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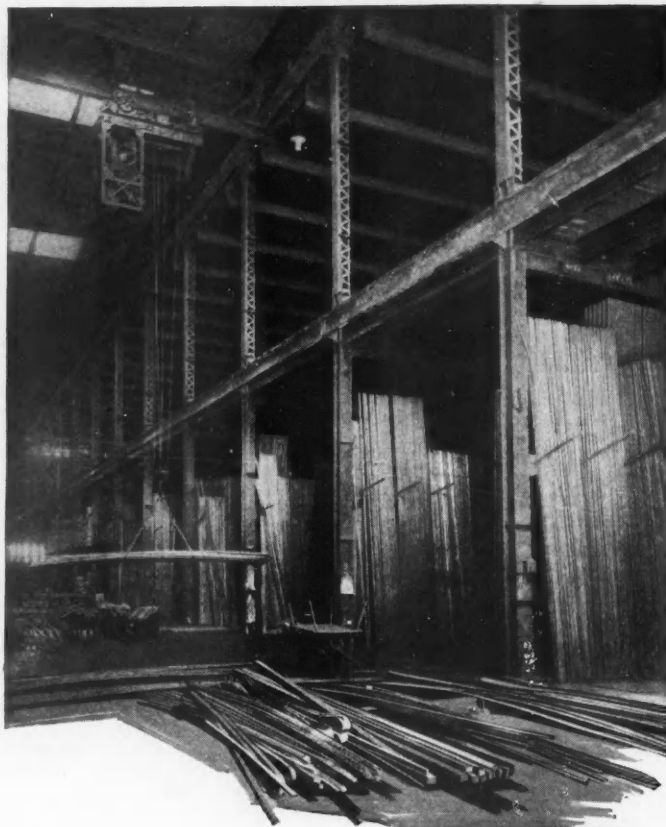
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Short Talks by the Editor



"You Have Done the Impossible"

IN spite of strikes, coal shortage shut-downs, scarcity of paper and shortage of workmen, the new Radford 1920 Building Activity Poster Calendars have been produced this year practically on time, and have already been shipped out to the lumber dealers.

Seven carloads of paper have been run thru the presses five times. More than eighteen million impressions were required to produce this 12-sheet poster set in four colors and then print on the lumber dealer's name. A total of 336 lithographic plates had to be made.

The stupendous character of this task is, of course, not apparent to the casual observer who sees and admires a single copy of this set of building posters and asks the lumber dealer if he may have it to take home.

The immensity of the job is probably not even realized by the individual dealer who placed an order for several hundred sets, to be imprinted with his name, for distribution around the First of the Year to his customers and friends—to promote building improvements in his trade territory all thru the year.

Those, however, who have been in position to see and comprehend this job in its entirety have declared in no uncertain terms—"You have done the impossible. With manufacturing conditions as they have been since early last summer and getting steadily worse right up to the fuel shut-down just before Christmas; with costs taking a new jump practically every month, forcing you to pay more for paper, more for inks, more for plates, more for press work, more for tinning (and the job required four hundred thousand feet of tin!) and more for boxing, you folks have lived right up to your promises, both on price and quality, and have made deliveries practically on time. You have done the impossible this year—what very few other publishers have been able to do."

Such an expression coming from the proprietor of one of the large line-yard lumber companies was naturally gratifying to Mr. Radford and his associates. It showed a real appreciation of the tremendous difficulties we have had to overcome this year to get out our new Poster Calendar and supply it practically on time to our many customers.

When you remember how the printers' strike in the early fall forced a hundred or more of the leading

popular magazines and class journals to suspend publication, to miss several issues entirely, or to bring them out months late; and when you take note that right now the acute paper shortage has forced several big, high-grade magazines to use rough "newspaper" stock instead of their customary good paper, *we certainly are to be congratulated*, we believe, in that we have succeeded in our endeavor this year to produce more than a quarter of a million 12-sheet sets of building posters in colors, delivering them practically on time, all properly imprinted and bound, boxed and shipped to over three thousand different points; and have not raised the price one cent, nor sacrificed one single point on the quality of the paper stock used nor of the art pictures in colors that make up this very attractive "building activity" set.

Our lumber dealer customers have realized the situation and we want to take this public way of thanking them for their patience and consideration.

Several of the prominent line yard lumbermen, when these unavoidable delays were explained to them, said:

"That's all right; even if these posters are a little late for the holiday season, they will be in time to catch all of the active planning and building season, and will work for us all thru the year. That's worth a whole lot more to us than simply the holiday season or sentiment alone. We consider your poster calendars as a real building promotional proposition for use all thru the year. It is more than a holiday token. Everyone of the twelve poster sheets has its value, and will not be lightly laid aside or destroyed."

With the striking appearance of this poster set, its size, beauty of coloring and the real practical building suggestions it contains, we have no fear but that it will be prominently displayed everywhere, even tho it has to displace less attractive calendars already up.

The entire quantity has now been lithographed—seven carloads of paper have been put thru the presses five times; and as this is written the last of this huge amount of building promotional material is being boxed and packed for shipment.

Our contractor and builder readers have no doubt been thinking that it's about time for "my dealer" to be coming out with his new calendar for 1920. Don't worry; it will soon be ready to hand out to you.

And it sure is a beauty—well worth waiting a few days to receive.

The Promise of 1920 for the Building Industry

GREATEST VOLUME OF BUSINESS IN HISTORY OF COUNTRY AWAITS BUILDERS.

JANUARY 1, during the last few years, at least, has been the time when everyone has been required to take stock of the activities of the preceding year; what has been accomplished, and what have been the earnings. The word "required" is used because the income tax law makes it obligatory on practically all of us to make a report of our earnings to the internal revenue collector.

The first of January, 1918 and 1919, ended rather lean years for members of the building industry. But this January finds builders and all those who are in the business of supplying builders with the materials and equipment they use in a more happy frame of mind. Business during the last year has been more than good; it has broken records. The removal of the restrictions on building; the active campaigns to promote building everywhere, and the great need for buildings brought an era of unprecedented prosperity to the building industry. But the prosperity of 1919 will not hold a candle to that of 1920.

1920 to Be Greatest Building Year

This year will see the greatest activity in the history of building in the United States. Prices of labor and materials delayed building considerably during the first part of last season. Prospective builders held the opinion that prices would come down. Prices have not come down; neither is there a probability that they will come down in the near future. But this fact will not have the effect it had last year. Those who want to build now are satisfied in their minds that there is no possibility of reductions in labor and materials; they need buildings and need them badly; and will go ahead with their plans.

This means that during the coming twelve months every person connected with the business of building, be he contractor, material dealer, architect or the manufacturer of builder's equipment and building materials will have the most prosperous year in the history of his business.

Are Builders Prepared for 1920?

The most important question at this time is: "Are the members of the building industry prepared for this enormous building activity?"

Without attempting to sound an alarm, there appears to be some doubt as to whether or not the manufacturers of materials and equipment will be able to supply the demands that will be made upon them during 1920. But there is a way to be insured against this condition. That is to take stock of the probable needs during the year and get in an order now; at least, arrange for deliveries of the equipment and materials that it is now certain will be needed. It does not require a long memory to remember the warning issued by coal mine operators last summer. Those who heeded it had no difficulty in keeping warm during

the coal strike. Those who did not buy in advance of their needs got, as one newspaper philosopher pointed out, "what was coming to them."

Last October millwork manufacturers declared that in some cases they were several months behind in their orders. They asked that lumber dealers and contractors anticipate their wants and put in their orders as far ahead as possible. It is not uncommon to get reports from the manufacturers of contractors' equipment that they are "oversold," meaning that their output is sold in advance of its manufacture.

This month is an excellent time for material dealers to take an inventory of the orders they have on their books now and prepare to fill them. This month is the time when contractors should look over their equipment and determine what needs replacing. Will the old concrete mixer go thru another season; is a new portable saw rig needed; or is there a piece of equipment that is not now possessed, but that will be needed to take care of all the work that is in sight during the year?

And when these things are being considered, let everyone remember that 1920 is going to be the biggest year in the history of the building industry—and prepare accordingly.



Rules for Estimating Quantities of Sheathing, Flooring, Etc.

FOR common sheathing laid horizontally on a wall or roof without openings, add one-tenth to the actual superficial area to allow for waste. On the walls of dwellings, figure the walls as tho without openings and allow nothing for waste. If sheathing is laid diagonally, add one-sixth to the actual superficial area.

For tight sheathing laid horizontally, add one-fifth for 6-inch boards, one-seventh for 8-inch boards, and one-ninth for 10-inch boards. If laid diagonally add one-fourth for 6-inch boards, one-sixth for 8-inch boards and one-eighth for 10-inch boards.

For 3-inch matched flooring add one-half to the actual superficial area to be covered.

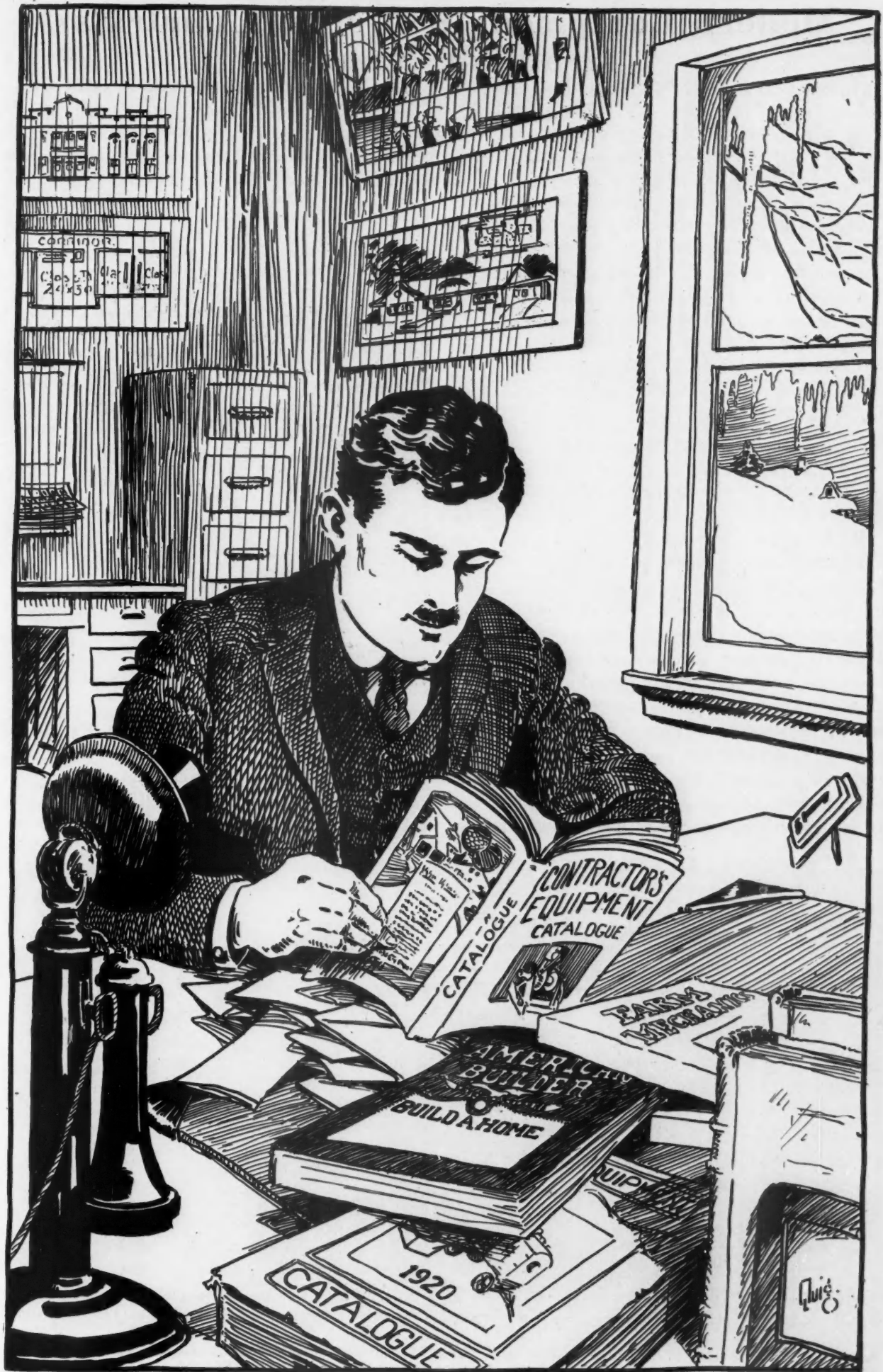
For 4-inch flooring add one-third and for 6-inch flooring add one-fifth. Ceiling is measured the same as flooring.

For drop siding, add one-fifth to the superficial area.

For lap siding laid 4 inches to the weather, add one-half to the actual superficial area; if 4½ inches to the weather, add one-third.



FOR roofing large halls or rooms a segmental timber arch, with an iron or steel tie for taking up the horizontal thrust, makes about the cheapest truss that can be built, especially where there is no ceiling to be supported.



Modern Equipment Will Meet Country's Building Needs

CONTRACTORS, CONFRONTED BY LABOR SHORTAGE, CAN REPLACE MEN WITH MACHINERY AT A SAVING IN COST—1920 WILL BE BIGGEST BUILDING YEAR.

MAN is weak of himself and of small stature. He stands on a basis, at most for the flattest soled of half a square foot, insecurely enough, nevertheless he can use tools, can devise tools. With these the granite mountains melt into light dust before him; he kneads glowing iron as if it were soft paste; seas are his smooth highways; wind and fire his unwearied steeds. Nowhere do you find him without tools; without tools he is nothing; with tools he is all.

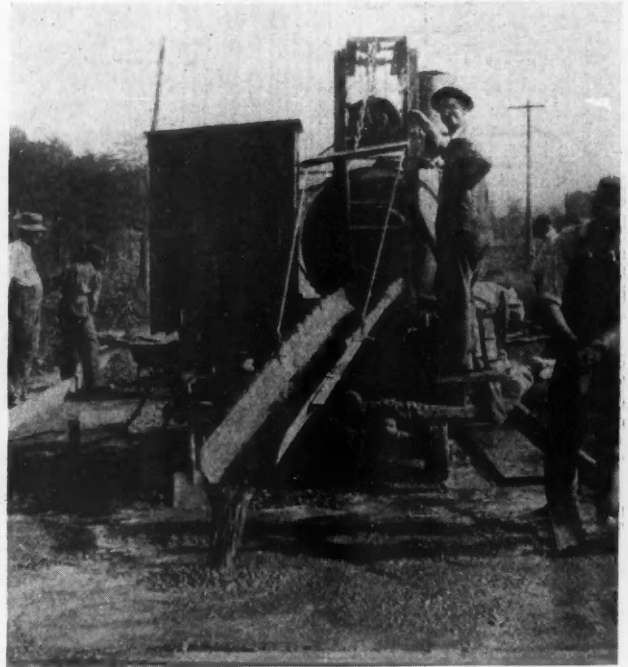
—THOMAS CARLYLE.

NO MATTER how expert, a workman cannot do high-class work without the necessary tools. Carrying this thought into the contracting field it can be emphatically stated that a contractor cannot achieve the maximum of success unless he has the equipment required for his workmen to perform their tasks economically and efficiently.

This fact is recognized by thousands of successful contractors—successful from both the standpoint of erecting substantial and high-class buildings and from a financial standpoint. Good equipment, chosen to perform the tasks that are required by the class of work the contractor accepts, is as necessary as a thorough knowledge of standard building practice.

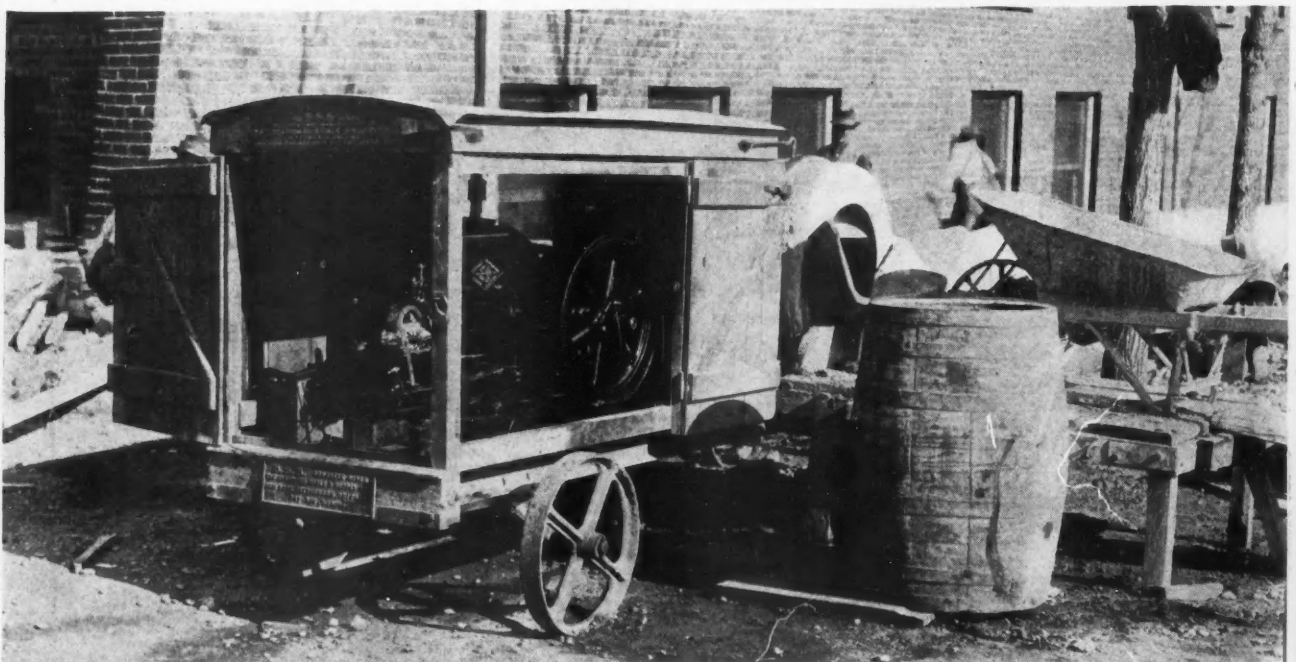
This year of 1920 finds contractors facing an extraordinary situation. They are in that most comfortable position of having all the work they can do. Last year, with the obstacles of high material prices,

increased labor costs and the unsettled conditions that followed the ending of the war, contractors in the building field broke all American records.

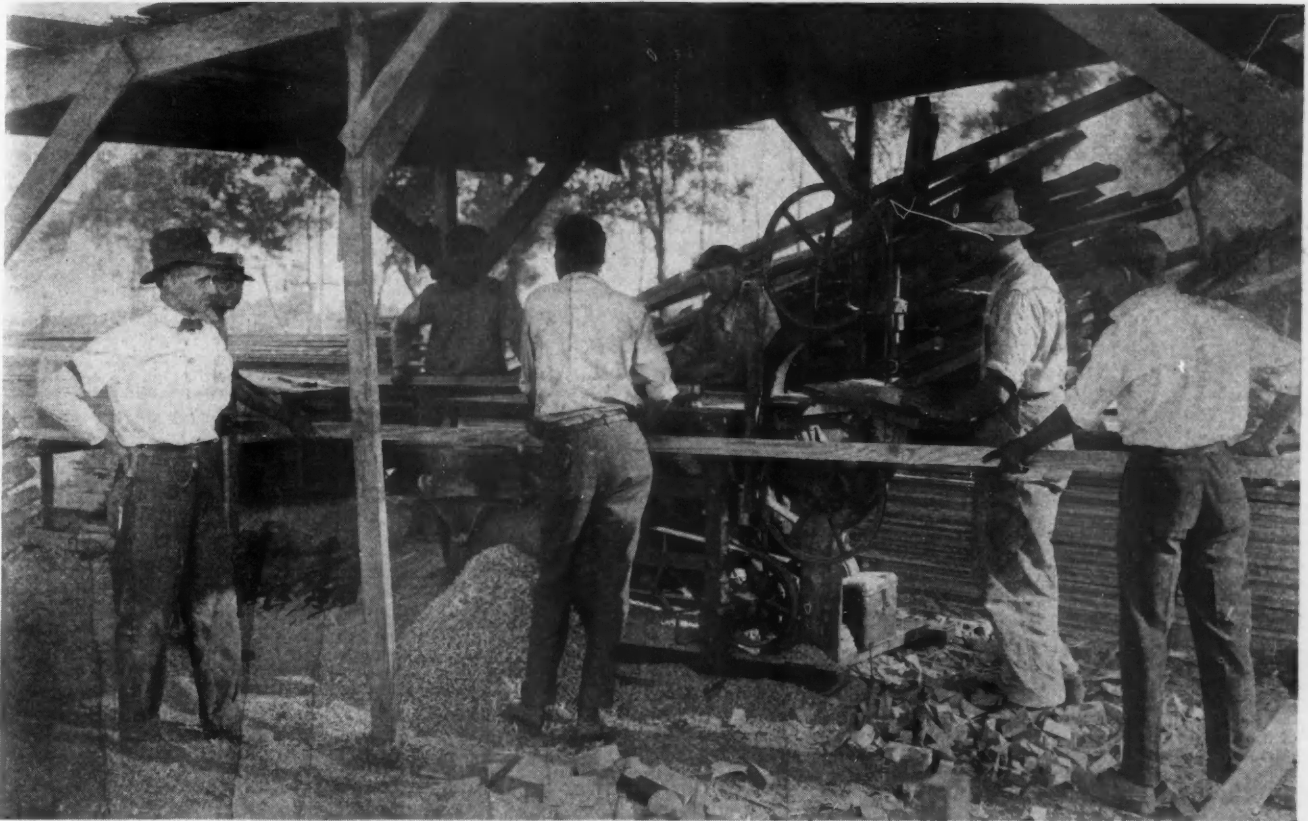


Paving Mixer Delivering Concrete in Place. The Swinging Spout Saves Any Handling of the Materials After They Are Mixed, a Method That Cuts Costs.

The exact figures of the total sum of money spent for building construction during 1919 are not available, and cannot be secured, because outside of the larger



A Vital Part of a Power Mixer Is the Engine That Drives It. This View of a Power Mixer Shows How the Engine Is Housed and Mounted on the Same Truck, Carrying a Power Plant to the Building Job.



A Combination Saw Rig and Wood Worker Is One of the Most Necessary Pieces of Equipment on the Job. The Power Plant—an Electric Motor Where Current Is Available, or a Gas Engine Where It Is Not—Drives the Saw and Other Tools. This Equipment Is a Time and Labor Saver and Adds to the Profits of the Contractor.

cities no records are kept. But as an indication, and, perhaps, a basis on which to make an estimate, the following may be cited. The statistics given are comparative figures of the building and engineering operations in the cities of the states north of the Ohio river and west of the Missouri river. They were compiled by the F. W. Dodge Co., New York City, from the building permit records kept by cities where there are building regulations. The figures for the last ten years follow:

Contracts awarded

| | |
|-----------------------------|-----------------|
| Jan. 1 to Dec. 1, 1919..... | \$2,332,902,000 |
| Jan. 1 to Dec. 1, 1918..... | 1,631,929,000 |
| Jan. 1 to Dec. 1, 1917..... | 1,527,370,000 |
| Jan. 1 to Dec. 1, 1916..... | 1,243,998,397 |
| Jan. 1 to Dec. 1, 1915..... | 857,190,100 |
| Jan. 1 to Dec. 1, 1914..... | 677,920,300 |
| Jan. 1 to Dec. 1, 1913..... | 798,117,500 |
| Jan. 1 to Dec. 1, 1912..... | 803,391,500 |
| Jan. 1 to Dec. 1, 1911..... | 735,283,813 |
| Jan. 1 to Dec. 1, 1910..... | 756,284,931 |

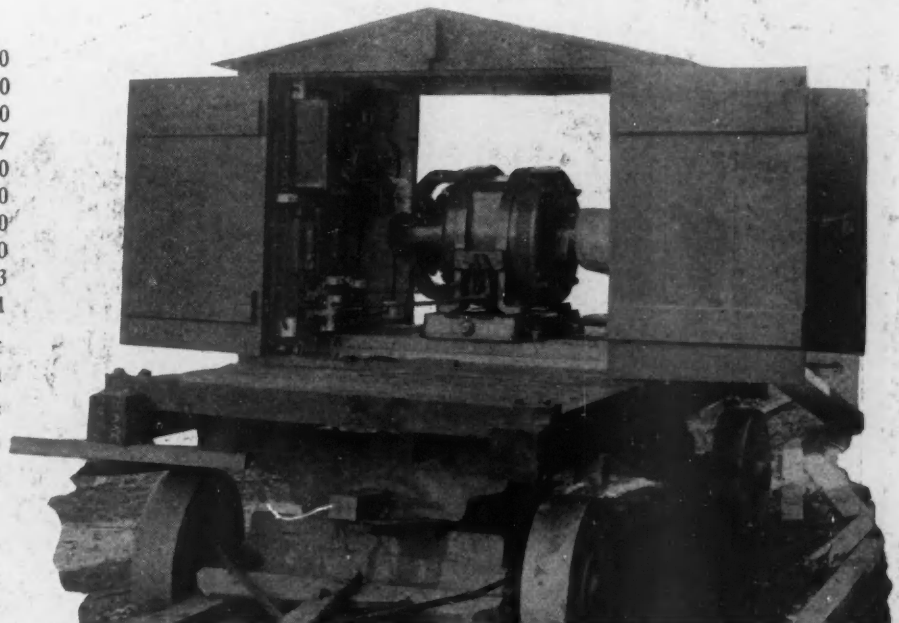
These figures do not take into account the immense amount of farm buildings, nor the work done in the smaller communities, which, it is safe to say, equals or exceeds that in the cities.

This might be termed the construction work that was imperative; that is, buildings that were so necessary that they were built, irrespective of

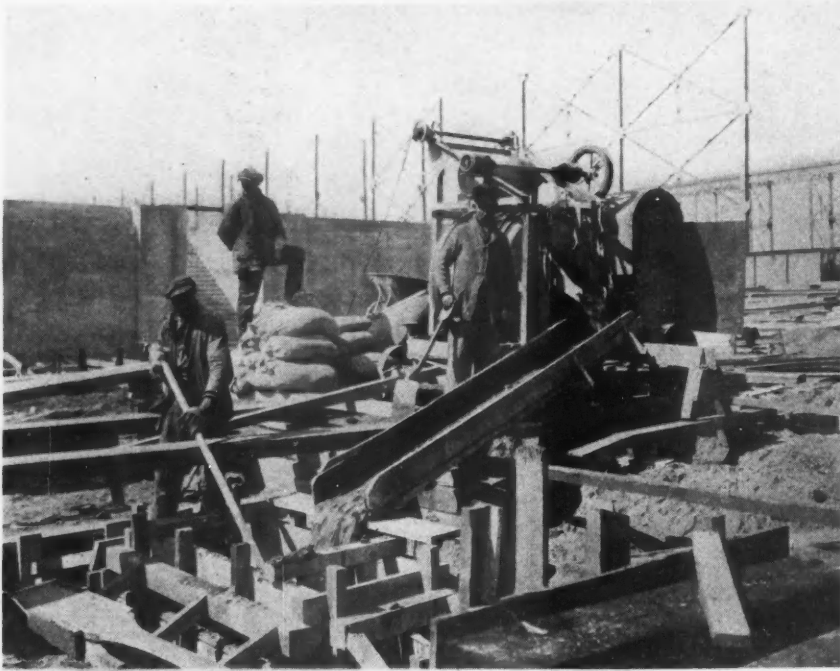
whether or not the owners believed with a majority of the people that prices soon would come down. Prices have not been lowered, and there is no possibility that they will be. But what is most important is that the people of the country now realize this fact and are planning to go ahead with the construction of the buildings that are so urgently needed.

Contractors Preparing for Prosperous Year

To take the fullest advantage of this condition,



15-Horsepower Motor Mounted on a Truck Takes Power Equipment to the Building Job.



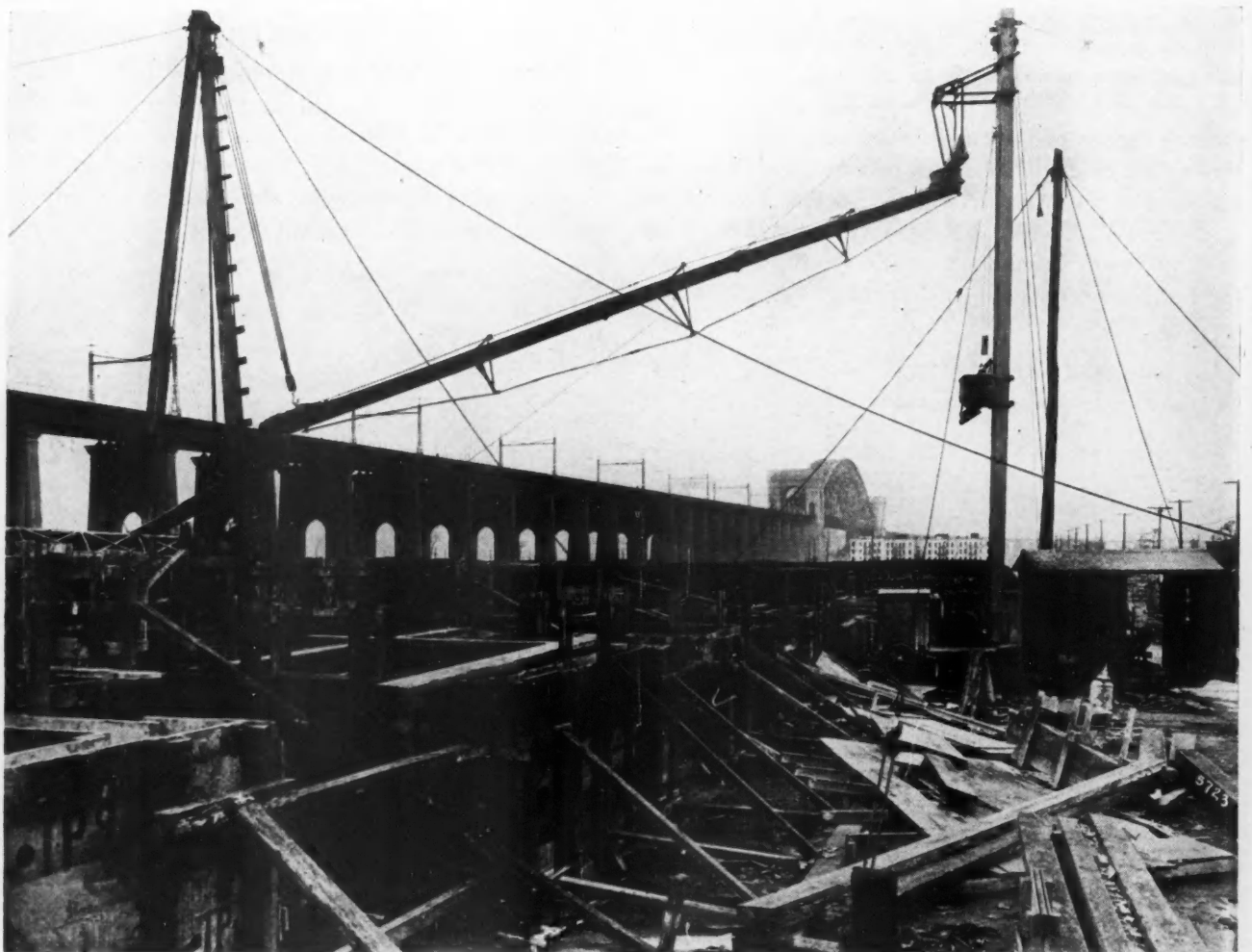
Setting the Mixer So That It Delivers the Mixture into the Forms Is Another Method of Lowering Construction Costs. A Wooden Spout, Set on Saw Horses, Is Shown Here Carrying the Concrete from the Mixer to the Forms.

foresighted contractors are busy now getting ready to do a maximum amount of work this year. Labor is scarce and wages are high. But there is machinery

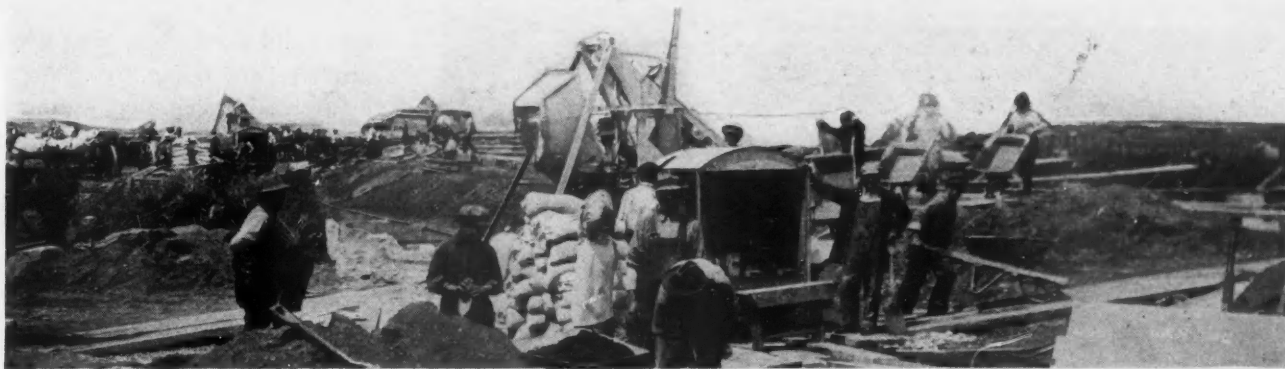
power hoist, except, of course, on small work. Hauling materials, equipment and men to and from the building site is not now done by horses and wagons.

that will replace much labor, and will make those workmen who are available more efficient. Consequently they are getting the equipment they have into shape; are replacing that which has outlived its usefulness, and are buying that which they do not now own and which they will need.

Proper equipment goes far in solving the labor problem. Building contractors in all parts of the country have often stated that a portable saw rig, taken to the building job and set up in a convenient place, saves two or three carpenters. No up-to-date contractor would think of mixing concrete by hand. It is too costly, and besides the mixing seldom is done properly by the hand method. The mixer also saves labor. The hod carrier also has lost his job to the



Mast Bucket Hoist and Concrete Conveyor in Place, Showing How the Materials Are Hoisted, Dumped into the Chute and Carried by Gravity into the Forms. This Is a Comparatively New Method of Handling Concrete But Has Been Found to Be Efficient and Economical



Large Mixers Speed up the Work on Big Construction Projects. They Turn Out Large Quantities of Concrete and Enable the Men to Pour Many Yards During the Day. Where Large Areas of Concrete Are Laid It Is Necessary to Pour It Quickly, and the Large Mixer Enables the Contractor to Do It.

They cost too much, when their expense is compared with that of a motor truck.

Irrespective of the saving of labor that good equipment accomplishes, it has another most valuable mission in this year of record building activity. Equipment speeds up the work and enables the contractor who uses it to take on more work.

Labor-Saving Equipment Earns Profits

This combination of labor-saving and increased business gives equipment double profit-making power. It not only saves building costs, but makes more work possible, thereby greatly increasing the contractor's profits and enabling him to successfully compete for building jobs. He is in a position to do the work at the lowest possible price consistent with good construction.

Undoubtedly one of the most valuable pieces of machinery a contractor can own is a concrete mixer. It was not so many years ago that concrete mixers were of such large capacities and were so costly that only those contractors who specialized in larger construction work could profitably operate them. Manufacturers of mixers, however, quickly met the demand for smaller machines and brought this most valuable piece of equipment within the range of the needs of every contractor. Now there is a mixer for every job, no matter how large or how small. Hundreds of successful contractors got their start in the contracting business with a small mixer, and assert that it is to this machine that they owe the success they have attained.

What is true of the concrete mixer is equally so of the portable saw rig. These machines take to the job the means of performing any and all of the operations that formerly were done in the wood-

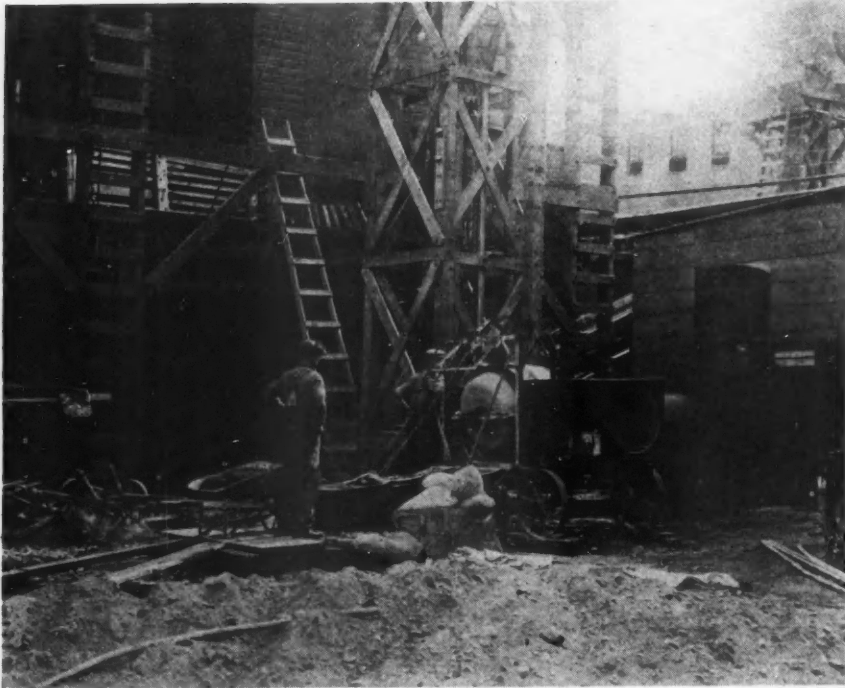
working shop. The saw rig makes it possible to dimension the lumber on the job, rather than in the shop. The rigs are so arranged now that they can be used for cross-cutting and ripping, jointing, tenoning, and the various other cuts that the carpenters require. They save the time of the carpenters and speed up the work with fewer men.

Material Conveyors Speed Up Work

A comparatively new piece of equipment that contractors are using and finding of great value is a mast hoist bucket plant for use on small as well as large jobs. With this plant concrete can be easily and quickly conveyed from the mixer to the forms at all points on the job, without moving the mixer. It saves much labor, and can be erected and dismantled quickly. It is shown in operation in one of the illustrations that



Laying a Concrete Retaining Wall in Advance of the Construction of a Large Building. This Portable Mixer Is Moved Along the Forms and Saves Wheeling.



Here the Power Mixer Is also Operating the Hoisting Drums. It Mixes the Concrete and the Engine Furnishes the Power for the Hoist Elevator, Delivering the Materials to the Upper Floors.

accompany this article.

How contractors use their various pieces of equipment is shown by the other illustrations. Mixers in operation on building jobs; portable saw rigs and woodworkers; mixers that operate material hoists, trench pumps, material handlers, all have proven that they are money-savers and profit-makers on the building job.

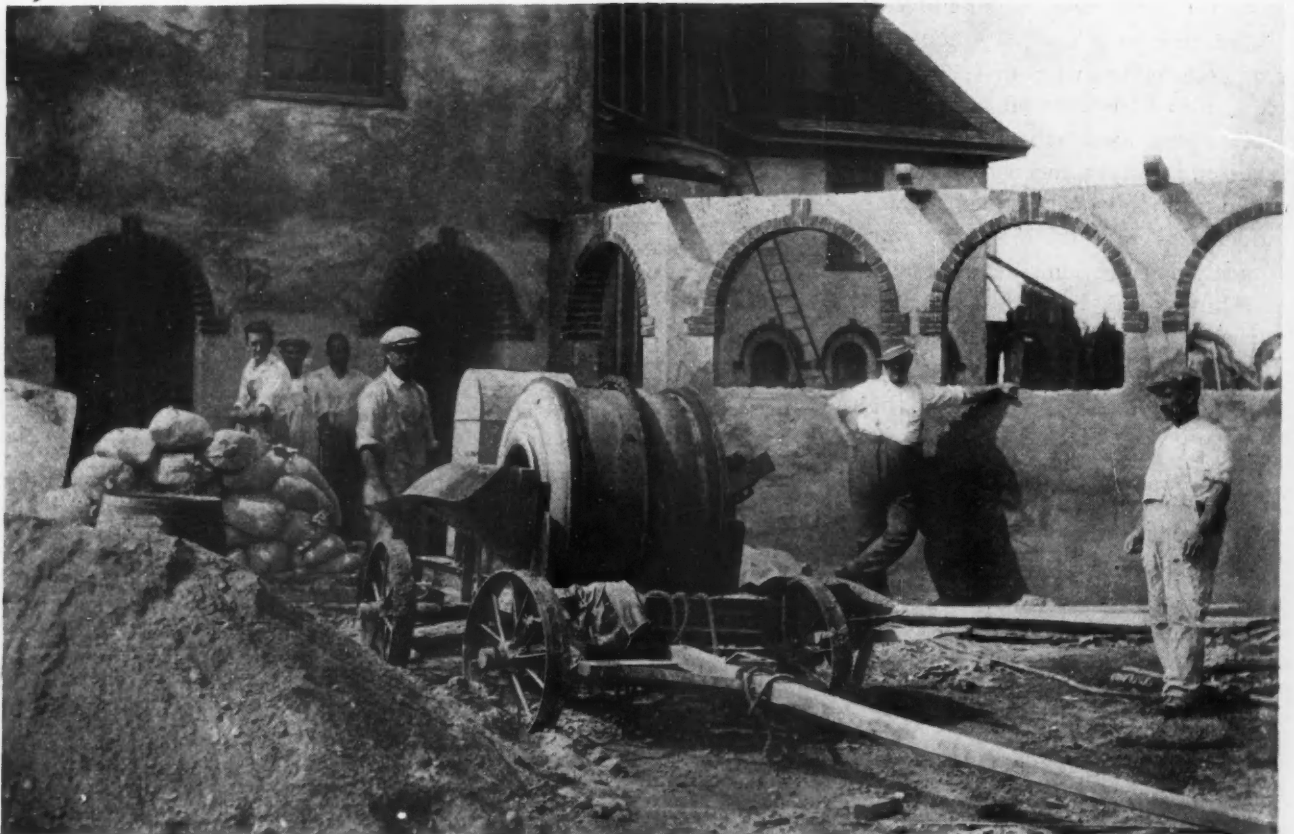
orders in advance—as far as possible in advance—of the time when deliveries are wanted.

This year offers a great opportunity for young and experienced men in the building industry to get into the contracting business. Almost all of the contractors who now are taking large building jobs served their apprenticeship in some one of the building trades and got their experience as journeymen. A majority of

This is the time of the year when contractors are doing two things: They are making up their estimates on proposed building jobs, and are getting in their orders for the materials they will need for the buildings already contracted for. But the forehanded ones also are seeing to it that their equipment is in the proper condition to start on the work as quickly as possible.

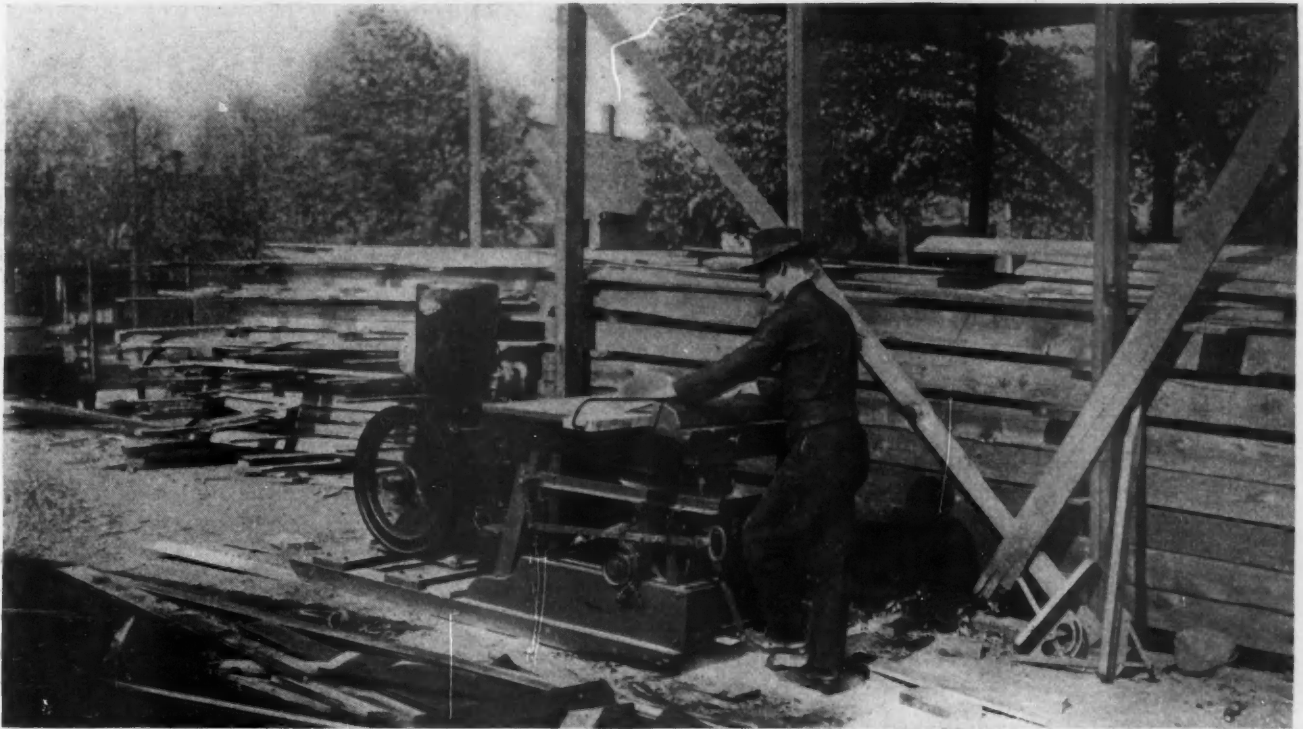
Equipment Manufacturers Prepared for Big Demand

Equipment manufacturers are going to have just as big and prosperous a year as the contractors. They expect that the demand for the equipment they make will be great and have prepared to meet the requirements of the contractors. They will be better able, however, to make deliveries of their equipment on time if they have the



Concrete Mixer at Work During the Construction of an Elaborate Long Island Home. The Picture Shows Part of the Completed Building.

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A Power Cut-Off Saw Is Another Useful Piece of Equipment.

contractors began as carpenters, and thereby gained the knowledge of building methods and the experience that made them capable of figuring estimates and supervising the work on the jobs they secured.

This same career is open to every man in the building industry. He, of course, must have some capital, but his greatest asset in going into the contracting business is a thoro knowledge of building methods. No man can be sure that work is being done right unless he knows how to do it right himself.

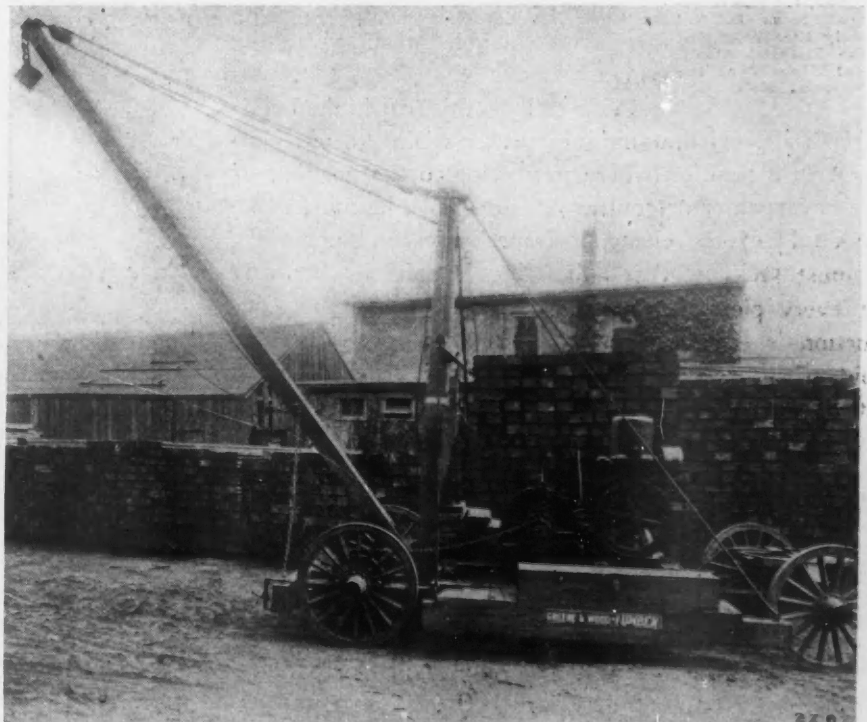
Investigating the modern methods of erecting buildings and doing construction work of all kinds is something that every man in the building industry owes to himself. The various pieces of helpful literature the makers of equipment prepare for contractors and others in the building field are a liberal education in building. They show by text and illustration the methods used by contractors. They are worth securing, and can be had for the asking.

We all want to do our best to meet our country's building needs. Every man connected with the building industry, be he architect, contractor, material dealer, or artisan, knows that the people of the country need homes; that the manufacturers need plants; that business men need buildings in

which to do business, and that there are roads to be built, sidewalks to be laid, and, in fact, there is a great need for all kinds of construction work. If this work is done, or if all that it is possible to do is finished in 1920, contractors must be equipped to do a maximum amount of construction work.



MANUFACTURERS' catalogs contain a great fund of useful information. Ask for them.



Material Dealers Use Portable Boom Derricks to Handle Lumber and Other Materials in the Yard. The Engine and Mast and Boom Are Mounted on a Truck and Can Be Easily Hauled to Any Part of the Yard.

DESIGN OF SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

The Three Simple Stresses

ARTICLE I OF AN INSTRUCTIVE SERIES ON STRENGTH OF MATERIALS AND ENGINEERING DESIGN

THE question "Who won the great world war" is much discussed. Of all the answers given, "It was won by the engineers," seems to come the nearest to the truth. The engineer not only knows how to do things, but he also knows why. He is trained to think. Never was there a time when men needed to think more seriously as to why they do things than the present.

That the young men and women of this day have grasped the situation is proved by the unheard of numbers applying for admission to our colleges and night schools. They realize that we are entering a greater industrial age. If they are to take their proper places in the ranks, they must be trained to think.

Now, everyone cannot go to college, nor are they situated where they can attend night schools. But there are avenues open to ambitious young people whereby they may receive valuable training along many lines.

Especially is this true in the building trade. If the young carpenter wishes to put himself in a position where promotion to the position of boss carpenter or contractor is possible, he must make a study of the element of mechanics and materials. He must know that a building is safe, by knowing that every piece of timber or steel used in its construction is strong enough. By this means he will avoid using members unnecessarily large, thus saving materials, when the world is so much in need of economy and conservation.

True, there are many hand books on the market, which tell the builder what size timbers he probably needs, or which suggest formulas for the determination of such members; but unless one has had training in the manipulation of such formulas, serious mistakes may be made. It is only by much training and experience that a person may be able to figure timbers with a good degree of accuracy.

When a new building is to be constructed, the owner's desires as to comfort, convenience and beauty must be considered. This may call for new designs,

in which case a knowledge of what must be done to secure certain results is absolutely necessary.

The AMERICAN BUILDER proposes to present to its readers a series of articles on the subject of safe construction. If its readers study these articles carefully, and apply the principles to the similar problems in their own experience, they will find the road open for promotion and advancement.

Before one can begin the design of timbers, he must have some knowledge of the kinds of forces with which he must deal, and how such problems are to be handled. This first article will therefore deal with the simple fundamentals of mechanics which apply to the building trade.

The old saying "a chain is no stronger than its weakest link," can be applied to buildings with special emphasis. A building is no stronger than the weakest member used in its construction. In order that the necessary strength of a member may be calculated for safety and economy of materials, one must have some

knowledge of what takes place within the fibres of such a piece of timber or iron when a load is placed on the piece.

The "pull of gravity" or weight of every load placed on a piece of timber, as well as the weight of the member itself tends to pull the member apart, crush it, or to cause particles to slip by each other. Under certain conditions of loading we may have a combination of these actions at the same time.

When a piece of timber is placed with a load on it, or when a force acts on it, the force which this member exerts to resist breaking is called internal stress or simply stress. The simple stresses are called (1) Tension, (2) Compression and (3) Shear.

Let a 4" by 4" timber weighing 20 pounds be suspended from the ceiling at B by a spring balance attached to the ring at A, the center of the upper face. Let a load of 40 lbs. be hung from the lower end at

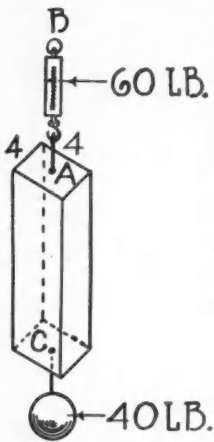


Fig. 1. The Gravity Stress Is Not Only the Weight of the Material Itself, but Also What the Material Holds.

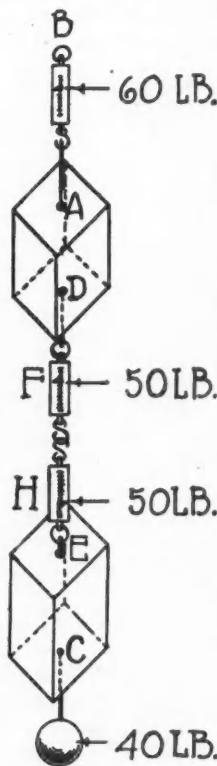


Fig. 2. Spring Balances Recording the Tension at the Middle Section of a Block.

C as in Fig. 1. The spring balance will read 60 lbs. which equals the weight of the bar, 20 lbs., plus the weight of 40 lbs. at the bottom.

Now cut the bar across the center into two equal parts as in Fig. 2, and attach a spring balance F at the center of D of the upper section. Also attach a balance H to the lower half at E. Then fasten the balances

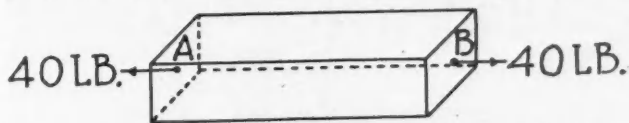


Fig. 3. In a Horizontal Tension Member the Weight of the Beam Is Not Figured.

F and H to each other. Each balance will be found to read 50 lbs. This is true because H lifts half the bar 10 lbs. and the lower weight 40 lbs. The balance at B registers 60 lbs., which is equal to the upper half of the bar 10 lbs. and the pull of the lower spring which is $60 - 10 = 50$ lbs.

Now the action of the spring shows the tendency of the load to pull the bar apart at the center. Before the bar was cut this same tendency or force to pull the member apart was there, and was resisted by the fibres of the material. The bar is said to be in *tension* and the force of 50 lbs. is the *internal stress*. If sections were taken at other points, two equal and opposite forces would be found, which represent the force to be exerted by the fibres at that section.

If the beam were placed horizontally on the floor as in Fig. 3 the weight of the beam that now acts straight down, would not effect the tension due to a pull of 40 lbs. at each end of the bar. Springs placed at any section between A and B would read 40 lbs., showing that the stress on the fibres is 40 lbs.

In Fig. 1, if the lower end of the timber rested on the floor or any other support, and a load of 40 lbs. be placed on top, the tendency of the load would be to crush the fibres of the beam. It is said to be in *compression*. Now place a small platform scale in the section at the middle between the two pieces. The scale will register 50 lbs. But the direction of the forces are opposite to those in Fig. 1, showing that the fibres are acting to resist crushing and are therefore in compression.

In Fig. 4 a type of oblique butt joint is shown. The oblique bar is in compression due to the force P acting on the fibres of any cross-section. The lower member is in tension as it must resist being pulled apart. Now the compression member presses against the face of the cut, A E F D. This force tends to slide the block A E F D—B C H G to the right. The internal resistive force is exerted by the lower face A B C D, where there is a tendency to slide one face over the other much as the two blades of a pair of shears act when cutting cloth. This internal stress is called *shear*.

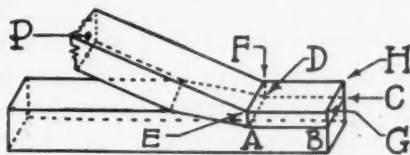


Fig. 4. One Type of Oblique Butt Joint, Showing Area Under Shear.

Two members of a roof truss pinned together as in Fig. 5, tend to slide by each other. They are resisted by the fibre stresses on the section of the pin between the bars. The pin is in shear.

In Fig. 1 the force of 40 lbs. was applied at a point and is called a concentrated load, but the force of 50 lbs. at C which the fibres exert is considered as acting over the entire cross section, and is called a uniformly distributed force.

All internal tension, compression and shear resisting forces are considered uniformly distributed. If then the uniformly distributed force is P lbs., and the area over which it is distributed is A sq. in., the pounds per sq. in. of force, called stress intensity and represented by S is found by the formula.

$$S = \frac{P}{A} \quad (1)$$

For example at C in Fig. 1, $P = 50$ lbs. and $A = 16$ sq. in.

$$S = \frac{50}{16} = 2.125 \text{ lbs. per sq. in.}$$

Suppose that in Fig. 5 the horizontal force exerted by the oblique member on the mortised joint is 1000 lbs. Also that $AB = 6$ in. and $BC = 4$ inches. Then $\text{Area} = 6 \times 4 = 24$ sq. in.

$$S = \frac{1000}{24} = 41 \frac{2}{3} \text{ lbs. per sq. in.}$$

In Fig. 6, take a simple beam resting on two end supports. Let the concentrated load at the center be 10,000 lbs. Now by experience we know that the upward action of each support will be one-half the load, or 5000 lbs. This is a compressive stress. If the support is 6" by 6" the area $A = 36$ sq.in.

$$S = \frac{5000}{36} = 139 \text{ lbs. per sq. in.}$$

This stress of 139 lbs. represents the force exerted by the fibres of the supports to prevent crushing. In Fig. 5, let the force acting in each rafter be 5000 lbs. Suppose the pin is 1 in. in diameter.

Then $A = .7854$ times diameter squared equals .7854 sq. in.

$$S = \frac{5000}{.7854} = 6366 \text{ lbs. per sq. in.}$$

If a load of 1000 lbs. is placed on the end of a short block as in Fig. 7, it tends to crush the block. The fibres of the timber are in compression. The 1000 lbs. must have a certain bearing area, but we represent it as acting at a point. The force is shown as a vertical line, the length of which represents 1000 lbs. The arrow head drawn with the point down, indicates the direction in which the force acts. All the fibres across

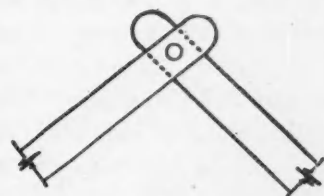


Fig. 5. Type of Rafter Joint with Pin Under Shear.

any section of the block exert forces in the opposite direction, uniformly distributed over the area, and the sum of which is 1000 lbs.

The stress intensity is

$$S = \frac{1000}{16} = 62.5 \text{ lbs. per sq. in.}$$

THE LAW OF MOMENTS

Another very important principle used in designing the members of buildings is the law of moments. As an illustration, suppose a beam 6 feet long, weighing 100 lbs., is placed with its ends on

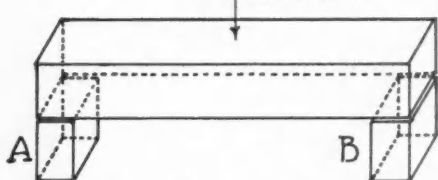


Fig. 6. A Simple Beam with Concentrated Load at Center, Showing Bearing Blocks in Compression.

platform scales A and B, Fig. 8. If the beam is of uniform size and material thruout, its weight may be considered as acting at its center or center of gravity. Now multiply 100 lbs. by its distance 3 ft. from A. The result is 300 foot pounds. This result is called the moment of 100 lbs. about the point A. Also 50 lbs. \times 6 ft. = 300 ft. lbs. Notice that the two moment results are equal.

The moment of a force about a point is the measure of the tendency of a force to produce rotation about the point, and is equal to the force times the perpendicular distance from the point to the force.

In Fig. 8 the 100-lb. force tends to rotate in the direction of the hands of a watch or clockwise, while the 50 lb. force tends to rotate the beam in the opposite or anti-clockwise direction. Since the moments 300 ft. lbs. are equal to each other, they balance and there is no rotation.

We may then state the following rule:

When forces acting on a body do not produce rotation about a point, the sum of the moments of those forces tending to rotate clockwise, equals the sum of the moments of the forces tending to rotate anti-clockwise.

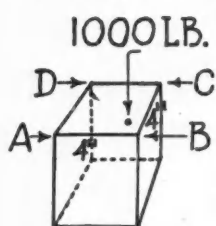


Fig. 7. Illustrating a Block in Compression.

If a load is in the middle of a beam, it is almost self-evident that the end reactions are each one-half of the load and the principle of moments need not be used. However, there are many problems in building where a heavy piece of machinery may not rest on the middle of the beams supporting the floor. In order then that the proper sized beam may be used, the end reactions must be determined by the principle of moments.

Suppose that a rod 6 ft. long is suspended from the wall by two spring balances as in Fig. 9. Now suspend a load of 20 lbs. at B, 4 ft. from A, and 2 ft. from C. The spring balance at A will show an increase of 6 2/3 lbs., and the one at C will show an increase of 13 1/3.

These results may be verified by moments as follows: Taking moments about A

$$20 \text{ lb.} \times 4 \text{ ft.} = 80 \text{ ft. lbs.}$$

$$13\frac{1}{3} \text{ lb.} \times 6 \text{ ft.} = 80 \text{ ft. lbs.}$$

$$\text{or } 80 \text{ ft. lbs.} = 80 \text{ ft. lbs.}$$

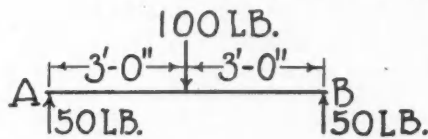


Fig. 8. Showing an Analysis of the Law of Moments: Equal Reactions for a Center Load.

This shows that the tendency of the 20 lbs. to rotate in one direction around the point A is balanced by

the tendency of 13 1/3 lbs. in the opposite direction.

As a further check take moments about C.

$$6\frac{2}{3} \text{ lbs.} \times 6 \text{ ft.} = 2 \times 20 \text{ or } 40 \text{ ft. lbs.} = 40 \text{ ft. lbs.}$$

Also from moments about B.

$$6\frac{2}{3} \times 4 = 13\frac{1}{3} \times 2 \text{ or } 26\frac{2}{3} \text{ ft. lbs.} = 26\frac{2}{3} \text{ ft. lbs.}$$

Now take the case of a beam 20 ft. long supporting a floor with a machine weighing 2000 lbs. placed with its center of gravity 5 ft. from the right end as in Fig. 10. Take moments about the point A.

$$2000 \times 15 = 20 \times C.$$

$$C = \frac{2000 \times 15}{20} = 1500 \text{ lbs.}$$

Since the reactions at C and A together hold up the load 2000 lbs. the reaction at A is 2000 - 1500 = 500 lbs. Or the reaction at A may be found by taking moments about the point C.

$$20 \times A = 2000 \times 5$$

$$A = \frac{2000 \times 5}{20} = 500 \text{ lbs.}$$

Now the reactions at the ends of the beams are also the values of the forces tending to shear off the beam at the side of the support.

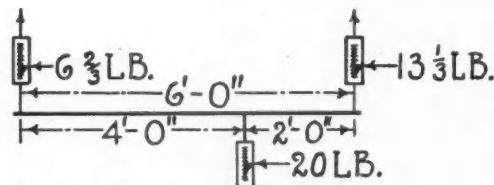


Fig. 9. Spring Balances, Showing Reactions for a Load Not at the Center of the Beam.

The beam must be chosen of large enough cross section to resist this shear. The supports must also be large enough to stand a force in compression equal to the reactions as just determined.

A rule by which the reactions or upward forces exerted by the supports of a beam may be determined is as follows: If several loads are placed on the beam, the reaction of the support at the right end is found by multiplying each load by its distance from the left end, taking the sum of all these products, and dividing the sum by the length of the beam.

The reaction at the left end is found by multiplying each load by its distance from the right end of the beam, and dividing the sum of these moments by the length of the beam.

As a check on the work, the sum of the two reactions must equal the sum of all the loads.

For example take a beam with length and loads as shown in Fig. 11.

Let R_1 and R_2 be the left and right reactions, respectively.

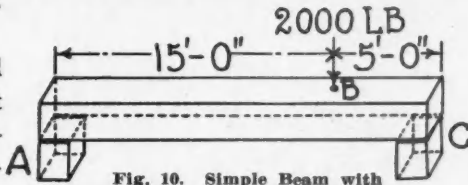


Fig. 10. Simple Beam with Load Not at the Center.

The calculations are tabulated as follows:

$$\begin{aligned} 1000 \times 5 &= 5000 \\ 2000 \times 10 &= 20000 \\ 3000 \times 15 &= 45000 \end{aligned}$$

$$\begin{array}{r} 20 \overline{) 70000} \end{array}$$

$R_2 = 3500$ lb. the value of the right reaction.

$$\begin{aligned} 3000 \times 5 &= 15000 \\ 2000 \times 10 &= 20000 \\ 1000 \times 15 &= 15000 \end{aligned}$$

$$\begin{array}{r} 20 \overline{) 50000} \end{array}$$

$R_1 = 25000$ lb. the value of the left reaction.

$$\begin{aligned} \text{Check. } 3500 \times 2500 &= 1000 \times 2000 \times 3000 \\ 6000 &= 6000 \end{aligned}$$

Thus far no attempt has been made to determine the proper sizes of members against failure from tension, compression or shear.

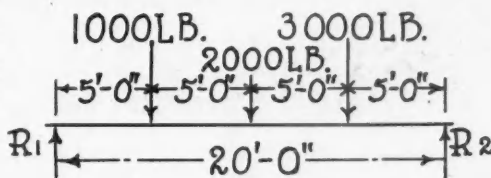


Fig. 11. Simple Beam with Three Concentrated Loads.

The object has been to acquaint the reader with the simplest ideas in regard to forces, how they act, and how they are to be determined. In succeeding articles, the question of safe designing will be considered, by using safe working values for stresses, as determined by experiment and experience.

How to Calculate Stresses on Trusses

CALCULATIONS for the stresses in a truss are always based on the assumption that the loads are transferred to the joints, and that the members are free to move at the joints as if hinged, even altho the actual joint may be made with riveted connections. The loads at the joints are, of course, equal to the reaction of the purline, or of the tie-beams or principals, if these receive the ceiling joists or rafters. When the load on the roof or ceiling is uniformly distributed, as is usually the case, the simplest method of computing the joint loads, is to find the roof or ceiling area contributory to the joint, and multiplying this area by the weight or load per square foot.

As a rule, the area contributory to any joint is equal to the distance half way to the next joint on each side, multiplied by the distance half way to the next truss or wall, on each side.

Estimating Material Quantities

TO cover 100 square yards requires from 1,400 to 1,500 laths, or say 1,450 for an average job, and 10 pounds of 3d nails.

Three-coat plastering on wood laths, plaster-of-paris finish, will require from 8 to 10 bushels of lime, $1\frac{1}{2}$ yards of sand, 2 bushels of hair and 100 pounds of plaster-of-paris per 100 square yards.

If finish coat is omitted, deduct 2 bushels of lime and all of the plaster-of-paris.

If sand-finished, omit the plaster-of-paris and add $\frac{1}{2}$ yard of sand.

Two coats on brick or stone walls (brown coat and finishing coat), will require 6 to 8 bushels of lime, $1\frac{1}{2}$ yards of sand and 100 pounds of plaster-of-paris to 100 square yards.

Suspended Ceilings

OFFICE buildings, apartment houses, etc., having a flat roof, require a ceiling below the roof for appearance in the rooms, and also for heat insulation.

In office buildings the upper ceiling is often framed and constructed similarly to the floors, but with lighter construction. More often the ceiling is suspended from the roof, as this requires much less steel and is consequently much cheaper, while it answers the purpose fully as well, if the roof-beams are efficiently protected.

THE carpenter expects no good luck save as he knocks on wood.

CARPENTERS and cheerfulness usually company together. There are a few grouchy carpenters but their number is decreasing. Soon they will be as extinct as the great auk or dodo, and the terms "cheerfulness" and "carpenter" will be, as the colored brother said: "Anonymous and the same."

“A NAIL in time saves nine.”

“A job in the hand is worth two in the architect's office.”

“Build, not alone for today, but for tomorrow.”

“It is only a dull carpenter who works with dull tools.”

“The expert workman will not ‘Save at the spigot and waste at the bunghole,’ in cutting material.”

“The line between good workmanship and poor is not, like the equator, an imaginary line.”

“The plumber wipes his joints, but the carpenter wipes his forehead instead, and says: ‘Mighty good joint!’”

“The three greatest needs of a good carpenter—a hammer, a saw and a conscience.”

“The architect draws the plans but the ordinary carpenter draws his wages and is content.”

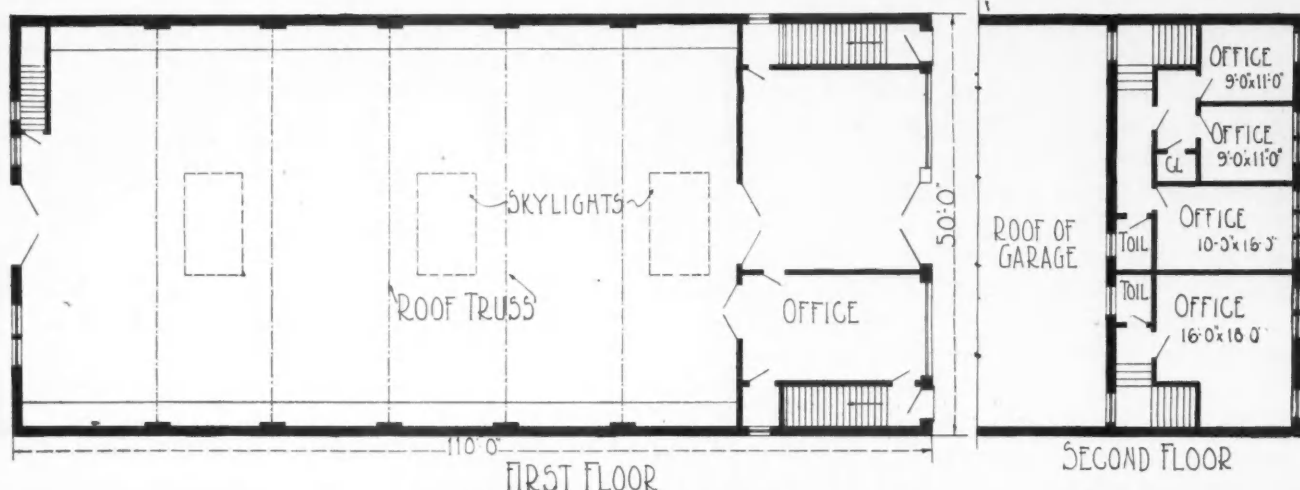


Exterior of Unusually Attractive Public Garage, with Offices at Front of Second Floor. Face Brick and Terra Cotta Beautify the Front.

Public Garage and Office Building of Brick and Terra Cotta

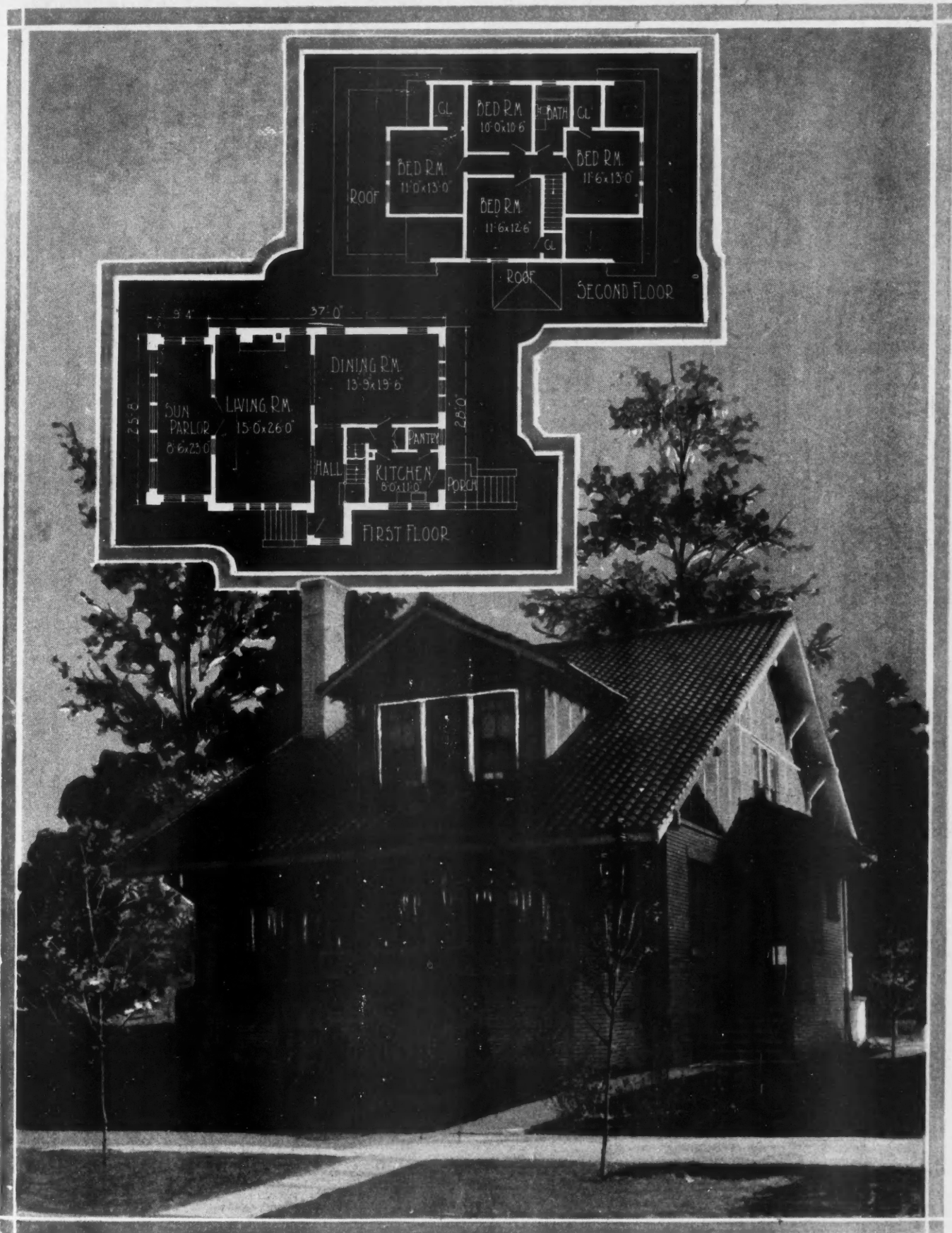
HERE is an extraordinary design for a public garage—one that takes it out of the general run of buildings designed and erected to house automobiles, salesrooms for accessories and automobile repair shops. The exterior view shows how attractive it has been made by the use of face brick and terra cotta, while the floor plans show the layout of the garage and of the offices on the second floor.

The size of the building is 50 by 110 feet. The front of the building is two stories, space for four offices of varying sizes being provided on the second floor. It is of standard brick construction, set on a concrete foundation with a concrete floor. The attractive front is secured with face brick and elaborate terra cotta trim. This is a building that will stand out among the others of its sort and will meet the requirements of the garage owner who wants "class."

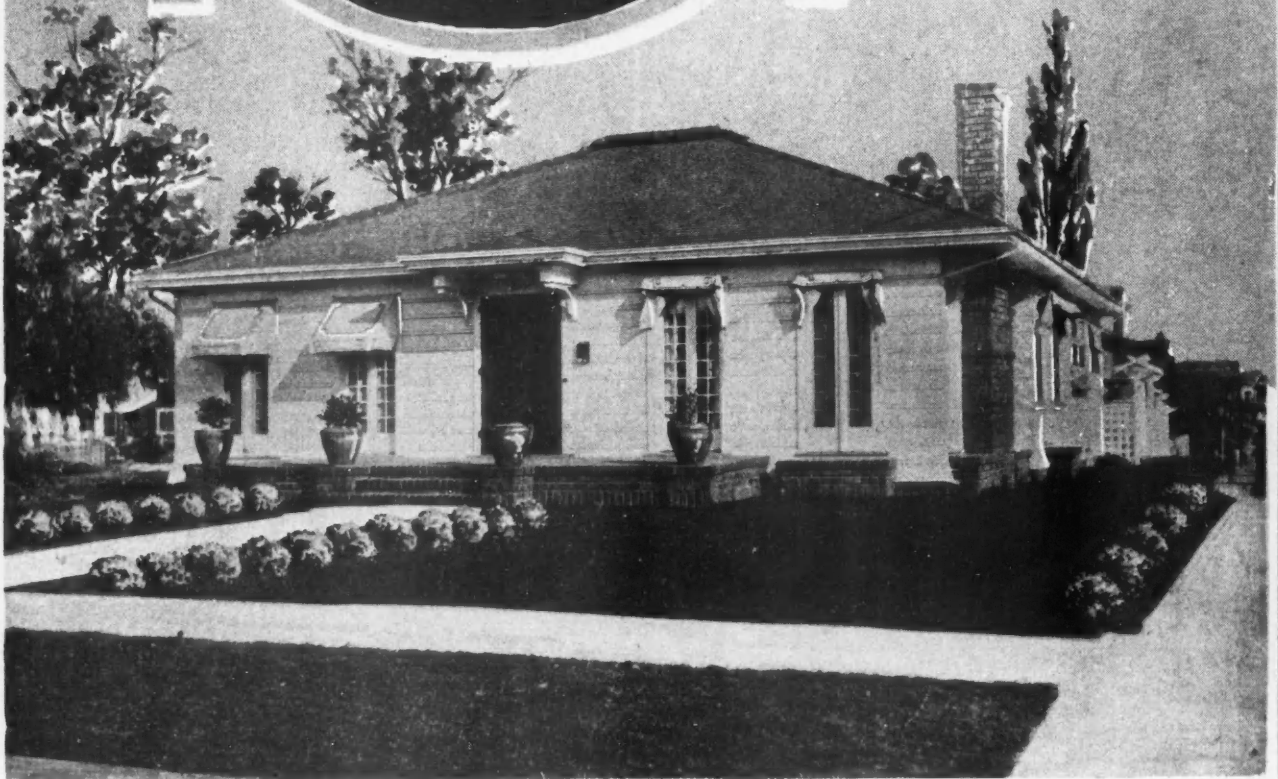
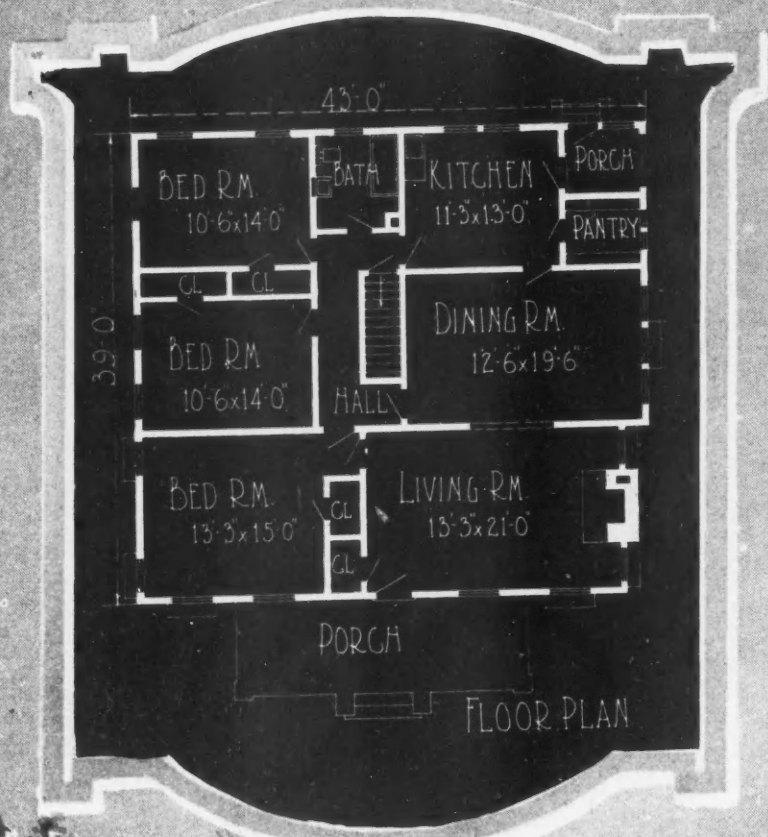


Floor Plans of Public Garage and Office Building.

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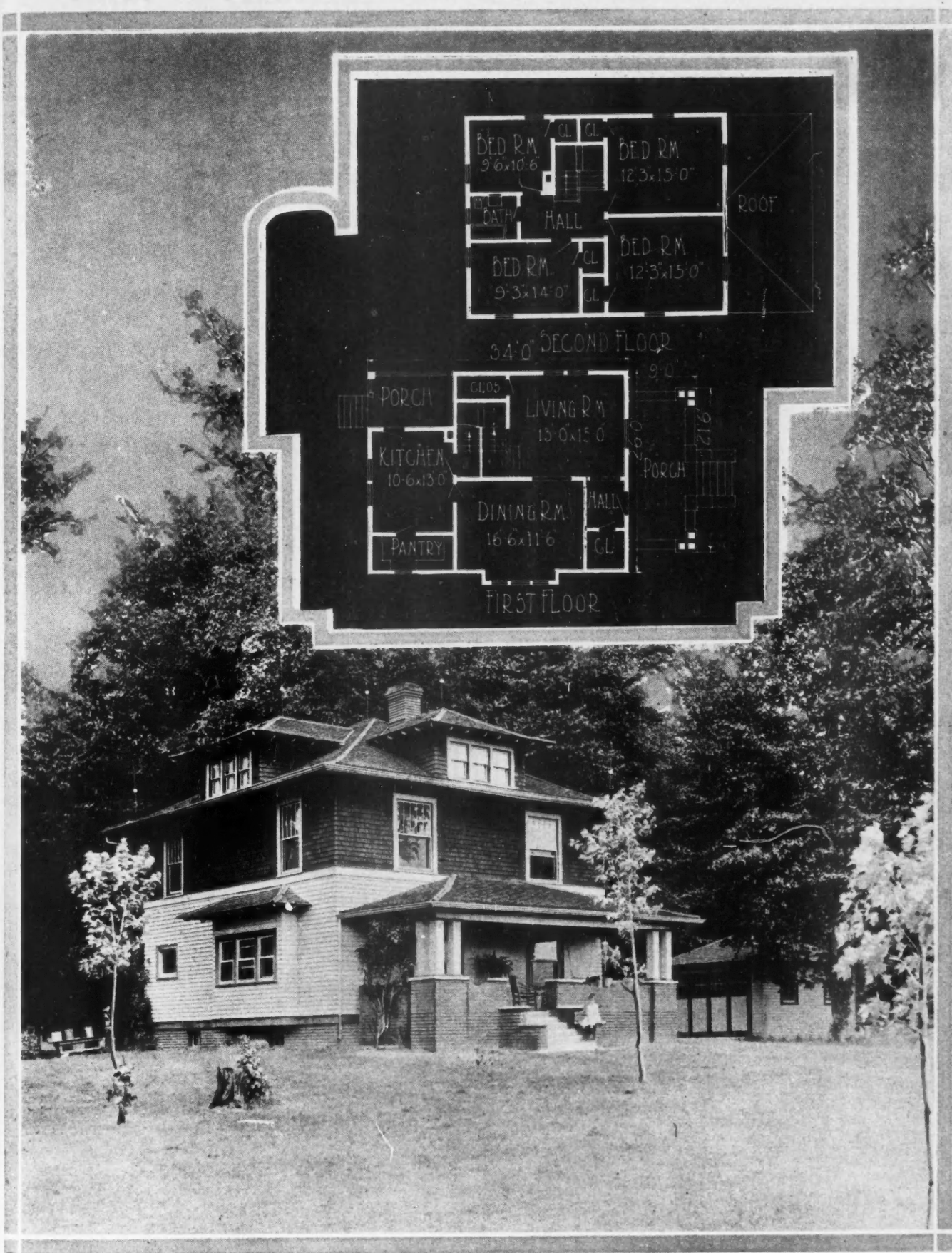


STORY-AND-A-HALF BRICK AND STUCCO HOUSE. The handsome effect that is secured in a story-and-a-half house by the use of a steeply pitched roof and high gables at either side and in the dormer is displayed in this design for a seven-room home. The dimensions of this house are 28 by 37 feet, which makes it equally suitable for city or rural home builders. It is of face brick construction to the second floor sill, and frame with stucco above. The attractive roof is of tile. The living room, 26 by 15 feet, with the large enclosed sun parlor opening off it is a good feature, while the corner dining room is a light, cheerful place. There are four good bedrooms and bath on the second floor.

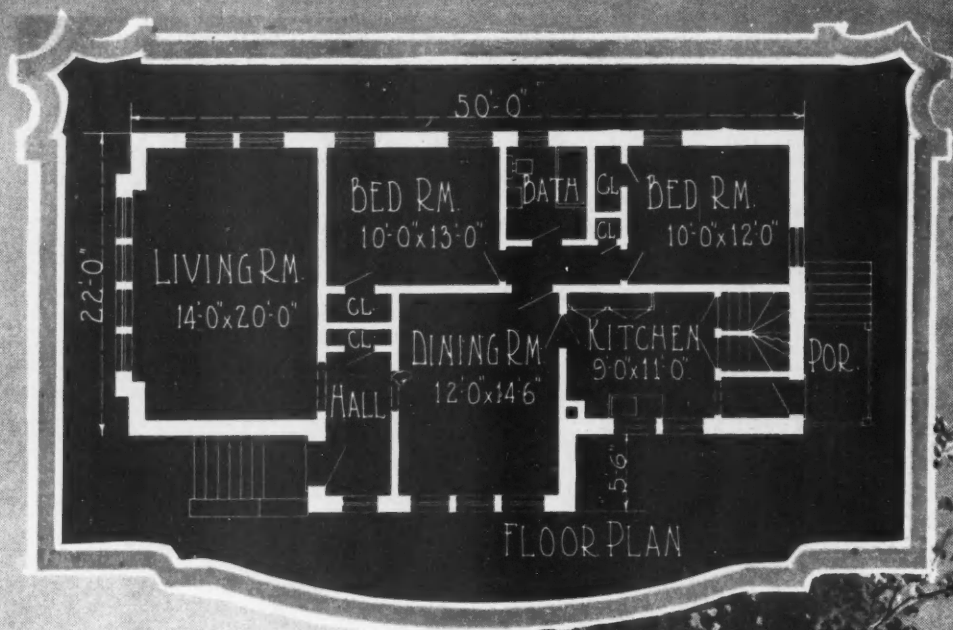


SIX-ROOM, HIP-ROOF, WHITE BUNGALOW. Here is a bungalow that will be just the home for the family of slightly more than the average size. It contains six rooms and bath, three of the rooms being bedrooms. The bungalow has a hint of the Colonial in its exterior appearance and in the interior arrangement. Ranged along one side of the house are living and dining rooms and the kitchen, all of good size. On the other, separated by a hall, are three bedrooms, with the bathroom at the rear. The floor plan shows how conveniently the rooms have been arranged and of what good size they are. The brick terrace at the front adds to the beauty of this bungalow design. The dimensions are 43 by 39 feet.

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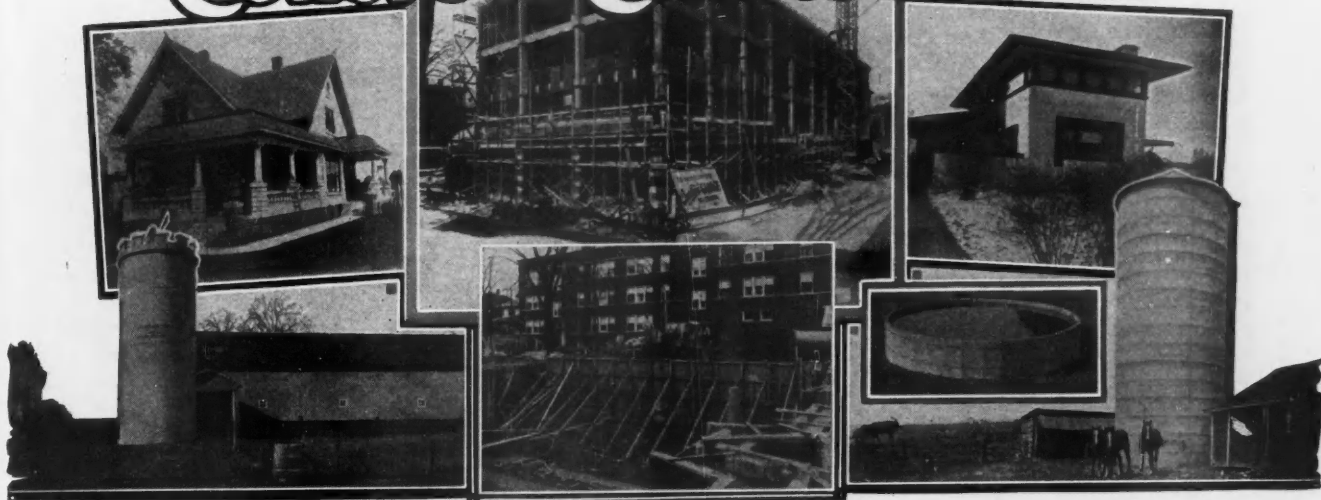


SQUARE, SEVEN-ROOM HOUSE. That a square, economical house can be made most attractive by an ingenious use of materials and exterior trim is shown by this design for a seven-room house. Here plain and shingle siding, hip roofs, attic dormers and exposed roof rafters, with a wide porch have turned what would have been a house of average appearance into a beautiful home. The dimensions of the house are 26 by 34 feet. It is of frame construction, set on a brick foundation. The house contains living and dining rooms and kitchen on the first floor, and four corner bedrooms and bath on the second. Besides there is much space that can be utilized in the attic. This is an exceptionally good, economical home design.



FIVE-ROOM BRICK AND STUCCO HOUSE. Here is a design for a brick and stucco house that is out of the ordinary. The house has the appearance of being much larger than it is, as it has an attic, the ceiling of which is high enough to permit the owner to finish off two or three rooms on the second floor. It is attractive in appearance, made so by the use of face brick and stucco in the gables. The dimensions are 22 by 50 feet. The foundation walls are run high above grade, saving in excavation, and also are veneered with face brick. Five rooms, all of good size and well-arranged, are shown on the floor plan. This design is suitable for both city and rural home builders.

Concrete Construction



Concrete Block Bungalows With Stucco Exterior

QUANTITIES OF MATERIALS AND METHODS FOR THIS TYPE OF CONSTRUCTION

THE house constructed of concrete stucco blocks, with stucco exterior, combines the advantages of the strong, rigid concrete walls with the very pleasing appearance of any one of two dozen or more colors and textures of portland cement stucco. The houses described in this article are part of a recent development at Riverside, Ill., a suburb a few miles west of Chicago, noted for its winding roads and unusually attractive homes.

The problem of the small dwelling house today is to reduce the time and labor of construction, save material and at the same time produce buildings which conform to modern ideas of fireproofness and good appearance. Concrete block and stucco construction offers an attractive solution and, therefore, is becoming very popular.

Figure 1, showing section thru the wall, indi-

cates how the blocks are laid directly on a spread footing (usually 24 inches wide by 12 inches deep for building of the size of the bungalows here described), and continued up at a fairly uniform rate with very little delay or special operations except around doors and windows. The blocks are all made with plain rough surface, without special surfacing, and may be rapidly laid up, as no pointing or finishing is required. The size of the unit, the speed of laying and the uniformity of the operation are factors which have operated to keep costs down. Only two coats, in place of the usual three coats of stucco are required, reducing considerably the labor and material. The uniform surface of the wall make it possible to materially reduce the stucco thickness.

Concrete stucco block form an unusually good base for stucco, presenting a uniformly rough surface



Figure 1. Concrete Block and Stucco Bungalow at Riverside, Ill. The Building Trim Is of Concrete and the Roof of Cement-Asbestos Shingles, the Only Exposed Wood Being in the Window and Door Frames.

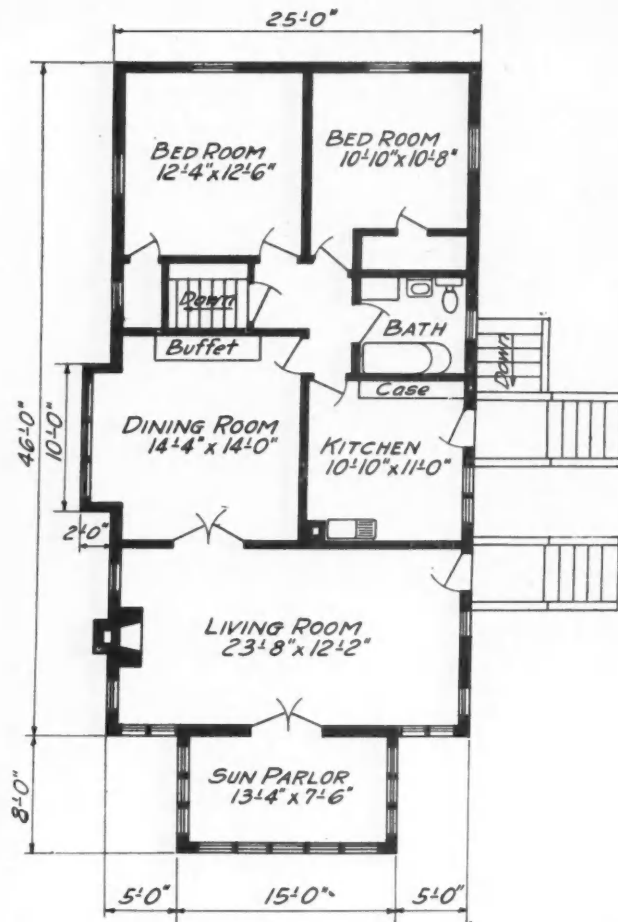


Figure 2. Plan of Bungalow Shown in Figure 1. A very Popular Five-Room Layout Which Has as Much Space as Some Seven-Room Apartments, Yet is so Compact That Steps are Reduced to a Minimum.

which is in a practically true plane. The blocks are equal in absorption, being made of the same concrete mixture. These blocks can only be successfully made in well-equipped concrete products plants under American Concrete Institute specifications approved and enforced by city building inspectors.

An attractive feature of the houses shown is the pre-cast trim including the watertable and sill courses, lintels and other special units. The sill course is given a smooth gray surface, carefully steam-cured and troweled only with wooden tool to prevent crazing. The sill course and other trim protrudes about one inch beyond the surface of the stucco and eliminates the usual wooden trim on stucco surface house, which has to be maintained.

Popular House of Blocks and Stucco

The house shown in Figure 1, and for which plan is shown in Figure 2, represents a popular suburban type. The arrangement of the entries on the sides requires that the house be placed on a lot at least 40 feet in width, and pref-

erably 50 feet. This design is especially good for shallow lots, as any depth over 75 feet will provide the space required. Deeper lots are, of course, preferable in every case.

The walls of this house require 23 courses of 8 by 8 by 24-inch stucco (plain face) block, or about the equivalent of 1900 whole block. There is also about 170 lineal feet of watertable block and about 160 lineal feet of sill course block, capping blocks for the

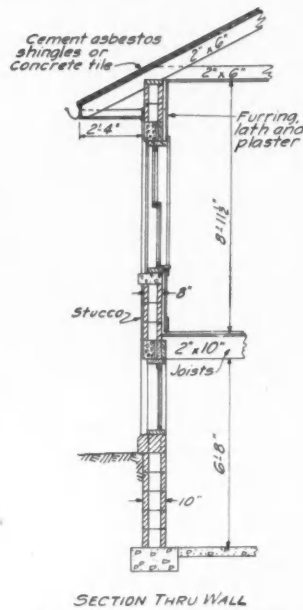


Figure 3. Section Thru Wall of Concrete Block and Stucco House Shown in Figure 1. The Exterior of the Wall Below Grade is Plastered with Portland Cement Mortar or Painted with Hot Pitch.

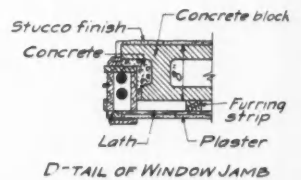
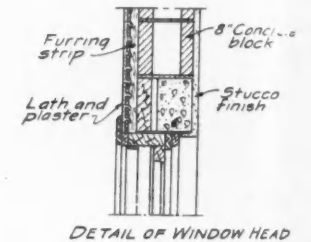


Figure 4. Details of Window Head and Window Jamb, House Shown in Figure 1.

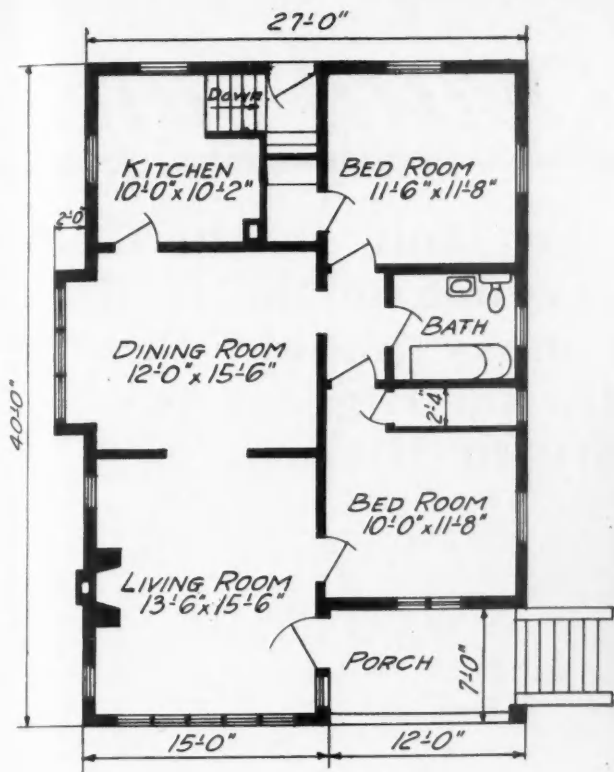
porches and some 30 lintels. The chimney is constructed of wall block with fire tile lining up to the roof line, above which point regulation concrete chimney block are used.

How to Mix and Apply Cement Stucco

The first stucco coat need have an average thickness of about one-fourth inch made of a 1:3 mixture of cement and sand, to which a small amount of hydrated



Figure 5. Laid with 3/8-Inch Mortar Joints, Each 8 by 8 by 24-Inch Block Occupies a space of 1 1/3 Square Feet in the Wall, or the Equivalent of About 12 Brick, Single Thickness or 24 Brick Double Thickness. Joints Do Not Have to Be Tucked or Pointed.



PLAN

Figure 8. Plan of Four-Room Bungalow at Riverside. While the Five-Room Type is Recommended as Preferable, Giving Additional Bed Chamber at Moderate Increase in Cost, the Four-Room House is Identical in Quality with the Larger Structure and May Be Considered Preferable by Those Who Do Not Require More Ample Sleeping Facilities.

lime is added. The function of the lime is simply to make the mixture more workable, and need not exceed three to five pounds per sack of cement. No hair is required nor is it necessary to score the surface of this coat. The surface coat may be applied according to the usual practice.

The roof is of cement-asbestos shingles on wood frame. To make this type of roof fire-repellant, stucco coat on metal lath should be applied under the eaves in such a manner as to entirely cover the wooden framing. Such a roof is practically unburnable so far as fire from without is concerned. Where it is desired to give the roof a heavier appearance, concrete roofing tile may be substituted with only a moderate additional expense.



Figure 6. Applying the Stucco. Portland Cement Stucco, Properly Applied, Becomes Monolithic with the Body of the Wall. Recent Machine Methods of Applying Stucco Greatly Reduce the Cost Per Square Yard of Surface.

The house shown under construction in Figure 7, and for which plan is shown in Figure 8, is constructed along the same general lines, but has sill course and lintel over group windows in sun parlor cast in place.



STUCCO finish should not be applied in cold weather.



Figure 7. View of Partially Completed Concrete Block and Stucco Bungalow at Riverside, Ill. Forms for Monolithic Lintel and Sill Course are Still in Place. Block Walls of This Type Can Be Completed from Footing in About 2½ Working Days.



Fred Beard says:

“This is the Time in the Year When Everyone in the Building Business Should Prepare for the Biggest Activity in History”

“HAPPY NEW YEAR, FRED!”

“Same to you, Sam; with a generous portion of prosperity added,” replied Fred Beard, as he looked up and saw his old friend Sam Williams, the contractor, who had entered the Beard hardware store and walked back to where the proprietor was at work on his books.

“Figuring up the year’s business?” asked Sam.

“Yes,” said Fred Beard, “and I find that it has been a pretty good year. You found it the same, didn’t you, Sam?”

“Well, I don’t keep books the way you do. I know about how I come out by what I have left when the year is over.”

“That’s no way for a business man to do,” admonished Beard. “Keeping books is one of the most important part of any business. Many men have been thrown into bankruptcy because they didn’t keep a strict account of their transactions. They ‘thought’ they were solvent, but when they got right down to brass tacks they found that they were not. And it’s mighty easy to get that way unless you know all the time where you stand.”

“Well, I’m too busy most of the time to bother with books. Besides, I wouldn’t know how to keep them if I wanted to,” replied Sam.

“Better find out before it’s too late,” warned Beard, indicating by his tone that the subject was dismissed.

But the contractor was somewhat nettled by his friend’s abrupt warning.

“How would you begin, Fred?” he queried.

“Well, this being the first of a new year, I would start by finding out just where I stand. I am getting ready now to take an inventory of my stock.”

“But I haven’t any stock; that is, I haven’t much to inventory,” interjected Sam.

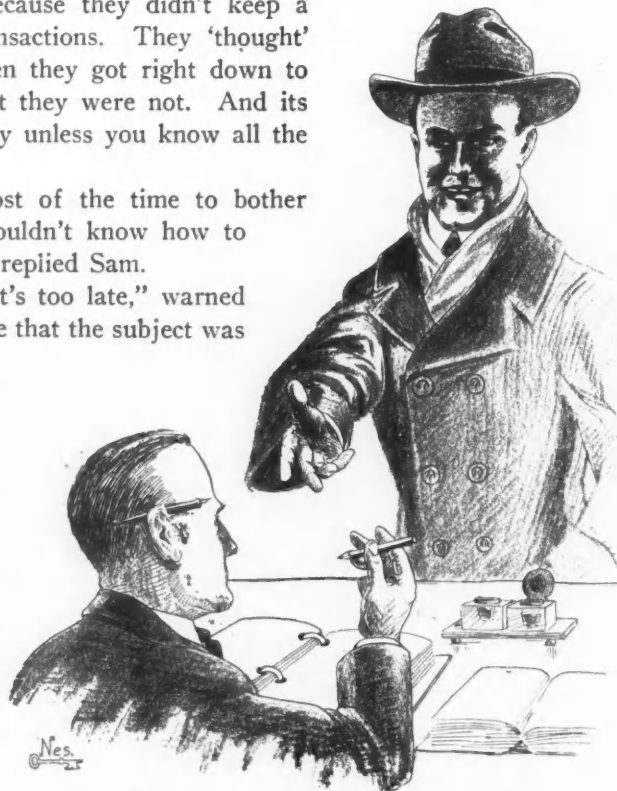
“You haven’t, eh?” said Fred. “I don’t suppose you consider your concrete mixer as anything. That saw rig you take on the job doesn’t amount to anything either, I suppose. How about all that equipment I see you hauling to a building site before you begin work, and during the progress of the job?”

“That isn’t stock, that’s equipment,” returned the contractor.

“Certainly it is, but it all cost you money didn’t it? And it’s all worth money, too, isn’t it? In other words everything that you have and use in your business is an asset; something that you have to have if you are to continue in business. You wouldn’t call my counters, and show cases, and tool rack stock, but they are part of my assets; things that cost me money and are worth money, too. All of them go into my inventory.”

“I hadn’t thought of my equipment in that way,” said Sam.

“Yes, sir,” went on the hardware dealer; “this is the time of the year when I do two things: I find out what I did last year, and from that make my plans for the coming year. By comparing my purchase ledger with my inventory, I know what articles I sold and how many of them. That gives me a basis for my buying. You ought to take more than an inventory, Sam. You ought to go over your equipment carefully and decide now what you need, and then buy it. You want to be prepared to start in as soon as the weather breaks. By buying the equipment you are going to need now, you don’t lose any time, and



“Figuring Up the Year’s Business?” Asked Sam.

can get the most out of this busy year."

"It does look like it was going to be a big year with me. What with all the building that is contemplated, and the contracts I already have signed up, I won't have time to do much of anything but work this coming season," returned Sam. "Ed. Maple, the lumber dealer, also says he is preparing for a record business. He's getting his orders in for stock already."

"That shows that Ed. is alive to his opportunities. It's a wise business man who reaches out and grabs business while it is going, rather than wait for it to fly into his front door. And that's what Ed. is doing. But the point I wanted to impress on you, Sam, is that this is the time in the year when it behooves every man in the building industry to get ready for the most prosperous year in the history of building. The demand for building this season is going to tax the capacity of the contractors to do the work and of the material manufacturers to furnish the materials that the contractors use. The dealer who has the stuff is going to be mighty popular this year; and the contractor who is equipped to do the maximum amount of building is going to be the contractor who will be figuring up his income tax a year from now."

"Things do point that way," said Sam. "I see that the Y. M. C. A. is going to have an 'Own Your Own Home Day' January 20. The secretary was asking me today if I would co-operate with his organization. He wants to make a display at the Y. M. C. A. building, and wanted me to put up some good home building designs."

"You agreed to do it, didn't you, Sam?"

"Sure. I've got that promotion bug you have been circulating around for the last several months. I look at such things in a different light from what I used to."

"That's the ticket. As I have said before, and will keep on saying: we can't overlook a single opportunity to promote building. That's where we get our bread and butter, and a little cake. And if we supply the

fuel for the fire when such organizations as the Y. M. C. A. offer to cook for us, we won't go hungry."



Girder and Column Protection

AS the columns and girders of building form the "back-bone" of the structure, it is of vital importance that they be very thoroly protected from heat. As a rule, the manner of protecting these structural elements depends quite largely upon the floor system adopted. The concrete companies naturally prefer to use concrete wherever possible, and hence where concrete is used for the floor construction it is generally employed for encasing the columns and girders. Where hollow tile is used in the floors, the same material is almost invariably employed for protecting the steel frame.



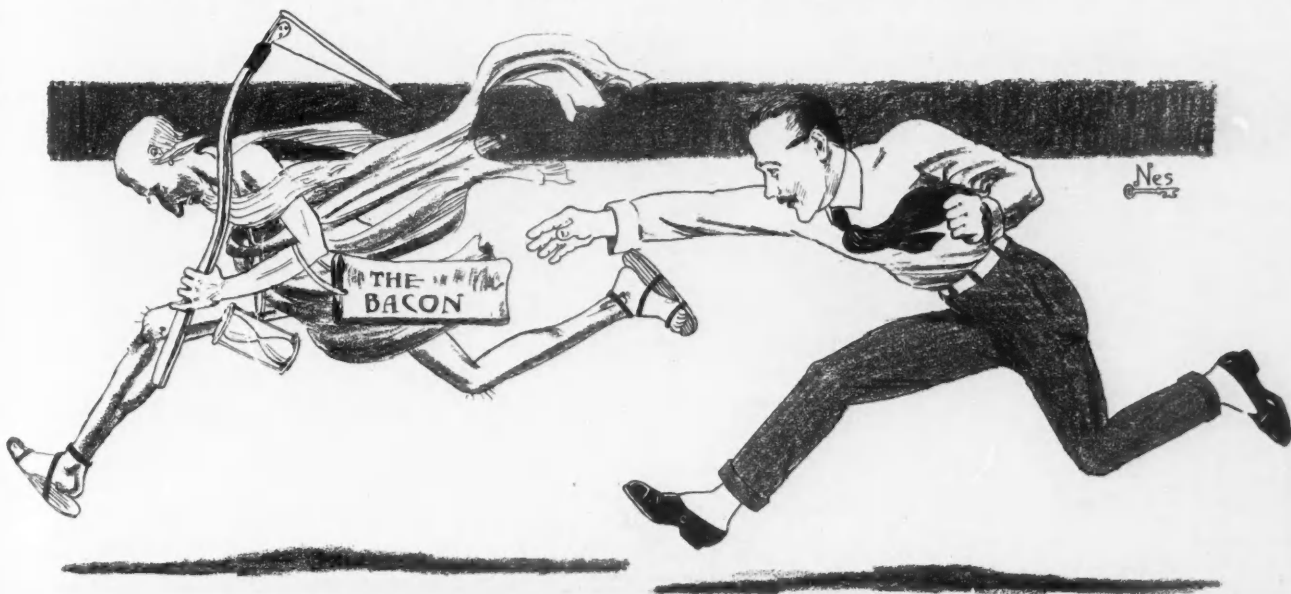
EVERY builder who is a good builder takes pride in the buildings he erects. And the AMERICAN BUILDER takes a satisfaction in reproducing photographs of such buildings, for the reason they pass good building ideas along. When you have finished a building of which you are proud, send in a photograph of it and a pencil sketch of the floor plans. Both will appear in an early issue of the "World's greatest building paper."



GOOD times are upon us, and prosperity with its "open sesame," when the music of the saw and the hammer are heard in the land; but when the music of the carpenter is hushed the streams of prosperity dry up, and men say, "Hard times."



PARTITIONS of stone concrete are seldom used because of the necessity of forms in their erection, making a comparatively expensive partition. Unless reinforced they take up too much room. The practical concrete partition is cement stucco on metal lath.



"It's a Wise Business Man who Reaches Out and Grabs Business When It Is Going," Said Fred Beard.

The Future for Aircraft Buildings

MAJOR REED G. LANDIS FURNISHES AMERICAN BUILDER WITH DESIGNS OF STRUCTURES TO HOUSE AEROPLANES AND AIRSHIPS, WHICH, HE SAYS, WILL BE NEEDED EVERYWHERE—THE BUILDINGS REQUIRED

THE recent transcontinental air race demonstrated, officers of the U. S. Air Service assert, the need of airdromes placed short distances apart over the country.

The officers who made this statement were looking into the near future. They can see the time when not only mail, but express matter and passengers will be carried by the airplane and airship.

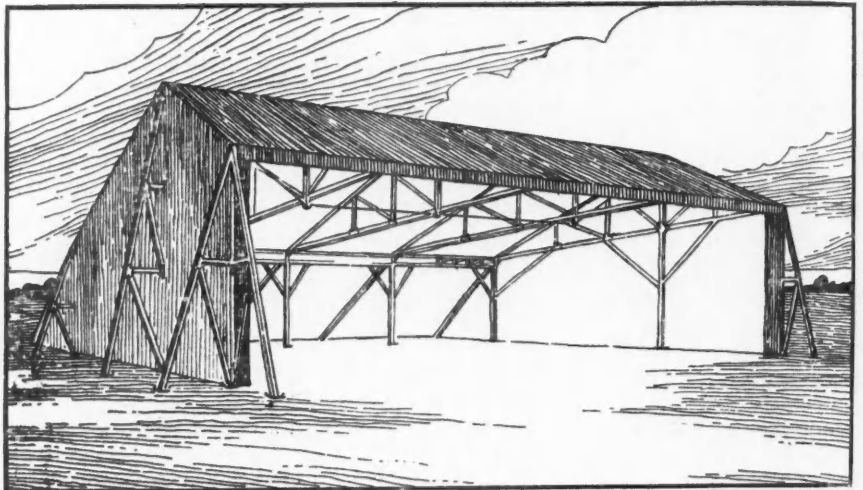
Recently, no less an authority on aeronautics than Major Reed G. Landis, formerly of the U. S. Air Service and one of the American "aces" and now vice-president of the Interallied Aircraft Corporation, New York City, said:

"I am of the opinion that there will be considerable demand for houses for aircraft. There also should be a demand for single machine hangars, houses that will accommodate one machine, with a spread of approximately 50 ft. and depth of 40 ft., and 10 ft. high."

Major Landis suggests that the building industry make a study of the buildings aircraft will need and has furnished the AMERICAN BUILDER with designs of the buildings and the layout for an air station. They are semi-portable buildings, designed especially for the

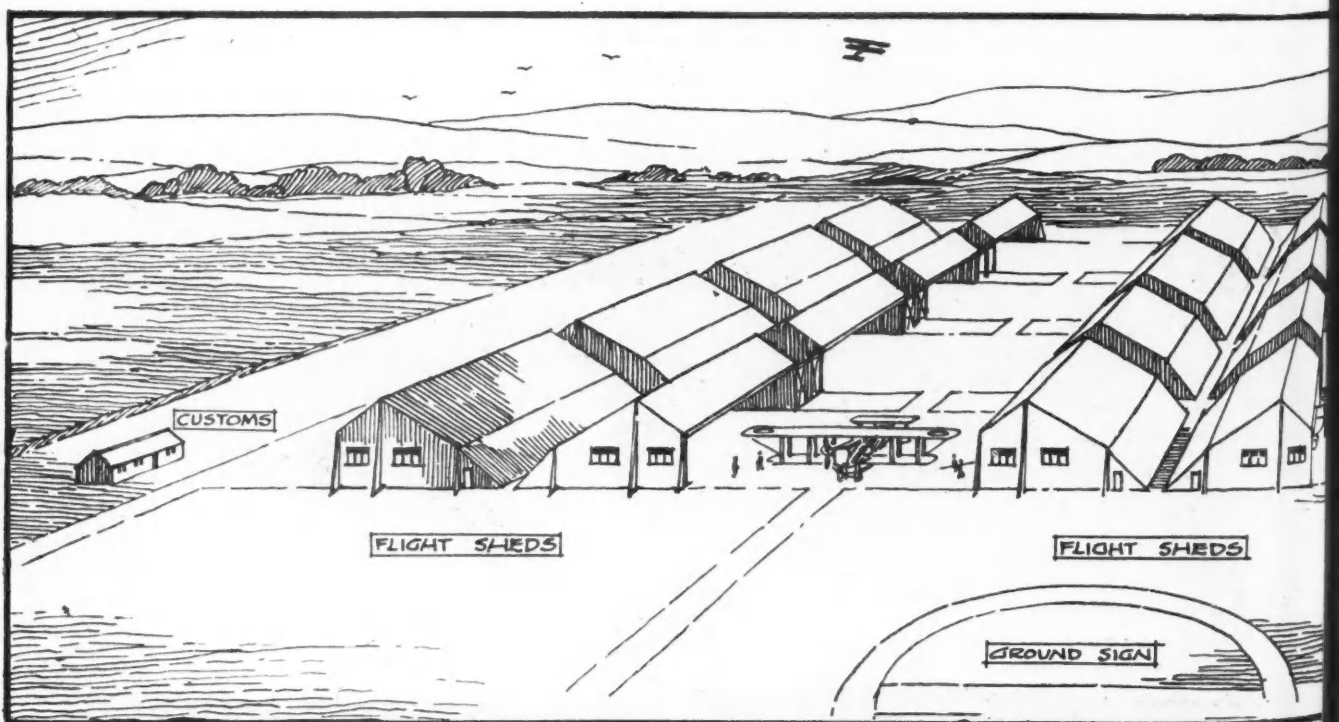
different types of machines—the single-seated airplanes, the larger airplanes, and the airship.

So that the readers of the AMERICAN BUILDER may have an idea of the design and construction of these buildings, drawings showing them, and the manner of laying out an airdrome and the location and types of



This Hangar Is Built up of Wood and Metal Parts, and Is Lighter and More Economical in Material Than Any Other Hanger Made. It Has a Clear Floor Area of 72 Feet by 40 Feet. Height at Front 14 Feet, 4 Inches, and at Back 8 Feet, 4 Inches. There Is an Additional Floor Space at Rear 72 Feet by 8 Feet, Available for Use as Store or Workshop. The Covering May Be of Canvas, with Sliding Curtains to the Opening, or, if the Structure Is to Be of a Permanent Nature, of Asbestos Sheetting with Sliding Doors.

buildings needed are herewith reproduced. These buildings are of English design, but were the types used by all of the Allied armies, the American included.



This Scheme Shows the Arrangement for an Air Station Adjoining an Aerodrome, Providing Accommodations for Twenty-Hotel, and

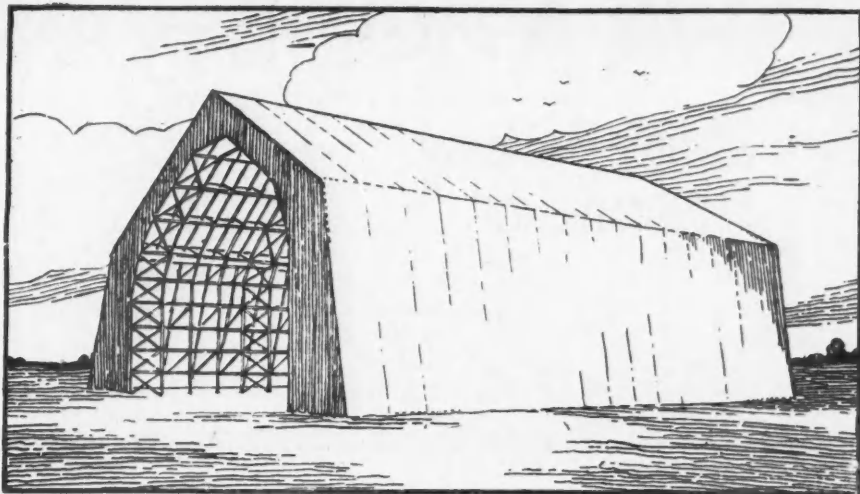
Hangars Simple in Construction

Aircraft hangars are of simple construction, much similar to the frame and truss supported roof methods used in barn construction. The framework of the hangars shown is of wood or steel, but each section is limited in size so that it may be taken down and moved readily. The temporary structures are covered with canvas; the more permanent hangars are covered with corrugated iron, weather boards or asbestos sheeting. The openings of the temporary structures are fitted with canvas curtains, hung so that they will slide easily; sliding and folding doors close the openings of the more permanent buildings.

During the "salvage" period last spring and summer, the English government sold many hundreds of aircraft that were in Canada to individuals and organizations thruout the United States. In many of the smaller cities, business men clubbed together and purchased machines for exhibition purposes. Pilots were and are numerous, many thousands of young men having been trained to fly at the army flying fields in this country.

Building houses, or hangars, for these machines undoubtedly furnished a problem to many local builders. But American ingenuity and American adaptability both were brought into play and in hundreds of cities will be found weather-proof and fire-resistant aircraft hangars.

It is of the future, however, that those interested in

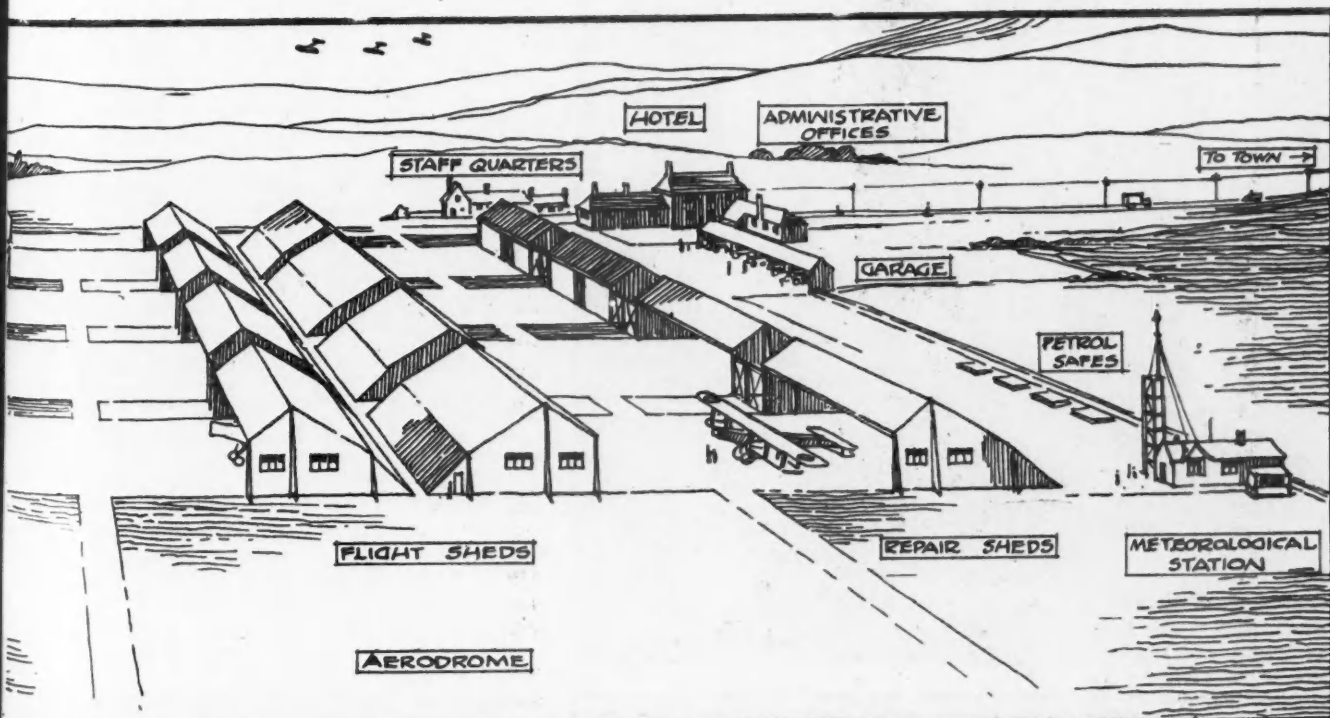


This Building Is Constructed of Wood and Metal Parts. It Has a Clear Floor Space of 176 Feet by 50 Feet. An Internal Central Height of 56 Feet Is Provided.

aircraft are thinking, when they talk about the need of airdromes. These men know the capabilities of aircraft and are convinced that it will be only a short time before much of the country's transportation will be accomplished thru the air. The development of the airplane and the airship will bring need of buildings of a new type. Undoubtedly, great improvement will be made in the present-day designs, but those shown here satisfied the needs of the machines during the war, and thousands like them undoubtedly will be built in the United States during the next few years.



PHOTOGRAPHS of good farm buildings always are interesting. If you have erected a barn, a corn crib, a hog house or a farm home during the last season, send a photograph of it, and the floor plans, if possible, to the Correspondence department. It will appear in an early issue.



Four Large Planes, with Four Repairing Hangars, Workshops, Stores, Meteorological Station, Passengers' and Pilots' Rooms, General Offices.

OWN A HOME-SAVINGS CLUB

Home Building
Remodeling

Modern
Improvements



"I Live in My Own Home"

MEMBERS OF THE "OWN A HOME SAVINGS CLUBS" ARE ON THE ROAD TO BECOMING IDENTIFIED WITH THE BETTER CLASS OF AMERICAN CITIZENS

HUNDREDS of thousands of Americans during the last month have discovered how easy it is to accumulate a considerable sum of money by consistent saving. These thousands were members of the Christmas Savings Clubs, conducted by banks in every city and town

of the country. They started a year ago to deposit a small sum each week. At Christmas they reaped the reward of their perseverance.

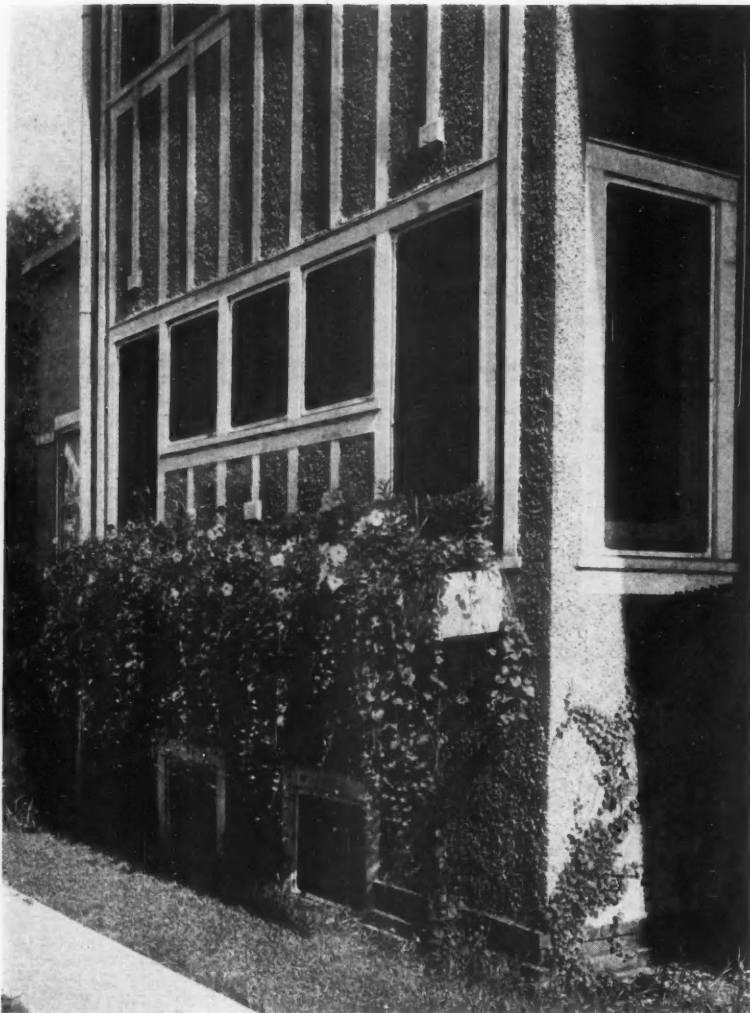
They succeeded because they HAD AN INCENTIVE TO SAVE.

That is exactly what an "Own a Home Savings Club" does for its members—it gives them AN INCENTIVE TO SAVE. And the incentive back of "Own Your Home Savings Clubs" is a great deal stronger than that back of the Christmas Savings Club. Owning a home pays larger dividends than any other investment. It brings happiness to the man and his family; it increases their self-respect; it places the members of the family among the substantial, worth-while people of the community in which they live; and, greatest of all, home owning inspires in his business associates a confidence that brings greater prosperity.

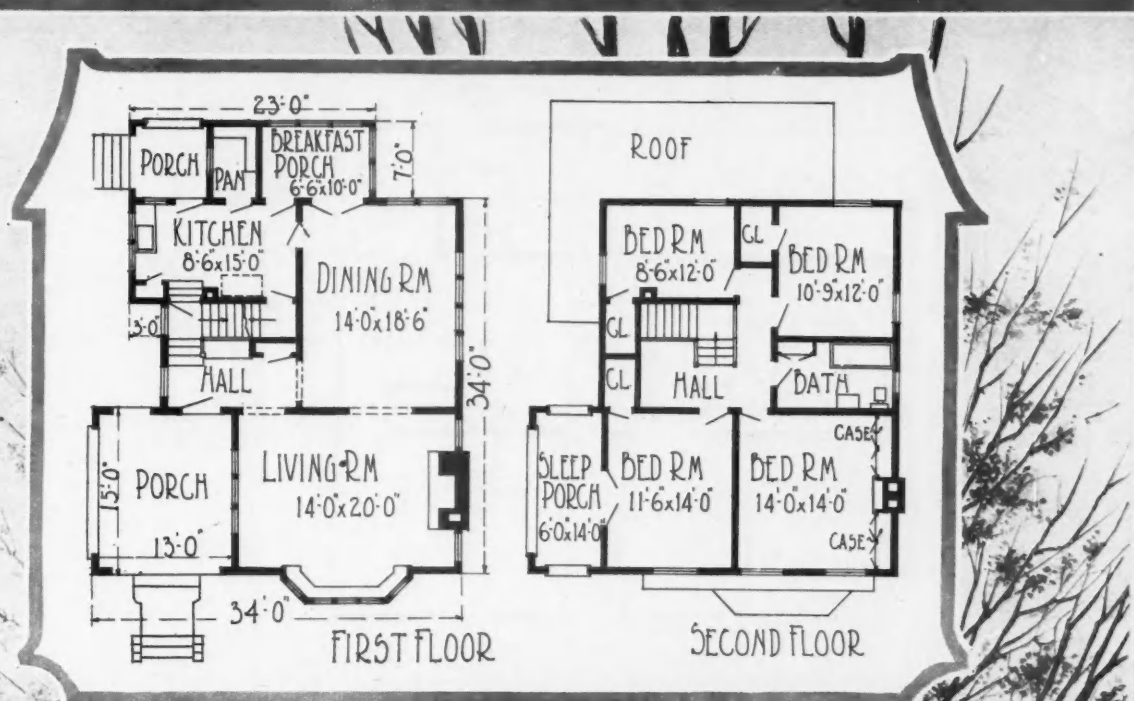
It has now been several months since the AMERICAN BUILDER launched its "Own a Home Savings Club" plan. The idea took immediate hold on the members of the building industry and on the bankers to whom the subject was broached. Aside from the fact that there is a great need for home building, these clubs have paved the way for greater business for builders and larger and more numerous savings depositors for the bankers.

There is nothing intricate about an "Own a Home Savings Club." The bank puts the idea of laying aside a certain sum each payday for a home before the people of the community. The business men of that community help create enthusiasm for the plan. Once started, the Club advertises itself, thru its members, and its success is assured.

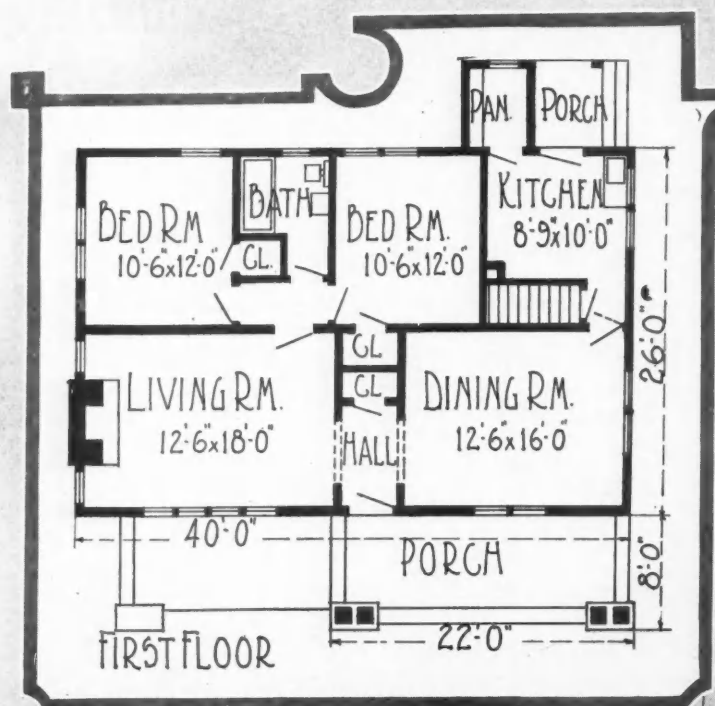
Have you started an "Own a Home Savings Club" in your community?



Homes Occupied by the Owners Usually Are More Attractive Than Those Which Are Rented. The Home Owner Adds Pretty Touches, Such as a Window Box, Because He Takes a Justifiable Pride in Making His "Own Home" Beautiful.

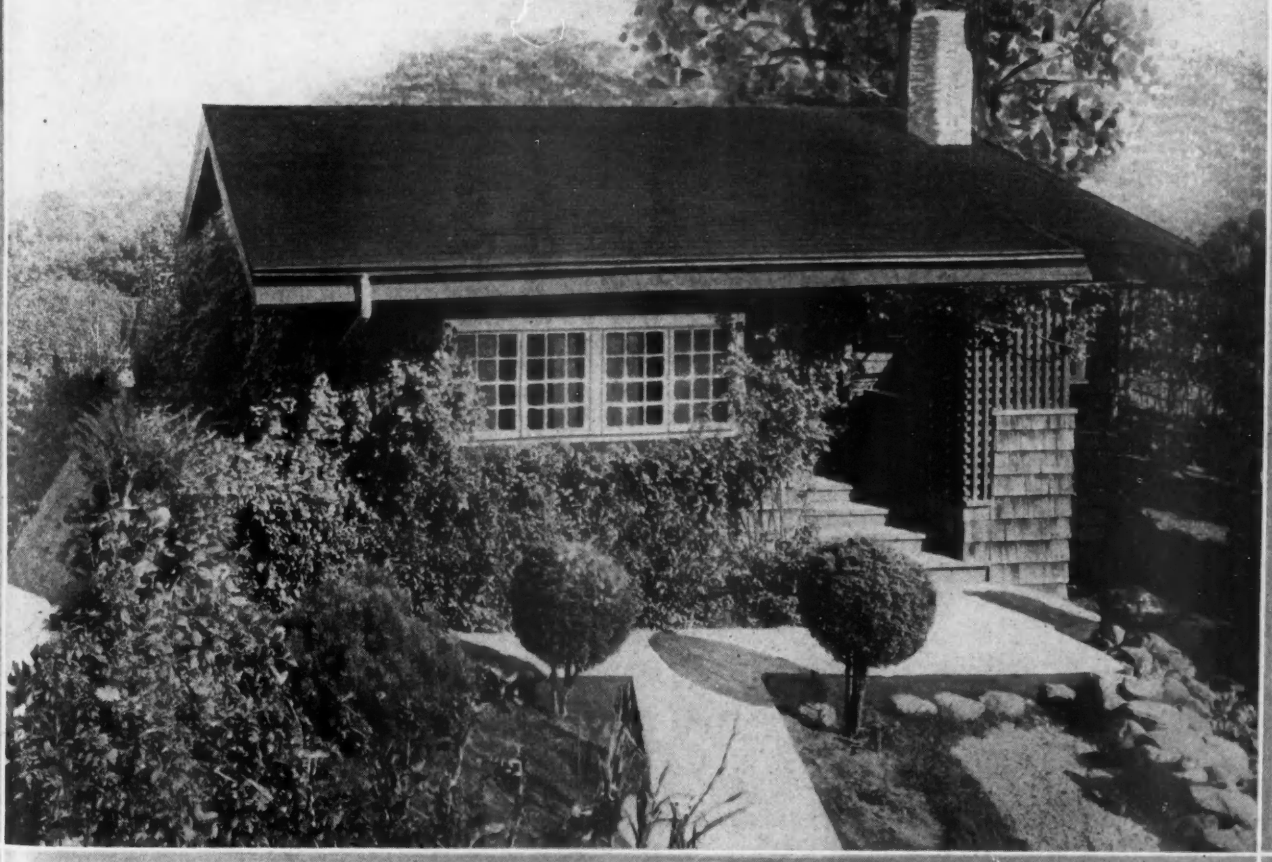
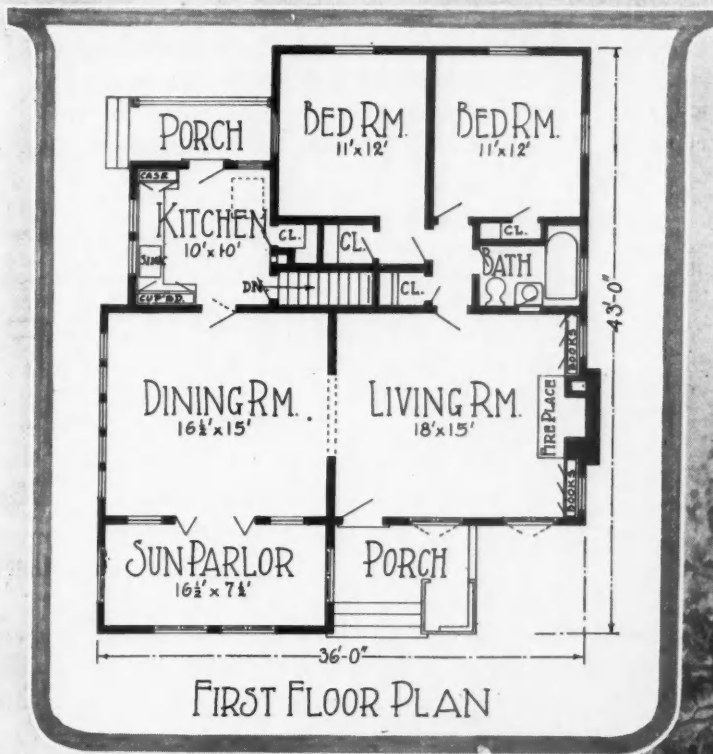


MODERN STUCCO HOUSE OF SEVEN ROOMS. This design for a stucco house contains the good features that are found in most modern homes. The broad entrance porch, with the enclosed sleeping porch above it, makes this a most distinctive home. The dimensions of the house are 34 by 34 feet. Large living and dining rooms and the kitchen are on the first floor, and four bedrooms, bath and sleeping porch on the second. At the rear of the first floor is a projection 7 by 23 feet, containing a breakfast porch, 6 feet 6 inches by 10 feet, the pantry and rear porch. All of the rooms are of good size and conveniently arranged. This is an excellent home building design for either the city or rural builder.



FIVE-ROOM BUNGALOW COTTAGE. For the suburban or rural home builder this five-room frame cottage of the bungalow type is a good design. Its exterior is attractive and its interior convenient and comfortable, while it is an economical home to build. It is 40 feet wide and 26 feet deep, of frame construction on a concrete foundation. Living and dining rooms are at the front, divided by an entrance hall, which is entered at one end of the porch. At the rear of the dining room is the kitchen, while back of the living room are two bedrooms, with the bathroom between them. All of the rooms are of good size. The pitch of the roof permits plenty of attic space, while under the house is a full basement.

A
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AN ARTISTIC FIVE-ROOM BUNGALOW. Gardening enthusiasts will appreciate this design for a 5-room shingled bungalow as it lends itself to a setting among flowers, shrubs and trees, something that all homes, whether they be bungalows or other types of houses, do not do. The bungalow shown is 36 by 43 feet, of frame construction, with wide shingle siding. The living and dining rooms are across the front of the house, the kitchen in the rear of the dining room and the two bedrooms and bath back of the living room. A good-sized sun parlor opening out of the dining room at the front is a feature of this design. All of the rooms are of good size and are compactly arranged.

Design for a Seven-room Brick House

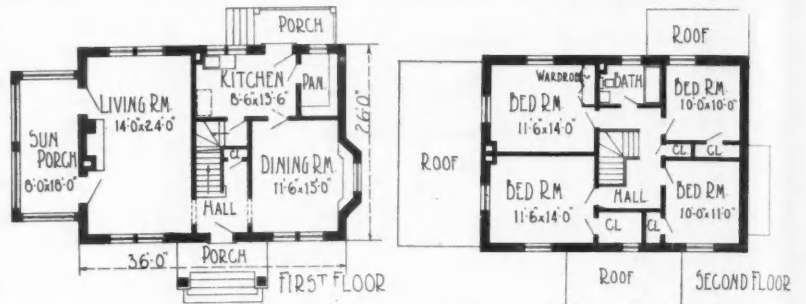
COLONIAL DESIGN, WITH ENCLOSED SUN PARLOR, PROVIDES COMFORTABLE HOME

BRICK houses, especially those of a size suitable for the average family of moderate means, always are in demand. Brick make a home of fine, substantial appearance and, it is claimed, are most economical from the standpoint of upkeep and operation. Certainly it is a well-recognized fact that they are warm in winter and require less fuel to heat, and are cool in summer.

The design shown here is of the Colonial type, 26 by 36 feet in dimensions, and contains seven good rooms—three on the first floor and four on the second. Its exterior appearance is good, having the balance of the Colonial and the attractive pillared porch, and an enclosed sun parlor of large size.

The interior arrangement on both floors is excellent. A hall, out of which run the stairs, separates the living and dining rooms. The former is large, 14 by 24 feet, and has the fireplace set in the center of the front wall, with the entrance doors to the living porch, 16 by 8 feet, on either side. This arrangement makes a most

cheerful and comfortable lounging place for the family. On the other side of the hall is the dining room, also a cheerful place with its double windows at the front and a bay at the side. At the rear of the dining room is the kitchen. The four bedrooms on the second floor



Floor Plans of Seven-Room Brick House.

all are corner rooms, with the bath located convenient to each of them. A full basement extends under the house.

This design will provide a comfortable, convenient and attractive home—one that has an air of substantiality—and will appeal to prospective home builders, of whom there is a legion this year.



An Unusually Good Brick House Design, Size 26 by 36 Feet. The House Contains Seven Large Rooms Besides the Enclosed Sun Porch, and Has Many Attractive and Convenient Features.

DETAIL OF ROOF MOLDING
SCALE $\frac{3}{4}$ IN. EQUALS 1 FT.

DETAIL AT TOP OF ENTRANCE
SCALE $\frac{1}{2}$ IN. EQUALS 1 FT.

DETAIL AT BASE OF POST
SCALE $\frac{3}{4}$ IN. EQUALS 1 FT.

DETAIL OF BRACKET
SCALE $\frac{3}{4}$ IN. EQUALS 1 FT.

SECTION
SCALE $\frac{3}{16}$ IN. EQUALS 1 FT.

ELEVATION
SCALE $\frac{3}{8}$ IN. EQUALS 1 FT.

SIDE ELEVATION
SCALE $\frac{3}{16}$ IN. EQUALS 1 FT.

PLAN
SCALE $\frac{3}{8}$ IN. EQUALS 1 FT.

SHEATHING 6'-4" 3" 4'-3" 6" 8" 4" 1'-2 1/2" 5'-4" 6'-7" 1'-8" 6" 8" 6" 8" 6" 8" 7'-9" 8"

TIMBER ENTRANCE FOR A BRICK HOUSE

Architectural Details Drawn by S. Chester Danforth, Architectural Draftsman.

Story-and-a-Half Stucco and Shingle House

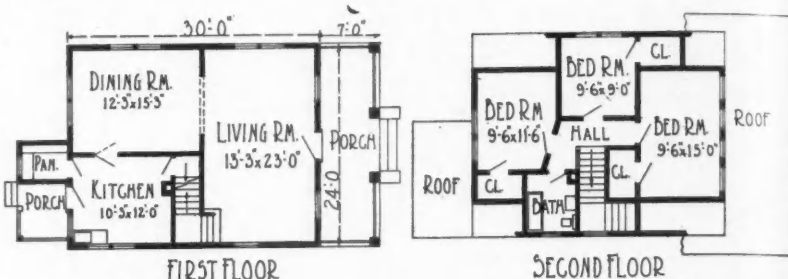
DESIGN FOR A SIX-ROOM DWELLING, 24 BY 30 FEET

A COMBINATION of stucco and shingles makes a home of excellent exterior appearance. Usually such combinations are used in a story-and-a-half house, such as the design shown here. This house is 24 by 30 feet in size and contains six rooms, three on the first floor and a like number on the second.

Both the front and rear porches extend the full width of the house, the former providing an attractive outdoor sitting place, and the latter a convenient place for the housekeeper in summer. The living room is large, 23 by 13 feet, 3 inches. The dining room is on the corner and is 12 feet, 3 inches by 15 feet, 3 inches.

Two of the three bedrooms are located in the gables and the third is made a cheery room by the wide dormer set into the roof at the front. The bathroom is conveniently located. A full basement provides space for the heating plant and storage.

The house is of frame construction, with the stucco imbedded in either metal lath or expanded metal, or in wood lath.



Floor Plans of Six-Room Story-and-a-Half House of Stucco and Shingles.

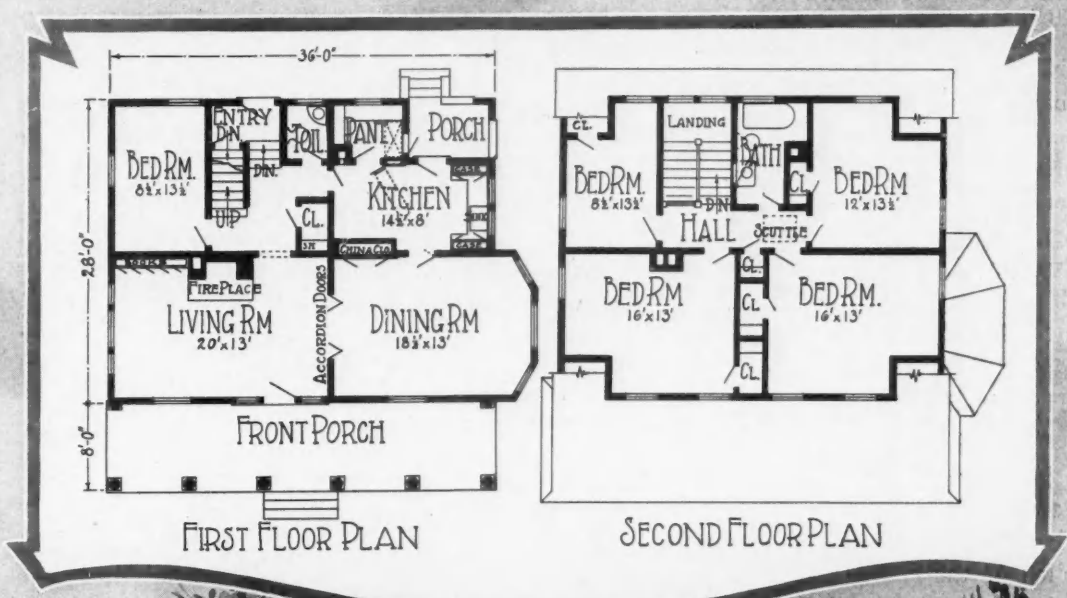
This design provides the prospective builder with a home that is economical to build, attractive in exterior and convenient in its interior arrangement.

There is another good point about this design. It is of the type that will appeal to the average family and is readily rentable or salable.



An Attractive, Economical Home. This House Is of Frame Construction, with Stucco and Shingle Exterior. It Contains Six Good Rooms and Bath. Size, 24 by 30 Feet.

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EIGHT-ROOM DUTCH COLONIAL SHINGLED HOUSE. Here is an unusual Dutch Colonial house. The full width porch, with its Colonial columns, the wide dormer and the dining room bay give it an individual exterior appearance. The size is 28 by 36 feet, with an 8-foot porch projection. The house contains eight rooms, five of which are bedrooms, one on the first floor and four on the second. The living and dining rooms are large and occupy the front of the house. As they are connected by two pairs of accordion doors, the two rooms can be thrown together. The convenient arrangement and the sizes of the rooms are shown on the floor plans.

"This Is the Home I Am Going to Build"

MR. "H." OF THE AMERICAN BUILDER STAFF, DECIDES THAT A STORY-AND-A-HALF HOUSE OF HOLLOW TILE, WITH BRICK VENEER UP TO THE SECOND FLOOR SILL AND STUCCO ABOVE, IS WHAT HE WILL BUILD WITH THE MONEY HE SAVES WHILE A MEMBER OF THE "OWN A HOME SAVINGS CLUB." THE PLANS ARE SHOWN IN THE BLUE PRINT SECTION

SOMEONE has said that "difference of opinion is what makes horse racing." Difference of opinion, too, is the reason why there are so many types of homes, constructed of a variety of materials. This has been proven by the wide difference in the home building plans selected by members of the AMERICAN BUILDER staff who joined the "Own a Home Savings Club" when it was started three months ago in the AMERICAN BUILDER office.

The plans shown this month may be called "The Home Mr. H. Is Going to Build." They are for a seven-room, story-and-a-half house of hollow clay building tile, with an exterior of face brick and stucco.

What an attractive home this will be is shown by the perspective. The size is 28 by 44 feet, 6 inches. The steep pitch of the roof, with the high gables at either side, the three-window dormer, and the wide, semi-private porch all combine to give the exterior an attractive appearance, which is enhanced by the artistic use of the face brick veneer on the porch foundation and up to the first floor sill and the stucco above.

Four rooms and an enclosed sleeping porch are shown on the first floor plan, and three bedrooms and bath on the second. The first floor rooms all are of

good size, and there are a number of excellent features in their arrangement and the conveniences planned for them. The living room is 14 by 26 feet, and has an exceptionally well-designed fireplace, details of which are shown on Sheet 4 of the blue prints. Back of the living room on one side are the dining room and kitchen. On the other side are a bedroom and the enclosed sleeping porch.

Good use of the space on the second floor has been made by the arrangement of the bedrooms and bath, so that each will be well lighted and ventilated. Also it will be noted that there is a great deal more than the usual amount of closet space provided in this size house.

Mr. "H." has selected hollow building tile for his home for the reasons, he explains, that the air spaces in the tile act as efficient insulators against the heat of summer and the cold of winter; the house will be heated more easily and economically, and it will be practically fireproof.

While this plan was made for Mr. "H.," it is one that will please many home builders, as it is of the average size and can be constructed for a moderate amount of money.



Seven-Room Story-and-Half Stucco House, Size 28 by 44 Feet, 6 Inches. This Is the House Mr. "H." of the American Builder Staff, Plans to Build. COMPLETE BUILDING PLANS IN THE BLUE PRINT SUPPLEMENT.

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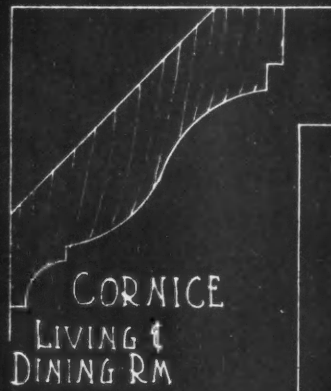
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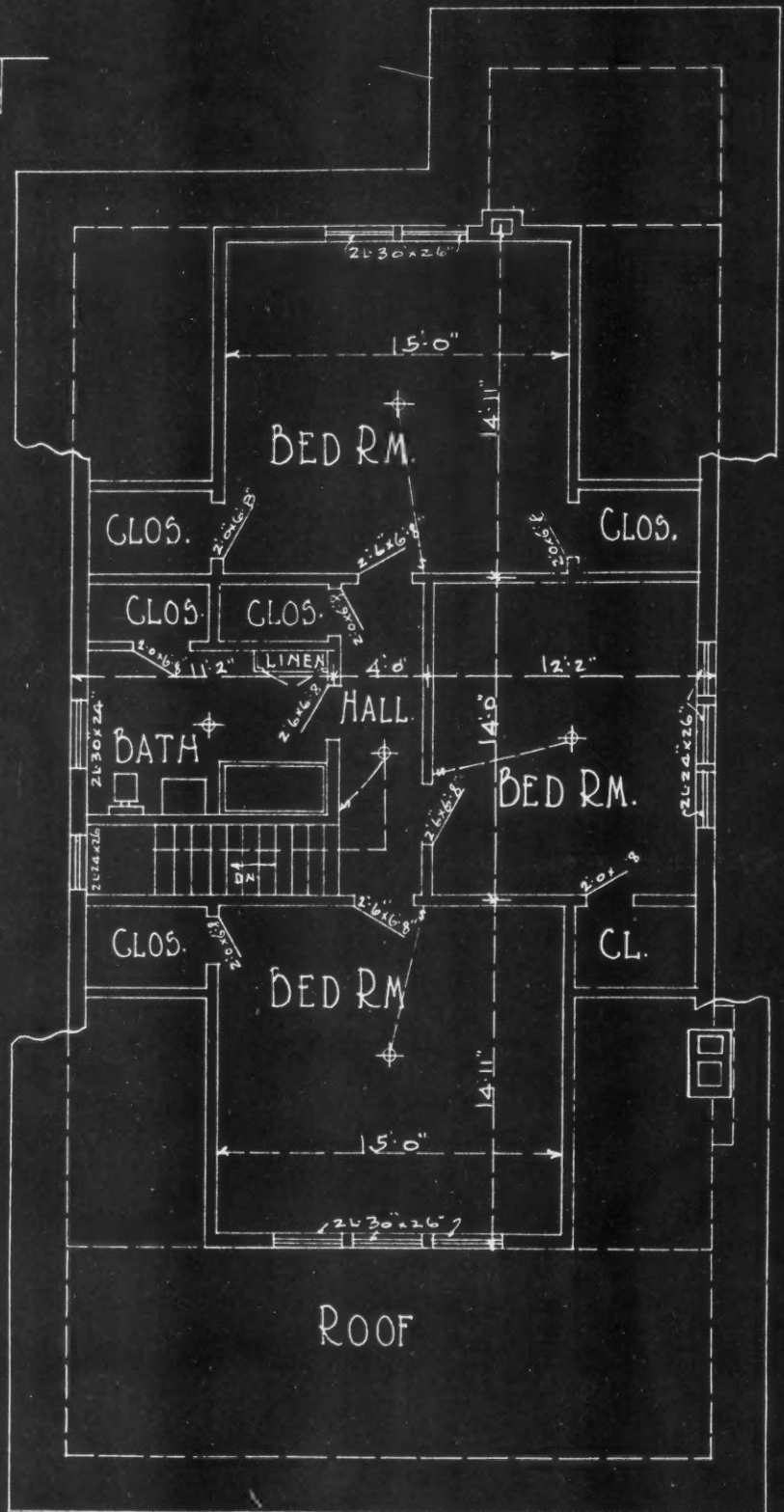
AMERICAN BUILDER BUILDING PLANS



MED. CASE



LINEN CASE
SCALE 3/8"=1'-0"



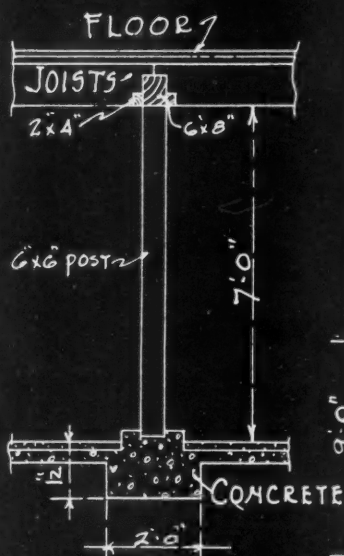
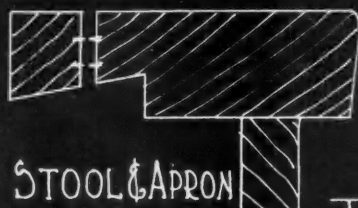
SECOND FLOOR

SCALE 1/8"=1'-0"

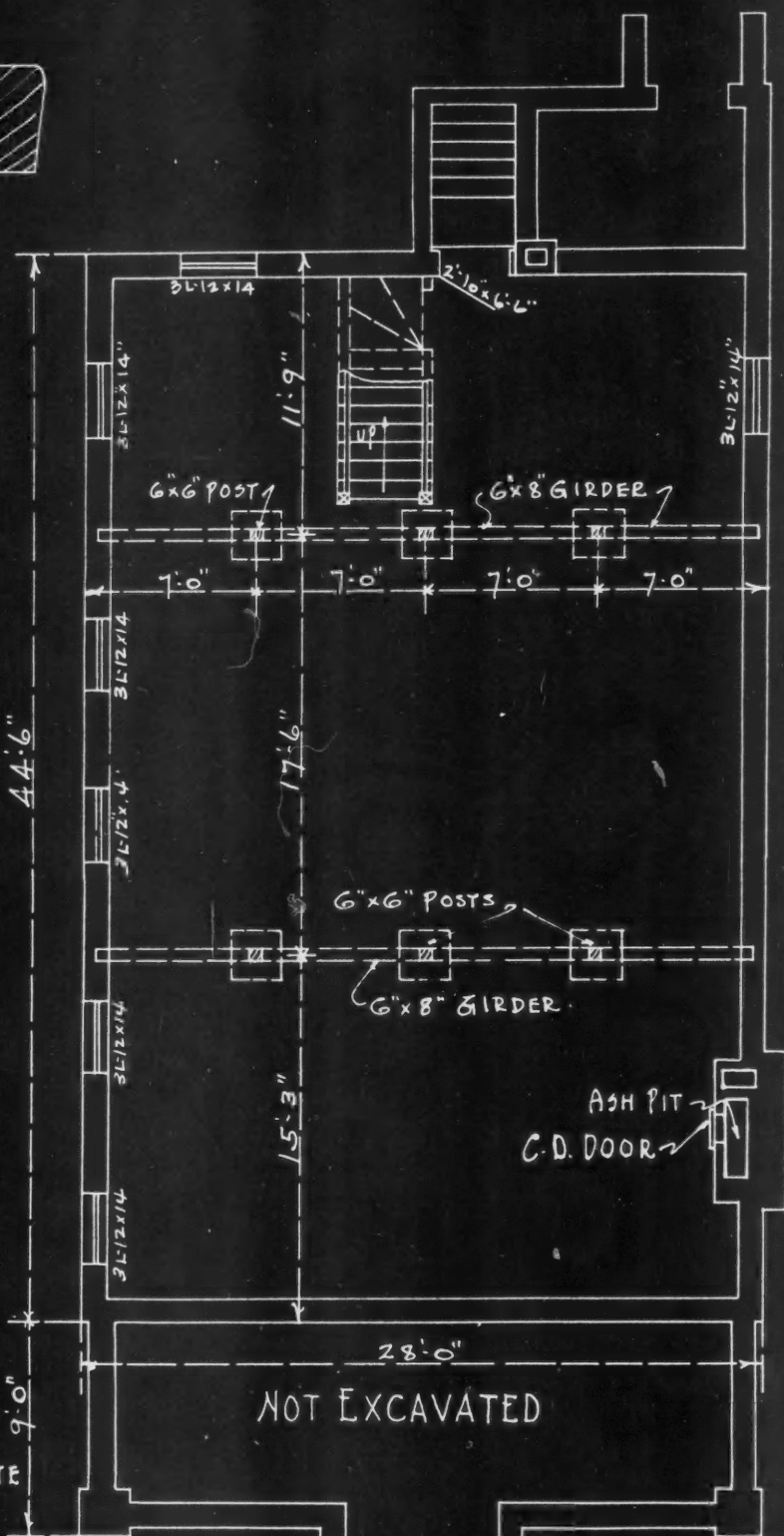
EIGHT ROOM RESIDENCE

SHEET N^o 2

AMERICAN BUILDER BUILDING PLANS



POST & GIRDER
SCALE 1/4" = 1'-0"



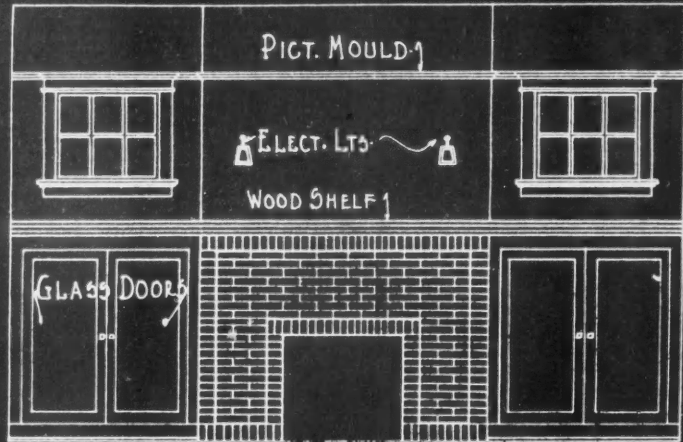
SCALE 1/8" = 1'-0"

BASEMENT PLAN

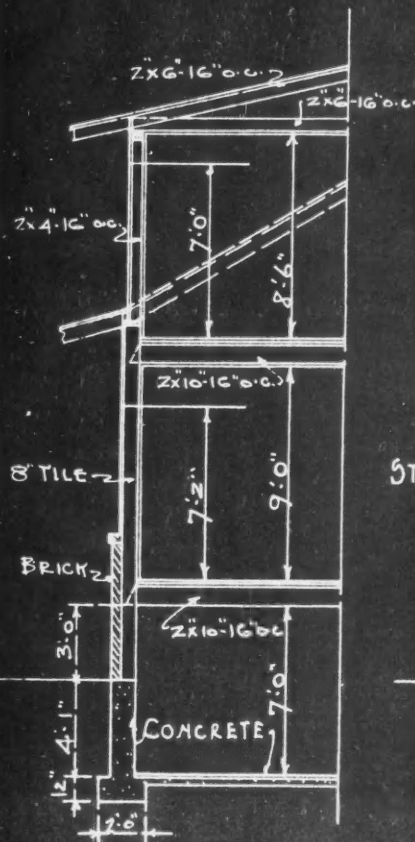
AMERICAN BUILDER BUILDING PLANS



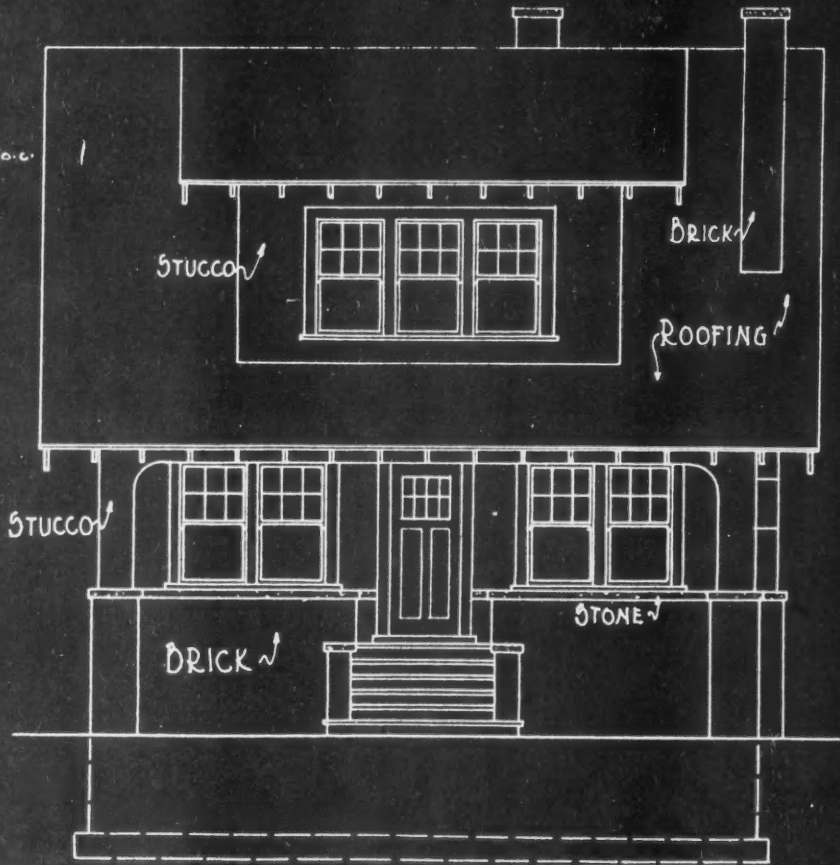
FRONT DOOR



BOOK-CASES & FIRE-PLACE
SCALE 1/4" = 1'-0"



SECTION.



FRONT ELEVATION

SCALE 1/8" = 1'-0"

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Design for Narrow-Lot Three-Flat Building

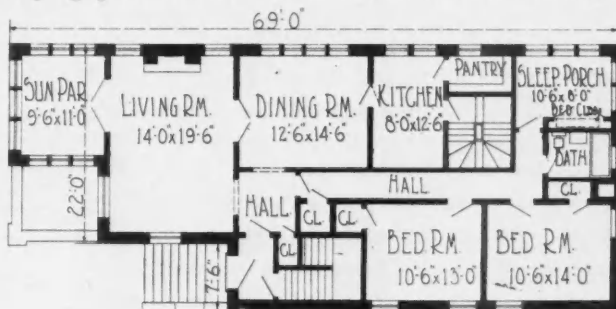
MODERN STRUCTURE OF FACE BRICK WITH TERRA COTTA TRIM HAS THREE FIVE-ROOM APARTMENTS

NOWHERE will the prospective apartment house builder find a more attractive design for a three-story building than the one here shown. Its architectural lines are good; it has all the features that are demanded by the present-day apartment house dwellers, and from the exterior presents an exceptionally fine appearance, made so by the artistic use of face brick and terra cotta trim.

The building is of standard brick construction, with a veneer of light-colored face brick. Various types of terra cotta trim are set into the veneer wall, and preserve the balance of the panels and soldier courses.

This design is especially well suited for the larger cities as it requires only a narrow lot. Its dimensions

are 29 feet 6 inches by 69 feet. While there are only five rooms shown on the floor plan, the addition of the good-sized sun parlor at the front and an enclosed sleeping porch at the rear makes each of the three



TYPICAL FLOOR PLAN

Typical Floor Plan of the Apartments in Three-Story, Modern Apartment Building.

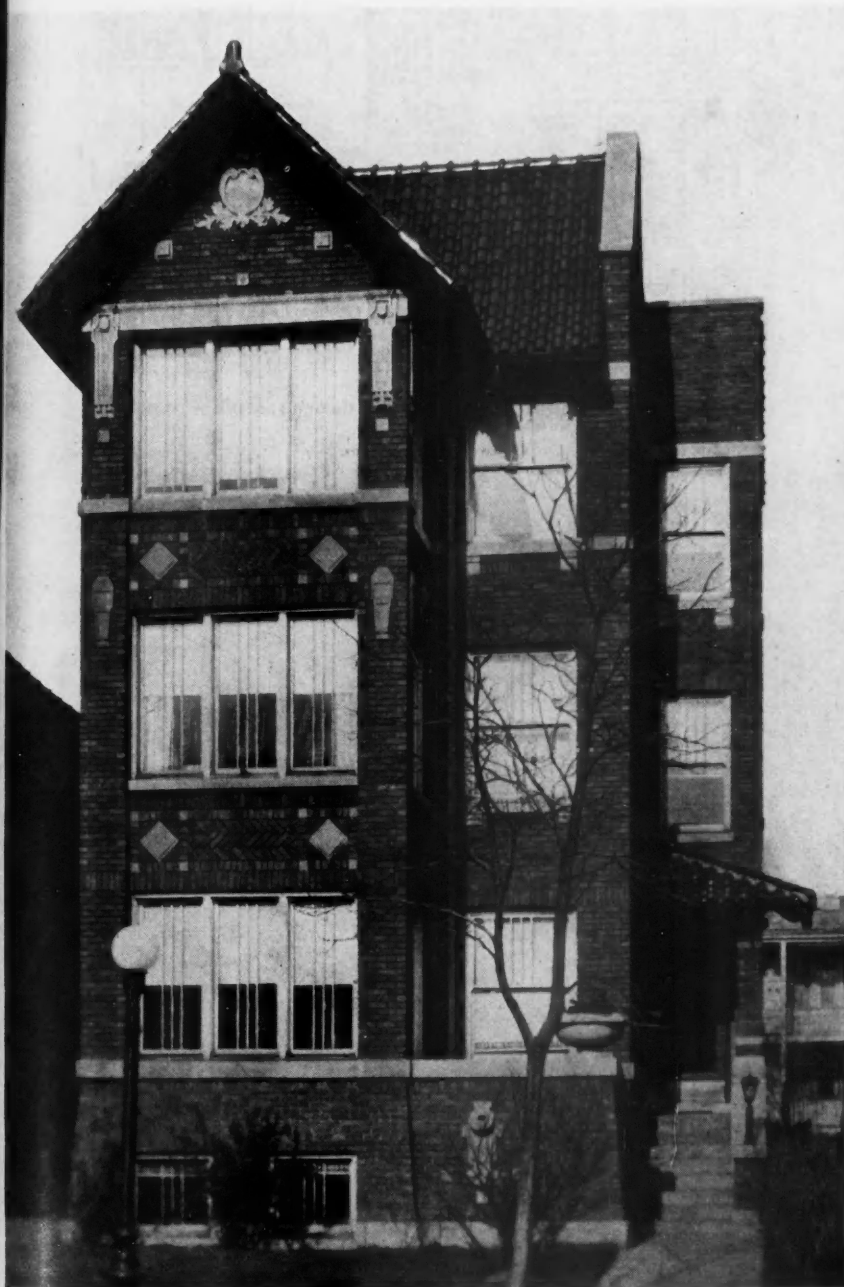
apartments in the building ample to accommodate a family of good size. The floor plan shows how well the space has been utilized and how conveniently the rooms have been arranged. The large living room, with sun parlor off it; the good-sized dining room and kitchen that are placed so that the work can be done with a minimum amount of effort, and the compactness of the sleeping rooms, all close to the bathroom, make this design one that many owners will want to build from.

Not only are city contractors being called on to erect such apartment houses as the one shown, but they also are popular in the smaller cities. The convenience that city people have found in apartments now is wanted everywhere, and when the economy in construction costs that is found in apartment buildings, and the number of families they house is considered, there is added that incentive to construct flat buildings.

Owners now are making their plans for apartment houses to be constructed this spring and summer. And many of them will be erected.



CONCRETE used in fireproof floors may be either plain or reinforced. Without reinforcement its use is not generally practicable in anything but very short spans, on account of its expense or great weight.



Three-Story Apartment Building of Brick and Terra Cotta, Size 29 Feet, 6 Inches by 69 Feet. This Design Combines a Most Artistic Exterior of Face Brick and Terra Cotta, and Conveniently Arranged Apartments of Five Rooms, Bath and Sleeping and Sun Porches.

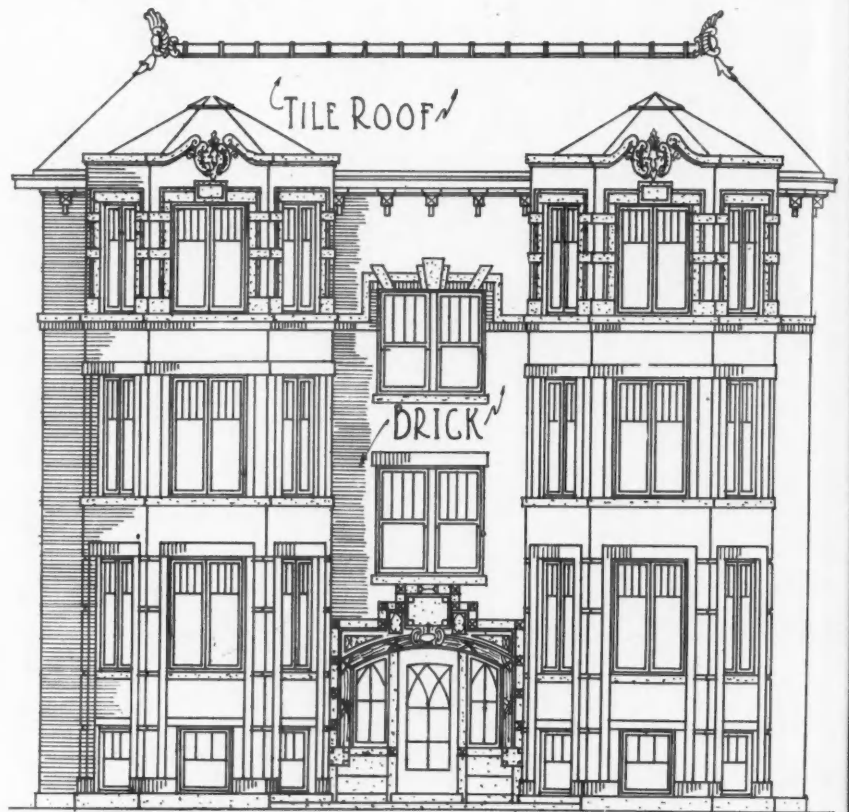
Design for a Large Court Apartment Building

THIRTY-SIX FOUR-ROOM APARTMENTS, EQUIPPED WITH SPACE-SAVING BEDS ARE CONTAINED IN THIS BUILDING

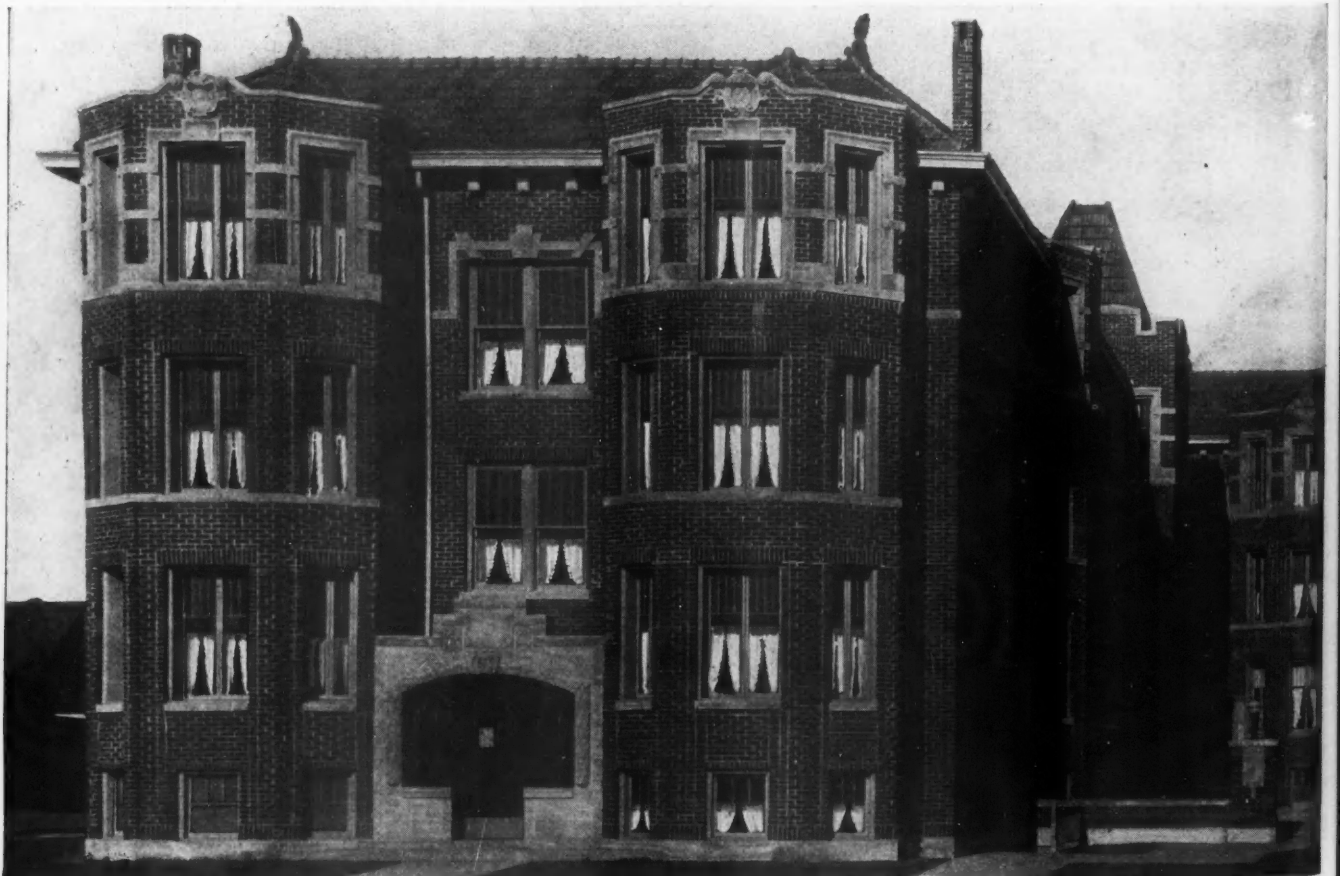
ON this and the following page is shown a design of a modern "court" apartment building of the type that is popular in the larger cities. It is of standard brick construction set on a concrete foundation, and is three stories with a full basement, the front of which also contains apartments.

The floor plan on the following page shows how the architects have utilized the space so as to get the living rooms at points where they have the best light, and how the other rooms are placed for the convenience of the tenants. The drawing on this page is a partial elevation of the street facade.

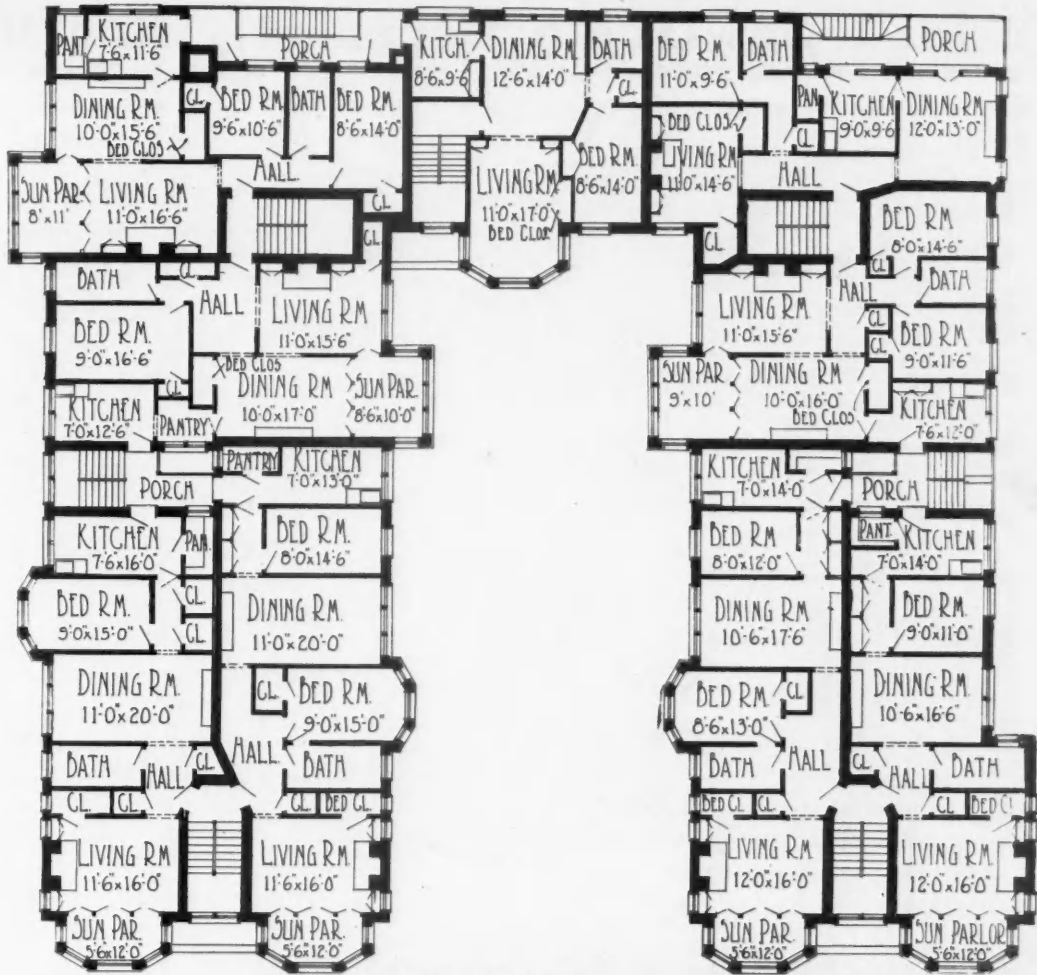
While this is a large building, it is the sort that owners are building continuously, as its design allows the most economical use of a deep lot. By a re-arrangement of the floor plans, smaller apartments, equipped with the modern space-saving beds and closets, can be built and the number of units increased.



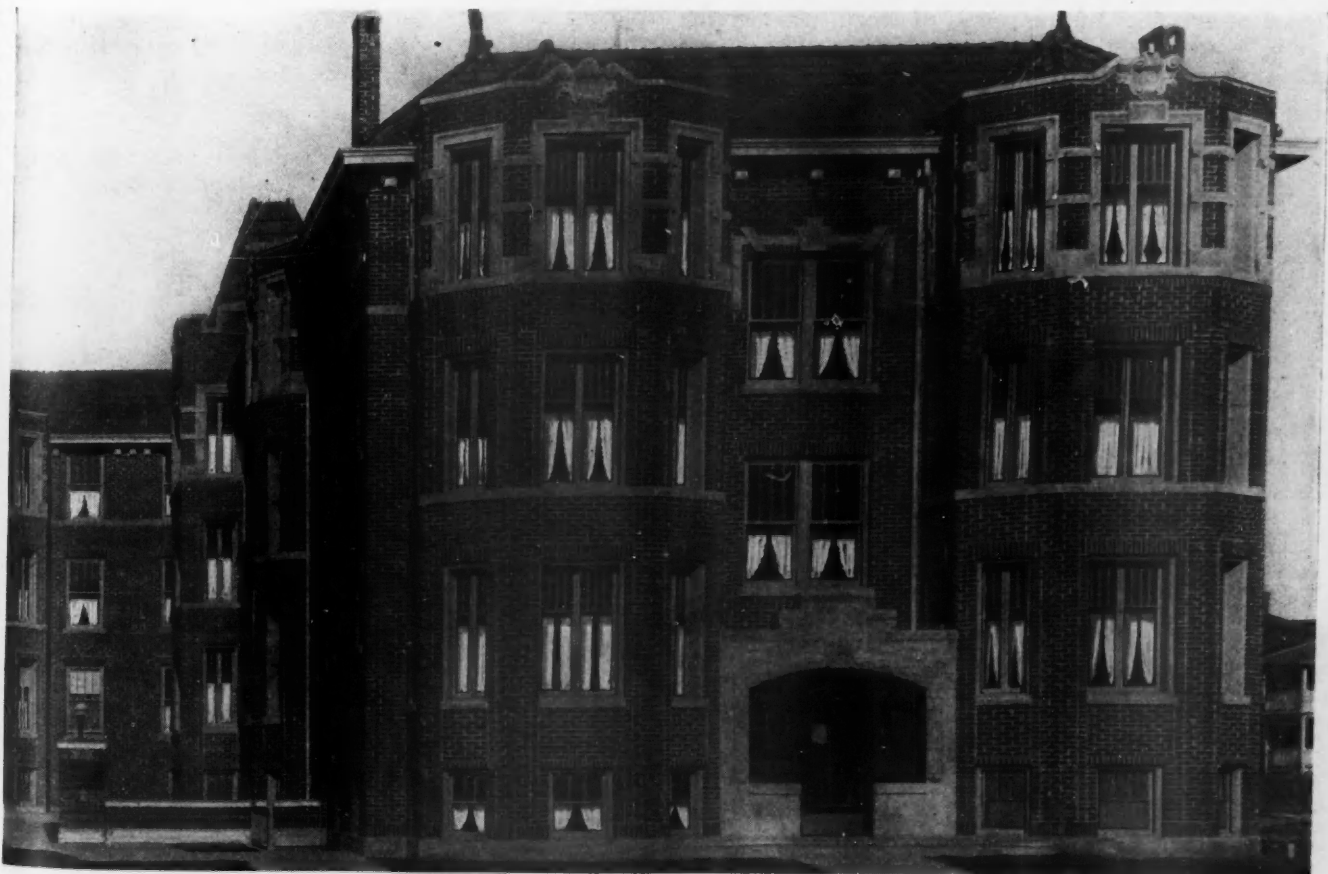
Front Elevation of One Wing of Large Court Apartment Building.



Modern Apartment Building for a Deep City Lot. By Building Around a Court the Number of Small



Typical Floor Plan Showing Room Arrangement.



Apartments Can Be Increased, and Made More Pleasant. E. J. Ohrstein & Hold, Architects, Chicago.

Design for a Saw-Tooth Community Hog House

FRAME BUILDING, 54 BY 24 FEET, WILL KEEP EIGHTEEN SOWS AND THEIR PIGS WARM AND HEALTHY

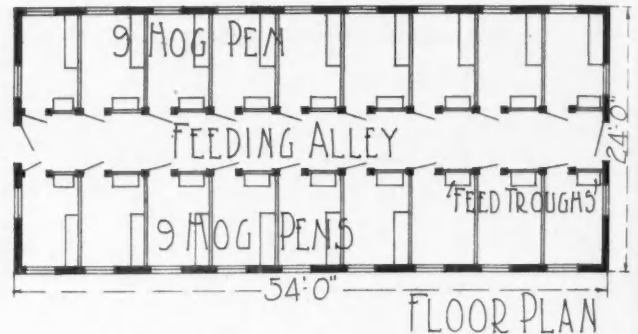
THE modern, weather-tight hog house is one of the most profitable buildings on the farm. When the hog raiser has a building that will house his sows and their pigs so that they will be protected from the cold in winter and early spring it will earn him large profits. Provided with the proper housing sows will have two litters of pigs a year—one in the early spring, and a second in the late summer. And, besides, a greater percentage of the little pigs will be raised.

For the farmer who goes in for hog raising pretty extensively the design for a hog house shown on this page is good. It is a frame building, 54 by 24 feet, and contains 18 pens. It will be noted that the building sits on a cinder bed raised somewhat from the surrounding ground. This provides good drainage and keeps the house warm and dry. The building is of frame construction, with tight weather boards. The roof is framed so that there is a saw tooth rise at the center, providing space for a second row of windows.

Hog houses should be set so that they extend east and west and face the south. This position exposes the windows in the side and in the roof to the winter and spring sun, giving access for the sunlight to both rows of pens.

Thru the center of the building there is a feeding alley, making the work of feeding the animals simple. Part of the floor of the pen is of wood, whether the

floor of the building be on cinders or concrete. On the floor is the bedding for the sows and their pigs, which aids in keeping the animals warm. Warmth



Floor Plan of Saw-Tooth, Community Hog House.

and fresh air are two requisites for the successful raising of hogs.

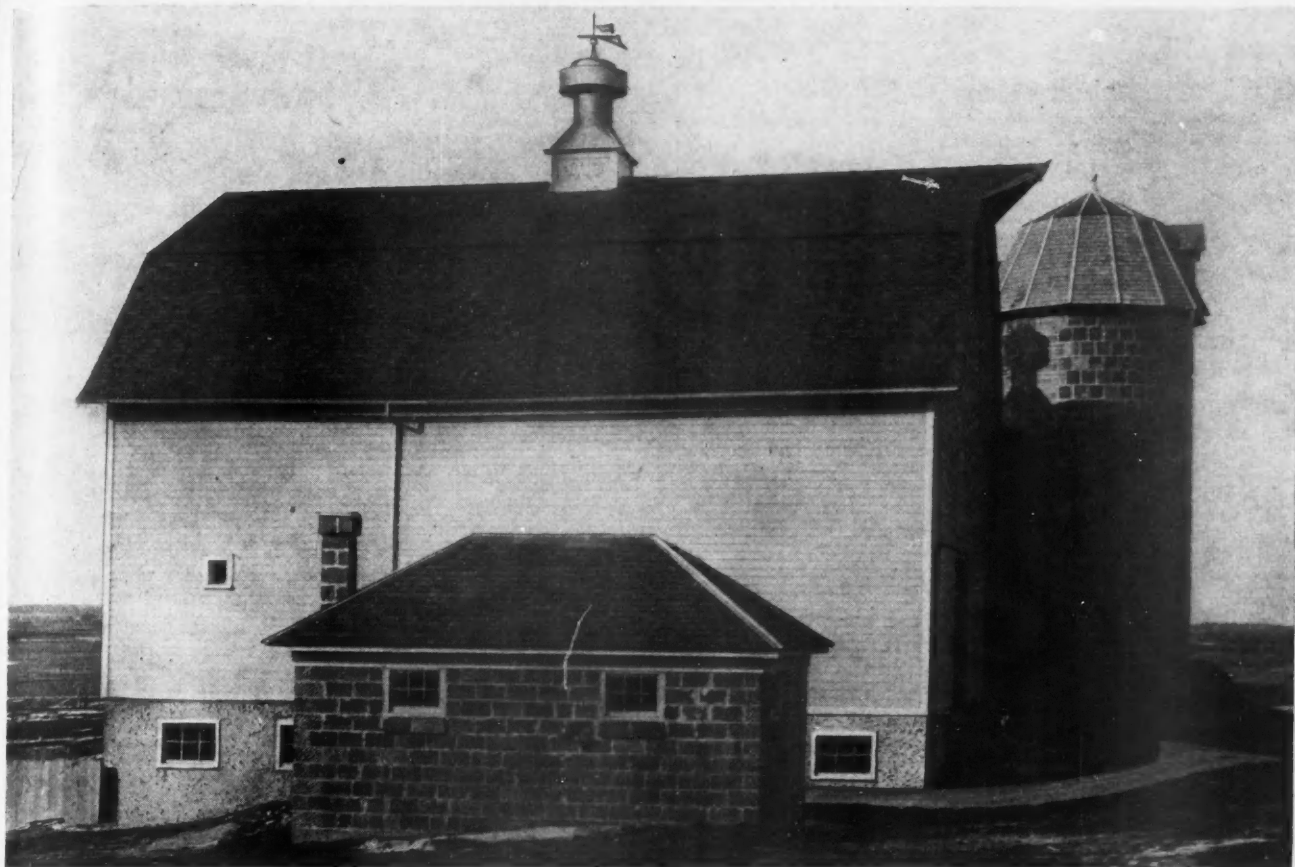


Wooden Trusses with Iron Ties

WHERE there is no ceiling beneath the roof, and it is desirable to make the trusses as light in appearance as possible, wrought-iron or steel rods may be used for the ties, still retaining the wooden principals and struts. Such trusses will be cheaper, for moderate spans, than steel trusses, while they are just about as good, particularly where the rafters and purlins are to be of wood.



South Exposure of a Saw-Tooth, Community Hog House, That Will Provide Warm, Healthful Quarters for Eighteen Sows and Their Litters. The Building Is 24 by 54 Feet and Is of Frame Construction.



Modern Gambrel Roof Dairy Barn, with Hollow Clay Tile Silo and Milk House. The Barn, 36 by 63 Feet, Contains Twenty-Four Single Stalls and Two Pens. The Silo Is Connected with the Barn by a Feed Room, and Contains the Modern, Labor-Saving Equipment That Present-Day Farmers Demand.

Design for a Dairy Barn and Auxiliary Buildings

WELL-ARRANGED BUILDINGS INCLUDE BASEMENT COW STABLE BARN, SILO AND MILK HOUSE, ALL HAVING LABOR-SAVING EQUIPMENT.

BARNs planned with the cow stable in the basement are expedient where the site is sloping or has a sheer drop of from seven to ten feet. The barn design shown here is suitable for such a site, or may be built with a filled driveway.

This gambrel roof barn, 36 feet wide and 63 feet

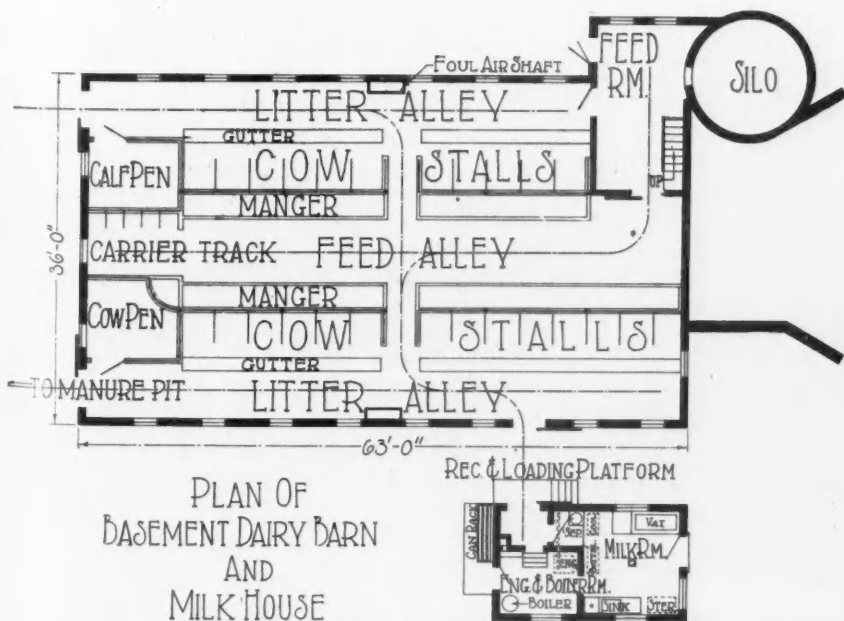
long, has 24 single cow stalls and two pens in the basement, while above are two floors, one for storage and the other for hay. The floor plan shows the arrangement of the stalls and the labor-saving equipment that is installed in all modern barns.

The floor of the stable is of concrete with continuous concrete mangers, divided by steel manger partitions, movable stanchions, and an overhead carrier track for transporting feed and litter.

The barn walls extend to the silo, the lower opening of which is in the feed room, to which the carrier track has been extended.

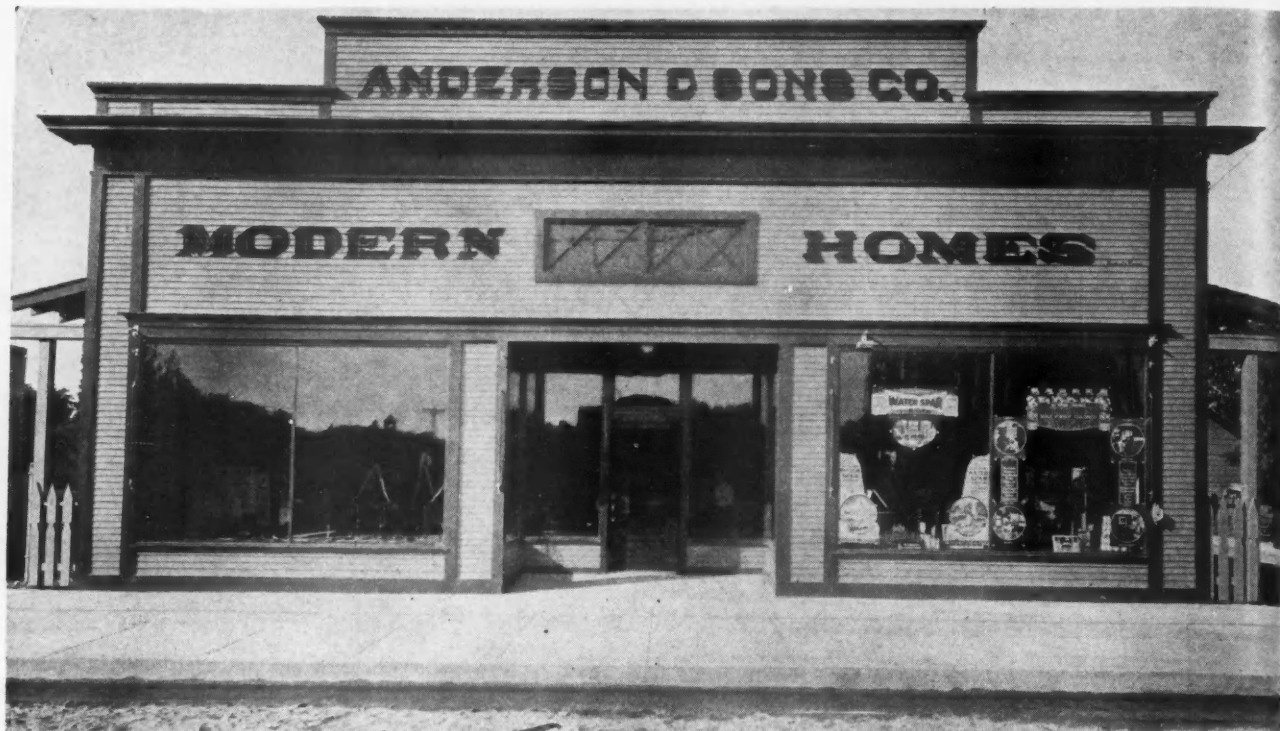
Near the barn is a well-arranged milk house, the carrier track running to the receiving and loading platform. Milk house equipment is designated on the drawing, showing how it should be placed to handle the milk efficiently, after it is transported by the carrier from the stable.

The barn is of frame construction, while the silo and milk house are of hollow clay building tile.



PLAN OF
BASEMENT DAIRY BARN
AND
MILK HOUSE

Floor Plans of Modern Dairy Barn and Milk House.



The Inviting Exterior of the Anderson & Sons Co. Store at Hyrum, Utah.

Building Up a Big Lumber Business

ANDERSON & SONS CO. HAVE 14 YARDS IN UTAH AND EACH ONE IS A "HOME OF MODERN HOMES"—ATTRACTIVE EXTERIORS PAY, SAYS MR. ROBERT ANDERSON, THE GENERAL MANAGER

By J. S. Williams

Sec. Shingle Branch, West Coast Lumberman's Assn.

UTAH, noted for its sugar beets, its great Salt Lake and its mines, is the home of another institution that is adding to its fame. It is there that lumber merchandising is being developed to a fine science thru the retail lumber stores operated by Anderson & Sons Company.

While not so many years ago, even Robert Anderson, the company's general manager, spoke of his place of business as "just a lumber yard," now the towns-

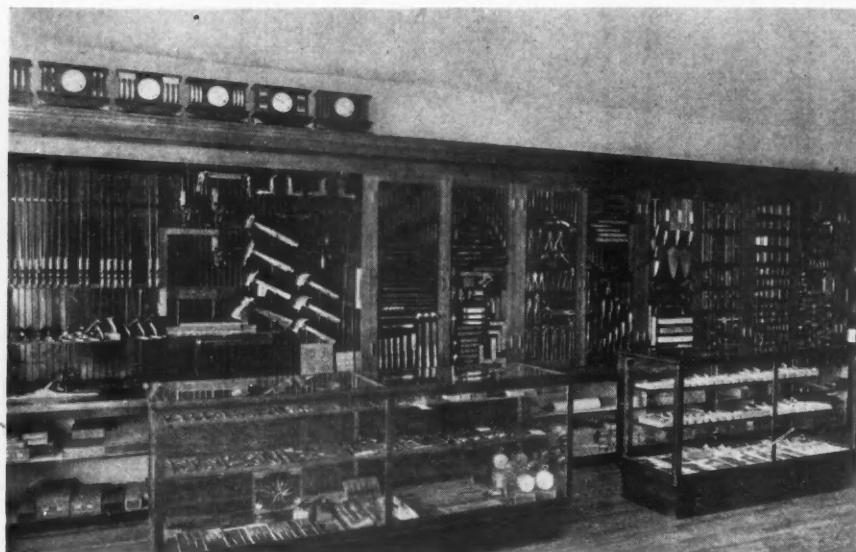
people where these establishments are located, immediately correct anyone so indiscreet as to refer to them as "lumber yards." They insist that they are stores.

Mr. Anderson first conceived the modern lumber store idea thru a study of the important part that women can take in buying lumber. His stores are merely the product of his thinking along this line.

Modern Methods Used to Sell Lumber

Every store, and there are fourteen of them in all, has a strictly modern front with lots of plate glass that lets in plenty of light. There is always an attractive display in each Anderson window. In front of each store, wherever possible, is a parking strip of green grass and some shade trees that mark them as distinctive institutions.

And inside are polished floors, polished counters, plate glass display cases, neatly arranged shelving devices for builders' hardware, paints, stains and varnishes. There are neat displays of doors and mill-work and interior finishes, all just



Display of Builders' Tools and Hardware at Hyrum, Utah, Store of Anderson & Sons Co.

A Modern Lumber Yard

as carefully kept up as a modern dry-goods store.

In the center of each store, Mr. Anderson has installed a porcelain drinking fountain thru which snow water from the nearby mountains is ever bubbling. Overhead an indirect lighting system provides a soft, even glow over the whole store.

Immediately back of the main display room is a room for storage and for heavier hardware, and adjoining this room is the main lumber shed where, in even ended, neatly stacked piles, all lumber is stored, protected from the weather.

In speaking of the results of the Modern Lumber Store Plan, Mr. Anderson says:

"The attractive exterior of our stores just naturally draws the whole family inside, and when once inside, it has been our experience that visitors become so interested in the goods we have on display that they



Robert Anderson, Pres. Anderson & Sons Co., Logan, Utah.

buy thousands of dollars worth of things that otherwise might go uncalled for.

"Of course," he continued, "we use

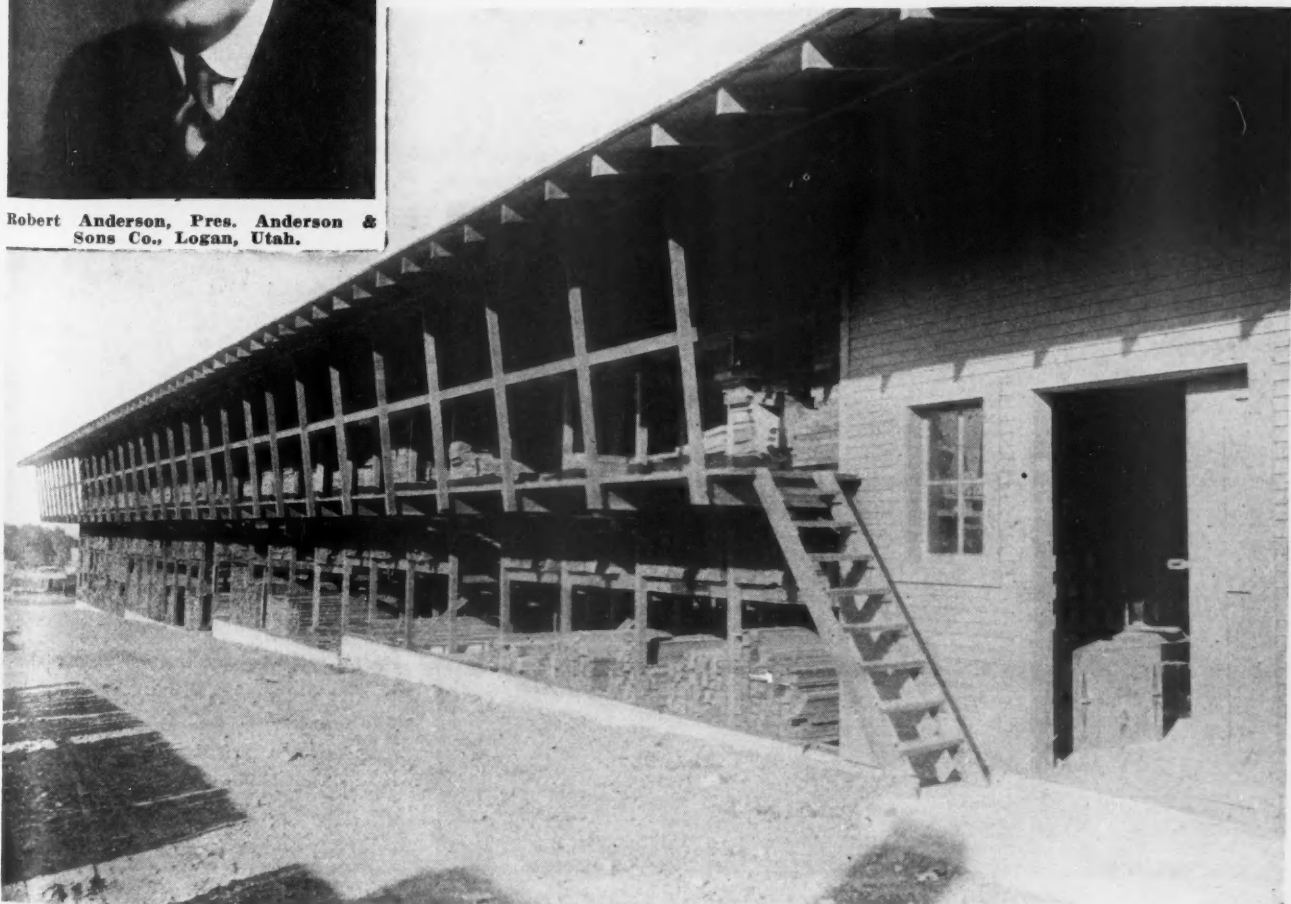
modern plan systems and we have on file complete plans, specifications, bills of material and complete prices on practically every type of building each community requires."

When the "Build Now" campaign was becoming a national slogan, Mr. Anderson was asked what he thought about it. He replied:

"It's a good idea nationally, but we've been conducting 'Build Now' campaigns every twelve months in the year since we started the Modern Lumber Store idea."



Paint Display at Hyrum, Utah, Store of Anderson & Sons Co.



Storage Shed of the Hyrum, Utah, Store of Anderson & Sons Co.

Building a Factory Lunch Room

PLANNING AND EQUIPPING CAFETERIAS FOR EMPLOYEES IS PART OF MODERN CONTRACTOR'S WORK.

By G. A. NICHOLS

WHEN a contractor erects a building for a customer he naturally should be interested in it from a standpoint of professional pride and love of accomplishment as well as from profit considerations. It is not enough for him to see that good materials are used, that honest workmanship is given and that a general all around fair deal shall be extended. He should see to it that the building fulfills its purpose in a one hundred per cent way regardless of what that purpose may be. This is why the up-to-date builder of today insists upon knowing more than architecture and materials. His experience and knowledge necessarily must extend over a wide range of business subjects.

Some people look upon the builder more in the nature of a workman rather than the combination of high class business and professional man which he really is. They are willing enough to take his word so far as the technical points of construction are concerned. But they think they ought to have the say when it comes to practically everything else connected with the proposition.

Of course every successful builder knows how erroneous is this idea, and how really little many people know about what they really want or at least what they ought to have. This is the very reason why the builder is striving to broaden his viewpoint and to give his clients a great deal more than the conventional building ideas. This is why the builder is interested in the future performance of the structures he makes.

Modern Factory Planned to Promote Efficiency

Nowhere does this apply more positively than in the

factory. To build a factory that will make good in every sense of the word one must consider efficiency, conservation of employes' health and energy, saving of time and a great many other things in addition to the conventional arrangements for the making of that factory's product. Indeed the builder must take some radical steps forward these days. He must take into account the growing necessity of the so-called welfare work and make proper arrangements for such in his building plans. In this latter respect many a manufacturer has but a distorted view. He knows vaguely that there is such a thing as employe betterment but it is an enigma to him. He too often regards it as something for the high brow to worry about. He is a business man making goods and has no time or energy to waste on "isms" or theories.

On practically everything else relating to the plant and the efficiency of the plant the manufacturer insists on having expert counsel and advice. His lighting must be correct; his ventilation efficient; the layout of his operating departments must be worked out to the minutest details. But with all this thought about efficiency, far too many manufacturers are overlooking the most important efficiency factor of all—the personal efficiency of the worker—and this one omission can offset all the careful work he has done in organizing his plant.

Employe betterment is nothing more or less than promoting by the most practical means the personal efficiency of the worker. It is *not* charity and in all its application has but one end—building up the employe's health and morale to make him a better producer.

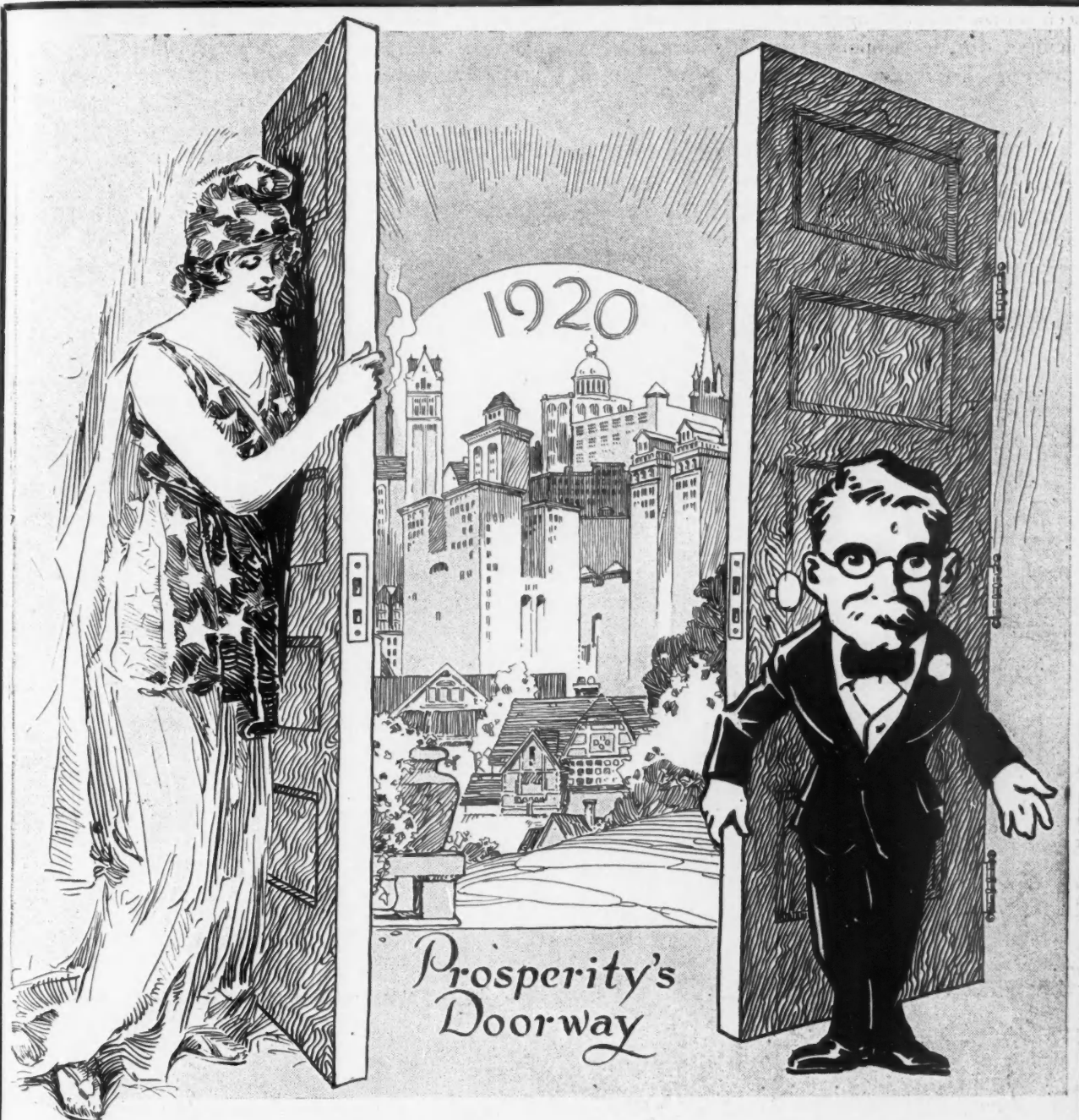
This applies in the small plant as well as the large—in both places it is the same—a strictly efficiency proposition.

If a workman has a painful boil on his neck, is it good business to let him go along with it and perhaps not get proper medical attention? Or is it better to have medical facilities right in the factory, so that this boil may be looked after? Approach the thing from a strictly business standpoint and it can very easily be seen why big employers of labor lay so much stress upon betterment work.

Everybody knows that proper nutrition is an absolute essential of efficiency. If a factory man, woman, boy or girl does not get proper food, then his efficiency is decreased in exact ratio. It has



The Style of Equipment Shown Here Is Very Popular in Factory Cafeterias. It Is Slightly Lower in Cost Than Table Equipment and Is Extremely Durable.



Mr. Stanley Worker Says:

HERE'S wishing you a great big share of the prosperity that 1920 has in store for every dealer in Wrought Steel Hardware made by the Stanley Works.

The Door of Opportunity swings open, easily, smoothly and noiselessly when hung on three Stanley Ball Bearing Butts.

Keep your eye on the car-owner in your vicinity—more garages than ever before will be built this year. Have a copy of our little booklet "8 GARAGES" handy to show him when he calls.

THE STANLEY WORKS

NEW YORK
100 Lafayette Street

New Britain, Conn.

CHICAGO
73 East Lake Street

been shown time and again that for a factory to have facilities for its employes to eat nutritious warm lunches is to increase the efficiency of those employes in a worth while measure.

Illustrating Need of Plant Lunchroom

One day last summer the writer had occasion to visit a prosperous factory in a fair sized Wisconsin town. The working force numbered about 500, including 200 girls.

eating. *The human machine has to have fuel.* If the factory had provided a cafeteria where its employes could have supplied their noonday wants it would have noticed a worth while increase in efficiency and output.

It has been proved repeatedly that such cafeterias confer great benefit upon the employe. And they benefit the owner because they help him get more and better service from his people.

Many workers, both male and female, get an "all-in" feeling along about 10:30 in the morning or 3:30 in



Every Part of the Kitchen Should Be Planned and Built with a Definite Idea of the Whole Forming a One Hundred Per Cent Efficient Unit. The Section of the Kitchen Pictured Here Is a Splendid Example of Such Planning.

When the noon whistle blew a heavy rain was falling. The factory was located in a semi-residential portion of the town and there were no eating places around worthy of the name. One or two saloons and a couple of very indifferent lunchrooms were all.

The employes scattered in all directions. Some caught street cars going down into the business section. Others rushed to the saloon and others crowded into the little restaurants.

The girls for the most part had brought their lunch with them. They sat around almost anywhere they could and ate their cold food.

This was a clean, modern up-to-date factory that paid good wages and that apparently was co-operating with its employes in numerous ways.

It neglected the overwhelmingly important thing—

the afternoon. They think this is a result of hard work.

Wrong!

Hard work never hurt anyone.

This "all-in" feeling is merely a result of a rebellion going on somewhere in the worker's internal mechanism. The supply of fuel is running low. The machine may not stop but it lags.

Women Workers Require Rest and Refreshment

Some industries see that their women workers can take a few minutes' rest at such times. But it isn't always rest they need. Very often it is food. A cup of hot milk or cocoa or a bowl of soup can put new life into workers in their "off" times.

The storage battery in an automobile will die if its



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Estimating Practical rules. Problems worked out from the plans. Brickwork and carpentry. Excavations. Labor and material for footings in brick, concrete and rubble stone. Methods of practical builders. Reinforced concrete—full plans and specifications for re-inforced concrete buildings. Estimates of labor and material required. Labor and material for brick work: figuring common and pressed brick walls of different thicknesses, etc. Chimneys, fire places and cisterns. Fire proofing, tile, tile flooring, arches, partitions, furring, terra cotta, etc. Lumber and timber; figuring board feet. Estimating posts, girders, sills,

joints, studs, bridging, rafters, etc. Estimating all kinds of roofs, floors, siding, cornices, etc. Labor for rough and finished carpentry.

Construction Estimating mill work. Labor and material for window and door frames, sash, blinds, base board, wainscoting and all kinds of closets, cupboards, etc. Lathing, plastering, sheet metal work, exterior and interior marble jointing and decorating, glazing, plumbing, heating, wiring, etc.

Brickwork: Footings and foundation walls of brick, concrete and stone. Brick laying, joints in brick work, pointing, tuck pointing, etc. Brick and stone arches. Use of different kinds of stone.

Carpentry: Kinds and uses of wood, etc., cornices, interior details, framing, roof construction, bridging, miter joints, butt points, etc. How plans are made. Complete instructions illustrated by working blueprints of all kinds of buildings, private, public and business.

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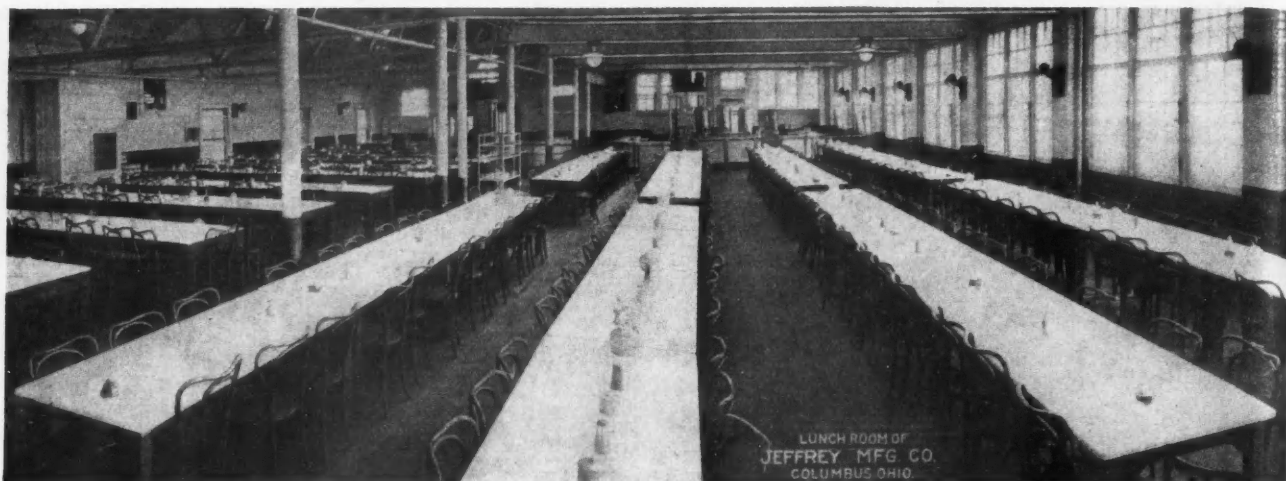
136 Chicago "Tech" Bldg., Chicago
Without obligation on my part, send me the Free Lesson in plan reading, also information on your Builders' Course in Plan Reading, Building Construction, Estimating, etc.

Name.....

Address.....

City or Town..... State.....

Present Occupation.....



The Cafeteria Pictured Here Is Extremely Complete and Satisfactory. This Installation is Quite Typical of the Modern Industrial Cafeteria.

original stock of "juice" isn't replenished as the wear goes on.

Human machines are built on the same basis. The more they have to draw upon their stored-up power the less efficient they are in the long run.

Can factory cafeterias be made to pay a profit? Yes. But most managements are satisfied if they can break even. It is an asset tho even if one is obliged to foot a deficit.

Whether a cafeteria pays or whether it is run at a loss depends upon the mode of operation. It has to be carefully planned and properly conducted. It is an important business venture that will run away with itself in expense or fall behind in service if it is not well equipped. It is a restaurant and should be conducted on restaurant principles. It should not be entrusted to the tender mercies of novices or theorists. An expert restaurant man or woman should be placed in charge. The food should be purchased in quantities. A careful check-up system should be provided. There should be sufficient variety. Each item should be charged for separately so that if a person wanted to do without butter or get along with one piece of bread his check would be in accordance. Prices should be based on cost. Waste should be eliminated and the most stringent food conservation policies used.

Experts Aid in Planning Cafeteria

The highest class expert counsel can be obtained by any factory desiring to go into the cafeteria proposition. The thing has been studied out and worked down to such a fine point that nobody need go into it unadvisedly. The experiment has been tried. Certain things will work and certain things will not.

Whether the factory be great or small a thoroly thought thru plan can be put into operation in the way that will meet its requirements best.

The average factory owner, tho an expert at making his product, is not necessarily a cafeteria expert. It would be remarkable if he was. But he does not have to go striking out in the dark, trying this thing or that until he stumbles upon the right thing.

All he need do is to indicate in a general way what he wants, give the expert his view as to this or that, and then have laid out before him the entire proposition and be presented with plans as to how to proceed.

The same expert can install the equipment, get the cafeteria into complete working order and turn it over to the management in a way that can make it a complete success from the very start.

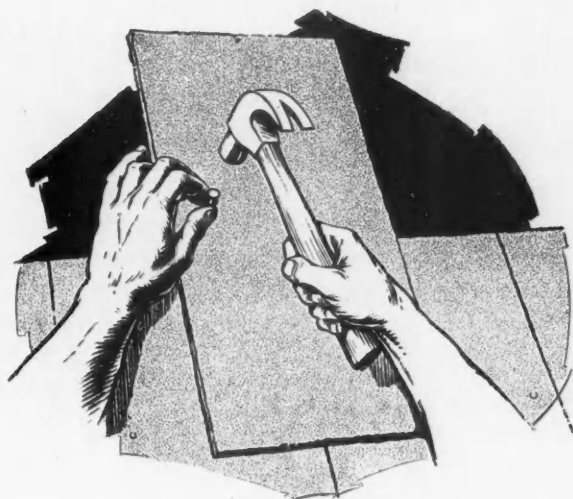
The business man who thus cares for the interests of his employes—and incidentally conserves his own interests—is in select company.

All over this country leading concerns are profitably carrying out the cafeteria idea.

Westinghouse Co. Has Modern Cafeteria

An illuminating example of an up-to-date factory cafeteria is shown in plans recently matured by the Westinghouse Electric Company. This company has erected a splendid building for the express and exclusive purpose of providing proper lunchroom facilities for its employes. This will be the largest cafeteria in the world and was installed complete by a concern that makes a specialty of this equipment. The investment for building and equipment will mount well up in the hundreds of thousands. Every possible convenience will be installed. The food will be of a high grade and the prices will be low. The idea is not to make money out of the cafeteria but to give the Westinghouse employes the right kind of food under the right kind of surroundings and thus increase their efficiency. If there is any direct loss entailed it will be more than made up thru the increased productive power of the employe.

Unquestionably the cafeteria is the most successful type for factory feeding. Its success depends pretty much upon its layout. The laying out of the cafeteria is a highly specialized science that only experts are acquainted with. The average builder cannot be expected to know all about the scientifically laying out and proper equipment of the cafeteria. This is a study of a lifetime that has been evolved out of many years of experimentation in various kinds of lunch-



You buy the nailholes with the shingles

IT'S an absolute fact. Every Johns-Manville Asbestos Shingle comes to you with the nailholes already made—yes, and even with the nails to fit the holes. That's what makes it so easy to lay Johns-Manville Asbestos Shingles.

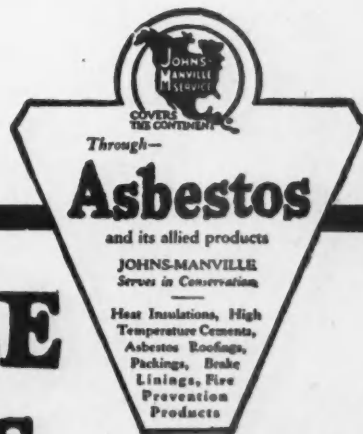
You don't need an outfit of slater's tools—and a slater to use them. Any carpenter with a hammer and the ability to follow a few simple instructions can lay Johns-Manville Asbestos Shingles and do a good job.

Do you know of any other high class roof covering that can be applied without high-priced, specialized labor?

Of course you know Johns-Manville Asbestos Shingles can't rot, curl or crack. They won't disintegrate—and they can't burn.

Send to any Johns-Manville branch for complete information about these easy-to-lay shingles. Find out what they will do for you on the work you are contemplating.

H. W. JOHNS-MANVILLE CO., New York City
 10 Factories—Branches in 63 Large Cities
 For Canada: Canadian Johns-Manville Co., Ltd., Toronto



JOHNS-MANVILLE ASBESTOS SHINGLES

rooms and restaurants. But the services of experts can be at the disposal of the builder in such a way that the builder really can use them as his own.

In making plans for a factory therefore it is good business and good sense for the builder to go thoroly into this subject of employe betterment, paying particular attention to the matter of feeding. In ninety-nine cases out of a hundred, a properly planned cafeteria will best solve the feeding problem. The big equipment houses have experts that gladly will work with the builder in this to the end that the cafeteria in the new factory shall be of a type that will be a real help in increasing the owner's profits.

Builders Profit by Special Knowledge

The builder who devotes some special study to this and who is one hundred per cent up-to-date in the whole problem of employe betterment will thus have an unusually strong talking point in his search for new business. Realization of the importance of betterment work is being impressed upon the manufacturer today as never before. It is as has been previously said the one thing about his business concerning which he knows the least. He welcomes expert dependable counsel wherever he can get it. Thus the builder with knowledge along this line and with facilities for getting

all the latest expert data—data which is kept thoroly up to the minute in these rapidly developing times—will be in position to enhance his own reputation in a decidedly worth while way.

Of course the builder as a business man need not be preached at in this particular. He knows the advertising value of high grade expert service and counsel. The thing that probably has deterred him heretofore from giving the employe betterment matter his attention, has been his own organization's lack of expert knowledge on the subject. With this secured it really does seem as if the builder was about to enter upon a worth while period of advancement in the matter of employe betterment.



THE most important partitions in a building are those enclosing interior shafts. Vertical openings thru buildings form flues and cause up-drafts. In all buildings, fireproof as well as non-fireproof, therefore they should be enclosed for two reasons: first, to prevent a fire that would find a natural outlet in such openings from spreading to other floors; and, secondly, to prevent as far as possible fire getting into these openings where the draft would greatly increase its fury.



The Arrangement Here Is Ideal for a Smaller Cafeteria. It Is Planned for Quick Service. Note the Phonograph in the Fore-ground. In This Particular Case the Cafeteria also Serves as a Rest Room During the Lunch Hour.

DEPENDABILITY

ATLAS-WHITE

is the ideal cement for making mortar to be used in Pointing, Setting and Backing. Its non-staining quality is one of the reasons why Atlas-White is found so often — On the Job.

THE ATLAS PORTLAND CEMENT COMPANY

New York Boston Philadelphia Savannah Chicago
Dayton Minneapolis Des Moines St. Louis



ATLAS WHITE

Industrial Housing in England and Scotland

STANDARDS OF COMFORT AND CONVENIENCE MUCH HIGHER SINCE THE WAR—SHORTAGE OF HOMES IN EUROPE GREATER THAN IN UNITED STATES

By John Y. Dunlop

IN the great cry for houses for the working classes all over England and Scotland, it is generally admitted that the standard for comfort and convenience in the various building schemes is very much higher than ever it was.

The war has done much to contribute to this in many ways and the improved education of the masses of the people is also an impelling factor.

Recently some excellent plans have been published which will prove most suitable for those small house buildings and which will provide the minimum amount of work for the wife or the maid with the maximum amount of **comfort**.

In large cities the housing problem is most serious and urgent. Glasgow alone needs 47,000 new houses. In Edinburgh, for example, there is a shortage of 10,000. Dundee wants 6,000 and there are thousands of other cases.

No Houses for Rent

At the present time it is practically impossible to get a house in any district and it is quite a common thing to hear of offers being made of 50 pounds to anyone who can put one on the track of a house which is to let.

The result of the scarcity is that small houses which originally cost from 500 to 600 pounds to build are being sold for over 1,000 pounds.

Material Prices Halt Building

The price of material makes it absolutely impossible for the private builder to build. Timber and cement are costing in England today 200 per cent more than they did before 1914, mason work has risen 120 per cent, while tradesmen's wages are more than double and unskilled labor in the building trades three times what they used to be.

There is no use blaming anyone for the rise in the cost of building material, but certainly the government are not entirely clear of this charge.

Take bricks, for instance. The government made it **obligatory** on the brick makers to reserve a certain stock at a controlled price of 54 shillings per thousand.

The result is that to the ordinary buyer the brick-makers have made up the price to 75 shillings because while this **reserved** government stock was lying in their yards, they were getting no money for it, and they had only a small quantity of bricks to sell.

Want Builders Released from Army

There is also the difficulty of securing labor and many think that the time has come when an urgent call ought to be made on the military authorities to demobilize without loss of time all the soldiers who were formerly engaged in the building trade.

This would necessarily include masons, bricklayers, plasterers, joiners, plumbers and all men essential in



Four-Apartment House for Workers at Crawley, Hampshire, England. Brick and Stucco, with Slate Roof and Brick Chimney.



Vulcanite

"FAMOUS for QUALITY"

**ORNAMENTAL ROOFING
STYLE "B"**

**Is More Satisfactory—In Every Way
For substantial homes of every kind—Everywhere**

Ask for a sample, examine it closely. See how thick the felt is, how thoroughly it is impregnated and coated with asphalt. Test its tensile strength, try to pull it apart. Note the extra thick coating of crushed red or green slate, attempt to rub it off—it's imbedded pretty securely, is it not? Test it in any manner you see fit. The more severe the test—the more you will be convinced as to its sterling worth, its great durability and weather and fire-resisting qualities.

As for its beauty, not only of its crushed slate surfacing but also of the design itself, we are content again to leave it in your hands. We know from past experience what the verdict will be.

The first cost, cost of laying, and cost of annual upkeep are all much less than that of wood shingles. Style "B" is often laid over old wood shingles.

Send for a sample. Examine it. Let it speak for itself. It will show you how to economize on roofing.

LUMBER DEALERS

We co-operate with you. Let our "Dealer Helps" and other advertising service help swell your roofing sales. Write for samples, literature and prices.

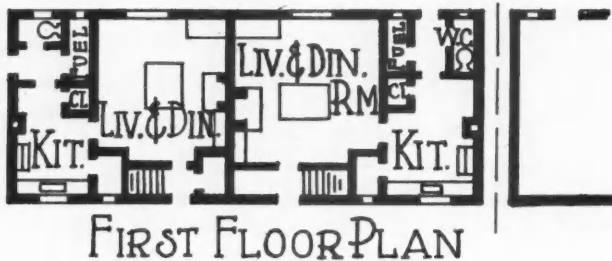
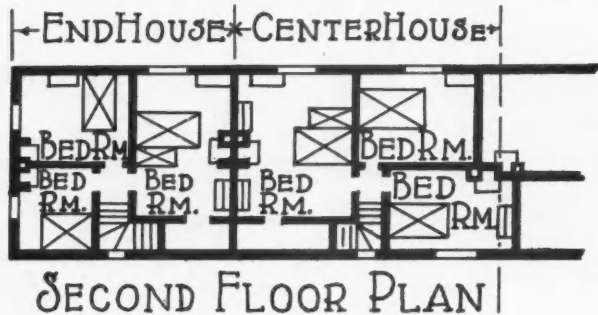
Patent Vulcanite Roofing Co.
FAMOUS for QUALITY

| | | | |
|----------------|--------------|---------------|----------|
| Chicago | Kansas City | San Francisco | New York |
| Cincinnati | Birmingham | Minneapolis | Albany |
| Anderson, Ind. | Franklin, O. | Buffalo | |

the erection of dwellings for the people.

During the war few apprentices were left in the building trade, and therefore our new industrial schemes of buildings are being started when the ranks of the operators have been thoroly depleted.

The average estimated cost of new houses to be erected by local authorities under the government



Typical Floor Plans of Four-Apartment House Shown on Preceding Page.

scheme is for a four-room house to cost 800 pounds and for a five-room house to cost 1,000 pounds.

In this country at the present time money cannot be borrowed under 5½ per cent, and with all the local authorities going into the money market at the same time, the cost is sure to be much higher. At 5½ per cent the cost of the money for a five-room house would be 55 pounds.

Then there fails to be added rates and taxes and other charges which have all to be met by the owner of the house which can be taken approximately at 26 pounds, bringing the annual cost of financing the new house to 81 pounds, which, of course, is prohibitive if the proposed houses are to be let at 10 shillings per week, the amount arranged for in the most of districts.

The line drawing and the half-tone illustrations show typical examples of those houses referred to.

Of course all those houses are of masonry construction and timber is only used for the roof, floors and the window and door furnishings.

Government Advocates Brick Houses

In the most of the building schemes which have been approved by the government, the walls are to be built with common brick, which will not scale nor waste away when exposed to frost.

The walls are to be built with lime mortar consisting

of one part blue lump lime and three parts clean, sharp sand.

Where the authorities have adopted hollow walls they are to be built of two 4½-inch thicknesses with a 2-inch cavity and with galvanized iron ties, two at least for every superficial yard and one to every 12 inches in height to the sides of all openings.

In such forms of construction, the base of the wall is to be filled in solid with fine concrete up to 6 inches below the level of damp course.

All the joints of the brickwork are to be well filled in and pointed and neatly weather-struck where the wall forms an exposed face.

All division ground floor walls are to be 4½-inch brick and internal partition where the house is of one story may be 3-inch concrete slabs.

But where a second upper story is formed, 3-inch partitions may be used on the first floor, and in cases where these carry the second floor joists they must come immediately over 4½-inch brick walls on the ground floor.

Every room, where practical, is to have a fireplace in which the flues and chimney head opening are to be 9 inches by 9 inches.

The flue is in no case to be straight, but with easy bends and turns and to be properly gathered over the fireplace and be parquetted as the work proceeds.

The chimney stacks are to have a protecting course at the top and each flue is to be finished with a chimney pot set and well flanchued up in cement mortar.

Where window sills are used they may be of stone, brick or concrete, or of two courses of plain tiles headed in cement which are set weathering and which project 2 inches.

Stone Walls Must Be 12 Inches Thick

In localities where local stone is procurable and the price compared favorably with other fabric, stone walling is to be used, but the stone walls must be at least 12 inches thick and have a sufficient number of bond stone and large quarry stone.

The external face of the stone walls may be rough cast and in all cases the walls are to have 1½-inch damp courses just above the ground level.

At the present time there is not much chance of stone work being used in any of the building schemes for the reason that even the refuse of the quarry which might be used in small houses would not compare favorably with the price of brick.

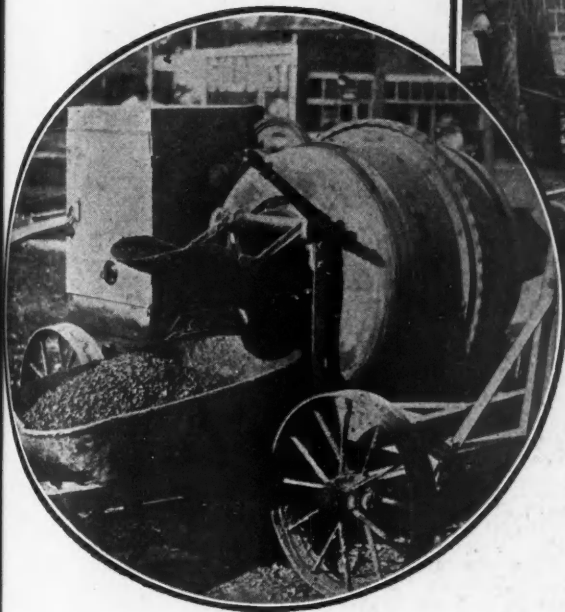
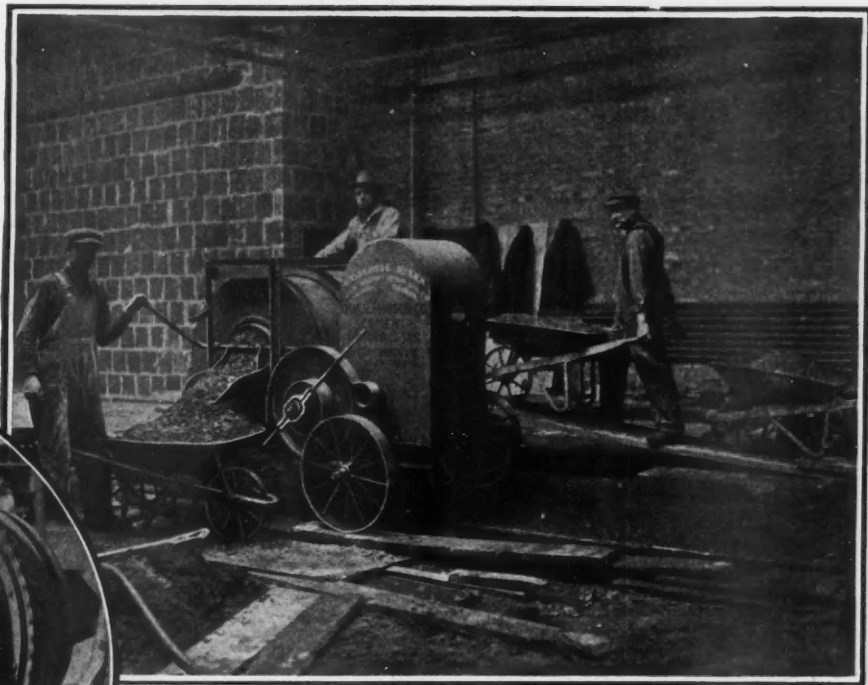
Of course stone work cost more to build per square yard and when you take into consideration the extra cost in cutting blocks for the formation of the window and door openings, the difference is so great that stone must be counted out of the question if economy is to be taken into consideration.

All the roofs of those houses are either to be covered with tiles or slates.

(Continued to page 116.)

The **Universal Mixer** is just the machine to use when the mixer must be moved frequently and quickly. Light in weight but strong on "go". In 7 cu. ft. size, with gasoline power and platform.

The **Low Charge**, in 7 cu. ft. size is heavier and stronger—a small edition of the big Lakewood mixers. Power loader, batch hopper or charging platform. Gas or electric power.



One of These Lakewood Mixers Should Be Used on Every Job

Here's What a Lakewood Low Charge Did for W. L. Eby

W. L. Eby, Contractor, of Oklahoma City, used his Lakewood Low Charge Mixer 360 days continuously one year and 250 days the next year. The only new parts purchased were two drive chains.

Today the mixer is practically as good as new. Mr. Eby used it to mix concrete on the new Exposition Building for the Oklahoma State Fair.

110 of these Lakewood Low Charge Mixers were on active duty with the Engineers in France. And they did their work regularly day after day.

Good proof that Lakewood "Built to Last" means just that. Get your mixer from Lakewood. It pays YOU.

Want a Copy of Bulletin 21-A?
By Return Mail.

MANY contractors have found that Lakewood Universal Mixers on the job pay big dividends. For instance, the North Chester Realty Co. used 10 Lakewood Universals on building construction near Philadelphia.

The Casper Ranger Construction Company used six Lakewood Universals to mix concrete for the foundations for 300 houses at Quincy, Mass.

Wells Brothers used seven Lakewood Universals at Harrisburg, for government housing work.

These and hundreds of other instances where one, six, ten or more Lakewood Universals have been used on one job show that contractors thoroughly appreciate the value to them by using Lakewood Universal Mixers.

THE LAKEWOOD ENGINEERING COMPANY
CLEVELAND, U. S. A.

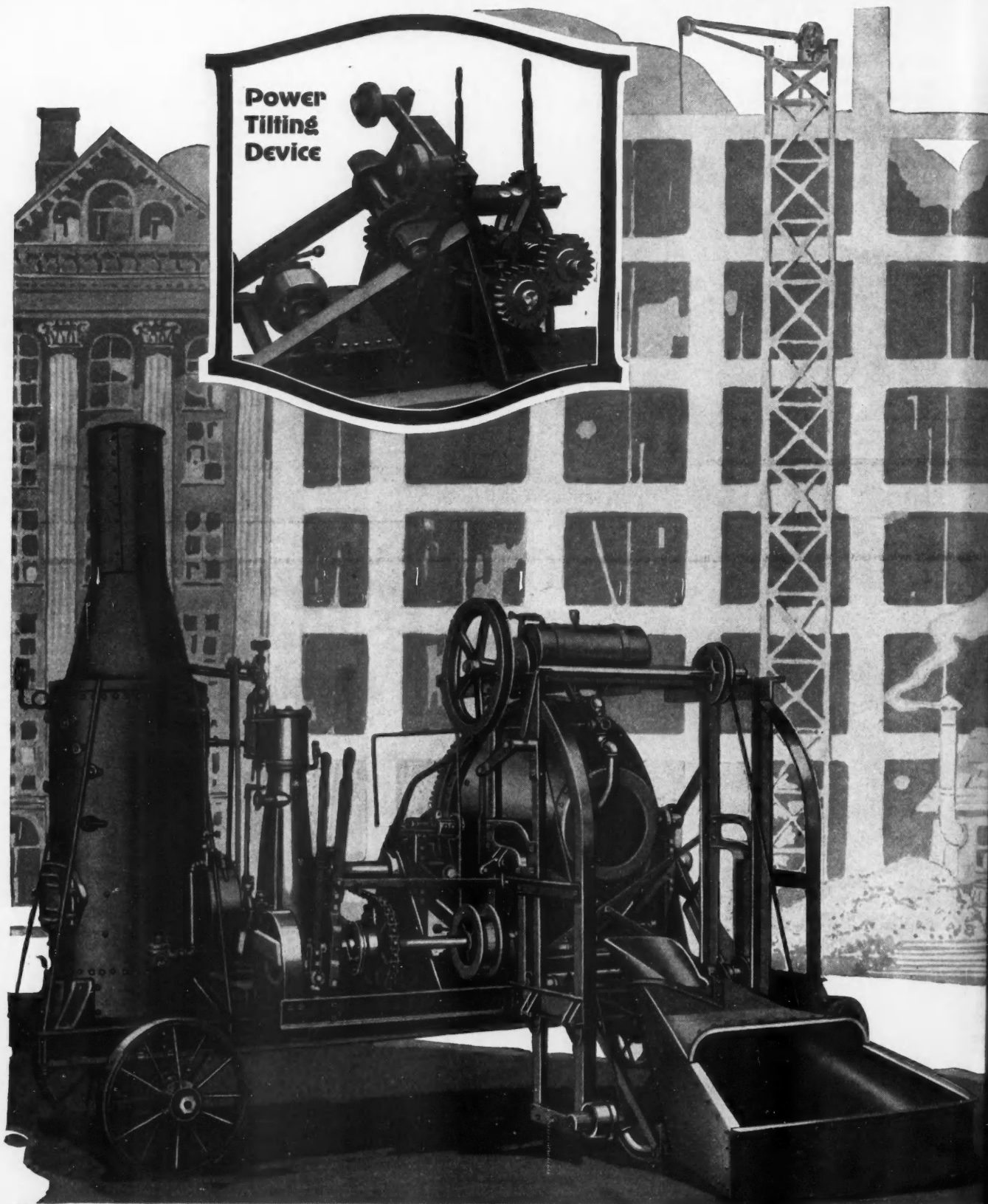
Offices in all the principal cities.

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SMITH

SMITH TILTING MIXERS

—built for Permanency

AN ambitious young salesman once remarked in a confidential salesmen's meeting that "the trouble with that Tilting Smith is that it never wears out—no chance for a replacement sale."

That "never-wear-out" sort of "trouble" is just what insures the investment you make in Smith Concrete Mixers, or in any SMITH Contractors' Equipment.

For over 20 years the Smith Tilting Mixer has maintained supremacy in this field. It is the standard of Excellence and Efficiency. It is the ideal toward which many have striven. It is built for permanency.

Besides the 14-S, illustrated here, the Smith Tilting Mixers are made in 10-S, 21-S, 28-S and 56-S sizes.

Get your equipment orders placed early. There is sure to be a shortage this year. Write us a letter, and the nearest T. L. Smith distributor will get in touch with you at once.

The T. L. Smith Company

3187 Hadley Street

Milwaukee --- Wisconsin

SMITH TILTING MIXERS - SMITH NON-TILTING MIXERS
SMITH SIMPLEX PAVERS - SMITH EXCAVATORS
SMITH FORCE AND DIAPHRAGM PUMPS
COMPLETE CONTRACTORS' EQUIPMENT



MIXER

Industrial Housing in England and Scotland

(Continued from page 112.)

The tiles are to be made with nibs and are to be laid to a four-inch gauge and not less than a two-inch lap, and every fifth course is to be nailed with two stout composite nails to each tile.

The hips and valleys are to be formed with proper valley and hip tiles, while the verge tiles are to be tile and half.

Slate Used on Roofs

In slating, local slates are to be much encouraged which is possibly due to the transport difficulties.

The amount of lap is to be 3 inches thruout the roof, and each slate is to be fixed with two 2-inch stout composition nails to 2-inch by 1-inch battens.

These two nails to each slate look all right on paper, but I would be very sorry for the man who is sent to repair a broken slate on a roof which has been wholly nailed as described above.

There are a great number of points in the carpenter and joiner work which are also interesting, but space prevents their description.

- Internally all apartments are to be plastered above the skirting, which means that all external walls which are built solid will require to be strapped and lathed.

Since all these roofs are to be covered with slates and tiles, flashings are required for chimneys and other projections passing thru the roof.

These flashings are to be 4-pound lead, so also are any soakers and valley pieces which may be required.

Gutters behind chimneys are to be five pounds and are to be turned up four inches against the brickwork and eight inches under slates or tiles.

Hot water is to be provided in all the houses and may be either by the tank or cylinder system or where the bath is on the ground floor and not far from the boiler on an approved gravitation system.

On the whole the plumbing fittings which are described in the various descriptions of the work are of a good quality.

Externally the woodwork and ironwork is to be painted, while the external woodwork is to receive one coat of approved wood preserving stain, and the woodwork of the windows is to be painted three coats of oil color.

Building Materials Scarce

Of course, one of the most menacing of the ten many serious difficulties which Britain is at present struggling with in its effort to restore the prosperity of the nation, is the great dearth of building material.

So much is at stake and so much depends on the securing of material for the erection of buildings of all kinds that the problem is hardly less momentous than the threats of war.

While the question directly affects the health of us all it has yet more pressing claims to the earnest consideration of those engaged in the building industry, and it is not surprising that in those circumstances architects and builders are earnestly seeking trustworthy information concerning the many substitutes for ordinary building materials.

Both those which have established reputations and those which inventive enterprise has recently introduced with a view to the reduction of cost of our present housing efforts can be used.

Of course it is admitted that further reduction can only be effected by improved manufacture and working methods.

We must have an increased production to counteract the recent increase in wages.



THE questions in the Correspondence department are interesting, as many of them present problems that are new to a great many builders. Solving them is good mental exercise for those who know how, and the answers are an education for the others.



Workers' Houses at Hethercrays, Parstey, England. Stucco Over Brick with Dormers of Stucco Over Wood.

Carpenters and Contractors!

LOUDEN

Expert Barn Building Service Will Help You



Wm. Loudon
Barn
Building
Specialist

The "Better Barn" Movement

is sweeping over the farming states. Many farmers in your locality need new or larger or better barns NOW.

You Can Have "FIRST CALL" on This Work

with Loudon Expert Help. Loudon service to Carpenters and Builders is practical. It enables you to give your prospect the best there is in barn building for the least money—to show him how he can build, arrange, equip and operate his barns to the greatest advantage, and make it most profitable. It will simplify your work and give you a stronger

assurance of getting the order to "Go ahead." If you will write us briefly what kind of barn your prospect has in mind, number and kind of stock he wishes to house we will send you without charge or obligation blue prints and suggestions accordingly. Complete working plans with material lists, etc., supplied at actual cost of production.

Get the Loudon Barn Plan Book

If you could see it you would not be without it for many times what other books along this line usually sell for. Yet we will send you this book postpaid without charge, if you will send us the names of one or more prospective barn builders in your locality, so we can help you get them started building.

Loudon Barn Plans is a big book—7 1/4 x 10 1/4 inches when closed; contains 112 pages, and is devoted entirely to barn building—not a catalog. Shows 74 barns and other farm buildings, with floor plans and estimated cost; tells about concrete work, drainage, lighting, ventilation, silo building. Numerous construction details illustrated and fully described in a way that any one can understand.

Loudon Labor Saving Barn Equipment

does so much in solving the farmer's big barn labor problem, in saving feed, manure value, and in giving cows the comfort and healthy conditions necessary to maximum milk yield, that no barn can be really profitable without it. Let us send you the Loudon Equipment Catalog—postpaid—no charge or obligation. 224 pages showing steel stalls and stanchions, litter and feed carriers, animal pens, manger divisions, hog unloading tools, power hoists, barn and garage door hangers, water bowls, cupolas, ventilators—"Everything for the Barn."

Write us today and let us help you line up the barn building business in your locality.

The Loudon Machinery Company

(Established 1867)

5533 Court Street FAIRFIELD, IOWA

The Loudon Machinery Co.

5533 Court Street, Fairfield, Iowa

Please send me full information on your Barn Buildings Service to Carpenters, also books checked below:

- Loudon Barn Plans
- Loudon Catalog

Prospective builders are:

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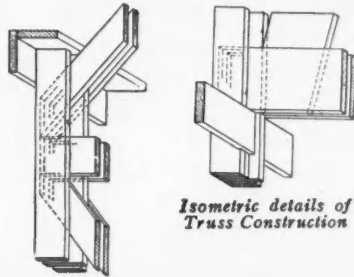
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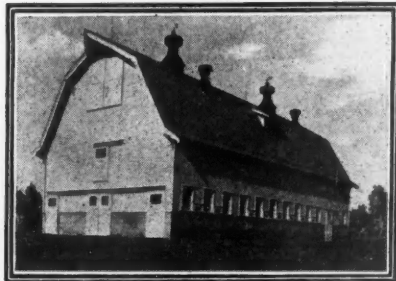
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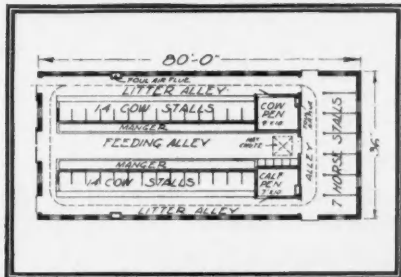
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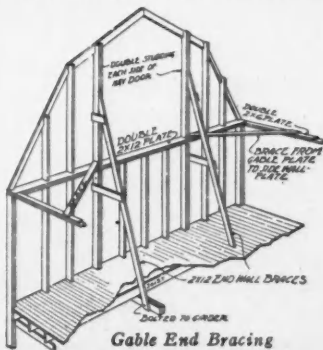
Isometric details of Truss Construction



Completed barn according to Design No. 6159 for 28 cows, 2 pens, 7 Horses.



Floor Plan for Barn Design No. 6159. See description Page 52 Barn Plan Book



Gable End Bracing

National Conference on Concrete House Construction

HOME BUILDING NEEDS OF COUNTRY TO BE DISCUSSED AT CHICAGO MEETING, FEBRUARY 17 TO 19.

FROM Feb. 17 to 19 inclusive, there will be held at the Auditorium Hotel in Chicago, a National Conference on Concrete House Construction. The purpose of the conference is two-fold; first, to consider the housing problem in the United States and Canada, and second, to present, crystallize and make available information regarding the most modern practice in the construction of concrete houses and concrete housing projects.

We cannot get away from the fact that there is an alarming scarcity of housing accommodations, and that unless some decisive and far-reaching effort is made to relieve the situation we, in this country, will find ourselves in the condition now existing in some European countries where people are forced to live in caravans and tents or any other temporary shelter that can be thrown together.

The present social and political unrest within our land is in no small measure an outcome of this deplorable condition. Families living in rented quarters must always be in surroundings marred and abused by others. By continually moving from one place to another they are unable to make permanent friendships and associations. Such a condition leads to dissatisfaction, induces unproductiveness, and brings about a gradual descent in the social scale.

The home owner is the rock on which the foundation of the nation's political and economic stability is built. None of the various forms of social and political unrest will flourish in a community of home owners. In such a community, rather, is found a refreshing, wholesome attitude and a common striving for the community's and the nation's best interests.

Home Building Need of Country

Thruout America there is no more vital need than that of home building, and the organization of such a housing conference as this is a timely recognition of the urgent need to attempt relief for existing conditions. The very great shortage at present is attracting public attention not only to the immediate necessity for more houses but also to the fundamental need for housing of the sort that makes for good homes and happy and contented people.

The house must be more than just a shelter and the community more than just a group of houses. Individual ownership of the home builds pride in the community and makes for good citizenship. More and more, home builders are realizing the necessity of building economically and permanently. Demand for information has been so great and practices so varied as to make the need felt for the standardization of the practice of constructing concrete houses.

The National Conference on Concrete House Construction is being called with a view to meeting these

demands. It will pay especial attention to methods of financing home building, community planning, fire protection and methods of constructing the various types of concrete houses. Every phase of the housing problem will be considered.

The following committees are now being organized:

- Architecture and Design.
- Community Planning.
- Financing Permanent Homes.
- Fire Prevention and Insurance Rates.
- Building Codes.
- Monolithic Concrete Houses.
- Special Unit Houses.
- Concrete Block Houses.
- Concrete and Cement Roofing.

Many Organizations Are Co-Operating

Many well-known organizations are co-operating in this movement, among them being the American Concrete Institute, the Associated General Contractors of America, the Concrete Products Association, the Portland Cement Association, the Illinois Society of Architects, the Illinois Chapter of the American Institute of Architects, the U. S. League of Building and Loan Associations and many other organizations of local and national influence.

During the week in which the National Conference on Concrete House Construction meets there will also meet at the Auditorium Hotel the American Concrete Institute, the Concrete Products Association, the Concrete Block Machinery Association and the American Concrete Pipe Association.

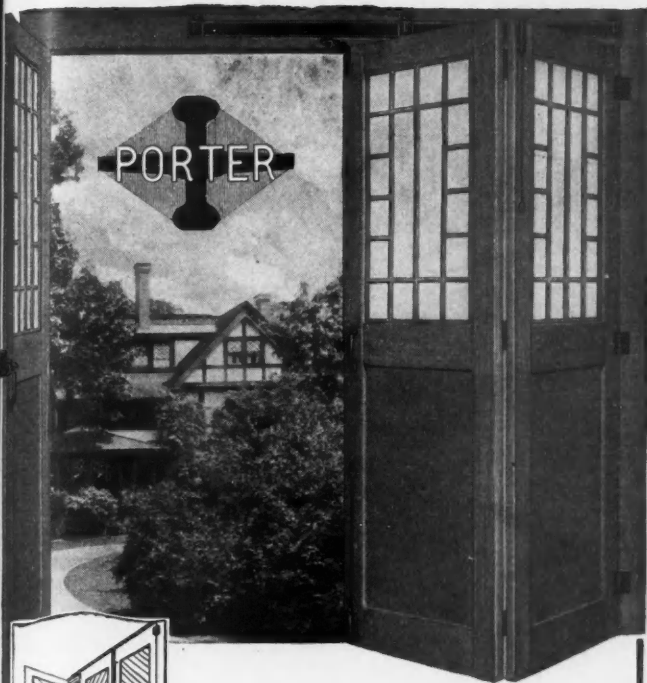
The conference will be attended by architects, contractors, community planners, cement products manufacturers, industrial and real estate development concerns, building and loan associations, and others interested in any phase of the housing problem. Individuals and concerns engaged in these and allied occupations are urged to attend the conference or send delegates so they may take part in launching a movement which will be of inestimable benefit to the nation at large.

Those intending to attend should write the Secretary, 111 West Washington street, Chicago, Ill., for program.



Concrete Roofs

FLAT roofs are constructed in the same way as the floors, except that the beams and girders are set so as to give a slight pitch to the roof, for draining the water. As the roofloads are usually less than the floorloads and there are no partitions to be supported, the arches or roof-panels are usually considerably lighter than the floor-panels, but the general construction is practically the same for both.



Artistic Garage Doors

Save Space and Open Easily

The illustration shows what perfect garage doors are made possible by "Straight-Away" Garage Door Track and Hanger. This simple, trouble-proof and sagless device overcomes all the disadvantages of ordinary tracks and hangers. It is simple, easy to install, inexpensive to buy, and makes doors easy to open regardless of ice and snow conditions.



Views Inside the Garage



STRAIGHT-AWAY

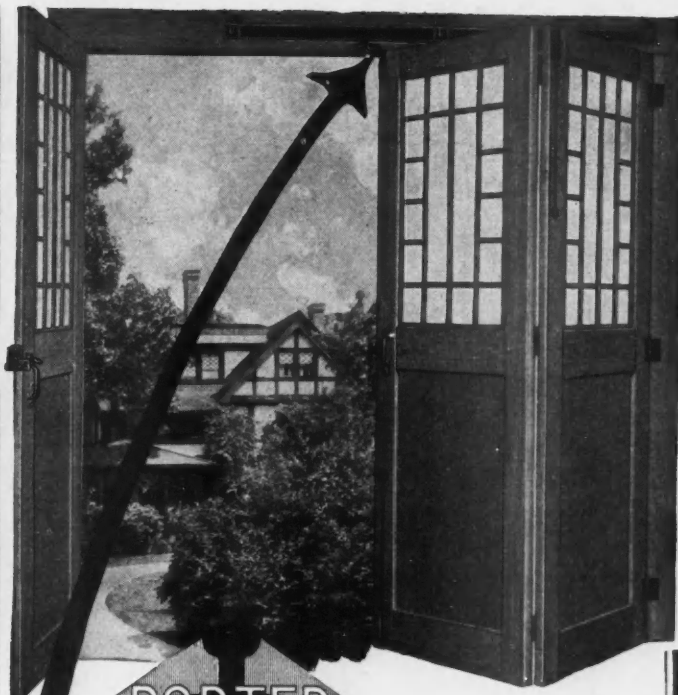
No Sag

Garage Door Track & Hanger

One man can easily and quickly install it. The extra cost and extra labor required to install the curved track are eliminated. This is due to its patented *offset swivel Hanger*, which runs on a *straight track*. Slotted holes are provided to permit of easy, quick adjustments when desired or necessary.

Designed primarily for standard doors 2 ft. 8 in. by 8 ft., for an 8-ft. opening. By using an extra length of track "Straight-Away" can be used for larger doors. Specify Porter's "Straight-Away" Track and Hanger and you will provide for ideal garage doors for your client.

J. E. PORTER COMPANY
479 Guion St., Ottawa, Ill.



The Latest Garage Door Track Refinement

Specify Porter's "Straight-Away" Garage Door Track and Hanger, and you have provided for space-saving, inward folding-sliding doors that have every desirable advantage.

The extra cost and extra labor required for installing the curved track hanger are eliminated, because of the Porter *Offset Swivel*. This permits the roller bearing truck to roll on a straight track. Doors easily open and close. Friction is reduced to minimum. Ice can't jam the sills. Perfect fit of doors against jamb and weather strip is insured. Storms can't blow in doors hung with "Straight-Away." Slotted holes in door strap provide for quick and easy adjustments when desired or necessary.

Shows Offset Swivel and Sectional View of Track and Hanger

The "Straight-Away" is made primarily for standard doors 2 ft. 8 in. x 8 ft., but it will do just as well for any 3 doors specified. Extra length of track can be provided.

The complete outfit is packed in a strong carton, except the track which is packed separately. Requires no expert help to install it. Screws are placed in envelopes and plainly marked where they are to go.

"Straight-Away" is backed by a guarantee that protects both you and your client. Write for further information.

J. E. PORTER CO.
782 Guion St., Ottawa, Ill.



STRAIGHT-AWAY

No Sag

Garage Door Track & Hanger



You are Requested and Urged to Make Free Use of These Columns for the Discussion of all Questions of Interest to the Building Industry

A Nut for the Mathematicians

To the Editor:

Wakarusa, Ind.

I have long been a subscriber to your paper and think it as good as it can be made and satisfies a large list of subscribers. Here is a nut for some of them to crack. Am making a concrete mixer of my own design. The cylinder is 12 inches in diameter and 6 feet long, around which four spiral paddles are to be placed. What is the diameter of the circle which will lay out the pieces when cut so that they will fit around cylinder? The paddles are to make three-fourths spiral of cylinder, which is 6 feet long.

Yours truly,

LLOYD I. HERSHBERGER.



Asks Advice on Saw Mill Construction

To the Editor:

Bridgeport, N. Y.

I am going to ask for your opinion in connection with a water mill. What I mean by a water mill is a mill driven by water power. This timber I intend to saw is from 7 inches to 1 foot in diameter and I kindly ask you to let me know what size mill and saws I need to saw that size timber? What would have to be the size of the driving or water wheel and the size of the pit wheel and the pinion wheel, the size of the shafts and pulley wheels? The mill is supposed to run with double gear. I also want to know the length of the belts or belting.

JAMES MAHONEY.



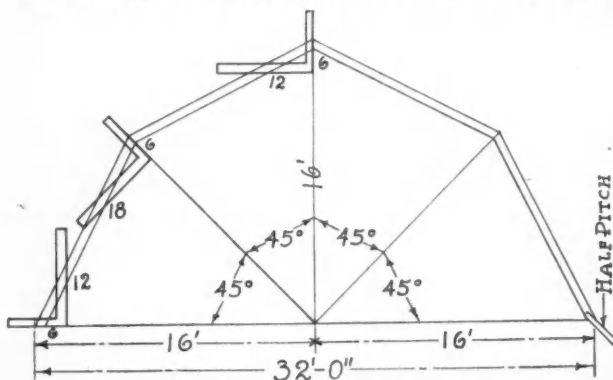
How to Cut Gambrel Roof Rafters

To the Editor:

Isabel, S. Dak.

I have enclosed diagram showing how I cut rafters for gambrel roof.

Notice the distance from plate to ridge is one-half of width of building. The cuts at plate and ridge are 6 and 12. The cut where the rafters join forms an angle of 45 degrees



Mr. Haskell's Method of Getting Cut of Gambrel Roof Rafters with the Steel Square.

from the center of building and will cut 6 and 18 on the square.

Draw plan of roof scale 1 inch to 1 foot to find length of rafters.

P. L. HASKELL.



How to Keep Throat of Hand Plane from Choking

To the Editor:

Freeport, Ill.

Enclosed you will find \$2.00 for your AMERICAN BUILDER. I wish to inform your subscribers of a little thing of itself but big in results. That is plane chips balling up in throat. I have a set of planes and all of them choked up in throat badly. I thought that throat was too small, so I took out the plane bit and noticed that throat had a square shoulder in front of plane bit. I filed the square part down to a sharp point and had no further trouble in chips balling up.

Pass it along to the boys, please.

D. C. TRESTES.



What Causes Oak Flooring to Bulge?

To the Editor:

Springdale, Ark.

I enjoy reading the Correspondence department of your valuable paper and get much good from it. A woman here has two rooms with $\frac{3}{8}$ -inch oak floor beneath. In many places the oak has sprung up—in some places so much so that the tongue of one board is almost out of the groove of the other one. What caused it and what can be done for it? Will it ever go back into place or will it have to be taken up and relaid?

L. O. NICKERSON.

Answer—While we do not know the circumstances, we would guess that the oak floor that you mention is laid in a house which has no basement or a basement that is damp. Oak flooring is thoroly kiln-dried before it is delivered to the job. In other words, it has been shrunk, and when laid where it is exposed to dampness it will swell. If the floor has been in the condition you mention for some time, undoubtedly the boards would have to be taken up and the imperfect ones replaced. However, this would do no good unless the damp condition is removed.—EDITOR.



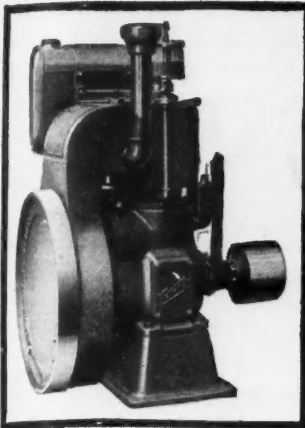
Mr. Cole Has Another Problem and Gives a Tip on Use of Steel Square

To the Editor:

Spokane, Wash.

Since asking the assistance of the members of your great family, which was published in the September issue of your valuable paper, I have removed to the above address.

I wish to thank each and every one who answered the



The Multi-Purpose, Air Cooled
"New-Way"
 5 Engines in One

**The First Real Contractor's Engine
 Has Arrived**

For years contractors have looked for this engine.

It must be, they said, a multi-purpose engine, adaptable to all kinds of work, big and little. It must combine the power range and usefulness of a series of engines in one model.

It must be a heavy duty engine but light enough to move easily from one job to another—compact enough to fit in anywhere on any machine.

It must be absolutely dependable under any conditions—must never tie up the work by a breakdown.

It must be fool-proof, dirt-proof, dust-proof, weather-proof. All water cooling nuisances must be eliminated.

In short, it must be many perfected engines combined into one.

The "New-Way" multi-purpose air-cooled 2 to 5 h. p. engine is the final product of 15 years manufacturing leadership. Such an engine was bound to come some day. Now we have discontinued all other models and standardized our great plant to make this one master engine.

The "New-Way" was adopted for army use during the war just as the Liberty Motor was. It was adopted only after the most terrific and gruelling tests. It was built for rough war use and such dependability for work under the hardest possible conditions was never known before. It is adaptable to

any work—any drive—any fuel. Its fuel economy is amazing. Runs on gasoline or kerosene.

Years of success have proved the "New-Way" air-cooling system ideal. Neither freezing cold nor scorching heat affect it. All water troubles are ended.

The "New-Way" is the lightest weight heavy duty engine ever made, complete and ready to run. It is built like a fine automobile engine. Its exclusive features include high tension Bosch magneto, automobile float-feed carburetor; throttling governor. Instantly by moving a lever the speed can be changed from 400 to 500 r. p. m. as may be desired. No other contractors' engine has this important feature. Only engine made with all gears and governing parts enclosed and operating in bath of oil.

Night Work

With a "New-Way" you are ready for emergencies. When time is money you can attach it to a generator and flood light the whole job for night work.

Specify "New-Way"

Specify a "New-Way" on all power-driven machinery. It doubles its value and you can detach and use the engine for countless purposes. This new era engine means speed, dependability and profit on every job. Write for full description.

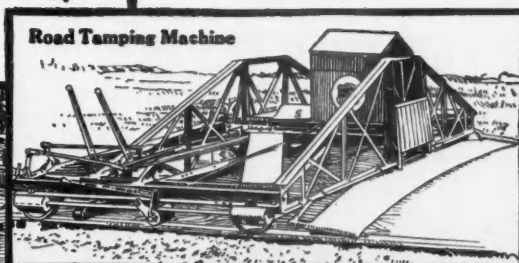
THE "New-Way" MOTOR COMPANY
 LANSING, MICHIGAN, U.S.A.

Some Uses

- | | |
|-----------------|----------------------|
| Road Machinery | Tamping Machines |
| Concrete Mixers | Floor Surfacers |
| Air Compressors | Section Railway Cars |
| Back Fillers | Loaders |
| Hoists | Conveyors |
| Saw Outfits | Flood Lighting |



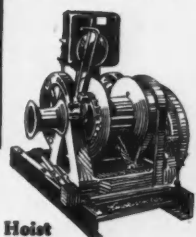
Concrete Mixer



Road Tamping Machine



Saw Outfit



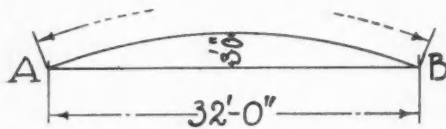
Hoist



"Goes and Goes Right on Gasoline or Kerosene"

same and will say that "it" was just what I needed. And so, being encouraged by my last efforts, I will go a little further and ask another question.

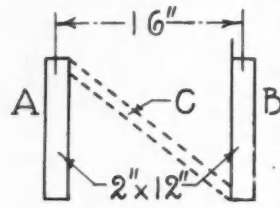
Taking the same sketch as was used in the September issue,



M. J. Cole's New Problem.

to B, as per sketch, both mechanically and mathematically, and especially by the steel square.

While I am asking so many questions I will try to show a very easy method of laying out bridging directly on the material at hand. This may not appeal to the older hands,

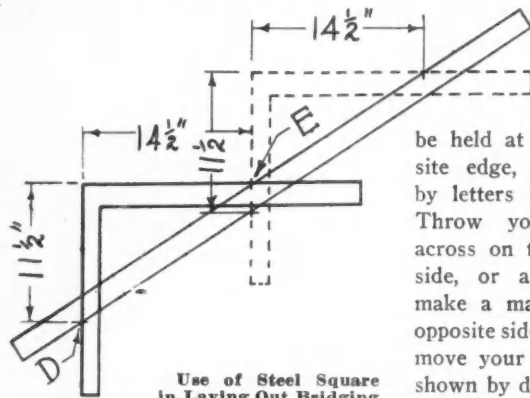


Method of Laying Out Bridging.

but it is very handy to know, and I have found very few journeymen who can lay them out direct upon the stick to be used. Here is the way I do, represented by the sketch. Let A and B represent your joists and C your bridging, as sketch shows, 2x12-inch joist and 16 inches on centers. The actual depth of joist would be about 11½ inches and the

distance between would be 14½ inches. Now to lay that out I will make another sketch.

Take the actual depth of your joist on the tongue of your square and the actual distance between them on the blade and, as per sketch, 11½ would be held to the edge of the stick nearest you while the distance between, 14½, would



Use of Steel Square in Laying Out Bridging on the Sticks.

be held at the opposite edge, as shown by letters D and E. Throw your pencil across on the tongue side, or at D, and make a mark at the opposite side, E. Then move your square as shown by dotted lines and place in the same way as at first and

mark on the tongue side, as at D, and you have your pattern.

This is very handy to know around large work and where there are various openings, which make the spacings come different, because you can lay out each separate piece in just a few seconds.

Trusting I have not used too much valuable space and that the above will be of help to some of the family, I am a hearty supporter of the AMERICAN BUILDER and especially the Correspondence columns.

MORRIS J. COLE.



What is Reasonable Charge for Equipment on Cost-plus Job?

To the Editor:

Freeport, N. Y.

Recently I finished a job of waterproofing three cellars on the basis of cost plus 10 per cent. I submitted a bid to do this work by contract, but the architect, who acted for the owner in this case, decided to let me do the work as

above stated. I am pleased to say that the result as to the cost was about the same as my bid.

I had no previous experience as how to make a proper charge for my equipment and overhead expenses, but thought I had struck it about right when I received the certificate from the architect without any protest.

I presented the bill, together with the architect's certificate, to the owner and expected to get my check for the balance (the owner having paid part on account), as my work was perfectly satisfactory in every detail.

I was disappointed when the owner did not honor the architect's certificate, but made serious objection to the charges for my equipment and said he would have to take the matter up with the architect.

Being a reader of the AMERICAN BUILDER I happened to think of you as an authority in matters of this kind, and take the liberty of enclosing copy of my bill and ask for an opinion from you. My bill follows:

| | |
|---|----------|
| To waterproofing three cellars on the basis of cost plus 10%: | |
| Steel for reinforcement, as per bills | \$219.17 |
| Express charges, as per bills | 8.14 |
| Freight charges, as per bills | 3.45 |
| Gravel for concrete, as per bills | 120.00 |
| Toxement waterproofing, as per bills | 34.50 |
| Ceresit waterproofing, as per bills | 30.20 |
| Anti-hydro waterproofing, as per bills | 67.50 |
| Portland cement and lumber, as per bills | 289.98 |
| Plumbing, as per bills | 13.79 |

\$786.73

For use of equipment:

| | |
|--|--------|
| Hired power pump, 21 days | 54.13 |
| Auto, 21 days, 480 miles, at 10c | 48.00 |
| Trailer, 21 days, at 50c per day | 10.00 |
| Concrete mixer, 6 days, at \$8 per day | 48.00 |
| Power Pump, 12 days, at \$6 per day | 72.00 |
| Hand diaphragm pump, 20 days, at 50c per day..... | 10.00 |
| For use of 4 pairs of rubber boots, 20 days, at \$1.... | 20.00 |
| For use of lumber, shovels, picks, bars, wheelbarrows, mixing boxes, pails, brooms, brushes, watchman's shanty and tool house, canvases, barbender and lot of masons', stone cutters' and carpenters' tools, at the rate of \$4 per day, for 20 days | 80.00 |
| To miscellaneous materials, as per bill | 119.44 |
| Compensation insurance | 17.13 |
| To labor, as per time sheets | 792.02 |

\$2,057.45

Plus 10% on cost

205.74

\$2,263.19

Credits:

| | |
|---------------------------|--------|
| 10 bags cement | \$9.00 |
| 4 sheets steelcrete | 17.28 |
| 9/20, by check | 500.00 |
| 10/11, by check | 500.00 |

\$1,026.28

Balance

\$1,236.92

P. S.—My wages is included in the labor cost, as I worked with my men. I have made no charge for office expenses.

A. S. JOHNSON.

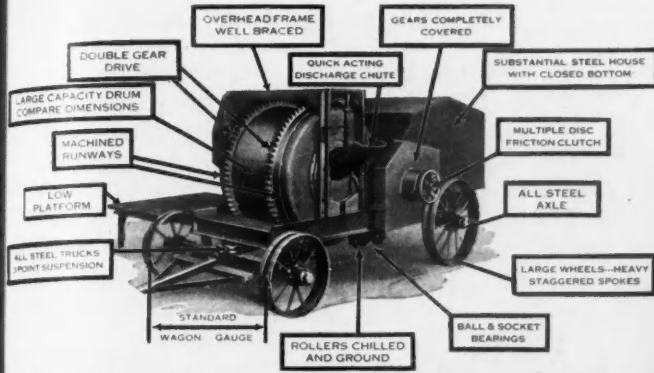


Wants Poultry House Design

To the Editor:

Peoria, Ill.

The plan book and magazine are great. Sometime I wish you would show a sketch of a poultry house about 60 feet long, one that can be used from both sides. I am figuring on putting one up next spring and it would sit in the middle



DANDIE

The Big Value Light Mixer

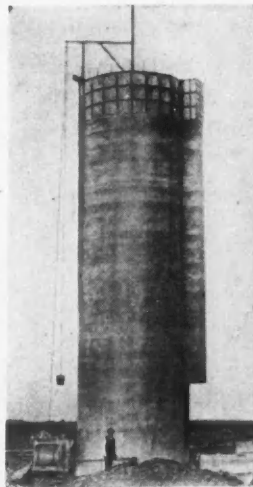
Send back the coupon at the bottom of this page—and get the full facts about the remarkable value of the light mixer field—the light mixer built first for **reliability** and then built in **volume** to keep the price down.

No, sir, the Dandie is not the cheapest mixer—it is the first light mixer built as strong as a light mixer can be built. It stands up to all the work you can give it—is dependable to stick on the job without costly delays.

But the price is within the range of light mixer prices—that is why it is the **remarkable value**—you are surprised that you could get such construction for the price. It is only made possible by scientific design, big production and standardization

of every part. This is how we get the price down, not by skimping.

Get the Dandie Catalog—get the full details of how volume production has put new reliability into the lighter mixer field—see for yourself why the Dandie is the remarkable value of the industry.



4 cu. ft. and 7 cu. ft. capacities Wet Batch Rating. No. 104-S, gasoline, No. 107-S, steam or gasoline. May be equipped with low charging platform, power charging skip, automatic water-measuring tank and light duty hoist.

The Big Yardage Mixer for Footings, Sidewalks, Silos, Culverts, Etc.

SEND BACK THIS COUPON

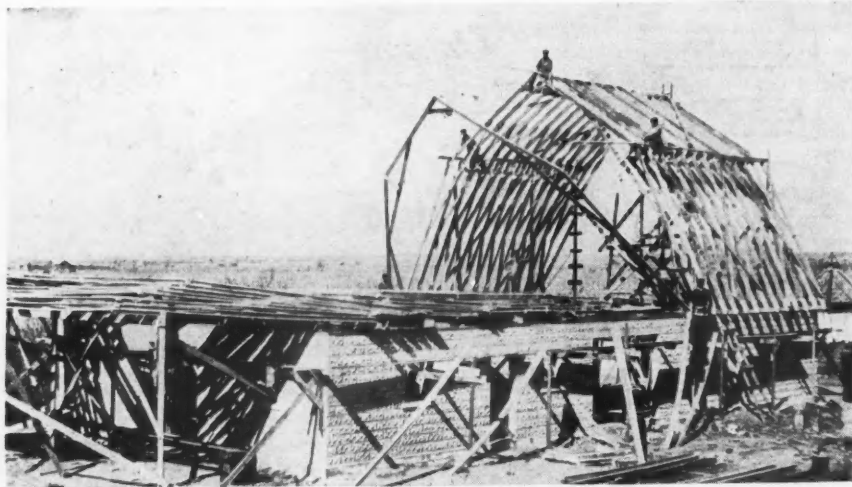
KOEHRING MACHINE CO., Milwaukee, Wis.

Please send, without obligation, your Dandie Big Value Catalog K-5, and advise me where I can see a Dandie Mixer.

Also send me information on items marked X in Bar Benders Bar Cutters

Name _____

Address _____



Raising the Rafters on One of the Barns Built by J. B. Gladfelty, Alton, Kas.

of the lot with runs on both sides. I would like to get an idea on how to build and arrange one inside and outside.

GEO. WEEKEN.



The Barns They Build in Kansas

To the Editor:

Alton, Kansas.

I am sending you my renewal for the *AMERICAN BUILDER*, which I could not get along without. I am also sending you a couple of photos of a barn that has made quite a hit in and around this part of Kansas. I would like to see it in print as they might help some other carpenter. You will find me on the top. The barn is 40x70. First rafters 18 feet, top rafters 16 feet. Blocks made by the McArthur Board Block Molds. The top course has a wire cable laid in air chamber and then filled with concrete so as to tie it together.

Yours for business,

J. B. GLADFELTY.



Another Method of Getting Length of Brace

To the Editor:

Columbus, Ohio.

The problem submitted by Mr. Doyle in the October

secured by applying the square either to the vertical or horizontal lines.

J. D. DE BRA.



Would Like to See Painters' Department

To the Editor:

Stewartsville, Ind.

I only find one thing lacking in your paper. You should have a painters' department. Most all contractors wish to know what the other fellow is using for finish, and in this locality most of the jobs are contracted and include a paint job, or, in other words, a complete job, inside and out.

Yours with best wishes for a merry Xmas and prosperous New Year,

WM. E. YORK.



Requests Manufacturers' Catalogs

To the Editor:

Berlin, Wis.

I am going to start contracting next year. Would be very thankful to you if you would send my name to any firm that is sending out catalogs or pamphlets pertaining to building material or general building contractors' equipment.

SAM T. GREENE.



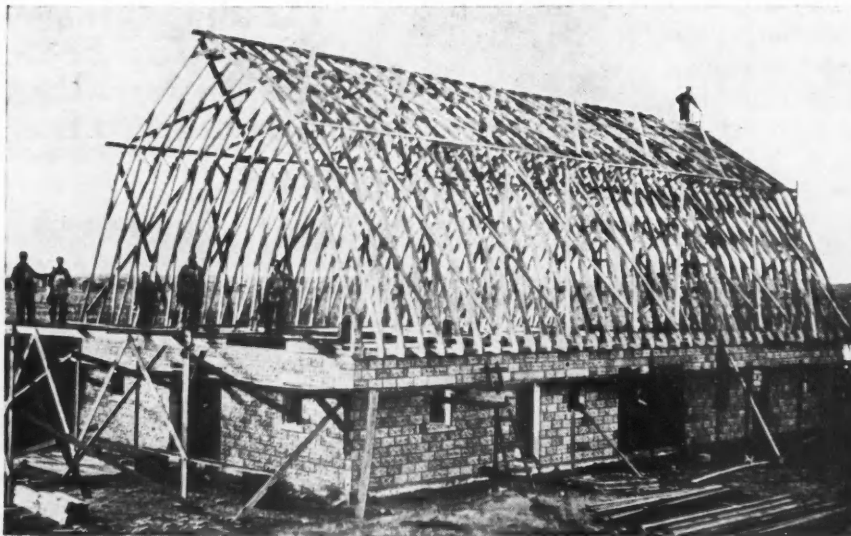
Need American Builders' Equipment in England

Manchester, England.

To the Editor:

I am, in common with the majority of builders, keenly interested in the house shortage in this Old Country, and feel convinced that builders as a body are not aware of the wide range of concrete machinery that I regularly saw advertised in the *AMERICAN BUILDER* while I was in Canada and a subscriber to that journal. I am sure that if some of the makers were to get in touch with the big distributors of this part of the world there would soon be some business doing.

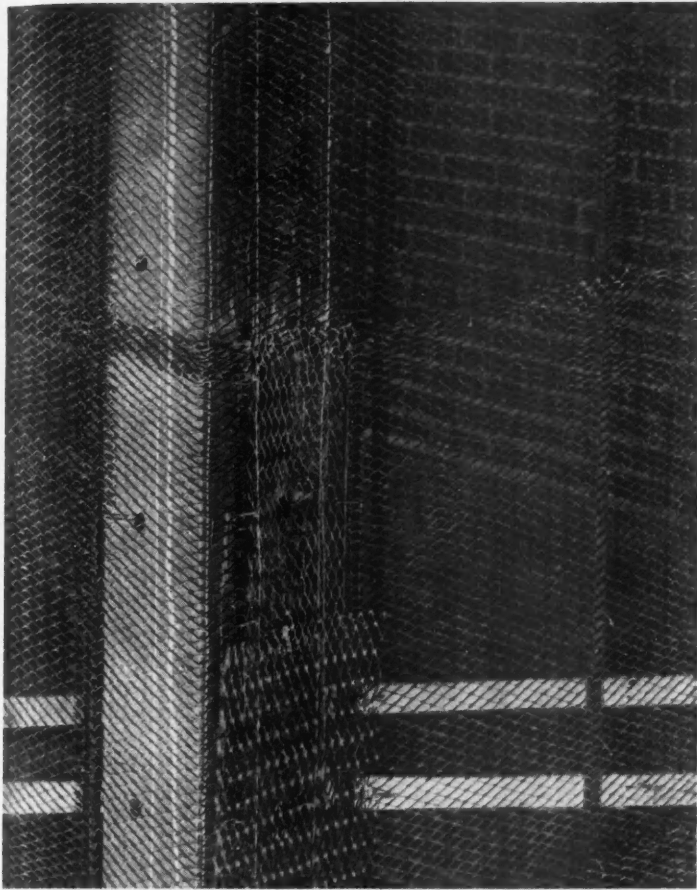
In answer to a request to be put in touch with certain advertisers I once made to you, I received quite a lot of trade catalogs, etc., which I brought back with me and have since distributed among members of the kindred trades. No doubt they have been of some use, for I've seen lots of American



Ready for the Roof Boards on Barn at Alton, Kas. J. B. Gladfelty, the Builder, Is Standing on the Ridge.

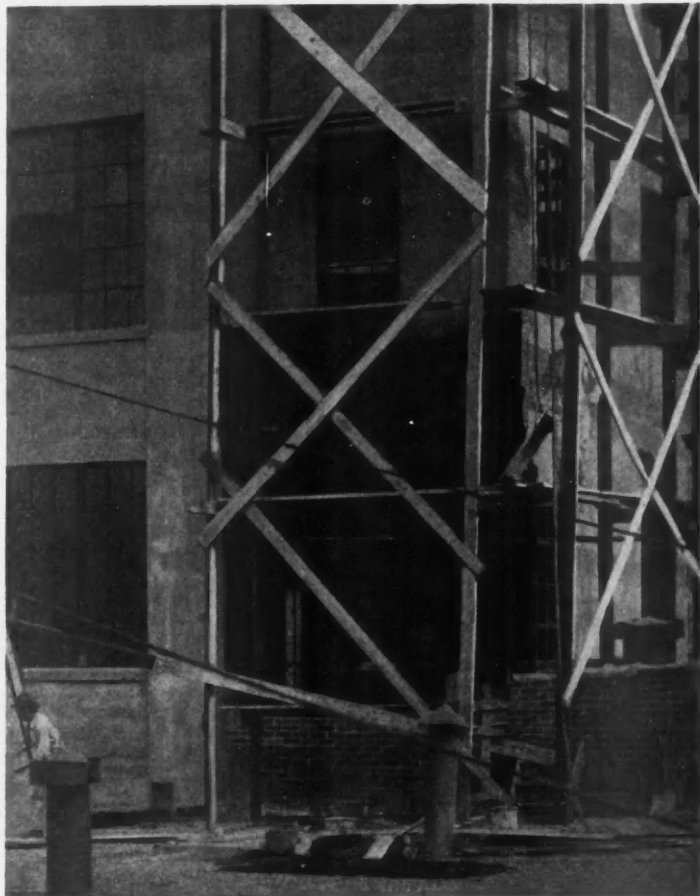
FIREPROOF

Elevator Shafts and Outside Stairways



The illustrations on this page are used to show how easy it is to provide fireproof elevator shafts and outside stairways with a minimum of labor and expense. Note behind the meshes of the lath in the photograph at the left—how the steel channels are placed, how simply they are attached to the building. Cross-wired at the intersections, they provide a rugged steel skeleton on which the lath may be applied rapidly. This illustration is printed to show the adaptability of steel channels and metal lath to varying construction problems—outside as well as inside the building.

Note in the photo at the right how this sturdy skeleton of steel is enclosed in its plaster coat. The rigid Ideal Lath takes the plaster without sagging, becomes after plastering the heart of a solid, reinforced wall, with lath and plaster one united mass.



There is an enormous demand these days for just this kind of fire-resistant construction that withstands the elements and endures for a lifetime. Factories need enlargements, new buildings, outside shafts and stairways. Architects and contractors can keep up to the minute by specifying these materials.

The Youngstown Pressed Steel Co.
Youngstown, Ohio

Makers of

- | | |
|--|-----------------------------|
| Ideal Metal Lath | American Corner Bead |
| Mahoning Metal Lath | Youngstown Expanded Metal |
| Youngstown Metal Lath | Parker Corner Bead |
| Youngstown Prong Lock Studding | Sharon Cold Formed Channels |
| Crimped Metal Furring | |
| Sharon Perforated Cold Formed Channels | |

merchandise here, altho I do not claim it is at all owing to my efforts.

However, may I again trespass on the promise you regularly make to your readers (I am not one now simply because I can't get "A. B.") and thru you ask your advertisers to oblige me with their catalogues of concrete machinery, etc? At present I only possess part of the "Van Guilder," but would like to have complete sets of all, as there are possibilities that are very big.

If any makers already have agents here, I should be obliged if your advertisers will give me their addresses.

ARTHUR NUTTALL.



Where Should Roof Overflows Be Located?

To the Editor:

Columbus, Wis.

Would you be so kind and give me your opinion of the following: We have a building here, size of roof is 26 by 76 feet. The roof is to be a Barrett Specification Tar and Gravel. The downspout leading the water from this roof is one 4-inch diameter conductor. Is this large enough for this size of roof?

The architect has two overflows marked on plans. They are 12 inches higher than the lowest point of the roof. He claims that the flashings must be made water-tight so that the water could raise 12 inches to the overflows. This does not look proper to me. I think the overflows ought to be down, even with the lowest point of the roof.

CARL IBISCH.



Asks for Rule to Get the Curve for Header in Silo Roof

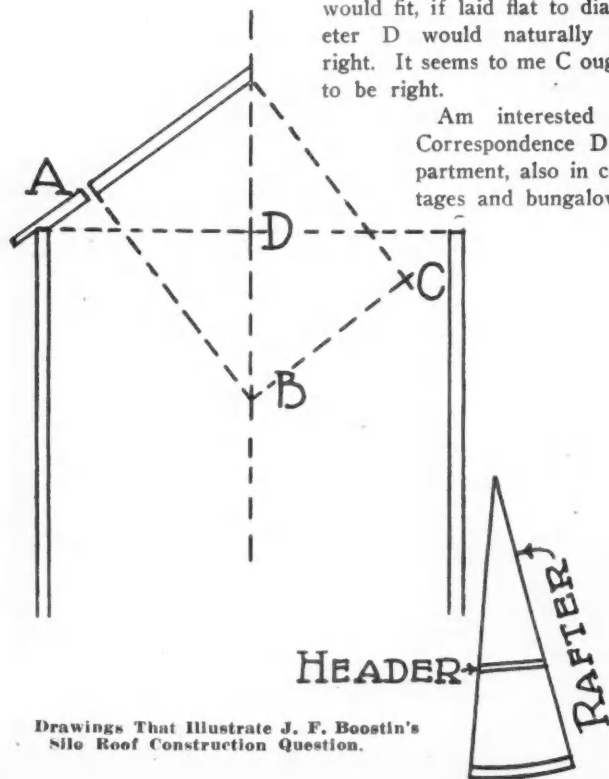
To the Editor:

Isanti, Minn.

Please have your expert show us where to center from to get the curve for a straight header to go between rafters on a silo roof.

If header was curved B would fit, if laid flat to diameter D would naturally be right. It seems to me C ought to be right.

Am interested in Correspondence Department, also in cottages and bungalows.



Drawings That Illustrate J. F. Boostin's Silo Roof Construction Question.

Have the usual equipment of brackets, mixer, sawrig, hoist and complete rig for making the blocks and erecting a block silo. Have to do everything from installing a water system, milking machine or electric light plant to moving a silo or windmill.

Wishing you all a prosperous New Year, I am

J. F. BROOSTIN.

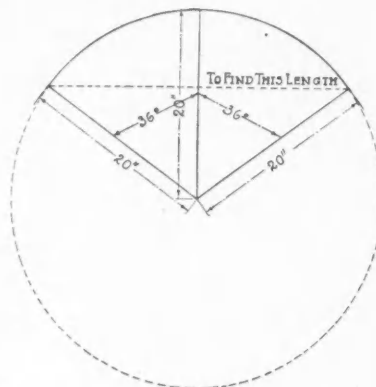


Another for the Mathematicians

To the Editor:

Quincy, Ill.

Each month I notice in your Correspondence department certain building problems asked and explained by brother readers, which have been of much interest to me. And now will some reader of the AMERICAN BUILDER give me a solution for the following?



Having the radius and length of the circumference of a certain segment of a given number of degrees, find the chord and sine of said segment mathematically. For instance, this:

What is the Rule for Finding Chord and Sine of Segment of This Circle?

The radius of this segment, as shown by

the drawing, is 20 inches with an angle of 36 degrees from center. I would be pleased to have a rule that would give me the length of the chord and sine of this segment.

T. E. FRIKE.



Wants to Build Woodworking Shop, Free of Posts

To the Editor:

Steinbach, Man., Can.

I want to build a woodworking shop 40 by 56 feet and 12 feet high. I would like to know how to brace or support the roof so that I have room free of a post. The pitch of the roof is 1 1/4 inches to the foot.

FRANK GRIESEN.



Wants Mahogany and Walnut for Cabinet Work

To the Editor:

Jackson, Mich.

Will you please advise of the name or names of any concerns in most any part of the country who deal in such lumber as mahogany and Circassian walnut?

I wish to buy this material in small quantities, for cabinet making purposes.

GEO. B. TUBBS.



Simple Method of Solving W. F. King's Problem

To the Editor:

Portland, Ore.

In the September issue W. F. King wanted to see this problem worked out: A board 18 feet long, 6 inches wide at one end and 16 inches wide at the other. Where would it be cut in two so that each piece has the same number of square inches? It was solved by Felix McGrew and several others. Mr. McGrew would like to know if any one has a simpler method to come out with it. I will give him a very easy method to solve it by simple mensuration. Here is the rule:

CALORIC PRICES DOWN

Quantity Production Lowers Prices

The big news of 1920—Caloric makes heavy price reduction in the face of the highest labor and material costs in history.

Increased factory capacity and concentration on one product to meet the avalanche of Caloric demand—these are the outstanding facts back of this new Caloric achievement.

To the Caloric Dealer this means PRICE LEADERSHIP added to QUALITY LEADERSHIP. It means selling argument competition cannot meet. It means opportunity UNLIMITED.

The 1920 Caloric is the nearest perfect heating plant produced—perfected in important details and improved in quality wherever improvement has been found possible.

The Caloric is an unequalled success in over 76,000 buildings from Alaska to Florida and from Maine to California. Caloric advertising always surpassing in previous years the combined advertising of competitors, will in 1920 far outstrip anything we have ever before attempted.

Caloric price leadership is a new call of opportunity. One of the fine territories still open may be in your locality. Details of the Caloric proposition on request. Write for them NOW.

Monitor Shipping
and Selling Service
is Nation Wide

The Monitor Stove Company

(The Monitor Family)

121 Years in Business Cincinnati, Ohio
700 Gest Street

HEATING
HEADQUARTERS



LARGEST MANUFACTURERS OF WARM AIR FURNACES IN THE WORLD

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

Subtract the square of the small end from the square of the large end. Then divide by 2. Now subtract the quotient from the square of the large end and extract the square root and you get the width of cut dividing the board into two equal areas. Now you want to know the length of the two pieces. Add the width of the cut and one end together and divide by 2 to get the mean width. Next divide one-half the area of the board by the mean width thus found and you get the length of that end. Then subtract that from the length of the board and you get the remaining length.

R. B. STARRETT.

Michigan Carpenter's Saws Half-Century Old

To the Editor:

Riverdale, Mich.

I was greatly interested in an article in the October number of the *AMERICAN BUILDER*, telling about Mr. McCormic and his Henry Disston & Sons saws that he has used for forty-seven and forty-nine years, respectively—truly a remarkable record.

While reading Mr. McCormic's letter I was reminded of a remark made by Mr. A. Carmer, a carpenter of this place, about the age of his saws.

As I was working with Mr. Carmer at the time, I decided to find out if possible just how long he had used his saws. He gave me the following information:

He bought the two saws shown in the accompanying picture from the Castleman Hardware Co. at Coldwater, Mich., in 1866, while the hammer standing on the "saw horse" is six years older and still in fine shape.

The saws, like Mr. McCormic's, are the justly famous Henry Disston & Sons make.



A. Carmer, Riverdale, Mich., and the Saws He Purchased in 1866 and Has Used Ever Since.

Mr. Carmer, who is a veteran of the Civil War, celebrated his eightieth birthday by shingling a house that he built here this summer; in fact, he has been "on the job" right thru the season, doing the same work and just as much of it as the younger men.

By the way, he says "more saws are worn out by excessive jointing than by natural wear."

Mr. McCormic in his letter says: "I would like to see the man who has more saws in good condition and older than mine."

As Mr. Carmer's saws are in fine condition, considering the fact that he has used them exclusively for fifty-three years, I am sending this picture of him and his saws, which is next best to meeting the man himself.

I subscribed for the *AMERICAN BUILDER* mostly thru curiosity, but now find I cannot get along without it. Even the advertisements are a fund of interesting information for the builder.

JESSE W. HARRISON.

These Saws 78 Years Old

To the Editor:

Preston, Idaho.

I have a Henry Disston saw that was a present to my grandfather on his twentieth birthday—that makes it 78 years old. It is like a large spring; can bend tip end thru the handle. It has a soft wood handle, such as beech or bass. It is not like the ones of the past 25 or 35 years. The saw was placed in an attic and remained there 21 years with his tools. On tearing down his house, it was found with three saws in frames, such as are used by the Norwegians in Norway, my grandfather's native land.

P. H. MONSON.

How to Prevent Cement Washing Off Cistern

To the Editor:

Moville, Iowa.

How can I construct a concrete cistern so that the loose cement will not wash off into the water? It is to be filled with soft water.

J. C. LARKIN.

Answer—Sodium silicate, commonly known as water glass, can be effectively used for this purpose. Water glass may be obtained at any drug store and should be diluted with about three to five parts of water. The walls of the cistern should first be thoroughly cleaned and washed and all loose particles removed. After the wall has thoroly dried, the dilution of water glass should be applied with a brush and allowed to dry. The walls should then be washed the second time, again dried and a second coating of water glass applied. After this second application has thoroly dried, the entire wall should be flushed with water to remove the excess water glass. That which has entered the pores will form an insoluble material with the other alkalies of the concrete and will add considerably to the density and insolubility of the wall.

THE EDITOR.

Is Sheathing Necessary for Stucco Over Metal Lath?

To the Editor:

Seroco, N. Dak.

Seeing that you're writing about cement houses, I would like some information. Can a building be put up by nailing the metal lath on studding and plaster inside and out, or must sheathing be put on outside? Would it be cheaper than a lumber house if a person did not count labor for hauling sand?

I am also thinking of putting up a cement wall, say, 8 inches with a 1-inch or 1½-inch dead air space and tie wall together with rods. If this could be done the outside

True Craftsmanship



WHETHER it be a dainty cabinet lid, massive portal or just plain door—there is a McKinney hinge or butt of proper beauty and design to fit.

The name "McKinney" on a hinge or butt stamps it as a standard product—worthy to blend artistically with the most elaborate architectural design and to perform the most sturdy tasks.

For fifty years McKinney hinges and butts have filled every hinge need. Effectively and silently they have served without sagging or repairs.

They have stood the test of years and won!

Your facilities for designing or building are hardly complete without the McKinney illustrated catalog. You will find it a valuable reference in meeting standard hinge needs and matching artistic plans.

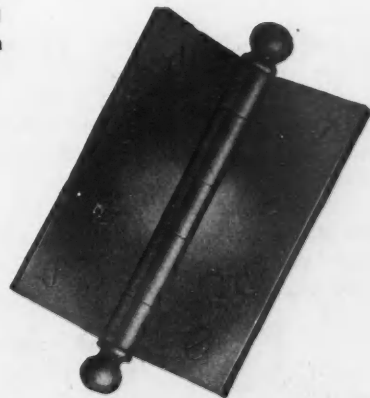
See that this book finds a place within easy arm's reach! A request for your copy will be answered by return mail without the slightest obligation on your part.

Hinge consideration *is* important!

McKINNEY MANUFACTURING CO., Pittsburgh
 Western Office, State-Lake Bldg., Chicago Export Representation

McKINNEY Hinges and Butts

Also manufacturers of McKinney garage and farm building door-hardware, furniture hardware and McKinney One-Man Trucks



could at future time be stuccoed and inside plastered right on wall. It's cheapness I am after.

Respectfully,

M. J. STAIGLE.



Bungalows Popular in New Mexico

To the Editor:

Clayton, N. Mex.

Enclosed find check of \$2.00 for one year's extension of subscription to your paper.

Will state that I am well pleased with the paper only would like to see more plans of one-story bungalows and residences, as out here in this part of the country, 5,000 feet above sea level, two-story houses are not in favor as advocated in the wartime housing plans, because the wind blows here 360 days out of the year and from 20 to 60 miles an hour, as the old saying is, and the people are especially averse to high buildings in the country.

Wishing you success and hoping that you may give more of the one-story bungalow styles when convenient, I am

O. F. BEINERT.



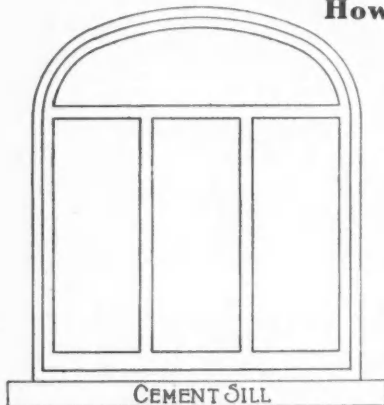
How Can This Window Frame Be Improved

Fenelon Falls, Ont.

To the Editor:

Will you please give me some information on enclosed sketch of window frame? Where could it be improved on for right proportion to itself? It is to be filled with leaded glass.

H. LITTLETON.



Mr. Littleton's Window Frame Design.



Asks Help on Floor Finish

To the Editor:

Vegreville, Alta., Can.

I am putting down a maple floor in a job I have and I would like if you would advise me of the best method of finishing this floor, either wax or varnish finish. There seems to be a great deal of difference of opinion among painters as to the best material for the first coat. I would be pleased if you would let me have this information at your earliest convenience.

CHARLES GORDON.



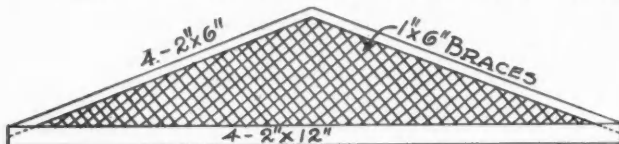
A Good Roof Truss

To the Editor:

Watseka, Ill.

I am sending a rough sketch of a roof truss, which I think is a good one. If you think it will do anyone good you can publish it.

First spike two 2x12s together the length you want the truss, then cut your rafters any pitch you want the roof. Cut the braces of 1x6 and space them 6 inches apart and nail well. Then cross them the same and nail well. Now you are ready to turn the truss over and put two 2x12s on the other side of truss, after which put the rafters on in the same manner, which makes the 2x12 and 2x6 rafters



Design for a Lattice Truss, Submitted by C. J. Bare.

4 inches thick, 2 inches on either side of the cross braces.

I think you will find this to be as good a truss as can be built, as I have built several, and they are carrying a heavy load and have not sagged one bit.

Yours truly,

C. J. BARE.

P. S.—I believe it is Wm. Miller, of Crosswell, Mich., who asks for this information.



Wants Advice on Cost-Plus Contracts

To the Editor:

Paynesville, Minn.

Could you give me any advice in regard to the "Cost-Plus Fixed Fee" plan of contracting?

Is this plan used very much?

About what per cent of the total cost of the building does the contractor usually receive for his services?

Would it not be well to use this plan occasionally now when it is hard to get definite prices for a period ahead?

What form of contract is drawn up for this kind of a deal?

E. G. OPITZ.



Proper Proportions of Gambrel Roof

To the Editor:

New York City.

Can you advise me the best method to proportion a gambrel roof for first-class residence work, width of house ranging from 18 to 30 feet? I have seen many where the proportion was so bad as to make a poor looking roof.

WILLIAM A. EHLERS.

Answer—The usual proportions of a gambrel roof are 60 and 30 degrees.—THE EDITOR.



What Makes Pitch Accumulation in Chimney?

To the Editor:

Tabb, Va.

I have seen many questions asked and answered, so I have one to ask. I have a flue 8 by 8 inches, which can accommodate four rooms, one heater to each room, tho there are only two rooms used, which are on lower floor. There is a coat of pitch that forms on the inside of this flue. Is there anything I can do to prevent this pitch? I use an air-tight heater thimble about four inches from floor. Would it be necessary to put an extra thimble if this chimney has good draft? I think it sweats. I use different kinds of wood, such as gum and pine, as fuel.

Hope I may get some information on this.

HENRY L. RIGGINS.



The Simplest Roof Truss

The simplest truss that can be built is that which consists only of two struts or rafters and a tie beam. As the unsupported length of a strut, on account of economy, should not exceed 12 feet, such a truss is not suitable for spans exceeding 20 to 24 feet, and even for a span of 20 feet there should be a center rod, as shown by the dotted line R, to support the tie-beam. To utilize this truss for a greater span than 24 feet, it will be necessary to brace the rafters from the foot of the center rod. This gives us the king-roof truss, the modern type of the old-fashioned king-post truss, which was built wholly of wood except for iron straps.

When the tie-beam supports a ceiling or attic floor, rods should be inserted to support the load on the tie-beam. By increasing the number of rods and braces this type of truss may be used up to 64 feet, and even for greater spans, but it is not an economical type when the span exceeds 60 feet, on account of the increased length of the center braces and rods.



Art Craft is *The* Economy Roof

Easily laid over old wooden shingles, it saves the expense and litter of ripping off the old roof. It is fire-safe. It gives lasting service. Slate-surfaced. Beautiful patterns. Colors—red and green.

Again we leave you with this one thought—Art Craft is a real economy roof. Ask us to tell you how Art Craft will bring you more business.

BIRD & SON, inc., Dept. C, East Walpole, Mass.

Established 1795

1472 West 76th St., Chicago

200 Fifth Avenue, New York

Canadian Office and Plant: Hamilton, Ont.

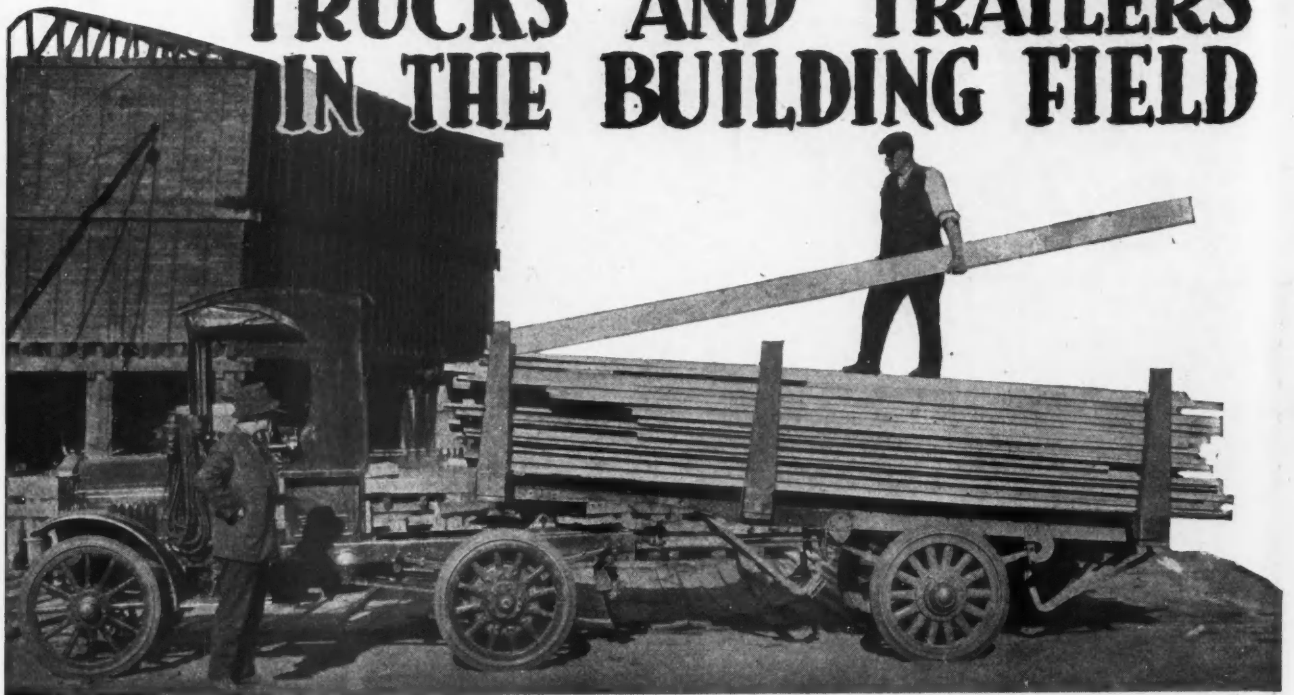


Art Craft Roof

BIRD & SON, Inc., Dept. C, East Walpole, Mass. I want to learn how Art Craft will bring me more business.

Name..... Address.....

TRUCKS AND TRAILERS IN THE BUILDING FIELD



Motor Trucks Needed By Contractors

TRUCKS ARE LABOR-SAVING AND PROFIT-MAKING PIECES OF HAULING EQUIPMENT

THERE is no activity in which the old saying that "time is money" has a more direct application than in the contracting business. Waste of time means waste of labor and of the money-making capacity of equipment, and a consequent loss in the profit the contractor makes or expects to make when he starts a building job.

In figuring a contract, the contractor knows what the materials will cost, and he can be pretty certain of the price per hour he will have to pay the labor he will need. It is then up to him to see that materials and equipment are at hand

so that the men will be able to work continuously.

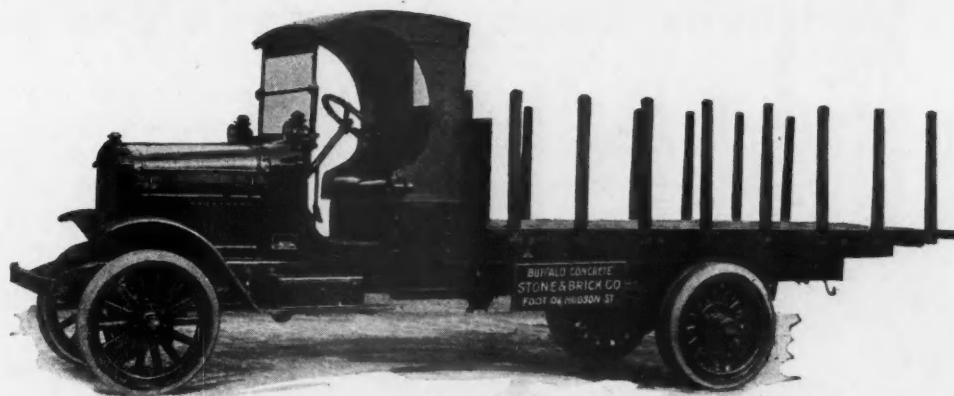
When the progress of a building depended on the ability of teams and wagons to deliver materials and equipment to the job, contractors experienced many costly delays—delays that often turned what promised to be a profitable contract into one on which he lost money. This problem, however, has been solved by the motor truck.

Motor Trucks Are Time-Savers

Contractors were among the first to recog-



Watt & Sinclair, Carpenters and Builders, New York City, Use This "Republic" Truck for Hauling Materials and Equipment to Their Jobs. The Truck Shown Here Has a Small Load of Lumber Needed in a Hurry. The Speed of Motor Trucks Often Brings Up Materials When a Slower Method of Hauling Would Permit the Work to Lag.



Stewarts pay daily profits on work like yours

Stewarts more than pay for themselves. They are bringing in new business every day for builders everywhere, handling old trade and new, steadily and at a profit.

Stewart design eliminates hundreds of really needless parts, making a stronger truck, simpler to operate, more economical in cost of gasoline, oil, tires and repairs, and **\$200 to \$300 less expensive to buy than the average truck.**

The Stewart factory offers to put you in touch with other builders who know by experience that Stewarts pay actual profits. If you are interested, write for this information—the best proof you can get.

The owner of the above truck says:

On December 10th, 1918, our 3½-ton was purchased and it proved to be so dependable with our ever increasing business that eight months later we were so pleased with the quality that we purchased another Stewart Truck.

Our 3½-ton truck has run an average of 12 hours daily. Three months or more steady running, 7 a. m. to 11 p. m., seven days a week. Total tonnage hauled on this truck alone over 7000 tons, averaging 6 miles to gallon. Total cost of repairs on 10 months' operation less than \$75.00, including a general overhauling.

Our business requires a truck to travel through 99% bad muddy roads, delivering stone to streets unpaved and with mud up to the hubs. We consider ourselves very fortunate under these conditions, that our choice was the Stewart Truck, and unqualifiedly recommend them to anyone contemplating the purchase of a truck of quality as the best truck on the market, regardless of price.

(Signed) **BUFFALO CONCRETE STONE & BRICK CO.,**
By M. H. Purcell, Manager.

Stewart Line 5 Sizes:

| | |
|------------------|--------|
| ¾-ton | \$1195 |
| 1 -ton | \$1650 |
| 1½-ton | \$1975 |
| 2 -ton | \$2575 |
| 3½-ton | \$3500 |
| f. o. b. Buffalo | |

Makers of Quality Trucks since 1912

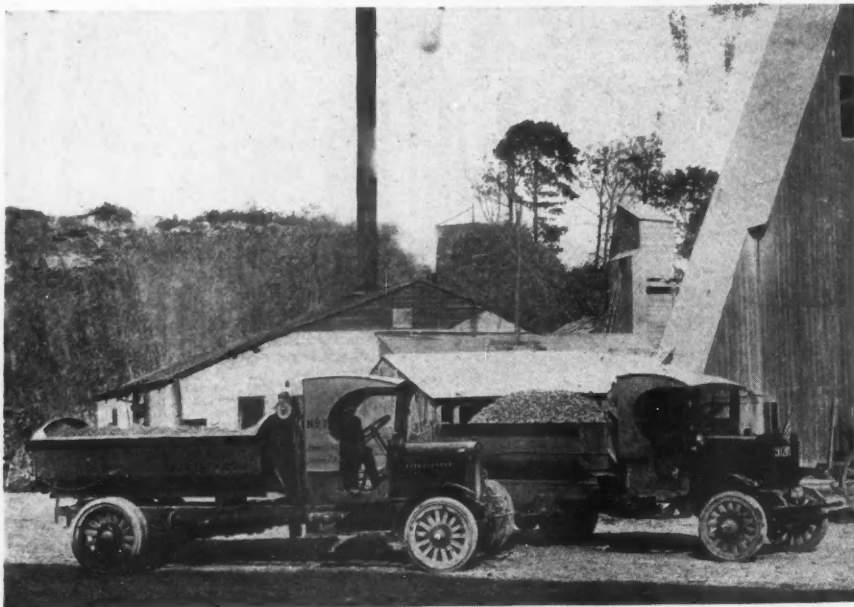
Stewart

MOTOR TRUCKS

Stewart Motor Corporation

Buffalo, N. Y.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



"Service" Trucks of J. S. Sowerbutt, Paterson, N. J., Getting Loads of Crushed Rock at the Quarry. Both Trucks Are Equipped with Bodies Designed for This Class of Hauling.

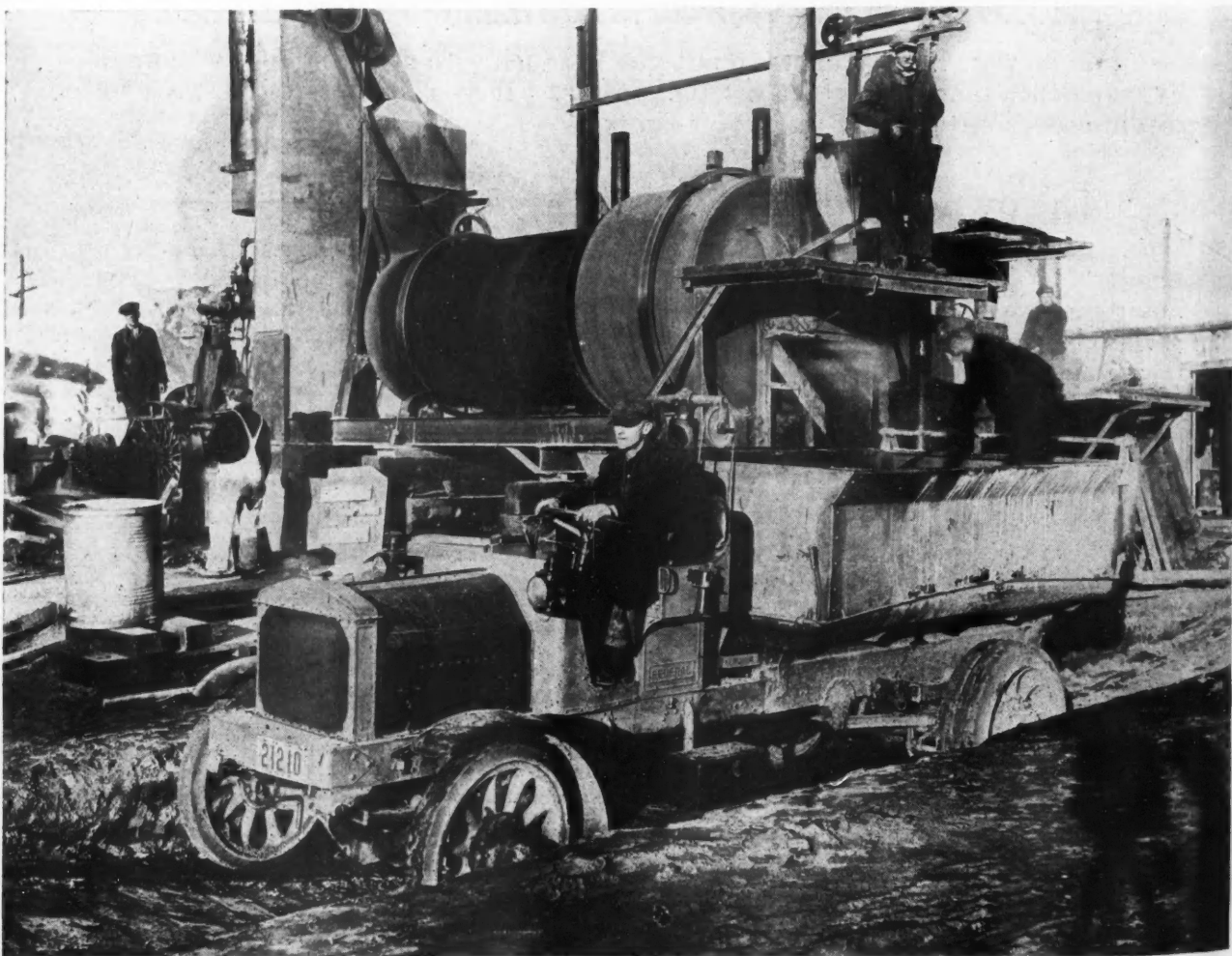
nize the value of the motor truck as a time-saver. Their speed, their ability to carry huge loads and the saving in the cost of operation when the number of teams and men they will replace is considered, made motor trucks most essential pieces of contractor's

Speed and Large Capacity Make Trucks Valuable

Speed and large capacity are the two points about a motor truck that makes it more economical than horses and wagons. It has been shown by those who have kept an accurate account of the work of motor

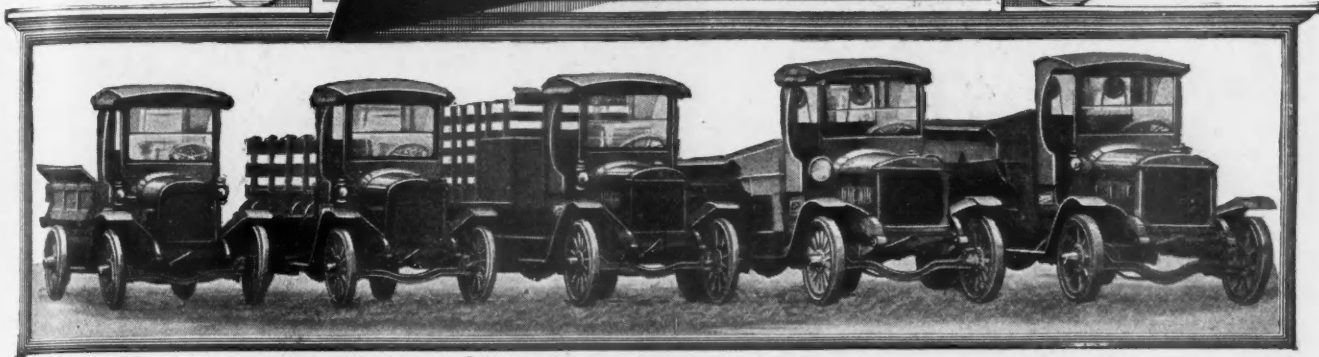
equipment. Thousands of successful contractors are using motor trucks; in fact, they would not be successful if they did not, and other contractors are annually replacing their horse-drawn haulage equipment with trucks.

Trucks may be said to "begin and finish" building jobs. They haul the equipment to the building site; they cart away the dirt removed from the excavation; they put the foundation materials and concrete mixer on the job; when the foundation is laid they haul the materials and equipment for the superstructure—and so on until the job is completed, the building cleaned up and the unused materials are hauled to the contractor's yard.



A Five-Ton "Federal" Truck Operated by the City of Manchester, N. H., on Construction Work. Here the Truck Is Shown Taking Concrete Mix Directly from the Huge Mixer for Delivery to the Construction Job. The Body Is of Steel, and Is Operated by a Power Hoist for Quick Unloading.

LIBRARY
CENTRAL BRANCH V.M.C.A.
85 MANHATTAN PLACE
BROOKLYN, N.Y.



Complete line of Acme Trucks as displayed at the National Automobile Shows

Where Proved Construction Is of First Importance

YOU can have definite assurance of the highest type of motor truck service. For Acme proved construction and Acme Proved Units are tangible qualities that you can count on even in the face of hard and heavy work that trucks in building and contracting service are expected to do.

21% of all the Acme's Built Go Into Construction Service

In every phase of building and contracting you'll find Acme the preference, for Acme by construction is typically fitted for this field. Made by a modern truck building organization, with wood-body and steel-body building plants, Acme can deliver trucks complete, ready for service on any size job.

Built in 1, 1½, 2, 3½ and 5 ton models.

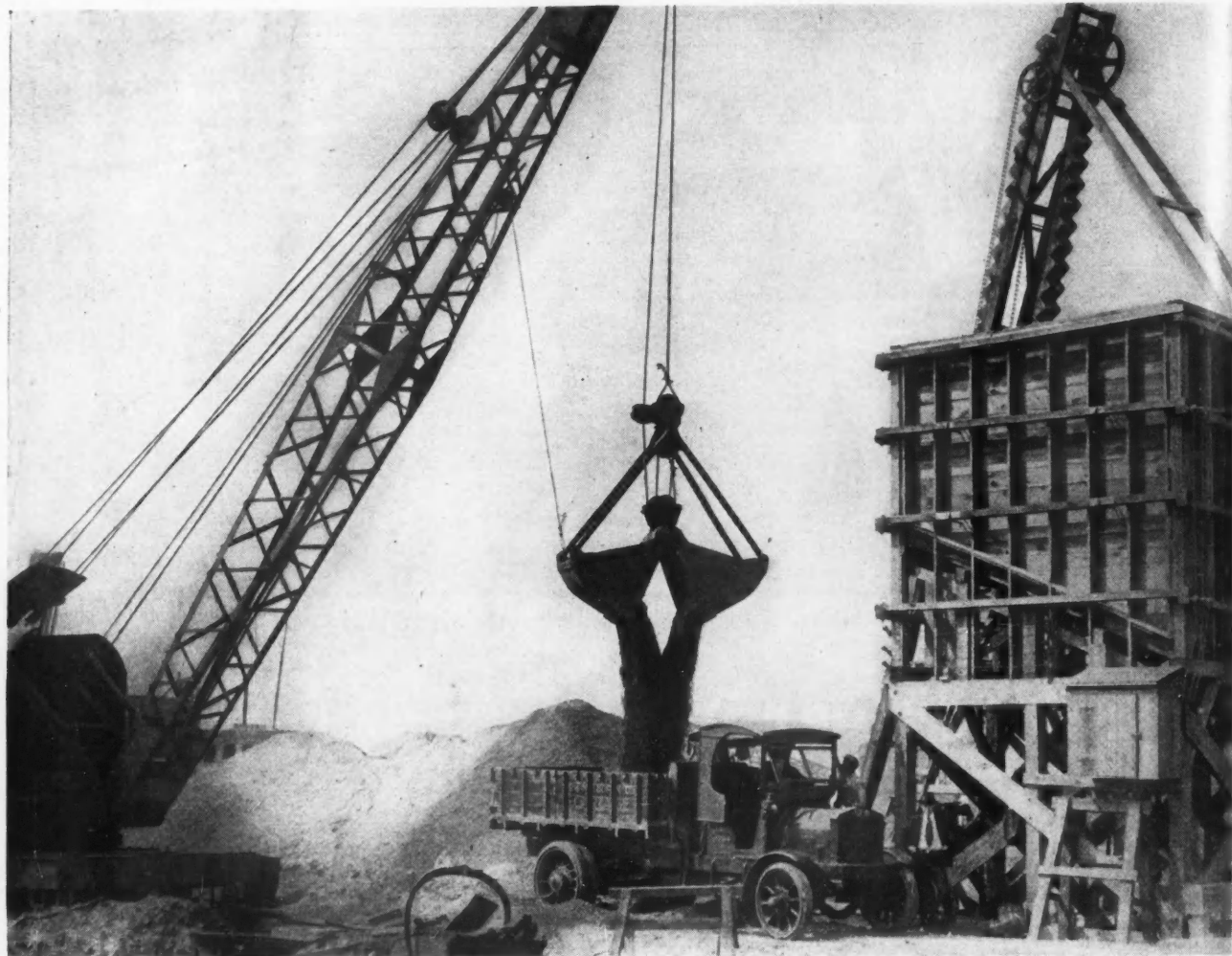
Acme proved construction means that you get proved performance in units which the engineers of the industry regard as leaders, all carefully selected and assembled by Acme engineers in a well-balanced truck. Write for catalog and partial list of users in the building and contracting fields. Address Dept. 164.

Acme Motor Truck Company

Cadillac, Mich.

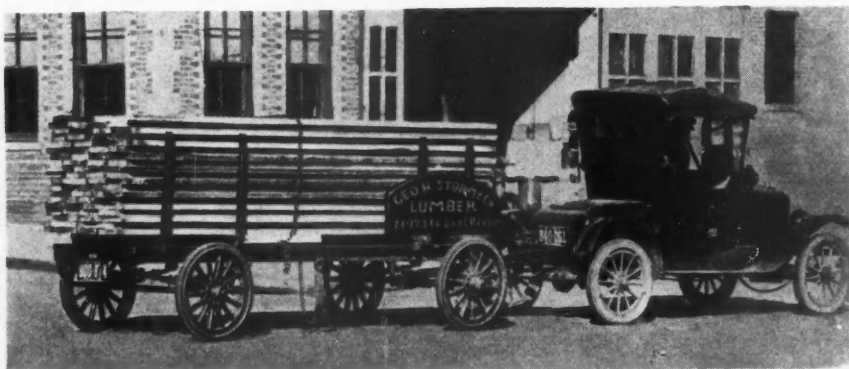


WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



An Interesting Picture of Activity in a Large Material Yard. Here Is Shown a "Federal" Truck Taking on a Load of Sand, Delivered by a Derrick Operating a Clam Shell Loader. The Material Bin Shown at the Right Is Filled by a Power Bucket Conveyor, and Is Emptied by Gravity. This Combination of Equipment Enabled the Materials to be Handled Quickly and Economically.

trucks that a one-ton truck will replace two teams, and cut hauling costs from 25 to 35 per cent. The cost of operating a truck, based on the expense per ton mile, decreases as the size of the truck increases. Four miles an hour is the recognized speed of a horse-drawn, loaded wagon. Fifteen miles an hour is the recognized speed of a motor truck. If a truck is kept continuously in operation, it will do more than the work of two teams, and save the cost of one driver, which, at the present price of labor, is considerable.



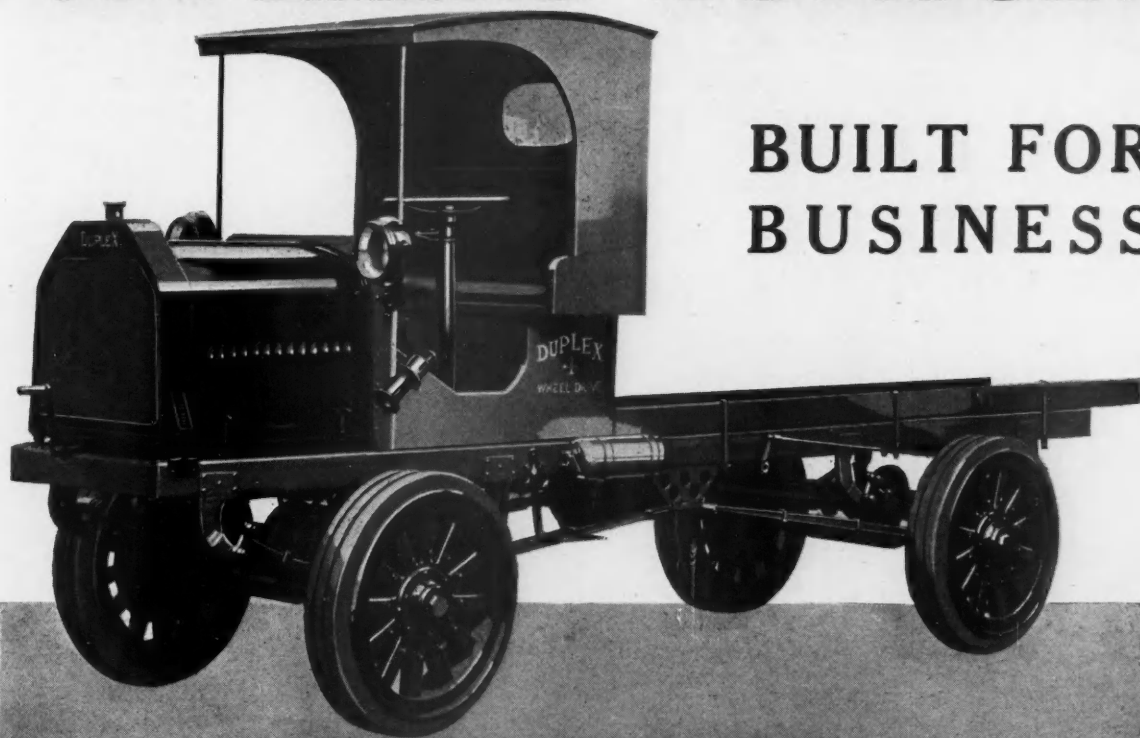
This Runabout with a "Trailsmobile" Attached Is Doing Great Service for George H. Storm & Co., Lumber Dealers of New York City. Mr. Storm Says That This Outfit Has Traveled as Much as 115 Miles a Day and Is the "Cheapest and Fastest Method of Hauling Lumber of Any We Have Ever Tried Out."

The feature of the motor truck that has been found most valuable to contractors, however, is its speed. It happens on practically every building job that some piece of equipment, or some materials are needed quickly so that the job can be kept going at full speed. The ability of the motor truck to haul the equipment or materials quickly saves much time that otherwise would be lost by the workmen.

Trucks Enlarge Builders' Territory

Motor trucks have greatly enlarged the scope of operations of the contractors in the rural sections. Also they have made it possible for these contractors to cut their costs considerably. They have the means of conveying their workmen and equipment and materials to jobs eight or ten miles away in a short time, which is an advantage that every rural contractor recognizes. Where the contractor formerly was limited by horse-drawn vehicles to a radius of from three to six miles, he now can, with a motor truck, profitably

DUPLEX TRUCKS



BUILT FOR BUSINESS

The Duplex Limited

HERE is a general purpose truck of medium capacity, pneumatic tired, which develops a road speed of 25 miles per hour loaded, with the motor running only 1300 R. P. M.

This means that the power is in the motor itself—and that the Duplex Limited does not depend for its power on low gear ratio.

The Duplex Limited is a Duplex through and through—fully as fit for its class of work as the famous Duplex 4-Wheel Drive—which has such a wonderful prestige in the heavy duty field.

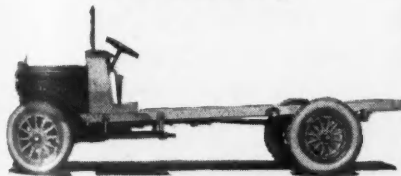
4 Cylinder, enclosed type motor—water cooled—cast endloc. Bore 4". Stroke 5½". 3 Point Suspension. Pneumatic Cord tires. 145" wheel base. Equipped with Windshield, Electric lighting and starting; Ammeter; Boyce Motormeter; Speedometer; Electric Horn; Tools; Jack; Rim Wrench; Front fenders; Grease gun. Driver's seat without extra charge. (Power Tire pump at extra charge.)

Write for Booklets Describing the Duplex Limited

Duplex Limited

\$2575

f. o. b. Lansing



DUPLEX
BUILT
FOR BUSINESS

IT is a fact that greater numbers of trucks are today being bought on their known performance value—not what you think they can do but what they actually do accomplish.

The famous Duplex 4-Wheel Drive Heavy Duty Truck has back of it years of remarkable achievement—and a standing so high that it is generally accepted as the leading truck of its kind.

In the Lumber and Logging Industry; in the Oil Fields; in Road Construction work; for hauling Sand, Gravel and Concrete—in fact, wherever *heavy hauling* is done there you will find Duplex 4-Wheel Drive Trucks—and you will find them making good.

Duplex 4-Wheel Drive—3½ Ton Capacity. Price \$4250 f. o. b. Lansing

The more critical you are as a buyer the more essential it is that you investigate the Duplex. Write for folders which give facts about the Duplex in owners' hands.

The Duplex Truck Company is one of the oldest and most successful truck companies in America—made so by the *owner service* of the Duplex Truck itself.

Today Duplex 4-Wheel Drive Trucks are finding increasing favor in all lines of business because everywhere business men want to get away from experimenting with trucks.

The facts about the Duplex 4-Wheel Drive are becoming more and more known.

Duplex Truck Company
Lansing • Michigan

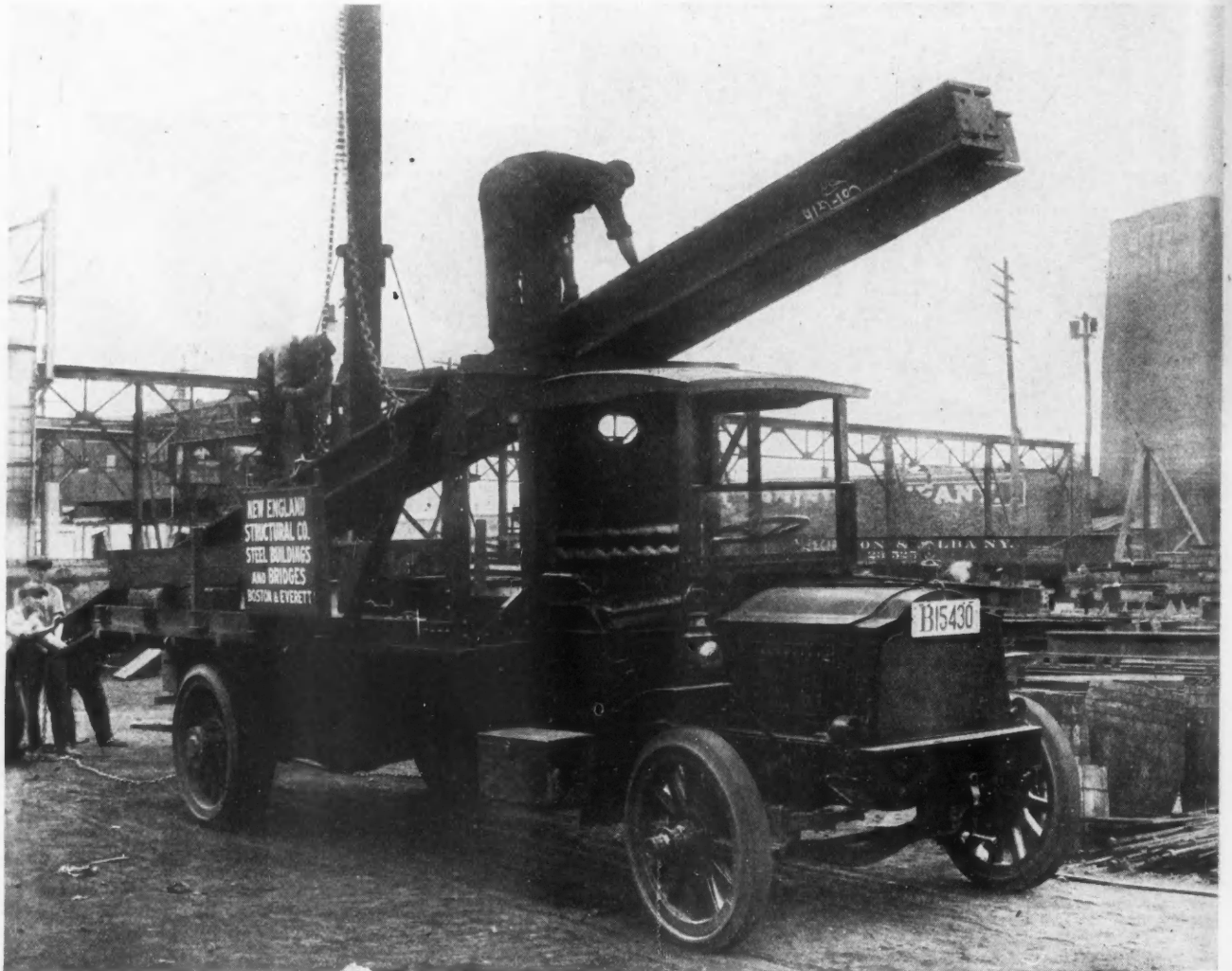
One of the Oldest and Most Successful Truck Companies in America

take on work within a radius of fifteen or even twenty miles. When it is remembered that with the increase of radius the territory that can be covered grows rapidly, it can be readily understood that truck increases a contractors' operations some 25 times.

There still is another valuable thing about a motor truck. That is that it is available for work 24 hours of the day. Give it gasoline and lubricating oil and it is ready for emergencies, whereas a team can only work a certain number of hours. When it becomes

"Our truck is saving hauling costs and is enabling us to take on work that we were unable to accept before we had it."

Motor trucks have taken a definite place in the equipment of contractors. They are useful in so many ways that they are kept busy probably more than any other machine the contractor owns. In this department this month are shown by illustrations a number of the uses contractors are making of trucks. These illustrations are made from photographs taken of the trucks



The Special Frame on the Forward End of This "Packard" Truck Enables the Truck to Carry Steel Beams Much Longer Than the Length of the Truck Body. Getting Building Material to a Job Is One of the Contractor's Problems. Delay Means Idle Workmen and Less Profit and Sometimes Loss. This Particular "Packard" Carries Two or More of These Lengthy Beams to This Job While the Workmen Were Erecting Those Previously Delivered. In This Way the Truck and Men Were Kept Busy All the Time.

necessary to keep the hauling equipment going after hours to enable the job to progress, the motor truck is always available.

The best basis upon which a contractor can figure whether or not he can afford to discard his teams and purchase a motor truck, is the experience of others in the same line of business.

Truck Users Say They Save Costs

Not long ago the AMERICAN BUILDER set out to discover what contractors who own trucks think of them. Every response to the letters of inquiry sent to subscribers contained the same enthusiastic report:

at work. From the smallest and least expensive of automobiles used as tractors for trailers to the heavy trucks especially designed for the use of contractors, the pieces of hauling equipment shown are performing their work well, are saving money on the job and earning a good profit for their owners.

This year of 1920 is going to be a busy one for contractors. This is the season of the year when contractors should be getting ready to handle the largest amount of work of which they are capable of doing. Every contractor will be able to do more if he has the proper equipment. And, as has been pointed out, a



Copyright 1920, by The Goodyear Tire & Rubber Co., Akron, O.

Pneumatics Protect Loads for This Produce Company

"Pneumatics offer all-round advantages over solid tires in our hauling—save trucks, loads and improve working spirit of drivers. They require 1½ less gallons of gasoline on a 90-mile run. Solid-tired trucks sway over the road, but trucks on pneumatics run straight. Goodyear Cords are giving excellent service."—P. P. Triller, Purchasing Agent, The Wadley Company, Produce Wholesalers, Indianapolis, Ind.

TWENTY-FIVE motor trucks distribute poultry, eggs and butter for The Wadley Company throughout central Indiana.

During the past year Goodyear Cord Tires have demonstrated their ability to reduce time and costs in comparison with solid tires in this service.

A 90-mile trip has been made repeatedly on the pneumatics in 3 less hours with 1½ less gallons of gasoline than when covered by a solid-tired truck.

Due to the jarring and shifting action of trucks on solid tires, delicate produce has been damaged frequently, whereas the pneumatics prevent such loss.

Mud has stalled the solid-tired trucks, but the gripping

Goodyear Cords have proved dependable under all adverse road conditions by reason of their firm traction.

An official describes the present mechanical condition of a Goodyear-Cord-equipped truck as being far better than could be expected on solid tires after a similar long term of hard work.

The photograph above affords additional and important evidence by showing Goodyear Cord Tires still on duty after nearly a year of continuous hauling.

Information concerning pneumatic equipment for motor trucks and its results can be obtained from local Goodyear Truck Tire Service Stations, or by writing to The Goodyear Tire & Rubber Company, at Akron, Ohio.



GOODYEAR

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Two-Ton "Federal" Truck and Five-Ton Trailer Equipped with "Martin" Rocking Fifth Wheel, of C. B. Coles & Sons Co., Camden, N. J. This Combination Gives the Coles Concern a Piece of Hauling Equipment of Large Capacity at a Minimum of Cost.

motor truck, or several motor trucks, are as necessary as a concrete mixer or saw rig. Good, modern equipment speeds up the job, saves costs and makes money for the contractor. And one of the essential things to own is a motor truck.



Care of the Motor Truck

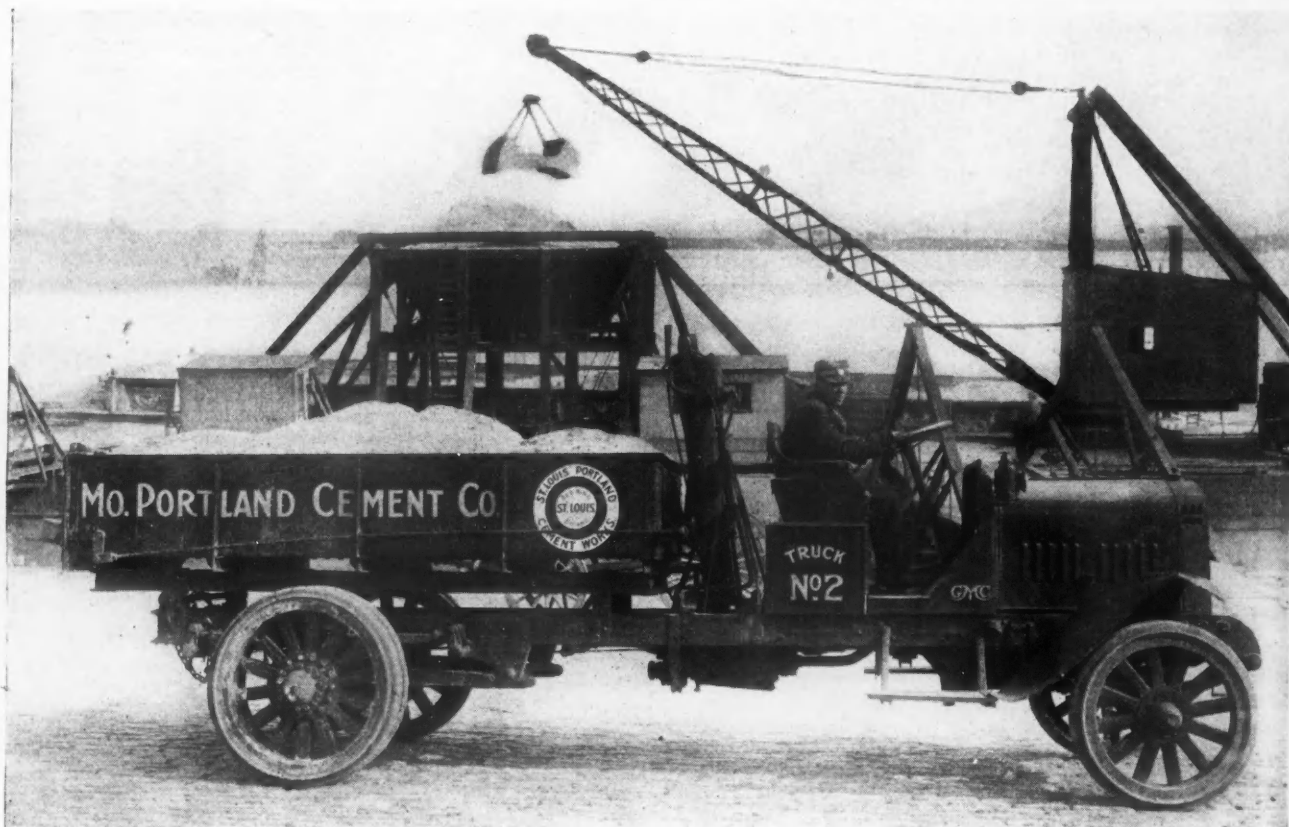
ONE of the most important units of a motor truck and the one least considered by the user, is the truck frame. The frame can be termed the backbone of the truck, and the strains and stresses to which it is subjected in the course of a day's work rarely are considered by the driver.

The careless driver usually goes at top speed, regardless of the load he has on his truck. He fails to notice the chuck holes so common to the roads in all parts of the country. Suddenly one wheel drops into a deep rut or hole and comes out just as suddenly on the other side. Imagine the terrific strain on the frame from the impact. Of course, the spring action will relieve the shock to some extent, but the major part of it is delivered to the frame itself. As we observe instances such as this where trucks are mercilessly overloaded and are forced to travel over rough streets

and pound over railroad tracks at 15 to 20 miles an hour, we can only wonder at the achievement of the truck manufacturers in making frames that will stand such usage.

Frequently trucks are allowed to operate with tires that are about completely worn out, practically no rubber being left on the tire base. This is "penny wise" and "pound foolish" economy, as the cushion effect of the tires is entirely gone and the full road shock is delivered direct to the springs, frame and in fact the entire truck mechanism.

The tires should be replaced before they are worn down to within an inch of the steel base. Do this



The "G. M. C." Truck of the Missouri Portland Cement Co., St. Louis, Mo., Leaving the River Dock with a Load of Sand, Taken from the Barge by the Clam Shell Loader. This Method Permits the Truck to Be Loaded Quickly and Enables It to Do a Maximum Amount of Work.

The evidence of Republic value is *undeniable*. No business man needs to go beyond the bare fact that 60,000 Republics are *establishing records everywhere*—for *performance*, for *ruggedness*, for *economy*. With more users of its product than of any other make, the Republic Company has become, in six years, the largest manufacturer of motor trucks in the world.



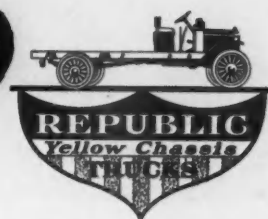
REPUBLIC TRUCKS

Republic Motor Truck Co., Inc., 953 Michigan Avenue, Alma, Michigan

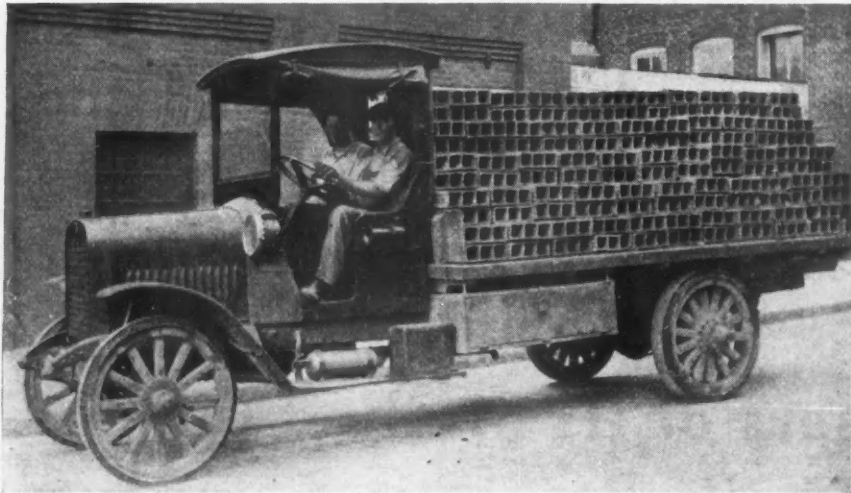
National Truck Shows

New York, 8th Coast Artillery Armory, January 3 to 10

Chicago, International Amphitheatre, January 24 to 31



WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



A Good-Sized Load of Tile on the "Acme" Truck of L. H. Klus & Son, New Castle, Ind. This Firm Keeps Its Truck Busy During the Building Season Hauling Materials and Men to the Buildings It Has Under Construction.

and you will be amply repaid by longer service in your truck.

In cold weather, it is possible that the oil in the hoist will become stiff and the hoist operation will not be as free as during warm weather.

Simply dilute the oil with a small quantity of kerosene and you will find the hoist will work freely.

Trucks that are not stored in heated garages should have the water thoroughly drained from the radiator and cylinders every night during fall and winter months to guard against freezing, and be sure not to forget the drain cock at bottom of water pump housing.



Contractors Keep Truck Busy All Year

L. H. KLUS & SON, general contractors, New Castle, Ind., have the distinction of being the owners of the oldest motor truck in New Castle.

During the building season this truck is kept busy from early in the morning until late at night hauling building materials of every kind—lumber, brick,

tile, and in the other a load of cinders.

It surely will interest prospective truck owners to learn of Mr. Klus' experience in the line of repair expense. It would be natural to suppose that repairs on this old-time truck would be heavy. But to use Mr. Klus' own words, "If the garage men had to live on repairs to our truck they would starve."



Sell More Paint Specialties

DEALERS know there is more money to be made in the paint specialties than in most of the staple lines. It requires some little ingenuity to establish a steady, large-volume trade in the specialties. Most people never think of using some of the best paying lines unless the dealer suggests it to them by advertising or some other way.

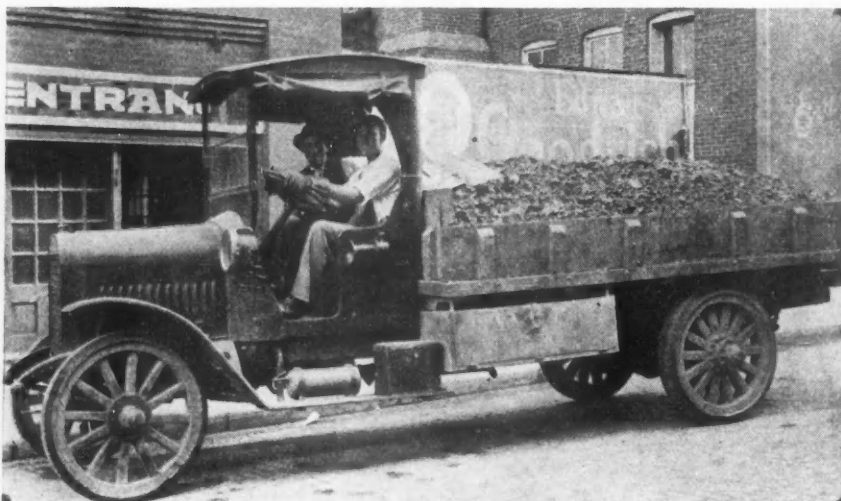
Take, for instance, metal lacquers. People store their trunks in cellars, garrets and damp closets. The locks, hinges and trimmings soon rust and then break. A few cents' worth of lacquer is the stitch in time that saves nine. While lacquer costs but a few cents, suppose hundreds of packages of it were being sold to all trunk owners; wouldn't the aggregate profit be worth while?

Take the couch hammocks found on hundreds of porches in every dealer's territory. They are exposed to outdoor conditions; the enamel is rubbed or scratched off the frames; the frames rust. A coat of ordinary porch chair enamel would prevent damage. A suggestion from the dealer will sell the enamel.

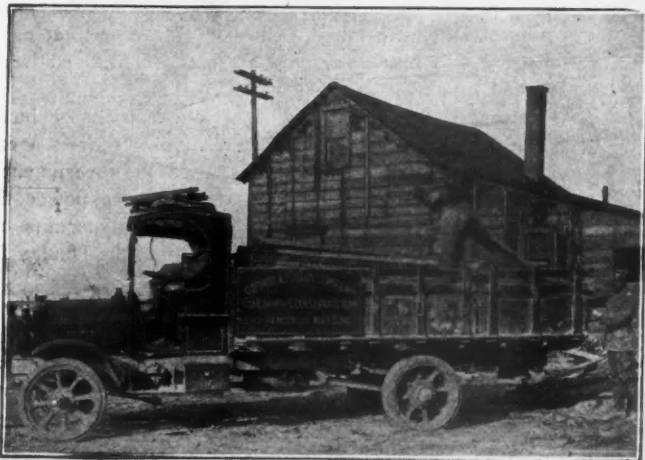
Thousands of dollars are spent annually by home owners in replacing water and gas pipes exposed to dampness in cellars and elsewhere and consequently rusted out. A coat of anti-rust paint once a year would stop this rust. A suggestion from the dealer will sell many a can of paint and relieve the owner of the expense of many a costly and unnecessary plumbing and gas fitting job.



WHEN you are confronted with a new building problem and are not exactly sure how to go about it, write to the Correspondence Department.



In Winter L. H. Klus & Son Use Their "Acme" Truck for General Hauling. Here It Is Shown with a Load of Cinders.



Another FEDERAL

This Federal 3 1/2 ton truck was on the job 365 days in the year for the George A. Fuller Company during the building crisis. It is believed by this company to be one of the reasons for its success in the meeting of the unusual demands made upon it.

FEDERAL

A Construction Truck That Gives Real Service

These are strenuous days in the building construction field. For the last year contractors have been rushed as never before. "Speed" was the watchword—and the contractor who could make the most speed was the one that would pile up the most good will, and the most profits.

Among Detroit Contractors, the success of George A. Fuller Company, 504 Penobscot Building, stands out conspicuously.

The George A. Fuller Company readily acknowledges that one of the reasons for

its success during the building crisis of the last year, was the Federal Truck.

The three-and-one-half ton Federal shown in the illustration was on the job every day 365-days-in-the-year, and was one of the reasons for the ability of the George A. Fuller Company to meet the unusual demands laid upon it. If the building contractor will talk with others in his field he will soon find that the opinion of Federal service, and Federal reliability, and Federal stamina, is shared generally by the trade.

Traffic News, the Magazine of Haulage, Sent Free On Request

FEDERAL MOTOR TRUCK COMPANY
79 FEDERAL AVENUE
DETROIT, MICH.

"Shorten the Miles to Market"—"Use Motor Trucks"

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



NEWS OF THE FIELD

Furnace Manufacturer Reduces 1920 Prices

The Monitor Stove Co., Cincinnati, maker of the Caloric pipeless furnace, announces that a substantial reduction in the price of the Caloric will be made in 1920. The announcement of the company says:

"While prices in all lines of business have shown an upward tendency, the Monitor Stove Co., of Cincinnati, the largest manufacturer of warm air furnaces in the world, announces a substantial reduction in dealer prices of Caloric furnaces for 1920. The success of the Caloric pipeless furnace has been so remarkable from the very start when it was introduced ten years ago, that practically the entire output of the Monitor Stove Co. is now devoted to the manufacture of this specialty.

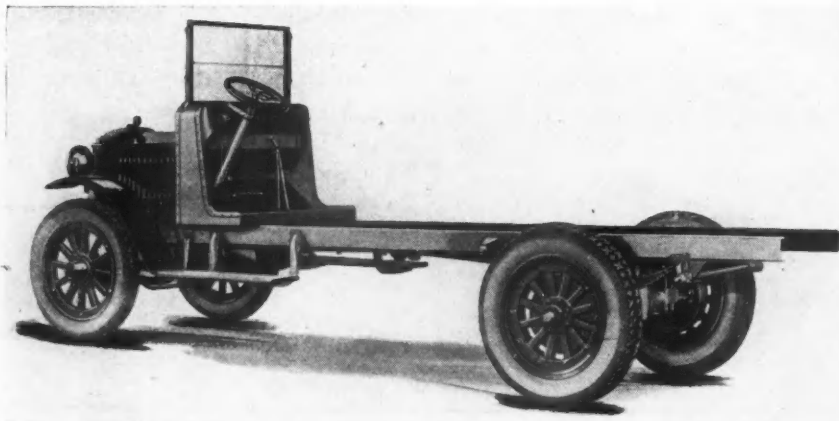
"In spite of higher costs of labor and materials than ever before in the history of the company, the Monitor Stove Co. has been able, by marketing a quality product thru aggressive advertising and selling methods, to build its business to the point where quantity production has enabled it to reduce prices. The company expects its sales for 1920 to show a phenomenal increase over the sales of 1919."

Duplex Announces a Medium Capacity Truck

Convinced in their own minds and supported by insistent requests of dealers and users alike, the Duplex Truck Co., Lansing, Mich., after three years of careful and far-reaching investigation determined to meet the great need in the truck field for a medium capacity continuous service model, capable of running at high rates of speed.

Heretofore models designed for other purposes have been adapted to quick delivery uses, but have proven unsatisfactory. This has been due to the fact that a construction intended for slow, heavy hauling will not stand up under the extra strains imposed by fast driving.

To properly serve this class of truck user the Duplex Co. set about to design and build such a model. The result is



"Duplex Limited," the New High Speed Truck Made by the Duplex Truck Co., Lansing, Mich.

what is known as the new medium capacity pneumatic equipped Duplex Limited. Only specifications that contribute to speed and extra strength to stand such speed have been selected.

Power is supplied thru a 4 by 5¼-inch motor having an S.A.E. rating of 25.6 horsepower. This motor is a modified class "B" design so successfully used in government work. At normal speeds the motor develops more power than its rating would indicate, and its construction permits of high speeds without danger of injury. On high the Duplex Limited will travel at from 5 to 30 miles per hour.

The Duplex Co. contends that truck speeds should be secured thru motor power and not thru a low gear ratio. This accounts for the adoption of a motor which, at first glance, appears to be too large for a truck of medium capacity.



Prism Companies Consolidated

On January 1, the American 3-Way Prism Company absorbed the American Luxfer Prism Company, and the enlarged organization will henceforth be known as the American 3-Way-Luxfer Prism Company. The officers of the new company are C. H. Pascall, president; C. P. Mills, vice-president, in charge of the New York factory and sales office, and J. J. Ohlis, secretary and treasurer.

This consolidation enables Mr. Pascall and his associates to offer the building industry the best items formerly produced by these two concerns in the prism lighting field. With factories both in Chicago and New York, and distributing points in the principal cities, they are ready for any demands for a varied line of goods.



Stewart Motor Corporation Prosperous

At a meeting of the board of directors of the Stewart Motor Corporation, Buffalo, makers of Stewart trucks, which was held November 1, the regular quarterly dividend of 2 per cent on the preferred stock was ordered paid, also a 2½ per cent dividend on the common stock.

The rapid growth which the Stewart has enjoyed since the company was incorporated seven years ago, has necessitated the acquisition of larger quarters and the new nine-acre plant recently purchased is now in full operation.

The progressive assembly system is used in the new factory and will make possible a yearly production of 10,000 trucks.



L. J. Mueller, Head of Furnace Plant, Dead

Louis J. Mueller, senior, president of the L. J. Mueller Furnace Co., and prominent in Milwaukee business circles, died Dec. 16, 1919, at the age of 82 years. Mr. Mueller had been active up to the time of his death, which was sudden and unexpected.

Mr. Mueller was born in New York City in 1837, where he secured his early education following, which he learned the tinner's trade. He moved to Milwaukee in 1855, and shortly after arriving there engaged in business, opening a store on Reed street. This business was later expanded when Mr. Mueller began, in a small way, to manufacture furnaces.

During the last thirty-five years the Mueller Furnace Co. has manufactured furnaces and boilers exclusively, and at the present time the offices of the company occupy the building which was formerly the factory at Reed and Florida streets, while the factory at Fif-



KISSEL TRUCKS are employed in the building business to eliminate transportation delays, maintain shipping schedules and increase transportation efficiency.

The most important factors in designing a truck for industrial purposes — total weight of trucks, motor size, motor speed, rear axle ratio, tire size — have been properly selected and combined in Kissel Trucks, giving an incomparable chassis of perfectly balanced moving and fixed units, headlined by the powerful Kissel-built engine — trucks built to maintain schedules the year 'round.

The necessity of Uninterrupted Transportation throughout the winter months prompted Kissel to originate the ALL-YEAR Cab that protects truck drivers, increases their efficiency and keeps trucks operating the year 'round.

5 different sized models from the ¼ ton to the Goliath. Our nearest Kissel dealer is thoroughly competent to make a survey of your requirements. Make an appointment with him. This incurs no obligation.

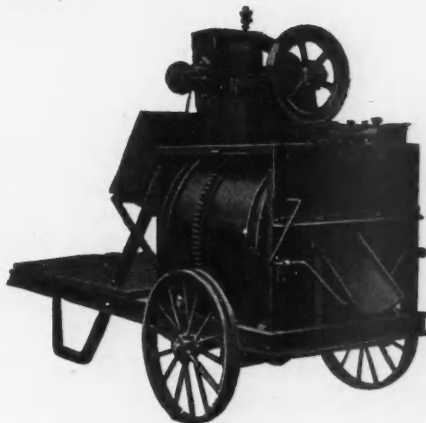
KISSEL MOTOR CAR CO.
Hartford, Wis. U. S. A.

KISSEL TRUCKS
5 CAPACITY MODELS

You Need Fewer Men With Archer Mixers

Fewer Men—The Archer will do away with three or four men to every gang. It is the original end-discharge mixer. No wheelers needed.

Speed—Works faster—mixes better. One man can move it and it does not need a team to take it from place to place. Made in one bag and half bag sizes.



Why worry about men. Get an Archer Mixer and get along with smaller crew

Send Coupon for Book

Let us tell you how much more profitable it is for you to have one or two small Archers do your work than one big expensive machine. Send the coupon.

END DUMP BODIES With Hand Hoist

We make the Archer Dump Body and Hand Hoist. They are ideal for contractor's bulk hauling—sand, gravel, excavations, paving, coal, etc. The body is built with great strength and a pull of only 20 pounds on the hoist will dump a 5 ton load in 2½ minutes; One ton in 30 seconds. No upkeep cost. Ask us for particulars and prices.

Archer Iron Works
2438 West 34th Street - CHICAGO, ILL.

Tear Out and Mail This Coupon

ARCHER IRON WORKS,
2438 W. 34th Place, Chicago, Ill

Please send me your free booklet on

Archer Mixers Data on Dump Bodies

Name _____

Address _____

teenth and Oklahoma avenues, has grown to such proportions that approximately 500 men are engaged in the manufacture of furnaces in that plant.

Associated with Mr. Mueller in the business are his two sons, Louis J. Mueller, Jr., and Gustave C. Mueller.

Mr. Mueller was one of the oldest members of the Old Settlers' Club, a member of the Association of Commerce, and in his younger days was prominent in a number of bowling clubs. Even at his advanced age he still was an ardent bowling enthusiast and a member of several teams in the city.

He is survived by his widow and four sons, Paul, Arthur, Louis, Jr., and G. C. Mueller.



Bishopric Mfg. Co. Is Building Canadian Plant

The Bishopric Manufacturing Co., Cincinnati, O., maker of Bishopric Board, has purchased ten acres of land in Ottawa, Ont., and has started the erection of factories for the manufacture of its product for the Canadian market.



John J. Moore, Jr., Joins Beaver Board Companies

John J. Moore, Jr., who has been selling building materials since 1910, with the exception of the time he served in the U. S. Army, has joined the sales force of the Beaver Board Companies, and is connected with the New York sales office. He will represent the companies in New York City.



Patent Vulcanite Roofing Co. Consolidates With Beaver Board Companies

The rumored merger of the Patent Vulcanite Roofing Co., of Chicago, with the Beaver Board Companies, Buffalo, N. Y., has been confirmed by the officials of the former company in Chicago. The new arrangement means that the Patent Vulcanite Co. will have the backing of the strong Beaver Board Companies and will begin a large expansion of its business at once. President Glendinning, of the Patent Vulcanite Co. and its founder, will retire from the active management of the roofing concern, but retains a large financial interest in it. With the exception of President Glendinning, the Vulcanite organization is to remain unchanged and the business will continue as tho it were a separate concern.



Upson Company Enlarging Plant

Work on the roll paper stock rooms, beater rooms and machine, engine and boiler rooms for the Upson Wall Board Co. contract work at Lockport, N. Y., let to the Aberthaw Construction Co., Boston, is approximately 45 per cent complete. The additions to the plant representing in all an outlay on approximately \$400,000, include four buildings of reinforced concrete with brick walls.



Another Bonus Distributed by Milwaukee Corrugating Co.

The Milwaukee Corrugating Co., of Milwaukee, Wis., is again distributing bonuses among its employees. This is a practice the company started a few years ago, at the holiday season, and has been kept up without a break, in spite of the war and building trade restrictions. The bonus amounts to one full month's salary, if the employe has been with the company one year; three-quarters, one-half and one-quarter of a month's salary are given those who have been in the employ of the company nine, six and three months, respectively.

The management notified its employes that this bonus was given to them in appreciation of their loyalty and faithful services and in view of the present unusual conditions. They also suggested that this money be invested in Liberty Bonds or other safe securities, in order to provide for a "rainy day," rather than immediately spending it for amusement or for luxuries and nonessentials.



Louden Machinery Company Expands

At a recent meeting of the stockholders of the Loudon Machinery Company, of Fairfield, Iowa, they authorized an increase in the capital stock from \$750,000 to \$1,500,000. The business of the concern has rapidly expanded and the increase in working capital is necessary to take care of the increased volume of business, and means expansion along all lines.

Mr. Roy Loudon, advertising manager, says that in addition to increased domestic trade the concern also has enjoyed a very satisfactory volume of foreign business, and their plans contemplate greater manufacturing facilities in order to continue giving their dealers the best possible service.

Since 1867 the Loudon Machinery Company has been manufacturing a line of complete barn equipment for the farm and in addition they also manufacture an overhead carrying system for the factory, garage, etc. The latter has grown into big volume and the Loudon overhead equipment has revolutionized lifting and conveying methods and is now in use by a large number of the most modern factories in the country. This branch of the business is also expanding very rapidly.



How to Build Fireproof Partitions

AS a rule the partitions in fire-proof buildings are not required to support any weight, but merely to serve the purpose of dividing the space into rooms, and to confine a fire to the compartment in which it originates. No greater strength is therefore required in a partition than is necessary to carry its own weight. However, rigidity is required, and that in proportion to its height and unsupported length. Where partitions separate apartments or sections of a story, that is, when they practically are without window or door openings, they should be rigid enough to prevent the passage of water from a hose stream as well as flame. In other cases this may be unnecessary; in fact, at times it may seem desirable that the partitions are easily removed for the purpose of getting at a fire spreading thru doors or windows.

The materials of partitions should be incombustible. They should also be poor conductors of heat. It is also desirable that they shall not be affected by water. Lightness is also a desirable quality, as any increase in the dead weight of the construction adds to the cost of the structure. Partitions should also be as sound-proof as possible.

So far as may be, fire-proof partitions should have no window openings in them, and even as few door openings as possible. In many buildings, however, where halls have no openings into streets or courts, such windows are necessary for lighting the halls. When this is the case the frames should be made fire-proof and wire glass should be used, the sash being stationary, if possible.



Cleaning Up After Masons

OFTEN during building operations or remodeling the brick or tile work about the fireplace, porch and foundations will be disfigured by splashes of mortar, plaster or stucco which it seems impossible to remove by ordinary means.

A solution of muriatic acid applied with a stiff brush will turn the trick quickly and easily. Only be sure to wash the acid off carefully afterwards or it will leave a stain.

Trailmobile

Trade-Mark Reg. U. S. Patent Office

The Motorless
Motor Truck
Thousands in Use

DIVISION No. 1
Light, one-way four-wheeled Trailmobiles for use with passenger cars or light trucks: 1,250 lbs., 1/2 ton and 1 ton.

DIVISION No. 2
Heavy-duty four-wheeled Trailmobiles for use with trucks: 1 1/2 tons, one-way; 2 tons; 3 1/4 tons, and 5 tons reversible and one-way.

DIVISION No. 3
Semi-Trailmobiles: 2 1/2 tons, 4 tons, 6 tons and 10 tons.

"The Trailmobile has given excellent satisfaction. It is the cheapest and best method of hauling", the owners say.

Write now for booklet,
"Economy in Hauling"

The Trailmobile Co.
583 E. Fifth St. Cincinnati, O.

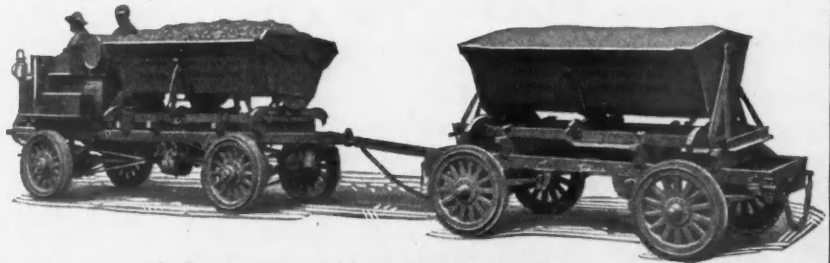
Gets Material To the Job

WHETHER the material to be moved is light or heavy, the haul short or long, there is always profitable work for the Trailmobile to do in the building business.

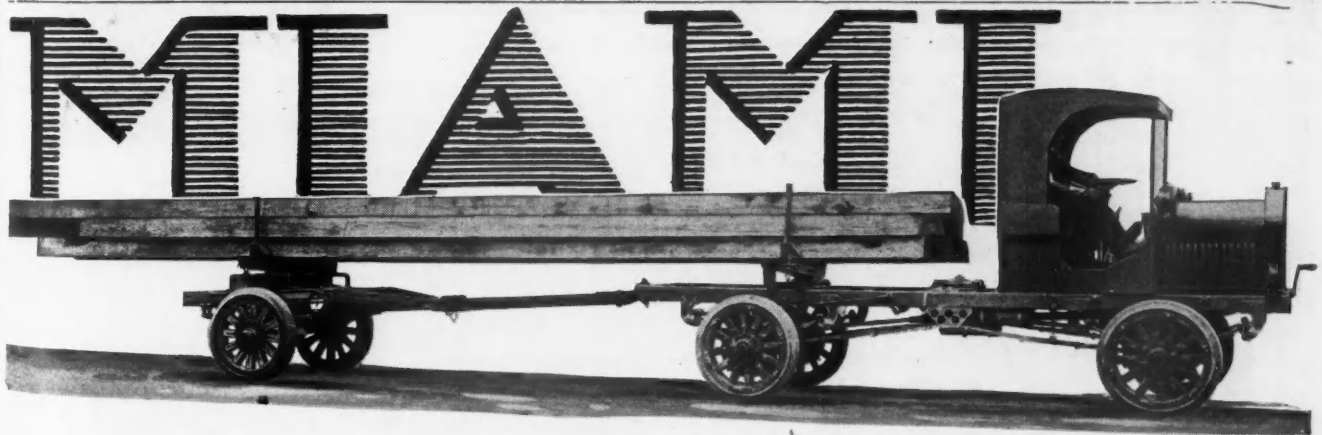
It doubles the effectiveness of the truck and makes it possible to deliver the material in half the time.

It can be used with the heaviest trucks, or in the smaller sizes with passenger cars for lighter hauling.

The Lawrence Construction Company of Augusta, Ga., hauls three tons of rock and sand on trips of from three-quarters of a mile to six miles with this Trailmobile equipped with a dump body.



Good roads are preserved by reducing the load carried on each wheel



OUR NAME, our business reputation, and our years of experience, are back of every trailer we put out. Our aim is to make a truly satisfactory type of trailer to fit every need of modern building projects. You, as a contractor, have long known that the load cannot always be made to fit the trailer—the trailer must fit the load. That is what we have done for you—each of our twenty-five models is perfectly fitted to carry the load it is designed for, be it long beams or pipes, tile, shingles, express, or workmen; capacities varying from 800 pounds to 6 tons. Tell us what you have, how, and in what size load, and we will tell you how best to cut your hauling expenses.

THE MIAMI TRAILER COMPANY, Troy, Ohio

OUT ON THE JOB



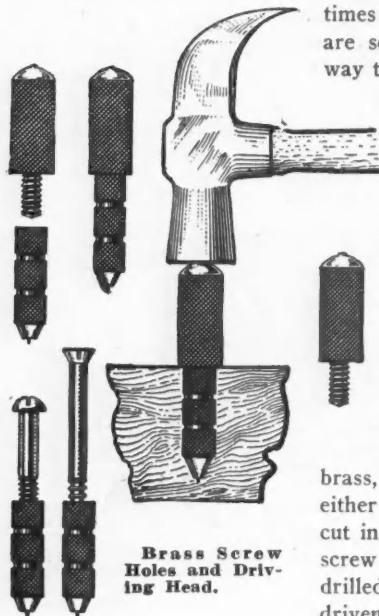
What Builders Are Finding Good

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.

Metal Screw Holes Make Best Jobs

Every carpenter likes to leave his work as perfect as possible. Also he wants to do it so that it will last. When a screw is driven into any sort of material there should be no possibility that it will pull out, or make a rough, unfinished hole, which it often-

times does when the materials are soft or brittle. The best way to do a really artistic job, where screws are employed, is to use screw holes. Two metal screw holes, entirely different in manufacture and of different materials are here described.



Brass Screw Holes and Driving Head.

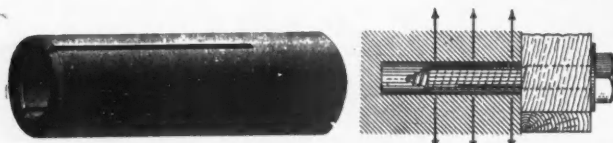
Brass Screw Holes with Ready-Cut Threads

The screw holes shown in the accompanying illustrations are made of brass, and have threads for either wood or machine screws cut in them. The hole for the screw hole is first bored or drilled, and the screw hole is driven into it with a hammer.

With the screws the manufacturer provides a driving head which is screwed in and removed after it is driven in. By the use of this hole a screw can be driven in and taken out as often as necessary, without damage to the materials in which they are imbedded.

Lead Screw Holes in Which Screws Cut Own Threads

Another type of screw hole is made of lead. It is claimed that while this hole weighs only five ounces it will hold two tons. It is slotted on two sides, the slots extending part way from each end. These slots allow for expansion,



Lead Screw Hole in Which Screws Cut Own Threads. Slots Allow the Casing to Expand.

holding the screw holes tightly in place. The screws are forced into the soft metal, cutting their own threads. They can be installed quickly and start to expand with the first turn of the screw.

Both of the screw holes described are made in different sizes for wood and machine screws, and are not costly. But they enable the workman to give his client the most satisfactory job.



Doors With Built-In Parcel Receivers

During the last few years it has become an accepted architectural and building practice to install a parcel receiver either in the outside wall of the kitchen or in the kitchen door of homes and apartments. This is especially true in the larger cities where practically all purchases are delivered by the merchant. The advantage of a package receiver is that it enables the women members of the household to leave the home whenever they desire, without consideration as to when the groceries, the milk or the package from the department store will arrive.

One of the most modern ideas of package receiver construction has been the placing of the receiver or receivers in the kitchen door. This feature is built-in and the door so equipped is delivered to the contractor by the material dealer, and all that is required is to hang it in the casing.

The novel and efficient feature of this package receiver is that "it is always locked and always unlocked." That is when the outer door is open, the inner is locked; when the package has been



The Deliveryman Puts the Groceries in the Receiver and Shuts the Door, Which Automatically Locks and Unlocks the Inside Door.

delivered, the deliveryman locks the outside door, which operation automatically unlocks the inner door and permits the removal of the merchandise. This is accomplished by an ingenious lock. The accompanying illustrations show interior and exterior view of the door. In one illustration the groceries are being placed in the receiver, in the other the housekeeper is removing them. And by the lock arrangement described, there is no possibility that a modern "Oliver Twist" can climb thru the opening.

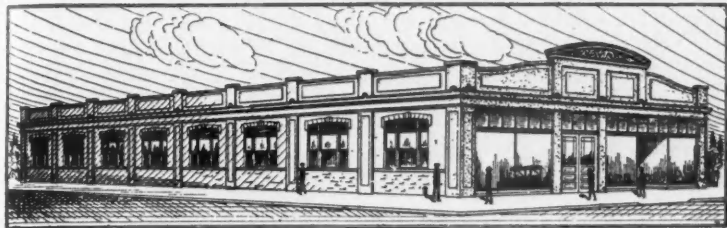


Taking the Groceries Out of the Receiver.

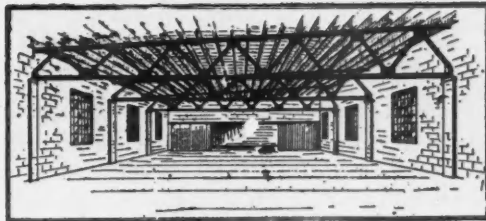
The doors are made in all woods, either glazed or unglazed, and are fitted with one, two or three receivers.

Besides the receiver-fitted

MODERN GARAGES



GARAGE—ROUND LAKE, ILL.



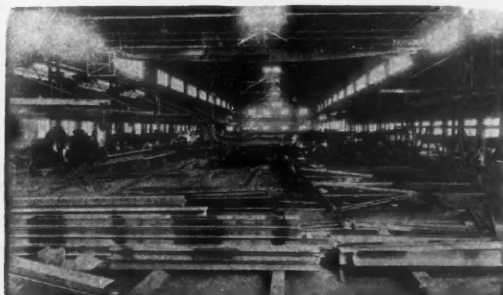
GARAGE—ST. JOHNS, MICH.

Write for One of Our "Garage Illustrations," Showing at Least 50 Modern Buildings Designed By Us

STRUCTURAL STEEL—MODERN STORE FRONTS—FIREPROOF BUILDINGS
STEEL WINDOWS—FIRE ESCAPES—WIRE PRODUCTS—STEEL BRIDGES—ELEVATORS—STEEL
CEILINGS—SKYLIGHTS AND CORNICES—MILLWORK AND GLASS—ROOFING

"INTERNATIONAL SERVICE"

Means immediate shipment of your orders from one of the largest stocks of steel in the world
 Plants operate 24 hrs. per day



INTERIOR VIEW OF STRUCTURAL STEEL PLANT
 EVANSVILLE, INDIANA

INTERNATIONAL STEEL & IRON CO., Inc.

Address Dept. 18

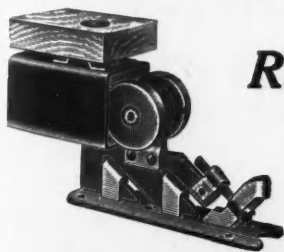
EVANSVILLE, IND.

OPERATING
 INTERNATIONAL STORE FRONT CO.—INTERNATIONAL WOODWORKING CO.
 INTERNATIONAL BRIDGE CO.

WE OPERATE
 STEEL PLANTS—SHEET METAL PLANTS—WOODWORKING PLANTS

Convenient Doorways Make Convenient Homes

and a sure way to have convenient doorways
 in the home is to hang the doors on



Richards-Wilcox Sliding Door Hangers



On Windy Winter Days unused rooms may be closed off,
 insuring warmth and comfort—also heat economy.



Sliding Doors cannot slam in the Wind—preclude accidents
 —Conveniently confine noise to one room.

Steel channels and ball bearings insure smooth running and durability. Fibre wheels and wood-lined track produce silent operation. Accessible adjustment in the tracks and hangers counteracts the effect of settling walls.

Write for Folder QF-13 entitled
 "Vanishing House Doors." Sent without obligation.

Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides
 CHICAGO ST. LOUIS PHILADELPHIA
AURORA, ILLINOIS, U.S.A.
 BOSTON NEW YORK MINNEAPOLIS
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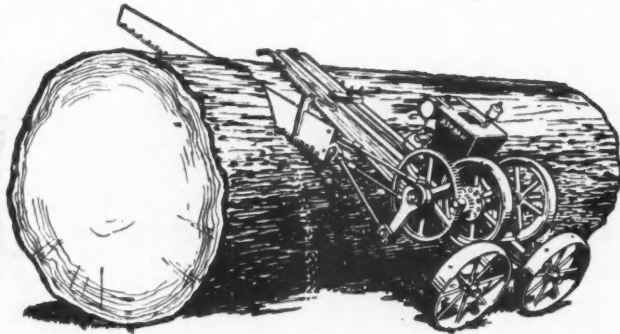
doors, there is available the receivers designed to sit in the kitchen wall, if so desired. The wall receivers also are equipped with the double lock.

This is a building specialty that will appeal to home builders and to the owners of apartment buildings.



An Improved Power Drag Saw

In these days of labor shortage all are interested more than ever in any device that will enable them to accomplish a great amount of work at lower cost or to lighten certain



Power Drag Saw at Work on Large Log.

tasks without even any actual saving in money. One thing that does this is a drag saw, a machine which embodies many improvements.

The drag saw shown in the illustration is the only power outfit operated by one man that cuts down trees by power, saws up branches by power, saws logs by power and, with all this, will also do belt work. One man, with this improved power drag saw, saws from 25 to 40 cords of wood a day and at very low cost—about 1½ cents a cord. And the work is really no work at all. The old hard job of cross-cut sawing is a thing of the past where the drag saw is used.

The outfit is mounted on wheels and is easily moved to the timber to be cut and just as easy to move from log to log and cut to cut. The wheels turn on a swivel axle and the outfit moves along the log sidewise, from cut to cut, without stopping the engine. The engine is of the 4-cycle, governor controlled type, developing more than 4 horsepower. It is equipped with magneto ignition. Engine experts say it is one of the most efficient motors ever perfected. The machine is sold only thru dealers and is considered a wonderful business producer.



Decorative Electric Fans for the Home

Heretofore the electric fan has been designed solely for utility, and tho the better grades have graceful lines and fine finishes, all makes have been kept plain and devoid of ornamentation. This simplicity is suitable for the great majority of purposes for which the fan is used, but there is now a growing demand for fans that will harmonize with the handsome furnishings of hotels, clubs, theatres, offices, and private residences.

To enable architects and interior decorators to obtain fans that will carry out any desired scheme of decoration there has been brought out a de luxe line of fans, consisting of 10, 12 and 16-inch oscillating fans, encased in ornamental compo, finished by skillful artists in any desired manner.

A comprehensive series of standard designs, covering recognized periods, has been produced, but special designs to suit any original decorative plan can be readily produced. Standard finishes are French gold, French gray, and old ivory, but any other colors, including polychrome, can be supplied.

In addition to the compo covered fans there is also a novel and attractive line with decorative reed coverings, which strike a distinctive note of coolness and informality.

The fans are supplied for desk, table, and bracket mounting, but their effectiveness is enhanced by mounting them on columns or standards of wood, ornamented with compo, or reed, which have been designed to harmonize with the fans. These standards are wired and have a plug at the top, to which the fan is connected. The fan can therefore be easily removed in winter and a lamp, plant, or other object put in its place.



Plaster and Metal Partitions

THIN partitions of plaster applied to metal lath and studding so as to make a solid partition finishing about 2 inches thick, have been very extensively used in fire-proof buildings.

They are remarkably stiff, owing to the adhesion of the plaster to the steel, and they are lighter and occupy less space than any other practical fire-proof partition of equal strength.

In fire tests these partitions act very much as the plaster-block partitions, resisting thoroly the passage of the flames.



The Song of the Carpenters

C an't you hear the saw's rich music,
A nd the rapid hammer beat?
R ound about us hear the echo,
P enetrating, clear and sweet?
E ven now hear music rising—
N otes of richest cadence swell;
T o the heavens buildings rising,
E ven now their story tell.
R ah for carpenters' rich music;
S welling tune we love so well!



Two Types of Decorative Electric Fans That Are Popular with Home Owners.

WATERLOO

Construction Machinery

The WONDER 5

Capacity: 5 cu. feet of concrete per batch
Especially adapted for use in narrow, congested places.

Quick discharge.



Increased Production!
That is the cry of the times.
More Production — and no more strikes.
WATERLOO machinery for increased production.

This and the following three pages are devoted to WATERLOO construction machinery. Although only a few types are illustrated here, we make machines covering every kind of construction work.

Mixers

Compact, dependable and speedy, this machine has proven a money maker for many progressive builders in the field.

Note the principle of "wonder" mixing.

Drum tilted at angle of 30° above horizontal. Batch carried up and dropped on cone shaped device, immediately caught by four blades and kneaded thoroughly—none escapes. Batch is carried up again and dropped. Concrete is always kept moving toward center of drum. This concentrated mixing action assures well-mixed concrete—with no air in it—which means stronger concrete.

Wonder Mixers are furnished in types suitable for any kind of mixing job you may have.

WATERLOO CONSTRUCTION MACHINERY CO.

103 Vinton Street, WATERLOO, IOWA

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

Law for the Builder

WHO STANDS LOSS CAUSED BY DESTRUCTION OF BUILDING BEFORE COMPLETION AND ACCEPTANCE?

By Leslie Childs

CHARLES MILSKE, a contracting builder, entered into a written contract with the Steiner Mantel Company, in which he agreed to erect a brick factory and storehouse in Baltimore county, Maryland. The contract stipulated that the building was to be completed in forty-seven working days, the total consideration being \$8,794.50.

Payments upon the work were to be made as follows: \$500 when the building was completed to the first floor and the first floor joists laid; \$1,000 when the building was completed to the second floor, and the second floor joists laid, etc. It was also provided that Milske should execute a bond in the sum of \$4,000, conditioned for the faithful performance of the work.

Milske entered upon the work, and when the building was almost completed, it was blown down by a storm of great severity that swept that section of the country. After the destruction of the building Milske and the Steiner Mantel Company failed to agree on what was a proper settlement between them, for the losses occasioned by the storm. Whereupon Milske filed suit against the company in an attempt to force them to stand the loss.

In his action at law Milske sought to recover the profits on the contract, the value of the material used, and \$1,500 in addition, same being an unpaid instalment which was due at the time of the destruction of the building.

As the principal basis for these demands Milske relied upon a stipulation in his bond, which he contended was a part of the contract, that read as follows: . . . "that the principal shall not, nor shall the surety, be liable for any damage resulting from an act of God."

Milske set up in his action that as the storm was an act of God, the provision in his bond, as quoted from above, relieved him from all loss, and placed the loss upon the Steiner Mantel Company. His contention being that the bond and contract were to be taken together and construed as one instrument. The case finally reached the court of appeals and in deciding the points raise, among other things, it was said:

"The original obligation to construct the building had been undertaken by the plaintiff Milske (the contractor), and the bond must be treated as a contract of guaranty or suretyship for the faithful discharge of his duties under his agreement with the defendant (Steiner Mantel Company). The original and distinct obligation of the plaintiff (Milske) existed, and

that the bond was a mere collateral agreement founded upon it, appears clear from the language employed, and from a consideration of the surrounding circumstances. The bond may therefore be dismissed from the case, and should not have been introduced into the declaration. With the bond out of the case, it must be admitted that the plaintiff (Milske) cannot recover for the loss which the storm occasioned, for by all authorities, in the absence of special provisions in the contract providing for such a contingency, the loss must fall upon the plaintiff (Milske). . . .

"The contract sued on is an entire, and not a divisible contract. The thing with which it deals in the building and construction, in a certain specified manner, of a factory and warehouse. But it contains certain stipulations by which the defendant (Steiner Mantel Company) obligated itself to pay to the plaintiff (Milske) certain specified and definite sums of money at stated periods as the work progressed. When the

building had reached the stage of completion designated in the contract, the obligation of the defendant (Steiner Mantel Company) to pay the sum specified therein became fixed and absolute. . . .

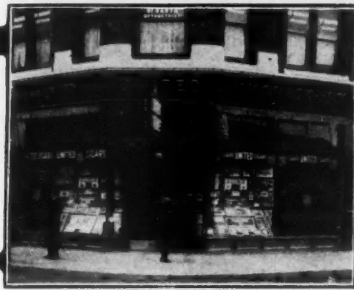
"It is therefore clear that if, before the building had been destroyed by the storm, a definite sum of money was due to the plaintiff (Milske) under the stipulations of the contract,

for work done, and which the defendants refused to pay, and if, after the occurrence of the storm, the plaintiff (Milske) was ready and willing to rebuild said factory and warehouse according to the terms of the contract, and was prevented by the defendant (Steiner Mantel Company) from so doing, two distinct breaches of contract were thereby committed by the defendant (Steiner Mantel Company) for both or either of which a right of action accrued to the plaintiff (Milske).— Charles Milske vs. Steiner Mantel Company, 65 Atl. 471, L.R.A.N.S. 1105.)

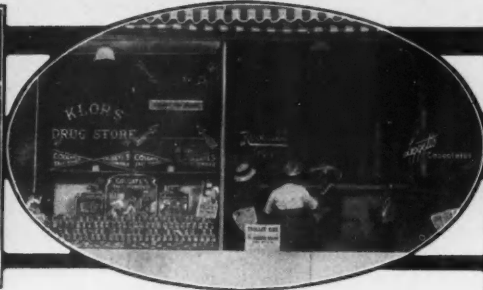
The court thereupon affirmed the judgment of the lower court, which was decided on the pleading in favor of the Steiner Mantel Company, but remanded the case for a new trial, in order to permit Milske to change his pleadings and obtain a trial on the merits of the case. Holding in effect that if Milske could show that he was prevented from finishing the contract by the actions of the Steiner Mantel Company that he could collect for the instalments due at the time of the



(Continued to page 160.)



UNITED CIGAR STORES CO.
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WALK OVER

It Is a Profitable Job—
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ZOURI SAFETY METAL STORE FRONTS

Progressive merchants everywhere are realizing more and more the extraordinary value of their show windows as sales producers. Our advertising is familiarizing them with the advantages of our construction. You can help yourself by helping your local merchants in their show window installation, and the subsequent conservation of plate glass through ZOURI Safety Key Set Construction.

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We have forty-five distributors in the United States and Canada. There is one near you with a complete stock of ZOURI SAFETY and INTERNATIONAL CONSTRUCTION, assuring you no delay in shipping service.

All our distributors sell ZOURI and INTERNATIONAL Construction exclusively and maintain store front departments in charge of especially trained men who are at your command. They will appreciate the opportunity to explain ZOURI superiorities such as the Adjustable Setting Block, that insures

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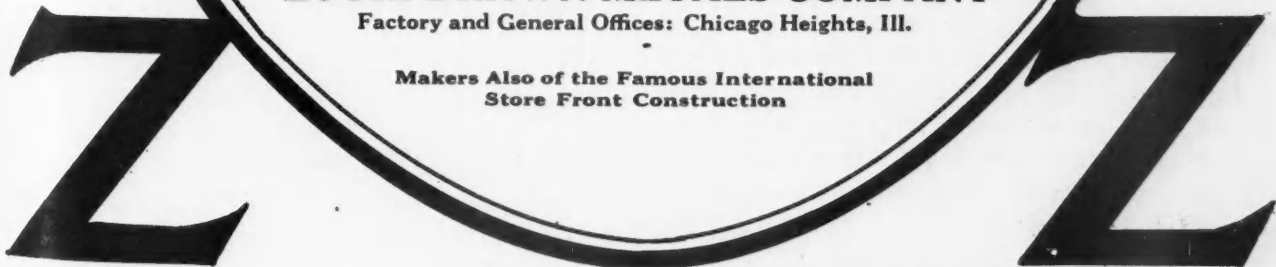
They will also be glad to place at your disposal without obligation their broad experience in building show windows that command maximum sales

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ZOURI DRAWN METALS COMPANY

Factory and General Offices: Chicago Heights, Ill.

Makers Also of the Famous International Store Front Construction



Compensating Cleats for Table-Tops

CONSTRUCTION METHODS TO PREVENT CONTRACTION AND EXPANSION OF WOOD

By Henry Simon

THE expansion and contraction of wood under changing atmospheric conditions is something that can never be entirely done away with. Woods may be selected for particular work, which are least subjected to this influence, they may be thoroly "cooked" or kiln-dried and the finished product be covered with protecting coats of varnish, and by these combined means the effects of changing conditions of humidity largely offset, but there are still many cases where some or all of these preventatives cannot be utilized and there are others where all of them together cannot prevent the buckling, or, which is more frequent, the splitting of large wooden surfaces. One instance is furnished by drawing-tables, which are often of large size. It is impracticable to give them any protecting finish. There are also large tables used for other purposes where either low price or some other consideration makes it undesirable to use a sufficient amount of protective coats. In very dry climates, again, such as those largely prevailing in the Western states, even the best protection and the most careful processing prove inadequate. And

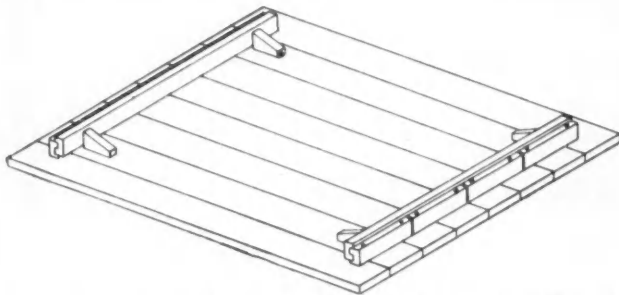


Fig. 1. Drawing Table Top With Cleats So Constructed as to Allow for Expansion and Contraction.

last, but not least, the ideal materials are not always available when a piece of work has to be done.

While it is not possible, however, to defeat the law of nature which causes wood to contract and expand, it is possible to compensate for this movement and thereby to avoid entirely its destructive effects.

This is made feasible by the application of the peculiarly constructed cleats shown in the illustrations, which, while permitting the wood surface any amount of movement or "creeping," firmly hold it in place and compel it to remain flat and straight.

The principle involved is very simple. Each cleat consists of two separate, yet connected, parts. One of these parts is firmly attached to the table, but is divided into a number of completely independent short sections. The other part is continuous and is not fastened to the table, but is slideable and connected with the sectional portion, tho resistant to any but a longitudinal movement.

How to Apply This Principle

In Fig. 1 is shown the application of this principle

to a drawing table. Both portions of the cleat are made from the same stock, the latter being so designed as to make it engage in itself in a snug sliding

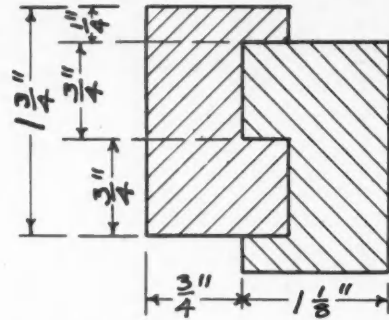


Fig. 2. Section Showing How Cleats Are Put On Drawing Table as Shown in Fig. 1.

fit when reversed upon itself. This is done by plowing out a $\frac{3}{8}$ by $\frac{3}{4}$ -inch groove in one flat side and at a distance of $\frac{3}{4}$ inch from one edge, thereby leaving a tongue $\frac{3}{8}$ by $\frac{3}{4}$ inch, which just fits the groove, while a $\frac{1}{4}$ -inch tongue is left at the other. A section of this stock is screwed and glued to the under side of the top in the usual place, with the edge having the small tongue against the surface. These cleats are then marked off in lengths from 4 to 6 inches and sawed completely thru. Another piece of cleat stock of the same length is then cut and connected with the stationary cleat, after the engaging surfaces of both have been thoroly rubbed with paraffine and held in position by small blocks screwed to the table and lightly bearing against the cleat, thus holding it in position without binding.

A table made in this manner will neither buckle nor split even under extremes of weather condi-

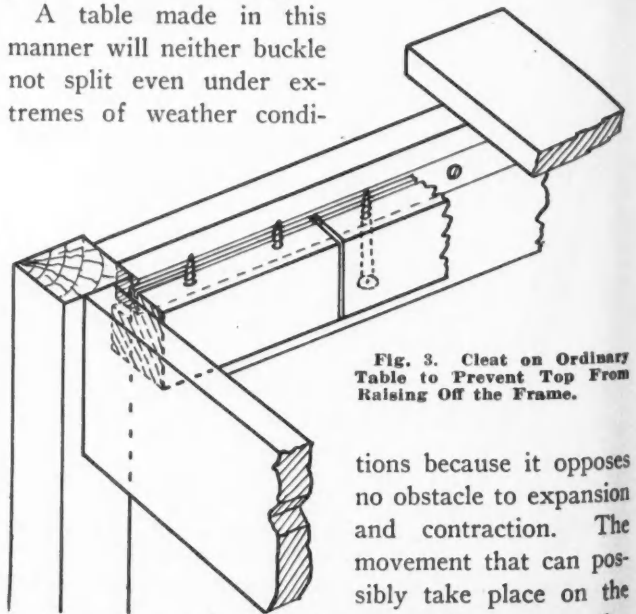


Fig. 3. Cleat on Ordinary Table to Prevent Top From Raising Off the Frame.

tions because it opposes no obstacle to expansion and contraction. The movement that can possibly take place on the section over each block is so small as to be far below the elastic limit of the wood. The spaces between the cleat blocks permit the top to creep backward and forward without impeding it. On the other hand, the solid cleat performs its function of holding the top in alignment as fully as if it were nailed to the top itself.

(Continued to page 160.)



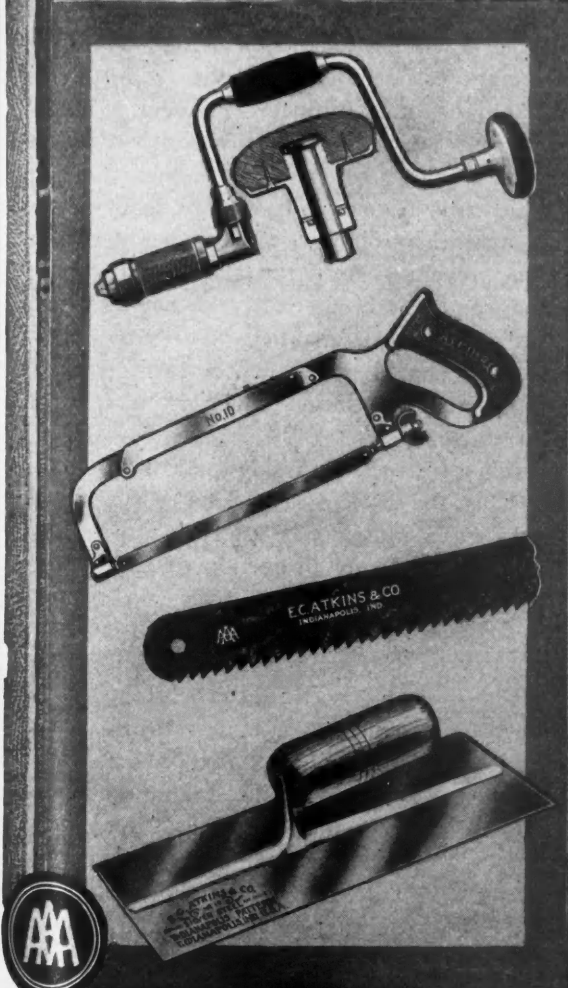
The
"Build It Now"
 idea is growing. In normal times, under normal conditions, it required the building of about 600,000 homes annually. For over two years normal construction has been suspended, therefore, over 1,000,000 homes are needed. This means more building. Be prepared for more work and buy

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Write for our catalog which illustrates and describes
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Careless Estimating Costly to Contractors

MANY ITEMS OF "GENERAL EXPENSE" OFTEN OVERLOOKED—WHAT THEY ARE

By George M. Petersen, Estimator

EDITOR'S NOTE—This is the second of two installments of an article on general expense items in estimating. The first installment appeared in the December issue.

Freight of materials is usually included in the cost of materials when they are originally estimated, but some firms have a habit of taking them under General Expense. Freight, in general, must be watched pretty closely because so much of the building material is sold f.o.b. the cars at the town in which it is to be used that one will often overlook the fact that a few items are quoted "f.o.b. factory."

Fire insurance should be carried upon every job until it is taken over by the owner. By consulting the owner before placing the insurance an agreement can usually be made whereby the owner will take over the policies when he accepts the building and will pay the contractor, prorata for the unexpired term of the policy.

Liability insurance is another real item which is often improperly charged to Overhead or not charged at all. An uncertain item of this nature can hardly be classed as overhead expense when it is based upon the pay-roll and can be figured very accurately from it. It is a perfectly legitimate charge for General Expense and that is the proper place to put it. This

insurance item is often passed by with the remark that "it don't amount to much," but in this day of high wages it does amount to a real big sum on every job and a tremendous amount at the end of the year. An average fair-sized job of around \$100,000 means in the neighborhood of \$700 for insurance which must either be included in the General Expense item or be paid out of the anticipated profit on the job.

As a rule permits do not amount to a great deal but at other times they run up into a fair sized item. Consider them carefully before passing them by.

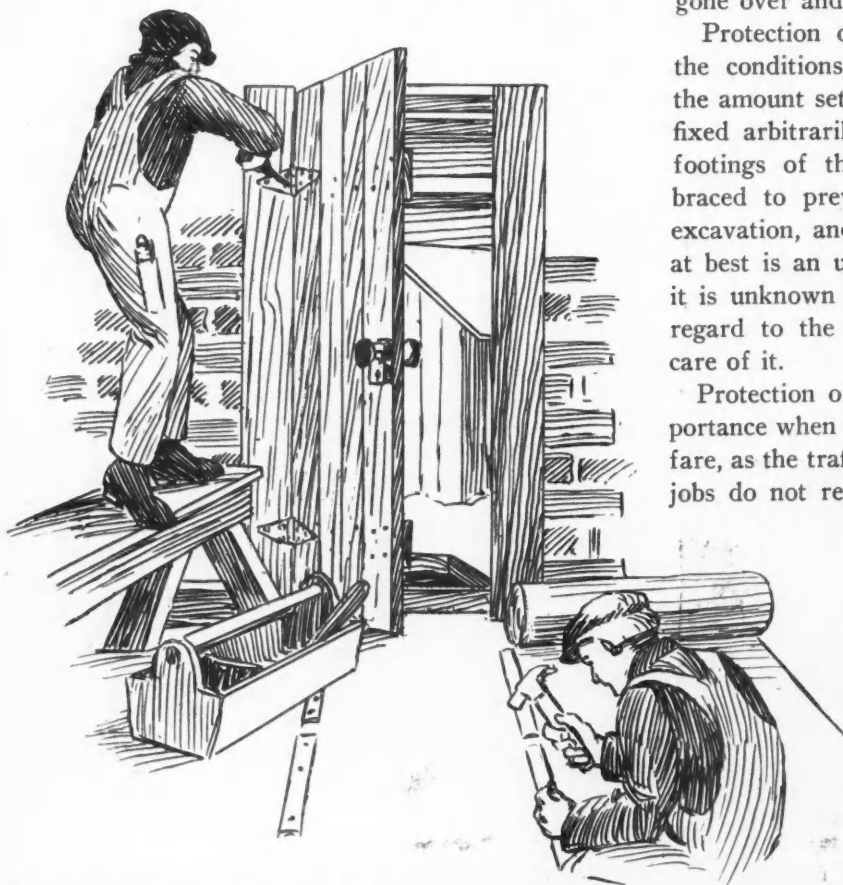
Cost of Protecting Work

Protection of work involves greater or lesser expense in comparison with the character of the project. This item covers the protection of stone sills, ground courses, belt courses, cornices and the like, which must be boxed up and protected until the job is completed. Then there are the items of protecting floors, tile work and things of a like nature which will vary considerably with the character of the work. A bank building, for instance, will require considerably more protection than will a school building and the latter will require more than a factory. A high-class residence will require much more than will a store building, so that each particular job should be carefully gone over and estimated individually.

Protection of other property involves a study of the conditions surrounding the proposed work and the amount set down to cover this item should not be fixed arbitrarily. Some jobs require that walls and footings of the adjoining property be blocked and braced to prevent them from sliding into the new excavation, and this is an expensive operation which at best is an unknown quantity. The very fact that it is unknown should make the contractor careful in regard to the appropriation which is made to take care of it.

Protection of streets and sidewalks is of vital importance when the work is to be done on a busy thoroughfare, as the traffic must not be interfered with. Many jobs do not require any protection of this kind, but the projects which do require it cause it to be an item of importance.

Temporary buildings are required on practically every job, but many contractors figure that they can use the material used in the construction on the job, so that the buildings cost them nothing. Of course this is absurd, but there are many construction men who believe that they are right in taking this stand. They refuse to consider that the labor alone in erecting and demol-

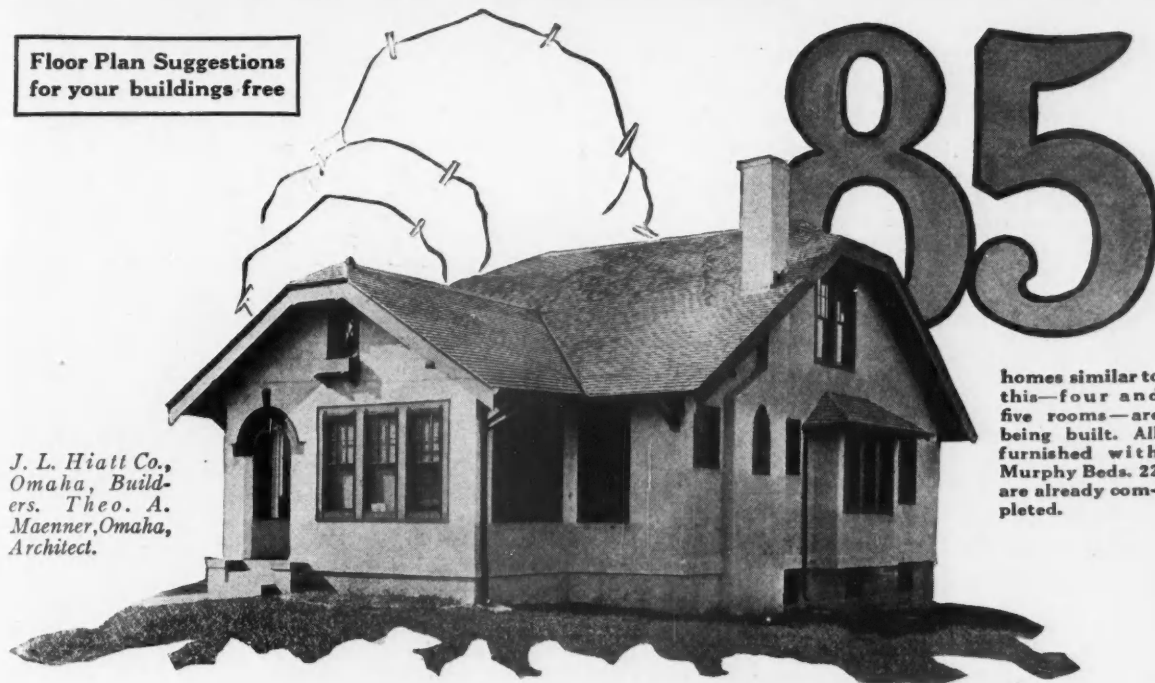


There Are Many Small Costs, Such as Enclosing the Work in Winter That Should Not Be Overlooked.

MURPHY IN-A-DOR BEDS

Floor Plan Suggestions
for your buildings free

*J. L. Hiatt Co.,
Omaha, Builders.
Theo. A. Maenner, Omaha,
Architect.*



homes similar to
this—four and
five rooms—are
being built. All
furnished with
Murphy Beds. 22
are already com-
pleted.

Beds and Bungalows

To build eighty-five snug little bungalows economically so that they can be marketed at moderate prices, there is just one method: the Murphy method.

Murphy Beds cut down building costs by eliminating rooms without curtailing capacity or comfort. In addition, the occupants have fewer rooms to furnish and decorate.

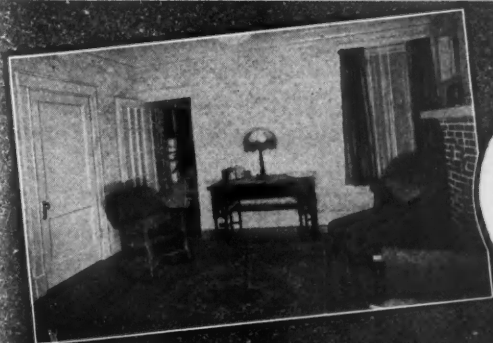
Can YOU Afford to Build Without
Installing Murphy In-a-Dor Beds?

MURPHY DOOR BED COMPANY

469 Fifth Avenue
New York
659 Leader News Bldg.
Cleveland, O.

22 West Monroe Street, Chicago
Chemical Building, - St. Louis

305 City Club Bldg.
Kansas City, Mo.
111 Murphy Street
Dallas, Texas



ishing the temporary structures is a considerable item and ease their minds by saying that the expense is "too small to bother with." The only answer to this line of reasoning (?) is that absolutely no *known* item is too small to be taken into consideration.

Staging and Scaffolding

Staging and scaffolding are required on every job and must be included under the item for which it is to be used, in the lumber list or under the General Expense item. The latter place is the proper one to put it because the full value of the material should not be charged up to any one job, but should be spread over two or three, the labor involved, of course, is charged directly and in full to the job.

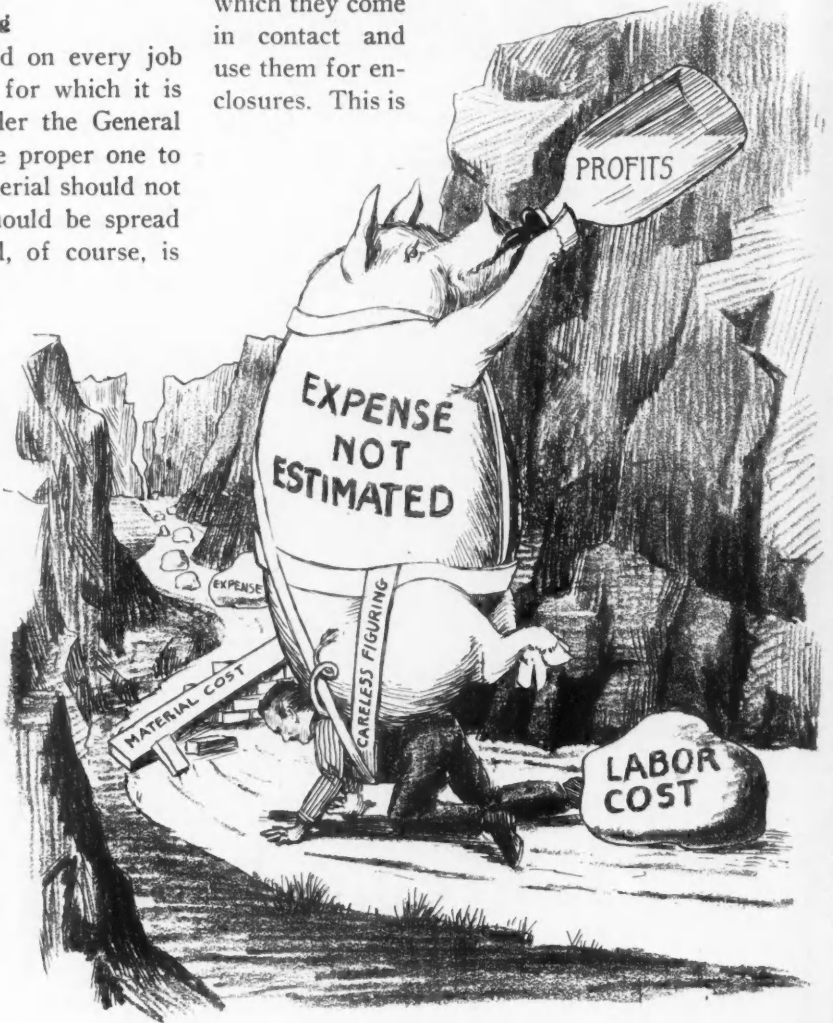
Storage of supplies and material is another vital item. It is far cheaper, in the end, to erect temporary buildings in which to store material and supplies than it is to run these articles into the basement of the building and then move them to the place where they are to be used. Labor, today, is too expensive and too scarce to allow any of it to be wasted, so that properly located temporary buildings are the most economical in the end. It is policy, even for late fall and winter work, to place temporary enclosures over gravel and sand piles to prevent water getting into them and freezing so that the piles will have to be thawed out before the material can be used. Proper storage of materials should be given considerable thought, and, when a satisfactory solution has been reached, the item should be charged under General Expense.

No large, present-day construction job is complete without its telephone. The amount of time saved by having a phone on the job will more than offset the cost, so that the writer can find no fault with the contractor who lumps the item with his labor and forgets it. However, it is, properly speaking, a known quantity and should be included in the estimate as an item.

Extra Cost of Work in Winter

Temporary closing and heating of building is an item which is all too often underestimated. Of course, the sum to be appropriated for this part of the work will naturally vary with the character of the job, but it is a nice little item to figure out. The enclosure itself will usually amount to several hundred dollars and the heating will cost a few hundred more, so that in the aggregate it is a fairly large amount of money that is involved. Of course, irregular openings can often be more cheaply enclosed by using canvas than by using wood, but there will always be many places

where wood will be absolutely necessary and the lumber used for this purpose is, in the majority of cases, worthless for anything else, so that it must be charged directly to the building. Many contractors save all the old sash with which they come in contact and use them for enclosures. This is



Present-Day Contractors Have a Heavy Load and Should Be Careful Not to Add to It.

an excellent idea, but they neglect to allow for the carting to and from the job and the labor involved in erecting and removing from the building. Watch these little corners and don't overlook a single bet than can be avoided.

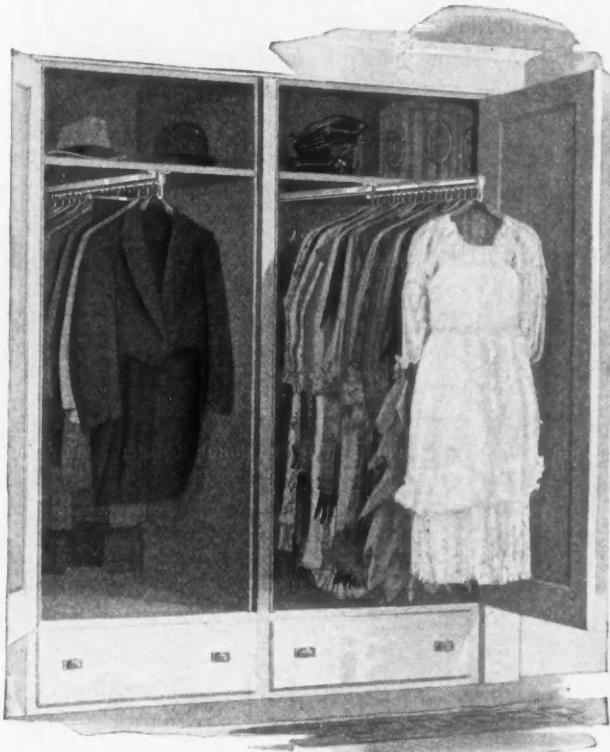
Temporary lighting often becomes necessary on an enclosed job which is being worked thru the dark winter days, but except under unusual conditions, or underground work, it is hardly of sufficient importance to bother with. If, however, the character of the proposed work is such that temporary lighting will be necessary do not forget to make provision for it in your estimate, because its cost will be a great deal more than you would imagine unless you have had experience with it at a previous time.

A temporary office should be included upon every job of any size and the plans of the building, the details and other things pertaining to it should be kept in it. The timekeeper should be kept in it so

Roomier Closets in Smaller Spaces

—and not only roomier but better, because they will keep the wardrobe fresh, orderly and more easily accessible. All these advantages in only a fraction of the space needed for the old fashioned closet are afforded by the

KNAPE & VOGT Garment Care System



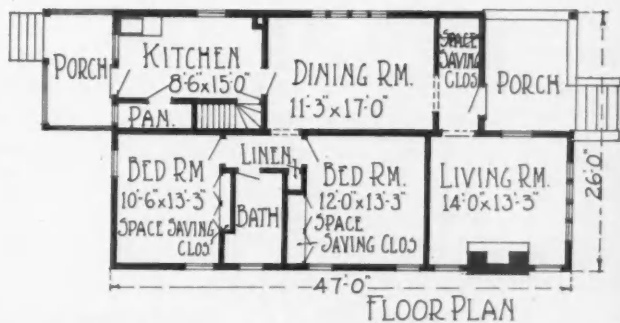
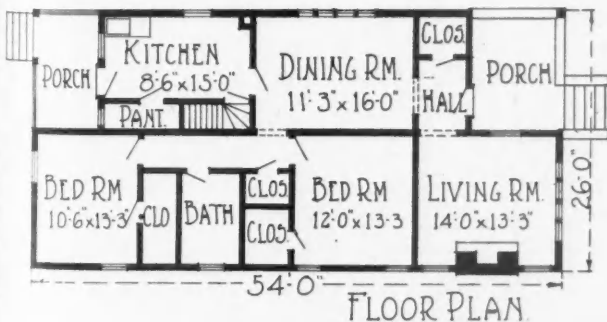
This shows a modern closet equipped with the Knappe & Vogt Garment Care System

Every cubic foot of the closet is made available for the better hanging of garments. Several hundred dollars worth of space in any dwelling is thus released for use in other rooms; or you can hand the money back to the owner as a clear saving.

Another saving; wiring for lighting is unnecessary. The carrier on which the garments are suspended slides on roller bearings right out into the light and air of the room. No more rummaging for clothes; no more moths.

Call on us for detailed information. Let us work with you on plans for new homes and show you how to get the most out of your floor spaces. Phone, write or call at any of our offices.

Saving 15% on Cost: The accompanying comparative floor plans show how space may be saved by substituting smaller, more efficient closets for the old space wasters. The second plan shows a saving of seven feet in length of building with dining room one foot longer and other rooms the same size. The closets of the second plan equipped with the Knappe & Vogt Garment Care System will hold more clothing than the old closets indicated in the first plan.



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

New York, 168 Church Street
St. Louis, Title Guarantee Bldg.

Chicago, 546 Washington Blvd.

Boston, 86 High Street
San Francisco, Rialto Bldg.

that there will always be someone on the job to answer the phone and give the necessary information to the various mechanics on the job who may want to be enlightened upon some detail of the work which they do not understand. The office can also be used for a shelter for the watchman, if one is employed on the job. This building should have light and heat as well as the telephone previously mentioned.

Sufficient Water Sometimes Expensive

Water is an absolute necessity upon every construction job and provisions must be made to secure it. This is a simple matter in a city where all one must do is to give the water department a check, but in outlying districts it is often an expensive proposition to secure the liquid. Many times factories will be rushed to completion before the water supply is available to the contractor and he will have to provide water for himself. Also there are many small communities where the supply of water is so limited that none can be used for construction work. These conditions involve considerable expense upon the part of the contractor, who must either haul the water to the job in wagons or trucks, drill a well or pipe it some distance from a creek or stream; so the water supply should be carefully investigated before the item is passed by. It is a known quantity, in the cities, so, no matter how small the item may be, charge it up in your estimate.

Under the head of miscellaneous come any special items which may apply to a special job and also such items as expected increases in the cost of labor before the job is completed. This labor cost is a wild one, nowadays, and the successful contractor keeps his ear continually on the ground so that, when a big job comes along, he will know exactly what condition the labor market is in and what increases, if any, he may expect before the job is finished.

Interest on Money Invested in Equipment

Interest on investment in plant is often included with the "Depreciation of Plant" item, but should not be done that way as all "Interest" accounts should be kept under a special account in the contractor's ledger. Interest should be figured upon all balances which may be still charged against the items of plant in use on the job after the "depreciation" charge has been deducted.

There are many contractors who will say, "How can I get any work if I figure in all of these General Expense items and my competitors do not?" The answer to this is very simple. The contractor who "guesses" at his items usually adds a so-called "Profit and Overhead" of from 20 to 25 per cent of the cost of the operation. He also usually has an item of from five to ten per cent which he terms "Incidentals" which should properly be termed "errors." On the other hand the contractors who figure carefully every KNOWN item, then add their "Overhead" and a reasonable "Profit" will be as low as is consistent with

proper workmanship and working conditions so that, in the end, they really stand a better chance of getting the job than the fellow who takes a chance.



Compensating Cleats for Table Tops

(Continued from page 154.)

Another and slightly different manner of applying the same principle is shown in Fig. 3, in which it has been used on an ordinary table. Here the cut-up cleat is merely provided with a rabbet fitting over a strip screwed to the side of the table, the tongue thus formed on the cut-up section holding the top from raising off the frame, while the table sides keep it from moving the other way. As it is necessary to fasten the cut-up cleat to the table after both the table-top and the solid cleat are in place, the sectional cleat-stock is provided with an $\frac{1}{8}$ by $\frac{1}{8}$ -inch groove, to catch any glue that might otherwise work between the two cleats and prevent them from properly performing their functions.

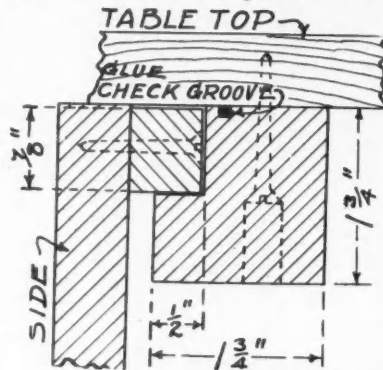


Fig. 4. Cross Section Showing Method of Applying Cleat to Ordinary Table, as Shown in Fig. 3.

As in the other case, the mutual contact surfaces of both cleats should be well coated with paraffine before they are put in place, and they should not be set up too tight, but with a small

amount of play between them.

By the use of these cleats, even very large table tops left in the natural finish can be kept from buckling or splitting under unfavorable conditions. Where the surface is left unfinished, however, it is advisable to apply linseed oil or wax to the end-grain, in order to close the pores and to prevent those sections of the table from drying out faster than the rest and, possibly, checking.



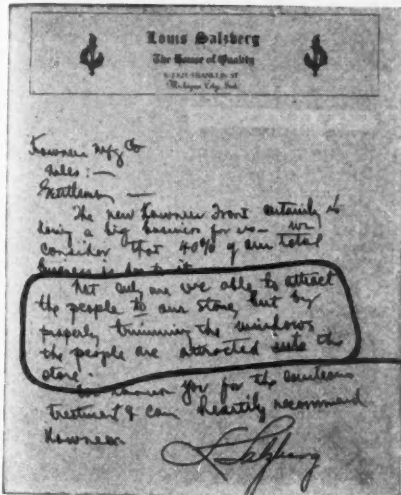
Law for the Builder

(Continued from page 152.)

destruction of the building. Also that he would have a right of action for damages, for breach of the contract, against the Steiner Mantel Company for their failure to permit him to finish the contract.

But the court followed what is no doubt the great weight of opinion in holding that Milske could not recover for the damages caused by the storm. It has been held in the great majority of cases that where a contractor contracts unqualifiedly to erect a building, and it is destroyed before completion, he must bear the loss. In cases of this kind, where there appears an insurable interest, it would seem but prudent for the contractor to protect himself by insuring until completion and acceptance.

Kawneer STORE FRONTS



**Investigate
This Profitable
Work for
1920**



*business is on to us.
Not only are we able to attract
the people to our store but by
properly trimming the windows
the people are attracted into the
store.*

Let Satisfied Kawneer Customers Build Prestige For You!

CONTRACTORS and Builders everywhere are making good profits installing Kawneer All Metal Store Fronts. They are not only making money, but are building valuable prestige in their locality. Every Kawneer Store Front Job they install is a reputation-building advertisement for them.

Good Profits in Kawneer Work

There is a lot of store remodeling work in your locality. Seven out of ten stores in your town are prospects.

Any contractor who can build a house or store building can install a Kawneer System All Metal Store Front.

Cash in on This Work in 1920

We are prepared to show you how a connection with the pioneer and recognized leader of store front manufacturers will be profitable to you in 1920.

Fill out the coupon and mail it to us today.

Send This Coupon Today!

KAWNEER MFG. CO.

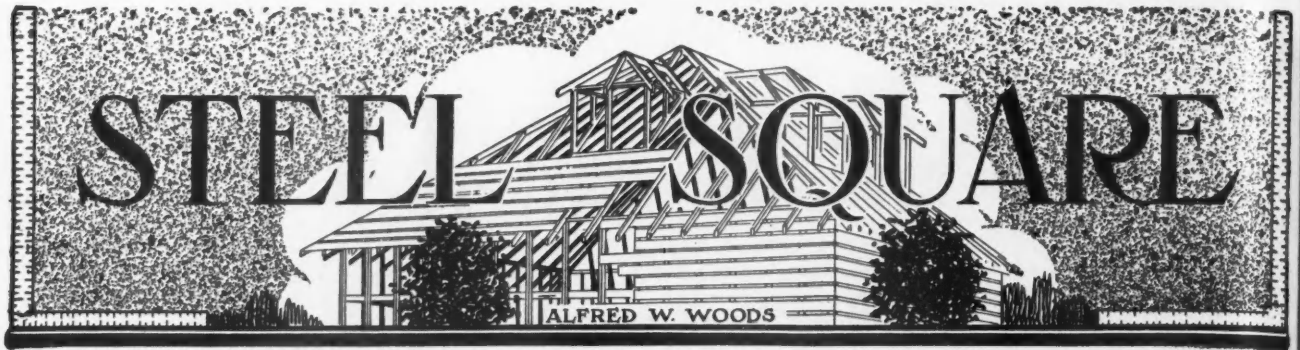
2426 Front Street, NILES, MICH.

**KAWNEER
MFG. CO.**
2426 Front Street,
NILES, MICH.

Please send me Full Information about Kawneer Store Fronts.

Name.....

Address.....



Possibilities of the Steel Square

SHOWING A PRACTICAL WAY FOR THE DEVELOPMENT OF THE HIP FOR ANY SHAPE THE ROOF MAY HAVE

By A. W. Woods

THERE are a number of ways for developing the hip for curved roofs, but the one herewith illustrated presents, we believe, all things considered, about the best solution for arriving at problems of this kind, and especially so where compounded curves enters into the problem. It is known as the stretch rule system, which is simply dividing the run of the common rafter and that of the corresponding hip into the same number of parts, that is, by letting the common standard rule for one foot represent the run of the common rafter, which would be the same as taking 12 on the tongue of the steel square, as shown in Fig. 1.

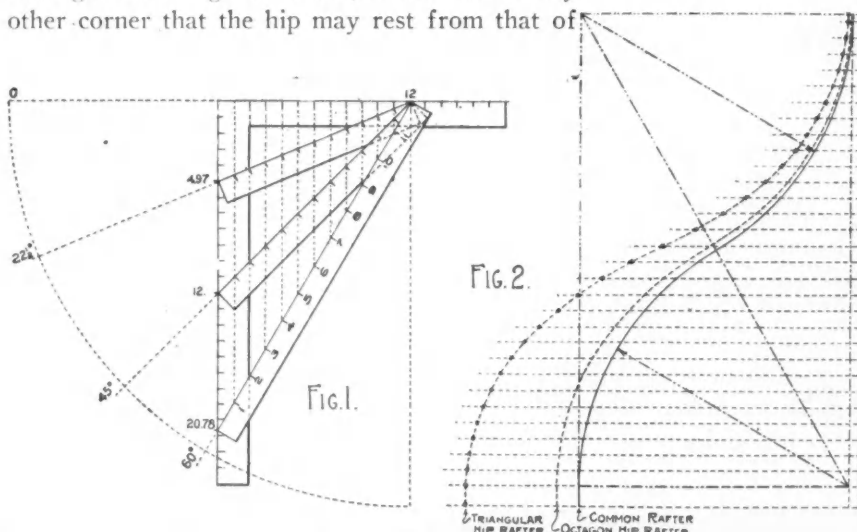
Now, by taking a straight edge piece of wood and placing one end at 12 with its edge at the angle that the seat of the hip rests from that of the common rafter and where it intersects the blade will represent the length for the stretch rule as from 12 to 4.97 (practically 5); this will be the proper length of the rule for the octagon hip measurements. If the straight edge piece is placed so as to extend from 12 to 20.78 (practically 20¾), it would represent the measurement rule for the hip resting on a square corner; and if the straight edge extended from 12 to 20.78 (practically 20¾), it would represent the measurement rule for the hip resting on a triangular corner, and so on for any other corner that the hip may rest from that of

the common rafter, it does not make any difference what it is.

In this example we have used regular polygonal corners, that is, they will come around and join, making a roof of equal sides, but that does not matter whether the hip is to be developed for a regular corner or not, just so the straight edge is placed on the square at the angle that the seat of the hip is to rest from that of the common rafter; and divide this improvised rule into twelve equal parts and by again dividing one of these parts we will have the stretch rule ready for business. In other words, it is just the same as if we were to take a piece of rubber 12 inches long divided into regular standard measurement and by holding one end at 12 on the tongue, laying it along the member without stretching, it will reach to the heel of the square and will represent the length of the run of the common rafter for a one-foot run. Now, by a little pulling on this rubber rule, it can easily be stretched from 12 on the tongue to 5 or to 12 or 20¾ on the blade, and yet in each case its markings would be divided into 12 equal parts, assuming, of course, that its elasticity be the same at all parts. Thus it will be seen that the rubber in its stretched condition represents the gain in the run of

the hip over its normal length for the common rafter; but for working purposes it is necessary to have the straight edge rule divided as shown, and we are ready for business.

In Fig. 2 is shown an ogee or compound curve for the common rafter, and in this case the curves are equal and laid off with the trammel, but it does not matter what the shape is or how it is developed, the real question is how to develop the hip to coincide with it. The method is as follows: Select a floor or level space, on which lay off the full size of the run, rise and desired curve for the



How to Develop Corresponding Curved Hip Rafters.



"I WANT TO BUILD A HOLLOW TILE HOME"

THAT is what many prospective home builders in your community will say to you in a very short time. Will you be able to build it?

The Hollow Building Tile Association, made up of America's leading manufacturers of this modern building material, trade-marked **MASTERTILE**, has begun a country-wide advertising campaign to show the Building Public the many decided advantages, economies, and comforts of Hollow Tile construction.

When the Building Public knows that a permanent, fire-resistive Hollow Building Tile house compares favorably in first cost with a well-built frame house, and has the added features of coolness in summer, eco-

nomical heating in winter, and freedom from repairing and painting, they will build Hollow Tile houses. If you cannot build them, some more progressive contractor in your own town, or one near by, will get the contract.

We want every reader to know how to build Hollow Tile houses, and to be in a position to figure on them when this demand comes.

Hollow Building Tile construction is simple. Any carpenter-contractor can readily take it up. Our new Hollow Tile Manual makes it easy, for it covers all the essential details of Hollow Building Tile construction for the average building. A careful study of its pages will put you in a position to figure intelligently and safely on any building of Hollow Tile.

Send for your copy of this Manual today. Be the "early bird" in your locality and get some of the business which our advertising campaign will create.

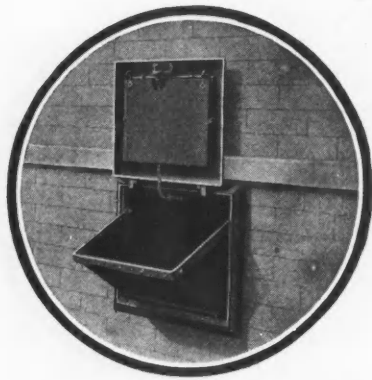
THE HOLLOW BUILDING TILE ASSOCIATION
 Representing America's Leading Manufacturers
 BY THIS TRADE MARK **MASTERTILE** YOU SHALL KNOW IT
CONWAY BUILDING · CHICAGO

USE COUPON FOR THIS FREE MANUAL

THE HOLLOW BUILDING TILE ASSOCIATION, 111 W. Washington St., Chicago, Ill.
 Gentlemen:—Please send me your Manual as advertised in the January issue of the American Builder.

I am planning to build _____
 (If you have ever used Hollow Tile please tell us for what buildings and how you like it. _____)

 (Name) (Business) (Street and Town) (State)



Brings You a Double Profit

YOU can add to your profits by specifying the use of The Majestic Coal Chute, and at the same time render a valued service to your customer—a service which means good-will and more business for you. Thus you profit **twice!**

Included in the foundation of homes or other buildings, the Majestic Coal Chute guards and protects against marring or scarring caused by the careless delivery of coal.

The **Majestic Coal Chute**

**Insures Lasting Beauty
Guards Against Damage
Lessens Depreciation
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Glass panel serves as window when chute is locked (automatically) and not in use. Sturdily, durably made—both body and hopper being constructed of

Keystone Iron

Builders everywhere are seeing our strong advertisements in *The Literary Digest* and other magazines and will appreciate it if you remind them to include the Majestic in their specifications.

Write for Catalog 12G and name of nearest jobber. Working Drawings gladly furnished.

THE MAJESTIC COMPANY
841 Erie St., Huntington, Ind.

common rafter, then lay off parallel lines with the seat, as shown, letting them extend beyond the curve for the common rafter, as shown. These lines do not necessarily have to be evenly spaced, say not more than four inches apart, and when the curve is receding it is well to have them even closer than that amount because the measurement checks, as we will show, will not be so far apart, thereby making the measurement checks more accurate for running the offhand curve for the corresponding hip.

We are now ready to proceed with the measuring process as follows: First, measure the parallel lines with the standard rule from the rise line to the curve line of the common rafter; then go over the same line and measure off the same amount with the stretch rule for the desired angle and check. After thus measuring all of the lines, run an offhand curve thru the checks and the required curve will be defined for the corresponding hip.

There is another problem in connection with the hip that should not be overlooked, and that is the backing of the hip. Someone has said that this is a lost art, and from long personal experience we believe the saying is not very far out of the way.

Of course, in the case of the reasonably low, straight pitch, it does not matter so much when the seat cut is made to allow for the backing, that is, so that the edges of the hip will be in the plane of the back of the common rafter, but this allows a hollow space between the roof boards and the top of the hip which should not be in a first-class job.

In the case of the curved roof it is more of a problem of how to find the backing line on the side of the rafter on account of the ever changing curvature of the roof, but this should not be allowed to worry one, as the amount to set off on the parallel lines is exactly the same on all the lines and by running offhand curve thru these points will give the proper gauge line on the side of the rafter from which to remove the wood to a center line along its back.

The proportion is found in Fig. 1, as follows: Let 12 on the tongue represent one-half of the hips thickness, then as the figures shown on the blade are to 12, this will be the proper amount to set back on the parallel lines to obtain the proper gauge line. Thus, for the octagon hip it would be practically five-twelfths of one-half of the hip's thickness. For the square corner it would be twelve-twelfths of one-half its thickness and for the equilateral angle it would be practically twenty-one-twelfths of half the hip's thickness, which in this case is equal to $1\frac{3}{4}$ inches.



A WOOD-BUTCHER is not a carpenter; a time-killer is not a carpenter. A carpenter is a skilled wood-workman with a conscience-attachment that sounds the alarm at the least evidence of shipshod work.

"Built Just Before the War"

**This Well Planned Six Room Home
of Beautiful Brick
Cost Less Than Three Thousand Dollars**

This attractive six room home of Brick won first Prize in a country wide small residence competition, conducted by the "American Builder," just before the war.

The competition requirements called for photographs and floor plans of houses which had actually been built, costing \$3,000.00 or less was open to ALL CLASSES of building materials.

Award was made on architectural appearance, interior arrangement and economy of construction.

Hundreds of photographs and floor plans were submitted from all parts of the country, but brick scored the signal victory. It won First Prize.

Send for Free Folder of Floor Plans

We would like to send you, without cost or obligation, an illustrated descriptive folder of this prize-winning home

This folder contains floor plans, interior views and an itemized account of the pre-war cost. It is so complete that any contractor can figure the present cost of this home locally.

**The Permanent Buildings Society
Chamber of Commerce, Chicago, Ill.**



THIS COUPON GETS FREE FOLDER OF FLOOR PLAN

**THE PERMANENT BUILDINGS SOCIETY
Chamber of Commerce, Chicago, Ill.**

(PLEASE PRINT YOUR NAME AND
ADDRESS TO INSURE DELIVERY)

Gentlemen:—Please send me Free Folder of Floor Plans of Gates' Prize Brick Bungalow offered in January issue of American Builder. I am also planning to build.....

Give name of lumber and building material dealer

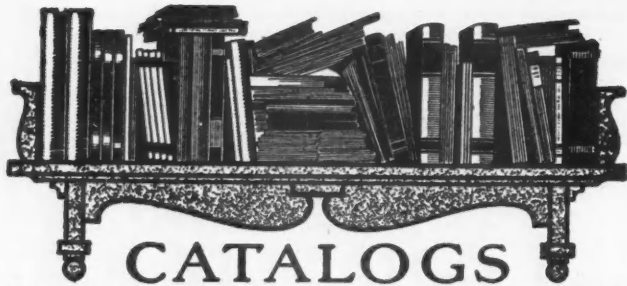
(YOUR NAME)

(YOUR BUSINESS)

(YOUR TOWN)

(YOUR STATE)

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



CATALOGS BULLETINS & BOOKS RECEIVED

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

"Applied Science for Woodworkers," by William S. Doole, principal of the New York Navy Yard Apprentice School, is a practical textbook on physics, chemistry, etc., written in a clear and concise style and in such a way that the interest of the student is maintained. It is a cloth bound volume of 468 pages, well illustrated. Published by the Ronald Press Co., New York City. Price \$2.

"O-K Hoisting Machinery" is the title of Catalog No. 19, of the O-K Clutch Co., Columbia, Pa. The booklet contains 24 pages and cover and contains descriptions and illustrations of the various types of hoisting machinery the company manufactures.

"The Plant for the Small Concrete Job" is the title of a four-page, two-color folder describing the Insley Mast Hoist Bucket Plant, manufactured by the Insley Manufacturing Co., Indianapolis, Ind. Illustrations show details of the buckets and hoist, and a view of the plant in operation.

Small Portable Gas Engines, made by the Emerson-Brantingham Implement Co., Rockford, Ill., are described in a 12-page booklet, issued by the company. One engine described is mounted on skids and has a capacity of four horsepower, while larger ones are mounted on trucks.

Concrete flower box and garden bench of concrete and how to make them is one of the subjects covered in "Alpha Aids No. 19," published by the Alpha Portland Cement Co., Easton, Pa. This issue of the magazine is devoted to concrete work in the winter time.

"Economy in Hauling" is the title of a 16-page well-illustrated booklet, describing the many uses of auto trailers, issued by the Trailmobile Co., Indianapolis. The illustrations show "Trailmobiles" in use by contractors, lumber dealers and in other businesses. The company also has issued several other pieces of interesting literature describing the trailers it makes.

"Complete Equipment for the Manufacture of Concrete Products" is described in a 16-page and cover catalog, issued by the W. E. Dunn Manufacturing Co., Holland, Mich. The equipment described is machinery for the manufacture of cement tile and other cement products. The



MULLER
ASBESTONE
GUARANTEED PRODUCTS
TRADE MARK

Everlasting Stucco

ASBESTONE EVERLASTIC MAGNESITE STUCCO, the wonder of the age, is recognized by the leading authorities in building construction to be the most reliable exterior wall coating yet produced. EVERLASTIC STUCCO can be applied on wood, cement, brick, stone, etc., is non-absorbing, waterproof, fireproof, and will last a lifetime. EVERLASTIC STUCCO is superior to cement stuccos, in that it does not crack or chip. EVERLASTIC STUCCO is the ideal material for old or new buildings. Enduring. Indestructible and artistic.

Inquiries Solicited, Samples and Prices Free—Write Today

Franklyn R. Muller & Co.

Composition Floors and
Stucco Manufacturers

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974 Madison Street
WAUKEGAN, ILLINOIS

SOMETHING TO



ADORE

LANE'S BALL BEARING
PARLOR DOOR HANGERS

AT ALL HARDWARE STORES

Manufactured by

LANE BROS. CO., Carroll St., Poughkeepsie, N. Y.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

Mr. Contractor:

Will you figure out this plan with us?
 How much sentiment have you found in the contracting business?
 It's a case of "dog eat dog," isn't it?
 Then why don't you plan to be the winner?
 Have you estimated the heating on the houses you have figured on?
 And have you lost contracts because you did not figure on the heating?
 Contractors throughout the country are making a nice profit on the side—in two ways—

1st—By including Hero Heating in their estimates.

2nd—By installing Hero Heating in stove heated homes.

Do you know that the pipeless furnace has come to stay?
 Do you want to sell the pipeless furnace that always gives satisfaction—the Hero?

Do you want the Hero sales corporation behind you to help you?
 Do you want to work under the Hero Pipeless guarantee?
 Then write today for our plan and territory rights—and we'll figure out your profit with you?

PIPELESS DIVISION

HERO FURNACE COMPANY

Makers of Room Heaters, Pipeless and
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59 WEST LAKE STREET, CHICAGO



Learn to Be a Draftsman and Draw Your Own Plans

By means of these two books the contractor, builder or carpenter can advance by easy steps from the first principles of drafting room practice to the complete work of an architect's office, including drawing to scale, tracing, detailing, lettering, rendering, designing, etc. He can combine the work of the architect and builder. He will learn not only how to plan the structure, but how to lay out the work, specify the materials and finish, make the contracts, and take complete charge. A complete set of plans with every dimension, all sizes of windows, doors, etc., is shown in these books. This serves as a guide as it shows the process from the preliminary sketch to the finished plan.

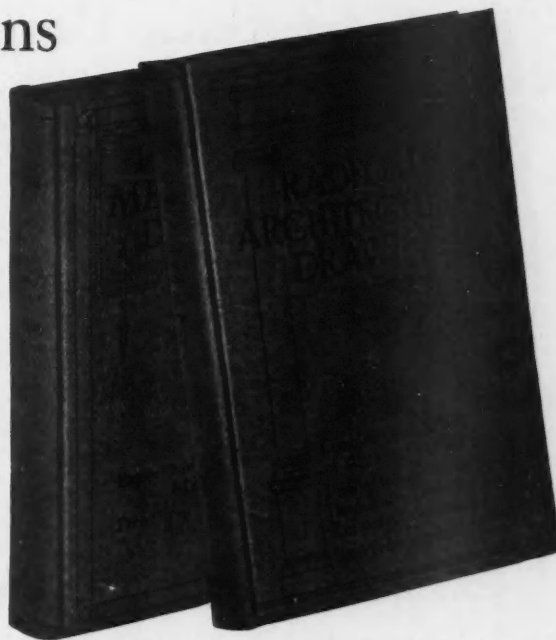
Radford's "Mechanical Drawing" is a book of 272 pages, with 165 illustrations, and a supplement showing perspective views and floor plans of 41 brick, cement and frame residences.

Radford's "Architectural Drawing" is a book of 304 pages, with 147 illustrations and a supplement showing perspective views and floor plans of 41 brick, cement and frame residences.

Each book is printed on high-grade paper, bound in cloth, is 6x9 inches and has a beautiful illuminated cover.

Don't Depend on Another Man's Brains

Develop your own ideas. Be in a position where you can work a customer's hazy suggestions into a tastefully arranged, complete plan, showing all dimensions.



Price \$3.00 per set

American Builder 1827 Prairie Ave.
 CHICAGO

catalog is extensively illustrated.

Oil burning engines for general power purposes, ranging in horsepower from 25 to 100, are described by text and illustration in a six-page folder, issued by the Anderson Foundry & Machine Co., Anderson, Ind. The engines the company makes are of the semi-Diesel type.

"Old Chatham and Neighboring Dwellings South of the Berkshires" is the title of No. 5, Vol. V, of the White Pine Series of Architectural Monographs. A number of photographs of old homes in New England are contained in the book, while there is an interesting description of them by Alwyn T. Covell. Published by the White Pine Bureau, St. Paul, Minn.

Universal Sawing and Jointing Machine, made by the Lane Manufacturing Co., Montpelier, Vt., is described in a booklet issued by this company. This is a portable machine and is well-adapted to the use of contractors.

White Stucco Homes of several types are shown in illustrations contained in the October issue of the Medusa Review, issued by the Sandusky Cement Co., Cleveland, O.

The Root Portable Saw, a machine that rips and cross-cuts planks, joists and timbers, is described in a 12-page catalog, issued by the B. M. Root Co., York, Pa. This machine has a capacity of any thickness of timber up to 6 inches.

Farm Power and Farm Light Plants, made by the Phelps Light & Power Co., Rock Island, Ill., are described by text and illustration in the advertising literature of the company. A technical description of the engine and generator is contained in a four-page folder entitled "Mechanically Superior Phelps."

"Triangle Mesh Reinforcement in Stucco Houses" is the title of a 16-page booklet on stucco house construction,

issued by the American Steel & Wire Co., Chicago. "Triangle Mesh Concrete Reinforcement for Building" is another interesting booklet on concrete construction issued by the same company.

"Portable Painting Equipment" for building exteriors and interiors and all kinds of stationary work, is the title of a folder of interest to building contractors and master painters, issued by the De Vilbiss Manufacturing Co., Toledo, Ohio. The folder explains the economy of using the Aeron System of airbrush painting.

Store fronts of all kinds are described by text and illustration in a folder, entitled "Remodeling America," issued by the Brasco Manufacturing Co., Chicago. The folder shows how contractors can profit by installing modern store fronts in the buildings they erect.

Save Your Customer Money and Make A Profit Yourself



The contractor who takes the order for the water system, and installs it when the house goes up, makes an extra profit and at the same time the cost to his client is considerably less than the expense of a later installation.

The Deming Water Supply booklets will prepare you to give this service. Sent free together with details of our special contractor's offer.

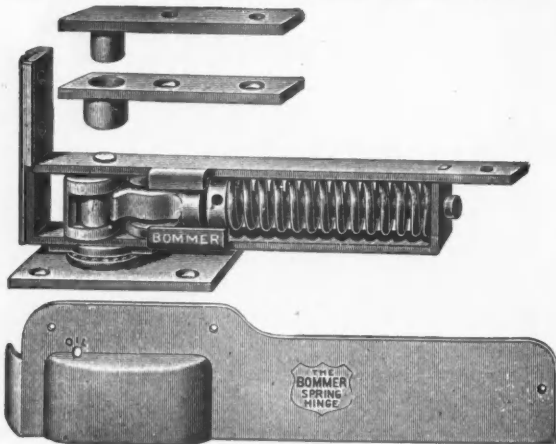
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BOMMER

Floor Surface Spring Hinge

Double or Shingle Action, Holdback, Ball Bearing. Every moving part of this hinge can be oiled from a single hole on outside of side-plate.



The most durable hinge of its type; holds the door open when swung to 90 degrees at either side

Your Hardware Merchant Can Supply Them

Bommer Spring Hinge Company, Brooklyn, N.Y.



Stained with Cabot's Creosote Stain
C. M. Hart, Architect, Bay Shore, N. Y.

Stained Shingles

The Warmest, Most Artistic and Most Economical of all House Finishes

Wood shingles are two or three times warmer than the gummed paper substitutes, and they are cheaper, last longer and are incomparably more artistic and attractive. When stained with the soft, moss-greens, bungalow-browns, tile-reds and silver-grays of

Cabot's Creosote Stains

they have a richness and beauty of tone that no other finish can equal and the creosote thoroughly preserves the wood. Use them also on siding, boards, sheds and fences. Anyone can apply them with best results at least expense.

Cabot's "Quilt"

makes floors and partitions sound-proof by breaking up the sound-waves and absorbing them. It makes walls and roof cold- and heat-proof by a cushion of minute dead air spaces that prevents the conduction of heat. From 28 to 50 times as efficient as cheap building paper.

You can get Cabot goods all over the country
Write for samples and name of nearest agent.

SAMUEL CABOT, Inc.

Manufacturing Chemists BOSTON, MASS.
1133 Broadway, New York 24 W. Kinzie St., Chicago
Cabot's Brick Stains, Stucco Stains, Conserve Wood Preservatives, Damp-proofing, etc.

The Insley Mast Hoist Bucket Plant

equipment which has no equal

For The Small Concrete Job.

INSLEY

A simple and efficient set of concrete placing equipment which is designed for use in connection with one-half and one-sack capacity mixers.

The plant is of low first cost, can be quickly erected and provides a system for elevating and distributing concrete on small work that is efficient in every sense of the word.

Write for illustrated circular.

INSLEY MANUFACTURING CO.

Engineers INDIANAPOLIS, INDIANA. Manufacturers

It's a Pleasure to Install

"MILCOR" BARN VENTILATORS

And "Daylight" Hog House Windows

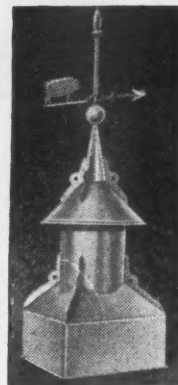
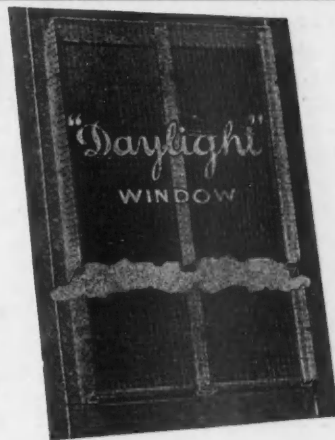
"Milcor" Ventilators are easy to install, and they are correct in design, with beautiful aluminum finish. The slanting sides of the base provide ample space for the hay track when flues are installed. Sheet metal screws are furnished instead of bolts, so that the person installing it is not forced to get inside the ventilator in erecting.

"Daylight" Hog House Windows are of puttyless construction and very easily put in the roof. The time, labor and trouble of puttying in the glass is entirely done away with. Rain and condensation is carried away in grooves and channels provided in the metal frame.

Our No. 12 Hog House Vents are easy and quick to install. They afford an outlet for foul air and bad odors, without admitting draughts, snow or rain. Fit companion pieces for the "Daylight" Window. Ask your dealer or write us for particulars.

Milwaukee Corrugating Co.
Milwaukee, Wis.

Branch at Kansas City, Mo.
Minneapolis Sales Office Lumber Exchange



Reinforced concrete buildings, of several types, are shown in the December-January issue of "Concrete in Architecture and Engineering," published by the Portland Cement Association, Chicago.

Low Down Automatic Feed Concrete Mixers, made by the Elite Manufacturing Co., Ashland, Ohio, are described and illustrated in a four-page folder the company is sending out. The mixer is of the three-sack type and is mounted on a truck. "Folding Metal Scaffold Brackets" is the title of a folder describing the scaffold brackets the Elite company makes.

"How to Lay and Finish Maple, Beech and Birch Floors," is an interesting and instructive booklet, issued by the Maple Flooring Manufacturers' Association, Chicago. The booklet contains 16 pages and cover and a number of illustrations.

"Mixers" is the one-word title of a 48-page and cover catalog describing Lansing equipment for contractors, issued by the Lansing Company, Lansing, Mich. The catalog contains descriptions of the several different types of concrete mixers the company makes, together with numerous illustrations.

"Boss Labor-Saving Construction Machinery" is the Catalog No. 920 issued by the American Cement Machine Co., Keokuk, Iowa. The catalog contains 64 pages and cover and is well illustrated with engravings showing the concrete mixers and other contractors' equipment the company manufactures.

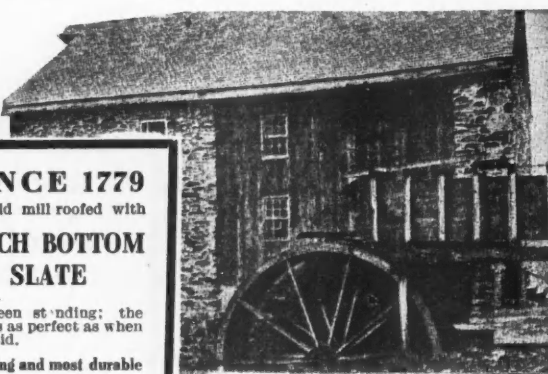
A Standard Automatic Saw Gauge, equipped with adjustable stops placed at any desired distance from the saw, is described in a circular entitled "A Money Saver," issued by the Freeport Truck & Clamp Co., Freeport, Mich.

Floor Surfacers and Wall and Base Rubbing Machines are shown by illustration and described by text in a 12-page booklet, issued by the Cavicchi Polishing Machinery Co., Quincy, Mass.

"The Blystone Batch Mixer" for mixing concrete, plaster and mortar, is described in a 16-page, well-illustrated folder, issued by the Blystone Manufacturing Co., Cambridge Springs, Pa. The circular shows the various sizes and types of mixers the company makes.

Builders' Hoists are among the many products of the Brown Clutch Co., Sandusky, O., shown in the company's catalog, which contains 84 pages and cover, and has many illustrations.

Anchor Concrete Block Machines, Anchor automatic tampers and other cement machinery are shown in the catalog of the Anchor Concrete Stone Co., Rock Rapids, Iowa. Besides a description of the machines and illustrations, the catalog shows a number of concrete block buildings.



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