

# AMERICAN BUILDER



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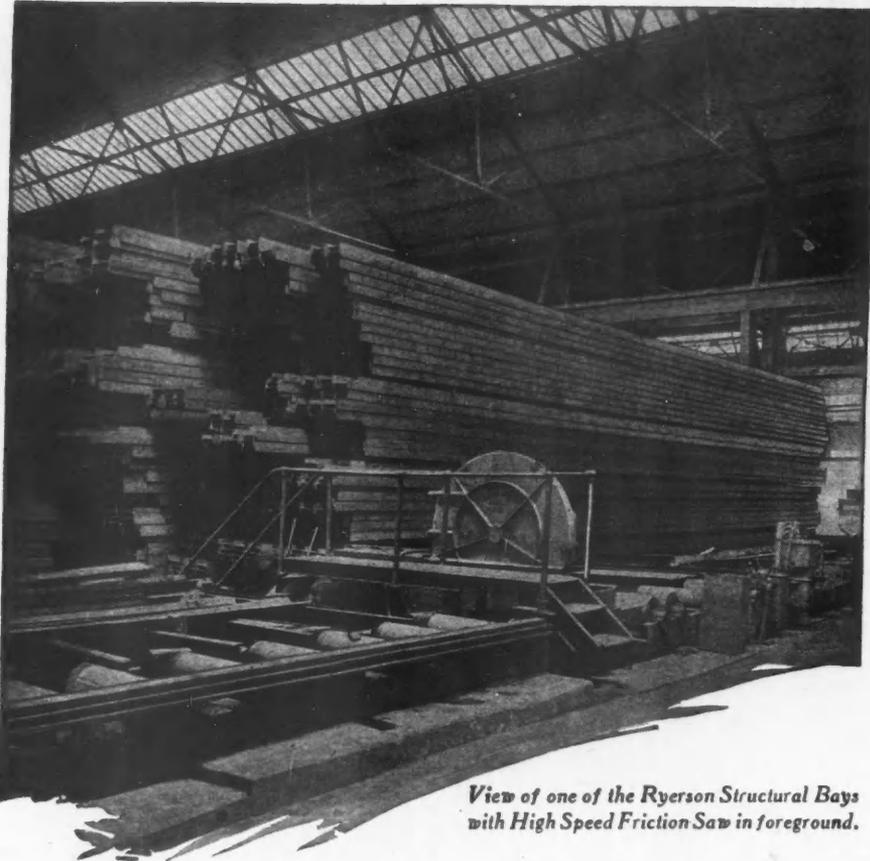
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*View of one of the Ryerson Structural Bays  
with High Speed Friction Saw in foreground.*

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# Short Talks by the Editor



## Pay No Money to Strangers

**T**HE AMERICAN BUILDER employs no subscription agents. Have nothing to do with any stranger who comes to you representing himself as authorized to take your money for subscriptions to the AMERICAN BUILDER.

It has recently come to our attention that a certain Wm. Clark (also using the name James Heard) has been traveling thru Western Ohio representing himself as an agent of the AMERICAN BUILDER. He uses a fake subscription receipt, which is simply an ordinary receipt form, rubber stamped "American Builder, New York."

Of course he keeps all the money he collects, and we never hear of it until the disappointed subscriber writes in wanting to know why he doesn't get the paper.

If this rascal or any other stranger approaches you for your subscription, call the police.

We will pay a liberal reward for information leading to the arrest and conviction of these robbers. The AMERICAN BUILDER employs no subscription solicitors. The safe rule to follow is positively to pay no subscription money to strangers.

Practically all of our Big Family of 50,000 readers have been gathered together by means of letters and circulars sent direct from the publication office. We have always preferred to deal direct with our friends, the subscribers, rather than thru agents or middle men.

Occasionally we have asked our subscribers to call the attention of their friends to the magazine, and a great many have done this, and have helped their friends by sending in their subscriptions for them. We are very grateful for this loyal co-operation from our subscribers, and hope that it will continue. This is friendly work among people you know and who know you, and has nothing to do with the advice just given, "PAY NO SUBSCRIPTION MONEY TO STRANGERS."

It is much safer and you will get prompter attention if you will deal direct with our home office, 1827 Prairie Ave., Chicago, Ill. You can send post-office order, personal check, stamps or currency, at our risk, with perfect confidence that your order will be given our best attention.

Every little while word comes to us of fly-by-night fellows traveling around the country taking orders for building publications and keeping the money. We sincerely hope that very few, if any, of our subscribers, either present or prospective, will be taken in by these crooks. The well-known AMERICAN BUILDER policy of employing no subscription agents should be a protection to Our Folks.



## Economy in Construction

**N**EVER was there a time when contractors and workmen needed to conserve materials and their energies more than they will this year. Every saving that is made on a building job will be appreciated by the owner, as costs are high enough without unnecessarily adding to them. Careful planning of the building to be erected so that there is conservation in its size means saving materials; teamwork between the various trades working on the job means saving in labor costs.

The contractor who acts as his own foreman and the foremen who are delegated to manage the men by contractors can, by "routing" the work, make a considerable saving on any building that is being erected. "Routing" the work is what has brought success to the large modern manufacturers. There is no lost motion during the manufacturing process. That does not mean driving the men, but laying out the work so that they do no unnecessary work.

This can be accomplished by placing the materials on the job so that the workmen do not have to use their energies in getting it to the spot where it is to be placed. Having the material ordered and delivered to the job in advance of the time it will be needed is another most important phase of building. Stopping the work because of the failure of materials to arrive is disheartening to the workmen and costly to the contractor.

Time devoted to mapping out the work so that it can be accomplished speedily and efficiently is well spent. All it means is study and forethought on the part of the contractor, and his foremen.



**B**UILDINGS are the primary tools of industry and homes are the bulwark of the nation.

## Building "Drudgless" Homes

CONTRACTORS SEE IMPORTANCE OF BUILDING WELL-DESIGNED, WELL-EQUIPPED HOMES FOR THEIR CUSTOMERS

By Wm. B. Reedy

**S**UCCESSFUL homebuilding today has come to mean more than the erection of four walls and a roof to act as a shelter. The real home is not only the result of study of the basic principles of construction but the outgrowth of a thoro sympathy with certain new factors affecting the inside life of the home. Electricity, inventive genius and the housekeeper are three influences that have brought about this change in building ideas.

So persistently have these influences enlarged their radius of activity that even the architectural scheme has been molded to new forms—time-worn methods have disappeared and we find the home taking on a new aspect.

We are living in an age of convenience. Thru the medium of electrical devices, new machinery and labor-saving equipment the bulk of the hardships of life have been eliminated. Especially is this the case in the home. The old days of housewife drudgery are still memories of painful clearness. Only gradually has the picture faded of mother breaking her back as well as her spirit over the washboard and tub. Today the modern washing machinery and laundry equipment have made the life of a housekeeper what it should be, a life of service with plenty of time to devote to the family and other interests. The growth of woman's sphere has effected vital building principles.

And as a result we find the change in ideas all along the line. Modern plumbing, attractive as well as sanitary and efficient, has become one of the basic features in modern dwellings. Running water eliminates an enormous waste of effort and makes the bath not the exception but the rule. In the construction the owner is inclined to minimize the importance of plumbing because the pipes and equipment are in the walls and out of sight. An Indian who was visiting civilization for the first time was more amazed at water running from faucets than all the automobiles, skyscrapers, and airships.

Gradually the smoky heating stove that made one room too hot and the others uninhabitable is joining the shades of the past. Hot air furnaces with automatic control, hot water and steam plants make the home a place of comfort from basement to attic. Heating is now a definite part of architectural plans.

When electricity came into the home, drudgery went out the window. Perhaps no other single discovery has played such a part in making the modern home a real place to live in. With it came a host of labor-saving devices, accessories and appliances, all of which help to cut down labor waste and save the strength of the housekeeper. Electric lighting plants have brought sunshine to farm homes, electric irons, mangles, washing machines, vacuum cleaners have taken the droop

from the shoulders of women and erased the tired look from the faces of mothers.

Obviously the builder cannot profitably overlook these developing factors when drawing up his plans. They have come to be as much an integral part of the modern home as the lumber, brick or concrete in the outside walls. Upon them very often depends the domestic happiness of the family.

Not less important than the labor-saving machine devices is the equipment designed to save space and incidentally labor. As a result of their introduction, houses are not built so large, and naturally the work of the housekeeper is decreased.

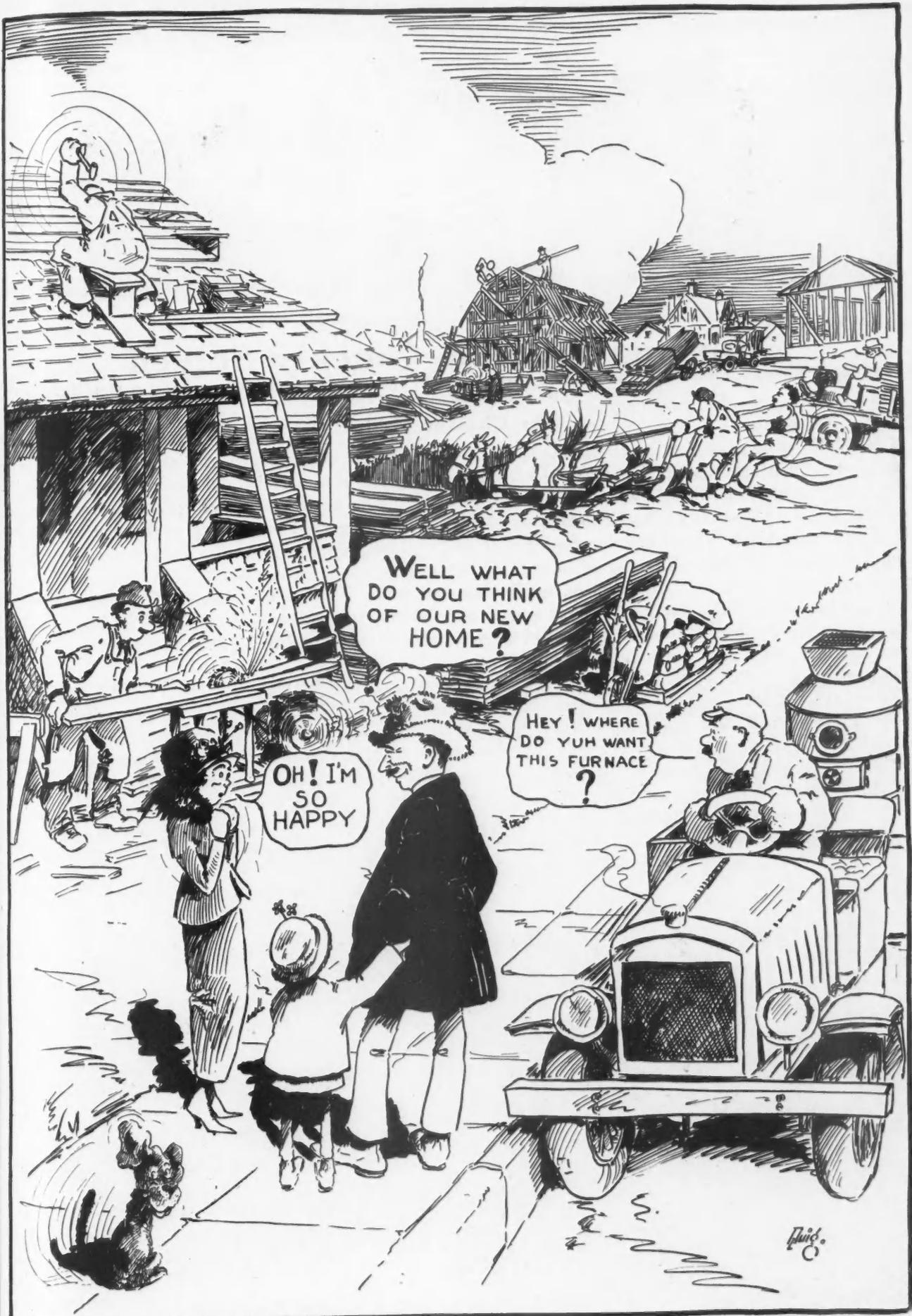
Whole rooms with their continual exacting demands for upkeep can be eliminated by built-in furniture. The kitchenette, wall refrigerators, built-in beds, small kitchens with various food storing devices, compact pantries, dish-washing machines, are all examples of this new influence that is not only relieving much of the needless work in the home which the housewife helped to create, but is giving her time for outside activity. The construction of a home is no longer exclusively a man's job because the woman very often is the source of new ideas. She is a firm believer in modern appliances because they have become her stock in trade.

Such matters as choice of interior trim, location of equipment, finish of floors, arrangement and size of rooms, all involve labor and should be chosen so as to increase the general comfort of all concerned. An artistic trim, highly carved, is extremely difficult to keep clean. In the building of shelving, care should be taken that it is not placed out of reach.

Unless labor-saving equipment is placed with some scheme in mind it will be practically as useless as none at all.

The arrangement of doors and windows is an important part of the building plans. Out-of-the-way places for windows mean difficult tasks when cleaning time comes. Doors should not be placed so that they will interfere with adjacent doors or take up space that can be efficiently used. The careful selection of a floor finish may seem trivial on the surface but it really is important from a labor-saving standpoint. A dust-resistant finish can save many an unnecessary hour of tedious work.

The arrangement and size of rooms are seldom accorded the attention they deserve. The large kitchen of a few years back is no longer needed because of modern cooking apparatus that requires very little space. The position of the bedrooms in relation to the bath and other rooms is a matter of importance. By a little careful study and wise selection of modern equipment, the new home can be made really efficient as well as comfortable.



CARTOON BY ED. QUIGLEY



A Street of Beautiful Homes in Flint, Mich.

## Housing Problem Quickly Solved

GENERAL MOTORS CORPORATION FIND ANSWER TO FLINT PROBLEM IN USE OF BIG SCALE METHODS AND LABOR-SAVING EQUIPMENT

By Chester Shafer

**I**N THE construction and practical completion of a city of 950 homes in less than a year the DuPont Construction Company, of Wilmington, Delaware, serving for the General Motors Company, at Flint, Michigan, has shown the method for coping with a difficult housing problem. Starting on May 1, 1919, the houses were completed, in the main, by December 1, being fitted with water, gas, sewer and electrical connections. Some minor details, held up by cold weather, and a few stretches of paving, remain to be completed. By April of this year the homes will be occupied by employes of the General Motors Company, who will handle the costs, ranging from \$3,000 to \$7,000, on a time-payment plan.

Standardization of operation allowed for the rapidity of work on the project. Each job was organized into a department. Each department had its foreman and its regular gang of workmen. One

department did the rough framing, another the exterior trimming, while a third did the interior trim. Painting, plastering and all other operations were handled in the same way, thus giving expert and experienced workmanship on all details. Thirty types of houses were erected. The most prominent types were the all frame, with asphalt shingles, the brick veneer, and the half tile with wood shingles. All first floors are of hard wood and the second of pine.

### Street Paving on Big Scale

The streets in the project are of asphalt. Storm and sanitary sewers are provided. In pouring foundations placing plants were set up so that one plant covered two houses. In this way two houses were poured and the mixer was moved and set up again in 30 minutes. All material for the job was hauled over a narrow gauge railroad. At the height of the



Bird's-Eye View of Civic Heights, Showing the Variety of Types of Construction Used in the Solution of the Flint Housing Shortage. This Suburb Contains 950 Homes Erected in Seven Months by the General Motors Corporation.

job 20 miles of the road were in use. A maximum haul of 3 miles was registered over grades as steep as 2½ per cent on the main line. Both steam and gas locomotives were used. The road pouring work for the pavements was done with batch boxes on narrow gauge cars. But 11 men were required around a mixer. All concrete facings for the asphalt surface were reinforced by expanded metal. Over 1,500,000 pounds of expanded metal were used.

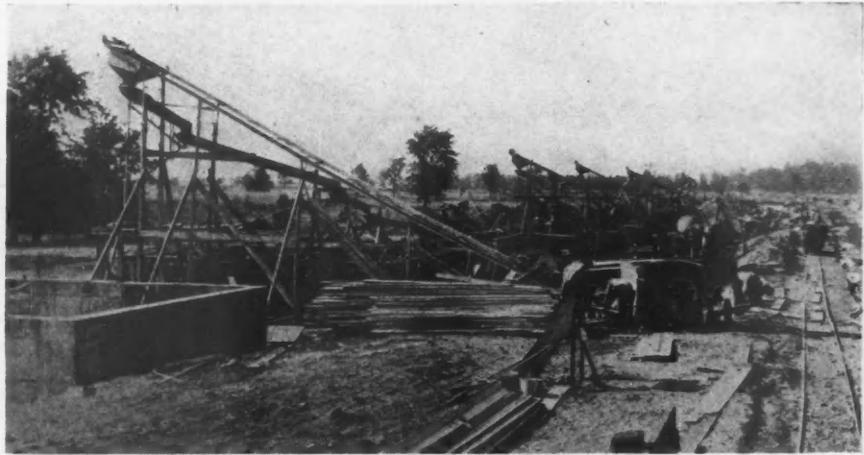
For the cellar foundations excavators with light drag lines were used. Steel forms were set for the foundation walls and placing plants were operated. The curbing and sidewalks were all poured from the batch boxes used on the narrow gauge cars. The narrow gauge lines were constructed in every street and materials were hauled to the very point of usage. Locomotives were used to a large extent on the narrow gauge. The batch boxes were of 3-ton capacity.

### Houses Vary in Style

After much investigation it was decided to build five types of houses: four-room bungalows with two

bedrooms, a living room, kitchen and bathroom; five-room bungalows and houses with two bedrooms, dining room, kitchen and bathroom; six-room bungalows and houses with three bedrooms, living room and dining room; seven-room houses with four bedrooms, and eight-room houses with five bedrooms, living room, dining room, etc.

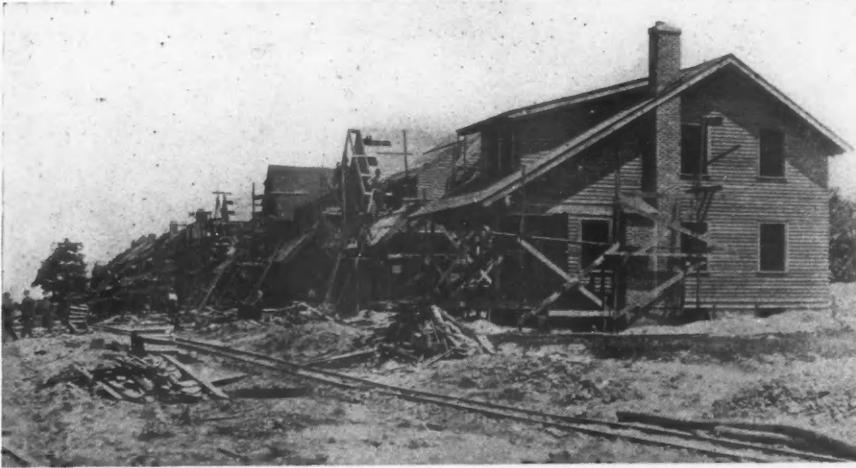
On 150 of the houses asphalt shingles were used. Slate shingles were used on 150 houses and the balance were treated with wood shingles. About 100 houses were brick veneered. Wall board was used



Placing Plants All Set for Foundations. Each Machine Takes Care of Two Buildings. Batch Cars Hauled Mixed Concrete to the Placing Plants from the Unloading Yard.



Steel Forms Set and Everything Ready for Pouring of Concrete from Placing Plants. Use of Modern Equipment on Large Scale Was Responsible for the Success of This Great Building Feat.



**Frame Row Under Construction. The Narrow Gauge Railroad Which Figured Prominently in Construction Is Shown. The Lumber Was Sawed in Unloading Yard and Brought to the Job by This Railroad.**

extensively. On all tile houses the exterior was stuccoed, while the interior was furred out. Each house is equipped with electric lights, a hot air heating plant, gas range, and gas hot water heater. All houses were papered by the contractors.

In the ditching work in the street five ditching machines were operated. Mechanical back fillers were used behind each ditcher.

#### Unloading Yard Feature

An unloading yard was maintained about 2 miles from the job at the connection of the narrow gauge with the broad gauge. Here most of the work was done that permitted of swiftness of operation on the project. A number of saws cut all lumber used into proper lengths as soon as it was unloaded. This sawing was always done by the same men and it was accomplished in fast time. The cut lumber was then hauled to the project and was ready for immediate use. All difficult framing, such as porch roofs, was

done at the yard also. A regular gang of carpenters achieved this work and prepared the pieces for fitting. Several small saws were set up on the project for emergency work, but 99 per cent of all sawing was done at the yard. The construction gangs were thus provided with material without loss of time on detailed work.

At the unloading yard the gravel and cement for the foundations were mixed with the minimum of human labor. An unloading crane transferred the gravel from broad gauge cars to bins. The bins, erected over a narrow gauge spur, were used as mixers. After the cement had been dumped in the mixture was released into narrow gauge cars and hauled to the project, where it was all ready for use in the final mixer. The services of one man on the crane and one man to dump in the concrete were all that were required to complete the initial mixing process.

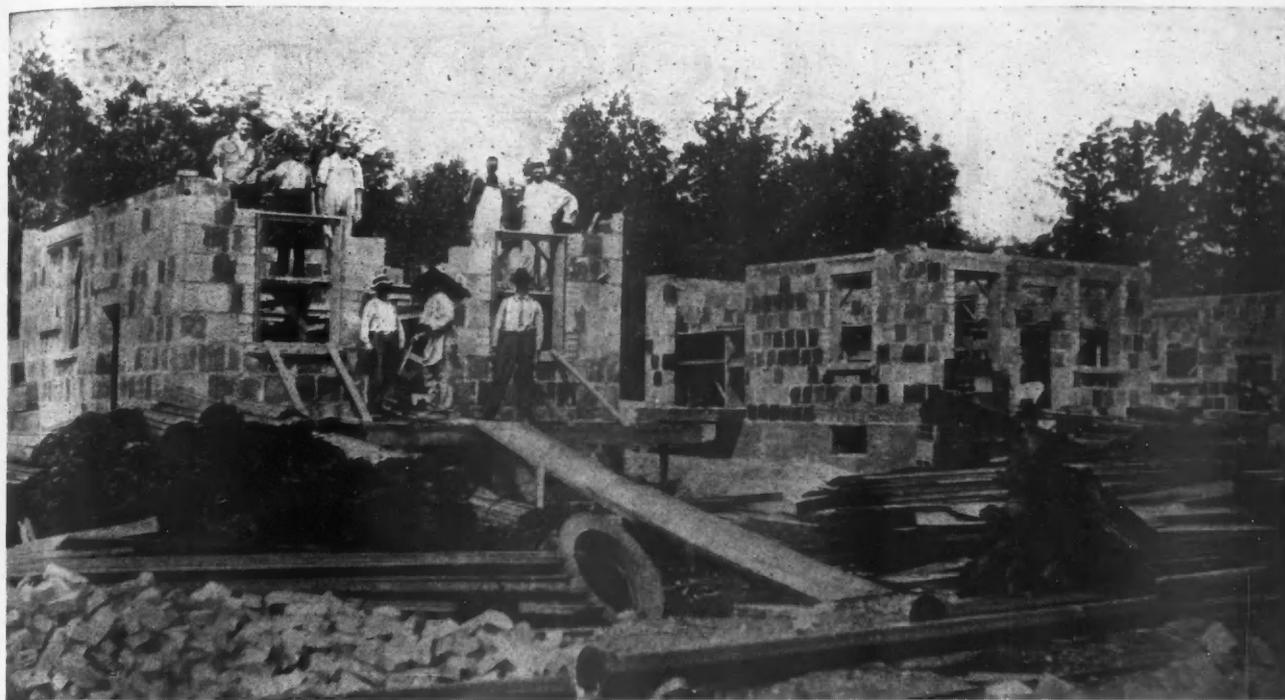
#### Novel Ideas Employed

Several novel ideas were always in evidence on the project. During the winter, for instance, when the outdoor work was very disagreeable, canvas houses were built around the houses which were being erected. These "kimonas" permitted work with plaster and concrete. Stoves set up in the intervening space kept the atmosphere warm. This gave comfort to the workmen and made the use of the materials possible.

The success of the project is liberally attributed to the engineers and the advanced ideas of standardization. But the ideas applied to the treatment of work-



**Whole Row in Course of Construction. This Picture Shows How Lumber and Material Were Hauled to Scene of Operations on Narrow Gauge. Speedy Hauling Prevented Many Delays.**

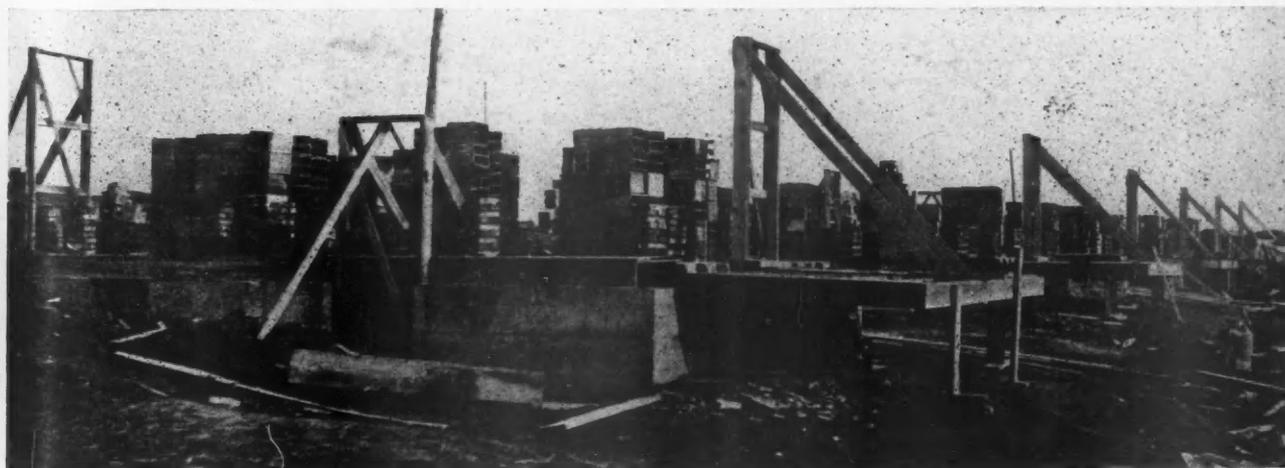


**Mason Gang Completing Walls Ready to Give Way to Carpenters for Finishing Work. On All Tile Houses the Exteriors Were Stuccoed and Interiors Furred Out.**

men, to insure satisfaction with conditions, were by no means the slightest factor. At certain times as many as 3,500 men were employed. To keep these men pleased, and at the same time securing the maximum effort and skill, was no small task—in 1919. However, the men were housed in clean, well-ventilated, electric-lighted bunkhouses, six to a house. A moving picture theater was erected and operated nightly. This camp was 2 miles from the main part of Flint. Had the men wandered to the city each night they would have squandered money—and time that they needed for rest. The movies held them at the camp and made an early bed-time possible, which, in turn, meant freshness the following day. Home talent vaudeville shows and athletic shows were staged frequently. A large commissary provided all necessities, and some luxuries, at cost. Meals were served in

a huge dining hall and no expense was spared. Board and room were obtainable for \$8 a week. Excellent wages were paid. One workman, among many others, saved \$140 every two weeks. This was because he found his amusement and his necessities in camp. Church services were conducted every Sunday. A camp postoffice was operated. A weekly paper was published. A camp photographer was maintained. He photographed the winning organizations in the various speed-up contests and flashed the plates on the screen at the theater. Special emphasis was made on safety first. Figures on accidents were published daily on a bulletin board and each week in the paper. Cleanliness was mandatory. The bunkhouses and mess hall were kept scrupulously clean. It was requested that a man shave at least every other day. Hot and cold

*(Continued to page 172.)*



**The Carpenters Have Just Finished the Flooring and Have Moved on to Make Room for the Masons to Set the Walls. The Work Schedule Was an Important Factor in Finishing the Job in Remarkably Short Time.**



# GOOD HOUSE DESIGNS



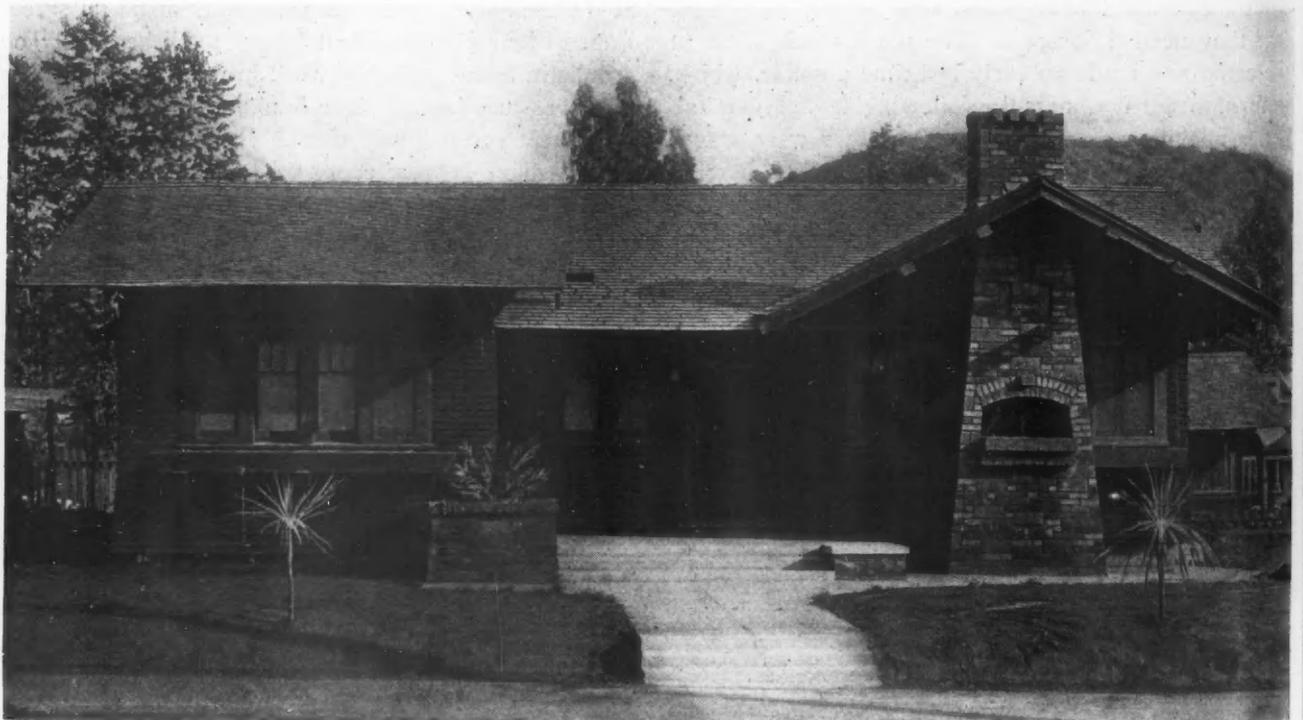
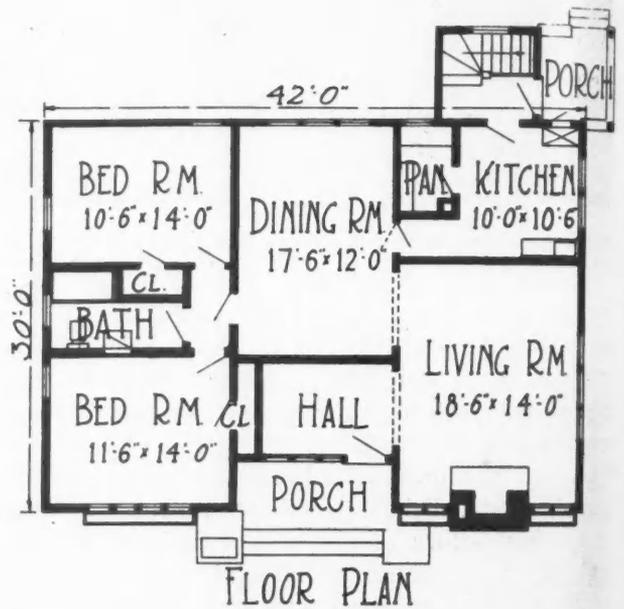
## Design for Five-Room Frame Bungalow

ATTRACTIVE LITTLE HOMES HAS MANY APPEALING FEATURES

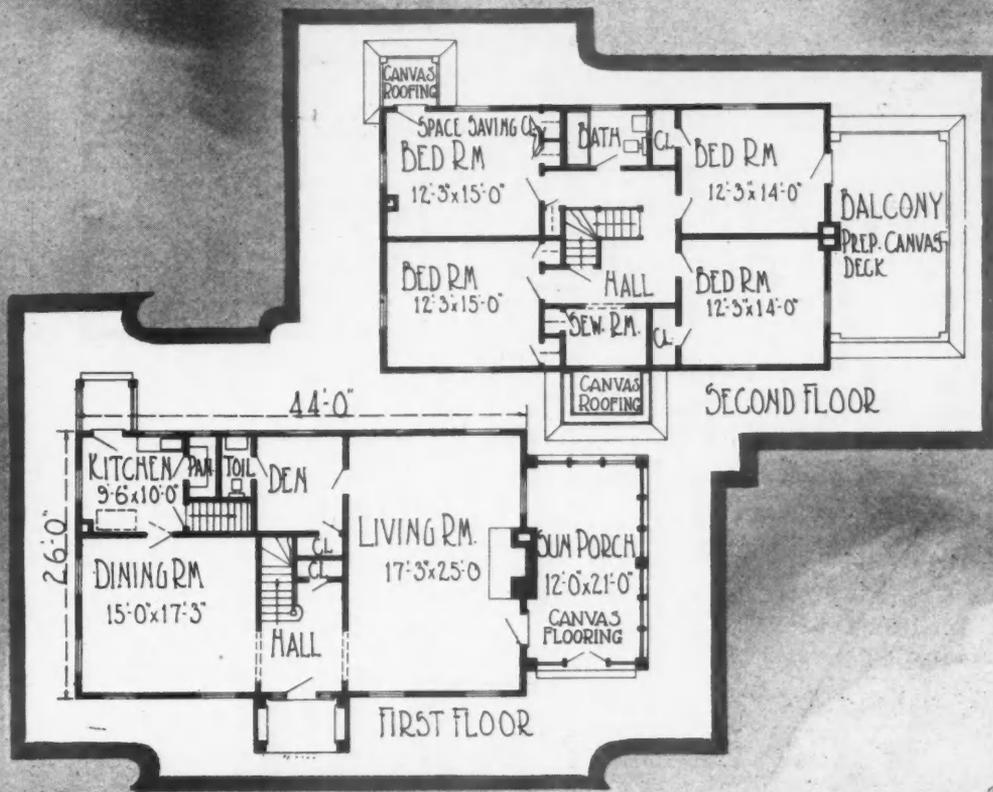
**B**UNGALOWS are a popular type of home and certainly will be in great demand when the active homebuilding season opens up. In the great variety of styles offered, it is difficult to find a bungalow more attractive than the one illustrated on this page.

This frame home contains five rooms of comfortable size. It is 42 by 30 feet, and set a few feet above the walk level allowing for a terrace which lends itself to considerable decoration. The exterior appearance is further enhanced by a unique and large chimney constructed of odd shaped brick.

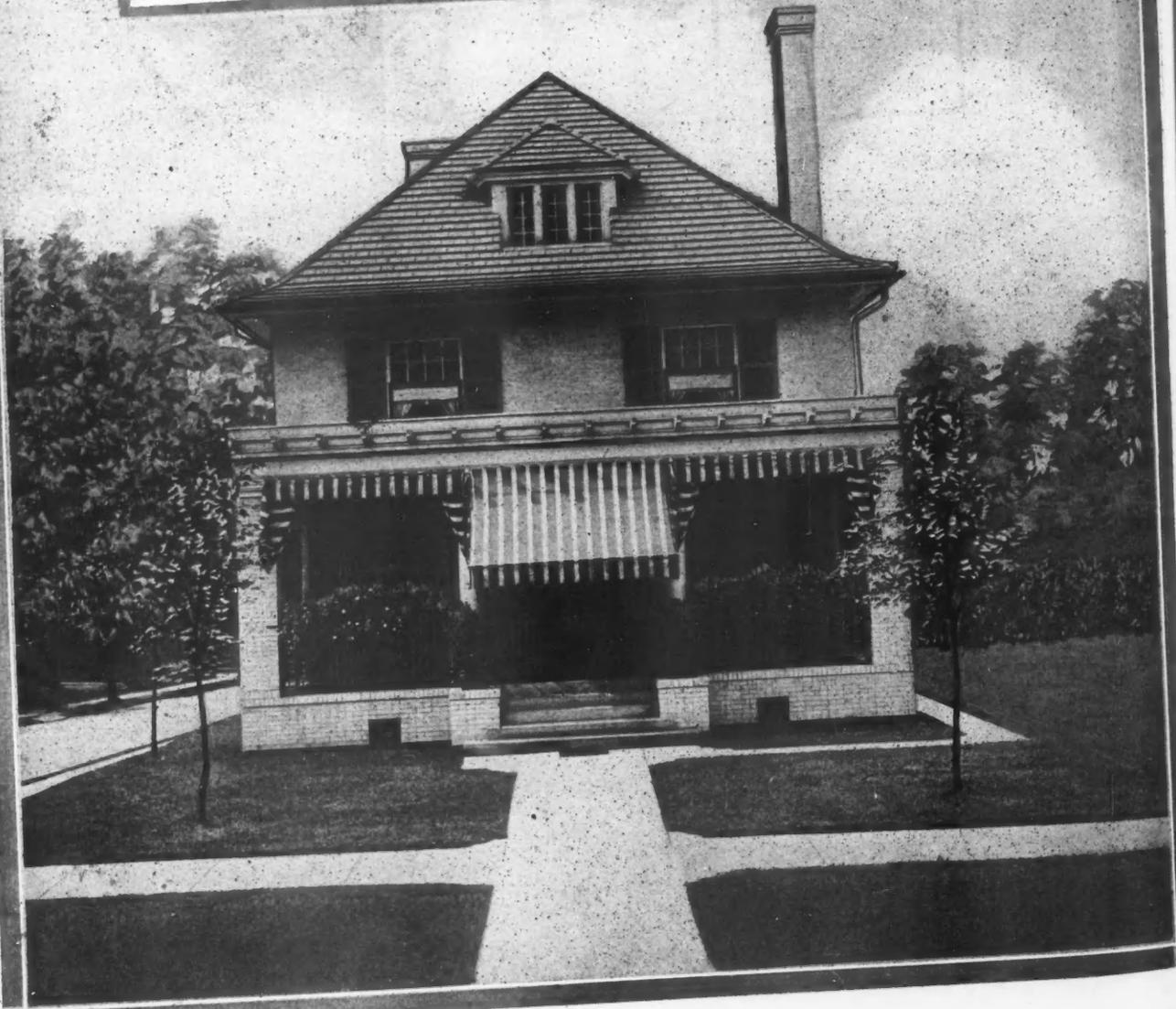
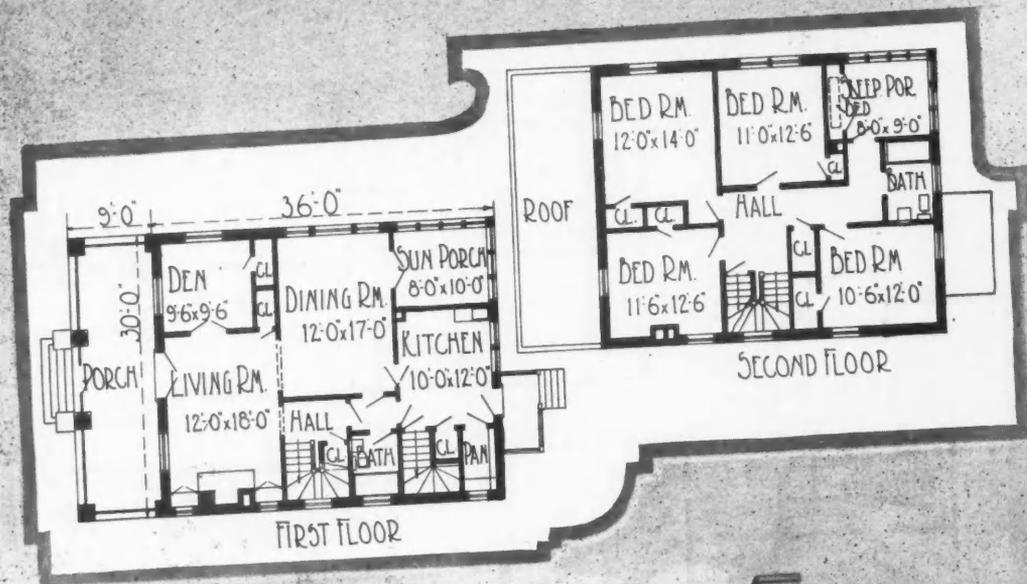
In the floor plan arrangement, the two bedrooms and bathroom are placed at one end of the bungalow. The hall is directly in front of the dining room which is located in the central part of the house. At the other end is the living room with its large open fire place and back of it the kitchen opening out on a small rear porch.



Cozy Frame Bungalow of Five Rooms That Home-Builders Will Not Overlook. A Type of Building Excellently Adapted for Suburban or Subdivision Setting or Shallow Wide Lot.



**EIGHT-ROOM COLONIAL HOUSE.** A quaint, attractive home that will fit very well in a suburban setting. The shingle siding, shuttered windows, and small, square-roofed entrance with latticed sides add considerably to the charm of the building. The sun porch, altho an addition to this style of structure, is a distinct advantage and not out of harmony with the general scheme. In the construction prepared canvas has been used extensively for flooring and roofing in the sun parlor, on the hood of the entrance and over the back porch. The first floor consists of a dining room, kitchen, extra toilet, den and a large living room, which is 17-feet, 3 inches by 25 feet. Four bed rooms, a space-saving closet, bathroom and a small sewing room make up the upper floor.



**EIGHT-ROOM BUFF BRICK FINISH HOUSE.** A very substantial structure built on square, economical lines, with living room, dining room, den and kitchen on first floor and four bedrooms on the upper floor. The large, spacious front porch, extending the full width of the house, is especially inviting. The rather severe Puritanic lines of the porch are easily brightened by the addition of a pergola decoration and an ornamental iron balustrade, providing an excellent setting for porch plants and vines. The hip roof is covered with flat tile and topped by an impressive chimney, which leads from the large fireplace in the living room. The building is 30 by 36 feet.

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Home-Builders Here Is an Inspiration. This Attractive Story-and-a-Half Stucco Home with Gambrel Shingle Roof and Large Dormers Contains Six Rooms, Three on Each Floor. It Is 24 by 36 Feet.

## Design for Six-Room Stucco Home

ATTRACTIVE BUILDING HAS WELL-DORMERED ROOF AND ARTISTIC ENTRANCE

**H**OMEBUILDERS seeking ideas should get real inspiration from the beautiful stucco residence shown here. It embodies charm as well as strength, and certainly will appeal to the man looking for a small cozy home.

The building is 36 by 24 feet with the long side facing the street. On the first floor is found the living room, a large comfortable room with an entrance from the porch. The porch is on the same level with the lawn which has been raised several feet above the walk.

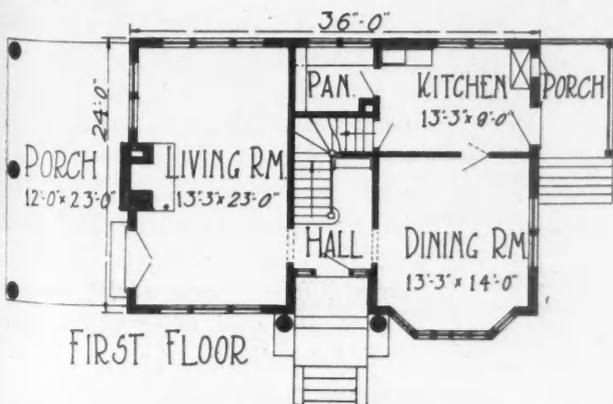
An artistic concrete stairway with low concrete balustrades and landing form an attractive approach to the main entrance centrally located in the building. It leads into a hall which opens in turn into the living and dining rooms. The kitchen completes the first floor plan.

Three bedrooms and bathroom make up the second floor plan. The porch has a shed shingle roof and is supported by substantial concrete pillars. The main roof is gambrel-shaped and covered with large shingles. Each room in the dwelling has at least two windows and in most cases three. The dormer is sided with shingles.

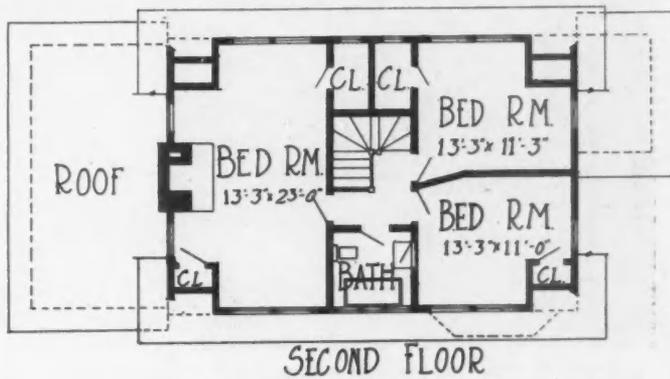
Many homes of this type will be erected during the coming spring.



**T**HE most important partitions in a building are those enclosing interior shafts. Vertical openings thru buildings form flues and cause up-drafts. In all buildings, fire-proof as well as non-fire-proof, they should be enclosed, to prevent a fire that would find a natural outlet in such openings from spreading to other floors.



First Floor Plan of Stucco Home.



Second Floor Plan of Stucco Home.

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## Build the Laundry for Modern Equipment

ARCHITECTS AND CONTRACTORS LOCATE FLOOR DRAINS AND ELECTRICAL OUTLETS FOR WASHING MACHINES AND OTHER LAUNDRY LABOR-SAVERS

**O**PERATION of the home has been affected by the high cost of labor more, perhaps, than any other institution that is so closely related to the daily lives of the members of American families. Not only is household labor held at exorbitant wages, but it is all but impossible to secure. This situation brings the housekeeper to the point where she must have her home equipped with modern labor-saving machinery. "Machinery" may appear to be the wrong word to use in this connection, but the power driven devices of many kinds that are constantly used in the home are nothing more than "labor-saving machinery."

There will be many thousands of homes built this year; other thousands will be erected during each of the years that follow. These homes will be modern homes; they will be designed to give the home owners the greatest in satisfaction and comfort.

Connecting these two thoughts, architects and con-

tractors are planning and building homes for their clients with the idea of comfort and convenience prominently in their minds. And in doing so they are designing the homes so that the laundries may be equipped with power-driven laundry equipment.

Laundries to accommodate an electrically-driven washing machine, an electric iron, and a mangle must have conveniently located electric outlets. For the washing machine they need either stationary tubs connected with a storm water sewer, or a floor drain thru which the water from the machine and tubs can escape. Without these built-in features, there is little saving of labor and little comfort and convenience for the housewife, who, by necessity, is forced to do her own washing and ironing.

Three views of well-equipped laundries in modern homes are shown in the accompanying illustrations. Also three types of washing machines, all electrically-driven, are pictured. Two show how the architects and contractors have located the electric outlets and floor drains so that the hot and cold water may be piped directly to the washing machine and the tubs, and be allowed to escape thru the floor drains into the sewers. The other laundry is less convenient because it is necessary to drain the washing machine into pails and lift them to the stationary tubs, where they were emptied.

Forethought in the design and construction of the home to accommodate such labor-saving devices as are used in laundries gives the home owner the comfort and satisfaction he expects when he builds a home for himself and his family. And even tho the client may overlook this important feature, the architect or contractor who suggests this feature is giving the home builder the greatest service.

In planning the laundry as to construction features, contractors and architects should first learn what type of machine the builder has or expects to install. Different machines require that the laundry have different treatment, but with a knowledge of what will be installed in advance of the construction of the home, the fittings will be properly located.



Build the "Woman's Workshop" So That It Can Be Equipped With Modern Labor-Saving Power-Driven Machinery.



Well Equipped Laundries Need Electric Power for the Washing Machine and the Electric Iron.

In homes where electric light from a commercial plant is not available, another satisfaction-giving and labor-saving piece of home equipment is an individual electric light plant. In one of the illustrations the small electric generator and storage batteries are shown. Such a plant as this is not expensive either in first cost, nor to operate.

The installation of such a plant also requires that the building be constructed to accommodate it. Wiring a home for electric lights is not a difficult job for the average contractor, nor is it expensive if done when the home is erected. But to put in electric light wires after the house is built is not only difficult and more expensive, but not nearly so good a job can be done.

Electric lights and the many labor-saving pieces of household equipment that may be had when electricity is available, go a long way toward giving the builder a satisfactory home. Architects and contractors are winning friends by recommending and installing individual light plants, and preparing the homes they build for the modern equipment that should go into every one of them.



**Australian Women Want American Ideas in Homes**

**D**EMANDING American labor-saving kitchens, housewives of Sydney, Australia, are appealing to the Australian Institute of Archi-

itects for more attention to domestic working conveniences in house designing. Great interest has been manifested thruout Australia and New Zealand in the labor and space-saving features employed in the designing and building of American homes.

"Every architect ought to be obliged to serve six months in a kitchen before he is allowed to plan a house," declared one woman at a recent meeting of Sydney women, "then he would see the importance of making that part of the house more agreeable. There wouldn't be any 'servant problem' if architects would plan their houses so that kitchen work would be simpler. American architects are developing all sorts of labor-saving devices for the kitchen and Australian builders could easily follow the American example."

Australian property owners, as a consequence of this action, are trying to get in touch with American builders in order to work out a system of built-in closets, sideboards, kitchen and bath cabinets, doorbeds, and similar conveniences.

The rapid growth of industrial life in Australian cities is calling for more home-building, and the local women are anxious that new ones be fitted out with all of the compact arrangements of kitchen equipment.

Representatives of the Interchurch World movement in making their survey of the world have found an enormous demand for American building ideas.



Individual Electric Light Plants Not Only Supply the Home With Electric Light, But Also Power for the Washing Machine.

## Design for Modern Two-Apartment Building

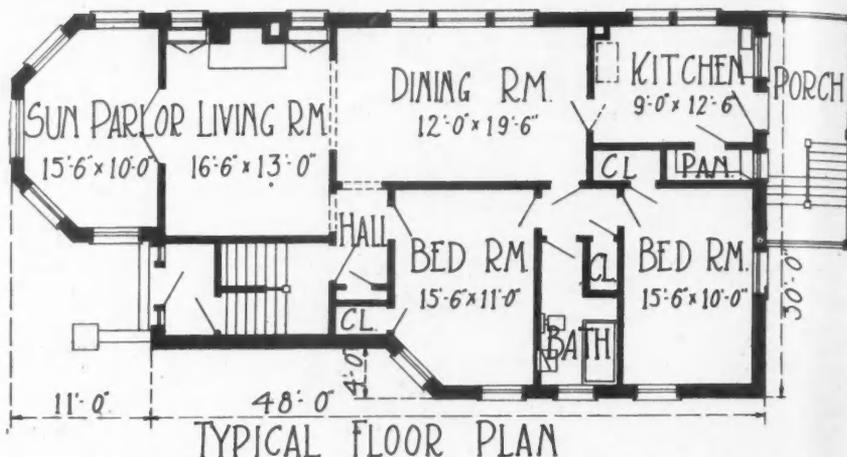
A BUILDING THAT PROVIDES A HOME AND ALSO ADDITIONAL INCOME

CONTRACTORS will find that the two-story apartment building is among the most popular investments where the man of moderate means is concerned, and consequently will find it very advantageous to their interests to have several plans of this type of building ready. Its popularity is due to the fact that it not only provides a home for the owner, but furnishes an additional income thru the rental of the second apartment.

The two-story apartment building shown here represents a combination of attractiveness and utility that will find many an interested buyer. Built substantially of brick with terra cotta trim, it has an artistic front, rendered rather unique by a hexagonal-shaped sun parlor and large French window over the entrance. The entrance is particularly attractive. It is wider than usual, consisting of a main door and two side windows. It is further enhanced by a heavy pillar of brick on one end on which is mounted a stone flower pot.

The sun parlor has five windows placed about a

common center and is covered by a similarly shaped roof of heavy green tile. The trim above the windows and around the sills is well designed and quite attractive. The front part of the roof is also green tile.



First Floor Plan of Five-Room Apartment. Top Floor Similar.

In each apartment the arrangement calls for five rooms, perhaps a little larger than the usual size of rooms in larger apartment buildings. As a rule, the construction of this type of building permits of more comfortable apartments. The living room is 16 feet 6 inches by 13 feet and is equipped with a brick fireplace with artificial heating apparatus. Wall book cases are built on each side and above each are the small windows which have proved so popular.

The dining room immediately adjoining the living room is long, being 19 feet 6 inches by 12 feet, and has a combination bay window.

The two bedrooms are on the same side of the apartment with the bathroom between, a very logical arrangement. The kitchen and porch complete the floor plan. The building is 59 feet long, including the sun parlor, and 30 feet wide.

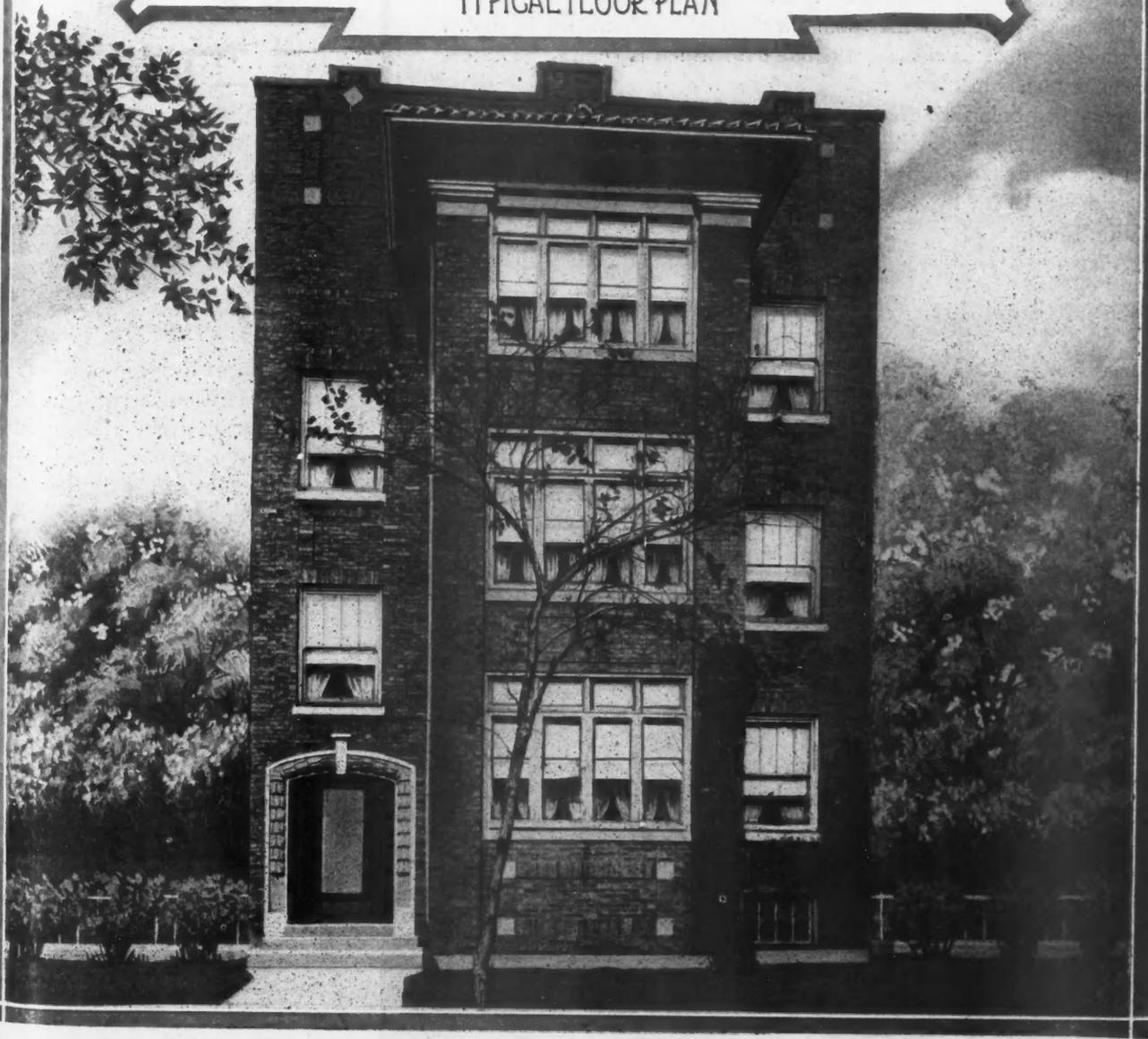
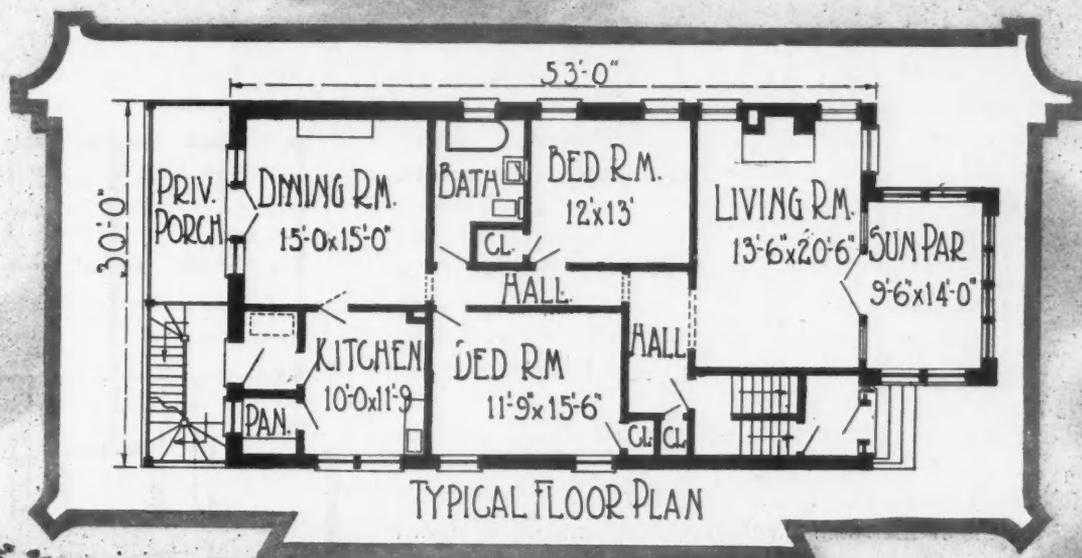
During the great building season which is about to open this type of building will without doubt be in great demand because of its great economical advantages for the small investor. It lends itself to a wide variety of styles, but the type presented here is among the most attractive.

The sun parlor is the unique feature of this house because of its unusual shape, which allows the windows to catch the sunlight.



Attractive Two-Story Five-Room Apartment Building of Brick Construction. This Structure is an Excellent Investment for the Man of Moderate Means.

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**THREE-STORY APARTMENT BUILDING OF BRICK AND TERRA COTTA.** This handsome structure, built on broad and economical lines, contains three unusually comfortable apartments of five rooms each, with a sun parlor in front and sleeping porch in the rear. The arrangement of the dining and living rooms at opposite ends of the house is rather unique and not without its advantages from a housekeeper's point of view. Two bedrooms and bath open out on the hall which connects the main rooms. Much cheer is added to the large living room by the bright sun parlor adjoining, while the brick fireplace is a feature that proves attractive in the cold months. The building is 30 by 53 feet.

## Design for Six Apartment Building

APARTMENTS IN ATTRACTIVE BRICK STRUCTURE CONTAIN FIVE AND SIX ROOMS AND SUN PARLOR

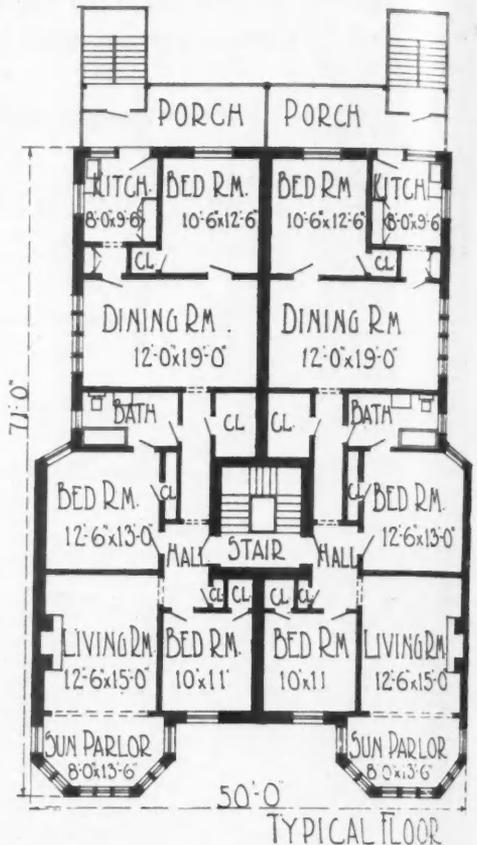
**S**ELDOM will the contractor who has been called upon to build a double lot six-apartment building find a better example of that type of structure than is presented in the building shown here. Architecturally attractive, it contains four apartments of six rooms each and two of five rooms. The vestibule on the first floor takes up the space occupied by bedrooms in the upper apartments.

Apartments of this size are sufficiently large for a good-sized family, and in addition have a sun parlor and large porch in the rear which can be screened in and used for sleeping purposes. The building is of standard brick construction with a veneer of light face brick in front. Plenty of light for each apartment is provided by the large number of windows in the front of the building and the sun parlor.

The building has a high basement, one side of which has been fitted up as a home for the janitor. The other side is used for storage and heating purposes. The building is 71 by 50 feet.

The arrangement of the rooms in the upper apartments is shown in the floor plan on this page. The hall, which is centrally located, opens into apartments on each side of the building. The living room and one bedroom face the street. Directly in back of the living room is another bedroom with bath adjoining. These two rooms open out on a hall which leads to the dining room, the largest room in the apartment, 12 by 18 feet. An extra closet is off the hall near the dining room.

A small modern kitchen and bedroom complete the plan. Thruout



TYPICAL FLOOR

Arrangement of Typical Floor Plan of Apartment.



Six-Apartment Building of Brick Construction with Veneer of Light Face Brick. Four Apartments Have Six Rooms Each, the Two Lower Ones Have Five.

the apartment the idea of plenty of sunlight has been carried out. The dining room has four windows, each bedroom at least one. That plenty of light can be provided even where buildings are close together is conclusively shown in this building plan.

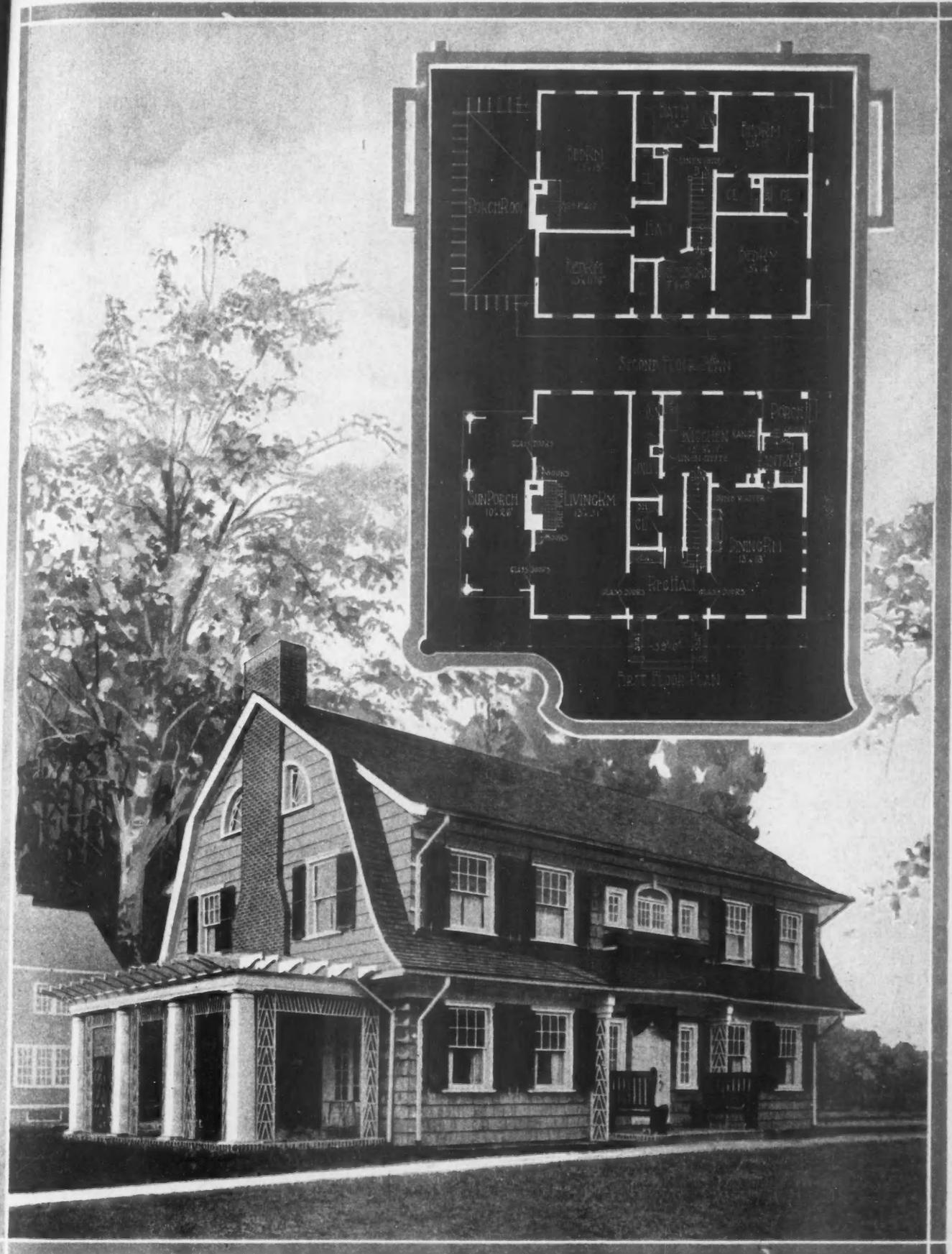
In the great building program which is soon to be started, not only the city contractor will be called upon to build this type of structure, but contractors in smaller cities and towns will be kept busy. The conveniences offered in apartment buildings as well as the economy of their construction are being recognized everywhere and as a result they are being constructed in large numbers.

Buildings of this size are attractive investments. As a result many owners are making plans for an extensive building program this spring and summer with apartment buildings as the principle feature. The substantial income they yield and their popularity are great incentives to stimulate their construction.

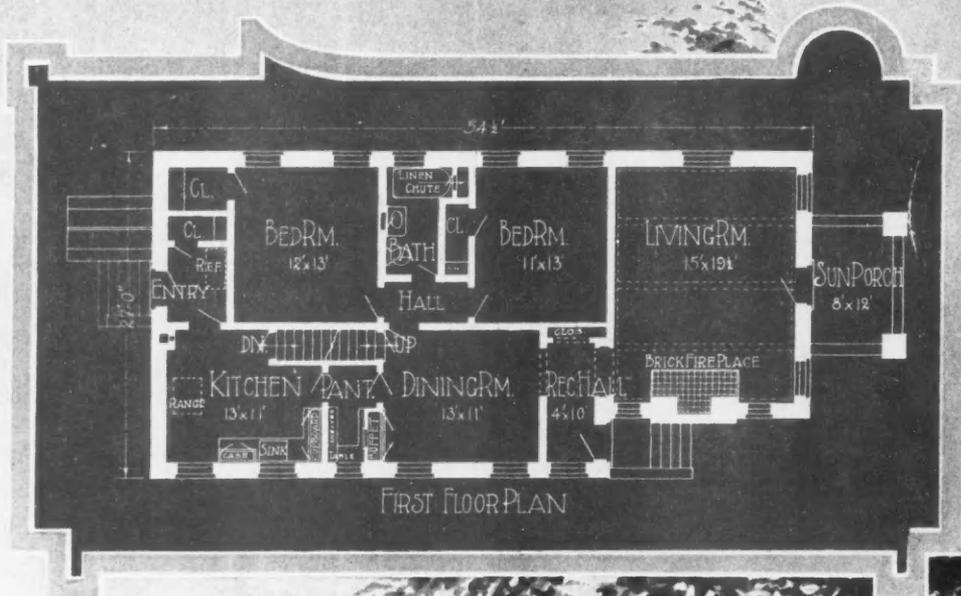
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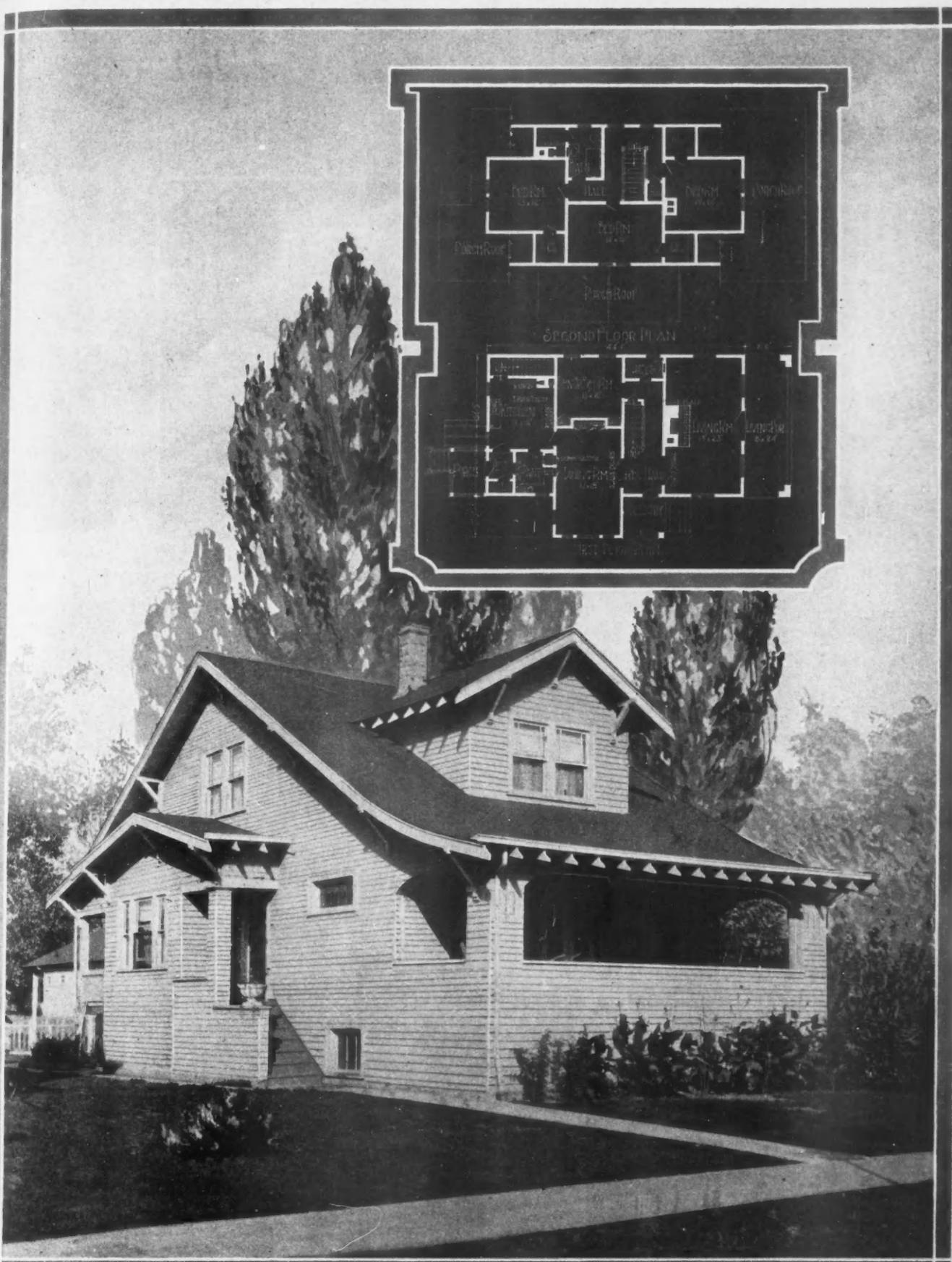
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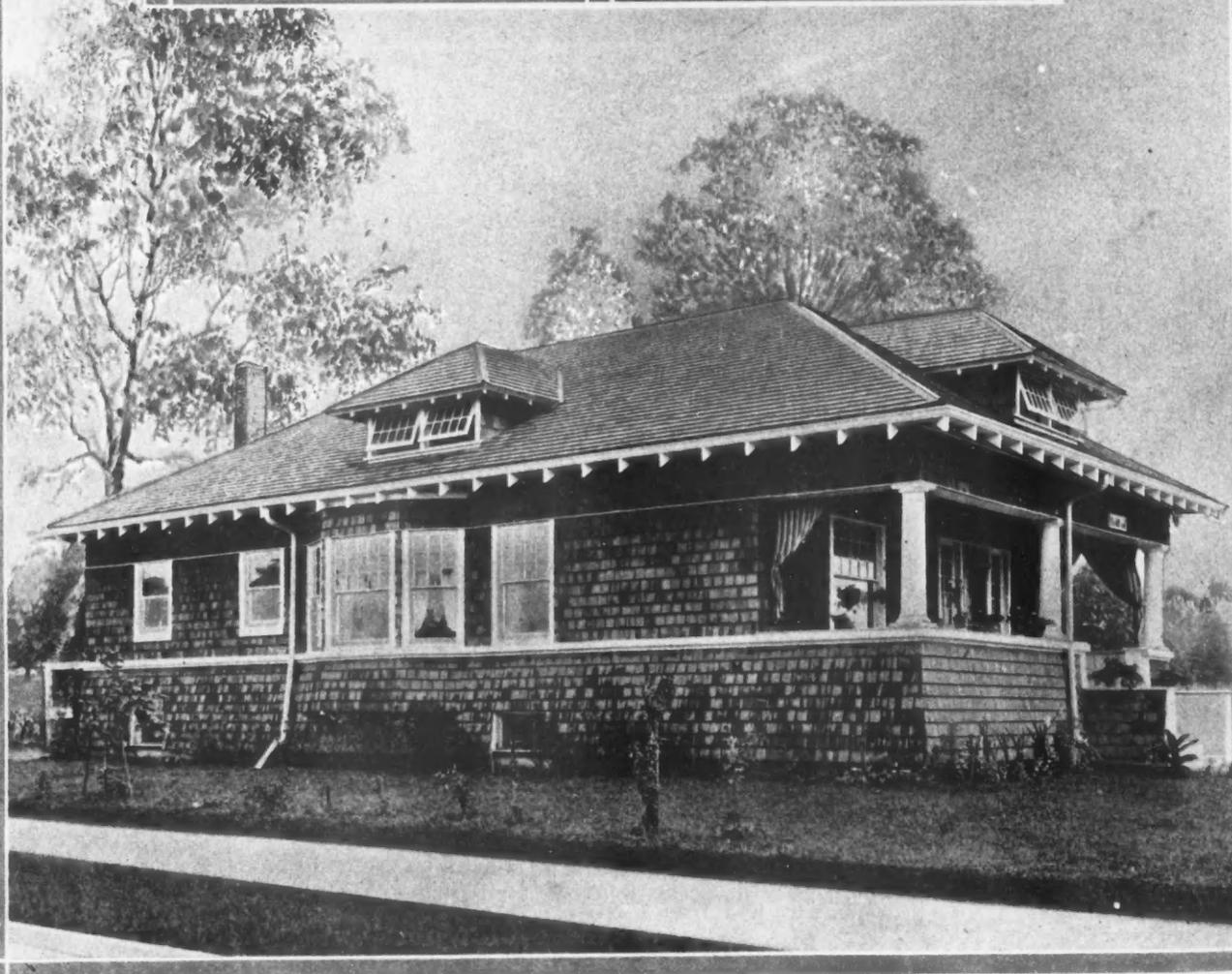
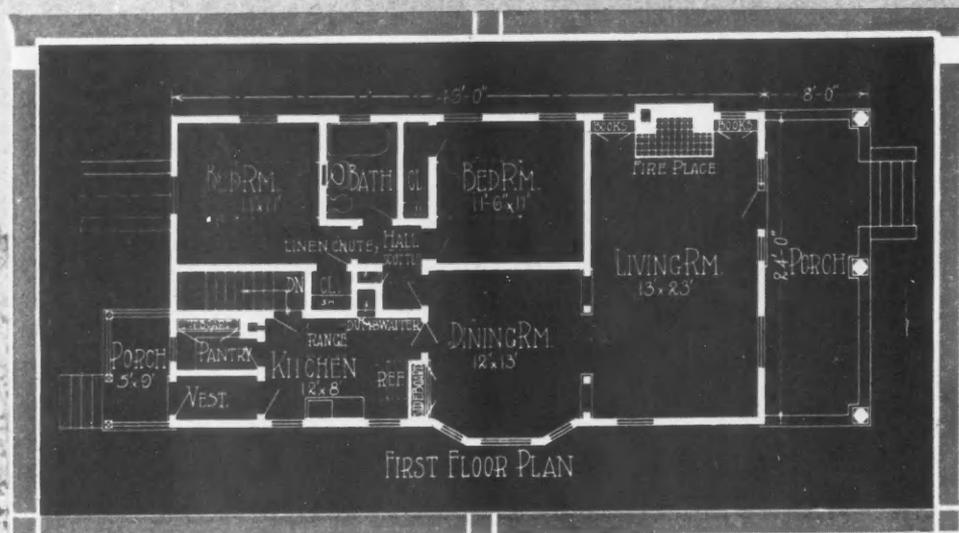
**D**UTCH COLONIAL WITH SHINGLED WALLS. There are many people who have selected the Dutch Colonial as their favorite type of residence architecture. In this excellent example the materials used in finishing the exterior were, on the walls, 24-inch silver gray stained shingles, while the roof is covered with 16-inch moss green shingles. The excellent room arrangement is typical of houses following this style of architecture. The size is 39 feet by 32 feet, with an open porch at one end, 10 by 26 feet.



**A** MODERN BRICK BUNGALOW. The quest today is for the type of home that the man of average means can afford to build and that conforms to building code regulations for buildings inside the fire limits. Here it is—the modern face brick cottage or bungalow. It will go on a narrow lot and make a real home. Five excellent well-lighted rooms are provided; also bath, pantry and plenty of closets. Size of house is 54½ feet by 27 feet.



**B**EAUTIFUL STORY-AND-A-HALF HOME. The exterior of this house, with its pure white walls, is attractive in every sense of the word. Attention is particularly directed to the design of the roof and also to the broad private porch across the front of the building. Within, there are a large, pleasant living room, a cozy den which might serve as a bedroom if necessity demands, a spacious dining room and an exceptional kitchen, on the first floor, and three bedrooms on the second floor. The size of the house is 44 feet by 31 feet, exclusive of the living porch, which is 8 by 24 feet.



**S**INGLE-SIDED BUNGALOW OF FIVE ROOMS. On this five-room bungalow the walls have been finished thruout with stained shingles. The hip roof is decorated with a simple open cornice, this construction being used on the small dormers as well as the main roof. The plan shows a cozy arrangement of rooms, including a well equipped kitchen, living room and dining room on the L plan, with colonnade, two bedrooms with the bath between. The building is 46 feet by 24 feet, not including the porches.

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## Law for the Builder

CONTRACTOR'S RIGHT TO RELIEF BECAUSE OF MISTAKE MADE IN AMOUNT OF BID

By Leslie Childs

**W**HEN, and under what circumstances, a contractor is entitled to relief from a mistake made in submitting a bid, is a question upon which the courts are not in accord. But the majority of them hold that where the mistake is made without negligence, and the employer has not been prejudiced, relief may be afforded the contractor. A case of this kind, which illustrates the general rule, was that of *St. Nicholas Church vs. Carl Kropp*, a Minnesota case reported in 160 N. W. 500, L. R. A. 1917 D 741, the facts being as follows:

The St. Nicholas Church, a religious body, desired to erect a church and advertised for bids. Carl Kropp and others filed bids, each accompanied by a certified check for \$1,000 to insure the signing of a contract should a given bid be accepted. Kropp's bid was for \$30,973, being about \$3,900 below the next highest bid, and the committee in charge of the building awarded the contract to him, notifying him of this fact.

That same day Kropp discovered that he had made a mistake in computing the total amount of his bid. It seemed that he had omitted the item for the structural iron, called for by the specifications, which amounted to something like \$2,350. He promptly notified the building committee of this mistake, and told them that he would not enter into the contract unless they gave him at least \$2,000 more than his bid called for. This they refused to do, Kropp declined to sign the contract and stopped payment on his certified check that he had deposited when submitting his bid.

St. Nicholas Church thereupon awarded the contract to another bidder, and brought an action against the bank upon which Kropp's check had been drawn, in an attempt to collect the \$1,000 that had been deposited.

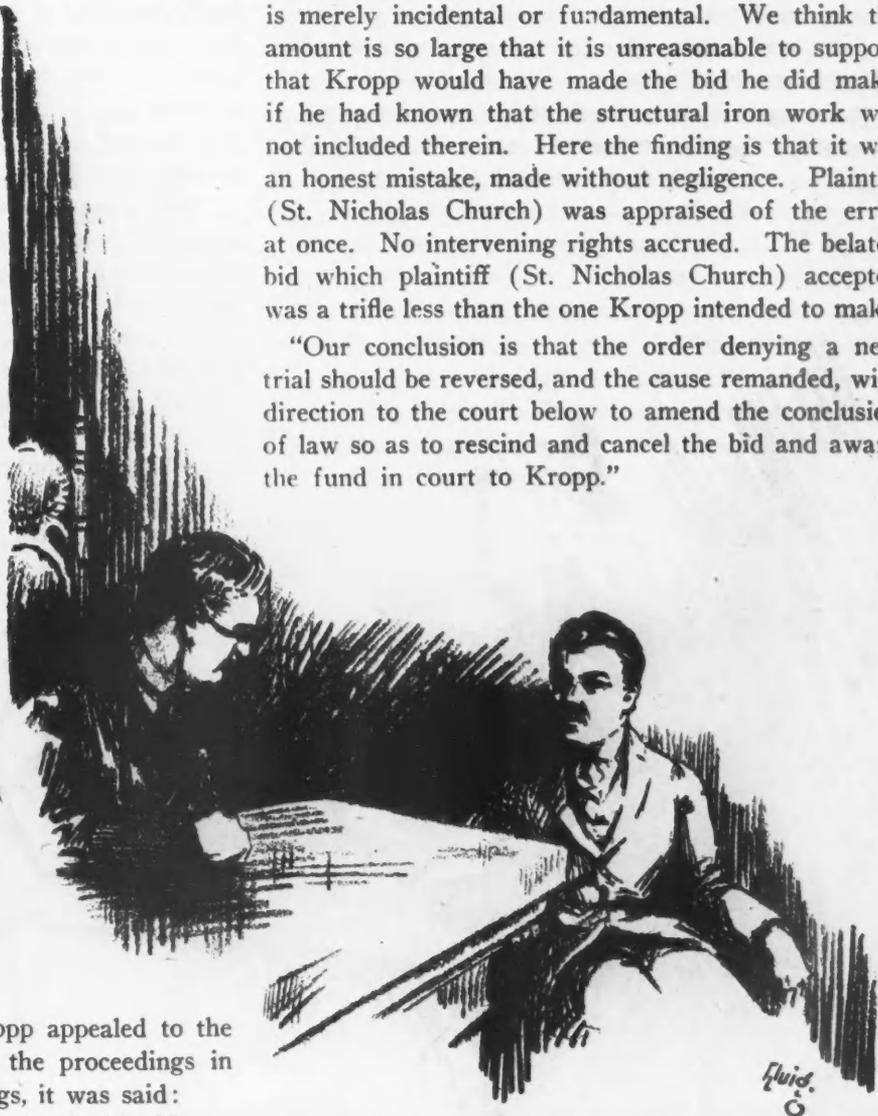
In the lower court judgment was rendered against Kropp, the court holding that the church was entitled to the \$1,000 deposited by him as a forfeit. Kropp appealed to the supreme court, and in reviewing the proceedings in the lower court, among other things, it was said:

"The jury and court found that in his bid Kropp

had made an honest mistake without negligence. The mistake amounted to more than \$2,000. Does this entitle him to any relief when plaintiff (St. Nicholas Church) was not to blame in any way for the mistake, and had no knowledge that Kropp had made it? We think the facts herein bring the case within this principle governing an unilateral mistake, stated in Sec. 1381 Story's Equity Jurisprudence: 'But where the mistake is of so fundamental a character that the minds of the parties have never, in fact, met, or where an unconscionable advantage has been gained, by mere mistake or misapprehension, and there was no gross negligence on the part of the plaintiff, either in falling into the error or in not sooner making redress, and no intervening rights have accrued, and the parties may still be placed in statu quo, equity will interfere, in its discretion, to prevent intolerable injustice'. . . .

"The question here is whether a mistake of over \$2,000 in the bid upon the construction of this church is merely incidental or fundamental. We think the amount is so large that it is unreasonable to suppose that Kropp would have made the bid he did make, if he had known that the structural iron work was not included therein. Here the finding is that it was an honest mistake, made without negligence. Plaintiff (St. Nicholas Church) was appraised of the error at once. No intervening rights accrued. The belated bid which plaintiff (St. Nicholas Church) accepted was a trifle less than the one Kropp intended to make.

"Our conclusion is that the order denying a new trial should be reversed, and the cause remanded, with direction to the court below to amend the conclusion of law so as to rescind and cancel the bid and award the fund in court to Kropp."



"It Was an Honest Mistake," the Judge Told the Contractor.



# Fred Beard says:

## "You Builders Can Help Owners Get Better Equipped Homes"

"THERE goes another washing machine sale," said Fred Beard, with a disappointed note in his voice. "I had that woman sold, too. And the worst of it is she wants a washing machine and would have bought one, only for one reason."

"What's that, Fred?" inquired Sam Williams, the contractor, who was occupying his favorite seat in the rear of Fred Beard's hardware store—a place Sam found not only comfortable during the winter, but also profitable, as Fred Beard was a live-wire merchant and a man who gave Sam many profitable building promotion ideas.

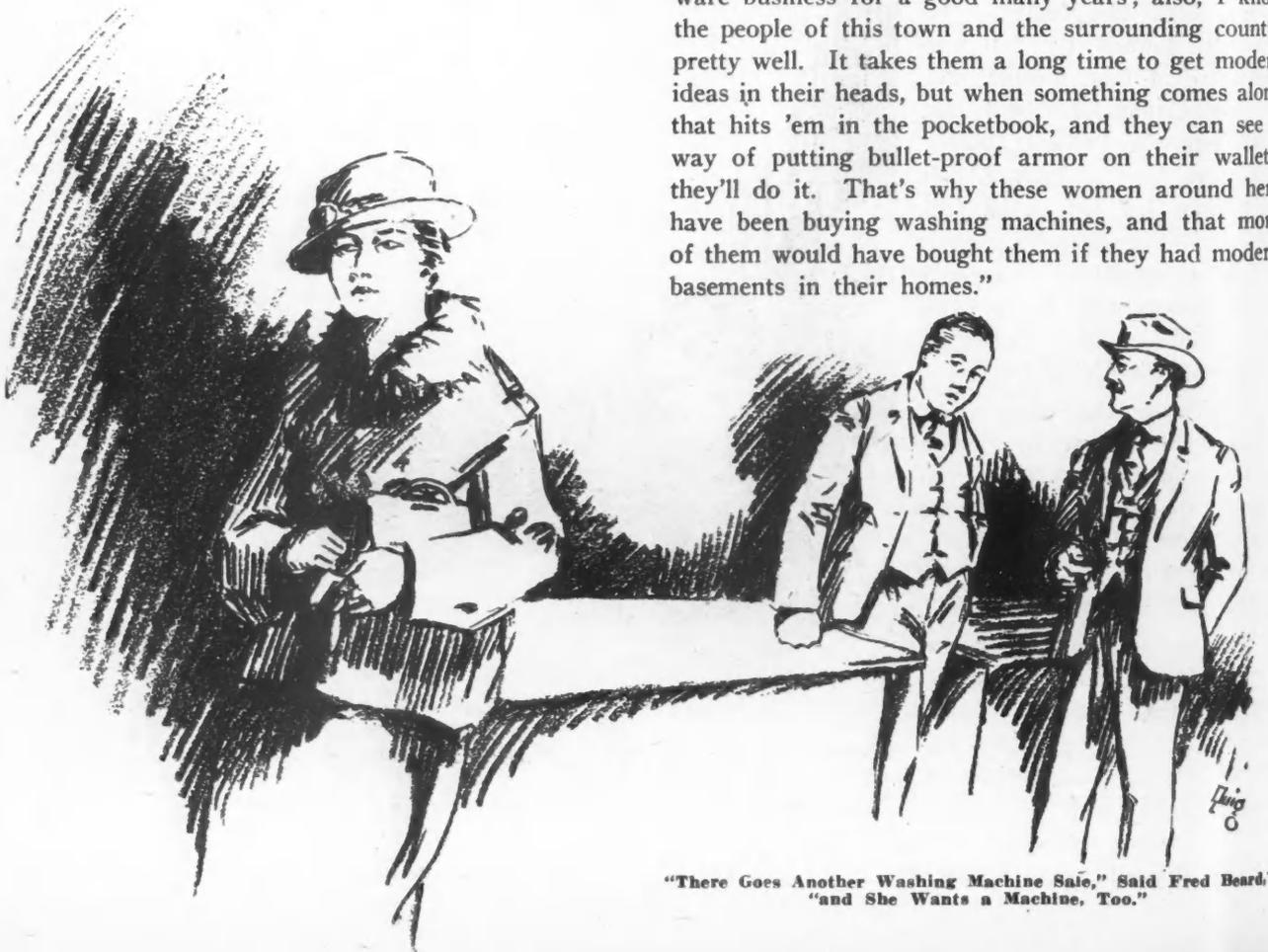
"The reason is, Sam," said Beard, as he sat down opposite the builder, "that not more than half the houses in this town have modern basements."

"What's that got to do with a woman's buying a washing machine?"

"Everything," replied the hardware man, but, for the moment did not go into details of what that "everything" meant.

"You know, Sam, I laughed heartily some months ago when Mrs. Lapham told me that her washerwoman had demanded \$3.50 a day and that she wouldn't pay it. That is, I laughed to myself. Right there I figured that some of these women who had been hiring their washing done would be doing it themselves. And, that they soon would be buying power-driven washing machines, for the simple reason that a washing machine will pay for itself in six months with the money saved by getting along without a washlady.

"And I was right, too. I have been in the hardware business for a good many years; also, I know the people of this town and the surrounding country pretty well. It takes them a long time to get modern ideas in their heads, but when something comes along that hits 'em in the pocketbook, and they can see a way of putting bullet-proof armor on their wallets, they'll do it. That's why these women around here have been buying washing machines, and that more of them would have bought them if they had modern basements in their homes."



"There Goes Another Washing Machine Sale," Said Fred Beard, "and She Wants a Machine, Too."

"But what's a modern basement got to do with a washing machine?" insisted Sam.

"Just this," said Fred. "When a woman pays a considerable sum of money for a washing machine, she wants to get all the labor-saving benefits of her investment. Now a washing machine's two chief achievements are, first, that it rubs the clothes; second, that it eliminates lifting pails of water and emptying tubs.

"A well planned basement has in it an electrical fixture for the plug that connects with the washing machine motor. It also has a floor drain, so that the stopper can be removed from the washer tank and the tubs that should be placed alongside the machine, and the water allowed to drain out onto the floor and escape thru the floor drain.

"Now take the case of Mrs. Roth, who just went out. Her home is one of the kind that has a 'cellar' rather than a basement. The floor is of well-packed clay, but it has no drain in it. Besides, if it had, water turned onto a clay floor creates a walking surface that is unsatisfactory, to say the least.

"Mrs. Roth's kitchen is not very large, either. So, to get the best results with an electrically-driven washing machine she would have to do one of two things, both of which are expensive. She would either have to build an addition to the kitchen to accommodate the washing machine and the tubs, or put a cement floor and sewer connection in the basement. And she doesn't feel that she can afford to do either."

"What do you think she'll do?" asked Sam. "Screw up her courage and get me to build an addition to her kitchen, or get Con Crete to lay a floor in the basement?"

"Probably neither," said Beard. "She'll just go along breaking her back over a wash tub, or paying the increased wages the washerwomen are demanding. Too bad, too. She doesn't seem very strong, and a power-driven washing machine would be a God-send to her."

"Well, all of us can't have these modern luxuries," remarked Sam.

"Luxuries," repeated Fred Beard. "You don't call a machine that will save three or four dollars a week in the cost of housekeeping, and at the same time make cleanliness a delight, a luxury, do you? No, sir, a washing machine is a necessity in these days.

"And right here, Sam, is a tip for you. You're going to build a number of new homes in this town this season, aren't you?"

"Going to begin just as soon as the frost gets out of the ground," replied Sam.

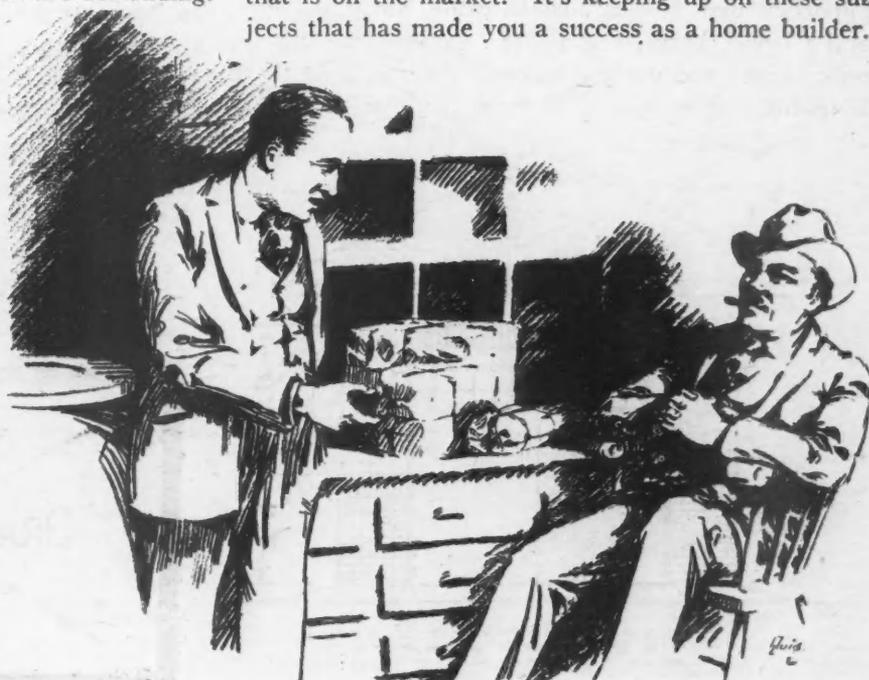
"Well, see that the plans you are building from call for a finished basement—a basement with a cement floor and sewer connections. Go on the theory that a modern home is to have a modern laundry—one where the proper equipment can be put in. Get the wife of the owner interested in a certain electrically-driven washing machine, so you will know how large it is going to be. Then you can locate the electric socket in the right place, and put in a floor drain so that the tubs can be emptied directly into it. In fact, give the owner the sort of a home that will make the work in it convenient and easy."

"Kinda looking out for yourself, too, aren't you, Fred? Kinda looking forward to selling the people I'm going to build homes for washing machines."

"Certainly I am. That's what I am in business for. But at the same time I am trying to make life more comfortable for the people of this town. Every woman to whom I have sold a washing machine is better in health and better mentally than those who are going along tiring themselves out on Mondays—losing all the good the Sunday rest has done for them."

"Well, I'll put it over for you, Fred. All of these people that I am going to build for have consulted with me about the kind of heating plant they will buy; and about the plumbing fixtures and the electric wiring and outlets. They look on me as a sort of first aid to the home builder, I guess. That's why I can talk to them about the value of having a basement designed for an electric washing machine."

"Why shouldn't you help them in deciding on what goes into the home?" queried Beard. "You know more about this equipment than the home owners do, Sam. And I know that you never overlook an opportunity to learn about the best home equipment that is on the market. It's keeping up on these subjects that has made you a success as a home builder."



"Plan the Basements of the Homes You Build so That They Will Be Ready for Modern Laundry Equipment."



## Permanent Garages in Demand

DESIGNS OF SMALL BUILDINGS INDICATE SUBSTANTIAL CONSTRUCTION

By C. A. Willson

**P**ERMANENCE, durability, beauty—these are the qualities which the prospective building owner will demand in whatever he is going to build this spring. These are the qualities which the contractor must be able to incorporate into that building.

In the last few years a great deal of consideration has been given to the question of permanence in small buildings.

By small buildings I mean buildings which are less important than houses, that is, cattle, horse and general purpose barns, hog houses, garages, ice houses, milk houses and poultry houses. Among these there is no building in which the three qualities of perma-

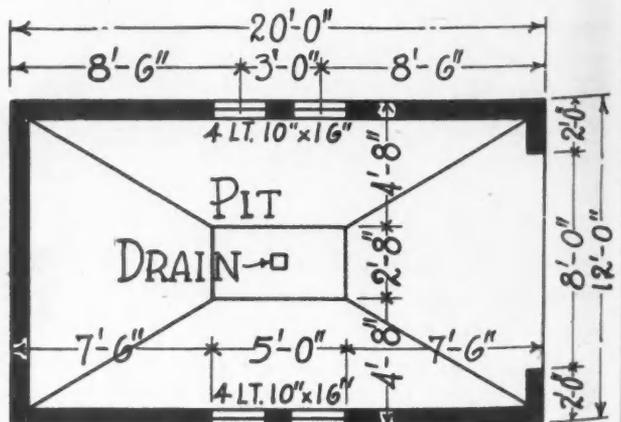
nence, durability and beauty are more to be desired than in the garage.

The accompanying photograph illustrates a two-car garage in which these qualities have been very successfully combined. The walls are of brick veneer construction and the roof is made of clay roofing tile. Sliding doors form the two ends of the building and are hung from storm-proof tracks. The interior is well lighted by the two windows seen in the picture. As is also shown in the photograph, two different kinds of brick are used—a yellow, rough texture brick from the ground to the soldier course, and above red, rough texture brick is used. The yellow brick is also used to set off the windows.

The drawings shown below illustrate a one-car garage which is similar in design to the one just described. It is 20 feet long and 12 feet wide.



Front Elevation of Single Car Garage, 12 by 20 Feet. Constructed of Hollow Clay Tile with Brick Veneer on Lower Part and Stucco Above.



Floor Plan of One-Car Garage, Showing Pit Arrangement.

The walls are built of brick and hollow clay blocks up to a height above the ground of 3 feet, 5 inches. This much of the wall is 9 inches thick. From this point to the roof the wall is 8½ inches thick, built of tile, stuccoed on the outside. As shown in the drawings the interior is lighted by two large windows in each of the side walls.

The roof is covered with prepared roofing. The floor is made of hollow clay blocks covered with a thin coating of concrete. Tile seconds can be used very successfully in the floor and may be purchased from most clay products manufacturers for a price less than that of first-class blocks.

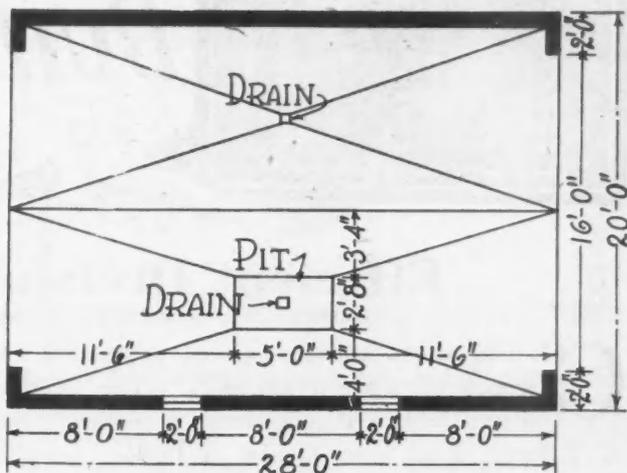
A pit is provided in the middle of the garage so that repair work under the car may be done more advantageously. The floor slopes toward the pit from all four walls and a drain is placed in the bottom of the pit. This makes possible a washing of the floor occasionally.

These two garages, altho similar in design, differ somewhat as to method of construction. The predominating feature of each is the factor of permanence. When once they have been built, they will stand without further attention.



A SMALL percentage of hydrated lime or lime putty added to the cement mortar will make the mortar work better, adhere better to the tile, and will give a more waterproof mortar mixture. Not over 15 to 20 per cent of the volume of the cement should be used; too much lime weakens the mortar and reverses the above-mentioned advantage by making the

mortar more absorbent. A straight lime mortar, however rich a mixture, is not suitable for setting hollow tile.



Floor Plan of Two Car Garage Equipped with Drain and Pit.

WINDOW frames of a size that will fit in with the tile units without cutting should be used, whenever possible.



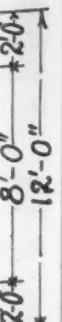
IN putting up rafters it often happens that the rafters are cut a little long, or by using a thick ridge-board the rafters must have a little cut-off at the top end. To find the exact length of the rafter after the ridge-board is in place take a pole and take the length from the corner of the plate to the corner of the ridge; transfer this length to the rafter, which gives the correct length.



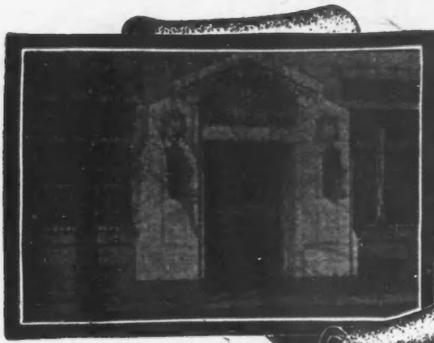
Two-Car Garage of Hollow Tile Construction with Brick Veneer. The Roof Is Clay Tile. Two Kinds of Brick Were Used—Yellow, Rough Texture Brick Up to the Soldier Course and Red Brick Above. Size, 26 by 26 Feet.

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# ALL SORTS OF BUILDING PLANS



## Efficient Division of Two-Lot Store

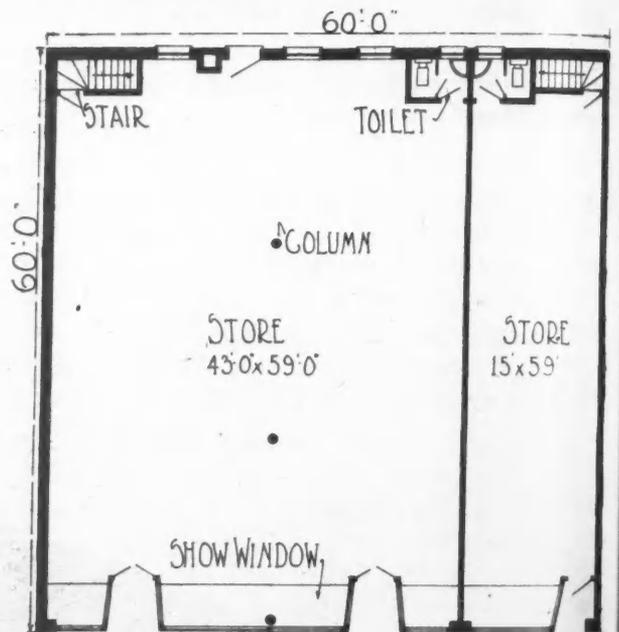
DESIGN FOR ONE-STORY STORE ADAPTED FOR CHAIN STORE USE

CHAIN stores are the finished product of the school of modern efficiency. The building shown here illustrates how two chain stores of different lines have divided a two-lot store in a manner that will enable each to run its business on a minimum of space. The large store is 45 feet wide, or in terms of property, a lot and half. It is adapted for a general merchandise business which needs some room for surplus stock. The remaining half lot is occupied by a cigar store, which can be operated in a small space because fresh stock is received frequently, and only enough room for actual trade is needed. The general merchandise store is not paying the rent that it would ordinarily pay for two full lots, nor is the cigar store paying for a full lot.

The building is one story high with a basement for heating and storage purposes. It is built of brick with an ornamental terra cotta front that can be washed frequently and thus retain its bright appearance. The large store has two entrances set well back to increase the show window space which practically covers the entire front of the building. The smaller store has an entrance slightly narrower than the others and placed next to the outer wall.

Each store runs the full length of the building, 59 feet, and has a toilet in the rear.

Saving space thru the use of half, quarter, and other irregular-sized stores such as are shown here has been one of the big factors in the success of the chain-store system. They carry no excess merchandise and consequently use a store just large enough to handle the everyday business.



FLOOR PLAN

Floor Plan of Store Showing Division.



Chain Stores Believe in Space Economy. This Double Store Has Been Divided in Unique Way to Prevent Waste of Space and Increase Return. The Small Store Is 15 Feet Wide, the Large One 45 Feet.

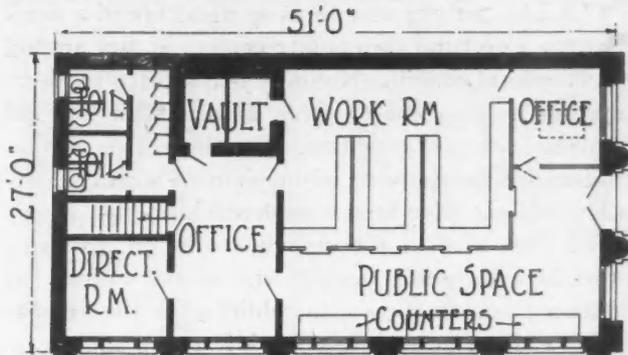
# Design of Modern Bank Building

BRICK STRUCTURE WITH TERRA COTTA FRONT ADAPTED FOR MONEY INSTITUTION

**B**ANKS boast of an architecture and style peculiar to themselves. As a rule, it possesses a certain amount of dignity and impressiveness which tends to reflect the power of the medium of the banking business, money. Moreover an impressive building has an inherent attraction for people because it inspires confidence in the firm which is so substantially housed.

This feature is especially striking in the bank building shown here. The large terra cotta pillars and artistic facade give it a monumental appearance. The brick construction is further enhanced by a well selected trim, while the large windows give the structure a pleasing expression of frankness.

By no means large, the building is only 27 by 51 feet, it is efficiently designed to handle a good business. The attractive double mahogany door leads into the public space which is used by the customers. The outer side of the front half of the building is divided into an office and general working room, containing the tellers and bookkeepers' cages. The rear half of the building is set aside for the personal business of the bank and contains the vault, private office and directors' room. Two toilets are also located in the rear.



FLOOR PLAN

Plan of Banking Floor Showing Arrangement of Offices.

It is easy to see that an artistic building of this type is a decided asset to any town or neighborhood and a magnet for business.



**I**T IS one of the inalienable rights of every American citizen to be a home owner, to have a place absolutely sacred to himself and family, into which no unwelcome guest may intrude, and where he can, as in his own castle, "defy the slings and arrows of outrageous fortune." A homeless man is like a man without a country.



A Real Bank Building that Inspires Confidence in Customers. The Terra Cotta Front and Large Open Windows Make the Structure Very Attractive. This Building is an Asset to Its Community.

**Design for Small Church**

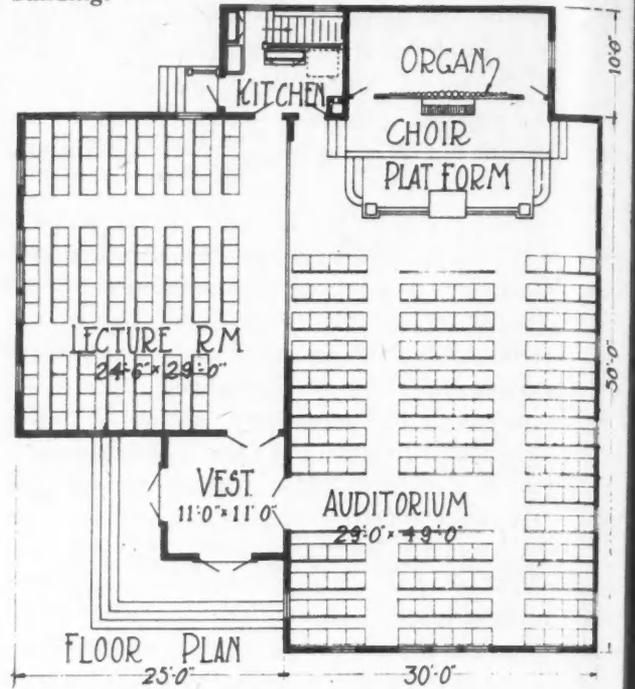
**Frame Structure Contains Kitchen and Lecture Room for Social Functions**

**S**OCIAL activity as well as spiritual life in a small town or rural community centers in and around the local church. Not only is it a place for worship, but it has come to mean a social club for the members of the congregation. For this reason several features are incorporated in the plans of a church now that would not have been considered formerly.

The floor plan of the church shown on this page shows how the social activity end of the church has influenced construction. In addition to the regular church auditorium with its choir loft, pulpit and organ, provision is made for a kitchen and lecture room, which are needed frequently for dinners, entertainments, and socials of all kinds. The church proper is 30 by 50 feet, with a 10-foot addition in the rear to take care of the organ. The lecture room, located at the side and opening off the vestibule, which also leads into the church, is 24 feet 6 inches by 29 feet.

The church is divided into three rows of pews with aisles between, the center row holding five and each outside row holding four persons. It has a capacity for several hundred people. The kitchen is located in the rear of the building next to the organ and has doors leading to the auditorium and lecture room.

The building is of frame construction and has a steeple with bell loft. The Gothic windows are covered with stained glass. The double entrance is located in the lower part of the tower at one corner of the building.



Floor Plan of Church Showing Lecture Room Addition.



The Social Center of the Small Town and Rural Community is the Church. This Church Has In Addition to the Auditorium for Spiritual Services a Lecture Room for Meetings and Dinners as Well as a Kitchen.

# Design for Small Post Office Building

BRICK STRUCTURE DESIGNED TO HANDLE LARGE MAIL BUSINESS

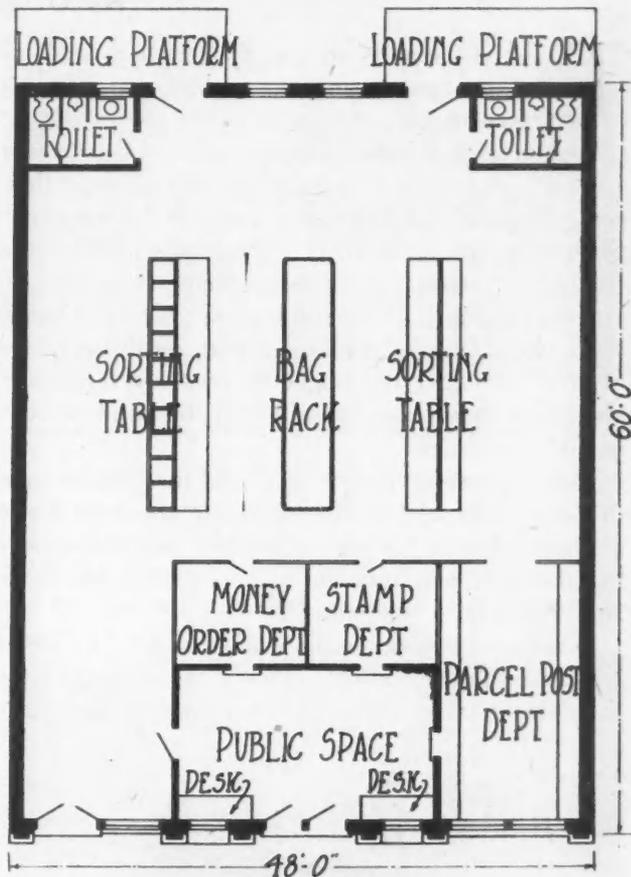
POSTOFFICES are necessary institutions. In their construction a great deal depends on the floor arrangement. Unless it is carefully planned, the great efficiency needed in the postal service cannot be attained and a consequent and costly delay is the result.

Special attention was given to the arrangement of the postoffice floor shown in the accompanying plan. Every square foot of floor space has been adapted for a specific purpose. In the front part of the building we find the space with desks for the public and the cages for stamp and money order clerks. A rather large section is given over to the parcel post section because of its continually increasing size.

But direct personal business contact with the public is the smallest part of the mail service. The actual handling and sorting of mail requires space, and in this building this important fact has not been overlooked. More than two-thirds of the floor space is devoted to this phase of the work. The work floor is equipped with two long sorting tables with the bag rack in between. The adjacent floor space is used for holding the outgoing and incoming mail bags. At the end of the building are two loading platforms—one for receiving, the other for shipping. The mail come thru one door, is sorted, placed in bags, and loaded at the other platform.

The building has an attractive brick front with terra cotta trim and stone up to the windows. It has two double door entrances—one in the center of the building for the public, the other for employees. It is 48 feet wide and 60 feet long and one story in height.

This size and type of postoffice building is excel-



FLOOR PLAN

Typical Floor Plan, Showing Public and Work Rooms.

lently suited for branch work in large cities or towns and can be constructed very economically because of little interior construction.



One Link in a Great Chain. This Postoffice Is Suitable for Branch Work in Large Cities or Towns and Is Designed to Handle a Substantial Volume of Mail. Floor Arrangement in a Postoffice Is of Great Importance.

## A New Front on a "Side" Street

HOW A FREEPORT JEWELER DOUBLED HIS TRADE AND DID A CONSTRUCTIVE THING FOR HIS TOWN

By O. R. Hardwell

**T**HIS is the story of a retail merchant who had the courage to smile at custom and laugh at precedent.

Four years ago Edward Bengston was proprietor of a jewelry store situated on the busiest corner in Freeport, Illinois. He had spent considerable money in advertising his location as "Bengston's Corner." A cross-town, street car transfer point, Bengston had provided a neat public waiting room, and in numerous other ways (not to mention his unusually attractive window displays) he sought to veritably trade-mark his store's location and brand it in the mind of every possible customer.

Just then the rent went up. And the jeweler faced the unpleasant alternative of paying the store owner a sharp advance for his established location or leaving the high rent zone for the only available vacant site "down on a side street."

It required courage to make a decision. Yet Bengston picked the side street. Picked the only thing that was left—a saloon that had closed its doors two years

before, when the town went dry.

It cost \$5,397.33 to put a "clean dicky" on the saloon. But Edward Bengston's fine enameled terra cotta front has since made a main street out of a side street. It has pulled a backward and obscure thoroughfare out of its rut. It has set a standard in modern store fronts for other merchants to emulate, and improved the community's general appearance. It has done much more—it has doubled the volume of Bengston's jewelry sales in four years.

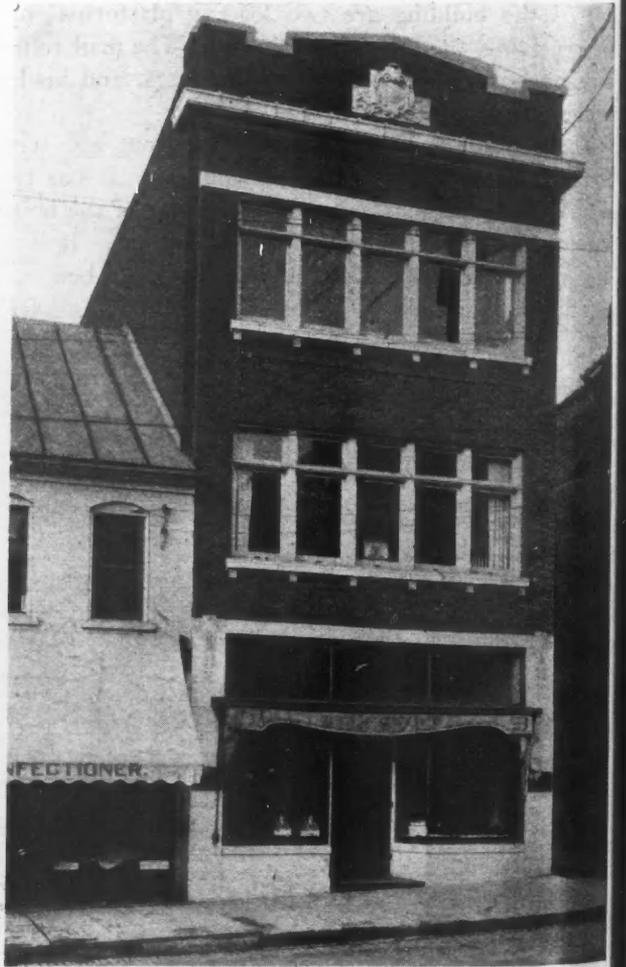
Mr. Bengston recently stated: "Location is not always a main factor in business success, for, it stands to reason, everybody can't have the most prominent corner in the town. I have demonstrated what can be done down on a side street, even when custom, precedent and expert opinion told me I was dead wrong."



**B**E conservative if you wish, but first have something to conserve.



Building Before Remodelling. It Had Been the Home of a Saloon Until the Town Went "Dry" Two Years Ago. The Street Was Considered Poor for Business.



"Bengston's Corner" Today. Its Fine Enameled Terra Cotta Front Has Helped to Change a Poor Side Street Into a Crowded Business Thoroughfare.

# Concrete in the Lumber Yard and Shed

CAN BE USED IN MANY WAYS WITH EFFECTIVE RESULTS

WHAT extensive use may be or has been made of concrete in and around lumber sheds and yards is not realized until an opportunity of examining a number of illustrations of such actual use is presented. An accompanying group of pictures illustrates this point. They show a builder's supply yard where in one case concrete pavement forms a platform for mixing concrete that at spare time is worked up into concrete block; another, a platform that is used as a stacking place for shingles to keep the bundles



Builders' Supply Yard Equipped with Concrete Platform for Mixing Concrete to Be Worked Up in Spare Time Into Concrete Block.

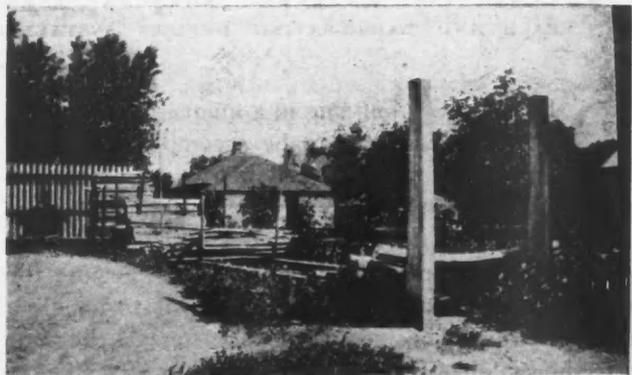
In an issue of the AMERICAN BUILDER several years ago, a drawing and photograph were shown of concrete lumber pile supports. One of the Wisconsin yards has adopted such supports for its lumber piles and has, in addition, built composite trackways be-



Stacking Place for Shingles Made of Concrete.

from contact with the soil; another, a pair of curbs or runners finished with re-inforced concrete posts at one end to permit the stacking up of cedar or other posts or similar timber pieces.

The advantages of concrete pavement in such locations are parallel to its advantages on the open highway. Mud and dust, with the possibility of having a loaded truck or team stalled, is eliminated. It goes without saying that anyone would be attracted by the cleanliness that such pavement introduces, since it invites the spirit of clean up and keep clean. Once built, it is always built.



Pair of Curbs or Runners Finished with Concrete Posts at End for Stacking Up Posts and Large Pieces of Timber.

tween the piles, these trackways serving as drives for the yard trucks and as a railway for push carts. The rails in this case are set on precast concrete slabs, to which they are attached by fittings bolted in the concrete when cast, the slabs being made wide enough so that they serve to pave the wagon wheel track.

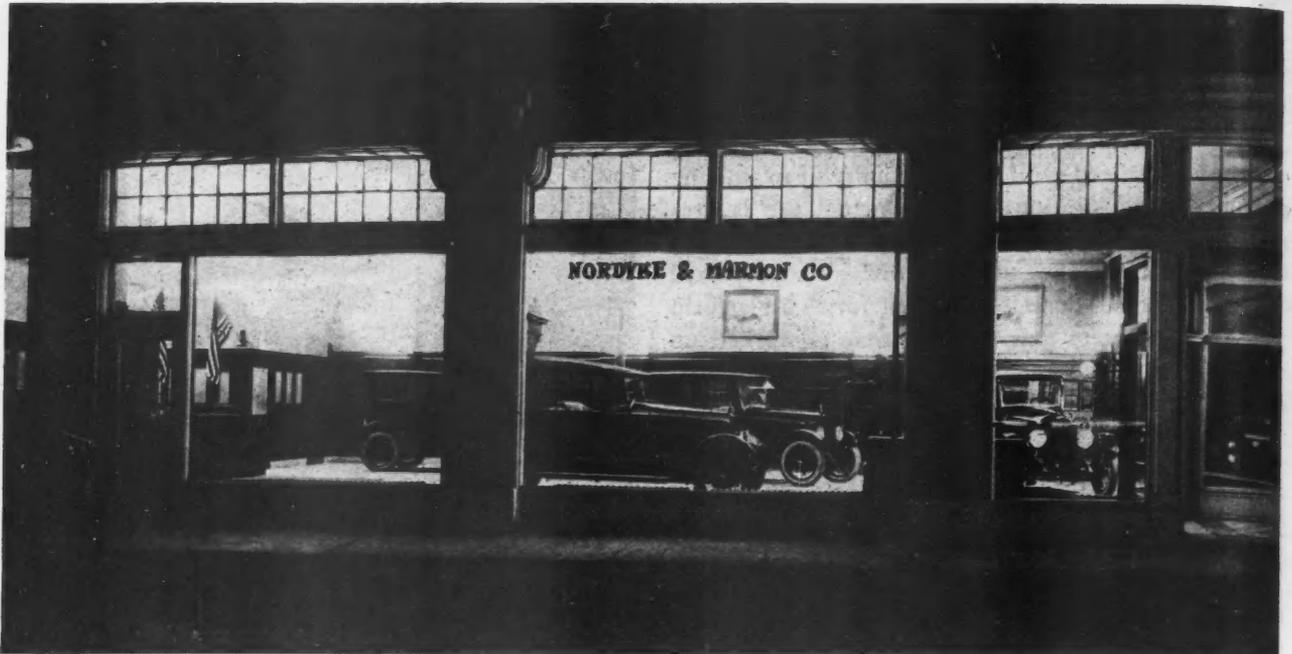


## Rule for Squaring Up Work

THE old rule of 6-8-10 is used generally by all mechanics in squaring up their work, and it is the quickest and most reliable method known, except the use of an engineer's instrument. Measure 6 feet from the corner on one side and 8 feet from the same corner on the other side, and the diagonal of these two points should be 10 feet. If not, the lines are not square or at right angles to each other.



Lumber Yard with Concrete Supports for Piles and Combination Trackway for Yard Trucks and Push Carts. The Rails Are Set on Concrete Slabs Which Are Wide Enough to Serve as Wagon Wheel Track.



Lighting Effects and Window Arrangement Are Two Important Factors in Making New Service Plant Magnet for Trade.

## How to Build Equipment for Modern Factory

SPACE AND LABOR-SAVING DEVICES INSTALLED IN AUTO SERVICE PLANT BOOST EFFICIENCY

By Shirley Ware

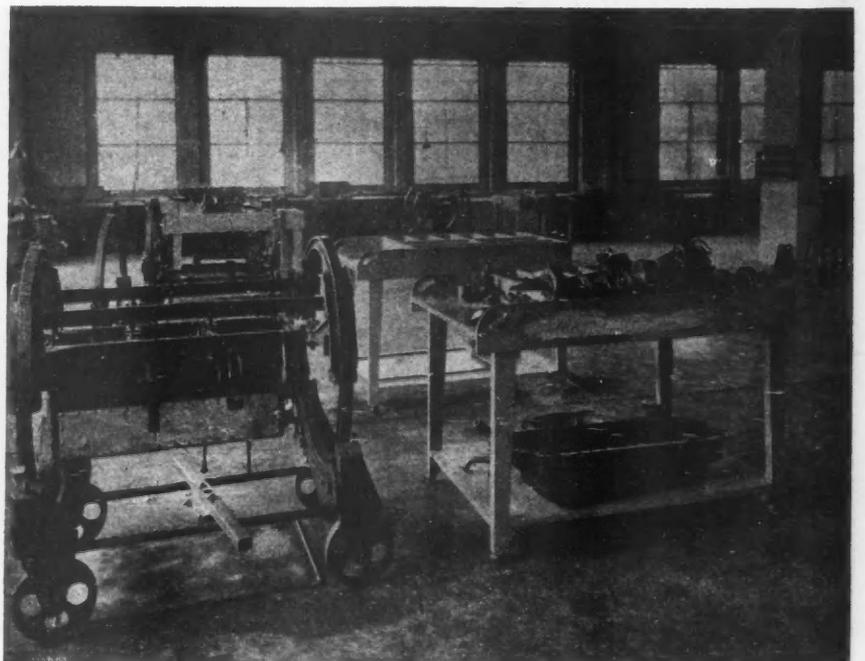
**D**RESSING a building in a unique garb without losing efficiency can be accomplished by cooperation between the alert contractor and business man who readily recognizes the value of space and labor saving devices. By the wise and careful selection of equipment designed for this purpose the space can be so adapted and arranged as to handle a highly specialized business without waste. At the same time the building arrangement can be so attractive as to stimulate business.

A striking example of this use of labor and space saving equipment in a logical arrangement is shown in a motor service-station recently built by the Nordyke-Marmion Co., of Indianapolis, Ind., This miniature factory, as it is called, was built upon a downtown site in the motor row with the thought of combining a salesroom and repair department in a convenient-to-the-motorist location. It stands on a popular drive where hundreds of motor cars pass daily.

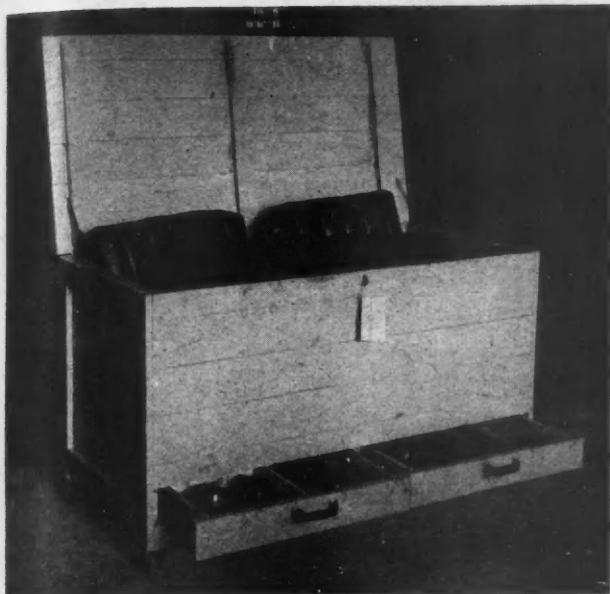
Upon entering the salesroom, the first thing that draws attention is the system of lighting. In addition to the large globes that hug the ceiling and which are known as the indirect lighting system, reflectors of powerful candle power are secured to pillars in such positions

as to reflect a strong light upon those parts of the car the company wishes to feature most. One of each model manufactured is exhibited and ample space is afforded for the car to be seen from all sides.

A door from this salesroom opens into one of about equal size. Ten or twelve used models are displayed here and it is immediately obvious that the cars are seen to much better advantage because of the well fitted and well furnished background, and the cars are



"Motor Ambulances" for Holding Disassembled Parts of Motor. These Tables Prevent Confusion of Various Parts of the Different Cars in the Factory for Repairs.



Individual Lockers for Storing Cushions, Curtains, Carpets, Etc. The Inside of the Locker Is Partitioned Into Many Sections to Separate the Contents. The Lockers Are Sealed with a Lead Seal Until Car Is Ready to Be Refitted.



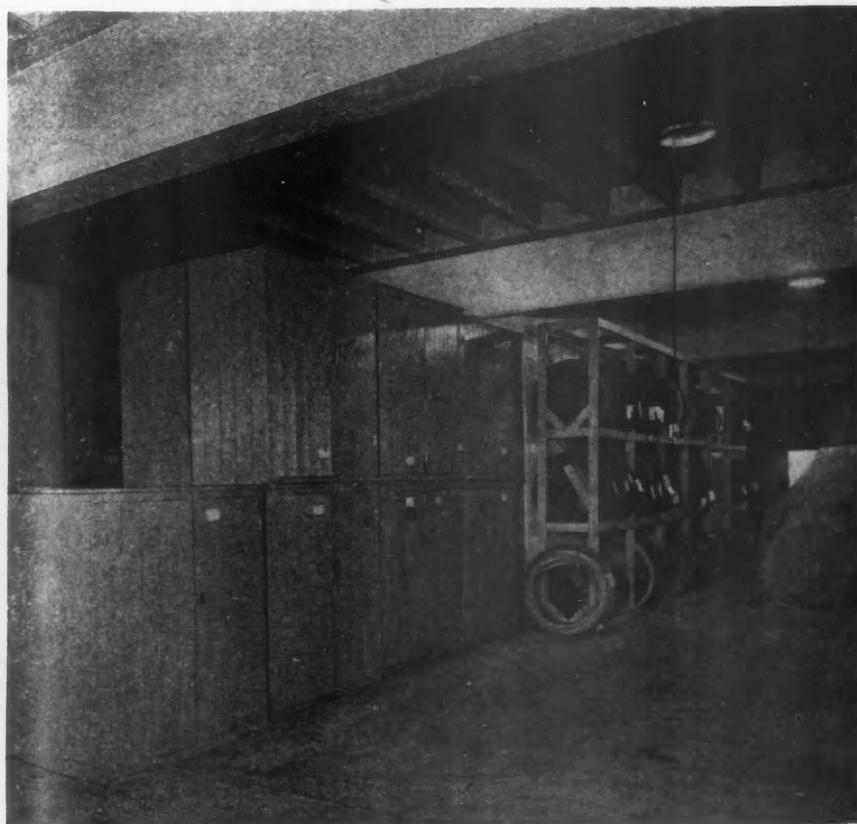
Gaskets Filled in Long Drawers to Prevent Parts from Getting Mixed Up. This Arrangement Saves Much Time and Labor.

not crowded together in the "junk-pile" exhibit accorded the used car in many factories. The visitor sees the car at its best, and, by the way, "visitor," not "prospect" or "customer," is the name all callers are known by among salesmen and other employes.

### Hospital for "Sick" Cars

In the rear of the building, a large door opens to admit the car coming into the factory for repairs. It

is first driven into a room with concrete floor (in fact the floors thruout are of concrete) and cleansed thoroly by a shower spray device that is attached to the ceiling. A rubber hose connection is also provided on either side for the purpose of cleaning the fenders and wheels that sometimes prove obstinate. The machine is then backed upon a freight elevator and carried to the second floor which comprises the repair department.



Lockers for Parts and Racks for Tires of Cars Being Repaired in Factory. Efficient Arrangement of These Storage Devices Eliminates Confusion When Car Is Ready to Be Assembled.

The car is examined thoroly and if found to be in serious trouble its motor is dismantled and the parts are placed upon a "motor ambulance," that, equipped with rollers, is wheeled to one side until the motor is again assembled. In this way there is no probability that the parts will become confused with those of any other car in the factory for repairs.

To anyone who has spent a night at a hospital, booked for an operation, these methods will be easily recognized as that institution's procedure. Other hospital adaptations are the painting of a design in black upon all doors where finger prints come in contact with the frames, and equipping the stationery bowls with foot-valves in order that finger prints may not appear here also.

### Efficiency Arrangement Means Better Service

Before the car is sent thru the various stages of repair, its inner contents and body parts are removed and stored away for safe

keeping. The carpets, cushions, clocks, lamps, etc., are put into an individual chest until needed. A lead seal, similar to that used by the freight car locks the chest and a tag containing owner's name, car number and other necessary information is attached thereto and a duplicate given to customer. Tires are detached, placed in racks and tagged similarly.

An office for service manager is at one end of the building. Here a bulletin board with an up-to-the-job record of the progress of each car is installed, and as the car moves from one department to another, the proper notation is made thereon, e. g.,

Customer's Name.	Car Number.	Order Number.
Robinson	920815	818119
Remarks—Assemble 11/1/19		

When a telephone inquiry comes into the office, it is immediately referred to the Service Department and all that is necessary is a glance at the bulletin board to ascertain just what is to be done before the customer may have the car. A similar record is kept of the batteries in service. In this way there is no unnecessary waiting for the information.

#### Handy Stock Containers Aid

The tier and bin arrangement is used for storing small parts. Each tier is lettered alphabetically, and each row and bin numbered. A card index is used

in connection with same and each card contained therein is indexed alphabetically and is lettered and numbered with the tier letter, row and bin numbers. The number of the parts in stock is also shown, and when a part is taken from the bin, a deduction is made for further record. In this way an employe may secure the part desired with no trouble whatever.

Gaskets are filed in large flat drawers with nails



Tiers with Bins for Keeping Small Auto Parts. These Tiers Are Designated by Letters and Each Bin has a Number. A Corresponding File Index Is Kept in the Office.



Racks for Drying Parts After Painting. All Racks Are Equipped with Rollers to Allow Them to Be Taken to Any Part of the Building.



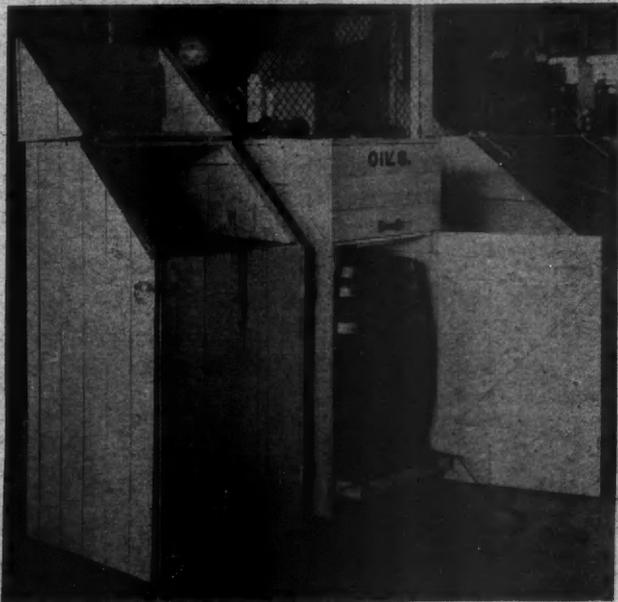
Scrap Bins, Showing Quick Methods of Dumping.

driven so as to fit the holes in the different patterns, thus keeping them in place.

Tool racks built in pyramid shape are provided for the important tools that are not in constant use. Outlines of all tools are painted in bright red upon a background of gray and a nail holds each tool in place. At the end of the day if a tool is missing the checker is able to know which one it is at a glance.

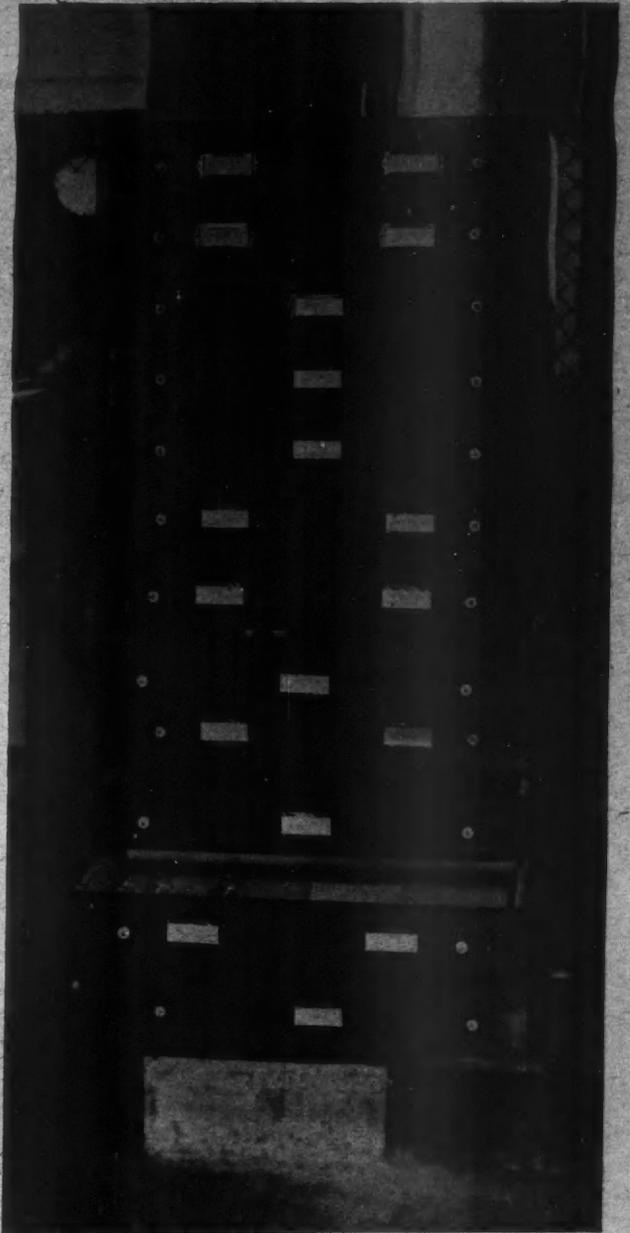
A cabinet similar to the filing cabinet is used for keeping a complete supply of incandescent lamp bulbs at hand. A partition of wood with small holes is fastened about half-way in each drawer and the bulbs fit into the openings, in an upright position. Not only is the workman saving time but a large percentage of breakage is eliminated.

A manner of keeping waste in the repair rooms without its appearing unsightly is found in the scrap bins which are equipped with two doors, at top and side, one for dumping the waste and the other for securing it as needed.



Boxes with Hinged Doors for Storing Oil. The Barrel Is Placed on a Platform Fitted with Rollers. It Can Be Wheeled Out When Needed and Returned to the Box Out of Sight.

A container in which the oil barrels are hidden is made with a door that opens out and one that lifts up. The barrel is mounted upon a platform with



Case with Drawers Used for Storing Incandescent Light Bulbs. A Partition with Small Holes Keeps the Bulbs Erect, Preventing Breakage.

rollers allowing same to be pulled outside the container when a very large quantity of oil is desired.

**Provides for Employes' Comforts**

Not only is the plant well ventilated and well lighted, but many other provisions for the employes' comfort are to be found. The interior, walls and woodwork, are painted in light gray, which is a color not too bright to be tiresome to the eyes and yet bright enough to give the factory light and cheer. In order to eliminate offensive gases, a rubber hose is attached to the exhaust pipes of the automobile and floor pipes connected to the rubber hose continue to carry the exhaust outside the building. A butterfly valve connection

(Continued to page 151.)

## "This Is the Home I Am Going to Build"

MR. "K." OF THE AMERICAN BUILDER STAFF, DECIDES THAT A BRICK RESIDENCE OF SEVEN ROOMS WITH PERGOLA PORCH AND HEAVY TILE ROOF IS THE HOUSE HE WILL BUILD WHEN THE HOME-BUILDING SEASON OPENS UP

**H**OMEBUILDING seemed to be the most important topic of the day. Everywhere he went Mr. "K," of the AMERICAN BUILDER staff heard people talking about the kind of home they were going to build this spring. Finally he got a touch of the fever himself and decided to build one of his own, but different from those that have already been suggested.

What he had in mind is indicated in the plans shown this month. They call for a large seven-room house of brick construction with a concrete basement.

This home is a pleasant combination of the substantial and artistic in architecture. The rather heavy lines of the square brick type are softened and greatly enhanced by the artistic pergola porch and distinctive tile hip roof well broken up by dormers. The combined effect of these touches are very pleasing.

On the first floor, as the plan indicates, is a large living room, 28 by 14 feet 6 inches, with a well de-

signed brick fireplace and side bookcases fitted with glass doors, a comfortable dining room, kitchen, lavatory and an inviting little "breakfast nook" fitted with a unique table and side benches. The entrance is on the side of the house opening on a drive way, which extends to the garage in the rear.

Four bedrooms are shown on the second floor plan. Each one has a pair of windows to provide light and ventilation. In addition to the bedrooms is a bath room and sleeping porch. Plenty of closets are also provided.

The substantial feature which is found thruout the building is particularly emphasized in the basement plans. The posts, girders and walls, which are concrete, are stout and strong. The basement has a concrete floor with a drain near the laundry tubs.

That Mr. K is strong for modern conveniences that will lighten the work of the housekeeper is shown by the laundry equipment consisting of a modern washing machine and mangle.

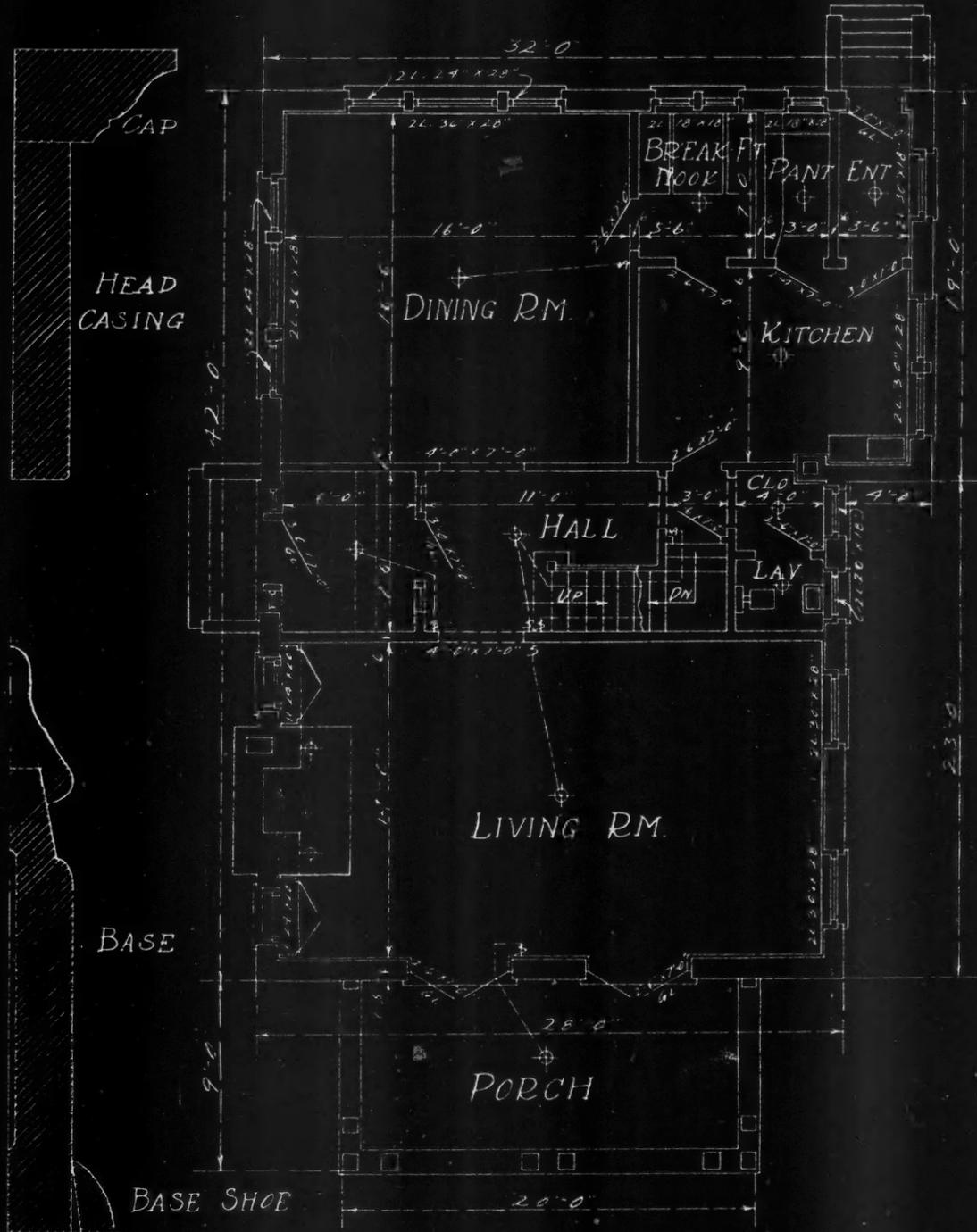


Seven-Room Brick House with Concrete Basement. Size, 42 by 33 Feet. This Is the Home Mr. "K" of the American Builder Staff Is Going to Build This Spring. COMPLETE BUILDING PLANS IN THE BLUE-PRINT SUPPLEMENT.





# AMERICAN BUILDER BUILDING PLANS



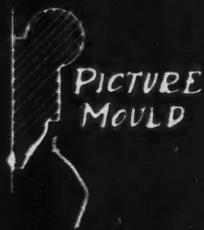
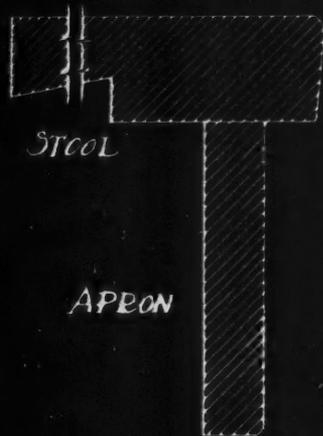
FIRST FLOOR PLAN

SCALE 1/8" = 1'-0"

EIGHT ROOM RESIDENCE

SHEET N<sup>o</sup> 1

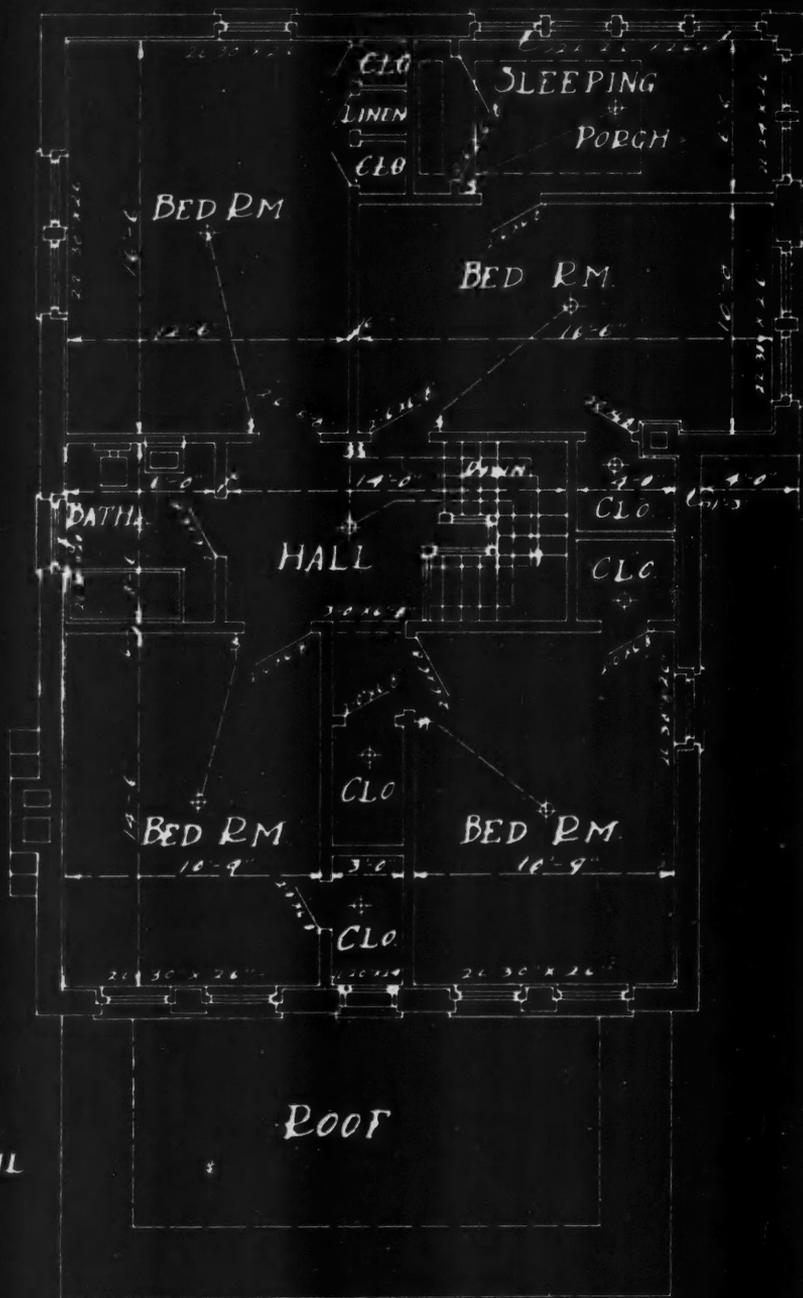
# AMERICAN BUILDER BUILDING PLANS



SIDE  
CASING



CHAIR RAIL



SECOND FLOOR PLAN

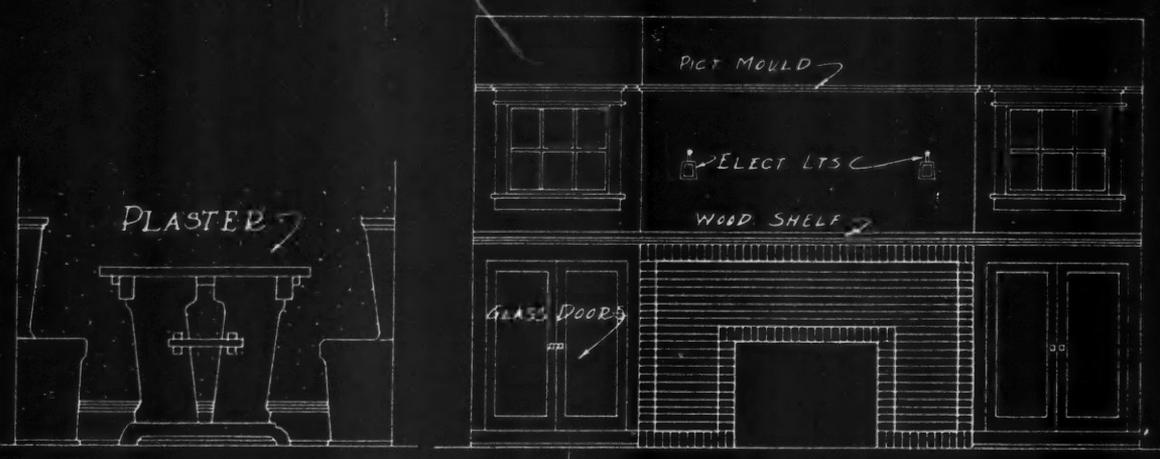
SCALE  $\frac{1}{8} = 1'-0"$

EIGHT ROOM RESIDENCE

SHEET N<sup>o</sup> 2



# AMERICAN BUILDER BUILDING PLANS

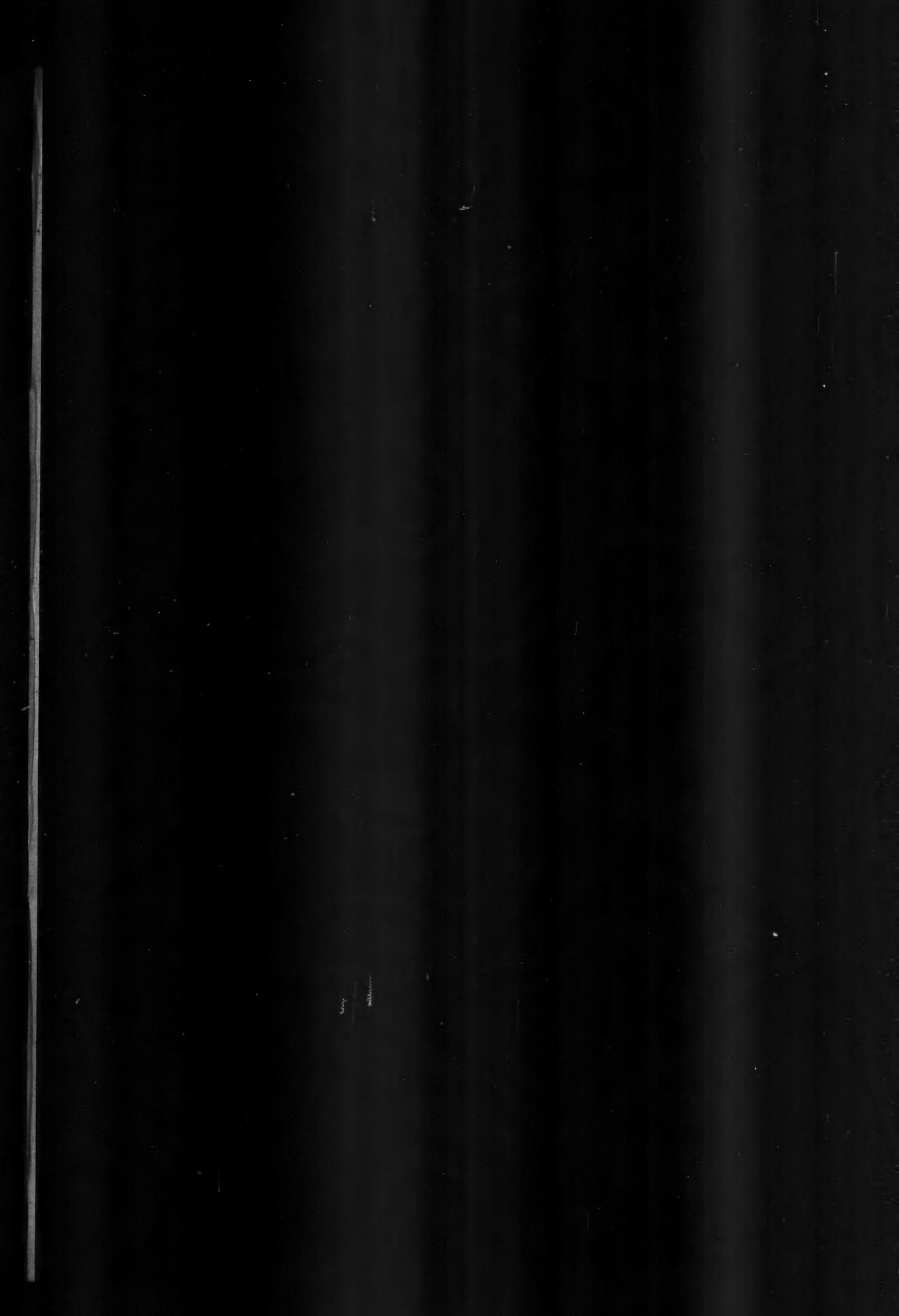


BREAKFAST NOOK DETAIL SCALE  $\frac{3}{8}$ "=1'-0"  
FIRE PLACE & BOOK CASE DETAIL SCALE  $\frac{1}{4}$ "=1'-0"



FRONT ELEVATION  
SCALE  $\frac{1}{8}$ "=1'-0"

## EIGHT ROOM RESIDENCE SHEET N<sup>o</sup> 4





# DESIGN OF SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

## Design of a Simple Beam for Stresses

ARTICLE 3 OF AN EXTENSIVE SERIES ON STRENGTH OF MATERIALS AND ENGINEERING DESIGN

ONE OF the most important problems in construction is the designing of floor beams when the load that they must carry is known. Many floor beams are of the simple beam type. That is, they rest on end supports, with the ends free to lift slightly when the beam bends under a load. In a floor beam, the load to be carried is considered uniformly distributed. That is, every foot of beam must carry equal loads. In Fig. 1 a simple beam is shown. The series of circles along the top of the beam indicates the uniformly distributed load. Now, experiment and theory have both shown that in a beam where the material is of uniform grade, the greatest danger from failure will occur at the center, C. This tendency

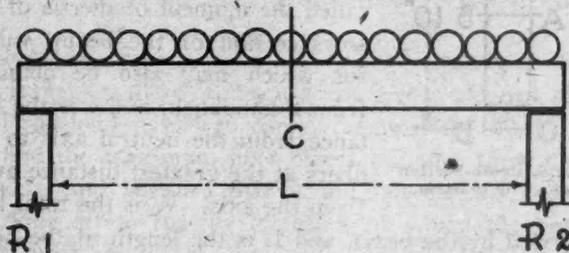


Fig. 1. Side View of a Beam with Uniformly Distributed Load.

to fail is due to the reaction, R. The force R tries to rotate the left half of the beam around the point C in a clockwise direction. Such a force produces what is called a bending moment. The problem is to so design the beam that it will not break from bending moments.

To determine this bending moment, proceed as follows: Suppose the load on the beam is  $w$  pounds per ft. of length. If the beam is  $L$  ft. long then the total load is  $W = wL$ . Each reaction is one-half

the load, or  $\frac{W}{2}$ . But to the left of the point C there

is also one-half the load, or  $\frac{W}{2}$ . By the laws of

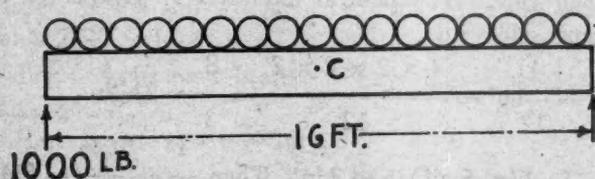


Fig. 3. Beam with Uniformly Distributed Load of 2,000 Pounds.

mechanics any uniformly distributed load over a beam may be replaced by a single load of an equal number of pounds at the center of the beam. The left half of the beam may be represented as in Fig. 2, with the forces producing bending moment. From the article

on "The Three Stresses" the moment of  $\frac{W}{2}$  is found

by multiplying the force by its distance from the point C.

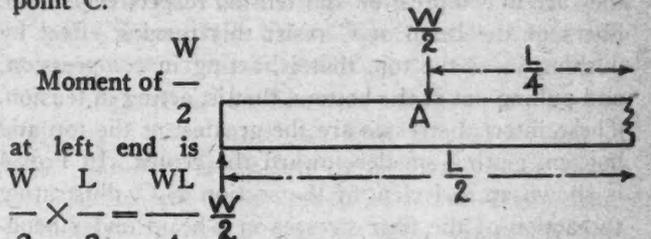


Fig. 2. Left Half of Beam of Fig. 1, Showing Forces Producing Bending Moment.

Moment of  $\frac{W}{2}$  at left end is  $\frac{W}{2} \times \frac{L}{2} = \frac{WL}{4}$  (clockwise).  
 Moment of  $\frac{W}{2}$  at A is  $\frac{W}{2} \times \frac{L}{4} = \frac{WL}{8}$  (counter clockwise).

Since one of these moments tends to balance the other, the total bending moment is the result obtained by subtracting one from the other, or

$$\text{Bending moment (B. M.)} = \frac{WL}{4} - \frac{WL}{8} = \frac{WL}{8}$$

Note: In using this formula  $L$  must be in inches.

For example, take a beam 16 ft. long, which carries a uniformly distributed load of 2000 lbs., as shown in Fig. 3. The reactions are each 1000 lbs. The view of the half of the beam to the left of C shows two forces of 1000 lbs. each producing bending moment about point C. The moments are calculated as follows:

Moment of 1000 lbs. at A is  $1000 \times 8 \times 12 = 96,000$  inch lbs. (clockwise).

Moment of 1000 lbs. at B is  $1000 \times 4 \times 12 = 48,000$  inch lbs. (counter clockwise).

B.M. at C = 96,000 —

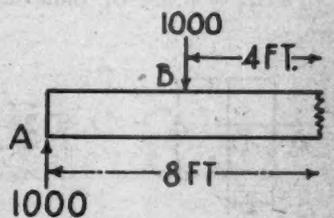


Fig. 3A. View of Left Half of Beam with Forces Producing Bending Moments.

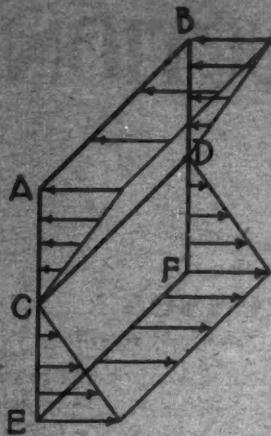


Fig. 4. End View of Section at C of Fig. 1, Showing Fibre Stresses.

The clockwise turning effect of the left half of a beam tends to crush the top fibers of the section at C, and to pull the bottom fibers apart. That is, they are in compression and tension respectively. The fibers of the beam at C resist this turning effect by pushing in at the top, that is, acting in compression, and pulling out at the bottom, that is, acting in tension. These internal stresses are the greatest at the top and bottom, getting smaller toward the center. In Fig. 4 is shown an end view of the section at C, illustrating the action of the fiber stresses in a beam under bending moments. At every point in A C D B there is a compression force. The length of the vector represents to some scale the number of pounds in the force, and the arrow head the direction in which it acts. At every point in C D E F there is a tension force, the arrow heads pointing in the opposite direction. Figure 4 shows that at all points located at the same distance from the line CD the fiber stresses are equal. If the beam is made of wood, steel or wrought iron the tension forces at the bottom of the beam are equal in magnitude to the compression forces at top and so on for points at equal distances from the line CD. The figure shows no stress at the center line CD of the section. This line is called *the neutral axis for the section*. So long as the fiber stress does not get greater than the elastic limit of the material, the line CD goes thru the center of gravity of the section of the beam. If the beam is symmetrical in shape the center of gravity is always the same distance from the upper and lower edges.

That a piece of material will act as explained in the preceding paragraphs can be illustrated by loading a piece of wood until it begins to fail. The very top fibers begin to splinter first,

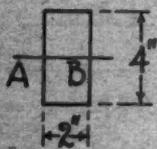


Fig. 5. (1)

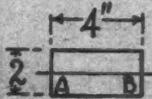


Fig. 5. (2)

Cross-Section of a Beam for Comparing Moments of Inertia.

48,000 — 48,000 inch lbs.  
 This result could have been obtained from the formula  

$$\frac{1}{8} WL$$
  
 Here  $W = 2000$  lbs. and  $L = 16 \times 12 = 192$  in.  
 Then  $\frac{1}{8} WL = \frac{1}{8} \times 2000 \times 192 = 48,000$  inch lbs.  
 Formula (1) is the standard expression for the greatest or *maximum bending moment* in a beam with a uniformly distributed load.

then the bottom fibers show signs of tearing apart.

Now suppose that the compression forces acting against the face ABCD were replaced by one single force, so placed that it would exert the same effects on the beam as the distributed forces. Also suppose that the tension forces acting on CDEF were replaced by one force with a pull equal to the distributed forces on this face. Now each of these forces tends to rotate around CD in the same direction and it is the sum of their moments that balances the bending moment  $\frac{1}{8} WL$ , because the beam is held in equilibrium.

From the theory of mechanics, the turning moment of the fiber stresses at any section, for a load within safe limits, is given by the formula  $\frac{PI}{c}$ .

The formula for the safe loading of a beam with the load uniformly distributed is  $\frac{1}{8} WL = \frac{PI}{c}$  (2)

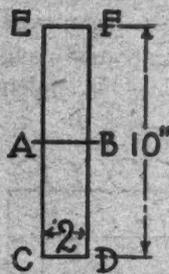


Fig. 6. Cross-Section of a 2 by 10 beam.

In this formula P is a safe working fiber stress for materials, values for which may be gotten from handbooks on construction. It is called the moment of inertia of the cross section of the beam, values for which may also be obtained from a handbook, and c is the distance from the neutral axis to the fibers at the greatest distance away from the axis. W is the total load carried by the beam, and L is the length of the beam in inches.

While the values of I can be obtained from a handbook, it is convenient to know how to calculate the I for rectangular sections. For rectangles

$$I = \frac{1}{12} bh^3 \quad (3)$$

Where b is the dimension on which the rectangle rests or the one parallel to the neutral axis of the section and h is the height of the section. *Note that in calculating I all dimensions must be in inches.*

For example, in Fig. 5 (1) let the cross section of the beam be a 2x4 with the neutral axis AB.

$$\text{Then } I = \frac{1}{12} bh^3 = \frac{2 \times 4 \times 4 \times 4}{12} = \frac{32}{3} = 10\frac{2}{3} \text{ in.}$$

In Fig. 5 (2) the beam is loaded, resting on the long side. The neutral axis AB is parallel to the long side.

$$I = \frac{1}{12} bh^3 = \frac{4 \times 2 \times 2 \times 2}{12} = \frac{8}{3} = 2\frac{2}{3} \text{ in.}$$

In Fig. 5 (1)  $c = 2$  in. Then  $\frac{I}{c} = \frac{10\frac{2}{3}}{2} = 5\frac{1}{3}$

In Fig. 5 (2)  $c = 1$  in., and  $\frac{I}{c} = \frac{2\frac{3}{4}}{1} = 2\frac{3}{4}$ .

The expression  $\frac{I}{c}$  is called the section modulus and is the factor by means of which the size of a beam must be determined. The section modulus is given in all handbooks, corresponding to the various sizes of beams. Now, referring to formula (2), it is seen that the bending moment increases or decreases with the section modulus. The section modulus determines the strength of the beam. For a given beam the builder naturally wants the greatest load possible within the limits of safety. Then he must place the beam so that its section modulus is the greatest. Referring to the preceding results, it is evident in this case that  $\frac{I}{c}$  is greater when the larger dimension is vertical than when the beam is placed with long dimension horizontal. This condition is always true. If the beam were square then  $\frac{I}{c}$  is the same both ways.

If the length of a beam were given, also its size and the load it had to carry, the problem would be to find the maximum fiber stress  $P$  under these conditions, and be sure that it did not exceed a safe working stress for the materials of which the beam was made.

Referring again to Fig. 3. Suppose the beam is 2x10 inches and of white oak. The cross section is shown in Fig. 6.

$$I = \frac{1}{12}bh^3 = \frac{2 \times 10 \times 10 \times 10}{12} = 166\frac{2}{3}$$

Now  $W = 2000$  lbs.,  $L = 16 \times 12 = 192$  in., and  $C = 5$  in., the distance from the neutral axis AB to EF or CD.

From formula (2).

$$\frac{1}{8} \times 2000 \times 192 = \frac{P \times 166.7}{5}$$

$$48,000 = P \times 33.4$$

$$P = 1437 \text{ lbs.}$$

A safe working fiber stress for white oak is 1000 lbs. per square inch. Since the maximum fiber stress caused by the above load is 1437 lbs., it is too great for a 2x10 inch beam. The beam would not be safe.

Try a 4x10 inch beam. Everything remains the same but  $I$ .

Here  $b = 4$  and  $h = 10$ .

$$I = \frac{1}{12}bh^3 = \frac{4 \times 10 \times 10 \times 10}{12} = 334$$

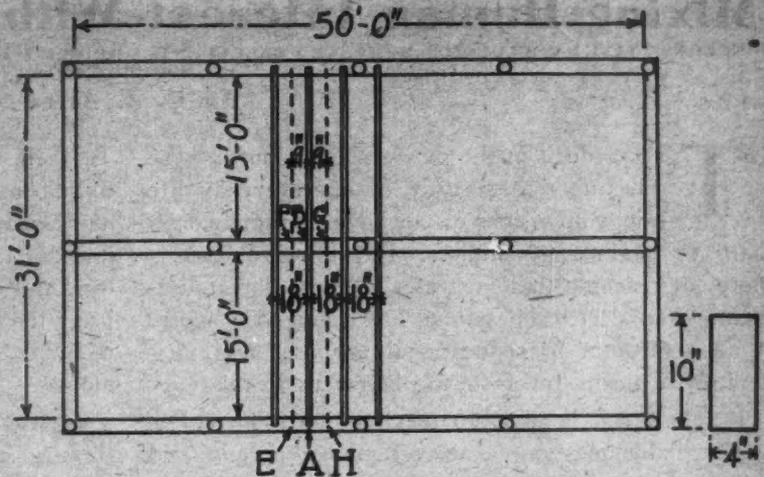


Fig. 7. Top View of Floor for Barn. Cross-Section of Beam.

$$48,000 = P \frac{334}{5} = 66.8P$$

$$P = 718.5$$

Since this value of  $P$  is less than 1000 lbs., the beam is safe. Two 2x10s placed side by side would also serve to carry the load safely.

As a practical application, take the problem of designing a floor for a hay barn to hold 70 tons of hay. The floor is 30 feet by 50 feet. Floor beams 4x10 inches are to be spaced 18 inches from center to center. To find if they are safe. Since the floor is 30 feet wide a heavy girder will be placed thru the center and two spans of floor beams, each 15 feet long, will be used, as in Fig. 7. Any beam, as AB, must hold a section of floor equal to the rectangle EFGH with area

$$A = \frac{18}{12} \times 15 = 22.5 \text{ sq. ft.}$$

The total weight on the floor is  $70 \times 2000 = 140,000$  lbs.

The total floor area is  $30 \times 50 = 1500$  sq. ft. Each foot of floor space must carry a load of  $\frac{140,000}{1500} = 93.3$  lbs. per sq. ft.

The uniformly distributed load on AB is  $W = 22.5 \times 93.3 = 2100$  lbs.

The beam AB is shown in Fig. 8.

$I = 334$ , from the previous problem, for a 4x10-inch beam;  $L = 15 \times 12$ ,  $W = 2100$ ,  $C = 5$ .

$$\text{Then } \frac{1}{8}WL = \frac{PI}{c}$$

(Continued to page 172.)

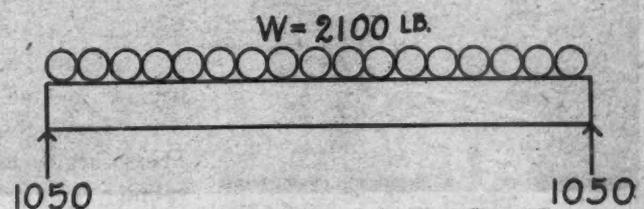


Fig. 8. A View of One of the Floor Beams.

## Mixing Human Interest With Building Products

CONCERNS FIND CELLULOID ROMANCE EXCELLENT MEDIUM FOR INCREASING INTEREST IN BUILDING PRODUCTS

By E. J. Allee

"THEY do it in the movies." To most people this important feature of our everyday life brings up visions of cowboys, slapstick comedians, or fascinating vampires. But its significance is more far-reaching than just as a medium for amusement. The alert business man has begun to visualize it as a medium for educational purposes and incidentally a means for fostering better trade relations.

But, how can it apply to the building industry? is the inevitable question. The average man is convinced there is no sentiment, no human interest in cold stone, steel girders, or concrete, yet the Indiana Quarrymen's Association had a film made showing how their product was quarried and brought to market and proved there was plenty of real interest in that phase of the building activity. Now another industry very vitally interwoven with the building profession has tried the experiment with success.

To most people the idea of mixing romance with paint does not sound reasonable. But it can be done successfully and profitably. This fact was demonstrated clearly in a recent moving picture campaign carried on by a paint corporation to acquaint their dealers more intimately with the product they were selling.

The dealers had been handling the products for years but had never given them a second thought.

To them it was paint, a commodity, well recognized, to be bought and sold, and they let it go at that. They had never seen the plant where it was manufactured, nor did they know how it was made. Scattered all over the country as they were, it was impossible to bring them all to the plant, so unlike Mahomet and the mountain the plant was brought to them—via the movies.

The picture was not a plain industrial film. The scenario expert was a good student of human nature so he mixed in a little romance.

The opening scene is in the store of a paint dealer who is a failure. Soon along comes Son, home from war and full of pep. He is ambitious to see the cash register in Dad's store fill other than a decorative function. At the psychological moment a paint salesman arrives and shows them the way out. Of course, there is a pretty girl in the film. This girl looks as good to Son as to the audience—and there's a honeymoon. On this happy trip the newlyweds stop off at Milwaukee and go thru the plant where the paints are made which made Dad successful in business. This honeymooning trip thru the factory furnishes the industrial part of the picture.

On their trips salesmen carried this three-reel business romance and a suit case projection machine. They attach the projector to an electric light socket in a



The Cash Register Was Not Overworked in this Paint Store Before the "Movies" Showed How to Keep Out of the Bankruptcy Court.

hotel room and bring prospects in to the movie show.

Further along the line a number of local dealers used the film to sell products to the townspeople, having the picture shown at local theaters.

The picture was produced by the Rothacker Film Co., and was shown at hardware, and lumber dealers' and painters' conventions, etc., in all the large cities.

The plan worked so well that the paint people are having another film made for the use of the local dealers.

The title of this picture is "Save the Surface and You Save All." In this film Mr. and Mrs. Upson Downe are as run down in their luck as their cottage is run down in appearance. They decide to sell and go West. Prospective buyers come, see and pass on. The village squire philosophizes: "When ye're sellin' a hoss, ye curry him fust—try a bit o' paint on yer place." The young couple act on the squire's hint. However, when they get the house painted the place looks so nice they decide it is too good to sell. When shown in a theater this film will carry the local dealer's name.



After Gaining Success in a Commercial Way, Son Seeks Success in Another Direction.



### Concrete Conference Plans Extensive Program

**F**OUNDATIONS for a definite program to bring about early relief for the present housing shortage were laid at the first conference of Concrete House Construction held in Chicago last month.

Special emphasis was placed on the part concrete and its associated products would play in the great campaign, and all the members were enthusiastic over the building outlook.

Several important resolutions of far-reaching importance to the building industry at large were adopted. It was recommended that exemption from income tax on first mortgages on dwelling houses be granted to stimulate loans in that direction and divert them from investments which are taxable.

Priority in the shipment of building materials was urged to relieve the acute shortage of houses and speed up building. Building officials were urged to use their influence in effecting economy in construction by standardization of requirements for building materials of all kinds and removal of undue restrictions. More reasonable laws on the use of concrete were also advocated.

Since one of the chief problems in the building situation is lack of funds to finance home building, it was urged that funds now tied up in first mortgages held by building and loan associations be made available for home construction.

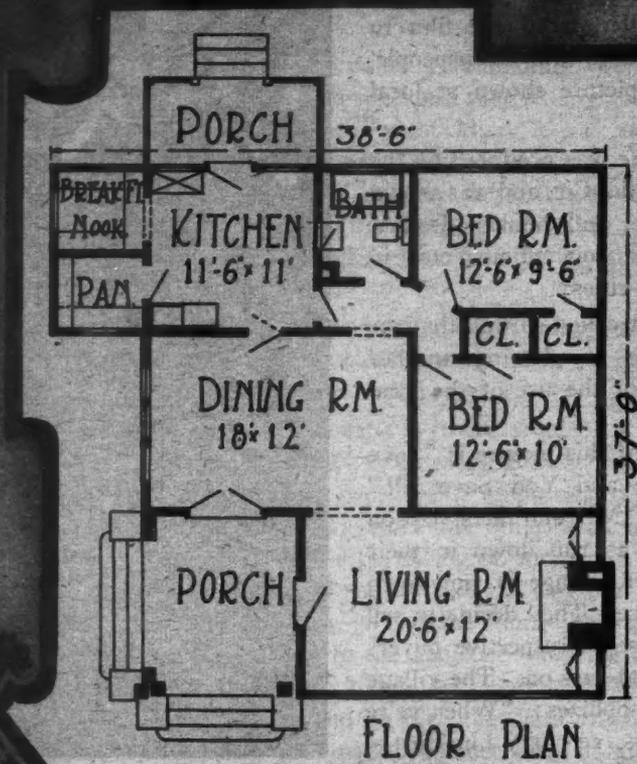
The subject of proper comfortable farm houses was given considerable attention. Minimum requirements for a good residence on the farm should include permanent material, light bright spaces for sleeping purposes, at least one window in every room, provisions for culinary operations and a room in which the family can assemble for social life and adequate equipment to lessen household labor, including heating and water supply and adequate sanitation.



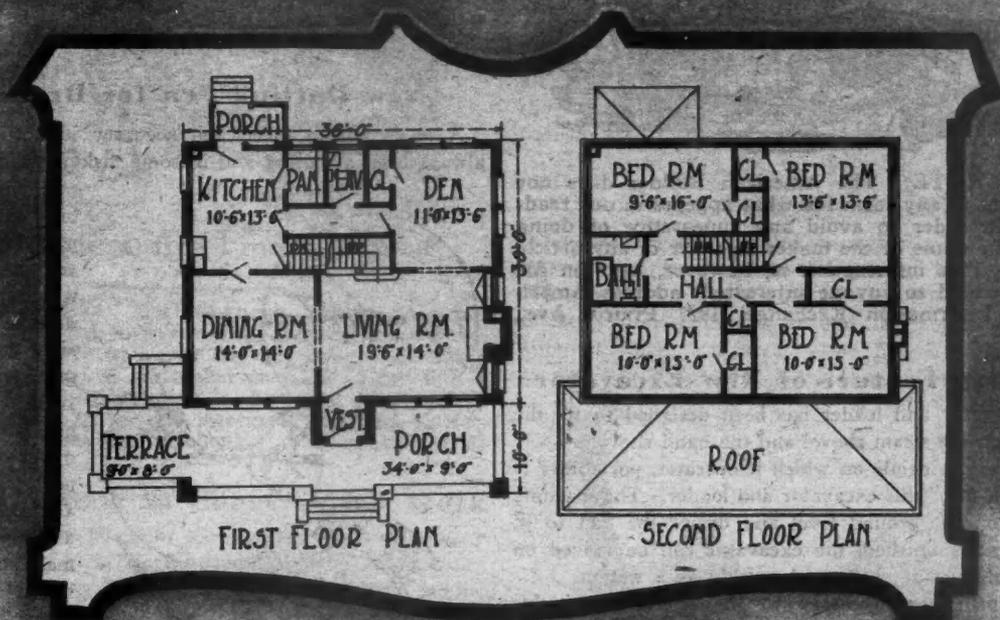
**T**HE pointing of stone work is usually done as soon as the exterior part of the building is up, unless this part of the work is reached in cold weather, as no pointing should be allowed during weather when the mortar will freeze, either during the day or night. In extremely hot weather, if pointing is done, it should be protected by hanging canvas or muslin over it to keep off the hot rays of the sun, as the heat will dry it too fast and the cement will lose its strength. All joints before pointing should be raked out at least three-quarters of an inch deep.



No stone shall be used that does not bond or extend in the wall at least six inches.



**FIVE-ROOM FRAME BUNGALOW.** Here is your dream home—a delightful little house set in a garden. Its trellised sides and pergola archway call for a setting where vines and flowers are plentiful to add harmony to the general scheme. It has a low gable roof of shingles and attractive entrance that will find immediate response from home-lovers. Inside are five cozy rooms, laid out with an idea to convenience, and breakfast nook. The great open fireplace in the living room spreads that feeling of comfort that typifies a real home. In the rear is a frame garage with a concrete trackway leading down to the street. The house can be entered thru the French doors of the dining room or the main door into the living room. Size, 37 by 38 feet 6 inches.



**EIGHT-ROOM BRICK AND STUCCO HOUSE.** For those desiring a substantial but not fastidious home this combination brick and stucco dwelling will prove satisfactory as well as economical in cost. The stucco starts just below the sills of the windows on the second floor. As an added feature the large front porch has been extended beyond the side of the house in the form of an open terrace with heavy brick balustrades and a stairway leading to the drive. The dimensions of the house are 30 by 36 feet. The porch with terrace is 42 feet long and 9 feet wide. On the first floor are the living room, dining room, den and kitchen with four bedrooms and bath on the upper floor.



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**Portability Feature of New Excavator**

A new excavator and loader has been designed to fill the big gap between the steam shovel and the hand shovelers.

Because of the principle on which it operates, portability is a feature "built into" this excavator and loader. The machine always stays on the ground level and draws the dirt to it. After the work is finished, the excavator can be moved on to the next job just as easily and quickly as a wagon.

Only two men are necessary to the operation of this machine—one at the operating levers and one at the loading point. At a point anywhere within 50 to 200 feet from the machine is stretched a chain, at right angles to the line of digging, upon this chain are two sheaves, hooked to the chain, either sheave may be unhooked and re-located in an instant. One heavy cable passes from the hoist drum on the machine, then to the digging skip, then thru both sheaves, back to the retrieving hoist drum on the machine.

The operator at the machine manipulates but two levers and a foot brake. As he places power on the digging line, the other man manipulates the handles, on the skip, so as to fill it with the material to be dug or removed. The skip has a capacity of 15 cubic feet per trip. As soon as the skip is filled, the man releases the handles and allows the skip to ride to the excavator. As the skip strikes the apron at the machine it unlocks the catch of the pivot arm on the machine. The arm then carries the skip up over the machine and onto a slanting chute located on the front of the machine from where the material in the skip discharges into the waiting wagon, truck or railroad car. The skip is then quickly

retrieved to the starting point and the operation repeated.

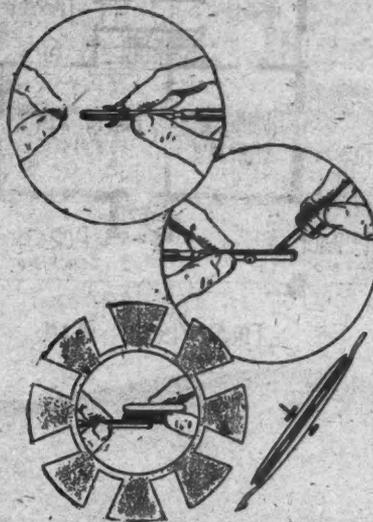
The machine is especially designed for excavating work, for the removal of materials from one location to another and for general work where flexibility of operation is not limited. It likewise eliminates the pick-ax and shovel worker entirely.



**New Dotting Pen for Draftsmen**

A short cut to speed and accuracy in dotting which has always been a tedious and irksome task for architectural and

mechanical draftsmen bids fair to be realized in the form of an inexpensive pen which recently made its appearance. It consists of a little grooved wheel which is held between two nibs similar to those of an ordinary ruling pen. These grooves are ink reservoirs and are supplied from the main reservoir between the nibs as shown in the diagram. Thirty different sizes of wheels give the draftsman plenty of variety.



These Diagrams Show How Dotting Pen Is Adjusted, Inked, and Cleaned.

This pen draws unbroken, broken, dotted, wavy and combination dot and dash lines. The supply of ink is replenished between the nibs as in ordinary pens. In adjusting the pen, the wheel, which will give the desired size, is first selected, then inserted between the nibs which are



New Dotting Pen for Draftsmen.

opened by loosening a knurled nut, and placed on a small pinion. The nut is then tightened so that the wheel revolves easily without allowing side play. An adjustable fork protects the wheel and slides against the ruler when one is used.



**Rules for Measuring Slate Roofs**

Plain roofs are measured by multiplying the length of the roof by the length of the rafter.

Roofs with hips, valleys, gables, etc., are measured by multiplying the length of each section thru the center by the length of the rafter, and in addition to the actual surface of roof, measure the length of all hips and valleys by one foot wide; also what the first, or cave course, shows to the weather by the length of eaves.

No deduction is made for dormer windows, skylights, chimneys, etc., unless they measure more than four feet square when one-half is allowed. If more than eight feet square the whole is allowed.



New Excavator Designed to Fill Gap Between Steam Shovel and Hand Shovelers.

# OUT ON THE JOB



What Builders Are Finding Good

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## Use Paving Mixer in Construction Work

In building the new plant for the Cadillac Motors Company at Detroit, the Du Pont Engineering Company of that city used a paving mixer in a variety of ways and secured unique service.

This paver, equipped with a swivel chute, was utilized for the pouring of all of the footings of the columns of this vast building. The footing of each column was 8 feet wide, by 8 feet long, by approximately 8 feet deep. The paver was placed between the rows of excavation and poured first on one side and then on the other side by merely swinging the chute. Since the paver could traction its own way it was able to pour these footings exceedingly fast.

After the paver had completed this work it was driven under its own power to another spot where it was put to work pouring the fence walls on one of the large tunnels which is a part of this tremendous undertaking.

It was then taken into the building proper after they had



This Paving Mixer Poured the Footings of the Columns in the New Cadillac Plant Erected in Detroit. It Was Used in a Variety of Ways in the Construction Work.

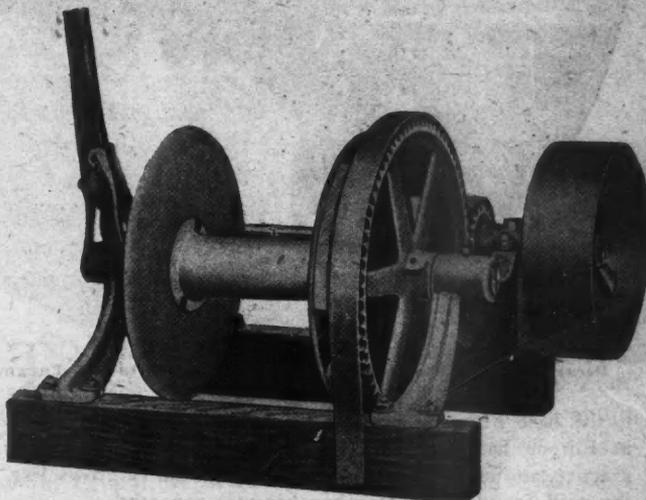
begun to rise above the ground and was used for grouting in the floors. It was also used for pouring all of the floor slabs.

Its use was not limited to the first floor. As the work progressed it was used on each floor in turn. It was taken from one story to the next by a gigantic crane which hooked onto two cables wrapped around the machine and swung it up to the next floor. It proved to be the utility machine of the job, and during the entire time it was in use, which was considerable over a year, did not have a single breakdown.



## An Inexpensive Hoist

The hoist as an aid to the contractor in loading and hoisting material and scraping dirt has proved to be very valuable. It has helped to increase his capacity for business, boost his efficiency while cutting costs, and has been a benefit in many different ways. Its great value lies in its power. Great weights which formerly required many men and much time



Small Hoist with Two Drums Each Having a Capacity of 1000 Lbs. on a Single Line.

to hoist are now handled thru the medium of this machine easily with a minimum of man power and time.

In building it is a big factor in every stage of the construction—excavating, sinking the piles for the foundations and hoisting the material used in the building.

A machine like the one shown in the accompanying illustration is equipped with two large drums, each with a capacity of 1000 pounds on a single line. They are driven from a single pulley shaft with a pinion that turns two large gears, which are in turn fitted with a friction clutch. This clutch operates the drums independently. At the same time this hoist costs little.



## Wood Preservative as Factor in Building Field

Heretofore wood preservatives have been marketed mainly to telephone, telegraph, railroad and power transmission line companies whose operation calls for the use of many posts, but of late contractors, farmers, and builders have become interested.

Decay in wood is caused by fungi which feed on certain portions of the wood fibre. These fruiting bodies produce spores which reproduce decay like seeds produce plant life. They develop fastest with moisture, heat and air, hence the excessive decay of fence posts and foundation timbers at, or just below the ground line. The cure for this is a preservative that will destroy the fungi without harming the wood fibre. The best known element for this use is creosote which



Decay of Foundation Timbers of Corn Crib Due to Rot Fungus Feeding on Fibres.

is the base of many preservatives. The scarcity of timber in Europe has made the treatment of wood an accepted practice, and as the timber supply in this country grows less, the need for wood preservation becomes apparent.

The wood preservative is applied to wood by either the tank or brush method. The open tank treatment consists of an immersion of the wood in two baths; first in a hot bath, the oil being heated to 150 to 200 deg. F. and following this by a cold bath with the oil at the prevailing temperature. The brush treatment is accomplished by the liberal application of the preservative with a broad wire bound brush. The preserving qualities of the oil depend on its penetration.

The picture shown here illustrates the action of the fungi on foundation timbers.

### Mixer Handy in Street Railway Repairs

Street railway companies have found that concrete mixers are a valuable machine to include among their equipment. Track repairs must be made continually and it has been found that a small mixer can be hauled to various points along the line with little expense. It is important that the ballast of a track be kept in tip-top shape at all times to prevent the possibility of track sagging. In the illustration the crew are patching up a poor stretch and are just drawing the batch from the mixer.

The mixer is the revolving drum type, operated by an automatic dump. Both engine and machine are in control of

the operator at all times. By pushing or pulling the automatic dump lever the mixer will dump or turn to a loading position. It is operated from the side most convenient. The feature of this mixer is its accessibility for loading and discharging, for a wheelbarrow can be run alongside the machine.

The tilting mechanism can be operated by a man on the left side of the machine while the aggregate is loaded and the batch discharged on the right, or vice versa.

The mixer has a capacity of eight to ten cubic feet and is capable of mixing a fourth of a yard a minute. The mixing operation is in plain view of the workers at all times.

### Bathroom Fixtures That Require No Plumbing

Every home in rural communities and on the farms should have and can have a completely equipped bathroom, whether or not the house is piped for water. When there is a water pressure system, of course ordinary plumbing fixtures are installed. But there are many thousands of homes built every year in which water pipes are not installed, for the simple reason that no water pressure is available, or the home owner does not feel like going to the expense of installing

an individual water pressure plant.

For homes of the latter type, however, there are available bathroom fixtures that require no plumbing. Each piece, bathtub, washstand and closet, is complete in itself. The bathtub is of the folding type, and, in the frame at one end is a water tank, holding 12 gallons. Under the tank is a burner that uses either gas, gasoline or kerosene. The tub is drained thru either a permanent drain or a hose. A like tank and heater are attached to the washstand, while the closet is of the type that uses chemicals, which make it odorless and sanitary.



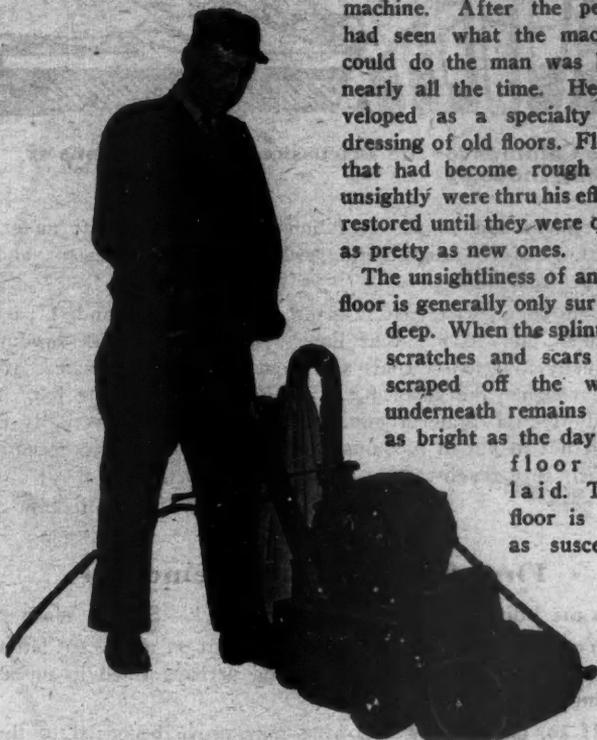
Concrete Mixer with Tilting Mechanism Preparing a Batch for Street Railway Work.

These three fixtures complete are not expensive, and will give every home the contractor builds a completely equipped bathroom.

**Power Driven Floor Smoothers Work Wonders on Old Floors**

By E. V. Laughlin

OPERATING of a power driven floor smoother is a profitable business in almost any community. In the town where the writer lives a carpenter purchased such a machine. After the people had seen what the machine could do the man was busy nearly all the time. He developed as a specialty the dressing of old floors. Floors that had become rough and unsightly were thru his efforts restored until they were quite as pretty as new ones.



Power Drive Floor Smoother Source of Profitable Business for Carpenter.

The unsightliness of an old floor is generally only surface deep. When the splinters, scratches and scars are scraped off the wood underneath remains just as bright as the day the floor was laid. The floor is just as suscepti-

ble of oil and varnish. It is indeed wonderful how a power driven smoother improves an old floor. It will pay some carpenter to institute such a business in a community not now provided.

**Body Is Important Feature of the Truck**

THE choice of a body very often doubles the value of a motor truck for its owner. This is especially true in business which requires the handling of several different kinds of material. The contractor who is obliged to haul bulky materials, such as sand, crushed stone, and lime, as well as brick, cut stone and machinery, can get a wide range of activity out of the truck with little cost by a wise selection of the body.

A good example of the utility body in use in the building trade is shown in the accompanying illustration. This truck is owned by Eggert Bros., Akron, Ohio, general contractors. The body is a platform, primarily, with metal flooring

which can be dumped by means of a hydraulic hoist. By the addition of side boards, Eggert Bros. have an excellent dump body for hauling sand. High rack sides can then be added, giving a body suitable for lighter material.

**Modern Factory Equipment**

(Continued from page 135.)

prevents that gas from "backing up" when all the pipes are not in use.

Benches upon which the cylinder hoods are mounted are of great convenience in painting the hoods, also in rubbing when same are dry. In order that painted parts may dry without taking up a great deal of space, racks with many shelves have been made, one to hold the various small parts, one for fenders, one for tires, etc. A canvas cloth is placed over them to prevent dust from settling, and the racks, equipped with rollers, may be wheeled to any part of the factory desired, instead of compelling the workman to carry a few of the parts at a time.

By means of these important time and labor-saving equipments A. B. Wagner, who directs the building, firmly believes that his production has been greatly increased, his workmen are better satisfied, and his customers receiving far better service by their installation.

TO make brickwork look new and bright, apply a wash as follows: Take one-half pound of glue, soak it in water overnight and then dissolve it in about eight gallons of water, then add one ounce of bichromate of potash in solution and ten pounds of dark Venetian red and enough yellow ochre to give the desired shade. Apply the wash as thin as possible with a large white-wash brush.

ADVICE for domestic felicity to all husbands and wives: First, plan a home; second, build a home; third, make a home.



Utility Body on Federal Truck Operated by Eggert Bros., Akron, Ohio. Side Boards Can Be Added to Haul Sand.

# CORRESPONDENCE

QUESTIONS ANSWERED

IDEAS EXCHANGED



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

## How Is Length of Gothic Rafter Found?

To the Editor:

Lansford, N. Dak.

As I am a subscriber to your valuable paper, I would like to ask some of the steel square artists how to determine the length of a gothic rafter, by geometry and the size of boards or planks, and the length it takes in building them up. I have always laid them out on the loft floor, but the other way would be handy in making an estimate for different size barns, as they usually run from 28 to 50 feet wide.

J. A. DAVIS.



## Stucco Contractor Builds Attractive Garages in Tiffin, Ohio

To the Editor:

Coldwater, Mich.

I am enclosing some views of stucco jobs at Tiffin, Ohio. I have been doing stucco work for the past fifteen or twenty years, and am pleased to give you my method of putting on this work.

I am not in favor of "patent" stucco, and think "cement stucco" best if done right, applied to metal lath, using clean sand and proper workmanship. Medusa Waterproofing and Medusa White Portland Cement have been used in most of my stucco work and make a perfect and stainless finish.

I make a plastering mortar of clean sand, lime and rope fibre-mortar to be lean, not rich. Taking four pails of mortar and one pail of cement, I mix thoroly and apply, and give the surface a rough-swept finish. When dry, dampen and apply second coat of  $2\frac{1}{2}$  parts sand to 1 part

of cement and 10 per cent lime—surface to be left under float. Before rough-casting, white-wash with cement and 10 per cent lime.

The rough cast coat is made of 1 part fine sand, 1 part cement and 10 per cent lime. Apply with whisk broom. Usually four to six coats are given the wall; the more coats the rougher the surface will be, and the better the job. I add Medusa Waterproofing the last two times over. It is best not to put in too much waterproofing in mixtures until nearly thru rough-casting.

C. L. BALL,

Contractor.



## First Solution Too Elementary

To the Editor:

Seattle, Wash.

You have by this time passed judgment on my recent letter relating to Mr. Cole's problem, and perhaps ruled it out as being too elementary.

If so, perhaps the following may prove beneficial to the "readers" of the AMERICAN BUILDER:

It is nothing but the rule of Huyhen for calculating *approximately* the length of a circular arc I am herewith submitting. Huyhen's rule is: From *eight times* the chord of half the arc subtract the chord of the whole arc, and divide the result by three. A very expedient rule since it does away with transcendental numbers, trigonometry and degrees. Thus the approximate length of an arc is gathered by utilizing the two chords and "Huyhen's rule."

KNUTE A. WESTHOLM.



## Porch Furniture Offers Field for Carpenters

To the Editor: Upper Montclair, N. J.

Your magazine is O. K. Gets better every number. Have taken it since 1913. Keep it seasonable and put in any new pointers on screens and sash enclosures.

People's porches and lawns would look better if the carpenters would talk garden and porch furniture. I think we have a large field for that work. Porches as a rule are spacious and can stand moderately heavy furniture, the kind a carpenter would make. Give us a few designs, those of wear-long and comfort-giving qualities preferred. You may publish this in your correspondence department if you see fit.

W. K. DONN.



Attractive Stucco Garage Built by C. L. Ball in Tiffin, Ohio.



# New STANLEY SCREEN HARDWARE BOOK



A New Book right from the press describing and illustrating STANLEY SCREEN HARDWARE.

Your customers and clients will be asking about Screen Hardware very soon, so be prepared before the season.

Gladly sent upon request a copy of this new book, and if desired, an Architectural Service Sheet.

Ask for the book by B9

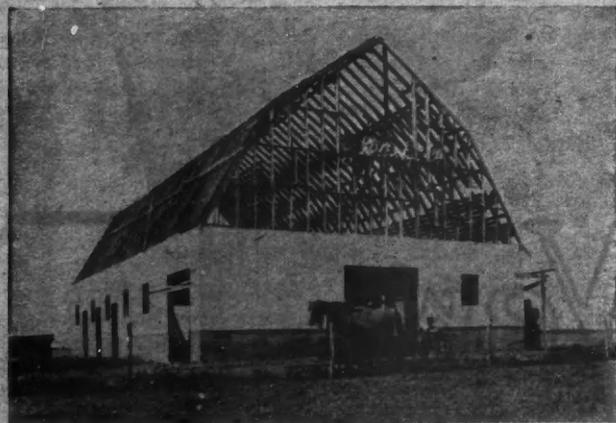
**THE STANLEY WORKS.** New Britain, Conn.  
New York: 100 Lafayette Street Chicago: 75 East Lake Street



Mr. Dohms and Crew Laying Foundation for Horse Barn on Echo Dale Farm, Ogden, Ia.

### Constructed Four-Foot Concrete Barn Wall in Nine Hours

To the Editor: Ogden, Iowa,  
I am sending three photographs showing the successive stages of construction of a large horse barn I just built for Simon Peterson, breeder of Belgian draft horses and owner of the Echo Dale Farm. The picture taken in the early stage shows the concrete foundation in detail. The walls are 13 inches thick at the bottom and taper to 8 inches at



Roof Frame All Set. The Studding is 18 Feet High.

the top which is four feet high. The studding is 18 feet 3 inches high. I placed the mixer on a wagon so that the discharge spout would be high enough to run the mixture into the forms without handling, and used two gravel wagons to keep the mixer operating continuously. In addition I used a cement wagon and water wagon close to the work so that every move counted. With eight men we built the entire four-foot wall in less than nine hours, which included the time required in moving the machinery.



Barn Completed. It Is 42 by 72 Feet and Equipped with Modern Watering Outfits for Horses.

The barn is 42 by 72 feet and is equipped with box stalls and watering outfits for horses. I have no plan to send to show the exact arrangement of the interior.

Each stall has doors on the outside and inside. The inside doors open on a 10-foot driveway which runs thru the barn.

I used a New Way mixer made at Eau Claire, Wis., with a capacity of six cubic feet to the batch. It turned out a batch a minute.

WM. DOHMS,  
Contractor and Builder.



### Wants Rule for Marking Tools with Acids

To the Editor: De Soto, Iowa.  
I have been a reader of the AMERICAN BUILDER for the last three years and I feel I could not get along without it now. I think I saw in your correspondence pages some time ago a recipe for marking tools with acids. Can you or any of your readers tell me what kinds of acids and what proportions to use?

J. A. POLKE,



### What is Best Way to Sheath a House?

To the Editor: Ohio, Mo.  
In your work, "Practical Carpentry" which I have, I do not get your idea of the best way to line or sheath a dwelling. We call it boxing here, I mean the rough sheathing under the finished siding or under the plastering if placed on the inside of a building.

I always induce the owner to let me put this boxing on the inside, then a lath placed perpendicularly over the studs to nail regular laths. My idea is that the clinches in the plastering will hold better, also we have better nailing for finish inside and then the women can drive picture nails or others anywhere on the wall. But, I would like to have your idea as to whether it is as good for the building to have it inside as outside, or is it better.

One other advantage to the carpenter is that he can get the roof on sooner so as to work inside during bad weather. However, all these advantages do not necessarily prove that the lining is better for the building when placed inside instead of outside as many do.

Please let me have your idea of it. LINN ELVINS.



### Who Can Help Him Out?

To the Editor: Haigler, Neb.  
Will you kindly tell me where I can get Lignumvitae wood to make some plane stocks? I am a constant reader of the AMERICAN BUILDER and want you to let me know when (or before) my time expires. I don't want to miss an issue. Would it be a good idea to give the boys (your boys) some practical lessons in reading plans, drawing them, how to get patterns for cutting the ellipse (hole) for pipes going thru roofs, sheet metal, wood, and so on? I try to teach them what little I know and it makes for efficiency.

M. W. ROLLINS.



### How is Joist in Sloping Floor Installed?

To the Editor: Stockholm, Wis.  
As I am a subscriber to your paper, I would like to ask a question or two in regard to the simplest and best way of putting in the joist when the floor is to slope as in churches. Also how much should the floor slope to the foot?



# Free Lesson

## Learn to Read Blueprints

Mail coupon today for this **FREE LESSON**. It will positively convince you that **Plan Reading from Blueprints** is not at all difficult—that by our new, easy method you can master it in a short time. You don't pay a cent for this lesson—now or at any other time—and your request for it places you under no obligation at all.

You are looking ahead to something better than working with the tools of your trade. Some day you hope to become foreman or superintendent in charge of building work—perhaps go into business for yourself. In any such case a knowledge of plan reading is absolutely necessary—and we want to show you how to get it. Thousands of bright, energetic, capable men are being held back because they lack this knowledge. They are expert workmen but they seldom, if ever, get a chance to study the blueprints or have them explained. They must follow the lead of the man who does understand plan reading and directs their work. We give you practical instruction in blueprint reading that you can apply to your everyday work. We place in your hands blueprints used in actual building-work in Chicago and other cities, and send full instruction on every point. Every detail is carefully explained by practical contractors and builders—men in charge of construction work right here in Chicago. You get the benefit of their long years of practical experience. They give you the kind of knowledge that brings advancement and a fatter pay envelope.

### Learn by Mail **Builders' Course** Easy Payments

Just a few hours of your spare time at home each week devoted to study will enable you to master this Course in a surprisingly short time. Our lessons come to you by mail in convenient form for spare-time study—during evenings at home or at any other convenient time. Note the wide range of subjects covered in this thorough, comprehensive and practical Builders' Course.

Throughout the entire course your instruction is under the personal guidance of our experts. Every subject is handled in a plain, straightforward manner in language that you can easily understand. You are taught the things you need to know—and taught in such a way that you will remember them. And you can get all this training on easy monthly payments, so small that you will scarcely feel the cost.

### Complete Course Includes:

**Plan Reading** How to read a building plan. Floor plans and elevations. Use and meaning of different lines on the plan. Sections and section lines. Cross sections. How different materials are shown on the plan. How to read dimensions. Detail drawings. How to lay out work from the plans. Tracings and blue prints—how they are made. Practice in reading complete plans from basement to roof, etc., etc., etc.

**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 chimneys. 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.

**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.

**Construction** Brickwork: Footings and foundation walls of brick, concrete and stone. Brick laying and stone arches. Use of different kinds of stone. Carpentry: Kinds and uses of wood, cornices, interior details, framing, roof construction, bridging, miter joints, butt joints, etc. How plans are made. Complete instructions illustrated by working blueprints of all kinds of buildings, private, public and business.

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Begin at once to prepare yourself for more responsible work and better pay. Mail the coupon and by return mail get the Free Lesson in Plan Reading together with full information regarding our Builders' Course which will prepare you to make more money. Remember, this places you under no obligation whatever. But get the Free Lesson, judge from it and the full descriptive literature we will send you, how easy it really is to master this course—and then decide about enrolling with us.

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

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WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

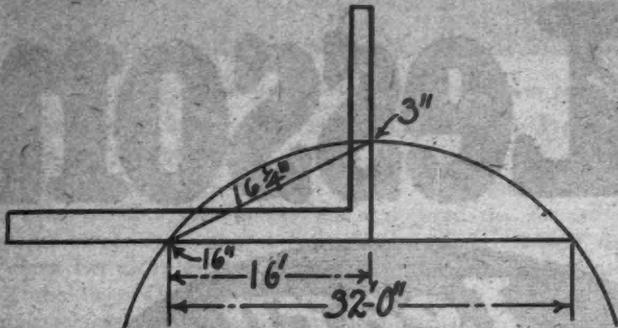
I would like to get the necessary information in your March number if possible; if not possible, to have it in the April issue. Thanking you in advance. EDWIN SUNDVALL.

### New Reader Offers Solution

To the Editor:

Canandaigua, N. Y.

I received my first copy of the AMERICAN BUILDER a few

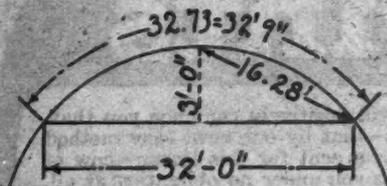


Using Steel Square to Solve Mr. Cole's Problem.

days ago, and am very much pleased with it. Together with my remittance am sending a solution of Mr. M. J. Coles'

problem. If there is any way of finding the length of an arc of a circle with the steel square I should like to know it myself. However, this gives very good results. The length of  $\frac{1}{2}$  the arc may be found by direct measure of the square, but does not give quite as accurate results as by square root. The drawing explains itself.

W. E. DOUGLASS.



$$\frac{8 \times 16.28 - 32}{3} = 32' - 9''$$

Mathematical Solution Shown on Sketch.

square, but does not give quite as accurate results as by square root. The drawing explains itself.

### Contractor Reports Building Prosperity

To the Editor:

Lamberton, Minn.

I am sending you a photograph of a hollow tile barn and silo which I built in 1919. This barn is 34 by 70 feet with 13-foot studs and has a gothic roof. I must say that the last season was a very busy one, as nearly everyone was anxious to build something or other. This community is certainly improving its buildings and has put up more new



Combination Hollow Tile and Frame Barn with Gothic Roof and Hollow Tile Silo Built by W. A. Krengel, Lamberton, Minn.

houses, barns, and sets of farm buildings in the last eight years than in the twenty years before that time. I have been building in this community for the last thirteen years, and instead of the building going slack, as in some places, it seems to increase each year as the clipping from local paper which I enclose will show. If you wish to use it in print, you can do so if room is available. I have been a subscriber to your magazine for seven or eight years and like it better every year. I am boosting my home community, your job, and my job.

WILLIAM C. KRENGEL.

P. S.—Any question answered if possible.

### Wants Advice on Plastering Bathroom

To the Editor:

Woden, Iowa.

I would like to have a little advice in regards to plastering the walls of a bathroom. The party wants it plastered half way up the sides. He wants it real white and waterproof so he can wash them. It will also be laid out like brick work. I have the scratch coat on. Please advise me what kind of material should be used for that kind of work at once.

CHAS. BAACK.

Contractor and Mason.

### Who Can Answer This Question?

To the Editor:

Ainsworth, Nebr.

Can some of your readers inform me if a  $7\frac{1}{2}$ -foot raise in a lattice truss 75 feet long is enough with one span 50 foot and one 25 foot?

J. C. JENSON.

Contractor and Builder.

### Needs Pointers on Laying Oak Flooring

To the Editor:

Montrose, Colo.

Would you please tell me either by mail or in your correspondence columns how to put down  $\frac{3}{4}$ -inch oak flooring (tongue and grooved and end matched) with glueing or face nailing it?

P. E. IFFLAND,

Carpenter and Builder.

### How to Resilver Mirrors

To the Editor:

Perryton, Texas.

Please send me information on resilvering mirrors, as I have some that I would like to do. CURT SUMMERS.

Answer—Use the following solution:

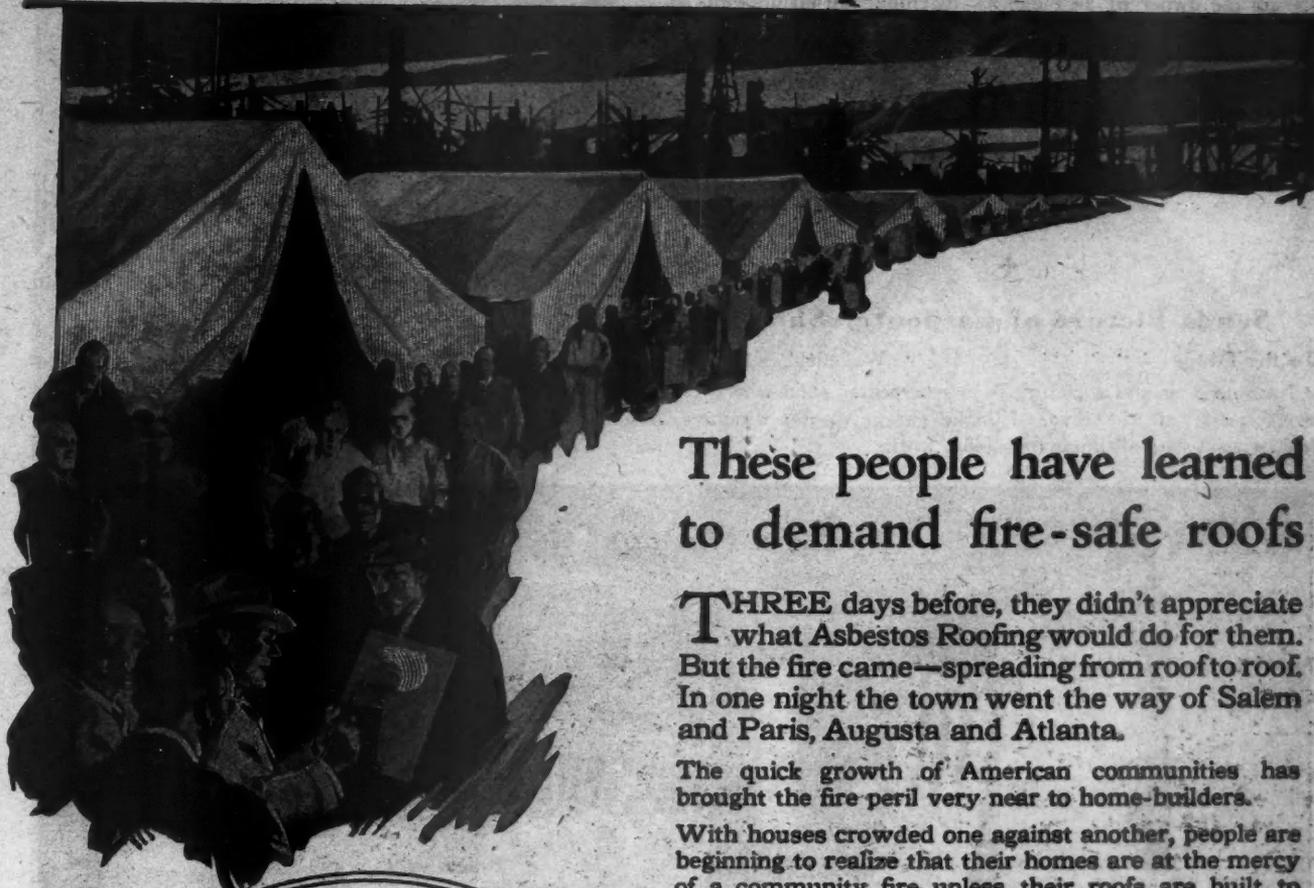
Sugar: Twenty parts. Nitric acid: One part. Alcohol: Thirty parts. Water: Two hundred parts.

Silver solution: One part silver nitrate. ( $\text{AgNO}_3$ ) in ten parts of water, adding to this ammonia water  $\text{NH}_4\text{OH}$  until the brown color has disappeared, and the solution again becomes clear, then adding one part caustic potash in ten parts of water at which the solution should again become dark, and finally, sufficient ammonia water to bring it to a straw colored tint. Then place the mirror face up in a suitable dish, and pour the silver solution on it.

When resilvering with sugar reducing solution, mix equal parts of the sugar and silver solutions and quickly pour the mixture on the mirror. Continually agitate during the resilvering which takes from five to twenty minutes and is complete when the bath runs muddy. The solution is then poured off and the glass washed with distilled water. The temperature should not be above 21 deg. C. (70 deg. F.).

THE EDITOR.

# What Asbestos is — *Fireproof*\*



These people have learned to demand fire-safe roofs

**T**HREE days before, they didn't appreciate what Asbestos Roofing would do for them. But the fire came—spreading from roof to roof. In one night the town went the way of Salem and Paris, Augusta and Atlanta.

The quick growth of American communities has brought the fire peril very near to home-builders.

With houses crowded one against another, people are beginning to realize that their homes are at the mercy of a community fire unless their roofs are built to resist communicating fires.

There is a roofing that sparks cannot ignite—that even resists the flame of a blow torch. It is made of Johns-Manville Asbestos—that mineral substance which repels fire.

Today, with home building increasing by leaps and bounds, people have learned that their property is endangered as much by "outside" flames as by those which originate within. They are demanding the protection that only a fire-safe—a Johns-Manville Asbestos Roof—can give.

*Johns-Manville Asbestos Roofings are approved by the Underwriters' Laboratories, Inc.*

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

*A combination of qualities found in Asbestos alone.*

- \*1. Fireproof
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- 6. Acid-resisting
- 7. Non-conducting

Through—  
**Asbestos**  
and its allied products  
JOHNS-MANVILLE  
Serves in Conservation  
Heat Insulations, High  
Temperature Cements,  
Asbestos Roofings,  
Packings, Brake  
Linings, Fire  
Prevention  
Products

# JOHNS-MANVILLE ASBESTOS ROOFING

### Plaster on Brick Walls Drips in Damp Weather

To the Editor: Jersey City, N. J.

I am the owner of an old brick dwelling, the inside walls of which were plastered directly upon the brick work without laths or any other material; in consequence of which, in damp or wet weather, the walls are wet to the point of dripping. At the present time when there is not a steady fire they are ice coated.

Can you suggest anything to remedy this condition?

H. SCHOPMANN,  
Carpenter and Builder.



### Sends Picture of Carpenter Shop

To the Editor: Wakefield, Kans.

I am sending you a picture of my carpenter shop where I work nearly all the time. I make garage doors, window frames, sash, and all kinds of cabinet work.

unable so far to find a reliable formula for determining the area of same. The AMERICAN BUILDER has helped me so many times before, I thought I would ask this favor. R. L. PROSSER,

Contractor and Builder.



### Wax on Hardwood Floor Gives Good Result to Reader

To the Editor: Stewartsville, Ind.

In answer to Charles Gorden's request: From experience I found that wax gives the results on hardwood floors. We should have a reason for all statements. With a hard filler underneath, varnishes often scale or check; not so with wax. Varnishes will often blister when the same amount of heat will only soften the wax and not blister it. Now, I would suggest the following treatment for hardwood floors. Use a good paste filler thinned with turpentine, put on filler and rub out with a cloth before dry. Of course, the floor is supposed to be clean and smooth. If filler shows too heavy on floor, sand paper lightly with fine sand paper. If you wish



Mr. Woodbury's Carpenter Shop. He Makes Garage Doors, Window Frames, Sash and All Kinds of Cabinet Work.

I use a Fay & Egan 330A variety saw, with hollow chisel mortising and boring attachment.

ROY A. WOODBURY,  
Carpenter and Builder.



### A Nut for Mathematicians

To the Editor: Maquoketa, Iowa.

I have a little problem that I wonder if you could help me with. I would like a formula for determining the number of square feet in the area of a dome of any base and any altitude. I have formulas for determining the area of a perfect hemisphere, but they do not work out on anything less than the hemisphere. Example: What is the area in square feet of a dome with a span of 16 feet and an altitude of 4 feet?

I build silos and tanks with dome roofs and have been

an oak coat, add burnt rubber to filler trying out each time until you get the shade wanted. Allow 24 hours for filler to dry, put on first coat of wax, rubbing out well. Allow 12 hours for drying and then apply the second coat. Rub with polishing mit or woolen cloth. Other cloths do not give as good results as woolen. Give the last coat of wax plenty of elbow grease and the results will be all that were expected, if not more.

WM. E. YORK.



**P**AINT dealers could do their customers a good turn by inducing them to buy spar varnish for porch ceilings. Most people make the mistake of assuming that because a porch ceiling is under cover, in a sense, an ordinary interior varnish may be used on it with satisfactory results. They are doomed to disappointment, for the ceiling is exposed to outside atmospheric exposure and a varnish should be used on it that is designed to combat such rigorous conditions.



## Repairing Season

**T**HE Repairing Season is at hand. Art Craft will play no small part in beautifying the houses of America.

Fix these points firmly in mind: Art Craft is fire-safe; it gives lasting service; it comes in beautiful shingle or tile designs, slate-red or slate-green; laid right over old wooden shingles, it saves expense and litter of ripping off the old roof.

You are missing out on a real opportunity unless you are prepared to offer your customers Art Craft. Write us for complete information.

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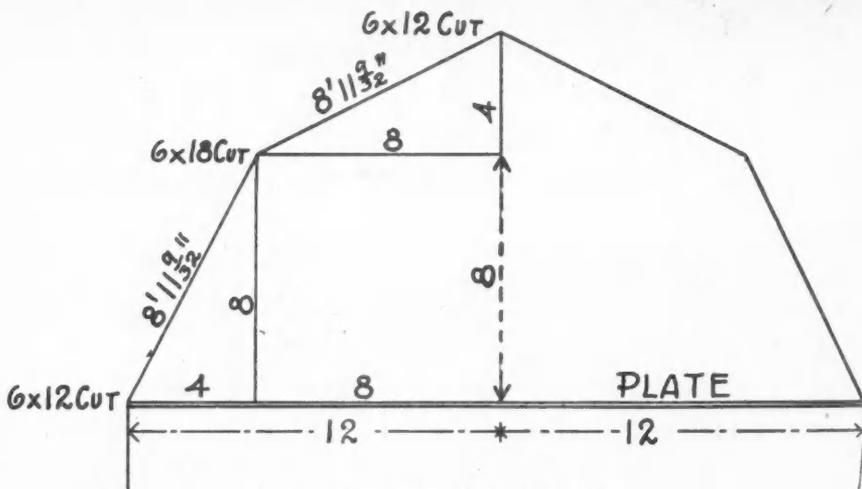
**NEW YORK**

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**BIRD & SON, INC., Dept. C, East Walpole, Massachusetts**

I want to learn how Art Craft will bring me more business. Send complete information. Name..... Address.....



Mr. Loomis' Sketch of Gambrel Roof.

**Sketch of Gambrel Roof**

To the Editor: Melfort, Sask.

I am a subscriber to the AMERICAN BUILDER and in the January issue noticed a few things which I would like to comment on.

P. L. Haskell, of South Dakota, sends a good sketch of a well proportioned gambrel roof for a barn, but does not explain it sufficiently to be of benefit to those that need it, namely the location of gambrel in relation to roof. I enclose a sketch which explains itself and is applicable to any width building. A better way to get the length of rafters is by square root or the rule of 3. Ceilings would not be accurate and could vary 1/2 inch easily. In answer to the question, "What caused oak floor to bulge?" it was:

Probably because the building had surface or shallow cement foundation, "no basement" and no ventilation was provided in cement walls. If such is the case, cut a 6 by 6-inch hole in opposite sides and the floor will stay put when repaired.

I have had the best results in finishing maple floors by applying white shellac liberally and then waxing. The shellac makes an excellent filler, and is not affected by hot or cold water and does not scratch, nor does it change the color of "pulled" grain against lights as does stain or varnish stain of any kind which will turn spots several shades darker than the general effect, leaving a splotched appearance.

D. A. LOOMIS,  
Contractor.

**Offers Information on "Cost Plus" Contracts**

To the Editor: Janesville, Wis.

In several of your issues I have noticed requests for information regarding the "cost plus" method of letting contracts. As I have had considerable experience with this class of work, I may be able to give your readers some light on the subject.

**Cost Plus Contracts**

On "cost plus" contracts, it is the customary practice for the contractor bill to consist of the cost of labor and material plus a certain percentage. To quote one of our contracts, "Material costs shall be the net costs of all material delivered on the job, and labor costs will include current prices for all skilled and unskilled labor, foremen, and superintendence required for the work." The amount paid by the contractor for liability insurance is borne by the owner, altho a fee is not allowed on it.

Where the contract specifies that the owner shall pay a rental for the contractor's equipment, we find a daily rental by dividing the first cost of the piece of equipment by its estimated life in working days, and adding to this the daily cost of fuel, oil, etc. "Hand tools," such as picks, shovels, rubber boots, etc., are not classed as equipment.

On contract where labor only is furnished, and all material is supplied by the owner, a percentage is usually granted for depreciation on equipment, and a further percentage for profit and overhead.

W.M. WALLACE REEDER.

**Sends Table for Computing Chord Lengths**

To the Editor: Pottstown, Pa.

On page 126, correspondence department of the last January's issue, Mr. Frike asks for a mathematical method of figuring certain properties of a circle.

Enclosed is a table with explanations and illustrative examples which I think Mr. Frike and many other readers will find convenient as an accurate method of solution and especially simple as it avoids the use of a logarithm or trigonometry table.

Exact Formulae

- A = Angle
- R = Radius
- C = Chord
- B = distance to chord

$$C = 2 R \sin A$$

$$B = R \cos A = \sqrt{R^2 - \frac{C^2}{4}}$$

$$\left(\frac{C}{2}\right)\left(\frac{1}{R}\right) = \sin A$$

TABLE TO COMPUTE CHORD LENGTHS

1	2	3	4
A read down	C/2 — Sine A-B	Diff 1°	A read up
0°	.0000	.01744	90°
5	.0872	.01728	85
10	.1736	.01704	80
15	.2588	.01664	75
20	.3420	.01612	70
25	.4226	.01548	65
30	.5000	.01472	60
35	.5736	.01384	55
40	.6428	.01286	50
45	.7071	.01178	45
50	.7660	.01064	40
55	.8192	.00936	35
60	.8660	.00806	30
65	.9063	.00668	25
70	.9397	.00524	20
75	.9659	.00378	15
80	.9848	.00228	10
85	.9962	.00076	5
90	1.0000	.....	0

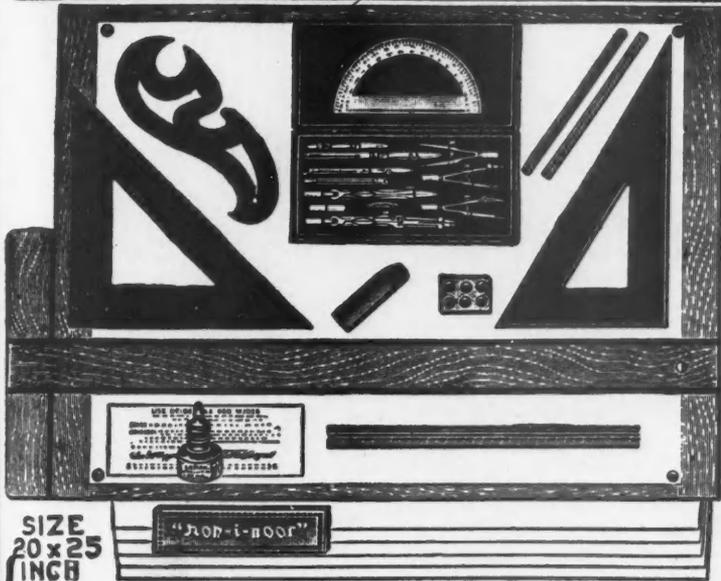
HOW TO USE THE TABLES

C  
1. The values of B and — are given for Radius of 1 and 2  
values of A differing by 5°. For angles to 1° (degree) interpolation is necessary. For other radii multiply values by  
radius reduced to feet or to inches. C = 2 — Note  
2  
C  
values of B are not same as — or Sine A, but correspond  
2  
to value of A in column 4, reading up.

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# Drawing Outfit and Drawing Table **FREE**



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Post Office..... State.....

2. Exact Formulae are solved by use of logarithm and trigonometry tables.

Example I.  $A = 25^\circ$   $R = 2' 6''$

$$\left. \begin{array}{l} C \\ \frac{C}{2} \\ C = .8452 \end{array} \right\} \text{for } R = 1''$$

$$C = .8452 \times 30'' = 25.356'' = 25\frac{1}{32}''$$

$$B = .9063 \times 30'' = 27.189'' = 27\frac{9}{16}''$$

Example II. Illustrating Interpolation  
 $R = 20''$   $A = 36^\circ$  (Mr. Frike's problem)

$\frac{C}{2}$  for  $36^\circ$  not given, but difference for  $1^\circ$  between  $35^\circ$  and  $40^\circ$

$\frac{C}{2}$	for $35^\circ = .5736$	B for $35^\circ = .8192$
	+ .0138 diff for $1^\circ$	— .0106
	for $36^\circ = .5874$ and $R = 1''$	
	$\times 20$	for $36^\circ = .8086$ $R = 1''$
$\frac{C}{2}$		$\times 20$
	$= 11.748$	
$\frac{C}{2}$		$B = 16.172'' = 16\frac{3}{16}''$
	$C = 23.496 = 23\frac{1}{2}''$	

W. H. BLANK, C. E.



9 a. m.—First Truss Has Just Been Put in Place by E. A. Opitz, Paynesville, Minn.

concrete block barn with the roof starting on the joists. It has a large haymow.

### Photos Show Remarkable Building Work in Minnesota

Paynesville, Minn.

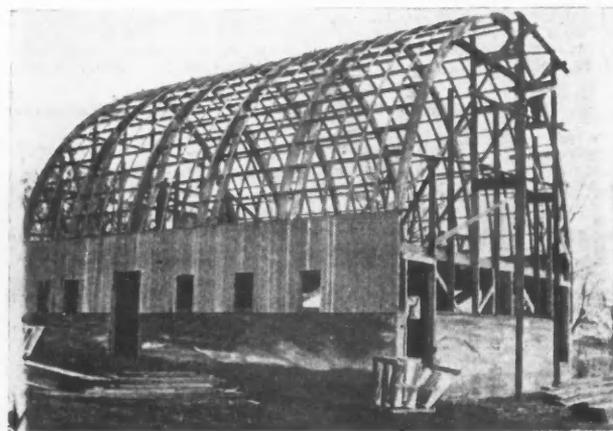
To the Editor:

I am sending you snapshots of barn construction that may interest some of the AMERICAN BUILDER readers. I built seven barns last year. The enclosed pictures show a barn on which the first truss has been set at 9 a. m. By 4:30 in the afternoon the crew of five men had the roof frame completed.

I also built a large

E. A. OPITZ,

Contractor and Builder.



4:30 p. m.—Roof Frame Completed. Five Men on the Job.

### Frost Will Not Come Thru Tile

To the Editor:

Keosauqua, Iowa.

I have a residence to build this coming spring, 36 by 60 feet, two story, and of hollow tile. I am told by some people that claim to know, that after the building is plastered on the inside and stuccoed with plaster on the outside, the frost will go thru the walls in cold zero weather and make them damp on the inside; also that it will be very hot in summer. As this is my first experience with hollow tile I wish you would tell me something about it. Is it necessary to strip the outside walls and lath first before plastering the inside? How should the mortar be mixed? Is it injurious to the mortar to put too much lime in it? I await your answer.

J. S. BELL.

*Answer*—Frost will not "come thru" the walls of your house if you build them of tile. If the tile you use are standard building tile, such that the horizontal mortar joint is continuous thru the wall, then moisture or frost may collect on the inside of the wall in extremely cold weather. The mortar joint will conduct heat about thirty times as fast as the tile itself. So condensation of moisture, or even the formation of frost, will occur along these mortar joints in severe weather because of this difference in temperature between them and the air inside the house. But this will not be as serious as people would lead you to believe. This same thing occurs in standard lumber construction. It is what makes streaks in ordinary lathed and plastered walls, the image of the lath standing out like the ribs on an old cro-bait of a horse. Moisture condenses, and dust collects thereon and makes dirty looking streaks. And no doubt you have seen frost on the wall back of pictures, etc., in very cold weather.

But do not let this talk keep you from having a tile house with all its advantages. It can be prevented completely by proper methods of tile construction.

You may use any standard make of this tile for your walls. You may line them with furring tile, and plaster onto these. Or you may fasten 2 by 2 inch furring strips of wood to the inside of the wall as it is being laid up. You may lath and plaster onto them in the usual manner. Or you may cover them with some such material as insulite, which bonds readily with mortar, and then plaster onto this. This last is the best method when you can't get a tile which has a discontinuous mortar joint. Either one of these will give you a house wall more proof against condensation of mortar than with standard lumber construction.

If you could get masons who would do a good, careful job with pure cement mortar, it would be better. If they insist on having some lime to make the mortar spread easier, do not let them use more than five per cent. of lime. This will make it spread easily enough, and will not seriously injure your mortar. One of the best layers of tile I know gives his masons just this amount of lime and tells them they can't have a bit more on the entire job.

JAMES A. KING, C. E.



### Troubled Over Keene's Cement

To the Editor:

Traer, Iowa.

I am a reader of the AMERICAN BUILDER for little more than a year. I would like to ask you to answer the following questions: Does Keene's cement rub off after it is put on walls? What makes it rub off?

The latter part of December I had a contract to plaster a big two-story house. The walls, 4 feet 6 inches high, in the kitchen and bath room were to be imitation tile work. We have been using lime and stucco for that kind of work up until about a year or so ago. Since then I started to use Keene's cement.

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# STARKS OUTSIDE STAINS

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- Starks Creosote Disinfectant
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Every product is guaranteed by the manufacturers in all climates and against any atmospheric conditions.

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STARKS OUTSIDE STAINS are sold through the dealers and building material supply companies in carload lots with the usual jobbers discounts and co-operation from the firm, which is necessary to promote the sale of these materials in the jobbers' territory.

Wire or write today for Jobber's terms, stating the territory covered, the number of men you travel and the amount of your annual distribution of building material supplies.



# STARKS MFG. CO. KANSAS CITY MISSOURI

FIRST AND MAIN STREETS

When I put the Keene's cement on, I had it mixed according to directions. What I had just put on and finished in the morning was hard enough to mark in the afternoon. I had a nice glossy finish before I started to mark. After the marking was done, I troweled it down again, using brush and water. We were using clean water. It was pretty cold that time, but there was a furnace in the house, but I think the owner let the fire go down after we left there, so the finish may have chilled a little. It does not show anything, however.

When I was done with the job I had a nice and hard finish. I was satisfied with it. Two weeks after I went back again and the finish rubbed off just like flour in a sack does when you rub against it.

Does Keene's cement always do that? I can't understand what makes it rub off.

I wish you would write me about it, if you please, and put the answer in the next number of the AMERICAN BUILDER, too.

I like to read the AMERICAN BUILDER very well, but there is one thing about the house or bungalow plans—I think some rooms way too big and others are a little small. Any dining room 18 by 14 is big enough, and kitchen and bedrooms should not be any less than 12 by 12, but 14 by 12 is better. I mean this especially for common houses.

HENRY SCHOENING,  
Bricklayer and Plasterer.

**Building Barns in Oklahoma**

To the Editor:

Aline, Okla.

As I have only been a subscriber to your paper for a few months, I hardly feel like one of the family yet, but think the AMERICAN BUILDER is all right. I enjoy the correspondence part of it very much.

I have been contracting for quite a while and am working on a \$4,000 bungalow at the present time. I built five barns the first of last year and one barn and five houses during the latter part of 1919.



Bank Barn in Course of Construction in Aline, Okla.

Am sending some pictures of a bank barn I had started last winter when the big snow struck us. It was a month after I had run the concrete before I could start the frame. This barn is 38 ft. by 50 ft., seven feet to top of the concrete and 12 feet from concrete to plate. I built my roofs on the half pitch principle. The rafters are braced on each side with 1 by 6, with a short piece of 2 by 6 in the elbow between the 1 by 6, and a short 1 by 6 each side of the 2 by 6 coming out on each side of the joint. This makes a very stiff rafter. I mark my rafters on the outside edge while I have them on the saw horses. For my sheathing (if I use 6 inch) I mark their place on rafters. I mark two, then by

placing one at each side of the pile I use a straight edge and mark all others at once.

By doing this I can put my tie boards on permanently when the rafters are raised and the most common laborer can do the sheathing. I visited this barn one year later and there was not a crack in the concrete wall that could be seen ten feet away.

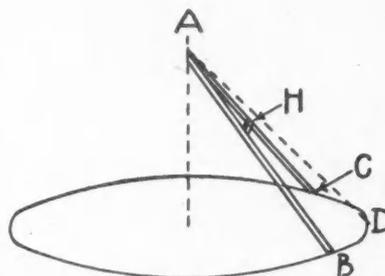
This barn was built for Geo. Geist, west of Aline. I also built him a 28 x 56 foot modern house about a year before I built the barn. He hauled sixty-five four-horse loads of sand, ten miles on the two jobs.

EVAN J. ELKINS,  
Contractor and Builder.

**How to Find Curve for Header in Silo Roof**

To the Editor:

Palmyra, Neb.



Drawing Illustrating Rule to Find Curve for Header in Silo Roof.

In answer to Mr. Broostin's request in the January issue for a rule to get the curve for a header in silo roof, I submit the following:

In the drawing AC and AB represent rafters and H the header set temporarily. Now stretch a line from A to D.

the center of the minor arc BC, measure the distance from the line to the header. This measurement together with the length of the header will enable you to inscribe an arc which will come close to that which is required.

This solution is not solely mathematically or absolutely correct, as it is my opinion that when the surface of a cone intersects a plane, the line of intersection lies in an ellipse except when the plane is parallel to the base of the cone at which time it lies in the form of a circle.

This is my first letter to the AMERICAN BUILDER in more ways than one, as my first subscription accompanies this letter, tho I have read the AMERICAN BUILDER for a number of years, getting it at news stands. I will now look forward to getting it more regularly.

A. W. WALKER,  
Contractor and Builder.

**Uses Algebra to Solve Cole's Problem**

To the Editor:

McAllen, Tex.

Enclosed please find herewith formula to find the length of an arc of a circle as follows:

$$l = 4\sqrt{\frac{c^2 + 4h^2}{3}} - c$$

c = chord of segment  
h = height of segment

or in other words, extract square root of the sum, the square of the chord plus four times the square of the height and multiply square root found by 4. From this subtract the length of chord and divide by three.

Substituting c = 32h = 31.

$$4\sqrt{\frac{32^2 + 4 \times 31^2 - 32}{3}} = 4\sqrt{\frac{1024 + 36 - 32}{3}} = 4\sqrt{\frac{1060 - 32}{3}} = \frac{4 \times 32557 - 32}{3} = \frac{130.228 - 32}{3} = \frac{98.228}{3} = 32.7426 \text{ ft.}$$

Am also enclosing a pencil sketch of the mechanical method and formula for finding radius of circle.

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An Exclusive Vulcanite Design

THE SELF-SPACING DEVICE

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STYLE "G"

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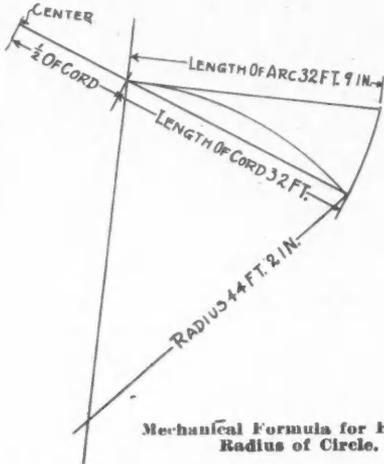
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c = chord or length of segment;  
 h = height of segment;  
 r = radius of circle:  
 $c^2 + 4h^2$  Substituting

$$\frac{32^2 + 4 \times 3^2}{8 \times 3} = \frac{1024 + 4 \times 9}{8 \times 3}$$

$$\frac{1060}{24} = 44.166 \text{ ft. or } 44 \text{ ft. } 2 \text{ in.}$$



Mechanical Formula for Finding Radius of Circle.

This all applies to Mr. M. J. Cole's questions.  
 NICK THIELEN.

✦  
**Which is Best Method?**

To the Editor: Meyronne, Sask.  
 I am still a reader of your valuable paper, and I am sure it would be almost impossible for me to get along without it. I do not know which department to forward this question to, so I will send it under the usual address. I would like to know at the earliest possible date, mathematically speaking, if a furnace will work as well with the cold air registers sitting in the baseboards on the outside walls or on the floor near the outside wall in each room. It is customary in this district for the tinsmith to put the cold air register on the floor. I am constructing a house at present and they, or the owners, do not want the registers on the floor, as it is a hindrance to laying carpet. Please advise which is the better system of the two.  
 D. R. LEADLEY.

✦  
**Finding Length of Arc**

To the Editor: Seattle, Wash.  
 Mr. Cole's new problem, to calculate the exact length of a circular arc when radius is the known property or when other properties by which radius can be calculated are known is a novel way to ask how to square a circle. It has never been done exactly by any mathematician in history. It has been established that an arc and a chord are not commensurable quantities, but are related by the transcendental number  $\pi$  (pi) = 3.1415927 . . . which number has been calculated to more than two hundred decimals and yet not coming to an exact closure. For all practical purposes tho, it may be enough to use the first five decimals and in rough figures  $\pi = 3.14$  . . . is most practical. The circumference is to the diameter as 3.14 is to 1, says the schoolma'am.  
 However, when the length of a circular arc is desired it is quite imperative to know the central angle of the arc. In Mr. Cole's problem this is effected by dividing half the chord by the radius, which quotient, always less than unity, is named the *linus*, or *line*, for half the central angle subtended by the arc or the chord. Tables of trigonometric functions, numbers calculated by eminent mathematicians and preserved for posterity, are very handy. They contain numbers, func-

tions, for angles of a few minutes to any degrees required or desired.

A little training in trigonometry is quite necessary in order to comprehend what is meant by trigonometric functions and how these functions are represented by straight lines in a circle, which radius is assumed to equal unity. Thus half the chord of any arc is named *linus* or the *line* for half the arc or half the central angle the arc subtends. When a function's numerical value is known or computed it is looked up in the tables and the corresponding angle is found in the margin column.

In Mr. Cole's problem the angle or the arc thus found approximate 42.5 degrees. That is the whole arc. Now it is early comprehended that the arc is to the whole circumference as the 42.5 degrees are to 360 degrees. But instead of this analogy a short cut can be taken thus: Multiply the degrees of the arc by the radius of the circle and by the decimal fraction .01745329. The result is the length of the arc. Thus the answer to Mr. Cole's problem would be:  
 $42.5 \times 44\frac{1}{2} \times .01745329 = 32.75$   
 or 32 feet 9 inches approximately.

Another gentleman wanted to know length of chord corresponding to 72 degrees angle or arc. Seventy-two is one fifth of three hundred and sixty; hence, the chord is the side of a regular pentagon inscribed in the circle. In a circle with unity as radius the side of the inscribed regular pentagon is 1.17558 . . . This number multiplied by the radius gives the length of the chord corresponding to a central angle of 72 degrees.

The line for 36 degrees is half this number, or .58779 and no other number.  
 KNUTE A. WESTHOLM.

✦  
**Tile for Basement Walls**

To the Editor: Belvidere, Ill.  
 I want to put a wall under a house. What do you think of tile for a basement wall and floor? How many tile can a mason lay in a day? Is it cheaper than concrete? How many will I need and what kind?  
 W. G. VANORNUM,  
 Carpenter and Builder.

*Answer*—A hard burned clay tile makes an excellent basement wall. In general, it is cheaper than solid concrete; you avoid trouble and expense of framing for the cement concrete wall. It makes a drier and warmer wall, because hollow tile do not conduct heat so rapidly as does solid concrete.

Tile also make an excellent basement floor. Lay the tile on a well-tamped sand base. "Float" each tile into place carefully. Cover with about one inch of concrete of a one to three mix. Lay boards or planks over the tile so the workmen do not step on individual tiles when pouring the concrete. Pour the concrete quite wet, and give it a well troweled finish; it is even better if you use a finishing coat of one to one mix about one-fourth inch thick. This makes a sanitary, warm, dry floor. It costs no more than solid concrete. Use tile that are 4 by 12 by 12, and you will require 775 of them for a floor of the size you sketch.

I can't tell how many you will need for the walls. You did not give the size of the windows. You can figure it for yourself as follows: If there were no doors or other openings, you would have a wall of 784 square feet. From this deduct the area of all openings; doors and windows. Multiply the remainder by 2.2 and you will have the number of standard 8 by 5 by 12 tile required to lay up an eight inch wall; this being the size used generally.

An average mason will lay up at least 300 of these tile working eight hours a day.

To say what kind of tile are "best" would be expressing a personal opinion and laying myself open to accusations of favoritism. Any manufacturer who advertises tile in AMERICAN BUILDER puts out a reliable quality of tile for your purpose.  
 JAMES A. KING,



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Whether you are building for re-sale or for an owner, you want to give your customer all you can for his money. You want him to be proud that you built his home, for that means future dollars for you.

Barrett Everlastic Roofings will serve you often, as they are adapted to all types of steep-roofed buildings.

**Everlastic Multi-Shingles** come in strips of four, saving time, labor and nails. They are beautifully surfaced with real crushed slate in soft, natural art-shades of red or green and make a fitting-roof for the finest residence.

**Everlastic Tylite Shingles** are individual shingles (8 x 12 3/4 inches) made of the same materials as Multi-Shingles, with red or green crushed slate surface. With Everlastic Shingles you have fewer shingles to handle and can cover more squares per day. Being pliable, they readily fit around projections.

**Everlastic Slate-Surfaced Roofing** is an unusually artistic and durable roll roofing for use on buildings of the better class. It is surfaced with crushed slate in red or green. Also used for valleys or flat-roofed dormers, etc., where Everlastic Shingles are used for the main roof. Nails and cement in each roll.

**Everlastic "Rubber" Roofing**—The most popular roofing of this type, now in use on thousands of buildings in all parts of the world. It is tough, pliable, elastic, durable, and very low in price. The greatest value in "Rubber" roofing. Comes in rolls 36 inches wide. Nails and cement in each roll.

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## \$3,000,000,000 Year Gets Good Start

NEW RECORD IN BUILDING ACTIVITY WILL BE ESTABLISHED IN 1920 IF THE PACE SET IN THE FIRST MONTH IS MAINTAINED

NEW records in building activity will be established in 1920 if the pace set in the first month is maintained. Statistics of building contracts awarded during the month of January in the territory east of the Missouri and north of the Ohio rivers, as compiled by the F. W. Dodge Company, show two outstanding facts. In the first place the contracts amounted to 10 per cent more than the average monthly figure for 1919; and, in the second place, industrial plants took the lead over all other classes of building, comprising 39 per cent of the total.

Contracts let in January amounted to \$235,848,000, whereas the average monthly figure for 1919 was approximately \$213,000,000. The January figure included \$91,712,000 for industrial plants, or 39 per cent of the total; \$47,727,000, or 20 per cent of the total, for residential buildings; \$37,697,000, or 16 per cent of the total, for public works and utilities; and \$34,726,000, or 15 per cent of the total, for business buildings.

These figures give an indication of the accumulated demand for construction work. Ordinarily the month of January shows but little activity in comparison with months later in the year, the amount of building contracts let in that month running normally to only about 5 or 6 per cent of the year's total. With so large a figure for January, the previously published estimate of three billions for the year's total of contracts seems very likely to be fulfilled.

Projected or contemplated work amounting to \$523,000,000, was reported in January, as against a monthly average of \$360,000,000 for projected work reported in 1919.

The increase is particularly marked in the Northwest.

January building contracts in Minnesota and North and South Dakota amounted to \$7,246,000, which is greatly in excess of the figure for January of any previous year recorded, and about 27 per cent in excess of the average monthly figure for 1919. The month of January, 1919, showed a total under \$1,000,000.

Practically half of this January total, or \$3,659,000, was for residential buildings.

Contemplated work amounting to \$12,400,000 was reported in January.

**B**UILDING contracts in the Central West (comprising Illinois, Indiana, Iowa, Wisconsin, Michigan, and portions of Missouri and eastern Kansas) during January amounted to \$61,423,000. While this does not equal the monthly average for 1919, which was \$74,000,000, it is more than double the figure for any previous January.

Industrial plants accounted for \$17,309,000, or 28 per cent of the total; business buildings amounted

to \$16,924,000, or 27 per cent of the total; and residential buildings amounted to \$12,870,000, or 21 per cent of the total.

A great increase in activity in the Central West may be expected, if the reports on contemplated projects be taken as an indication. In January, these reports amounted to \$190,326,000. The average monthly figure in 1919 for contemplated work amounted to approximately \$137,000,000.

**J**ANUARY building contracts in western Pennsylvania, West Virginia and Ohio amounted to \$43,556,000. This figure is somewhat in excess of the average monthly figure for 1919, which amounted to \$35,000,000.

More than half of this total, or \$22,780,000, was for industrial plants, one project, an extension to one of the large steel plants, accounting for \$14,000,000. Public works and utilities amounted to \$6,191,000, and residential buildings amounted to \$5,750,000.

Contemplated work amounting to \$37,775,000 was reported during the month. While this figure is under the total for contracts awarded, it shows an advance over the average monthly figure for contemplated work in 1919, which amounted to something over \$31,000,000.

**I**N New York state and northern New Jersey, contract awards in January amounted to \$79,570,000, which is not only an unprecedented figure for January, but is greatly in excess of the average monthly figure for 1919, which was just under \$46,000,000.

In this district industrial building has taken first place, amounting in January to \$37,045,000, or 47 per cent of the total. Public works and utilities amounted to \$19,383,000. Residential buildings took third place, the total for this group being \$10,235,000.

The promise of continued activity is given in the reports of contemplated work, which amounted in January to \$112,209,000, which may be compared with \$76,400,000, the monthly average for 1919.

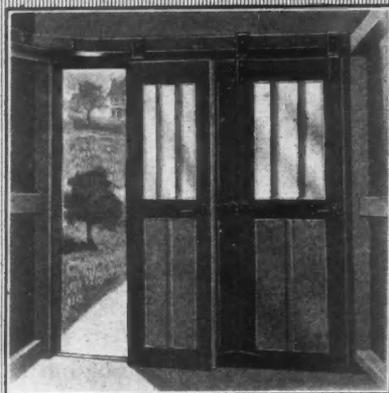
**J**ANUARY building activity in eastern Pennsylvania, southern New Jersey, Maryland, Delaware, the District of Columbia, and Virginia, as measured in contract awards, amounted to \$26,191,000. The average monthly figure for 1919 was, roughly, \$32,500,000; for the month of January, 1919, it was slightly under \$16,000,000.

In this district residential buildings held first place in January, amounting to \$10,511,000, or 40 per cent of the total, and industrial buildings came second with \$7,986,000, or 30 per cent of the total.

Contemplated projects were reported to the amount of \$98,458,000. The average monthly figure for contemplated work in 1919 was \$55,000,000. These figures give promise of greater activity that is due to mature as the season advances.

# LOUDEN

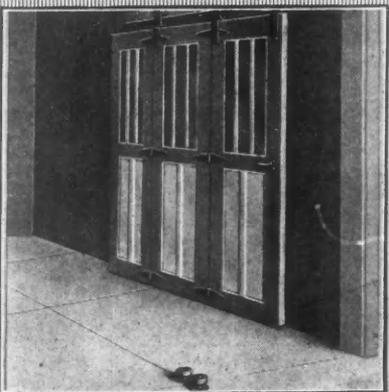
## Garage Door Hanger



Foot Entrance Open  
Not necessary to move entire door.



Hugs Corner Closely—Takes up no  
floor space when opening or closing.



Doors Flat Against Wall  
Entirely out of the way when open

### You Will Find It Much Easier

to close a garage building contract if you name the Louden Garage Door Hanger in your specifications. A Louden Door gives lasting satisfaction and is a constant booster for the contractor who build it because of its many valuable, practical and

#### Distinct Louden Advantages

**Space Saving**—Hugs corner closely when opening or closing; lies flat against wall when closed; garage need be no larger than necessary to hold cars.

**Convenience**—Two doors in one; built in three panels, one panel hinged for use as foot entrance—not necessary to move entire door to enter or leave garage.

**Safety Against Accidents**—The Louden door is entirely out of the way when open—leaves entire front of garage clear for passage of cars.

**Unfailing Easy Operation**—Louden Garage Door Hanger is all inside. Cannot be obstructed by snow, ice or trash. Moves easily on roller bearing trolleys.

We are the originators of this type of door in which a swinging door is hinged to a sliding door to run on a curved track. The United States Government has granted us a patent on this construction (No. 1,184,983), and any other door hanger constructed in this way is not only an imitation but is also an infringement of this patent.

#### Louden Doors Easy to Build

Any carpenter can build a Louden Door from the simple directions which accompanies it. All the hardware for the doors; track hangers, hinges, stay rollers, screws, nails, trolleys, etc., come packed in a stout box. Track comes in bundle securely tied. Built for doors of all sizes, 6, 8, 10, 12 feet. If you have a barn building job on hand let us give you helpful suggestions and blue prints. No charge; no obligation. It will also be to your advantage to suggest Louden Labor Saving Barn Equipment: Litter and Feed Carriers, Stalls and Stanchions, Water Bowls, Animal Pens, Hay Carrier Forks and Slings, Power Hoists, Barn Door Hangers—"Everything for the Barn." Illustrated catalog postpaid on request.

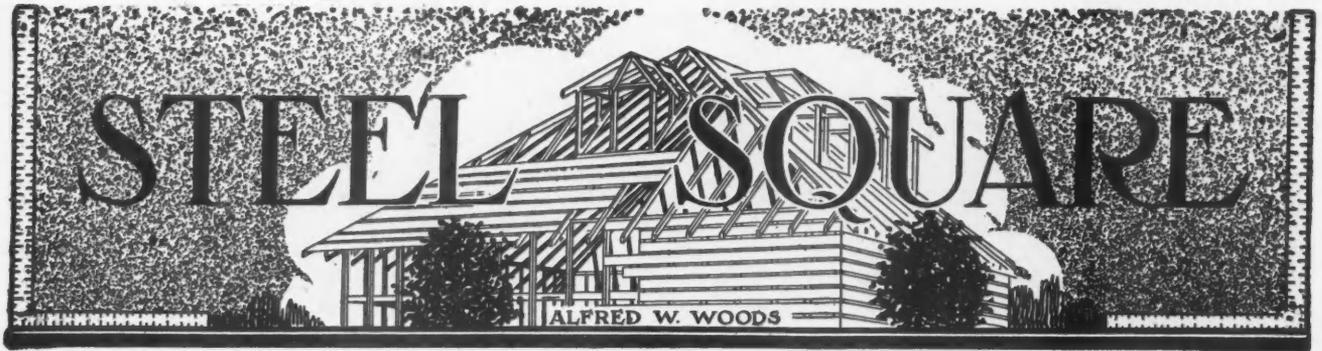
### THE LOUDEN MACHINERY CO.

Established 1867

5535 Court Street, FAIRFIELD, IOWA

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## The Steel Square as a Price Computer

SHOWING THE STEEL SQUARE AS A CALCULATING DEVICE IN THE PURCHASE OF VARIOUS COMMODITIES

By A. W. Woods

IN most all of our writings on the possibilities of the steel square we have dwelt with it as a tool for the use of the carpenter in connection with the squaring of timbers, framing of roofs of all conceiv-

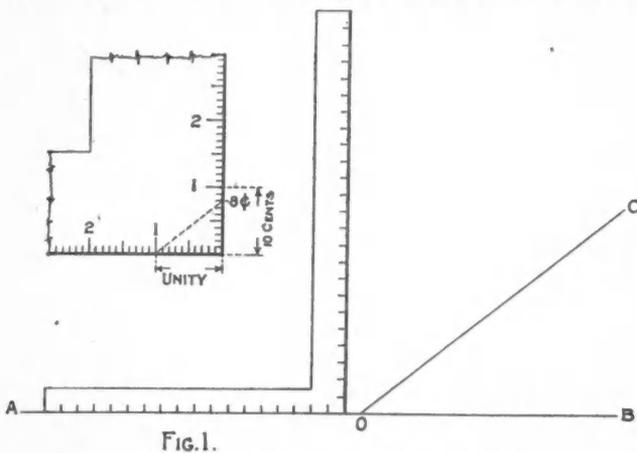


FIG. 1.

able shapes and other tasks in his daily work.

The point we wish to bring out now is that its usefulness does not stop with the carpenter alone; for in fact it is a wonderful calculating machine in a monetary way. Tho simple and even clumsy in appearance, its rigid arms are far reaching, so far that we do not know its limitations.

Therefore it cannot be considered as a tool confined to any one branch of trade; we will show that the

market man, the farmer, the banker, the "loan shark" and in fact most everyone can use it where a calculation is required, and that, too, without pen or pencil. To most people it would seem quite funny after making the day's purchase at the market place to see the white-aproned artist behind the counter doing business on the square—that is, we mean, reckoning the cost of the purchase by the aid of the common steel square; but such can be done, and you ask "how can it be done?" Well, we will show you.

Like everything else that is worth while, it requires preparation—but when once prepared, the rest is easy. Without preparation, it is like going to war with a wooden gun—you could not do much execution with it, while the other fellow would beat you to it.

However, the preparation in this case is very simple. Just lay off a line on a piece of common wrapping paper as at A-B, as shown in Fig. 1, and from about the middle of this line and at an angle to it, lay off another line as O-C, thus forming the angle B-O-C.

This angle, in connection with the steel square, forms the calculating basis and is therefore governed by unity and its selling price, and is reckoned on the heel of the square, as shown by the insert in Fig. 1. One inch on one arm of the square is made to represent unity, as one pound, one or a number of dollars, one acre, etc., while the other arm is made to repre-

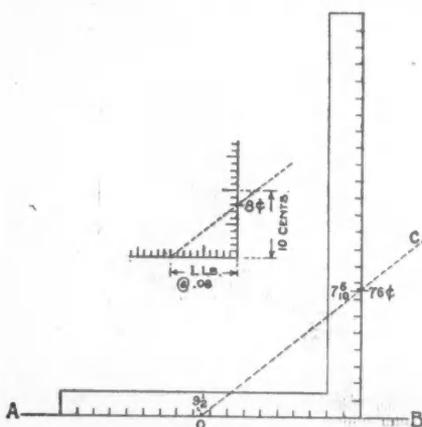


FIG. 2.

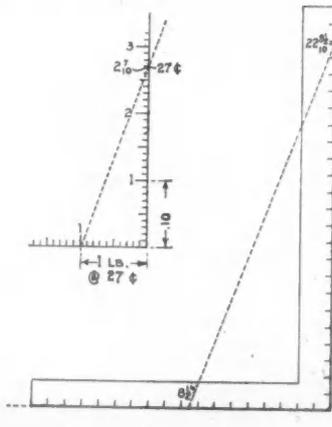


FIG. 3.

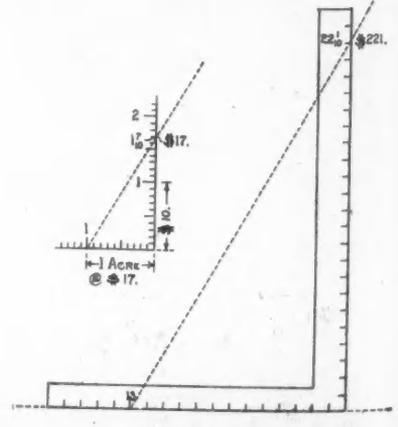


FIG. 4.

How the Steel Square Can Be Used to Figure Prices.

# Stop that noise!

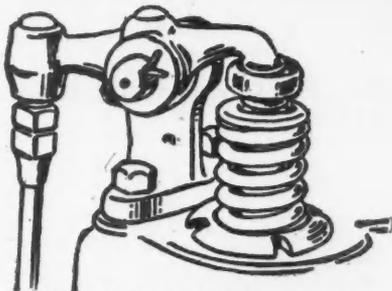


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Just a simple little arrangement that is very easy to put on. The sectional view shows the two Vanadium spring discs with cushion of oil between. The cap retains oil which is pumped in and out between springs by action of rocker arm. Valves stay adjusted. Insures minimum wear on valve action.

Fill out the coupon and take advantage of this Trial Offer.

Soenksen-Spiers Eng. Co. Aurora, Illinois

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#### SPECIAL OFFER

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To SOENKSEN-SPIERS ENG. CO.

Aurora, Ill. I drive a ..... Car, Model ..... Send

me a set of "Oil Cushion Tappets" for same. I enclose \$..... (\$5.00 6 cyl.—\$3.50 4 cyl.)

I will have them installed on my car in accordance with the instructions you send me and if I think I could afford to be without them after I have tested them for 7 days, I can return them to you and you will immediately refund my money—no questions asked.

Name ..... Street Address .....

Town ..... State .....

Our Reference—Any Bank in Aurora

sent the price on a sliding scale, as cents, dimes or dollars, as required; and since money is reckoned in decimals, we will use the side of the square that is divided in tenths.

Our first purchase is porterhouse steak at 8c per pound. Now, don't get excited; we are perfectly aware that 8 cents will only buy a grease spot nowadays, but we do not want to be forced to put an extension on the square to accommodate the present price.

Now, by letting one inch on the tongue represent one pound and the same amount on the blade 10 cents, then each tenth of an inch on that member will represent 1 cent. Thus the angle is determined, as shown by the insert in Fig. 2, and after preparing the diagram, as shown in Fig. 1, we are ready to apply the square by placing the tongue on the line A-B and slide along this line to the right, and the instant the heel passes the 0 point the calculation begins. Say the purchase amounts to 9½ pounds, we let the 9½ in. mark rest at the point 0, as shown in Fig. 2, and it will be found that the angle line passes at 7 6/10 in. on the blade, which represents 76c, and is the answer.

Suppose the price 27c per pound, then the angle would be as shown by the insert in Fig. 3, and by repeating the operation as above described, if there be 8½ pounds in the purchase, the angle line will be found to intersect the blade 22 and 9½ tenths and represents \$2.29½, which will be the answer.

A farmer sells his land at \$17 an acre and he has 13 acres of it. How much did it bring him? The diagram and answer will be found in Fig. 4.

The banker loans his money at 6 per cent per annum. What will \$1 bring at the end of eighteen years? The diagram and answer will be found in Fig. 5.

And now we come to the loan shark, the 10 per cent per month man, while you wait. The most of us would not have to wait long until we were done for. In this kind of calculation he (the shark) can slip one over and get by with it on the square. By referring to Fig. 6 will show how it is done. At the end of six months there will be 60c due, at the end of ten months there will be \$1 due, which is equal the principal. At the end of one year there will be \$1.20 due, besides the original dollar—and all this for only one

dollar to begin with. Suppose the principal was fifty dollars—but a second operation will hardly be necessary. Fine business.

We were going to figure out how old is Ann, but upon second thought modesty forbids, besides it would not be on the square to tell.



### Housing Problem Quickly Solved

(Continued from page 107.)

showers were convenient, as well as huge tubs where clothing could be cleaned. Politeness was also insisted upon.

This liberal treatment of the men, following psychological lines, had as much to do with the success of the project as the mechanical standardization. It fostered the activity that produced the homes like mushrooms in Civic Heights. And there is no dissatisfaction on any side now. It's satisfaction both with the employer and employe. And this satisfaction solved the housing problem that confronted General Motors.



### Design of Safe Construction

(Continued from page 143.)

$$\frac{1}{8} \times 2100 \times 15 \times 12 = \frac{P \times 334}{5}$$

$$47250 = P \times 66.8$$

$$P = \frac{47250}{66.8} = 707.3 \text{ lbs.}$$

Since 707.3 lbs. is the maximum fiber stress, and 1000 lbs. is a safe working stress, the 4x10-inch, 15-foot beams will sustain the load safely.

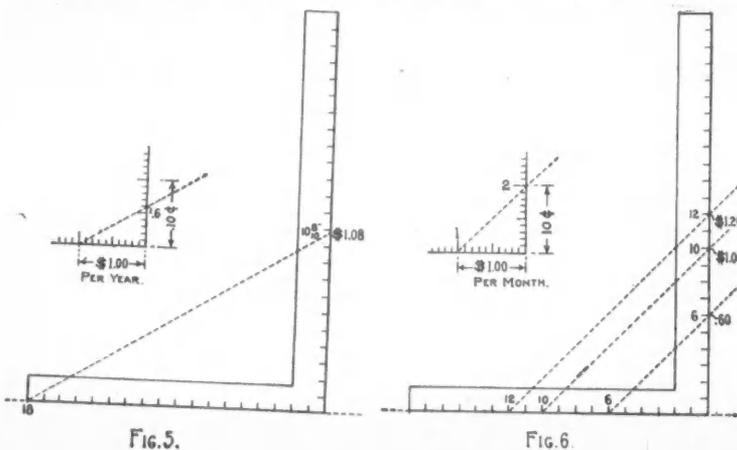
Referring again to formula (2) and the principle of moments, it is evident that the bending moments of a beam increase as the length of the beam increases. This, in turn, increases the fiber stress. Therefore, in designing beams, one must consider the effects on fiber stress due to length of beam and in section modulus.

The next article will deal with the problem of choosing a beam, when the length and loads are given, but shape of beam unknown.



### Weights Per Cubic Foot in Pounds

Asbestos .....	192
Brick .....	119
Fire Brick .....	137
Portland Cement .....	81
Gravel .....	109
Lime .....	50
Limestone, broken .....	85
Sand, dry, loose .....	90
Sand, moist, loose .....	95
Slate .....	175
Loose Earth .....	80
Pressed Earth .....	100
Window Glass .....	165
Granite .....	165
Ashes and Cinders .....	40 to 45
Clay .....	120
Water, distilled .....	62
Water, sea .....	64



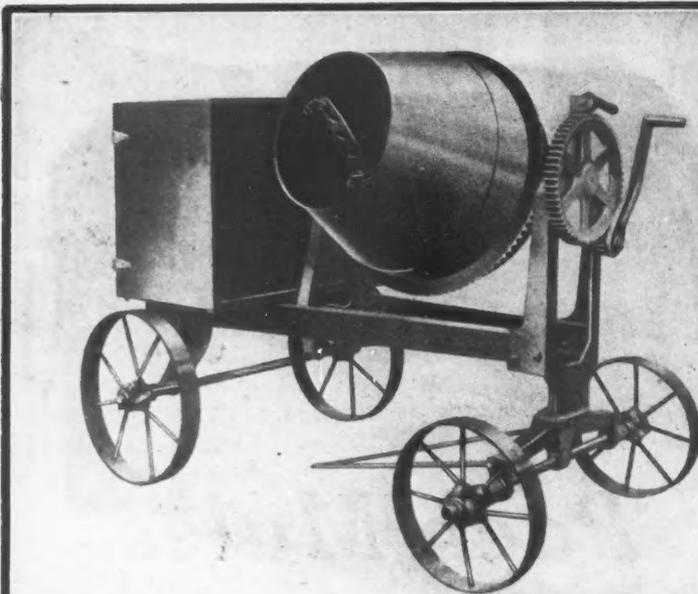
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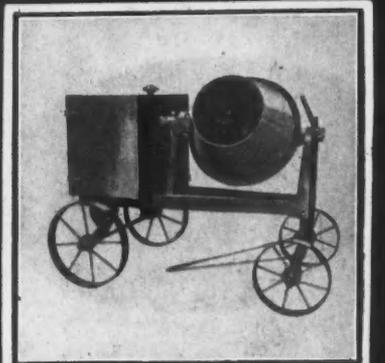
# STEWART

## BUILT ON THE SQUARE

# STEWART



Large illustration shows our Model "C" Four-Forty. Small illustration shows our Model "C" Three-Thirty



### FIVE SIZES

- Two-Twenty**—2 to 3 cubic feet per batch, 20 cubic yards per day.  
**Three-Thirty**—3 to 4 cubic feet per batch, 30 cubic yards per day.  
**Four-Forty**—4 to 5 cubic feet per batch, 40 cubic yards per day.  
**Six-Sixty**—6 to 7 cubic feet per batch, 60 cubic yards per day.  
**Nine-Ninety**—9 to 11 cubic feet per batch, 90 cubic yards per day.

*And every one of them a real money-maker.*

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# STEWART MFG. CO.

# MIXERS

**SOLD ON THE SQUARE**

# MIXERS



## TWENTY MODELS

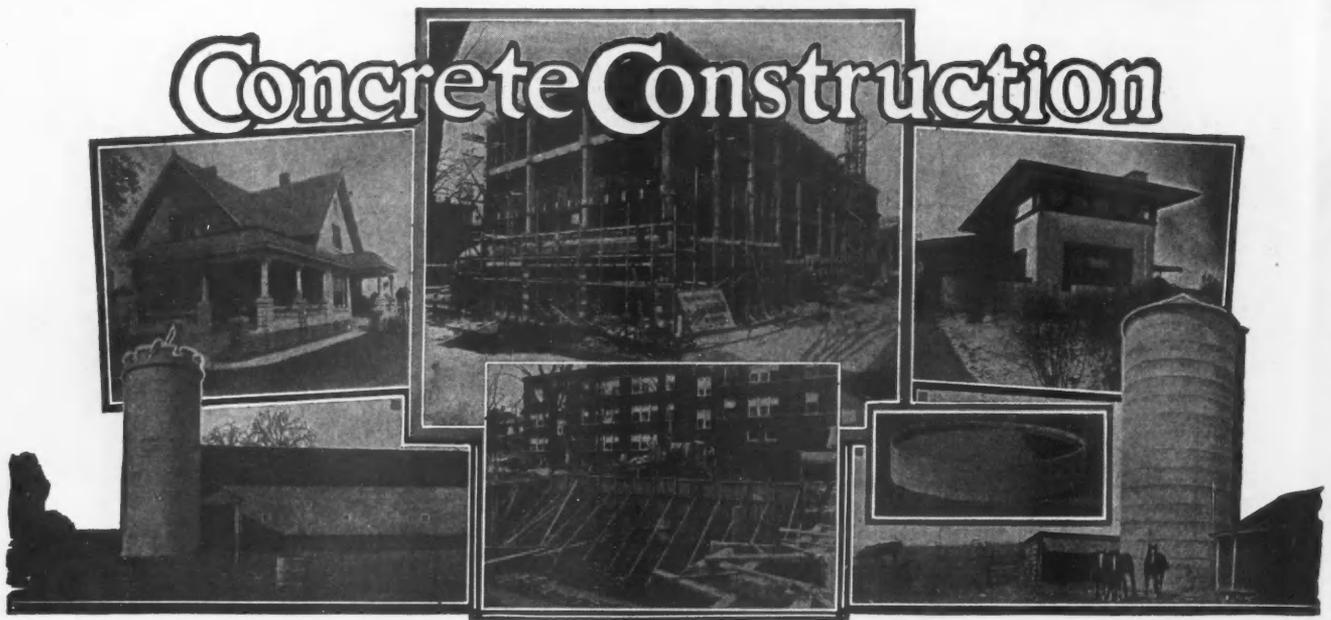
You can buy a STEWART Mixer any way you want it—with engine, without engine, with trucks or without trucks, on skids, with side loader, without side loader, with water pump, water tank, or in fact any way your work demands. And every machine is built to hook-up to your way of doing things and make money for you.

WRITE FOR CATALOG

Large illustration shows our Model "TL" Six-Sixty. Small illustration shows our Model "C" Six-Sixty.

# CO.

**154 Rath St., Waterloo, Ia.**



## How to Set Machinery in Concrete

SIMPLE METHODS OF INSTALLING MACHINES OR MECHANICAL EQUIPMENT IN CONCRETE STRUCTURES

By H. Colin Campbell

TO THOSE who have never had the experience of setting machines, shafting, motors or other mechanical equipment in concrete buildings, the problem of doing this work seems difficult of solution. Everyone knows that there is no special difficulty in setting machines, hanging shafting, counter-shafts or other necessary equipment in mill constructed buildings and while it is, of course, not so easy to attach such fittings in concrete buildings, it, nevertheless, is so relatively easy that the work involved is far less than the average millwright imagines unless he has had that experience. In a well planned mill or factory building, the details are so well worked out in the original plan that the exact or nearly exact location of every machine and shaft is marked on the drawings, and in most cases suitable provision can be made for the necessary attaching devices while concrete is being placed and as the work otherwise progresses from stage to stage.

### Modern Tools Make Task Easy

Modern tools, such as pneumatic drills, make it about as easy and as speedy a job to cut into a concrete section as does the brace and bit for boring a

hole in wet timber. Where proper forethought is given to the mechanical equipment to be installed in any building about to be erected, there need be but little actual cutting of the concrete when the time for real installation of machines arrives. If heavy machines are to be set on concrete floors, holes sufficiently large can be left in the floors to receive the necessary bolts. These may be run thru the floor slab or thru the floor beams or girders. Usually they are spaced every 24 to 36 inches on centers. To provide for possible play or adjustment that may be necessary for close fitting, the holes may be formed by setting pipe sleeves in the concrete at the time of placing. Common practice in arranging to support ceiling fixtures where there are no beams or girders is to set cast iron spool sockets at regular intervals in the ceiling. Anchor bolts or sockets permit rigidly supporting and fastening as desired, almost any kind of equipment.

### Heavy Machinery Needs Independent Foundation

For heavy machines which produce shock, it is often wise to make use of an independent foundation entirely separate from the floor. In such cases the conditions must be studied carefully for different kinds of soils under different conditions as to supporting capacity. Heavy machine foundations must of course be designed so that settlement will be avoided. Footings should be used to increase the bearing area sufficiently to handle the load, which in general may consist of combined weight, and shock due to impact created when the machine is in operation. Monolithic foundations such as may be scured with concrete are particularly well adapted for this work.

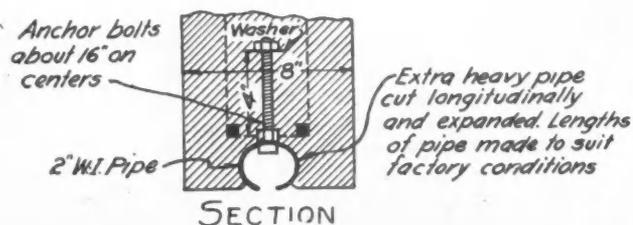


Fig. 1. Cross-Section Showing Split Rod Iron Pipe Cast Into Lower Face of Concrete Girder.



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For Roof and Walls

Shingle Branch, West Coast Lumbermen's Association, 426 Henry Building, Seattle, Washington; or, The Shingle Agency of British Columbia, 1026 Standard Bank Building, Vancouver, B. C.

A foundation built of precast cellular concrete units similar to ordinary concrete building block, made monolithic by filling the cores with a rich concrete mixture is also very good. Such construction has, in some cases, an advantage in that the cells before filled, afford opportunity to embed reinforcement and thus make the foundation reinforced instead of mass concrete. They may also afford convenient means for setting anchor bolts, by means of which machines are later to be attached in required position.

#### Rubber Cushions Reduce Impact

In general, concrete machinery foundations require no reinforcement as they are made sufficiently massive to take care of any shocks or stresses set up by heavy machines operating with impact. The effect of impact both in the case of large and small machines and those set on concrete floors or individual foundations can be considerably reduced by rubber cushions placed between the concrete supports and the bed of the machine. Ceiling fixtures are supported either by cast iron spool construction or by bolts put into the concrete beams, girders and floor slabs, or by some form of metallic slot embedded in the girders, columns and ceilings. Sometimes line shafting is supported on 3 by 6-inch wood stringers which in turn are bolted to the concrete ceilings by some one of the methods just mentioned. Any of these is successful and permits attaching machinery and suspending shafting in a dependable manner.

If a number of small machines are to be installed

and it is possible that conditions may sometimes compel occasional or frequent moving of them to different places, it is often merely necessary to weight the machine to the floor by attaching it to a unit concrete base such as shown in Fig. 2. In this case a wooden frame is made of 4 by 4-inch joists with steel rods  $\frac{3}{8}$  or  $\frac{1}{2}$  inch in diameter run in both directions, with their ends entering holes in the wood frame. The enclosure within the frame is then filled with a rich concrete and anchor bolts set in proper locations to correspond with bolt holes in the beds or bases of the machines to be set. When the concrete has properly hardened, the machines are lowered to place and bolted down. The weight of this concrete slab is sufficient to hold small machines rigidly in place. Shafting is often supported from concrete ceilings by 3 by 6-inch wood stringers or structural steel stringers bolted to the ceiling by anchor bolts set in the concrete, or sometimes by expansion bolts set in holes drilled for that purpose.

#### Use of Devices and Fittings

A number of devices have been used in connection with beam ceilings as movable or adjustable fittings, to permit setting of machines at desired spacing or intervals. These include cast iron slot sections regularly spaced, and anchor bolts likewise distributed at predetermined locations. All of these methods have had successful application also. Grooves have been cast in the sides of concrete beams and the ends of metal clamps inserted furnish the necessary support.

Another illustration shows the use of a split rod iron pipe cast into the lower face of a concrete girder and securely anchored by a bolt running back into the girder's section. A fixture bolt with especially formed head enters the pipe slot. Plumbing, heating and sprinkler pipes are generally provided for in a manner different from that used in installing other mechanical equipment. Contracts and specifications usually provide that the contractors for these utilities must designate the places in the floors and walls where sleeves are to be inserted for their use. Once this is done, the matter of running piping is comparatively simple.

#### Individual Motors Aid Work of Setting

The increased use of machines with individual motors makes the problem of setting machinery in concrete buildings a much easier one. It does away with all the

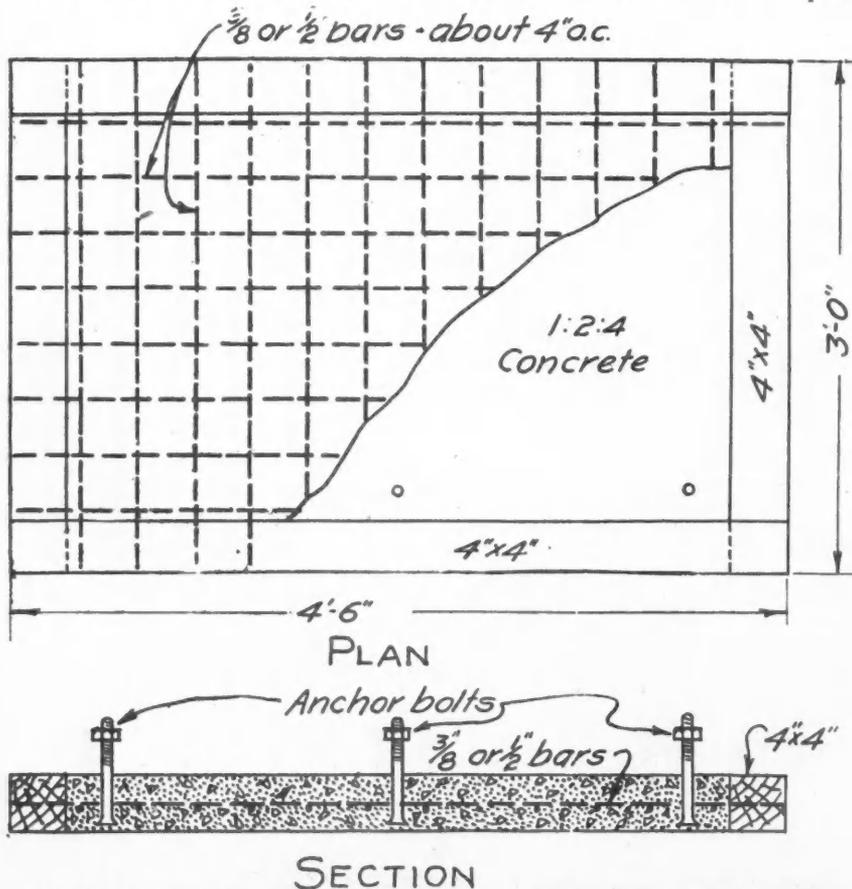


Fig. 2. Plan and Cross-Section of Unit Concrete Slab Designed to Hold Machines Rightly in Place.

# DEPENDABILITY

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 is the ideal cement for making Cast Stone—hard, weatherproof, durable stone—in pure white or an infinite variety of colors and textures, with a minimum labor of shaping, whether simply molded or richly ornamented.

**THE ATLAS PORTLAND CEMENT COMPANY**

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



*Upon request we will promptly send to architects one or all of three books: "Color Tones in Stucco," "Non-Staining Mortar for Pointing, Setting and Backing," "Cast Stone."*

**ATLAS WHITE**

problems in connection with line shafting and counter-shafting. However, the matter of attaching lines securely to the floor still remains. Heavy machines with a box, bed or base do not need bolting down, but can be anchored by merely grouting them to line and level. Lighter machines than those subjected to shock must be fastened down. In such cases, holes from 2 to 3 inches deep are drilled in the concrete floor. Into these holes wooden blocks may be driven to take the lag screws that pass thru the machine base or the holes may be fitted with expansion sleeves into which the bolts enter, or the bolts may be inserted in the concrete holes and the surrounding spaces filled with molten sulphur or lead. Any of these methods are practical. The actual drilling of the required holes is very easy, provided pneumatic drills are used.

Another method which has been adopted sometimes for light machines is to cover the area of the concrete floor with a separate floor or platform, to which the machines are lag screwed in the same way as to an ordinary wooden mill floor. Some of the heaviest machines attached to ceilings are the electric motors for group drives. In some cases these are suspended from latticed steel girders which in turn are bolted to the concrete girders of the floor by means of anchor bolts. In another, the motor is bolted to either channel iron stringers, which are attached to concrete beams by U-hangers, or straps.

#### Boiler Settings Present Problem

Too little experimenting has been done in using concrete for boiler settings. The reason for this may probably be explained by the permanence of the construction which is an objection if alteration or changes are desired. Also, some concrete boiler settings have

proved failures because those who designed or built them failed to recognize the fact that in spite of the great resistance of concrete to fire, it is not suitable for furnace lining. The conditions to which boiler settings are subjected bring temperature changes in the concrete which must be successfully neutralized by proper design and reinforcement; also, the surfaces of a setting in the furnace must be lined with fire brick. Aggregates must be selected especially for their fire-resisting qualities. Trap rock and hard slag are the preferred ones. Caution should be given against setting machines on concrete or building a fire in a boiler with a concrete setting, before the concrete has aged sufficiently. Time must be given for the concrete to thoroly harden, otherwise the weight and shock of the operation of a machine may cause the concrete to crumble before the cement has become completely hydrated.

✦  
**M**ONOLITHIC concrete walls to be overcoated should be rough and of coarse texture, rather than smooth or dense. Walls of this type should be cleaned and roughened, if necessary, by hacking, wire brushing, or effective means. The surface of the concrete should be brushed free from all dirt and loose particles and should be wetted to such a degree that water will not be rapidly absorbed from the plaster, but not to such a degree that water will remain standing on the surface when plaster is applied.

✦  
**I**N BACK plastered construction, the lath should be fastened direct to the studding and back plastered, and no sheathing is used.

✦  
**B**UILDINGS of hollow tile, terra cotta, brick, concrete, concrete blocks and similar materials are well adapted for the application of stucco because of their rigidity. This, however, depends on good, solid footings or foundation, a requirement which should be met in all stucco structures. Masonry walls should also provide a good surface for the bond or adhesion of stucco, and wherever possible this bond should be insured by some form of mechanical key. For this reason raking out the joints in a brick wall is recommended as an added precaution, and similarly, walls of concrete or concrete block should not be too smooth, but preferably rough and of coarse texture.

✦  
**S**ENATOR Calder of New York says: "The tenant, no matter how long he remains on the land or in the community, is losing the 'unearned increment.' By changing from one community to another he deprives himself and family of permanent acquaintances and friendships. This brings about a discontented state of mind, induces unproductiveness, leads to waning power and a gradual descent in the social scale, all of which would be avoided if the family lived in its own home, 'be it ever so humble.'"

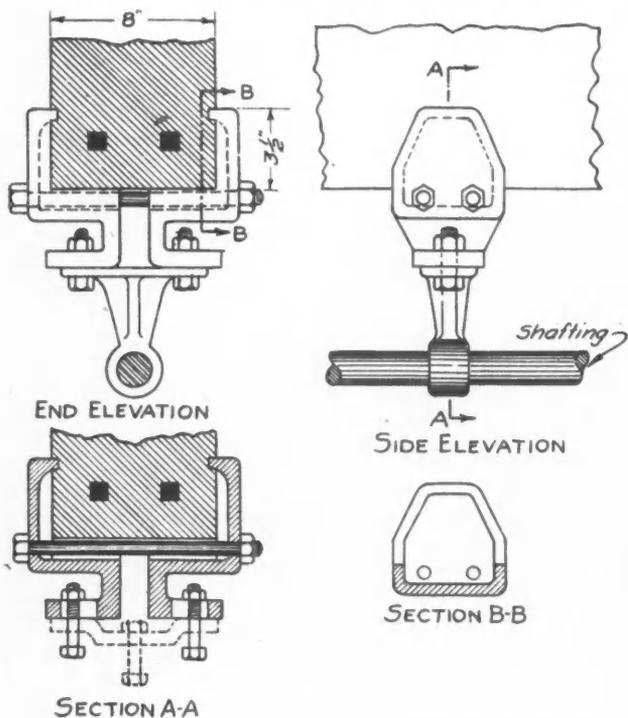


Fig. 3. Machinery Clamp for Fastening Machinery to Concrete, Wood Beams, Columns, Walls, Floors and Ceilings.



# E-Cod Fabric



—is “the ideal plastering base” for every exterior and interior use. Today—in most cases—its price is lower than wood lath and you can get it.

E-COD FABRIC is composed of a heavy, waterproofed felt backing reinforced with No. 14 guage galvanized wires, woven together so as to secure the maximum efficiency of these two materials. E-COD FABRIC is weather-proof, water-proof, fire-resistive, and is practicable to all styles and classes of construction.

E-COD FABRIC is lower in first cost, it saves in every operation of plastering, and eliminates checking, cracking, staining of the plaster slab, and is an absolute guarantee against disintegration because the galvanized reinforcement becomes completely imbedded in the plaster.

Why use other plastering bases when E-COD FABRIC gives you everything desired at a lower price than any other durable lath on the market.

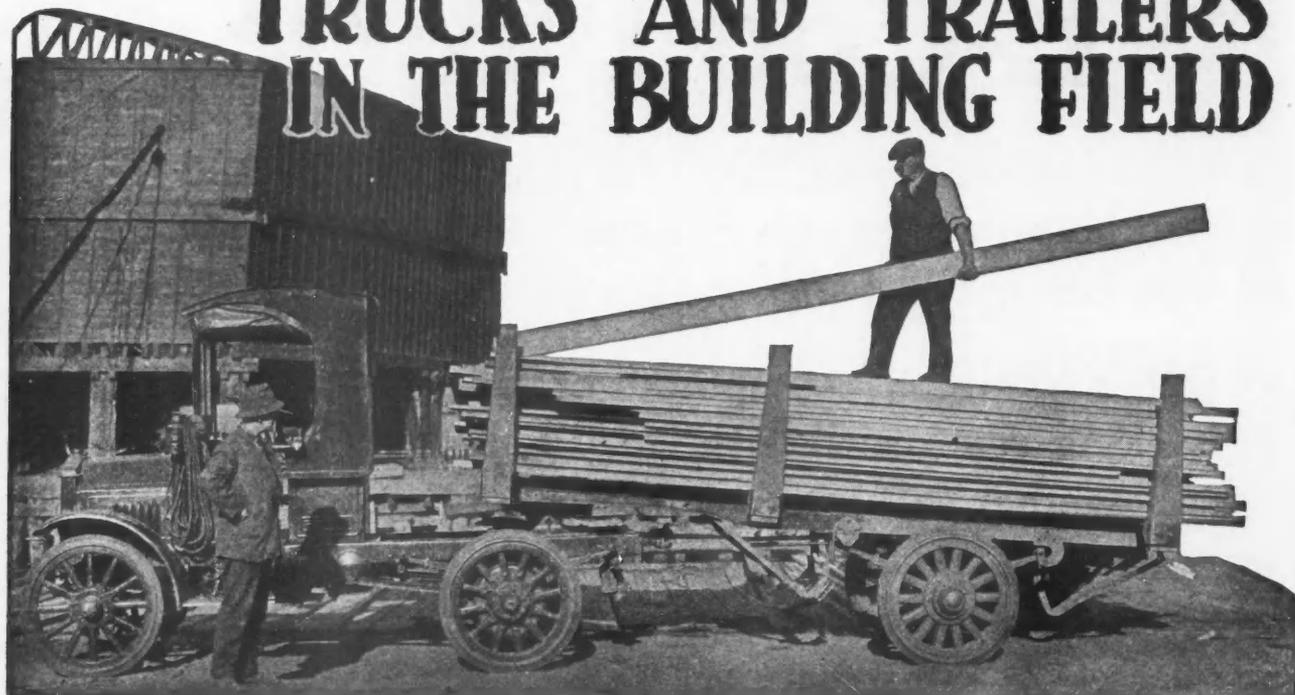
You can't go wrong when you use, specify, or sell E-COD FABRIC. Write us today.

**MacAdams and Call**

111 West Washington Street

Chicago, Illinois

# TRUCKS AND TRAILERS IN THE BUILDING FIELD



## Motor Truck Important in Homebuilding Season

BUSY CONTRACTOR WILL FIND TRUCK A VALUABLE AID IN RUSH SEASON

By J. D. Eddy

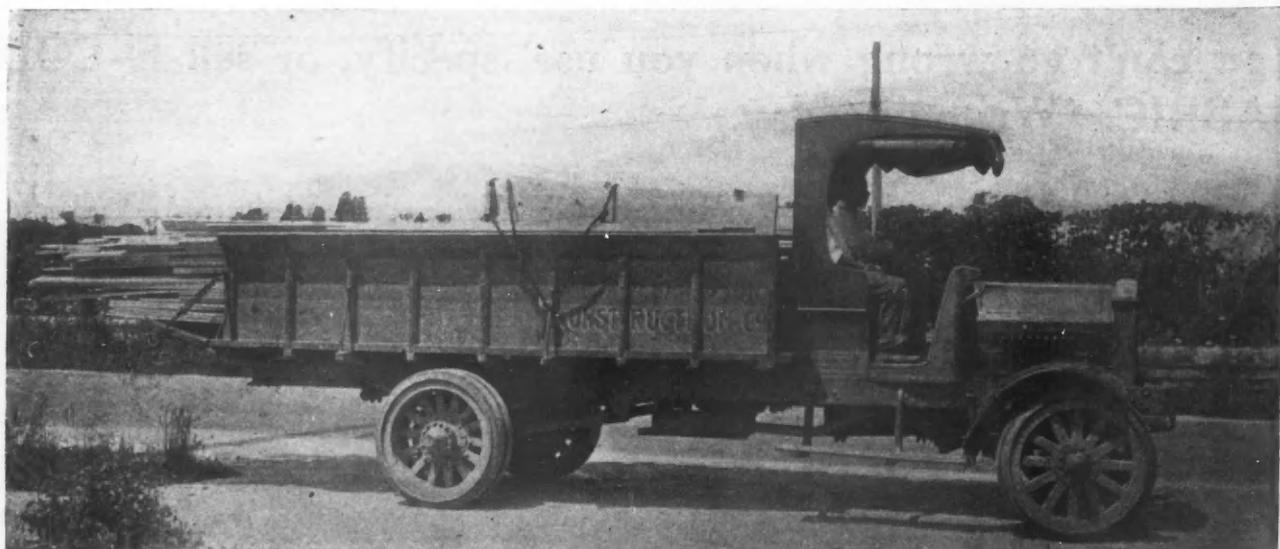
**G**REATER demands for speed and efficiency will be made upon the building trade this spring than ever before. The season just opening promises to break all records for homebuilding. The average contractor will be called upon to do more work, and do it faster than he has ever dreamed of.

In this big game which will keep them all going at top speed one of the most important roles will be played by the motor truck. Because of its general efficiency and versatility it will be found an aid in

more ways than one and an important factor in keeping the machinery of construction in smooth running order. Hauling of material to the job is one of the necessary steps in the process and the successful contractor will subconsciously turn to the surest method—truck transportation.

### Hauling Machinery to Job

The first thing a contractor has to do when starting on a job is to get his machinery into position. The truck is handy to haul the mixer, the gas engine, cranes, and all the other equipment that is needed.



R. R. Richardson Construction Co., Norfolk, Va., Have Found This "Federal" Truck Very Efficient for Carrying Lumber and Other Building Material. They Intend to Use It Extensively in the Big Spring Home-Building Rush for Making Quick Hauls.

# Stewart

## MOTOR TRUCKS



### Making good all the time for contractors

*Here's another fine Stewart record made in daily hauling*

The M. P. Berglas Manufacturing Co., owner of the above Stewart Truck, writes, over the signature of Louis Berglas, President:

"In reply to your inquiry regarding the Stewart Motor Truck, we are pleased to advise that since we have purchased same, that is, April, 1918, from the Herman Motor Co., Inc., we have been entirely satisfied with the service given by the truck.

"In fact, upon further investigation, we find, though the object be small, that we still have the original tires on the truck, although same is in continual active service.

"(Signed) M. P. BERGLAS MANUFACTURING COMPANY,  
"By Louis Berglas, Pres., Brooklyn, N. Y."

### For low hauling expense get a Stewart

There is a definite reason why Stewarts cost less to buy and run at less expense—make money for their owners, instead of running up bills.

The Stewart is no guess-work truck. It is just right for its work, neither too light nor too heavy. Stewart simple construction has rid the machine of hundreds of needless parts, hundreds of pounds of useless weight.

This means a stronger, simpler truck, with less dead weight to move. Dollars are saved every day in tire mileage, gasoline and oil costs, repair or replacement bills.

That's why Stewarts are used today in 600 American cities, on hundreds of farms and in 38 foreign countries. That's why the Stewart Motor Corporation, in seven years, has come to be one of the world's leading truck producers.

*A just-right truck for every use*

$\frac{3}{4}$  ton    1 ton     $1\frac{1}{2}$  ton    2 ton     $3\frac{1}{2}$  ton

## Stewart Motor Corporation, Buffalo

*Quality Trucks Since 1912*



This "Federal" Truck Owned by Eggert Bros., General Contractors, Akron, Ohio, Has a Utility Dump Body That Is Very Useful. This Picture Shows It with the Side Boards Fitted for Hauling Gravel and Bulky Material. It Is Dumped by Means of a Hydraulic Hoist.

It can carry a heavy load, and, not like the old way, take a long time to get started and a long time to get to its destination. With the rapid development of construction machinery and its universal use in the building game, the contractor is confronted with a hauling problem every time he starts a new job that might stagger him had he not a truck to take care of it. If necessary he can hook on a trailer and carry a double load on one trip. In a busy season, time is money and the sooner he can get his machinery in place and ready for work, the better his showing when the final reports are made out.

up the needed amount and get back to the job with practically no loss in time.

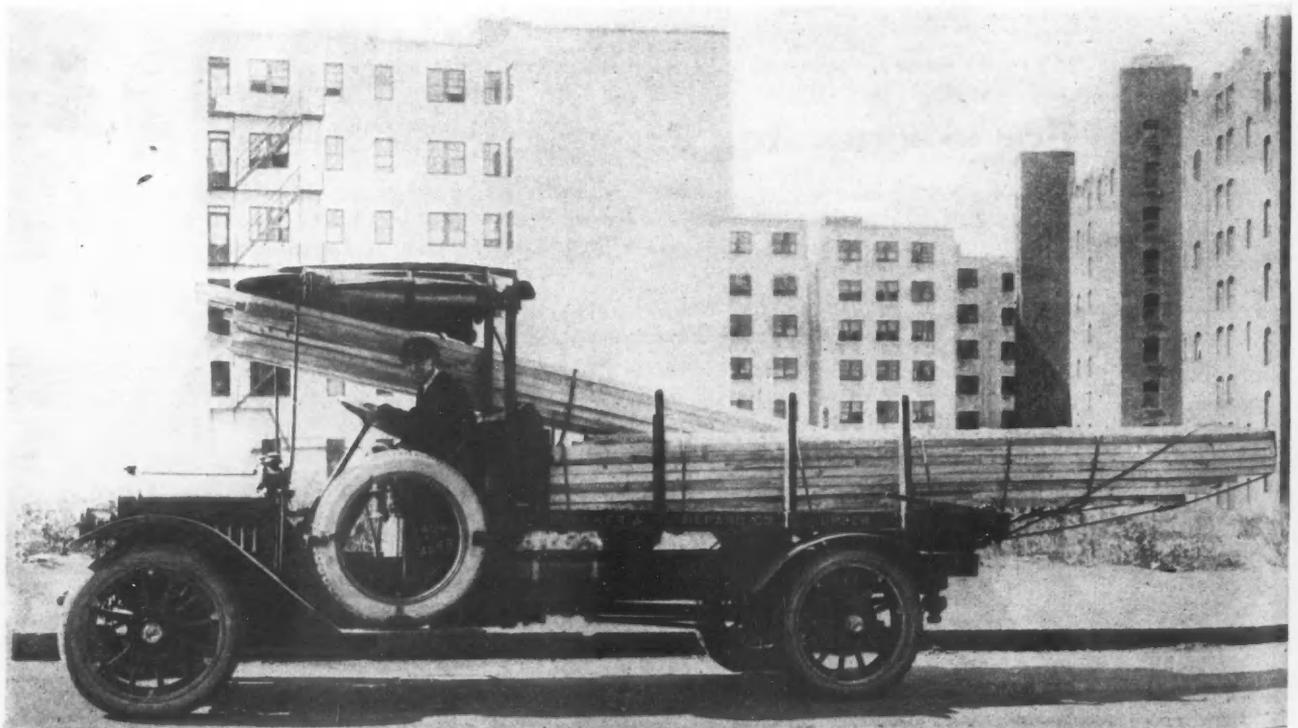
Again, in the midst of the big rush, the mixer may get out of order, or the gas engine refuse to function. The steam shovel, which up to that time was moving along without a hitch, suddenly lays off. Spare parts, extra bolts, are needed—the machine may have to be brought to a repair shop; the truck is always handy.

Likewise, if he has made a slight error in figuring brick, lime, or any of the other materials which he uses, he can get it in a hurry.

#### Light Truck for Pick-Ups

Once the actual building is started there are many unexpected factors that crop up and demand solution.

Take the pick-up end of the building game first. Very often a contractor finds that he is short a few thousand feet of lumber just when things are running smoothly. A very small matter, to be sure, but without the lumber the work cannot go ahead. Without it he cannot keep the carpenters working, and if they stop the other men will be held up. Here is where the truck comes in handy. If he has a light, speedy, two or three-ton truck, it is only a matter of minutes to run over to the yard, pick



Making a Pick-Up of Lumber for a Rush Job. This "GMC," Owned by the Bracker & Shepard Lumber Co., Is Adapted for Speedy Hauls and Is Very Useful in the Busy Season to Haul Light Loads on Rush Orders.

Another  
**FEDERAL**

*"Shorten the Miles to Market—Build Better Roads"*



*Federal three and one half ton truck operated by Peter Judiin, Inc., New Orleans, La.*

## Here's a Truck of Sound Value

It's this soundness of value found in Federal trucks that commends them so highly to the builder and contractor. Go over, point by point, Federal specifications, ask any of the hundreds of Federal owners in your business about Federal's mechanical efficiency, and you cannot help

but be impressed with the fact that here is a truck in which sound value has been built.

The man who has used a Federal year in and year out on such jobs as a contractor's work requires of them will speak, too, of their unusual economy and trouble-free service.

FEDERAL MOTOR TRUCK COMPANY  
79 FEDERAL STREET                      DETROIT, MICH.

# FEDERAL

*One to Five Ton Capacities*



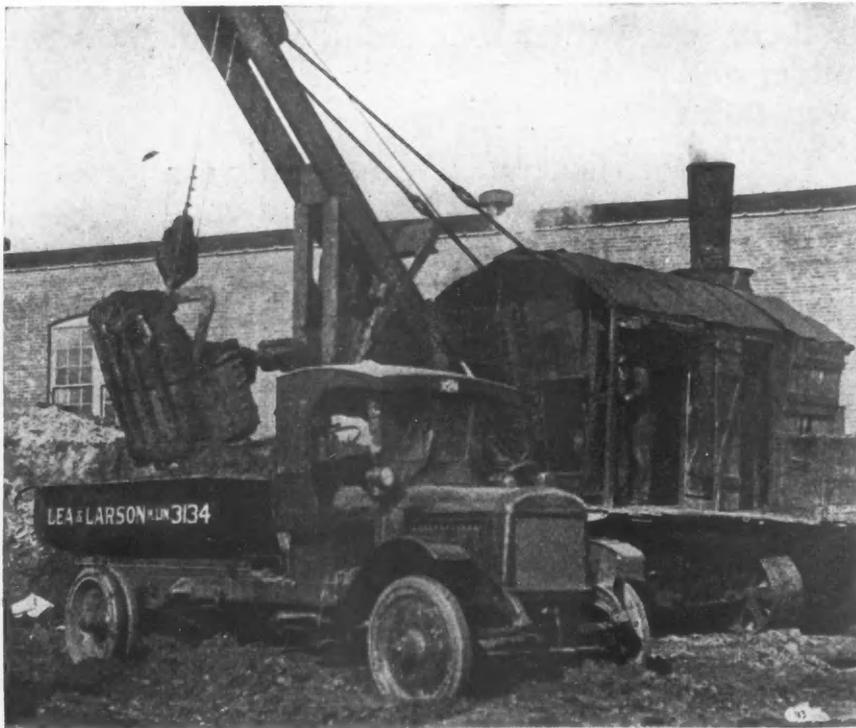
Loaded with Wall Board. This Two-Ton "Stewart" Truck, Operated by the Builders' Mortar & Supply Co., Milwaukee, Wis., Is Light and Speedy and Especially Adapted for the Quick Hauling That Will be Needed This Spring in the Building Rush to Keep the Men Supplied with Material.

In the old days a slip-up of this nature meant several hours, and sometimes a whole day's delay. The horse-and-wagon method was slow and not sufficiently powerful to carry more than a light load. The truck has both carrying power and speed.

**Keeps Work Going on Several Jobs**

In a busy season, such as the home-building season

is, the contractor as a rule has several jobs going on at once. His main worry is to keep down costs and invariably he does this thru speeding his work. In this case he can use the light type of truck to haul small quantities of material from one building to another, keeping his entire gang going ahead at full speed. The light truck is really providing a messenger service that is extremely valuable in the busy season.



A 3 1/2-Ton "Republic" Truck Doing Its Bit in Excavating Work. Heavy Trucks Have Been Instrumental in Speeding Up Building Work and Cutting Down Costs Because of Their Carrying Capacities and Speed.

The contractor who accomplishes what he has to do in the quickest way is bound to get the business. And in the coming season it will not be a case of looking for work. it will be rather a case of trying to do as much as you can of the great amount that is waiting.



**Heavy Truck Valuable for Hauling Material**

THE variety in types offered in the motor truck is of considerable advantage to the builder. While part of his work can be successfully and quickly handled in the lighter, faster type, the heavy hauling of brick, crushed stone, steel, and heavy timbers calls for the large-sized truck with a powerful frame capable of carrying great loads. The great, five-to-ten-ton capacity vehicles carry loads that are beyond the ken of the horse

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# DUPLEX TRUCKS

B U I L T F O R B U S I N E S S



## The Duplex Limited

Built to handle a normal load of 3000 pounds, or a maximum of 5000 pounds, including body, at a speed limited only by legal restrictions—from 5 to 30 miles on high.

Such speed in the Duplex Limited does not depend upon gear ratio but upon engine power—greater power in fact than is usually specified in trucks of equal capacity.

The Duplex Limited was constructed in response to the insistent demands of Duplex owners and dealers for a general purpose two-wheel drive, medium capacity Duplex Truck designed and built to the high mechanical and proven service standards of the famous heavy duty 4-Wheel Drive Duplex.

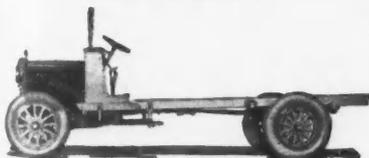
And the Duplex Limited is worthy of the Duplex name—for it is a Duplex, every inch of it, from tail light to radiator cap.

4 Cylinder, enclosed type motor—water cooled—cast embloc bore 4", Stroke 5¼". 3 Point Suspension, Pneumatic Cord Tires. 145" wheel base. Equipped with windshield. Electric lighting and starting; Ammeter; Boyce Motometer; Speedometer; Electric Horn; Tools; Jack; Rim Wrench; Front fenders; Alemite 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

## What Does It Cost You To Haul Materials?

### The Records Show That the Duplex 4-Wheel Drive Truck is the Practical Truck for Contractors and Builders

The great secret of the success of the Duplex 4-Wheel Drive in the transporting of dead weight loads is the fact that the Duplex 4-Wheel Drive Truck is not merely designed to carry such loads but to **haul** them.

There is power in **every wheel**—no straining and excess vibration to get started. The motor power is applied simultaneously and steadily to all four wheels and the truck starts easily and without strain.

Whether the roads are good or bad the Duplex 4-Wheel Drive can keep going so long as any **one** wheel can find traction.

The Duplex 4-Wheel Drive has 14 inches clearance as against the average 9 inches. There is 5 inches extra leeway for ruts, stumps and stones.

Gear Housings are on top of the axles—out of danger from obstructions.

Because all the motor power is applied simultaneously through all four wheels it gets even, steady traction **at once**—and the start is made without strain or shock.

The saving in wear and tear on motor and chassis because of this ease in starting, **alone** saves a big percentage of depreciation and repair bills.

Remember that the Duplex 4-Wheel Drive is an **established** success in actual business practice. There is nothing theoretical about it. Its lower cost records are actual records as established by business men under business conditions. Its efficiency is a matter of every day performance in many lines and under conditions as they are.

Write us for folders which give the facts as **Owners** find them. Talk to the Duplex dealer near you. He is a practical truck man and he can and will tell you frankly how and why the Duplex 4-Wheel Drive is a very safe investment for this class of work. Get the facts.

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

**Duplex Truck Company**  
Lansing • Michigan

*One of the Oldest and Most Successful Truck Companies in America*

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

age. And they do it in much shorter time. In addition to the speed which they have, they are equipped with special bodies for unloading, which inevitably cut down the delays at stops and increase the working capacity of the truck.

The successful contractor facing one of the greatest seasons in his industry, cannot neglect to muster together all the available labor and time-saving devices to make his end of the work a success. He should be spending his time figuring out the most efficient methods and means to carry on a busy campaign and

The fact that motor trucks are built to meet conditions imposed by the tires is not often realized by owners. They are in the habit of considering tires an accessory, but, on the contrary, tires play an important part in the actual design of the vehicle itself.



### Truck Does the Work of Five Teams

“MY TRUCK is doing the work of five teams on short hauls and seven teams on longer hauls,” says H. T. Hamilton, Ithaca, N. Y., who makes



Four-Ton "Packard" Truck Getting Heavy Load of Gravel for Concrete Foundations. This Truck Is Owned by the Beaver Brook Foundation Co., Waltham, Mass., Who Make a Special Business of Foundation Work. This Is the Type of Heavy Truck That Will be Used Extensively for Hauling Bulky and Heavy Material This Spring.

in his calculations cannot very well overlook one of the most important cogs in his system, the motor truck.



### Care of Tires Important

MOST automobile tires are ruined either by neglect, abuse or ignorance. Sudden braking, striking against curbs and other obstructions, and lack of sufficient inflation are among the chief offenses and help to reduce mileage and shorten the life of the tire. The careful driver of a large truck can greatly increase the output of a tire by exercising care at the proper time and in turn will cut his expense account.

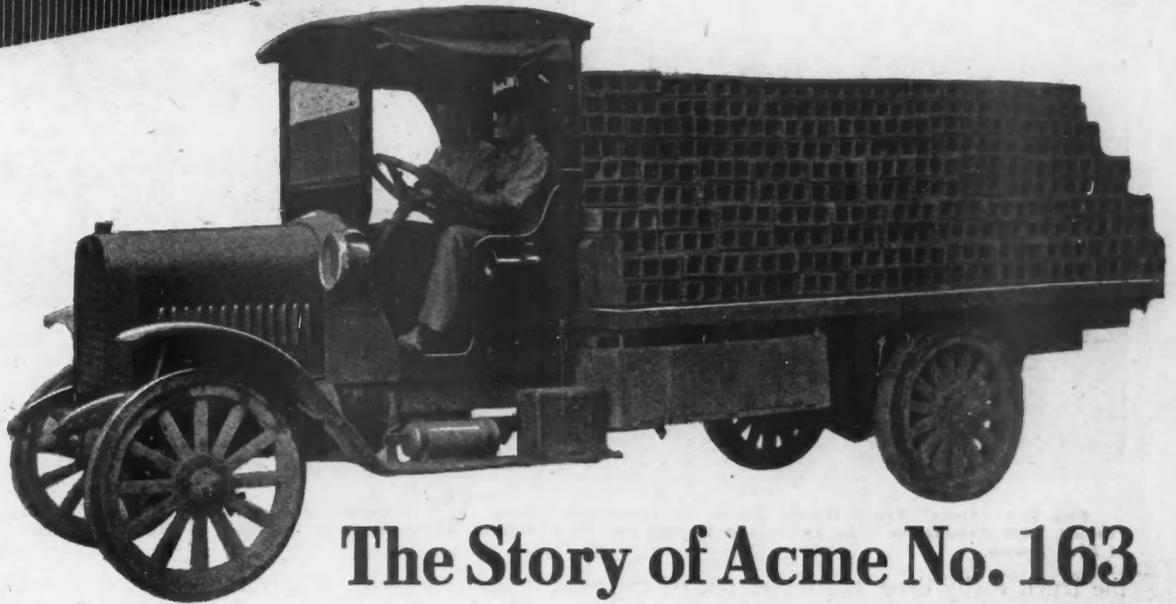
a specialty of hauling heavy building material. He has carried two yards of sand daily during the summer, averaging 50 to 60 miles a day and has often climbed heavy hills with a grade of from 10% to 16%. In the busy season the truck averages 15 to 18 miles an hour.

The 2-ton truck shown on page 190 has carried as much as 7200 lbs. On one occasion, when the driver had a load of screened gravel on the truck weighing 5200 lbs., he stopped to pull a mixer out of a rut in the road. Two teams had been working at it unsuccessfully until he came up. In two attempts

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# ACME



## The Story of Acme No. 163

"If the garage men had to live on the repairs on our truck they would starve." That is what L. H. Klus & Son, of New Castle, Ind., says about the Acme Truck shown above. It's Acme No. 163—one of the earliest built. It is kept busy during the building season hauling lumber, tile, brick, plaster, steel and other building material. In winter this Acme is kept busy hauling hogs and cattle to Indianapolis, fifty miles away, and returns with merchandise. No. 163 is the oldest truck in New Castle, and is seen on the streets every day as if it were new.

That is the type of performance that Acme proved construction assures to owners. For the Acme seal is your bond of the industry's proved units correctly assembled by Acme engineers in a well-balanced truck. It is your protection against untried units.

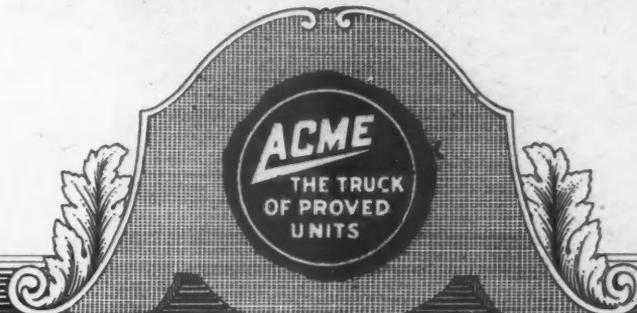
### Built in 1, 1½, 2, 3½ and 5 Ton Models—Also Acme Built Bodies

Acme is conspicuous for the high type of performance it renders even over long uninterrupted periods. It is proved in building and contracting service. Write for catalog and partial list of Acme users.

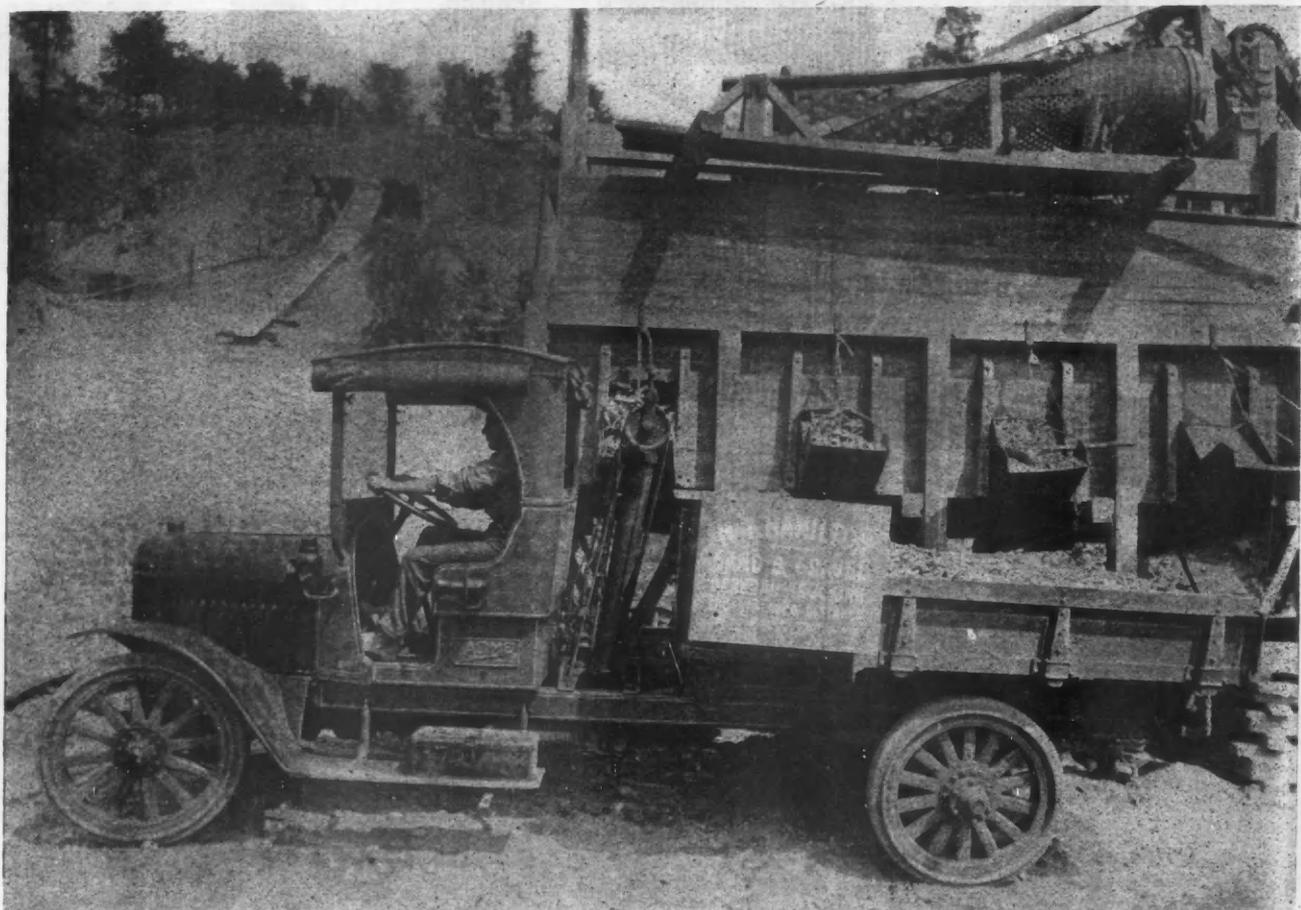
## Acme Motor Truck Company

200 Mitchell Street, Cadillac, Mich.

The Seal  
of Dependable  
Performance



Trade-Mark  
Registered U. S. and  
Foreign Countries



Two-Ton "Acme" Truck Owned by H. T. Hamilton, Ithaca, N. Y., Carrying Heavy Load of Crushed Stone. Mr. Hamilton Has Carried 7,200 Pounds on This Truck and During the Busy Season Averages 15 to 18 Miles an Hour. He says It Takes the Place of Five Teams.

the truck easily drew the mixer out of the mud onto the brick.

Mr. Hamilton has found that the truck gets the material to his customers on time, and that it is an important factor in the rapid increase of his hauling

business. Contracts in his community are going to men who operate trucks.



### How Lumber Dealers Cut Their Hauling Costs

**M**ANY lumber dealers cut their hauling costs by two or more trailers or semitrailers with each one of their automotive units. While one trailer is being hauled to the building job, the yard men are loading another. The tractor returns the empty trailer, quickly attaches to the loaded trailer and is away again, without loss of time.

This method of speeding up deliveries and saving the cost of both driver and tractor is made possible by the ease with which the tractor is attached and detached from the trailer. It is the work of a moment to disengage the two hauling units.

One large Chicago lumber company that uses this method is the Big Bay Lumber Co. This concern uses a small truck, equipped with a rocking fifth wheel at the rear. A similar wheel is attached to the for-



Loading Up a "Martin Rocking Fifth Wheel" Semi-Trailer with Lumber in the Big Bay Lumber Co.'s Chicago Yard. While One Trailer Is Being Loaded the Other Is Being Hauled to the Job.



## Team Mate of the Steam Shovel

A fitting team-mate of the steam shovel, this GMC Truck admirably justifies its operation in connection with excavation for building.

Day after day, week after week, every GMC Truck delivers hauling service for its owner in proportion to the quality built into it at the GMC factory.

No motor truck can deliver quality unless the builder conscientiously strives toward that end.

In the GMC factory, plain, honest quality is the first consideration.

Year after year the prestige and popularity of GMC Trucks has been growing. Today GMC on a truck is like U. S. A. on a bond.

GMC Trucks are made by the truck making unit of the General Motors Corporation and backed by that largest of all automobile organizations.

Branches, distributors, dealers and service stations are available to every community where motor trucks are operated.

Let your next truck be a GMC.

**GENERAL MOTORS TRUCK COMPANY**  
Pontiac, Mich.

*One of the Units of the General Motors Corporation*

(601)



Starting a New Load While the Other "Martin Rocking Fifth Wheel" Semi-Trailer Is Being Hauled to the Job. The Use of Trailers Has Made the Hauling of Lumber 15 and 20 Miles an Everyday Occurrence.

ward end of the semi-trailer. The tractor is backed under the forward end of the semi-trailer, which lifts it off the horse, and the coupling is made.

The principal items of hauling costs are the time of the tractor and driver. The investment in the former is considerable and the more continuously it is kept at work, the cheaper becomes the hauling cost. So with the cost of the driver. The more lumber he is

able to deliver, the less the cost per thousand feet, or ton mile.

Motor trucks and trailers have not only cut the cost of lumber hauling but have greatly increased the territory in which it is profitable for a lumber dealer to do business. When the hauling was done by teams, delivery to points more than five or six miles from the yard was so expensive that it was prohibitive. However, by the use of speedy trucks, or trucks and trailers, the distance at which deliveries can be made profitably has been tripled, and hauling loads of lumber 15 or 20 miles is an everyday occurrence with lumber dealers.

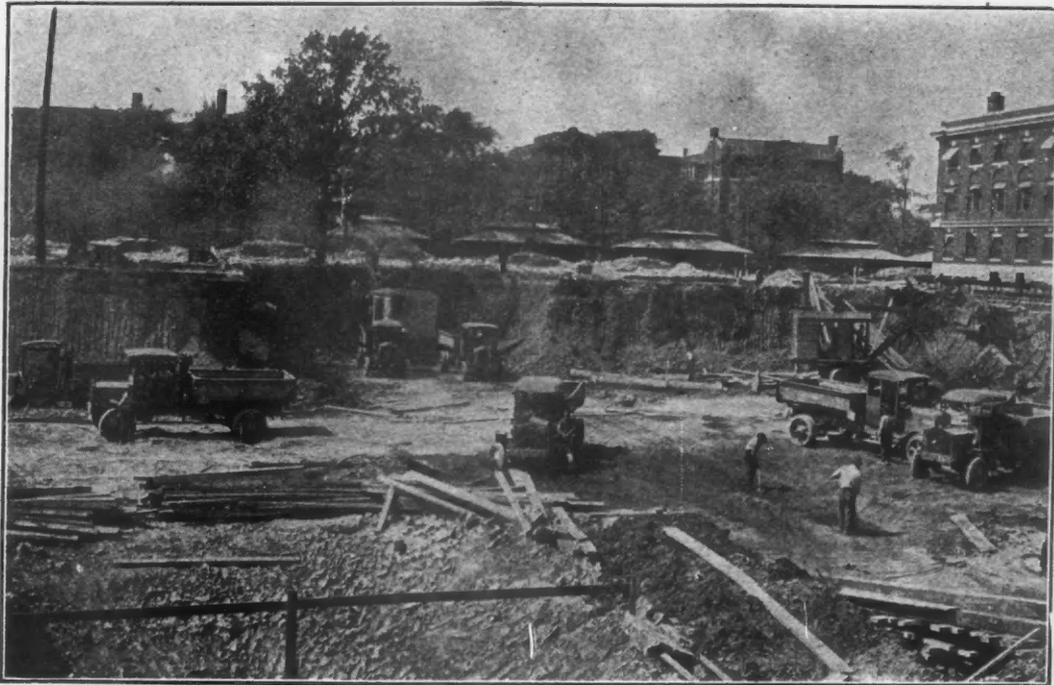
Service, of which delivery is one considerable item, is what wins customers. The lumber dealer who has the hauling equipment to deliver lumber purchases to his customers

quickly and at the least cost is the dealer who gets the most business, and makes the greatest profit.

One motor truck will deliver as much lumber in a day as three teams and wagons. And the investment is practically the same. However, the truck saves the wages of at least two men, makes the work less arduous, shortens the driver's day and is a great deal more satisfactory for both the lumber dealer and



Two-Ton "Indiana" Truck and Trailer Loaded with 3,000 Feet of Lumber for a Job Out in the Country. The Sipsey River Lumber Co., Aliceville, Ala., Have Been Using This Combination for a Year. They Carry a Double Load on One Trip by Using the Trailer.



*Seven Packard trucks in Excavation Work—an especially heavy service that emphasizes the constant dependability of the Packard as compared with the uncertainty of the average assembled truck*

## Which Contractor Can Count on a Good Profit

**W**ITH wages constantly on the jump, the only way the contractor can be sure of a profit these days is to push his operations at top speed.

Trucks tied up on the road, even temporarily, mean idle steam shovels and mounting costs.

Once the contractor begins to keep accurate figures on his trucks he finds out which trucks to keep and which to

scrap—and what make of truck to put his money on in the future.

Here are some facts, summarized from the National Standard Truck Cost System operating in 16 cities.

Packard Trucks show 10 per cent lower gasoline costs than any other.

They show 30 per cent lower repair costs than any other.

They show a lower

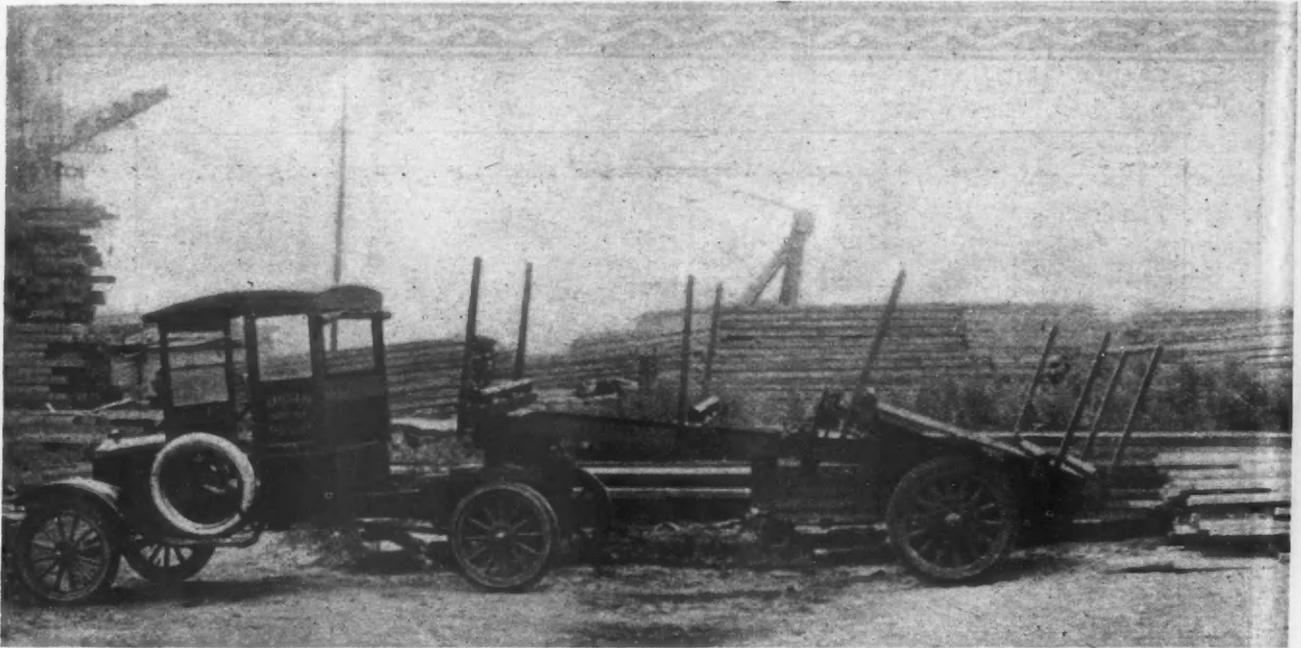
wage cost per ton-mile transportation — make the trip in shorter time.

Ninety per cent of all truck owners who have used the System for a year or more and have compared the Packard with other trucks have standardized on Packard.

The contractor who applies these transportation facts to his own business is surest of a Good Profit.

*“Ask the Man Who Owns One”*

**PACKARD MOTOR CAR COMPANY, Detroit**



Three-Ton "Semi-Trallmobile" with Lumber Dump Just After It Has Unloaded Lumber and Ready to Start Out for Another. This Trailer Is Owned by Church E. Gates & Co., New York City, Who Have Seven More in Active Use, Four Semi-Trailers and Four of the Four-Wheeled Type.

his customers. And by the addition of a trailer or semi-trailer, the efficiency of the truck is increased, and the cost of hauling decreased.



#### Find Trailer Asset in Lumber Business

**C**HURCH E. GATES & CO., New York City, have found that the semi-trailer with lumber dump is an asset to their lumber business. The trailer shown in the illustration has been an active part of their concern since May, 1919.

The rear end of the trailer is so arranged that it can be tipped up. When the driver is ready to unload he moves the pile of lumber to the rear of the trailer by means of a crank. After it has passed the center of gravity on the truck, the rear end tips up and the pile slides on to the ground.

The unloading process is a matter of a few minutes, whereas it would mean a considerably longer time if the truck was unloaded by hand. Instead of the customary delay at its destination, the truck drives up, dumps the load and is off again for another load. The value of such a contrivance in the lumber yard is easily seen.

In another illustration the truck and trailer equipment of the Sipsey Lumber Co., Aliceville, Ala., is shown carrying 3000 feet of lumber. They have used this for over a year and find it a great economy, especially in making long hauls to customers in the surrounding country. They have found a double load can be carried on a single trip.



#### Clutch Riding Wastes Power

**A**RE you a clutch rider? Does your foot continually rest upon the pedal controlling this important part of your truck? If so, you are uncon-

sciously wasting power and are helping put the clutch into a condition where it will slip permanently. Spend a few minutes studying your clutch, its make-up and principle on which it works, learn to keep your foot off the pedal when it is not required to be there, and you need never have any trouble from this device.

Now about clutch riding. The man who keeps his foot continuously on the pedal exerts some pressure—however slight and tho but the weight of the foot—which has a tendency to release the spring tension and make the clutch slip. Slipping is a waste of power and there is a friction which wears away the contact surfaces, adding all the while to the slipping propensity. You should not act as tho fearing a need to release the clutch all the time. With practice the foot should go automatically into place.

Any pressure on the clutch pedal is transmitted directly to the clutch throwout bearing and will surely bring disastrous results to this bearing if clutch riding is practiced to any great extent.



#### After Service Important Factor in Buying Truck

**T**HE contractor who is buying a truck cannot afford to overlook one of the fundamental principles of his purchase, it must have expert after-sales service. The average buyer of a truck does not intend to acquire the expert knowledge needed to take care of a large truck, nor does he want to tie up a large amount of money in spare parts.

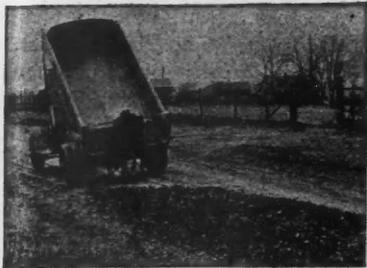
So when buying his car he should look to the man who is selling it for any repair work that may be needed in the future. It will be good policy for him to buy from the manufacturer who makes a strong point of furnishing this after-scale service.

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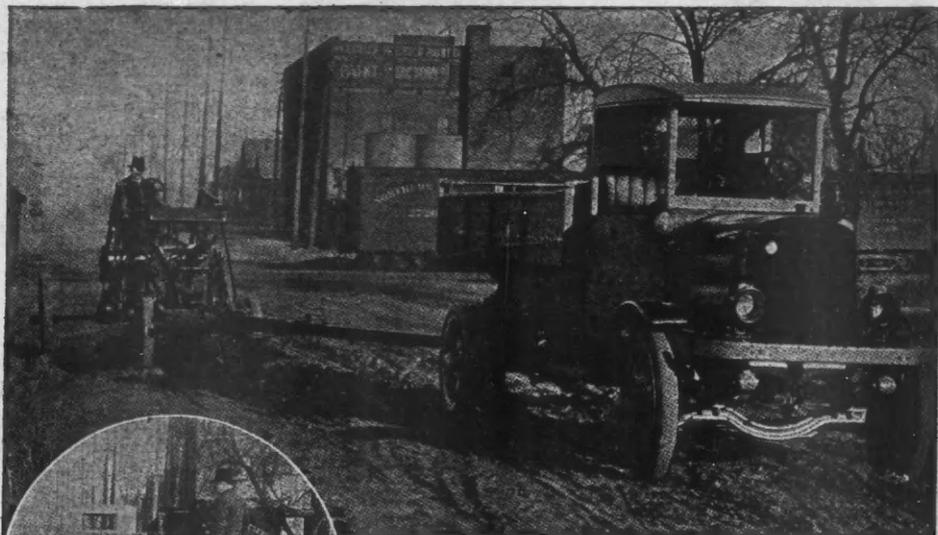
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The Kissel "Heavy Duty" Road Builder in Action.

Above—About to Discharge Its Load.  
Below—Spreading Its Load.



Kissel has spent Fourteen Years to bring Kissel Trucks up to that point of Mechanical Perfection and Superiority that Insures Dependable Performance, Uninterrupted Service and Economical Maintenance.

## How Colorado Highway Commissioners Solved Their Road Building Problems with Kissel Trucks

**T**HE necessity for conserving men and the growing scarcity of available equipment have caused municipal officials and county commissioners in charge of road-building districts to revolutionize their methods in carrying out road-building projects.

At this time when the subject of good roads is of such national importance, and when the vital necessity of more good roads becomes apparent every day, the most efficient equipment for good road building has been receiving considerable attention.

A case comes to our mind in which the County Commissioners of the Washington County Highway Department of Colorado found a way to complete their contract without taking a tractor away from farm work, and at the same time discovered an added utility of the motor truck.

With the work on the contract far behind schedule they decided to try out a "Heavy Duty" Kissel Truck as the motive power. The truck was equipped with a steel dump and hydraulic hoist and was originally intended for the hauling of road material, but nevertheless the commissioners decided to give it a trial on the work of drawing an eight-foot road grader.

Much to their surprise, it was found that the truck

was of more than sufficient power to handle this grader easily, and with considerably more speed than a tractor. As a result, it is now being used continuously for grading purposes when not required for hauling road material.

This use of the motor truck is being undertaken as a matter of efficiency because it is not only doing both jobs with the same power plant, but also the speed of the truck is greater than that of the tractor, and hence it is accomplishing more work in less time. The original investment in machinery was not nearly as great, its upkeep but a fraction of what it would be if both tractors and trucks were employed.

Moreover, as it is the custom of commissioners to employ a limited number of men, and as grading work and the hauling of road material is seldom required to be done in the same district simultaneously, the use of the truck for this purpose eliminates the necessity of using two expensive equipments part of the time, as the truck can be used continuously by the same crew, every day, with a big saving in depreciation and operating expense.

For further information of the adaptability of Kissel Trucks for road building and other municipal work, see the nearest Kissel dealer or write direct.

### Kissel Motor Car Co., Hartford, Wis., U.S.A.



## NEWS OF THE FIELD

### R. E. S. Geare New Sales Manager of T. L. Smith Company

R. E. S. Geare, construction engineer, has been appointed general sales manager of the T. L. Smith Company, of Milwaukee, manufacturers of concrete mixing machinery and contractors' equipment. He will be in charge of the general sales offices, Old Colony Building, Chicago, where the advertising and sales departments are now located.

For the past four years Mr. Geare has operated under the firm name of Geare & Co., Engineers, specializing in sales engineering in the construction and power plant field. Geare & Co. handled the business for the T. L. Smith Company, the Manistee Iron Works, and others.



R. E. S. Geare

Mr. Geare is a graduate of Lehigh University, M. E. class of 1904, and has always been interested in power plant operation, consulting engineering work and sales engineering promotion. Prior to the inception of Geare & Co. he was connected with the Westinghouse Electric & Mfg. Co. and Templeton Kenly Co. He recently designed a new traveling grate stoker which is now in the process of manufacture.

The need for intensive sales and advertising work became so highly important in the field for construction machinery that Mr. Geare was glad to put aside the rest of his work and centralize his efforts upon the development of the business of the T. L. Smith Co.

### Devoe & Reynolds Company Enjoys Prosperous Year

The annual meeting of the stockholders of Devoe & Reynolds Co., Inc., was held at the general offices in New York, on Wednesday, February 11, 1920. The figures presented to the stockholders in the president's report indicate the best year that the company has enjoyed in its long career of one hundred and sixty-six years.

The stockholders passed a resolution expressing their satisfaction with the management of the business, and resolved that they would not offer for sale or sell any of their holdings in the Company, and assured the management it would have their steadfast co-operation in advancing the interest and expanding the business of the Company.

The following board of directors was then elected: W. H. Phillips, I. W. Drummond, E. H. Reynolds, J. M. B. Drummond, S. R. Harrington, J. J. Alsasser, S. S.

Menken, G. H. Phillips, C. A. Campbell, E. S. Phillips, and A. W. Francis.

Immediately after the stockholders' meeting, the new board was organized and elected the following officers: W. H. Phillips, president; I. W. Drummond, first vice-president; S. R. Harrington, second vice-president; C. A. Campbell, third vice-president; J. M. B. Drummond, secretary; J. J. Alsasser, treasurer; E. S. Phillips, assistant secretary; E. T. Gray, assistant secretary; D. Kiefer, assistant treasurer; C. D. Potter, assistant treasurer; and H. E. Reed, assistant treasurer.

The directors also approved and passed upon the plans for a large addition to Plant No. 1, at Smith street and Hamilton avenue, Brooklyn, and work upon this new building will be begun immediately. The foundations will be laid for a ten-story building, and six stories will be pushed to completion as rapidly as possible.

During the past year the company has incorporated two subsidiary companies, the Devoe & Reynolds Co. of Texas, Inc., and the Devoe & Reynolds Co., Inc., of Massachusetts.

They have moved to a large and commodious building at 88-90 High street, in Boston.

They have opened branches in Cincinnati, Ohio, and Fort Worth, Texas, and have other locations in view to carry out their campaign of expansion.



### Ransome Concrete Machinery Co.'s New York Office Under New Management

The Ransome Concrete Machinery Company, of Dunellen, N. J., have placed their New York office, 150 Nassau street, in charge of Lemuel Smith, Jr., F. C. MacDonald and James H. Fitzgerald. Mr. Smith, who has been with the company for a number of years, has for the past two years been assistant sales manager. Mr. MacDonald has been selling mixers in the New York territory for a number of years, and Mr. Fitzgerald has been in charge of the pneumatic mixer department of the Ransome company for a number of years, being recognized as an authority in this line of work.



### J. B. Johnston, Crucible Steel Man, Appointed General Manager Standard Scale & Supply Co.

J. B. Johnston, formerly manager of the ordnance department, Crucible Steel Company of America, Harrison, N. J., has been appointed general manager of the Standard Scale & Supply Co., Pittsburgh, Pa. The Standard Scale & Supply Co. manufactures "The Standard" Concrete Mixers and other contractors' equipment.



### Robert Glendenning, Former Head of Vulcanite Company, Dead

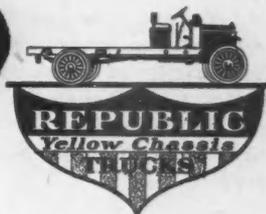
Robert Glendenning, founder and president for years of the Patent Vulcanite Co., died of pneumonia on Feb. 2, 1920. He was 57 years old. A month prior to his death, Mr. Glendenning had retired from active business when the Vulcanite concern was merged with the Beaver Board Companies of Buffalo, N. Y. He retained a large financial interest in the concern.



### Indiana Limestone Quarrymen's Association Reorganizes

The Indiana Limestone Quarrymen's Association with headquarters at Bedford, Ind., in anticipation of a year of unprecedented building was reorganized and expanded recently. The personnel of the association was increased and several

# REPUBLIC TRUCKS



The ruggedness of the Republic is amazing. Its reputation in this respect is so remarkable that it undoubtedly is regarded as the most dependable truck in America. It stands up, and keeps on standing up—for years! More business men use the Republic than any other truck—over 60,000 of them. The point is, they keep on adding new units to their Republic fleets. Proof of Republic economy, in other words, is overwhelming.

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

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

important appointments made. H. S. Brightly, formerly of Chicago, was appointed secretary. George B. McGrath was transferred from Washington, D. C., to take charge of the Metropolitan Service Bureau at 489 Fifth avenue, New York City. He will also temporarily continue his activities as field representative of the association in the Atlantic states.

C. Roland Yanson was transferred from Bedford, Ind., and placed in charge of the Chicago Service Bureau at 231 Insurance Exchange, Chicago. W. S. Whyte, with headquarters in Bedford, will cover the middle states territory, succeeding Mr. Yanson. The association's activities in the western field will continue under the supervision of J. R. Sargent with headquarters in Topeka, Kan.

Mrs. C. L. Walters was promoted to the position of secretary of the Bedford Stone Club Auxiliary and C. H. Badgley of Toronto, Canada, will act as manager of the Canadian organization.



### Phelps Light & Power Located in Rock Island

The Phelps Light & Power Co. is located at Rock Island, Ill., and not at Peoria, as the article in the "News of the Field" department in the February issue incorrectly stated.



### Upson Company Doubles Capital

The rapid progress of the wall board industry is indicated by the increase of the capital of the Upson Company, Lockport, N. Y., from \$1,000,000 to \$2,000,000.

Eight years ago the Upson Company was started in a very small way by two brothers, C. A. Upson, president, and W. H. Upson, Jr., secretary-treasurer. Their wall board met with approval and soon their small one-story plant became inadequate to supply the increasing demand for the product.

In 1914 the company finding it necessary to enlarge their plant, purchased several acres of land in West Lockport and erected a small modern plant. Since then progress has been so rapid that large additions have been added yearly.

The company is now engaged in the construction of a large new plant adjoining its other properties.



### National Federation of Constructive Industries to Hold First Convention March 24-25

The first annual meeting of the National Federation of Constructive Industries will be held at The Hotel Sherman, Chicago, on March 24-25. The federation is designed to promote closer co-operation between manufacturers, distributors, contractors, architects, engineers, financiers and other construction interests. Invitations have been extended to all associations concerned with construction.



### Ohio Builders Favor More Fire Protection

The Ohio Builders' Supply Association at the convention held at Columbus, Ohio, January, 1920, came out strong for more fire protection. They passed the following resolution:

WHEREAS, The housing shortage in the United States creates a serious situation, and,

WHEREAS, The fire losses reported in 1917 to the National Board of Fire Underwriters amounted to \$66,166,420 in 232,021 residences, and,

WHEREAS, The cost of material and labor is constantly mounting so that individual losses are likely to be greater year by year, cutting down our national resources to a tremendous extent, and aggravating the housing situation to an unnecessary degree. Be it, therefore,

*Resolved*, That this association go on record as to the necessity of giving more adequate fire protection to the combustible members of residences; be it further

*Resolved*, That each member of this association be requested to advise prospective owners of the situation and furnish full information as to the best available methods of protecting such structures.



### Pressed Steel Corporation Consolidates

The Hydraulic Pressed Steel Company has consolidated all of their interests under the name of The Hydraulic Steel Company of Cleveland. The individual plants will be known as follows: The Hydraulic Pressed Steel Co. of The Hydraulic Steel Co., Cleveland; The Hydraulic Steelcraft Co. of The Hydraulic Steel Co., Cleveland; The Cleveland Welding & Manufacturing Co. of the Hydraulic Steel Co., Cleveland; The Canton Sheet Steel Co. of the Hydraulic Steel Co., Canton. The executive offices of the company are in the Illuminating Building, Cleveland, Ohio, with branch offices in New York, Chicago and Detroit.



### F. C. Austin Company Increases Manufacturing Facilities

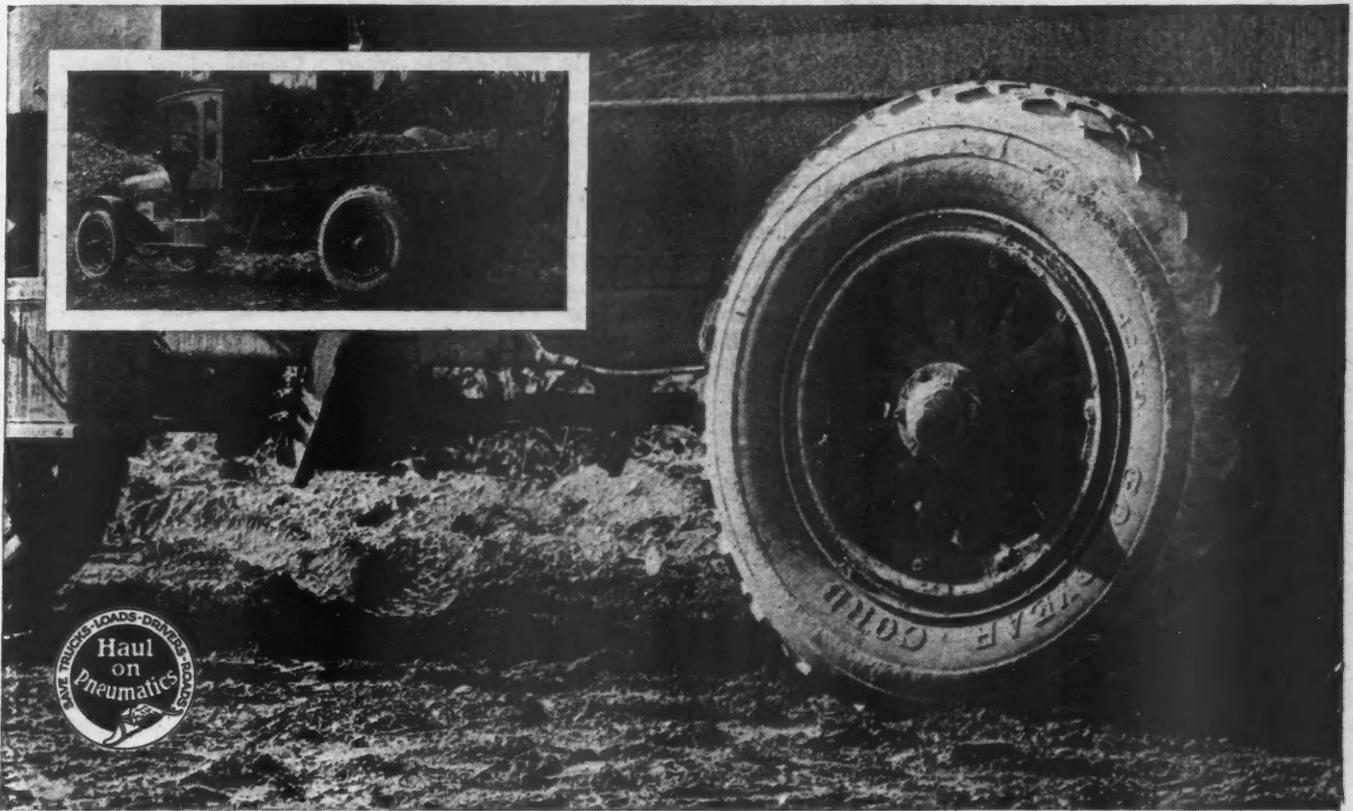
The F. C. Austin Co., Inc., Chicago, Ill., has combined with the Linderman Co., Muskegon, Mich. The combination of

## Sale of Buildings and Equipment

### U. S. NAVAL TRAINING CAMP DETROIT, MICHIGAN

Sealed bids for the sale of buildings of the U. S. Naval Training Camp, Detroit, Michigan, will be publicly opened at 10:00 a. m., on March 9, 1920, at the Navy Recruiting Office, Journal Building, Detroit, Michigan.

Catalog of this sale may be obtained from Lieutenant Commander N. B. Farwell, (SC) U. S. Navy, Senior Member, Board of Sale, Naval Training Station, Great Lakes, Illinois.



Copyright 1920, by The Goodyear Tire &amp; Rubber Co.

# Yardage via Pneumatics

*"In hauling yardage on contract my truck on Goodyear Cord Tires has made six to eight more round trips, of ten miles each, per day than any solid-tired truck on the same work. During a recent rainy spell my truck on Goodyear Cords was the only one hauling gravel to a mixer — the solid-tired trucks were stopped by soft going. This means money to me." — W. S. Devenwater, Contract Hauling, Grand Rapids, Michigan*

THE facts given in the above letter furnish new and additional proof that in contract hauling trucks equipped with Goodyear Cord Tires clearly outclass those on solid tires.

Even though the difficulties are frequently extreme and the work arduous, the Goodyear pneumatics are regularly producing substantial economies.

These economies are made apparent when, despite bad roads, trucks on the big Goodyears haul sufficient yardage to keep mixers and high-priced labor busy.

Economies are evident when trucks on Goodyear pneumatics tally more trips each working day, when they roll surely over soft and thawing ground.

Substantial economies are plainly apparent when, after months of hard usage, the cost records of trucks on Goodyear Cords show less truck repairs and less depreciation. The injurious effects of jars and jolts are minimized.

This efficiency of the perfected pneumatic is due to its cushioning, traction and activity; all of which are made practical by the sturdy toughness of Goodyear Cord construction.

More detailed information about the results that they will produce in hauling building and construction material can be obtained by writing to The Goodyear Tire & Rubber Company, at Akron, Ohio.

GOODYEAR  
CORD TIRES

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

Austin and Linderman plants increases eight-fold the capacity of the present Austin plant, and gives this new company one of the largest capacities for earth-loading and cement-working machinery in the United States.

The F. C. Austin Machinery Co. is incorporated to take over the entire business of the F. C. Austin Company, Inc., and retains the personnel of the companies whose combined efforts are directed towards supplying the demand for the Austin machines.

F. C. Austin retires from the active management and B. A. Linderman, president of the Linderman Company, assumes control. Offices of the combination will continue in the Railway Exchange Building, Chicago.



### Substitute for Frosted Glass

ALL kinds of glass are scarce on the markets, and frosted glass is particularly hard to get now.

A makeshift substitute that isn't bad at all if properly applied, consists in brushing on the plain glass a coat of ordinary flat wall paint, afterwards stippling it with a stiff brush to give it uniform appearance and eliminate the brush marks.

In factories and other places that do not call for de luxe appointments, this painting of windows in place of frosted glass will answer permanently and save considerable money, for the glass is not only scarce, but it is high in price at present.



### Outside Stain Company to Expand

A paint and color factory to supply the territory from San Diego to Vancouver west of the mountains is to be established in Los Angeles by the Starks Manufacturing Co., Kansas City, Mo.

W. A. Ruff, sales manager of the company, is looking into the possibilities of the project. Because of the climate he favors this location for such a factory, which has to use many materials which congeal in cold temperatures.

John J. Starks, vice-president and general manager of the company, has stated that the company contemplated establishing branch offices and a branch factory on the Pacific Coast. It has an extensive trade on the increase in that section and in the Southwest, particularly in stains for bungalows. Kansas City will continue to be the headquarters.



### Wall Board Corporation Gives Life Insurance as Christmas Gift to Workers

Finding in an investigation among their organization and factory workers that a large percent of them were not alive to the need of adequate life insurance protection for their dependents, the Upson Company, Lockport, N. Y., decided that the best Christmas gift would be life insurance.

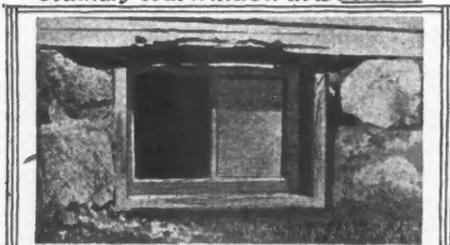
The amount of each policy is based upon the length of service of any employee with the company and each year will be automatically increased up to the sum of \$1,000 for factory associates and \$1,500 for the office employees. If the employe should leave the company he retains the privilege of continuing the insurance upon his own resources.

A vote of appreciation was received from the men and several employes have increased the size of their policy.

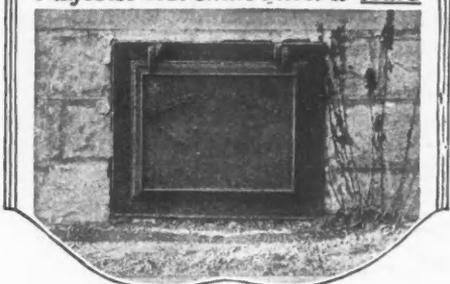


IN setting out and putting up horses for stairs the tread should be made to pitch about one-eighth inch in its width, as this makes a much easier stair than if the treads were perfectly level.

Ordinary Coal Window In 15 Months



Majestic Coal Chute After 15 Years



## 13 Months or 13 Years?

These two pictures tell why you should protect your house with a Majestic Coal Chute.

With an ordinary coal-bin window your house may look fully as bad as that shown in the upper illustration in thirteen *months*, after two seasons' coal is delivered.

But with a Majestic Coal Chute it should be in as perfect condition after thirteen *years* as the one in the lower illustration. This chute was in use more than thirteen years when the photograph was taken and the house is not marked or scarred.

Your house—every house—can be Majestic-equipped. Write for latest catalog and specifications. Working drawings gladly supplied.

**THE MAJESTIC COMPANY**  
602 Erie Street - HUNTINGTON, INDIANA

# Majestic COAL CHUTE

*Protects Against Damage  
Enhances Property Value  
Lessens Depreciation  
Saves Money*

# KELLASTONE

IMPERISHABLE STUCCO



## USE KELLASTONE for BUNGALOWS

Contractors and builders should make capital of the popularity of bungalow construction—the natural result of higher rents and excessive fuel cost.

All of the advantages of sturdy construction at moderate cost, reduced fuel and upkeep expense in the home are assured the builder through the use of

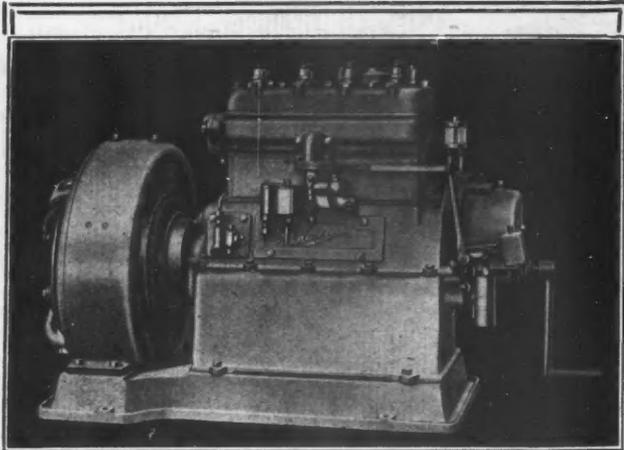
## KELLASTONE

IMPERISHABLE STUCCO

The original magnesite stucco. Successfully applied in any kind of weather. By its use the contractor can combine profits for himself and at the same time give the owner satisfactory bungalow construction.

KELLASTONE is equally adapted for more pretentious houses, apartments, public buildings etc., and for remodelling and rebuilding jobs. Ask for full information about KELLASTONE.

**NATIONAL KELLASTONE CO.**  
Room 515 155 E. Superior St. Chicago, Ill.



*Universal*

**4 K W  
ELECTRIC  
GENERATING  
SET**

The Universal 4 K W set is being specified for all new buildings requiring isolated electric service, because of its smoothness of operation, reliability and economy.

It has sufficient power to carry the overloads now imposed on small lighting plants. It can be used to supply current direct on the line 110 volts, or operate through storage battery as desired. Its capacity of 4000 watts gives ample power to carry lights, motors, and utensils, with 200-20 watt lamps if desired.

**CINEMA**

The Universal is known among the moving picture trade as the ideal plant for operating picture machine and house lights of a small theatre.

**ARMY AND NAVY**

Used over 1500 Universal 4 K W sets during the recent war.

**AT HOME**

Many large farms, homes, and churches use one or more Universal sets to supply their current.

It will interest you to read how this best known of plants is constructed in our big especially equipped factory.

Send for Bulletin No. 30

**UNIVERSAL MOTOR CO.**  
OSHKOSH, WIS CONSIN



**CATALOGS  
BULLETINS & BOOKS  
RECEIVED**

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

"Lifting Loads with Less Labor" is the principal article in the February number of "DooR-Ways," published monthly by the Richards-Wilcox Manufacturing Co., Aurora, Ill. It describes and illustrates the application of Over-Way equipment manufactured by the concern.

Concrete for War Memorials is discussed in the February-March issue of Concrete in Architecture and Engineering issued bi-monthly by the Portland Cement Association, Chicago, Ill. The other articles are devoted to the uses of concrete in all kinds of buildings.

"Acme Angles" is a sixteen-page booklet published monthly by the Acme Motor Truck Company, Cadillac, Mich. The February issue contains letters from customers who have used the Acme truck in a wide variety of businesses. It also contains helpful hints to truck users.

"New Homes for Old" are illustrated in the December Medusa Review, a monthly paper devoted to the products manufactured by the Sandusky Cement Co., Cleveland, Ohio. Other pictures of buildings constructed of stucco or cement bricks are shown, as well as pictures of concrete garden furniture and building trim.

"Kohler of Kohler News," published by the Kohler Co. organization at Kohler, Wis., is a twenty-six-page booklet with cover dealing with the activities of the employees of this concern, which manufactures enameled plumbing ware products.

A History of Stucco started in the January number of Expanded Metal Construction, the monthly magazine published by the Northwestern Expanded Metal Co., Chicago, Ill. It will take up the use and origin of stucco in the past and now. The rest of the issue deals with the use of metal lath, which is one of the products of the company.

"Republic Trucks" is the title of a color booklet with cover issued by the Republic Motor Truck Co., Alma, Mich. It contains photographs of the Republic truck as it is used in a wide range of activities, as well as drawings of chassis with specifications.

"Garage Hardware for Rolling Doors" is the title of a sixteen-page booklet issued by the Stanley Works, New Britain, Conn. It contains several illustrations showing the various combinations of rolling doors used in garages with descriptive text.

How and Where to Use Oak Flooring is fully described in a booklet and folders issued by the Oak Flooring Manufacturers' Association, Chicago, Ill. They take up in detail the laying, handling and finishing of oak flooring.

"Gilt-Edgings" is a small journal issued by the R. J. Schwab & Sons Co., Milwaukee, Wis. It is devoted to pipeless furnaces and accessories which the company manufactures.

# FRONT RANK

TRADE NAME REGISTERED

*Burns Your Smoke*

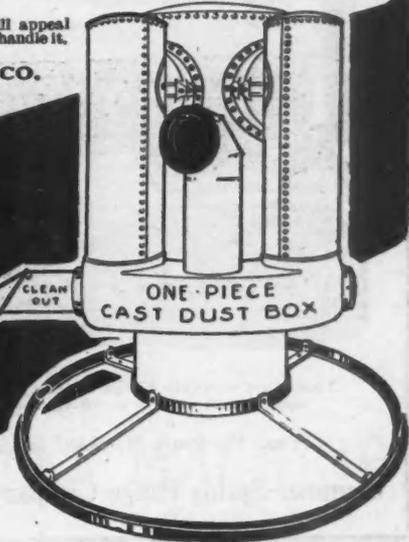
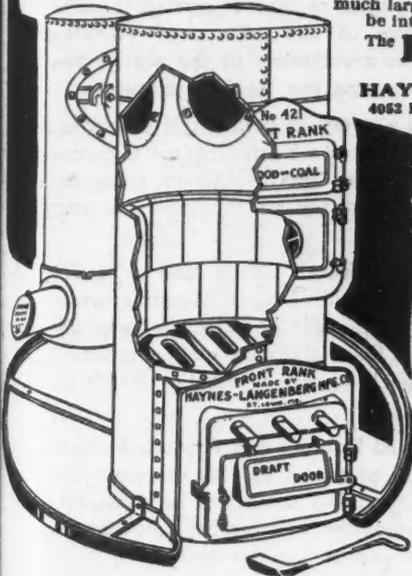
THIS is a front view of the FRONT RANK with the jacket off; note the large grate openings, fire brick lining of firepot, and roomy doors.

That is why it gives more heat for the fuel consumed than other furnaces do. The two heat traps between firepot and chimney prevent the heat from escaping up the chimney with the gases and give ample time for complete combustion of inflammable materials within the smoke, thus extracting full value from the fuel burned. The radiating surfaces are much larger than average, and vertically arranged so radiation cannot be interfered with by gradual coatings of dust.

THIS is a rear view of the FRONT RANK with the jacket off; note the two tall cylinders which are the heat-traps, and the easily cleaned dust box.

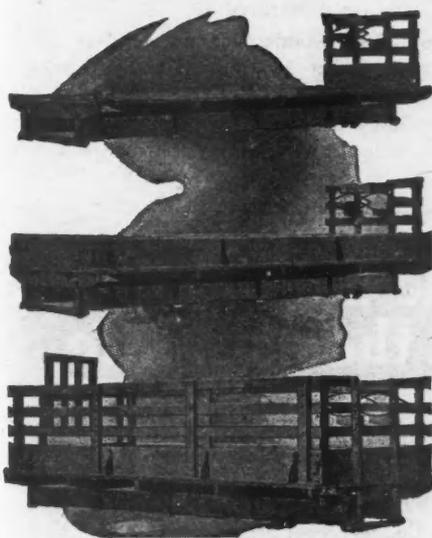
The **FRONT RANK** Pipeless Furnace is the furnace that will appeal to your prospects. It will pay you well to handle it. Write for our literature and prices.

**HAYNES-LANGENBERG MANUFACTURING CO.**  
4052 Forest Park Blvd. St. Louis, Mo.



# ALLITH-PROUTY

## Convertible Wagon Bed Hardware



Enables you to build, during your spare time, three wagon bodies in one and at less expense than the cost of one new body. It provides a grain bed that is a tight and leak-proof—a stock rack that slips on snug and solid—a hay rack bed that allows loading and unloading to be done faster and easier.

### We Furnish Set Complete

in every detail—already to install. Even instructions and drawings which makes it easy for any carpenter or farmer to do the work—and do it at exceptionally low cost. Send for our illustrated literature that shows and describes this hardware and illustrates how easy any one can make this combination wagon bed.

**Dealers** everywhere find farmers keenly interested in this money and labor saving hardware, for the combination body type is needed on every farm. Get in touch with us for our proposition.

Write for our general catalogue No. 90 showing and describing our complete line of FIRE DOOR HARDWARE, Door Hangers and Tracks, Overhead Carriers, Garage Door Hardware, Spring Hinges, Hardware Specialties, Rolling Ladders, etc.

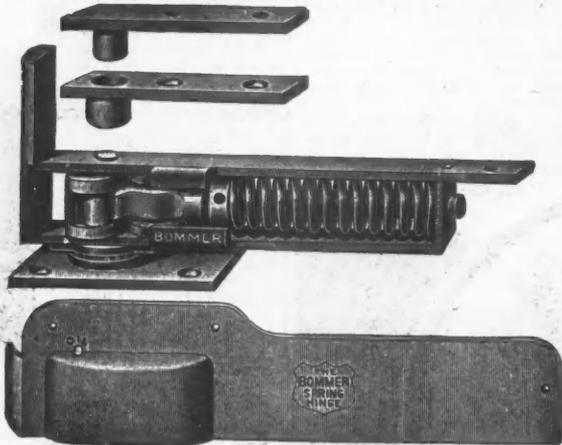
ALLITH-PROUTY CO. DANVILLE ILLINOIS.



# 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 80 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.

"Niagara Rooms" is the title of a 24-page booklet in colors issued by the Niagara Wall Board Co., Buffalo, N. Y. It contains attractive photographs of interiors showing the uses of wall board as well as a section on farm buildings.

Tap wrenches are described and illustrated in a small folder recently issued by the Alert Tool Co., Philadelphia, Pa. The advantages of the high speed solid tap wrench which the firm manufactures, is set forth as well as that of a combination ratchet tap and extension high speed wrench to be used in reaching out-of-the-way places.

"Aberthaw Preliminary Report on Vibration" is a bulletin issued by the Aberthaw Construction, Boston, Mass., dealing with the preliminary work carried on by the Aberthaw investigation of the effects of vibration in structures. It contains a summary of the replies answering the original inquiry sent out by the committee.

"The Red Book" is a compact little book describing the products manufactured by the United States Gypsum Co., Chicago, Ill. The extensive line of plasters, cements, tiles and wall boards are illustrated and explained in encyclopedia form in 96 pages.

"Durable Garage Hardware" is the title of a 56-page cover booklet issued by the Frantz Manufacturing Co., Sterling, Ill. It contains seventeen color plates of garages of various types with floor plans as well as many other photographs of garage hardware which the firm manufactures.

Facts About Prepared Roofing and Asphalt Shingles are presented in a bulletin prepared by the Prepared Roofing and Shingle Manufacturers' Association, Chicago, Ill. Explanatory text, testimonials and actual photographs of roofing that has been exposed to fire tests form the basis of this booklet.

"Genuine Comfort in the Cold Weather" is the subject of the pamphlet recently issued by the Steam Corporation, Chicago, Ill. It deals with the Nokol Automatic Heater which uses oil as fuel.

Tool Chests for Builders and Mechanics as made by the Union Tool Chest Co., Rochester, N. Y., are described in several small folders issued by that company. Various types of tool chests are illustrated.

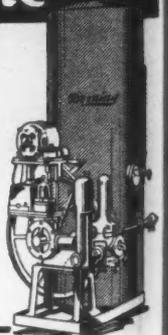
"8 Garages and Their Stanley Hardware" has been published in miniature form by the Stanley Works, New Britain, Conn. It is a 32-page booklet containing illustrations and floor plans of eight garages with information as to the exact amount of Stanley hardware needed to equip them.

## Include the Water System in the estimate

THE low cost of a Deming Hydro-Pneumatic System makes the expense practically negligible when figured in with the total cost of building. The contractor is not only able to plan and deliver a more modern and livable home, but by our special contractor's offer makes a neat additional profit. Write for full details.

The Deming Co., 99 Depot St., Salem, O.  
Henion & Habbell, Chicago Harris Pump & Supply Co., Pittsburgh

**Deming**  
WATER SYSTEMS





**This Trade Mark Identifies  
QUALITY**

Quality that endures—quality that assures lasting satisfaction for a buyer and adds to the prestige of a builder. The enduring excellence of



**Paints Varnishes Stains Fillers Colors**

is daily proof of careful manufacturing from highest grade raw materials.

*Prices, Samples and Literature on Request—write us*

**EUGENE E. NICE**

268-274 South 2nd Street

PHILADELPHIA, PA.

# THE HERCULES

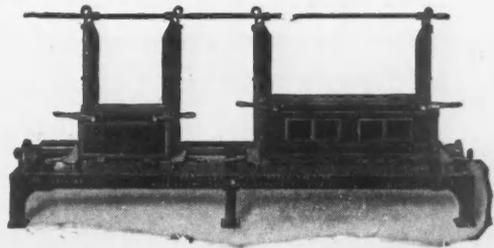
A Concrete Block House is not complete as to durability and appearance, unless the trimming is made of concrete. Artificial stone also make ideal trimming for brick and stucco buildings. Stucco should be used on concrete blocks on account of color, low absorption and equal expansion.



All necessary blocks and trimming stone can be made on the

## HERCULES MACHINE

with any mineral facing desired.



### The HERCULES is

distinctive, elastic, accurate and durable with both quality and production considered.

The equipment may be extended to meet increasing demands. Simply add new plates or forms to the original machine. Get away from the close competition by using a *Hercules*, and make high grade work to be used above the foundation.

*May We Send You Our Catalogue?*

You cannot afford to be without our

### CEMENT BAG CLEANER

if you use any quantity of cement. May we send you a descriptive circular giving the savings that can be accomplished, and a partial list of users?

## Century Cement Machine Co.

56 Brown's Race

ROCHESTER, N. Y.





# KEEP YOUR EYE ON CANADA!

**"She Is Your Next Best Customer"**

The Annual American Exports to Canada amount to

**\$400,000,000**

Are you getting your share of this?

WINNIPEG is only one example of Western Canada's remarkable growth. Winnipeg arose from a prairie town to her present place as the world's greatest grain market.

What it takes to get this business is information.

## MACLEAN DAILY REPORTS tell you what you want to know

The industrial information gathered by our reporters thruout Canada is delivered daily at your desk.

These daily reports put your salesmen on real prospects. No hazy rumors and wasted trips. This service will mean contracts for you that you would never hear of otherwise.

Hundreds of firms are using MacLean Daily Reports.

Write for our pamphlets

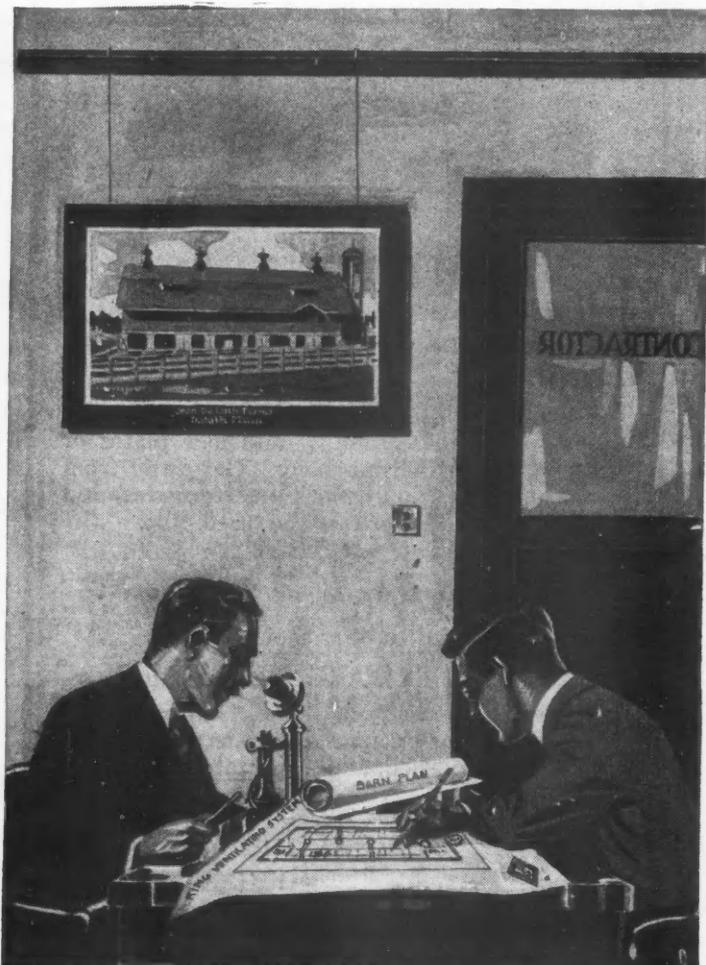
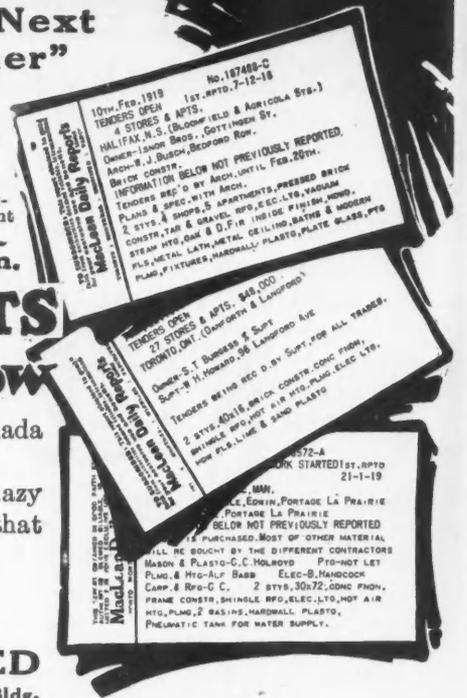
### MACLEAN DAILY REPORTS, LIMITED

345 Adelaide St. W. Toronto, Ont.

119 Bd. of Trade Bldg. Montreal, Que.

607 Electric Ry. Chbrs. Winnipeg, Man.

212 Winch Bldg. Vancouver, C. B.



## Unload Your Barn Ventilating Problems Onto Us

Let us assume the responsibility of ventilating the barns you build. Planning a ventilating system that will operate satisfactorily requires knowledge gained only through long study and experience. Put the problem up to us by asking your customer to let you put in a King System.

Good barn ventilation means more than the Aerators on the roof. King Systems consist of three units—King Aerators, Foul Air Flues and Fresh Air Intakes. King Aerators can, of course, be used without the other parts of the system, but with the complete system you can guarantee satisfactory ventilation of the entire building.

When we accept an order for a King System our responsibility does not cease until the building is properly ventilated.

Send us the plans of the next barn you build and let us make an estimate on a King System for it. Our book on Barn Ventilation should be in your hands for reference. Write us.

#### King Ventilating Co.

1202 Cedar St. Owatonna, Minn.  
(On the Jefferson Highway)  
Ventilating Engineers for Barns, Hog Houses and Creameries



The King Aerator drawing moisture out of a building. The steam can easily be seen in cold weather.



Be sure this diamond King trade-mark is on the ventilating system you install.

# KING SYSTEM OF VENTILATION

"Makes Good Barns Better"

# MIAMI

## KEEP MOVING

EVERY hour your truck stands idle is an hour of expense without returns. The transportation of every load too bulky or awkward in shape for your truck to take means increased production cost. Keep your truck moving, and do all your own hauling, by using a MIAMI TRAILER.

"Miamis" come in styles and sizes to carry anything, from 30 ft. timbers, to sand or men. Capacities from 800 lbs. to 12,000 lbs. They are sturdily built of best materials, and each is carefully inspected before leaving the factory. The Timken Roller Bearings, Shock Absorbing Drawbar, Artillery Wheels, Solid Rubber Tires and Oil Tempered Semi-Elliptic Springs make the Miami an asset that will give the best service under any conditions.

*Write and tell us of your hauling problems and we will tell you how to cut your expenses.*

THE MIAMI TRAILER COMPANY, Troy, Ohio



# TRAILERS

## The Insley Mast Hoist Bucket Plant

*For handling concrete on Small Concrete Jobs*

IF you have concrete work on which you use either one-half or one-sack mixers, this is equipment which you cannot afford to be without. Of low first cost and such construction as to permit of quick erection, it solves the problem of elevating and distributing concrete on the smaller job where the erection of a tower is not justified.

*Write For Particulars.*



INSLEY MANUFACTURING CO.

Engineers INDIANAPOLIS, INDIANA. Manufacturers

# Trailmobile

Trade-Mark Reg. U. S. Patent Office

## Haul Material Efficiently

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., 3/4 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.

**DIVISION No. 4**  
Pole Trailmobiles, 2 ton, 3 ton and 5 ton.

The high-grade rugged construction of the Trailmobile; its exclusive dumping mechanism and efficient coupling and steering devices, give it many advantages.

Write for literature.

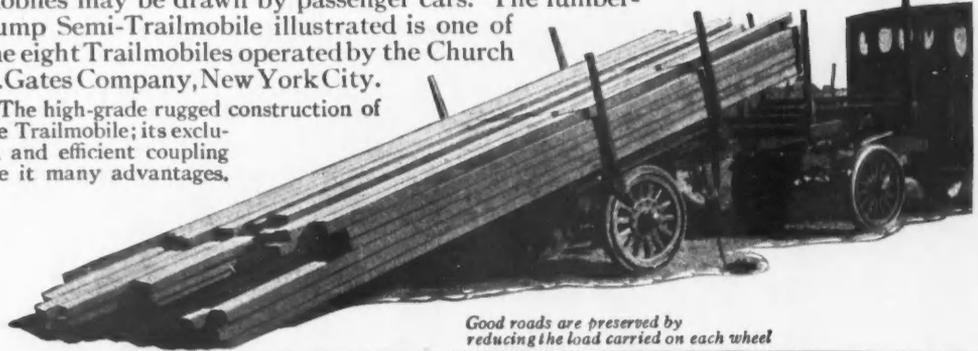
**The Trailmobile  
Company**  
583 E. Fifth Street  
Cincinnati, O.

**I**DLE standing time for loading or unloading is practically abolished by Four-wheeled and Semi-Trailmobiles with special frames for dumping lumber.

The load can be put on while the driver and motor unit are away on another trip. The load can be deposited on the ground in a few seconds without scattering.

Trailmobiles of suitable models and sizes are provided for the building trades. Lighter four-wheeled Trailmobiles may be drawn by passenger cars. The lumber-dump Semi-Trailmobile illustrated is one of the eight Trailmobiles operated by the Church E. Gates Company, New York City.

The high-grade rugged construction of the Trailmobile; its exclusive dumping mechanism and efficient coupling and steering devices, give it many advantages.



Good roads are preserved by reducing the load carried on each wheel

## "The Hen That Laid the Golden Eggs"

may be a myth—but the idea appeals, and the woods are full of people out hunting for just that kind of a chicken.

Following this line of thought, thousands of Jack-the-Garage-Builders have climbed the beanstalk of doorway convenience and feathered their nests with the down of comfort and economy that comes from that modern hen that lays the golden eggs of doorway perfection.

## Slidetite Garage Door Hardware

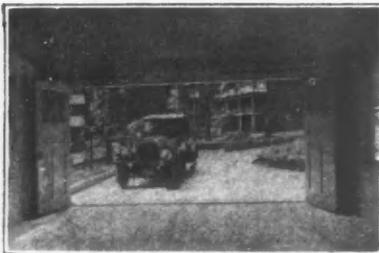
**SIMPLE TO INSTALL. EASY TO OPERATE.**

Doors cannot sag. Close weather-tight. Do not need locks nor holders to keep them from blowing shut. Make an attractive and convenient doorway.

If you have "Slidetite" on your garage you know that it is the last word in Garage Door Hardware. If you do not have "Slidetite" you owe it to yourself to find out about it.

You undoubtedly pass garages every day "Slidetite" equipped—ask one of the owners. They are always glad to demonstrate "Slidetite."

Write for descriptive folder QF-1.



### Richards-Wilcox Mfg. Co.

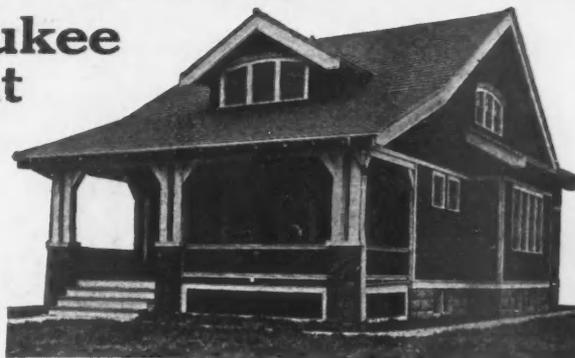
A Hanger for any Door that Slides.  
CHICAGO ST. LOUIS LOS ANGELES PHILADELPHIA  
AURORA, ILLINOIS, U.S.A.  
BOSTON NEW YORK MINNEAPOLIS SAN FRANCISCO  
LONDON, ONT.



Here's What a Milwaukee Contractor Says About

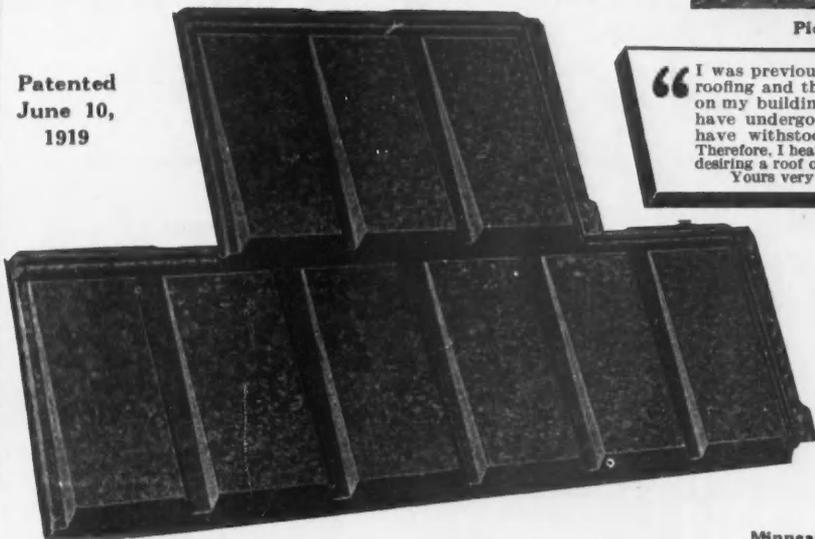
**"Titelock" AMERICAN Metal Shingles**

—And he is in a position to know:



Picture of the building referred to below

Patented  
June 10,  
1919



“ I was previously uninformed about the use of this class of roofing and therefore rather skeptical about putting them on my buildings, but since these Shingles were erected they have undergone tests of severe rain and hail storms and have withstood same with no indication of any leaks. Therefore, I heartily recommend the use of these shingles to anyone desiring a roof of artistic appearance and lasting qualities.  
Yours very truly, JOHN HUPFER, Contractor and Builder ”

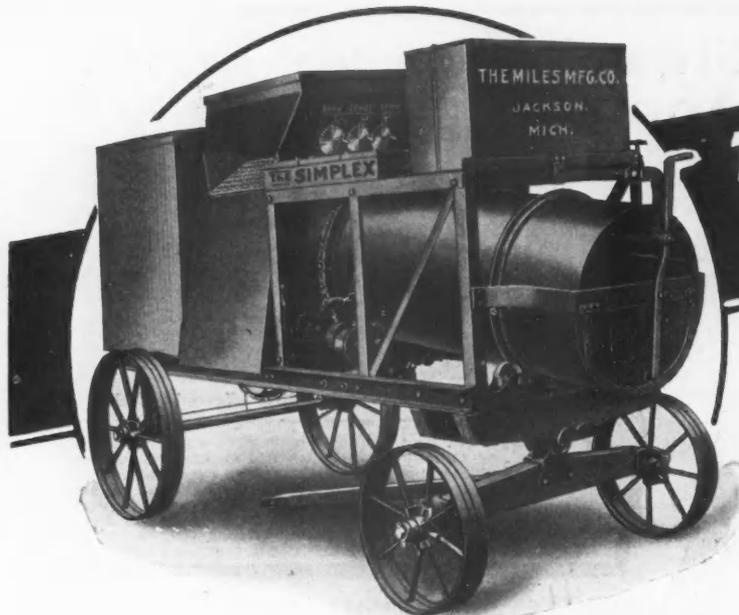
“Titelock American” shingles are especially appropriate for residence buildings. They reduce insurance cost approximately 10%. They are artistic in appearance and will outlast practically any other shingle made. We make other patterns of “Titelock” Metal Shingles and Tile. Ask for Safety Roof circular. Estimates furnished on application.

**MILWAUKEE  
CORRUGATING CO.**  
Milwaukee, Wis.

Branch at Kansas City, Mo.  
Minneapolis Sales Office, Minneapolis, Minn.



**T**HE Circulation of the American Builder is 50,000 copies monthly, a circulation which represents in one grouping more than twice the number of intelligent, discriminating, wide-awake builders, dealers in building materials, architects and contractors enjoyed by any two other publications in the building field.



**TAKE A LOOK AT THE "SIMPLEX"**

**IT IS A COMBINATION OF THE BEST IN MIXERS**

An automatic proportioning continuous mixer with a revolving drum.  
 Saves 10% on the cement and an average of 50% on the cost of labor.  
 You can't afford hand labor in these days of high wages and scarcity of help.  
 Our catalog will show this mixer from every angle. **WRITE FOR IT.**

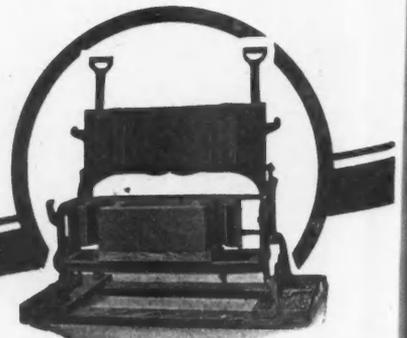
**It Pays to Make Good Blocks**

Architects and contractors will pay more for blocks made by the Miles Wet Process because they are finely faced and have density and strength. Our No. 5 machine makes 50 different sizes and a wide range of designs.

*Write for Prices and Catalog*

**THE MILES MANUFACTURING CO.**  
 JACKSON, MICHIGAN, U. S. A.

No. 5

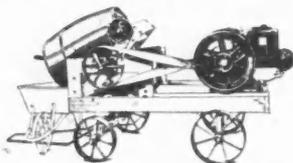


**It'll Keep Six Men on the Jump**

Work and lots of it! The Sheldon Concrete Mixer is built to stand up under the toughest kind of service and keep it up the year around. It gives a perfect mix in one to two minutes. It is easy to charge and discharge and will work in very close quarters when necessary. It is so easily moved from place to place that it is often set to dump directly into the forms and move along with the work, saving the labor of wheeling long distances.

Its cost is remarkably low. In fact many farmers, even, have found it profitable to keep a Sheldon for their occasional concreting jobs. It is the ideal mixer for the Carpenter-BUILDER. There is good profit in placing foundations, walks, driveways and other bits of concreting with a Sheldon instead of subletting the work or doing it by hand. Large contractors use it on all ordinary work and find it makes a big saving for them on odds and ends of large projects. In many cases the Sheldon has replaced larger and much more expensive machines with much more satisfactory service.

**Sheldon Concrete Mixers**



No. 8X. A contractor's machine from the ground up; one of the most popular of our eleven models among contractors. Equipped with Stover 2 H. P. engine. Very easy to move from place to place. Dumps into wheelbarrow or directly into forms (all Sheldon models dump the same way). Costs complete less than some hand mixers.

**GET THE CATALOG**

For complete information on all models—hand and power, on legs, skids, or trucks, fill in the catalog coupon and send it to us today.

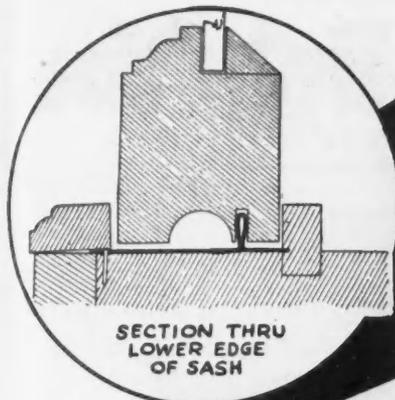
**Sheldon Mfg. Co., Box 3003 Nehawka, Neb.**

**Sheldon Mfg. Co.,**  
**Box 3003, Nehawka, Neb.**

Please send me your 1920 Catalog and 30-day Free Trial Privilege Offer.

Name.....

Address.....

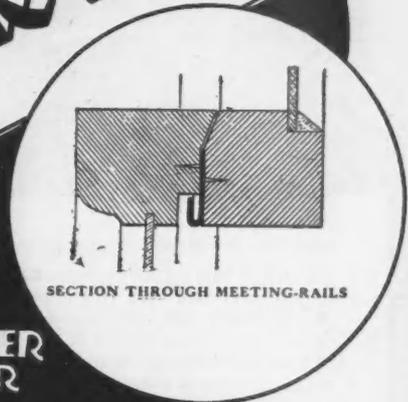


SECTION THRU LOWER EDGE OF SASH

**"THE EASIEST STRIP ON THE MARKET TO INSTALL"**

made entirely of metal

**Allmetal Weatherstrip**



SECTION THROUGH MEETING-RAILS

WRITE FOR OUR SPECIAL OFFER TO THE CARPENTER

**ALLMETAL WEATHERSTRIP CO. CHICAGO**  
124 W. KINZIE ST.



Self-Riveting

Self-Adjusting

## An Urgent Necessity to the Builder

From Iowa comes this letter:

"Please send us, special delivery, 1 box of No. 14 ANKYRA Ankor Bolts. We have used up the last box in stock and our experience during the past two years proved quite conclusively to us that we cannot get along without them.

"Hanging fixtures on any wall is just *pastime* when you have ANKYRAS."

ANKYRA advantages to the builder are:

1. Time and labor saving.
2. Ease of application.
3. Hold in any wall.
4. No nailing blocks necessary.
5. Permanent fastenings.

Prove these advantages to yourself. Tear out this advertisement, pin a Dollar bill to it and mail it. You will get a collapsing tool and 25 No. 8 ANKYRAS by return mail.

**ANKYRA MANUFACTURING COMPANY**  
151 Berkley Street Wayne Junction  
PHILADELPHIA



Fastening grounds for tile or plaster to hollow tile walls—just **one** of the many uses for ANKYRA ANKOR BOLTS.

# This Book Will Help You



When considering a crib or granary, the grain elevator is the most important feature of construction. Be sure that it is right, that it will

give you the greatest capacity and the most satisfactory service at the least expense.

We invite you to write for our new illustrated book of crib plans. It describes in full why the Meadows Inside Cup Elevator is the one you should install. It tells all about the mechanical efficiency which we have built into the MEADOWS GRAIN ELEVATOR, the *enclosed* construction, both sides and the back of the elevator being enclosed, a notable feature of the Meadows, the positive delivery, the extra large sprockets in the hood which prevent the cups whipping around at the delivery point, and all the other features which have gained the Meadows recognition as one of the greatest labor saving devices on the farm.

The crib plans in this book will be of the greatest help and worth real money to you. They will show you how when building the crib you can save enough materials to pay for your elevator. It is free. Write for your copy today.

**THE MEADOWS MANUFACTURING COMPANY**

40 Main Street, Pontiac, Ill.



## Lightning Rods

### CARPENTERS!

You are the logical men for our agency proposition.

Every time you build or work on a farm you are in an ideal position to sell lightning rods to the farmer.

All farm journals now advocate the use of good lightning rods and the farmer is just waiting for you to show him how his buildings and stock can be protected.

This letter from Mr. Austin shows what carpenters can do by putting their time into this pleasant occupation.

HAWKEYE LTG. ROD CO., Cedar Rapids, Iowa.

"I worked at the carpenters trade for over twenty-five years, as a contractor most of the time. Five years ago I was induced to sell Lightning Rods as a side line in the buildings that I built, and was well paid for my trouble. The next year I quit my trade and sold your rods throughout the season, and did a good business. In fact I was so well pleased with the work and the good pay that I have been selling your rods ever since."

Respectfully,

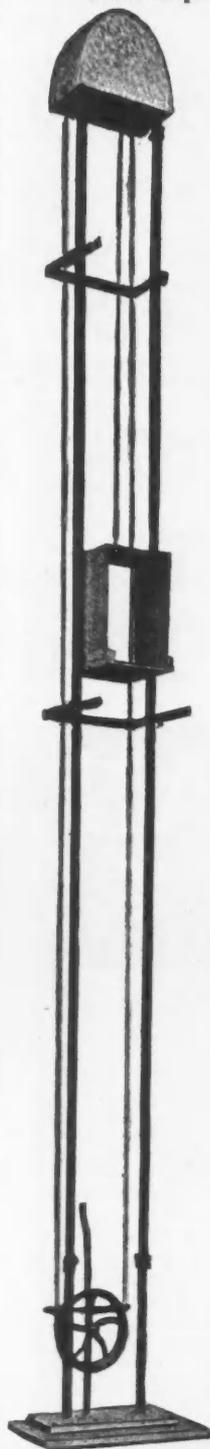
H. G. AUSTIN, Wilton Jet., Ia.

Write us today for our proposition and get started in a business that pays big. Hawkeye Rods are easiest to install and have features not found in other goods.

**HAWKEYE LTG. ROD COMPANY**  
North 17th St., Cedar Rapids, Iowa

## The "STANDARD BALTIMORE" DUMBWAITER

Increases the Value of Apartment or Private Dwelling  
Saves Steps and Makes for Better Delivery



It is easily put up and is built to last.

On outdoor installations the hoisting machine is covered by galvanized iron hood *to protect it from the weather.*

The *guides* and *supports* are made of  $2\frac{3}{8}$ " outside diameter steel tubing, this tubing being fastened to the wall or other support by fasteners consisting of  $2" \times \frac{1}{2}"$  wrought iron brackets. All parts are painted with marine green copper paint to resist corrosion.

The *tail sheave* assembly is of our patented floating type. This keeps the hand rope in proper position and at uniform tension and avoids the possibility of the rope kinking or twisting.

Our *patented rope coupling* makes it possible for all splicing to be done here at our works.

For inside or outside use, whether for institutions, houses, apartments, stores or industrial plants, the STANDARD-BALTIMORE DUMBWAITERS will give reliable service. Send for folder 1303.

**STANDARD ELECTRIC & ELEVATOR CO., Inc. BALTIMORE**  
Main Office, 118 E. Pratt St.  
BALTIMORE, MD.

Contractors  
Earn  
as high as

# \$10,000

A YEAR

and you can make  
a handsome profit  
representing the

## HERO Pipeless Furnace AND Air-Washer— Humidifier System

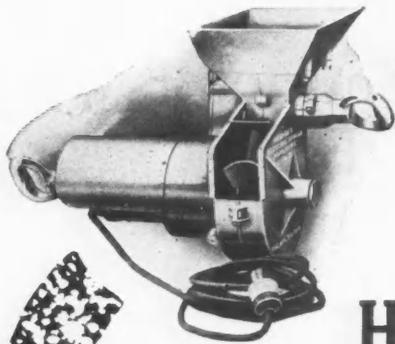
Why not make some of the ready money selling to every stove heated home in your territory and buy for your own needs *at cost?*

We give you *active co-operation and exclusive territory.* Our Sales plan is a "dandy." Write for it today.

**HERO FURNACE COMPANY**

(30 Years of Success)

59 West Lake Street CHICAGO, ILLINOIS



**You can Save  
50%**

**Hodges Electric Stucco Machine**

Can be attached to any electric light socket, weighs but 30 lbs., and hangs from shoulder of operator. Centrifugal force of blades projects stucco completely embedding lath and producing enamel surface. Any artistic effect can be produced.

Three men operate this machine. One mixes, one supplies the operator and the third operates the machine. It not only projects stucco in artistic effects, but also plaster, concrete aggregate, and water proofing on concrete, hollow tile, brick, block, stone, metal or wood lath.



Before

Write for Catalog

We have figures to prove our claims. Gladly sent with our catalog on request.

**Hodges Stucco Machine Works**  
Dept. A. B.

Union Central Tower Cincinnati, Ohio



After

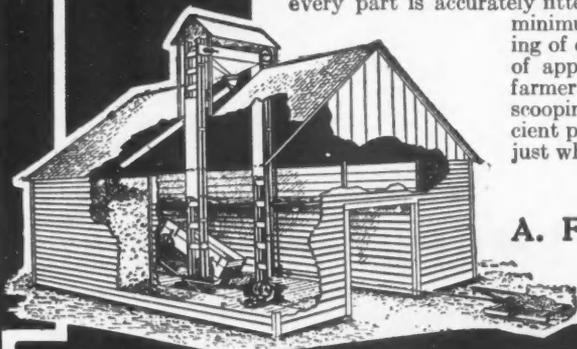
**BE THE MEYER MAN  
IN YOUR COMMUNITY**

**WE WANT** one reliable wide-awake representative in each grain-growing community, to introduce "Meyer" Elevators. It will be of interest to you to consider the merits of the "Meyer" and the profits so easily made.

Behind every Meyer Elevator sold stands our absolute guarantee. You can readily see, on examining a Meyer, how we can afford to give such complete protection to our agents and purchasers; every inch of material used is of the best quality, every part is accurately fitted and firmly fastened, the design is such that there is a minimum of friction, maximum capacity and speed, and no shelling of corn. That it actually does so is attested by the hundreds of approving letters coming to us from pleased owners. Every farmer in your community who is still wasting time and labor by scooping his grain by hand, or who is bothering with an old inefficient portable elevator that spills his grain and gets out of order just when he needs it most, is an easy prospect for a Meyer.

Write today for catalogs and full information

**A. F. MEYER MANUFACTURING CO.**  
340 Walnut Street, MORTON, ILLINOIS



# ONLY \$195<sup>00</sup> MOUNTED COMPLETE WITH ENGINE

## The **Gilson** Concrete Mixer

A practical, low priced Concrete Mixer made especially for contractors who need an economical mixer for average concrete work. Mounted on Truck with 1½ H. P. Engine with built-in Magneto and Engine housing.

Nothing approaches the GILSON in positive service for money invested. Will handle 2¼ to 3 cu. ft. of concrete to a batch, and a batch per minute giving it a capacity of 35 to 45 cu. yds. of concrete in 10 hours.

### Mixes Concrete, Mortar or Plaster Perfectly

Made of iron and steel, practically indestructible. One-horse engine turns it easily when loaded. Has Patented Reverse Unloading Gear which forces rapid discharge by merely tilting drum. Is perfectly balanced, easy to handle, loads on one side, dumps on the other.

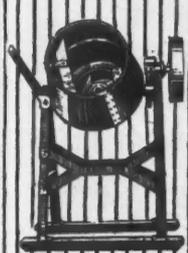
Build walks, foundations, feeding floors, silos, install barn equipment, etc. The machine perfectly mixes wet or semi-dry concrete. No time is lost, \$195.00 buys the Gilson mounted on truck with 1½ H. P. Engine with built-in Magneto and engine housing complete.

Same on truck without engine and engine housing \$95.00. On skids, \$58.50—All prices f. o. b. factory. Send your order today or send for complete illustrated circulars giving all needed information.

**GILSON MIXER CO.**  
628 7th Avenue  
WEST BEND WIS.



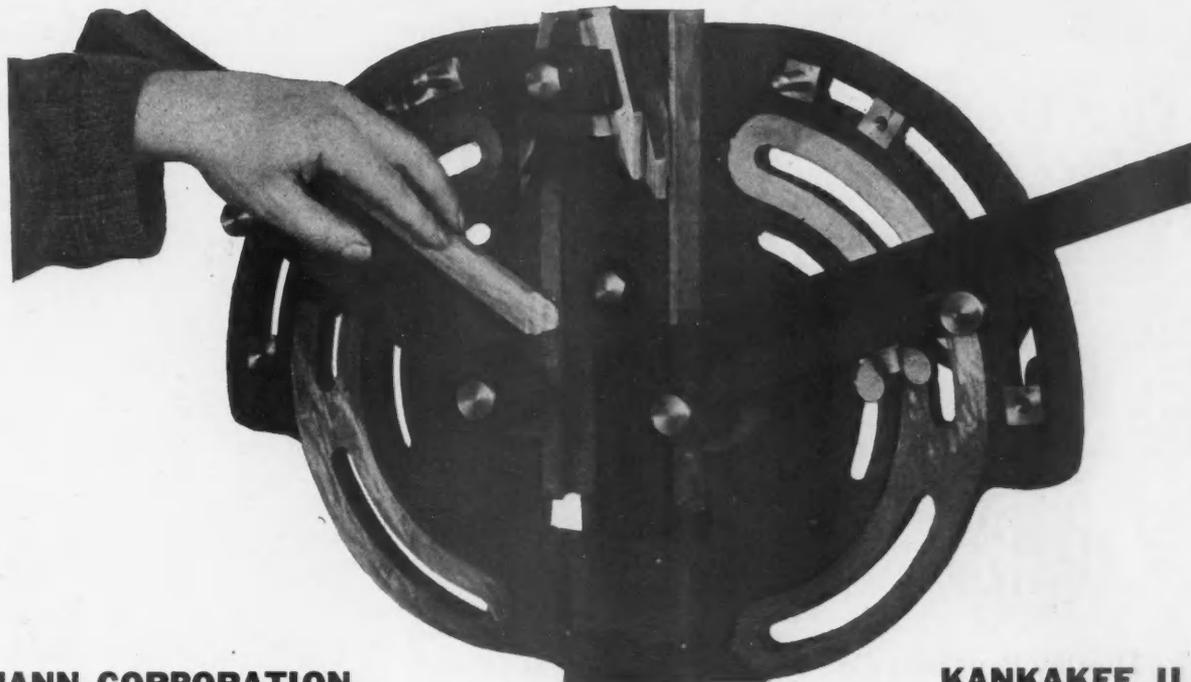
Showing Mixer unmounted in unloading position.



Showing Mixer in working position.

# THE AMERICAN SASH TRIMMER

COPEs BAR ANY ANGLE—CUTS COST OF TRIMMING DIVIDED LIGHT SASH. OVER THREE THOUSAND IN USE.



**MANN CORPORATION**

**KANKAKEE, ILL.**

## Here's a Plan That Will Help You Double Your Profits This Year. Read it - Then Act Quick

**T**HE carpenter or contractor who secures the exclusive sales rights for the Barnett System of Lightning Protection this spring will make big money.

Hundreds of new buildings going up—hundreds of old ones being remodeled—and every one can be equipped with Barnett pure copper cable rods, if the right man is on the job.

You're the logical man to rod these buildings. You know the owners and they have confidence in your ability and good judgment.

You'll make from \$20.00 to \$50.00 on every building you rod, and we'll help you get the business.

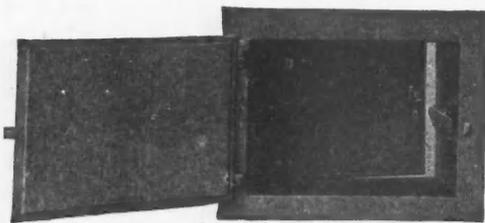
Our plan includes everything you need in the way of printed matter, newspaper ads, movie slides, and samples—we'll refer all inquiries to you and help you turn them into sales.

*Let us tell you more about it*

**JOS. L. A. BARNETT & CO.**  
CEDAR RAPIDS, IOWA

# LIGHTNING

There's a Lot of Satisfaction in Making a Home Safe—and a Lot of Profit, Too.



### The Donley Package Receiver

**K**EEP strange men with muddy feet from breaking in upon the privacy of the kitchen; put an end to door-step deliveries; let the housewife go and come at her convenience by installing the Donley Package Receiver in new homes and old. A steel box with iron doors, it locks securely when closed from the outside; but lock is released when package is removed from within. Fast being recognized as a necessity to every household.



The Donley Brothers Co., 7400 Aetna Rd., Cleveland

### The Donley Rubbish Burner

**F**OR the residence or apartment that has no coal furnace, the Donley Rubbish Burner is a valuable aid to neatness. The iron front and top, shown below in illustration with grate, are installed in masonry of chimney which forms sides and back. This Rubbish Burner found instant acceptance in the natural gas region. It prevents rubbish from accumulating; safe, clean, convenient.

## DONLEY DEVICES

*Modernize the Home*

- Donley** Dampers (poker controlled).
- Donley** Ash Dumps and Ash-Pit Doors.
- Donley** Package Receivers.
- Donley** Meter Box.
- Donley** Garbage Receivers.
- Donley** Coal Chutes.
- Donley** Metal Clothes Posts.
- Donley** Metal Stanchions.
- Donley** Rubbish Burner.

*Other Donley Building Specialties.*

*All have a reputation for usefulness and sound construction.*



# Does the American Universal Way of Floor Surfacing Pay?

I'm sick of this job. I'm going to quit to-night.



While this man worked 2400 hours a year at 75c per hour, his wages totaled

**\$1800.00**

And many have done even better. Anyone can run an "American Universal".

## Figure it yourself

The "American Universal" electrically operated machine and one man will do the work of six men the old way of hand scraping.

I'll say the American Universal Way is easy and fast.



This man did the same amount of work, and better work, in 400 hours at 75c per hour and his wages, plus all operating cost, only totaled

**\$300.00**

Let us show you. Send for our 5 days' free trial proposition.

**American Floor Surfacing Machine Co. TOLEDO, OHIO**  
The Oldest Concern in the Business 515 South St. Clair St.



*"Beautiful Birch for Beautiful Woodwork"*

Our nation-wide campaign of advertising is calling upon millions of prospective home builders to insist on "Beautiful birch" for the interior finish, veneer doors, floors, etc. We're working with (and for) the men who must *do* the building—"Team Work." You're with us, of course?



THE FREE birch BOOK GIVES INTERESTING FACTS ABOUT "THE HARDWOOD THAT ALWAYS MAKES GOOD." WRITE FOR IT—TODAY.

THE BIRCH MANUFACTURERS

201 F. R. A. BLDG.

OSHKOSH, WIS.

# WHEN MASTER SAW-MAKERS MEET-



**OHLEN**

**BISHOP**

The result of their combined resources, facilities, and years of experience in saw-making, is such a saw as will fully satisfy the most exacting builder.

Ohlen Saws and Bishop Saws and Tools are designed, constructed, finished and finally rigidly inspected by expert saw makers in our two great plants devoted entirely to the process. The saw as it reaches the builder is consequently a perfectly balanced, easily handled tool of finest temper that will remain so for more years than you will ever use it.

We also make Mill and Metal Cutting Saws, Trowels, Knives, Scrapers and other builders' tools of equally high quality. You can't make a mistake in Ohlen-Bishop products.

*Write for our catalog today and see for yourself*

## The Ohlen-Bishop Company

General Sales Division,

COLUMBUS, OHIO, U. S. A.

Mill Saw Division  
THE JAMES OHLEN & SONS PLANT  
Columbus, Ohio

Hardware Division  
THE GEO. H. BISHOP CO. PLANT  
Lawrenceburg, Ind.

Atlanta, Ga., Cleveland, O., New York City,  
Portland, Ore., St. Louis, Mo.  
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## The Reputation of Wolff Plumbing

**I**T is a big asset to the dealer, builder or architect who installs or specifies this super-quality line. The supremacy of *Wolff Plumbing* has been proved for 65 years. Why not profit by it? Our new catalogue will show the way. Write for it today.

### Wolff Manufacturing Company

Manufacturers of

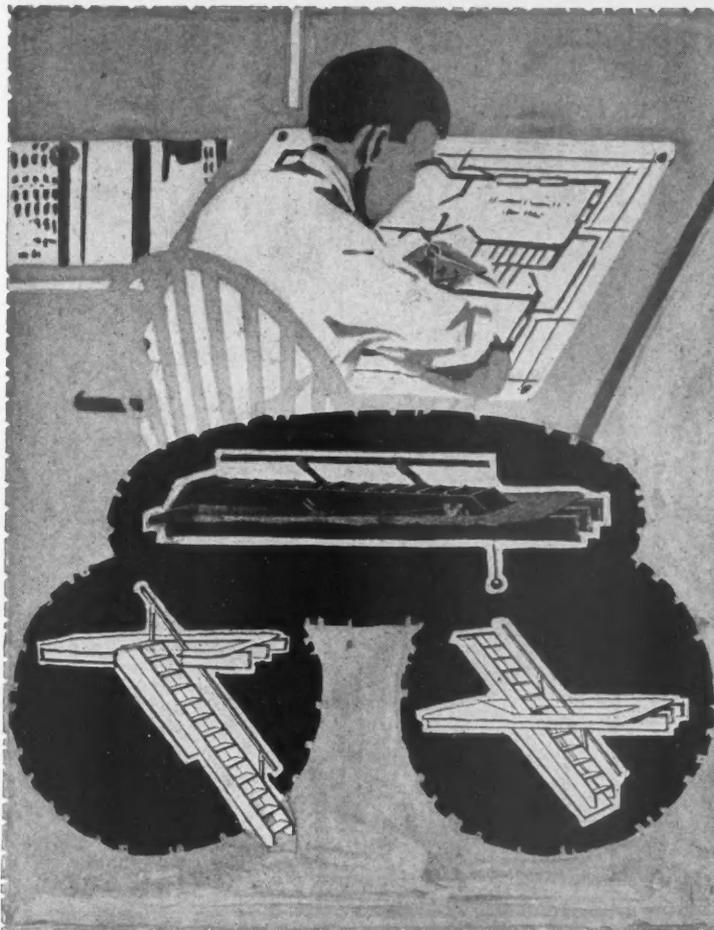
Plumbing Goods Exclusively

CHICAGO

General Offices—255 N. Hoyne Ave.

Show Room—111 N. Dearborn St.

1920



# 2 MORE ROOMS

You are puzzled over where that extra room is going to fit in on your house plan. Frontage is limited, small crowded rooms are unpleasant. But there is a solution to the problem—cut out that waste space. Make practical use of that big hallway with its stationary stairs by replacing them on your plan with the space saving

## Bessler Movable Stairway

And again, there is that gable space under the roof that would have been more waste space, accessible only by putting a ladder thru the trapdoor. Install a

## Bessler Movable Stairway

and convert that garret into another room for every day use.

The Bessler stair is strongly and compactly built and neatly finished; light and simple to operate it—a child can use it. When out of use it folds up into the ceiling, leaving only a neat stained or enameled panel to be seen. It is winning the highest approval in bungalows, two-story homes, garages, balconies in theatres, hotels and stores—in fact every place that a stairway can be used. Unless your space and resources are unlimited it would be to your interest to inquire.

**Bessler Movable Stairway Company**  
Akron, Ohio

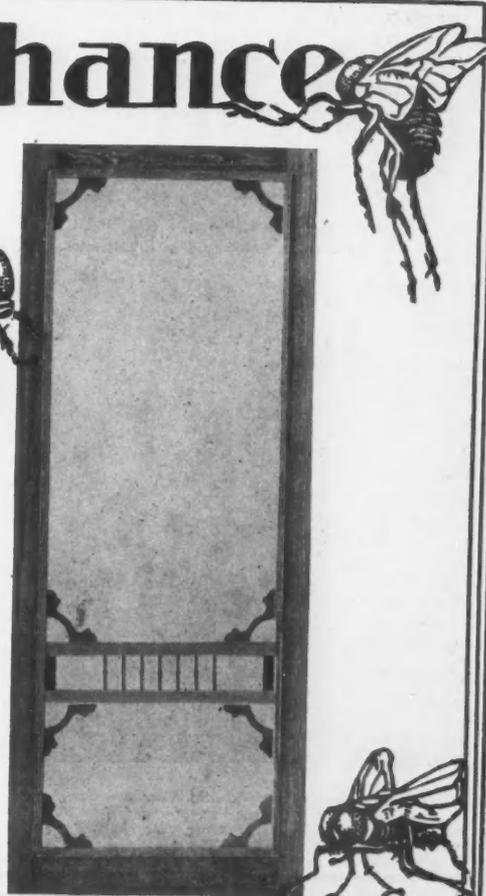
# He Hasn't a Chance with NO-SAG

## SCREEN DOORS Because They Fit!

Built of the best and strongest northern pine, accurately fitted and balanced, and—the individual feature of these doors—still further reinforced with a central brace of 28 gauge steel that has been coated with a rust-resistant gold lacquer. The flanges of this brace enter slots in the side and center rails of the door where they fasten securely with barbed brads. No-Sag Screen doors can be used for years under ordinary conditions, and will not sag or draw away from casing leaving cracks to admit flies.

**"NO SAG"**—The better Screen Doors are carried in stock by most lumber dealers. Ask your dealer to show you one, or write for catalog.

**CADILLAC LUMBER COMPANY**  
CADILLAC, MICHIGAN





An old  
frame  
building  
before  
being  
overcoated"  
with stucco

Same building  
with stucco over  
HY-RIB.



## Old Buildings Easily Modernized

THERE are countless numbers of old buildings in which the frame work, joists, studs, foundations, etc., are in excellent condition, yet they are of little value because of the dilapidated exterior condition.

Stucco on Hy-Rib Metal Lath will quickly transform such buildings into modern, fireproof structures and will greatly increase their value.

Hy-Rib Metal Lath insures successful stucco and plaster work, because it thoroughly reinforces the stucco or plaster—cracking is prevented and permanence assured.

Economy, fire resistance, freedom from vermin, elimination of frequent painting, and low upkeep cost are a few of the advantages resulting from Hy-Rib Metal Lath construction.

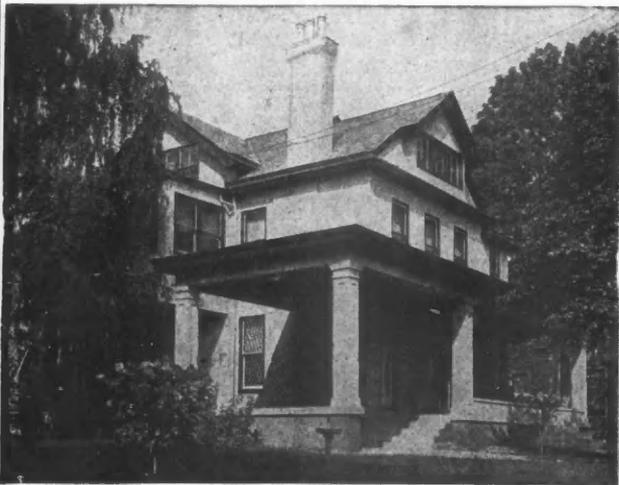
Hy-Rib Metal Lath is furnished in various types and weights, so as to meet every practical requirement. Used successfully in walls, floors, partitions, ceilings, roofs, etc. The complete Hy-Rib line includes metal lath, studs, corner beads, etc.

The big 64-page Hy-Rib book sent free on request.

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YOUNGSTOWN, OHIO

WAREHOUSES AND SALES OFFICES IN PRINCIPAL CITIES  
Reinforcing Steel, Metal Lath, Steel Windows, Steel Buildings, Pressed Steel, Cement Tile, Etc.



Residence of Arnold Kaichen, Cincinnati, Ohio  
An Old Wooden House Transformed into a Modern, Permanent  
Residence by Overcoating with Hy-Rib Lath and Stucco.



## HOMER

ORIGINAL PATENTED  
PIPELESS FURNACE

—and *SOME* furnace,  
too, when it comes to  
heating the average  
eight to ten room house

We are always looking for real live contractors or building material dealers to represent us.

The Homer is well advertised and sells easily. If you are interested, write us and we can show you where it will be dead easy for you to dispose of several carloads a season.

### Homer Furnace Company

Homer, Michigan

141 Strong Ave.

# Stop Mistakes IN ESTIMATING

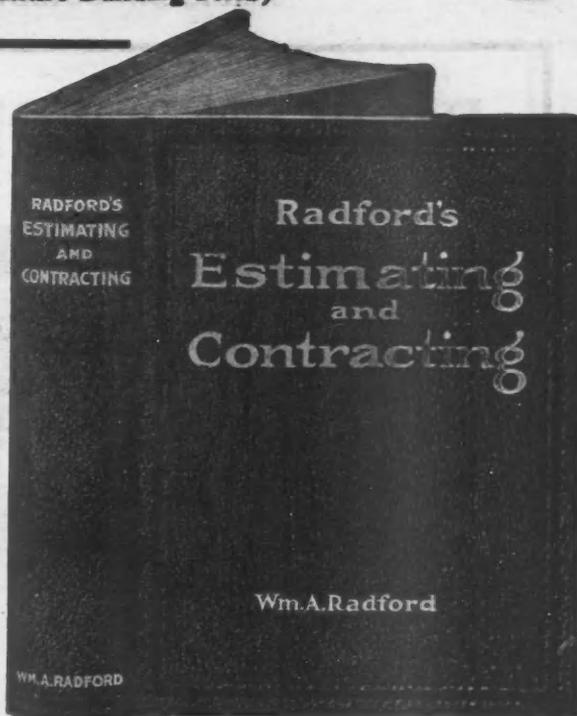
By Means of this Accurate  
**900-Page Book**

Bound in Fabrikoid Leather

A mistake in estimating means the difference between a profit or a loss on a contract. In these days of modern construction it is not safe to guess or go by "rule of thumb." Even experienced contractors who rely upon eyesight or rough calculations make costly errors.

## HELPS TO EASY FIGURING

It gives quotations and other data indicating the cost of materials and labor, standard schedules and forms used for measurements and estimates, labor-saving tables and all other points a contractor, builder or carpenter should know.



## Condensed Summary of Contents

### ESTIMATING AS A SCIENCE

General Principles of Estimating.  
Estimating Essential to All Successful Business Operations.  
Requirements of the Good Estimator.  
Accuracy Versus Guesswork.  
What to Avoid in Estimating.  
Remedies for Inaccuracies.

### ESSENTIAL BASIS OF ALL ESTIMATING

Analysis of Proposed Operations.  
Cost Finding and Cost Distribution.

### CONDITIONS AFFECTING COST

Local Market Conditions.  
Freight and Haulage.  
Rates of Wages Paid in Various Trades.

### METHODS OF ESTIMATING

Comparative and Analytic Methods.  
Approximate, Detailed Estimates from Carefully Figured Data.  
Estimating by Cubical Contents of Similar Structures.  
Estimating by the Square of 100 Sq. Ft.  
Estimating by Quantities.  
Unit-Costs for Material.

Labor Costs.  
Percentage for Profit.  
Margin for Variations and Contingencies.

### PRELIMINARIES TO ESTIMATING

Fees of Architects, Consulting Engineers and Designers.  
Examination of Site.

### COST FACTORS CLASSIFIED

Factors Common to Construction in General.  
Factors Involved in Special Types of Construction.  
Factors Incidental or Accessory to Various Constructions.

### COSTS COMMON TO CONSTRUCTION IN GENERAL

Leveling and Preparing Site.  
Employer's Liability Insurance.  
Water Supply During Construction.  
Number of Men and Teams Required.  
Rates of Wages.  
Cost of Superintendence.  
Earth and Rock Excavation.  
Foundations and Footings.  
Back Filling.

### COSTS INVOLVED IN SPECIAL CONSTRUCTIONS

#### CARPENTRY WORK

Measurements.  
Timber and Lumber (Grades and Sizes).  
Framing.  
Sills, Joists, Studding, Columns, Bracing.  
Furring and Lathing.  
Scaffolding.  
Floors.  
Stairs.  
Porches and Piazzas.  
Interior Finish and Trim.  
Building Paper.  
Clapboarding.  
Shingled Siding.

#### ROOF CONSTRUCTION

Framing, see Carpentry.  
Wood Shingles.  
Metal Shingles.  
Asbestos Shingles.  
Cement Shingles.  
Asphalt Roofing.  
Roofing Felt.  
Prepared Roofing.  
Tile Roofs.  
Tin Roofs.  
Corrugated Metal Roofs.  
Slate Roofs.  
Pitch and Gravel Roofs.  
Galvanized Iron Roofs.  
Cost of Laying Different Kinds of Roofs.

Painting Roofs, see Painting.  
Skylights, see Glazing.  
Ventilators.  
Cornices.  
Ridge Rolls.  
Gutters and Downspouts.  
Flashings.

#### MILL WORK

Doors and Door-Frames.  
Sash and Window Frames.  
Blinds.  
Transoms.  
Mouldings.  
Columns and Capitals.  
Cupboard Doors.  
Store Fronts.  
Thresholds.  
Stair and Handrails.  
Newels and Balusters.  
Grills and Spindles.  
Mantels and Consols.  
Chair and Plate Rails.  
Wainscoting.  
Screens and Weather Strips.  
Clothes Line Posts.

#### CONCRETE CONSTRUCTION

Concrete Houses.  
Reinforced Concrete.  
Masonry Construction.  
Steel Construction.  
Heating, Ventilating.  
Plumbing, Gas Fitting.  
Electric Wiring, Plastering.  
Painting, Decorating.  
Paperhanging, Glazing.  
Hardware, Roads and Pavements.

This book will save you many times its cost on every job you estimate. Send for it TODAY.

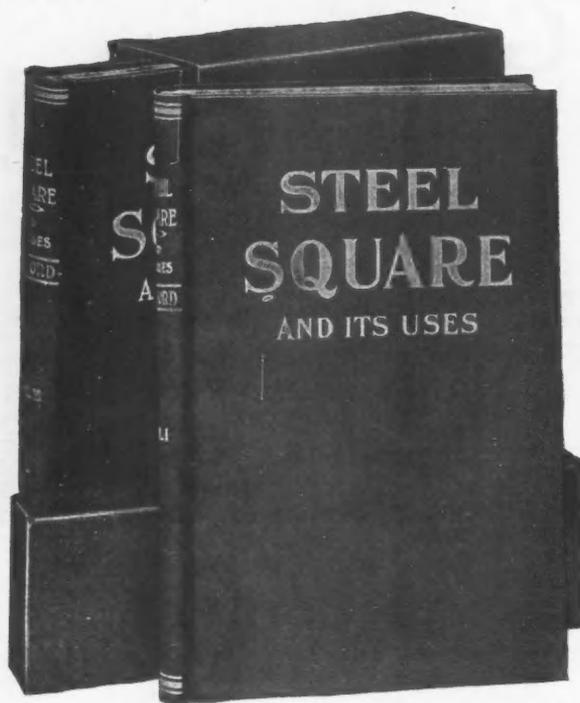
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The Most Useful Instrument in the  
Tool Chest—Learn Its Many Uses

### Steel Square and Its Uses

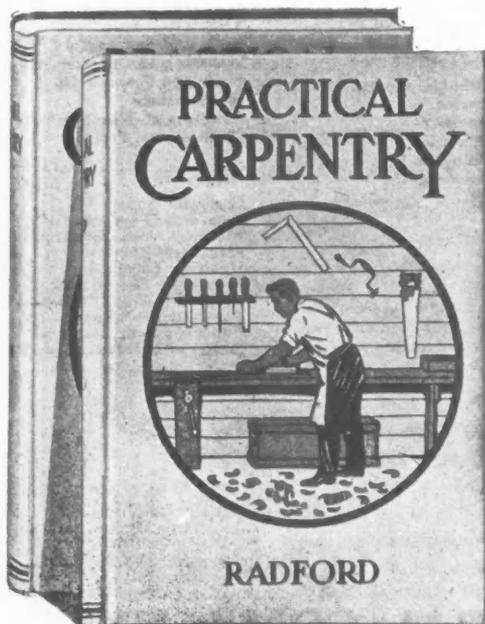
Two Volumes—Over 300 Pages Each  
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Special chapters are given to that part of stair building to which the steel square can be applied. Other chapters discuss the adjustable fence, roof framing, hip-roof framing, hoppers and hopper bevels, combination squares, key to the steel square, polygons and miters, pitches, how to measure solids, liquids and distances and miscellaneous rules and examples. These books contain a vast amount of absolutely new, practical, every day information, necessary for every progressive and successful carpenter to know.

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Two Reliable Text Books Describing and  
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**Over 600 Pages and 400 Illustrations**

Special chapters devoted to good and faulty construction and all kinds of framing, besides information on geometry, arches, centers, window and door heads, steel square in carpentry, house framing, roofs and roof construction, building construction, covering of roofs, mouldings, joints, straps and other fastenings, stair building and many questions and answers on all subjects pertaining to building. They describe the best and quickest ways for laying roofs, rafters, stairs, floors, hopper bevels, miters, coping, splayed work, circular work and for forming all kinds of joinery and carpenter work.

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## 138 New House Plans

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### *Homes to Suit Every Desire*

Every new home in town means business for the lumber dealer, the material dealer, the contractor and the carpenter; in fact, the whole building industry profits. In this new book, "HOMES FOR EVERYONE," there are designs to suit every taste and every pocketbook. Cottages and bungalows from two and three to six and eight rooms, farm houses, tenant houses, apartment houses, suburban and town houses—in frame, brick, cement, hollow tile, etc.

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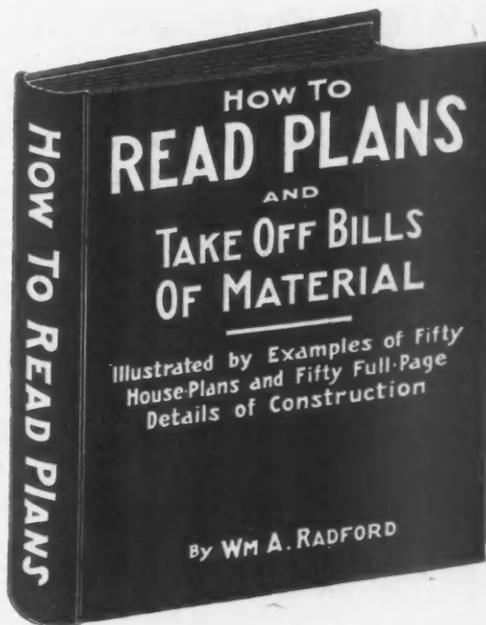
Makes Blue Prints as Plain as Photographs

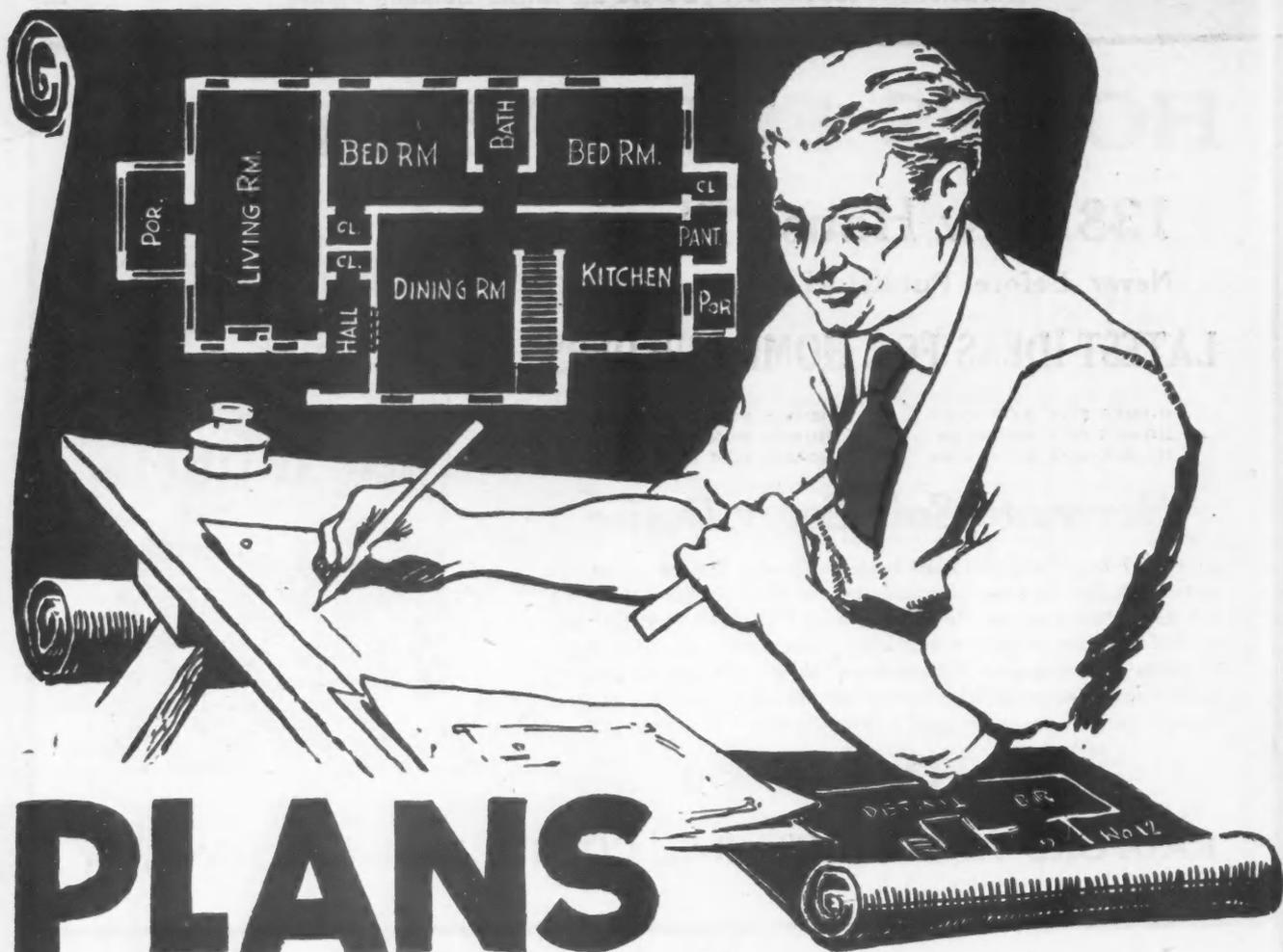
Shows how to Figure Quantities and  
Take off Bills of Material

This book of 256 pages gives the correct answer to every building problem. It contains the latest and most reliable, practical information on original drawings, tracings, blue prints and rough sketches. It shows how to figure inside and outside dimension, heights, openings, take off quantities and a great amount of other data that is indispensable to the man who has to do in any way with construction or the use or estimating of materials. It is illustrated with 350 drawings, diagrams, details, etc., including fifty full page details and fifty house plans, which serve as examples for the instruction given in the book.

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*If you have a rough sketch, get our Estimate on Complete Plans now*

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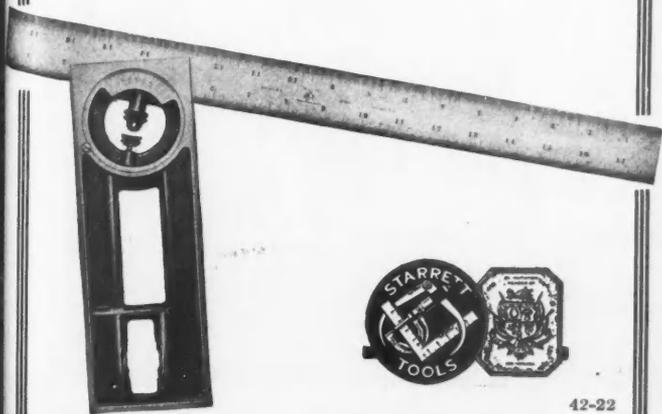
# Starrett Tools

**F**OR FORTY years  
I have helped men  
do better work.

The builders' tool shown here is only one of the 2100 different kinds and sizes of fine tools described in Catalog No. 21 "6." Copy free on request.

## The L. S. Starrett Company

*The World's Greatest Toolmakers*  
Manufacturers of Hack Saws Unexcelled  
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42-22

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TRADE MARK



(Actual photo of untreated stanchions in basement barn)

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**Build a Reputation for  
Erecting  
Decay Proof Buildings**

**H**OW many times have you seen buildings undermined by decay that were otherwise perfect buildings? How often have you wished you could overcome this decay caused by weather conditions, and damp places, assisted by the deadly wood decay germs that feed upon the fibre of the wood?

The solution is simple if you use Durasote—an effective wood preserver that is easily applied, and adds years to the life of wood. It preserves all wood against weather and decay. It prevents timbers resting in damp places from decaying.

Durasote, distilled from pure coal tar, is an effective wood preserver that penetrates the wood, rendering the wood fibre unfit for germs to live upon, and neutralizing the effect of moisture on the wood. It stains the wood a rich brown—it will not evaporate or leach out of the wood, leaving it unprotected.

*The Builder who makes his buildings last  
gets his pick of the contracts*

Write for free booklet and learn about the many uses of this exceptional wood-preserver.

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is of incomparable beauty when dashed with Crown Point Mica Spar. Sparkles like diamonds and retains its sparkle indefinitely. Milled in four stucco sizes. Write for samples.

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NEW YORK, N. Y.



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**The Famous Saw  
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All high-grade workmen know the world wide reputation of Disston Saws—Disston leadership for 80 years is one of the traditions of the trade.

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*"America's Largest and Longest Established Makers of Saws and Tools"*  
**PHILADELPHIA, PA., U.S.A.**



**Griffin**

**Pressed Steel Door Stops**

No. 640

Are drawn into shape from one piece of high quality Cold Rolled Steel making them extra strong—guaranteed **indestructible**.

The rubber bumper is made from the best rubber and is backed up by a metal disc, which in turn is knurled, "ENTRENCHED," in place—and will stand all the "Banging" one can possibly give it, and absolutely cannot work out of place.

**Beautiful Yet Plain**

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No sharp edges or corner to cut the hand on, catch the clothes, as the woodwork is dusted. This is the door stop your customer is looking for. Have your Hardware Dealer show them to you.

*Send for complete circulars and information at once*

**The Griffin Mfg. Co.**

Erie, Pennsylvania

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NEW YORK

17 E. Lake St.  
CHICAGO

**Was \$100  
Now \$57**

**NEW OLIVER  
NINE FOR  
NEARLY HALF**

This is the most startling typewriter offer of all! A brand new, latest model Oliver for \$57. The identical model formerly priced at \$100.00. We make it possible for you to save \$43 by our new way of selling, ways we learned during the war.

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The Oliver Nine—our latest model—direct from the factory to you. It is the finest, the costliest, the greatest typewriter ever built. Used by the leading concerns.

Who would ever pay over \$57 again for a new typewriter? Especially when we not only make a new low price, but also give the lowest terms—about 10 cents per day—over a year to pay.

**STARTLING  
FACTS**



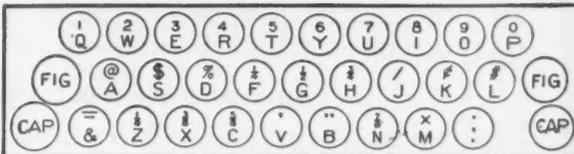
**Contractors' Special!**

For contractors, our Special Oliver Nine is unbeatable. Besides being the best for ordinary correspondence, none can equal it in figure work. It has the characters you need, as shown on the keyboard herewith.

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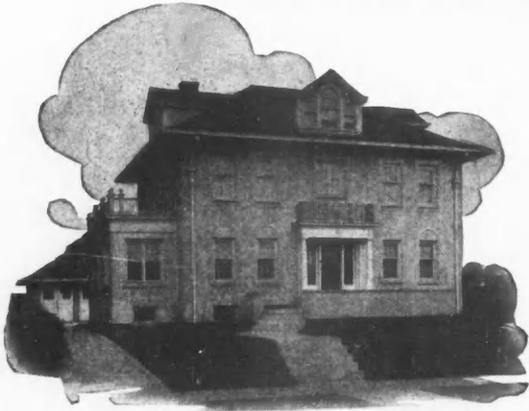
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THE STANDARD MAGNESITE STUCCO

## The Stucco of Permanent Beauty



### Better Results At a Lower Cost

It has been thoroughly demonstrated through rigid tests that *Elastica Stucco* is superior in quality.

The proof of this fact is in evidence everywhere. Owners of *Elastica Stuccoed* houses are satisfied owners because they know from experience that *Elastica* is not only the best stucco but is actually less costly to use.

*Elastica* can be applied satisfactorily in winter or summer. It is fireproofed—waterproofed—crackproofed.

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Use *Elastica*. It is the ideal stucco.

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are time and labor-savers—a batch a minute, no tilting or tipping—no slop over or spill—no waste.

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The logical machine for a busy builder—requires the minimum of attention—can be used on all jobs—mixes mortar or concrete easiest to charge or discharge.



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## Frank Manufacturing Co.

241 Century Building

DES MOINES, IOWA



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# KOHLER

And HOTEL FORT DES MOINES

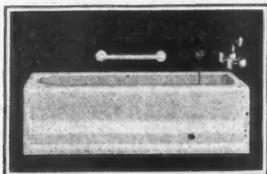
In the center of the nation's prosperity, the capital city of Iowa boasts no finer welcome to the traveler than the Hotel Fort Des Moines. And here, where beauty mingles with the utmost consideration for comfort, are found 346 snow-white, glistening, Kohler "Viceroy" Baths. These tubs, durable, easily cleaned, full-sized, are the conveniences looked for by travelers familiar with the nation's best hostelries, and are found also in homes, apartments and clubs where more than ordinary discrimination is in evidence.

\* \* \*

If your file lacks that convenient hand-book, "KOHLER of KOHLER," illustrating and describing in detail the Kohler Enameled Plumbing Ware Products, write.

## KOHLER OF KOHLER

Kohler Co., Kohler, Wisconsin  
Shipping Point, Sheboygan, Wis.  
AND TWELVE AMERICAN BRANCHES



Kohler "Viceroy" Built-in Bath  
Recess Pattern

MANUFACTURERS OF ENAMELED PLUMBING WARE

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## Copper Clad Store Fronts

From I-Beam to sidewalk Brasco forms the one complete and economical solution to the Copper Store Front problem. Study its details and observe as you go along, its many exclusive features, chief among which are these:

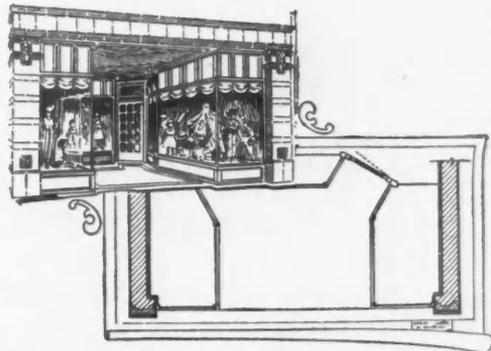
It utilizes every advantage of the wood setting; the imperishable properties of Cypress creosoted; the beautifying and protective qualities of Copper.

It provides as no other does, generously for all ventilation and drainage requirements.

It avoids both the resilient and the erratic harsh tension grip, and in their stead employs the supple uniform pressure provided in wood by Nature.

It has long since proved its right to first place among materials noted for their structural value and business producing power.

Every contractor should have complete details and description of Brasco. You are assuming no obligation whatever in writing for complete information. From the standpoint of price and installation cost you are most vitally interested.



# Brasco

## Manufacturing Company

5029 So. Wabash Ave.  
Chicago

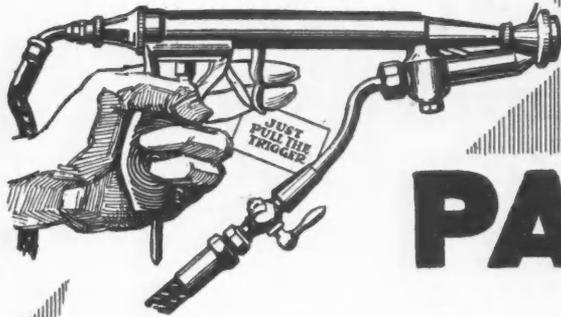
Brasco Mfg. Co., Chicago

Please forward Special Store Front Book No. 24, and oblige

Name .....

Town.....State.....

Business .....



**AIR DIGS DEEPER THAN HAIR**

**PAASCHE  
AIR BRUSH**



**A**LL you have to do is pull the trigger and PAASCHE does the rest. Paint is quickly forced into the pores making a clean, uniform and reliable surface that cannot be produced with a brush.

Haste without waste is the PAASCHE way.

Saves time and money on paint jobs. One man with a PAASCHE can do the work of from 4 to 8 men with brushes.

By the use of interchangeable parts PAASCHE can be used for different kinds of material and can be used anywhere from bridge painting to calcimining.

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*Saves Time at Every Turn.*

Here you have a rapid fire drill, with adjustable tension for hard or soft woods and the 8 different size Drill Points furnished with it.



A turn of the cap does the trick that saves time, labor and Drill Points. This drill is about as valuable to the average mechanic as any "Yankee" Tool we make. Built for hard service. Your dealer can supply.

➡ Send for the "Yankee" Tool Book  
A postal will do

**NORTH BROS. MFG. CO.**  
PHILADELPHIA, PA.

**\$5<sup>00</sup>**  
BRINGS IT  
TO YOU

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Now you have the opportunity to own a strictly high-grade, accurate Convertible Level on Aloe's Easy Rental Purchase Plan—and without previous experience, or technical knowledge, you can put it to work so that it will make big money for you. Only \$5.00 brings it to you—then put it to every possible test. If you are pleased with it, pay the small monthly installments and the level is yours.

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*Sold on a strictly guaranteed-to-make-good basis*

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Getting more and better work done with fewer men is accomplished with the Aeron spray-painting equipment.

One man coats 500 and more sq. ft. of average work per hour with the Aeron, where 4 or 5 men with the brush are ordinarily required.

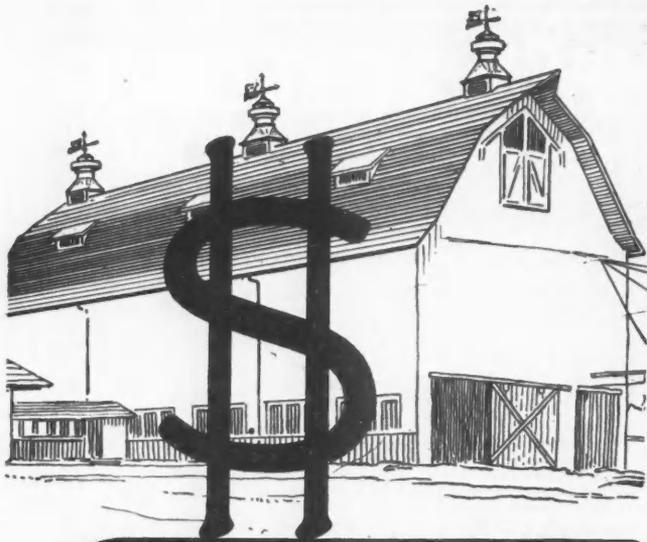
The proper kind of paint is applied on concrete, stucco and like surfaces just as easily as on the wood or metal surface—and whether it is outside or inside work.

The Aeron uses no more paint than the hand brush method. It saves the expense of replacing brushes.

The entire outfit is compact and can be easily moved from place to place by the operator. It is simple in construction and costs little to keep up.

*Full detailed particulars as to how painting costs can be cut and better results obtained on your different jobs, will be gladly mailed to you.*

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Think of the barn jobs in your community that you could get with the help of James service. Farmers are today awake to the needs of better built barns and are finding exactly what they want in James Barns and James equipment. They are reading our advertisements in their leading farm papers—and they know through years of service the matchless quality of anything in barn equipment bearing the James trademark.

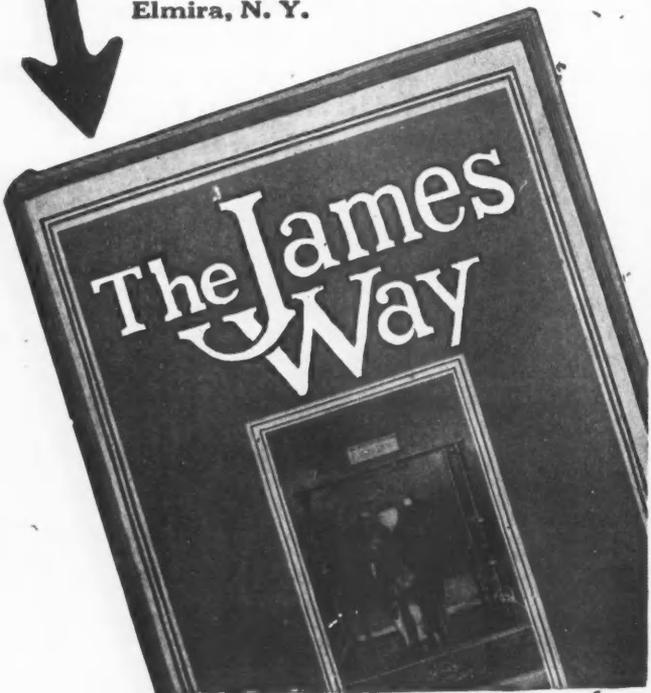
Send us the names of farmers you know who wish to build or remodel their barns, and mention the size of their herds. We will circularize the farmers whose names you send us, and will send you our book

### The James Way—FREE

Our book should enable you to suggest to your customers the most practical way to handle their barn problem—how they can save time and work about the barn—get the right plans—avoid mistakes in building—best ways to arrange equipment—provide lighting, ventilation, make good use of floor space, etc.

*Take advantage of our service and get more and better barn contracts*

**James Manufacturing Co.**  
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When passers-by stop to admire a home, the owner has reason to feel proud. You can make a house the envy of a street with one or two applications of Bay State Brick and Cement Coating.

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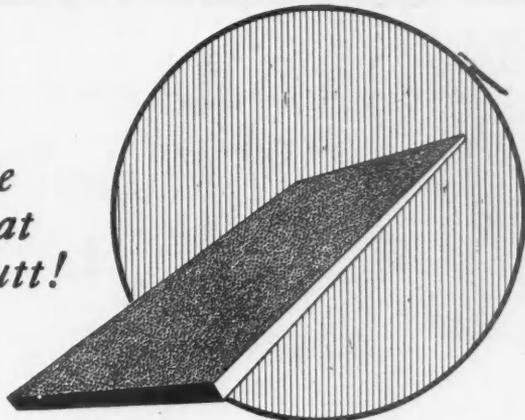


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New York Office, Architects' Bldg.

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**T**HE longer the roofs you lay last, the better reputation you will have for strictly quality construction. All over America contractors and builders are using Winthrop Tapered Asphalt Shingles because experience has proven that Winthrop roofs do last longer—and they are so much more satisfactory to handle and lay.

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Winthrop Tapered Asphalt Shingles come in two colors, red and green.

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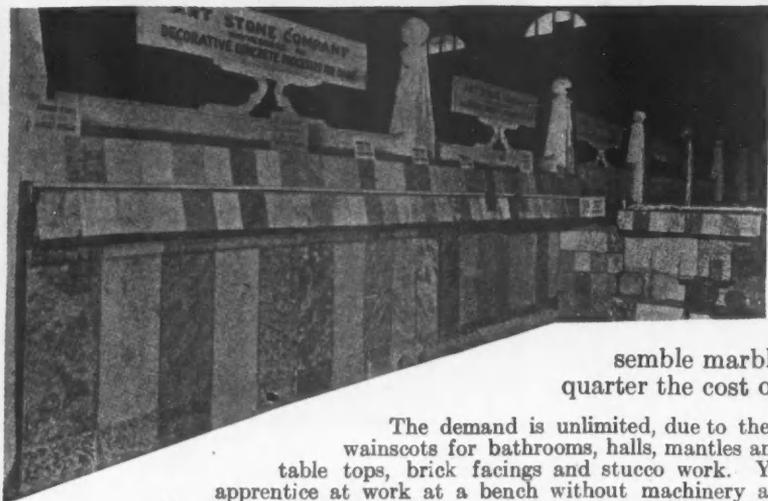
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Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

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|---|---|
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| <input type="checkbox"/> Architectural Draftsman    | <input type="checkbox"/> ADVERTISING                |
| <input type="checkbox"/> Contractor and Builder     | <input type="checkbox"/> Window Trimmer             |
| <input type="checkbox"/> Building Foreman           | <input type="checkbox"/> Show Card Writer           |
| <input type="checkbox"/> Concrete Builder           | <input type="checkbox"/> Sign Painter               |
| <input type="checkbox"/> Structural Engineer        | <input type="checkbox"/> BUSINESS MANAGEMENT        |
| <input type="checkbox"/> Structural Draftsman       | <input type="checkbox"/> Private Secretary          |
| <input type="checkbox"/> Ship Draftsman             | <input type="checkbox"/> BOOKKEEPER                 |
| <input type="checkbox"/> Plumber and Steam Fitter   | <input type="checkbox"/> Stenographer and Typist    |
| <input type="checkbox"/> Heating and Ventilation    | <input type="checkbox"/> Higher Accounting          |
| <input type="checkbox"/> Plumbing Inspector         | <input type="checkbox"/> COMMERCIAL LAW             |
| <input type="checkbox"/> Foreman Plumber            | <input type="checkbox"/> Common School Subjects     |
| <input type="checkbox"/> Sheet Metal Worker         | <input type="checkbox"/> Mathematics                |
| <input type="checkbox"/> CIVIL ENGINEER             | <input type="checkbox"/> GOOD ENGLISH               |
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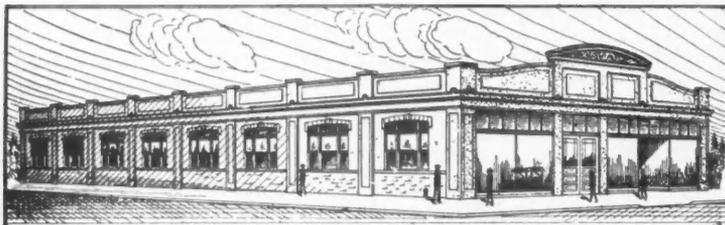


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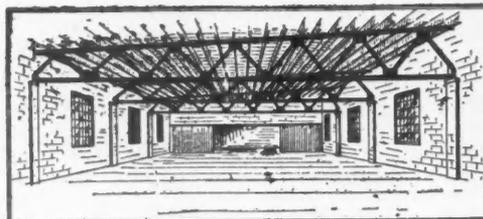
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# \$2000 Profit Moving This House

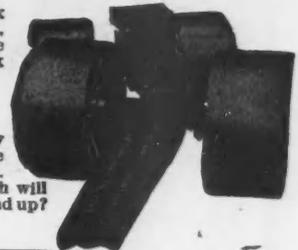
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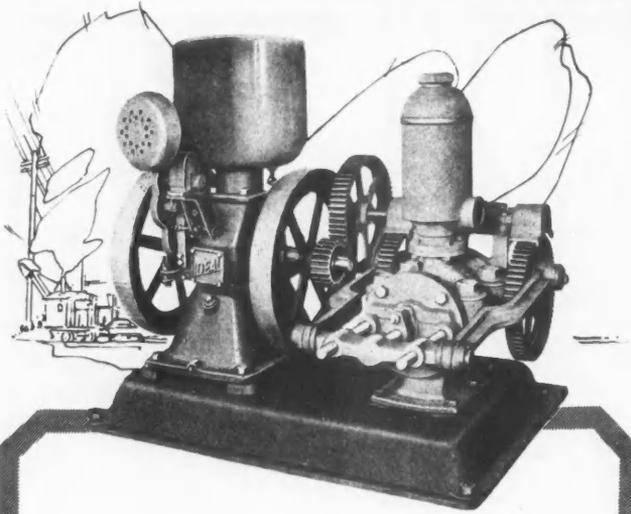


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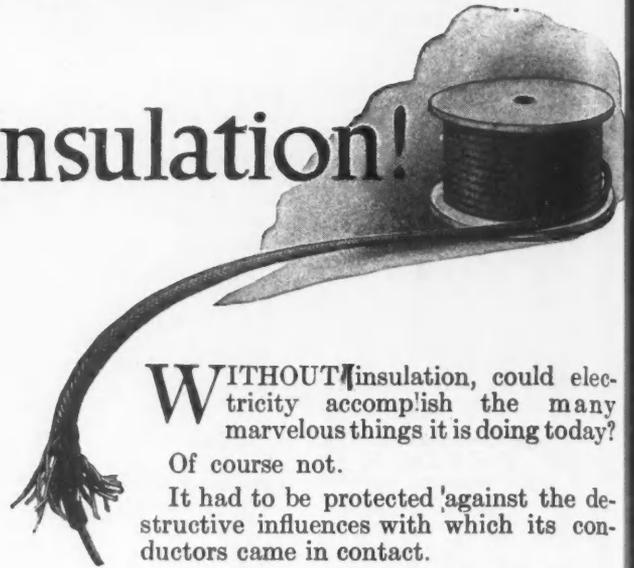
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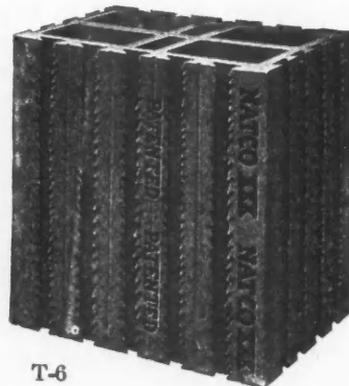
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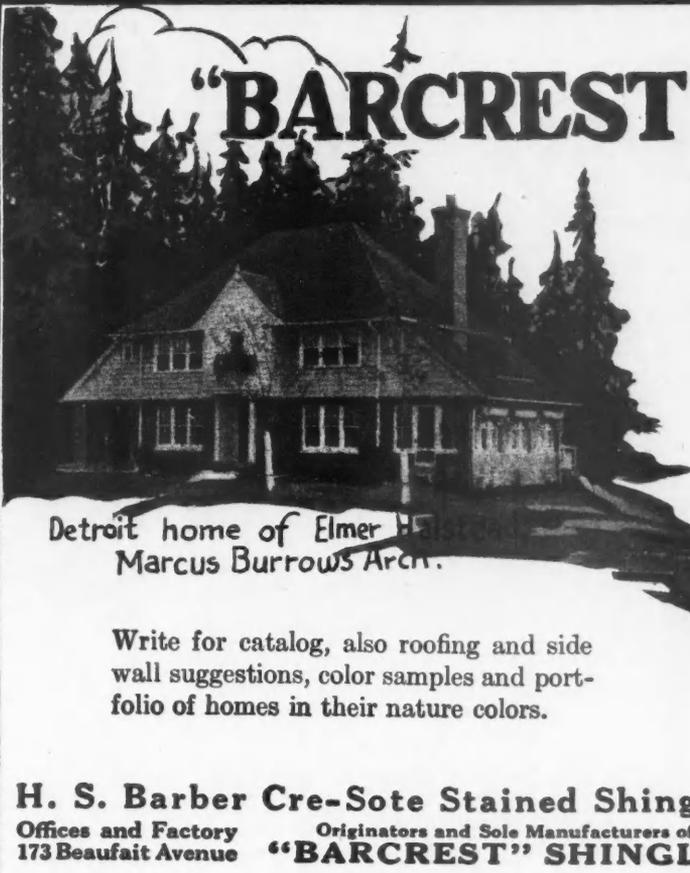
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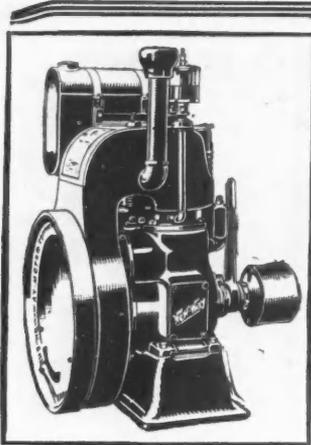
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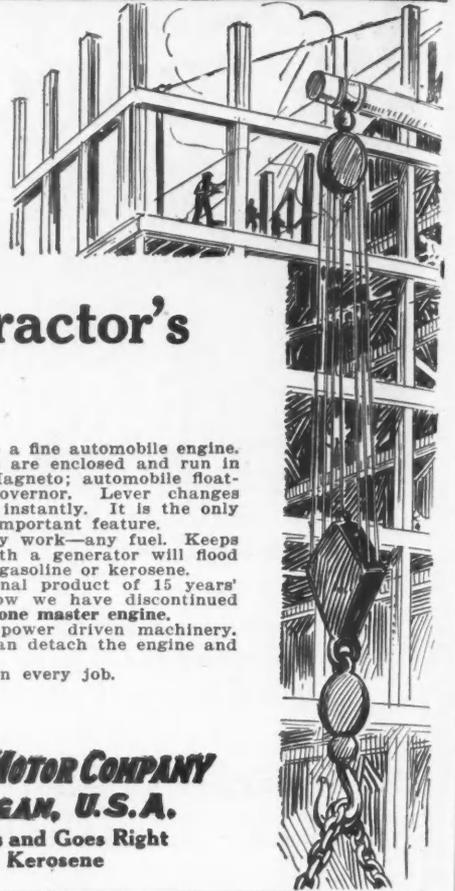
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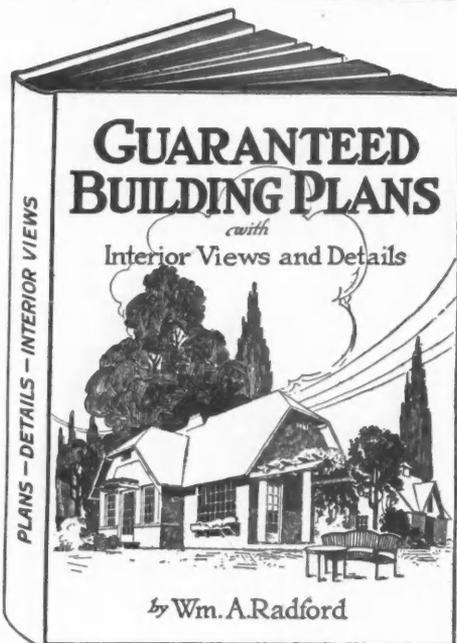
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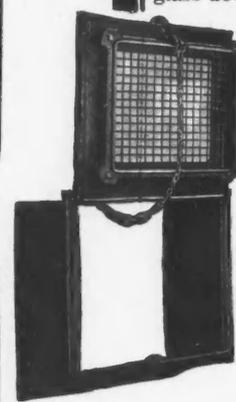


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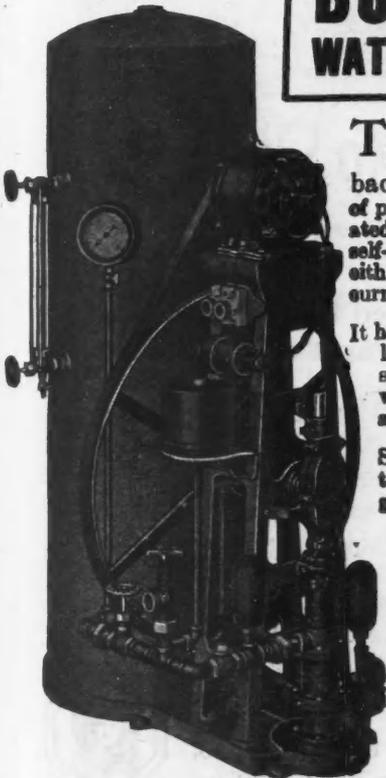
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**EQUIP THE HOMES YOU BUILD WITH**

**BUCKEYE WATER SYSTEMS**



THE Buckeye Electric House Pump is backed by forty years of pump success. It is operated automatically and is self-oiled. Equipped with either alternating or direct current motor, as required.

It has a capacity of 180 gallons per hour, which is sufficient to supply the water demand in almost any home.

Shipped complete ready to install; this insures a good substantial profit to the Builder or Contractor.

Write Today for  
Details and Prices

**MAST, FOOS & CO.**

SPRINGFIELD, OHIO  
Department K



**Fiberlic WALL BOARD**

The material from which it is made, the fact that the pulp is chemically cleansed and that the fibre lengths give the finished product that natural reinforcement that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic for strong, permanent and sanitary construction.

**MacAndrews & Forbes Company**  
200 Fifth Avenue, New York City  
Factory: Camden, N. J.

# Save the Wages of 3 Men

## A boy can do it with the Hafa-Hors Brick Cleaner

THE "HAFA-HORS" Brick Cleaner will clean more brick than any four men you can put on the job with old fashioned hand tools. Regardless of how dirty the brick may be or what kind of mortar has been used,

this machine will clean them quickly and well. No further need for you to use half-cleaned brick that slow up your workmen and cut into your profits.



Does the work of 4 men

### Reclaim your used brick

Increases market value while effecting big saving in labor. Does not require skilled operator; anyone can use it successfully.

We make and sell outfit complete with engine, ready to run. Our standard 1/2 H. P. "HAFA-HORS" Engine is used. A simple, compact, portable rig, that will pay for itself many times over in a season. Write us for details and prices.



Lid raised showing Hafa-Hors Engine. Closed Hood protects it from dirt.

ELGIN GAS MOTOR COMPANY 60 River Street ELGIN, ILL.

Do you know the advantages of the end-discharge over the old fashioned side-discharge Mixer

## THE ARCHER

is the original end-discharge

## MIXER



The end-discharge drum is mounted on a two wheeled truck and this means you can deliver the wet mix direct into the forms—no wheelers needed. No loading platforms to build and move away. Two men can move the ARCHER anywhere without the aid of a team.

Made in two sizes—one bag and half bag.

Write to us for more particulars telling how with an ARCHER you save men, save time and speed up the work.

We make the Archer Steel Dump Body and Hand Hoist. They are ideal for contractors' bulk hauling—sand, gravel, excavations, paving, coal, etc. A pull of only 20 pounds on the hoist will dump one ton in 30 seconds. Ask for particulars and prices.

### ARCHER IRON WORKS

2439 W. 34th Street

CHICAGO, ILL.

# Insist Upon Having Badger Sheet Metal Products

Badger Building Specialties and other sheet metal products have been standard for years. They are quality goods that are guaranteed to give you satisfaction and save you money.

### Ask Your Dealer

Hardware, Implement and Lumber dealers everywhere sell Badger products. Your dealer can supply you if you insist. Look for the Badger trade-mark. It is your guarantee of service and satisfaction. Complete catalog upon request.

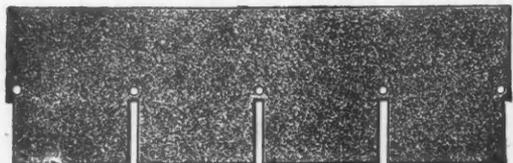
### The Badger Line Includes

- |                                |             |                    |
|--------------------------------|-------------|--------------------|
| Cornices                       | Skylights   | Eaves Trough       |
| Finials                        | Ventilators | Conductor Pipe     |
| Sheet Metal Roofing and Siding |             | Metal Barn Battens |
| Galvanized Screw Joint         |             | Metal Ceilings     |
| Well Casing                    |             | Hip Shingles       |
| Hog House Skylights            |             | Ridge Rolls        |
|                                |             | Galvanized Tanks   |

Dealers: Write for catalog and discount sheet. Large capacity and favorable location insure prompt shipment same day your order is received.



Badger Corrugating Co.  
Dept. 00.  
LA CROSSE, WISCONSIN



## Rex Strip Shingles

Grayish Green

Dark Red

Guaranteed for Ten Years Without Paint or Renewal

REX STRIP SHINGLES make an artistic, economical, fire resisting slate surfaced roof. A roof that is guaranteed for just as long as one of individual shingles and—There is a saving of 37½% on nails and labor.

Buy Through Retail Dealers or Order From Us Directly

### The Flintkote Company

Asphalt Shingles

Prepared Roofing

90 Pearl Street

BOSTON, MASS.

New York

Chicago

New Orleans



# DO YOU KNOW?

75 per cent of the Store Fronts  
in your town need remodeling

You can install a Coulson front on each one, at a big profit to yourself, and know that you are helping your customer increase his profits at least 50%. No matter what condition the front is in you can make it up-to-the-minute the Coulson plan. Coulson fronts are easy to build. We furnish everything complete, ready to install. All Coulson exclusive features are patented, this protects you as well as ourselves.

Write us today for complete information about Coulson Fronts

**THE J. W. COULSON & COMPANY**  
85-107 W. Spring Street COLUMBUS, OHIO



## CRESCENT

### A RELIABLE CANDIDATE

FOR A LONG TERM IN YOUR SHOP

#### It Will

Increase the productive power of your shop. Which is simply another way of saying—"boost your profits." How? By installing a Crescent Universal Woodworker in your shop.

WRITE NOW FOR OUR CATALOG



Your industrial housing jobs require the use of a Crescent Woodworker.

The Crescent Universal Woodworker will enable you to do your band sawing, cross cutting, ripping, resawing, panel raising, grooving, disc grinding, sanding, jointing, sawing, boring, tenoning, da-doing, knife grinding and mortising. A saver of many dollars on labor bills.

**THE CRESCENT MACHINE CO.**  
224 Main St., Leetonia, O.

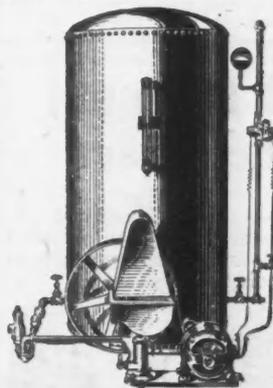
## MODERN FARM HOMES

call for modern water service installations. Incorporate in plans for farm and suburban homes

# HOOSIER Water Service

One of these installations will provide adequate water service for the isolated home.

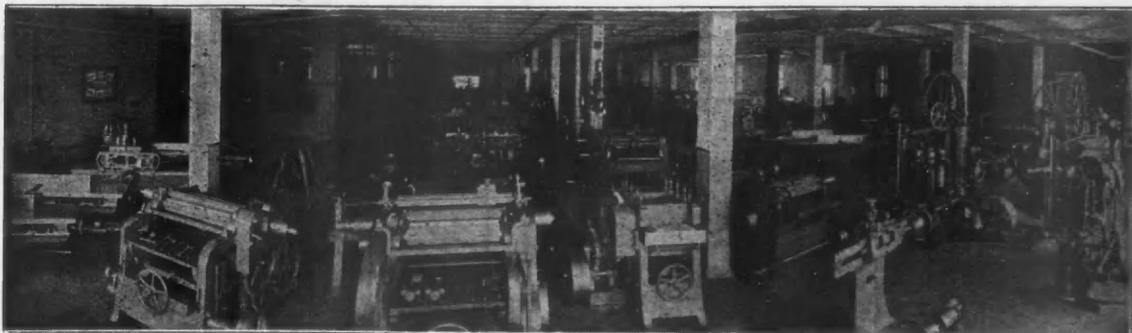
Send today for Bulletin F and familiarize yourself with the many outfits shown therein, that you may be prepared to recommend the most suitable installation to meet the demands which will be made upon it.



Hoosier Water Service tanks are coated inside with a rust resisting preparation, which prevents rust and corrosion. Lengthens life and usefulness of tank.

**FLINT & WALLING MFG. CO.**  
DEPT. W, KENDALLVILLE, INDIANA

Write for catalogue showing full line of Wood Working Machinery for Carpenters and Builders. Also Bargains in second hand Machinery.



Michigan Representatives  
**C. H. LOWRY**, Head Salesman  
**E. T. STEARNES**, Assistant Salesman  
Room 301 Commercial Savings Bank Bldg.  
Grand Rapids

**CHICAGO MACHINERY EXCHANGE**  
1215-1223 Washington Boulevard, CHICAGO, ILLINOIS

Indiana Representative  
**W. A. REDMOND**,  
305 Merchants Bank Bldg.  
Indianapolis

## An Ideal at Work—

When you wish to judge a man's ability you watch him at his work. The same is true of a machine—only when it is working does its true worth show fully.

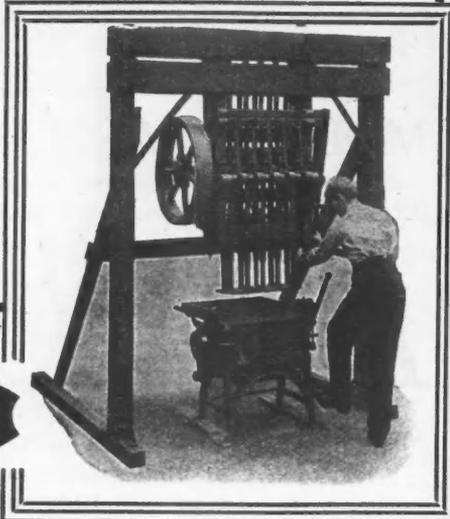
Watch an Ideal Concrete Block Outfit at its busiest moment. You will be struck by the speed at which it works, the ease with which it is handled, its convenience and simplicity, the wide range of styles and sizes it is capable of producing, and finally the excellence of the completed product in proportion, accuracy, design and surface finish.

Ideal Machines are more universally used than all others combined. The reasons for this are fully set forth in our latest catalog, which we will gladly send you on request. Write today.

**THE IDEAL CONCRETE MACHINERY CO.**

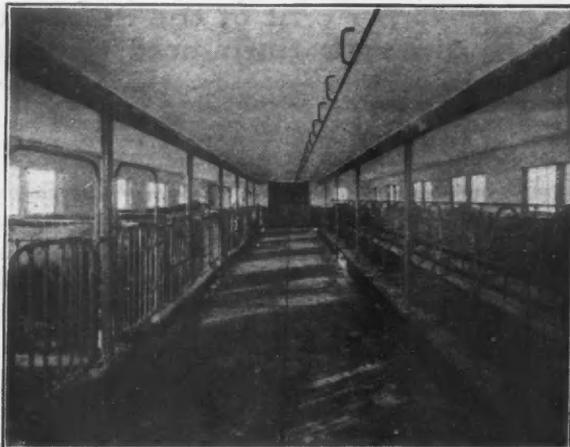
1308 Monmouth Avenue

CINCINNATI, OHIO



*Ideal*

## Builders Are Doing It And Are Making Good Money



One of Five Barns on Large Dairy in Utah  
All CLAY Equipped Throughout

Many builders of modern barns, hog houses, etc., specify and install CLAY Equipment. It is the most modern; saves the customer some money, because it is so simple, and makes the builder a better profit and a thoroughly satisfied customer. CLAY Equipment is different from the ordinary lines. It helps to eliminate competition and is easier installed because of its unique construction.

Let our service department assist you in making barn plans, hog-house plans, drafting, blue-printing, designing, etc.

Builders and Dealers: Write for your free copy of our new No. 12 Catalog. It contains helpful building data.

**IOWA GATE COMPANY**

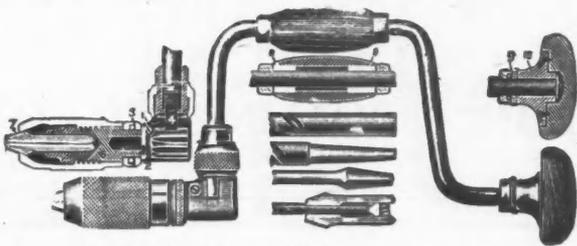
526 Clay Avenue

Cedar Falls, Iowa



## V & B Patented Ratchet Brace

V & B Braces are unique in construction. The chuck cannot work loose, as there is no end screw. Our patented key construction holds the chuck firm. The jaws will hold all styles of bits up to and including one-half inch.



Nickle Plated—Walnut Handles—Ball Bearing Head  
No. 222 Brace. All sizes. 10-in. sweep. \$5.00 each.

## Vaughan's Vanadium Nail Hammer

The toughest, strongest Hammer made



No. 41-20 oz. 41½-16 oz.  
42-18 oz. 42½-10 oz. Note  
Wax Hole in end of handle.  
All sizes \$2.75 each.

**Vaughan & Bushnell Mfg. Co.**

Makers of Fine Tools

2114 Carrol Ave., CHICAGO

**T**HE Wayvell Chappell Automatic Ball Bearing Electric Floor Surfacing Machine is what you need to finish your new or old wood floors quickly and just the way you want them.

The machine is simple, easily handled, made correctly, built to last—the result of years of experience in building this specialty.

As **QUALITY** of work is the first essential in finishing floors, particularly new work in residences, flats, apartments, etc., all roller vibration must be done away with. It is remarkable how smoothly and steadily this ball bearing machine operates.

Only surfacing machine having roller sanding even with baseboard from either side of machine; doing away with uneven work of edge roller attachment. Removes old varnish, paint, oil-soak, black, etc., rapidly, or cuts down warped edges quickly. Four sizes — for the largest areas or the smallest rooms.

The Little Automatic Electric Surfacing Machine (on desk) is a wonder for removing varnish from desk tops, counters, etc., or for new work, show windows, sills, doors, in corners, closets, or other confined spaces.

Write for folders. Accept our free trial offer.

Manufactured by

**Wayvell Chappell & Co.**

408 W. Grand Ave.,  
Dept. D, Chicago, Ill.



Pat. 1916



Pat. 1912-1916



## In Remodeling Store Fronts

Consider more than just appearance. Think of the value of illuminating the far corners of the store's interior. The one economical way to daylight a store is with

### 3-Way-Luxfer Prism Transoms

They cost but little more than plain glass yet they reduce artificial light bills to the lowest point.

3-Way-Luxfer Prism Transoms are made of 4" pressed tile of Lalalite glass, accurate of angle to give greatest efficiency.

Write for prices of any contemplated job. Sold by all glass jobbers'

### AMERICAN 3-WAY-LUXFER PRISM CO.

1309 S. 55th Street, Cicero, Ill.  
(Chicago Suburb)

139-141 Spring Street,  
New York, N. Y.

## Carpenters-- Make Extra Money!

Here is a profitable side-line business by which every carpenter can make many extra dollars. No loss of time from regular work. Just carry a sample of Henry Airtight Weatherstrip—and make sales while on your regular jobs. Nearly every house holder will buy. Saves coal. Protects health.



The Henry Airtight Weather Strip for bottom of doors and side hinged windows. A perfect protection against rain, cold, snow and dust. Approved by architects, carpenters and builders wherever known. Carpenters and others are making big money selling them.

Write today for our proposition.

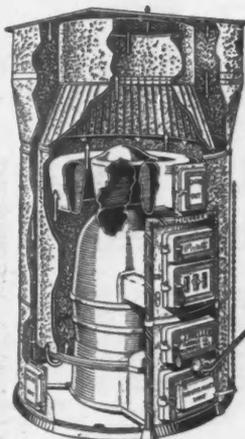
The Henry Airtight Weatherstrip Co., Crawfordsville, Ind.

Henry Airtight Weatherstrip on door, opened, showing attractive appearance.



## It Stands the Test of Real Service

WHEN you talk construction features of the Mueller, the "Big 3" Pipeless Furnace, you have arguments which never fail to convince. The Mueller has absolutely established its superiority under the most rigid tests of service. Its three big exclusive features—the "Big 3"—and other important construction advantages, are the reason.



### MUELLER The "Big 3" PIPELESS FURNACE

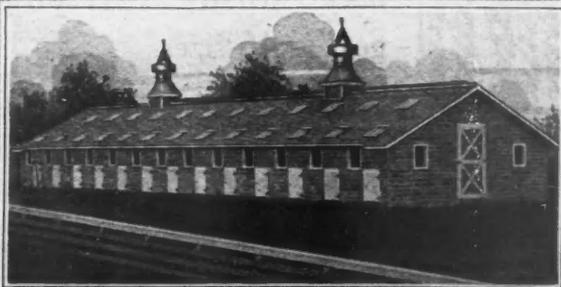
1. Large and Properly Proportioned Register Face.
2. Spacious, Unobstructed Air Passages.
3. Vast and Scientifically Designed Heating Surface.

Learn more about the Mueller. It offers an opportunity for increased profits you cannot afford to lose. Hundreds of home owners in your community are ready to install a Mueller now.

Write for the Mueller Book on pipeless heating and our special proposition to contractors and builders.

L. J Mueller Furnace Co.  
218 Reed St., Milwaukee, Wis.

Makers of Heating Systems of All Types Since 1857



Patented non-continuous mortar joint, makes it moisture proof and insures greater insulation. A popular and easily laid tile for small buildings.

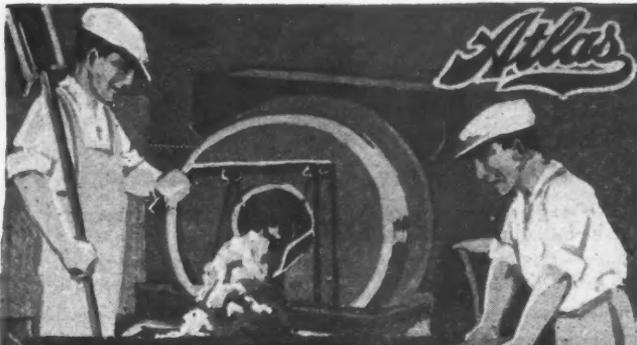
## The Beginning

of good hog house construction is DENISON LOAD BEARING TILE NO. 23.

## The End

is service which gives an increasing satisfaction, because of efficiency and economy which can be had from no other material.

Mason City Brick & Tile Co.  
900 Eighth Street, MASON CITY, IOWA



**SIMPLICITY ITSELF**

**S**IMPLE to operate, easy to adjust, with no unnecessary parts to get out of order and delay your work—those are the salient points of the Atlas mixer. If you have ever watched an Atlas at work you will remember how smoothly it ran, how quick and thorough was the mixing, you were also probably impressed with the strength of its parts, attained without excessive bulk. If you have not seen an Atlas it will be well worth your while to write for our latest catalog and prices.

Atlas Mixers are made in four sizes, two styles, and are suitable to all mixing needs. Tell us about the type of work you handle most, and we will be glad to aid you in selecting the style of machine you will find most satisfactory.

**Atlas Engineering Company**  
3009-3021 Lisbon Avenue  
Milwaukee, Wis.

*"Get me a Yale Door-closer"*



*Any Door is a Better Door with a Yale Door Closer*

*Correspondence Invited*

**E**VERY main entrance, closet, library, kitchen, bath and screen door, there is need for a Yale Door Closer.

The Yale Reversible Door Closer comes in sizes and finished to suitably and completely fit every kind of door.

In mechanical construction and design the "Yale" is typical of every other Yale product—and proves itself better in operation and ease of maintenance in hundreds of thousands of installations under all conditions of use and climate.



The Yale & Towne Mfg. Co., Makers of the Yale Locks - - - - - 9 East 40th Street, New York City  
Chicago Office 77 East Lake Street Canadian Yale & Towne Ltd., St. Catharines, Ontario

**You Profit Most When You Get the Real**



**C**OMPO BOARD is in a class by itself—it is the only wall board that has the patented wood core center, constructed of kiln-dried wood slats, cemented between specially prepared moisture-proof paper under terrific pressure and heat. This gives Compo Board extra strength, stiffness, durability and keeps it from warping.

Resists moisture, heat and cold. Easy to put up and lends itself to many decorative schemes. You can paint it, paper it or kalsomine it, and it will not crack, shrink or buckle. Gives greater satisfaction than plaster walls and costs less in the end. Handles and saws like lumber.

*Ask for Compo Board. Recognize it by the wood core. Sample and interesting Booklet FREE.*

**The Compo Board Co.**

5777 Lyndale Ave. No.

At 44th

MINNEAPOLIS MINNESOTA



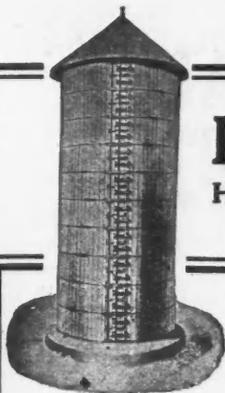
**Lane's Automatic Lock Blocks**

**WITH** these Blocks one man can do the work of two using the ordinary kind. No "slip back" holds "all you get." 46 sizes.

*Catalog shows our entire line. Send for it. :: ::*

**LANE BROS. CO.**

Cherry Street Poughkeepsie, N. Y.



## BUILDERS!

Here's a Real Opportunity to Make Extra Profits

THERE is a big demand for silos with such unusual features as those used in our famous "Ladder-Hinge Door" and Lasco Tile Silos. You can make money selling and erecting them.

### LADDER HINGE DOOR AND LASCO TILE SILOS

Are the only silos built with the famous Hinge Door. Door forms a perfect ladder—steps 15 inches apart. Safe, easy—any boy can operate. Door always in place—no lost doors. Lever lock is operated with one hand. Keeps ensilage next to door perfectly. Positively will not sag, bind or stick. Used everywhere for many years. Recognized as the best silo door ever made.

#### Go After the Business in Your County

Nearly every farm needs a silo. Nearly every farmer realizes his need and wants a silo. Why don't you sell them a Ladder-Hinge Stave Silo or a Lasco Vitriified Tile Silo?

Get our proposition. There's money in it for you. Write for details today.

**LANSING SILO COMPANY**  
315 East Shia Street, LANSING, MICHIGAN

## Have You Watched a Blystone in Operation?

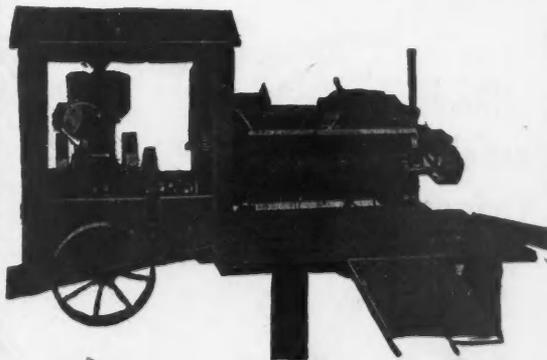
They are unlike any other made. The Patent Reverse Spiral Arrangement of the mixing blades is found only on the Blystone.

With this arrangement the batch is carried from one end of the drum to the other twice with every revolution of the shaft and shoveled over forty-four times each minute. The Blystone mixes successfully concrete, mortar, hardwall or the old-fashioned hair plaster.

WRITE FOR OUR CATALOG

### BLYSTONE MANUFACTURING CO.

419 Carpenter St. Cambridge Springs, Pa.



## Puts Modern Heat in Any Home

When you handle the Waterbury, old houses as well as new ones, are your prospects. It's easily installed in basement or small excavation. No water or air pipes to add to expense and take up space. Burns any kind of fuel.



## THE WATERBURY Seamless Pipeless FURNACE

supplies entire house with clean, healthful, moist-air heat through a single register. Seamless, welded steel construction prevents gas, smoke or dust entering rooms. Every advantage of steam or hot water heat without the cost. Makes satisfied customers and larger profits.

Interesting proposition to dealers and contractors Write for it.

**The Waterman-Waterbury Co.**  
1121-57 Northeast Jackson St. Minneapolis, Minn.

## CALCIMINES AND WATER PAINTS

These materials are so much cheaper than wall paper and oil paints, and are so much better than lime wash that every wide-awake builder and owner should investigate them fully. Learn which are the most practical, and find out how much they will help to reduce costs.

Calcimines are glistening compositions intended for decorating ceilings and walls of residences, offices, schools, churches, theatres. The best are called **MURALITE** and **CALCITINE**.

Water Paints are caseinous compositions intended for whitening ceilings and walls of factories, mills, sheds, garages, stables.

The best is called **PERMANITE**.

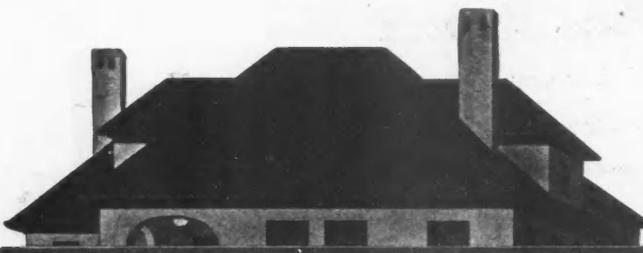
Our products are more practical than any similar ones on the market, and are sure to please you.

Send for description cards and prices

### M. EWING FOX COMPANY

Manufacturers

240 East 136th St. NEW YORK 501 S. Peoria St. CHICAGO, ILL.



## The Wisest Course

in selecting the proper roof is not through the media of false advertising or gorgeous color offerings, but on the reputation the material enjoys.

Reputation can be based on time alone—and SLATE is the only roof that has withstood the ravages of time.

**Play Safe      Use SLATE**

QUICK ACTING  SELF LOCKING

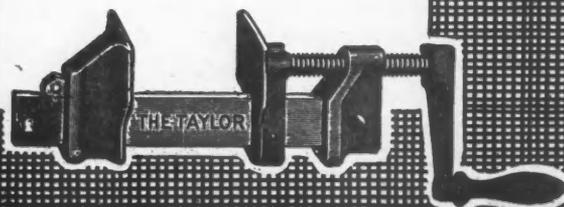
## Clamps

**An Investment  
Not an Expense**

The quickest and strongest clamps made. That's why they're the standard in U. S. Government Works and in such concerns as General Electric Co., Singer Sewing Machine Co., Victor Talking Machine Co., etc.

*We can PROVE it in your own shop. Write today.*

**James L. Taylor Mfg. Co.**  
Poughkeepsie, N. Y.



# PORTAL WALL BEDS

*You can* offset the high cost of building.  
*You can* insure against a possible drop in values.

**Higher rentals** and less space with the use of Portal Wall Beds give a margin of profit large enough to cover all emergencies.

**Build or remodel NOW** and take the cream of the big demand.

*Portal Wall Beds*  
Received Highest Award Panama-Pacific Exposition

WRITE

**W. L. Van Dame Company, Chicago**  
**Marshall & Stearns Co., San Francisco**

BURR-AVERY CO., Cleveland..... Agents for Ohio  
G. E. SHERMAN, Detroit..... Agent for Michigan  
H. E. HOLBROOK CO., Boston..... Agents for New England States  
STIX, BEAR & FULLER CO..... St. Louis  
KITCHEN & QUICK..... Tulsa, Oklahoma  
D. B. PORTER..... Omaha, Nebraska

## TROUBLE SAVERS

are unquestionably the most efficient, time and labor-saving scaffolds on the market today.

No bolts, screws or nails. They hook to the studding and your scaffold is up in much less time than it takes to tell you about them.

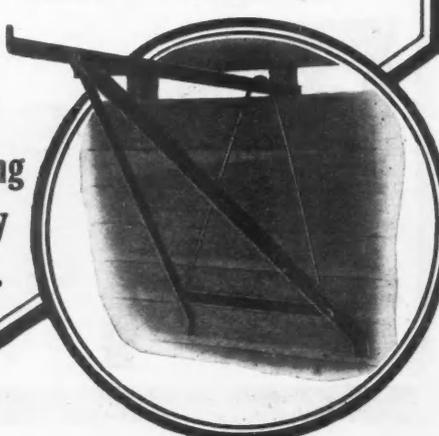
If you have been wasting many hours on each job building your own scaffolds, try "Trouble Savers" on your next job.

Use them for 30 days and if you are not extremely well pleased, we will refund your money.

*Write today for our proposition.*

**Steel  
Scaffolding  
Company**

Evansville,  
Indiana



# Builder's Special

500-Foot and 1,000-Foot Lightning Rod Outfits Shipped Direct

THERE'S an extra profit waiting for you on many jobs, which you can easily get by installing proper lightning protection. The property owner has confidence in you—make this extra money yourself. With only a small investment in our Builder's Special Outfit, you will realize this big profit in selling and erecting.

**Thompson's**  
**THE WORLD'S BEST**

Guaranteed Lightning Protection

The Builder's Special Outfit is designed to meet your needs. A 1000-Foot Outfit will equip from 6 to 8 average buildings, a 500-Foot Outfit from 3 to 4 buildings.

**An Extra Profit You Can Get**

Many Thompson agents are making \$3,000.00 extra per year. Every unrodded rural building is a prospect for a sale ranging from forty to several hundred dollars. Your profit on a complete 1000-Foot Outfit is \$165.00; on a 500-Foot Outfit, \$82.50.

**FREE** If you are a Builder, Carpenter Contractor, or Lumber Dealer, with your initial order we will give you free a set of the necessary Special Lightning Rod Tools. This offer is limited.

Write today for illustrated Dealer's Catalog, Instruction Book (shown at left), and full details of our Introductory Offer and Exclusive Agency Proposition.

**THE GEORGE E. THOMPSON LIGHTNING ROD COMPANY**  
Originators and Distributors  
Dept. B, Owatonna, Minnesota, U. S. A.





PROFITS

FOR  
**AGENTS**

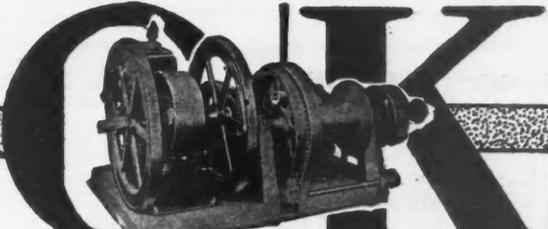
**COAL** conservation is a subject every home-owner is deeply interested in because of coal strikes and the constantly soaring cost of fuel. This gives you a timely and unequalled opportunity to make big profits by selling and installing

**SAGER METAL WEATHERSTRIP**

Sager Weatherstrip is the most modern and improved fuel saver in use. Easy to install and permanent when in.

We still have good territory left for enterprising representatives. Write without delay for full information.

**SAGER LOCK COMPANY**  
North Chicago, Ill.



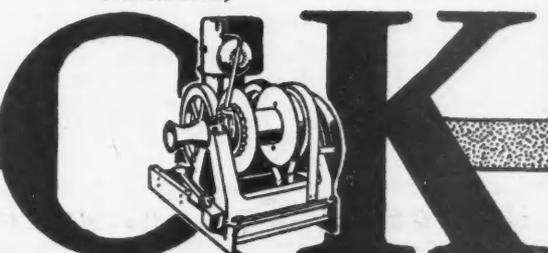
## POWER

AT A MAXIMUM  
**O. K. POWER HOISTS**

May be had in single, double or reversible styles, each equally practical and efficient. They will give you many years of service without developing weak points or causing trouble from complicated parts. The O. K. Hoist for busy contractors.

Our latest catalog shows our complete line of hoists. Write for it today.

**O. K. Clutch & Mach. Co.**  
Florence St.  
Columbia, - - Pa.



The Most Enduring and the Most Attractive Roof at the Most Reasonable Cost



**SHELDON'S SLATES**

### A Growing Number of People Prefer Sheldon's Slates to Any Other Roofing

WE are constantly receiving inquiries from owners for names of roofers who lay slate. This shows that there are a growing number of people who prefer slate to any other kind of roofing. We are selling more Sheldon's Slates than ever before.

## SHELDON'S SLATES

RED GREEN, PURPLE, BLACK

cost no more than an ordinary shingle roof—or a roof of Asbestos or asphalt shingles—and their life is immeasurably longer; they never wear out.

The Booklet illustrated contains interesting facts for the man about to have a new roof put on or an old roof repaired. It is also a splendid thing for the roofer to give to his roofing prospects. Copy on request.

**F. C. SHELDON SLATE COMPANY**  
GRANVILLE, N. Y.



**Pleased Customers!**

The beauty, convenience and year 'round comfort that Whitney Windows add to homes make delighted customers and build profitable prestige for you.

**WHITNEY WINDOWS**

open outward in pairs—out of the way of curtains, screens, etc.—slide easily to any point in the opening—afford wide unobstructed view. Never rattle, stick or slam.

Furnished complete, stock mill work, factory fitted with patented hardware, ready to set into openings. Our large stock of materials insures prompt delivery.

Write on your letterhead for our proposition to contractors and interesting illustrated booklet.

**Whitney Window Corporation**  
134 East Lake Street  
MINNEAPOLIS MINNESOTA

## Tile Silos and Bins Are Indestructible



THE SPECIAL Preston-Lansing method of construction, bracing block against block in ship-lap formation, makes a silo or storage bin that will last indefinitely. Between each tier of blocks is a thick layer of cement and twisted steel reinforcing. Only a thin line of mortar is exposed, leaving a smooth surface inside and out.

### Preston Lansing Tile Silos and Grain Bins

are fire-proof, water-proof, vermin-proof, weather-proof and wear-proof. Their first cost is their only cost. The smooth finish and even color give a beautiful effect.

Preston-Lansing Silos are fitted with Steel Hip Roofs, giving extra silage space. The fire-proof metal chute protects the continuous doorway.

There is a growing demand for tile for silos and co-operative grain bins. Let us give you further information.

**J. M. PRESTON CO.**  
Dept. 428 Lansing, Michigan  
Factories at  
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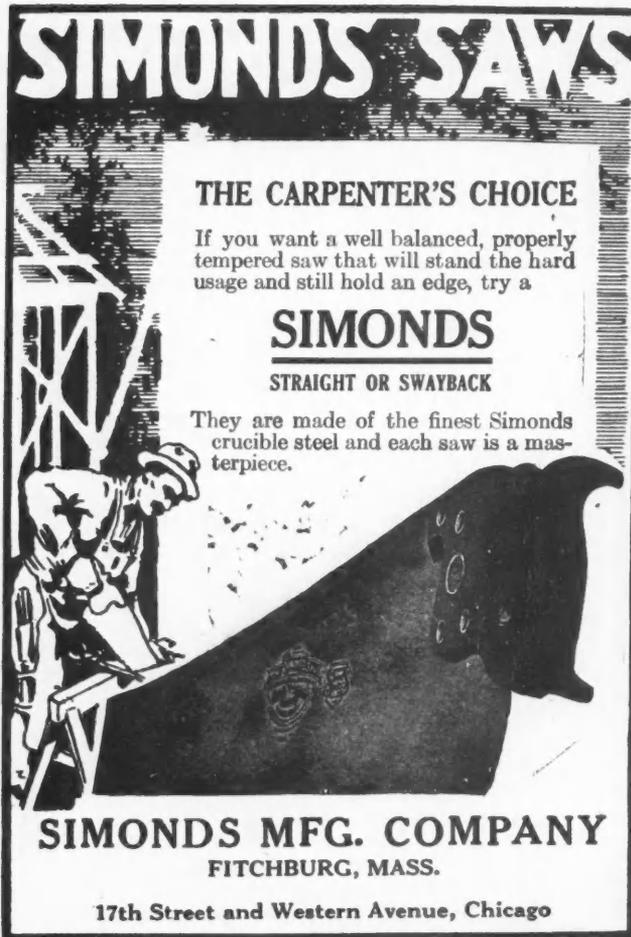
# SIMONDS SAWS

**THE CARPENTER'S CHOICE**

If you want a well balanced, properly tempered saw that will stand the hard usage and still hold an edge, try a

**SIMONDS**  
STRAIGHT OR SWAYBACK

They are made of the finest Simonds crucible steel and each saw is a masterpiece.



**SIMONDS MFG. COMPANY**  
FITCHBURG, MASS.  
17th Street and Western Avenue, Chicago

## Goods Made by are Made to Please



A practical necessity in every home, flat, store or office this Spring to hang screens up right. No straining or sweating with these simple sure-to-work fasteners on all screens. Superior in every way over the ordinary kind. Every builder's customer will appreciate these hangers.

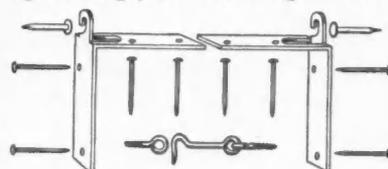
### Kees Screen Fasteners

Simple to attach and put up. Cost no more than common hinges, yet have many conveniences that every builder and contractor want and that insure satisfaction with their clients. Your hardware or building supply dealer will show them to you or write to Dept. 90 for details.



### Half-Screen Hangers

are easily attached. Screen hung on a dowel which is placed after screen is fitted with fixture assuring an accurate and tight fitting job. Made right—act as a brace for screen



frame corners and hold securely while screen is swung out. Adaptable to all types of windows casings and require very little labor to attach.

**F. D. Kees Mfg. Co. Beatrice, Nebr.**



**You can read satisfaction here**

Gentlemen: I am more than pleased with your furnaces. I am sure that they will save from 30% to 40% of fuel, as compared with any hot air system. **IN THEM, YOU HAVE THE MOST PERFECT NATURAL CIRCULATION OF AIR AND TEMPERATURE—** all the heat of the furnace is naturally thrown into space you want to heat, while my cellars are the same for storage, as before. **THEY ARE A PERFECT SUCCESS, AND A PLEASANT SURPRISE.**

Yours very truly

**Contractors—**

You who are looking for the heating equipment that is—

- the simplest to install.
- safest to operate.
- surest to satisfy.

Write to us and let us send you promptly full information on Modern Way Furnaces. We ship them ready to install—except smoke pipe—no special tools or a mechanic required.

**THE MODERN WAY FURNACE CO.**  
FORT WAYNE, INDIANA

**WHETHER YOU BUILD A MODEST COTTAGE OR AN ELABORATE MANSION**

the question of **WATER SUPPLY** is an important one. When you install a **REECO SYSTEM OUTFIT** you have the satisfaction of knowing that you have the **BEST** and that it has cost you no more than a cheaply built one.

**REECO Complete Pneumatic Tank System**



Send for Bulletin BA-1

**GASOLINE and KEROSENE ENGINES and PUMPS — ELECTRIC PUMPS — HOT AIR PUMPING ENGINES — COMPLETE PNEUMATIC or GRAVITY SYSTEMS**

**Rider-Ericsson Engine Co.**  
Walden, N. Y.

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**Keep Your Money-Eye on**

**OAK FLOORS**

Carpenters who keep a wise eye open for a chance to build *business with money* in it have found out a thing or two about **OAK FLOORS** as profit makers.

$\frac{3}{8}$ " **OAK FLOORS** laid *over old floors* and finished complete can be offered, whenever you see a chance on your other jobs, at a price way under what the same area of good carpet would sell for and yet show you a good profit.

You'll find that your customers like the idea and take to it readily and you can get a lot of first-class profitable work by just a hint dropped at the right time. ("**OAK FLOORS OVER OLD FLOORS.**")

We are advertising to millions of people in the big magazines and farm papers and we have extra fine printed matter to help you. We will send it free if you say the word. **SAY IT.**

**OAK FLOORING**  
MANUFACTURERS' ASSOCIATION  
1000 ASHLAND BLOCK: CHICAGO:

THE MARK OF QUALITY



THE MARK OF RESPONSIBILITY



No. 4051

No. 4050

Send 49 cents for Two

**Transparent Celluloid Triangles**

4"—45° and 5"—60°, and our complete new catalog.

**Spaulding-Moss Company**  
32-34 Federal Street  
Boston

Distributors of Hermes Tracing Cloth

# Sand's Aluminum Levels

Always Tell the Truth

The standard of accuracy. And not only the most accurate—but easiest to read, even in the dark. Never rusts—cannot warp, split or crack—and are easily handled. The lightest levels made—strong and durable because the greatest strength is placed where most needed. Ask your dealer to show you these levels, and also write for our new circulars showing full size levels.

J. SAND & SONS Originators of Aluminum Levels 1023 - 29 Rivard Street, Detroit, Michigan



### THE ONLY SCREW HOLES IN THE WORLD

You drive the screw holes with a hammer in any material. The screw holes are made for wood screws or machine screws to fit all sizes of screws. The head is removed and you leave a permanent screw hole.

**The Stine Screw Holes Co.**  
Manufacturers  
 WATERBURY, CONN., U. S. A.  
 DEPARTMENT 41

*Once a Screw Hole, Always a Screw Hole*

*The Biggest Little Thing in the World*

Some of the Reasons Why Screw Holes Will Be Bought and Used and Not Become Dead Stock for Anyone

- 1—They can be used without damage to receiving material.
- 2—They enable you to standardize to wood or machine screws in all material.
- 3—They are made of brass and will not rust under atmospheric or moisture conditions.
- 4—ECONOMY—They save more time value than the holes cost.
- 5—You get them for nothing and are paid for using them when you count time saved.
- 6—Screw holes have been needed ever since the first screw was used.
- 7—Special tools are NOT needed in using them in any material.
- 8—They can be used in any place a screw can be used.
- 9—By using screw holes, screws can be used in many places, and in many materials where it is impossible to use screws without them.
- 10—These are the only ready-made screw holes in the world.
- 11—No special screws are needed. These screw holes fit any wood screw or machine screw now in stock.
- 12—They make the neatest possible job in any material.
- 13—Every store where screws are sold must carry them in stock, because the line of screws is not complete without screw holes for them.
- 14—Every shop and factory where screws are used must also have these screw holes to fit the screws.
- 15—They are endorsed by all dealers in screws and by all users of screws.
- 16—Screw holes are entirely new and the world supply is yet to be furnished.
- 17—This is a progressive Old World of ours, and every active person in it must adopt all improved methods, and all new articles that will help him keep in the front line of progress.
- 18—Be among the first to stock up in screw holes if you are a dealer in screws.
- 19—Be among the first to install screw holes in your shop or factory, as you begin to save money soon as you use them.
- 20—In spite of the high cost of brass, screw holes are yet cheap.
- 21—We are letting the world know that screw holes can now be secured, by means of extensive advertising in all the principal Trade Journals that have the largest circulation among dealers in screws as well as users of screws.
- 22—Do not let your customer ask you for screw holes before you have them in stock. BE A LIVE WIRE.
- 23—They make everlasting holes in any material.
- 24—They mean "Plug-No-More" screw holes.
- 25—They are the result of Necessity being The Mother of Invention.
- 26—Anyone who can drive a nail can use screw holes.
- 27—Send for a sample and convince yourself.
- 28—Mechanics who see them say, "What do you think of that?"
- 29—In fact there are NO REASONS why screw holes should NOT be used.

Each of these reasons are enough to sell Screw Holes. There are many other reasons. Write at once for our handsome Color Card showing screw holes in various materials which will be sent on request, together with samples and price list.

## Shinn-Flat

### Lightning Rods

#### Prevent Lightning Losses

Shinn-Flat is the greatest scientific Lightning Conductor ever devised. It is endorsed by scientific authorities in preference to all round or other old-style cables or rods. It sweeps the field of all competition.

**\$50 TO \$100 EXTRA WEEKLY SELLING PROTECTION**

Rutherford G. Young, New Galilee, Pa., writes: "The Lightning Conductor Business is booming. It is the easiest and most honest money I can make. I have handled Shinn-Flat for 8 years and am convinced you have the best system of Lightning Protection on the globe. It is no trick to make \$50 to \$100 extra a week."

We help you get business.  
Write for particulars.

**W. C. SHINN MFG. COMPANY**  
1228 Lytton Bldg., CHICAGO

## The TRIPLE "A" Spring Driven Floor Smoother

will be found a great help to the building contractor and the floor specialty man during the coming period of reconstruction.

Here is a machine that does the work of six men — one week's work in a single day. Figure the saving.

It has a powerful automatic spring motor that does more than half of the work — adds nothing to the cost of operation, yet doubles the efficiency of the machine. You will need to try this machine to be convinced of its marvelous work performing capacity and the high quality of the work that it does. Every Triple "A" user is an enthusiastic booster. You will want one before long — better write us now and get full particulars.

**TRIPLE "A" MACHINE COMPANY** - 4125 Ravenswood Ave., Chicago

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# THE JAMES SWAN COMPANY, Seymour, Conn.



Awarded Medal of Honor on Mechanics' Tools at Panama-Pacific Exposition.

Manufacturers of all kinds of BITS, CHISELS, DRAW KNIVES, GOUGES, GIMLETS, AUGERS, NAIL SETS, SCREW DRIVERS, COUNTER-SINKS, BORING MACHINES and EXPANSIVE BITS.

Buy only Carpenters' Tools bearing the Trade Mark which stands for Quality.



## Royal Ventilators



## For Farm Buildings

Ventilation for farm buildings is a necessity. Actual tests have shown that live stock kept in well ventilated buildings thrive and are healthier all around than stock kept in ill-ventilated buildings.

Talk ventilation to your farmer customers. All good barns are well ventilated. Ever notice some of the large dairy barns? They all have ventilators and most of them are Royal Ventilators.

Let us send our catalog. It illustrates and describes our farm building ventilators and other ventilators we make. Write for it.

**ROYAL VENTILATOR CO.**

417 Locust Street, Philadelphia, Penna.



Residence of Stucco Construction  
Roebling Wire Lath Used for Exterior and Interior

## "HOME BUILDING"

The highest ideal of most men is to own their own home. When consulted on the matter of home building the prudent architect or builder will recommend stucco construction over

## Roebling Wire Lath

From the point of Economy, Beauty and Durability  
FOR OUTSIDE AND INSIDE CONSTRUCTION

Write for Catalog

Manufactured only by

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Main Office—614 S. Broad St., Trenton, N. J.

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## Build the Fireplace Right

Don't try to reduce the cost by leaving out a good damper. It results in an expensive fireplace to operate and allows rain, wind, birds, and other objectionable things to enter the room when the fireplace is not in use.

Stover Dampers support the brick work, form a smooth throat, regulate the draft perfectly, and reduce the labor cost of erecting fireplaces.

The price is low enough so a Stover Damper can be used in every fireplace. Made in several styles for all size openings. The improved style shown above is one of the most popular.

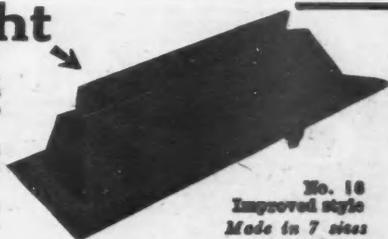
Send for catalog No. 1740 showing our fireplace fixtures and giving information as to the best fireplace construction.

We also make wind mills, feed mills, gasoline engines, hinges, pulleys, saw vises, latches, sink brackets, and other hardware.

**Stover Mfg. & Engine Co., 725 East St., Freeport, Ill.**

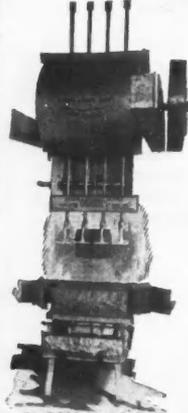
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Name ..... Business .....  
City ..... State .....



**Stover Mfg. & Engine Co.**  
Freeport, Illinois

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



**The Demand for Concrete Block Building Units Is Greater Than the Supply**

Get into the block making business and be sure that you make only high-grade block.

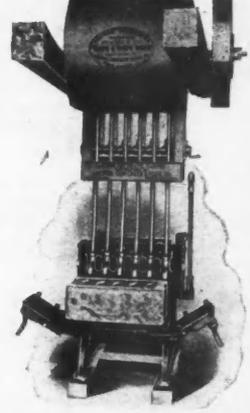
**ANCHOR** Continuous Air Space Block Machines

make the only absolutely frost and moisture proof block on the market. A very simple and efficient machine with a large output at a low price.

**Anchor Automatic Tampers**

are made to work over any make of block, brick or stave machine. Double your output and increase the density and uniformity of your blocks with an Anchor Tamper. *For prices and information write*

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MULLER  
**ASBESTONE**  
 GUARANTEED PRODUCTS  
TRADE MARK

**Everlastic 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.

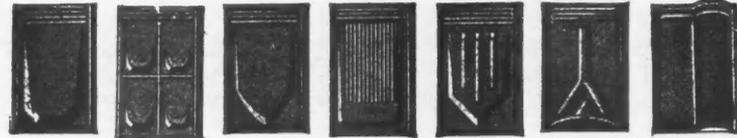
EVERLASTIC STUCCO is the ideal material for old or new buildings. Enduring, indestructible and artistic.

*Inquiries Solicited, Samples and Prices Free—Write Today*

**Franklyn R. Muller & Co.**  
 Composition Floors and Stucco Manufacturers      **Asbestone**      974 Madison Street  
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**WALTER'S & COOPER'S METAL SHINGLES**

*The Shingles That Last*



*The Shingles That Last*

The Most Complete Line of Designs      The Best Quality Workmanship and Finish  
 Made in Painted Tin or Genuine Re-dipped Galvanized Tin

**SOLD AT THE RIGHT PRICE**

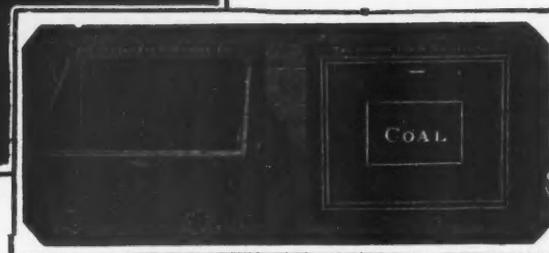
May we send you full-size samples and prices?

**NATIONAL SHEET METAL ROOFING CO.**      339-345 GRAND STREET  
 JERSEY CITY, N. J.

**CANTON COAL CHUTES**

—a profitable side-line for the enterprising builder. Every basement is your prospect; and in Canton chutes you have an article with the selling points which readily make a prospect a patron.

Its simplicity, strength, and trim appearance make it the most satisfactory chute on the market. No glass in this coal chute to break and mar appearance. Write today for catalog B-8 and agency offer.



**CANTON FOUNDRY & MACHINE CO.**  
 Canton, Ohio

# MYERS DOOR HANGERS



**No. 3**

There is a feeling of satisfaction when you call a customer a good article of any kind—you know it means future sales for satisfaction always breeds business.

Myers Stayon Adjustable Tandem Door Hangers are trade developers and business retainers. They create satisfied customers through their stayon flexible and adjustable features, tandem rollers, steel roller bearings, heavy axles, malleable iron frames and other improvements which insure easy sliding doorways for buildings of any kind. They hold and produce door hanger sales because of the service they give.

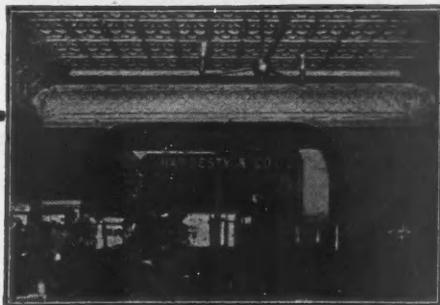
Catalog and prices to dealers only.

F. E. MYERS & BRO.  
ASHLAND, O.

**OTHER MYERS LINES PUMPS AND HAY TOOLS**



**F. E. MYERS & BRO.,** No. Orange St. Ashland, Ohio  
**ASHLAND PUMP AND HAY TOOL WORKS**



## Edwards Metal Ceilings and Walls

The demand for Edwards' Metal Ceilings and Walls isn't coming—it's here now! Thousands of home owners and home builders are reading our advertisements in the leading magazines. We must have more agents. Our product is right. Our prices are right.

*Write for Territory*

It's going to be a case of "first come, first served" with favors to no special one. Right now the territory is being snapped up. Don't wait. One day's delay may mean that some one else will be given your territory. Don't delay; write today for new Ceiling catalog and special agent's proposition.

**The Edwards Manufacturing Co.**  
401-417 Eggleston Avenue Cincinnati, Ohio  
The World's Largest Manufacturers of Metal Roofing, Metal Shingles, Metal Spanish Tile, Metal Ceilings, Metal Garages, Portable Buildings, Metal Lockers, Rolling Steel Doors, Partitions, etc.

No. 1



**"I Make Money Remodeling Store Fronts — So Can You"**

Why don't you buy your store front construction direct from the factory? Twenty-nine years of experience has convinced us that contractors prefer to do business direct. You profit by the direct service, and the money saved on even a small order is no small item. We have no expensive branches or road salesmen, making it possible to sell Desco construction for less. Desco is complete, strong, it protects the glass and an inexperienced man can quickly install it without trouble.

**Desco**  
METAL STORE FRONTS

There is a big demand for better store fronts and you are the logical man in your town to sell Desco. Be sure to get our free book of store front suggestions and Desco details, with prices and your discount. Let us help you land your share of this profitable business. Send today—no obligation.

See Sweet's Catalog

**Detroit Show Case Company**  
491 Fort Street W. DETROIT, MICHIGAN

**STORE FRONTS**

## "CREO-DIPT" Selected Stained Shingles

For beautiful small-home building, specify "Creo-Dipt" Stained Shingles for side walls as well as roofs. Permanently stained in soft-toned shades of red, brown, green, gray, they insure true economy. The open market does not afford such quality of shingles; stained by our preserving process, they defy time and weather.

**Portfolio of Homes**

For delightful suggestions, send today for Portfolio of Fifty Large Photographs of Distinctive Homes and Color Samples. Ask about "Creo-Dipt" Thatch Roofs; 24" "Dixie White" Side Walls.



**CREO-DIPT COMPANY, Inc.**

1028 Oliver Street  
North Tonawanda, N. Y.



Bergman Home—by Arch., Homer Bliss, Rockford, Ill.

# Contractor's Handy Auto Trailer

## SPEED - ECONOMY - STRENGTH



Capacity—2000 pounds. Body—8 feet long, 46 inches wide, 12 inches high. Body and under frame built of open hearth steel. Axles—1½ inch square bed, special high carbon steel. Springs—Semi-elliptic, oil tempered and double heat treated. Bearings—Bower roller. Wheels—1½ inch spoke, artillery type, second growth hickory. Tires—32x3, solid rubber. Weight—624 lbs.

Other models with gates at front; also extension tongue which permits carrying lumber, poles, ladders, etc. 30 feet long.

Write for Catalog C.

**Rogers Brothers**  
COMPANY  
Albion - - - Pa.



is easy to lay because it requires no white lead bedding. It will not crack, peel, buckle or shrink.

It is absolutely waterproof and its remarkable durability makes it economical.

For the roofs and decks of porches, sun parlors, conservatories, etc., it has no equal.

Ask the carpenter or builder who has used BAYONNE and he will confirm above statements; or investigate it by sending to the manufacturers for sample book P which also contains prices and directions for laying.

**John Boyle & Co., Inc.**

ESTABLISHED 1860

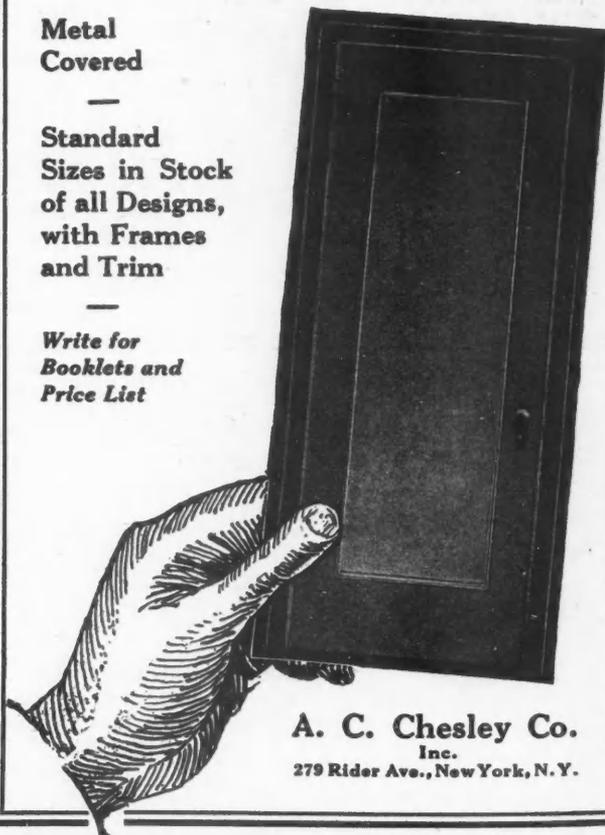
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## STOCK FIRE PROOF DOORS

Metal Covered

Standard Sizes in Stock of all Designs, with Frames and Trim

Write for Booklets and Price List



**A. C. Chesley Co.**  
Inc.  
279 Rider Ave., New York, N. Y.

## PROFITABLE SAWS

SILVER SAWS embody such principles and improvements as make it possible for them to PRODUCE!

They have proven their superiority by a most remarkable record of satisfying service.

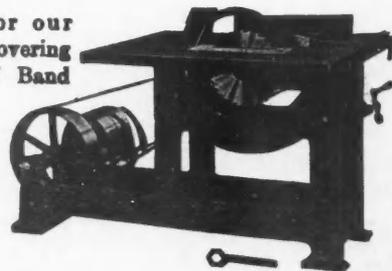
Their praises rise from the lips of half a million enthusiastic contractors all over the United States.

**A TIP**

Don't let your competitor take

the lead. Equip your shop with Modern Silver machinery and be assured of the utmost wood working machinery efficiency.

Write today for our illustrated catalog covering a complete line of Band Saws, Swing Saws, Saw Tables and Jointers in various sizes and styles.



**THE SILVER MFG. CO.**  
Box 345, Salem, Ohio





# Real Protection



**R**EAL protection from lightning is easy to sell.

Every electrical storm creates a fresh demand. Every new building is a prospect. All agricultural schools and farm papers advocate the use of correct lightning rods.

## Sell (BURKETT RODS) THE "BURKETT SYSTEM"

And you have a real lightning protection, approved by the National Board of Fire Underwriters and endorsed by the largest Fire Insurance Companies in the United States.

To insure protection, experts say lightning conductors must either be tape, tube or cable.

Burkett Rods have all three. A spiral copper tape that carries moisture into the ground.

Around this is a tube of woven cable of pure soft copper. **THREE-FOLD PROTECTION.**

WRITE TODAY FOR OUR AGENCY OFFER AND GET STARTED IN PAYING BUSINESS

**The Burkett Lightning Rod Co.**  
Main Office and Factory  
Fremont Ohio

AMERICAN

## Sash Pulley

of pressed metal throughout. Parts electrically welded. Plain, roller or ball bearing wheels with combination groove for either chain or cord.

**Rust Proof and Fully Guaranteed**

**SOLD BY HARDWARE DEALERS**

### The American Pulley Company

Main Office & Works  
4200 Wissahickon Ave.  
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# Increase Your Profits

**E**QUIP the barns with this modern ventilating device and thus build your reputation and good will for the future. Also you make more profit on present jobs. Owners realize the importance of good ventilation, and every OK Cupola owner boosts for you.



## CUPOLAS

are known to thousands of farmers as the **best.**

Are made of heavy galvanized steel; bird, storm, rot and rust proof. Neat in appearance. Are easy to erect—shipped ready to install. Farmers want them. You cash in big by supplying this need.

Write for full particulars and our special discount to builders and contractors where we are not represented.

**Phillip Bernard Co.**  
2402 Floyd Avenue  
Sioux City, Iowa



## Particularly Your Local "Post" Readers Want Round Oaks!

They are reading the big Saturday Evening Post full pages every four weeks—are interested—are wondering "who" the Round Oak man can be. Get our unusual local advertising and sales proposition! Be in position to advise them that *you* are the man—before they shop in another town!

The Beckwith Co., Dowagiac, Michigan  
"Round Oak Folks" Established 1871

# ROUND OAK

Stoves—Ranges—Moistair and Pipeless Heating Systems

# DUMB WAITERS and Hand Power Elevators.

Standard sizes in stock for immediate shipment. Blue prints and full directions for erecting with each outfit.

Complete catalogue on request.

## SEDGWICK MACHINE WORKS

Specialists for Twenty-five Years

154 West 15th Street

New York



\$45 Complete with 10ft. Cord

### DUMORE 1-D Portable Drill

For speed in drilling and countersinking small holes. Just what you need. Can be used on steel, iron, brass, aluminum or wood.

Write for further information.

#### Wisconsin Electric Company

6721 Sixteenth Street

Racine, Wisconsin, U. S. A.



No. 6187—Builders Complete Transit—\$145.00

If you contemplate the purchase of a

## Transit or Level

consult us. We specialize in Instruments and Field Equipment for Architects, Builders and Contractors

Catalogue on request

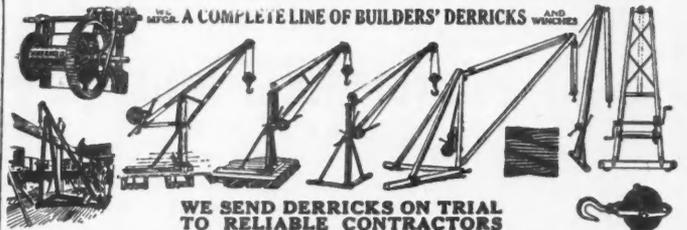
### F. Weber & Company

Philadelphia

Main Office 1220 Buttonwood St.  
Retail Stores 1125 Chestnut Street

BALTIMORE, MARYLAND  
227 Park Avenue

ST. LOUIS, MISSOURI  
825 Washington Ave.



WE SEND DERRICKS ON TRIAL TO RELIABLE CONTRACTORS

#### Our Motto is SATISFACTION or DERRICK RETURNED

Write for circular No. 2 with illustrations, descriptions and best prices on our complete line. The Sagen Builders' Derricks are built of best Crucible Steel and Malleable Iron Fittings, which makes them light, strong, safe and durable. The derricks will please you and probably more than pay for themselves on the first job. Get one on trial.

### SAGEN DERRICK CO.,

3101-3125 W. GRAND AVE.  
CHICAGO, ILL.

NEW YORK OFFICE—GRAND CENTRAL TERMINAL

HARD-  
WOOD  
FLOORS



PARQUET  
STRIPS

## ORNAMENTAL PARQUETRY

All Kinds and Thicknesses. Your Mechanics Can Lay It. Send for Colored Catalogue

### WOOD-MOSAIC COMPANY, INC.

NEW ALBANY, INDIANA

## Cornell-Wood-Board

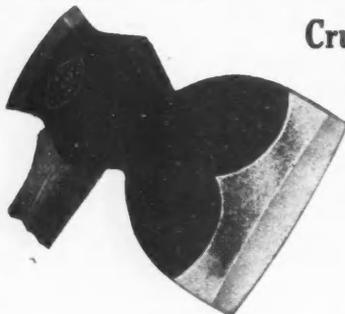
Excels for Walls, Ceilings and Partitions  
Repairs Alterations or New Work

For quality repair and alteration work, show your customers that Cornell-Wood-Board is unequalled. Will not warp, crack or buckle and nails direct to the framework or over the old walls. Easily put up and lasts a lifetime. Resists heat, cold and moisture and is ideally adapted for the walls and ceilings of Homes, Garages, Stores, Offices, Farm Buildings, Industrial Housing, Factories, etc. Increase business and make friends by recommending Cornell-Wood-Board.

Write for Free Samples, sent on request

### Cornell Wood Products Co.

190 N. State Street  
Dept. 104 CHICAGO



### Crucible Tool Steel Edge and Head Hand Axe

Ask your dealer to show you one. You will soon see the difference.

Your dealer has them or will get a sample to show you.

#### The L. & I. J. White Co.

10 Columbia Street

Buffalo, N. Y.

## Paint DEVOE Paint

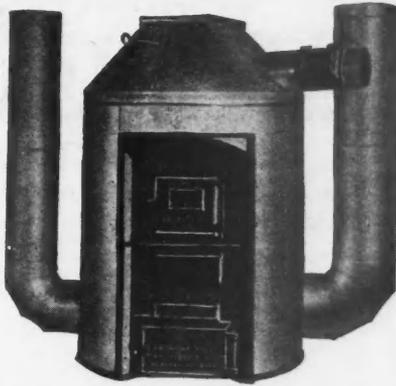
Guarantee formula on every can



DEVOE & RAYNOLDS CO., Inc.  
New York—Chicago

**Great Bell  
PIPELESS  
FURNACE**

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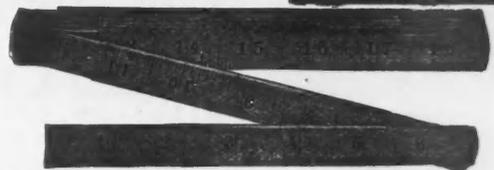
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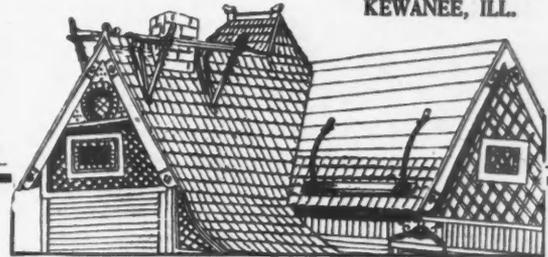
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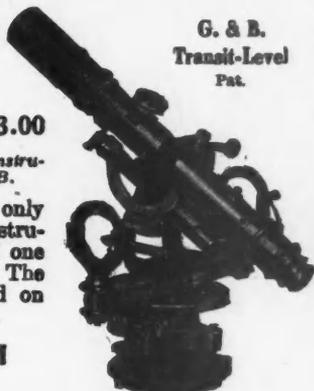
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Losses because of lack of light and ventilation are appalling. Such losses are not only individual misfortunes but neglect of duty to our country. Help stop them.

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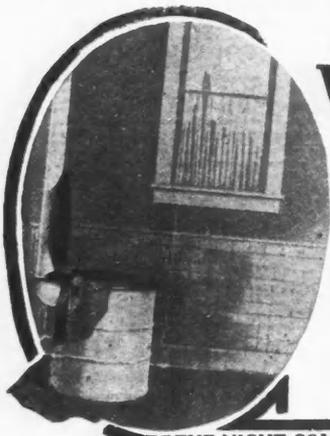
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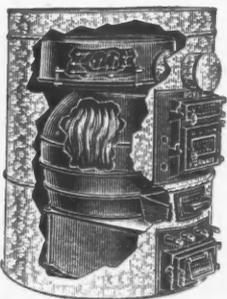
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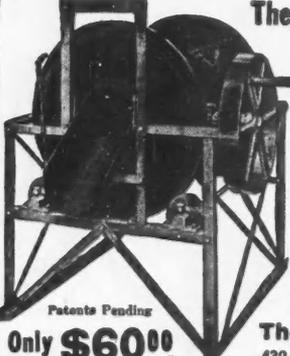
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Furnished with Pipeless fittings when desired. Made in five sizes suitable for a cottage to a church.

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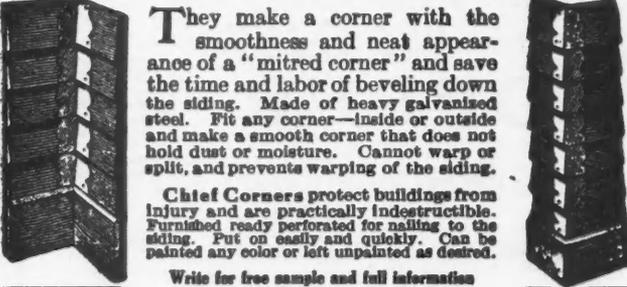
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They make a corner with the smoothness and neat appearance of a "mitred corner" and save the time and labor of beveling down the siding. Made of heavy galvanized steel. Fit any corner—inside or outside and make a smooth corner that does not hold dust or moisture. Cannot warp or split, and prevents warping of the siding.

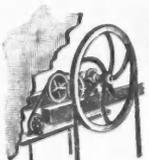
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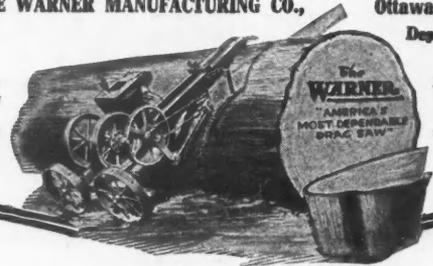


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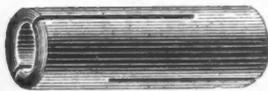
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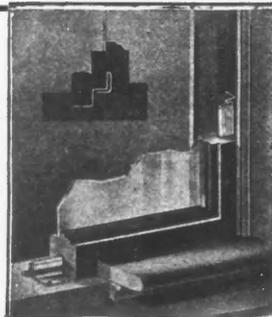
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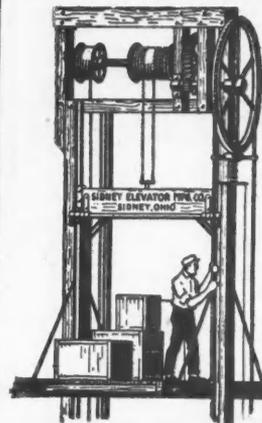
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Our machines are easily installed from our complete plans and instructions which are sent with each elevator.

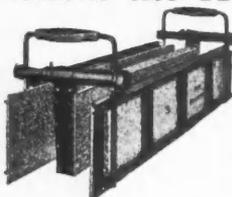
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For Every Home  
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Provides practical, sensible and sanitary accommodations indoors protected from cold and stormy weather.

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**Cannot Rot!**

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## Steel Clothes Posts



Far better and cheaper than wood. Can be set up or taken down at will. No holes to dig, thus saving 75 cents per post cost of labor, paint, etc. Ornamental and do not disfigure the lawn. Have already stood the test for eleven years.

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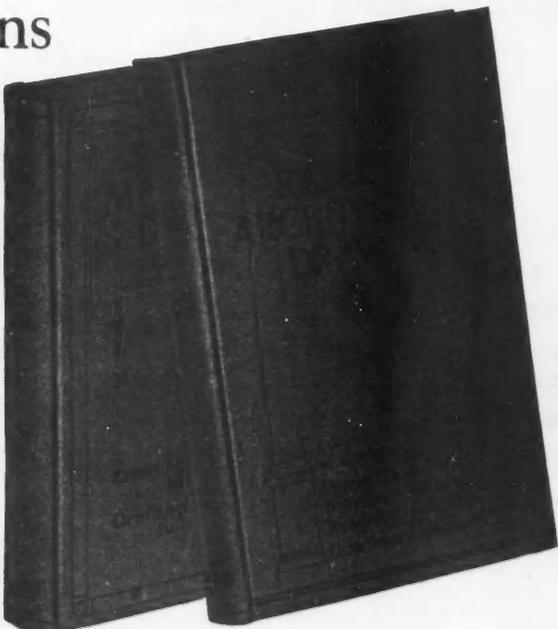
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*Pays for Itself on the First Job*



Do your nailing fast and with comfort—on any pitch roof. Don't mouth nails, they don't taste good. This **HAND NAILER** is the **ONLY NAILER**—wear gloves or mittens—throw in nails by the handful and nail away. Nails easily driven through tin or quite heavy sheet iron.

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Special price for an order from this ad. only \$7.00. We to ship parcel post, prepaid.

Ask about our **ROOFING NAILERS** for asphalt shingles and prepared roofing.

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*Cuts Mixing Costs in Half*

**LOW IN PRICE**

**Mixes Quick and Thorough**

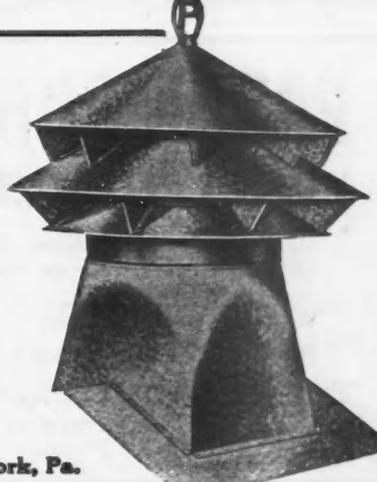


**THE** Little Mixer with an enormous capacity. Easily mixes 30 to 45 cu. yds. of finished concrete per day. 6 to 9 cu. yds. per hour is possible under favorable conditions. It hoes, plows and stirs breaking up all the tiny cement globules and giving a quick, thorough uniform, dependable mix. Can always be set to discharge direct into form.

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Exhaust all foul air from Barns, Factories, Schools, Churches, etc.

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The anvil has been redesigned so that it will perfectly set any Hand Saw. Any One Can Use It.

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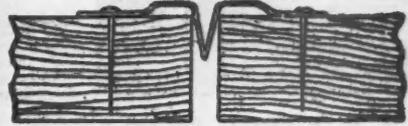
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They allow for expansion and contraction of siding 5, 6, 8, 10 and 12 foot lengths—interlocking joints. Ready cut; no waste. Metal directly to siding.

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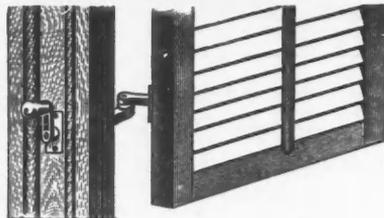
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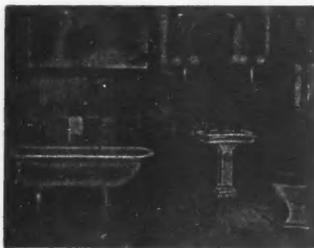
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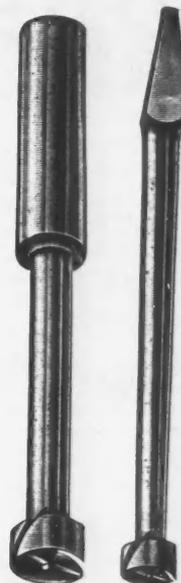
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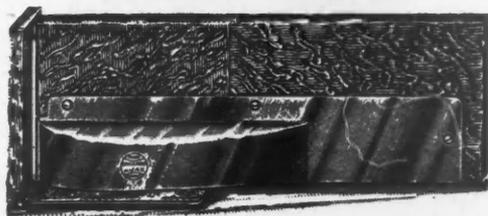
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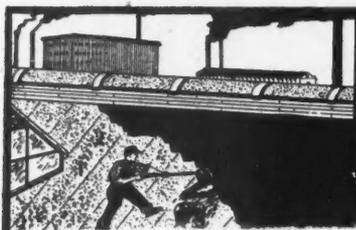


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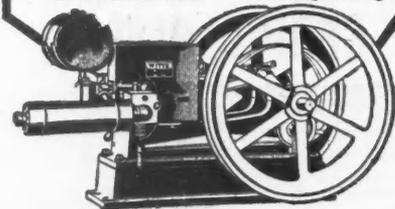
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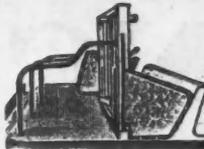
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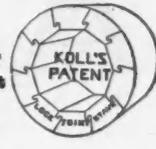


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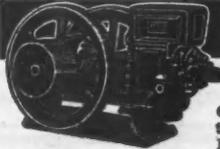
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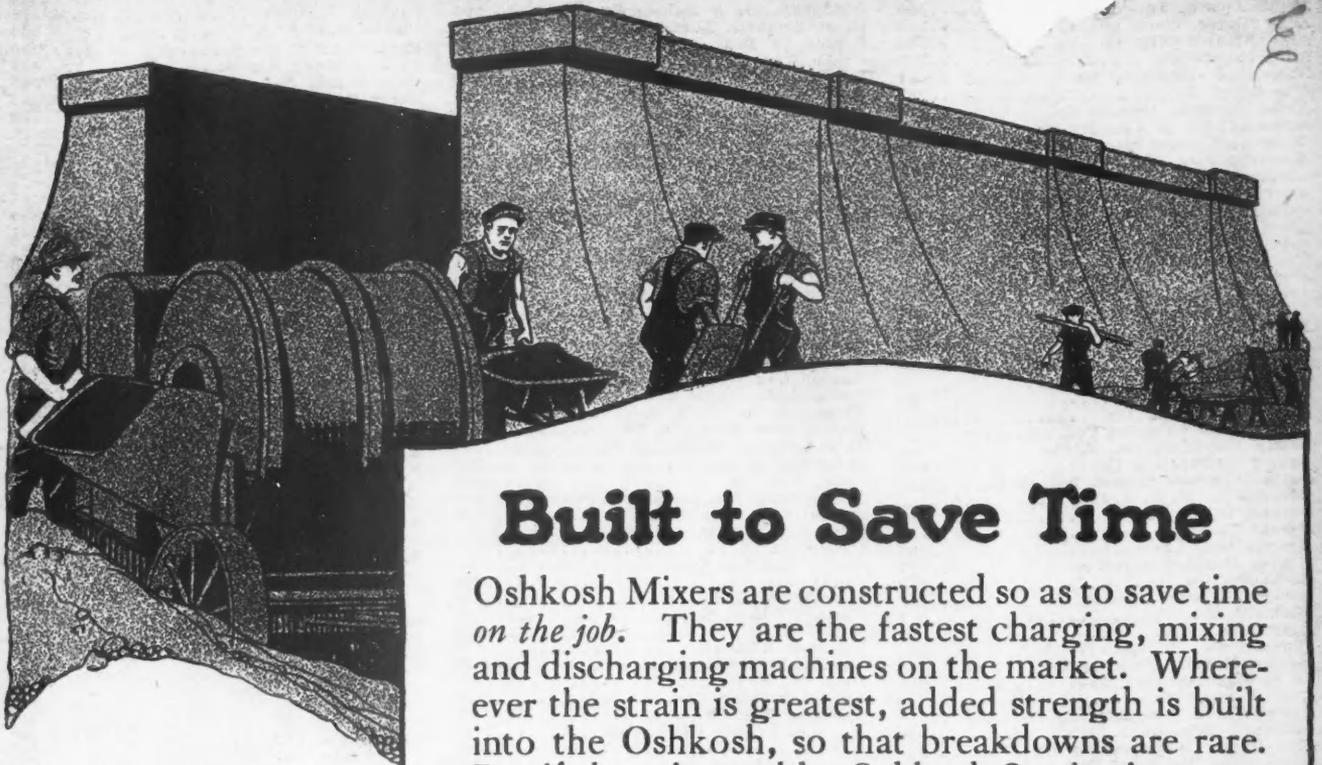
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Disston & Sons, Henry.	226	Muller Co., Franklyn R.	254	Wadsworth-Howland & Co., Inc.	232
Dixon Crucible Co., Jos.	261	Murphy Door Bed Co.	86	Warner Mfg. Co.	262
Domestic Engineering Co.	17	Murphy Varnish Co.	76	Warren-Knight Co.	262
Donley Bros. Co.	216	Myers & Bros., F. E.	255	Waterloo Construction Machinery Co.	53
Drew Carrier Co.	89	National Fireproofing Co.	236	Waterman-Waterbury Co.	247
Dunn Mfg. Co., W. E.	25	National Kellastone Co.	201	Wausau Abrasives Co.	77
Duplex Truck Co.	187	National Mfg. Co.	274	Wayvell, Chappell & Co.	244
Edwards Mfg. Co.	255	National Sheet Metal Roofing Co.	254	Weber & Co., F.	258
Elgin Gas Motor Co.	242	Neville Mfg. Co.	259	Wedell & Boers.	269
Elite Mfg. Co.	59	Newark Steel Pest Co.	264	West Coast Lumbermen's Association.	177
Elmberg Co., E. F.	22	New Jersey Wire Cloth Co.	253	Whisler Mfg. Co.	269
Federal Motor Truck Co.	185	New Way Mfg. Co.	68	White Co., David.	262
Flintkote Co.	242	New Way Motor Co.	238	White Co., L. & J.	258
Flint & Walling Mfg. Co.	243	New York Blue Print Paper Co.	240	Whitney Window Corporation.	250
Fox Co., M. Ewing.	247	Niagara Wall Board Co.	44	Willis Mfg. Co.	73
Fox Supply Co.	263	Nice, Eugene E.	205	Wisconsin Electric Co.	258
Frank Mfg. Co.	228	Nicholls Mfg. Co.	261	Witte Engine Works.	268
Geier & Bluhm.	259	Night Commander Lighting Co.	260	Wolff Mfg. Co.	218
General Electric Co.	62	North Bros. Mfg. Co.	230	Wood Mosaic Co.	258
General Fireproofing Co.	45	North Carolina Pine Association.	23	Woodworker Mfg. Co.	57
General Motors Truck Co.	191	Northfield Iron Co.	265	Yale & Towne Mfg. Co.	246
Gilbert & Bennett Mfg. Co.	90	North Western Expanded Metal Co.	270	York Automatic Dumbwaiter Works.	269
Gilson Mixer Co.	215	Novo Engine Co.	173	Youngstown Pressed Steel Co.	81
Goodell-Pratt Co.	38	Oak Flooring Bureau.	251	Zouri Drawn Metals Co.	80
Goodyear Heights Realty Co.	268	O. K. Clutch & Machinery Co.	249		
		Oliver Typewriter Co.	227		



### Another Case of Oshkosh Service

MacArthur Concrete Pile and Foundation Co., write us that expert gas engine mechanics and engineers spent 5 days trying to put their mixer in order. Then they called in Oshkosh Service, and the mixer was back on the job in a few hours. "And the most prominent point was your service charge amounted to only \$10.75. All this after we had had spent close to \$100.00—for the other expert's advice."

### Eliminate Costly Shut-Downs

Breakdowns will occur even with the best mixers. If you own an Oshkosh machine you won't have to wait for days for a new part, or substitute an unsatisfactory makeshift.

Oshkosh Service Stations are located in every state—near enough to give over-night service—at the longest. We will gladly furnish the name of your Service Station.

## Built to Save Time

Oshkosh Mixers are constructed so as to save time *on the job*. They are the fastest charging, mixing and discharging machines on the market. Wherever the strain is greatest, added strength is built into the Oshkosh, so that breakdowns are rare. But if there is trouble, Oshkosh Service insures a new part or an expert repairman at once.

You can cut down the time requirement on practically every concrete job with an

### Oshkosh Heavy Duty Low Charging Mixer

Will turn out 60 to 80 batches of mixed concrete an hour for 10 hours a day. Loads direct from a wheelbarrow; discharges direct into a wheelbarrow. Charging platform only 21 inches above the ground.

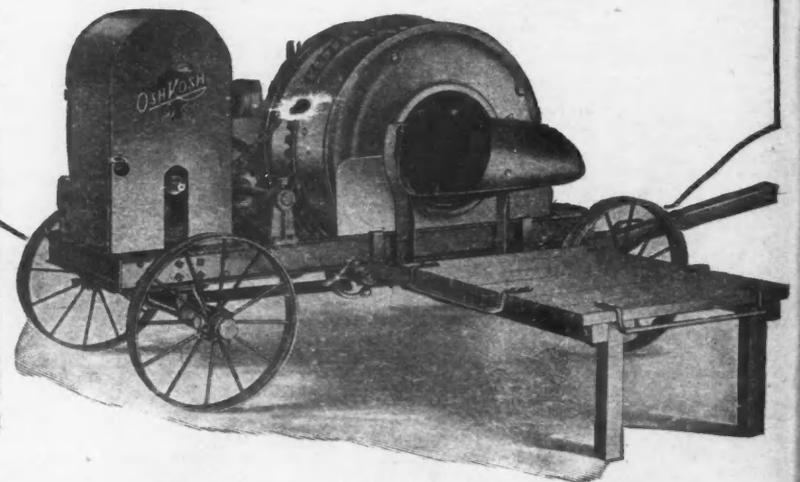
## Oshkosh Mfg. Co.

805 Amber St., Oshkosh, Wis.

New York Branch: 154 West 38th St., New York, N. Y.

R. H. Hyland & Co., 323 North Wells St., Chicago, Ill.

Garfield & Co., Hearst Bldg., San Francisco, Cal.



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