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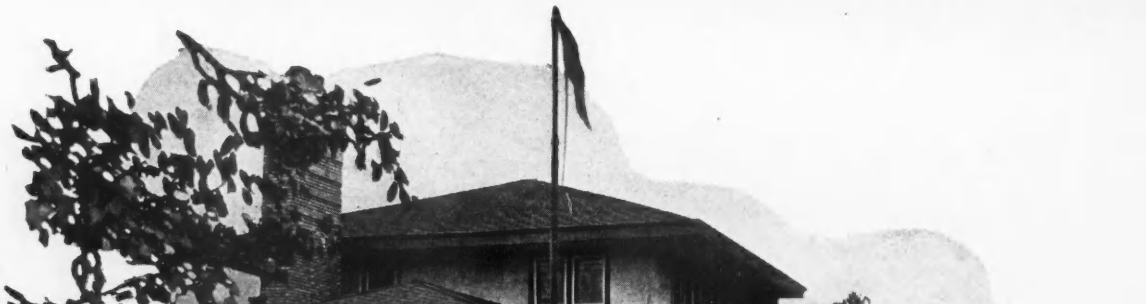

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KRAGSTONE

The STUCCO BEAUTIFUL

Short Talks by the Editor

All The Traffic Will Bear

NEVER was there a more fallacious economic principle applied to business than that which calls for merchandising at the maximum price the traffic will bear regardless of fair return or actual worth. That this has been proved beyond the slightest shadow of a doubt is shown by the events of last year. From an orgy of extravagance, a spree of spending, the country has settled back morosely into a sulk and the very merchants who last year advocated these methods are now loudest in their cries for help.

Hypnotized by the glitter of the gold that flowed into the coffers without end, they lost sight of the true principles of business and are now paying the penalty. To endure business must be conducted on fair and honest principles.

The building industry is no exception to this rule. While it has been remarkably free from such practices there are some members who are not entirely innocent. Moreover, there are certain unwritten laws, gentlemen's agreements and the like in some localities that threaten to undermine the confidence which honest and fair dealing has instilled in the public at large. These agreements must be scrapped. There is no place for waste, dishonesty and graft in the building profession. They only serve to increase the burden of the poor man who is trying to build a small home and add to the bill which he can ill afford to pay. Once these malodorous features are removed there is little doubt of a quickening in the resumption of activity. Even the best of homes must undergo a housecleaning once a season.

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Bank Cooperation Needed

WITHOUT doubt Senator William E. Calder of New York, chairman of the Committee on Reconstruction, knows as much, if not more, about the housing situation than any other individual. He has made a thoro investigation of conditions in every section of the country and has had excellent opportunity to form some positive conclusions. Therefore when he addressed a convention of real estate men at Chicago the other day, what he had to say should be of vital importance to every building contractor and architect.

Failure of the banks to use the savings deposits of the American people to help finance their homebuilding, he declared, was one of the chief causes of the present nationwide housing shortage. Only 8% of the $2,000,000,000 savings deposits are now being used for real estate loans while 92% is being used for commercial loans.

In his opinion 50% of this money should be used for building.

"It would be far better to use the savings of the people when necessary to build their homes than it would be to permit this money to be loaned for speculation and commercial purposes and then attempt thru special tax exemptions and subsidies to get it back into normal uses."

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Getting Results

WHEN we went down to Jersey City recently to see an event of international importance, we saw something else which interested us as much as the actual show. It was the wonderful stadium which had been erected in record time to hold a crowd of 90,000 people. Without a doubt it represents one of the achievements of the building industry, but above all, it demonstrates beyond question the value of power machinery on the job and its superiority over manual labor.

Called upon to complete this stupendous construction project in a space of six weeks, a task that required 2,000,000 feet of lumber, the contractor put into action the best power machinery he could get. He not only wanted to save time but expense. Were it not for the use of modern labor saving building machinery and equipment this arena would not have been ready on time and a tremendous amount of money would have been lost.

Builders and contractors thruout the country should be vitally interested in this very interesting work as each and every one of them is called upon at all times to cut down expense and delay on his building jobs. The progressive builder has modern equipment. That is one of the big reasons why he gets the business. We are living in an age of speed and only those who can keep up the pace will share in the rewards. This New Jersey contractor was called upon to perform a mighty task and was found not wanting. Will you be able to say the same if confronted with a similar proposition?

He's Wasting His Time Here!
—Bome in Asheville, N. C., Citizen.

Prepare for a Fall Offensive!

AMERICAN BUILDER OFFERS A NEW SERIES OF BEAUTIFUL BLUE RIBBON HOMES FOR SALES AMMUNITION

YES, we agree with you that the weather is hot; hotter than it has been for many years. It's pretty hard to keep on the job when the perspiration is rolling down in streams and the little heat devils are playing a merry tat-ta-tat on your ambition. The cool breezes of some distant lake or fishing haunt are a mighty temptation.

But—we are not going fishing this year; that is, game fishing. We've decided that this is the logical time to go after some business, and in spite of the heat, the temptations and the lassitude which threaten to while us away from serious thoughts, we are doing it. Can you say the same? Are you doing anything to make this fall one of the busiest in your history? There is no reason why it should not be—the boys are all back on the job, in fact there is less conflict in the building industry now than any time during the last three years.

We've had our big spree and the inevitable sick headache that follows such dissipation, and now we are beginning to feel like we did before the war—full of hope, energy and action. All spring things were in the doldrums, but there is a change in the air. Have you noticed? Get up early some morning and take a good sniff!

Well the hotter it got, the more we thought, and we finally concluded there would be nothing more appropriate to offer our readers than plenty of popular artistic, substantial and comfortable home designs.

Blue Ribbon Homes!

Because these are the best types we have called them the Blue Ribbon Homes. They are to be built of all kinds of material and are designed to accommodate all sizes of families. Bungalows, cottages, story-and-a-half houses, square homes, English homes, and many others—a variety that you will need in pushing this fall's building program.

For there is going to be a busy building season from now on. Costs are being adjusted, labor troubles settled and business in general is gradually getting hold once more. We have passed thru a very trying period, inevitable after a costly war, and now we are ready for another stimulating, constructive and profitable era.

June was a month of price and wage adjustments. Considerable progress was made and much of the hesitancy that has been holding back prospective home builders has been removed.

"America has turned the corner in the present financial depression and 80 per cent of Americans are trying to get back to normalcy in their living, spending and buying," said Herbert Hoover, Secretary of Commerce, in an address to the real estate men of America gathered in convention at Chicago this month.

"Nearly 60 per cent of our population are living as tenants, a larger rate than in most countries. If we are to build up the stability and happiness of our people this is just the reverse of what should happen."

More homes and more home-owners are the essential need of the country. The AMERICAN BUILDER believes that a boom in home building will stimulate business in all lines. Demand for building materials will keep the mills and factories busy and provide employment for thousands of people. Incidentally construction work will attract thousands more from temporary pursuits and put men back in their regular work.

"My right and left are smashed, I am attacking in the center," was the terse message of Foch to headquarters in the first battle of the Marne. Confidence! That is what turned this mighty battle of all ages from defeat into victory. In this period of readjustment and reconstruction confidence will help more than all the artificial means to hasten the country back to normalcy—back to genuine, rock bottom prosperity. Confidence will enable the building industry to carry its share of the program to a successful conclusion. Confidence is the magic potion that turns rentpayers into homeowners.

Peace is in the air. Five of the largest nations in the world have signified not only their willingness but eagerness to disarm. Peoples who have fought for centuries are now sitting at the conference table and talking harmony and future co-operation. With peace comes prosperity. They are inevitable associates. Wage adjustments, price changes, are all being handled with this same saneness of mind and give-and-take attitude that spells ultimate satisfaction and presages a healthy resumption of all lines of business activity. In this work of readjustment and reconstruction the building industry will not be among the laggards but rather far out in the lead.

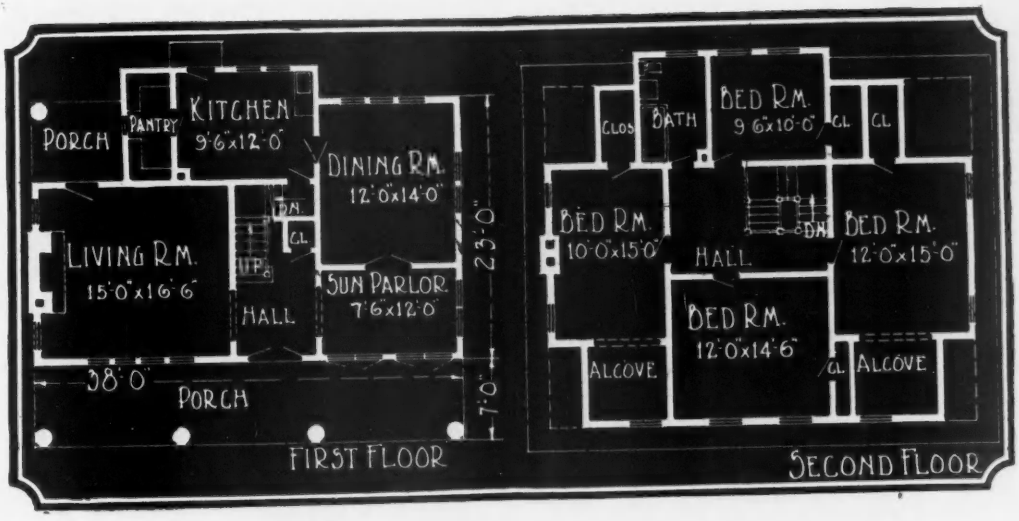
"My right and left are smashed, I am attacking in the center," was the terse message of Foch, in the first battle of the Marne. He was not dismayed by the onslaught on either side, but took the initiative and turned the defeat into victory. What we need is a little more of Foch's confidence.

✣

OWNERS making interior alterations or additions to buildings should be encouraged to have this work done in the "off-peak" season. Old buildings should be demolished in the cold weather to make way for the new construction, and not (as is so often the case) at the time when the new building itself might be under way.

BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



MODIFIED COLONIAL DESIGN OF VERY PLEASING EFFECT. It is quite a treat to be able to show on this page such an all-around charming and cozy home as this delightful stucco and shingled sided house. It has a most appealing and hospitable appearance with a touch of that quaintness of the early architecture of this country that never loses its attraction. The white porch columns, broad roof dormers, shuttered windows and overhanging roof are features that add immensely to its inherent charm. This home contains seven rooms of good size and a sun parlor. The living room is large and roomy, fitted with the customary open fireplace, and all rooms are excellently lighted. The kitchen is small but complete. Four bedrooms are located on the upper floor. The house is 38 feet wide and 23 feet long, not including the front porch, which is 7 feet deep.

Getting Publicity for the Builder

SEVERAL SUGGESTIONS FOR STIMULATING BUILDING BUSINESS IN YOUR TOWN

By Frank H. Williams

PUBLICITY is a good thing for a builder's business when such publicity is of the right character. Publicity draws the attention of the general public to the things the builder is doing, makes the public talk about the builder and, therefore, makes the public feel like patronizing him when in the market for any of the sort of work which he is doing.

But comparatively few builders feel like engaging in the trouble and expense of a regular newspaper campaign and most builders when they want publicity to help their business, want it to be quick and particularly effective.

This being the case it might be well for those builders who do realize the value of publicity and who want to use it when the occasion arises, to consider some of the ways in which effective publicity can be quickly obtained. It is the purpose of this article to suggest some of the methods by which such publicity could be secured and it is hoped that from this article builders will secure pointers which will prove to be of real aid to them in their business.

Suppose that A. B. Smith, builder, unexpectedly realizes that competition has become exceedingly keen and that definite inroads are being made upon his business. And he feels that he must do something quickly to recover lost ground and to gain the increase in his business which should normally have come to him.

And suppose that Mr. Smith, after considering the proposition carefully, compiles a list of the women club members in the city. He does this by securing programs of the various local women's clubs and by taking from each program the list of members which is always printed by club women in their annual programs. Then he sends to this list of women a circular letter reading somewhat like this:

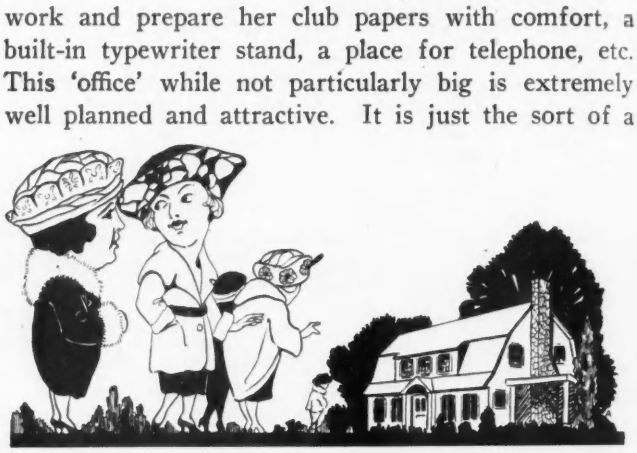
"Dear Madam:

"The club women of this city are notably progressive and alert to the trend of the times. They are always in the forefront in giving their endorsement to any advancement in civic affairs or in other lines.

Interest the Newlyweds by Offering Prizes for Home Sugestions, These Prizes to Apply as Payments on a Home.

Consequently the club women of this city will undoubtedly be tremendously interested in a distinct innovation in home construction which we have embodied in a new home we are constructing on Sunshine Hill, in the new Lakeside addition.

"In this new home, in addition to the customary 'den' for the man of the house, we have incorporated an 'office' for the woman of the house. In this 'office' are built-in bookshelves for her books, a built-in, commodious desk which is big enough to enable her to work and prepare her club papers with comfort, a built-in typewriter stand, a place for telephone, etc. This 'office' while not particularly big is extremely well planned and attractive. It is just the sort of a



Get the Club Women Interested in Your Work. Their Names Add Considerable Prestige to Any Project and Attract Business.

thing that every progressive, modern woman has longed to have in her home.

"We want all the club women of the city to see this new home with its 'office' and for this reason have planned special open-house days all day next week. Notice on the attached card the day upon which *your* club is especially invited to inspect this house. A woman attendant will be on hand to explain things exactly, carnations will be distributed to visitors and as the 'office' has been fitted up with rugs and furniture especially for open-house week, you can see exactly how the 'office' will look after the home is occupied.

"This is a personal invitation to you to be present at this event and we hope you take advantage of this opportunity. A. B. SMITH, Builder."

Wouldn't such a letter and such a striking innovation in home construction arouse the interest of every woman to whom the letter was sent? And wouldn't all this tend to make the women of the city talk about Mr. Smith as well as tend to bring more business to him?

The way to get publicity is by doing something unusually interesting and then by telling just as many people as possible about it.

In the event of some such stunt as the foregoing being used, additional publicity could be secured by telling the newspapers about the stunt and by getting them to run stories speculating as to whether or not

woman's new duties, now that she has become a voter and has assumed so much more importance in civic life, etc., don't demand some such fundamental change in home building construction. Also after the special exhibition days for the club women of the city an open house could be held for all the other women and this would give further publicity to the affair.

Or suppose that Mr. Smith has plans made for a particularly attractive home which he calls "The Newlyweds' Home." And suppose that he has cuts made of the plans for this home and publishes these in newspaper advertising together with some copy reading like this:

"ONLY NEWLYWEDS WHO HAVE BEEN MARRIED WITHIN A YEAR CAN COMPETE IN THIS, OR COUPLES WHO WILL BE MARRIED WITHIN THE NEXT SIX MONTHS.

"We will give $100 to the first newlywed or engaged couple who purchase this house.

"We will give $10 to *anyone* who can make a practical and real suggestion for improving the plans for this house.

"The preparation of the plans for this house involved a tremendous amount of time and thought. We feel that this house is one of the best laid out little homes that has ever been planned. But, of course, nothing is ever so good but what it can be improved upon. So, before we start building this house, we want to get all the suggestions we can as to improvements which might be made to it.

"Send in *your* idea. It will cost you nothing to try and you may win $10.

"Remember—we will give the $100 only to the newlyweds or engaged couple who buy the house.

"But anyone, married or single, is entitled to try for $10 by sending in a suggestion for improving the house. A. B. SMITH, Builder."

Everybody likes to try to get something for nothing. Nearly everybody, too, feels that he could draw up plans for a home which would be the best ever. So a contest of this sort would prove to be very popular. And the offer to give newlyweds who purchase the home a credit of $100 on the purchase price would create a lot of attention and make folks talk about the house. All of which would bring a lot of publicity to Mr. Smith and tend to make his business grow in the way that it should grow.

The builder has exceptional opportunities for securing publicity because of the very nature of his business. Good-looking homes, unusual homes and interesting buildings of all kinds invariably create a lot of talk whenever the attention of the public is directed to them. And it is a very easy matter for the builder to do a little different thing in building in order to create such talk and secure the resulting valuable publicity.

Publicity, as has been said before, is a mighty good thing for the builder providing it is the right sort of publicity.

Get the right sort of publicity for *your* business *now!*

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Great Cities Show Decrease in Horses

FIGURES showing the rapid decrease of horses in centers of population such as Chicago and New York are rather startling.

In Chicago, for instance, the decrease is dramatically shown in a comparison of the number of licenses granted for horse-drawn vehicles during the past five years. The figures are as follows:

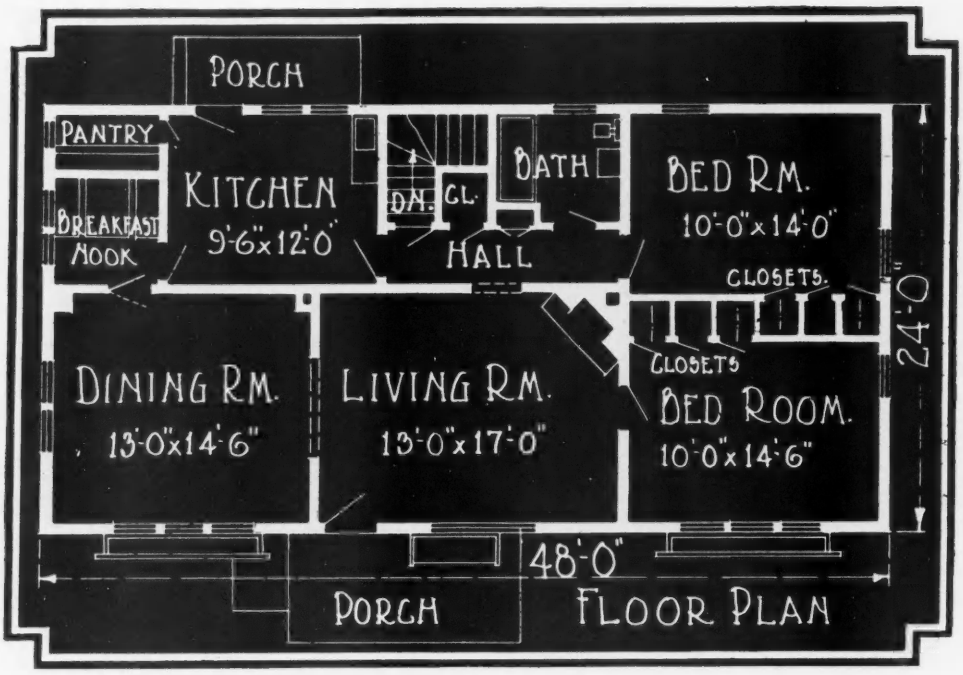
1914	70,843
1915	67,385
1916	63,803
1917	60,415
1918	51,793

From these figures it will be noted that there has been a decrease approximating 27 per cent in five years, and that 1918, a year which marked a sudden appreciation of commercial car service, due to the excessive demands placed upon all producers by the war, showed a net decrease of 8,622 horse-drawn vehicles over the year previous.

Are We Eventually Going to Become a Nation of Tenants? More Streets of Homes Like This Will Insure Prosperity and Stability. The Home Owner Is a Responsible Citizen.

BLUE RIBBON HOMES

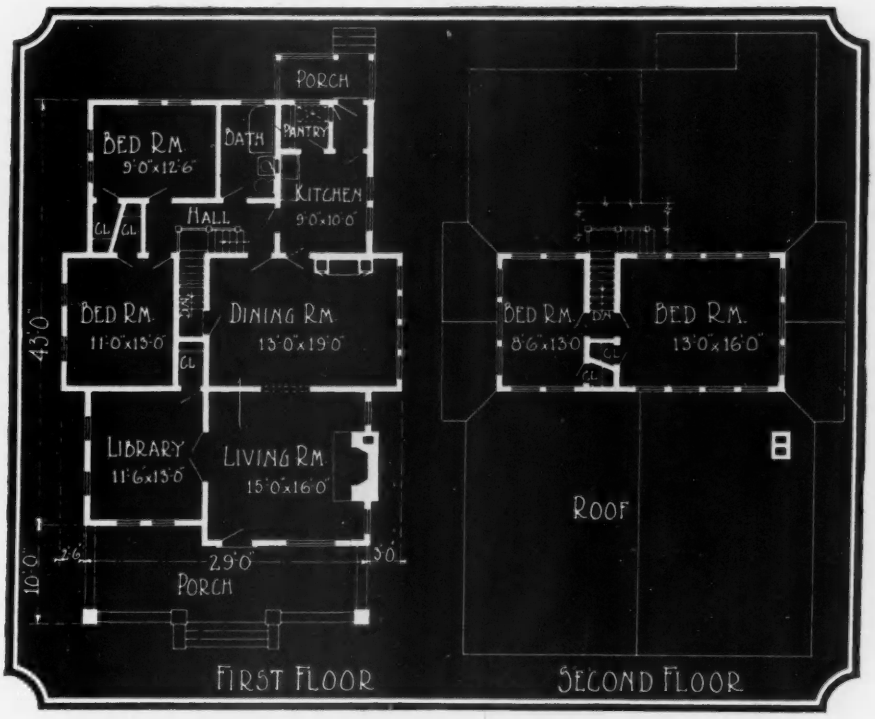
PRACTICAL & ARTISTIC



DELIGHTFULLY COZY WESTERN BUNGALOW OF DISTINCTIVE DESIGN. One of the wonders of the last decade has been the development of this type of d welling which first appeared on the sunny Western coast. It permits of a wide variety in design and room arrangement and is always charming in exterior appearance. This little bungalow has sides of wide shingles with artistic touches in the way of flower boxes, door trellis, and porch seats. The low gable roof gives a rakish effect which appeals to many people. There are five large rooms with an additional breakfast nook adjacent to the kitchen. The living room is 13 by 17 feet and has a fireplace in one corner. The bedrooms have been equipped with space-saving garment carriers which eliminate large closet space and give that space to the bedrooms proper. Size, 48 by 24 feet.

BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



"AIRPLANE" BUNGALOW DESIGN OF QUALITY AND APPEAL. In this age of airplanes, the effect is readily seen in more than one branch of endeavor. That perhaps accounts for its influence on architecture and the introduction of the so-called "airplane" bungalow. Here is a design of this type, a stucco structure of eight rooms, two of which form the upper deck which gives cause for the name. These upper rooms are bedrooms and are usually converted into sleeping porches in the summer time, having exposure on three sides. On the first floor are six rooms, conveniently grouped with sleeping rooms separated from the living rooms by a hall. The living room and dining room are both bright and cheerful rooms of good size. A library is also provided. This home is 29 by 43 feet.

Omaha's Three Hundred Little Concrete Homes

CAN BE ACQUIRED ON SMALL MONTHLY PAYMENT BASIS AND ARE ECONOMICAL IN COST—REAL AID TO WORKMEN OF SMALL MEANS

By A. J. R. CURTIS

ACCOMPANYING illustrations show the first of Omaha's 300 little concrete houses under construction by the Drake Realty Construction Company, nearing completion. While quite small in size they are long in quality. Every inch of space within is used to excellent advantage and the buildings are on large 50-foot lots close to transportation. The houses are spread out around the city, no more than three being placed side by side in any one location. They make a particular appeal to the wage earner of limited means who aspires to own his home, because they are designed to be economical, and very nearly maintenance free, and may be acquired on a small first payment.

These houses are in single and double units. The single houses are 21 feet by 31 feet in ground plan and contain living room, dining room, bedroom and bath, all on one floor. The double houses have two such apartments with floor plan reversed. The basements have concrete floors, and contain the hot-water heating plants.

The wall construction used for all of these houses is of double wall type, granite face concrete block thruout, laid in cement mortar. Exterior block on all four sides of the houses are surfaced with an attractive marble and granite aggregate giving the houses a very pleasing "faced" appearance from every direction. Sills, belt courses and coping are of white cement and marble finish. The first 15 houses have flat roofs covered with first quality composition roofing. Later houses have pitched roofs to be covered with asphaltic roofing, cement asbestos shingles or cement roofing tile at the option of the purchaser.

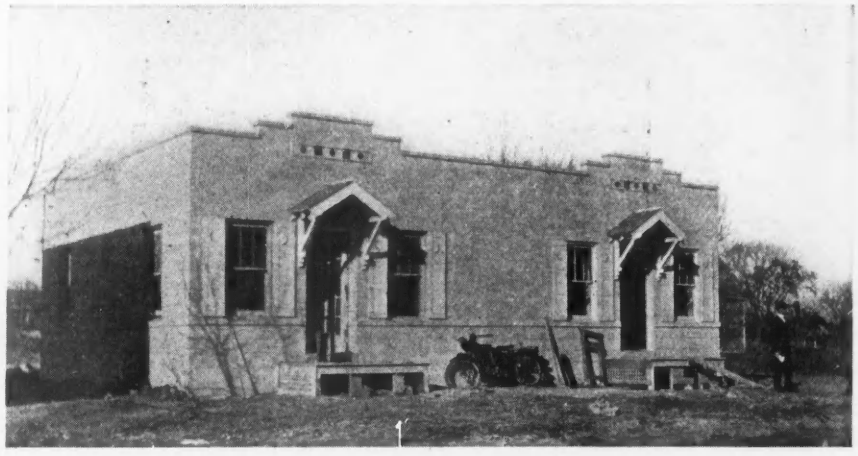


Fig. 1. A Two-Family Drake House in Omaha, Built of Granite-Faced Concrete Block. The Small Ornaments Above the Entranceways Are Terra Cotta Inserts. On the Exterior of This Building Porches Remain to Be Completed and Trellises Set in Place Between Front and Side Windows.

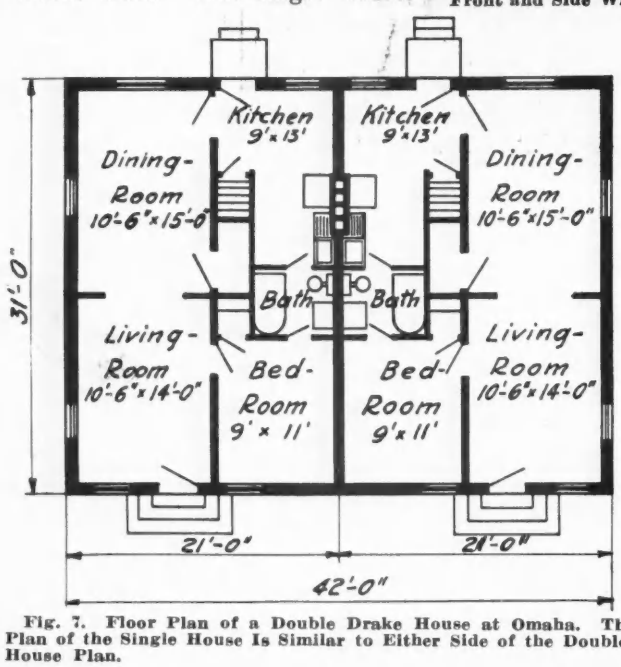


Fig. 7. Floor Plan of a Double Drake House at Omaha. The Plan of the Single House Is Similar to Either Side of the Double-House Plan.

Front windows have shutters and the front entrance has a canopy or full-width porch as desired. Several ornamental trellises are placed between windows for decorative purposes. The interior woodwork is of Georgia pine and the floors hardwood. The plaster is applied directly to the interior block wall and is given a sand float finish. Plumbing, lighting and other fixtures are modern and attractive.

These little houses are being sold on small monthly payments with an initial payment of $500. The single houses sell for $4,000 and the double houses for $7,000. The worker who buys the double house rents the spare apartment for more than the maximum interest charges and the owner applies on the payment of the principle practically the entire sum he would otherwise be paying out in rent. The houses are being dis-

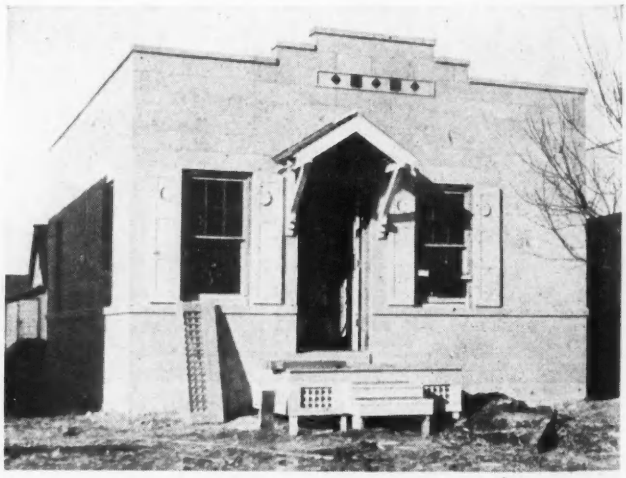


Fig. 2. A Single-Family Drake House Similar to the Double House Shown in Fig. 1. More Recent Houses of This Type, with Same Arrangement of the Rooms, Have Pitched Roofs.

Fig. 4. House Shown in Fig. 1 at an Earlier Stage in Its Construction. The Single Houses Contain About 2,300 Double Block, and the Walls Are Laid Up in Three to Four Days. The First House Was Started December 1, and Two or Three Houses Have Been Started Every Week Since.

posed of as rapidly as completed.

As a result of local interest in the successful building and selling plans of the builders, unsolicited inquiries recently reached them from Chicago and two other middle west cities looking to the construction of similar groups at these points.

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Piling Sacked Cement

WHEN cement in sacks is stored in high piles for a considerable time, there is a tendency for that in the lower sacks to "cake" due to pressure of the sacks above. Cement that has caked from this cause can be reconditioned by either rolling or dropping the sack on the floor.

Cement to be stored for a short time only may be piled 12 to 15 sacks high, but if to be stored for a long period, piles should not be more than 7 sacks high in order to minimize caking or "warehouse set."

The cement may be piled directly on concrete floor laid on a well tamped fill of cinders or gravel, or a floor elevated above ground.

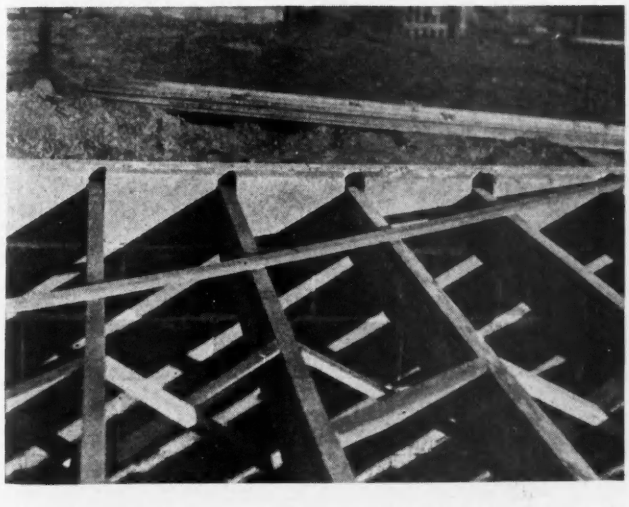

Fig. 5. Illustrating Well-Handled Detail in Construction of the Concrete Block Houses at Omaha. The Wooden Floor Joists Are Held Securely in Place and the Space Between Joists Neatly and Tightly Filled by the Use of Special Joist Block Which Are Substituted for the Regular Inside Wall Block at the Course Shown.

When storing for long periods in permanent structures, pile about one foot away from wall.

To lessen the danger of piles overturning, pile the sacks in headers and stretchers—that is, alternately lengthwise and crosswise so as to tie the piles together. However, if piles seven sacks high are laid up carefully there will be little danger of their overturning. This height of pile makes it easier to handle sacks in and out of the storage building because the hand-trucks used to move cement in the storehouse usually carry 7 sacks.

The capacity of a storehouse depends upon its floor area and the height to which sacks are piled. A sack of cement occupies a little over 2 square feet of floor space and about 1.25 cubic feet of volume space. If it is necessary to store a greater amount of cement on a given floor area, the height of pile can be increased to 14 or 15 sacks high. This is usually the maximum that can be laid up economically.

The space in the storage building should be sufficient to allow proper clearance between piles and building walls, and 3 feet for trucking aisles between piles. The different shipments should be so piled as to permit removal from storage in the same rotation as received.

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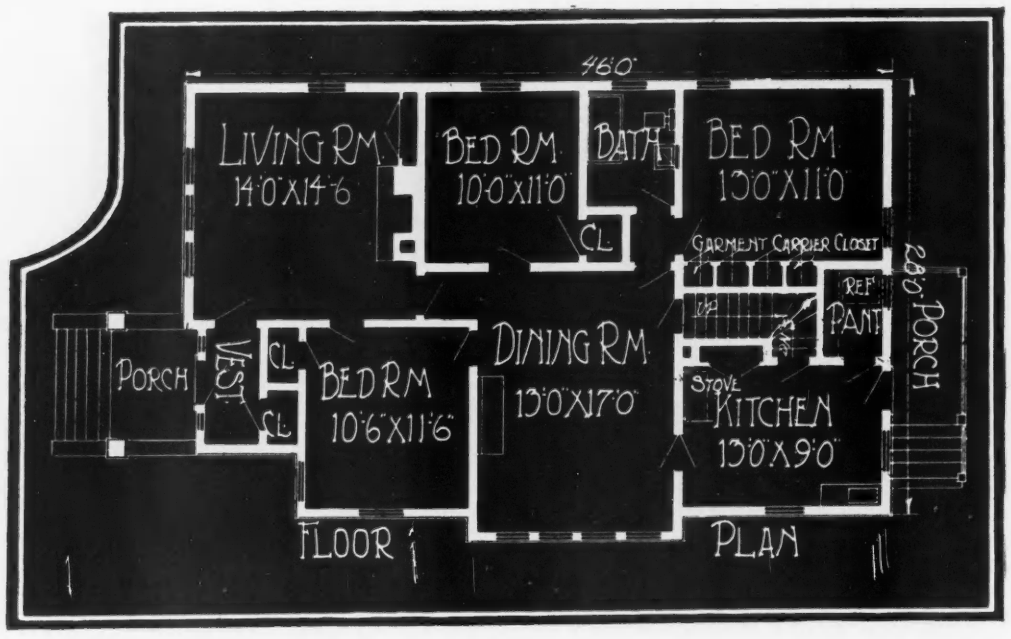
Stop Burning Up Homes

TODAY the housing problem is easily one of the great issues. All unnecessary construction was forbidden during the war, and now that the restrictions have been withdrawn the high prices of materials and labor and industrial troubles have tended to reduce the amount of building. In many industrial centers newcomers are unable to get houses to live in, rents have gone up, and the situation has become so serious that state and municipal commissions are seeking a solution

Why not stop burning up the existing buildings, if there are not enough to go around and more cannot be built under existing conditions? Thousands of homes are burned each month, most of them thru carelessness. If housing is so important, if homes are so hard to find, why not be careful with those that we have? Apply fire prevention methods. Be careful about matches, smoking, lighting and heating apparatus and gasoline. Clear out the rubbish, inspect the flues, watch the shingle roofs. Conservation is the order of the day, and if the shortage of dwellings will cause house-holders to be careful about the fire hazards of their homes one criminal cause of that shortage will be greatly reduced.

PRACTICAL & ARTISTIC

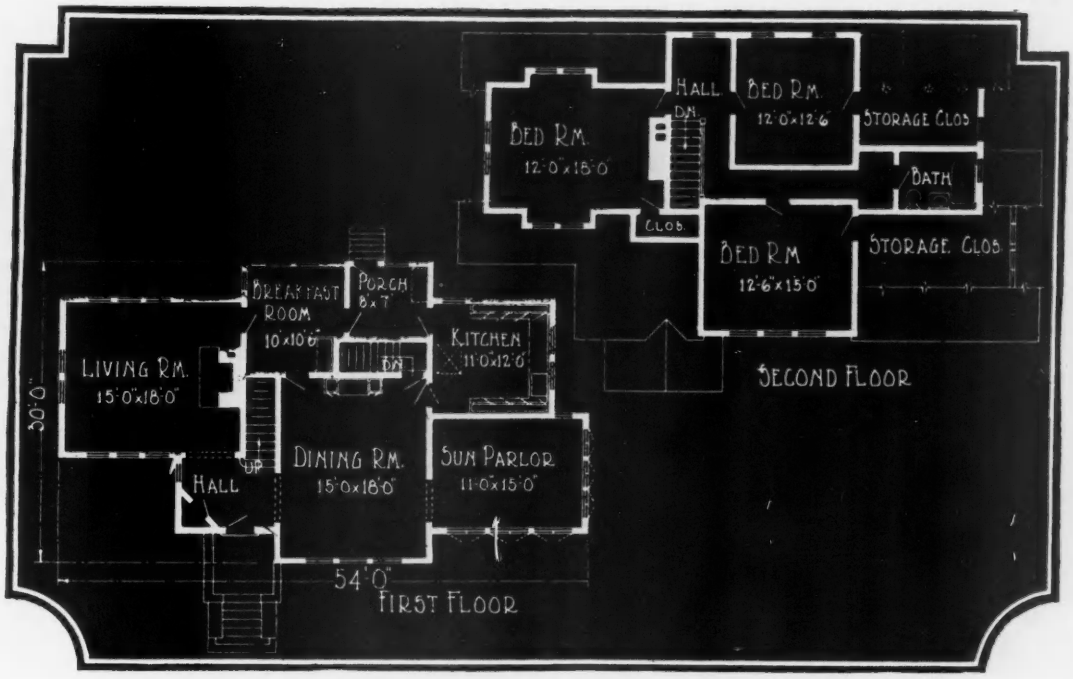
BLUE RIBBON HOMES



CHARMING SIX-ROOM HOUSE OF ORIENTAL DESIGN. The influence of the Far East architecture is readily seen in the pagoda porch and dormer roof of this stucco and brick house. They help to give the building an exotic and unusual appearance, a quality that will appeal to those who are in search of something different. It is a substantial house with brick foundation and hollow tile walls with stucco finish. The windows are well spaced and ample in number. There are six rooms in all, living room with open fireplace, dining room, three bedrooms and a modern kitchen with pantry and outdoor icing refrigerator. In the bedrooms space has been saved by the installation of garment carriers. Altho the half story is not used, it can very quickly be converted into living quarters in case extra bedrooms are needed. A well designed two car garage is at the rear of the site. Size of house, 28 by 46 feet.

BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



ATTRACTIVE AND "HOMEY" HOUSE OF ORIGINAL DESIGN. Rambling and spacious, this delightful dwelling is ideal from the standpoint of comfort and efficient room arrangement. There are six main rooms, three on each floor with a large, bright sun parlor and breakfast room on the first floor in addition. The house is built with the long dimension frontage and the living room is located in a wing, giving three sided exposure and plenty of window space. The exposed rafter effect on the roof, which is quite well broken up by dormers, is very artistic, as is the shingle siding stained to a rich brown color. The sun parlor is an important and welcome feature and something that will appeal to home builders. The dimensions of this house are 56 by 30 feet.

Are You Getting That Furnace Business?

HUNDREDS OF CONTRACTORS ARE MAKING GOOD SELLING FURNACES FOR THE HOMES THEY PLAN AND BUILD. WHY NOT YOU?

By Wm. B. Reedy

"BY-PRODUCTS are the most successful feature of most modern businesses," remarked Y. I. Wynne, successful manufacturer, who took a keen interest in the weekly luncheons of the business men in the town.

"When the packers first went into business," he continued, seeing that the others were interested, "they confined their efforts to killing animals for food. Beyond that they were not interested. By-products were thrown away and burned up. But as the business developed they came to recognize the profit that lay in these very products they were throwing away and the by-product busness was started. Today it is the most profitable branch of their business."

"That is very good as far as it goes," spoke up Jones, builder and contractor, "but I don't see how it applies to my business."

"On the contrary," answered Wynne with a smile, "the building business is an excellent example in point. There is no reason why the contractor cannot apply

Get the Furnace Contract in That New Home You Are Building.

the experience of the industry to his own. Most builders think their work is confined to actual building. But is it? There are by-products which he can turn into profit. He should not have all his eggs in one basket.

"Take the furnace, for instance. What is more reasonable to assume than the builder as a salesman of furnaces as a sideline to his contracting business? He is the logical man because it is upon his advice and suggestions that the prospective homeowner installs a furnace. Very often in the original plans the client may not have intended to have a heating plant, but, due to the influence of the builder, consents. As a link between the manufacturer and the ultimate user the contractor and builder looms up as an important figure."

"You know, I never thought of it from that angle," said the contractor brightening up perceptibly. "You have given me an idea that I am going to put to work this afternoon. John White is planning on a new home and I know I can sell him on the furnace idea."

And as it transpired Jones sold White a furnace.

He was like many others who had never thought of it before. In many towns the contractor and builder is the sole counsel and advisor of people who are planning new homes. It is up to him to suggest features that will make the home just as comfortable and attractive as possible, because if it does not work out this way, the contractor will be called upon to explain. Therefore it is to his advantage to convince the client that he should have modern improvements, one of the most important of which is an efficient heating plant. As the recognized agent of the manufacturer he will be able to talk with intelligence.

The plane of living of the American people has rapidly risen in the last few years. Whether he believes it or not, the builder is an instrumental factor in bringing about this result. He has introduced and installed in homes new devices and features that make homelife infinitely more pleasant and comfortable, and in giving these results the furnace has by no means been unimportant. Today the house without a furnace or heating plant of some kind is the exception. Farmers have been shown where this item in their home is one of the best additions they can make and in most cases only thru convincing argument by the contractor and dealer.

Satisfaction is the one sure foundation upon which to build success in any line of business. It is, therefore, quite important that the builder who wants to make a specialty of furnaces should pick out a line that will give this satisfaction to his customers. He should try to link up with a line that has a long standing reputation and a definite standard of value, and with manufacturers who have a reputation and are keen to maintain it because they realize a good reputation is the most valuable asset they can have. Such manufacturers will not put out inferior goods because they are jealous of their good name and they will be on the alert to improve their product. The line of furnaces which has the reputation and the confidence of a large list of users is the one to push.

It never has paid to push an inferior line of goods. The development of the pipeless furnace within the last few years has only increased the importance of this field to the contractor and builder. The builder of every new home as well as the owner of any residence, store, church or any other kind of building adapted for this type of heating is a logical prospect for a furnace. There are probably a score of live prospects in your community. They have been dependent upon mail order catalogs for their equipment. Why not show them the advantages of a reputable furnace of quality manufacture?

Every building that you build must have a heating system of some kind. Many of these owners are not acquainted with the advantages of this type of heating plant available for such a reasonable amount and it

will not take much argument to have them replace their present inadequate system.

You are the man who is on the ground floor on the furnace proposition. What are you doing to take advantage of your position? The manufacturers are only too glad to establish reputable agents in towns and they know your influence.

Brisk building operations always mean a big furnace business. With a busy fall building program in prospect, are you ready to take advantage of this opportunity? Building activity today will mean more for the furnace dealer and contractor who handles furnaces today than it did before the war because people who build new homes will not be satisfied with stove heating. During the prosperous war years they have become accustomed to the comforts of a heating plant. When they build their new home they will insist on one. If you have an agency for a reliable furnace concern the profit from the sale will be yours without much trouble.

Beware of the fallacy of price. "Skinning on the job is no longer tolerated by architects and reputable contractors." Service is the first consideration and the homeowner will not quibble over price when this is assured. By installing a cheap furnace a contractor only cuts off his nose to spite his face. Sooner or later this cheaper product will cause trouble and the blame will revert back to the contractor with the resulting loss in his own reputation and confidence on the part of his clients.

One of the biggest sources of business for the contractor, especially in the so-called new-old business, is the farmer. After a harvest he generally makes plans for improvements in his home and invariably one of the first items that come to his mind is the furnace—he is thinking of the winter that is soon to start. The alert contractor can catch him at this opportune time. Look over your list now and see if any of them are in line for a new heating plant.

(Editor's Note: This is the first of series of articles on how contractors and builders can make money selling furnaces. In following issues will appear stories of builders who have actually made a success in this work. They will tell you how it was done.)

Law for the Builder

JUDICIAL CONSTRUCTION OF BUILDING CONTRACTS WHICH PROVIDE FOR DAMAGES IN CASE THE CONTRACT IS NOT COMPLETED WITHIN A CERTAIN TIME

By Leslie Childs

IN THE execution of a building contract, where time is of importance, a clause designating the time to be consumed in completing the work is frequently inserted. And, to give this force, such contract may carry a stipulation to the effect that the contractor shall forfeit, or pay, a certain sum each day, after the agreed date, in the event he fails to complete the work on time.

Generally speaking, such stipulations are valid and will be enforced if the provisions in them are reasonable in the light of other conditions of the contract. In other words, by the weight of opinion the courts have not quarreled with such a contract as a contract. They have, however, quite generally declined to enforce them where the evidence showed that the agreed damages were in reality a penalty.

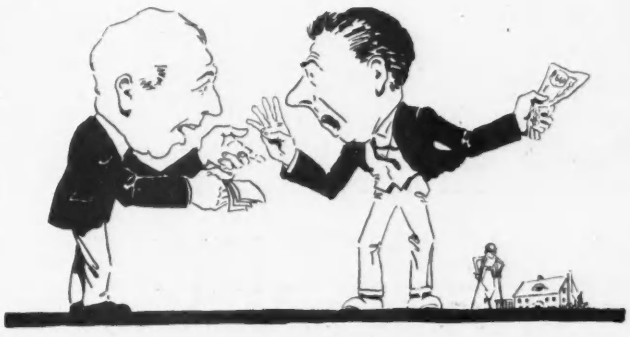
However, it seems that the rule followed by the weight of authority may best be illustrated by a brief review of a leading case on each side of the question. That is a case in which the provisions for damages have been held reasonable and enforceable, followed by one in which the damages agreed upon were held to be a penalty. As an example of the first named line of cases Crawford vs. Heatwole, 110 Va. 358, 66 S. E. 46, will serve. The facts in the case were in the main as follows:

Building Contract Provided Damages for Failure to Complete on Time

A contract for the erection of a dwelling house was entered into in which it was stipulated that for each day the work was incomplete, after a certain date, the contractors should pay the other ten dollars. The building was to cost $5,400, and the contractors failed to complete same until sixty-six days after the time specified in the contract.

Thereafter in a suit to enforce payment the owner paid into court the amount admitted to be due, but withheld the sum of $660 as liquidated damages, contending that according to the contract this amount was due him for the time he had been kept from the use of the dwelling house, after it should have been completed.

On appeal to the Supreme Court of Appeals it was among other things found that the total cost of the building was $7,000, $5,400 for the building and $1,600 for the lot, and that the rental value was $35 a month. It was also noted that the owner desired the building for a residence, that his wife was in delicate health, and they were living in a boarding house,

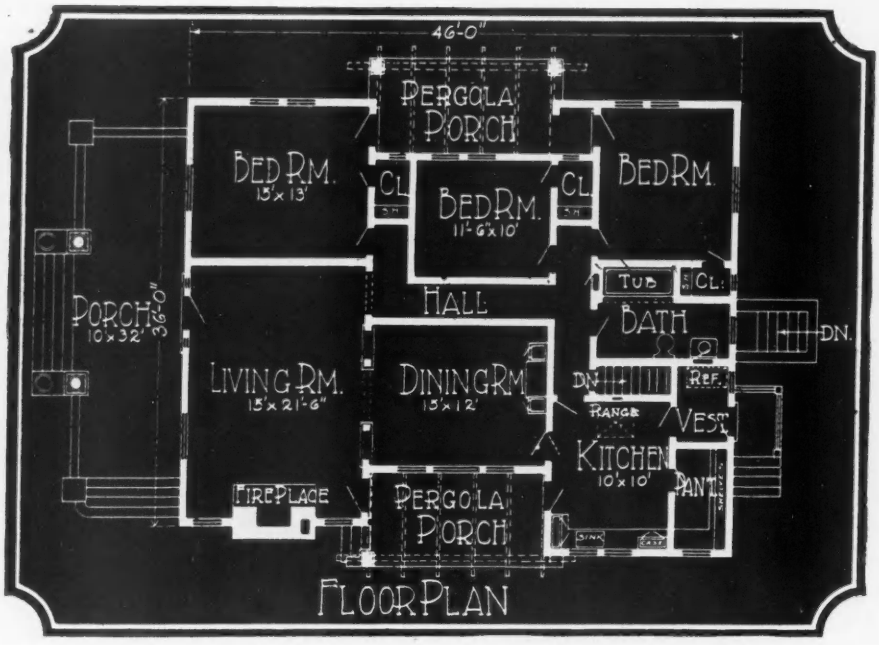


The Contractor Was Sixty-Six Days Late in Completing the House. The Client Sued for Damages Because of Injury to Wife's Health and Clause in Contract.

(Continued to page 96.)

PRACTICAL & ARTISTIC

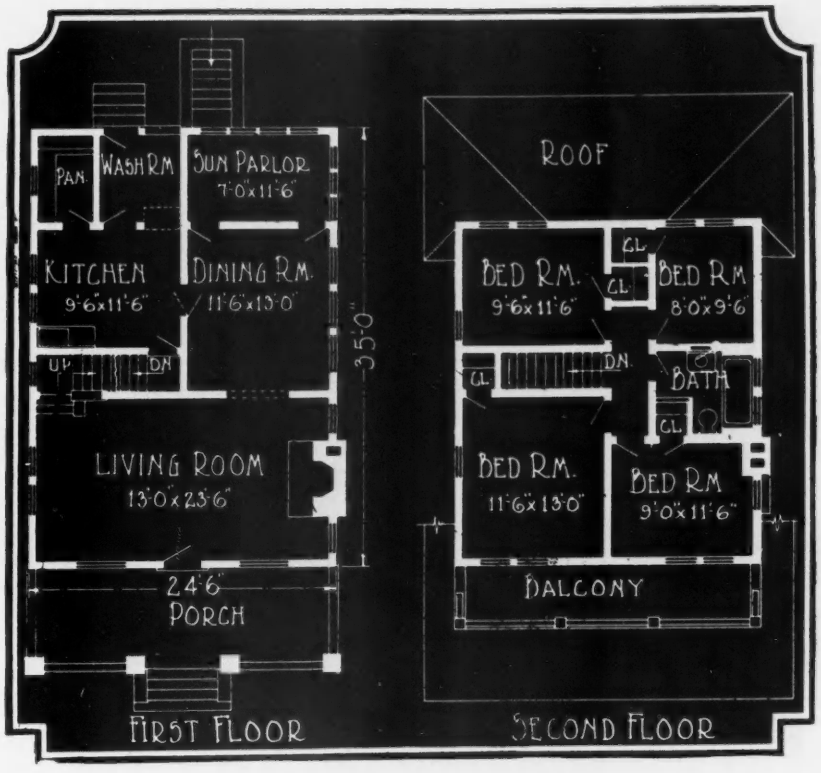
BLUE RIBBON HOMES



BUNGALOW DESIGN OF BEAUTY AND APPEAL. Go where you may, you will find the bungalow is constantly increasing in popularity. It insures privacy and individuality, two features which most homebuilders demand. At the same time it accomplishes this at a very surprising economy in cost. This home is built of frame with concrete foundation steps and porch floors. It is substantial thruout as evidenced by the sturdy columns and porch rails, and massive chimney. There are six rooms, three bedrooms grouped at one side of the house about a central hall with living rooms occupying the other side. The small pergola porch on the side is an enhancing feature and provides direct access to the kitchen without passing thru the other rooms. The large living room with fireplace is prerequisite to the bungalow home. In size, the dwelling is 36 by 46 feet.

BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



BEAUTIFUL ENGLISH HALF-TIMBER HOUSE. This well-built artistically designed home will appeal to the man of family who needs a good-sized home with plenty of bedrooms and a large yard for the children. Th are seven rooms in this house as well as sun parlor and wash room on the first floor. It is also an excellent farm home. Extending across the front of the house is a broad screened in porch while above in front of the front roof dormer is a balcony with artistic rail. The living room is a real place for recreation, 13 by 23 feet 6 inches with windows on three sides and a fireplace that burns. The dining room is placed conveniently close to the kitchen which is small and well equipped with built-in features. There are four bedrooms on the second floor and a high attic that can be used if necessary. The house is 24 feet 6 inches wide and 35 feet long.

Building in the Philippines

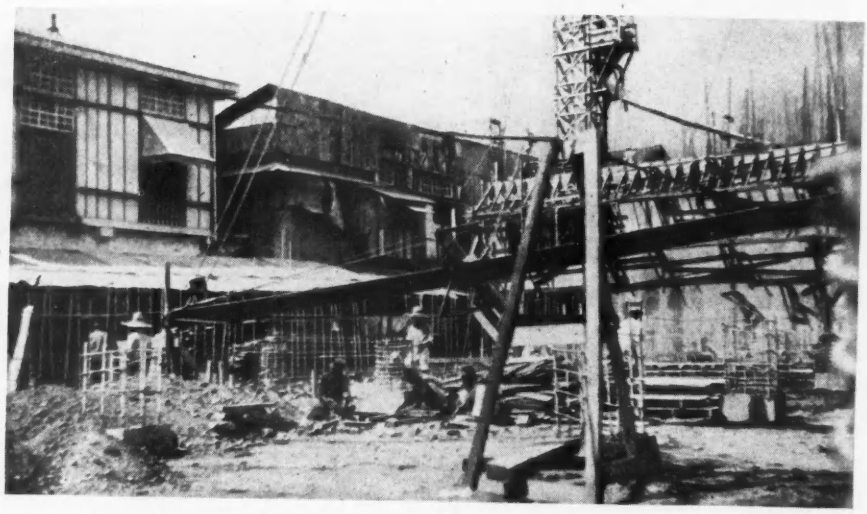
DESPITE LOW LABOR COST, BUILDERS FIND AMERICAN CONTRUCTION MACHINERY ECONOMICAL

By Wm. A. Radford, Jr.

LABOR troubles, as we know them here at home, are practically unknown in the Philippines. However, they have much trouble with labor. The average Filipino laborer is about one-tenth as efficient as an American doing the same sort of work. But as these men are paid in just about that proportion, it works out so that construction costs in the Philippines are about the same as in the United States.

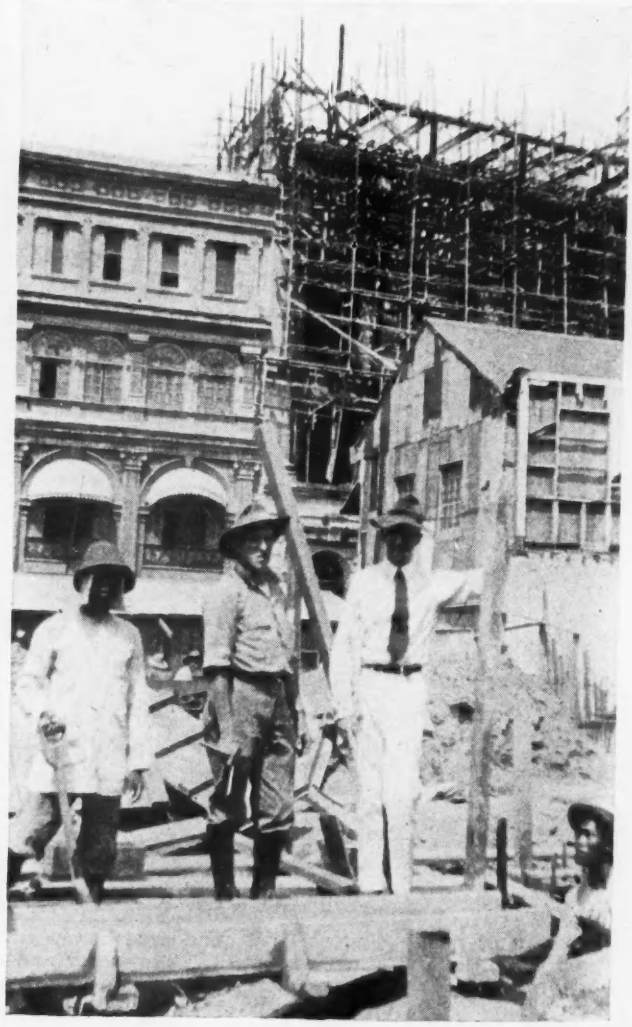
When labor is cheap and plentiful it is usually considered economy to employ men instead of machines. This theory is disproved by the building operations I observed in Manila. As I have told AMERICAN BUILDER readers before, there are several large, modern, reinforced concrete buildings in the course of construction in Manila, and on all of them the contractors are using the most improved of American construction machinery. I was told that the saving made by this machinery was considerable.

During my stay in Manila last May I spent consider-



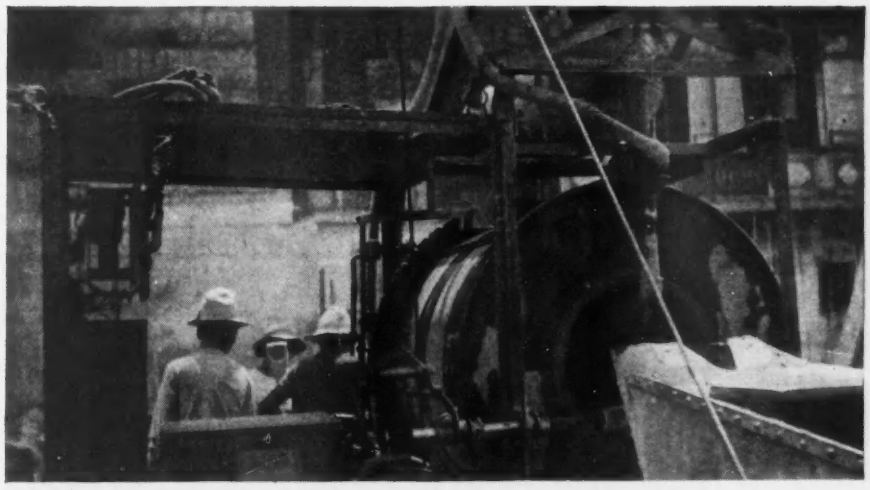
The Reinforcing Rods and the Concrete Hoist on the Pacific Commercial Co. Building, Manila.

Wm. A. Radford, Jr., in Front of Oriental Palace, Peking, China The Chinese in Uniform Is a Soldier in the National Army.

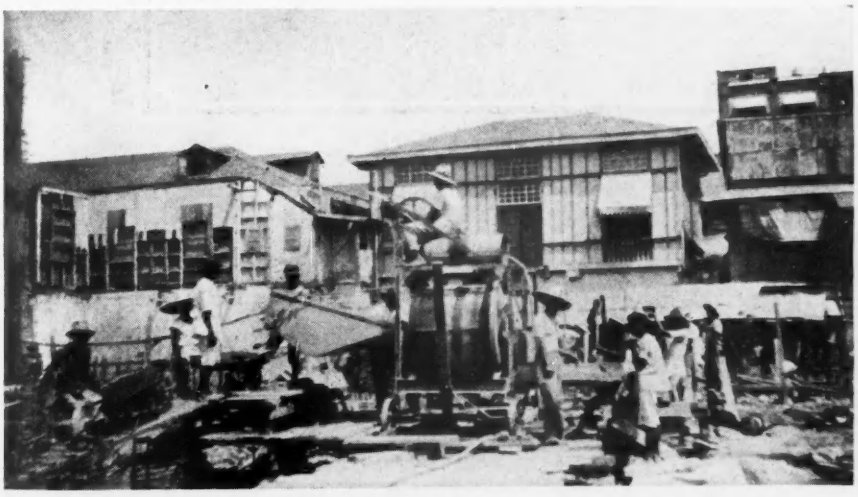


Two American Engineers on the Pacific Commercial Co. Building in Manila. They Are Using Modern Construction Machinery.

able time observing the building operations on the new concrete structure being erected for the Pacific Commercial Co. There were two Americans on the job—the construction engineer and the building foreman—and they were supervising the use of concrete mixers, concrete hoists and chutes, and other modern construction machinery, while natives were doing the actual labor. The building was going ahead rapidly, the speed obtained being in sharp contrast with a big bridge building project, supervised by natives. The bridge has been in the process of building for five years, and judging from what has been accomplished it will be another five years before it is finished. Several of the illustrations, reproduced herewith are of the Pacific Commercial Co. building, one on the first page being of Engineer Endsley and his foreman, the Americans in charge.



The Concrete Mixer Was Operated by Electricity and Turned Out Concrete Very Rapidly.



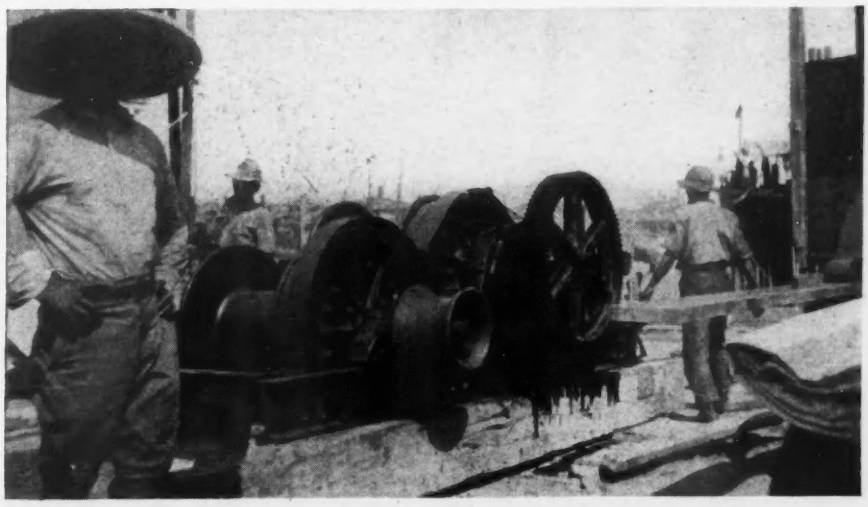
Another View of the Mixer in Use on the Pacific Commercial Co. Building.

The big concrete mixer, shown in one of the pictures, is stationed in the center of the building site. It is operated by an electric motor. Natives wheel the aggregates and cement to the loader, and the mixed concrete is dumped into the hoist buckets which carry it to a height sufficient to allow gravity to spout it to the concrete forms. It was surprising how rapidly the forms were being filled and the speed the men were making.

Two other similar buildings were being erected in Manila when I left. One is the new home of the Hong Kong and Shanghai bank and the other the Philippine bank. These buildings are six stories high and cover about a half block. The construction methods were practically identical with those used in the United States for similar buildings, with the exception that caissons were not used for the foundations, they being set on piles and one what is known as "raft" foundations of reinforced concrete.

Americans are making great changes in the appearance of the business section of Manila by the erection of buildings such as I have described. What appeared of greatest importance to me, however, was the fact that it pays to use modern, labor-saving construction machinery even tho labor is very cheap. ✣

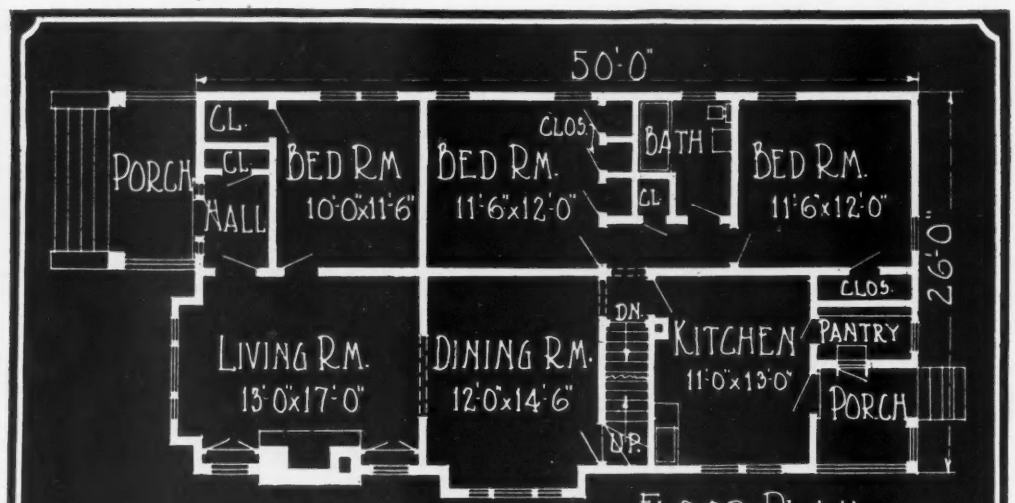
WHAT are you doing in your town to get the furnace business? Are you an agent for a reliable concern? If you have made a success of selling furnaces in connection with your regular business, tell us about it so that we can in turn give some helpful suggestions to some of your brother builders. Do you use a window display in your office? Send us the story.

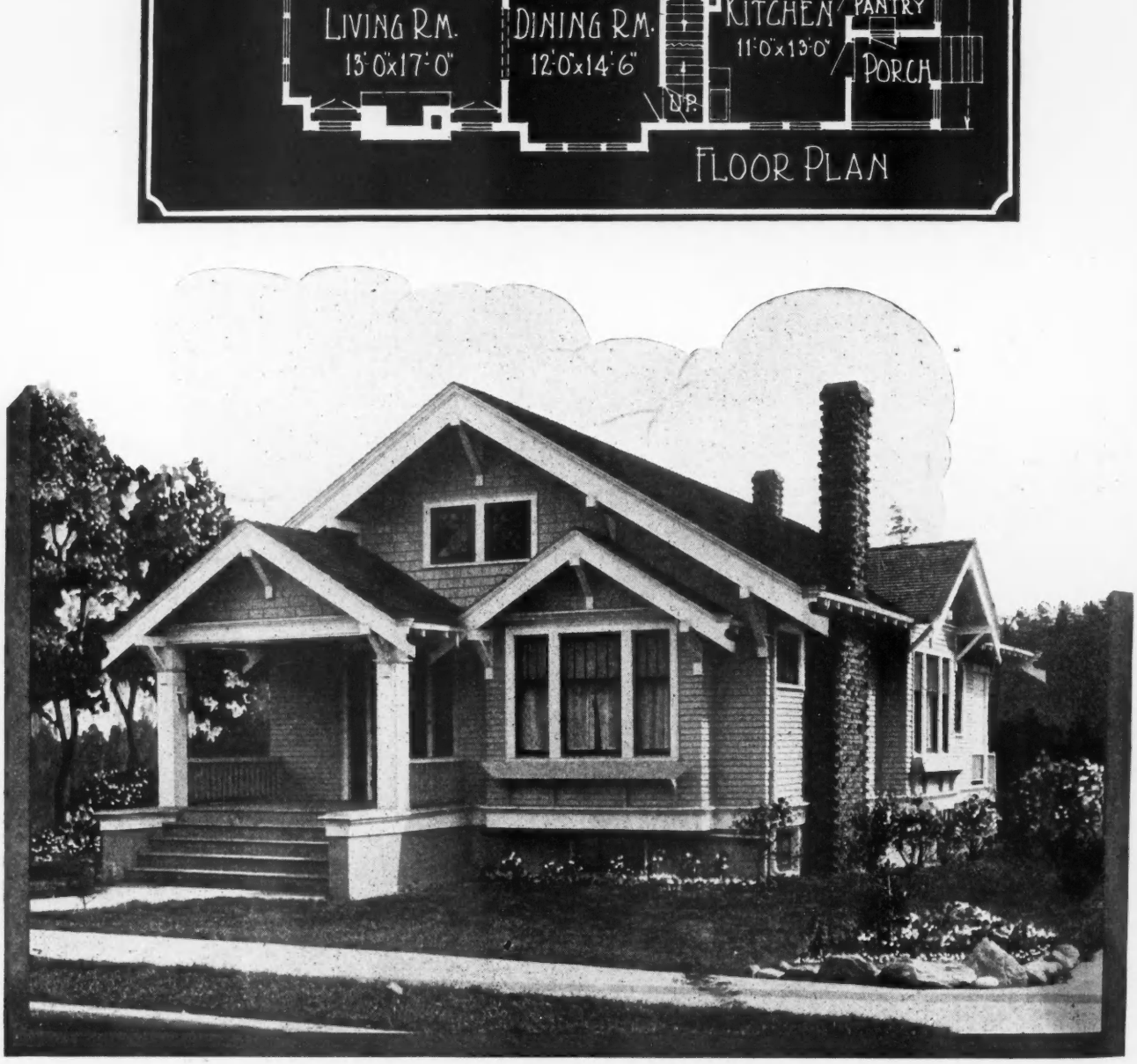


The American Hoist Used in the Pacific Commercial Co. Building at Manila.

PRACTICAL & ARTISTIC

BLUE RIBBON HOMES





COTTAGE TYPE BUNGALOW OF POPULAR DESIGN. There is nothing pretentious about this cozy little home, yet it is attractive and certainly homelike, a design that is bound to find a warm spot in the hearts of home builders of moderate means. Some features of the exterior trim that enhance the appearance of this home are the roof arches in front and the exposed rafters along the side eaves. The bay windows with gable hoods are also attractive and helpful. The floor plan calls for six rooms, three bedrooms, living, dining rooms, and kitchen. The house is set on a substantial concrete foundation. All of the rooms are of good size but not over large. This bungalow is 26 feet wide and 50 feet long.

Woman and the Home

Summer Porch Convenience

PORCH NOW AN EXTRA ROOM WITH COMFORTS—AN IDEAL OUTDOOR RETREAT IN HOT WEATHER

By Grace T. Hadley

The Society for Electrical Development, Inc.

TIME was when the family sat uncomfortably on a front porch in hard porch chairs armed with a palm-leaf fan with which to fight mosquitoes and other insects incident to a warm night. If the porch faced west and it was too warm to sit there the family gathered on the side stoop and sat there in varying degrees of discomfort until it was time to go in.

Porches are now more than mere entrances. They have been taken into the family life as a definite extra room by enclosing or screening the porch and equipping it with the essentials of an outdoor room. The first essential of the enclosed porch or outer living room is comfort and the first necessary thing to do is to screen it as a protection from insects; the next thing is to fit it with porch furniture of which there is such a pleasing variety and it should be provided with outlets for electric fan or table lamp. The porch should have at least one outlet in addition to the electric light outlet, placed about a foot above the floor so as to be protected from contact with water when the porch is washed.

Wicker ware or reed furniture, a swing couch hammock and plenty of gay cushions make the porch a pleasant place for the family to gather in the evening. When friends are entertained, there is a delightful informality about a comfortable living porch not rivalled by any indoor room. For the evening visits of friends, a soft cheery atmosphere is desirable and is supplied by table lamps, or floor lamps, or by lamps concealed in suspended wicker baskets.

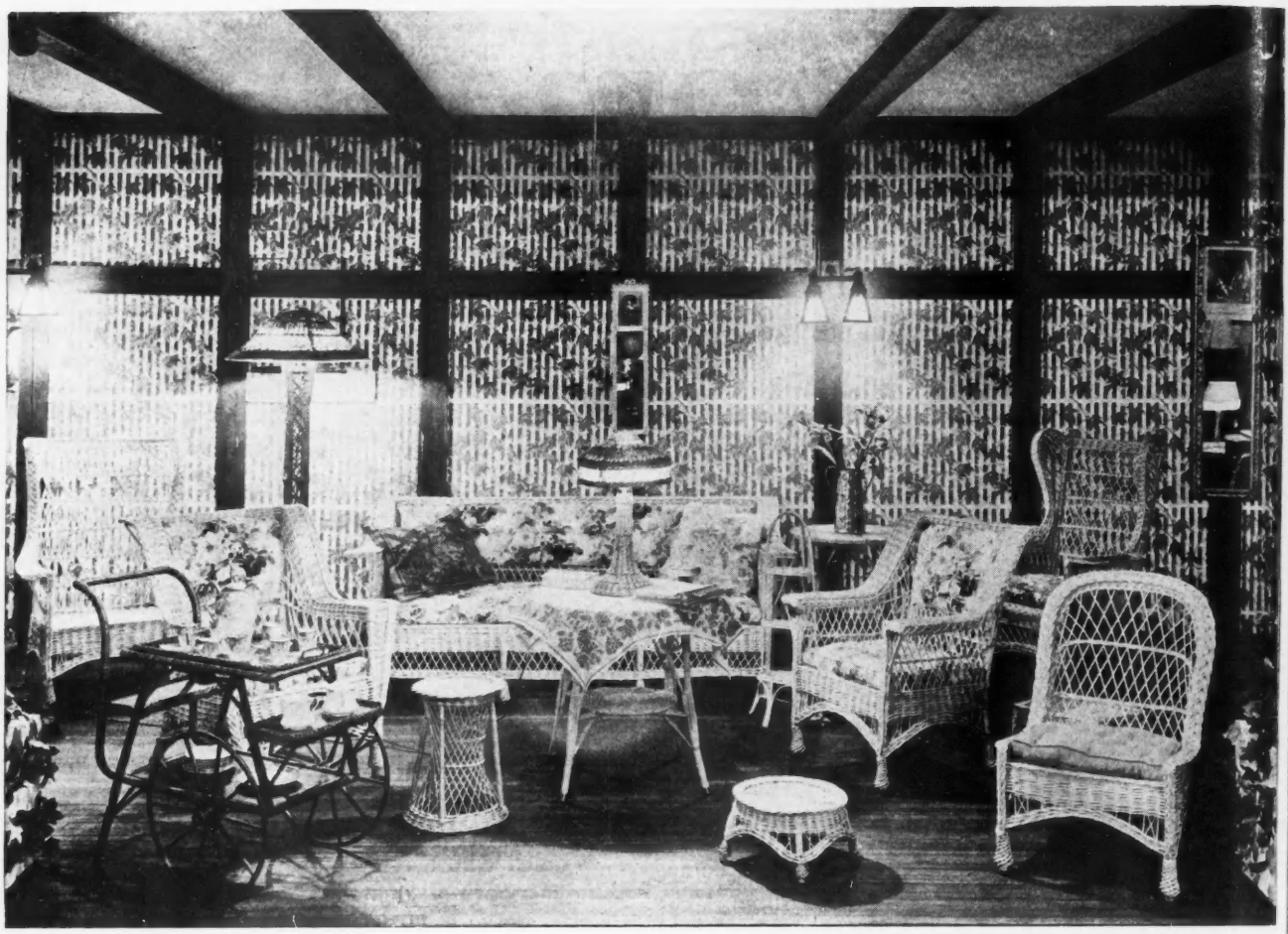
Music adds greatly to the life of a party so the phonograph with its electric motor may be moved to the porch and attached to the handy outlet there. A wicker flower stand to hold potted plants or a vase of fresh flowers on a wicker table will supply a decorative and colorful note. If refreshments are to be served a tea wagon is wheeled out on the porch. A plug cluster screwed onto the under side of the wagon, that is, underneath the top tray, makes it a simple and easy matter to use various electrical appliances such as tea samover, coffee percolator or chafing dish.

Practical Uses of the Porch

The porch living room has very practical daytime uses. Here with the electric sewing machine the summer sewing may be done in comparative comfort on warm days. Awnings can be let down in daytime that protect from the heat of the day. The portable sewing machine cover and all weighs less than a packed suitcase. It can be carried wherever one wishes to sew. Attach it to any convenient outlet and electricity does the really hard work of pedaling the machine.

Women who use it say they get more sewing done with less fatigue than by the old way. It simplifies sewing. It does the daintiest kind of work for it has all of the attachments for summer sewing work such as hemming, piping with the binder, tucking and cross-tucking, ruffling, shirring and edge-stitching.

Electrical Appliances Are a Source of Real Comfort in Many Ways and One of the Most Important Accessories for the Sun Porch on "Dog" days Is the Electric Fan. This Part of the Home Is Now an Important Feature.

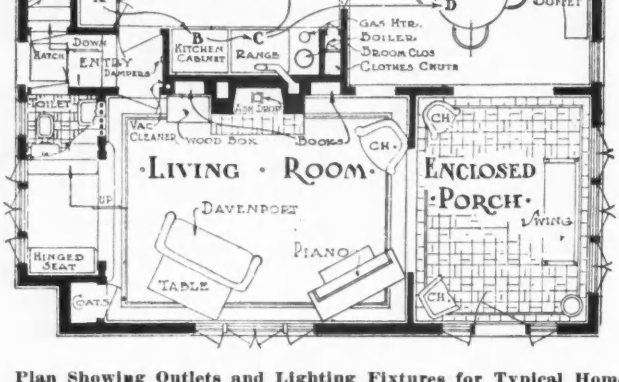


Cozy, Well Lighted and Well Furnished Sun Porch. The Illumination of the Summer Porch Is Important and if Carried Out Properly Will Add an Extra Room with All Comforts to the Home. The Porch Has Practical Uses for the Housewife and May Also Serve as a Sleeping Room at Night.

Then women who may be obliged to do some of the ironing find it cooler and more convenient to do this work on the porch. The electric iron is self-heating when connected with an electric outlet and does not require a super-heated stove. The operator is free to iron wherever there is a convenience outlet, on the porch if it is cool there in the morning.

All Year Round Uses of Electric Fan

Formerly summer could not be escaped except by taking refuge by the sea or in the mountains; for the folks at home there was almost no relief until the advent of the electric fan. Now in a city apartment of two rooms and bath with a fan in each room one can often be more comfortable than in a crowded summer hotel in the hills.

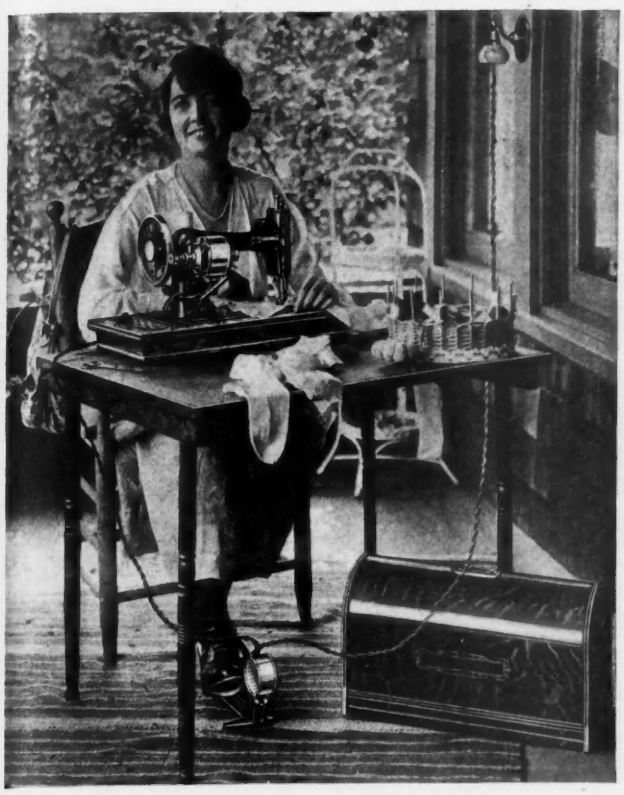


Plan Showing Outlets and Lighting Fixtures for Typical Home with Enclosed Porch. It Is Important to Provide Plenty of Wiring Outlets When Building the Home. This Plan Was Drawn Up by H. Montgomery Woods, Architect, Asbury Park, N. J.

"Many people get only half the comfort value of their fans because they do not plan their use," said a thrifty housekeeper. "Our flat is well provided with outlets so that we can attach our fans without unscrewing lamps from fixtures and the cost of running the fans is so slight in comparison with the comfort we enjoy, that we have ceased to regard them as luxuries but look upon them as absolute necessities. Neither do we store them in the fall for we find so many uses for them they are all-the-year-round utilities."

The use of the electric fan is quite as important in winter as in summer. In cold weather it reverses its well-known cooling effect and adds materially to the warmth of rooms, especially under-heated rooms. This is because steam and hot water radiators do not throw out heat waves; they simply raise the temperature of the surrounding air which must have thoro distribution before the room can be warmed.

Thruout the winter with the use of an electric fan the furnace in the home may be started later in the morning than would be otherwise possible. The rapid diffusion of heat warms the room in so much



During the Day the Housewife Can Do Her Sewing Via the Electrical Way on a Cool Summer Porch. At Night if the Porch Is Well Lighted She Can Finish Any Rush Job. These Facts Should Be Considered by the Builder When Talking Plans to Clients.

shorter time than without the use of the fan that the winter's supply of coal is made to go further.

✣

Euclid Avenue Widening Plan is an Interesting Construction Feature

IN the proposed Cleveland thorofare plan, the most interesting feature and one that will interest builders in all sections of the country, is that which deals with the widening of the famous Euclid Avenue, the most beautiful street in Cleveland, and one of the most picturesque in America. Like Michigan Boulevard in Chicago and Fifth Avenue in New York, it was once a street of magnificent homes, but has gradually succumbed to the inroads of business and mercantile establishments. The traffic has become so heavy that the street, 50-60 feet in width, is now considered inadequate to handle it.

As in most cities where there was no definite plan, the buildings were erected close to the street line. Because these buildings are large, the problem of widening the street becomes a serious one.

The city plan commission has offered a unique scheme to overcome this difficulty and at the same time increase the width of the street from East Fifty-fifth Street to University Circle to 120 feet. This they propose to do by building arcades under the adjoining buildings to provide for sidewalks as shown in the illustration. In this way the street will occupy what was formerly sidewalk space under the old arrangement. These arcades are to be 21 feet 6 inches in width and the building above will be supported by heavy columns and pillars. This arcade idea has been worked out with great success in Paris and no doubt adds much to the beauty of the street, provided the buildings are built along similar lines. Under this new plan Euclid Avenue will be 77 feet wide with two sidewalks 21 feet 6 inches wide. This will give plenty of space for two car tracks and three lanes of traffic on each side.

The Euclid Avenue feature is only one of several proposals that have been drawn up by the commission, which has planned a twenty-year improvement program. This commission hopes to save considerable money by providing against future crowding and escape the enormous expense of Chicago, New York and London, who tackled the thorofare problem after they were completely built up.

Upon investigation the commission has found that an 86-foot thorofare takes up but 30 per cent more land than a 66-foot thorofare, yet it is four times as efficient. It will pass twice the traffic at two or three times the average speed.

C. E. Conley, A. H. C. Shaw, engineers, Harry B. Brainerd, architect, and Wm. A. Strong, landscape architect, are the consulting staff of the Commission.

How Cleveland Proposes to Widen and Beautify Euclid Avenue. City Planning Has Become an Important Program of Every Large City. Millions of Dollars Are Being Spent. The Arcade Not Only Solves the Street Widening Problems, but Beautifies the Thorofare.

Small, Light-Weight Tile Reduces Building Cost

RECENT PERFECTION OF CEMENT TILE MACHINE MAKES AVAILABLE HANDY, WORKABLE WALL UNIT WITH TRIPLE INSULATION FEATURE—DETAILS OF CONSTRUCTION ON PAGE OPPOSITE BLUEPRINT

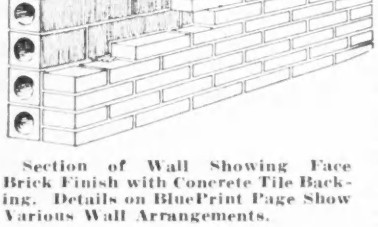
"WHEN costs come down, I'll build" is the usual comment. Naturally when some new method or device is brought forth that will accomplish this result, it is bound to attract the attention of every builder and architect. For thru this medium may be the means of their getting new business.

Builders have long felt the need of a small, square faced, hollow cement tile for wall construction. This unit has been made possible by the perfection of a tile machine which is designed to turn out its products on a quantity basis and without pallets.

Charming Little Home Built of Concrete Tile. A Stucco Coat Has Been Applied Over the Tile Which Is Not Much Larger Than Brick.

There are three sizes of this concrete wall tile, each one filling a distinct need in the building field. To replace the cumbersome, heavy block for heavy wall construction is the 8 by 8 by 12-inch tile. For lighter walls and serving in the place of both brick and block are the 6 by 6 by 12-inch and the 4 by 4 by 12-inch units.

It is the smallest of these tile that perhaps has a greater significance for the builder and which bids fair to challenge his attention because of its double-barreled economy possibilities. It is revolutionary insofar as concrete units go in that it is much smaller than the usual block (see blueprint details on opposite page), and but slightly heavier and larger than the ordinary brick.

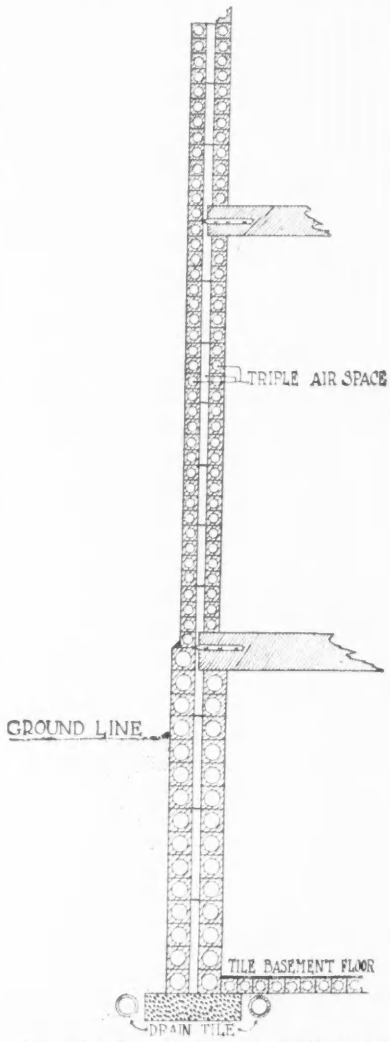


Section of Wall Showing Face Brick Finish with Concrete Tile Backing. Details on BluePrint Page Show Various Wall Arrangements.

It really can be likened to a hollow brick because it is handled with equal facility. Wielding his trowel in one hand, the mason grasps the tile with the other just as he would a brick, and in one operation lays up the equivalent in wall volume to three brick.

Altho the cylindrical hollow center running horizontally thru the length of the tile makes it a light weight unit of but eight pounds, it does not detract from its strength. An arch support is provided on all four sides, imparting a load-bearing strength well beyond the ordinary requirements.

This tile can be used in a variety of ways: in an ordinary four-inch single wall, as a curtain wall between supporting pilasters, or in a regular house wall, ordinarily eight inches thick, but when these tile are used, 9 inches, because of the inch air space allowed for continuous insulation. In the construction of private garages and farm buildings such as hog houses and poultry houses where a heavy wall is not needed this 4-inch tile is very satisfactory. It can also be used to good advantage in partition walls, face brick backing and stucco walls.



Cross-Section of Two-Story Wall of Concrete Tile Showing Triple Air Space—Two Dead Air Spaces and One Continuous Air Space. This Means Even Temperature for the Home.

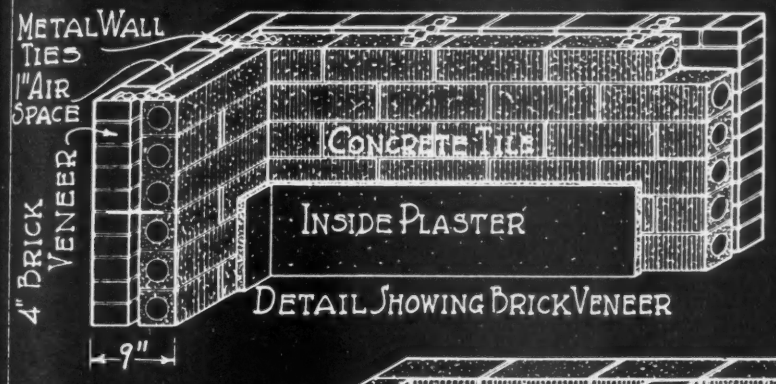
It has been found by long experience that insulation cuts down coal bills. Dead air spaces are barriers against the heat and cold. Continuous air spaces likewise. This concrete tile affords the advantages of both thru a certain type of construction shown very clearly in the details. Two row of tile are built up next to each other, forming a double wall. Between each row of tile is a space about one inch extending from the foundation to the roof rafter and providing a continuous air space. In addition to this insulation are the dead air spaces in each individual tile, giving, in all, triple insulation against changes in temperature.

These tile are either plain faced or corrugated on the sides affording a rough surface upon which stucco can be applied. In this construction no furring or lath is needed—the plaster being applied directly to the tile. Every three or four courses the tile are bonded together by metal ties.

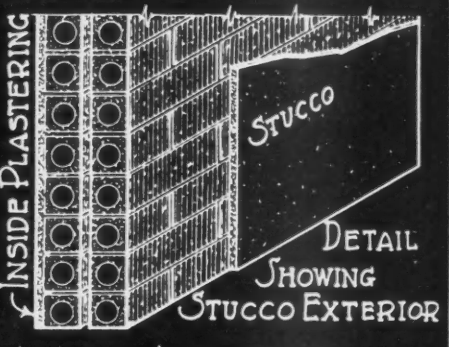
In the case of smaller buildings only one thickness of wall is needed. If brick facing is desired it can be added as shown.

Large quantity production of this tile has been

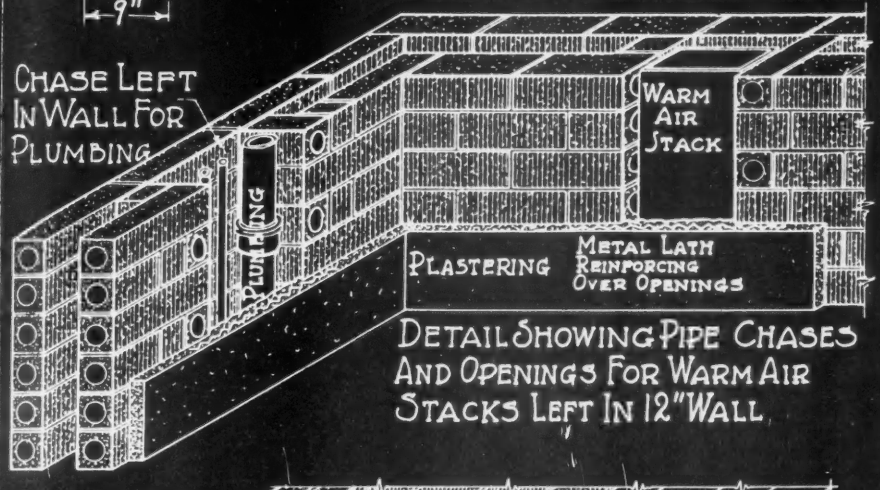
RECOMMENDED CONSTRUCTION



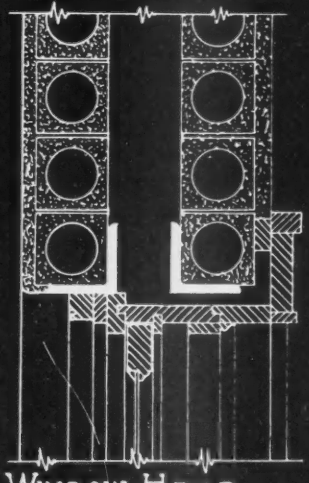
DETAIL SHOWING BRICK VENEER



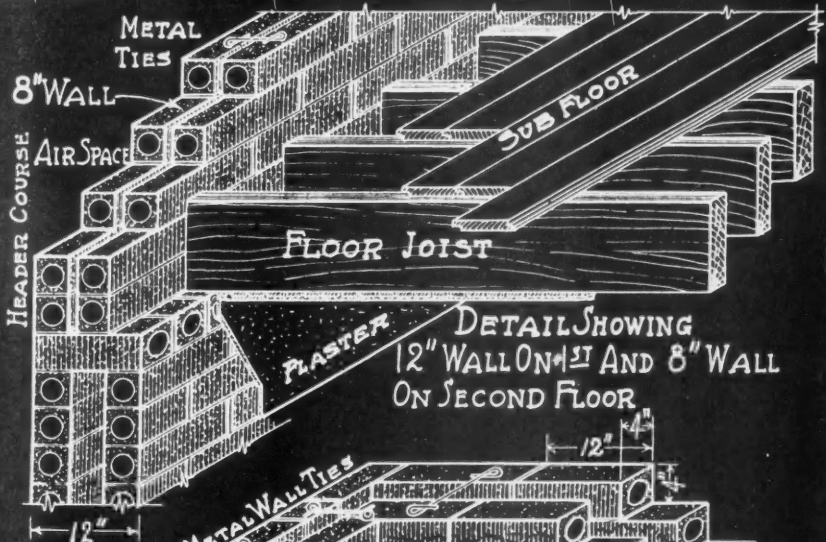
DETAIL SHOWING STUCCO EXTERIOR



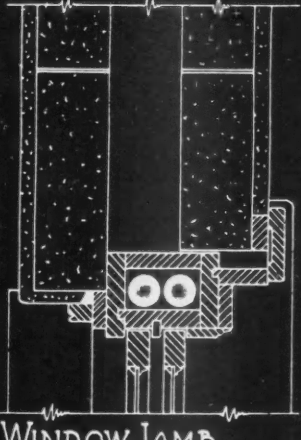
DETAIL SHOWING PIPE CHASES AND OPENINGS FOR WARM AIR STACKS LEFT IN 12" WALL



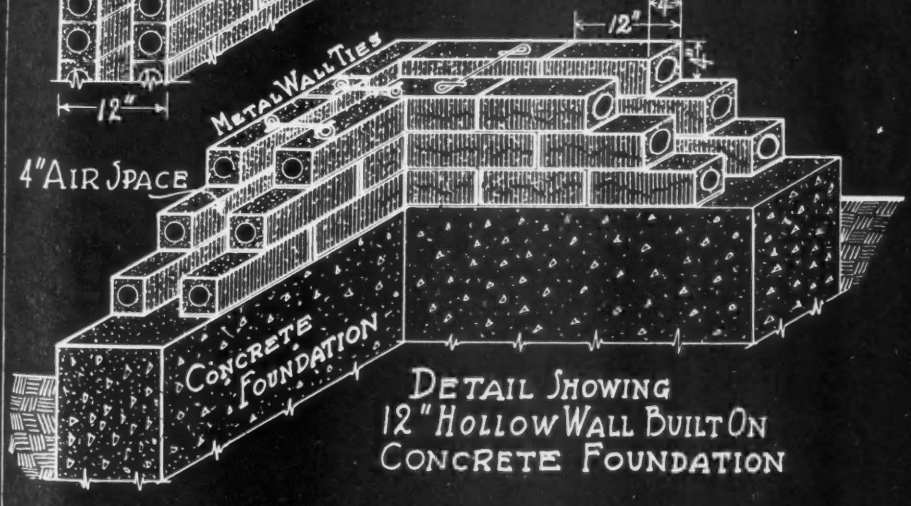
WINDOW HEAD



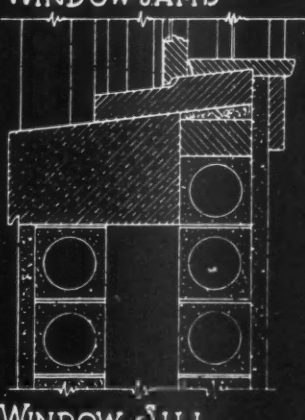
DETAIL SHOWING 12" WALL ON 1ST AND 8" WALL ON SECOND FLOOR



WINDOW JAMB



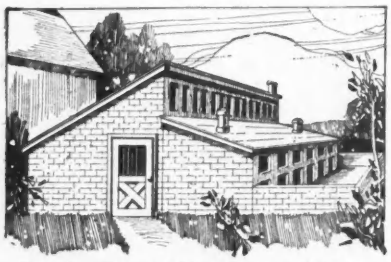
DETAIL SHOWING 12" HOLLOW WALL BUILT ON CONCRETE FOUNDATION



WINDOW SILL

HOLLOW CONCRETE TILE

made possible by the perfection of machines and equipment for a standardized concrete products plant which is a complete manufacturing unit. These plants are established under the supervision of experienced men and are furnished in three sizes. The five-man plant has a capacity of 6,000 uits daily, the three-man plant 3,000, and the two-man plant for smaller communities 1,500 daily. It also has facilities for making drain tile and an interlocking silo tile on the same quantity basis.



Popular Type of Hog House with Sawtooth Roof Built of Tile. Only One Row Is Needed. The Dead Air Space Insures Protection Against Cold.

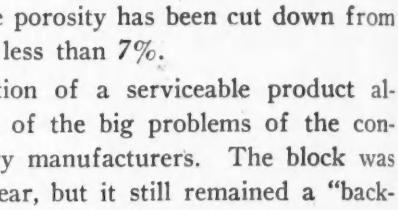
Practically every step in the operation from the handling of the raw materials to the finished tile is automatically regulated. The dry materials are elevated by power and automatically charged into an overhead mixer. Thoroly mixed, the concrete is conveyed by gravity to the tile machines from whence it emerges as finished tile. Loaded on cars, the tile are then moved into the curing room. A daily production of 6,000 products is thus obtained with but five men.

The fact that this tile can be made in such large quantities puts it on a basis with other building materials which are easily available. Its economy of production makes it all the more attractive.

Looking at the new rectangular, small and light weight concrete tile which is now made possible thru the development and perfection of machinery, it is hard to connect it with the large, imperfect, awkward unit that first made its appearance some years ago and was termed a concrete block.

But thru the years has come the inevitable development that characterizes everything American. Step by step brought down the size of the block to a point where it is workable. Moreover, the coarse aggregate which was largely responsible for the large size and rough appearance of the early block has been replaced by finer material to get greater tensile strength and smoothness, and the porosity has been cut down from as high as 50% to less than 7%.

Quantity production of a serviceable product always has been one of the big problems of the concrete unit machinery manufacturers. The block was made better each year, but it still remained a "backyard product," made by hand, using pallets, and involving a great deal of labor—a slow process which eliminated it as a factor in building on an extensive scale. The development of machinery has now placed the production of the concrete unit on a footing with that of other building materials and has made it possible for the architect and builder to give it serious consideration.



Attractive Single Garage Built of New Rectangular Concrete Tile. It Can Be Laid Quickly and Is Manufactured in Quantity on a Special Machine.

Law for the Builder

(*Continued from page 85.*)

awaiting the completion of the building. In reasoning from these facts the court in part said:

"The building was not intended for rental purposes, but for a home, and consequently the estimated rental value affords no just criterion for the measure of damages. Considered in connection with the cost of the property, the stipulated damages cannot be regarded as either unconscionable or unreasonable. Super-added to the difficulties in the way of estimating with approximate precision the damages usually inhering in this class of contracts, the condition of the defendant's wife, and the circumstances in which they were placed by the delay, render it all the more difficult to calculate the damages by marketable values. * * *"

The court concluded by holding that in the light of all the facts of record the stipulation for damages was enforceable.

The Other Side of the Question

As as example of those cases in which stipulations for damages, for failure to complete upon the agreed time, have been held to be penalties and unenforceable, Wheedon vs. American Bonding & Trust Co., 128 N. C. 69, 38 S. E. 255, is of value. The facts involved in this case being substantially as follows:

A contractor entered into an agreement whereby he was to erect a house. The contract price was $1,600, and it was stipulated that he was to pay ten dollars for each day's delay after the expiration of a certain date.

The contractor failed to complete the work on time, and it appears abandoned the work some time after the expiration of the date for completion fixed in the contract. The owner completed the building and then filed suit upon the contractor's bond to enforce the ten dollars a day stipulation. The amount to which the owner was entitled, providing the stipulation in the contract was upheld, was more than $600, but as this was the amount of the bond, it alone was demanded. This case also reached the higher court on appeal, and in passing upon the facts and evidence it

(*Continued to page 112.*)

Slate in Structural Work

EXCELLENT MATERIAL FOR STAIRWAYS AND TOILET ENCLOSURES IN BUILDINGS — DETAILS SHOWN IN BLUEPRINT PAGE 98

DUE TO certain properties inherent in slate, the use of this product as a structural material for stairs and toilet enclosures has increased greatly during recent years. It is non-combustible, dustless and easily cleanable.

In building stairways of slate two factors should be considered. First, the exact "rise of any stairs depends upon the height from floor to floor and the number of risers." This rise, however, must bear a certain relation to the tread or width of step. The width of the tread should be increased as the height of the rise decreases. According to the first rule, the sum of the tread and the rise should approximate 17½ inches. Thus a fairly comfortable stairs is one of 10-inch tread by 7½-inch rise. (Structural Service Bureau Bulletin.)

These dimensions are taken on the "carriage," "horse," or on the angles on the "string," as the supports for the stairs are variously termed, and while the rise naturally remains the same, the "nosing" on the tread increases its width by the projection used, which is generally from ¾-inch to 1¼-inch.

According to the second and better rule, the sum of two times the rise, plus the tread, should total from 24-inch to 26-inch. Thus, in the stairs above noted, twice the rise of 7½ inches plus the 10-inch tread equals 25 inches. The relation of tread to riser is also a question of judgment, and varies arbitrarily in special cases. For instance, outside steps to a public building or an interior monumental stairway should always have a wider tread and less rise than ordinarily would be the case.

In any continuous flight of stairs or from floor to floor there should be no change in the height of risers or width of tread, as the walking up and down becomes to a certain extent automatic, and any change would serve to unbalance the person walking and might result dangerously.

In "Stairs and Stairways," one of the "Safe Practices" publications issued by the National Safety Council, appears a table of "Standard Dimensions of Treads and Risers," which is here reproduced with a quotation from the text which precedes it, as follows:

"The tread should provide ample space on which to place the full length of the foot when descending without danger of striking the heel against the riser above; but not so wide as to compel an increased stride. It is good practice to make the tread width (exclusive of nosing overhang), plus twice the riser height, equal to twenty-five inches. In using this rule the thickness of the tread should be added to the height of the riser."

The use of winders should be avoided wherever possible, as they are undesirable and are only permissible in private dwellings. In public educational and amusement buildings, factories, office buildings, etc., they should never be used.

The center of travel in any stairs for a single person is from 18 to 20 inches from the handrail. Wherever it is necessary to use winders, they should be worked out so that the width at this distance from the narrow edge is sufficient for ease of walking and approximates in width the other treads on the straight runs. The best arrangement of winders is to divide a ninety-degree arc between the risers at the angle into three equal parts.

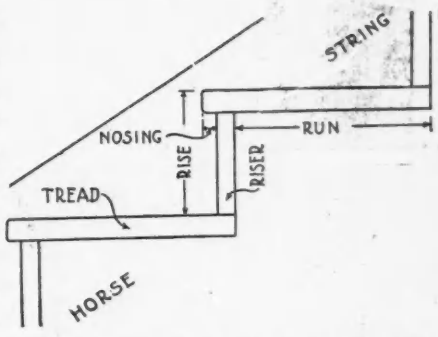


Diagram Showing Construction of Typical Stairway.

In determining strength of stairs it has been found that a densely packed crowd in a flat space weighs 140-150 pounds per square foot. It is not probable that such a load could be ever found on a stairway, but it is safe to take the highest figure to provide against the vibration which affects the stairway.

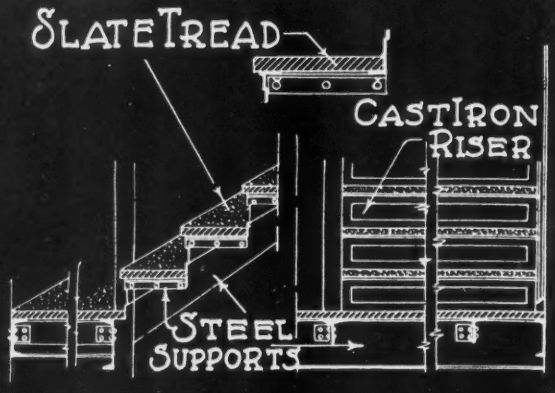
In the blueprint detail sheet on the next page, it is shown how slate is applied to all kinds of stair supports, such as iron, reinforced concrete, etc. In setting slate upon iron supports the slate should be thoroly dampened just before laying and each tread be thoroly imbedded in slater's cement on all risers or supporting angles or metal work. For open stairs this jointing should be neatly cut back or pointed from underneath as work progresses. All points between slate and slate, including those at ends, should be packed with same cement and pointed tight.

In reinforced concrete supports all slate work should be dampened and beaded or backed with cement mortar, composed of portland cement and two volumes of well-graded, clean sand. All joints

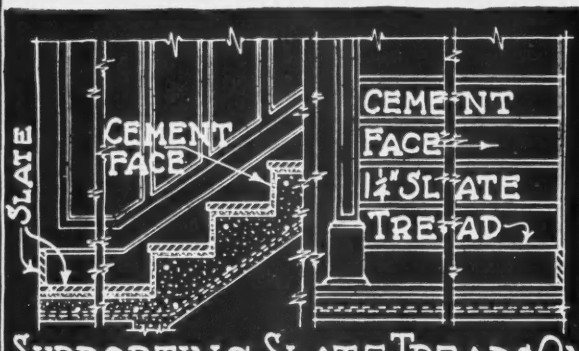
ANGLE OF STAIRWAY WITH HORIZONTAL	28°-27'	29°-25'	30°-25'	31°-26'	32°-28'	33°-32'	34°-37'	35°-44'	36°-52'	38°-02'	39°-12'	40°-25'	41°-38'	42°-53'	44°-09'	45°-26'	46°-44'	48°-04'	49°-24'	50°-00'
RISER - INCHES	6½	6⅝	6¾	6⅞	7	7⅛	7¼	7⅜	7½	7⅝	7¾	7⅞	8	8⅛	8¼	8⅜	8½	8⅝	8¾	8 13/16
TREAD - INCHES	12	11¾	11½	11¼	11	10¾	10½	10¼	10	9¾	9½	9¼	9	8¾	8½	8¼	8	7¾	7½	7⅜

Table of Standard Dimensions of Treads and Risers Prepared by National Safety Council.

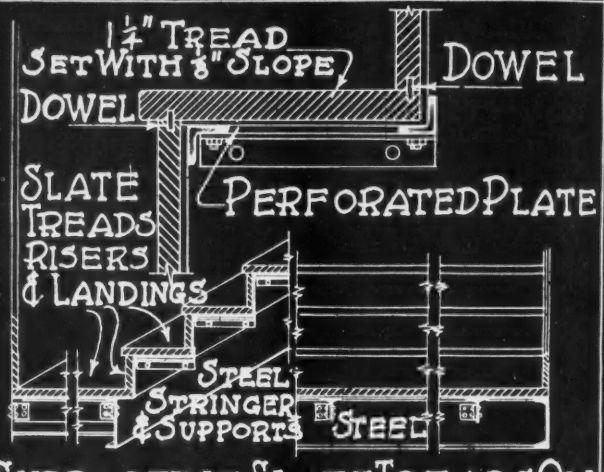
RECOMMENDED CONSTRUCTION



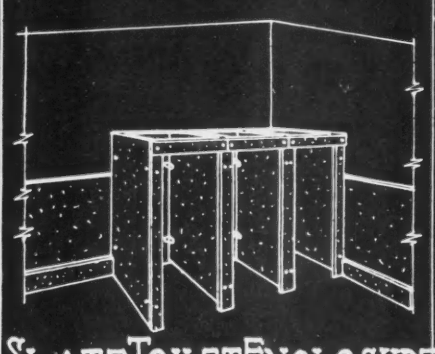
SUPPORTING SLATE TREADS ON CAST IRON RISERS



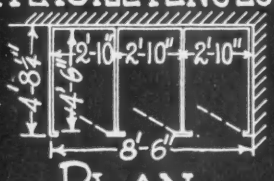
SUPPORTING SLATE TREADS ON REINFORCED CONCRETE RISERS



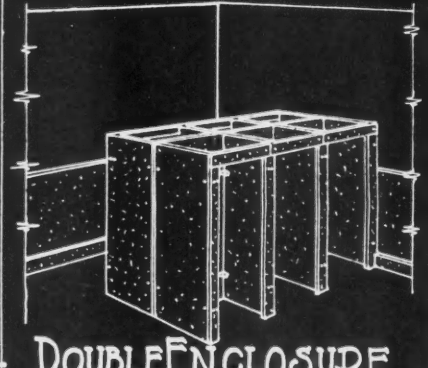
SUPPORTING SLATE TREADS ON SLATE RISERS



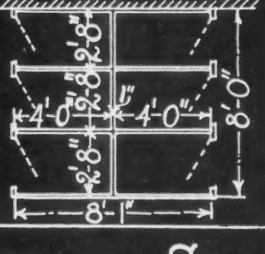
SLATE TOILET ENCLOSURE



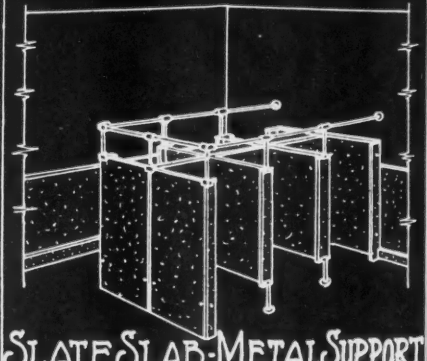
PLAN



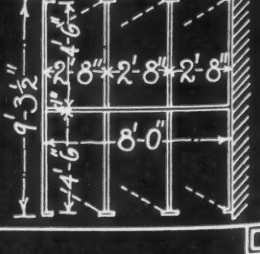
DOUBLE ENCLOSURE



PLAN



SLATE SLAB-METAL SUPPORT

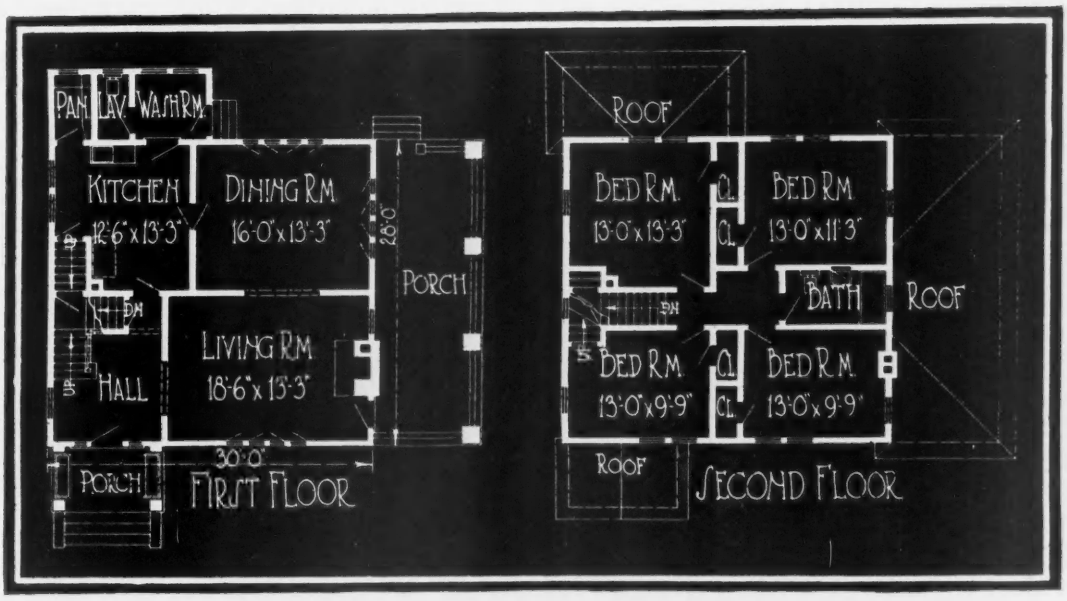


PLAN

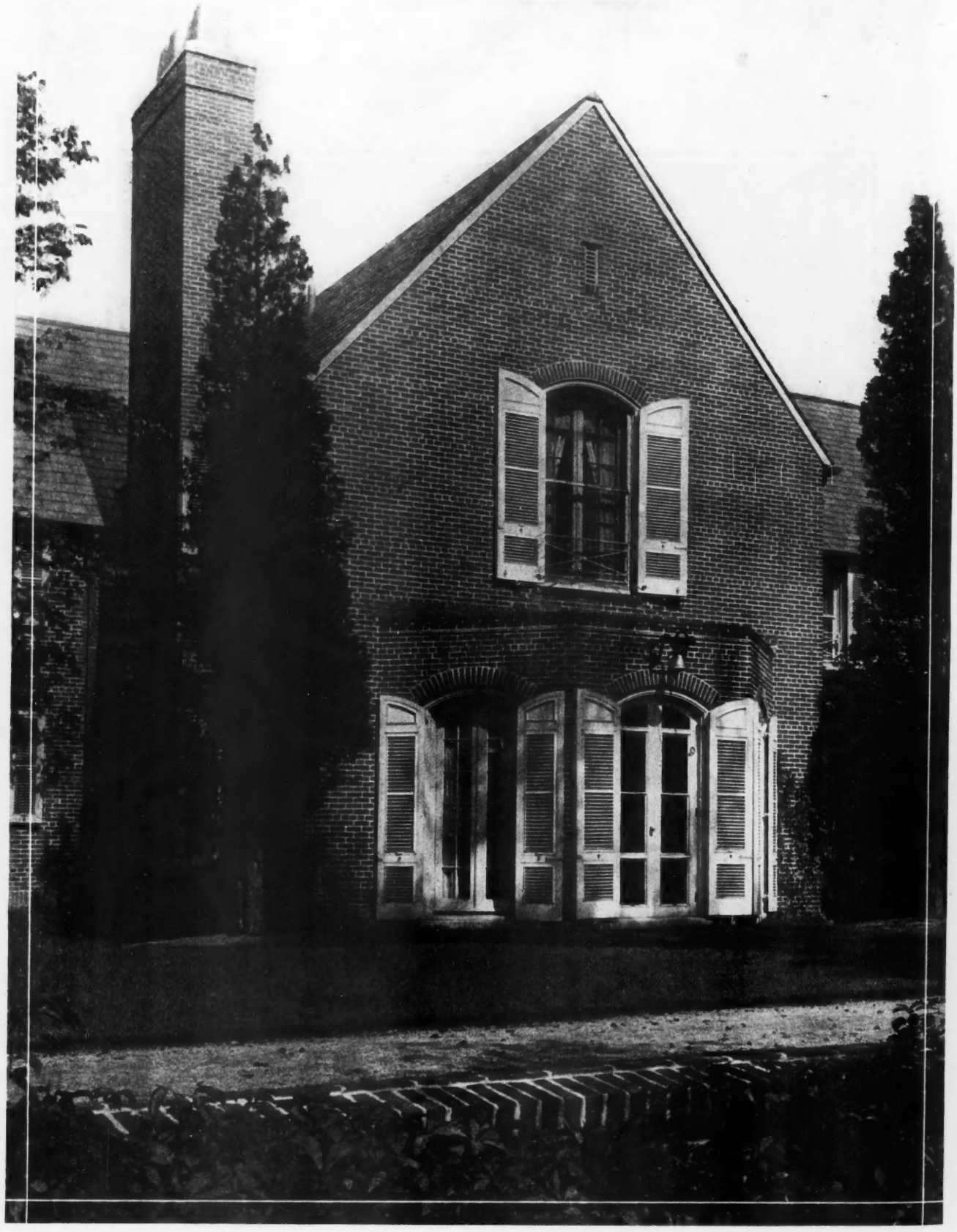
STRUCTURAL SLATE

BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



COMFORTABLE SEVEN-ROOM HOME OF PLEASING DESIGN. There is a quaintness and simplicity about this house that is bound to attract many homeseekers. It has an attractive exterior with shingle siding, broad front porch and hospitable side hooded entrance. In its small, well placed roof dormers, small paned windows, shutters and entrances it shows decided Colonial influence. Because of its rectangular shape it is an economical house to build. On the first floor are the large living room, 18 feet 6 inches by 13 feet 3 inches with open brick fireplace, dining room well lighted by two sets of four casement windows each, and kitchen. There is also a washroom adjoining the kitchen. On the upper floor are four bedrooms of comfortable size with ample closet space. The house is 30 feet wide and 28 feet long.



PICTURESQUE DETAIL OF ONE OF THE PRETTIEST COUNTRY ESTATES IN EAST. This is only one of the many interesting architectural angles of the Grahampton estate, Greenwich, Conn., owned by Harry W. Croft. It faces one of the finest old English gardens in the country. This home was designed by Bruno Jansen, architect, Pittsburgh, Pa. Note the artistic white shutters of quaint design, brick sills, and lintels and massive brick walls.

New Store Front Proves Magnet

HOW BLOOMINGTON, ILL., MERCHANTS AND BUILDING CONTRACTOR WORKED TOGETHER FOR MUTUAL GAIN

"OUR new store front is the best investment we have ever made. Our sales from the month of December to date have increased about 25 per cent, which I consider very good in view of conditions. The ventilation is wonderful, as the windows are always clear and never show any signs of moisture or freeze."

This is what Van Winkle & Hensel, merchants in Bloomington, Ill., think about their new store front. Two years ago they were located in the small store shown in the small illustration. But they believed in display and got A. J. Nafziger, local contractor, to submit plans for a new front. They had acquired the next building. Nafziger happened to be one of those builders who believes in making sidelines pay, so he was prepared to submit figures and handle the job. The result is apparent in the large picture. The firm now has a splendid double lot window display with island arrangement in the center giving an enormous amount of window space.

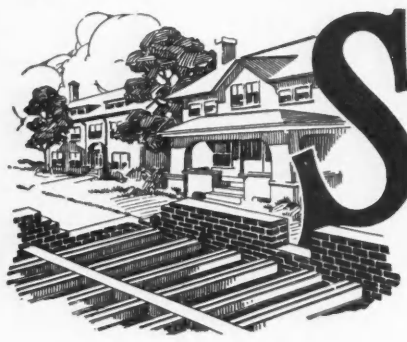
"These windows are wonders for selling power," said Mr. Van Winkle, in speaking of the new job. "In spite of the decrease in price of merchandise this year as compared to last year, we are doing more business, and I believe the new store front is responsible."

The success of this store front remodeling job should prove inspirational to builders in other towns who are wondering how and where they can increase their yearly income. There are stores in every community that are backsliding simply because they do not realize the drawing power of an attractive sales window. If the merchant is not wide-awake enough to realize this himself, there is a wonderful chance for the builder in his town to show him by citing the success of this Bloomington establishment. A good display window is like a magnet for drawing trade.

Before—Two Years Ago Van Winkle & Hensel, Men's Furnishers, Occupied This Small Ordinary Looking Store. But They Were Ambitious and They Knew a Live Building Contractor.

The case cited here is one of contractor and merchant getting together on a proposition that resulted in profit for both. There is ample opportunity for this store remodeling work in every town in the county and most merchants are anxious to be shown how they can increase their business.

After—Contractor F. J. Nafziger Had Recognized the Value of Store Front Remodeling Work and When These Merchants Consulted Him on a Job He Was Ready to Handle It. Here Is the Result. A Real Window Display That Has Proved a Magnet in Getting Business.



STEEL LUMBER Construction

Framing Joists for Openings

OPERATION VERY SIMPLE BECAUSE STEEL LUMBER CAN BE CUT AND HANDLED LIKE TIMBER

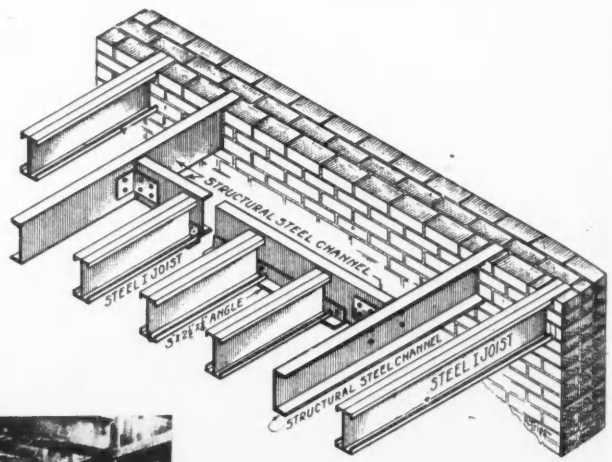
By Gilbert Canterbury

EDITOR'S NOTE—This is the eighth article of a series on the use of steel lumber in modern construction. Readers are invited to ask questions pertaining to this subject. Answers to all inquiries of general interest will appear each month in this department. Write in your problems now.

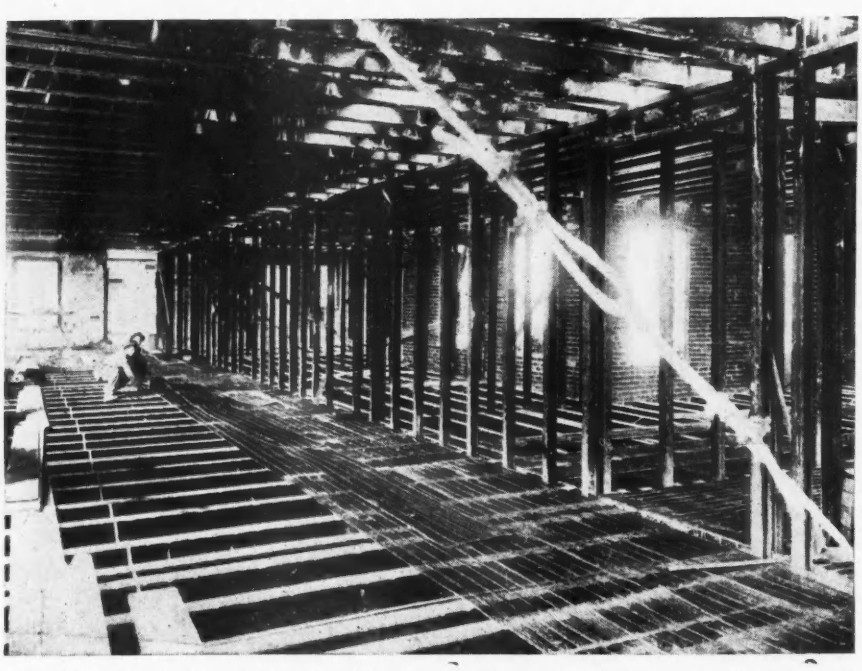
THE framing of openings in the firesafe first floor built with steel lumber is the one item in this construction that most frequently proves a problem to the contractor. Questions regarding the framing details for these openings are perhaps more numerous than any other questions asked of this department.

The fact of the matter is that small openings for such purposes as ventilator ducts, chimneys and so forth are framed with steel lumber joists in just about the same way they would be framed with wood joists. A header steel joist is run between trimmer joists and a tail joist fastened to this header. To accomplish this, the flanges of the trimmer joists are flattened out and these flattened flanges punched thru the end of the header joist with a metal punch, then bolted with small stove bolts or riveted with a small rivet, driven cold. The flange of the header joist is then flattened to admit the tail joist and attached in the same way.

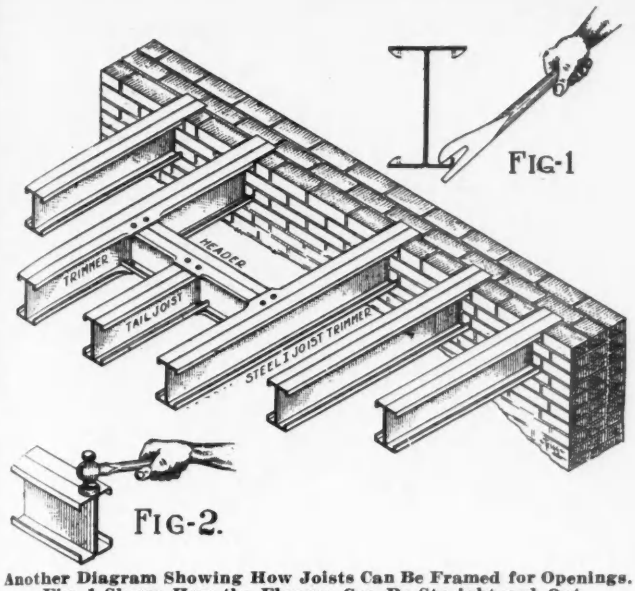
To the contractor inexperienced with steel, this may seem considerable of a task. In truth, however, it is a very simple matter. The joists are light steel and cut easily with any hack saw or with an acetylene torch. Punching of holes for the rivets or stove bolts can be accomplished with any standard punch or even with a wire nail. If an erection drawing of the first floor has been prepared, as it should be, and that drawing has been furnished with the order, the steel joists will always be delivered to the job already cut, even down the small pieces required for framing openings.



Method of Framing Steel Joists in Floor Construction to Provide Opening for Ventilator Ducts, Chimneys, Etc. This Is Not a Difficult Task as the Joists Are Light Steel and Can Be Cut with a Hack Saw or Acetylene Torch.



Steel Joist Floor and Steel Stud Partition Construction. The Workmen Are Placing Metal Lath for Firesafe Floor Slab.



Another Diagram Showing How Joists Can Be Framed for Openings. Fig. 1 Shows How the Flanges Can Be Straightened Out.

Framing around large openings, like stairwells, should have a little sturdier construction than the small openings. If the span of the tail joists for a stairwell opening is a short one, steel joists are used for header piece and sometimes the steel joists are used even if the span is long, and in these instances joist sections are used as posts running up from the basement floor to support the two ends of the header. Often, however, it will be found economical to use a rolled structural steel channel for trimmers and header. The header channel is attached to the trimmers by means of angle plates riveted and a standard shelf-angle is riveted to the header angle to support the tail joists. This fabricating work on the structural steel would, of course, be done at the plant of the company furnishing the steel.

Steel Bearing Partitions

In residence construction of steel lumber frame and in certain types of other buildings where the design is very regular, bearing partitions can economically be constructed with steel lumber joist sections and channel sections. Note the accompanying sketch showing framing of these steel "studs" around windows and doors.

The sill and cap plates at the top and bottom of the partition studs are four-inch steel channels minus the usual secondary flange. The studs are connected to these plates, top and bottom, with quarter-inch rivets or stove bolts. For wide openings where the load applied is sufficient to cause more than the allowable deflection in members spanning the opening, special support must be provided. The best support for this special use is No. 8 wire, placed and twisted as shown in the sketch.

In laying out the framing plans for partitions or walls, first make a detail of the standard openings. This detail can simply be indicated at the locations desired and straight studs spaced in between. The structural steel company furnishing the steel lumber and other steel will furnish the studs cut to length. The punching can be done on the job as described in the foregoing. Metal lath is attached to joist sections by means of standard spring clips. In attaching metal lath to channel studs the studs are punched for plain wire lath connections. These holes in the studs should be on about eight-inch centers. The details for door jambs and window frames are like those used in wood frame construction. A steel stud and metal lath bearing partition carries a surprisingly heavy load and provides an economical firesafe partition or wall construction.

Answers to Questions

Henry Blake, Indianapolis, Ind.: Answering your question regarding the notching of steel joists for sewer and water pipes running at right angles with the joist sections. I want to advise that this is not the practice in steel lumber construction. In residence construction where the first floor joists are left open in the basement it is customary to suspend the pipes by means of metal straps or wire passed over the top of the joists. In full fireproof steel lumber floor construction where the ceiling is metal lathed and plastered, it is necessary to arrange your design to run the pipes parallel with the joists or to suspend the ceiling. In case where heavy sewer pipes run at right angles with joists for only a short distance frame an opening for this pipe in much the same way as you would frame an opening with wood joists.

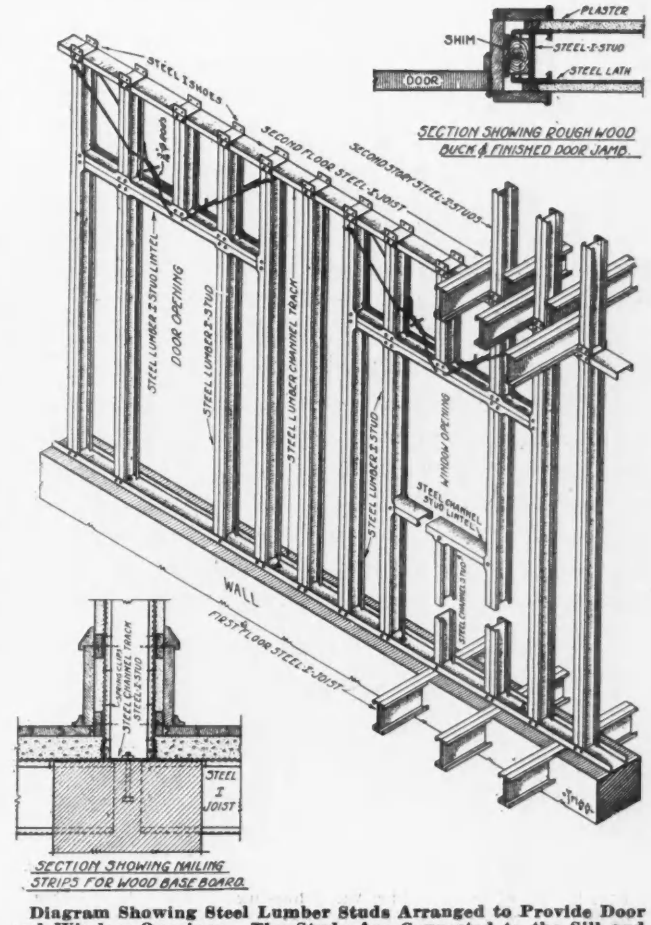


Diagram Showing Steel Lumber Studs Arranged to Provide Door and Window Openings. The Studs Are Connected to the Sill and Cap Plates with Quarter Inch Rivets or Bolts.

DESIGN of SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

Stresses in Roof Tresses

ARTICLE TWENTY OF AN EXTENSIVE SERIES ON STRENGTH OF MATERIALS

WHEN the type of roof truss has been decided upon, and the load that it must carry, the next problem is to find the stresses in each of the members in order that the proper sized timbers may be used. If the reader is familiar with algebra, geometry and some trigonometry, he would be able to figure the stresses by the so-called algebraic method. But a simpler way is the graphical method. One great advantage in this method is the check on the work. An error is sure to be discovered before going very far, and with care in the drawings and scale readings, quite accurate results may be obtained.

The fundamental principles upon which the graphical work rests are: (a) A force may be represented by a line having the direction of the force and of a length to represent the number of pounds in the force to a convenient scale. An arrow head on the line indicates the direction in which the force acts, and the letters which represent the force should be read in the direction of the arrow.

In Fig. 1, the line A B is a force acting down. Suppose it is 1 inch in length and represents 500 pounds. Then C D is a force of 500 pounds, acting upward. Notice that in each case the letters are read in the direction indicated by the arrow head. To the same scale a line one-half an inch long would be a force 250 pounds. If 2 inches long it would stand for 1,000 pounds. Any scale of length may be chosen for a drawing, but when once decided on all lines in the drawing must be measured by this same scale.

(b) If three or more forces lying in the same plane, act on a common point, and the point does not move, they are said to be in equilibrium. That is they are balanced forces. In Fig. 2 (a) O A, O B, O C and O D are four forces in equilibrium. Now from point E of Fig. 2 (b) draw E F equal and parallel to O A, from F, draw F G equal and parallel to O B; from G, draw G H equal and parallel to O C; from H, draw H E equal and parallel to O D.

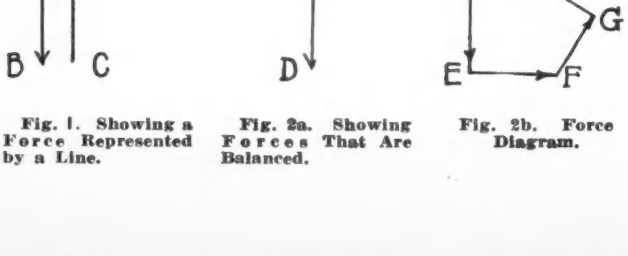


Fig. 1. Showing a Force Represented by a Line.

Fig. 2a. Showing Forces That Are Balanced.

Fig. 2b. Force Diagram.

The polygon E F G H must close if the forces are balanced. This principle is of great importance in the determination of stresses. If forces acting at a point are known to be balanced, but some of them unknown, the force polygon may be drawn and the forces measured and determined from the scale of the drawing.

The lettering of a drawing is an important item, and the method in common use will now be given. Fig. 3 (a) shows a simple roof truss carrying a load of 2,000 pounds. R_1 and R_2 are the reactions at the supports. Since the load is in the middle and the truss is symmetrical, each reaction is one-half the load, or 1,000 pounds. The three forces, viz. 2,000, R_1 and R_2 divide the space outside the truss into three parts. These spaces are represented by small letters a, b and c. Care should be taken to read the forces around the truss in the same direction, usually clockwise. The space within the truss is called d. Any force of the space diagram may then be represented by the letters of the two spaces which this force divides. Thus the 2,000 pounds is read force ab; R_2 is read force bc, R_1 is read force ca, the stress in the horizontal member force dc, etc.

We now construct the force diagram to determine the stresses in the members of the truss. Capital letters are used in the force diagram, corresponding to the small letters of the space drawin.g Thus force a b in Fig. 3 (a) would be A B in the force diagram, etc. In Fig. 3 (b) draw A B vertical and 2 inches long to represent the 2,000 pounds. Since the reactions are each 1,000 pounds, R_2 the force bc is shown as B C with C at the center of A B. Also force R_1 or ca is shown as C A.

Now at the joint E there are three forces, viz., R., the stress in E F and that in E G. These forces are known to be in equilibrium, and by principle (b) will form a closed triangle. We proceed as follows: Begin with R_1 or force c a, which is known in magnitude and direction. In the face diagram start at C and go to A, already drawn. From A draw a line parallel to force da. It is drawn of indefinite length, as we only know its direction. Since we know that ca, ad, and dc will form a triangle, being balanced forces, we know that d c must end at C, the point from which we

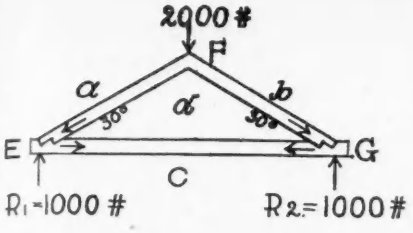


Fig. 3a. Space Diagram of a Simple Truss.

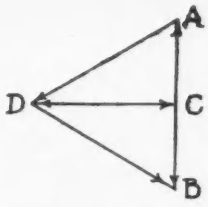


Fig. 3b. Force Diagram.

started. Also d c is horizontal. Then from C draw a line horizontal, extending it until it intersects the line drawn from A. This intersection is the point D. We now put on the arrow heads on the triangle C A D, being careful to follow the same direction in which the forces were taken. Then at the joint E put the arrow heads on ad, and dc pointing the same as the triangle C A D. Since the arrow head on ad points toward E, it shows that the force or stress in ad works against E. Member ad is then said to be in compression. Stress in d c work away from joint E and is in tension. A D is 2 inches long. But our scale was 1,000 pounds per inch. Then there is a compression stress of 2,000 pounds in a d. D C scales 1.73 inches. The stress in d c is 1,730 pounds.

We go now to joint G. There are three forces, viz., R_2, c d and d b in equilibrium. They must then form a closed triangle. Starting with the known force b c, we go from B to C. From C draw C D horizontal. Since this is already drawn we simply follow the line to D. From D draw D B to close the triangle B C D. Put on the arrow heads in the direction in which the triangle was drawn, and then place the arrow heads on the same forces at G. This shows d b in compression, scaled 2,000 pounds and c d in tension, scaled 1,730 pounds.

A check on the work consists in using joint F, where the forces are now all known, and see if they form a closed figure in the force diagram. Start with ab. We go from A to B, then from B to D for the force b d, then from D to A for force d a, which brings us back to where we started, thus proving the accuracy of the work.

Let us now consider a king post truss as shown in Fig. 4 (a). We will assume that the loads carried by the truss has been figured by the methods of the previous articles. Also assume that the loads on the truss are carried at the joints by purlins and are as shown in the figure. There are no ceiling loads, and the weights of the members of the truss are figured in on the joint loads. Since the load is symmetrical, the reactions are each 4,000 pounds. The space diagram is lettered as in the previous problems, first taking the loads and reactions, going clockwise, then lettering the spaces within the truss as shown. In constructing the force diagram we choose the scale of 1 inch to represent a force of 4,000 pounds. Since the total load is 8,000 pounds, we draw AF, 2 inches long. Then A B, one-fourth of an inch is 1,000 pounds, B C = 2,000 pounds, C D = 2,000, D E = 2,000 and E F = 1,000 pounds. In drawing the stress lines, no joint can be considered which has more than two unknown forces. A study of Fig. 4 (a) will show that joints 1 and 6 are the only joints having no more than two unknown forces. We begin with 1, first using g a. We go from G to A. The next force a b as we travel clockwise around 1. We now go from A to B. Next draw a line from B, parallel to bh. It is drawn indefinite in length, since bh is known in direction only. Since the forces at 1 are in equilibrium, they must form a closed figure in Fig. 4 (b). Then hg being the last force must close the drawing at G, the starting point. Draw a line from G parallel to hg to meet the line from B. This determines the point H. Putting arrow heads at 1, in the direction in which G A B H G was drawn, bh is in compression, since it acts toward 1, and hg is in tension, since it pulls away from 1. That is the lower chord prevents the truss from spreading.

We must now go to joint 2, as c i and i h are the only unknown forces, while at 3, there are h i, ij, jk, and kg. Begin with hb. Go from H to B, then from B to C. From C draw a line indefinite in length parallel to ci. Now i h must close the diagram. Then from H draw a line parallel to ih, to meet the line drawn from C. The intersection is point I. When the arrow heads are put on the forces at 2, hb is in compression as found before, cd is in compression, and ih is also in compression.

We now consider joint 4, as there are but two unknown forces, while at 3, there are three.

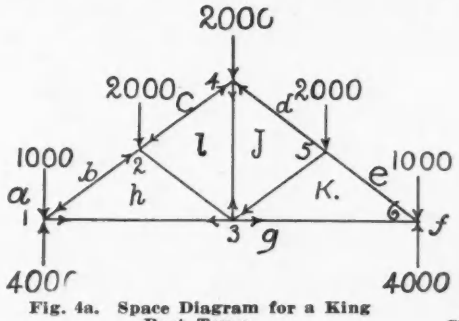


Fig. 4a. Space Diagram for a King Post Truss.

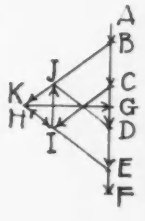


Fig. 4b. Force Diagram for the King Post Truss.

Begin with ic, starting at I and going to C. From C go to D to get force cd. From D draw a line parallel to dg. Since the figure closes at I, we draw a vertical line from I, to meet the line from D. The intersection is the point J. The arrow heads put on at 4, show Ij in compression, and j i in tension. Next consider joint 3, beginning with force gh. Go from G to H, from H to I, from I to J, then from J draw J K parallel to jk. A line from G parallel to gh intersects the line parallel to j k, thus locating K, which coincides with H. The arrow heads at 3 show jk in compression and Kg in tension.

For a check on the work, consider the forces at joint 5. Begin with de. Go from D to E, then E to K, K to J and J to D. The figure is closed, showing the forces in equilibrium.

The lines may now be measured by a scale, and the magnitude of the stresses found, since 1 inch of length equals 4,000 pounds.

Since the truss is symmetrical and symmetrically loaded, the stress in a member on the left side is equal to that in the corresponding member of the right side. For example stress, bh = stress, ek, stress hi = stress kj, etc.

A tensile or pulling force is usually represented by a plus sign (+) and a compression force or pushing force by a minus sign(—). When all the stresses have been found they should be arranged in some scheme like the following:

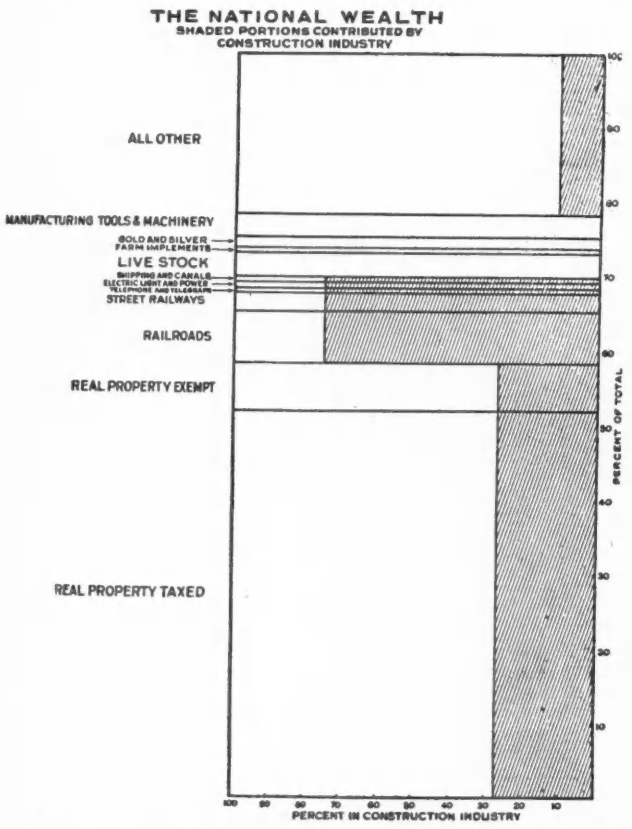
MEMBER	ab	cd	hg	ih	ji	dj	jk	lk	kg
Kind of Stress	–	–	+	–	+	–	–	–	+
Pounds in the Stress									

The kind of stress, viz., tension or compression is found from the stress diagram, and the magnitude of the stresses is found by measuring the lengths of the lines in the stress diagram, and reducing to pounds by means of the scale decided on in the drawing.

✣

Construction Is a Key Industry

IN a special report issued June 17, by the Committee on Statistics and Standards of the United States Chamber of Commerce, of which A. W. Douglas, of St. Louis, is chairman, the total national wealth of the United States is estimated at $288,464,000,000, of which $77,321,000 or 26.8 per cent is represented by the Construction Industry. The report presents an analysis of the relationship of construction to the basic industries of the nation, including manufacturing, mining, transportation, agriculture, trade and finance, and concludes that construction as a key industry should be classified separately as one of the nation's basic industries.



Eleven Million Persons, Workers and Members of Workers' Families, Depend Upon the Construction Industry for Their Livelihood. This Shaded Diagram Shows How Prominently Construction Figures in All Phases of Activity.

Twenty-Five Percent of Manufacturing for Construction

The report shows that in 1914 one-quarter of the 276,000 manufacturing concerns employing 10,658,000 workers with an annual payroll of $5,368,294,000 and an annual output worth $25,000,000,000, was devoted to construction products.

In 1920, 90 per cent of all iron ore, copper and zinc, and 95 per cent of all lead mined was consumed by construction. Twenty per cent of the bituminous coal and five per cent of the anthracite coal mined was used by manufacturers of construction materials, by the railroads in transporting these products, and by traction lines and public service corporations in service to construction workers. A rough estimate of the value of these minerals is $4,400,000,000 engaging more than 1,000,000 workers at an annual wage of approximately $1,000,000,000.

Twenty-five per cent of the freight transported by the railroads is construction materials.

Eleven Millions Depend on Construction

Eleven million persons, either as workers or as members of workers' families, are estimated to derive their living from construction, either directly or thru manufacturing and mining products used in the construction industry. The support given to agriculture and to trade by the annual expenditures of this great number of persons is estimated at more than $5,000,000,000 for rent, fuel, food, clothing, furnishings, recreation, etc.

Half of New Capital Issues for Construction

New capital issues during 1920 so far as reported, totaled $4,545,000,000, consisting of state, municipal, railroad and industrial securities, of which it is estimated 50 per cent were issued for construction in one form or another. A considerable portion of the new capitalization went to pay off maturing obligations, which were reflected, however, in past construction to a large extent.

Even this estimate does not cover the whole field. It excludes indebtedness of the Federal government for construction, for which segregation is difficult, and does not include issues of foreign governments or municipalities in this country, the proceeds of which were to be used for improvement and extension of their public undertakings. This sum also is short a huge amount of expenditure for new construction because a great amount of expenditures for additions to plant, structures, etc., is paid out of earnings and surplus and does not figure in the investment market.

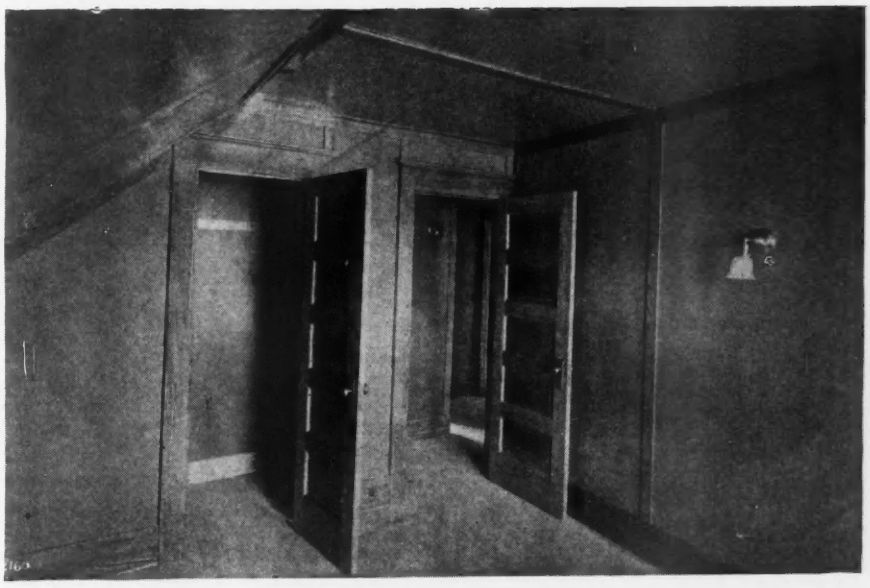
Modernizing the Old Home

HOW WALLBOARD CAN BE USED TO DRESS UP OLD ROOMS IN NEW GARB—PROFITABLE ODD JOBS FOR THE CARPENTER AND BUILDER

ONLY the other day a woman in Waukegan, Ill., was left $15,000 by a tramp whom she had befriended many years ago. Altho she did not realize it at the time of her kindly deed, she was finding a fortune in a suit of clothes.

That is just what many carpenters and builders can do today if they take advantage of the opportunity which is available to all of them. Their hope of profit lies, not exactly in old clothes, but in old homes that are in need of a new dress. These houses are too substantial, too dear to the hearts of the owners to tear down and replace by a new home, yet they are sadly in need of modern improvements. Perhaps it is an antiquated bathroom, hopelessly out of date, a medieval dining room, or something else that needs remodeling. The question with the owner is how can he have that job done right without a whole lot of unnecessary expense.

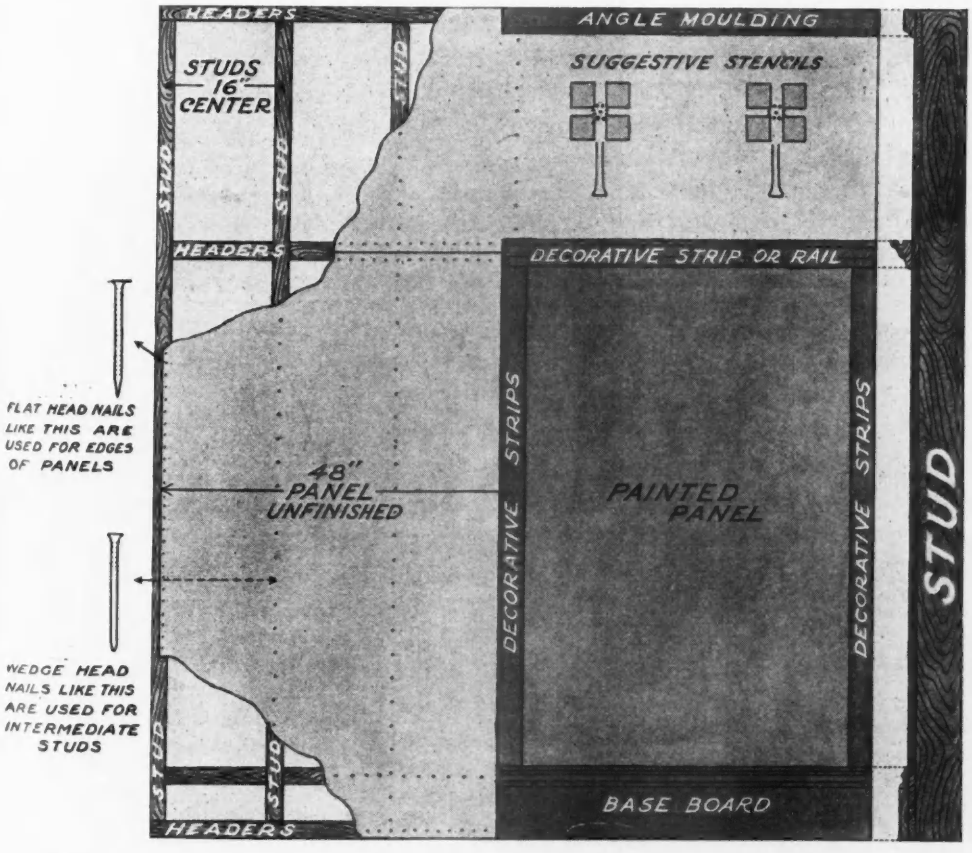
Invariably he will consult his friend the builder. What has the latter to suggest? Just this. He can suggest a plan of work that will not only meet his client's demand for economy and satisfy him as to the completeness of the job, but will also mean profit to the builder himself. The development of wallboard to the point where it can be handled like lumber has opened this field of remodeling work in old homes. In the lack of new building, there is plenty of this sort of work to be done.



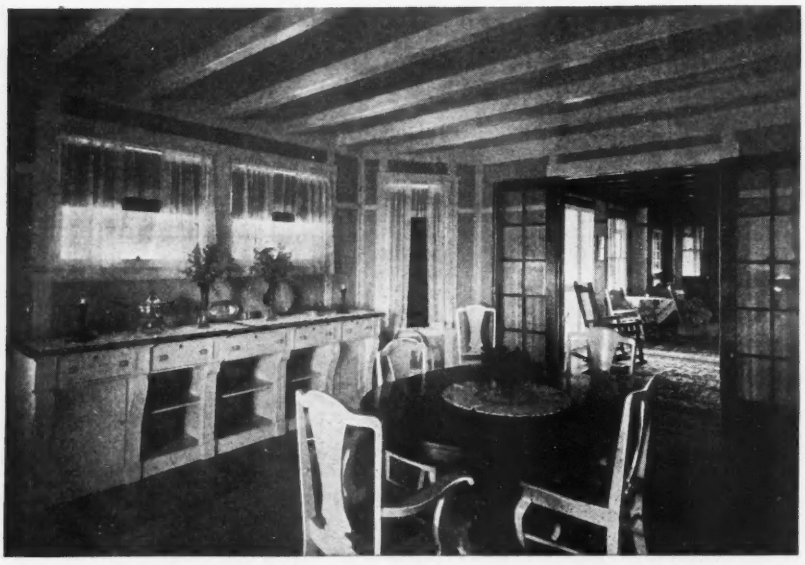
There Are Several Bright New Rooms in This Attic Since the Carpenter Divided It Up by Installing Wallboard Panels. Now That People Are "Doubling Up" There Is Real Use for High Attics and This Valuable Space Should Be Converted Into Living Rooms.

Hundreds of home owners are planning some changes in their homes this year and every year. Rooms with unsightly cracks in ceiling and walls have to be repaired. This work and much more can be carried out by the use of wallboard.

Take Jones down the street. He has a six-room house with a high attic which never has been used. But this year things are different. His young son, who got married last fall, is having a hard time paying the rent for his apartment. It was boosted in the spring and it is simply impossible for him to make the



Section of Wall Showing How Wallboard Is Applied Over Studs. In the Lower Right Corner of the Diagram Is the Completed and Painted Panel Surrounded by Decorative Strips.



This Is How the Same Dining Room Looked Very Shortly Afterward. The Workman Applied the Wallboard Panels Directly Over the Old Plaster Without Causing Any Dirt or Annoyance to the Housewife. He Also Added Artificial Beams, Which Are Very Attractive.

grade. Well, it is a case of back to the folks until times get back to normal. Two more rooms are needed. "What shall I do?" is the question bothering Jones, in talking it over with his friend the builder.

"I'll fix that up for you in no time," was the answer. "I'll get some wallboard and make those two rooms in a few days." And sure enough it was done and the two families have plenty of room, solving the rent problem. In the meantime the builder has made some profit.

This is only one of a hundred instances in which the builder can make money on odd jobs by using wallboard.

Repairing walls is a job which proves a source of trouble for the housewife because of the dirt it entails and the damage to furnishings. The use of wallboard for this purpose eliminates much of this nuisance. The room is in shape in two or three days with little litter or dirt. If the plaster in a home is badly cracked the wallboard can be applied without removing the old plaster. All that is necessary to do is to apply inexpensive wooden furring strips, 7/8 by 2 inches, then nail the panels of wallboard to the strips (see diagram) just as you would to the studs. In rooms less than 16 feet, the freize or ceiling panels can run from corner to corner. In larger rooms the panels can be joined in the center of the room or near each end.

The use of imitation beams in the ceiling will add refinement and beauty to the room. Finishing paint is then added and designs made by using stencils.

Wallboard Can Be Sawed and Nailed Like Lumber. This Man Is Using an Ordinary Cross-Cut Saw.

"I Want to Have That Unsightly Ceiling Fixed Up." This Is How the Dining Looked Before the Builder Took a Hand and Repaired.

Wallboard is very easy to handle as it can be sawed like lumber and can be bent to make covers and arches. In new buildings or in attics where the studding is exposed the board can be fastened directly to the studs or joists. The panels come in various widths. The edges between panels are covered by decorative strips.

Many attractive designs can be used in ceiling work regardless of the size of the room.

In wallboard work, decorative strips should be wide. They may be wood stained or painted, depending on the room and the nature of the furnishings.

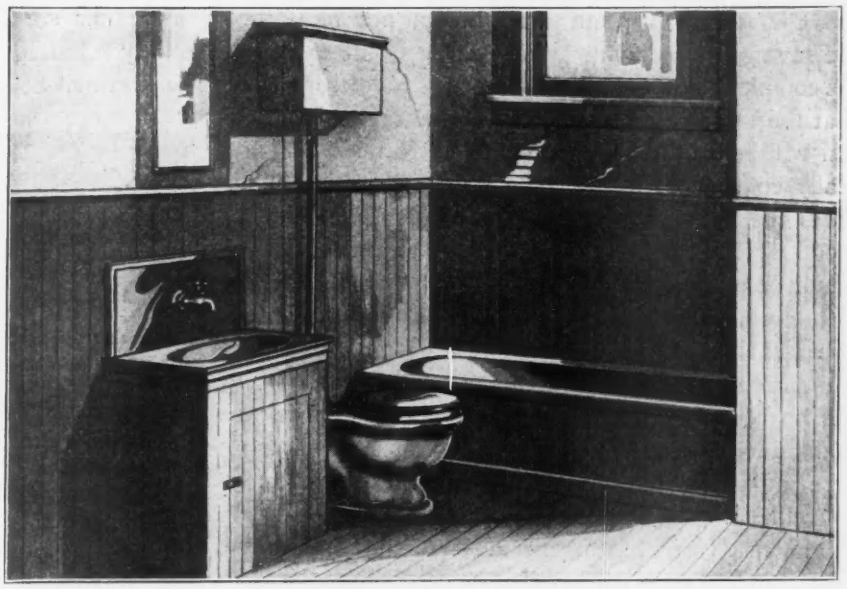
Beamed ceilings, which are popular are easily made. After the wallboard had been applied, it should be painted. Either oil or water paints can be used. Panels are generally furnished in sizes 32 and 48 inches wide and in various lengths. In applying wallboard over brick walls, furring strips are nailed to plugs driven between the bricks and the wallboard nailed to these furring strips. It is important to nail every 3 inches along all four edges, putting headers behind the top of the baseboard, behind plate rail and picture moulding, and to nail every 6 inches to intermediate studding. Use flathead nails for edges and brads for intermediate nailing. A small space is left between panels. A panel should never be left partially nailed over night.

To estimate wallboard work the builder must first know the distance between centers of the studding and between ceiling joists. This will give the width required. In figuring the wall panels take the distance around the room less the width of the doors, windows and other openings and divide the result by the width of the panel decided upon; this gives the number of panels required for the walls.

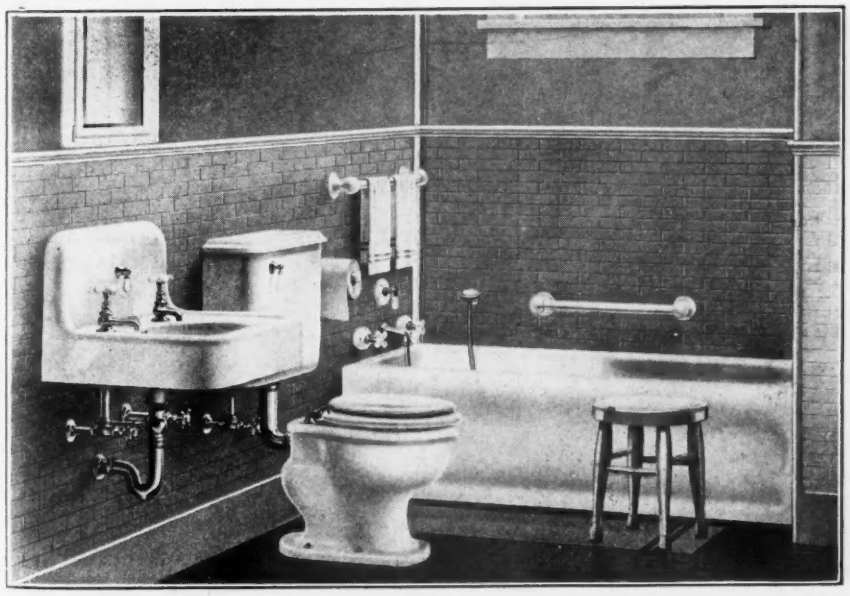
In some cases wallboard is blocked off to represent tile. This material is used in bathrooms.

One of the big fields for the contractor in wallboard work is in cottages, bungalows and summer homes. It can be applied quickly to the studding and decorated in a hurry so that the owner can occupy his home without delay during a limited season. Because of its light weight, this material can be shipped to out-of-the-way places at little cost. Wallboard is a good non-conductor, an important factor to consider in building a summer home because it keeps out the heat, and it is also strong enough to protect the home against heavy summer storms.

There are many other practical ways in which wallboard can be used on small jobs that will occupy the builders' spare time and keep the money rolling in despite sluggish business conditions. Some of these are window fronts (very completely described in the May AMERICAN BUILDER), exhibition booths at fairs and conventions, partitions in offices and storerooms, etc. In the construction of booths at fairs and expositions, which season is now starting, the wallboard is very appropriate because it needs no sanding, matching or joining and can be speedily attached to light framework.



The House Was Attractive and Substantial, but This Bathroom Was Hopelessly Out of Date. So the Owner Called in His Friend the Builder and Asked Him What He Could Do.



This Is What the Builder Did with the Aid of a Plumber. You Would Not Recognize This Immaculate Modern Bathroom as the One Shown Above with a New Suit of Clothes. Wallboard Was the Material Used on the Walls.

In the cellar there is always need for a dry room for hanging clothes on damp days. If the ceiling of the cellar is damp it affects the whole room. A few panels of wallboard will partition off a dry room where the clothes can be hung. The boiler can be enclosed in a similar room and the dirt kept out of the rest of the basement. A handy room for fuel can be built or a workshop. As most cellars are not plastered on the sides this work will be an effective improvement.

And in this work of remodeling we should not overlook one of the most important phases, that of farm buildings. The farmer has many places that are constantly in need of repair and he has found wallboard an effective material to use.

Steel Wall Forms in Concrete Construction

THEY SAVE MATERIAL IN CONCRETE WORK AND CAN BE USED OVER INDEFINITELY

By D. C. Grove

STEEL forms are the modern facilities for the building of concrete structures which enable the workman to accomplish more with less effort and the contractor to profit accordingly, not only thru the saving in labor, but by his saving in material and the completion of a much better job. It follows logically that the larger the job the greater the saving in material will be, as an equipment of steel forms which are really contractors' equipment and not material, eliminates the use of a sometimes prodigious quantity of wood which at the end of a few uses as form material has little or no salvage value.

Light steel wall forms, made of sheet steel, cannot warp, shrink, crack, leak, nor wear out in use as they are practically indestructible. They can absorb no oil, no concrete is lost, uniform wall thicknesses are maintained and the finished job presents a smooth surface impossible to attain in any other manner except by refinishing.

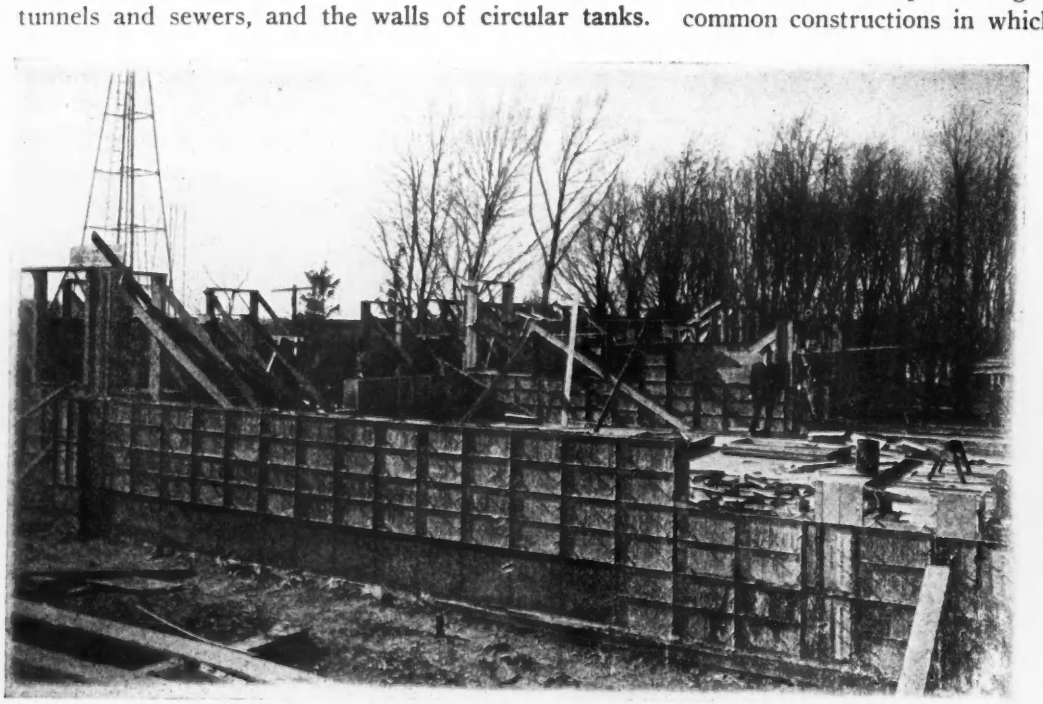
The uses for steel forms are limited only by the uses for concrete, altho the heavy wall forms or special forms for special and particular work are arranged somewhat differently than the forms dealt with in this article, the principles of concreting being the same, however.

These forms are peculiarly suited to the construction of houses, retaining walls, foundations and superstructures, but have found wide application in forming grain elevators, coaling stations, sewage purification works, baffle walls in reservoirs, side walls of tunnels and sewers, and the walls of circular tanks.

They have been used with great success on practically every type of monolithic concrete construction. On factories, concrete houses, residence foundations and other structures they have proven their adaptability. Perhaps their most spectacular records have been established on extensive housing projects. Many large companies have used them for their industrial housing undertakings.

Metal Forms All Set for Pouring of Concrete. In This Type Wire Ties Are Placed Across to Keep the Forms from Spreading.

The above examples are given merely as the most common constructions in which these steel forms are employed, but is not intended to mark the limitation of this form in any way, as with the growth of industry and the change in building conditions, new uses are being constantly found for such forms, progressing in direct proportion to the ingenuity and initiative of the designer and contractor and fostered by the rapidly increasing demand in all phases of industry to ascertain the exact cost of any work over which they exercise control.



Concrete Construction Under Way. In Foundation Work Generally Two Courses of Metal Forms Are Used Entirely Around the Walls. After the Concrete Is Poured the Lower Course Is Removed and Placed on the Top of the Second Course.

Setting the Second Course of Forms in Position for Pouring Concrete. These Forms Are Made in Standard Size and Are Supplemented by Fractional Panels, Lap Panels and Corner Panels.

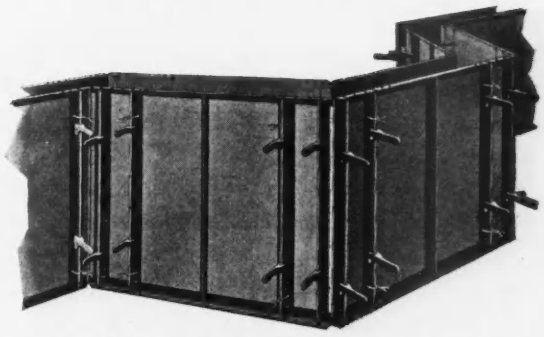
To give the reader a better idea of exactly what these forms are and how they can be used to best advantage, we are giving a short description of well known types and methods of application in the following paragraphs.

These forms are built entirely of steel, consisting principally of a number of steel plate panels, each approximately 2 feet square, reinforced with steel angles on all four sides and across the middle. The panels are connected and held to alignment by means of liners, clamps, keys, ties and interlocking devices. Fractional panels, lap panels, and corner panels are used for adjusting forms to the proper length between corners to provide the varying wall thicknesses.

When these forms are to be shifted by hand they are usually assembled in courses 2 feet high, this being the height of the panels, and in units containing not more than 24 square feet of surface, or 12 feet long. Larger units can be built up, depending on the mechanical methods of handling these forms which are adopted by individual contractors.

The experience of form manufacturers has shown that the two course method is the cheapest which can be employed in connection with foundation work. By this method two courses of 2-foot panels (4 feet high) running completely around the foundation are set up for such portions of the wall as it is desired to build at one time or for all of the foundation. Concrete is then poured for 4-foot height of wall. The lower course of 2 feet is then removed in sections which are convenient to handle and placed on top of the second course, becoming a third course secured by keys to the forms already in place. When the third course is poured, the forms for the second course are shifted upward and used for the fourth course. This process is repeated until the wall is carried up as high as desired.

If it is necessary to pour more than 2 feet high of wall at each operation, three, four or five courses of forms are recommended for use at one time. The forms are usually strong enough to fill 10 feet of wall at one pouring. One course is always left in place to support the courses which are shifted upward.



One Type of Metal Wall Forms Which Are Fastened Together by an Interlocking Device. These Panels Are About 2 Feet Square and Can Be Used Over and Over on Different Jobs.

The customary method pursued in setting up forms is very simple. The required number of standard panels is placed together and connected by the interlocking keys or horizontal liners. The enlarged sections so constructed are set up and in some cases wire ties inserted. These wire ties are used to keep these forms from spreading and are made in a tie-making machine. After two or more courses are set up with the ties in place the vertical liners are attached to keep the wall plumb.

For foundations and walls of houses it is sometimes convenient to use a two-course outfit entirely around the walls. To determine the size of equipment this rule may be applied: Multiply the total distance in feet around the outside of the foundation wall by 8. The result will be the total number of square feet of forms to be provided.

Steel Wall Forms Used on House Foundations in General Motors Co. Housing Project at Flint, Mich., Du Pont Engineering Co., Contractors. These Forms Are Taken Down in Units of Convenient Size to Transport to Next Foundation, in This Case 2 Feet Wide by 8, 10 or 12 Feet Long.

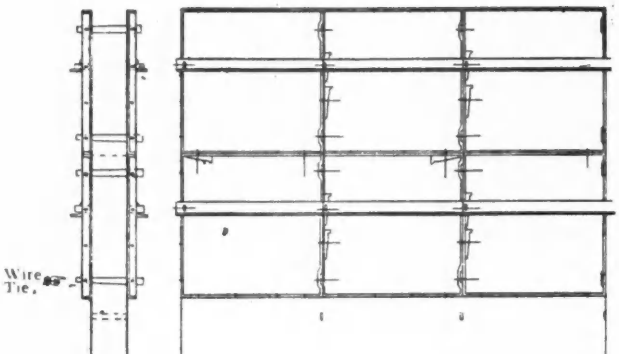
Steel Form Outfit for Building Circular Concrete Silos, Coal Pockets, Etc. Many Builders Make a Specialty of This Kind of Work.

One company has met with remarkable success in the development of standard steel form outfits specially designed for circular concrete construction. The illustration shows very plainly the nature of these outfits. They are used for the building of silos, grain elevators, coal pockets, smoke stacks, settling tanks, water tanks, etc.

These outfits have practically opened up a new field of work for contractors. Especially with silos, which represent the broadest field for this type of work, the farmers' acceptance has been practically universal. In a single state, Wisconsin, one can travel thru the rich farming country and see scores of farms, each with one or more silos of this construction. Many builders keeps several outfits busy, and an average of twenty-five to thirty silos per outfit per season is not at all out of the ordinary. And the field for these outfits in the building of coal pockets and grain elevators is opening rapidly.

It may be said in conclusion that the manufacturer of steel forms of today is coordinating his design with the well defined standards of the building field, which results in the purchase of equipment perhaps for one or two particular jobs, which, however, is equally adaptable to any other job, as the forms themselves are standard and made from standard parts.

In the description given above of the forms and their uses, it is clearly seen that skilled labor, except to direct the work, is not necessary. The work involved in handling steel forms on ordinary walls is, on the average, including lining up, removing, oiling, and all expense connected with the form work, about one-half that of wood forms. They are set up and shifted much more rapidly than wood forms and a smaller outfit will do the same work in less time.



Elevation and Vertical Section of Wall, Showing One Type of Light Metal Form in Position. In This Type Liners Are Used to Reserve the Alignment, Also Wire Ties.

✣

Law for the Builder

(*Continued fromp age 96.*)

was, among other things, said:

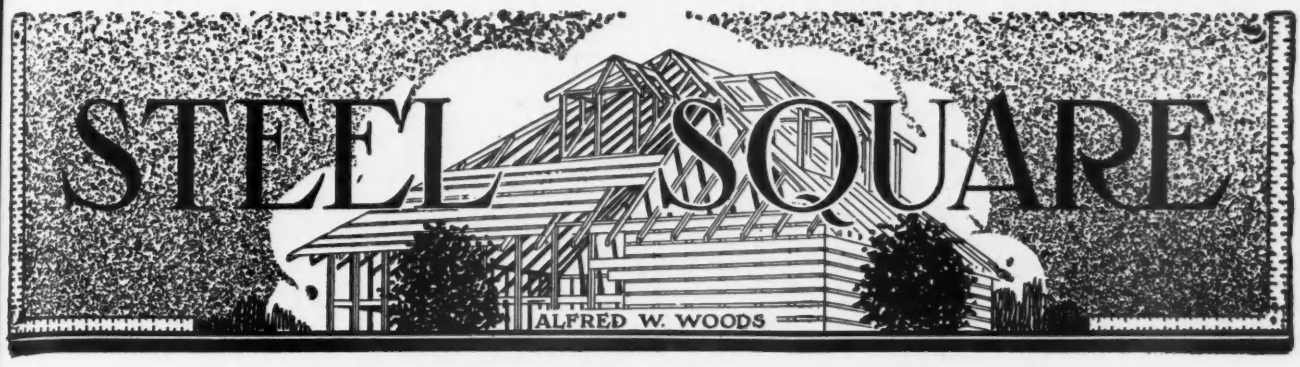
"Here the contract price of the building was $1,600. A stipulation of $10 for each day's delay to complete it after the time specified in the contract is palpably a penalty. The only damage really shown is the rental, and possibly the discomfort of not occupying one's own home. Such rent and discomfort fall far short of $10 per day, or even the $600 allowed for a delay from October 10th to February 1st, when the evidence shows that the rental value of a $3,000 house (nearly double the value) is $30 per month, or $1.00 per day. * * *"

The court concluded by holding that the damage clause in the contract was a penalty and as such not enforceable, and that the actual damages should be ascertained.

As noted heretofore the court decisions on the question under discussion are not in harmony; and, as each case of this kind must necessarily be decided in the light of the particular facts involved, the statement of a hard and fast rule is obviously impossible. However, it is believed that the two cases reviewed are fair examples of their respective classes, and when taken together indicate in a general way the rules followed by the weight of authority in construing contracts of this kind. And, broadly speaking, in the absence of statutes, these rules may be summarized as follows:

That parties to contracts may stipulate in advance the amount which a failure to complete on time will obligate the one failing to pay. And in particular may this be done where by the nature of the work undertaken it is difficult or impossible to ascertain the actual damages which will be caused by a breach of the contract.

However, if such stipulations are to stand they must not be exorbitant, oppressive or grossly in excess of the actual damages suffered, for in such case the courts will generally declare the stipulation to constitute a penalty.



How to Use Steel Square

SHOWING HOW CUTS OF POLYGONAL ROOF ARE OBTAINED

ILLUSTRATING the cuts and bevels with the triangle is probably the most practical way of showing the various cuts contained in and about the roof, regardless of its shape or pitch given the rafters, as by its manipulation all of the angles can be obtained. The steel square serves as the triangle, the blade and tongue forming two of the sides (run and rise) and these, applied to the pitch given the rafter, forms the third side, or if it be for a miter, then the angle in degrees of same from the starting point from the surface cut will give the proper angle to obtain the cut. In the last two illustrations, in the March article, are shown the various triangles in developing the lengths and cuts of the rafters for a square cornered building, but in an unguarded moment we said, "Proceed the same as above" for polygonal roofs. This would have been all right if we had used the tangent instead of the run of the hip to obtain the side cut. The result is right in the case of the square cornered building, because the tangent and the run are of equal lengths. As this does not occur in any other than the square corner, it is therefore not a general rule. We regret the slip, but then we take consolation in the fact that the best of jugglers sometimes make a miscatch. However, it serves as a good illustration to show wherein the difference lies.

In Fig. 1 is shown the triangles for a hexagon (six sided) roof and by comparing with the preceding illustrations, the reader can see wherein they differ. The application is the same except in the sixth angle. Angle No. 1 represents the plan and governs the layout of the diagram. In this, the angle between the runs of the common rafter and the hip are at 30 degrees. Now, by referring to Fig. 2, we show the angle bounded by A-B-C as shown at No. 1 applied to the plan of the roof as follows:

A-B run of the common rafter. A-C run of the hip. B-C tangent of the common rafter. Now by extending A-B intersecting a line at right angles from A-C as at E, then E-C will represent the length of the tangent for the hip. Note:—See the difference in length when compared with the run of the hip.

In Fig. 3 is shown how these angles may be obtained with the aid of two steel squares. It may be worked to a scale of one inch to the foot, or full scale for a one-foot run of the common rafter, as shown in the illustration. The figure on the tongue that gives the hexagon miter (6 11-12) represents the tangent for the common rafter as shown on square No. 1, and by placing square No. 2 with its heel resting at 6 11-12 and with the blade intersecting at 12 on square No. 1 then a line continued from the heel of square No. 1 and in line with the blade intersecting the tongue of square No. 2 which in this case is an 8 and represents the tangent for the hip. Now by erecting the rise from the intersection of the blades to D and D'. Then D-B represents the length of the common rafter and D'-C that the hip and these lengths, taken on the blade of the respective squares, will give the figures to use for the side cuts of the rafters. Thus—6 11-12 and 15⅛ as shown, will give the side cut of the jack, or of the common rafter, to fit in the angle between the hips at the peak (see Fig. 2) and 8 and 16¾ will give the side cut of the unbacked hip to fit in the peak or if it is first backed, then the same figures as shown on square No. 1 applied to the backing plane will give the same result. But of course, this is not practical,

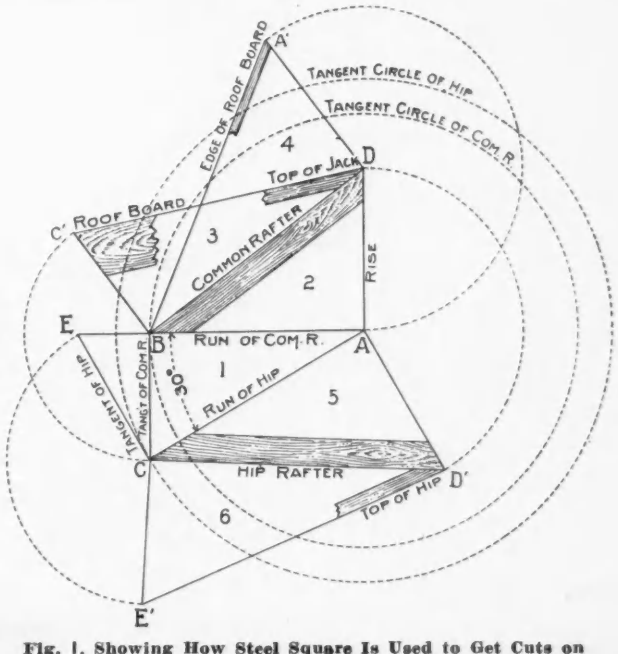


Fig. 1, Showing How Steel Square Is Used to Get Cuts on Polygonal Roof.

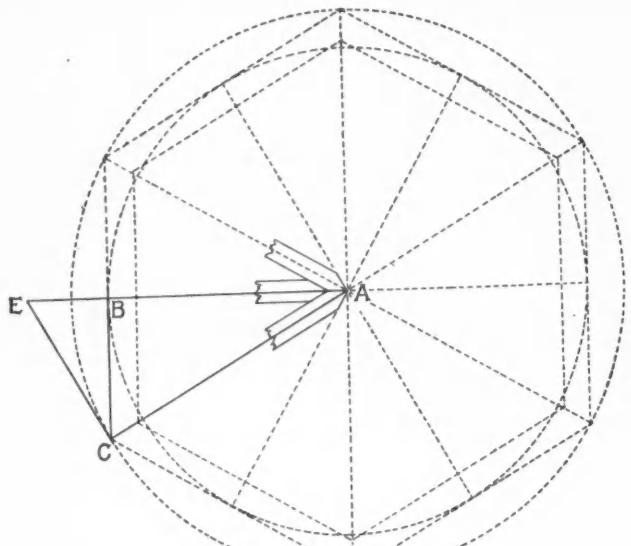


Fig. 2, Showing Triangles for a Hexagon Roof.

because the ends of the hip would run to a feather edge, as shown. A better way is to insert a hexagon block with sides equal, with width of the hip, then the cut on the hip would simply be the plumb cut. This would afford a better nailing space and each hip would have a direct bearing against the one on the opposite side.

The side cuts of polygonal jacks have been illustrated in previous articles and to complete this line of work, we show in Fig. 3 the accompanying illustration of the seat and plumb cuts for the corresponding hips and valleys. Beginning at horizontal line, which represents the run of the rafters, then 12 and 9 on the steel square represents the cuts for the common rafter for the ⅜ pitch. The steel square just beneath the horizontal line and with the 12-inch mark on the tongue resting at the rise, locates the angle of the respective runs with that of the common rafter and the figures to use on the blade of the square are the same as those used for the polygonal miters and as shown in the table. It will be seen the vertical line dropping from 12 on the tongue of the steel square at the seat cut of the common rafter, as at B, and where the same intersects the figures on the tongue of the squares resting just beneath on the individual runs, gives the figures to use on that member for the cuts. The rise being the same as the common rafter, we use the same figures on the blade, as will be seen by referring to the illustration. Now if the runs of the hip were pivoted at the point of the rise, as at A, and we could raise them up until they rest on the horizontal line, it would be found that the pitch lines would center at one point at the top, as at D, and they would all fall in between 12 and 17 on the tongue and center at 9 on the blade. The figures on the tongues of the squares would remain as shown for the seat cut. If there was no pitch given to these rafters, then the corresponding figures that gives the polygonal miters will give the side cut of the hip, tho the cuts on the square would be reversed.

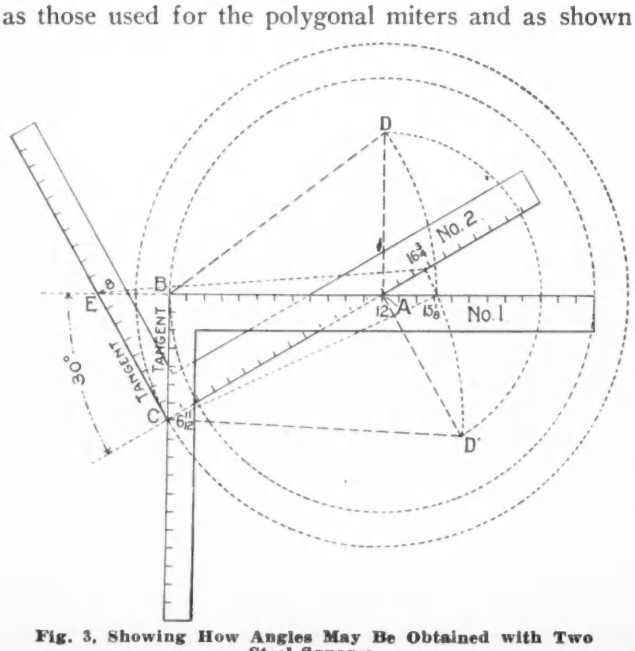


Fig. 3, Showing How Angles May Be Obtained with Two Steel Squares

Creosoted Wood Silos

THE wood-preservation studies at the Forest Products Laboratory have shown that the value of wooden silos can be greatly increased by proper treatment with coal-tar creosote. A good creosote treatment will not only increase the durability of the wood, but will reduce the tendency of the staves to shrink when the silo is empty. A creosoted silo cannot be painted afterwards; however, it does not need painting, for the creosote protects the wood, and its color is pleasing.

Highly durable woods, such as heart cypress or redwood, do not need protection against decay so much as the non-durable woods, but a thoro creosote treatment will make the non-durable woods, such as sap pine, last longer than durable species will without treatment.

Contamination of the silage by creosote from the staves need not be feared. This is borne out by experiments and by careful inquiry among the many farmers who have used creosoted silos. In order to be quite sure, it is well to allow the creosoted staves or the finished silo to stand a few weeks before filling.

The most thoro creosote treatment can be given by pressure methods. If pressure-treated wood is not available, very good results can be obtained by the hot and cold bath treatment. If a good penetration of coal-tar creosote is obtained by either of these processes it is not too much to expect the silo staves to resist decay 25 or 30 years.

Other methods of creosoting, such as painting, spraying or dipping can be used. They are less costly than the pressure treatment, but they are also less effective. They will probably add several years to the life of the silo and thus pay for themselves, but the more thoro treatments should be used wherever possible. Instructions for treating silo staves by these various processes may be obtained from the Forest Products Laboratory, Madison, Wis.

Formula for Glue

To the Editor: Palmer, Ill.

I notice in the May number Mr. Ware wants to know where he can procure glue that will give satisfactory results. I will give him the formula I use: Procure from any druggist 1 lb. sheet glue and 1 oz. nitric acid (C. P.), place the glue in 1 pint of soft water in tin vessel, then place in a larger vessel and dissolve by double boiling. When dissolved, place in glass vessel (fruit can is good). While still warm pour in acid and stir briskly with wooden paddle. Use after 24 hours. Keep excluded from air and it will keep indefinitely. Ask for glue for hardwood joining. If Mr. Ware cannot procure the glue in a nearby town let him write me and I will do what I can to help him out.

E. F. Painter.

Boring Holes in Earthenware

To the Editor: Seattle, Wash.

Can you enlighten me on a simple and quick way of boring holes (say 3/16-inch in diameter) in the ordinary solid earthenware used in plumbing fixtures.

This does not refer to the porcelain enameled iron, but to the solid material known as vitroware and similar materials.

E. E. Littlefield.

Builds Barn from American Builder Plans

To the Editor: Athens, Pa.

I am sending you a picture of a gambrel roof barn I am building for Edward Herrick, Sayre, Pa., from a blue print from your office. At the time it was taken three men had worked ten and a half eight-hour days except when Mr. Herrick helped to raise rafters, so you can see four men raised the roof.

W. A. Van Luvanee.

W. A. Van Luvanee, Athens, Pa., Built This Barn from Plans Shown in the American Builder. Only Four Men Were Needed to Raise the Roof.

Have You Ever Seen Such a Machine?

To the Editor: Gulfport, Miss.

Very often we secure contracts to demolish frame buildings. We understand some firm has placed on the market a heavily magnetized instrument that pulls the nails out of the wood without having to resort to the old primitive methods of forcing board out with an iron bar and pulling nails out with hammer.

If you know of any such tool or mechanism please write us the address of manufacturer.

Gates & Price Co.

Suggestions for Improving Garage Truss

To the Editor: Dolgeville, N. Y.

Regarding B. Bevendge's roof truss for his 44-foot garage I think he has designed a well-constructed and yet simple truss. In my opinion it is just the proper size of materials used, as shown in his sketch. If I were making any changes at all, I would say that the rods of the truss would be sufficient if ¾-inch diameter. The two end bolts at the foot of the main brace are more than necessary, as one bolt of ½-inch diameter would be sufficient. It is not well to put too mnay bolts in any construction, as the bore holes only take away a portion of grain in the timbers and thereby weaken them.

I advise Mr. Bevendge to nail his lower member up with coated nails, as they will not split his 1 by 8 boards as easily as common nails. After it is nailed up, I would draw some ⅜-inch carriage bolts thru all four boards about 2 or 3 feet on center, alternating along the member for more safety. Otherwise the truss is all right for this building.

N. Wesselmann.

Suggestion for Hog House Floor

To the Editor: Aldan, Pa.

In your publication at various times I have noted illustrations and descriptions of various types of hog houses. Particularly in your June issue appear sketches and a comprehensive description of a house built by Ben Johnson, of Clement, N. D.

All hog houses must have floors. It has occurred to me that many hog breeders profitably might install sanitary, resilient floors instead of the present wooden surfaces they employ.

Keeping a hog house clean is not an easy task, and anything which tends to

lessen the labor attached should be considered. Therefore—

Why do not more raisers of hogs use asphalt mastic floors?

Mastic, consisting of a mixture of Trinidad asphalt and sand and dust, makes a floor that is water and acid proof. It is not hard, unyielding and cold, like concrete, nor does it absorb liquids spilled upon it, as wood does.

Floors of this type will withstand wear indefinitely; Trinidad asphalt has served on city streets in some cases for 30 years. They can be flushed perfectly clean with a hose. They have the amount of resilience necessary to keep live stock contented—they do not tire animals.

This thought is advanced in view of the general discussion thru your columns, and with the hope that designers of hog houses may give the floor more consideration.

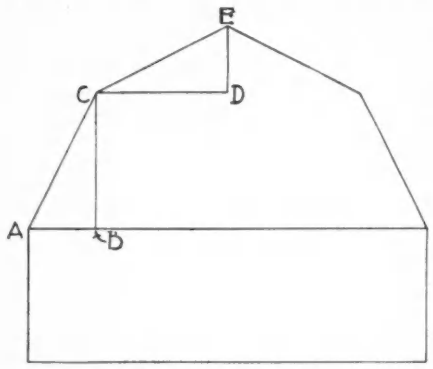
Yours very truly,
H. T. MACFARLAND.

✣

How to Make Truss

To the Editor: Lima, Ohio.

I am sending a sketch showing how to lay out a gambrel roof by using proportions slightly different than those used by E. H. Green in his method published in the May issue.



Sketch Showing How to Lay Out Gambrel Roof. This Was Drawn by T. C. Harrison, Lima, Ohio.

To lay out the roof make the run of the lower rafters at A-B and the rise of the upper rafters at D-E equal to one-sixth the span of building. Make the rise of the lower rafters at B-C and the run of the upper rafters at C-D equal to one-third the span of building. By using these proportions, the lower and upper rafters will be of the same length except when the lower rafters project over the eaves, in which case length of projection must be added to the rafter. The same set of figures which will cut the lower rafters will, when reversed, also cut the upper rafters. T. C. HARRISON.

✣

Solution for Mr. Cooey's Problem

To the Editor: Logansport, Ind.

In answer to Mr. Cooey's problem on obtaining cut for end of hip rafter.

Here is an 8-foot rise and 12-foot run on the common rafter. His cut is 8 by 12 on the square (8 on tongue, 12 on blade) stepped twelve times.

The hypotenuse or diagonal of 12 by 12 is called 17 in framing, or to be exact, 16.96+; so in laying out the hip we use 17 inches on blade and 8 inches on tongue, and applied the same number of times as on the common rafter e.g., 8 gives the top cut and 17 the plate cut. Now the difficulty results in not having enough material left to apply the square to, but try turning your square over in the manner shown in sketch and your cut will be correct. This method is very simple and saves climbing down after your level. WM. P. CROOK.

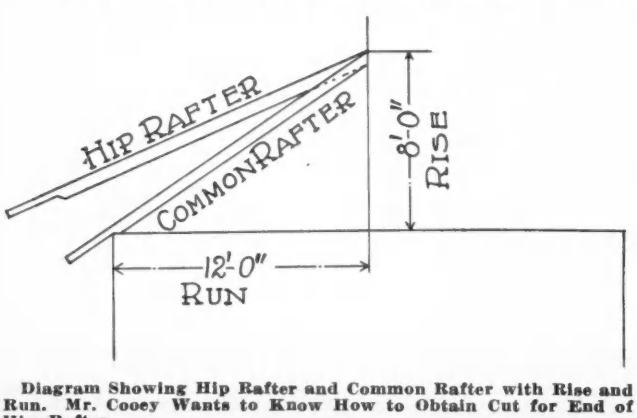


Diagram Showing Hip Rafter and Common Rafter with Rise and Run. Mr. Cooey Wants to Know How to Obtain Cut for End of Hip Rafter.

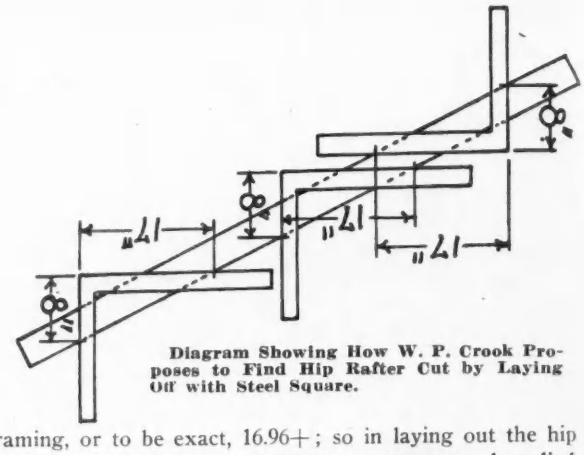
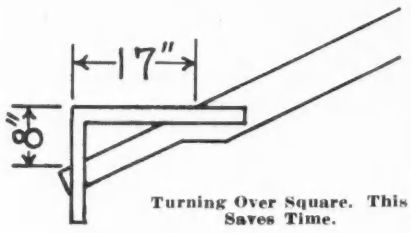


Diagram Showing How W. P. Crook Proposes to Find Hip Rafter Cut by Laying Off with Steel Square.



Turning Over Square. This Saves Time.

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How to Test Brick

To the Editor: East Cleveland, Ohio.

Answer to question of George L. Boles, Steward, Ohio, of June number, on how he can test brick strength.

All brick should be free from cracks, pebbles or pieces of lime, and should have sharp corners, well burned but not vitrified so that they become brittle. When two good bricks are struck together, they should emit a metallic ring.

Brick should not absorb ten (10) per cent of its weight of water soaked for twenty-four (24) hours. Crushing strength not to be less than four thousand (4,000) pounds per square inch, with a modulus of rupture which should never be less than six hundred (600) pounds per square inch for good, common brick, and eight hundred (800) pounds per square inch for best hard brick. Each should support a concentrated load of one thousand six hundred and sixty-six (1,666) and two thousand two hundred and twenty-two (2,222) pounds respectively at the center, without breaking, supported at each end with a span of six (6) inches and a one (1) inch bearing at each end. Brick size 4 by 8 by 2½ inches. For any other size of brick, safe concentrated load equals four times the breadth of brick times the thickness squared, times modulus of rupture in pounds per square inch, divided by six times the span in inches.

Answering question of Jos. B. Bevendge, Avoca, Pa., in June number, on whether truss is strong enough.

The truss shown supporting a uniform distributed roof load, taking ten (10) feet for the rise and fifty (50) pounds live and dead load per square foot of horizontal projection. The top cord at lower joint would have to be four (4) times as large as for minimum cross section. Or, the 4 by 6-inch top cord shown, taken between any two joints has only two-thirds the minimum cross section necessary to support the roof load as a simple beam, disregarding the additional minimum cross section necessary for compression. The center rod is the only vertical member stressed, and has sufficient strength.

JOHN A. COWING,
Bldg. Dept., City Hall.

Bert De Vries, Builder and Contractor, Ashton, Iowa, Has Rigged Up a Very Unique Portable Saw Rig on a Ford Car. The Car Engine Furnishes Power to Run the Saw Rig which Contains Complete Equipment.

Builds Unique Saw Rig

To the Editor: Ashton, Iowa.

I am sending a photograph of a portable saw rig which I built in my shop during the past winter.

It is so constructed that it can be installed on any Ford chassis, and the one engine furnishing power for running the machine and transporting the outfit. It is throttled by a special designed governor while running the machinery and throttled by hand while transporting the machine. The steering wheel can be let down below the top of the table and a section of the top is placed over the driver's seat, so there is a clear working top of 4 by 12 feet. It is equipped with a clock which records the actual time that the machine is in use each day, and is operated automatically from same switch which controls the engine.

The following is a partial list of the equipment: One rip saw, one swing arm cut-off saw, which can also be set stationary and adjusted to any height above the table for various kinds of work; one 20-inch band saw, one vertical arbor or shaper head which is adjustable to any height, one hollow chisel mortiser, one 8-inch jointer, one belt sander, two disc sanders, two drum sanders, emory wheel, tenoner, dado heads and grooving saws.

Most of the machinery is adjustable to do different kinds of work, and each can be run separately by the shifting of different belts and clutches, which are all controlled from the center left-hand side of the machine. There are no belts or any part of the machinery running while the machine is being transported from one place to another, and is so designed that it can be set right while in operation. The machine, complete with all its equipment, weighs 2,400 pounds.

The driver can sit in the center of the machine and the steering wheel can be lowered so as not to interfere with the work.

This machine has been thoroly tried out on all kinds of work, and has been found to be a success and very practical.

BERT DE VRIES.

✣

Not Sure of Cost Plus Contract

To the Editor: Cincinnati, Ohio.

In awarding a contract for remodeling an old building, I find difficulty in giving out the job, as I am not sure what should be the fair compensation to the general contractor in case of the award "at cost + % interest" (to contractor). I should be pleased to find the answer by other members of the profession.

M. MICKNOVITZ.

Wants to Recane Chair

To the Editor: Fort Worth, Tex.

I would like to have some of your readers explain the best method of recaning their old seats and also the process of resilvering mirrors.

JOHN W. STEPHENSON.

✣

Has Trouble with Hip Roof

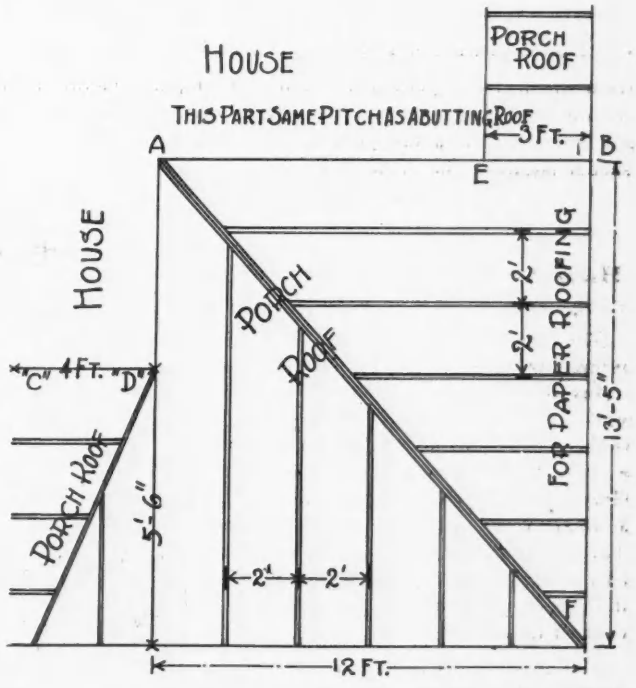
To the Editor: Pittston, Pa.

Recently I had a couple of roofs to frame which caused me a little trouble, that is, I did not understand the work as fully as I would like to. The first one was a concrete block garage, two stories, 34 by 38 feet; second floor was to be living quarters for the owner. To make the job as economical as possible he built the concrete blocks himself and when I arrived on the job he was there to help me do the work. He had a pencil drawing, ¼ inch to foot, calling for a 34 by 38-foot hip roof with a 4-foot ridge in the middle. The hips were to be 2 by 8 inch and jacks 2 by 6 inch. When I measured up the wall I used the 6-8-10 rule and found the building about 8 inches out of square, or 10 feet 8 inches, and the wall was out of level. To overcome this trouble I measured each jack separately—2 foot centers—and instead of it being 38 it was 37 feet 3 inches.

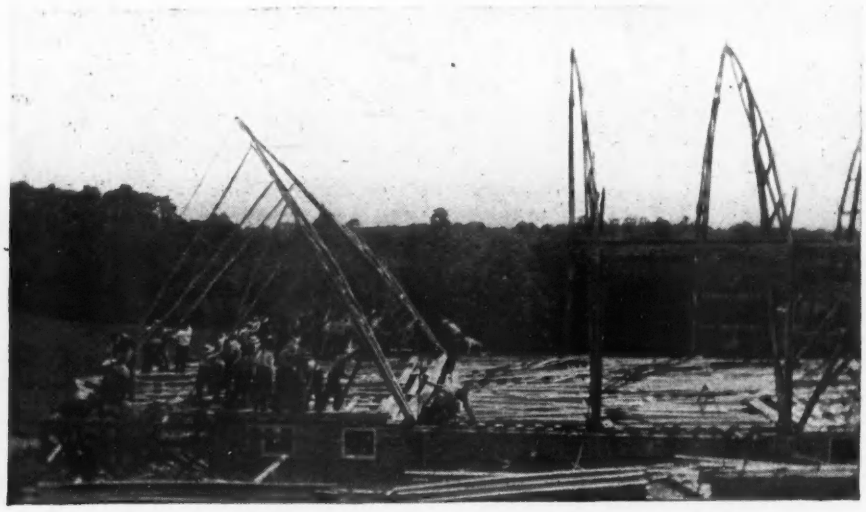
Now what I would like to know is this: What rule would you follow in a case like this? Could it be cut to fit without measuring each jack separately or would it have to be measured as I did. It is a large waste of time, I think.

I also am sending a drawing of a porch roof I worked on last week. The foreman laid it out himself. Does this drawing show the proper way to frame or would you put in common rafters from A to B, then carry out common rafters from C to D on the same pitch and put in a hip at E to F? Let me hear from brother carpenters. I would like to know the rule covering each of these two questions.

LOUIS BRANDENBURG.



Does This Drawing Show the Proper Way to Frame a Hip Roof? Asks Louis Brandenburg, Who Has Some Trouble with This Kind of Work. Send in Your Suggestions.

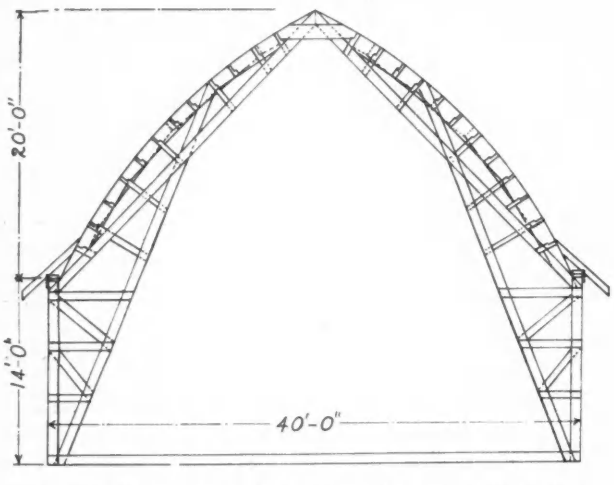


Raising the Rafters on a Barn Built by W. S. Kirkpatrick, Veteran Barn Builder at Bergholz, Ohio. He Has Been Building Barns for Twenty Years.

Sends Pictures of Gothic Barn

To the Editor: Bergholz, O.

I have been building the Shawvir plank barn for 20 years. I built one this summer for Harry Calhoun about 12 miles



Cross-Section Sketch Showing Roof Truss for Gothic Barn.

from Steubenville, Jefferson County, O. I put a Gothic roof on this barn, and it is one of the best barns I have seen. I am sending you some pictures and a pencil cross-section sketch showing the rafters.

W. S. Kirkpatrick.

✣

How to Resilver Mirrors

To the Editor: Benton, Ill.

Can you give me a recipe for resilvering mirrors? W. H. Lewis.

Answer—Place the old mirror in a weak solution of nitric acid—say, 5 per cent—which immediately removes the silver. Rinse a little and then clean thoroly with a piece of cotton wool and a mixture of whiting and ammonia. This cleaning is of utmost importance as the success of the job depends upon it. Front, back and edges should be cleaned thoroly.

The plate is then flowed with acid, rinsed under the tap, then flowed with distilled water and kept immersed in a glass-covered dish of distilled water until the solution is ready.

Use a stock solution of silver nitrate of the strength of 25 grains to one ounce of distilled water: take two drams of silver nitrate solution and convert into ammonia nitrate by adding ammonia drop by drop until the precipitate is dissolved. Add 3½ ounces of distilled water.

Then take in another cup 80 drops of formalin. Pour the solution of ammonia nitrate of silver into the dish containing the formalin, then back into the original dish and finally into the dish containing the glass to be resilvered. This should be done rapidly and the dish containing the mirror well rocked until the silvering is complete. The actual process takes about two minutes.

Cleanliness thruout is important. After the mirror is silvered, hold it under the tap and allow water to flow over it for about three minutes. Rinse it with distilled water and stand it up on edge of blotting paper. When it is quite dry take a pad of soft wash leather, spread a small quantity of fine optician's rouge on a sheet of clean glass and well coat the pad with rouge by polishing this sheet of glass. Afterwards polish the mirror by gently rubbing the surface with the pad.—The Editor.

✣

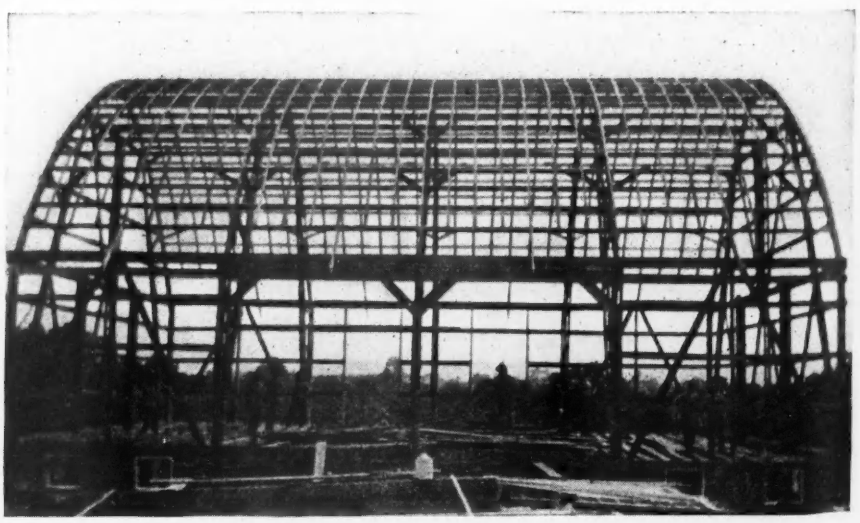
How to Clean Paint Brushes

To the Editor: Blanden, Neb.

Can you tell me how to clean paint brushes?

J. W. Wratten.

Answer—New paint brushes should be thoroly brushed back and forth on the hand until the dust and loose hairs are removed. New brushes require special attention the first few days. All brushes should be washed in benzine or turpentine and shaken dry before changing from one tint to another. All paint brushes which have become clogged by paint should be freed up with turpentine before using. Varnish brushes should be kept in the same varnish in which they are used, or in turpentine; but the latter treatment will make the brushes roughen in time and varnish is a much better preservative medium.—The Editor.



Gothic Roof Barn Built by Kirkpatrick for Harry Calhoun Near Steubenville, Ohio. The Cross-Section Above Shows How the Rafters Are Fastened Together.

Free to Contractors

Fill out and mail the attached coupon for a pint of Johnson's Floor Varnish, free and all charges prepaid.

Try a Free Can of *JOHNSON'S FLOOR VARNISH*

You know Johnson's Floor Wax. It is used all over the civilized world. We want you to know and use our Floor Varnish, too. It is of the same high quality as our Floor Wax. To prove this statement we are offering you a pint can absolutely free—all charges prepaid.

JOHNSON'S FLOOR VARNISH

We call it Johnson's Floor Varnish but it is equally good for woodwork, trim, furniture and linoleums. Johnson's Floor Varnish has good body—may be rubbed if desired—is absolutely waterproof—and will stand all reasonable tests.

Johnson's Floor Varnish is very easy to apply. It dries dustproof in two hours and hard over night. Gives a beautiful, high gloss which will not mar or scratch white. Has great elasticity and will not chip, check, peel or crack. Use coupon for your free pint.

S. C. JOHNSON & SON

"The Wood Finishing Authorities"

Dept. AB8

RACINE, WISCONSIN

Canadian Factory: BRANTFORD

S. C. Johnson & Son, Dept. AB8, Racine, Wis.

Please send me free, all charges prepaid, a pint of **Johnson's Floor Varnish.** I will test it and report results to you.

Name .....

Address.....

City and State.....

I Buy Varnish from .....

How the Stores Looked After Being Remodeled. The Value of This Window Space as Advertising Is Incalculable to the Owner of the Store. Many Builders Make a Specialty of Installing New Store Fronts in Old Buildings. This Store Is Owned by the McKinney Clothing Co., Durango, Colo.

Specializes in Store Front Work

To the Editor: Durango, Colo.

I am sending you some pictures of a modern store front which I have installed for the McKinney Clothing Co., of Durango, Colo. The pictures tell the story more effectively than words. Altho a contractor and builder, I make a specialty of store fronts and metal ceilings and find this line of work profitable. R. C. SALYER.

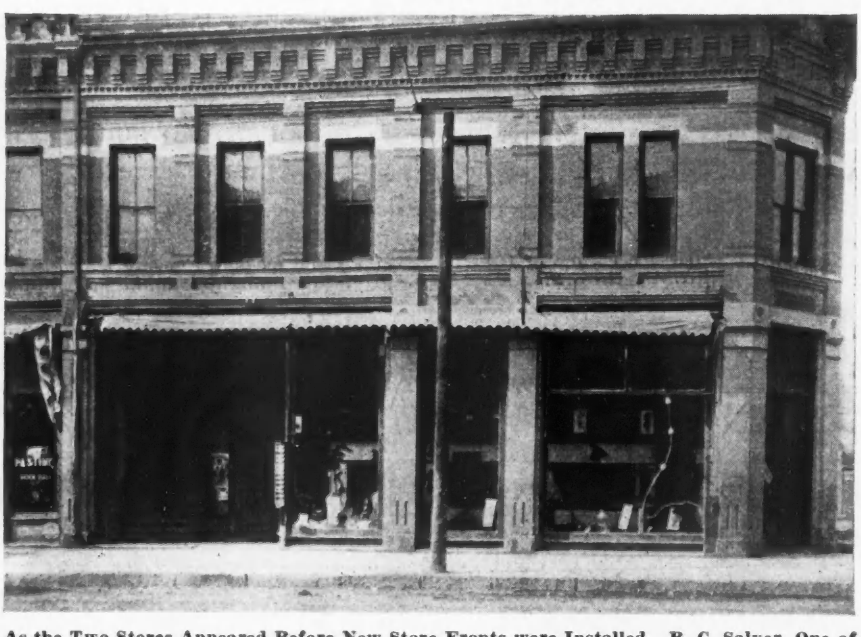
✣

Gives Facts on Shingle Laying

To the Editor: Vancouver, B. C., Canada.

In reply to the inquiry of H. K. Heinricks, of Breda, Iowa, in regard to shingling. I specialize in general building repairs, and get quite a lot of roof work. When repairs are slow I take new shingling. In eight hours I figure on laying four thousand with new straight work and when I have valleys and short runs, around three thousand, 3x shingles, No. 1, two nails to a shingle. The speed depends upon whether a man is doing it steadily, also whether he uses a gauge or straight edge. There are men up here who claim to lay 6 to 7 M per day. I have not seen them in action, it is only hearsay. One also has to figure on the height of the building; he has to carry up his shingles, and pitch of roof, or whether he uses galvanized nails or blued 1⅛-in. As you say, much depends upon the man. But faster than one bundle every 20 minutes is going some.

R. W. PRIMER.



As the Two Stores Appeared Before New Store Fronts were Installed. R. C. Salyer, One of Our Live Brothers in the West, Reports a Good Business in This Work in His City.

✣

How to Extend Foundations

To the Editor: Columbia, S. C.

In regard to Hans Madsen's questions on extending foundation down to the basement level, I submit the following plan which I have used with success a number of times.

Tunnel under the old foundation from basement side for a pier three or four feet long, going down to the required depth. Brick this up, leaving both ends toothed or blocked so work done later will tie in, then key up good with broken slate. Then move up six or eight feet, tunnel under and build another pier and so on the full length of the wall. When all piers are in and well keyed, come back to starting point, take out dirt between the piers, brick up and the job is done. The brick, of course, must be laid in cement mortar and well keyed between new work and old. W. A. CRARY.

✣

Point Not Clear

To the Editor:

In the May issue, on page 134, Correspondence Department, in Geo. D. Temk's reply to Chas. E. Nowell's inquiry "How to build a diamond spout," he says, "the line K will give correct level of diamond." Should it not have been bevel? JOHN CHADWICK.

Editor.—It should have been "bevel."

Have you strong competition in roofing?

THEN the fact that Johns-Manville Asbestos Roofing is out of the competitive class makes it ideal roofing for you to apply. For there is one thing certain—Johns-Manville Asbestos Roofing costs less per year of service than ordinary roofing. Ordinary roofing cannot compete with it on a service basis.

Of course, being made of the highest grade asbestos and asphalt, Johns-Manville Asbestos Roofing costs a little more than ordinary roofing to buy. Yet this slight difference in first cost is far outweighed by the years of extra service that it will render your customers.

For Johns-Manville Asbestos Roofing should outlast the building it protects.

But just because your customers don't have to renew Johns-Manville Asbestos Roofing, don't think for a minute that you're going to lose any profit on this account.

Get after the renewal business that is at once created when your customers, with buildings unsatisfactorily roofed, find they can re-roof for the last time with Johns-Manville Asbestos Roofing.

Every Johns-Manville Roof, no matter how old, is a sign board, bringing in new business for you—can you say that of any other roofing after it has been laid ten years?

Ask the nearest Johns-Manville branch to explain our roofing sales plan that gives you the jump on competition and puts your roofing business permanently on the profit side of the ledger.

Johns-Manville Asbestos Roofings are approved by the Underwriters' Laboratories, Inc., and take base rate of insurance.

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JOHNS-MANVILLE
ASBESTOS ROOFING

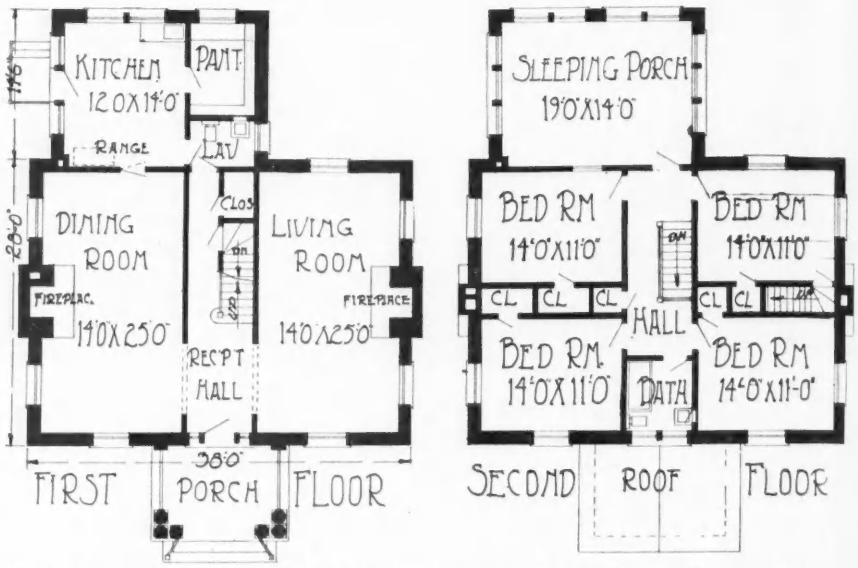
Charming Colonial Home Design of Brick

IDEAL DWELLING FOR THOSE WHO WANT LARGE AND IMPRESSIVE HOME—CONTAINS SEVEN SPACIOUS ROOMS AND SLEEPING PORCH

WHILE the pressing demand this season is for homes of smaller size there is always a call for homes of good size and pretentious design. For the man who has sufficient means and wants something distinctive, the brick house design shown on this page should be quite satisfactory. It is a large and impressive looking dwelling, built very substantially of brick and Colonial in design. The front entrance is particularly striking and massive with roof supported by heavy white columns. The characteristic shutters and roof dormers of the Colonial house are very much in evidence.

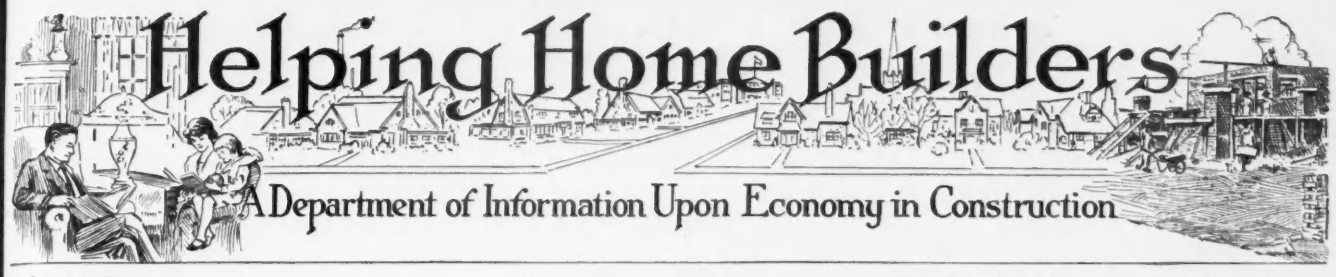
The floor plan calls for seven large rooms of which the living room is the most important. It is one of those great spacious rooms, 14 by 25 feet, located on the right of the small reception hall. It has a fireplace. On the other side of the hall, practically similar in size and arrangement to the living room, is the dining room, well suited for large dinners and receptions. These two rooms combined afford ample room for entertainments and dances.

The kitchen is not very large and is located in the rear wing. An extra lavatory has been provided for at the rear of the main hall. On the second floor there are four bedrooms, bath, and sleeping porch.



Typical Floor Plan Arrangement of Attractive Seven-Room Brick House of Colonial Design.

Pretentious Home of Very Charming Colonial Design. It Contains Seven Unusually Large and Comfortable Rooms and Sleeping Porch in Rear 19 by 14 Feet. It Is Built of Brick and Is 38 Feet Wide and 42 Feet 6 Inches Long, Including Rear Wing. A Brick Garage Is in the Rear.



1st Year August, 1921 Ralph P. Stoddard, Editor

SENSATIONAL *New Wall* LAUNCHED AS BRICK PRICES ARE REDUCED

Ideal Brick Hollow Wall Further Cuts the Cost of Brick Construction, Making the Brick Home One Type That Can Be Built at a Cost Within Reason.

There is one kind of home that can be built today at a cost which encourages the home buyer and builder to go ahead—the home of Brick.

Quickly following the recent general reduction of 25 to 50 per cent in Brick prices throughout the country, comes the announcement of the new Ideal Brick Hollow Wall, a construction development which cuts the cost of Brick wall construction fully one-third by saving materials, time and labor.

Thus the factors which have deterred building in many localities, have been overcome in the Brick home whose net cost is such as to inspire confidence at a time when confidence is needed.

Construction of the 8-inch Ideal All-Rolok Wall. Note positive break in the mortar joint.

Ideal All-Rolok Wall

Bricklayer Lays Greater Area of Wall Per Day

Fewer Brick and less time are required to build the Ideal Wall, hence bricklayers lay a greater area of wall per day. Moreover, the number of Brick laid per day per man has lately increased noticeably—another economy factor in Brick construction.

Saves From $200 to $500 On a Home

The Ideal Brick Wall can be built with 33 per cent fewer Brick than a solid Brick Wall. The saving in mortar will average 50 per cent and the saving in time and labor another 25 per cent. It is obvious, therefore, that the saving on any kind of a Brick house is such as to appeal to every Contractor and Builder who watches his costs. Ideal Walls also save furring and lath as they are dry when plastered on the Brick.

As to its economy, the saving on a 6-room house by using the Ideal Wall, runs from $200 to $500. As to strength, this Wall is at least 25 times stronger than it needs to be to support a 6-room, 2-story Brick house. As to beauty, it can be built with any bond or pattern and any desired effect secured. A rich, aristocratic Flemish Bond effect is the natural result of the Ideal All-Rolok Wall.

The Ideal Wall requires no special Brick or no special framework. It is the simplest as well as the cheapest Wall it is possible to build. It is as suitable to the modern apartment building, theater and hotel as it is to the average residence and garage. It makes a completely dry, warm building on account of extraordinary ventilation and can be built in 8-inch, 12-inch and 16-inch thicknesses.

Full details and drawings free from your nearest Common Brick manufacturer, or write to 1306 Schofield Building, Cleveland, Ohio.

Figures Prove Striking Economy of Ideal Wall

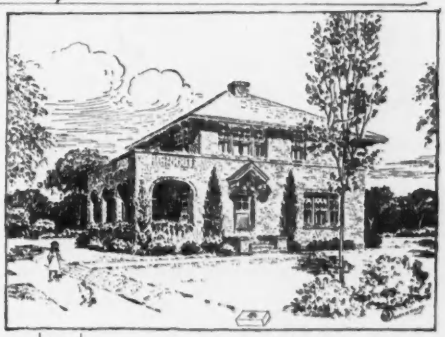
The striking economy of Brick homes built with Ideal Walls is evidenced in the detailed cost figures given by D. G. Perkins, manager of the Albany, Ala., mill of The Southern Cotton Oil Company, who recently completed a Brick Ideal Wall home in Albany.

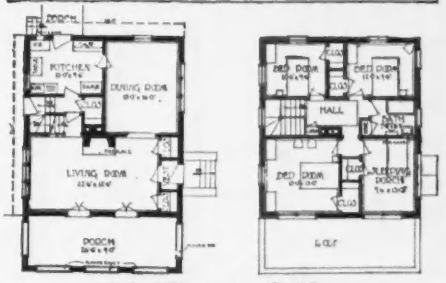
Compare these figures with the cost of erecting the walls of any other type of construction.

Mr. Perkins' 2-story house is 28 by 34. Foundations and first story, 12-inch Ideal Wall; second story, 8-inch Ideal Wall; footings, 28-inch solid. The front porch is 24 by 10 by 6 and the back porch 7 by 5 by 6. One large chimney with two flues is built in the wall, one flue being 13 by 18 by 36.

The average cost of Brick laid in the wall was $32.48 per M. Following are detailed costs of materials:

Sand	$124.66	
25 bbls. lime	52.75	
41 sks. cement	36.90	
320 lbs. lamp black	64.00	
Joist anchors	5.00	
Mineral red	10.60	
Metal beams for openings	47.60	
		$341.51
53,000 brick @ $14		742.00
Labor (bricklayers and helpers) 53,000 brick @ $12		636.00
		$1,719.51





It's Easy to Sell a House Like the Oneida

It's a handsome home, of the unusual type, which can be placed on a corner lot to great advantage.

The porch you will note is away from the entrance, assuring privacy and freedom from unwelcome interruptions. It is large and roomy with flower boxes all 'round. Two groups of French windows open directly upon it from a cheerful living room.

The interior is well arranged, the rooms being larger than the average. The living room is 22½ by 12½; the dining room 16 by 13. Upstairs are three large bedrooms and a sleeping porch, the latter with double hung windows which, closed, transform the porch into a bedroom. All rooms as well as porch and entrance vestibule, have large closets. The modern kitchen is 13 by 9½ with all conveniences, even a storage closet, just outside the door.

A Service for Builders

(Check the Literature You Want)

"BRICK for the Average Man's HOME." In this book are 34 other designs such as the Oneida, with complete working drawings (original full size blueprints) available for each at nominal cost. Each shows four elevations, floor plans, basement plan and section; detail of fireplace and built-in cabinets and cases and a complete bill of masonry materials and labor, and specifications. $1.00 postpaid.

"BRICK, HOW TO BUILD AND ESTIMATE." A book Contractors have waited for all their lives. So popular has it been that the third edition is now on the press. Prominent universities consult it as a reference work; thousands of builders and architects refer to it constantly. So complete and dependable is the data given that the number of Brick, amount of material for mortar or any mixture, hours of bricklayers' and laborers' time, may be quickly read off for any thickness and area of wall up to 10,000 sq. ft. laid in any bond.

This book goes into detail and shows, step by step, how to figure Brick costs. Postpaid, 25 cents; actual worth, $2.00.

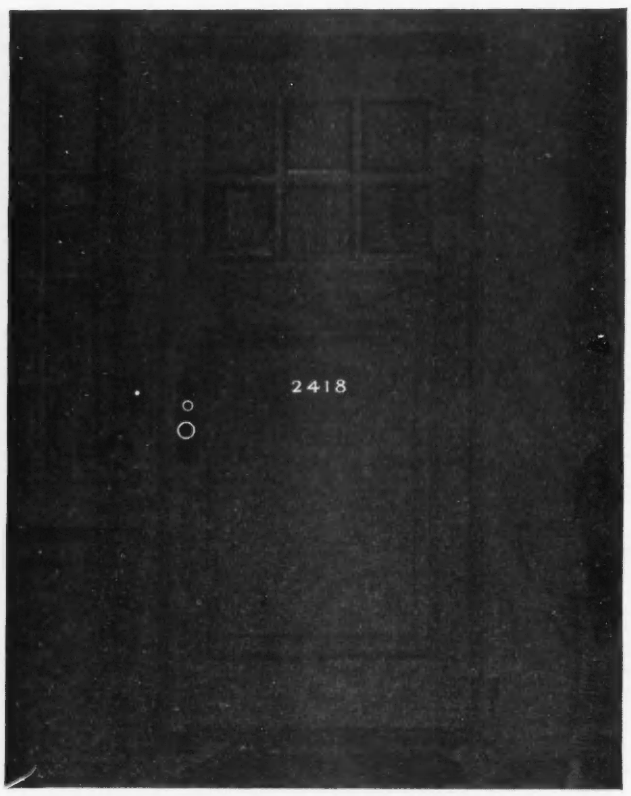
Free literature on the Ideal Wall interestingly describes and illustrates this sensational new development. Ask your nearest Common Brick manufacturer for a copy or write direct to The Common Brick Industry of America, 1306 Schofield Building, Cleveland, Ohio.

EDITOR'S NOTE: The American Builder does not accept payment in any form for what appears in our reading pages. In order to avoid any appearance of doing so, we omit the name of the maker or seller of any article we describe. This information is, however, kept on file and will be mailed to anyone interested; address American Builder Information Exchange, 1827 Prairie Ave., Chicago.

Radium in Construction

THE house is built. The prospective purchaser is found. Perhaps it is dark at the hour you are showing him the house. You enter the spacious living room. You know there is a switch in the room. You grope around the room fumbling at all the walls, vainly trying to find the electric switch button. You fall over a chair or some tools left by workmen. Your prospect grows impatient, and perhaps his injured shin will prevent the sale.

All of this happened in the past. But this is not a good description of what would happen today; because radium and radium luminous materials have changed all that. Today when you enter a dark room, the electric switch button shines out in the darkness. The radium in the luminous material with which it has been treated makes it easier to find now in the darkness than in the daylight. No one need today paw the air trying to locate the chain from an overhead light; and when the room is furnished, no shins will be bruised on the sharp corners of furniture; nor will the bric-a-brac be knocked over while hunting for the chain on the table lamp. The face of the clock is today visible at night, having been treated with radium.



Radium Has Now Invaded the Building Field. Illuminated Numbers, Key Holes, and Electric Switches Are New Conveniences for the Home Owner.

And before entering the house, street numbers will now be visible. The door knobs and keyholes and the house bells—all these are today made visible by radium.

In theatres of modern construction, the aisle seats are bearing illuminated numbers.

The amount of radium required has been determined by a long series of experiments. But, it has been found, the luminosity is not in exact proportion to the amount of radium used and a quantity has been determined which gives the greatest luminosity and the longest life for the least money.

The commercial material now available is guaranteed for the life of the instrument on which it is used. It is supplied to the manufacturer as a yellow powder. It is mixed with an adhesive and applied to the work at hand with the tip of a camel's hair brush. Care is taken not to brush the material but to place it on the surface drop by drop, so as not to crush the zinc crystals. It is interesting to note that the deterioration of the substance is not due to failure of the radium, but to a breakdown of the zinc crystals, due to the bombardment of radium particles. No known substance will stand up under this bombardment.

New uses are constantly being discovered for this material. A company is now in formation for the manufacture of luminous house numbers in large quantities. The best known use is in the luminizing of clock and watch dials and as locaters for electric switches. Some of the later applications are its use as keyhole locaters, on airplane and automobile instruments, ships' compasses and telegraph dials, mine signs, steam gages, pistol sights, poison bottle indicators, bedroom slipper buttons, furniture locater buttons, automobile steering wheel locks, etc. Two recent novel applications are in the manufacture of luminous fish bait and glowing eyes for toy dolls and animals.

✣

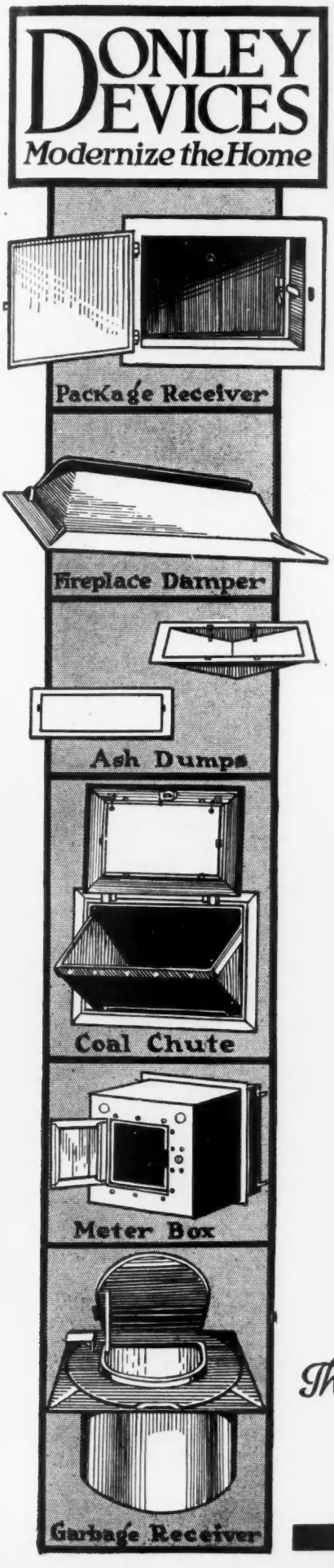
Ventilators for Doors

THERE is often a real need for a ventilator in the doors or transoms in hotels, hospitals, and buildings for various purposes. It is essential that such a ventilator be easily installed at a very reasonable expense and that it be attractive in appearance and, open or closed, proof against light rays or vision.

Ventilator Installed in Top of Door. Adapted for Hospitals, Hotels and Other Buildings.

Such a ventilator is now on the market. It is made of steel plate and is so constructed that the amount of air passing thru it can be regulated by a movable shutter. It is of standard height but can be made in any length. It is shipped ready to be installed in the rectangular space provided for it in the door or transom frame to which it is attached by mouldings. One of these ventilators in position in a door is shown in the illustration.

Light rays from corridor lights or windows will not pass thru the device altho it is open to its full extent for the passage of air to and from the corridor into the room. The fea-



These Things Belong in Every New Home

The Donley Package Receiver

Ends doorstep deliveries of meat, milk and groceries. It is a steel box built in the wall of the kitchen or entry, with iron doors opening outward and inward. Outer door locks automatically, and is released from within. No waiting at home for deliveries. no contamination by dogs or cats, no opening the door to strange men. A household necessity in daily use.

The Donley Fireplace Damper

Means warm smokeless, economical open fires in the new fireplace. Its smooth iron throat saves masonry work and prevents smoke eddies. Broad flange supports brick of fireplace front. Valve plate is easily regulated either by poker control or rotary key control as desired. Makes fireplace more than an ornament and genuine source of warmth and cheer.

The Donley Ash Dump

Made in two styles, is installed flush with the hearth and forms a gate to the ash pit. It keeps the dust and odors of the ash pit out of the room, promoting cleanliness. Write for illustrated booklet on Fireplace Construction.

The Donley Coal Chute

Takes the place of the old fashioned coal window with its marred, dirty appearance and its usual broken glass. Steel flanges and a steel door that opens against the side of the building protects its walls from damage. It is burglar proof and can be unlocked from inside only without entering coal bin. It is made also in grade line style for business buildings and terraced homes where sills are on the ground level.

The Donley Meter Box

Keeps the electric meter man outside the building and makes his work much easier and more rapid. It saves the home from intrusion at times when inconvenient to household and leaves thugs no pretext for getting inside. Built into foundation at point where electric wires enter. Read through glass door without unlocking.

The Donley Garbage Receiver

Replaces the unsightly, easy tipping, fly breeding, garbage can. It is located beneath the ground near kitchen door, or else in floor of rear porch, with top flush with surface. Foot lever opens it for depositing garbage. Inner receptacle easily removed for emptying. Is out of sight and fly tight.

Before you build write to us for complete catalog of Donley Devices

The DONLEY BROTHERS Co.
BUILDING SPECIALTIES
7400 ÆTNA RD CLEVELAND

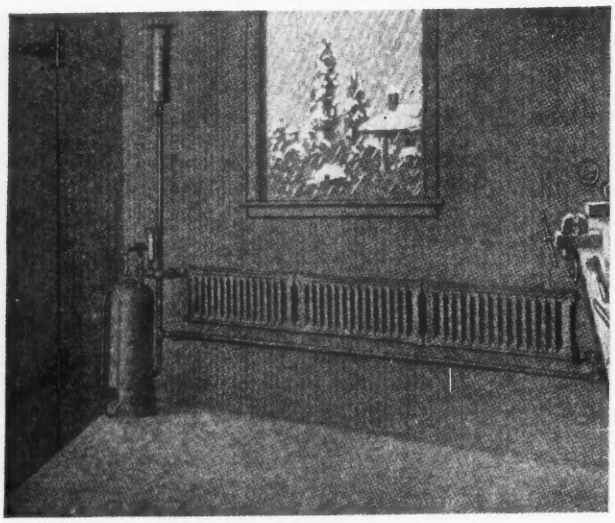
ture of this ventilator is the automatic arrangement which closes the shutter in case of fire in the room or corridor. This is accomplished by a weight suspended from a fusible link which fuses at 160 degrees Fahrenheit. This weight operates a lever that closes the shutter and stops the draft of air.

✣

Handy Garage Heater

WITH the increase in the number of automobiles and the subsequent construction of garages has come a demand for a small, compact heating apparatus at moderate cost. Builders find a device of this kind is essential to complete satisfaction on the part of the garage owner. Consequently garage heating systems have appeared of which one is shown in the illustration below.

This automatic heater is very simple in construction and low in initial cost and can be used in unusual places where ordinary equipment might not prove satisfactory. The important features are the copper generating coil, spiral in form and in direct contact with the combustion gases and with



How Garage System Looks Installed in Building. It Is Operated by Gas, Gasoline or Kerosene.

the water leg or space between the inner and outer shell of the generator. This arrangement permits free upward gas travel and a rapid water circulation.

The apparatus can be installed by the builder or mechanic in a few hours and can be equipped to burn either natural or artificial gas, kerosene or gasoline. The average gas consumption is 20 to 100 cubic feet of gas per hour. The floor space occupied is about 18 inches square and the height of the apparatus about 34 inches. It has a capacity of 100 square feet radiating surface.

There is a thermostatic control on the heater insuring steady heat. The heater is made in several sizes, the larger the size the greater the radiating surface. It forces the warm water thru radiator sections which are provided in a number to fit the requirements of the garage to be equipped.

✣

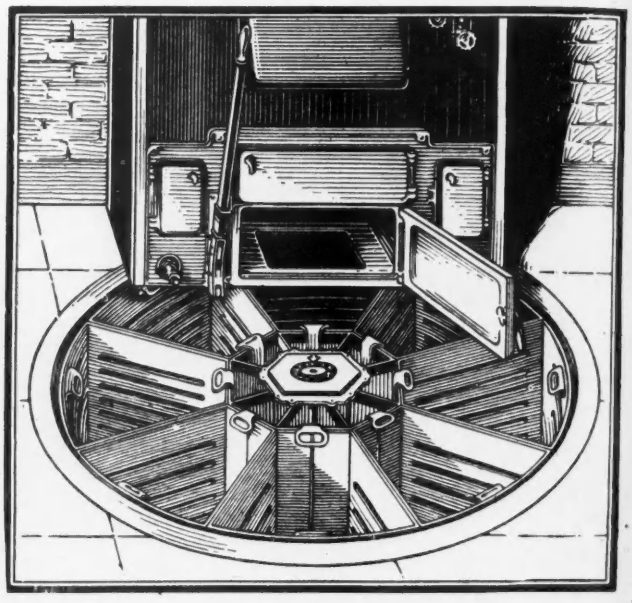
Efficient Rotary Ash Receiver

SANITARY and efficient removal of ashes, garbage and refuse is an important problem in all kinds of dwellings, public and other buildings. A unique ash receiver has been placed on the market designed to provide a means for the efficient removal of this waste material.

It consists of a circular pit excavated in the cellar bottom and extending under the front of the heater about 12 inches. In this pit is assembled the complete equipment as shown in the illustration, which consists of a metal form containing a series of specially constructed galvanized iron cans that revolve on a central perpendicular shaft, bringing one numbered can at a time directly beneath the ash pit.

As each can is filled the device is turned until the next number is in position under the grate and so on until all cans are filled. The whole device is covered by stationary top plates level with the basement floor, provision being made to receive the ashes thru an opening in the floor of the heater ash pit. One plate being removable permits the filled cans to be lifted out by block and tackle, included in the equipment and fastened to the ceiling.

This device is made in two styles, iron top and cement top



Rotary Ash Receiver Built in Cellar Floor in Front of Heating Plant. One Compartment Is Under the Grate to Receive Ashes. When Filled the Device Is Revolved and a New One Placed in Position. Device Shown with All Covers Removed.

finish. It eliminates all ash cans and boxes and keeps the basement clean from ashes, gases, and other nuisances.

Waste from the kitchen may also be deposited in the cans thru the open space in the floor of the ash pit, all odors being drawn up thru the fire box and passing out thru the chimney.

✣

THERE are in the United States over forty factories engaged in the manufacture of asphalt shingles and prepared roofing, representing with their allied interests an investment of more than $150,000,000. It has been conservatively estimated that the daily output of these factories exceeds 7,500,000 square feet of finished material. This daily output, if rolled into one sheet three feet wide, would stretch from Chicago to Buffalo, a distance of more than 500 miles, and would be sufficient to roof 4,000 dwellings of average size. This material is shipped not only to all parts of the United States but to South America, Mexico, China, Italy, Austria, Germany, England and Russia.

✣

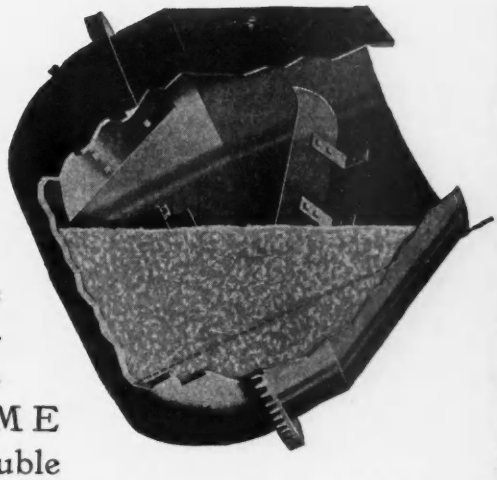
CHIMNEYS should always be built on a solid foundation resting on earth well below the frost line, at level of footing, whether they are interior or exterior chimneys. They should not be corbelled out as a projection from a wall, and the top of a chimney should be carried at least three feet above flat roofs and two feet above ridge of peak rooms. When the building is surrounded by taller structures it may be necessary to carry the chimney higher in order to avoid down drafts.

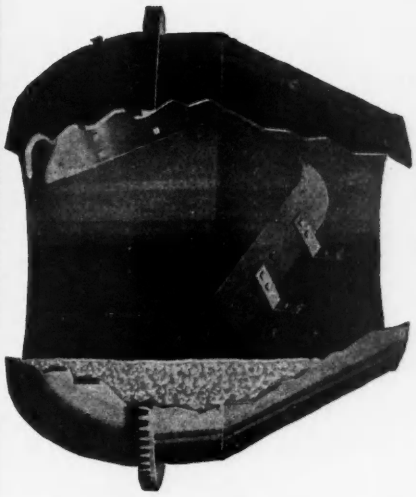
THE WISE CONTRACTOR WORKS WONDERS

Works WONDERS because he obtains more capacity with less weight; works WONDERS because he gets more years of service per dollar investment; works WONDERS because of the efficient simplicity of their design.

Here is Efficient Simplicity

Note the capacity of a SINGLE OPENING SINGLE BEARING WONDER Mixing Drum in its TILTED Mixing Position.





Then

Note also the LOSS of CAPACITY when we convert the SAME DRUM to a Double Opening in the Horizontal Position

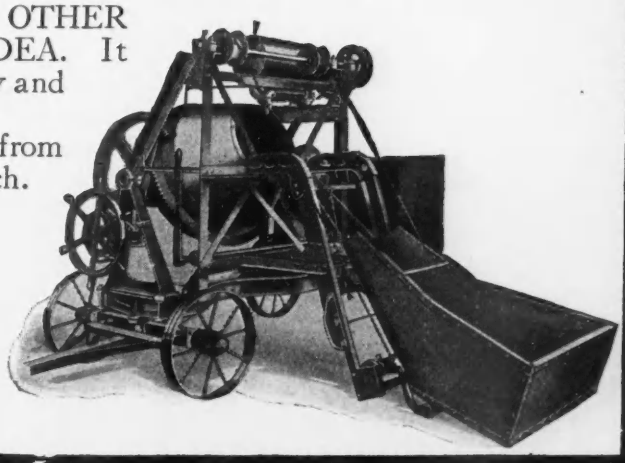
It Now Requires

Four Bearings and a Charging Hopper
Discharge is Complicated and Slowed Down
Visibility of Mix is Lost
To Maintain the ORIGINAL Capacity WEIGHT ONLY IS ADDED.

UNNECESSARY WEIGHT IN A PORTABLE CONCRETE MIXER IS ALL WASTE

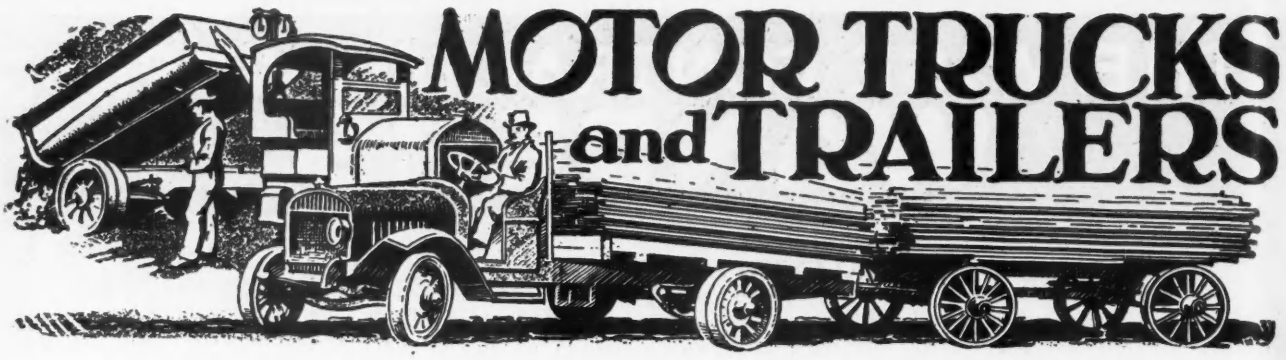
GRASP WITH THOUSANDS OF OTHER CONTRACTORS THE WONDER IDEA. It is Durability combined with Simplicity and Efficiency.

WONDER Mixers built in sizes from 3 to 7 cubic feet mixed concrete per batch.



For fine descriptive catalog of all sizes ask for M-33 with no obligation.

CONSTRUCTION MACHINERY COMPANY
Formerly Waterloo Cement Machinery Corp.
103 Vinton St. Waterloo, Ia.



Motor Trucks Increase Supply Dealer's Business Scope

PREVENT CONGESTION IN YARDS AND ENABLE CAMDEN, N. J., CONCERN TO DELIVER NECESSARY TONNAGE

By P. L. Sniffin

THERE are times, it is true, when horse-drawn equipment is better adapted to handle the building supply dealers' hauling equipments than motor trucks. But the Camden Lime Company, dealers in building materials of various kinds at Camden, N. J., are emphatic in their statement that "teams would never do for us."

While horses have never been relied upon entirely, Mr. Huilline, secretary of the company, voices more than an opinion when he says, "It would not have been possible to get enough teams in and out of our plant. The congestion in the yard, had teams been used, would have prevented our delivering the necessary tonnage."

That, in itself, Mr. Huilline feels, is reason enough for maintaining a fleet of eleven 2-ton trucks. Yet aside from this, the part they have played in the gradual substantial development of the business is a prominent one. Unquestionably, the freedom of the truck from the speed and capacity limitations of the horse, has enabled the Camden Lime Company to develop its business scope to a point where the present volume of business is several times that of six years ago. It was, in fact, six years ago that the first two trucks of the present fleet were installed. A year later, the experience with these led to the decision that a greater scope could be handled by the use of two more. So they were purchased and a year later another one followed, making five in all, four years ago. By this time, the business had increased to such an extent that the fleet was doubled in size by the addition of five more. Two years ago the last of the eleven was installed.

Whether the number of trucks increased with the business, or whether the business increased with the ability of the trucks is an unanswerable question. Yet in either case, the use of trucks was indispensable to the rapid growth experienced by this company. That they have been constantly on the go during their length of service is indicated by Mr. Huilline's statement of

Fleet of "Mack" Light Trucks Used by Camden Lime Co., Camden, N. J., Building Material Dealers. These Trucks Have Increased Their Tonnage Capacity. This Firm Uses Eleven of These Two-Ton Trucks. They Hauled 30,000 Tons of Material During Seven Months of 1920.

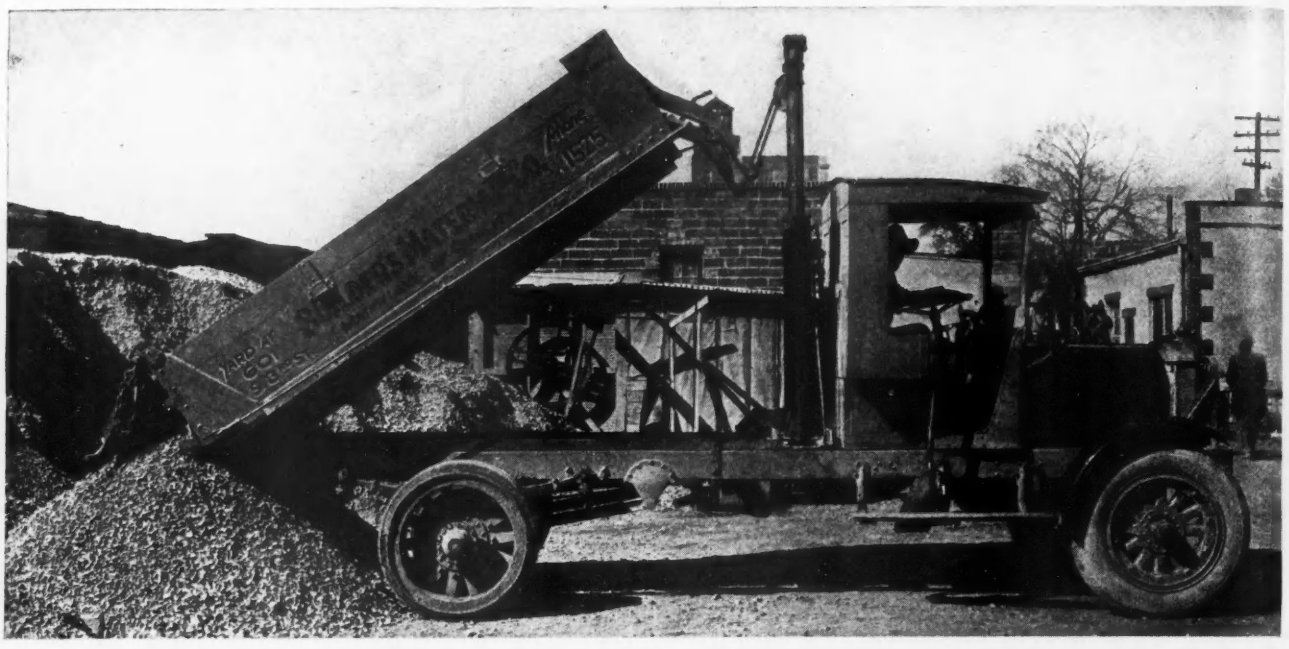
General Motors Trucks

As there is only limited storage space on the average city construction job, Holmes, Pyott & Co., Iron Works, Chicago, use a 2-ton GMC Truck to deliver material ***when it is needed.*** Among hundreds of other contractors depending on GMC Trucks are:

J. C. Byram & Co.	Birmingham, Ala.
DuPont Engineering Co.	Detroit, Mich.
J. Henry Miller	Baltimore, Md.
Rosslyn Supply Co.	Washington, D. C.
Thompson-Starrett Co.	Detroit, Mich.
Underhill & Sons	Glen Cove, L. I.
Mississippi Sand Co.	Alton, Ill.
Triangle Construction Co.	Ritzville, Wash.
Gordon Construction Co.	Casper, Wyo.
Southern Construction Co.	Dallas, Texas
A. R. Young Construction Co.	Clarksville, Ark.

GENERAL MOTORS TRUCK COMPANY
One of the Units of the General Motors Corporation
PONTIAC, MICHIGAN

(825)



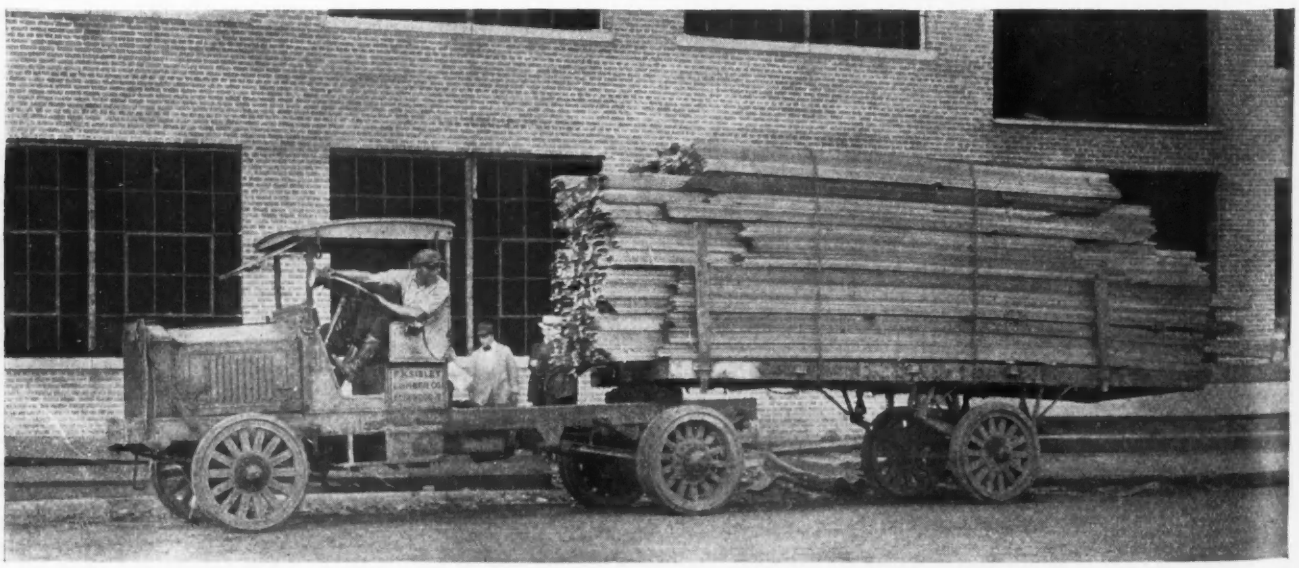
Included in the List of Progressive Cedar Rapids, Iowa, Concerns Is the Builder's Material Co. This Picture Eloquently Shows the Reason. This "Federal" Truck with Special Loading Body Is One of the Important Assets of This Organization and Typifies the Spirit Behind This Live Concern. Note the Pneumatic Tires on Front Wheels.

their approximate mileage to date. The two six-year-old trucks have gone 150,000 miles each, the two five-year-old trucks, 125,000 miles each and all of the rest have likewise averaged 25,000 miles a year. Since most authorities place the average yearly truck mileage at about 15,000 miles, it can be seen that the Camden Company's trucks have served their full quota of usefulness.

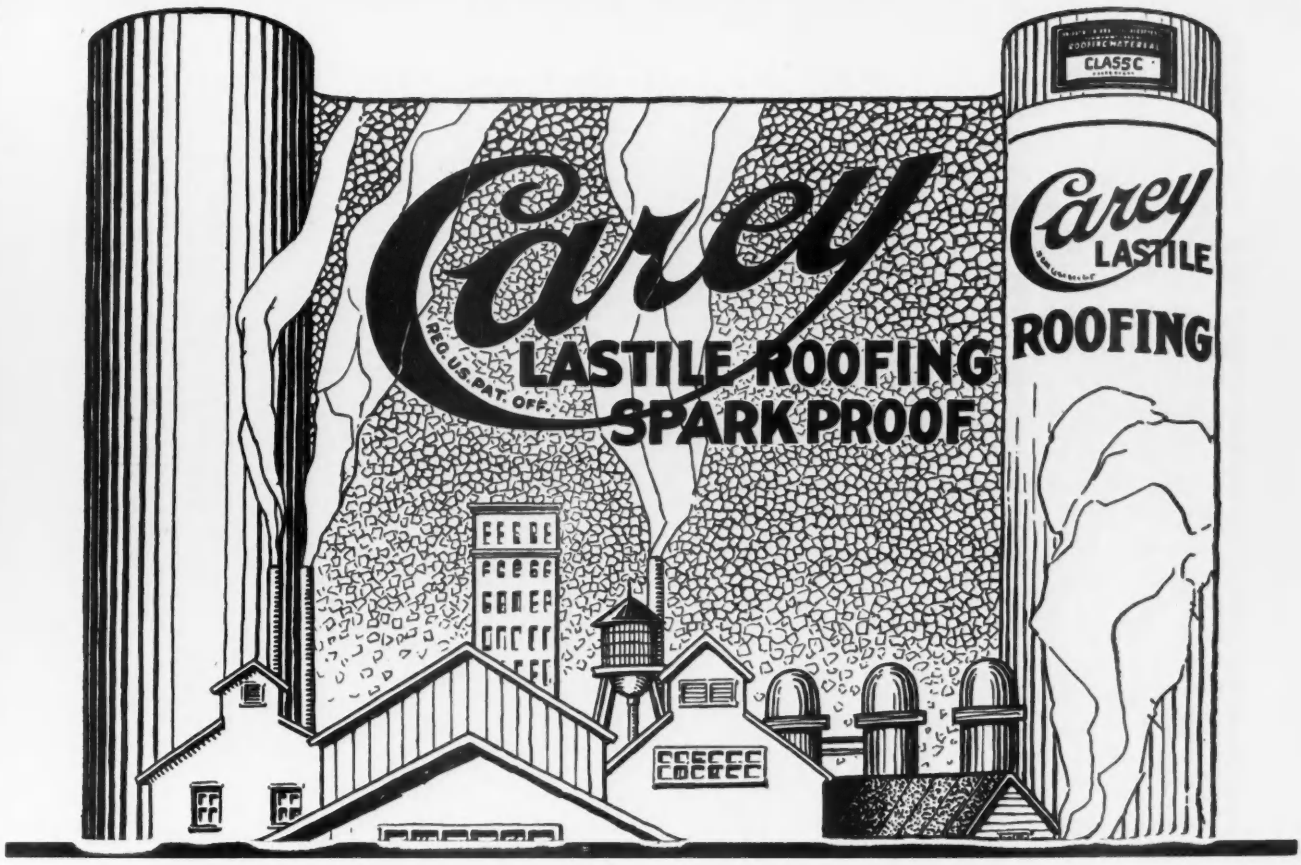
What most truck users would regard as unusual truck performance would probably appear to be every-day work to the Camden Company. For instance, during seven months of 1920, these eleven trucks together hauled 30,000 tons of material per day and it is evident that to accomplish this, they must have been running almost continuously.

But there is one vital point to be remembered in subjecting motor trucks to service of this kind, according to Mr. Huilline, and that is to take care of them accordingly. A great many truck operators make the grave mistake of forgetting lubrication, inspection, etc., when a busy period happens upon them, with the result that the trucks go to pieces rapidly and the cost of repairs or replacement makes the service a costly one. But not so with the Camden Lime Company. A competent mechanic is assigned to the charge of the fleet at all times and his duties increase as the amount of service rendered by the trucks increases.

The trucks are inspected regularly and lubrication is watched unfailingly. The slightest engine knock or symptom of possible trouble is reported to the mechanic in charge and is then properly taken care of. Minor troubles are revealed before they develop into large ones and in this way, repair and overhauling expense is reduced.



Carrying an Extra Heavy Load of Lumber on a Semi-Trailer Pulled by a Five-Ton "Standard" Truck. Lumber Dealers Find This Combination Very Efficient and Today More Than Ten Thousand Dealers Are Operating Trucks in the Lumber Business.



THE Fire Underwriters rate Carey Lastile very highly on account of the fact that it is surfaced with slate and is sparkproof.

The slate surface greatly improves the appearance of factory and business buildings giving them a red or green roof which tones up the appearance of the property.

The slate is fadeless and never requires painting---thus upkeep is reduced to the minimum.

Underneath this sparkproof and attractive surface is a tough body composed of asphalt saturated woolfelt. On account of the extra heavy felt used and the large percentage of specially refined asphalt, Lastile is unusually tough and durable.

Headquarters for the building and insulating products of

ASPHALT **ASBESTOS** MAGNESIA

"A Roof for Every Building"

Write for Booklets on Asfaltslate Shingles, Wallboard, and Roofings.

THE PHILIP CAREY COMPANY

510-530 Wayne Ave. Lockland, Cincinnati, Ohio

Strength of Screw Fastening in Plywood

IF THE screw fastenings in plywood construction are to be as strong as the plywood itself, it is important to adapt the size of screw, spacing, and margin to the particular species and thickness of plywood used. Tests made at the Forest Products Laboratory have shown that the commonly-used plywood species may be divided into the following groups, all woods in any one group requiring the same screw fastening to develop maximum strength.

Group I (Low Density)—Basswood, Cedar (Spanish), Cottonwood, Cypress (bald), Douglas fir, Fir (true), Hemlock, Pine (sugar), Pine (white), Poplar (yellow), Redwood, Spruce (Sitka).

Group II (Medium Density)—Ash (black), Ash, (pumpkin), Elm (white), Gum (black), Gum (cotton), Gum (red), Hackberry, Magnolia, Mahogany, Maple (soft), Syracuse, Walnut (black).

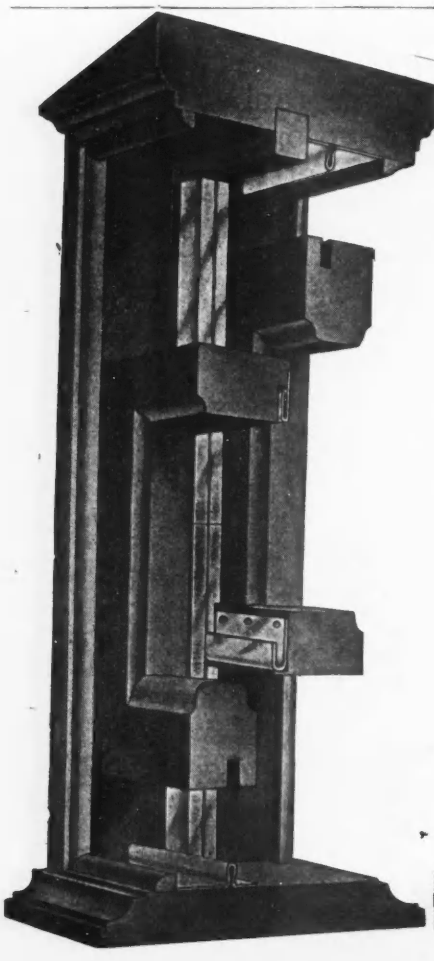
Group III (High Density)—Ash (white), Beech, Birch, Cherry (black), Elm (cork), Maple (hard).

The screw sizes, margin, and spacing for use with each species and plywood thickness will be found in the following table. The gauge is the smallest that can be used with the thickness specified and not cause failure thru breaking of the screw when the full strength of the plywood is developed. The length of screw is the shortest which will prevent the screw from pulling out before the full plywood strength is reached. The margin is the smallest distance from edge of hole to edge of plywood which will insure against failure by shear. The spacing is the distance from center to center of screw holes which gave maximum strength per linear inch.

Species of plywood	Thickness of plywood in inches	Gauge (number) of screw	Screw length in inches Species receiving point White ash	Spruce	Margin in inches	Spacing in inches
	3/30	4	½	⅝	½	⅜
	3/24	5	½	⅝	⅝	½
	3/20	6	⅝	¾	⅝	½
GROUP 1	3/16	7	⅝	¾	⅝	⅝
	3/10	9	⅜	1	¾	¾
	3/8	11	1	1¼	¾	⅜
	3/30	5	½	⅝	½	½
	3/24	6	⅝	¾	⅝	½
	3/20	7	¾	⅞	⅝	⅝
GROUP 2	3/16	8	⅞	1	⅝	¾
	3/10	10	1	1¼	¾	¾
	3/8	12	1¼	1½	¾	⅞
	3/30	6	⅝	¾	½	½
	3/24	7	¾	1	⅝	⅝
	3/20	8	1	1¼	⅝	¾
GROUP 3	3/16	9	1¼	1½	⅝	¾
	3/10	11	1½	1¾	¾	⅞
	3/8	13	1¾	2	¾	1

About equally good results were obtained with flat-headed screws without washers and round-headed screws with washers. Round-headed screws without

(*Continued to page 138.*)



SAGER
METAL WEATHERSTRIPS
Keep Out Drafts

You can't heat a room with the window open.

Every window that is not weatherstripped is open enough to make the coal bills considerably larger. Sager cuts coal bills 20% to 40% and that's what makes it easy for you to sell and install Sager Interlocking Bead.

CARPENTERS

You can make big money right in your own town selling and installing SAGER WEATHERSTRIPS. Thousands of other builders all over are doing it every year.

Easiest strip on the market to install.

Write us today for our Special Offer to all BUILDERS.

SAGER LOCK COMPANY
NORTH CHICAGO ILLINOIS


Give a New Birth of Strength and Beauty to Old Buildings
The contractor of today has a rich field of profit in the transformation of old, time-worn buildings into models of modern architecture. You can give a new birth of strength and beauty to run-down, decrepit buildings—turn them into masterpieces of modern design by overcoating with
KELLASTONE
IMPERISHABLE STUCCO
KELLASTONE has reclaimed the vanished youth and vigor of thousands of buildings which Time had robbed of beauty and deprived of the strength to defy cold, fire, decay and dampness.
No home is yet too old or time-scarred to be re-born with enduring stability and charm through an overcoat of KELLASTONE—the scientifically balanced all-mineral magnesite stucco. Contains no lime, gypsum, portland cement or similar ingredients—applied over any surface—will not crack under ordinary building strains like common stucco and is immune to fire, cold, dampness and the ravages of age. On new construction it is unexcelled and is as lasting as the pyramids.
Ask for booklet—
"The Story of Kellastone"
National Kellastone Company
Room 515, 155 E. Superior Street
CHICAGO, ILL.
THERE IS ONLY ONE GENUINE KELLASTONE
LOOK FOR THE NAME ON EVERY SACK
KELLASTONE
IMPERISHABLE STUCCO

NEWS OF THE FIELD

Prof. Paul Leaves Lumber Association

C. E. PAUL, for six years consulting engineer, National Lumber Manufacturers' Association, has resigned.

Since removal of main offices of association to Washington, D. C., in February, 1921, he has had charge of the Chicago office of the association in capacity of consulting engineer.

Has been connected with the association for six years and has had much to do with the development of its technical work which formerly consisted of an engineering bureau but now has expanded into the present technical and research department embodying four distinct lines of technical work.

After a short vacation he will resume his former private consulting practice specializing in construction and materials used in construction.

He will open a temporary office at 3300 Federal Street, Chicago, in August.

✣

F. E. Myers & Bro. Incorporates

F. E. MYERS & Bro., a co-partnership for over forty-five years, consisting of F. E. and P. A. Myers, has been incorporated as the F. E. Myers & Bro. Company, with a capital stock of $6,000,000. The new company will take over the manufacturing business heretofore conducted by the co-partnership without any change in the organization or the personnel of the company excepting the adding of dependable men of experience. The business of the firm will be conducted the same in the future as in the past. The officers of the company are as follows: F. E. Myers, president; P. A. Myers, first vice-president and general manager; John C. Myers, second vice-president; Guy C. Myers, third vice-president; F. B. Kellogg, secretary and treasurer, who together with A. N. Myers, T. W. Miller and G. D. Myers constitute the board of directors.

✣

Omission

IN the story of the new South Bend Tribune Building, which appeared in the July issue, the name of the contractor was omitted. The H. G. Christman Co. of South Bend erected this building.

✣

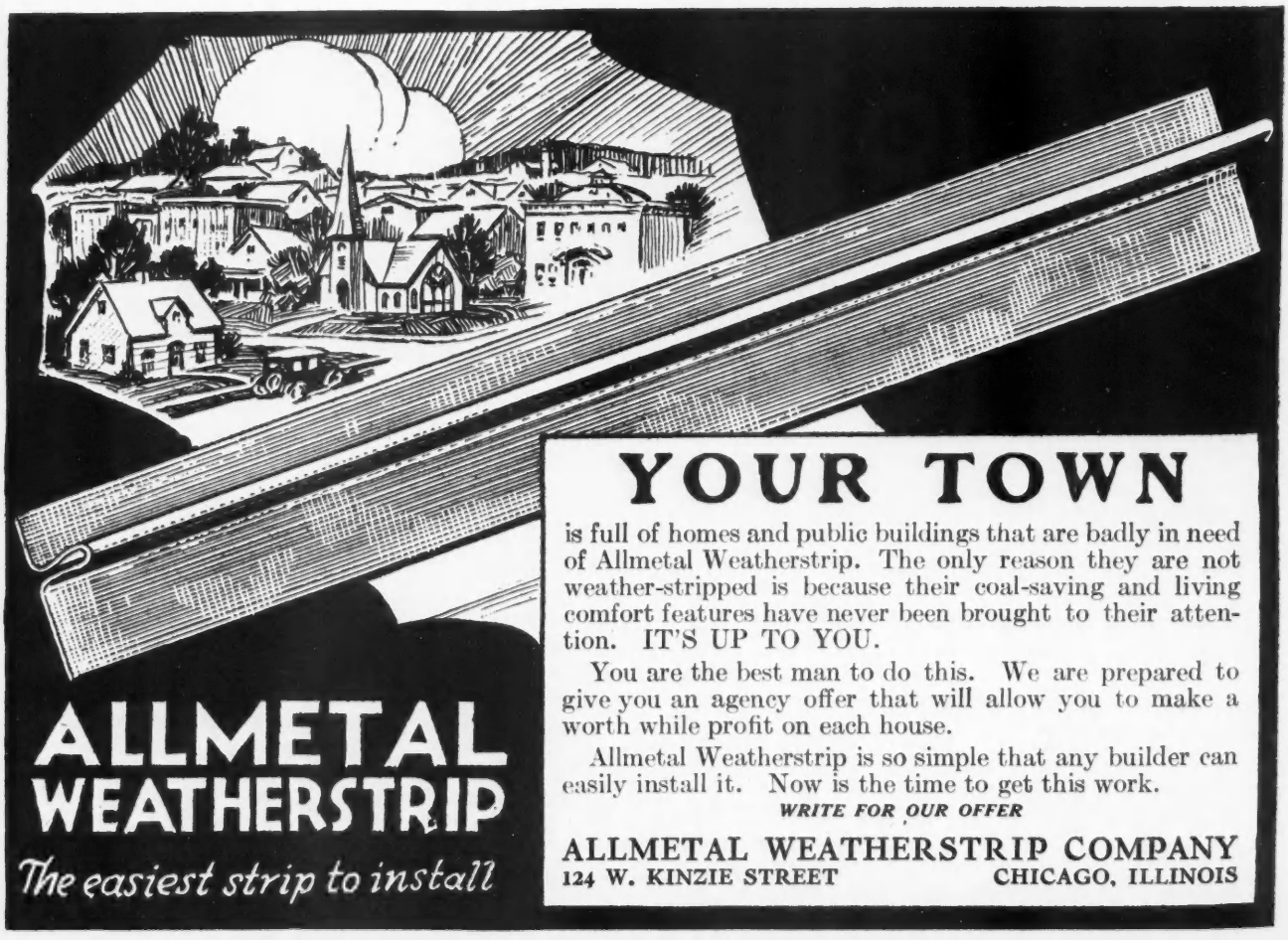
ASPHALT shingles are usually maunfactured of rag or asbestos felt, thoroly saturated with asphalt. On top of this is placed a heavy coating of harder asphalt which thoroly waterproofs the shingle and into which, while hot, is rolled mineral matter, such as crushed slate or feldspar, colored green, gray, red or brown as desired.

✣

PARANA PINE is the only Brazilian wood covering large areas in unbroken stands. It is more like yellow cypress or western larch than any of the United States pines.

✣

LUMBER in Brazil must be thoroly seasoned. Much is lost thru action of fungi which is even more destructive in Brazilian saw mills and yards than termites (white ants).



Announcing the All-Shingle House Competition

$1000.00 IN PRIZES

THE RED CEDAR Shingle Manufacturers of the U. S. and Canada offer cash prizes of $1000 for photographs and plans of the best designed all shingled houses submitted on or before November 1st, 1921.

We want you to send us pictures and plans which will emphasize the great charm and beauty of this typical American building material—the Red Cedar Shingle.

The requirements of this contest are simple. Contestants may be home owners, builders, contractors, lumber dealers or architects located in the United States or Canada. Intelligence in answering the questions will have just as much bearing on winning as professional knowledge.

Houses submitted to contain not less than five and not more than eight rooms with bath.

Exterior walls and roof are *both* to be covered with shingles.

Each photograph must be printed on smooth finish paper size 7x11 or 8x10. Your local photographer can make enlargements to either of these sizes.

Floor plans may be roughly indicated and drawn to any convenient scale with dimensions of each room clearly indicated in ink.

Each photograph and plan must bear the name of sender and street address of house plainly written in ink upon reverse side of both photograph and floor plan. A third sheet should accompany the photograph and plan upon which should be answered the questions indicated on the right hand column of this announcement.

List of Prizes

First Best Design	$250.00
Second Best	200.00
Third	150.00
Fourth	100.00
Fifth	75.00
Sixth	50 00
Seventh	50.00
Eighth	25.00
Ninth	25.00
Tenth	25.00
Eleventh	25.00
Twelfth	25.00
	$1000.00

Four Architects selected from different sections of the United States and Canada have kindly consented to act as Judges for this contest.

Address all replies

in United States to—

SHINGLE BRANCH, WEST COAST LUMBERMEN'S ASSOCIATION

HENRY BUILDING, SEATTLE, WASHINGTON

in Canada to—

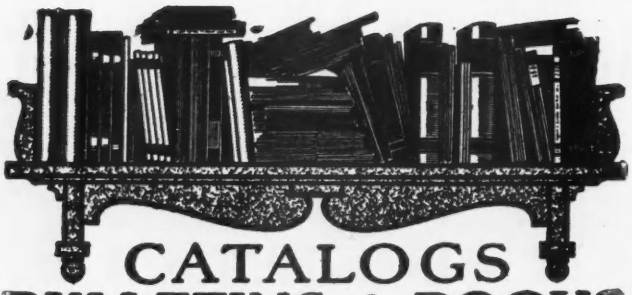
SHINGLE MANUFACTURERS ASSOCIATION OF BRITISH COLUMBIA

METROPOLITAN BUILDING, VANCOUVER, B. C.

Questions

Date house was built?
Name of architect or contractor?
What kind of shingles used? —(name of wood)
*What grade and thickness?
*Exposure to weather on roof?
*Exposure to weather on side walls?
How treated — stain or paint?
*Kind of nails used?
Has your roof ever been reshingled?
Reasons why you prefer an all shingled house?
(Trained writing is not essential—ideas are what count.)

**Your local lumber merchant, architect or builder will gladly assist you in answering these technical questions.*



CATALOGS BULLETINS & BOOKS RECEIVED

The following literature, dealing with subjects of interest to builders is now being distributed.

Wagner Elevator Door Hangers are completely illustarted and described in a new catalog, No. 20, recently issued by the Wagner Manufacturing Co., Cedar Falls, Iowa. Details of construction are also shown in this booklet.

"Industrial Electricity," "Direct Current Mill Motors," and **"Curtis Steam Turbines,"** are titles of three new booklets issued by the General Electric Co., Schenectady, N. Y. The first named is a short resume of the uses of electricity in manufacturing and construction with a description of the various electrical appliances.

The California Redwood Association 1921 Trade Extension Manual is now available, published by Evans & Barnhill, Inc., New York. It gives the association's 1921 activities in a nutshell, showing the policies and objectives with proofs and charts presenting the advertising campaign in prospect.

Sheet Metal and Sheet Metal Products of the Wheeling Corrugating Co., Wheeling, W. Va., are described and illustrated in a catalog, No. 292, issued by that company. This booklet contains interesting tables on roofings and sidings and specifications for gutters, valleys and ventilators.

Cooper's Spanish Tile, metal tiling for roofs, is the subject of a pamphlet issued by the National Sheet Metal Roofing Co., Jersey City, N. J. Complete directions for laying this kind of roofing tile are included in this paper.

"Pure Water Equipment" is the title of an interesting booklet being distrbuted by the Everson Filter Co., Chicago, Ill. Drinking fountains, water coolers, filters for use in offices, homes, hotels, clubs, theaters, etc., are described and illustrated.

Copper for eave troughs, conductor pipes, etc., is the subject of Book 1 now being distributed by the C. G. Hussey Co., Pittsburgh, Pa. It contains complete specifications for lining box gutters with sheet copper, joining metal cornices, and fitting flashings.

"Concrete Designer's Manual" is the title of a new book compiled by George A. Hool, S. B., and Chas. Whitney, M. C. E., and published by the McGraw-Hill Book Co., Inc., New York City, N. Y. It contains very complete tables and diagrams for the design of reinforced concrete structures in accordance with the joint committee recommendations, the American Concrete Institute recommendations, the New York Building Code requirements and the Chicago Building Code requirements. Price, $4.00.

Stained with Cabot's Creosote Stains
B. V. White, Architect, New York

Save Half Your Painting Bill

You can actually save *more than* half the cost on both material and labor, and get better results in beauty of coloring, wearing qualities and wood preservation, by using

Cabot's Creosote Stains

instead of paint, on shingles, siding and all similar outside woodwork. The colors are rich and handsome, not "painty." They wear as long as the best paint and wear better, and they are made of creosote, which penetrates the wood and thoroughly preserves it

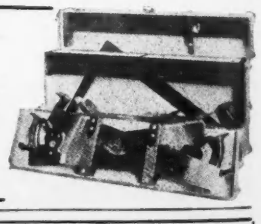
Cabot's Quilt

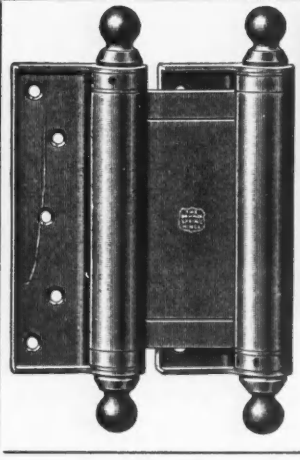
A genuine house-warmer. It's a cushion of dead-air spaces and is 30 times warmer than building paper. Quilt will pay for itself in a short time in saving coal, to say nothing of making the house comfortable for all time. Also a complete sound-deadener.

You can get Cabot's Stains and Quilt all over the country. Send for samples and names of nearest agents.

SAMUEL CABOT, Inc., Mfg. Chemists
BOSTON, MASS.
342 Madison Ave., New York 24 W. Kinzie St., Chicago
Cabot's Conservo Wood Preservative, Stucco Stains, Brick Stains, Damp-Proofing

INDESTRUCTO CARPENTER'S TOOL CASES
Made of three-ply Veneer with canvass, painted and varnished, waterproof, light and strong. Secure locks, strong handle, place for every tool, carried like suit case.
Write for booklet and prices.
WEDELL & BOERS
28 West Jefferson Ave. Detroit, Mich.

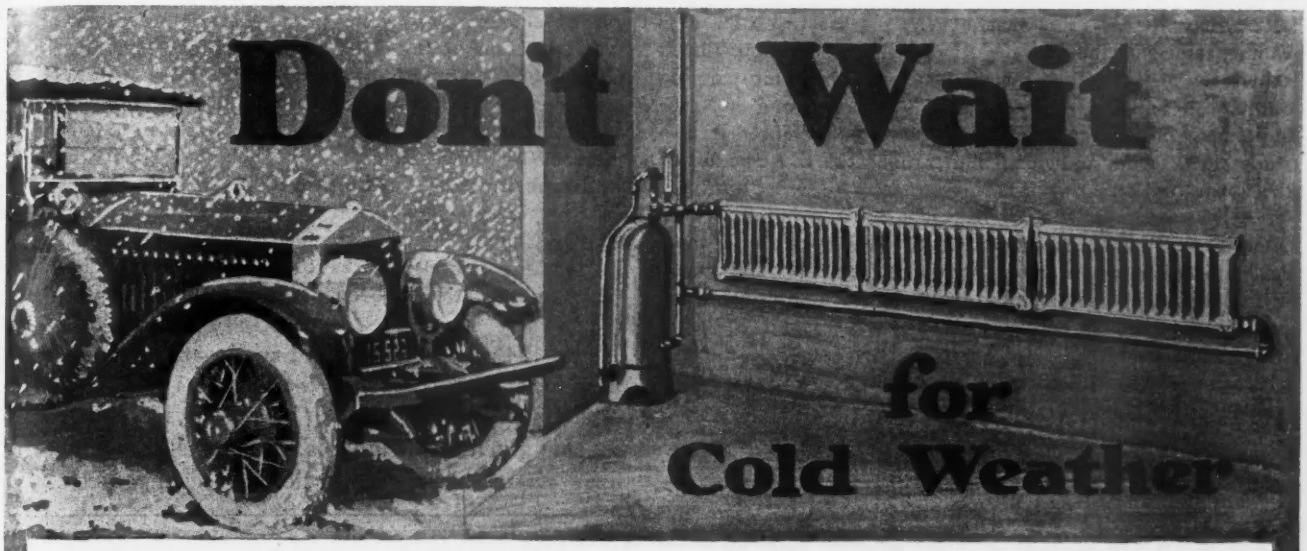




BOMMER SPRING HINGES

Standard for over 45 years, and steadily improved, retaining superiority over all others. In universal demand. Easiest to apply.

BOMMER SPRING HINGE COMPANY MANUFACTURERS, BROOKLYN, N. Y.



INSTALL THE LATTNER NOW

and be prepared for the cold spell when it comes. The LATTNER Automatic Hot Water Generator keeps your garage at an even temperature for a very reasonable cost during the winter months.

The LATTNER is easy to install, requires very little attention, no ashes to haul an nothing to get out of order. Generator equipped to burn natural or artificial gas. Complete information and prices will be sent to you upon application.

Write us today for Bulletin No. 103.

P. M. LATTNER MANUFACTURING CO.
CEDAR RAPIDS, IOWA, U. S. A.

You'll appreciate our R-W Hardware

because—

Its use enables you to build a vanishing French door which slides noiselessly out of sight at the mere touch of the fingers. Such doors are a delight to the owner and lend prestige to the builder.

Practically every building material and hardware dealer carries a complete stock of R-W hardware. If your dealer cannot supply your needs, come to us direct.

RICHARDS-WILCOX R-W AURORA TRADE MARK

Write today for our new Catalog Q16

Richards-Wilcox Mfg. Co.
"A Hanger for any Door that Slides."
CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA **AURORA, ILLINOIS, U.S.A.** BOSTON NEW YORK MINNEAPOLIS SAN FRANCISCO
LONDON, ONT.

"Paint with Air the Paasche Way" is the title of a new catalog issued by the Paasche Air Brush Co., Chicago, Ill. It shows by pictures the various ways in which air painting outfits can be used on the farm, in the city and in large buildings to save time and labor costs on the job. It also shows in diagram and detail illustrations the construction of the apparatus.

"A New Sample Book" has just been printed for the New York Blue Print Paper Co., New York, and is now ready for distribution among architects, engineers and others in the building profession who have use for blue print, drawing, tracing, profile and cross-section papers and cloths as well as other materials.

Storm Hand and Electric Dumbwaiters and Elevators are described and illustrated in a new booklet issued by the Storm Manufacturing Co., Newark, N. J. It includes specifications and price lists of hand elevators, automatic dumbwaiters, invalid lifts, sidewalk and basement elevators, electric dumbwaiters, and electric elevators.

"Concrete Roofing Tile" is the subject of a new pamphlet issued by Otto Walter, New York City, N. Y., manufacturer of concrete roofing tile machinery. This pamphlet shows the various types of tile in color manufactured by the Walter machine, which is also illustrated.

"Home Building" is the title of a very attractive booklet of thirty-two pages with covers now being distributed by the Northwestern Expanded Metal Co., Chicago, Ill. It contains many pictures of beautiful stucco homes in which metal lath has been used, also interiors.

✣

Strength of Screw Fastenings

(*Continued from page 132.*)

washers proved an inferior means of fastening. The spacing given in the table is for screws in a single row, but staggering is recommended wherever possible.

WIRE-REINFORCED

E-COD FABRIC

THE IDEAL PLASTERING BASE

Unexcelled as a Plastering Base

6 REASONS
1—Low First Cost
2—Saves Material
3—Saves Labor
4—Fire Resisting
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E-COD FABRIC is low in first cost—high in service. It saves money at every step of exterior or interior plastering. Combines maximum strength and durability with dollars and cents economy.

E-COD FABRIC not only affords a great saving but provides for Architect, Contractor and owner results that cannot be equalled.

Shipped in sheets 32 in. x 98 in.

Samples and prices on request. Write or wire.

Prompt Shipments

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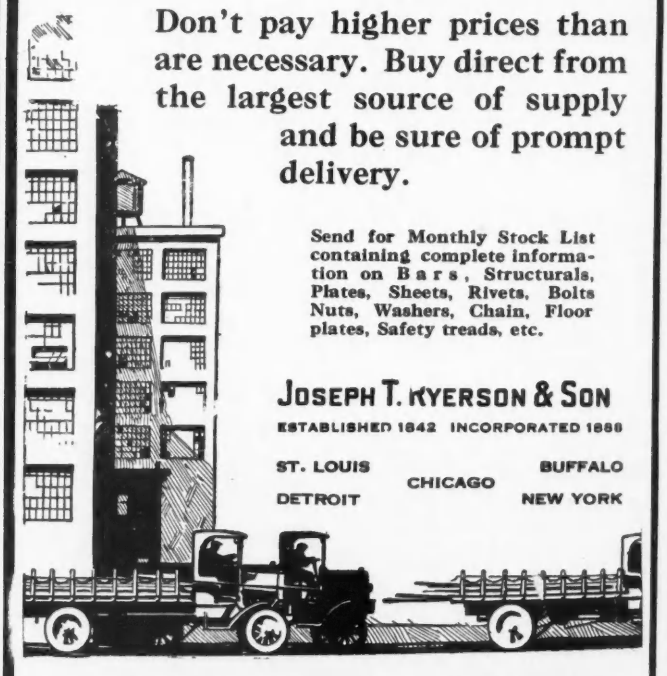
111 West Washington Street Chicago, Ill.

STEEL *for Quick* **Construction**

Don't pay higher prices than are necessary. Buy direct from the largest source of supply and be sure of prompt delivery.



Send for Monthly Stock List containing complete information on Bars, Structurals, Plates, Sheets, Rivets, Bolts Nuts, Washers, Chain, Floor plates, Safety treads, etc.

JOSEPH T. RYERSON & SON
ESTABLISHED 1842 INCORPORATED 1888
ST. LOUIS CHICAGO BUFFALO
DETROIT NEW YORK

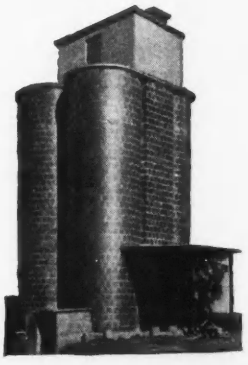
RYERSON STEEL-SERVICE

NATCO HOMES AND GARAGES

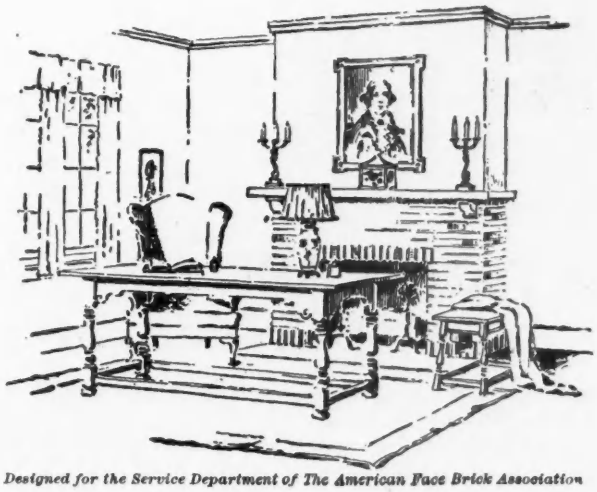
of Natco Double Shell Tile satisfy your clients because they are economical in first cost, attractive, repair free, easily kept warm and permanent in every sense of the word. Write for NATCO DOUBLE SHELL Booklet today.

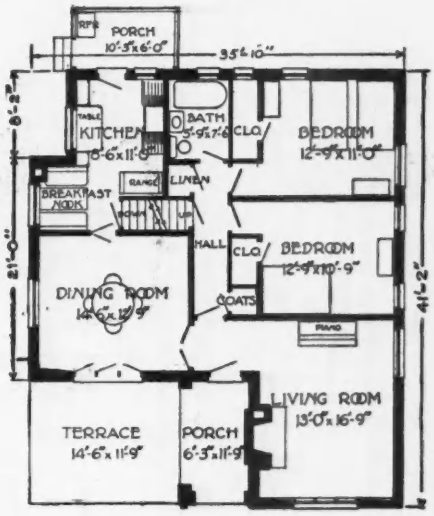
GET NATCO FIGURES ON YOUR NEXT STORAGE BIN

Natco Storage Bins of Firesafe Channel Tile, reinforced with bands of tough steel, laid in the channels and firmly imbedded in mortar are moderate in first cost. In that there is no depreciation, they give your client the cheapest storage protection he can possibly buy. Write for our bulletin 175 today. Ask us to help you land the next storage bin you figure on.



NATIONAL FIREPROOFING CO.
957 Fulton Building, Pittsburgh, Pa.





A·F·B·A USE FACE BRICK —it Pays

Designed for the Service Department of The American Face Brick Association

Five Room Cottage No. 505

A Charming Face Brick Cottage

HERE is a bungalow which is reminiscent of the English cottage, and which perfectly preserves the traditions of simple charm, dignity, and comfort. The living room, well situated to command a view toward the front, serves as the center of the home's activities.

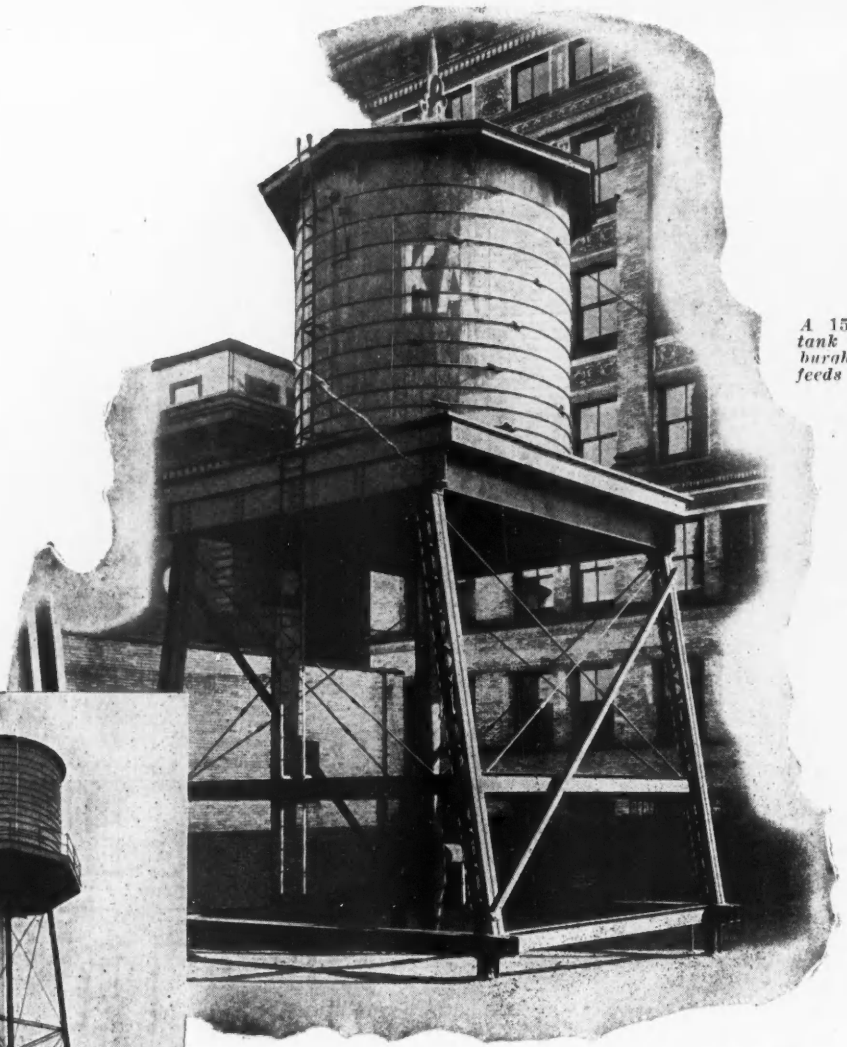
The dining room is of generous proportions, with French doors opening on the terrace. Between it and the kitchen is a delightful breakfast nook. Entire house is excellently arranged for compactness, convenience, and perfect inter-communication.

This picturesque house is typical of the many designs shown in our new series of four booklets, "Face Brick Bungalow and Small House Plans."

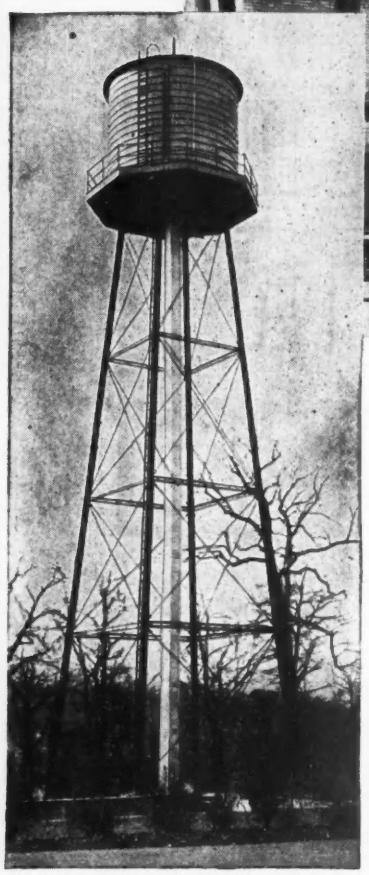
These designs, covering 3 to 7 room homes, are the work of most competent architects, so that builders will find them very popular with their clients. Complete plans and masonry material surveys are available at nominal prices for the 128 house arrangements pictured in the four booklets. We urgently advise you to get these booklets. They are 25 cents each or $1.00 for the set. Address Dept. A. 9.

THE AMERICAN FACE BRICK ASSOCIATION

110 South Dearborn Street, CHICAGO



A 15,000 gallon Redwood water tank on the roof of one of Pittsburgh's large department stores—feeds the sprinkler system.



A 30,000 gallon water tank of 3" Redwood. Installed at the Pittsburgh Field Club for club house water system, watering the greens and supplying water for swimming pool.

REDWOOD TANKS ARE A SOUND INVESTMENT

UTILITY, service and cost are the three considerations that should determine water tank specifications.

In first cost some tanks—both wood and metal—are slightly cheaper than Redwood tanks. But judged by the term of service—and cost for upkeep—Redwood tanks are better and cheaper. Hoops may rust out and be repeatedly renewed. Redwood endures. Repair or replacement costs are minimized whether the service be ten years or thirty years.

Water does not rot Redwood. Fungus does not attack it. No protective treatment is required because Redwood is impregnated during growth with the *natural* preservative which remains in the fibre during the life of the tank.

Redwood is odorless and tasteless. It is unaffected by acids, alkalies or oils. Redwood tanks, pipes and vats are in continual use for supplying cities and institutions with water, tanning leather, dyeing textiles, and for the strong solutions used in the leaching of copper. In all climates of the world Redwood tanks have been used for years, giving exceptional service.

Install a Redwood tank and you have a permanent job—a tank that neither rusts nor rots—that remains tight and sound indefinitely—that does not affect the tank contents and is not affected by them.

Technical Data on Redwood

The many construction, engineering and equipment uses for Redwood are illustrated and described in the seventh edition of Sweet's Engineering Catalogue. Write our Chicago office for the Redwood Engineering Digest and for Redwood Information Sheets describing the special properties of Redwood for a wide range of special uses—from cigar box making to lining refrigerator ships and building pergolas, for exterior wood work and interior finish, for silos and summer homes, for tanks and vats for all purposes.

The Pacific Lumber Co.
OF ILLINOIS
REDWOOD

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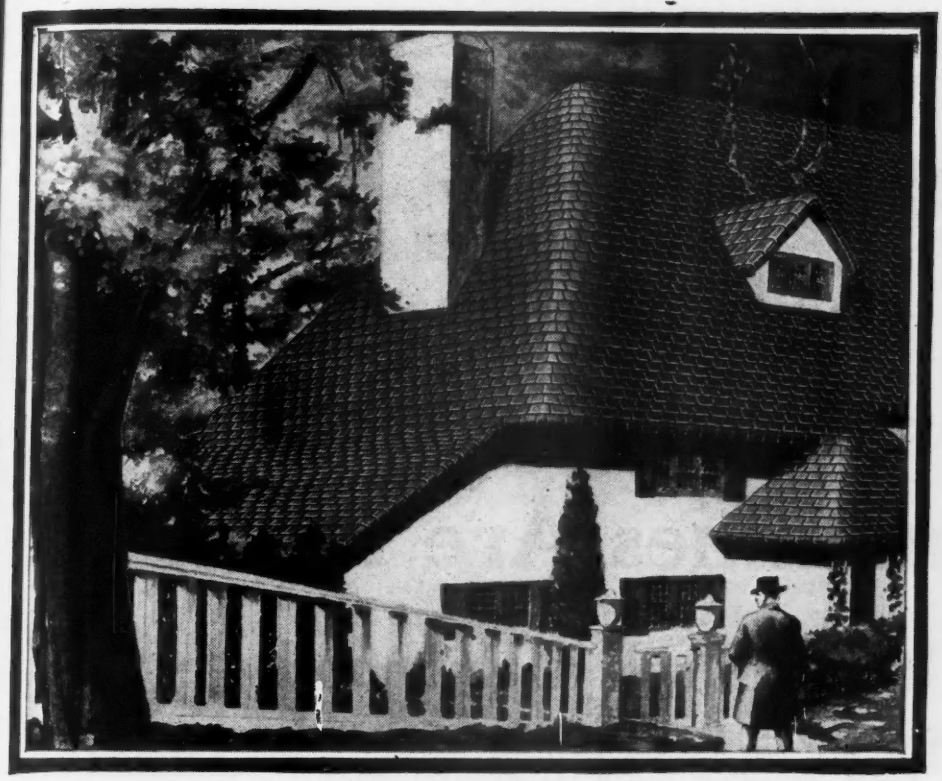

Fit For The Finest Home

The more substantial the house you are planning, the more essential that you should select the highest quality building materials for its construction. This applies especially to weatherproofing materials, for these must bear the brunt of nature's assaults. Remember this when you talk over specifications with your architect and builder.

You can put your trust in all Ruberoid Weatherproofing Products. Ruberoid Unit-shingles, for example, are made to meet a standard of quality—not a standard of price. They are made for the man who is satisfied with nothing less than the best, when the best means greater beauty, greater satisfaction, greater economy in the long run.

The same applies with equal force to all other Ruberoid Products, including Ruberoid Roll-roofing, Ruberoid Building Papers and Ruberoid Cement-waterproofing. Every Ruberoid Product is worthy of the name it bears.

There is a Ruberoid Distributor near you. Ask him about Ruberoid Weatherproofing Products.

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Smooth-surfaced Roll-roofing
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RU-BER-OID Unit-shingles

SHINGLES ROLL ROOFINGS BUILT-UP ROOFS BUILDING PAPERS
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ROCBOND

Exterior Stucco

The Construction of Which Communities Are Built

When you sell a Rocbond job you've made a friend, who sells a friend who sells a friend—

It is in this way that the endless chain of Rocbond sales is developed. Rocbond promotes community pride, community thrift and community spirit, which promotes community business for the Dealer.

The Quality

Greatest Structural Strength
Proven Durability
Guaranteed Standards
Built-In Fire and Weather Resistance
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Lowest Cost Per Quality Yard
Chloride Furnished in Flake, Powdered or Liquid Form
Eighteen Beautiful Stone Dash Combinations
Ready to Ship on Your Order

Rocbond is adaptable for both new and old construction and can be successfully applied the whole year through, summer and winter alike.

There's a worth while proposition awaiting worth while Dealers and Contractors in unoccupied territory—write for it today.

The Rocbond Co.

533 Home Guard Building, Van Wert, Ohio

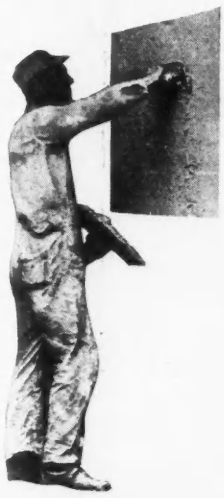
Van Wert, Ohio *Plants* Cedar Rapids, Iowa

MAGNESTONE ···STUCCO·

An Unlimited Field for Profits

is opened to the "live" dealer, contractor or plasterer in the remodeling of old frame or brick residences done in

Scratching In



Magnestone Stucco

Dashing

The influence the building material dealer, the contractor or plasterer has with local builders is unquestioned. Many property owners would remodel their homes if the practical man suggested such a course.

The average man needs to be "pushed" into those improvements that are for the betterment of his own property. A house to house canvas by a reliable dealer, contractor or plasterer would yield handsome profits to the solicitor. There are many such property owners in YOUR town waiting for YOU to urge them to do that work.

You are familiar with Magnesite stuccos. Let us tell you, show you, that MAGNESTONE STUCCO is the last word in stucco material for real quality and price.

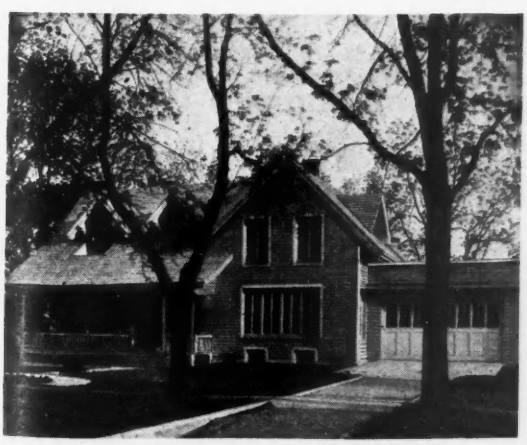


Illustration at the left shows the old home BEFORE being Magnestoned

Illustration on the right shows the "new" home AFTER being Magnestoned

AMERICAN MAGNESTONE CORPORATION

General Offices: **SPRINGFIELD, ILL.**

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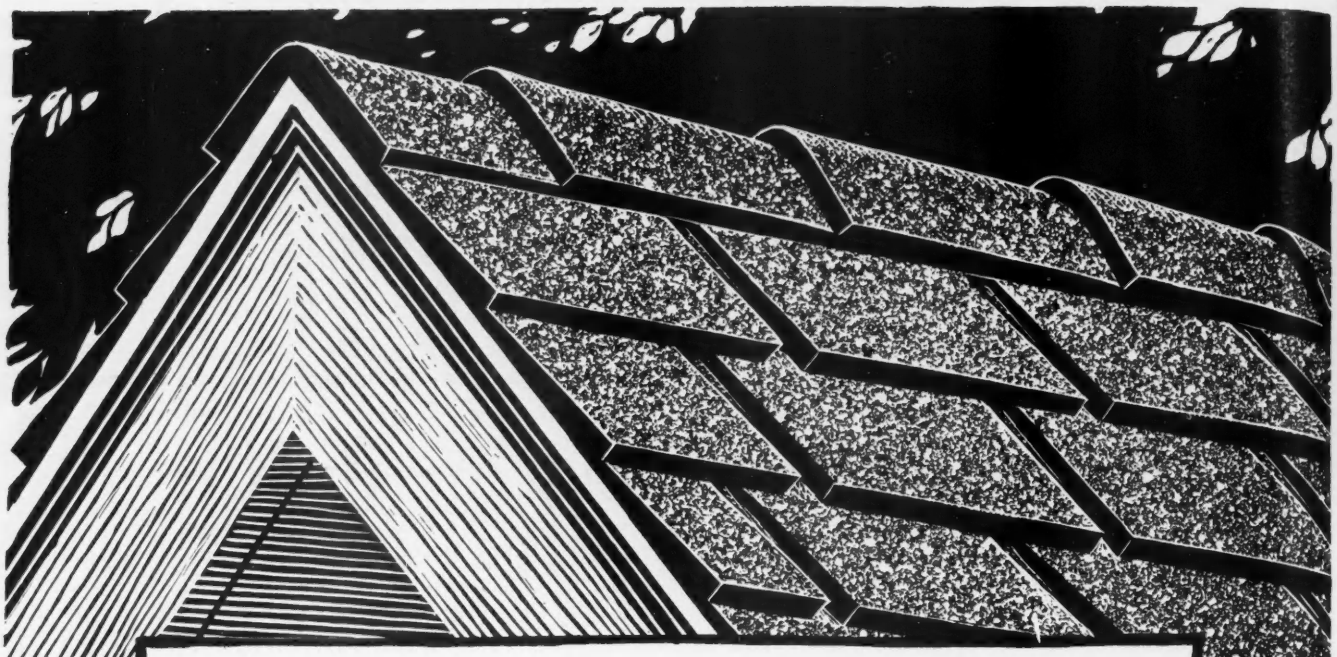
No. 6 of a Series of Advertisements about MAGNESTONE—Watch for No. 7



Trust The Taper

Do you know that the big butt of the Winthrop Tapered Asphalt Shingle is almost 3 times as heavy as the butt of the standard 9 ounce asphalt shingle?

By using Winthrops you have an extra 5 ounces of heavy felt, pure asphalt and natural slate exposed to combat the weather, resist fire and prevent leaks.

Sell a roof of long life, beauty, and fire and storm resistance by using Winthrop Tapered Asphalt Shingles.

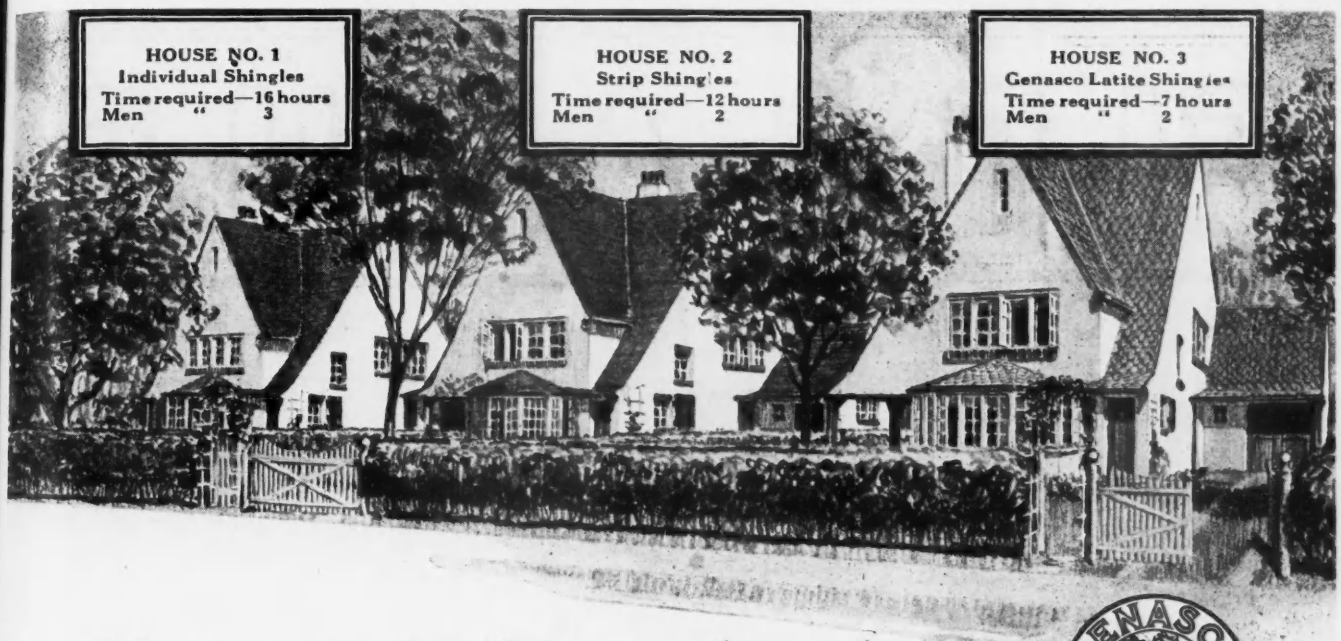
There is still valuable dealer territory open.

To help you make your own comparisons, samples will be sent upon request.

Please address Department B-13, at any of the following Winthrop Manufacturers.

Beckman-Dawson Roofing Co., ... Chicago, Ill.
Beecher, Peck & Lewis, ... Detroit, Mich.
Lockport Paper Co., ... Lockport, N. Y.
Brantford Roofing Mfg. Co., Limited, . . Brantford, Ont.
Canadian Roofing Co., Limited, ... Windsor, Ont.

Winthrop
Tapered Asphalt Shingles



How one builder reduced his roofing costs

A durable, attractive roofing that can be built at minimum cost. That's what you and every builder are looking for. That's what Genasco Latite Shingles offer.

These remarkable shingles, by a simple key device—just a straight piece of wire at the shingle butt—afford an interlocking, lock-on roof that the weather can't budge or damage.

Genasco Latite Shingles are attractive and conform to any style of architecture. Their double butts give a depth and texture—a "Shadow Line"—that totally dispels the flat appearance of the ordinary shingle roof.

They are especially adapted for laying over old wooden shingles.

The success of Genasco Latite Shingles has been immediate and unprecedented. Their quick-covering, self-spacing features appeal especially to builders. One builder in Ohio selected Genasco Latite Shingles for a large operation after the following test:

Three houses, alike in design, were roofed, respectively, with ordinary individual shingles, ordinary strip shingles, and Genasco Latite Shingles. The results strikingly demonstrated the greater economy and all-around superiority of Genasco Latite Shingles.

Genasco Latite Shingles—like other Genasco roofings—are made with Trinidad Lake Asphalt—the most effective waterproofing material known.

Builders who regard satisfied clients as their most valuable business asset have used and recommended Genasco roofings for years. Send for our illustrated booklet on Genasco Latite Shingles. It tells you all you'll want to know about this wonderful roofing.

New York
Chicago
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THE BARBER ASPHALT PAVING COMPANY
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GENASCO
THE STANDARD OF EXCELLENCE
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GENASCO LINE

- Trinidad Lake Asphalt (For streets and roofs)
- Standard Trinidad Built-Up Roofing
- Bermudez Road Asphalt (For road building)
- Genasco Roll Roofing
- Genasco Sealtac Shingles
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- Genasco Vulcanite Mastic Flooring
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- Genasco Asphalt Putty
- Genasco Asphalt Pipe Coating
- Genasco Asphalt Fibre Coating
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- Genasco Base Oils
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- Genasco Motor Oils
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Genasco

Asphaltic Roofing, Flooring, Paints and Allied Protective Products

FLEX-A-TILE
HOUSE TOPS

Modern Re-Roofing

IT'S the modern way to lay Flex-a-Tiles right over the old roof and get a better appearing, longer lasting roof than before. Scraping off the old shingles takes time and is an unnecessary expense. No need to litter up the yard and fill the house with dust and dirt. Just lay Flex-a-Tiles over the old roof.

Look at the buildings around you that need Flex-a-Tile Housetops. See the homes, stores, mills, warehouses, farm-houses and public buildings that need new roofs in your own community.

Tell Them About
Flex-a-Tile Housetops

Show them the permanent slate roof appearance attainable with Flex-a-Tiles, either fadeless natural green or a beautiful enduring red. Tell them how Flex-a-Tiles last—how they protect buildings from fire and all weathers and above all, how economical it is to lay them over the old roof.

FLEX-A-TILE
Slate Surface Housetops

Offers a Complete Line for Dealers:

Flex-a-Tile Individual Shingles
Flex-a-Tile Wide Space Shingles
Flex-a-Tile Giant Shingles
Flex-a-Tile Style Four Slabs
Flex-a-Tile Shingle Roll Roofing

Made by
THE HEPPES ROOFING DIVISION

Melrose Park (Chicago), Ill.

The RICHARDSON COMPANY

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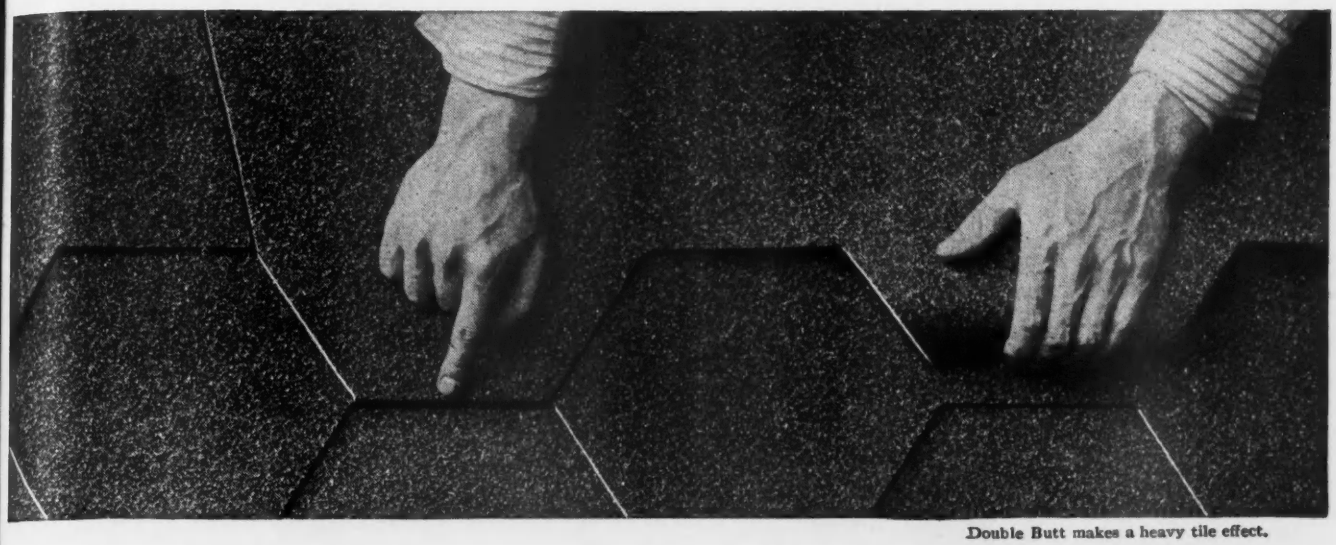


Double Butt makes a heavy tile effect.

Double Thick—Double Life

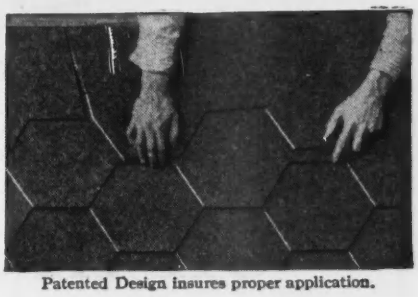
The Hexagon Slab Shingle is an exclusive Vulcanite patent. There is no other shingle like it.

Every square inch of this Vulcanite Roof is *double thick*. It cannot be otherwise. The patented design of this Vulcanite Hexagon Slab Shingle insures *correct laying* and provides a *double thick* roof that is secure against roughest weather and all destructive elements.

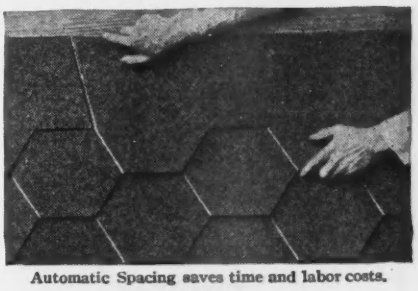
Examine the illustrations shown here. They clearly show how each slab *must* fit into its allotted space, how one tile lays over another in *double thick* style, and how this *double thickness* at every point adds *double life* and produces the heavy tile effect so much in demand on houses of the better type.

Every square inch of this Vulcanite Roof has *double life*. Every square inch is built of selected fabric felt, thoroughly saturated with refined asphalt. This tough, durable base is thoroughly surfaced with natural colored red or green slate—a coating that is always ready to fight off the most severe weather conditions. All Vulcanite Roofings are fire resisting, too.

Surely these are the roof qualities you wish to give the customers for whom you build. And if you have not already seen full sized samples of this Vulcanite Hexagon Slab Shingle, get in touch with the nearest Vulcanite dealer at once. See him for interesting, convincing literature, or write the nearest district sales office listed below.



Patented Design insures proper application.



Automatic Spacing saves time and labor costs.

Double Thickness at every point gives greater protection.

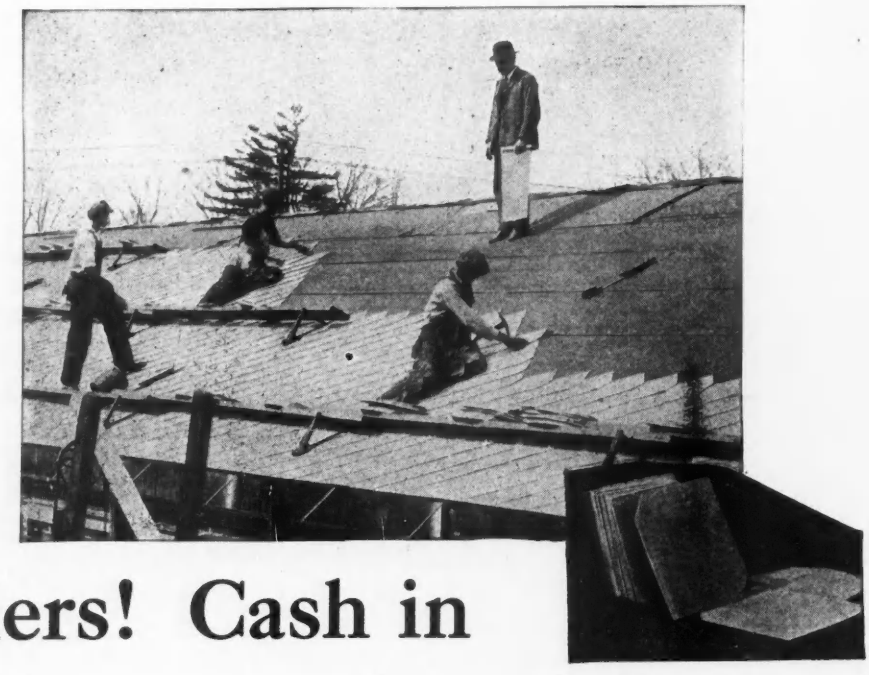
THE BEAVER BOARD COMPANIES
ROOFING DIVISION

Administration Offices, Buffalo, N. Y.; Thorold, Ont., Canada; London, Eng. ***District Sales Offices at*** New York, Philadelphia, Atlanta, New Orleans, Buffalo, Cleveland, Cincinnati, Detroit, Chicago, Minneapolis, St. Louis, Kansas City, Dallas, and San Francisco. ***Sold by Lumber and Building Material Dealers Everywhere.***

VULCANITE ROOFING

BEAVER QUALITY

BEAVER QUALITY FOR BETTER ROOFS



Dealers! Cash in on fireproof publicity!

Fireproof—

No paint—

No repairs—

Last forever

Keep down the high cost of upkeep

INDIRECTLY magazines and newspapers all over the country are advertising Ambler Asbestos Shingles. A concerted drive is on against inflammable roofing materials.

Take advantage of the situation. Dealers are making good profits who are handling

FIREPROOF

AMBLER ASBESTOS SHINGLES

Ambler Asbestos Shingles. Made in three styles, four permanent colors, Newport grey, natural slate, red and green. Lie snug to the roof, forming water-tight and fire-tight covering.

Ambler Asbestos Building Lumber. For siding, partitions, firedoors and wherever fire resistance is essential.

Ambler Asbestos Corrugated Roofing and Siding. For industrial, railroad and farm buildings.

Ambler Linabestos Wallboard. Wherever a superior flame-proof fire-resisting wallboard is wanted.

Send for Samples and Literature showing reproductions of installaitons.

ASBESTOS SHINGLE, SLATE & SHEATHING CO.
AMBLER, PENNA.

BRANCH OFFICES:—Atlanta—Boston—Buffalo—Chicago Cincinnati—Cleveland—Minneapolis—New York Philadelphia—Pittsburgh—Washington

Distributors throughout the Country.

This Is the Street of Opportunity

Every town has a street of opportunity. Your town may have several. The merchants on Opportunity street are installing modern store fronts to increase their business.

Why not become the store front builder of your town? You can, if you are a carpenter or a contractor. We will help you build up a most profitable business installing Desco store fronts.

Easy to Sell—Easy to Install

Every merchant needs a modern Desco front. And any carpenter can install it. Desco comes to you ready for easy installation. Every detail—such as ventilation, drainage, and glass protection against jars is provided for in the Desco construction. Simple. Strong. Attractive.

We Help You to a Greater Profit

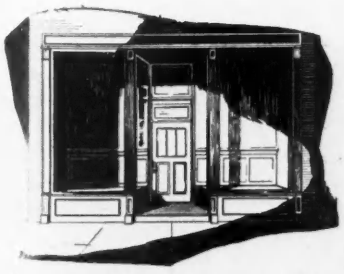
We have published an illustrated store front manual on designing and installing modern store fronts. It's a money making book for you. It contains the data you need to become a successful store front builder. It is a fact that hundreds of retailers from all parts of the country come to Detroit to inspect the modern store fronts, hundreds of which are built of Desco construction. This manual will be mailed to you without charge. Write us a postal today.

See Sweet's Catalog Pages 819-827 for Desco Details

DETROIT SHOW CASE COMPANY

1654 Fort Street, W. DETROIT, MICHIGAN

(45)



It is a simple job to tear out an old-fashioned front. Shoring up the upper structure and installing an I-beam requires little equipment. Fitting the building for the new Desco store front takes but a short time ordinarily.

Desco METAL STORE FRONTS

Ordinary carpenters can install Desco store fronts profitably—they save time in installing Desco construction because it is simple. Be sure to get full particulars.

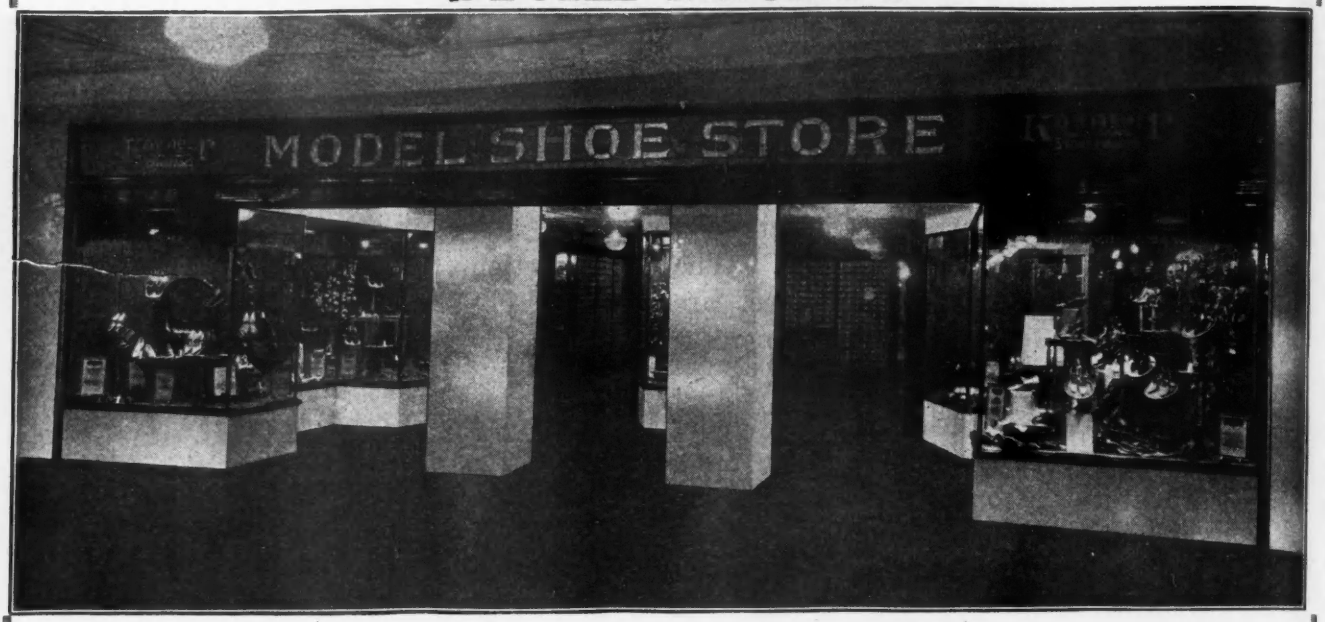
Another Big Victory

FOR

Kawneer

SOLID COPPER

STORE FRONTS



Awarded First Prize Silver Cup

AT

National Shoe Retailers Convention

MORE than 6000 Shoemen saw this prize Kawneer Store Front. Every live shoe retailer in the country now recognizes Kawneer Solid Copper Store Fronts as the best to be had.

Why Not Cash In On This Popularity?

Send the coupon today and let us show you how contractors and builders everywhere are adding to their profits and prestige by installing Kawneer Store Fronts in their locality.

Don't put off this opportunity. Pin the COUPON to your letterhead today before you forget.

THE KAWNEER COMPANY

1726 Front Street,
NILES, MICHIGAN

Please send me full details of Kawneer Store Front Work.

Name.....

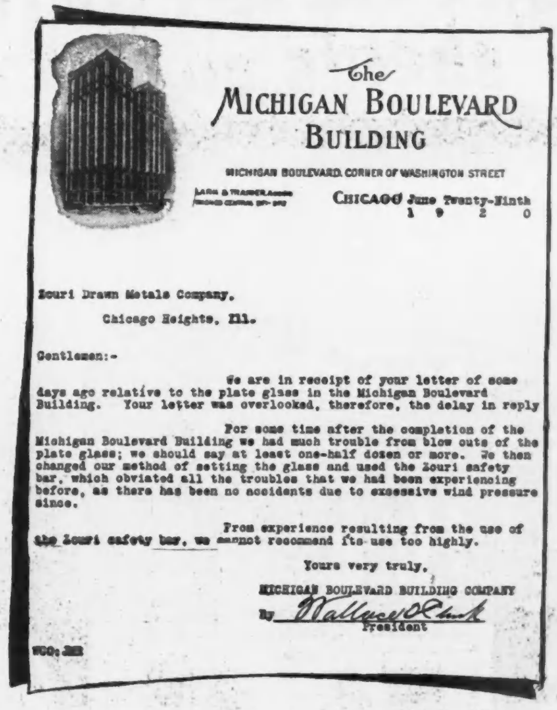
Address.....

THE KAWNEER COMPANY

1726 Front Street

NILES, MICHIGAN

As a Builder You Ought to Know—



The
MICHIGAN BOULEVARD BUILDING
MICHIGAN BOULEVARD, CORNER OF WASHINGTON STREET

CHICAGO June Twenty-Ninth 1 9 2 0

Zouri Drawn Metals Company,
Chicago Heights, Ill.

Gentlemen:-

We are in receipt of your letter of some days ago relative to the plate glass in the Michigan Boulevard Building. Your letter was overlooked, therefore, the delay in reply

For some time after the completion of the Michigan Boulevard Building we had much trouble from blow outs of the plate glass; we should say at least one-half dozen or more. We then changed our method of setting the glass and used the Zouri safety bar, which obviated all the troubles that we had been experiencing before, as there has been no accidents due to excessive wind pressure since.

From experience resulting from the use of the Zouri safety bar, we cannot recommend its use too highly.

Yours very truly,
MICHIGAN BOULEVARD BUILDING COMPANY
By Wallace O Clark
President

WOC; JMR

Builders everywhere are learning that Zouri Store fronts, with their special safety features, are always best. They minimize glass breakage and assure highest satisfaction. It will pay you to recommend and install

ZOURI SAFETY METAL STORE FRONTS

Zouri construction gives freedom from dangers of direct screw pressure, or a resilient rabbet. Zouri Safety Key-Set Corner and Division bars are patented features. Zouri copper units allow dignified beauty and an unusually attractive display. The **Underwriters' Laboratories** have approved Zouri construction. If you aren't acquainted with all that Zouri construction means

Consult Our Nearest Representative

We have 198 distributors in the United States and Canada. There is one near you with a complete stock of **Zouri Safety** and **International Construction**—assurances against delay in shipments.

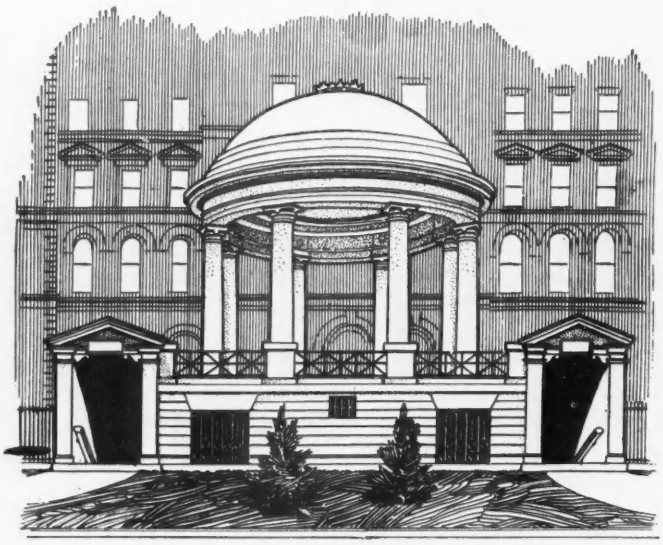
All distributors maintain store front departments in charge of especially trained men. They will be pleased to place at your disposal, without obligation, their broad experience in building show windows that command maximum sales.

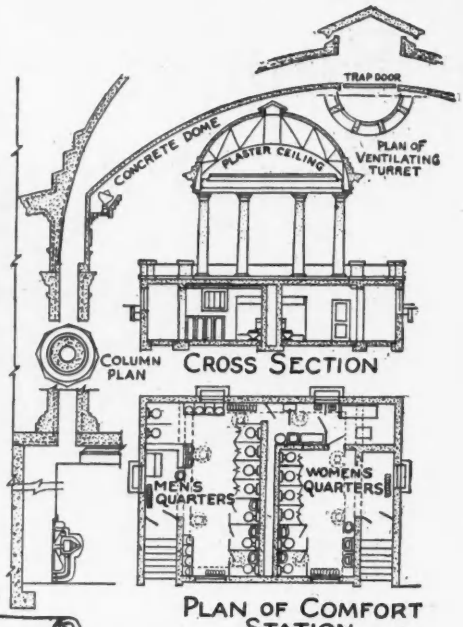
Write us for name of our nearest distributor

Zouri Drawn Metals Company

Factory and General Office
1606 East End Ave., CHICAGO HEIGHTS, ILLINOIS
Makers also of the Famous International Store Front Construction

Get these Practical ALPHA service sheets on Concrete Construction





CONCRETE PUBLIC COMFORT STATION AND BAND STAND LOUISVILLE, KY.

The above illustrations give an idea of the practical suggestions offered by the ALPHA Blueprint Service Sheets and Special Bulletins, which cover the following concrete improvements:

Workingmen's Homes	Spring House	Inclosure Walls	Tanks and Troughs
Walkways and Driveways	Small Dam	Barn and Silo	Piers for Small Boats
Cement Roads	Milk House	Corn Crib	Garden Furniture
Bridges and Culverts	Ice House	Smoke House	Greenhouse
Foundation and Hatchway	Manure Pit	Hog House	Coal Pocket
Gutter and Curb	Septic Tank	Storage House	Post and Walls
Storage Cellar	Oil Storage Tank	Poultry House	Walls, Sills and Lintels
Small Warehouses	Tennis Court	Dipping Vat	Garages and Runways

Cement Blocks — Overcoating of Old Dwellings — Cement Chimneys and Fireplaces — Winter Concreting

If you live east of the Mississippi, ask for the ALPHA handbook on concrete construction a free copy of the Sheet or Bulletin that interests you most, and for a copy of ALPHA AIDS, our magazine. We are obliged to ask those living out of our sales territory to send 50 cents to cover printing and mailing expense. Mention AMERICAN BUILDER.

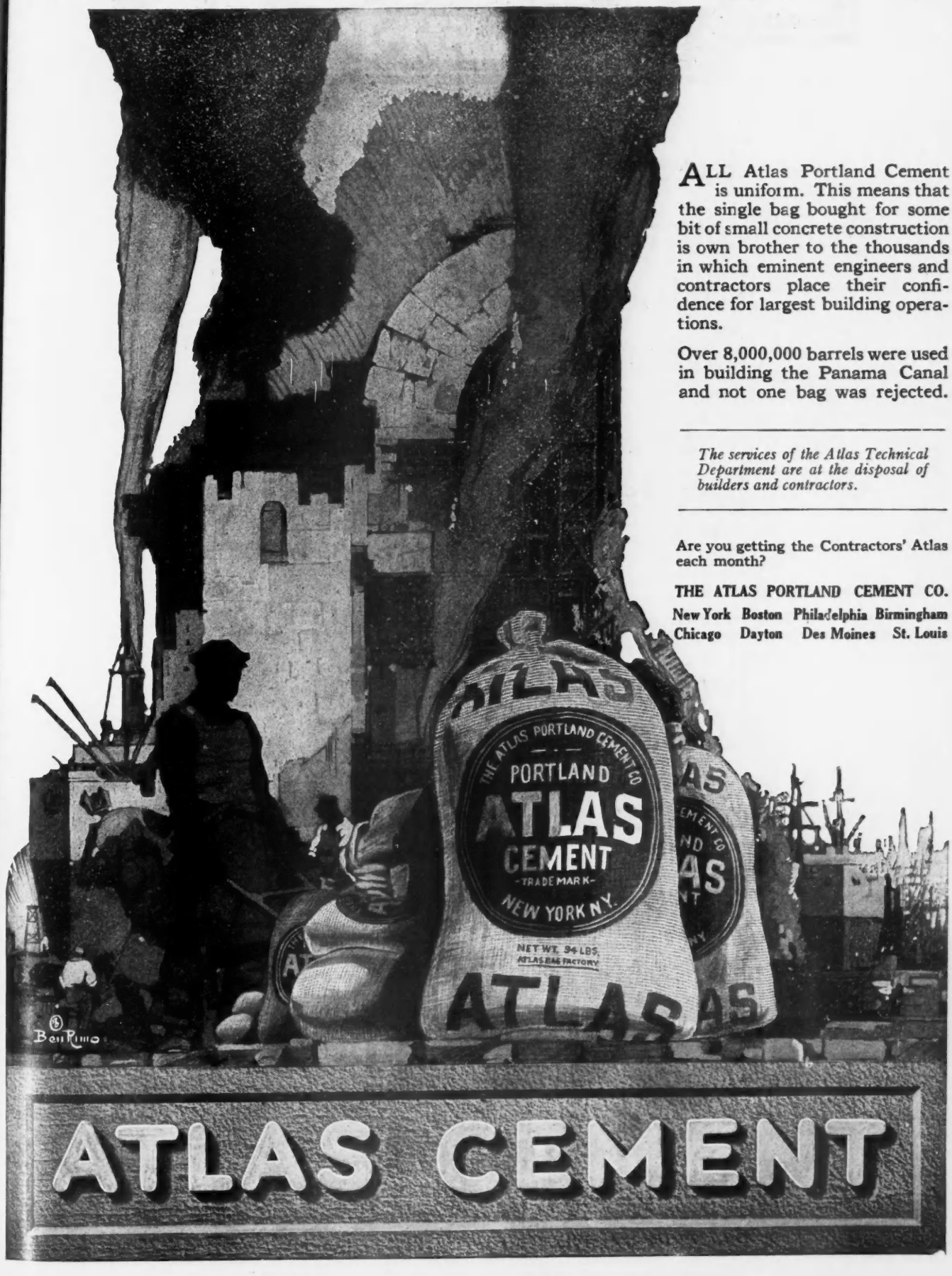
ALPHA PORTLAND CEMENT COMPANY, Easton, Pa., Chicago, Ill.

New York Philadelphia Boston Pittsburgh Baltimore Bellevue, Mich. Ironton, Ohio

Plants at: Alpha, N. J. Cementon, N. Y. Manheim, W. Va. Jamesville, N. Y. Martins Creek, Pa. Ironton, Ohio LaSalle, Ill. Bellevue, Mich.

Concrete for Permanence

DEPENDABILITY



ALL Atlas Portland Cement is uniform. This means that the single bag bought for some bit of small concrete construction is own brother to the thousands in which eminent engineers and contractors place their confidence for largest building operations.

Over 8,000,000 barrels were used in building the Panama Canal and not one bag was rejected.

The services of the Atlas Technical Department are at the disposal of builders and contractors.

Are you getting the Contractors' Atlas each month?

THE ATLAS PORTLAND CEMENT CO.

New York Boston Philadelphia Birmingham Chicago Dayton Des Moines St. Louis

LEHIGH CEMENT

Take no chances with your concrete work—always use Lehigh—the National Cement.

Thousands of contractors specify Lehigh because it is high grade, reliable and is available anywhere.

An army of Lehigh dealers, backed by fifteen mills from coast to coast—at your service.

LEHIGH PORTLAND CEMENT COMPANY

ALLENTOWN, PA. CHICAGO, ILL. SPOKANE, WN.

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Pittsburgh, Pa.
Jacksonville, Fla.
Mason City, Iowa
Kansas City, Mo.
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"I Recommend Sheetrock for Residence Jobs"

Like so many other contractors and builders, Mr. Al. Bertram, Lansing, Michigan, uses Sheetrock, the fireproof wallboard, in his own home. Here is what Mr. Bertram says about Sheetrock:

"In planning my home, knowing the advantages of Sheetrock, I used this material throughout. After living in the house for six months I find the walls and ceilings to be in perfect condition. Sheetrock for insulating purposes, in my opinion, cannot be improved upon. I gladly recommend Sheetrock for residence jobs."

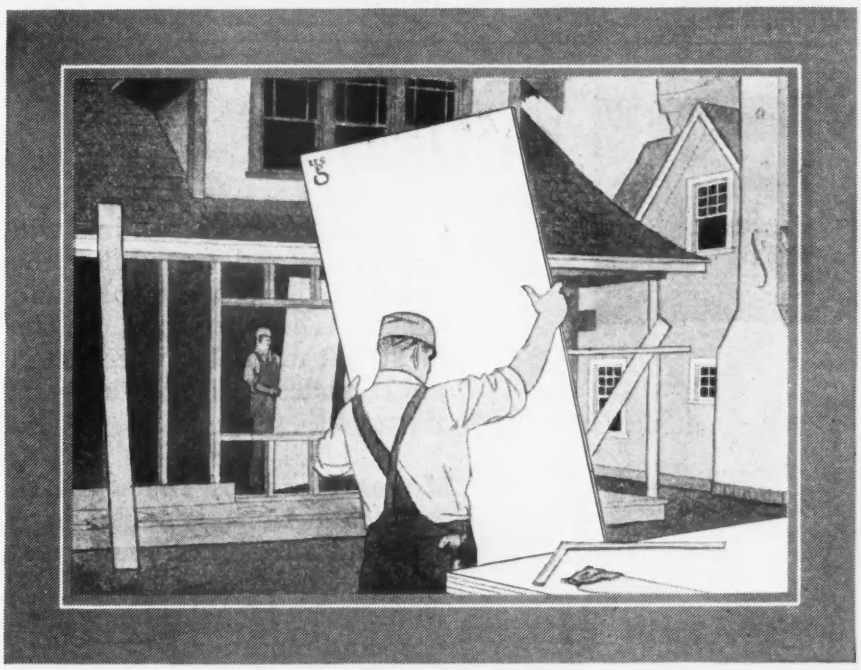
Sheetrock, due to the special U. S. G. process, can be sawed just like lumber and can be nailed directly to the studding or joints, exactly as you have handled pulp board in the past for temporary construction.

Yet Sheetrock, while quickly and economically put up, is *permanent*. It lasts, without warping or shrinking, as long as the building lasts. And it is fireproof. For Sheetrock is made from rock!

It resists both heat and cold. It is a sound deadener. And it takes any decoration—wallpaper, paint or calcimine. Our new Sheetrock Finisher, which comes all ready for use, conceals the joints and nail heads, and prevents discoloration showing through the decoration.

Fill out and mail the attached coupon for a sample of Sheetrock and complete information about the advantages of Sheetrock construction.

Sheetrock comes in standard sizes: 3/8 in. thick, 32 or 48 in. wide and 6 to 10 ft. long



U S G

SHEETROCK

The FIREPROOF WALLBOARD

UNITED STATES GYPSUM COMPANY

World's Largest Producers of Gypsum Products

General Offices: Dept. A, 205 W. Monroe Street, Chicago, Ill.

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New York, N. Y., Buffalo, N. Y., Boston, Mass., Washington, D. C., Philadelphia, Pennsylvania, Pittsburgh, Pennsylvania, Cleveland, Ohio, Cincinnati, Ohio, Detroit, Michigan, Milwaukee, Wisconsin, Minneapolis, Minnesota, St. Louis, Missouri, Kansas City, Missouri, Omaha, Nebraska, Denver, Colorado, Los Angeles, California

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Oakfield, N. Y., Plasterco, Va., Cleveland, Ohio, Gypsum, Ohio, Genoa, Ohio, Detroit, Michigan, Alabaster, Michigan, Grand Rapids, Michigan, Milwaukee, Wis., Fort Dodge, Iowa, Blue Rapids, Kansas, Southard, Okla., Eldorado, Okla., Piedmont, S. D., Loveland, Colo., Denver, Colo., Arden, Nev., Amboy, California

Sheetrock is inspected and approved by The Underwriters' Laboratories, Inc.

UNITED STATES GYPSUM COMPANY
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Send me complete information about Sheetrock.

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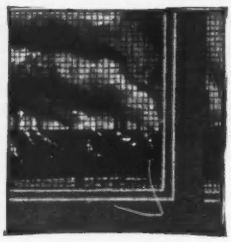
Monel Screening



SMOKE

ORDINARY screening will not stand up under the attack of the city's smoke and fumes. The chemicals in the air attack it. It becomes pitted and corroded and eventually is destroyed.

Monel Metal is resistant to chemical action—is as strong as steel and simply will not rust.

That is why Monel is being used more and more for city screens and why it costs so much less per year of service.

The name Monel identifies the natural nickel alloy—67% nickel, 28% copper and 5% other metals—produced by The International Nickel Company. Monel products include Monel blocks, Monel rods, Monel castings, Monel sheet, Monel wire, Monel strip stock, etc.

THE INTERNATIONAL NICKEL COMPANY

Producers of Metallic Nickel in the forms of Ingot, Shot, Electrolytic Cathodes—99$\frac{8}{10}$%, Malleable Nickel Nickel Salts, Oxides, Carbonates, Sulphates, Sulphides, Acetates, Formates—Monel Metal, Ingot, Shot, Blocks

67 Wall Street **New York City**

INCO MONEL METAL INCO NICKEL

Sykes Expanded Cup Metal Lath Makes Permanent the Charm of this Home

Residence R. E. Rollins, Des Moines, Iowa. Architects Vorse, Kraetsch & Kraetsch Contractors Wm. Knudson & Sons. Stucco on Sykes Expanded Cup Metal Lath

THE charm of this delightful home is due to many factors. The long, broken roof-lines, the beautiful colonial entrance, the casement windows, the profusion of shrubbery—all lend their influence to the total effect.

And here you see stucco at its best. The permanence of the stucco is insured by Sykes Expanded Cup Metal Lath.

When applied to the sheathing, Sykes Expanded Cup Self-Furring Metal Lath gives a perfect and uniform key without furring strips — a considerable saving in time, material and labor. It also gives an absolutely uniform thickness of stucco, with its backbone of permanent steel.

For back-plastered stucco construction, too, the unusual weight and rigidity of Expanded Cup makes it the ideal lath.

We have a distinctive type of lath for every place where metal lath is used

SYKES

Sykes Coal Chute Door

Sykes Coal Chute Door is the simplest, most economical and most satisfactory solution of the coal delivery problem. Made of strong pressed steel and malleable iron. Cannot break. Patent hinges hold door open. Automatically locks when closed. Burglar proof. A big seller wherever shown. Write for full information and prices.

SYKES METAL LATH and ROOFING CO.

504 Walnut Street, Niles, Ohio

Illustration Shows RADIANTFIRE Art Model as installed in Architects Samples Corporation, New York City

The HUMPHREY
Radiantfire

It will flood your room with **glowing radiant heat** in one minute after lighting. If you are cold, chilly or wet, it will warm and dry you in one minute. It will give you the greatest **comfort** you ever had in your house.

It will save firing the furnace for two months in the fall and spring. It will **save a ton of coal** a month in the winter time. You can run it two days for the cost of lighting the furnace once.

It burns ordinary City Gas and costs approximately three cents an hour to run—using natural gas less than a cent an hour. It will give you more heat than any other Gas Fire. It is **positively odorless.** Without dust, dirt or ashes. It is guaranteed. Write for catalog.

GENERAL GAS LIGHT COMPANY

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DEVOE

Will the Final Touch Destroy the Beauty You Create?

NO matter how much sound planning and skilled work go into the building, the most obvious thing about it is the way it is ***finished.***

Your client's eyesight cannot penetrate into brick and wood and plaster. It must stop at the surface coating—the ***paint.***

Even a good painter, if he uses the wrong paint, can in a few hours detract from or destroy the effect of months of your work.

Can the selection of paint then be looked upon as a detail to be casually decided?

The choice of paint products that will ***enhance*** your work need not be a bother to you. Rigorous and searching tests have already been made by the most severe of all critics—Father Time.

Devoe Paint Products have behind them the reputation and experience of 166 years. They are made by the oldest paint manufacturing concern in the United States. Surely you can trust them them to add a beautifying and "final touch."

Write for information

Manufactured by

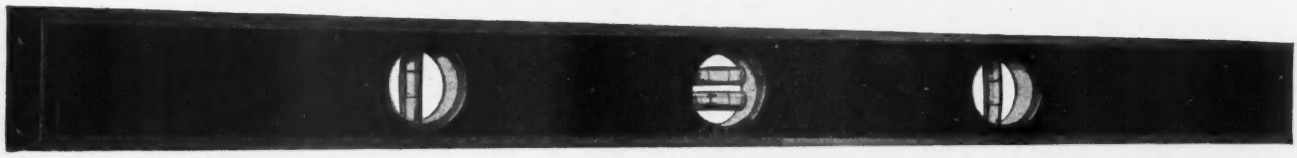
Devoe & Raynolds Co., Inc.

New York *Paints, Varnishes, Stains, Enamels, Brushes, Insecticides* **Chicago**

DEVOE & RAYNOLDS CO. INC. THE FIRST AMERICAN PAINT MAKER FOUNDED 1754

SAND'S

GIVE THIS LEVEL EVERY TEST
FOR ACCURACY, QUICK ACTION, SERVICE



Try this—the master worker's walnut level. There never was a level more carefully made or better adapted to guide the better kind of workman

Accuracy is sealed in, fool-proof, non-adjustable.

The spirit glasses are set solid; are marked with friction grip wire locaters and are protected with plate glass lenses—dust-proof, dirt-proof and water-proof.

Just go to your dealer—ask to see this fine level, and give it every known test for quick action, easy reading and all around utility. You will soon see why good workmen have depended on Sand's accurate levels for more than a quarter of a century.

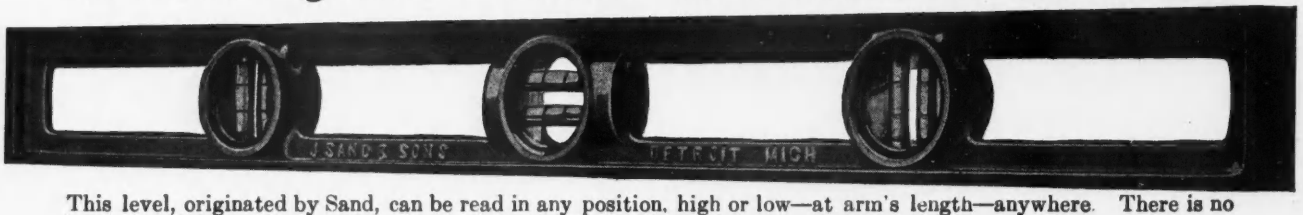
This master worker's level of very old, air dried wood is made in 18″, 20″ and 24″ length with four glasses.

Level Case Free to 500 New Customers

Knowing that once a man buys a Sand's Level he is always Sand's customer and always recommends Sand's Levels to his friends, we are offering 500 splendid level cases free to purchasers of new Sand's Levels. Your dealer will supply you, but if he does not have Sand's Levels in stock, we will send the level postpaid and include the level case FREE. The offer is limited to 500 new customers, so get yours now. This advertisement describes the features of these famous levels. Read it carefully.

Brass bound at $4.75, plain at $2.25.
Also made in 26,″ 28″ and 30″ length with 4 glasses, brass bound $5.00, plain, $2.50.
Special Amateur Level 8″, 12″, or 16″ at $1.50 or 18″, 20″ or 24″ at $1.75.

Here's the Lightest Level Made—The Easiest to Use and to Read



This level, originated by Sand, can be read in any position, high or low—at arm's length—anywhere. There is no level so satisfactory for overhead work—for plumbing ceilings, girders or shafting.

Yet, in spite of its lightness it stands up and holds its accuracy on the rough and ready jobs. It fairly speaks to you and always tells the truth.

These lightest and strongest of all levels are made in substantial milled frame of 99% pure aluminum and can be supplied as follows:

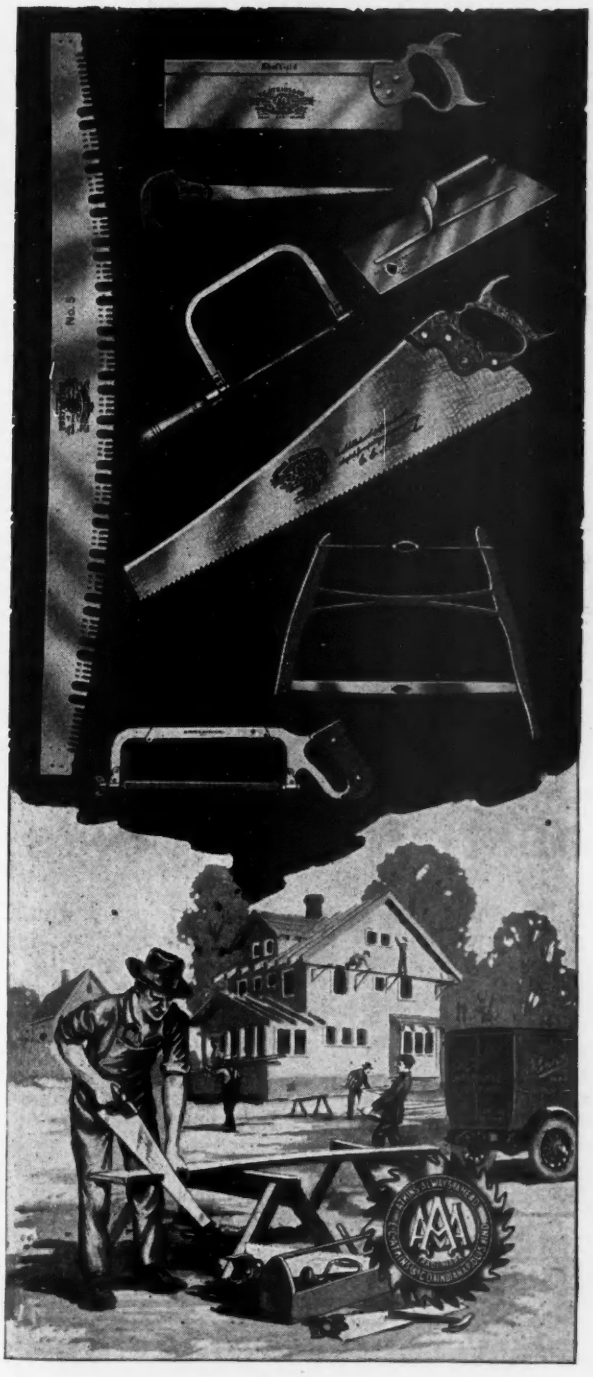
30-inch—4 plumbs and 2 levels - $9.00
28-inch—4 plumbs and 2 levels - 8.50
24-inch—4 plumbs and 2 levels - $7.50
All levels postpaid at above prices.

Write for an illustrated list of Sand's Levels.
Get these levels from your dealer—if he will not supply we will send any of them, postpaid, on receipt of prices above.

J. SAND & SONS, 4847 Rivard St., Detroit, Mich.

LEVELS

ATKINS SILVER STEEL SAWS



Mr. Carpenter and Contractor

In these days when it is necessary to scrutinize the expenditure of every cent for Saws and Tools, you can bank on the quality of

ATKINS SILVER STEEL SAWS

and rest assured that they will give you one hundred cents for every dollar you put into them.

They are the

Highest in Quality

hence the lowest in price

If your dealer cannot furnish you with Atkins Saws—write us at nearest point below.

Send 25c for carpenter apron, pencil and Saw Sense booklet

E. C. ATKINS & CO.

ESTABLISHED 1857 THE SILVER STEEL SAW PEOPLE

Home Office and Factory, INDIANAPOLIS, INDIANA

Canadian Factory, Hamilton, Ontario

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Branches Carrying Complete Stocks In The Following Cities:

Atlanta	New Orleans	Seattle
Memphis	New York City	Paris, France
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Minneapolis	San Francisco	Vancouver, B.C.

Saves Space and Construction Costs

THIS IS WHAT YOU BUY

This is the Knape & Vogt Garment Carrier. Adaptable to any closet, new or old. Easy to put up—anyone can do it. Made in all lengths from 12 to 60 inches.

HOW IT WORKS

Operating on a telescoping roller bearing track, the carrier containing the wardrobe comes from the closet at a touch of the fingers. Selection of garments is easy. Even closets 14 inches deep by 24 inches wide will hold a surprisingly large amount of clothing. These carriers sell immediately once their usefulness is demonstrated.

By building smaller and more compact clothes closets which will accomodate the Knape & Vogt Garment Care System, from 10% to 17% in the construction cost of the home can be saved. People have failed to realize until now what expensive, space eating items are large closets. The Knape & Vogt Garment Care System provides for smaller closets that save space, yet accomodate more clothing and care for it better than the old fashioned closet twice the size. These modern garment cases preserve the original lines of good clothes, prevent moths, create order. and give permanent satisfaction.

The builder or architect who is not acquainted with this system is not giving his client the benefit of the most modern developments in home comfort.

See Sweet's Catalog for Construction Detail.

KNAPE & VOGT MFG. CO., Grand Rapids, Mich.

Money Making Building Facts Explained

NOW ready for you—the new Library of Carpentry and Contracting—showing the very things that are helping other men make more money — all the new and better ways of doing things — a complete course in building methods for the beginner —a handy reference guide for the seasoned workman.

Every carpenter, every contractor, every man interested in any kind of building should see these books. They are the combined work of 25 well-known men, each an expert in his own particular field. They explain everything you want to know about carpentry and the contracting business. Every problem, great and small, every type of building, every new and improved method is made clear with hundreds of plans, pictures and blueprints.

Over 200,000 men in various lines of industry have made good and are earning more money because of what they have learned from the A. T. S. Books. What other men have done, you can do too.

World's Greatest Building Books

Just to give you an idea of what these books contain and what they will do for you, read through the partial table of contents given below. There are several thousand different subject but these few will show how complete the books are.

Partial Contents:

Carpentry (including everything from the raw timber and tools to the trimming and turning over to the owner) — Stair-Building — Steel Square—Plastering and Painting—Mechanical Drawing—Blue Print Reading—Architectural Drawing — Sheet Metal Work — Building Superintendence — Underwriters' Requirements — Heating and Ventilating — Steam and Hot Water Fitting—Sanitary Appliances—Water Supply — Drainage and Venting—Domestic Hot Water Supply—Hardware—Estimating—Contracts and Specifications — Legal Relations — Building Code — General Index and Review Questions and Index to each volume.

5 Big Volumes
2140 Pages
1000 Pictures
Blueprints and Plans

Cash In on What Other Men Have Learned

The old days of hit-or-miss experience are passed. You have got to know if you want to keep in the running now. It takes time and work to figure things out and keep doing it year after year. Don't you keep on doing it. Take the short cut and let these great books help you. You can't go wrong if you follow in the footsteps of men who have made good. The very knowledge and methods that made the authors of these books experts in their chosen fields are bound to help you to a lasting success and a greater earning power than you have now.

Membership Free

With each set of Carpentry & Contracting books we give a one year membership in this Society worth $12.00. This membership entitles you to the following benefits:

Consulting Privileges: The Society maintains a staff of engineers and experts to work out problems and answer questions by mail for its members.

Standard Tests: The means by which you are able to determine your exact fitness for the work you are doing or would like to do. This means finding out how much you really know about your job.

Free Employment Service: All members can use the Society's free employment service to get a good job. This includes listing in the bulletin called "Men."

Don't Send Money Now

We will lend you the whole set of these great money-making building books for a week to use as you please in your shop or home. Examine them carefully and decide with the books before you if you want to take advantage of this golden opportunity. Over 50,000 sets have been sold on this no-money-down plan—keep the books a week and send them back at our expense or pay $3.00 a month until the special price of $24.80 is paid. Regular price $37.50. There are no strings to this offer. It is open to every man over 21 in the United States and Canada. You sign nothing but this coupon. No agent will call on you. Mail the coupon and get the books, then decide whether or not you want to keep them. Mail the coupon now.

American Technical Society, Chicago

AMERICAN TECHNICAL SOCIETY
Dept. G-336, Chicago

Send me the five volume set of Carpentry & Contracting for a week's free trial by express collect. I will either return the books in one week at your expense or send you $2.80 as first payment and $3.00 every month until a total of $24.80 is paid. With these books I am to receive a free membership in your Society, including Consultation Privileges, Standard Tests and FREE Employment Service.

Name .....

Address ..... State .....

City .....

Reference .....

First—Build on Paper

What a barn is and what it costs depends in no small degree on the care with which it is built on paper in advance. Mistakes made on paper are easily righted, but once the barn is built, correcting mistakes costs money.

When a farmer builds a barn he wants it to be ideal for his particular purpose. He wants the right amount of storage space, enough light, air space and ventilation; work saving arrangements for feeding, watering the stock and cleaning the stable; easy handling of the hay; and right location of the barn for sunshine and cold wind.

He wants a barn that is correctly proportioned, individual in appearance and one that is strong enough to withstand all storms—a barn that will add value to his farm.

The contractor who builds such barns at the same time builds a reputation for himself among the farmers that pays big dividends in profits and satisfaction.

Jamesway Barn Plan Service

The contractor who is not already familiar with requirements for modern dairy barns will find much interesting information in the Jamesway book.

In the Jamesway organization are scores of barn planning experts whose experience is yours for the asking. For years these men have studied dairy barns—construction, lighting, ventilation, drainage, arrangement to save labor; how best to remodel old barns; and every year they have visited thousands of dairy barns in every section of the country and every year they have helped to plan thousands of barns.

The best of their ideas are in a 320 page book on barn building, remodeling, ventilation and equipment. This book will be sent free if you will give the name of a farmer for whom you expect to build or remodel a barn. Ask for *The Jamesway Book, No. 17.*

James Manufacturing Company
Ft. Atkinson, Wisconsin
Elmira, New York 706 First Avenue North, Minneapolis

For Dairy Barns; Hog, Beef, Horse and Sheep Barns; Poultry Houses, etc.

Jamesway

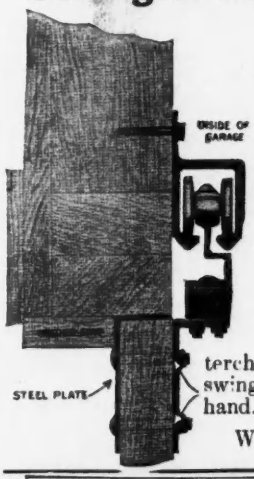
Labor-Saving, Money-Making Equipment

PORTER

"Dependable Since Sixty-Eight"

Here are a few of the items from the big 144-page Porter catalog that will particularly interest you as a contractor or builder—items that you will personally have occasion to buy or specify. On other Porter products—barn equipment, hay tools, door hangers, etc., you will want to be posted so you can advise your clients intelligently. We will gladly mail complete catalog on request.

"Straight-Away" Garage Set



The "STRAIGHT-AWAY" Garage Door Set is complete—track, hangers, latches, handles, hinges, bolts and screws. Installation is a one-man job; hammer and screw driver are the only tools needed.

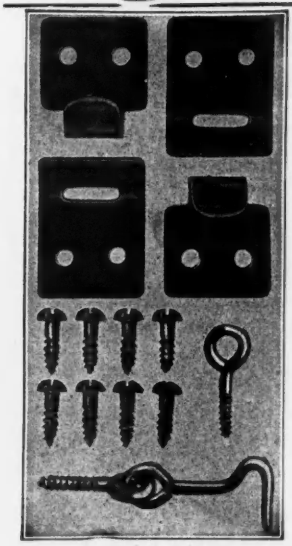
Track is on the inside, out of the weather. Roller bearing trolleys always roll smoothly and easily in the Porter Double-V Track. Patented offset swivel permits the use of straight track; doors always fit snugly. Hardware is interchangeable to allow doors to swing in or out, right hand or left hand.

WRITE FOR COMPLETE FOLDER

Single Lever Friction Hoist

Hundreds of contractors and builders are speeding production and reducing payrolls through the use of this sturdy hoist—the cheapest, surest, and most economical power for handling sand, gravel, cement, earth, lumber, mortar—or for any other lifting job.

It enables one man to do the work of four or five, at a remarkably low operating cost. A single lever controls both drums, an exclusive and valuable Porter feature. Ask for complete description and prices.



The Finishing Touch

When you build a home, complete the job by equipping it with this convenient inexpensive window screen and storm sash set. Each set consists of hinges, screws, hook and screw eye. Permits the hanging or removing of window screens or storm sash in a few moments. Allows them to swing out to an angle of 45 degrees without detaching, when windows are to be washed.

This is a small Porter item with a big value. Tell your patrons about it.

Porter Barn Equipment

The Porter line of equipment includes everything a farmer needs to make his barn modern, convenient, sanitary and profitable. It is simple and practical in construction—absolutely free from fads and unessential attachments.

Although it is fit for the finest show barn, it is built first of all for the men who are dairying for profit—the kind of men for whom you build.

It will be helpful to you to know the Porter line and to be able to explain it to those who ask you about it.

CATALOG ON REQUEST

J. E. Porter Corporation, 753 Guion Street, Ottawa, Ill.

Minneapolis Office: 426-A Washington Avenue N.

Get The Porter Catalog *of*

complete modern barn equipment, including:

Steel Stalls and Stanchions	Hay Tools
Steel Animal Pens	Barn Door Hangers
Drinking Bowls	Garage Door Sets
Litter and Feed Carriers	Hardware Specialties

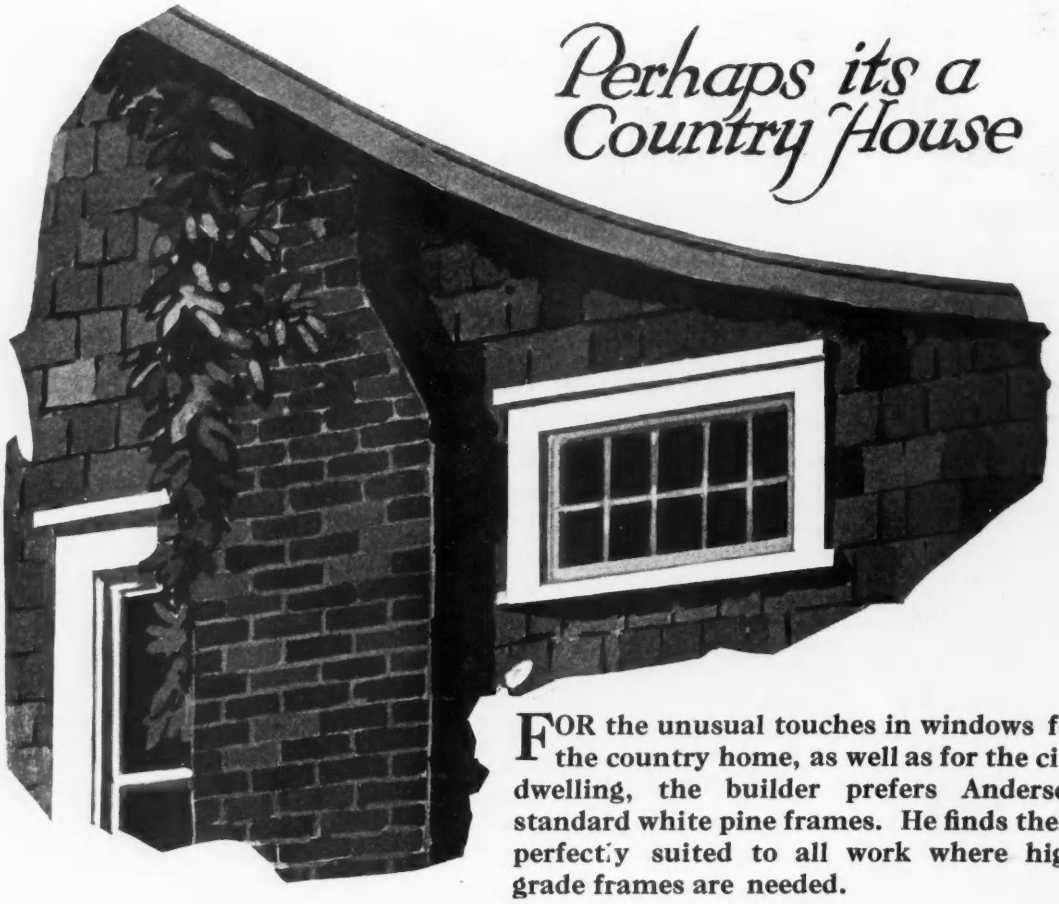
755-A

Gentlemen: Please send details of

- ☐ "STRAIGHT-AWAY" Garage Set.
- ☐ Single lever friction hoist.
- ☐ Window Screen hinge set.
- ☐ Porter barn plan service.
- ☐ Complete General Catalog.

NAME .....

ADDRESS .....



Perhaps its a Country House

FOR the unusual touches in windows for the country home, as well as for the city dwelling, the builder prefers Andersen standard white pine frames. He finds them perfectly suited to all work where high grade frames are needed.

The Builder's Choice

Andersen Frames provide the builder with a ready means of cutting costs while maintaining quality. Instead of waiting for special frames to be made, he now simply buys Andersen Frames which can be nailed up in ten minutes. They come in two bundles complete with pockets and pulleys.

Andersen Frames give you better quality at lower cost. All exposed parts are made of *Genuine White Pine.* You have 121 sizes of two-light window frames to choose from—all ready for prompt delivery.

A Book For Builders—Free

Write for our complete illustrated book for builders showing how Andersen window and door frames cut building costs. A copy is yours upon request.

WHITE PINE Andersen FRAMES

Andersen Lumber Company

Frame Manufacturers

Dept. A-9 South Stillwater, Minn.

Andersen FRAMES

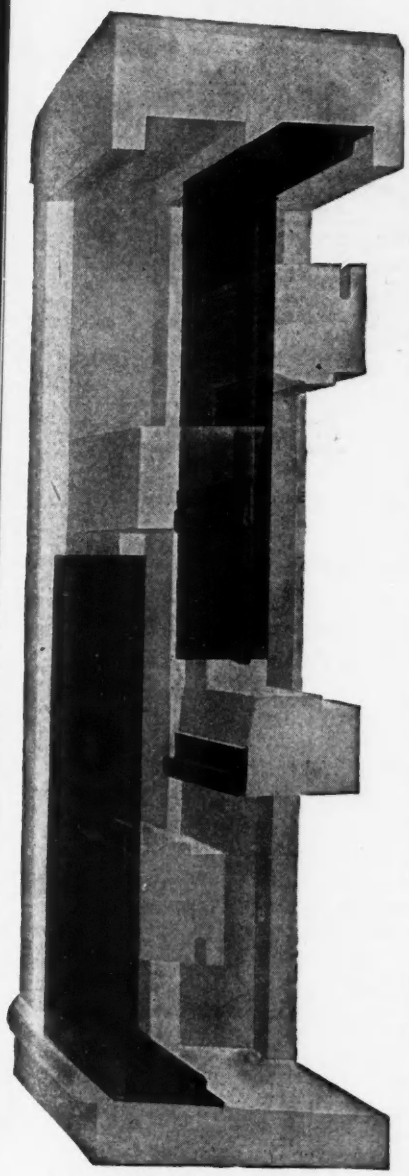
In the Days of Our Grandfathers

Rags and Old Papers were stuffed in the Cracks around Windows and Doors to keep out Cold, Wind, Storm and Dirt.

OUR FATHERS

Used Strips of Wood and Rubber or Felt which Wore Out, were Unsightly in Appearance and Inefficient

LOOKS LIKE OTHERS BUT ENTIRELY DIFFERENT



X-Ray View of Window Showing How it Appears Installed

We of Today

Demand that which is scientific in principle, practical in application, efficient in service and lasting in quality.

That's the "Why" of

Diamond Metal Weather Strips and Diamond Calking Compound

They Meet Every Requirement
Time Tested and Tried

Our Trade-Mark is Your Protection Against Imitations

PRACTICAL METAL THE DIAMOND WAY WEATHER STRIPPING

(Registered)

See that your specifications read and your contractor installs "DIAMOND" Weather Strips and Calking Compound in the Windows and Doors of your New or Old Building.

CONTRACTORS, CARPENTERS and Building Specialty Men will find a "DIAMOND" Agency Most Profitable

Some Very Desirable Territory Still Open

Send for Our Agency Proposition NOW — TODAY — Address

THE DIFFERENCE

The runway or side strip is made in two sections, a base with a foldover under which the rib interlocks and is held in place by a screw and mitre at sill or top.

To remove sash take out screw.

Only one side need be removed.

To replace sash just reverse operation.

After rib is removed if it is necessary to get into weight pocket it can be done without kinking or damage.

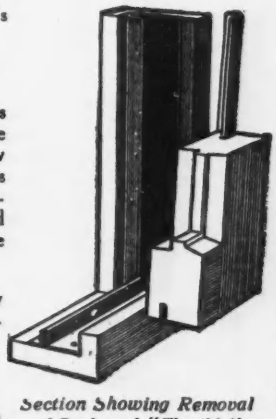
Our Equipments A, B, C, have this removable and flexible feature which is fully appreciated by carpenters and repair men.

Sash warp, swell and shrink and cause trouble by binding.

Parting stops or the dividing strip being exposed to the weather swell and bind the sash making it difficult to raise.

All this is avoided if *Diamond Flexible* strip is used as they are so made that they allow for these defects and adjust themselves to meet and overcome these objections.

That's why windows equipped with *Diamond Flexible* strips always slide easy.



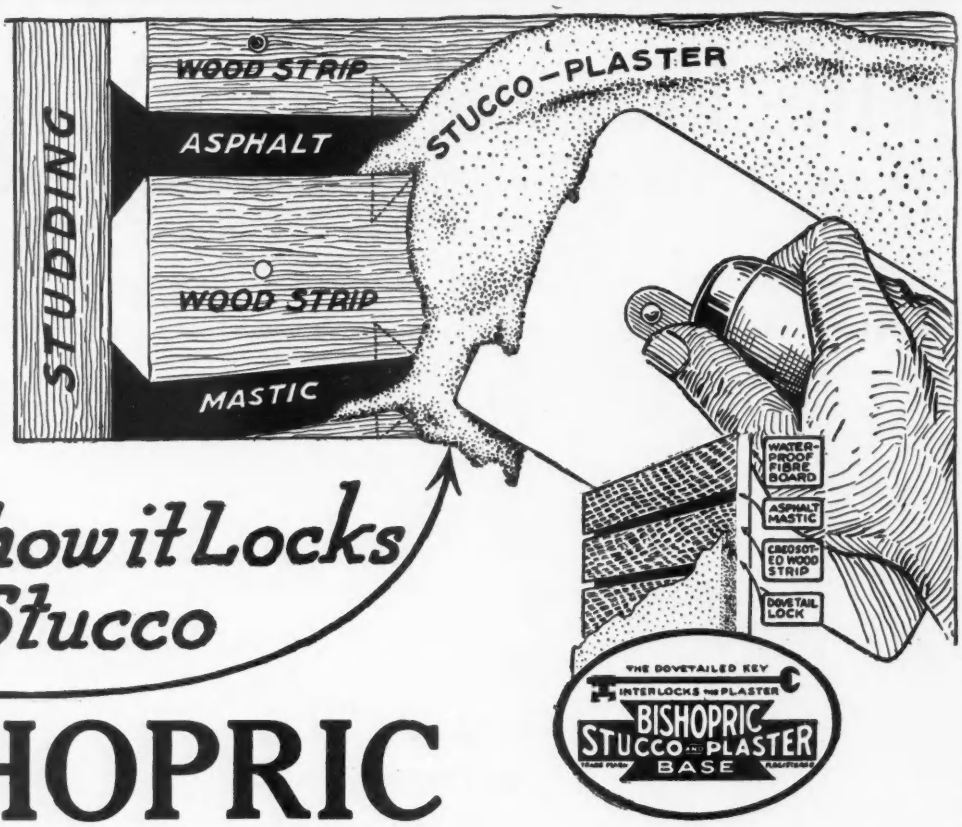
Section Showing Removal of Sash and "Flexible" Strip at the same time.

The Diamond Metal Weather Strip Company

632 KERR STREET, COLUMBUS, OHIO

WESTERN FACTORY BRANCH — FORT DODGE, IOWA

Bishopric for all Time and Clime



See how it Locks the Stucco

BISHOPRIC

Stucco and Plaster Base

For Exterior and Interior

Insures Beautiful, Durable Structures and Permanent Stucco and Plaster Walls

BISHOPRIC offers you the way to Bigger Business, Mr. Builder

The demand for houses everywhere is unprecedented. The demand for material that will enable one to build better and cheaper, thus *Bishopric* offers a steady, profitable business and a quick turnover at a good profit.

Think of the possibilities for remodeling by the use of BISHOPRIC for stucco exterior over old frame buildings.

There is plenty of big business in your territory. Go after it. "Get the jump" on the other fellow. Make an extensive cultivation for business. Dig up prospects.

Show them how to convert that old house into an ATTRACTINE, LIVABLE, BEAUTIFUL home and at a saving of about 50% on new construction. WATCH YOUR BUSINESS GROW.

Stucco Offers an Economical and Fast-Growing Appeal to People who Desire Homes of Distinct Individuality

The *Permanency* and beauty of Stucco Houses depends on the Base used.

Bishopric under Stucco is universally recognized as the Best Base and at the same time the least costly building material for Stucco Exterior over new or old buildings.

This reputation has been won by its wonderful record extending back for years, and today remains unassailed.

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Let us explain to you how to "Cash in" big and reap the benefits of our national advertising.

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