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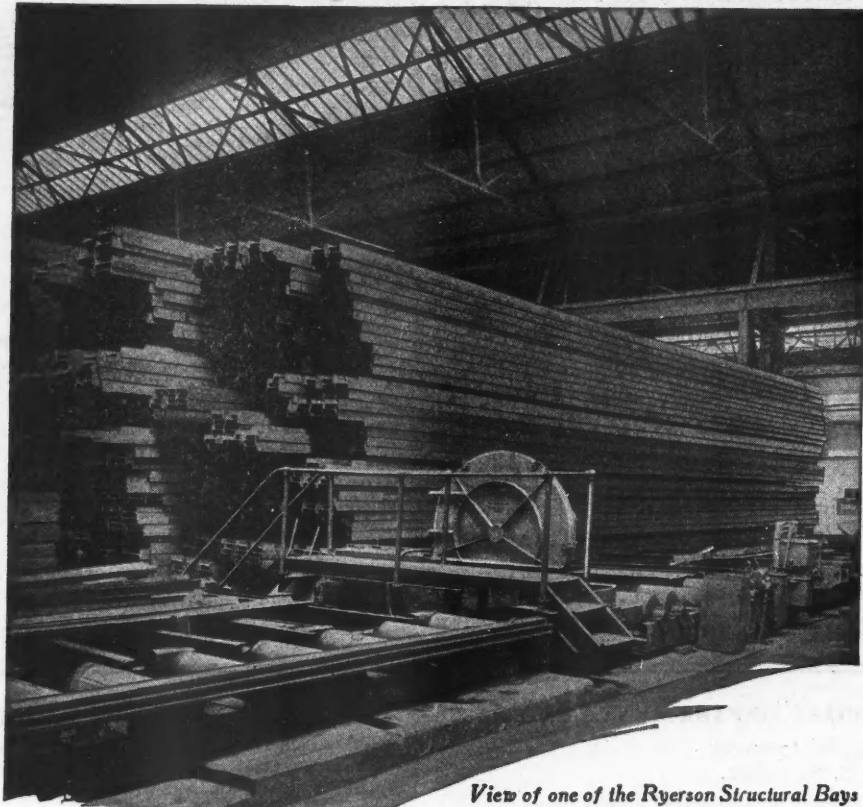
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*View of one of the Ryerson Structural Bays  
with High Speed Friction Saw in foreground.*

## Immediate Steel

Five Ryerson Steel-Service Plants maintain large and comprehensive stocks of the products of all the mills from the heaviest structural to the lightest bar, sheet or rivet.

Every product meets the standard specification of its class. Every product is stored in rooms or space especially provided to preserve its quality and finish.

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# Short Talks by the Editor



## Building for the Future

**M**ANY builders and building material dealers have more business than they can handle. Because of this some of them are stopping their promotion of more building. "Why advocate more? We can't take care of what we have now."

This seems to be a very natural question and the answer involves the discussion of a very vital policy of business—a policy that is fundamental. Recognizing this fact the Joseph Dixon Crucible Co. has published a very concise and enlightening statement which should be excellent food for thought for business men who have been swept off their feet by the present wave of prosperity:

"If we were building a business for today our policy would vary from day to day with the temporary changes with which every business has to contend.

"But we are building for the time to come and we hope that this business will become many times greater than it is today. Without the proper foundation it would undergo violent changes dependent upon temporary national, local or even imaginary conditions.

"If we should permit ourselves to become inflated with self-confidence when business conditions are favorable, restricting our selling and advertising activities, and go down in the dumps when conditions are not so favorable, this business would not amount to any more than the existing conditions would make of it.

"We say right now, without reservations, that we hope, regardless of how aggressive and efficient our manufacturing department may be, that it will never be able to catch up with our selling organization.

"If our efforts should be halted in the middle of the road in times of liberal buying to wait on the manufacturing department, there might come a time when the manufacturing department would have to suspend operations while waiting on the sales organization.

"With such a policy we would be running around in a circle, disorganizing one day and reorganizing the next.

"The greater the demand for our product, the quicker the turnover for mechanics; and the more frequent the turnovers, the larger is the volume of profit.

"In this business advertising is a sales policy—the same as our policy of maintaining a sales organization

—and we might as well consider the elimination of one as the other. Neither will be eliminated, as this business needs both if we are building for the future.

"We hope the idea will never creep into this organization that there will be any let-up in aggressive methods, which might suggest that when business is good there is no occasion for work and when business is poor it is too hard to get.

"We constantly have in mind that the American people are much more concerned in their own affairs than in ours, and if we should restrict our selling and advertising activities they will begin to forget us and this would be our fault. We are going ahead with the idea of increasing the present momentum in favor of our goods; and if conditions should turn face about, our dealers and ourselves will be in a better position to hurdle obstacles than if we originated a policy for each condition as it arose."



## Dan Cupid—Home Salesman

**I**N their haste and flurry to discover the cause of the present shortage in houses, most people have overlooked one of the most important factors in the problem. He is a diminutive gentleman, very often depicted as having little clothing and a pair of wings. None other than Dan Cupid, Esq. Instead of being dismayed by the present crisis, he is doing all in his power to make the situation even more acute.

With a record of 1,040,000 marriages annually, as against 70,000 houses constructed in 1919, he has every reason to be considered more seriously than is the case. However, if more people, especially builders, looked at life with the same optimism that Cupid does, there would be more houses built and less calamity-howling. He demonstrates an inspiring example in the face of unusual difficulties by going ahead at his customary pace, even a little faster. Obstacles only serve to stimulate his keenness and boost his results.

He is the greatest little salesman of homes today and the best press agent the building profession has. Shall it be said that we cannot fill the orders he brings in?



**C**UT the cost by using the new space-saving devices, is a policy that is working out very well in many localities.

## Framing a New Declaration of Independence

TIME IS PROPITIOUS FOR A RENTER'S ANNOUNCEMENT THAT HENCEFORTH HE WILL BECOME A FREE AND INDEPENDENT HOME OWNER

**T**HE decision made by a small band of colonists one hundred and forty-four years ago to break away from the established government and form a new and independent one of their own was momentous and far-reaching. We are fortunate to be able to see what their courage and determination accomplished.

So it will be in the years to come for the renter of today who decides now to break away from the established order of things and take the step which will insure himself and his children security and independence in the declining years of his life. That step is the purchase of his own home.

The time has come for him to make a declaration of independence—*independence of the landlord*. There is no incentive to saving, progress or substantial citizenship in the paying of rent. A man who owns his own home possesses something priceless, aside from the material aspect, in that he becomes master of his own movements. A movement of certainty, of absolute security, is worth years of doubt and insecurity.

In many cases the renter is too timid to take the chance of buying a home and paying for it in small installments. If our forefathers had been afraid to take even a greater chance, in which they risked all, we would not be the most independent people in the world today. Yet, compared with this undertaking, the matter of buying a home is trivial.

Independence Day this year should have a double significance for the great body of renters. It should not only be the anniversary of the nation's independence but be the birthday of a new resolve, which will eventually culminate in that complete happiness and security that only comes thru home ownership.



### Senate Seeks Data on Housing Shortage

**A**LL persons connected with the building industry should be vitally interested in the Senate investigation of the housing situation now under way. It indicates the public interest which has been aroused and calls for active and hearty co-operation.

A special committee of the Senate on reconstruction and production was created. Pursuant to Senate Resolution No. 350, by Senator Calder, with the following personnel: Wm. M. Calder, New York, chair-

man; Wm. S. Kenyon, Iowa; W. E. Edge, New Jersey; J. O. Wolcott, Delaware, and E. J. Gay, Louisiana.

The resolution creating the committee authorizes it to "inquire into and report to the Senate on or before December 1, 1920, (a) the existing situation in relation to the general construction of houses, manufacturing establishments and buildings and the effect thereof upon other industries and upon the public welfare, and (b) such measures as it may deem necessary to stimulate and encourage such construction work, to encourage popular investment rather than spending, to foster private initiative in building, and to insure co-operation between labor and persons or corporations engaged in transportation, banking or other business necessary to the development of such construction."

The resolution further provides adequate means for the operations of the committee from the contingent fund of the Senate and empowers it to sit at any place in the United States, to send for persons, books and papers, employ experts and supply itself with other requisites for a thorough and constructive inquiry.

Senator Calder in his speech before the Senate outlining the creed

of the committee declared for construction to increase industry—the means for production—in order to increase production. The committee is now organizing its efforts along these lines and has specifically requested the co-operation of manufacturers and public in bringing together all available information on the following subjects:

1. Data on shortage of housing and industrial construction.
2. Whether the shortage is increasing or decreasing.
3. The effect of the shortage on industry and the public welfare.
4. Remedial measures which have been taken affecting the various localities or industries.
5. Your views on the merits of such measures.
6. Your opinion as to the necessity for federal action in the present emergency.

Matters relative to the above should be sent directly to the Honorable William M. Calder, chairman, Senate Special Committee on Reconstruction and Production, Senate Office Building, Washington, D. C.

**W**HEN our forefathers framed that famous document in 1776 they wrote "finis" on a very pernicious system of taxation without representation. Today the renter is in an analogous position. He is paying monthly tribute, in most cases far more excessive than the occasion warrants, without the hope of gaining independence. The only way he can get that independence is by declaring himself, by changing his status from that of a tenant into a free land and home owner.

It is indeed fitting that on this occasion of the celebration of the anniversary of the framing of the famous document that the renters declare themselves and break away from the old rule which takes all and gives little, and assert their determination to join that large and happy body of citizens who have homes of their own.



**RENTER'S  
DECLARATION OF INDEPENDENCE**

**H**enceforth

**I will stop paying rent.  
Instead I will invest my money.  
I will win security for  
my family and will enjoy the  
satisfaction of independence.  
I will own my home.**

*(Signed)*

*Mr. Home Owner*







# Our Front Cover Modern Apartment Building

"SEE yonder building!" exclaimed the shade of the ancient cliff dweller to his youthful companion, pointing at our front cover apartment building. "That is the twentieth century cliff dwelling, the home of the honorable white man who likes to gather in cities and live in large buildings. We thought we were progressive when we built our homes in tiers, but times have improved. Today he climbs no ladders to crawl into a hole, but walks on carpeted stairs or rides in elevators to the tier on which he lives. There you find wonderful rooms with incredible wonders. 'Tis a changing world."

And so it is. Small wonder the old cliff dweller should be amazed when

even our grandfathers would have considered such development in apartment buildings not only imaginary but impossible. But progress sweeps on at a giddy pace and in the building field especially. Certain factors have been instrumental in bringing about this change, shortage in homes, scarcity of domestic help, big return from this sort of investment, not to mention the fundamental element, which as the old shade remarked, is also important human temperament. Men like to group together, whether be it a village often or a city of millions. That instinct of association is predominant. And in the modern ten to one hundred apartment building it reaches its peak of development.

Perhaps all of these reasons were responsible for the L-shaped apartment building shown on the front cover. Be it as it may, it represents an unusual combination of the latest types of apartments adapted to a very efficient space-saving arrangement. It comprises fifteen apartments, five on each floor, and an apartment for the janitor in the basement. Built of brick with stone trim, it has been designed to obtain the maximum return from the site which is long and narrow. To do this the architect has provided for five, four, three and one-room apartments, that last one mentioned having a kitchen-dining room, or as it is popularly known, kitchenette.



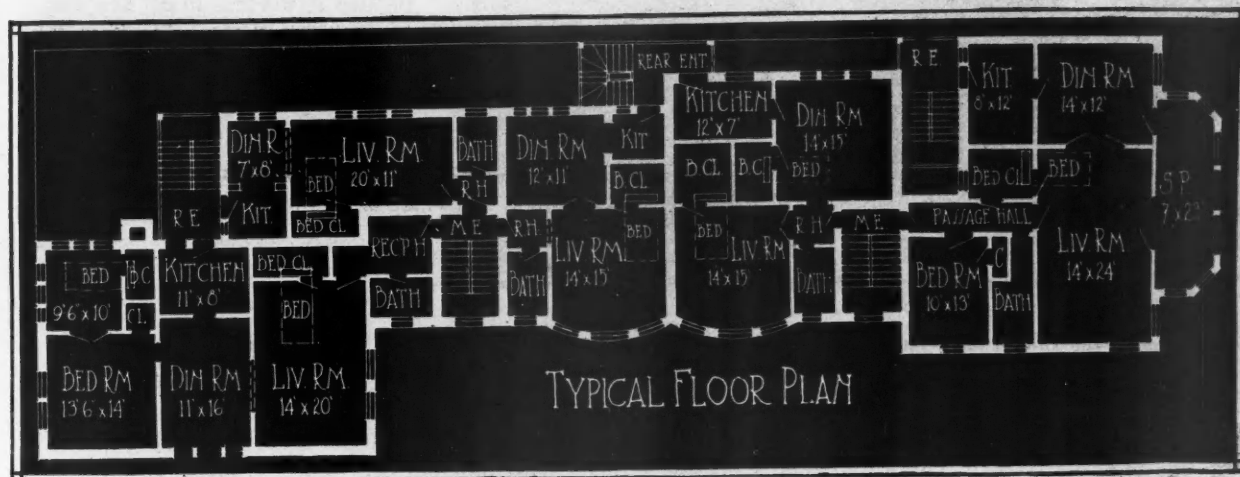
"The Family Is the Foundation of Civilization." Much of Its Success Depends on the Home Surroundings. A Home May Be What We Make It, But Modern Apartments with Labor-Saving Conveniences Work Wonders Toward Putting the Smile in the Mother's Face.

The main walk runs along the side of the building, branching off to the two main entrances, located in the center of the building. The basement is of the high English type which eliminates the necessity of a different first floor plan. This basement enables the architect to draw one plan to cover all three floors.

The front apartment contains four rooms; living room, dining room, bedroom, and kitchen. A space-saving bed, with bed closet, is provided for off the living room, and a pentagonal-shaped sun parlor permits the addition of seven windows to provide plenty

sidewalk thru a semi-circular bay window and contains three rooms; living room, dining room, and kitchen. In this apartment there is one space-saving bed installed in the bedcloset off the living room. The rooms are slightly smaller in size than those in the front apartment.

The fourth apartment which is the smallest in the floor arrangement and is the kitchenette type, is located on the rear side. Its floor plan calls for a living room, kitchenette, and bath. The efficiency of the kitchenette is seen very clearly in this apartment. By the use



This Floor Plan Shows How the Architect Used Every Available Inch of Space in Designing This Apartment Building. It Contains Fifteen Apartments of Varying Sizes, Five on Each Floor, Designed to Be as Efficient and as Comfortable as Possible. Each Apartment Has Plenty of Light.

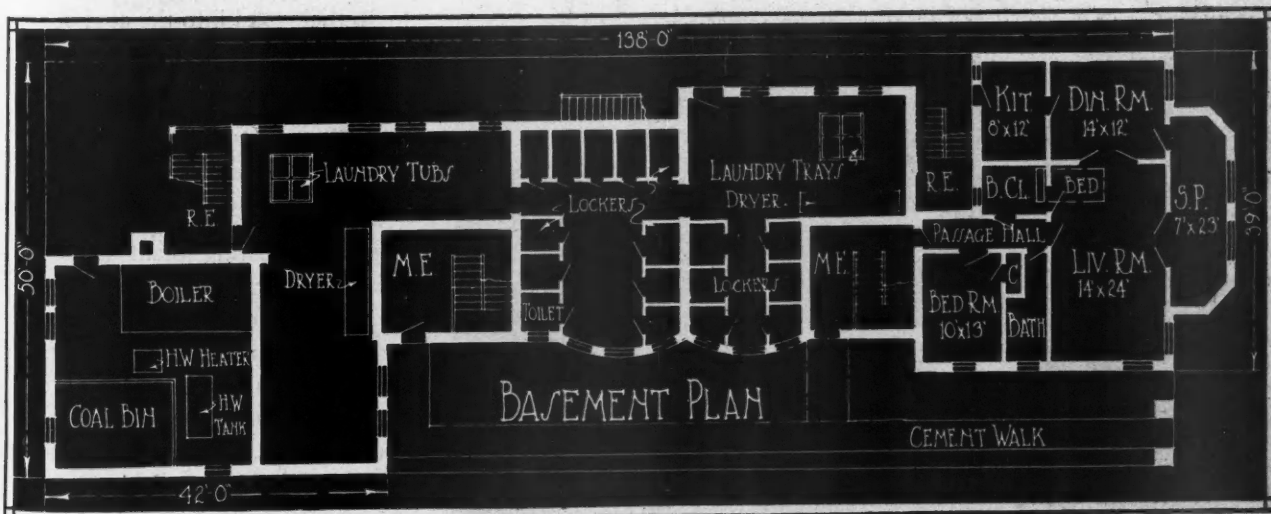
of sunlight and ventilation. A bathroom completes the arrangement.

Immediately to the rear of this is a three-room apartment facing on the side in which the bedroom has been eliminated and space-saving beds installed in closets off the living room and dining room, which are of equal size. The living room opens into the reception hall thru swinging French doors. The sun parlor is replaced in this apartment by a semi-circular bay window. The bathroom is off the reception hall.

The third apartment in this floor plan faces the

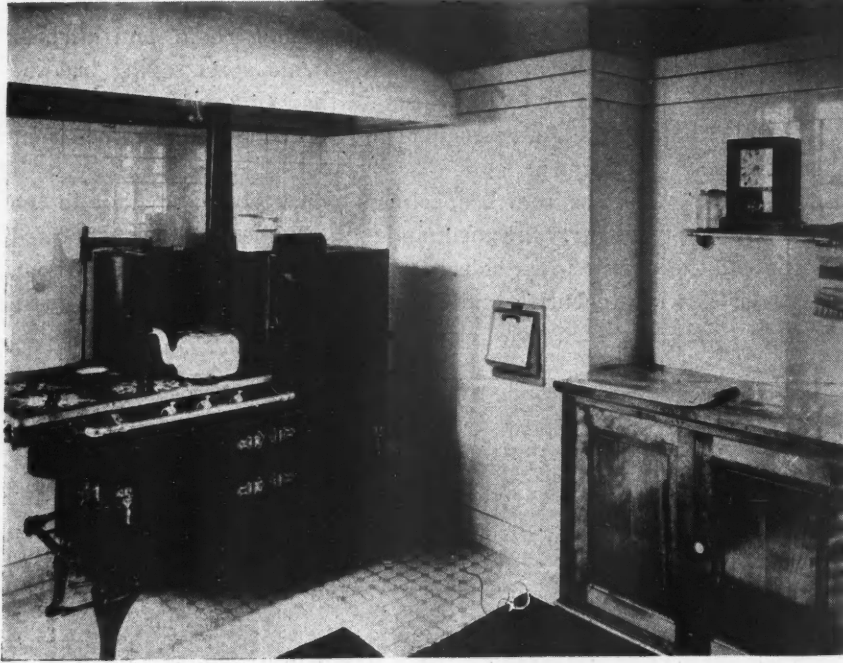
of this combination dining room-kitchen which are only separated by china cases, the architect has been able to get five apartments on one floor, whereas by any other arrangement he would find it difficult to locate more than four. The kitchenette practically reduces the size of the apartment to one room, the living room. The space-saving bed has been installed here. To make up for the lack of other rooms the living room is larger than customary, being 11 by 20 feet.

The rear apartment which makes up the base of the L is the largest of the five. It contains five comforta-



The Basement in This Building Is One That Will Attract the Attention of All Progressive Builders. The Floor Plan Shows the Skillful Arrangement of the Laundry Rooms, Lockers, Heating System and Janitor's Apartment. Mechanical Dryers Have Been Provided. The Building Is 50 Feet Wide and 138 Feet Long.

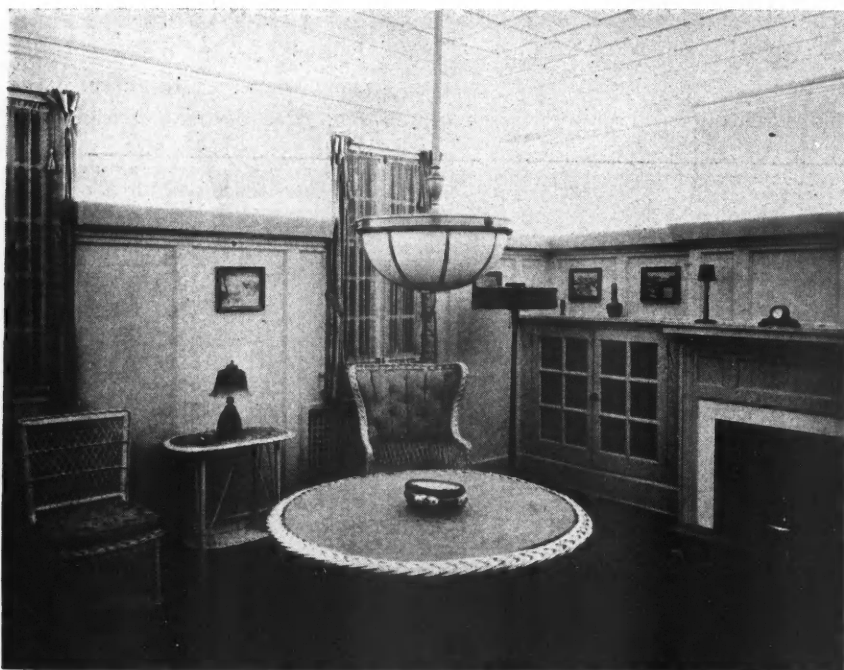




An Important Item in the Modern Apartment Kitchen Is the Garbage Incinerator. It Has Eliminated the Old "Can" System Which Is a Menace to the Health of the Tenants. The Garbage Is Thrown in the Hopper Shown Near the Stove and Drops Down to the Burner in the Basement. It Is Another Step in the Fight to Make the Kitchen a Pleasant Workshop.

ble rooms and is provided with plenty of light because of its ample window space. These five rooms are the living and dining rooms, one bedroom, kitchen, and an extra room which can be used for either library den, or bedroom. If the latter is needed, the space-saving bed can be lowered into position. The living room faces the front, looking out on the long walk and court and is 14 by 20 feet. An additional bed has been provided for in this room also.

By skillful manipulation of rooms and the use of space-saving devices the architect has succeeded in



Interior Finish Is Very Important, Especially in the Living Room Where It Is the Center of the Family Activity. In This Delightful Room, the Lighting Effects Are the Feature. By an Indirect Arrangement the Ceiling Is Flooded with Light, Which Is in Turn Reflected to the Room Below, Greatly Softening the Effect. A Linoleum Floor Has Been Laid in This Room.

providing five apartments on each floor in limited space. As a result, a maximum return in the form of rent is obtained from this building which is only 50 by 138 feet, or about two lots in width. Every inch of space has been carefully apportioned, but there is no evidence of crowding. In each apartment special attention has been given to light and ventilation; outside exposure is present in all apartments. The upper floors are identical in arrangement with the floor described.

The basement of a building of this size involves several problems that require special handling to obtain the maximum satisfaction. There are many people to be accommodated and served. To begin with, the janitor is perhaps the most important link in this service chain. He must be taken care of

first. He has been provided with a four-room apartment with sun parlor. These four rooms are living room, dining room, one bedroom, and kitchen. A space-saving bed has been installed in the living room. As a matter of fact it is identically the same as the apartments directly above.

The heating plant, upon which so much depends, and which to a large measure determines the success of an apartment building inasmuch as it either gives the utmost satisfaction or misery, is located at the rear of the house in a little room which is located in the L turn of the building. One part of this room is divided off into a coal bin very conveniently located with regard to the driveway in the rear where coal trucks can drive up and dump their load into the coal chutes built in the wall.

Only a few feet away from the heating plant is a hot-water heater, one of the important pieces of equipment in a successful building. It is essential in the warm weather when the heating plant is not in operation because hot water must be supplied regardless of temperature. The installation of one of these heaters, especially the type which is connected with the regular house mains, insures a constant supply at all times. It is operated in such a way that the moment the faucet designated for hot water is turned on in any flat the gas in the heater lights and hot water comes.

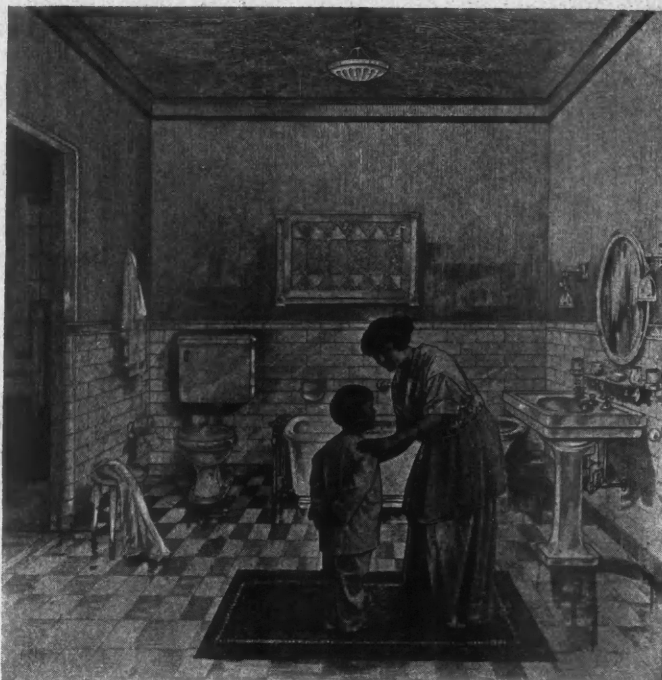


Of constantly increasing importance is the laundry arrangement. In this basement there are two laundries each equipped with four trays and a dryer. The old custom of hanging the clothes out in the yard is impossible in large buildings of this type, because there are no yards, and for that reason artificial dryers have been found very efficient. They speed up the drying process and thus enable the many tenants to do their work without conflict or confusion.

These dryers are operated either by coal-burning stove, gas, electricity or steam. In apartment buildings the gas stove type is generally used. The piping is so arranged that each tenant pays for his own gas used in the laundry. This system is being universally adopted by architects throughout the country. With these dryers installed the clothes are dried as they are being washed.

A most desirable feature of the basement plan is the provision for lockers for each tenant. They can be used for storing clothing and other articles which are not needed.

An apartment building of this type represents an attractive investment. Occupying only two lots, it offers a large return from fifteen high-price apartments. Today, in view of the enormous and insistent demand for smaller apartments, this building would have little trouble in the way of lack of tenants. As the conditions in the cities continue to follow along the lines which have been laid, space will continue to become scarcer and apartments will naturally be the outlet for this increasing population. Even now buildings are being built up to the full length of the lot. Yards are no longer popular. It is little wonder that



He Doesn't Object to Taking a Bath in This Bathroom. The Distinctive Feature of American Building Compared with That of European Countries Is the Bathroom. By the Perfection of Plumbing Fixtures, and the Increased Use of Sanitary Flooring Materials It Has Become One of the Most Attractive Rooms in the Home.

the shade of the cliff dweller who crawled into his tier back in the days of early America, should brush the cobwebs out of his eyes and look twice before he could really realize what had happened.

But the consoling fact about this transition in building practice is the fact that altho present civilization is unconsciously taking up the ideas of ages past, they are injecting the ideas of the twentieth century and making the modern cliff dwelling the acme of convenience, comfort and home qualities.

## Making and Setting Concrete Tile

**SPECIFICATIONS FOR MAKING ROOFING MATERIAL FURNISHED BY MANUFACTURERS OF MACHINERY—DETAILS OF TILE SHOWN ON PAGE 72**

**C**ONCRETE tile is made of portland cement and suitable aggregates molded into a uniform shape and size by special machinery designed for that purpose. Directions for the operation of this machine are issued by the manufacturers. Builders who are interested in starting a concrete tile making plant can get complete specifications and data from the manufacturers of the machinery who will gladly furnish the information.

The tile is made in the standard size of 9 5/16 by 14 3/4 inches, overall dimensions, in a variety of colors including red, green, brown, and natural gray, and other special shades. The weight of each tile is about 5 1/2 pounds and each square of 100 feet requires 150 tile weighing about 800 pounds.

It can be used on practically every type of building having a pitched roof. Heavy roof construction is not necessary; in most cases the following practice is observed. Rafters are usually 2 by 6 on 20-inch centers. Roof sheathing is shiplapped, at least 1-inch

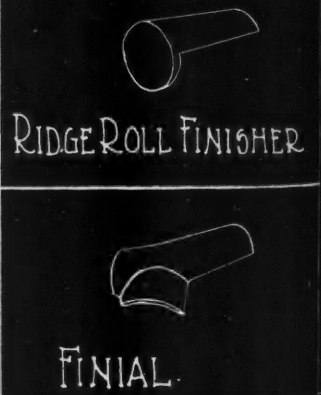
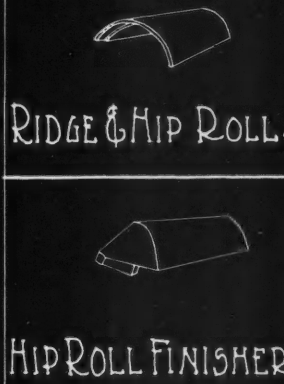
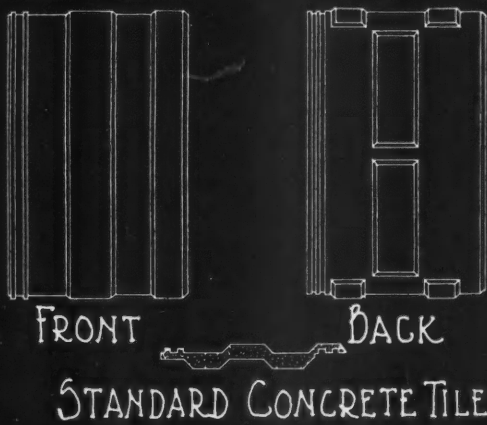
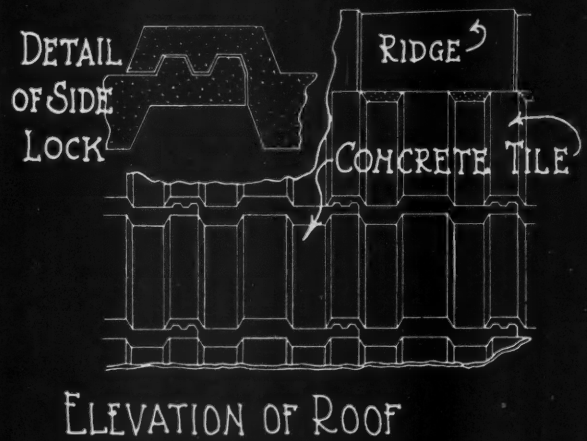
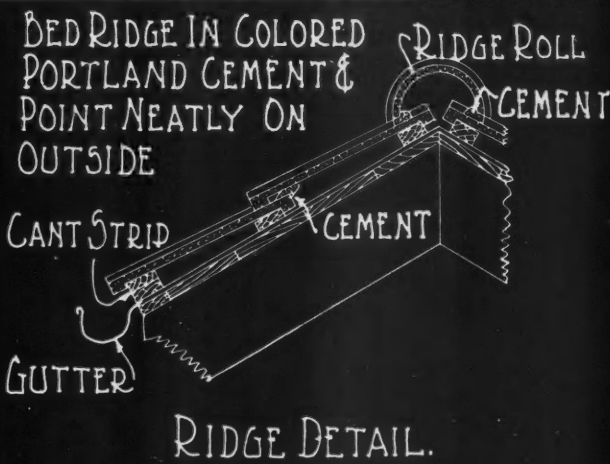
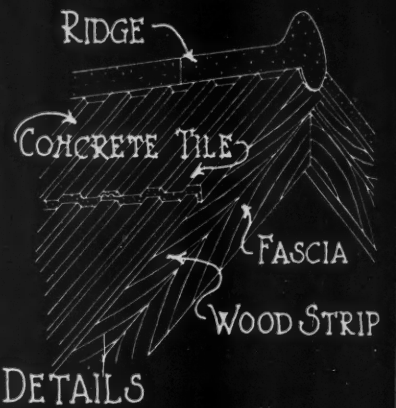
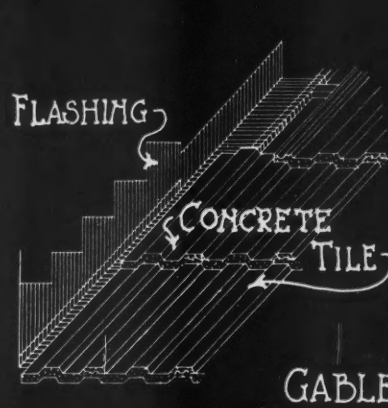
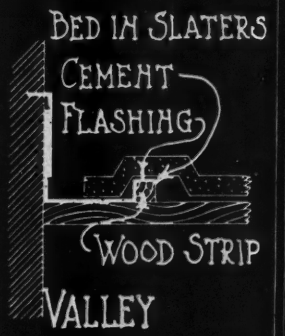
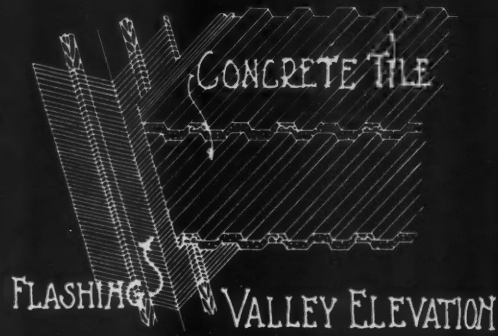
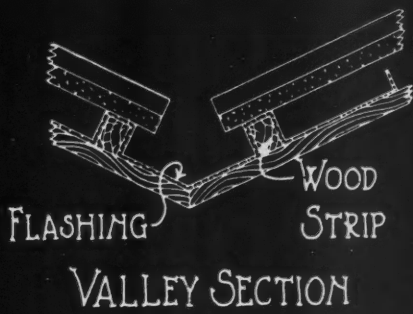
material, well seasoned, and closely laid. The gable fascia or barge rafter should be placed with the top edge 1 1/8 inches above the roof sheathing so as to come flush with the top of the nailing strip. Flashing and metal work should be in place, complete, before the worker starts. Aprons and counterflashing under which felting extends should be raised 3 inches for proper laying of felt.

The dead air space between the sheathing and tile affords an effective insulation against changes in temperature.

The roofing tile machines are equipped to make all necessary roof trimmings such as hip and ridge rolls, starters and finishers, eave tile, hip and gable finials, half tile and terminals.

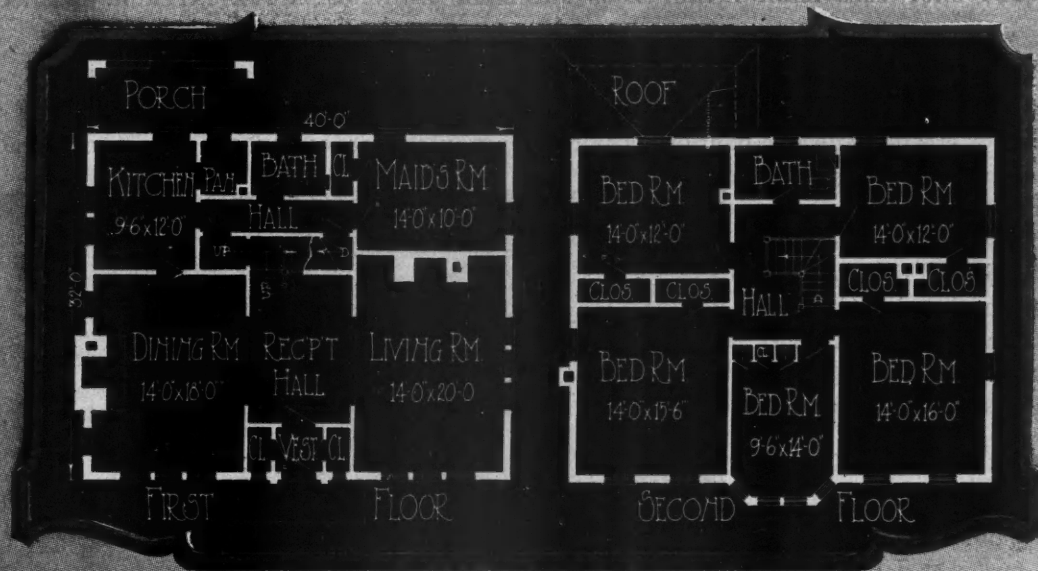
The laying of concrete tile calls for certain specifications which can be summed up briefly. Over the sheathing lay 12-pound tile roofing felt or heavier, parallel to eaves. The felt should be lapped not less than half the width of the sheet on every course.

# RECOMMENDED CONSTRUCTION



# CONCRETE TILE ROOFING





**D**ISTINGUISHED HOME OF RECTANGULAR DESIGN. A most striking feature of this attractive house is the ornate and well-designed concrete tile roof, the details of which appear on the blue-print page opposite. The use of small panes in the upper half of the windows in contrast to the full pane in the lower part adds a distinctive touch that does not detract from the charm and uniqueness of the style. This building also reveals the possibility of finish treatment in stucco. The contrast afforded by the white walls with dark window frames and roof makes pleasing effect. The interior arrangement calls for a living room, dining room, kitchen, maid's room, bath and large reception hall on the first floor, and five bedrooms and bath on the second. The size is 40 by 32 feet.



# Redwood Used for Effective Decorative Scheme

CANDY SHOP USES BARK INTACT LOGS AND BARK BARK SLABS FOR INTERIOR DECORATION

By Charles Alma Byers

SHOWN in the accompanying illustrations is a particularly interesting example of the adaptability of wood for creating effective interior decorative schemes, especially of the unusual kind. The interior views shown are the front and rear portions, respectively, of a candy and light refreshment shop in Los Angeles, Cal., and the aim of the designer naturally has been to have the shop constitute a sort of "show place," as well as to make it inviting to the public in other respects, which, as will be readily observed, has been most successfully accomplished. It is quite probable, in fact, that not a little of the patronage which the store enjoys was, in the first place at least, gained thru mere curiosity, aroused by the shop's reputation for uniqueness.

The first of the illustrations shows the front, or fountain and counter, portion of the store, and the other is a view of the large serving room in the rear. The former has a width of about twenty feet, and the latter is approximately forty feet square. Wood enters into the decorative scheme of each division in the form of broad slabs of bark, split shakes, and bark-intact logs and poles.

The covering of the walls, for instance, consists of bark entirely, set in upright sections; the split shakes are used for ceiling the rooms overhead, and the



Serving Room of Unique Candy Shop in Los Angeles in Which Bark and Logs Have Been Used for Interior Finish. Note the Four-in-One Fireplace in the Center of the Room. It Contains Four Separate Fireplaces. The Chimney Is Surfaced with Bark-Intact Logs.

logs and poles are used in the creation of a very prominent arrangement of ceiling beams and wall ornamentations. The ceiling is of modified chapel design, and is therefore especially well suited to the heavy handling of beams and braces here employed.

A very interesting feature of the rear serving room is a large four-in-one fireplace. Occupying the exact center of this room, this exceptionally massive feature, with its square base, deep mantel-shelf and square chimney, is designed with an open firehearth in each of its four sides; and each fireplace being intended for actual use, either separately or in group, the feature, moreover, is both decorative and very practical. The base, it will be observed, is constructed of rough stone, and the large chimney is outwardly surfaced with bark-intact logs, crossed at the corners in log-cabin fashion, and laid in white mortar, while the mantel-shelf consists of four adz-hewn timbers, halved together at the corners.



Fountain and Counter of Establishment. The Walls Are Covered with Bark Set in Upright Sections While the Ceiling Is of Modified Chapel Design and Well Suited for Heavy Beams and Braces.

The wood used for carrying out this interior decorative scheme, including logs, shakes, bark and other timbers, consists of California redwood exclusively, the natural colors of which are particularly conducive to creating a very attractive effect. The general appearance is naturally rustic; yet, because the scheme is so well handled, this suggestion of rusticity in no way seems either grotesque or overdone.

The rooms are also unusually interesting in respect to various details. From the ceiling domes, for instance, as well as from the side bracket ornamentations, are suspended many lantern-like lighting fixtures, created of hammered copper and amber-colored glass, those hanging from the ceiling being arranged in large clusters and the others being used singly. Also, among the log beams, are to be espied stuffed

squirrels, spruce cones and other decorative articles in keeping with the character of the place.

The flooring of both the front and rear divisions of the shop consists of dull-toned red and brown tile, and tile, some of its simulating hewn redwood, is also used for constructing the front fountain counter. The chairs and tables of the serving room are of oak, stained a light bluish-gray shade, and are designed somewhat after the camp style. Incidentally, to make them the more appropriate for the rustic setting, the chairs are backed and upholstered with rawhide.

A typical mountain lodge, of rather pretentious elegance, and appropriately rustic, located in the heart of a large city—such is the idea on which the shop was conceived, and which has been most charmingly and exceptionally well realized.

## Hot Water Heaters in the Modern Home

ALL-YEAR SUPPLY OF HOT WATER INSURED BY THE INSTALLATION OF SYSTEMS SHOWN IN DETAIL ON BLUE-PRINT, PAGE 77

**A**MONG the many conveniences being installed in the modern home is the hot water heater. It provides hot water during the summer months when the regular heating plant is shut off. Builders are specifying them in their plans for two reasons, to provide additional comfort for their clients and enable them to save money on coal bills. Complete specifications for these systems are furnished builders by the manufacturers.

These heaters are manufactured in a variety of design and are operated on a gas or coal-burning basis. The former is used extensively because of its convenience and the ready availability of gas.

There are three main methods of installation. In the first, called the direct, the water is heated instantly in the coils when the hot water faucet is opened. A few minutes elapse before hot water reaches the faucet. In the circulating installation, water is kept heated at any or all faucets at all times. The third or supplementary is the method in which the heater is connected with the house-heating plant coils and storage tanks. It intercepts the water as it flows from the tank to the fixtures and if the water in the tank is up to the desired temperature it passes thru the coils of this heater.

In the detail sheet on page 77 is shown the installation of a typical hot-water heater in a two-story apartment building. Placed in the basement, this heater is connected with the gas and water. The heating of the water starts as soon as the faucet designated as that of hot water is turned on. This action causes the small pilot light in the heater to ignite the gas and the water flowing thru a series of small pipe coils is instantly heated. Ordinary piping is used to connect the heater with the various fixtures.

The installation of a hot-water heater is simple, but to prevent any possibility of mistake the manufacturers have prepared specifications which they distribute

to builders, architects, and others who are interested.

It is good practice to connect the heater as close as possible to the most frequently used faucet. This is generally the kitchen. The hot water fixtures should be arranged as compactly as possible, the long runs of hot water piping should be avoided. In many large homes it is desirable to divide the fixtures, using one heater for each group. This improves the service by shortening the hot-water travel from heater to faucet. The hot-water riser and lines from the heater should be insulated with some standard insulating material. This reduces consumption of gas.

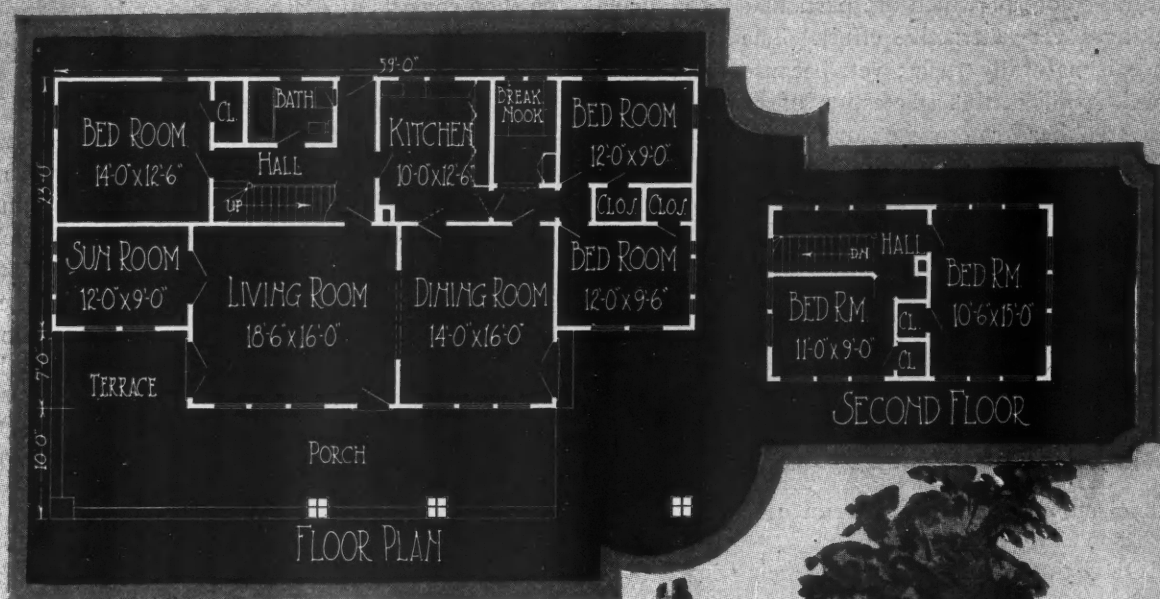
The water pressure must be strong enough to overcome the friction of travel thru heater and piping; to get this the pressure should be at least twenty pounds at the highest faucet.

There are many types of hot-water heaters on the market operated either by gas or coal. A type that is being used extensively is a gas-burning heater similar in construction to a range boiler, a combination boiler and gas water heater. The gas is lighted under the boiler and the water heated similar to that in the range boiler.

It can be connected with the water coil in the furnace and during the months when the house heating system is in operation becomes a plain boiler. In cottages and bungalows a small gas heater is often placed on a stand in the kitchen. The hot-water supply pipe passes down under the floor, where it leads to the various fixtures. It can also be fastened to the wall.

Another type of hot water heater generally known as the tank heater is a small apparatus designed to heat the water in the kitchen or basement tank. It is so connected with either of these tanks that it draws water from the top of the tank, where hot water naturally rises first, so that the whole tank does not have to be heated in order to secure hot water.

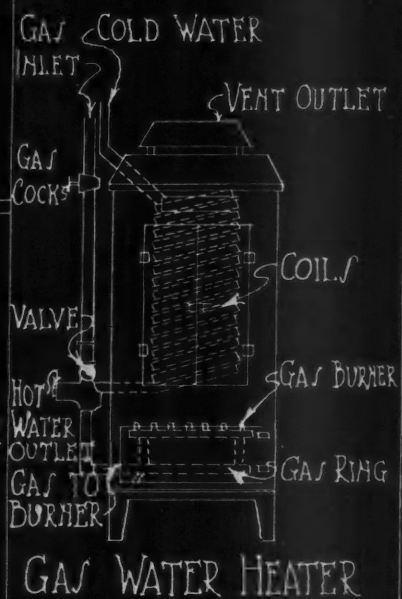
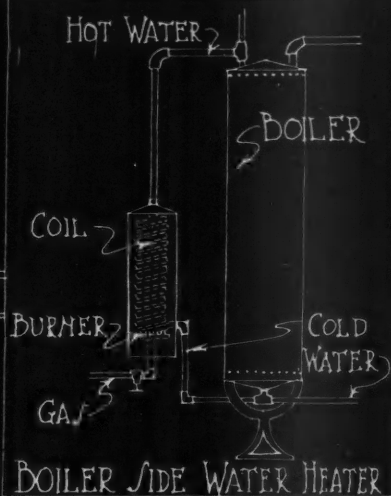
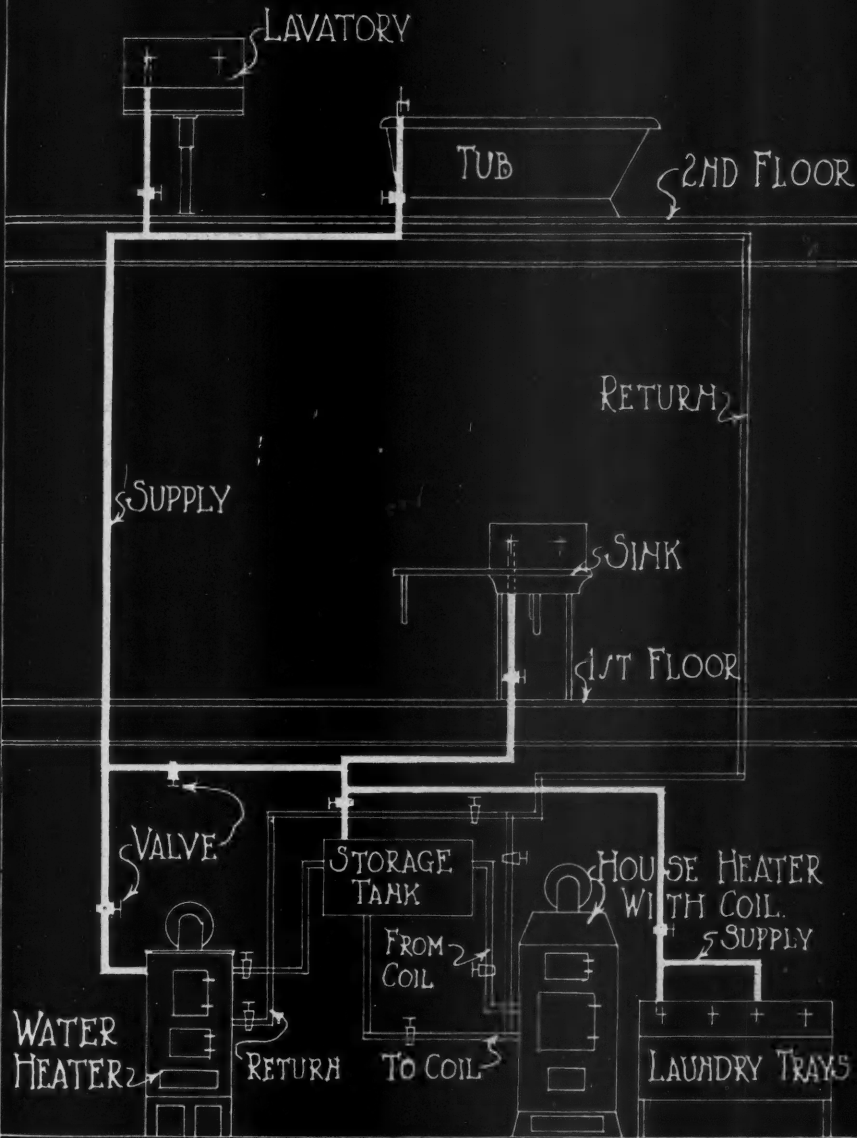




**UNIQUE "AIRPLANE" BUNGALOW.** For those desiring a homey bungalow of unusual design, this home should be especially appealing. It is an attractive combination of several features, of which the most distinctive is the cupola-like second story which gives rise to the expression "airplane." This little compartment contains two bedrooms which can be changed very easily into admirable sleeping porches in the summer weather by screening in the windows. The bungalow proper contains six large rooms, living and dining rooms, kitchen and three bedrooms. In addition there is a sun parlor and breakfast nook. The odd arrangement of the shingles on the exterior, projecting roof rafters, and divided casement windows make the exterior charming. Size, 30 by 59 feet.

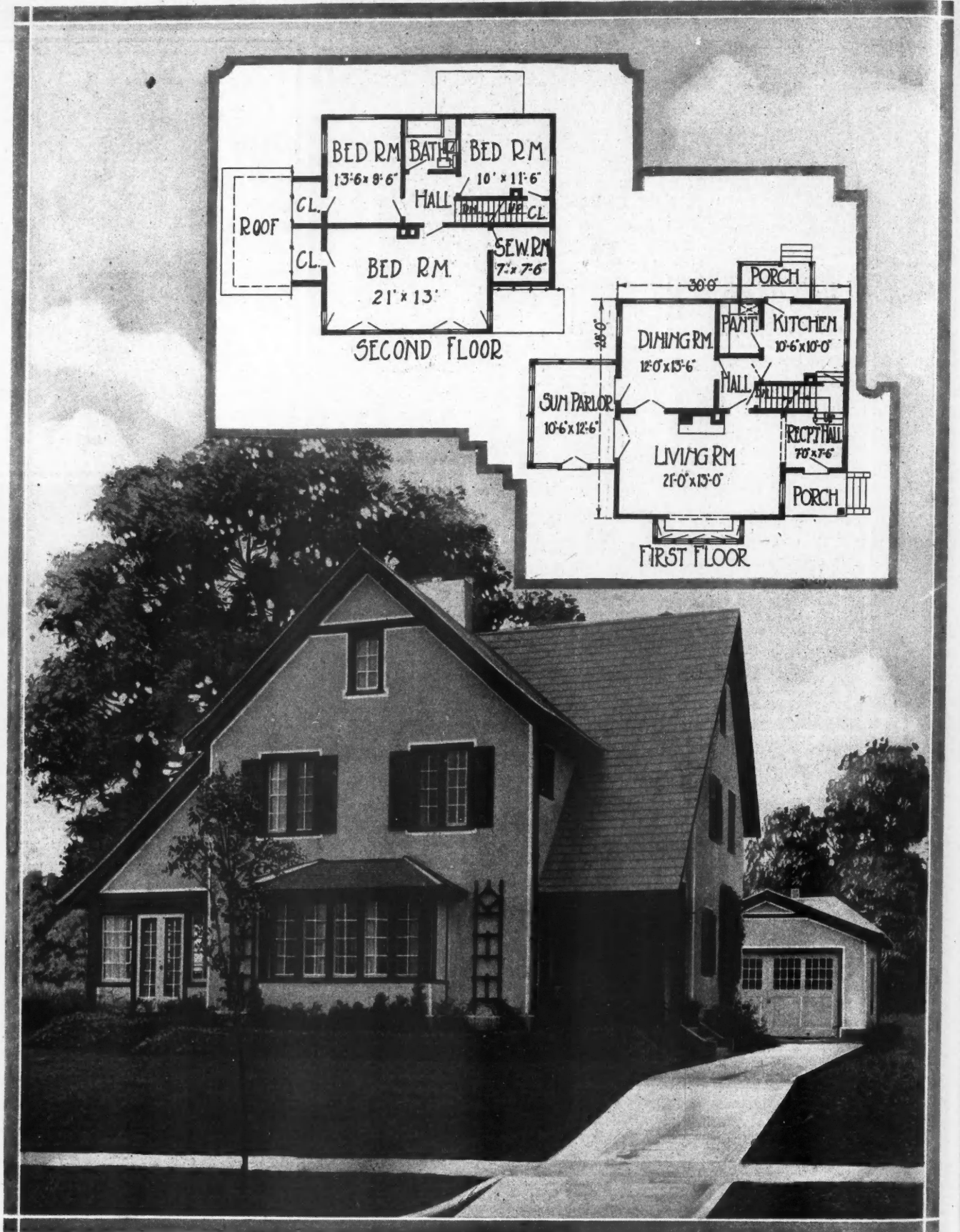


# RECOMMENDED CONSTRUCTION



THIS WATER HEATER MAY BE OF TYPE SO HOT WATER CAN BE TAKEN OFF DIRECT FROM HEATER COIL TO FIXTURES OR OF TYPE WHEREBY WATER IS HEATED AND RUN TO STORAGE TANK. EITHER GAS BURNING, OR COAL BURNING HEATER MAY BE USED. A GARBAGE INCINERATOR CAN ALSO BE USED FOR HEATING WATER.

## HOT WATER HEATERS

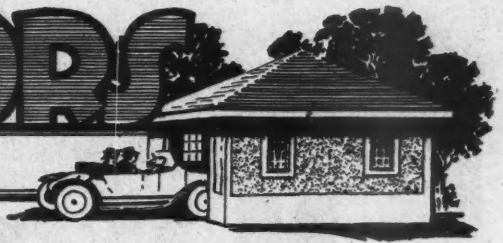


**ENGLISH TYPE STUCCO HOME.** The striking feature of this attractive home is its homey appearance. It radiates a feeling of substantial comfort and cheerful welcome. Behind those green shutters and small pane windows are six cheerful rooms, living room, dining room, and kitchen on the first floor, three bedrooms upstairs. The living room is large, 21 by 13 feet, well provided with light and warmth by a large bay window and an open fireplace just opposite. It opens into the dining room and sun parlor thru French doors similar in design to the windows of the house. Another pair gives egress from the sun parlor to the garden. In the rear an attractive garage of the same construction completes the hospitable picture. Size, 30 by 28 feet.



# GARAGE DOORS

~ how to build them ~



## Hanger Hardware Big Factor in Variety

DEVELOPMENT OF GARAGE DOOR EQUIPMENT HAS SOLVED MANY PROBLEMS INVOLVED IN DOOR CONSTRUCTION

**S**EVEN million automobiles! A mere trifle! Yet it only represents what is in use in the United States alone. Such a large family suggests a housing proposition of enormous proportions—garages here, there, everywhere. In the last few years garage building has become one of the important features of a contractor's activity.

The physical variety in the doors such as style of windows, panels, cross-piece designs, etc., are not important in the operating success of garage doors. By far the most important factor is the hardware, hinges, hangers, upon which the doors are operated. Each garage has its special limitations, requirements or architectural peculiarity that decides the type of doors and hanger to

be used. There was a time when all doors swung on hinges. It was the only type available, but as garage building became more elaborate city ordinances began to determine to a large extent their construction.

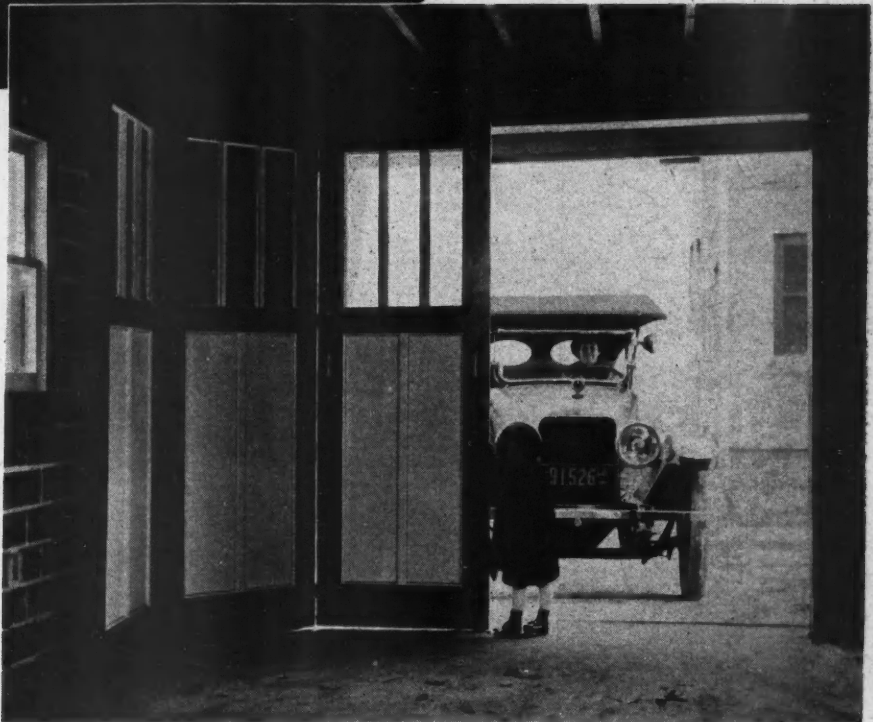
As a result, in many localities doors which swing out on a public highway are prohibited. For this reason new types have been developed to take care of this restriction.

While a garage may represent perfection in architectural design and constructive skill, it is useless unless the doors operate easily and



Combination Folding and Sliding Door Set Made Up of Six Doors. The Two Middle Doors Swing on Hinges to Make an Entrance. Each Set of Three Fold Up Accordion Fashion and Slide to the Side of the Doorway.

And, just like the automobile itself, its home calls for infinite variety as well as efficiency. Man can satisfy his slightest whim when buying a car for winter, summer, touring, speeding, comfort or endurance. In building his garage the choice is just as unlimited. There is the large, roomy two, three, or four-car garage, the small corner structure just able to squeeze in the allotted space, the artistic and utility, there are all kinds and all shapes. But the real "spice" in this great variety is the doors. They are the seasoning to a delectable dish which otherwise might prove a flat morsel.



Corner Sliding Doors for Garages with Limited Front Wall and Floor Space. Note How the Small Doors Hinged Together Slide Around the Corner on a Track, Without Taking Up Any Space of the Garage Proper. These Sliding Doors Are Made so a Child Can Operate Them with Little Effort.



Combination Folding and Sliding Doors Opening Out Instead of Inside. These Doors Are Made in Sets of Three to Ten Doors and Are Designed to Fit Garage Doorways Ranging from Eight to Thirty Feet. This Picture Gives a Good View of the Hanger Equipment.

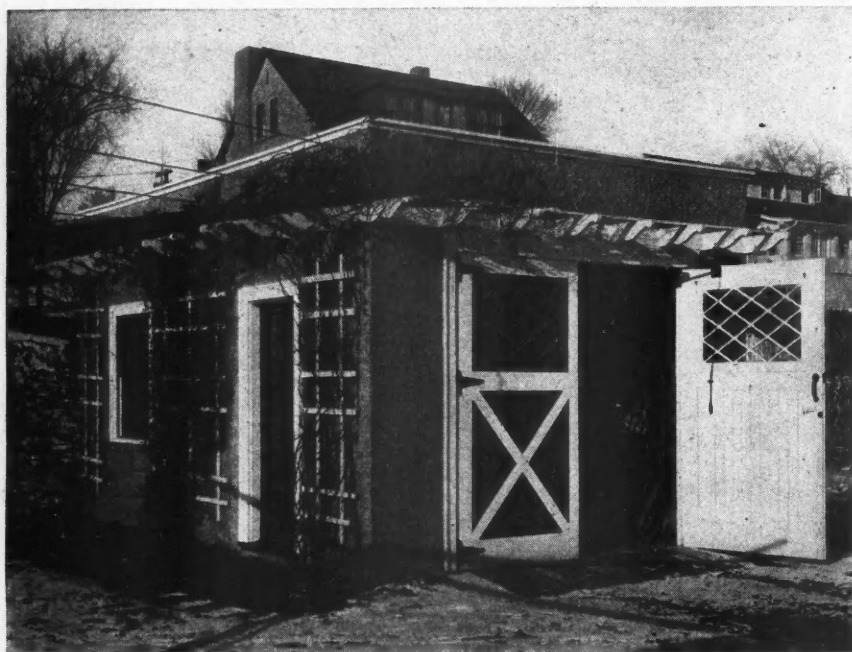
efficiently. It is at this stage of the job that hardware takes its cue and plays a prominent role in the completion of a successful task. The ideal garage door swings easily, fits closely and does not allow drafts to chill the air inside the garage. Good hardware is as important an item on the garage as a lock on the front door of the home and not only acts as a protection against intrusion, but is an attractive decoration to the appearance.

Variations in garage door hardware are about as numerous as the garages themselves, but taken gen-

and is more easily set. The concrete can be set so that the outside of the door extends beyond the highest part of the floor, thus preventing the water from running down the face of the door and following the bottom of the door inside of the building. The groove at the bottom of the door prevents water from creeping beneath the door.

The hinge or swing doors are so well known that much space is not needed to describe them. They possess several advantages in that they are economical to build and fit snugly when in position, keeping out any air that may damage the car. They can be made very attractive by the use of artistic and ornamental hinges. In this type of door the garage holder is important. It is a small device attached to the top of the door and the head jamb and holds the doors securely open and prevents them from damaging the car when entering or leaving the garage. The holder has a rigid steel arm which slides thru a steel catch plate and drops into notches in the end of the arm, when the door is opened. To close it a light pull on the safety chain releases the holder, which folds back out of the way along the head jamb.

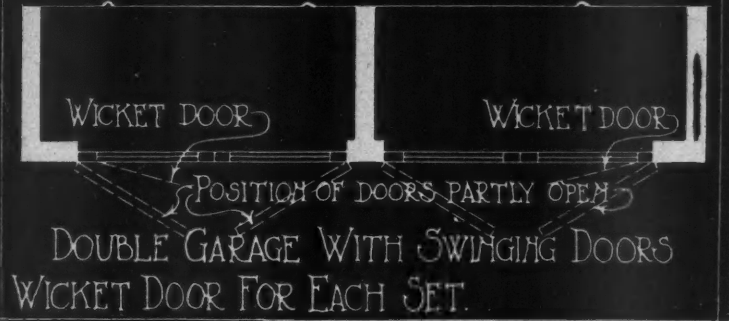
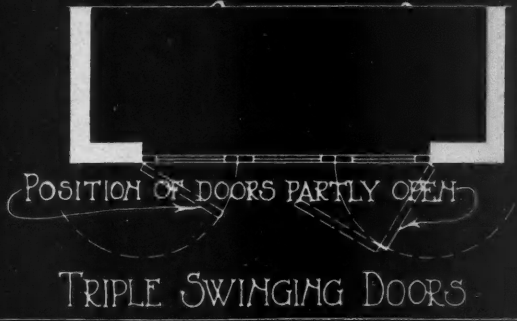
The combination sliding and folding doors which are now used extensively in garages of varying sizes can be hung to hold and slide on the inside or outside, as the



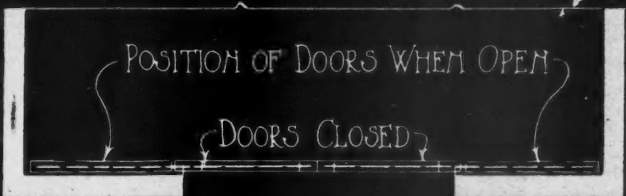
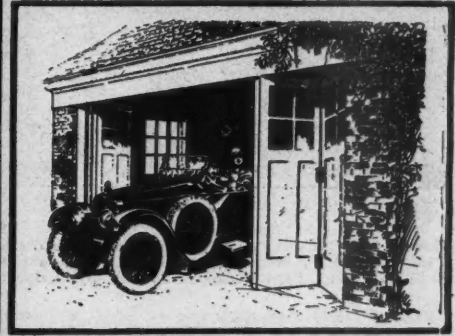
Popular Swinging Doors Used Extensively in All Kinds of Garages. The Important Hardware in This Type of Door Are the Butts. The Garage Door Holder Is Also Shown. It Is Designed to Prevent Slamming or Vibration.



# RECOMMENDED CONSTRUCTION



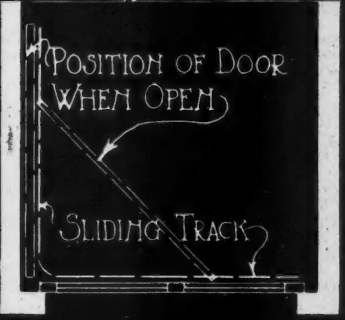
PAIR OF SLIDING DOORS USING DOUBLE TRACK. THREE OR FOUR DOORS MAY BE HUNG IN THIS MANNER.



SINGLE CAR GARAGE WITH STRAIGHT SLIDING DOORS.



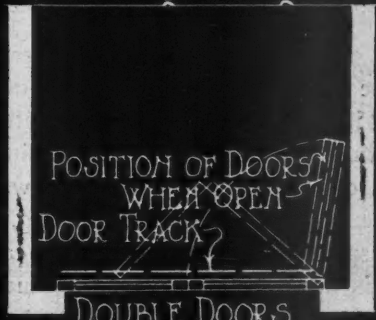
COMBINATION SWINGING AND SLIDING DOORS.



CURVED CORNER DOOR



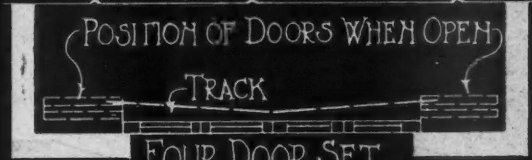
DOUBLE SLIDING DOORS



DOUBLE DOORS TO OPEN TO ONE SIDE.

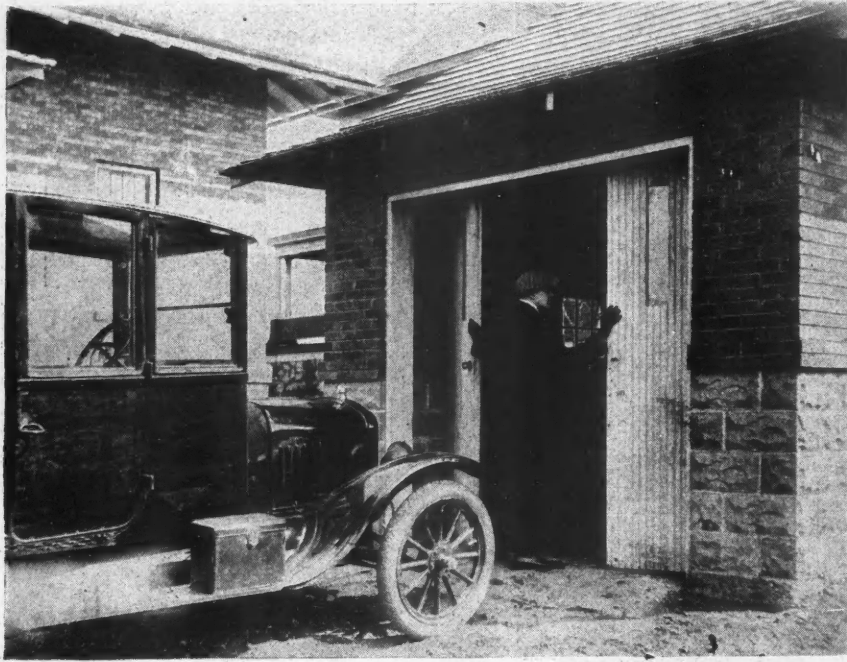


COMBINATION SWINGING & SLIDING DOORS.



FOUR DOOR SET. DOORS TO OPEN TO EACH SIDE.

# TYPES OF GARAGE DOORS

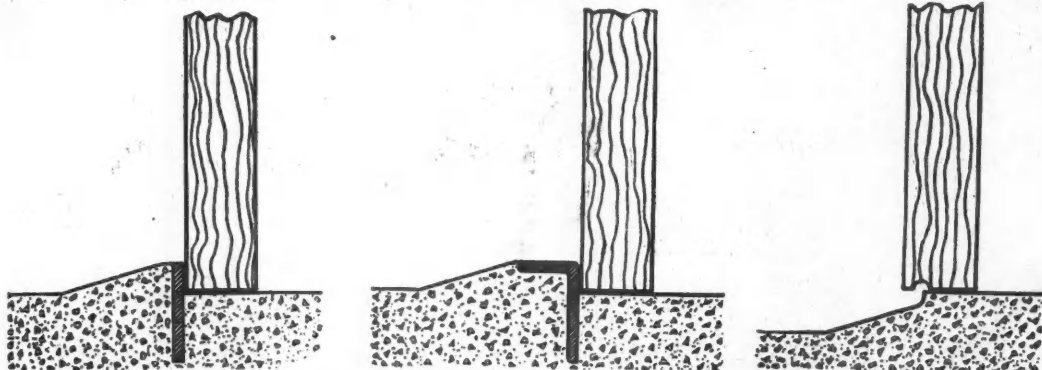


**Right Angle Doors.** These Doors Are Very Efficient in a Garage of This Type, Where Front Wall Space Is Limited and Floor Space Scarce. When Open the Doors Stand Alongside the Side Walls at Right Angles to the Opening.

arrangement dictates. They are made in sets of three to ten 3-foot doors to fit any door, giving an opening 8 to 30 feet. The number in the combination varies according to the width of the doorway and consequently the folding arrangement differs in each case. Several details of this type of door are shown on the blue-print page.

In this arrangement one door may swing on hinges to provide an entrance and can be located at the side or in the middle of the doorway, or the two sections may fold up and slide towards each side. For instance, the doors in a four-door set are hinged in pairs, and doors next to the jamb hinged in the jamb, and the door farthest from the jamb is supported by a door hanger running in overhead track.

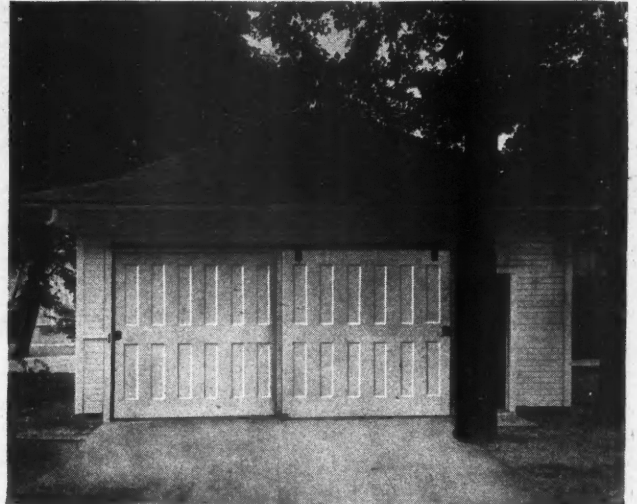
The right angle doors operate on a track and are used in garages where front wall space is limited and the floor space is at a premium. These doors, when open, stand along the side wall at right angles to the opening, inside the building, and require very little space in swinging around the corner. The details of this door are shown on the blue-print page. The



**Different Types of Thresholds for Standard Garage Doors.** These Thresholds Are Important as Windbreaks and Water Stops in Storms and Cold Weather.

hardware is adaptable to various doorway conditions, including single doors with space between the jamb and the side wall, double doors with space between the jambs and side walls, single and double doors with jamb adjacent to the side wall, and a pair of doors hinged together for opening with space between the jamb and side wall.

Another familiar type has the straight sliding doors. In this arrangement double sliding doors are hung in track and swing to each side of the entrance or they are hung on parallel tracks, in which arrangement they can pass each other and both can be pushed to the same side of the structure. Very often one track is installed



**Parallel Doors—One Outside, One Inside.** This Hanger Arrangement Allows the Doors to Pass Each Other. Both Doors Can Be Rolled to Either Side of the Doorway.

on the outside and the other on the inside of the garage. In the flush door type one of the doors is run on a trolley track with a compound curve which sidetracks the door as it opens to a position beside its companion door.

The corner door type slides on a trolley track which runs around the corner. The doors are swung around on this track and stand up close against the side wall. As many as five or six doors connected by hinges can be swung around on this arrangement.



In the angle corner doors each door is suspended by two hangers, one at either edge of the door. One of these hangers runs in a track from the jamb of the doorway to the side wall. These two hangers, acting together, swing the door when it is put in motion around, the corner of the garage so as to close the opening or away from the opening so as to stand the door out of the way against the side wall.

In view of the assortment offered for all conditions arising in the building of garages it is advisable for the contractor to keep in constant touch with this particular phase of the business. Very often a ready knowledge of garage door hanger equipment is the means by which he not only gets immediate business, but builds up the satisfaction that provides for the future.

That there will be no lessening in the use of motor vehicles for pleasure and transportation is obvious; as a matter of fact, this field will continue to increase. And with this development, the increase in garages is inevitable. As a field for the builders and contractors, it will become even more important than it is today. There will be a great deal of business for the progressive



Right Angle Doors as They Appear from the Interior of the Garage. This Picture Shows the Track Arrangement, also the Wicket Door, Which Is Very Convenient in Getting in and out of the Garage. The Space Saving Accomplished by This Type Is Apparent.

builder who knows garages, and who knows their requirements and possibilities. Improvements in door hanger equipment are being introduced continually, and it would not be bad business policy to keep in touch with this particular branch of building development.

## Laying and Finishing Hardwood Flooring

RECOMMENDED PRACTICE AND DIFFERENT TYPES SHOWN IN DETAIL ON PAGE 84

**H**ARDWOOD flooring has two standard thicknesses of  $\frac{3}{8}$  and  $\frac{13}{16}$  inch and two widths of  $1\frac{1}{2}$  and  $2\frac{1}{4}$  inches. A sub floor should be used under both thicknesses; in new houses it should be reasonably dry. Shiplap of 6 to 8-inch width is preferred, and it should be thoroly cleaned before the top finish is laid. It is good practice to use some sort of sheathing paper or insulating felt between the two floors and allow  $\frac{1}{2}$  inch space on all sides between the hardwood floors and the baseboard to take care of expansion. This opening is covered by quarter round or base moulding.

All tongued and grooved flooring should be blind nailed; in  $\frac{3}{8}$  inch thickness, three-penny finishing nails are used, while eight-penny nails are used in the  $\frac{13}{16}$  inch thickness. The nail is set at an angle of about 50 degrees. The maximum distance between nails should be 16 inches in  $\frac{13}{16}$  inch flooring, and 8 or 9 inches in  $\frac{3}{8}$  inch flooring.

After the flooring is laid it should be scraped to insure a highly polished finish. This can be done by one of the many types of floor surfacing machines that are used by contractors and carpenters. After

scraping it should be sandpapered and then swept. It is then ready for the finish.

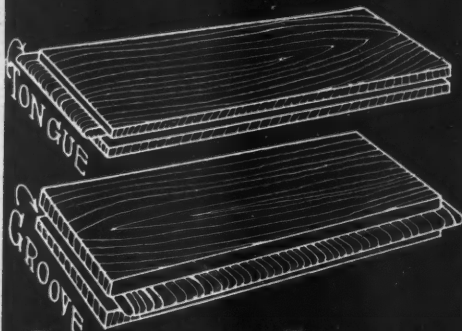
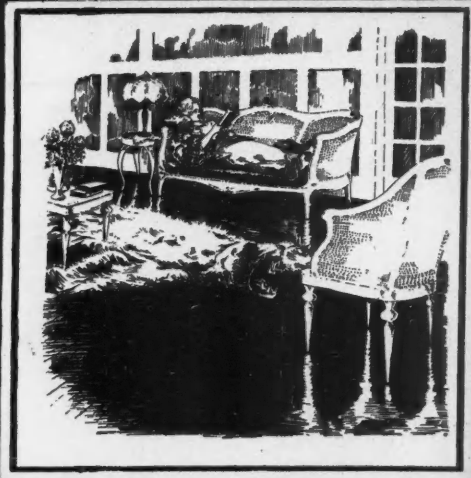
The finishing process is most important. First, the floor is treated with a paste filler of the desired tone to fill up all pores and crevices. When the gloss has left the filler, it is rubbed off with excelsior or cloth against the grain of the wood. The filler should have at least twelve hours to set and dry. Then shellac is applied before applying wax. When varnish is used one coat of filler and two of varnish are applied.

If a high class finish is not desired floor oil is often used. It serves as a filler as well as varnish, and is used in public institutions, office buildings, and stores.

Both heavy and light floorings are laid in parquet patterns, as illustrated on the detail page, in lengths of generally one foot, fitted together in squares or in a herring bone pattern.

In  $\frac{13}{16}$  inch flooring the  $2\frac{1}{4}$  inch face is usually preferred, and in the  $\frac{3}{8}$  inch the  $1\frac{1}{2}$  inch face is generally used. Narrower faces require a larger quantity of flooring to a given area.

# RECOMMENDED CONSTRUCTION

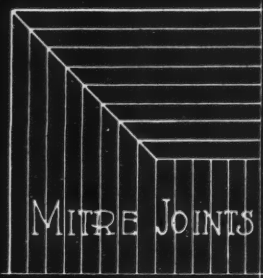


END MATCHED FLOORING

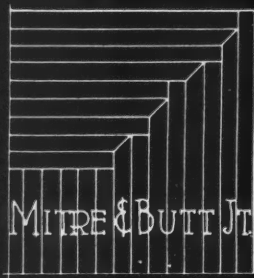
## LAYING HARDWOOD FLOORING

ONE ESSENTIAL PART IN LAYING HARDWOOD FLOORING IS THE ECONOMY OF END MATCHING, ALSO PROPER NAILING IS AN IMPORTANT FEATURE, THE NAIL SHOULD BE SET AT AN ANGLE OF ABOUT 50°.

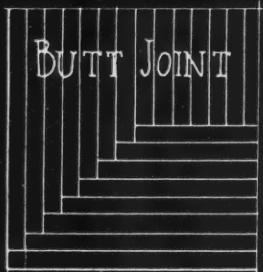
RECOMMENDED SIZES ARE:  
THREE PENNY FINISHING NAIL FOR 3/8" THICK SET 9" O. C.  
EIGHT PENNY FINISHING NAIL FOR 1/2" THICK SET 16" O. C.



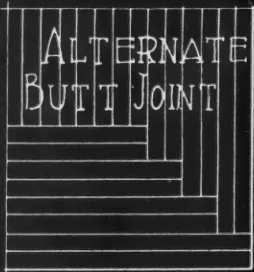
MITRE JOINTS



MITRE & BUTT JT



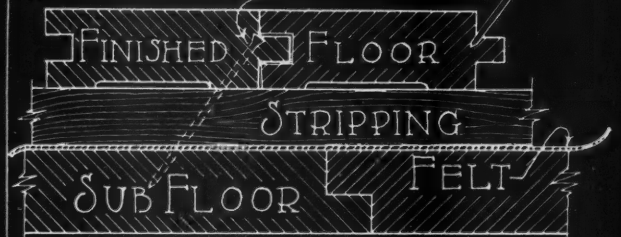
BUTT JOINT



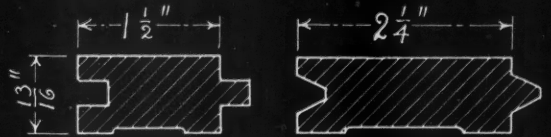
ALTERNATE BUTT JOINT

FINISHING NAIL SET IN PLACE

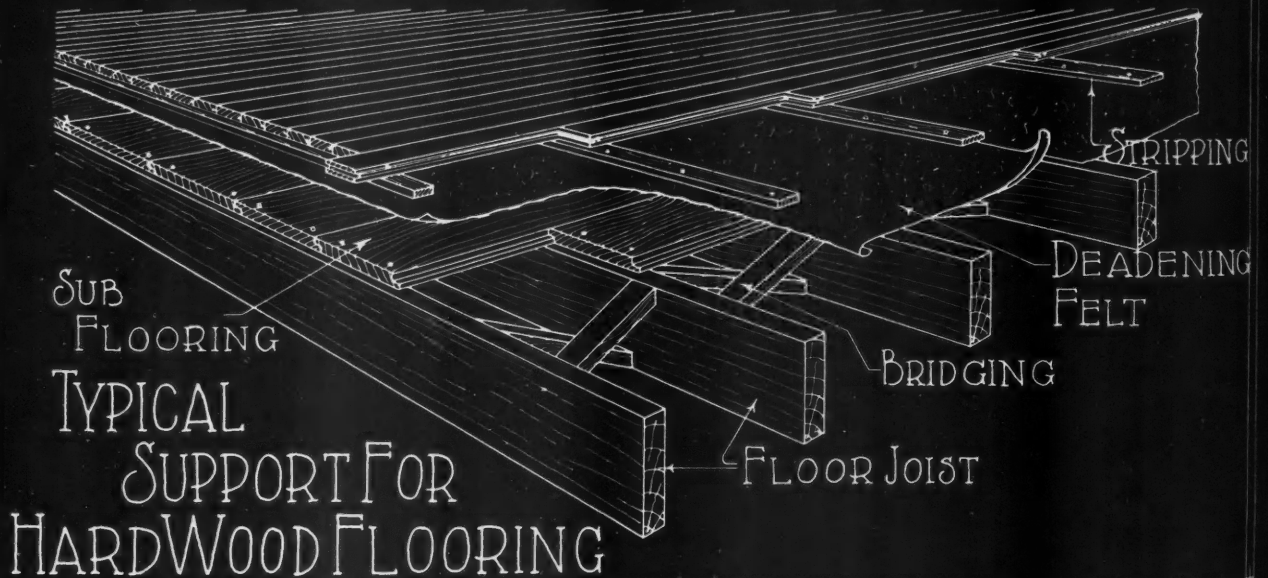
SET NAIL AT ABOUT 50°



SECRET OR BLIND NAILING



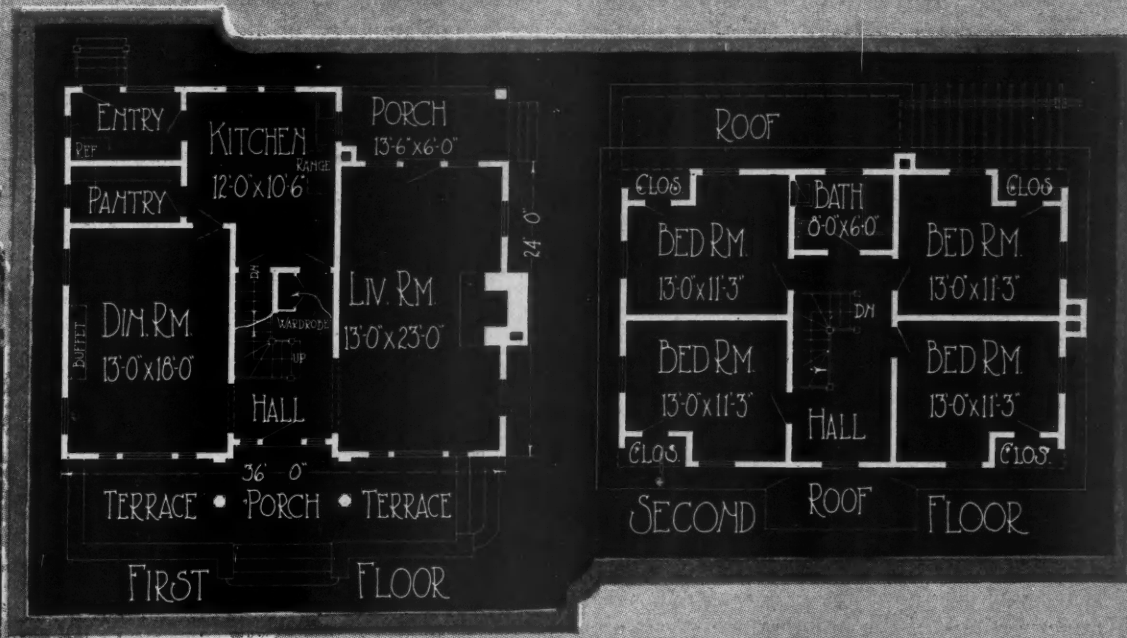
FOUR METHODS OF JOINING CORNERS STANDARD SHAPE & DIMENSIONS



TYPICAL SUPPORT FOR HARDWOOD FLOORING

# HARD WOOD FLOORING





**COMFORTABLE DUTCH COLONIAL HOME.** There is something about this type of home that always appeals. It gives the impression of comfort and cheerfulness. Perhaps two important elements in this result are the hospitable Colonial entrance with its classic columns and hood and the large brick chimney leading to the open fireplace. The low wide terrace leading to the entrance is a distinctive touch. The floor plans show seven large rooms. Here we find one of those great roomy living rooms, 13 by 23 feet, extending from the front to rear of the house, a dining room and kitchen on the first floor and four bedrooms upstairs. Each bedroom has two windows. The house is built of frame clapboard, painted white, and is 36 by 24 feet.

# Attractive Nine-Room Concrete Block Home

SPACIOUS HOUSE HAS SIX BEDROOMS AND AMPLE FACILITIES FOR LARGE FAMILY

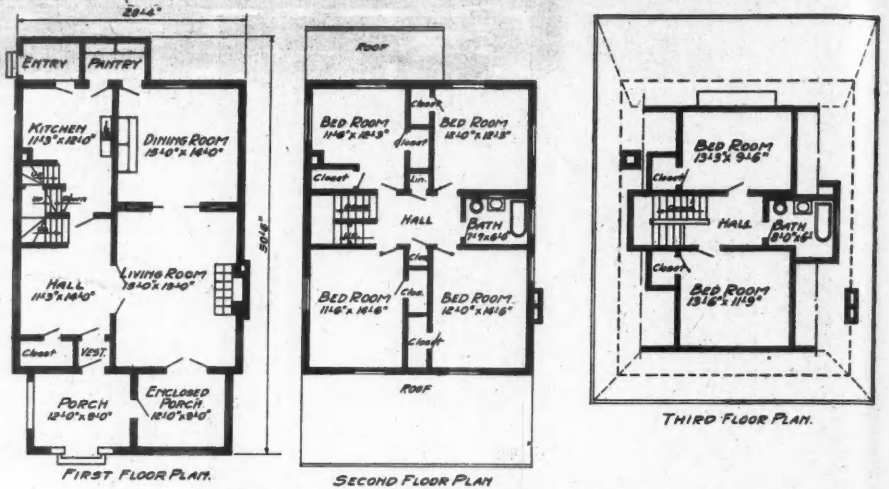
THE accompanying drawings and photograph show a nine-room house of excellent design, located at Morgan Park, Duluth, Minn. It is a product of the board of Dean and Dean, architects, Chicago.

Concrete block veneer construction was used, the outer walls being made of cast block 3 inches thick with face dimensions 7 by 24 inches. These blocks have a plain, smooth surface produced by body mixture, no special surfacing material being employed. Portions of the wall above the eave line are covered with portland cement stucco, producing harmonious contrast with the block surface below.

The frame portions of the building are of standard construction, using studding, heavy quality building paper, furring and plaster board. The roof is of green cement shingles, laid on ship lap covered with heavy roofing paper.

This house was designed for a large family requiring more than the ordinary proportion of bedroom space. The arrangement is also ideal for the keeping of roomers. It is so spacious as to constitute more than would be contemplated in the mere designation

of this building as a nine-room house. The living room is of ample proportions with large enclosed porch and hall adjoining with open arches between. The



Floor Plans for Nine-Room Concrete Block House.

dining room is separated from the living room by sliding or French doors. The kitchen and pantry are in good proportion.

Four bedrooms are provided on the second floor and two on the third floor, with spacious bathrooms of practically duplicate proportions on both floors. Unusually large closet room is provided. The basement contains partitioned fuel room, laundry, storeroom and vegetable cellar. The plans contemplate heating the building with warm air furnace.



Front View of Concrete Block House Described in the Accompanying Article. The Plain but Good-Looking Practical Home for the Family Requiring Ample Bedroom Space.



## Face Brick Bond and Mortar Joints

STANDARD BONDS, PATTERNS, AND OTHER DETAILS OF FACE BRICK CONSTRUCTION SHOWN ON PAGE 89

**A**MERICAN brick manufacturers have, with the aid of modern invention and scientific discovery, worked out face brick in a quantity, variety, and quality that is unequaled in any other part of the world. It is up to the individual builder to use them to the best advantage and for this reason the bonds, patterns and mortar joints should be thoroughly understood.

Bond may be defined as the method by which each brick in the wall is so placed that the entire wall, by the overlapping of individual bricks, forms one solid mass thru its length and breadth. The stretchers secure strength by their longitudinal bonding and the headers bond the wall across the width. For this reason most face brick construction is based on two methods, the first known as the English bond, which consists of alternating

courses of headers and stretchers, the second, Flemish bond, consisting of alternating headers and stretchers in every course, so arranged that the headers and stretchers appear in vertical lines. All ornamental bonds are variations of these two forms. Details of each are shown on the blue-print page on 89.

While bond refers to the arrangement of bricks as



Attractive Brick Home Finished with Face Brick and English Timber. It Reveals the Possibilities of this Type of Construction.



Close-Up View of Brick House, Showing Face Brick Construction. The Variations in Panel Patterns Can Be Seen Clearly Between the First and Second Floor Windows of the Sun Porch.

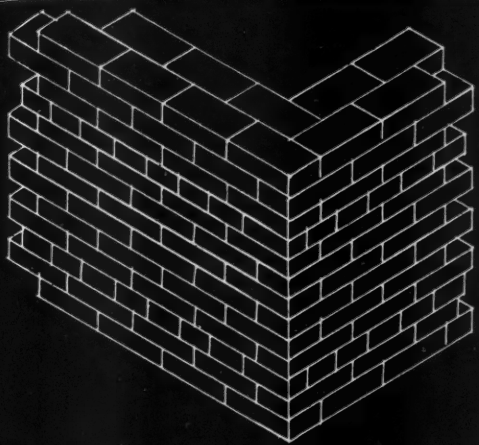
they overlap each other from course to course, pattern refers to the change of the brick texture or color used in the facing. It is also secured by the handling of the mortar joint and projection or recession of certain bricks from the plane of the wall.

But one of the most essential features of successful face brick construction is the mortar joint, which combines two functions, structural and ornamental. In artistic face brick work the ornamental element is the most important. Here much depends on color and form of the joint. The entire color scheme can be changed by the treatment of either color or joint. For instance, the flush joint in which the mortar is cut flush with the brick gives a decided line of color, whereas the sunk or cut joint eliminates the color of the mortar entirely and gives a shadow line around each brick.

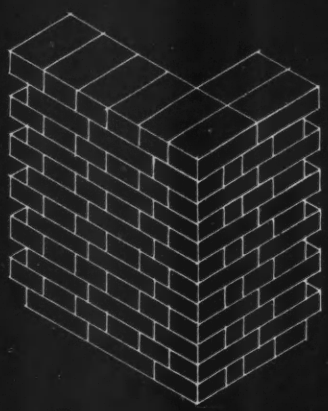




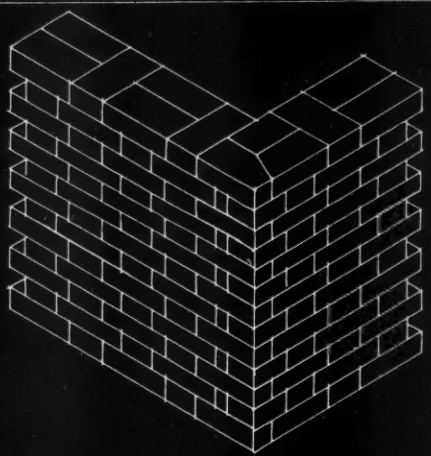
# RECOMMENDED CONSTRUCTION



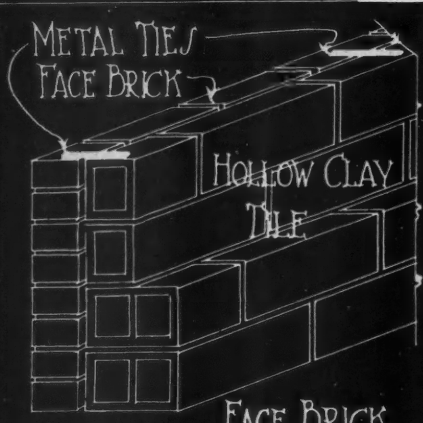
COMMON BOND - 8" WALL



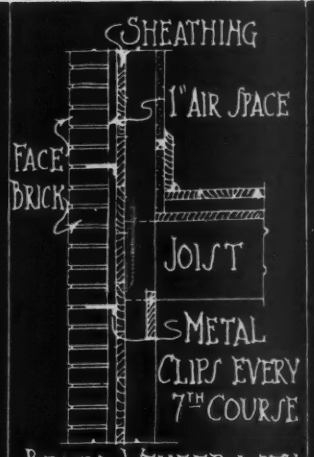
ENGLISH BOND



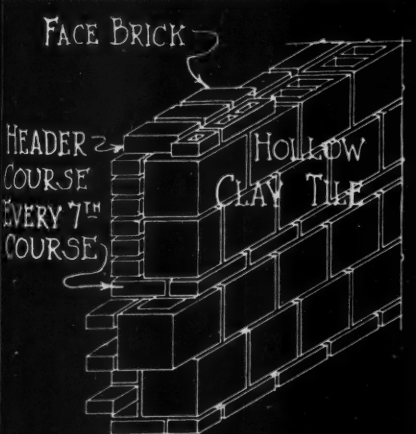
FLEMISH BOND - 8" WALL



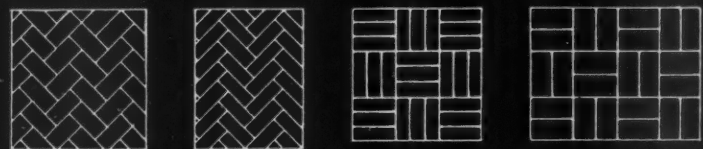
FACE BRICK WITH HOLLOW CLAY TILE BACKING USING METAL TIES



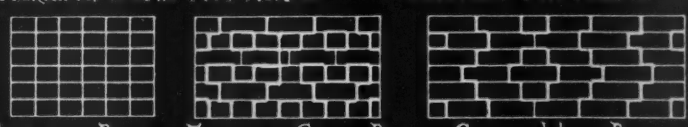
BRICK VENEER WITH FRAME BACKING



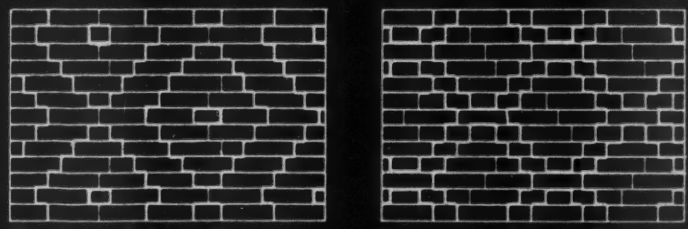
FACE BRICK WITH HOLLOW TILE BACKING



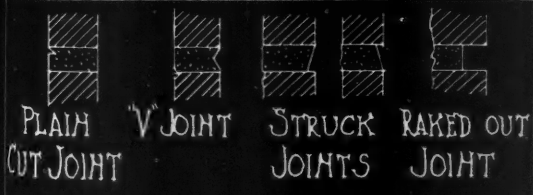
HERRING BONE PATTERNS      BASKET PATTERNS



CHECKER BOND. ENGLISH CROSS BOND. GARDEN WALL BOND.



GARDEN WALL BOND      FLEMISH BOND PATTERN



PLAIN CUT JOINT    V JOINT    STRUCK JOINTS    RAKED OUT JOINT

## BRICK PATTERNS AND BONDS

# FACE BRICK CONSTRUCTION

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## Dress Up the Old Home

ECONOMICAL METHOD OF REMODELING OLD FRAME STRUCTURES IMPORTANT BECAUSE OF PRESENT SHORTAGE OF BUILDINGS

**P**ONCE DE LEON died seeking the fountain that turned age into youth; the modern builder is decidedly more fortunate. Thru the ingenuity of manufacturers he has been provided with a material that turns old homes into new.

This material is stucco; this little story has to do with the variety known as magnesite stucco.

Magnesite is a rock which previous to the war was imported in enormous quantities from Greece and Austria. In 1916 it was discovered in America in large deposits near Spokane, Wash. It is estimated that there are 65,000,000 to 115,000,000 tons of this material in that region. Magnesite is used in many industries, but we are interested in it inasmuch as it is well known to builders.

When reduced to powder and mixed with magnesium chloride it makes a durable cement—from whence comes the stucco which has been mentioned.

But to get back to our story.

Today there is a greater shortage of homes than ever before known in our history. Every resource of the building profession is being used to alleviate this condition. When people are forced to live in abandoned trolley cars, tents, deserted boats, the situation de-



Before. Frame House in Springfield, Ill., Being Prepared for an Overcoating of Stucco. It Was Beginning to Look the Worse for Wear.



After. The Same Home After It Had Donned Its New Suit of Special Stucco. It Is Used Over Wood or Metal Lath. The Value of This Home Has Increased Considerably Thru This Operation Which Is Carried Out at a Low Cost.



mands attention. The prodigal waste of housing space that was so apparent in the days gone by has ceased; conditions have made an about face. No longer can any one afford to desert an old home because it has assumed a "lean and hungry" look. Space is too precious.

It is in this crisis that stucco has been assigned an important part. Builders found that a good coating of it applied to the exterior of a frame dwelling would make it look like new and add years to its life.

In the pictures shown on page 90 are two views of the same home, one before the stucco had been applied, and the other after. This transformation was brought about at a reasonable cost. The smaller picture shows the building just before the stucco coat was applied. It is difficult to believe the substantial and attractive looking structure below is the same building.

This process of putting stucco over a frame exterior is by no means difficult as a short explanation will show. Any weather-boarded house or old building can be covered in this manner. Old frame walls which are to be overcoated with stucco should be made structurally sound in every respect.

The stucco used in remodeling this home is a compound of various kinds of crushed stone, such as marble and granite, and gravel and torpedo sand, coalesced by magnesite cement prepared especially for exterior use. Where it is necessary to apply two coats there is no distinction between the material used in the first and second coats. The material which forms

the wearing surface is the same as that forming the key at the lath. It is applied in coat thicknesses of  $\frac{1}{2}$  to  $\frac{5}{8}$  inches.

In applying a material of this kind it is important that the framework underneath be substantial. It should not run to or below the grade line.

It can be used on stone, brick, tile or concrete in addition to frame. Broken and battered weather board covered diagonally with wood lath or metal lath makes a firm foundation for the application of stucco.

In this house wood lath was used as a base, altho metal lath can be used equally well. The lath were applied diagonally over the weather board without the use of furring strips. It can be applied horizontally with furring strips underneath. The mixture used was composed of eight parts stucco and five parts aggregate.

When the windows and door frames are covered with neat mouldings of the thickness of the stucco, as far as artistic effect and usefulness is concerned the home is as good as new, an old eye-sore has been changed into an attractive home, and most important of all the housing problem for at least one family has been successfully solved. The economic feature of this remodeling process is after all the most important. If all the deserted homes in the country were redeemed for use by this process or some other, conditions would be bettered considerably, for in every town, small or large, there is one or more of these buildings which are a constant reminder of the prodigal waste in housing space.

## Plank Frame Construction

DETAILS OF ESSENTIAL FEATURES OF MODERN TYPE OF BARN FRAMING AND STALL ARRANGEMENT SHOWN ON PAGE 92

**T**HE essential feature of plank frame construction is the truss built up out of 2 by 10s, 2 by 8s and 2 by 6s, all commercial sizes of timber carried in stock by every lumber dealer. These trusses are evenly placed thruout the barn, coming about 12 feet apart.

The purlin posts consist of two 2 by 10s, and run up on an angle from the floor plate to the brake of the roof, where the purlin plate is located. The truss chord is built up of two thicknesses of 2 by 10s, and runs from just below the roof plate up to the ridge. Three 2 by 6 inch struts run from the purlin plate down to the chord to stay it; 2 by 6 inch braces also come down from the purlin plate to the chord at a 45 degree angle to stay it laterally.

The ridge board is a 2 by 8. At the peak of each truss is a 2 by 10 collar beam. Each truss is securely tied at the bottom by means of doubled 2 by 12 inch joists securely bolted and extending across the floor of the barn.

In this truss,  $\frac{3}{8}$  inch carriage bolts with cut washers underneath all nuts are used for all connections and splices. No dependence should be placed on nails

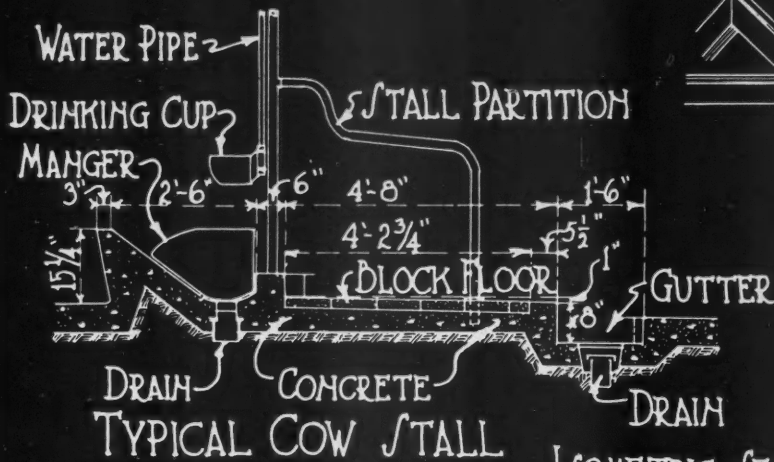
or spikes in building up a truss. Spikes will work loose in time, whereas a bolted joint will hold fast indefinitely.

The construction of this type of barn is very easy. The trusses are laid out and completely assembled on the ground. When the concrete foundation is ready the end truss is raised and held plumb with braces and ropes. The next truss is then raised and immediately the section of 2 by 8 inch wall plate is slipped in and nailed fast, and that holds the second truss in position.

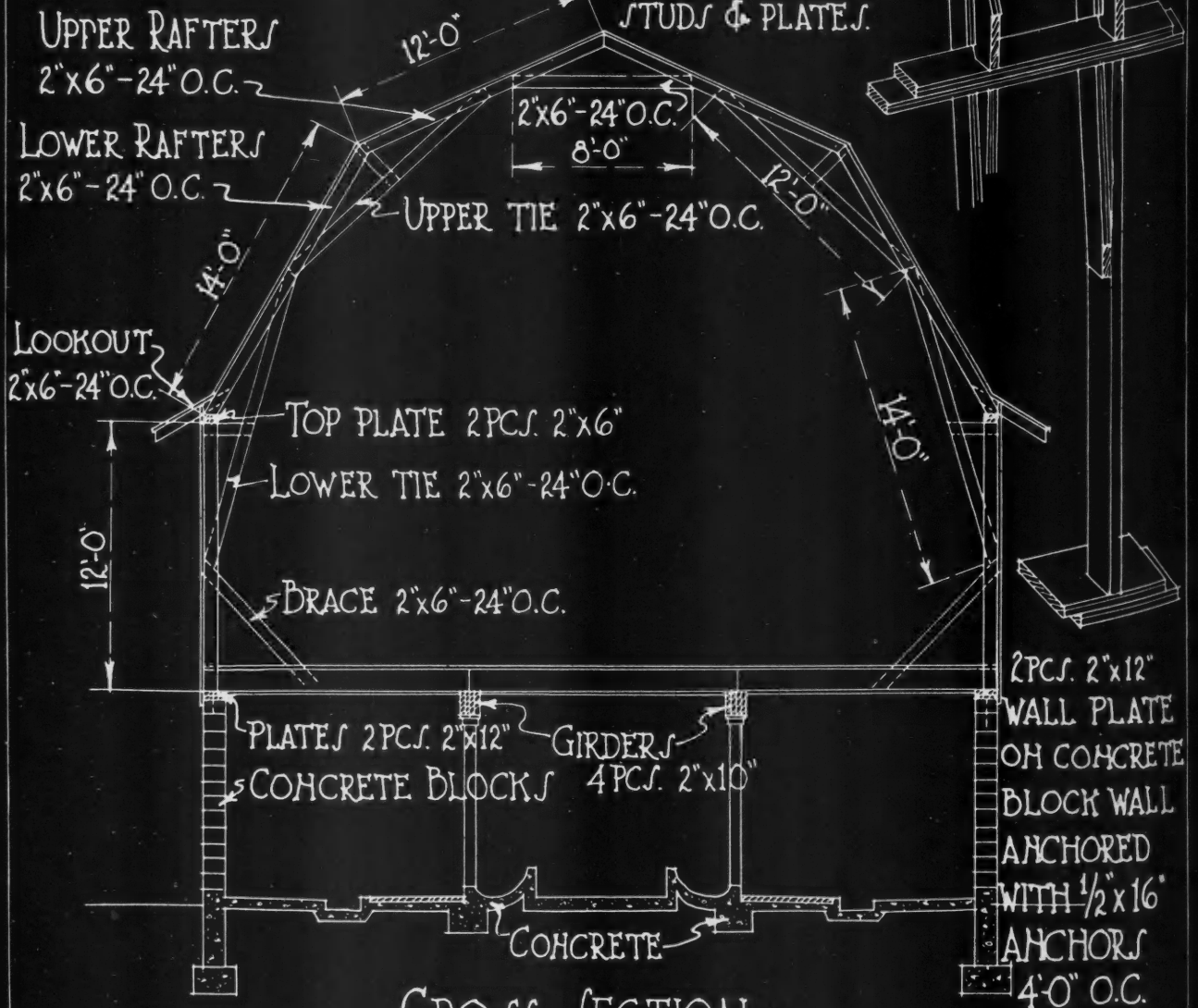
When all the trusses are up the roof plates are nailed on, and then ridge boards put in. A 2 inch block was laid in at the peak of each truss when it was assembled to prevent the ridge board space from pinching shut during the raising. These blocks are knocked out and the ridge board driven in. The purlin plates are next placed and braced and the rafters put on.

On the detail page is also shown a cross section of the stall arrangement in a modern barn. It gives an idea of the floor contour, showing gutters, feed alleys, and stall floors.

# RECOMMENDED CONSTRUCTION



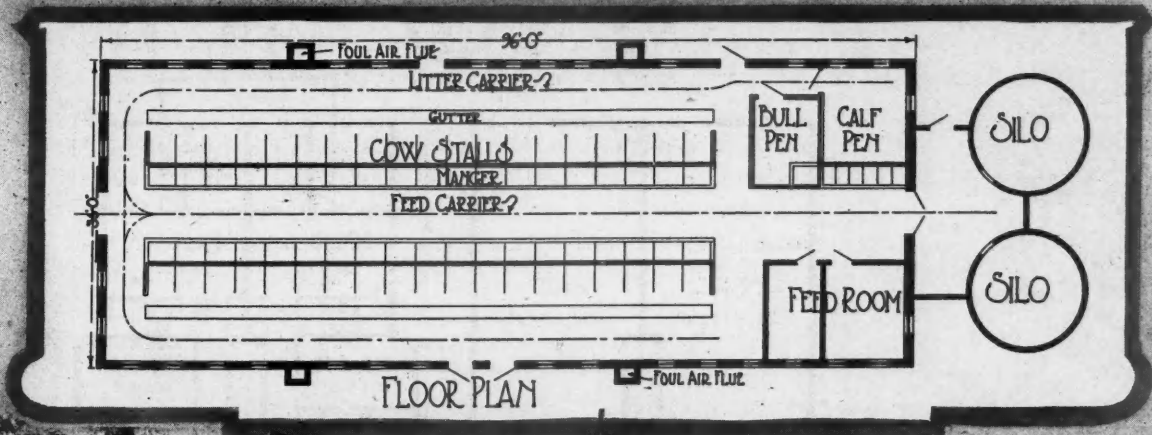
ISOMETRIC SECTION OF  
 RAFTERS, COLLAR BEAMS, BRACES,  
 STUDS & PLATES.



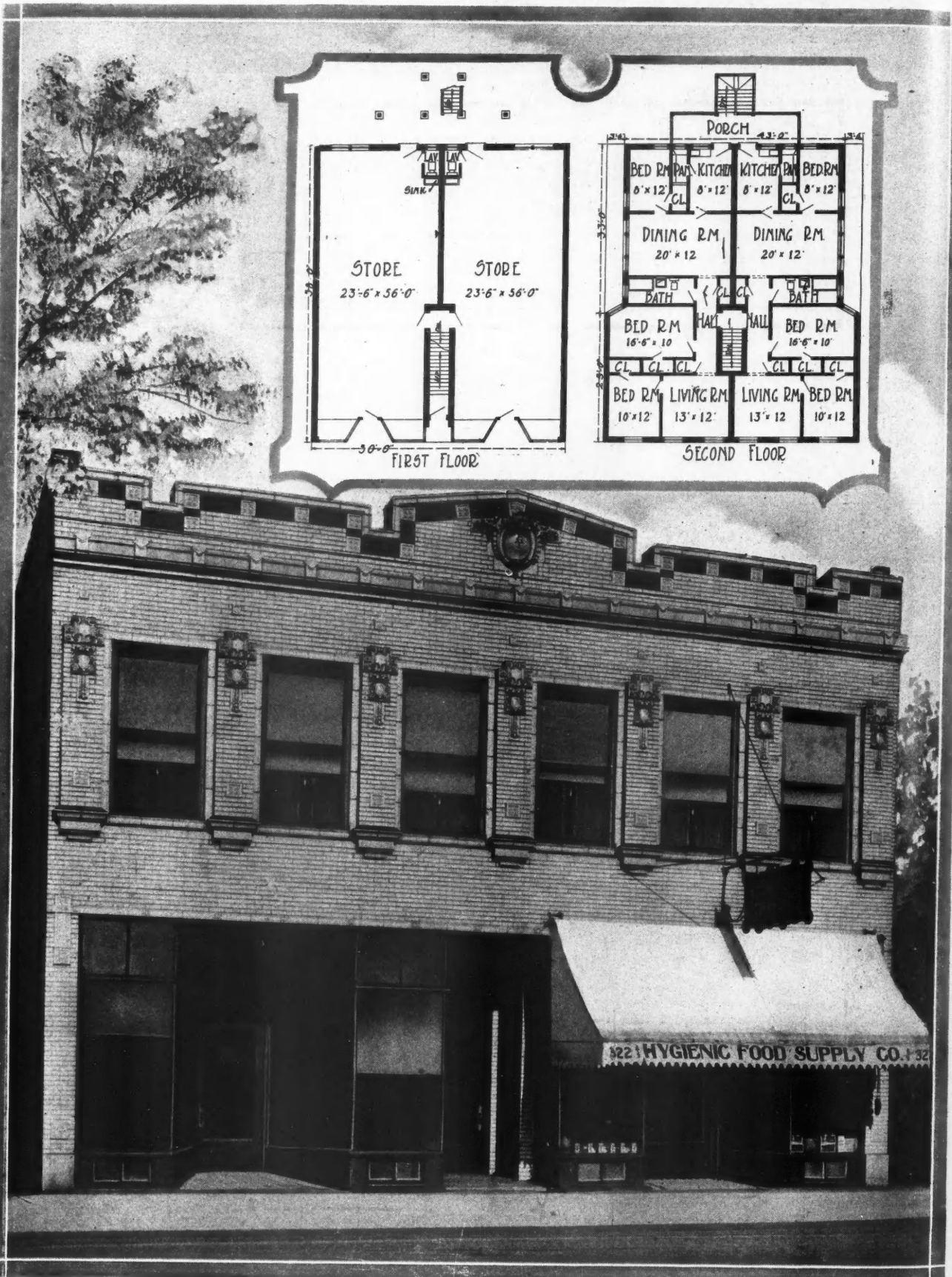
CROSS SECTION

# PLANK FRAME BARN CONSTRUCTION





**THE HUB OF THE FARM.** Ask a farmer what his most important building is—here is the answer. The dairy barn means much to the success of a successful establishment and for that reason the builder has a definite responsibility when constructing it. This substantial structure with gambrel roof and large storage facilities is 36 by 96 feet and is supplemented by two silos. The foundations up to the top of the stall floor are concrete block, above that frame. It is equipped with the most modern cow stalls and pens, mangers, and labor-saving equipment, such as feed and litter carriers, barn door hangers and hay tools. Foul air flues have been installed to keep the air fit to breathe.



**A**N ATTRACTIVE INVESTMENT. This modern store building with apartments on the second floor possesses several features that will attract the builder looking for a substantial return on his investment. Fronting on two lots it contains two well-lighted stores, 23 feet 6 inches by 56 feet each, equipped with modern store fronts, on the main floor, and two six-room apartments above. The building is brick with a front facade of attractive terra cotta. Each apartment has a living room, three bedrooms, a large dining room, 20 by 12 feet, and a kitchen. Three large windows in the front provide plenty of light to that part of the house. The building is 50 feet wide and 58 feet long.



## Projected Building Work Increases

DECLINE IN MAY TEMPORARY DUE TO UNUSUAL CONDITIONS—RELIEF EXPECTED SOON

**B**UILDING operations in the month of May showed a decline of 19 per cent from the operations of the previous month, according to statistics compiled by the F. W. Dodge Company. According to these figures, contracts awarded during May in the territory east of Missouri and north of the Ohio River amounted to \$247,186,000, compared with over \$300,000,000 for the months of March and April.

This slackening of activity can scarcely be more than temporary. Its principal causes are four: Disputes over adjustments in the wage scale, principally in Chicago and the Central West; freight congestion, which is felt principally in the East; the increasing difficulty of financing building operations, and the belief that prices of materials are due to drop.

These factors, tho they seriously handicap building operations, can scarcely be of more than temporary nature. The problems of wage adjustments and freight congestion may be solved very speedily. The difficulty of financing building projects, while it is great, is not

insurmountable. The public has already begun to see that declines in commodity prices can only be slow, at best, and it will soon realize that, in face of the enormous demand for construction of all kinds and the prospect of increased freight rates, building materials are likely to remain high longer than any other group of commodities.

The outstanding factor in the building situation, which overshadows all the difficulties and disturbing elements, is the accumulated demand for buildings. During the first five months of 1920, the F. W. Dodge Company reported contemplated and projected work amounting to two-and-one-half billion dollars, as against contract awards amounting to one-half that sum.

In the face of the enormous construction job this country has on its hands it is not going to pack up its tools and quit, but it will rather solve the difficulties one by one, and push the work to completion as rapidly as the adverse circumstances will permit.

## Daylight Factory Construction

DETAILS OF ROOF TYPES AND STEEL SASH WITH VENTILATORS SHOWN ON PAGE 97

**T**HE main element in the construction of the modern daylight factory is steel sash. It has provided builders with a means to increase daylight in a factory building and reduce the actual costs by taking the place of brick and concrete. In short, it makes up the greater part of the outside wall.

The steel sash is made up of panes of glass held in a steel frame. In buildings where this sash is used the entire area of window opening is available for lighting. There is practically no obstruction to the light at the muntins, mullions, lintels or jambs. For that reason the impression given is one of a wall of glass with the posts the only variations on the surface.

The importance of a daylight interior in a factory is apparent in more ways than one. It not only increases the output of the help by providing cheerful atmosphere, but improves the quality of the workmanship. Moreover, it increases the working space. Very little room is wasted and no dark corners are left for the accumulation of waste and rubbish piles.

Another equally important feature of the steel sash construction is the ample ventilation it provides. The ventilator is a vital part of the steel window. These ventilators are sections of the sash horizontally pivoted so that they can be tilted out. They swing outward and upward at the lower end, thus preventing excessive drafts and rain from falling in the building. This ventilation can be placed at any point in the sash and can vary in width (that is, in the number of panes of glass), altho the most popular size is three panels in width. They can be placed at the extreme top or bottom of the sash as one of the details on the blue-print

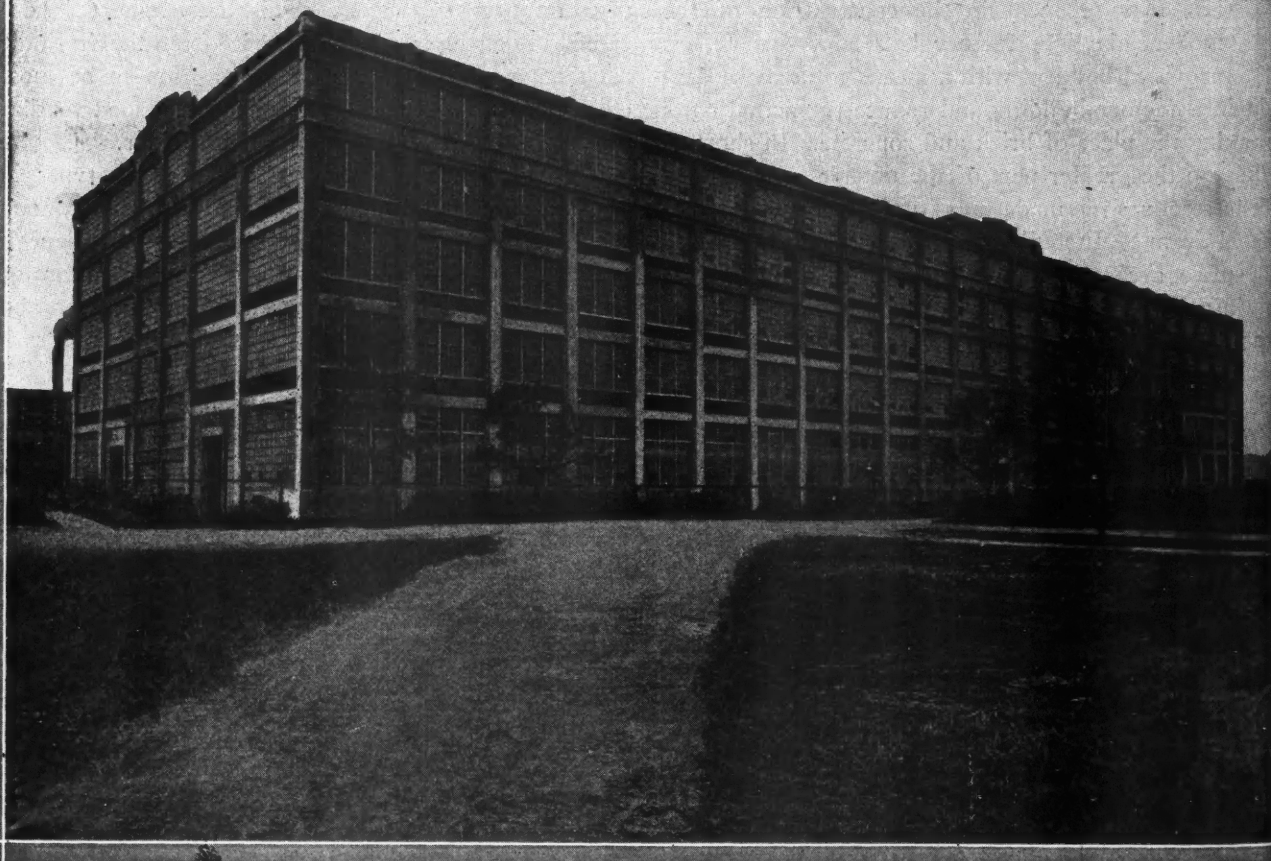
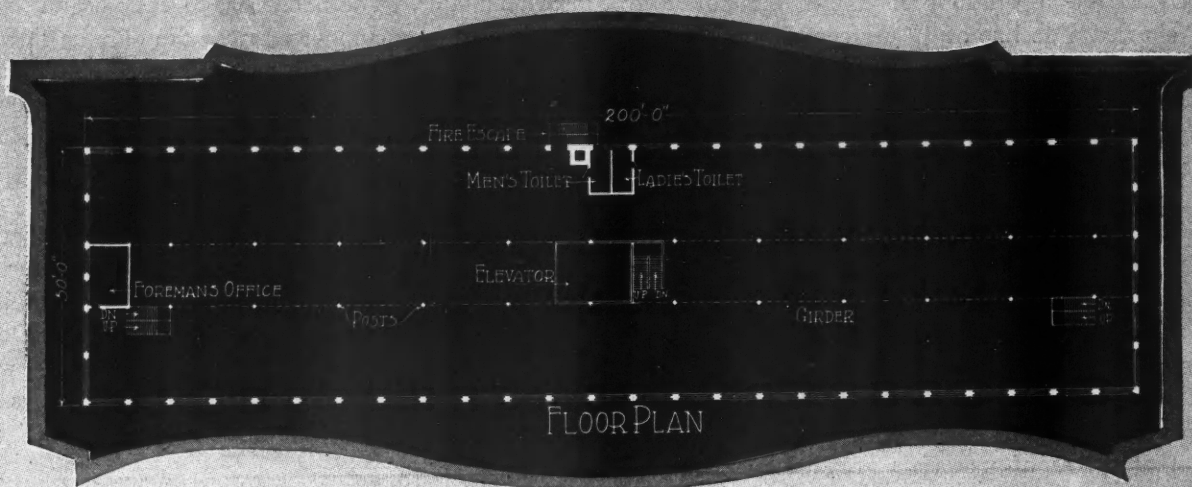
page on page 97 shows. This arrangement is designed to get the maximum benefits from the fresh air as it enters the building, and at the top to be most efficient in removing foul airs and gases. Good ventilation makes workmen active and industrious.

There are many variations in steel sash types in addition to the pivoted side wall ventilators. Among them are the vertical sliding sash with counterbalances, horizontal sliding sash for side walls and monitors of mill buildings, and continuous sash for monitor and saw-tooth roofs. It is essential that continuous sash be weather-tight under all conditions.

An important accessory in the operation of these steel sash is the so-called sash operator which is manufactured in a variety of designs. One type known as the rocker shaft consists of a worm and gear to turn a rocker shaft to which are attached arms that act directly on the sash thru rods.

Another operator intended especially for heavy continuous top hung sash consists of swinging arms which move in a horizontal plane and are right and left hand, eliminating any side thrust on the sash. The mechanism is the worm and gear type which locks the sash at any position and prevents slamming or vibration.

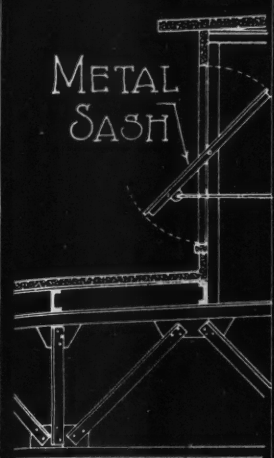
Builders who are interested in information on steel sash construction will find that the manufacturers maintain a staff of specialists who are ready to answer all questions on that subject. They are anxious to cooperate with architects, engineers and building contractors and render them the personal service which is needed in this task.



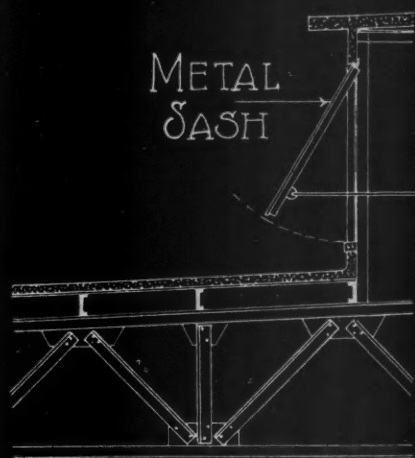
**M**ODERN DAYLIGHT FACTORY. Factory construction has experienced remarkable development in the last few years, particularly along the line of providing better light and ventilation for the workers. Much has been accomplished toward making a factory a better place to work in thru the perfection of the steel sash window. The details are shown on the opposite page. As the factory shown here demonstrates very clearly the old walls of brick and stone have been transformed into walls of glass. This sunshine factory is one of the many built by Uncle Sam to carry on his numerous activities. It is the machine shop at the Washington Navy Yard. It is of standard steel and concrete construction, 50 by 200 feet. The floor plan shows the typical arrangement of each floor.



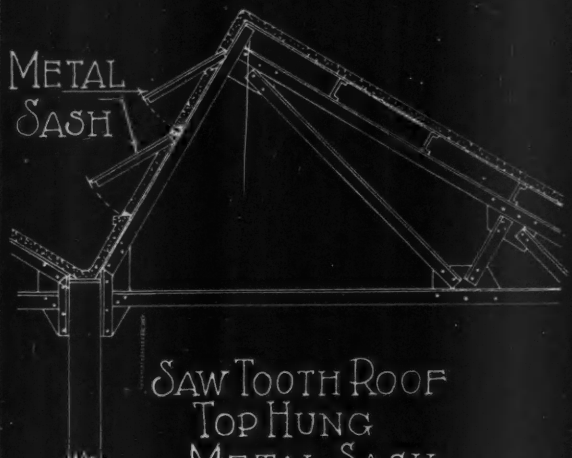
# RECOMMENDED CONSTRUCTION



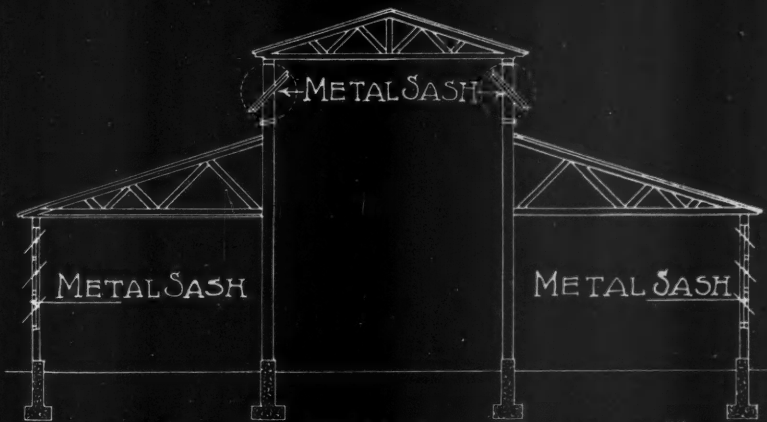
MONITOR ROOF  
CENTER PIVOT  
METAL SASH



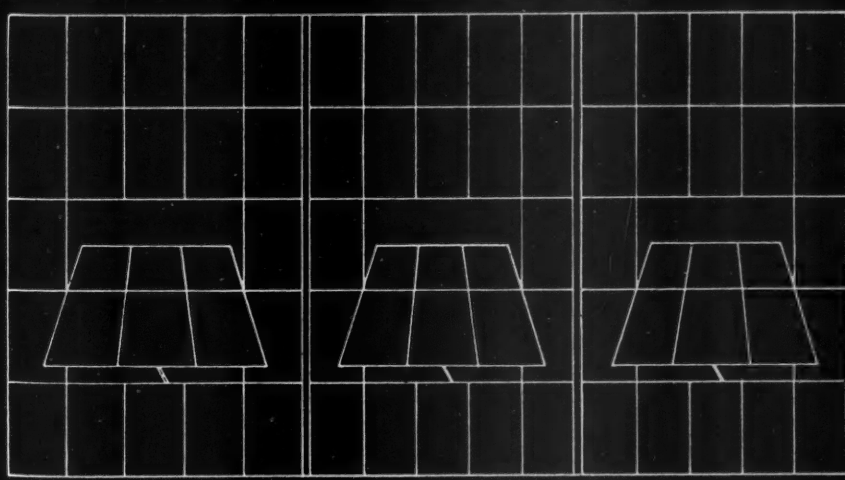
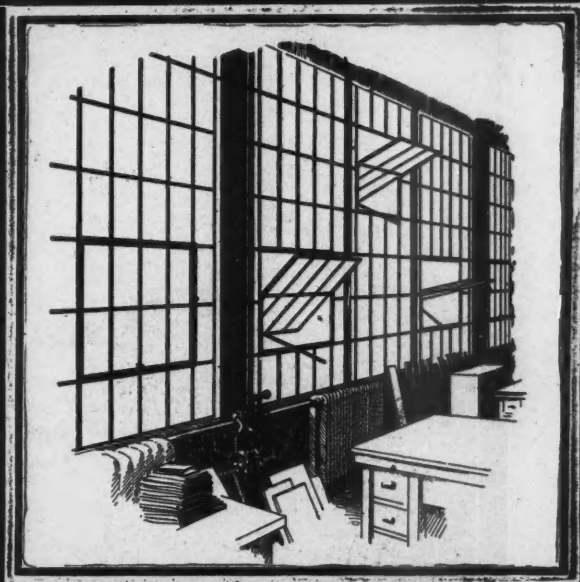
MONITOR ROOF  
TOP HUNG  
METAL SASH



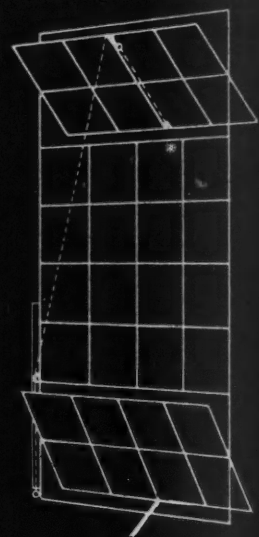
SAW TOOTH ROOF  
TOP HUNG  
METAL SASH



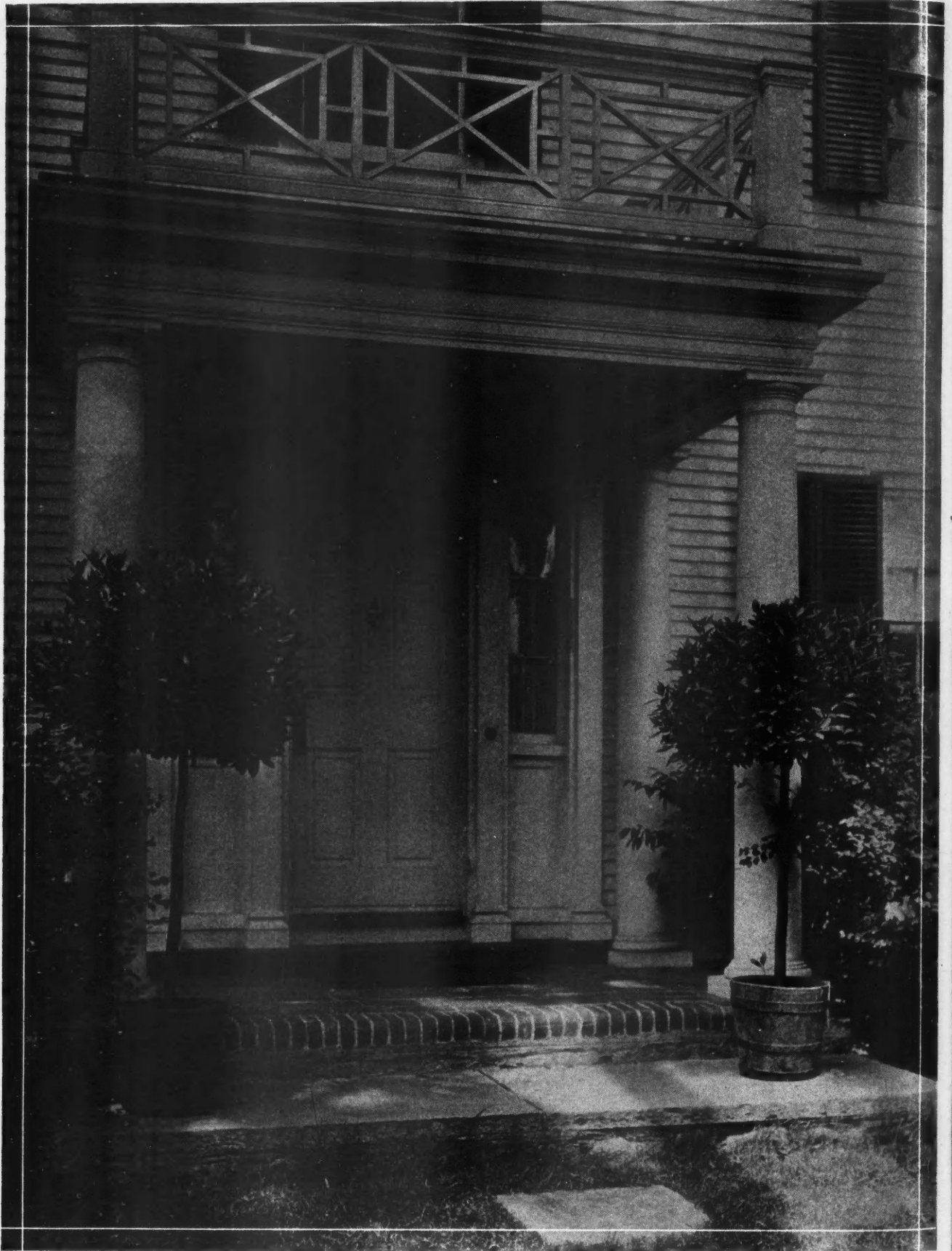
CROSS SECTION OF MODERN BUILDING USING  
METAL SASH



STANDARD SASH



# DAYLIGHT FACTORY CONSTRUCTION



**T**HERE IS HOSPITALITY HERE. The entrance of a home very often reveals the hearts that reside within. In this charming doorway we find a simple dignity which characterized the homes of Colonial days when politeness was the rule rather than the exception. The old-fashioned knocker close to the modern electric bell typifies the happy combination of the old and new in this home. The brick step is in keeping with the quaintness of the whole scene. While the rest of the house is not visible it is not difficult to imagine that it is just as homey and appealing as this entrance.



# DESIGN OF SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

## Horizontal Shear

ARTICLE SIX OF AN INTERESTING AND INSTRUCTIVE SERIES ON THE STRENGTH OF MATERIALS

**S**HEAR has been defined as the tendency of any two adjacent portions of a beam to slide by each other. When a strut or beam fails by shear, two portions actually move by each other as the two blades of a pair of shears. In the June article in this series the subject of vertical shear was discussed, and methods given for designing members against failure from vertical shear. The present article will be a treatment of the methods for finding the strength of the fibres of a beam against shearing on a plane at right angles to the plane of vertical shear. This is called horizontal shear.

The reader will get the best idea of horizontal shear by a simple illustration. Place several 12 by 1-inch boards on a couple of supports as shown in Fig. 1.

When the boards are of the same length, the ends will be practically straight and even. If now a load  $W$  is applied at the center of the pile, the boards bend or sag in the middle and the result is as shown in Fig. 2. Each board tends to slide on the one above or below it, and in this way moves the ends from their original positions. The horizontal motion of one board over the other is what causes horizontal shear.

Now, if each board were glued securely to the ones next to it, and a small load applied, the ends of the pile of boards remain square and even, the same as before the load was applied. There was still this tendency to slide, but the motion was prevented by the glue. This resistance measures the horizontal shear. Again, if the boards were securely bolted together, and a load applied, the boards could not slip. The shearing resistance is offered by the bolts.

When the pile of boards is replaced by a beam 12 by 5 inches and a load  $W$  applied the beam will bend slightly. There is still the tendency of one horizontal portion to slide past the adjacent face. However, if the beam is not overloaded the motion is prevented by the internal fibres of the beam, just as it was resisted by the glue or bolts. The resistance that the fibres can offer is called their horizontal shearing strength.

Some fibrous materials, such as wood and wrought iron, would be more likely to fail from horizontal shear than those materials that have no natural inter-

nal cleavage surfaces. Timber has a low shearing strength parallel to the grain, and a short beam fails by horizontal shear before giving way from bending caused by a load. Timbers heavily loaded often have openings or cracks along the sides. These openings are usually considered as a result of seasoning, whereas many of them really show a tendency to horizontal shearing.

Now it is proven in mechanics that the vertical shearing stress on any section of a beam is not the same at every point in the section, but is the greatest at the neutral axis or center line of the section. Also that the cross-section at the supports will be under the greatest shearing stresses. Then when designing a beam the unit shearing stresses should be figured for the neutral axis of the vertical section at the supports. It is also proven in mechanics that at any point in a beam the unit vertical and unit horizontal shearing stresses are the same.

In order that the reader may get a good idea of the subject in hand, Fig. 3 is drawn showing a simple

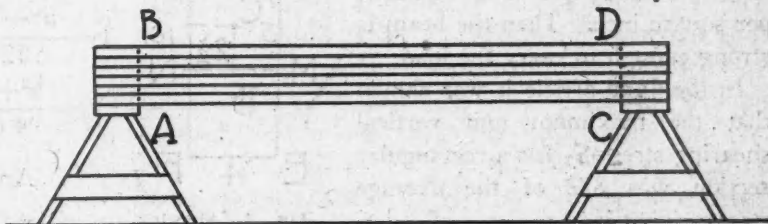


Fig. 1. Showing a Pile of Boards Without a Load. Vertical Lines AB and CD Show the Section Where Maximum Shear Occurs.

rectangular beam carrying a central load  $W$ .  $M K L N$  is a horizontal plane section thru the center. It is in this plane that maximum horizontal shearing stresses will be found.  $E F H G$  is the vertical section at the left-hand support.  $M N$  the line thru the center of gravity of the section is the neutral axis. Then the maximum vertical and horizontal shearing stresses will be found at  $M N$ .

While the rule for calculating horizontal shear  $S_h$  to be given will be true for beams of any cross-section, it will be stated with special reference to the section  $E F H G$ , shown in Fig. 4, which is the one in common use except in large structures. It is as follows:

To obtain maximum  $S_h$ , multiply the total vertical shear  $J$  ( $=\frac{1}{2}W$ ) at the support by the area  $M N H G$  of the vertical cross-section that lies above the vertical axis. Multiply this product by the distance from the

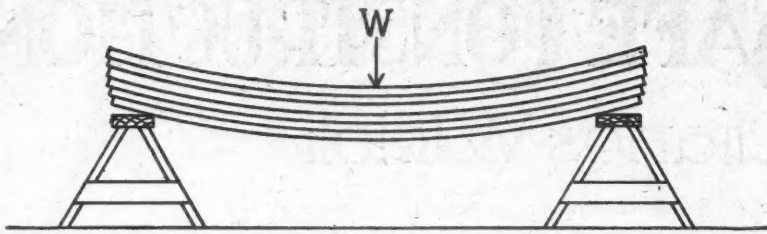


Fig. 2. Illustrating the Effect Produced by Horizontal Shear. Note the Saw-Tooth Effect at the Ends of the Boards.

neutral axis *M N* to the center of gravity *C* of the area *M N H G*. Divide the final product by the moment of inertia of the entire vertical cross-section *E F G H*, and divide this quotient by the width of the beam material at the center of gravity of the entire cross-section. The final quotient is the unit horizontal shearing stress *S<sub>h</sub>*.

For example, suppose a yellow pine beam 4 by 10 inches carries a central load of 2,000 pounds. To find the *S<sub>h</sub>* for the section is shown in Fig. 4.

As shown in previous articles,  $J = \frac{1}{2}W = 1,000$  pounds.

Area *MNHG* = 5 × 4 = 20 Inches, *B C* = 5/2 inches, *B* = 4 inches and

$$I = \frac{1}{12} b h^3 = \frac{4 \times 10 \times 10 \times 10}{12} = 333\frac{1}{3} \text{ pounds.}$$

Then by the rule

$$S_h = \frac{1,000 \times 20^{(*)} \times 2.5^{(\dagger)}}{333 \times 4} = 37.5 \text{ pounds}$$

\* Area. † Dist. to C. of G.

But a safe working stress in shear for yellow pine is 100 pounds per square inch. Then the beam is strong enough to carry the load.

In the June article it was shown that the maximum unit vertical shearing stress *S<sub>v</sub>* for a rectangular section was 3/2 of the average stress. That is

$$S_v = 3/2 \frac{J}{A^{(*)}}$$

\* Total area.

But *A* = 4 × 10 = 40 and *J* = 1,000.

$$\therefore S_v = 3/2 \frac{1,000}{40} = 37.5 \text{ pounds}$$

This is seen to be the same as *S<sub>h</sub>* and verifies the statement that at any point in a beam *S<sub>v</sub>* = *S<sub>h</sub>*. Then when the beam is rectangular, the rule need not be applied. Simply take 3/2 of the average vertical shearing stress and the result is *S<sub>h</sub>*, the maximum unit horizontal shearing stress.

However, there are many types of beams used where *S<sub>h</sub>* must be known, and can only be calculated by applying the rule. For this reason, in order that it might be available for use by the readers of the AMERICAN BUILDER, it is stated as follows:

$$S_h \text{ (maximum)} = \frac{J \times A \times V}{I \times b} \dots \dots \text{Formula I}$$

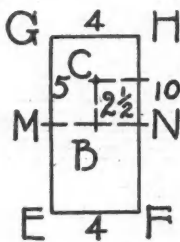


Fig. 4. Showing the Vertical Cross-Section at the Support.

Where *J* is the total vertical shear at the support, *A* is the area of the vertical section above the neutral axis, *V* the distance from the neutral axis to the center of gravity of the area *A* above the axis, *I* the amount of inertia of the entire vertical section with reference to the neutral axis, and *b* is the total thickness of beam material at the neutral axis.

The values for the letters in Formula I are to be found in hand books for the common forms of beams used in construction. However, a few of such forms are shown in Fig. 5 and the corresponding values of the letters to be used in each case are tabulated:

Figure	A	B	C	D	E	F
Moment of Inertia <i>I</i>	$\frac{a^4}{12}$	$\frac{bh^3}{12}$	$\frac{d^4}{20}$	$\frac{a^4 - m^4}{12}$	$\frac{bh^3 - cg^3}{12}$	$\frac{d^4 - n^4}{20}$
<i>V</i> , the distance to C. of gravity of Area	$\frac{a}{4}$	$\frac{h}{4}$	$\frac{d}{5}$	$\frac{a^2 + am + m^2}{4(a+m)}$	$\frac{bh^2 - cg^2}{4(bh - cg)}$	$\frac{d^2 + dn + n^2}{5(d+n)}$
Area above neutral Axis, <i>A</i> .....	$\frac{a^2}{2}$	$\frac{bh}{2}$	$\frac{11d^2}{28}$	$\frac{a^2 - m^2}{2}$	$\frac{bh - cg}{2}$	$\frac{11(d^2 - n^2)}{28}$
Breadth of beam material, <i>b</i> .....	<i>a</i>	<i>b</i>	<i>d</i>	<i>a - m</i>	<i>v - c</i>	<i>d - n</i>

The values of *J* are determined from the load. Suppose a beam of cross-section D carries a load of 2,000 pounds at its center. Let *a* = 8 inches and *m* = 4 inches. Then using the values from the table in column D:

$$I = \frac{a^4 - m^4}{12} = \frac{(8 \times 8 \times 8 \times 8) - (4 \times 4 \times 4 \times 4)}{12} = 320$$

$$V = \frac{a^2 + am + m^2}{4(a+m)} = \frac{(8 \times 8) + (8 \times 4) + (4 \times 4)}{4(8+4)} = 2.3$$

$$\text{Area} = \frac{a^2 - m^2}{2} = \frac{(8 \times 8) - (4 \times 4)}{2} = 24$$

$$\text{Breadth of beam } b = a - m = 8 - 4 = 4$$

$$J = \frac{1}{2}W = 1,000 \text{ pounds}$$

Applying the rule:

$$S_h = \frac{1,000 \times 24 \times 2.3}{320 \times 4} = 43.1 \text{ pounds}$$

If the beam is of oak or yellow pine the loading is safe.

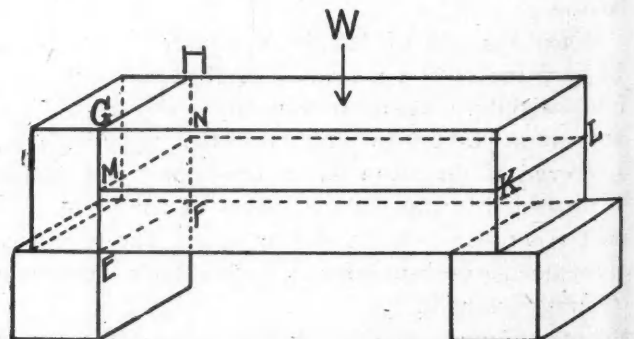


Fig. 3. Showing a Simple Rectangular Beam Carrying a Central Load. MKLN is a Horizontal Plane Section Thru the Center.



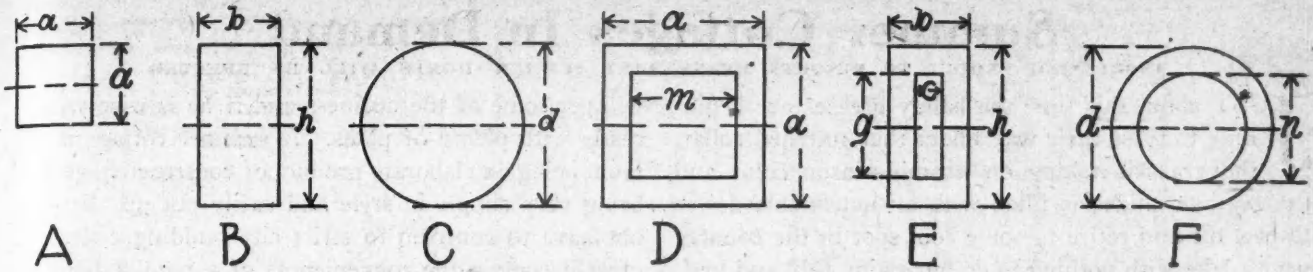


Fig. 5. The Cross-Sections of Some Common Shapes Used in Construction. Neutral Axis Shown in Each Case.

A natural question to ask is, when is there danger of a beam failing from horizontal shear before it gives way from bending. Theory shows and experiment has verified to a certain extent that when the length of a beam is less than ten times its depth failure will occur by shear. While if it is more than ten times the depth failure will occur from bending.

The article will be concluded by solving a problem where the length of the beam is less than ten times its height.

Take a yellow pine beam 6 by 10 inches and length 6 feet carrying a uniformly distributed load of 10,000 pounds. In order that a beam be safe against failure from bending it has been shown that

$$\text{Bending moment} = p \times \text{section modulus.}$$

$$\text{But bending moment} = \frac{1}{8} Wl = \frac{1}{8} \times 10,000 \times 6 \times 12.$$

$$\text{Section modulus} = \frac{1}{6} b h^2 = \frac{6 \times 10 \times 10}{6} = 100$$

$$\therefore \frac{10,000 \times 6 \times 12}{8} = 100 p$$

$$P = 900 \text{ pounds}$$

For yellow pine a safe fibre stress is 1,000 pounds. Therefore the beam is safe so far as bending is concerned. As previously explained, since the beam is a rectangle,

$$S_h = 3/2 \frac{J}{A}$$

Where  $J = \frac{1}{2} W = 5,000$  pounds and  $A = 6 \times 10 = 60$

$$\therefore S_h = 3/2 \frac{5,000}{6 \times 10} = 125 \text{ pounds}$$

But 100 pounds per square inch is considered a safe shearing stress and the beam would not be safe for the 10,000 pounds load. This example verifies the rule that when the length is less than 10 times the depth, the beam will be in more danger from failure by horizontal shear than from bending.



### Removing Paint from Iron and Steel Surfaces

**A**N easier and more rapid way than scraping or burning paint from the surface of iron and steel structures previous to the application of a new coat has been used by the United States Coast Artillery for cleaning the exterior portions of the big guns and gun carriages in their care.

In practice, a one-pound can of concentrated lye is dissolved in three quarts of boiling water, and to this mixture sufficient lime is added to emulsify the solution. This solution is freshly mixed each time it is to

be used and is applied with a brush and allowed to remain until it is almost dry. It is then removed and unless the paint is very old and thick it will come off with it. If one application of the mixture does not remove all of the paint, the surfaces are washed off and a second coating applied. Before a new coat of paint is put on, the surface of the metal should be thoroly cleansed with a solution of washing soda (in the proportion of one-half pound to two gallons of hot water), and well dried either by wiping with soft cloths or by the application of heat.



### How to Retain the Bark on Logs Used in Rustic Construction

**F**OR preventing the bark from flaking off logs used in rustic structures, the Forest Products Laboratory, Madison, Wis., recommends the following methods of seasoning and preparing the timbers as the most effectual:

(1) Cut timbers late in summer and score on two sides; that is, cut off narrow strips of bark for the entire length. Pile in shade in open pile to allow thoro circulation of air. Allow timbers to season until following spring or summer before using:

(2) Proceed as in (1), and in addition coat ends, stripped portions, and knots with coal tar creosote, using one coat a few days after timber is cut and another just before using the timbers.

(3) Proceed as in (1), but do not score bark. When timbers are in place, tack bark on with large-headed nails, placing one to every square foot of surface. Paint heads of nails to resemble color of bark.

(4) Tack or nail the bark on without particular attention to time of cutting or other treatment.

The nailing method has been used successfully by one western company which maintains numerous rustic hotels, and also on a large rustic building erected for exposition purposes.



**B**UILDING contracts let during May in western Pennsylvania, West Virginia, and Ohio, amounted to \$44,731,000, a decrease of 9 per cent from the April total, altho it is greater by sixteen billion dollars than the total for May of last year.

The May, 1920, figures include: \$11,811,000, or 26 per cent, for residential buildings; \$9,972,000, or 22 per cent, for public works and utilities, and \$9,650,000, or 22 per cent, for industrial plants.

## Summer Cottages In Demand

INCREASING EXODUS TO RESORTS MEANS MANY SUMMER HOMES WILL BE ERECTED

**J**UST about this time the balmy breezes are beginning to tease their way under that starched collar, the grass is taking on its mid-season color and the average citizen is filled with an indefinable desire to peel off and retire to some cool spot in the country near a lake with nothing to do but swim, fish, and loaf. He has heard the "call of the wild."

And it is at just such a time that the summer cottage built last year is going to come in mighty handy. Envious friends who have been spending hot vacations in hotter hotels right near by are realizing that they have been missing some real fun. Perhaps this summer they will consult the builder about putting up a summer home, a place that will drive away that tired feeling and prepare the system and disposition for another hard winter.

Each summer sees a great exodus of city cliff-dwellers to the cool spots of the summer resorts and country oasis all eager to get away from the hot grind. And with each exodus comes the inevitable demand for more summer homes, of which the cool rambling cottage is the most popular. As a result whole rows of these summer shelters are springing up along inland lakes and watering-places.

Naturally the building contractor who is on the spot

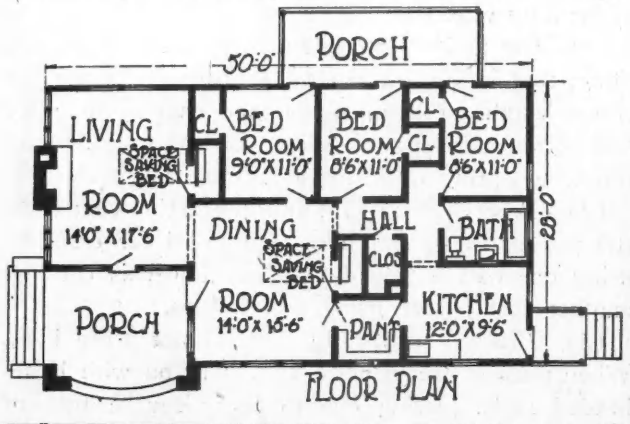
will get some of the business and if he is wise will be ready with plenty of plans. A summer cottage is far from being an elaborate product of constructive genius, being very simple in style and easily put up. It does not have to conform to strict city building codes nor must it contain the conveniences of a regular home.

As a rule, these cottages are small, frame in construction, size depending on the family, just enough to protect the inmates while asleep, with a broad porch where the lucky owner can loll around in the hot days within a few feet of the swimming pool. Progressive builders are now using extensively wallboard as interior finish to make the cottage more homelike and comfortable. An open fireplace is a source of comfort on chilly nights and helps to make the cottage a real hunting lodge in the fall.

Other summer homes tend more towards the permanent type and are built of substantial material, carefully planned and finished. The large porch is a distinctive feature of a summer home, small or large.

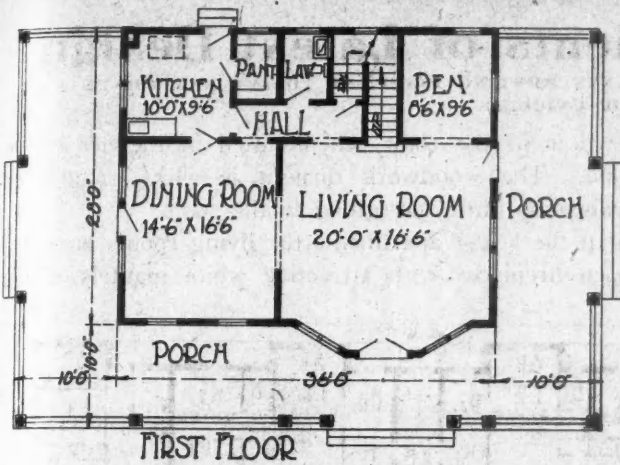
Two representative types of summer cottages are shown here with floor plans. They have been built along more substantial lines and indicate the tendency in modern construction of buildings of this type. People have found that a good cottage will last indefinitely and provide many comforts that have been lacking in the makeshift type of cottage.

In the bungalow shown here there is a brick fireplace installed in the large living room which has been

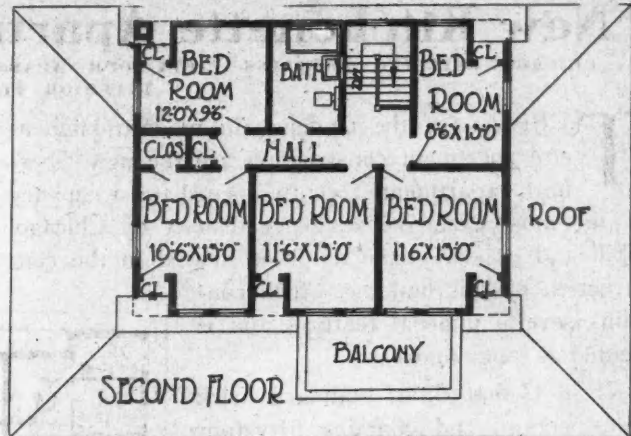


In the Hot Dog Days, a Delightful Summer Cottage Like This Is a Real Comfort. It has been Constructed at a Very Reasonable Cost; in Addition to Being Attractive it Is Substantial and Not Designed for One or Two Seasons. The Floor Plan Is Shown in the Inset Above. The Cottage Contains Six Rooms, of Which Three Are Bedrooms.





First Floor Plan of Summer Cottage.



Second Floor Plan of Summer Cottage.

fitted with a space-saving bed to take care of overflow at week ends. This small cottage can accommodate a goodly number of visitors in its three bedrooms and two space-saving beds.

The other summer home is built on more portentous lines than are usually found in buildings of this type, but reflects the roomy comfort which makes a summer home worth while. The large porch extending around three sides of the home should prove a welcome retreat for tired vacationers during the dog days when the sun

is oppressively hot.

The floor plans reveal a comfortable arrangement with plenty of sleeping space easy enough to accommodate the large quota generally found in a summer home. Five bedrooms and a bath make up the upper half story. Each room has at least two large windows and in some instances more. Of course plenty of fresh and cool air is essential to the comfort of its occupants and this particular detail must be taken care of in the planning of the building.



The "Kiddies" Look Forward to That Vacation in the Country Near a Cool Lake Where They Can Splash at Will. This Summer Home Shown Here Will Accommodate a Regular Family and Is Built for Solid Comfort—a Place to Loaf and Shake Off the Care of the City.

# New Kitchenette Apartments of Latest Design

CHICAGO BUILDING CONTAINS FIFTY-FOUR APARTMENTS RENTING FROM \$225 TO \$500 PER MONTH — INTERIOR FINISH UNIQUE

**T**YPICAL of the tendency in modern kitchenette apartment construction are the new Sherburne apartments recently opened for occupancy in the most exclusive residence district of Chicago. Skill and expense have not been spared in the construction of this building which contains several unusual features and is rented at fancy figures.

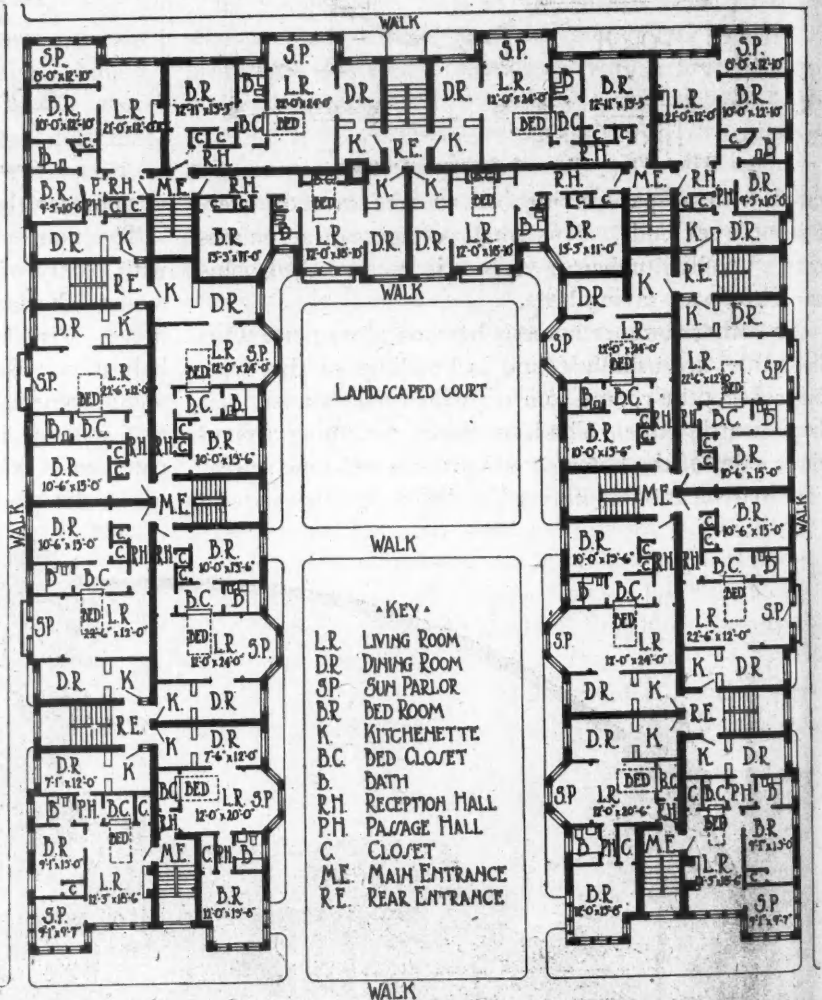
It is U-shaped, of standard brick construction, and contains fifty-four apartments fitted thruout with modern conveniences and comforts of the latest high-class apartment building and furnished in luxurious style.

Each apartment has an outside exposure either on the lake, which is adjacent, or the street and contain four to six rooms; in price they range from \$225 to \$500 a month. They consist of one large living room, one or two bedrooms, a well appointed bathroom, kitchenette and breakfast room, and the larger ones have also delightful sun parlors.

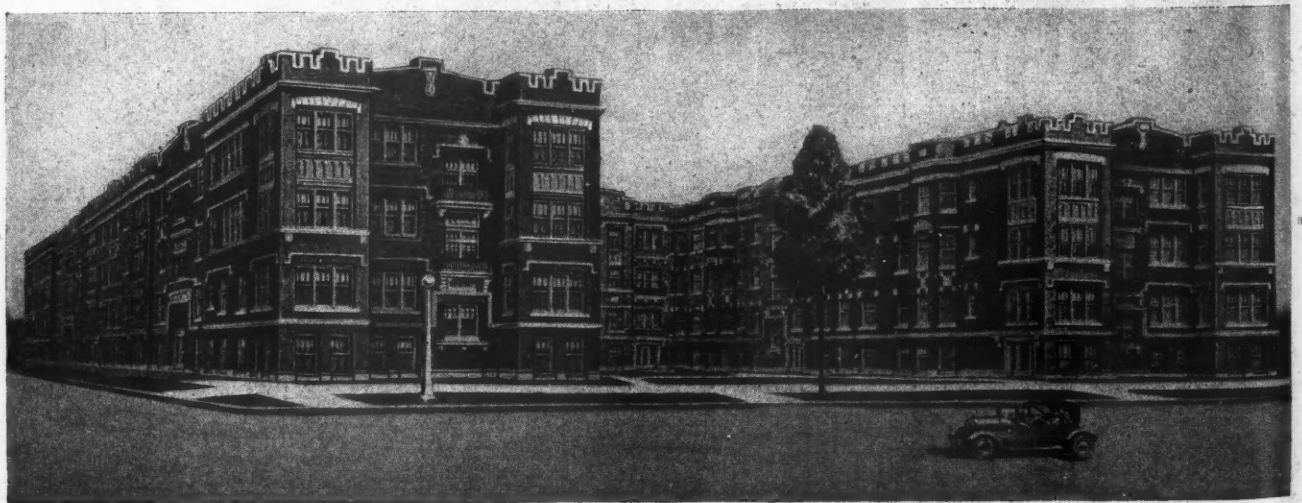
The furnishings are of the very best quality and design, special attention having been given to each individual room, bearing in mind its size, its use, its light and exposure. The walls of the living rooms are paneled, the panels in some being neutral tones to match the background of the walls, others are designed floral, foliage, or some other interesting pattern. The floors are covered with two-tone neutral rugs, corresponding in color to the

keynote of the color scheme used in the decorative plan. The woodwork thruout is white enamel or mahogany finish, according to the room.

In the larger apartments the living rooms have big open fireplaces with attractive white mantels which

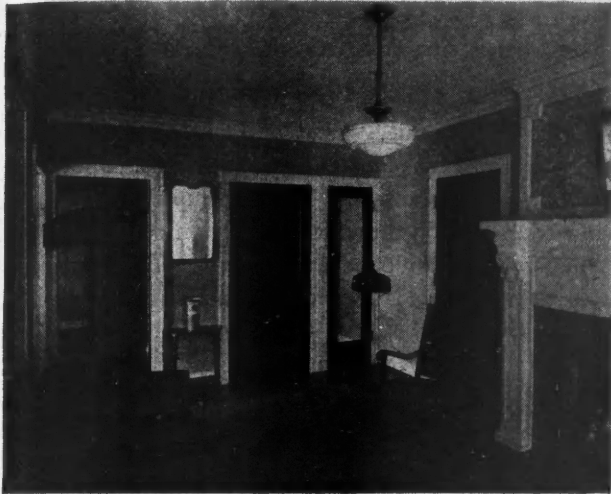


Floor Plan Arrangement of New Kitchenette Apartment Building. The Apartments Range from Four to Six Rooms.

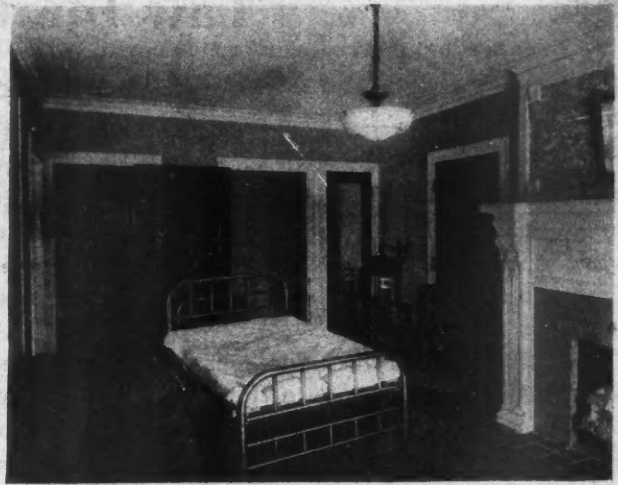


New Sherburne Apartments Recently Completed in Chicago. This Building Contains Fifty-four Kitchenette Apartments Furnished in Unique Style and Was Designed by Thos. E. Bishop, Architect. The Feature Is a Bathhouse in the Basement, Fitted with Lockers and Showers for Bathers.





Living Room as It Appears with Bed Concealed in Closet. The Space-Saving Bed Has Been Used Extensively in These New Apartments.



Space-Saving Bed in Position. In the Sherburne Apartments Double, Twin, and Concealed Beds Have Been Used Depending on the Arrangement of the Individual Apartment.

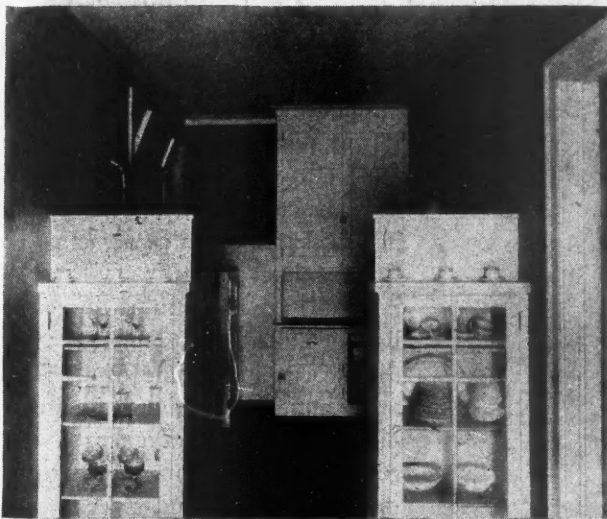
lend much to the decoration of the room and add a feeling of cheerfulness which makes them very home-like. The furniture in each of the living rooms consists of a large overstuffed davenport, two or three rooms chairs, a mahogany table and a mahogany desk. To these essential pieces are added attractive floor

the color scheme of the rooms. They are furnished with double or twin beds where the space permits, otherwise with wall beds.

The bathrooms are painted white and have tiled floors, and are equipped with the very best of modern plumbing fixtures.

The kitchenettes are equipped with the most modern conveniences and the tenants are furnished cooking utensils as well as linens, silver and dishes. The walls are painted in dainty tints of light blue gray and the woodwork is enameled in an ivory hue. The floor is covered with blue gray linoleum.

The small breakfast rooms are decorated to correspond with the adjoining kitchenette, and furnished in enameled furniture in keeping with this color scheme. The windows are draped in attractive cretonnes.



Kitchenette Showing China Cases, Range, Ice Box, Utensil and Food Cupboards. The Other Half of This Room Is Used as a Dining Room or Breakfast Nook as It Is Called.

and desk lamps, shaded in artistic silk or chiffon shades which carry out the color scheme of the room. There are silk and velvet surplice covers for the tables which add interesting color spots to the general effect.

The windows are doubly draped with lace curtains and silk overhangings.

In some of the apartments a sun parlor opens off the large living room. These sun parlors are furnished in the best quality of wicker furniture, enameled to suit the other decorations of the room and covered with gay figured cretonnes, the dominating color of which is repeated in the curtains at the windows.

The bedrooms are papered in dainty striped or flowered papers with rugs and draperies that carry out



The "Diningette" or Breakfast Room. This Room Is Simply but Artistically Furnished and Supplies an Intimate Place for the Family Meal.

## Law for the Builder

RIGHT OF CONTRACTOR TO RECOVER WHO ABANDONS WORK BECAUSE OF DEFECTIVE PLANS

By Leslie Childs

**T**HE Warehouse & Realty Company, a corporation, entered into a contract with the city of Spokane in which it agreed to construct a viaduct on a certain street in that city. The contract price was \$86,900, and the work was to be done in accordance with the plans furnished by the city engineer and under his supervision.

Two months later the Warehouse & Realty Company sublet the contract to John T. Huetter and Joseph Zirngibl, a partnership. Huetter & Zirngibl agreed to perform the work in accordance with the plans furnished by the city engineer. Payment was to be made to them on estimates from the city engineer; 80 per cent to be paid on each estimate when made and delivered, and the remaining 20 per cent retained until the contract had been completed.

Huetter & Zirngibl entered upon the contract, and after working several months a large portion of one of the walls collapsed and fell. The work had been done in strict compliance with the plans furnished, and under the direction of the city engineer.

After the collapse of the wall Huetter & Zirngibl employed two expert civil engineers to examine the work and plans. These engineers reported that the plans were defective, and that if the work was constructed according to them it would not stand. Huetter & Zirngibl notified the Warehouse & Realty Company of this report, and announced their willingness to proceed with the work, if the plans were changed so as to make the work possible.

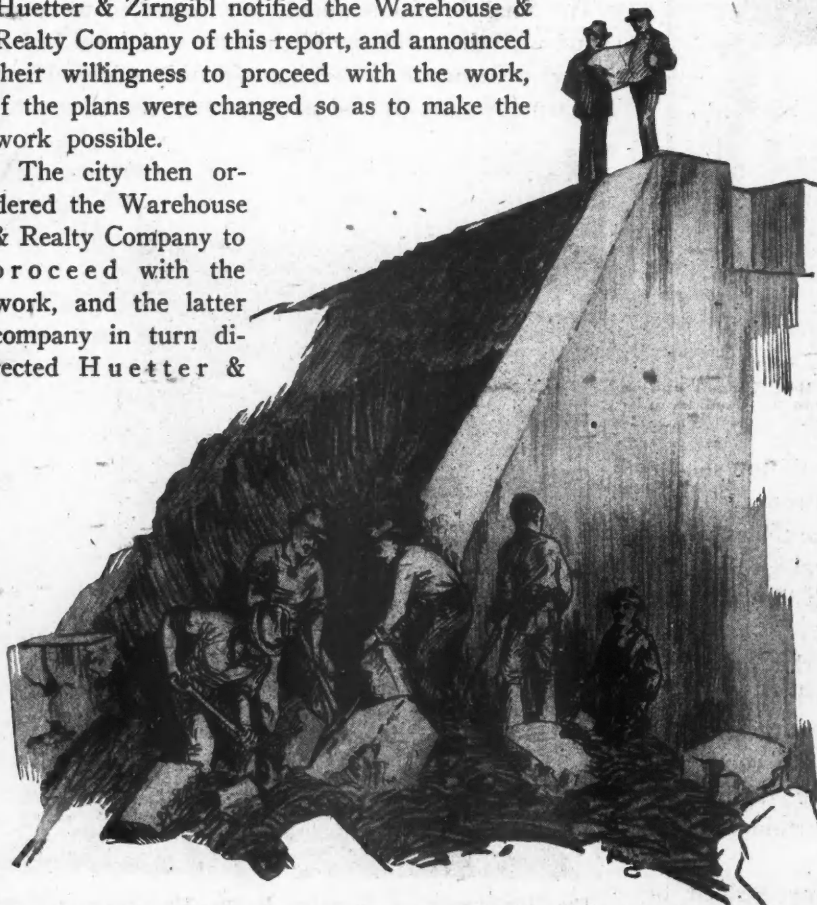
The city then ordered the Warehouse & Realty Company to proceed with the work, and the latter company in turn directed Huetter &

Zirngibl to continue. The latter refused to do this under the existing plans and specifications. The Warehouse & Realty Company then attempted to complete the work, but soon thereafter a portion of another wall fell, and they abandoned the contract. Later it seems, after the plans had been changed, the city completed the work.

When Huetter & Zirngibl abandoned the work they had been paid \$54,755.86, same being 80 per cent of the city engineer's estimates up to that time. The Warehouse & Realty Company refused to pay Huetter & Zirngibl the 20 per cent which had been retained, and the latter brought an action to recover this, and other items for material and labor. They also demanded the sum of \$2,982.15 in addition as profits which they would have realized had they been permitted to complete the work.

The lower court gave Huetter & Zirngibl a judgment for \$26,267.29, but refused to allow the \$2,982.15 claimed as prospective profits. Huetter and Zirngibl appealed, as did the Warehouse & Realty Company, neither of them being satisfied with the judgment. The case reached the supreme court and in deciding the questions raised it was said in part:

"Defendant's [Warehouse & Realty Company] main contention is that it was plaintiff's [Huetter & Zirngibl] duty to complete the work in accordance with their contract. It insists that the contract was an entirety; that plaintiffs [Huetter & Zirngibl] are not entitled to recover, having failed to complete it, even tho it was impossible of performance and that plaintiffs [Huetter & Zirngibl] are not excused from complete performance by reason of defective plans and specifications prepared by the city engineer. It further insists that the plans were furnished by the city, and not by defendant [Warehouse & Realty Company]; that they were on file with the city clerk; that plaintiffs [Huetter & Zirngibl] had access to them, and are in no position to insist that, by reason of defects in the plans and specification rendering the contract impossible of performance, they are exonerated from performing their work; that not being so exonerated, and having failed to complete their contract, they are not entitled to recover the 20 per cent of estimates withheld,



"After Working Several Months a Large Portion of One of the Walls Collapsed and Fell."

(Continued to page 124.)



# Electricity in the Modern Home

THE DUTY OF THE ARCHITECT AND BUILDER IN PROVIDING OUTLETS FOR ELECTRICAL LABOR-SAVING DEVICES

By Theo. Dwight

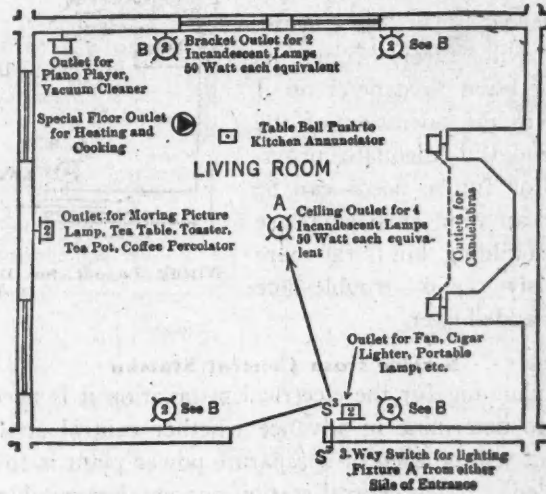
THE slowing up of building operations during the great war has brought about a shortage of housing thruout the country with which everyone is only too familiar. There is also a most serious scarcity of domestic servants and this must have its influence in the design of new houses, both of the detached and apartment type.

The architect and builder should give the closest study to labor-saving devices to simplify the work of the home and permit operation with fewer servants and even make possible the servantless house. Electricity is recognized as the greatest factor in such plans, so that a thoro knowledge of the equipment necessary to permit the convenient use of electrical household devices is essential.

No expense is spared by the home builder to provide safe and convenient plumbing and heating equipment and often 10 to 25 per cent of the total cost is represented by these items.

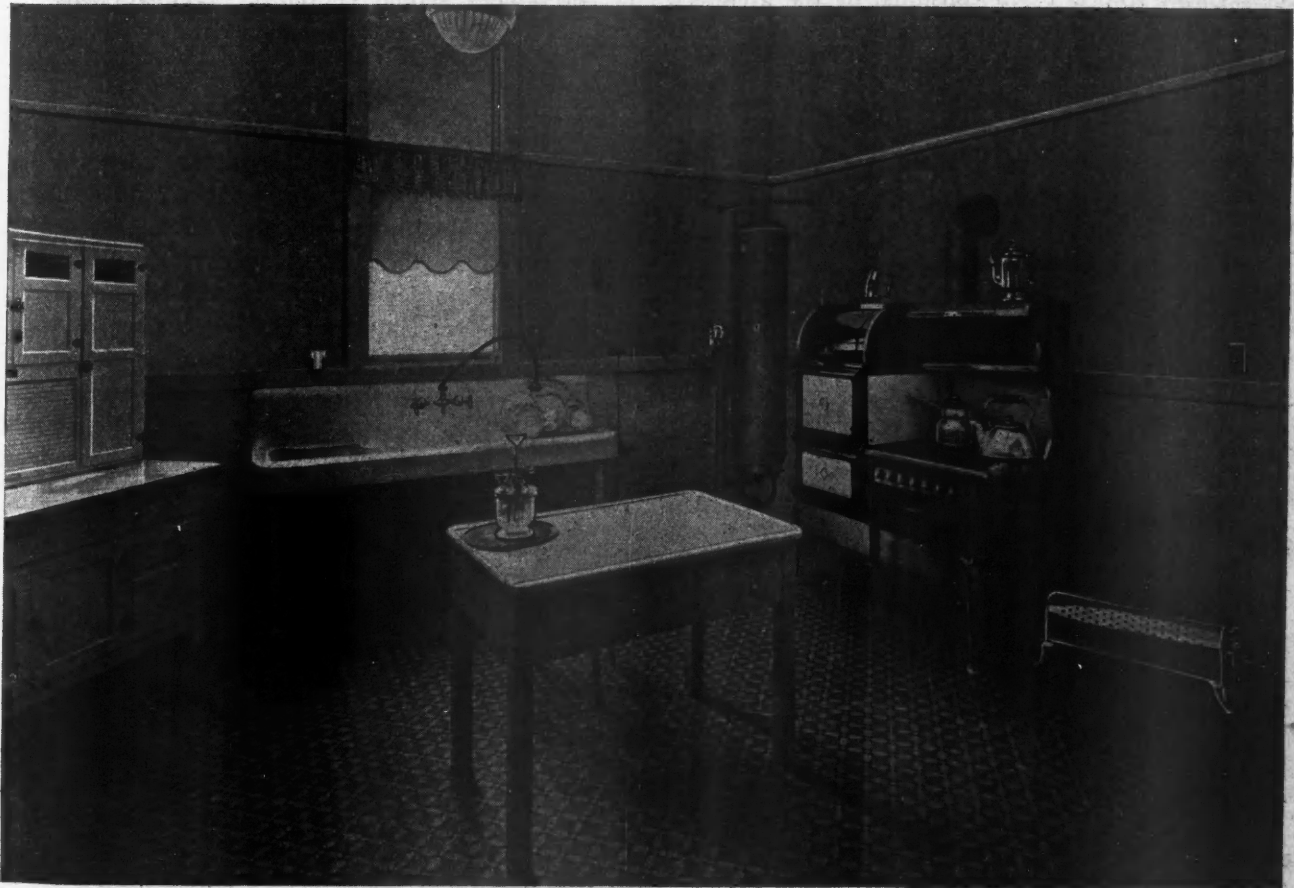
If the electrical requirements are given the same liberal consideration, it will still not cost but a fraction of what is paid to the plumber, yet it will add more to the ease and comfort of life in the home than any other feature. The householder will want to use many

of the labor-saving devices mentioned on page 109. It is the duty of the architect and builder to provide for their convenient service.



Wiring Layout for Living Room Showing Location of Outlets and Electrical Appliances That Are Being Used.

Architects and builders frequently feel that in drawing up their specifications to comply with the National Electrical Code issued by the National Board of



The Servantless Kitchen. Electricity Has Solved to a Large Extent the Problem of Domestic Help. This Kitchen Shows a Few of the Electrical Appliances That Have Taken the Place of Servants. It is a Real Workshop for the Housewife, Not a Place of Drudgery.

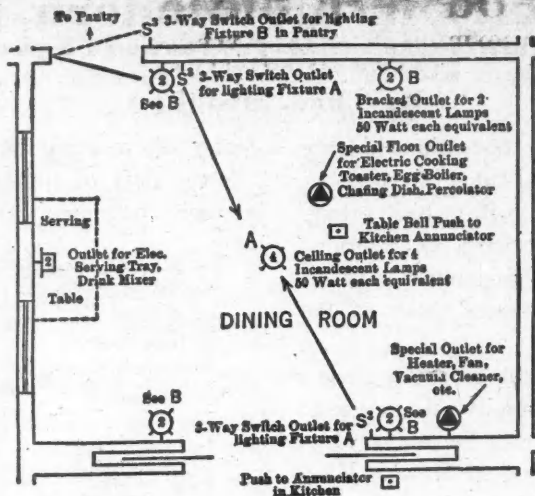
Underwriters they have done all that could be asked.

The code merely prescribes the minimum requirements allowable and it is only wise to allow a wider margin for safety and convenience as well as to take care of a larger use of electricity in the future. This will surely come as people learn to depend on it more in the operation of the household. Adequate provision for future needs can be made at very small expense when building, but is far more expensive and troublesome when added later.

**Service from Central Station**

In planning for the electrical installation it is necessary to determine in advance whether central station current will be used or a separate power plant is to be installed. When central station current is available it is generally conceded to be the more economical. If, however, such is not available, it is recommended that the installation be so designed that it can later be used for service from the central station.

The art of illumination has become a profession for the specialist who is often consulted by the architect and builder in laying out the wiring plans. Unfortunately, this specialist is concerned principally with the equipment for lighting and often confines his specifications to the



Wiring Layout for Dining Room Indicating Outlets and Appliances.

illuminating requirements, ignoring the need of providing for the electrical appliances which every modern household needs. The labor-saving devices and conveniences require adequate wiring capacity and suitable outlets to make their use effective. As all electric utilities consider "SERVICE" to their customers as a first duty, it is good policy to consult the central station management, as it is always ready to offer suggestions to insure the most efficient use of its service. In this connection it is well to

point out that many central stations have a special rate for heating, cooking and power purposes where the current for these uses is applied thru a separate meter. Other utilities accomplish the same result by a "clock" or "step" rate, using only one meter—that is, so much of the current consumed as is assumed to represent the lighting service is charged for at the usual lighting rate, and the larger consumption thereafter for heat and power is billed at lower rates.

For the above reasons it is important that the architect or builder should be thoroly familiar with the practice of the central station in this regard, and that the management be consulted freely.

As householders generally wish to protect themselves with fire insurance, architects should be thoroly familiar with the latest rules of the Fire Underwriters as represented by the latest edition of the National Code (Electrical), all local ordinances, and the rules of the utility and the publication of the Underwriters laboratories, listing all approved fittings and these should be exclusively used both for the sake of safety and to permit securing fire insurance at reasonable rates.

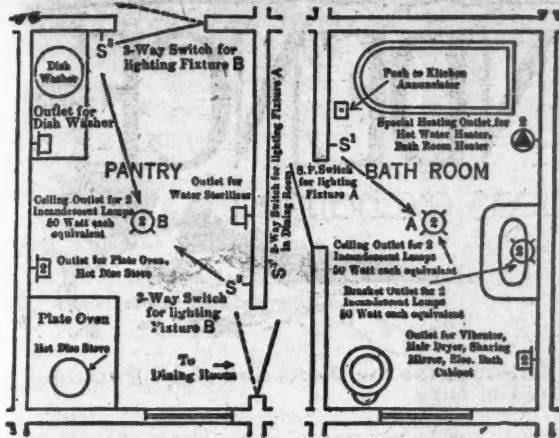
**Importance of Labor-Saving Appliances**

The architect or builder should familiarize himself with all phases of this electric service in the home and not leave this important part of the house equipment to the generally uninformed client or to the contractor making the lowest bid. It pays to deal with only the most responsible and able wiring con-



Old Man Drudge Is Putting Up a Losing Battle. The Electric Ironer or Mangle Is One of the Mighty Forces Opposing Him. It Has Helped to Put the Smile in Washday.



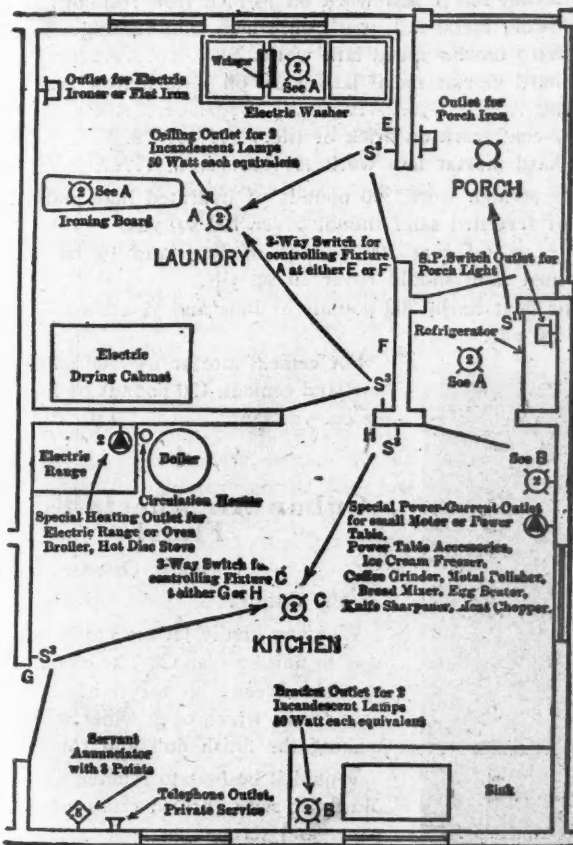


Pantry and Bathroom Have Their Quota of Electrical Appliances. This Diagram Shows the Outlets That Are Needed.

tractors and it is a good plan to submit the specifications to the local utility before signing the contract for the work. The majority of central stations will not connect service unless the work passes their inspection department.

When one realizes that over 15,000,000 electrical household devices have been sold in this country, that far over a million irons and over a half-million vacuum cleaners are being added yearly, it is obvious that this subject needs thoughtful consideration.

No new home wants the old coal range with the "toting" of coal and its soot and ashes. The electric range is one of the most modern ways of cooking—cool, clean, smokeless, dirtless, and efficient. For electric range installation, the central station should be



The Scarcity of Servants Has Made the Laundry Very Important in the Eyes of the Housewife. She Is Very Interested in the Washing Machinery and Accessories That Are Installed. The Kitchen Is Her Workshop. In Both Rooms the Placing and Number of Wiring Outlets Is Important.

consulted both as to rates and service requirements. The range manufacturers will gladly furnish proper specifications, as they are vitally interested in having their ranges properly installed.

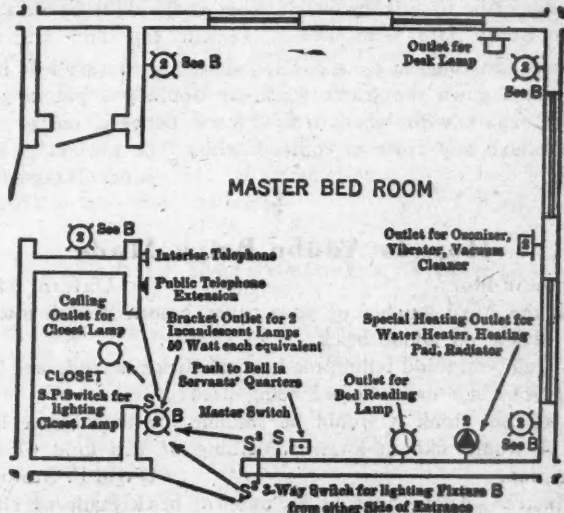
### Designing the Wiring Layout

#### APPLIANCES USED IN EACH ROOM WITH CURRENT THEY TAKE

LIVING ROOM OR PARLOR	
Electric piano .....	Watts
Talking machine (phonograph) ...	
Table lamp .....	50 to 100
Fan motor .....	50
Vacuum cleaner....	60 to 120
Tea table multiple outlet for samovar, percolator, toaster and chafing dish, each...	400 to 600

DINING ROOM	
Multiple Floor Outlet for: Dining or sewing table .....	Watts
Grill, chafing dish, percolator, toaster, hot wa-	
ter kettle and waffle iron, each	400 to 600
Wall Outlet for: Fan motor.....	50
Vacuum cleaner....	60 to 120
Radiator .....	600 to 1000



The Bedroom Is Very Important From an Electrical Standpoint. Provision for a Large Number of Electrical Appliances Should Be Made When the Plans Are Drawn Up.

BEDROOM	
Master switch to control general lighting .....	Watts
Reading lamp at bed .....	50
Outlets for: Heating pad.....	60
Hot water heater..	250 to 500
Fan motor.....	50
Radiator .....	600
Burling iron.....	40
Hair dryer.....	40
Sewing machine...	40
Vacuum cleaner...	60 to 120
Baby milk warmer	250
Vibrator .....	25

KITCHEN	
Range .....	Watts (special wiring) 1000 to 3000
Hot water heater	4000 to 6000
Washing machine..	100 to 180

- #### BATHROOM
- NO shadows.
  - Wall switch or insulated cord pull switch (key sockets are dangerous).
  - Master switch (from owner's room), etc.
  - Transformer.
  - Night light, alternating current.
  - Dimalite socket for direct current.
  - White light, 4-candlepower.
- The amount of current consumed by the present-day electrical appliances may be of interest.
- Taking the cost of electricity at 10 cents per unit (one kilowatt hour):

### Ten Cents Will Operate

- 16-candlepower light (Mazda) for 50 hours.
- 8-inch fan for 50 hours continuously.
- Toaster 12 minutes a day for 10 days.

(Continued to page 124.)

# 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

### Building a Stucco Fence

To the Editor: Vero, Fla.  
 I would like to ask for information in regard to building a fence 12 in. by 7 ft. by 500 ft. long, each side to be sheathed with Byrkit lath with a 4-in. cement cap, and stuccoed. Would you suggest a cement foundation with sufficient bolts to fasten down the frame work, or would you put in posts 12 ft. apart with wood frame work between posts? We don't have any frost to contend with. The ground is sand loam.

JOHN HARRISON.



### How Is Adobe Brick Made

To the Editor: Oxford, Ala.  
 In the April number of your paper I noticed with interest the article on adobe brick.

Would you mind telling me how this brick is made and how long it is sun dried before being used?

I do not think it would be suitable for the climate here, but I would like to know something of this kind of construction.

DAVID F. STOKES.

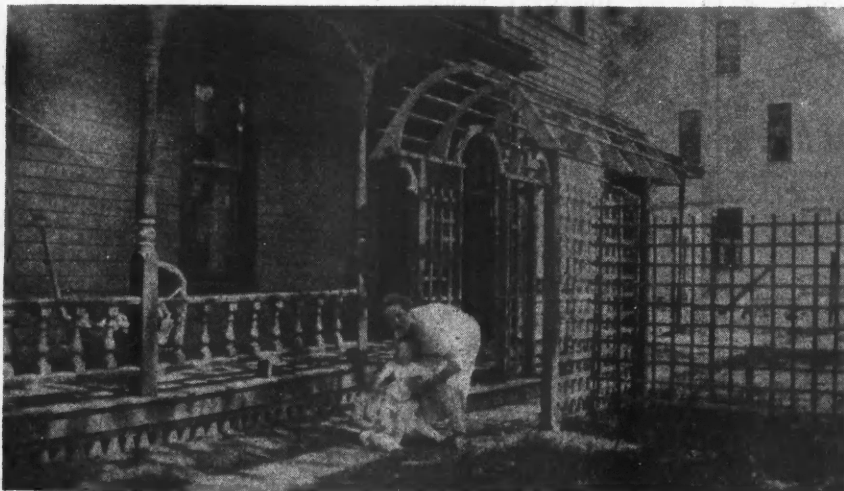
*Answer*—Adobe brick is an unburnt brick made of clayey soil and straw molded to form and dried in the sun. The soil for this use is generally found in desert or arid regions.

THE EDITOR.



### Builds Attractive Trellis

To the Editor: Fargo, N. D.  
 I am enclosing a photograph of a trellis which I built over a side step to my porch which, when covered with vines that I have set out, will add to the attractiveness of the place and will afford a very cozy entrance to the house.



Attractive Trellis Built by John Loddick, Contractor at Loddick, N. D. In the Summer It Is Covered with Vines and Makes a Very Charming Entrance.

It may give other readers some ideas. Should any one wish measurements, etc., of this particular trellis I will be glad to give them.

JNO. H. LODDICK.



### Some Information on Plaster

To the Editor: New Boston, Tex.  
 How much plaster does it require per square yd. for the first coat or fiber coat for the brown coat, and for the skin or sand finish coat? I am going to use Acme brand of plaster. How much projection should I give my grounds for lath and how much for plaster for brick wall?

J. R. WELBORN.

*Answer*—Details in the measurement of plaster work vary in different parts of the country. Grounds for various classes of work unless expressly specified to the contrary are:

	Inches
For 2-coat lath work.....	7/8
For 3-coat lath work.....	1
For 3-coat metal lath work.....	5/8
For 3-coat metal lath work on 1/2-inch iron framing..	1 1/8
For 3-coat metal lath work on 1-inch iron furring....	1 3/8
For hard mortar metal lath work.....	5/8
For hard mortar metal lath work on 1/2-inch iron furring .....	1 1/8
For 2-coat work on brick or tile.....	3/4
For hard mortar lath work.....	3/4

For scratch work 350 pounds of hydrated lime and 3/4 cu. yd. of screened sand should cover 100 sq. yds.

For second coat 200 pounds of lime and 1/2 cu. yd. of screened sand should cover 10 sq. yds.

For float finish 300 pounds of lime and 1/4 cu. yd. of sand for 100 yds.

For cement mortar use 100 pounds of portland cement, 150 pounds of lime and 3/8 cu. yd. sand.

THE EDITOR.



### Cuban Air Affects Piano Finish

Guaro, Oriente, Cuba.

To the Editor:  
 Will you kindly let me know the best way to finish a piano? The climate here in Cuba breaks up the finish into fine hair cracks which open wider with time, making the finish dull and rough.

Would it be best to remove all of the old finish with varnish remover or sand paper and scrape?

What is the best preparation to use after removing finish?

J. P. SPOOR.



**Young Architect Designs Modern Home**

To the Editor: Bennington, Vt.

Altho only 20 years of age I have long been an interested reader of the AMERICAN BUILDER. I am enclosing a photograph of a house which I designed last year and which has since been built.

The house is of first-class construction thruout. The outside is finished in bevel siding and stucco panels over Wright's wire lath. All materials used were the best obtainable.

The inside finish is of oak and chestnut with maple floors. The beauty and convenience of the interior are greatly increased by the addition of numerous pieces of built-in furniture. The house is also made convenient for the housekeeper by the addition of devices such as clothes chutes, swinging stool under kitchen sink, and a built-in ironing board. An ash dump directly from the kitchen range to the cellar contributes much to the cleanliness of the kitchen.

The contractor was Walter E. Dunham of Bennington, Vt.  
EDWIN W. DUNHAM.



This Home Was Designed by a 20-Year Old Architect. Edwin W. Dunham Is the Enterprising Young Man. He Specified the Latest Improvements. His Brother, Walter E. Dunham, Bennington, Vt., Built the House.

ner wall of an ordinary lathed and plastered frame wall.

So that the answer to Mr. Kenny's question depends primarily on the kind of tile being used and the way in which they are laid into the wall.

J. A. KING, C. E.



**Will Moisture Come Thru Tile Walls?**

To the Editor: Haworden, Iowa.

In clay tile construction will moisture come thru plastering that has been applied to the walls without furring or lathing?

L. T. KENNY & SON.

*Answer*—The answer to this may be either, yes, or no. It is "yes" if the tile used is the standard type in which some of the mortar joints are continuous thru the wall. The answer is "no" if the tile used is the specially patented kind which is so made that the mortar joint is not continuous thru the thickness of the wall. A brief explanation of how moisture or frost sometimes gets on the inside of a wall will show the reason for this "fifty-fifty" answer.

What Mr. Kenny refers to as moisture or frost "coming thru" a wall is in reality a "condensation." The moisture or frost originated inside the building, it did not come thru the wall at all. When this does occur, the moisture or frost will be found collected along those mortar joints which are continuous thru the thickness of the wall.

This is because the mortar conducts heat several times as fast as does the body of the tile itself. This produces cold streaks on the inner surface of the wall along these mortar joints. Here moisture is condensed out of the air contained within the building. If it is extremely cold outside, this moisture will be turned into "frost."

If the tile used are the patented design referred to, none of the mortar joints will be continuous thru the full thickness of the wall, but will be insulated by dead air spaces. A wall built of such tile does not need to be furred and lathed before plastering. If the walls are laid up according to the specifications and instructions of the manufacturer, plaster may be applied directly to the interior of the walls and they will remain dry, even under conditions when there would be condensation on the in-

**Removing Hardness from Oilstones**

To the Editor: Detroit, Mich.

In reply to Mr. Stahl, of Shamoken, Pa., how to take the oil and hardness out of an oilstone, I have found that the best way to renew an oilstone is to place the stone near the heat of a good hot stove. That will draw all the oil out; then take the stone on a cement sidewalk with a little sharp sand and water and rub it down for about 15 minutes. Rubbing on any stone will take the hard, glassy surface off. That hard surface is usually caused from the steel cuttings from the tools filling the pores of the stone and thus making it almost as hard as the steel itself.

MONROE BOSLER.



**What Roof Should He Build?**

To the Editor: Towanda, Kas.

I am planning on building a machine shed, work shop and granary under the same roof, 26x60 feet, and cannot decide on the roof. I am thinking of building a concrete roof about 1½ to 2 inches thick, either laid on a board sheeting



View of One Section of Living Room in the Dunham Residence, Showing the Fireplace and Bookcases. Clothes Chutes and a Built-In Ironing Board Were Also Installed.

or put on thinner material of some kind, such as that used in stucco work. I would appreciate any suggestions you would offer if above is practicable.

J. A. RARICK.



**Wants New Method for Figuring Costs**

To the Editor: Mitchell, Neb.

Can you tell me how to figure the cost of labor on a building? The wages are from 75c to \$1.00 per hour. I have tried several ways but would like to hear from other contractors.

L. F. OWEN.



**Question on Stucco Practice**

To the Editor: Westphalia, Mich.

We are to build a house this season with stucco exterior. As there are no stucco houses in our village and having never built one, we don't know the proper way to go at it. We would like to know the proper way to make the door and window frames, how far they should project from the sheathing, also the other exterior woodwork. Should common building paper be used under metal lath and how should the latter be attached? If you have a publication pertaining to stucco we would like to know price of same and thank you in advance for any advice you can give.

GROSS BROS.

*Answer*—A fundamental rule in the design of a stucco structure is: "Keep the water from getting behind the stucco." For this reason, whenever the design permits, an

overhanging roof or similar projection is recommended to afford protection. All exposed stuccoed surfaces should shed water quickly, and at water tables, belt courses and the like slope should be detailed.

Suitable flashing should be provided over all door and window openings wherever wood trim occurs. Sills should project well from the face of stucco and be provided with dipgrooves or flashing that extends across the wall below the coping and projects beyond to form a lip over the upper edge of the stucco. All roof gutters should be fixed and downspout hangers and other fixed supports should be put in place before the plastering is done, in order to avoid breaks in the stucco.

It is important that masonry walls be clean before the stucco is applied, as otherwise the bond of the stucco cannot be relied upon to stand the strain set up by moisture changes. Raking out the joints in a brick wall is an added precaution and walls of concrete should not be too smooth.

In frame walls good bracing is important to insure rigidity. Bridging between the studs at least once in each story is advisable where sheathing is used or not. In back-plastered construction the lath should be fastened directly to the studing and back-plastered and no sheathing is used. In sheathed construction the sheathing boards should be laid horizontally across the studs.

The application of lath is important in stucco construction. Metal lath is placed horizontally and is specified by weight rather than by gauge and should be galvanized or painted. Further details of application are furnished by the manufacturers. Wood lath is placed horizontally on the furring with 1/2-inch openings between them. Joints should be broken every twelfth lath and each lath nailed with 4d nails.

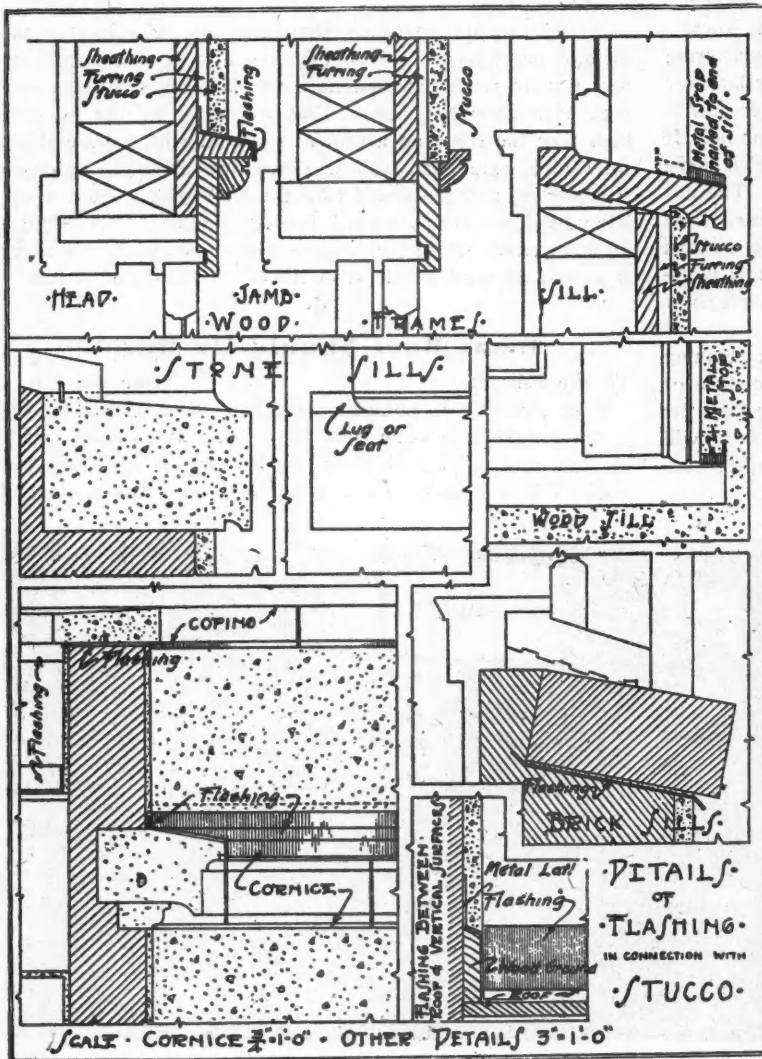
The ingredients of the mortar should be mixed until thoroly distributed. Mixing machine is recommended in preference to hand mixing. In mixing, all proportions are stated by volume. A bag of cement contains one cubic foot. 40 lbs. of hydrated lime is one cubic foot. Hydrated lime should be measured dry and not added to the mortar in the form of putty. The use of hair or fiber is optional and when used care should be taken to avoid clots.

Practice varies widely in the application and mixture of stuccoes. The use of hair, lime waterproofing materials, the variations in the coats, the number of thickness of the coats, the degree of wetting of the undercoats are subject to individual inclination.

In one of the standard methods plastering is carried on continually in one general direction without allowing the plaster to dry at the edge. The first coat should thoroly cover the base and be well troweled to insure the best bond possible. Before the coat is set it should be heavily cross-scratched with a saw-toothed paddle or other device to insure a strong mechanical key.

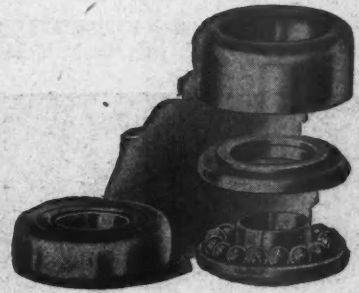
The second coat is applied on the day following the application of the scratch coat. The first coat is generally dampened but not saturated. When the second coat has stiffened sufficiently it should be dry floated by a wood float and evenly cross scratched to form a good mechanical bond for the finish coat. The finish coat should be applied not less than a week after the application of the second coat. In the case of two-coat work the first coat should be doubled.

Many forms of finish are available, such as



Details of Flashing in Connection with Application of Stucco.





Dust and dirt proof, non-detachable Ball Bearing Washers.

# THE STANLEY WORKS



*For more than three-quarters of a century this mark has appeared on dependable products. Look for it when buying Wrought Steel Hardware.*

## BALL BEARING BUTTS

### *Positive Service*

is obtained when you use this type of *The Stanley Works Butts* on your contracts.

The Ball Bearing washers do the work. They carry the load of the door and successful—too, every day where they are employed.

Have you seen our Ball Bearing Butt Book? It shows the correct type of Ball Bearing Butt for different installation conditions; gladly sent on request—write for it—A7.

### THE STANLEY WORKS

New Britain, Conn.

CHICAGO

NEW YORK

stippled, sand-floated, spatter dash, pebble dash, etc. The quality of these depends on the skill of the plasterers.

The diagram shows detail of flashing in connection with stucco work.

THE EDITOR.

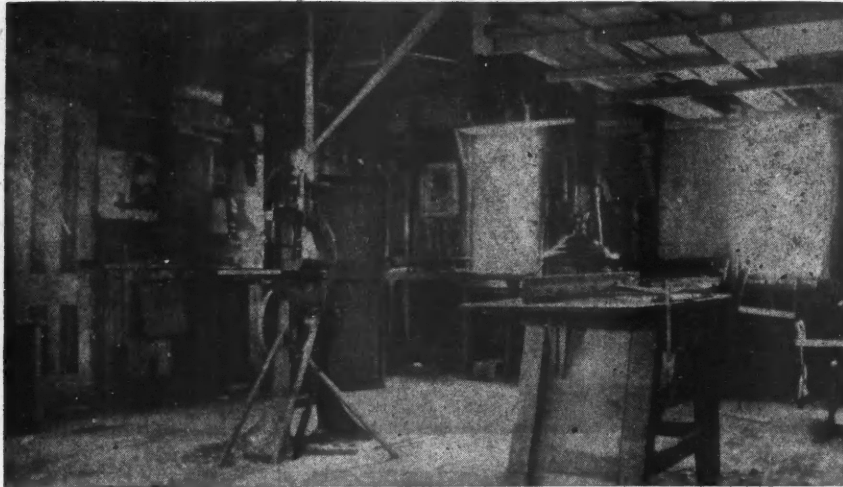


### Has Shop Well Equipped

To the Editor:

Arlington, Wis.

I am sending you a photograph of the inside of my shop, which is 18x30. I just built it last winter. I do all my



Interior of Carpenter Shop in Which J. C. Sauer, Carpenter and Builder, Arlington, Wis., Does All His Work. It Is Well Equipped with the Latest Machinery.

work, such as making window and door frames, window and porch screens. In the winter time I also rip out the stuff for silo roofs, for concrete silos, and other odd jobs that a man can do in a shop the size of mine. In the picture you will find a rip saw machine, a band saw, boring machine and turning lathe, which are all my own make.

J. C. SAUER.



### Bothered by Woodboring Insects

To the Editor:

Muskogee, Okla.

In December, 1919, I bought an 8-room, two story house in this city and on investigation find that in the living-room and bedroom and closet downstairs there is an insect that resembles a wood-boring worm. It first appeared at its worst in the spring as a winged insect and later as a worm that bores into the wood flooring and gets under the carpet. I also found them coming from behind the mantel and making streaks in the wall paper and plastering of the wall. I have tried insecticides by washing the floors and walls but cannot destroy them. I can find no one from whom I can obtain information. I have talked to lumber dealers, contractors and paper hangers.

I shall certainly appreciate your personal assistance in this matter at the earliest opportunity, as I want to repaper the house. The house has no basement, consequently, no dampness.

H. K. GOTCHER.

*Answer*—We have received thru the AMERICAN BUILDER, request that information be sent you regarding an insect "That bored into the wood flooring and get under the carpet," etc. In reply I beg to say that the damage is probably due to our native "white ants" or termites. The only effective preventative or remedy is complete insulation of untreated woodwork of buildings from the ground; for they must maintain contact with it to obtain the moisture necessary to their existence. When once contact with their moisture supply in the earth is cut off, the insects, no matter how numerous in the damaged wood, will soon dry up and die.

Woodwork can be protected from termite attack by using stone, brick, or concrete foundations, concrete lower flooring, or by impregnating foundation timbers with coal tar creosote. A thoro examination should be made of the foundation timbers of the house and they must be removed from any contact with the ground.

Fumigation or spraying is of no permanent value in dealing with this insect since, while it may kill the insect in the wood, others will continue to come up from the ground.

T. E. SNYDER.

Acting Forest Entomologist.



### Some Questions for Brother Readers

To the Editor: Maplewood, Wis.

I am sending in a few questions which I hope some brother will answer thru your correspondence columns:

I am doing a whole lot of cabinet work, and I have some fine white and black ash which has a fine figured grain, but I want information on finishing it, such as staining, filling and polishing to match oak.

Where can I get a book or work on cabinet making?

I would like to get some information in your columns in regard to sharpening saws, jointer heads, groovers and all such machine tools. I have a Parks woodworker.

Where can I get some information in regard to inlaying of different woods?

GEORGE KOHLBECK.



### Wants Information on Hanging Sash

To the Editor:

Rutherford, Tenn.

Will you please advise us as to the most approved method for hanging basement sash, where basement is to have kitchen and dining room?

THE C. H. SHARP LUMBER CO.



### How to Use Glue on Curly Pine?

To the Editor:

Broussard, La.

I would like to get some information from some of my brother carpenters about glue. What is the best glue on the market and where can I get it? I have a job to build school desk and expect to use curly pine. I have been doing glue work for many years but never could succeed much with pine.

H. BAUMANS, Carpenter and Contractor.



### Answers Mr. Knudson's Questions

To the Editor:

Chicago, Ill.

It is entirely safe and practicable to build a residence of concrete block in any climate, provided the usual practices of good construction are observed. The walls should be furred and lathed inside before plastering, if single-piece block are to be used, as shown in Fig. 1. If the block are of the two-piece continuous air space type, as shown in Fig. 2, furring and lathing is usually dispensed with altho for vigorous climates it is better to secure the additional insulation offered by the lath, the same as in the case of a double brick wall.

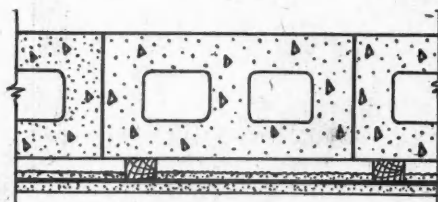


Fig. 1. Single-Piece Block Type. The Walls Are Furred and Lathed Inside Before Plastering.

It is necessary to reinforce concrete block silos with



**Where the easy way  
is the best way**

**WHEN** you start to lay Johns-Manville Asbestos Shingles for the first time, you will be amazed at the ease with which they can be applied.

To keep them in a straight line is no job at all, particularly when laid by the American method here shown, because these shingles are so accurately molded that, when placed side by side, the bottom edges are always true.

Around eaves, ridges and breaks in the roof surface, these shingles fit with a minimum of cutting.

Even the nailholes are all ready for the zinc-coated nails that are included with Johns-Manville Asbestos Shingles.

Easy to lay—certainly. And for the same reason, Johns-Manville Asbestos Shingles are among the most quickly laid of all fireproof roof coverings.

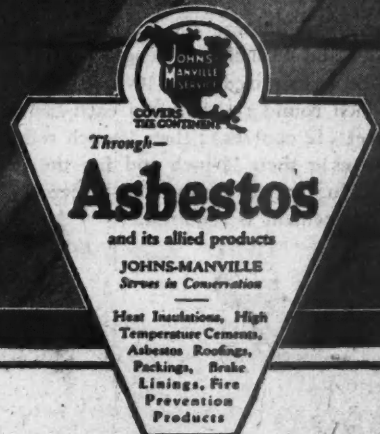
The nearest Johns-Manville branch will be glad to explain how these and the many other desirable features of Johns-Manville Asbestos Shingles will benefit you, whether you are a carpenter, a builder, or a supply dealer.

**H. W. JOHNS-MANVILLE CO.**

New York City

10 Factories—Branches in 63 Large Cities

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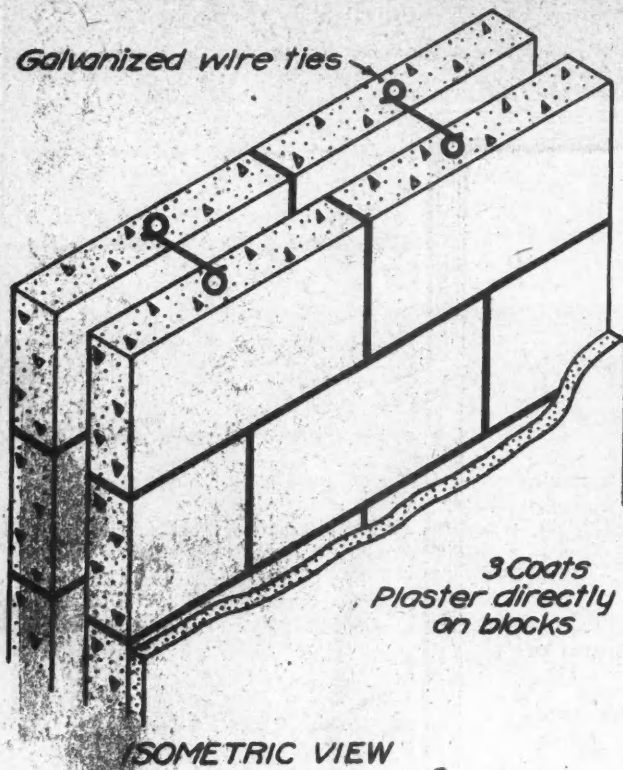


Fig. 2. Showing Two-Piece Continuous Air-Space Type. Furring and Lathing Is Not Used.

steel bands, preferably consisting of round rods laid in a recess in the top of the blocks or in the horizontal mortar joints, midway between inner and outer edge of the block. Unless there is a certainty that at least 50 head will be fed continuously, 16-foot diameter is preferable to 20-foot diameter. A silo 16 feet inside diameter and 50 feet high will hold about 180 tons of corn silage, a quantity sufficient to feed 40 head of cattle for at least 200 days.

Hollow concrete silo blocks are usually made 8 inches in width and 16 inches in length. About 2,300 block of this size would be required for a 16-foot silo. Reinforce the walls with 1/2-inch round rod between each course of block for the first 8 feet (12 courses); then 3/4-inch rod for the next 16 feet (24 courses); then 1/4-inch rod for the next 8 feet (12 courses) and No. 6 wire for the last 8 feet (12 courses). No vertical reinforcement is required.

A. J. R. CURTIS,  
Portland Cement Association.



"Chips of the Old Block." Mrs. Wm. Neumeister's Three Sons Have Taken Up the Building Profession, Following the Footsteps of Their Father. This Picture Shows a Group of Farm Buildings Which They Built at Scotland, S. D.

**Three Sons Are Builders**

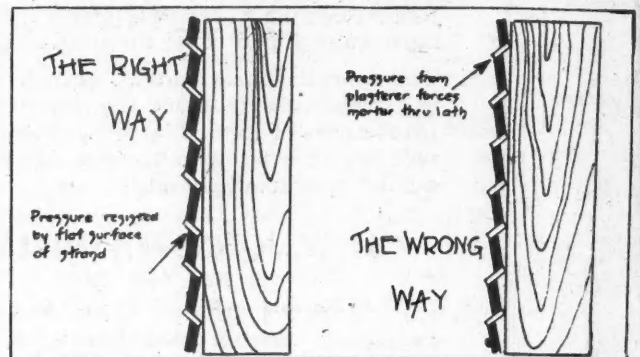
To the Editor: Scotland, S. Dak.  
I am sending a photograph of a set of farm buildings contracted for and built by my three sons at Scotland, S. Dak., in the summer of 1916. The oldest son signed the contract on his 21st birthday, the second was 19, and the youngest 17. My three sons are successors of their father in the building business and all are subscribers to the AMERICAN BUILDER.  
The boys are at present erecting a large schoolhouse to cost \$12,000.  
Mrs. Wm. J. NUEMEISTER.

**How to Stamp Tools with Acid**

To the Editor: Lane, Kan.  
Mr. J. A. Polk of DeSota, Iowa, wants to know how to stamp tools with acid. Take three parts blue vitriol to two parts salt. Add just enough rain water to dissolve it. Pulverize the vitrol. Have the tool clean where it is to be stamped. Cover this place with a coat of soap. Now, with a sharp-pointed hardwood stick or any smooth-pointed instrument, write thru the soap, bearing on hard enough to remove all the soap under the point of the instrument. Take a feather (shaving will do), dip it in the liquid and fill the letters written through the soap. Let it stay on a few minutes, then rub off soap and oil the tool. This is as good as any method I know of.  
J. P. WELLS,  
Carpenter and Builder.

**Preventing Waste of Plaster**

Some contractors complain that too much plaster is required in many cases where metal lath is used. This is



Sketch Showing Correct and Incorrect Methods of Applying Plaster to Metal Lath.

due to the fact that the lath is improperly placed, as the sketch illustrates. The strands should dip down away from the workman as he applies the scratch coat. If they point up they leave a myriad of knife edges for the plasterers every time an upstroke is taken.

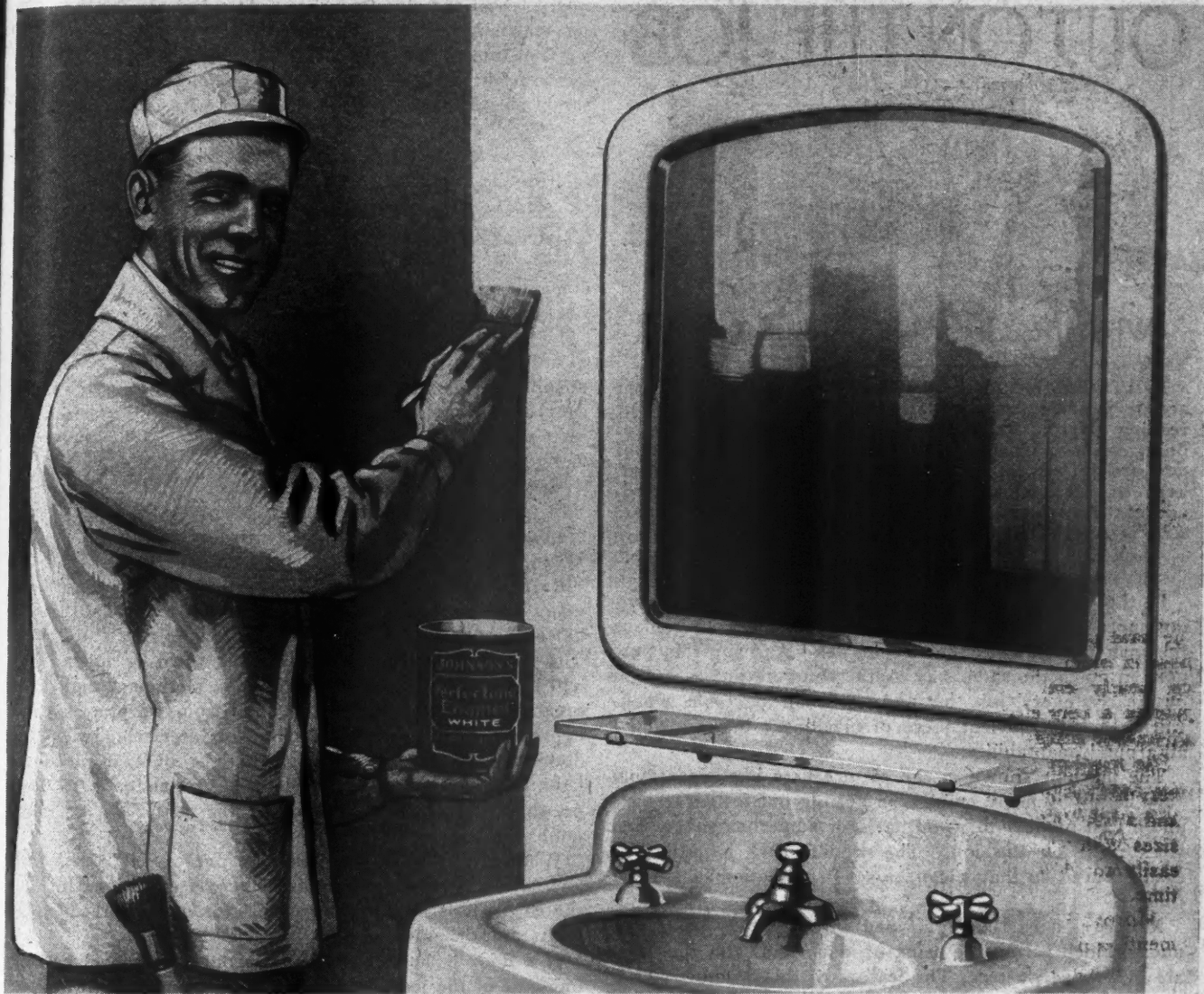
This same principle applies in all designs of metal lath, regardless of design.

**Protect the Mail Boxes**

Most rural delivery mail boxes are made of galvanized iron. Exposed to severe weather conditions as they are, the galvanizing soon wears off, the iron is attacked by rust, and the box gradually goes to pieces.

Mail boxes are so expensive now that it is worth while to protect them by an occasional coat of paint. Ordinary house paint answers the purpose very well, but for boxes finished in japan, stove enamel makes a very good re-finish. It imparts a brilliant, glossy black, and stands exposure splendidly.





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# OUT ON THE JOB



## What Builders Are Finding Good

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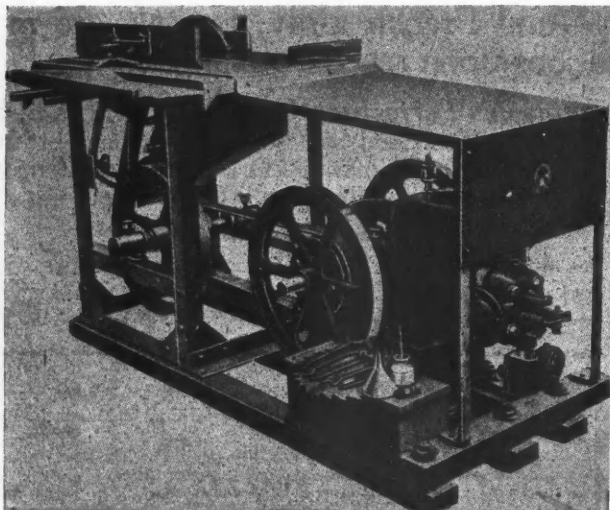
### Handy Portable Woodworker

In these days of labor shortage, the contractor is turning more and more to mechanical equipment to replace the man power which he cannot get. And for this purpose in much the same way as the concrete mixer is used on nearly every job, he finds a small portable woodworker a very efficient piece of machinery because of its all-around adaptability.

The machine shown in the picture here has been found very handy by many builders in getting out forms, frames, and a vast number of wood parts of numerous shapes and sizes right on the job. The woodworker is light and easily moved so that it can be set in operation in a short time.

Moreover it has been provided with a variety of attachments which permit the using of many odds and ends that are otherwise wasted. The feature of this woodworker is the fact that it is driven by kerosene engine equipped with a standard magneto. The engine is three horsepower and the total weight of the entire outfit is 1,150 pounds.

The extra equipment that has been designed for use on this woodworking machine includes a jointer for planing work. This is so attached that the work is self-squaring, and it can be adjusted to any angle. A boring attachment with  $\frac{3}{8}$ ,  $\frac{1}{2}$  and  $\frac{3}{4}$  inch machine bits, disk sander and



Small, Portable Woodworking Machine Driven by a Kerosene Engine. It Only Weighs 1,150 Pounds.

emery wheel are also furnished. Attachments for mortising, and moulding, a dado head, used for rabbeting, matching, and tongue and groove work, jig saw, wood lathe, and band saw help to make up a very complete assortment of handy aids to the carpenter or builder who has a machine.



### The Properly Hung Door

**T**HE efficiency of an extra butt is no longer a much mooted question. Thruout the country there is a general trend on the part of architects and builders to hang a door on three butts. In fact, to serve this growing demand manufacturers are now packing butts three to a box, constituting a set.

To say that doors are one of the hardest worked parts of any building, especially public buildings such as schools, hospitals, theatres, railroad stations, is to repeat a fact everyone knows. And, after all, it is the butts that make or mar the door. On them the stress and strain, the wear and tear, are bound to center.

Even the best butts are tested beyond capacity at times. The weight or load of the door is excessive. Green lumber, which often has to be used on the door, results in warping.

Careful analysis of the subject shows that there are many logical and practical reasons why the use of three butts to a door is true economy in the long run.

It has been demonstrated that the third or extra butt will hold the butt edge of the door in alignment and, to a great extent, will prevent the door from warping. Also, it prevents the door from striking or interfering with the door stop, if used (or the edge of the rabbet, if the door jamb is rabbeted) when the door has a tendency to bow or warp toward the door stop or the center of the door jamb.

While it may take more time to put on the extra butt and while the cost is slightly increased, the saving of the carpenter's time and expense later on to correct door faults more than offsets the initial investment.

If a door is hung on two butts only, each butt carries one-half of the load or weight of the door. When a door is hung on three butts, each butt carries only about one-third of the weight, thereby decreasing the strain and wear. More screws are driven into the door jamb and the door, thus relieving the strain on screws, the wood in the door jamb and in the door, which is an important factor.

When three butts are used the top butt can be set nearer the top of the door, thereby lessening the leverage of the door pulling away from the jamb. The lower butt can be set lower, thereby preventing the door hugging the door jamb near the bottom of the door. The top edge of the door remains in line with the head jamb, and the bottom edge of the door is parallel with edges of threshold.

The binding and sagging of doors are expensive troubles to correct. And it is to the credit of architect and builder that much thought is being given to overcoming of such annoyances by specifying and using "three butts to a door."



### Twenty-Penny Nails for Veneer Ties

In fastening to a wooden frame that is being veneered no ties are superior to 20-penny nails. Masons generally employ the following rule: Tie every eighth course of brick. Insert the nails so that they will enter the studs, and let them extend about half way across the face of the bricks. Hammer the nails down until they lie flat upon the faces of the bricks. The mortar and the weight of the bricks placed above will clinch the nails with a vise-like grip, thus holding the veneer of bricks rigidly to the wooden frame.

E. V. LAUGHLIN.





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Vulcanite Roofing comes in many styles and finishes—Shingles, Slabs, Ornamentals, Mosaics, Print and Rolls—all beautiful, durable and fire resisting. There is a Vulcanite Roofing for every type of building.

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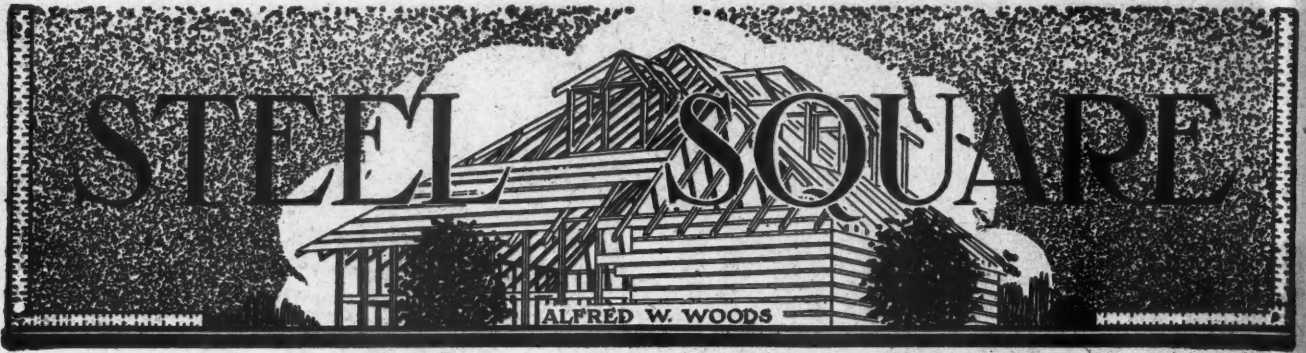
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# VULCANITE ROOFING



**BEAVER QUALITY FOR BETTER ROOFS**

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



## Possibilities of the Steel Square

SHOWING THE RELATION OF THE HIP RAFTER TO A COMMON RAFTER—HOW TO PLACE THE STEEL SQUARE TO OBTAIN THE CUTS AND BEVELS FOR ROOF TIMBERS

It is quite clear that a common rafter may be used as a hip for a building of less span, as will be seen by referring to Fig. 1. Here the common rafter for a 12-inch run becomes a hip for an  $8\frac{1}{2}$ -inch run. A hip for a 12-inch run becomes a common rafter for a 17-inch run. Therefore, the same rule must apply to both, that is, the tangent (commonly called run) and rise, taken to scale on the square, will give the seat and plumb cuts. The tangent and the length of the rafter taken to scale on the steel square will give the side cut for the hip to rest against the ridge pole. Cut on length. The same applies for the common rafter which gives the side cut of the jack to rest against the hip or valley. Taking the full scale for the hip as compared with the common rafter, it is practically 17 on the tongue and the length of the hip for a one-foot run on the gable taken on the blade, and the latter will give the cut. If 12 is used on the tongue for a foot run of the hip, its rise would necessarily be less than for a common rafter, as will be seen in Fig. 2. In this drawing is shown the corresponding difference for the  $\frac{3}{8}$  pitch. The 18 represents the length and this taken on a common rafter, as equal to that of the

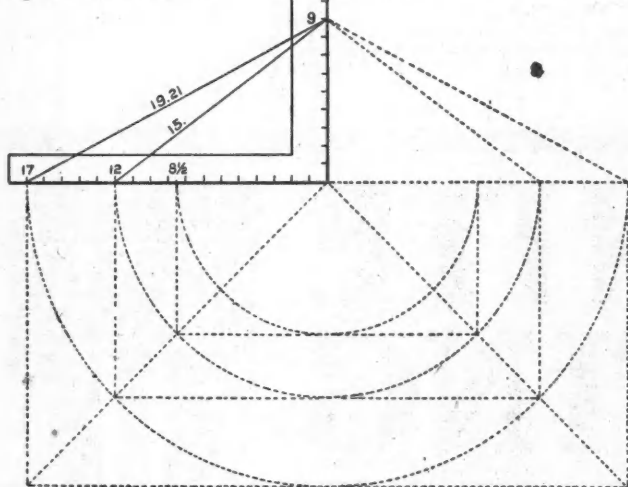


Fig. 1. Showing How a Common Rafter Becomes Hip for a Building of Less Span.

“B,” and it will be seen a line from this to 12 on the tongue passes at  $6\frac{6}{17}$  inches on the blade; because the common rafter having a rise of 9 inches to one foot, for one inch, it would only have  $\frac{9}{12}$  of an inch, while the hip would only save  $\frac{9}{17}$  of an inch to one inch. Then for 12 inches it would be 12 times  $\frac{9}{17}$ , equals  $\frac{108}{17}$ , or  $6\frac{6}{17}$  inches. Therefore, 12 on the tongue and  $6\frac{6}{17}$  on the blade will give the same results as 17 on the tongue and 9 on the blade, but as the former method necessitates a calculation that ends in fractions—fractions not given on the square—it is better to use the latter method because it obviates the fractions. In this illustration is also shown why 17 is used on the tongue,

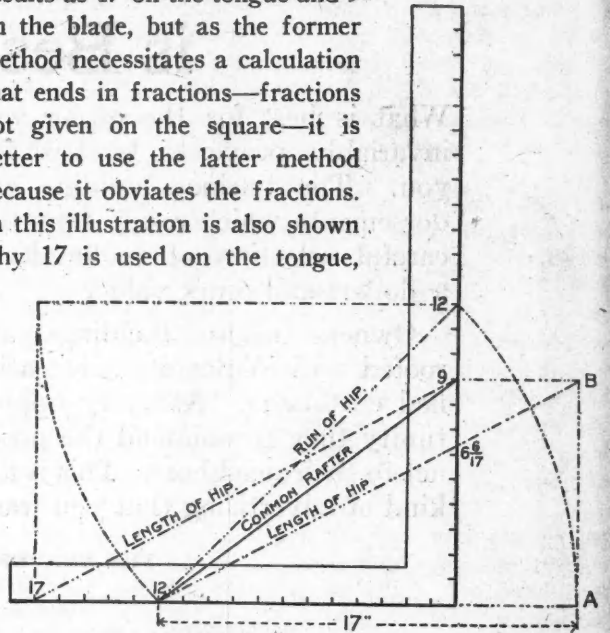


Fig. 2. Showing How the Various Measurements Are Obtained on the Square.

which is simply taking the length of the run of the hip on that member, as shown by the course of the dotted lines. A line from this point (17) to the rise of the common rafter, represents the length of the hip or valley for a one-foot run to correspond with that for the common rafter and is parallel with the line from 12 to “B,” as in the former method. Thus 17 is a standard number on the tongue for the hip or valley, just the same as 12 is used for the common rafter, the rise remaining the same avoids computations and greatly simplifies the work. While 17 is used on the tongue to obtain the cuts, the actual measurement is a little less than  $\frac{1}{32}$  of an inch of being 17 inches. This, however, is too small to con-

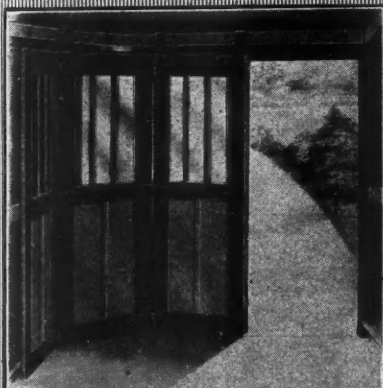


# LOUDEN

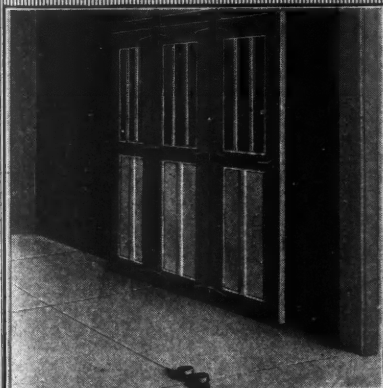
## Garage Door Hanger



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 Loudon Garage Door Hanger in your specifications. A Loudon Door gives lasting satisfaction and is a constant booster for the contractor who build it because of its many valuable, practical and

#### Distinct Loudon 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 Loudon door is entirely out of the way when open—leaves entire front of garage clear for passage of cars.

**Unfailing Easy Operation**—Loudon 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.

#### Loudon Doors Easy to Build

Any carpenter can build a Loudon 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 Loudon 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 LOUDON MACHINERY CO.

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sider, but the lengths of the rafters for accuracy should be reckoned from 16.97 inches.

So far we have tried to lead up more to the cause and effect and have in a general way touched on the different cuts about the roof, showing at the same time why they give correct results.

We will now take up the subject showing the various cuts in one diagram as

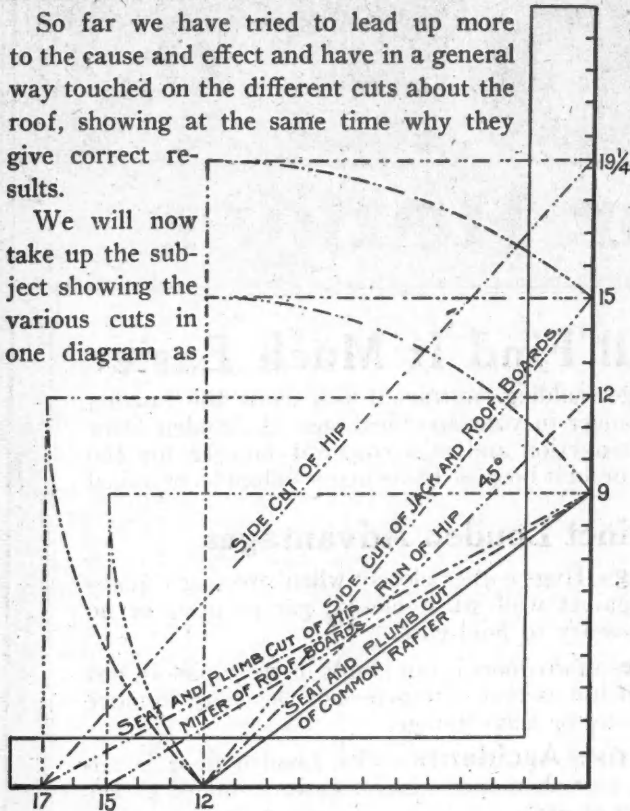


Fig. 3. Showing the Various Cuts with Relation to the Steel Square.

shown in Fig. 3. Here are shown the measurements on the steel square and afterwards illustrating each cut separately.

For example, we will take a  $\frac{3}{8}$  pitch. Take 9 on the blade. Why? Because, the run being 12 inches, the span must be two times 12, which equals 24, and since the pitch is reckoned by the span, we find that  $\frac{3}{8}$  of 24 is 9, and therefore represents the rise to the foot run. Then 12 and 9 give the seat and plumb cut of the common rafter. They also give the cuts for the gable boards resting either horizontally or perpendicular, as shown in Fig. 4. Take the length of the common rafter (15) on the blade and the tangent (12) on the tongue, and the blade will give the side cut of the jack as shown in Fig. 5. These figures will also give the side cut across the face of the roof boards to fit in the valley or over the hip, the tongue giving the cut. These figures will also give the side cut across the top of the purlin when it is set to the plane of the common rafter, the tongue giving the cut. Thus, all of the above cuts are obtained

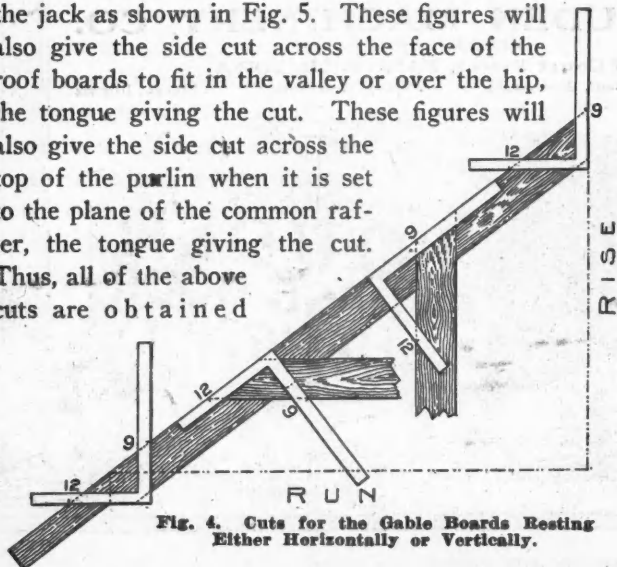


Fig. 4. Cuts for the Gable Boards Resting Either Horizontally or Vertically.

from the one set of figures, on the steel square. There are also other cuts about the cornice work to which these figures apply, such as the face cut across the plancier of a gable finish to member with that of a raking cornice, because they rest in the same position with the hip as that of the jack and the roof boards.

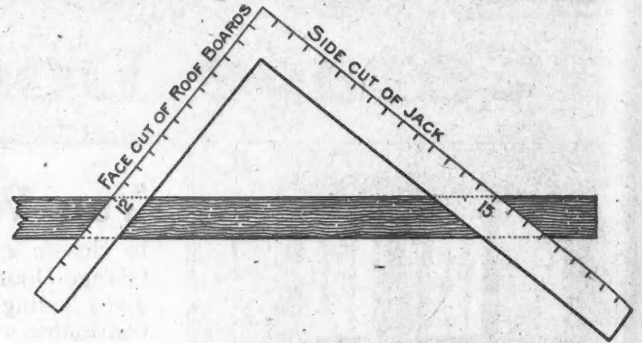


Fig. 5. Taking the Length of the Common Rafter on the Blade and the Tangent on the Tongue Gives the Side Cut of the Jack on the Blade.

The length of the diagonal line from 12 to 15 is also the length of the corresponding hip and this length taken on the blade, as at  $19\frac{1}{4}$ , and the length of the hip taken on the tongue, as at 17, gives the side cut of the unbacked hip. The blade giving the cut is

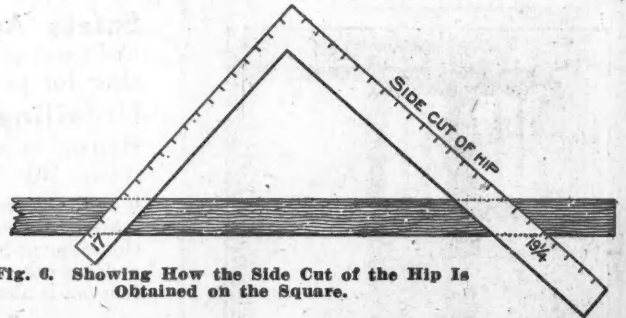


Fig. 6. Showing How the Side Cut of the Hip Is Obtained on the Square.

shown in Fig. 6. Nine on the tongue and  $19\frac{1}{4}$  on the blade will give the bevel for the backing of the hip as shown in Fig. 7. Take the length of the common rafter (15) on the tongue and the rise (9) on the blade, the latter will give the miter or edge cut of the roof boards to fit in the valley, or over the hip. The blade

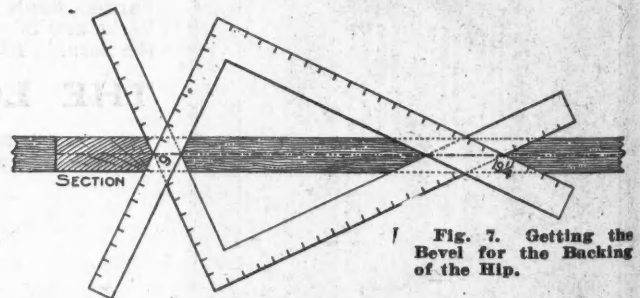


Fig. 7. Getting the Bevel for the Backing of the Hip.

giving the cut as shown in Fig. 2. From this it will be seen that from the right angle triangle formed by the run, rise and pitch of the common rafter, all of the cuts and bevels can be had. However, there are many ways of illustrating these various cuts and bevels and we will in future numbers of this magazine give other illustrations showing how they may be reckoned on the steel square. The ambitious mechanic of today is not satisfied with the one way of doing things and for that reason it is our intention to show various ways of illus-



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# Beautiful Roofs — CONCRETILE

Turn to pages 71, 72 and 73, and read the descriptive article on Concretile, the modern roof of beauty.

Go over carefully the well arranged interior of the beautiful stucco residence in a wealthy high grade residential suburb. This home is roofed with Concretile, which lends that finished appearance to his well designed home.

You will notice in the recommended construction blue print of the little details of Concretile laying, how simply it is laid. In the insert is a view of a Walter Concretile Machine, showing a completed Concretile being taken out after formed.

Concretile—"A Roof for all time," improves with age, with no deterioration. A good roof on your home will add many dollars to its value in the eyes of a purchaser.

We will gladly send descriptive literature to those interested in establishing Concretile plants.



*"A roof for all time"*

**Walter Concrete Machinery Co.**

416 Saks Bldg., Indianapolis, Ind.



WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

trating the same point, making the subject so clear that all who really care to master the principles involved in roof framing will understand and be able to use them in their work.

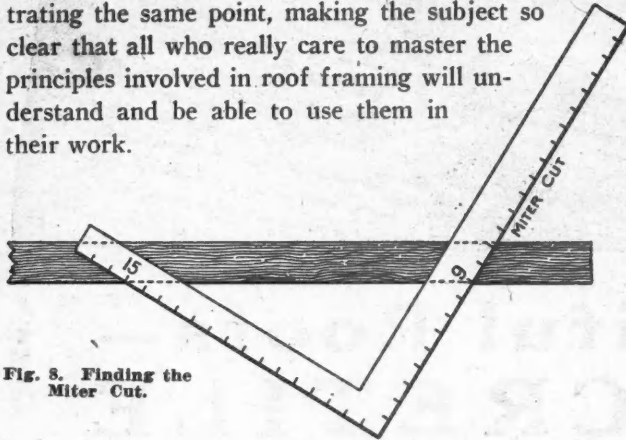


Fig. 8. Finding the Miter Cut.

### Designing the Wiring Layout

(Continued from page 109.)

Percolator 15 minutes a day for 10 days.  
 Vacuum cleaner (portable) ½-hour daily for 25 days.  
 Iron 3 hours (saving also laundress' time).  
 Washing machine for several wash days.  
 Vibrator 10 minutes daily for half a year.  
 Heating pad about 30 to 60 hours.  
 Sewing machine for 12 hours' continuous sewing.

In the transmission of electric current inadequate size of wire causes a drop in voltage (pressure), and this results in loss to the consumer. A 5-volt drop on a 110-volt circuit means a loss of 15 per cent of illumination at the lamp. The same drop affects the efficiency and consequently the time it takes to make toast, coffee, etc., and slows up your ventilating fan—ample wiring will prevent this loss, which falls on the consumer.

#### Branch Circuit from Panel Board

While the code prescribes No. 4 wire as the minimum size, this limits the branch circuit to 660 watts. The use of No. 10 or No. 12 wire will add *very* little to the cost and pays for itself in the end.

The electrical code, while requiring not less than No. 14 wire, with its area of 4,102 circular mils of copper for branch circuits limited to 660 watts (6 amperes of current at the usual 110-volt service), does permit fixtures such as dining room table domes, intended only for lighting, to be wired with No. 18 wire (1,624 circular mils), having only three amperes allowable carrying capacity. Obviously it is not good practice to use sockets on such domes for toasters and grills, each using 660 watts.

"They all do it and nothing happens," is an expression often used to justify such use, or abuse, but it isn't good practice, and a floor receptacle, with a multiple receptacle, attached to the underside of the table, is much more convenient and far safer.

#### Wall Outlet

While receptacles are frequently placed in the baseboard, their location on the wall about four feet from the floor near the door mouldings or other inconspicuous places is preferable.

It is now possible to obtain a standard form of plug and receptacle so that extension cords for all appliances

can be made interchangeable. The plugs on such appliances as do not correspond can be changed.

Labor-saving devices that are made to attach to lamp sockets used for lighting add unnecessary trouble, as it requires the unscrewing of the lamp with the risk of breakage. The cord must then be attached and later taken out again and the lamp replaced. In equipping a new house, save this annoyance by providing a sufficient number of proper outlets.



### Law for the Builder

(Continued from page 106.)

or to recover upon the other demands presented in their complaint.

"In the record before us there is nothing to indicate that the plaintiffs [Huetter and Zirngibl] warranted the plans and specifications prepared by the city engineer. They were not civil engineers, nor did they have any special knowledge of the fact that the plans and specifications were defective or that it would be impossible to construct the improvement in accordance therewith. . . .

"The theory upon which [Warehouse & Realty Company] insists that plaintiffs [Huetter and Zirngibl], as a condition precedent to their right to recover, should have completed their contract, conceded to have been impossible of performance, is that, having contracted after seeing the plans and specifications, they impliedly warranted the sufficiency of such plans. In the absence of an express warranty incorporated in their written contract, they cannot be held to have made any warranty whatever. If a contractor cannot perform by reason of defective plans which he is required to follow, which render the contract impossible of performance, which were not prepared or provided by him, but were prepared and provided by the owner, or by his architect or engineer, there would seem to be no just reason why the contractor may not recover for work done in strict compliance with such plans and specifications, under the provision and to the satisfaction of the owner, architect, or engineer, in an attempt to perform the contract. . . .

"The trial court, in the final judgment, permitted the plaintiffs [Huetter and Zirngibl] to recover all items demanded as above stated, except the profits which plaintiffs [Huetter and Zirngibl] claim they would have realized had they completed the contract. . . . We hold that a just conclusion was reached." . . .—(Huetter et al vs. Warehouse & Realty Company, 81 Wash., 331.)

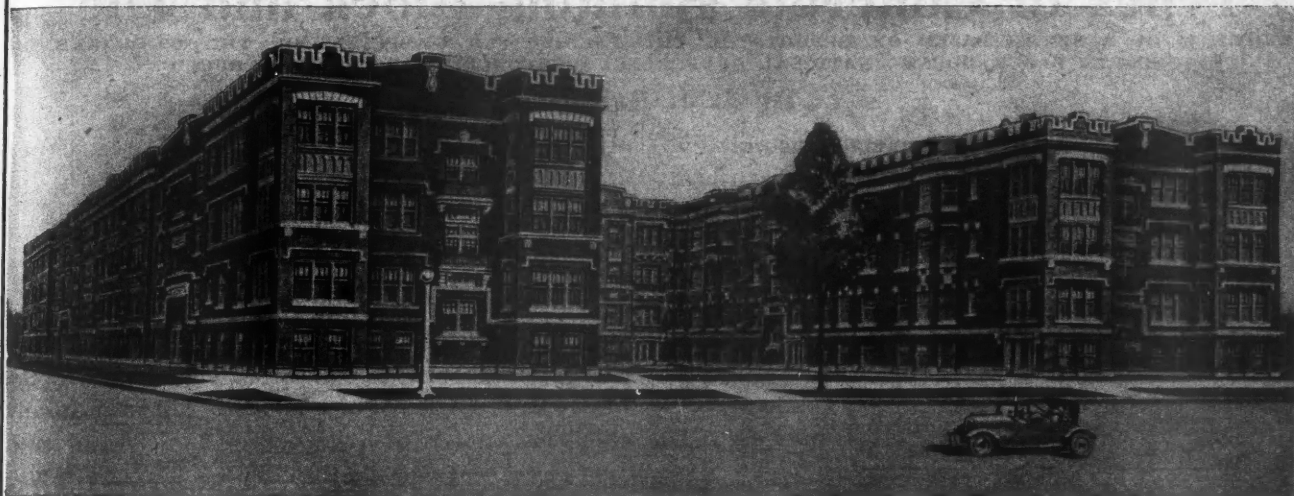
The court thereupon affirmed the judgment of the lower court in favor of Huetter and Zirngibl for all their demands, except the amount asked for as prospective profits.



THE walls of modern factory buildings are mostly glass. It is now understood that disease seldom lurks where sunlight has full sway.



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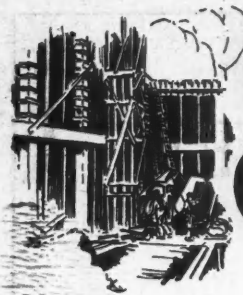


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# CONCRETE CONSTRUCTION



## Types of Concrete Building Block and Tile

ARTICLE II OF A SERIES BASED ON REPORTS OF THE VARIOUS SUB-COMMITTEES OF THE COMMITTEE ON CONCRETE BLOCK HOUSES, NATIONAL CONFERENCE ON CONCRETE HOUSE CONSTRUCTION

By A. J. R. Curtis

CONCRETE block and concrete structural tile are commonly manufactured in varieties which permit either hollow or solid wall construction as required. For most structural purposes hollow walls are preferable because of the lighter weight and economy of materials in addition to the advantages of insulation against the passage of heat and cold. Concrete building block and tile are often divided into the following classes:

1. Solid masonry units (this division may properly

include concrete brick as well as solid block and two-piece block).

2. Hollow concrete block.
3. Concrete building tile.
4. Architectural concrete shapes.

Solid block are employed principally in foundation work and as supports for heavy beams and slabs, their function in the latter case often being to take the load from the beam or slab and transmit it uniformly to hollow block below. Two-piece block are of such

shape that the two pieces are usually complements and when used together produce between them air spaces of desired shape and size, with or without cross ties, as desired.

Hollow concrete block probably constitutes the most popular type. The air spaces vary from 20 to 50 per cent of the block cross-section, with most of the types having air spaces approximating 33 per cent. Concrete building tile are considerably lighter in structure than the blocks, the thinner webs of the tile making the use of larger aggregate impossible and requiring a richer mixture for purpose of strength.

Architectural concrete shapes include sills, lintels, water-table and moulding blocks and an infinite variety of concrete architectural trim, the latter probably made only to architect's drawings.

### Standard Block and Tile Sizes

In Table A will be found a practically complete tabulation of standard types and sizes of concrete block and tile, the numbers corresponding with those used in the plate of block and tile shapes, Fig. 1. The dimensions given are the actual sizes of the block and do not include thickness of mortar joints. The block ordinarily spoken of as an 8 by 8 by

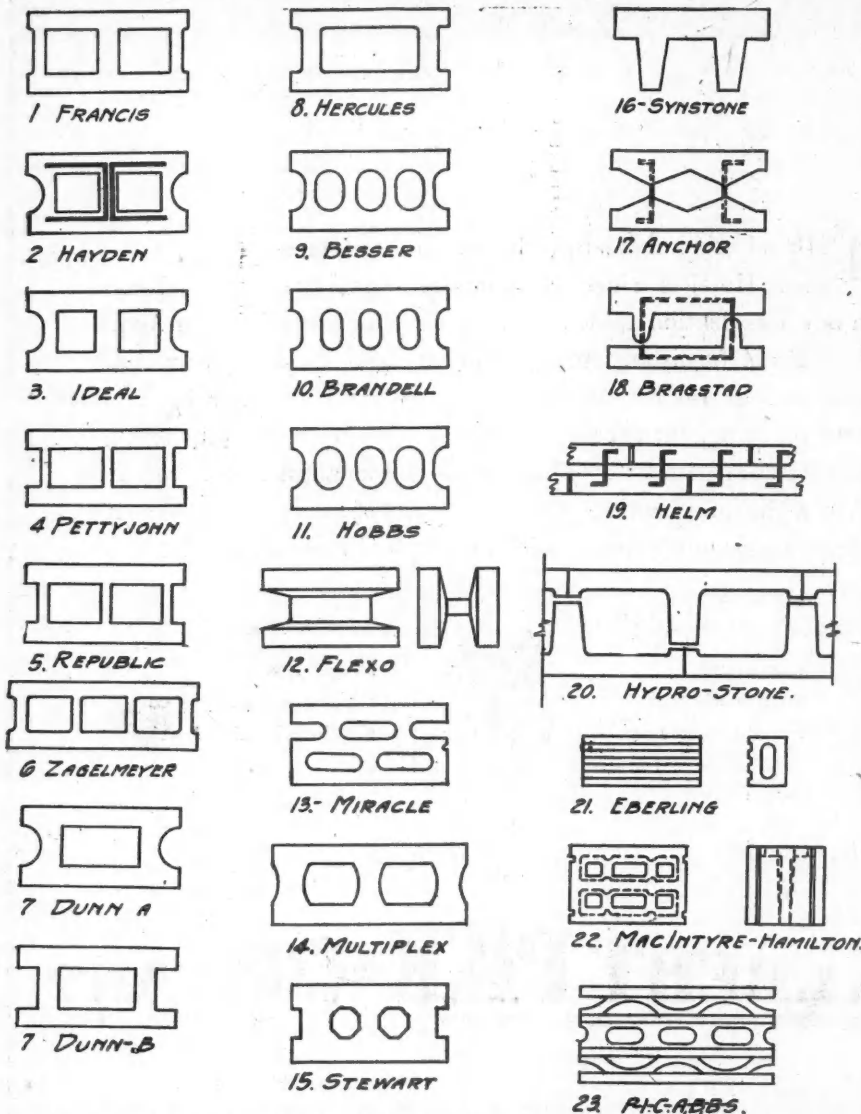
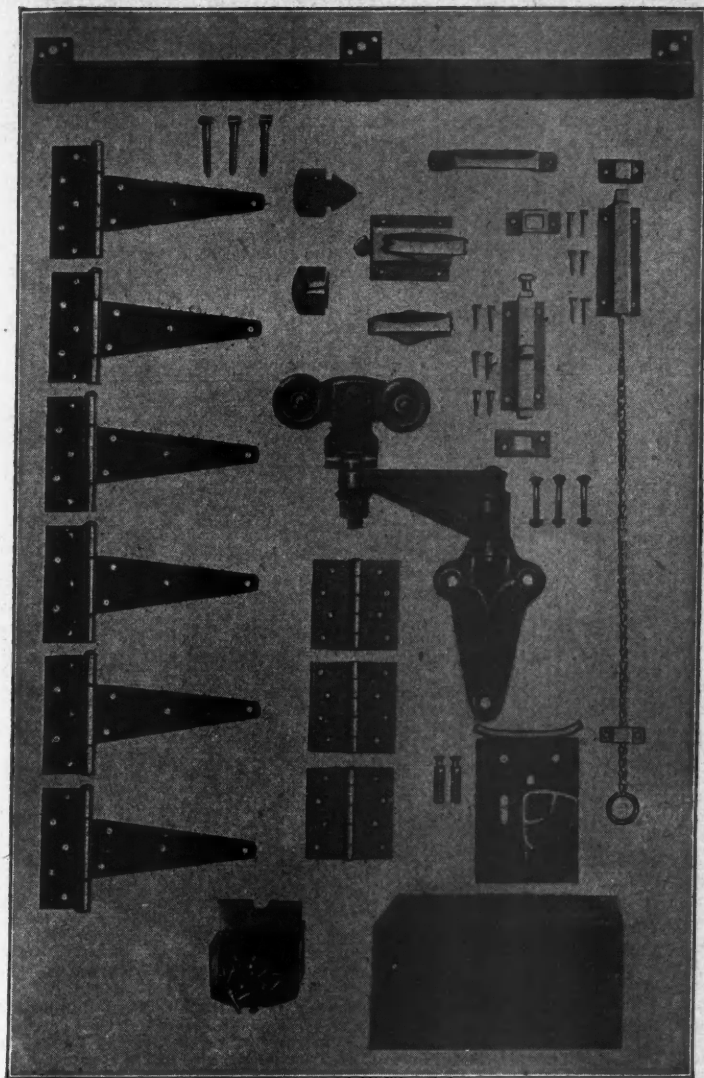


Fig. 1. Plates Showing Standard Shapes of Concrete Building Block and Tile. The Figures Appearing Opposite the Names of Various Types Correspond with Those Used to the Left of Table A.





## Every Garage Builder Needs

# WAGNER

## Garage Door Set

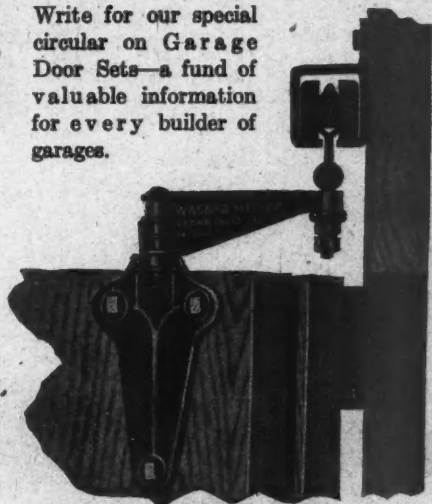
### No. 1558

**T**HERE is a distinct advantage in buying Wagner Garage Door Hardware in this way. Everything needed for complete installation is included in the set. It is the economical way—no time lost—nothing wasted—quickly and easily handled.

Wagner Garage Door Hangers insure utmost satisfaction—not for a few months, but for all time. Easy, quiet operation, freedom from trouble and their fitness in unusual places make them the best general purpose hangers procurable.

Set illustrated is for three door opening of 8 to 10 feet, and is but one of the many practical sets we furnish for openings of any width and for any number of doors from two to six. Prices permit their use on the cheapest garage—their points of superiority warrant using them for the medium or highest priced garage.

Write for our special circular on Garage Door Sets—a fund of valuable information for every builder of garages.



Wagner Cloztitle Hanger—Doors Open

## WAGNER Cloztitle Hanger

Designed especially for sliding folding doors, and permits doors to fold back at any angle, requiring very little space. When closed they fit snug and tight. The arrangement positively eliminates sagging, a big fault of all ordinary swinging doors. The swinging arm allows door to gradually move away from the wall, though track is fastened close to the wall in the regular way. Large roller bearings insure easy operation and reduce friction and wear.



Wagner Hanger—3 Door Arrangement

### Special Notice

Any of the garage doors shown on blue prints, page 81 of this issue, can be equipped with Wagner Hangers. There is a Wagner garage set for every type of opening.

**WAGNER MANUFACTURING COMPANY**  
Dept. N CEDAR FALLS, IOWA, U. S. A.

TABLE A—STANDARD SIZES AND TYPES OF CONCRETE BUILDING BLOCK AND TILE

Trade Name of Block or Tile	Process of Manufacture	Type of Block or Tile	Dimensions of Block or Tile exclusive of Mortar Joints
1. Francis....	Hand Tamp..	Rectangular... Air Space....	7 3/4" High 8-10-12" Wide 15 3/4"-23 3/4" Long
2. Hayden....	Power Tamp...	do .....	7 3/4" High 4-6-8-10-12" Wide 15 3/4"-19 3/4"-23 3/4" Lg.
3. Ideal.....	Hand or Power Tamp..	do .....	7 3/4" High 4-6-8-10-12" Wide 15 3/4"-23 3/4" Long
4. Pettijohn...	Hand Tamp..	do .....	7 3/4" High 7 3/4" Wide 15 3/4"-19 3/4"-23 3/4" Lg.
5. Republic...	Hand or Power Tamp..	do .....	7 3/4" High 2-4-8-10-12" Wide 15 3/4" Long
6. Zagelmeyer.	Wet Molds....	do .....	7-5-16" High 8-10-12" Wide 15 5/8"-16" 23 5/8"-16" Lg.
7. Dunn.....	Hand or Power Tamp..	do .....	7 3/4" High 8-10-12" Wide 15 3/4" Long
8. Hercules...	Hand or Power Tamp..	do .....	4" to 16" High 4" to 20" Wide 4" to 6" Long
9. Besser.....	Power Tamp..	Elliptical.... Air Space....	7 3/4" High 7 3/4"-9 3/4"-11 3/4" Wide 15 3/4" Long
10. Brandell...	Power Tamp..	do .....	7 3/4" High 4-6-8-10-12" Wide 15 3/4" Long
11. Hobbs....	Power Tamp..	Elliptical.... Air Space....	3" to 12" High 3" to 12" Wide 3" to 24" Long
12. Flexo.....	Wet Molds....	Miscellaneous Air Space Types.....	5 1/8"-7 5/8" High 8-10-12" Wide 10 5/8" 23 3/8" Long
13. Miracle....	Hand or Power Tamp..	do .....	7 3/4" High 9-12" Wide 23 3/4" Long
14. Multiplex..	Hand Pressure	do .....	3 5/8" 5 5/8" 7 5/8" High 8-10-12" Wide 19 5/8" Long
15. Stewart....	Hand Tamp..	do .....	7 3/4" High 8-10" Wide 15 3/4" Long
16. Synstone...	Wet Molds....	do .....	11 5/8" High 8-12" Wide 23 5/8" Long

17. Anchor....	Power Tamp..	Two Piece....	7-11-16" High 8-9-10-11-12" Wide 15 1/2" 23 1/2" Long
18. Bragstad...	Hand Tamp..	do .....	7 3/4" High 10" Wide 23 3/4" Long
19. Helm.....	Hand or Pressure.....	do .....	7 1/4" High 10" Wide 23 1/4" Long
20. Hydrostone	Power Pressure.....	do .....	8 5/8" 11 5/8" High 4 1/2" to 17" Wide 23 3/4" Long
21. Eberling...	Power Tamp..	Building Tile..	5" High 8 1/2"-12 1/4"-16 3/4" Wide 12" Long
22. Hamilton...	do .....	do .....	5" High 4-6-8-12" Wide 8-10-12" Long
23. P-I-C-A-B-B-S.....	Hand or Power Pressure.....	do .....	3" to 6" High 7-10" Wide 20" Long

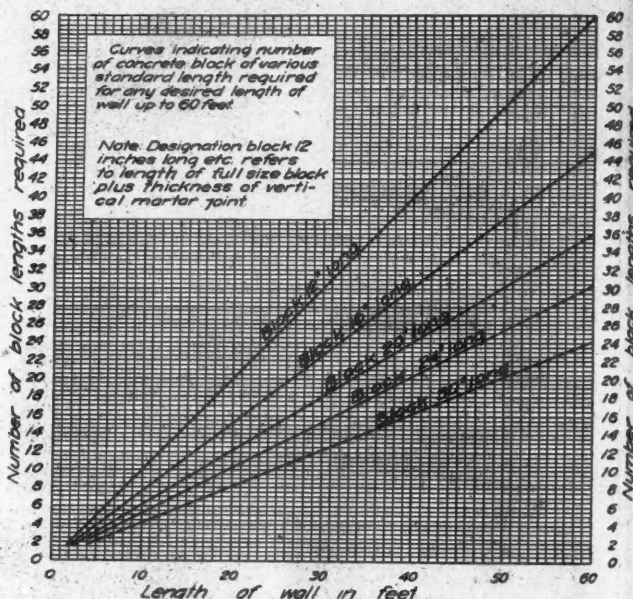


Fig. 3. To Find Number of Block of Any Standard Length Required for One Course of Wall of Any Desired Length. Follow Along Bottom Line to Numeral Indicating Desired Length in Feet; Then Follow Vertical Line to Horizontal Curve Representing Block Length to Be Used; Then Follow Horizontal Line to Margin and Read Off Number of Block Lengths Required. See Dimensions "B," Fig. 2.

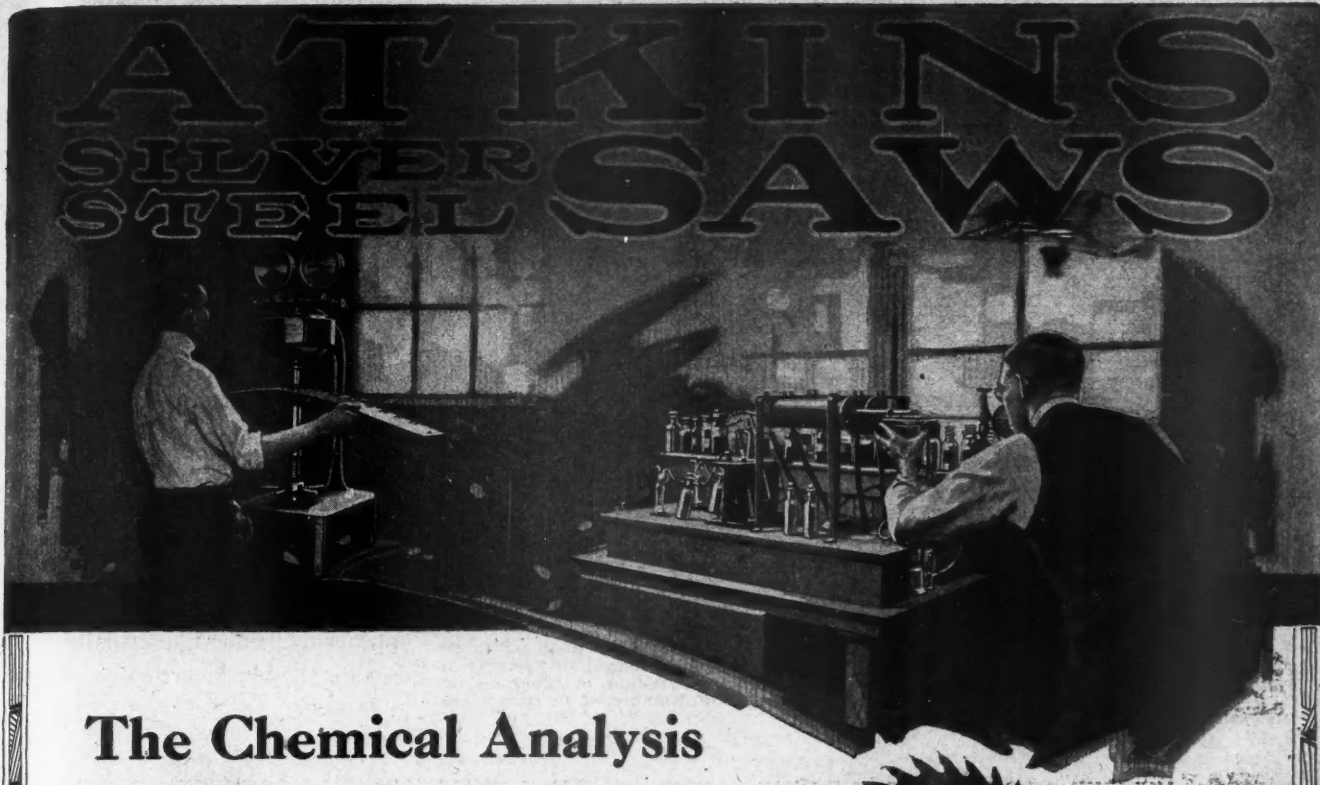


Fig. 2. Elevation of Concrete Block House Showing Dimensions "B" Conveniently Computed by Means of Curves Shown in Fig. 3, Dimensions "C" Computed Similarly by Means of Curves Shown in Fig. 4.

16-inch size is shown in the table as 7 3/4 by 8 by 15 3/4 inches, allowing for 1/4-inch vertical and horizontal joints. Most of the commoner types of blocks are designed for 1/4-inch joints, altho thicker joints may be used with no difficulty except that of keeping track of the irregular dimensions resulting. Other block sizes are laid out for 5/16, 3/8 and other thicknesses of joint up to 3/4-inch. Some of the systems of block machinery provide adjustments in the mold boxes to vary the joints as desired. For block 16 inches or more in length, the 3/8-inch joint is perhaps the most convenient.

For economy of construction the designer using concrete block should make as general use as possible of standard sizes, just as economy of lumber calls for adherence as





## The Chemical Analysis

In the making of crucible steel it sometimes happens that there is what are known as "off ingots"—the mixture not being correct. However, with our modern laboratory equipment we have the facilities for detecting any variations from the Atkins standard for "Silver Steel." We subject each plate to minute chemical analysis and physical inspection.

Our metallurgists know what constitutes the "Silver Steel" formula, and there is no deviation from it, hence you can depend upon Atkins Saws, because they are uniform in quality and efficient to the highest degree.

*Ask nearest dealer for latest literature*

## E. C. ATKINS & CO., Inc.

Established 1857

"The Silver Steel Saw People"

Home Office and Factory: INDIANAPOLIS, IND.

Canadian Factory:  
HAMILTON, ONTARIO

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LANCASTER, N. Y.

Branches carrying complete stocks in the following cities:

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Chicago	New Orleans	San Francisco	Sydney, N. S. W.
Memphis	New York City	Seattle	Vancouver, B. C.



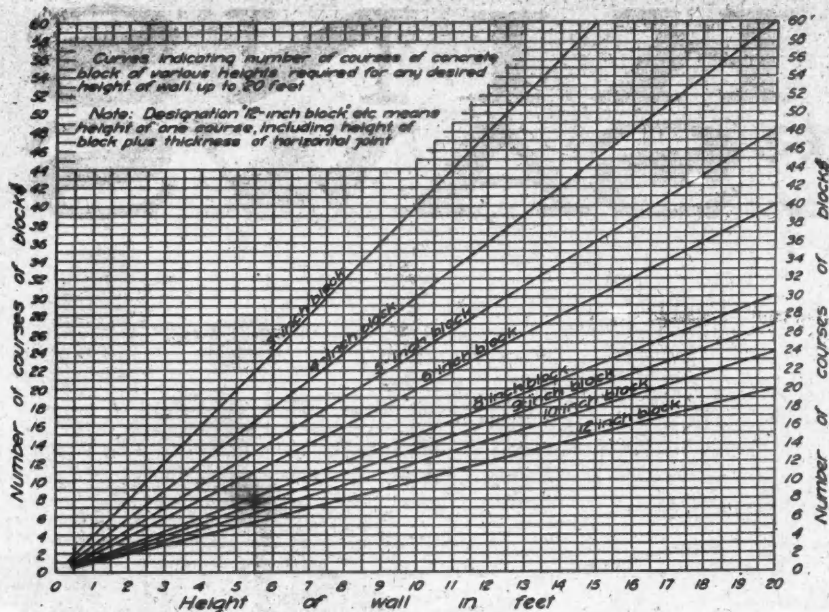


Fig. 4. To Find Number of Courses Required for Any Height of Wall Up to 20 Feet, Follow Along Bottom Line to Numeral Representing Desired Height in Feet; Then Follow Vertical Line to Diagonal Curve Corresponding to the Height of Block to Be Used; Then Follow Horizontal Line to Margin and Read Off Number of Courses. See Dimensions "C," Fig. 2.

closely as possible to stock lengths. Considerable saving can be affected by keeping wall lengths as nearly as possible in multiples of whole and half block, and door and window openings in multiples of quarter block. Fig. 2 shows elevation of a house with dimension lines for use in referring to Figs. 3 and 4. The distances B are conveniently gotten by reference to curve shown in Fig. 3, and distances C by reference to curve shown in Fig. 4.

It is advisable to avoid cutting concrete block and tile; concrete is more difficult to cut than stone or clay and cutting or patching block is almost certain to detract from the appearance unless unusually well done or the blocks are to be covered by stucco.

TABLE B—NUMBER OF CONCRETE BUILDING BLOCK OR TILE REQUIRED PER SQUARE FOOT OR MASONRY SURFACE

Length of Block in Inches	Height of Blocks in Inches							
	3	4	6	7½	8	9	12	16
8	6.00	4.50	3.00	2.40	2.25	.....	.....	.....
10	4.80	3.60	2.40	1.92	1.80	.....	.....	.....
12	4.00	3.00	2.00	1.60	1.50	1.33	1.00	.....
16	3.00	2.25	1.50	1.20	1.125	1.00	.75	.56
20	2.40	1.80	1.20	.96	.90	.80	.60	.45
24	2.00	1.50	1.00	.80	.75	.66	.50	.37
30	1.60	1.20	.80	.64	.60	.534	.40	.30

TABLE C—WALL AREA OF CONCRETE BLOCK AND TILE IN SQUARE FEET (AND DECIMALS OF SQUARE FEET)

Length of Block or Tile in Inches	Height of Block or Tile in Inches							
	3	4	6	7½	8	9	12	16
8	.166	.222	.333	.416	.445	.500	.666	.889
10	.208	.278	.416	.521	.556	.625	.833	1.111
12	.250	.333	.500	.625	.666	.75	1.000	1.333
16	.333	.445	.666	.833	.889	1.00	1.333	1.78
20	.416	.556	.833	1.042	1.111	1.25	1.666	2.222
24	.500	.666	1.00	1.250	1.333	1.50	2.000	2.666
30	.625	.833	1.25	1.562	1.666	1.875	2.500	3.333

## Insulation in Monolithic Concrete Construction

SWEDISH FIRM DEVICES SYSTEM TO PROVIDE SECOND DEAD AIR SPACE BY BUILDING TRIPLE WALL

By H. Colin Campbell

PRACTICALLY everyone is familiar with the methods by which insulation of walls is secured in the various ways concrete is used for building construction. Solid monolithic walls are usually furred on the inside, then lathed and plastered so that there may be a dead air space introduced to prevent condensation on interior walls from extreme differences between inside and outside temperatures. Only where range of temperature between seasons is low is it possible to apply interior plaster finish on any type of masonry construction if all evidence of moisture on inner wall face is to be prevented.

So-called monolithic concrete construction is frequently made hollow by building double walls. In such a case insulation is provided within the concrete section itself so that plastering may be done on the inner face of the inside concrete wall without any further preparation of its surface. The same is largely true

of most types of concrete block construction where dead air space or practically hollow walls are obtained by using cellular block. In several types of block construction it is possible to secure a continuous air space between inner and outer faces because of the manner in which block are laid or made.

It has remained, however, for a Swedish firm to develop additional insulation in monolithic concrete construction by introducing a second dead air space in the wall—in other words, building a triple wall. It is natural that considerable study should have been given to this subject in Scandinavian countries because their engineers have long been foremost in the applications of concrete. Also the severe winters in their northern latitudes have compelled particular attention to insulating the walls of their structures.

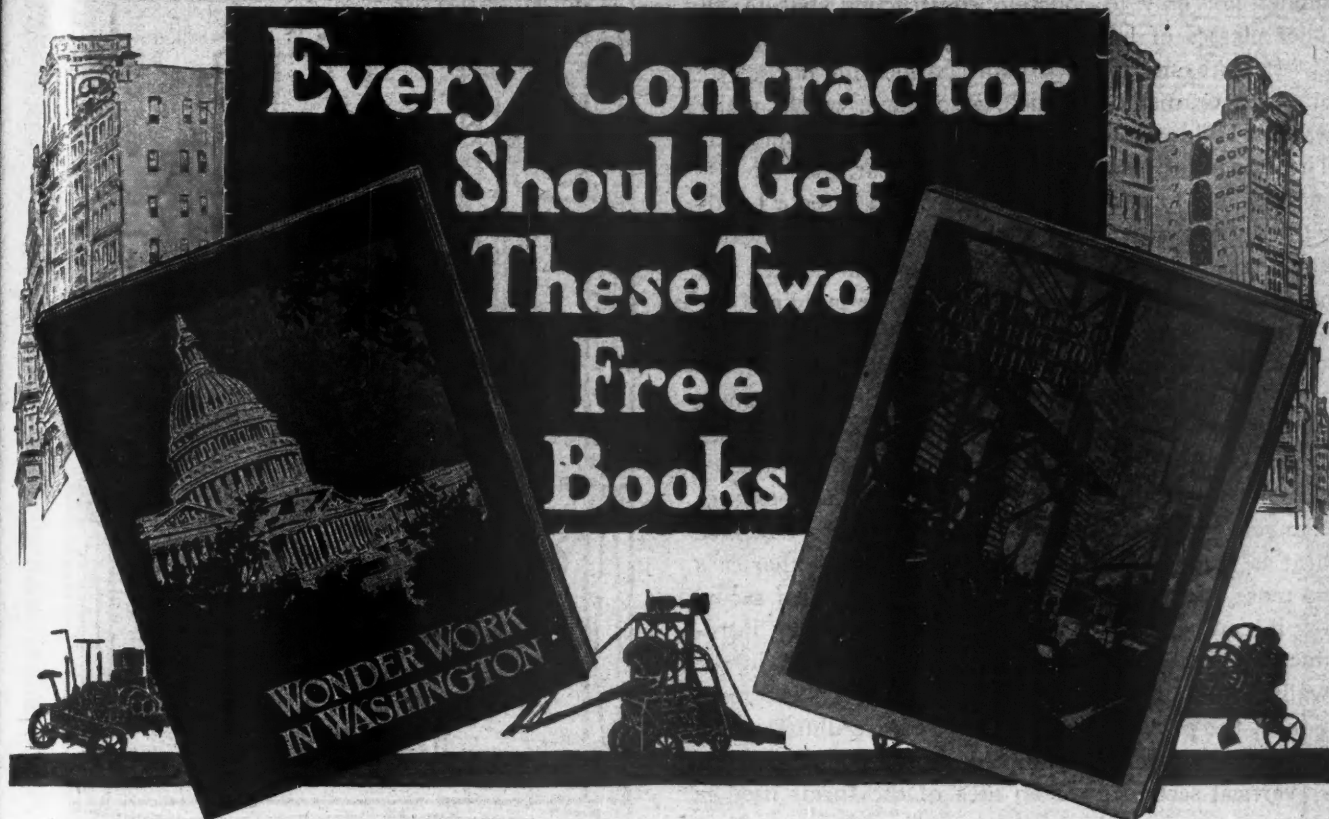
Study of this subject with a view to a better solution of it has been considerably neglected. That statement

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# Every Contractor Should Get These Two Free Books



## "Wonder Work in Washington"

- 1** This book is profusely illustrated with photographs covering a wide variety of the recent private and governmental construction in the Nation's Capital and these pictures are accompanied by detailed statements from the contractors and engineers in charge. The entire book vividly demonstrates the unusual range of work of which WONDER MIXERS are capable and the remarkable time and labor savings and increased production which they make possible. A postcard will bring the book to you at once and without charge.

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- 2** This is one of the finest catalogs of construction machinery ever published and is a mine of really worthwhile information for contractors and engineers. It completely covers the entire WONDER line of MIXERS and PAVERS and the WATERLOO line of TRACTION and NON-TRACTION BACKFILLERS, SINGLE and DOUBLE DRUM HOISTS, and DIAPHRAGM PUMPS. It is profusely illustrated and completely descriptive as to sizes, capacities, speeds, loads, methods of operation and all similar specifications and information. A postcard request will bring this book to you, also—without charge, of course.

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# WATERLOO CONSTRUCTION MACHINERY COMPANY

103 Vinton Street, Waterloo, Iowa

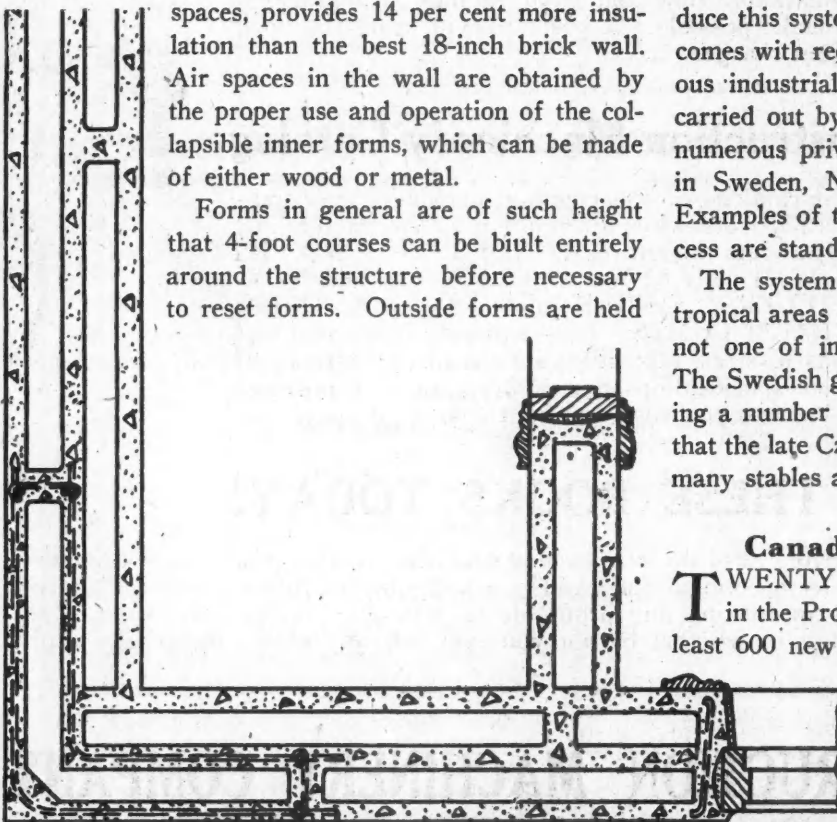
WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

applies not only to concrete construction, but to all other classes of building construction. The majority of structures are planned with considerable neglect of practices or methods which, if applied, would make warmer buildings in winter and cooler ones in summer. The sum total of loss of coal each year, general discomfort, not to mention ill health caused by poor building construction, which includes poorly insulated walls, floors and ceilings, cannot be expressed in dollars and cents. Certainly many houses and other buildings are drafty, principally because poorly built or poorly arranged.

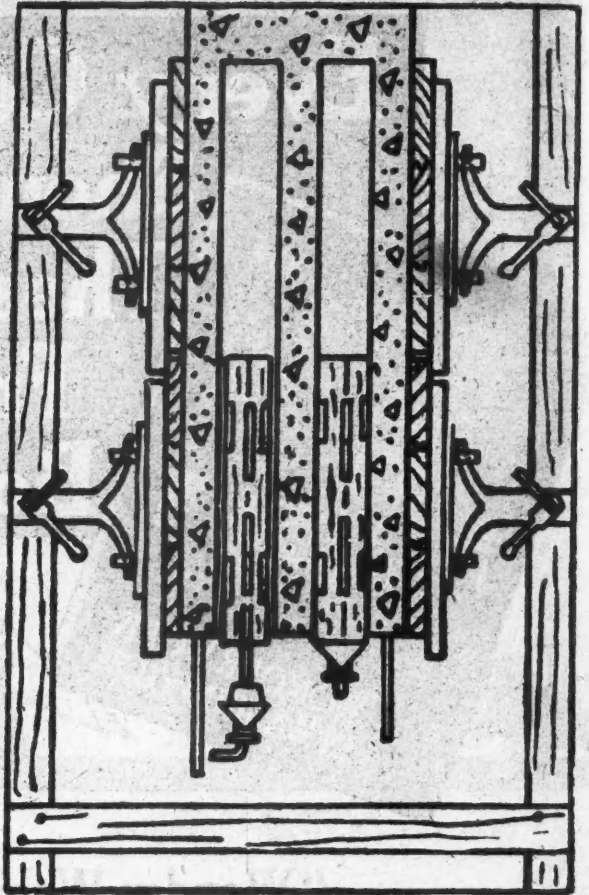
In the northern parts of the United States, the matter of insulating walls is vital. No type of structure can be called a success that does not afford at least a fair degree of insulation from extreme temperature changes. It is necessary to insulate against extreme heat as well as against extreme cold, and in either case no more effective insulation, considering cost of securing it, can be supplied than that attained by the introduction of as nearly complete dead air space in the walls as possible. In the Scandinavian system mentioned, the principles of construction are illustrated in one of the sketches showing a horizontal section. A vertical section gives an idea of the forms used in this construction which, of course, have been particularly developed to meet construction requirements. The walls are vertical slabs separated by light columns, so staggered that at no point in the wall is the concrete continuous from outside to inside face.

Official tests conducted by the Royal Technical Institute of Stockholm, Sweden, have shown that this wall, which has a total width of 12 inches, including air spaces, provides 14 per cent more insulation than the best 18-inch brick wall. Air spaces in the wall are obtained by the proper use and operation of the collapsible inner forms, which can be made of either wood or metal.

Forms in general are of such height that 4-foot courses can be built entirely around the structure before necessary to reset forms. Outside forms are held



Horizontal Section of Wall Showing Triple Wall Arrangement. The Dead Air Space Between These Walls Forms an Effective Insulation.



Vertical Section Showing Forms Used in Construction. The Walls Are Vertical, Also Separated by Light Columns So Staggered That at No Point in the Wall Is the Concrete Continuous From Outside to Inside Face.

in place by an easily adjustable device which is affixed to light scaffolding built on both sides of the wall. Only recently have efforts been made to introduce this system of construction in this country and it comes with recommendations in illustrations of numerous industrial housing developments that have been carried out by its application, not to mention equally numerous private homes, public buildings and hotels in Sweden, Norway and other European countries. Examples of the construction giving 100 per cent success are standing as far north as 63 degrees latitude.

The system has also been introduced in the semi-tropical areas of South America, where the problem is not one of insulating against cold but against heat. The Swedish government has used the system in building a number of government structures and it is said that the late Czar of Russia used the system in building many stables at one of his celebrated residences.

#### Canada Building Many Homes

TWENTY million dollars' worth of new building in the Province of Saskatchewan is predicted. At least 600 new residences and 200 new school houses will be built, besides business blocks, warehouses, etc.

The expenditure for all Canada for 1920 for new building and construction work is estimated at \$300,000,000 against a total of \$190,000,000 in 1919.





## Stimulate Building Activities

High costs and inferior quality of building materials have discouraged many a man out of building or remodeling—lost big jobs for contractors and profitable sales for dealers.

Restore lost business and stimulate building with a material that never varies in quality, that is uniform, permanent and weather-resisting—that saves labor.

### **KELLASTONE** IMPERISHABLE STUCCO

—transforms unattractive frame, brick or cement buildings into beautiful modern structures—is a modern masonry that promotes permanence as the ancient masonry perpetuated the splendor of the Roman Colosseum.

KELLASTONE is versatile in its utility—the original all-mineral magnesite stucco. Sets up with granite-like strength—beautiful color effects—and is immune to heat, cold, fire or weather. Send for an illustrated booklet—"Story of Kellastone."

Price advance only 15 per cent in four years

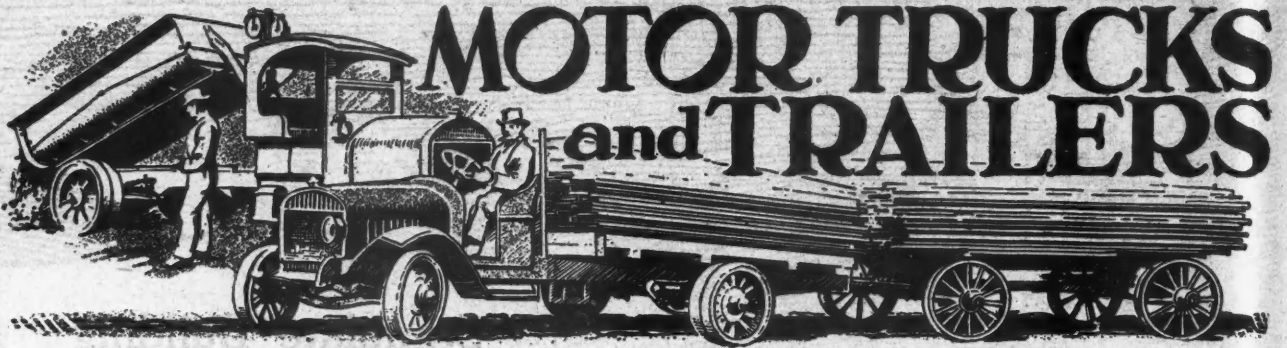
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# KELLASTONE

IMPERISHABLE STUCCO

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## Twenty-Four Hours a Day

MOTOR TRUCK BIG FACTOR IN CONTINUOUS OPERATION TO MAKE UP FOR THREE-YEAR CESSATION IN BUILDING

**B**UILDING by night is no longer unusual; as soon as it becomes dark great electric searchlights provide artificial daylight to keep up the work of construction. Much of the building, especially on big projects, is now carried on twenty-four hours a day in an effort to make up for the precious time lost during the last three years. For this purpose only the most highly developed equipment with unusual enduring qualities will suffice.

In the days of horse-drawn transportation such undertaking were rare indeed; but, today, the new "iron" horse which knows no physical fatigue can haul material incessantly. The motor truck pours the raw material into the crucible from whence it emerges a finished structure.

Men can work only as long as there is material on

hand. It is for this reason that transportation has always been the big problem for the building contractor. And in these long days the hauling problem becomes doubly significant. There can be no delay. The motor truck supplies a double solution. It works going and coming. Speeding away from the excavation with a load to the dump, it returns with sand, gravel, brick, or some other building material essential to the continued operation of the great building machinery. As the work is being pushed forward with the greatest speed possible, excavation is going on on one part of the job while actual building is in progress at the other end.

Incessantly the truck grinds out its heavy task, a real "horse" for work. As long as it is fed the fuel which gives it power, it will work. That is the reason



Loading Heavy Slabs of Cut Stone is a Difficult Task. Two Men Are Handling This Job Easily. D. E. Isaac, Building Material Dealer, Used This "Diamond T" in a Variety of Ways. He Finds It One of His Most Valuable Assets and His Steadiest Worker.



Part of the fleet of Federal three and one half ton dump trucks owned by and operated by Atlas Excavating Co., Detroit, Michigan.



Hard work and Federals are pals.

The fact that Federals are bought time and again, by men who already own a number of them, indicates the esteem in which they are held. Business men give repeat orders only when they are thoroughly satisfied that the trucks meet the gruelling tests of varied weather and road conditions in a manner which results in a profit on each dollar invested.

In the grinding, sorely-tested trials through which the Federals have been run, they have stood up with an economy of operating costs and upkeep that makes "repeat" orders a foregone conclusion. In the rearing of buildings they have served from carting away dirt for a foundation to hauling shingles to the roof.

Whatever the capacity of your business—Federals of varied sizes are built to meet your needs.

"Traffic News" which tells interestingly of the accomplishments of Federals will be mailed on request.

FEDERAL MOTOR TRUCK CO.  
79 FEDERAL ST. DETROIT, MICH.

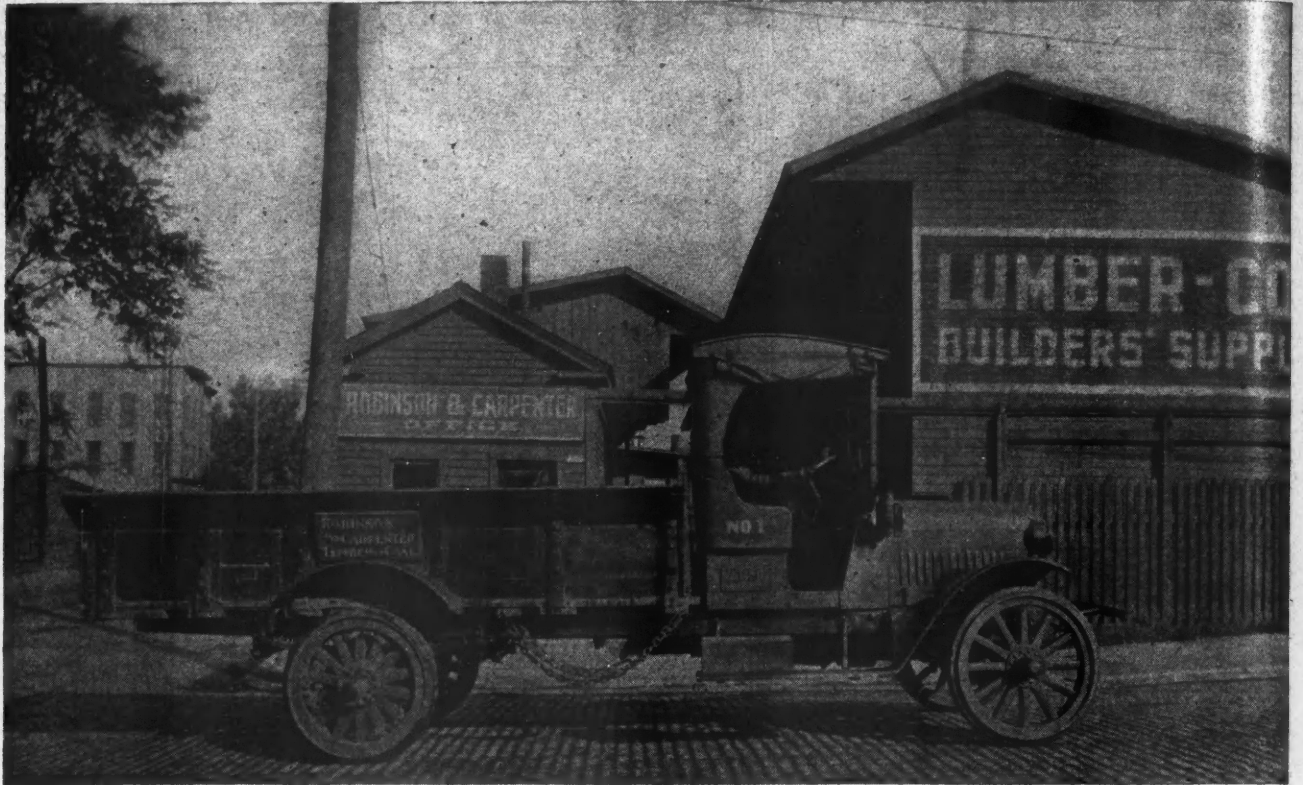


This is the sign of the Tenth Year Federal, a sign significant of ten years of success in every field of truck transportation.

Another

FEDERAL

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Robinson & Carpenter, Lumber Dealers in Ithaca, N. Y., Find This 2-Ton "Acme" Truck Very Efficient for Filling "Hurry-Up Orders." It Has Saved the Day Many Times by Getting Material to the Job in an Emergency. Its Features Are Its Speed and Hauling Capacity.

so many contractors are operating not one, but a whole fleet of trucks on the job. They found during the war that big scale operation paid and they are applying their newly acquired knowledge in times of peace on all sorts and manner of jobs. With a motor truck or fleet of motor trucks a schedule is a working fact.

No longer does the problems of loads rise up to rack their brains. As the amount of equipment rap-

idly increased the question of hauling became critical. But with the advent of the truck the task of hauling heavy machinery, which by horse and wagon was a monster task involving man power and time, has been reduced to a routine task of little moment. Loading devices have eliminated much of the delay and decreased the necessity of extra man power. Dumping devices have speeded up hauling time and cut labor costs.



Pneumatic Tires and Special Dump Bodies Are Two Important Factors in Getting Speed From Motor Trucks in the Building Business. This New "Republic" Truck Has Been Built for Speed and Mileage.

The building business of today is a high-g geared machine of inexhaustible reserve power and speed. It is not a "mudder" nor can it afford to be scratched at the post. And confronted with the task which faces it today, the demand for still more speed is too insistent, too vital, to be sidetracked.



### Cleveland Lumbermen Strong for Trucks

A LOAD of lumber on anything other than a motor truck on the streets of Cleveland is a novelty. Such complete acceptance of trucks as the logical unit of transportation in the lumber industry is not the outgrowth of chance. It is the result of a studied conviction on the part of lumber men, based on convincing

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# DUPLEX TRUCKS

## BUILT FOR BUSINESS

### Careless Truck Buying Makes Transportation Cost Too Much!

*The Truck is a Piece of Business Machinery. It Should Represent the Most Economical Method for Doing its Particular Job. Buy Your Truck on That Basis—And it Will be a Good Investment*

**R**ISING costs and the shrinking value of the dollar to a large extent can be offset by *intelligent buying*.

A steadily increasing number of business men are getting the facts and then buying their trucks on the basis of the facts.

There are many good trucks on the market. But value in a truck, very much like character in a man, isn't always completely revealed by what the eye can see.

Back of every Duplex Truck are *Fundamental Principles*—of design and of construction—factors that result in the *remarkable degree of service value* in Duplex trucks for the man who buys.

**There is Nothing Somebody Else Can Do to Save a Man From Paying the Price of His Own Limitation or His Own Carelessness**

Look in the used car columns of your local paper. Note the number and makes of trucks offered for sale and *think about* all the reasons.

In one day in three cities 324 different used trucks were listed for sale—and not one Duplex among them.

Are these trucks for sale because they were not bought right?

There is something significant here when you stop to analyze it.

Why is this tendency to standardize on Duplex so noticeable of late years?

The answer is very likely that trucks are *more and more being bought on the business basis of service delivered and what the service costs over a period of years*.

#### **This is a Time for Intelligent Buying**

A truck is just as much a piece of business equipment as any other piece of machinery. Its value is in *what it does and how cheaply it does it*.

Transportation is a necessary part of every business.

A truck gives a business man transportation facilities—at a high or a low price. *It depends on the fitness of the truck for its job.*

Now take a man who buys a truck for his business without getting all the facts first. Later he discovers that his truck is not as economical as it should be. He sells it at a sacrifice and gets another—and so on. Finally he buys the truck he should have selected the first time.

What is the result?

*He pays too much for his transportation. His costs for trucking are not right.*

**The Duplex Users of Today Are Probably the Most Intelligent Buyers and Users of Trucks in America**

Think of this—ninety per cent of the Duplex dealers have been distributing Duplex Trucks ever since this company was first organized.

What does this signify? It shows for one thing that their customers have found the Duplex Truck to be a successful truck for them.

The great significance of all this is that *Duplex users stay Duplex users*. Many of them had tried out five or six different makes of trucks before they got their first Duplex.

The whole history of this business shows that when a man buys his first Duplex it is only a little while until *he standardizes* on Duplex.

#### **Get the Facts for Yourself**

We have hundreds of letters from users in our offices that show some very remarkable facts. They are not edited. The letters stand just as they were written.

If you are a truck user and want to read these letters write us and we will send them to you for your private perusal. For ethical reasons we do not care to publish them.

## What Do You Think?

#### **Duplex 4-Wheel Drive**

Many companies in the heavy duty fields say that the Duplex 4-Wheel Drive is the only successful truck they ever owned.

If your kind of work has proved too much for the ordinary truck—you will find that the Duplex dealer near you can give you some really interesting facts. Many owners still seem to be using the *wrong kind* of trucks. Get the Duplex facts.



#### **The Duplex Limited**

Thoughtful men have entire confidence in the Duplex Limited—feeling that this *high speed* Duplex is a safe investment because of the fact that it is a Duplex.

Medium capacity—Pneumatic Tired—Two Wheel Drive—Full Electrical Equipment—here is a Speed Truck that *lasts*. Strong, rugged, mechanically and constructively *right*—it handles as easily and smoothly as a passenger car—and at a minimum of upkeep.

# Duplex Truck Company

## Lansing • Michigan

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

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

tests under the most exacting conditions.

The tests that have led to the acceptance of the truck are many and severe. A large number of the leading lumber firms of Cleveland are located in what is known as "the flats," a strip of lowland lying along the banks of the Cuyahoga River at a considerable distance below the mean level of the city of Cleveland. Because of the nature of the land the roads here are anything but ideal, being soft, rough and rutty. To make deliveries of lumber to the city, or get out of the city by way of its paved thoroughfares, trucks must negotiate the steep rise to the higher ground over grades that tax their power and stamina.

Teare & Co., who were among the early investors in truck equipment.

"We hesitated to put in trucks," says Mr. Potter, "but we realized that something had to be done. From the day of its installation our first truck demonstrated to us how needless our forebodings had been. We thought, for instance, that we were going to need an expert mechanic to drive the truck. The truck company thought not. 'Take the best driver you've got on team work—the fellow who takes care of his wagon and team—and put him on the truck,' the company suggested, 'he'll soon learn the trick of truck driving.' We took the company's word for it, tho we doubted



Carrying a Little More Than Its Share. This "Federal" Truck Does Not Believe in Rest as the Size of the Load Shows. In Fact It Is Ready to Work Just a Little Harder Than Usual to Make Up for Lost Time. The F. A. Gross Construction Co. Keep Their Men Supplied with Material All the Time.

Conditions such as those for years caused lumber men to doubt the adaptability of motor trucks to the needs of the lumber trade in Cleveland, and these doubts persisted until the increasing demand for building material, caused by the city's meteoric growth in the past decade, forced recognition of the fact that horse and wagon deliveries had been outgrown; that the building campaigns in the suburbs located five to ten miles from the flats had created a transportation problem that could be met only by modern methods.

The story of those early days of doubt is interestingly told by F. P. Potter, head of the firm of Potter,

its wisdom. We put Sam Rider, one of our best men, on the job. To our surprise, and Sam's, the combination worked at once, Sam liked the truck, and the truck responded to Sam's ministrations even better than his horses had. First thing we knew that truck was doing more work than three teams had been doing, and doing it quicker and better—and we were saving money on top of the improved service.

"Where we had been able to load a wagon at 6:00 a. m. for the trip to Gates Mills, about sixteen miles, and considered ourselves fortunate if the team got back soon after nightfall, now we discovered we



Do you know why "The Nations' Freight Car" has "The Famous Drive that Came from a Famous Gun?" It is one of many features of advanced engineering that have a direct bearing upon your own haulage problems. The reasons are interestingly explained in a book that will come by return mail at your request.



## Economy versus Cheapness

Diamond T for fifteen consecutive years has maintained a definite transportation standard. The standard has been, and is, not low price, but *lowest final cost.*

Constant adherence to that ideal explains the lasting satisfaction of Diamond T ownership.

**Diamond T Motor Car Co.**

4556 West 26th Street

CHICAGO, ILL.





Heavy Duty 5-Ton "White" Truck Owned by the Potter-Tearle Co., Lumber Dealers, Cleveland, O. It Is Only One of a Large Fleet. Note the Roller Body for Quick Loading and Unloading.

could load twice as much lumber on our truck, start it out on the same run at 7:00 o'clock, and have it back in the yard loaded and ready to go out again by one o'clock in the afternoon. We found that we were cutting the delivery cost in half, and the truck was ready for service without a moment's loss of time, while our horses, after that trip, were never good for anything but short hauls and light loads the next day, if they were good for anything.

"That settled the question so far as we were concerned. Since then we've sworn by trucks, and would hate to consider doing business without them. The roller body makes it possible for us to load and

unload in a very few minutes. It enables us to keep our trucks perpetually moving. Our new 5-tons, for instance, have been going since early spring twelve to fourteen or more hours per day, at practically no repair expense, and they have permitted us to take on customers at distances plainly impossible if we were relying on horse deliveries."

✦

#### Knowing What Your Truck Costs

**C**OSTS cannot be held down unless you know what those costs *are*. And unless you keep careful records you are always facing the possibility that transportation may be costing you more than you are getting out of it. If you use more than one truck, only accurate cost records can show which one of them is giving the cheapest service in the long run—and thus guide you in the selection of additional equipment.

The average cost of operating and maintaining a truck for fifteen months equals the original cost of the truck. If your truck seems to be carefully and intelligently handled and yet your figures far exceed this, something is wrong either with your figures or with your program of truck operation, and the matter will bear investigating. It is easy for the inexperienced owner to mistake cost appearances for cost facts.

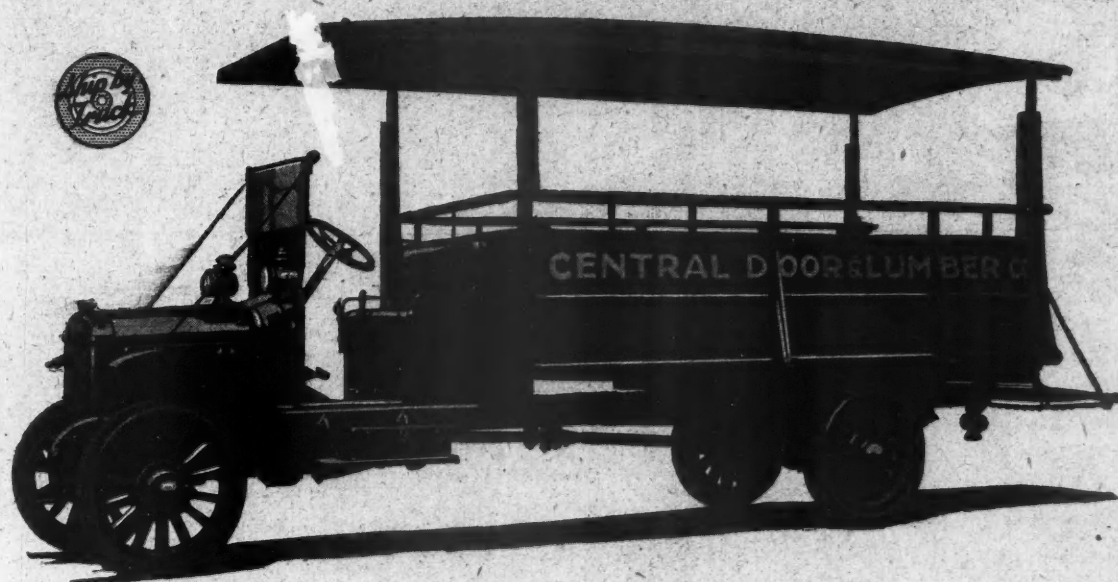
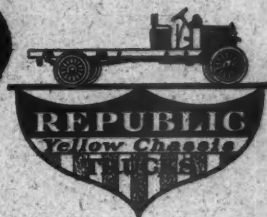
A truck owner in Detroit was hiring out his 5-ton dump truck for



The Slagle Lumber Co. Are Big Operators in Lima, O., and They Believe in Motor Trucks, Especially This 3 1/2-Ton "Gramm-Bernstein" Truck Equipped with a Slatted Stake Body and Lumber Roll-Off Device. This Device Has Cut Loading Time in Half.



# REPUBLIC TRUCKS



Service—nation-wide service—has helped win for Republic the greatest truck preference in the world. Two thousand authorized service stations, and seven factory-maintained National Parts Depots, assure Republic owners everywhere uninterrupted truck performance.

Republic Truck Sales Corporation, 953 Michigan Ave., Alma, Michigan

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



The Contractor Who Owns This "Service" Truck Has Devised a Unique Labor-Saving Device for the Body of His Truck. Each of the Four Compartments Contains Enough Gravel or Crushed Stone and Sand to Fill the Skip in the Mixer. As the Dump Body Is Lifted, Each Section in Turn is Released and Dumped.



# KISSEL

## Your Hauling Problems Can Be Solved

**T**HERE may be peculiar conditions—unusual obstacles—new problems—but they can be met—overcome—solved—by Kissel Trucks.

For Kissel Trucks represent a development in motor transportation far in advance of the problems they are called upon to solve.

The motor—sturdy, powerful—is designed and built by Kissel solely for truck requirements—and all moving units, together with the frame, springs and axles, are built to the Kissel standard. Five different sized models—a size for every business.

So again, your hauling problems can be solved by the use of the motor truck—Kissel Trucks—built to the Kissel standard.

KISSEL MOTOR CAR CO.  
MILWAUKEE, WISCONSIN

Manufacturers of Motor Trucks for Trucks



The Contractor Who Owns This "Service" Truck Has Devised a Unique Labor-Saving Device for the Body of His Truck. Each of the Four Compartments Contains Enough Gravel or Crushed Stone and Sand to Fill the Trip in the Mixer. As the Dump Body is Lifted, Each Section in Turn is Released and Dumped.



Five-Ton "Packard" Doing Its Bit in the Big Building Campaign. The Dump Body Has Eliminated Much of the Delay Connected with the Unloading of Brick. The Large Hauling Capacity of This Truck Cuts Down the Number of Loads for a Job.

\$12.00 a day, figuring that he was making a net profit of \$5.00. He figured \$3.50 a day for wages, \$2.99 for gasoline, 30 cents for oil, 40 cents for repairs—a total of \$7.19. As a matter of fact, it developed that this man was *losing* a dollar a day, or more, because he had failed to figure *other* expenses, which would add up something like this: interest, 65 cents; insurance, 40 cents; depreciation, \$2.50; taxes and license, 20 cents;

use most fuel in proportion to mileage; loads and stops; complete comparative records; repair costs per ton-mile; and any other specific information that would be of value in your particular business.



**K**EEP the exhaust clear of obstructions and do not allow mud to cake on the outside of the muffler or to clog the outlet.

tires, \$1.00; garage, \$1.00; overhauling, 20 cents, grease and waste, 15 cents. Added to his estimate of \$7.19 a day, this brought his cost up to \$13.29.

You have to know what your costs are before you can curtail them. The work your truck is actually doing can be shown by a clear, concise record of its performance and its costs.

To give you complete information on the efficiency of your truck, your cost record should tell you: how much it costs to deliver each package or to move each ton; which tires give most mileage; which driver is most efficient; which trucks need fewest repairs; to what extent service depends upon inspection and care; the most profitable routes (which, by the way, are not always the shortest); which trucks



Five-Ton "Highway" Trailer in Use by the Cadillac Motor Co., Detroit, Mich. This Trailer Was Used with "GMC" Trucks for Hauling Brick, Gravel, Sand, Etc., for the Erection of Their New Plant. They Doubled the Hauling Load at Little Extra Cost.





# General Motors Trucks

## Conserve Time With GMC Trucks

**C**ONTRACTORS must figure the time element closely, for work delayed means money lost.

Getting materials to the job when needed is most important if time is to be saved.

Reason enough why contractors the country over have added GMC Trucks to their equipment, for they know they can

depend on GMC Trucks for continuous operation and at a minimum expense.

The best of materials are used by skilled workmen in building these trucks—and GMC Trucks are *built* in the GMC factory, not just assembled.

Contractors using GMC Trucks can figure time closely for these trucks are thoroughly dependable.

**GENERAL MOTORS TRUCK COMPANY**  
PONTIAC, MICHIGAN, U. S. A.

*Branches and Distributors in Principal Cities*

(677)



WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Bad Roads Don't Mean Anything to E. T. Gresham, Norfolk, Va. He Used the 3 1/2-Ton "Federal" Truck Shown Here in All Kinds of Weather to Haul Building Material. He Is Strong for the Special Dump Body Because It Saves Time.

### Fifth Wheel on Trailers Aids Couplings

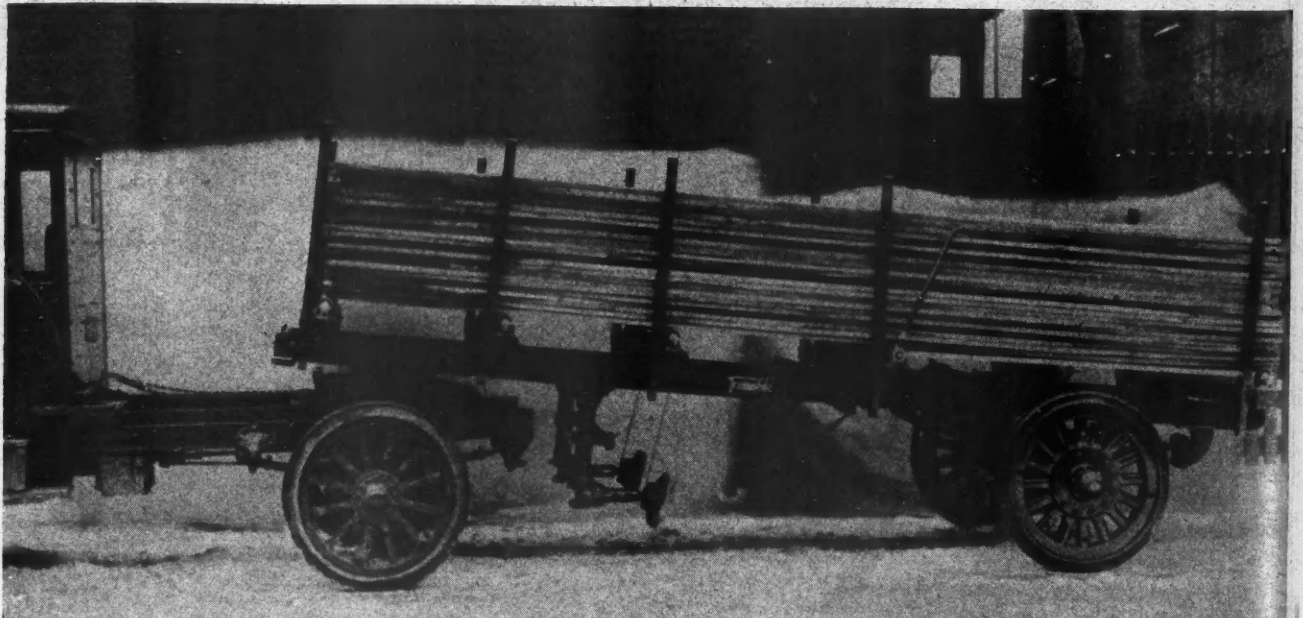
**I**N THE early types of semi-trailers, much time was wasted in coupling the trailer to its tractor. This was caused by the need of extreme accuracy in getting the upper half of the fifth wheel on the underside of the trailer directly over the lower half of the fifth wheel on the tractor, so that the kingpin connecting the two might be inserted without a whole series of backings and fillings to give an accurate register. This drawback has been eliminated in the use of semi-trailers by the employment of a semi-trailer with a special form of fifth wheel, with which it is not necessary to spot the truck accurately to make a connection. The truck can back in under

the semi-trailer from the side or from any angle. It does not have to back in from directly in front. Furthermore, the semi-trailer may be disconnected from the tractor by simply pulling a lever at the driver's side.

The automatic coupling properties of the fifth wheel are secured by making the two halves in the form of castings. The lower casting is in the form of a letter V. The upper casting is a circular plate with a large pin in the center, mounted on a rocker shaft and springs. The lower fifth wheel plate slants downward toward the rear, which allows for the pick-up of the semi-trailer without jacking, even tho the jacks may have sunk into the soft ground. At the apex of the V of the lower plate is a jaw arrangement similar to that em-

ployed in the railroad freight car coupler. This jaw arrangement engages the pin on the upper plate and snaps it into place as the tractor is backed in under the semi-trailer. In disconnecting the trailer, the fifth wheel pin is released from the jaws of the engaging device by the operation of a lever at the side of the driver's seat.

When disconnected from the tractor, the trailer is held upright by means of two props or jacks, which are carried permanently on the underside of the semi-trailer platform. These jacks are shown in the illustration on this page. They are each operated by a ratchet on the side. Both jacks may be manipulated at once if the ground is level.



"Trallmobile" Semi-Trailer with Special Fifth Wheel Which Makes Connection with Truck Without Accurate Spot. It Is Disconnected by Pulling a Lever at the Driver's Seat. The Two Jacks Underneath Hold the Trailer Upright When Disconnected.



# THE ROMORT AIR & WATER STATION

## Are You Planning A Filling Station?

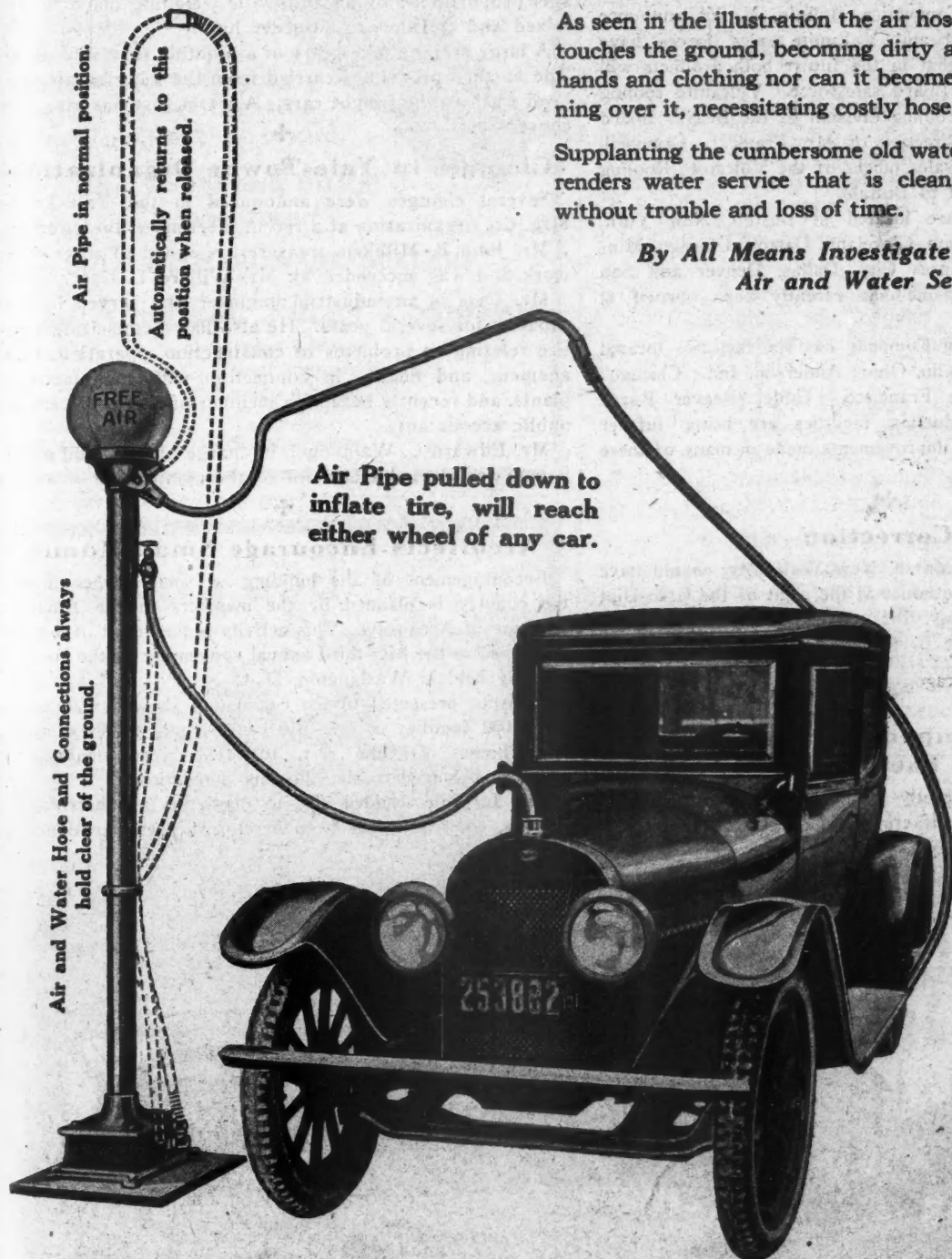
When you lay out the tire, air and radiator water service, be sure to investigate the Romort Air and Water Station.

It is by far the most efficient and economical combined air and water service you can specify.

As seen in the illustration the air hose of the Romort never touches the ground, becoming dirty and grimy to soil the hands and clothing nor can it become broken by cars running over it, necessitating costly hose replacements.

Supplanting the cumbersome old water bucket, the Romort renders water service that is clean, quick and efficient without trouble and loss of time.

*By All Means Investigate the Romort Air and Water Service*



Air Pipe in normal position.

Automatically returns to this position when released.

Air Pipe pulled down to inflate tire, will reach either wheel of any car.

Air and Water Hose and Connections always held clear of the ground.

MANUFACTURERS  
THE ROMORT MFG. CO.  
OAKFIELD, WIS.

*Write Us Today for Full Details*

SALES DEPT.  
THE ZINKE CO.  
1323 MICHIGAN AVE.  
CHICAGO ILLINOIS



## NEWS OF THE FIELD

### Beaver Board and Vulcanite Sales Forces Unite

The Beaver Board Companies, Buffalo, N. Y., announce that the Beaver Board and Vulcanite sales forces have been consolidated, and that in the future both products will be sold by the Beaver Board salesforce. Vulcanite roofing will be handled by the roofing division of the Beaver Board Companies, under the direction of Mr. Frank L. Campbell, sales manager, and the sales offices of the Vulcanite Roofing Company will be moved to Buffalo.

Direct sales offices are located at Boston, New York, Buffalo, Baltimore, Atlanta, Cleveland, Detroit, Chicago, Minneapolis, St. Louis, Kansas City, Dallas, Denver and San Francisco, and a new one has recently been opened at Cincinnati, Ohio.

The Vulcanite Roofing Company has six factories located at Albany, N. Y.; Franklin, Ohio; Anderson, Ind.; Chicago; Kansas City, and San Francisco. Under Beaver Board management these production facilities are being further expanded and extensive improvements made in many of these plants.



### A Correction

Architects Tooker & Marsh, New York City, should have been given credit for the house at the right of the Creo-Dipt Stained Shingle Company, Inc., advertisement in our June issue. The other house in the illustration is by Architect Robert Seyfarth, Chicago.



### Bestwall Company Builds Unique Factory

The new factory recently completed at Akron, N. Y., by the Bestwall Manufacturing Co., Chicago, Ill., is

unique in that it has roof and sides of the board manufactured by that concern.

It is built near the gypsum quarry, where the material is obtained for the manufacture of Bestwall board, and the mill will have a capacity of five hundred tons of stucco daily. The Bestwall board has been applied to wooden nailing strips which are held in place by steel angle purlins. The raw material is stored in tanks. The stucco is brought from the American Cement Plaster Company's mill by means of an overhead conveying system.

Sawdust is unloaded into a steel hopper from which it is elevated, screened, aired, and stored in a sawdust tank with a capacity of ten cars. The various materials used in making the wallboard are mechanically drawn from storage, proportioned by an automatic weighing machine, dry mixed and elevated to a feeder bin.

A large storage takes care of a month's supply of paper. The finished product is carried from the kilns by an overhead track to the freight cars. A warehouse has also been constructed.



### Changes in Yale-Towne Organization

Several changes were announced in the Yale-Towne Mfg. Co. organization at a recent meeting of the directors.

Mr. John B. Milliken, treasurer, resigned to enter other work and was succeeded by Mr. Willard L. Case.

Mr. Case is an industrial engineer and served in that capacity for several years. He also had a consulting practice relating to problems of construction, operation, management, and finance in connection with manufacturing plants, and recently became a member of a firm of certified public accountants.

Mr. Edward C. Waldvogel, in charge of sales and advertising, was elected a director of the company.

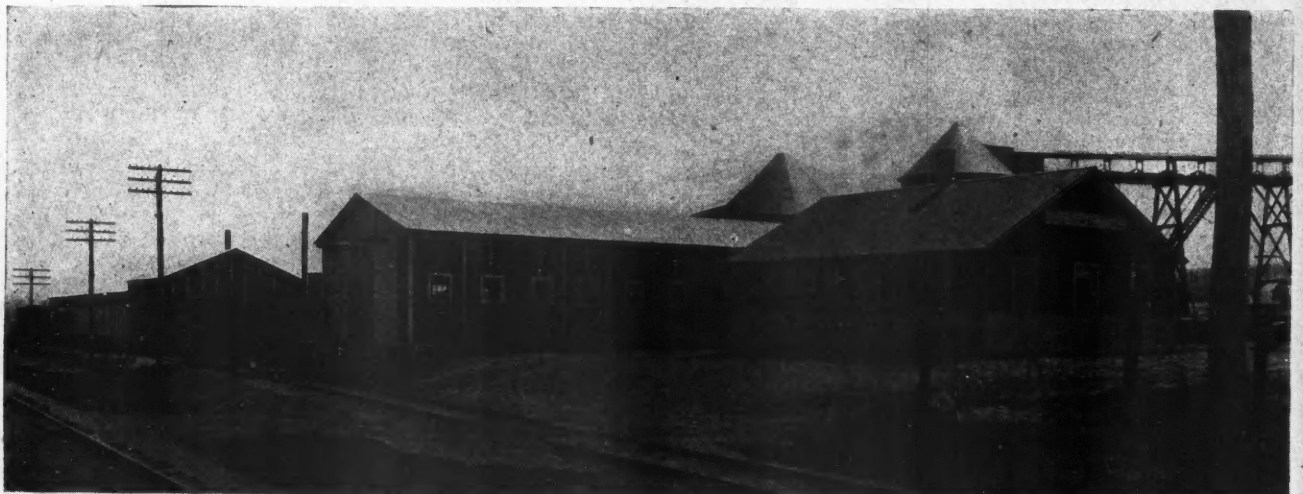


### Architects Encourage Small Homes

Encouragement of the building of small homes thruout the country is planned by the members of the American Institute of Architects. This activity is the result of a policy developed in the fifty-third annual convention of the Institute recently held in Washington, D. C.

Statistics presented to the convention showed that among 20,000,000 families in the 1910 census, only 5,000,000 owned their homes. Of the rest, 10,000,000 were tenants, and 5,000,000 belonged to the "floating population."

The Institute decided also to divide its membership into regions, whereas it has been heretofore been partitioned by



Unique Factory Built by Bestwall Co. at Akron, N. Y. They Used Their Wallboard for Roofs and Sides in All of the Buildings. It Is Near the Gypsum Quarry Where the Raw Material Is Obtained.





**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.  
 Philadelphia, Pa.

New York 33-35 Greene St.      Chicago 114 So. Clinton St.      Boston 165 Pearl St.



## Run Over 2½ Years —Never Laid Up

Messrs. Driscoll Bros. of Ithaca, New York, are in the building supplies business. Quick deliveries is one of the pillars upon which their successful business rests.

When they decided to purchase a truck some two and one-half years ago they surveyed the field carefully. The principle of "proved units—Acme Constructed" won them over to a two-ton Acme.

In the two and one-half years Driscoll Bros. have operated the truck, it has never been laid up for repairs. The Acme has thoroughly sustained the quick delivery reputation of this firm.

Acme Proved Construction is fulfilling the requirement of building operations in all parts of the country. We have some very interesting facts regarding Acme performance in this field. A recent independently conducted investigation has supplied us with data of vital importance to truck buyers and prospective truck buyers. Write for complete information.

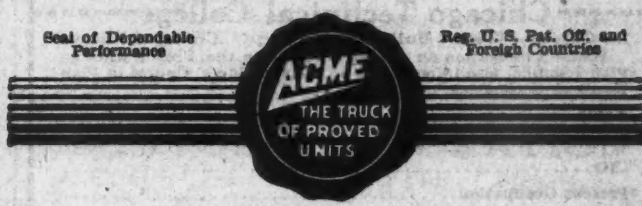
Built in 1, 1½, 2, 3½ and 5-ton models.

# ACME TRUCKS


**ACME MOTOR TRUCK COMPANY**  
 327 Mitchell Street      Cadillac, Mich.

Seal of Dependable Performance

Reg. U. S. Pat. Off. and Foreign Countries



## Strength and Simplicity

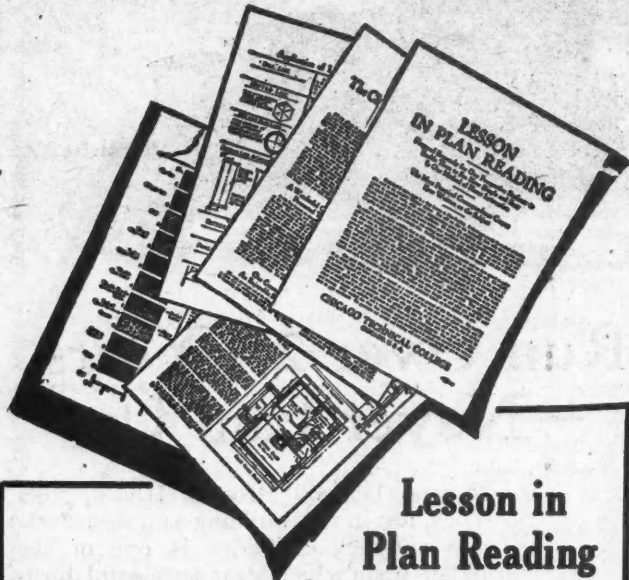


**ATLAS MIXERS**

are easy to operate and adjust. There are no unnecessary parts to get out of order and delay your work. They run smoothly and turn out a thoroughly mixed batch in a hurry. We make two styles of mixers in four sizes, suitable to all mixing needs. We will be glad to aid you in selecting the mixer best suited to your work.

*Write for our latest catalog today*

**ATLAS ENGINEERING COMPANY**  
 3009-3021 Lisbon Avenue, Milwaukee, Wisconsin



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Plan Reading

**FREE!**

Send now for this FREE lesson which we will send to prove how quickly you can learn Plan Reading by our new, easy method. Not a penny to pay for this lesson. Just ask for it. Without a good knowledge of plans your opportunities are limited. At work you don't get the chance to study blue prints or to have their meaning explained. We make the chance for you. We place in your hands plans used in actual construction by contractors in Chicago and other cities, and you get lessons by men in charge of building work who will help you at every step and make you an expert plan reader.

**Builders' Course  
On Easy Payments**

Our Builders' Course gets right down to the things you need to know. And you can get it on easy payments. A small first payment when you enroll—then payments monthly—so small you will never feel the cost. At least write and find out what this course really offers and how you can make more money by learning what we will teach you in a short time.

**Learn By Mail**

Use your spare time at home to learn how to be a better workman, a better foreman or a better contractor. Even after you complete the course you have the privilege of consulting us when you want suggestions. We will always be ready to help you.

**Some Things We Teach**

**Plan Reading** Use and meaning of all the lines. Plans and elevations. Reading dimensions. Detail Drawings. Laying out work from plans. Practice in reading plans from basement to roof, etc., etc.

**Construction** Brick work, stone work, carpentry, plans and specifications. Every detail explained for residences, office buildings, factory buildings, etc., etc.

**Estimating** Figures on every kind of building work fully explained. Labor and material. Problems worked out from plans. Practical builders' methods studied from plans and specifications of actual building of every kind.

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Get this information now. Learn how to make more out of your work or out of your business by knowing more about it. All this information is free. Send for Free Lesson and this information—now. Just send request on the coupon below.

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Without obligation on my part, send me the Free Lesson in Plan Reading, also information on your Builders' Course in Plan Reading, Estimating, etc.

Name.....  
Street.....  
City..... State.....  
Present Occupation.....

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

chapters. Its directors will be elected by regions, with each region a limited self-governing body.

Henry H. Kendall of Boston was elected president for the coming year, succeeding Thomas R. Kimball of Omaha. Charles A. Favrot of New Orleans was re-elected first vice-president; William V. Faville of San Francisco was chosen second vice-president; while William Stanley Parker of Boston was re-elected secretary, and D. Everett Waid of New York City was re-elected treasurer.



**Wholesale Lumbermen Name Officers**

J. H. Burton, of New York City, was elected president of the American Wholesale Lumber Association, which held a two-day session in Chicago recently, for the purpose of organizing under that new name. Ben S. Woodhead, Beaumont, Texas, was elected first vice-president; and C. W. Johnson, Seattle, Wash., second vice-president. L. R. Putman is the managing director of this association.



**Steel Concern Has New Sales Manager**

Mr. Allan Fraser has been appointed general sales manager of Wickwire Spencer Steel Corporation with headquarters in Worcester, Mass., where he will have charge of the sales of the output of the eight factories in Buffalo, Clinton, Palmer, Spencer and Worcester.

Mr. Fraser has been twenty-seven years in the wire business. He was associated with James A. Farrell, now president of the United States Steel Corporation and the American Steel & Wire Company prior to joining the Wickwire Steel Company when it extended its line of manufacture from pig iron to wire. Last fall, when the Wickwire Steel Company consolidated with Clinton-Wright Wire Company, forming the Wickwire Spencer Steel Corporation, Mr. Fraser became assistant general sales manager, from which position he has been appointed general sales manager.

The Clinton-Wright Wire Company was the result of the merger of Clinton Wire Cloth Company, Wright Wire Company, Spencer Wire Company, Morgan Spring Company and National Manufacturing Company.

Associated with him in the management of the sales will be John A. Denholm, sales manager of Wright Wire Company, and Charles K. Hardy, Jr., formerly of Spencer Wire Company.



**Sargent Company Elects Officers**

At the annual meeting of the stockholders of Sargent & Company the following directors were elected: H. B. Sargent, E. R. Sargent, J. D. Sargent, G. L. Sargent, John Sargent, Ziegler Sargent, Bruce Fenn, Wilfred Lewis, G. F. Wieport.

Following the stockholders' meeting, the following officers were elected: H. B. Sargent, president; G. L. Sargent, vice-president; Bruce Fenn, vice-president; Ziegler Sargent, treasurer; Murray Sargent, secretary; James J. Markham, auditor.



**A Correction**

On page 131 of the June AMERICAN BUILDER, the Romort Mfg. Co., Oakfield, Wis., sales department, the Zinke Co., 1327 Michigan Blvd., Chicago, Ill., presented an illustrated description of the Romort Air and Water Station for public garages.

In connection with this, reference should have been made to the articles and drawings, pages 99 to 101, which present a model gasoline filling station, and offer some good suggestions for the placing of this air and water service in connection with the other necessary equipment to make a filling station or public garage thoroly satisfactory and successful today.



# Trailmobile

Trade-Mark Reg. U. S. Patent Office

## Haul More at Lower Costs

**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., 4 ton, and 1 ton.

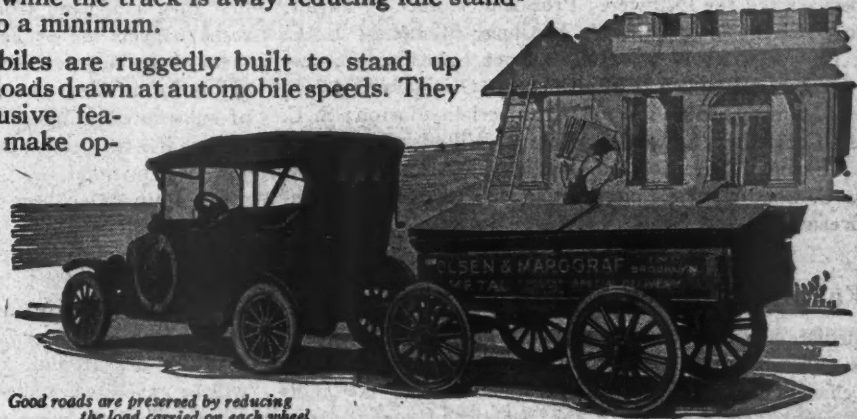
**DIVISION No. 2**  
Heavy-duty four-wheeled Trailmobiles for use with trucks: 1½ tons, one-way; 2 tons, 3¼-ton, and 5 tons reversible and one-way.

**DIVISION No. 3**  
Semi-Trailmobiles: 2½ tons, 4 tons, 6 tons and 10 tons.

**DIVISION No. 4**  
Pole Trailmobiles: 1½ ton, 3 ton, 5 ton, and 7 ton.

FOR the painter, the tinner, and the light contractor in every line a Trailmobile pulled by a passenger car provides a reliable and inexpensive means of getting tools, material and men to the job. Larger Trailmobiles used with motor trucks double truck capacity, double the effectiveness of the driver's work, and add only about 12½ per cent to operation and maintenance costs. They can be loaded while the truck is away reducing idle standing time to a minimum.

Trailmobiles are ruggedly built to stand up under full loads drawn at automobile speeds. They have exclusive features that make operation faster and more convenient.

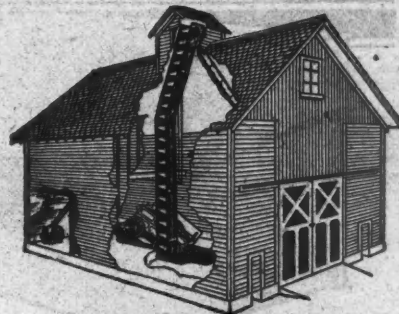


Good roads are preserved by reducing the load carried on each wheel

Write for all the facts

**The Trailmobile Company**  
2915 Robertson Ave. Oakley  
Cincinnati, O.

## FREE BLUE PRINTS



### CHEAPEST TO BUY LIGHTEST RUNNING STRONGEST BUILT

Write today for FREE CRIB PLANS and Illustrated Catalog of

## MORTON ROLLER CHAIN ELEVATOR

It has no equal at any price. It is the strongest, lightest running, simplest in construction. Special Morton Roller Chain has breaking strain of 16,000 pounds. It rolls—no friction.

No shelling of corn—no clogging—cannot overload. Capacity 20 to 30 bu. per minute. Install a MORTON and 20 years from now it will still give you real service. Satisfaction guaranteed. Write today for FREE Blue Prints and Catalog.

**MORTON CORPORATION**  
A. F. Meyer, Pres. 801 Meyer Bldg. Morton, Ill.

## A PERFECT KEY AND A PERMANENT ONE

A PERFECT KEY is as essential to a good stucco finish as the mortar itself—and a permanent key is produced only with a weather resisting fabric—

## Roebling Wire Lath

(Galvanized after Weaving)

will produce both these results. |

Write for Booklet. Made Only by

**The New Jersey Wire Cloth Co.**

Principal Office

614 South Broad Street Trenton, N. J.

Offices and Stores

Philadelphia: 223-27 Arch St. Boston: 93-95 Pearl St.  
New York: 210 Fulton St., near Hudson Terminal

### Wayvell Chappell Company Moves

Because of a constantly increasing business, the Wayvell Chappell Co., Chicago, Ill., manufacturers of electric floor surfacing machinery, have bought a new plant in Waukegan, Ill., and are now located at 137-139 North Jackson Street, that city.



### Against Changes in Grading Lumber

With a view to keeping lumber prices from climbing still higher, the National Hardwood Lumber Association, in closing its annual meeting at Chicago, put thru a resolution against any changes in inspection rules or the grading of lumber during 1920. The 350 members held that the producers are receiving a fair price for their output, while if gradings were altered prices would automatically advance and give another boost to high cost of living.

Officers elected for 1920 were: President, Horace F. Taylor, Buffalo; vice-presidents, J. W. McClure, Memphis; B. C. Curry, Philadelphia; W. C. Hull, Tupper Lake, N. Y.; secretary-treasurer, Frank F. Fish, Chicago. Directors: Edward Buckley, Manistee, Mich.; W. E. Chamberlain, Boston; S. C. Mengel, Louisville; Edward J. Young, Willetts, La.; J. C. West, Cincinnati; Charles A. Goodman, Marionette, Wis.; George C. Goodfellow, Montreal, Canada; Charles H. Barnaby, Greencastle, Ind.



### Favor Standardization of Lumber

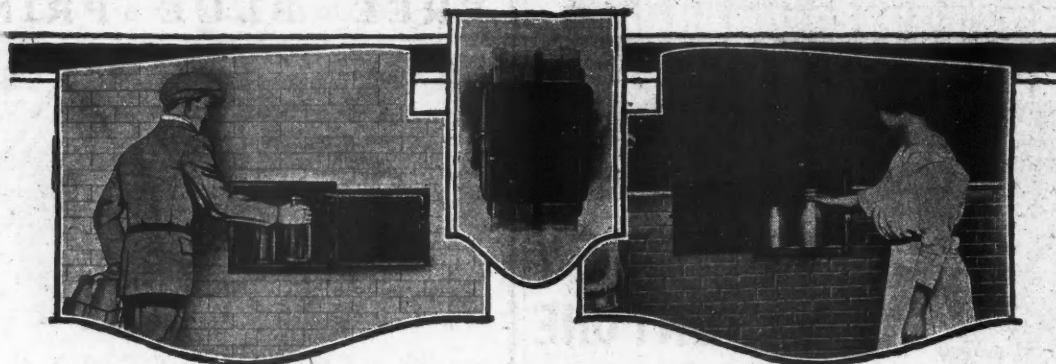
Immediate and concerted action in the adoption of standard grades and sizes of lumber, as a means of bringing about more efficient distribution of the products of the saw mills of the country, is the plan of the *American Lumber Association*.

In a letter to Professor C. E. Paul, head of the Engineering Bureau of the National Lumber Manufacturers' Association, L. R. Putman, directing manager of the new wholesaler's organization, emphasizes the necessity for standardization and invites the co-operation of the manufacturers in an intensive campaign, the purpose of which is to convince the producers of the demand for uniformity of forest products by all consumers, as well as engineers, architects, and building contractors.

"The wholesalers of lumber realize the importance of standardization," said Mr. Putman. "The big mills, as well as the smaller manufacturers, are slow to act in a movement which means a change in established methods, and the creation of a demand is the only way to bring about such a change. In some of the foreign countries they have standard grades and sizes. This is true in England. It is also true in France. Any movement for standardization in this country must come first thru a demand from the users of the products. In my recent travels the wholesalers have convinced me that today there is an urgent demand, and that delay in the adoption of uniform sizes and grades is aiding the manufacturers of substitutes. The brick manufacturers, the steel manufacturers, and the cement manufacturers have adopted standards for their material."

Mr. Putman has been in consultation with Waddy B. Wood, of Washington, D. C., former president of the Washington Chapter, American Institute of Architects, and Franklin T. Miller, of New York, president of the F. W. Dodge Co., and others who are urging the necessity of action on the part of the lumbermen.

Within a short time a special committee on standardization will be appointed, and no time will be lost by the wholesalers in an effort to bring about results. It is the intention of every wholesaler affiliated with the American Wholesale



## Receives Your Milk, Groceries, Small Parcels

Here is a silent, automatic servant that both receives and guards milk or packages. It is the Majestic Milk and Package Receiver.

With a Majestic Milk and Package Receiver in your home the delivery man need not leave your packages on the porch. He need not come into your kitchen. Instead, he places his deliveries in the receiver, closes the door, and your packages are protected against theft or destruction by weather or animals.

Consists of a metal box with doors on opposite sides. The outside door locks automatically when closed by the delivery man. The inside door can only be unlocked from within.

Write for our catalog showing this household convenience, also, Majestic Coal Chutes, Built-in and Underground Garbage Receivers.

**THE MAJESTIC COMPANY**  
1402 Erie Street  
Huntington, Indiana

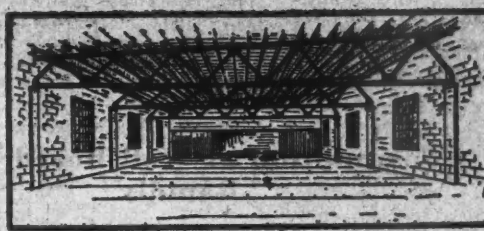
# *Majestic* Milk and Package Receiver



# MODERN GARAGES



GARAGE—ROUND LAKE, ILL.



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Write for One of Our "Garage Illustrations," Showing at Least 50 Modern Buildings Designed By Us  
**STRUCTURAL STEEL—MODERN STORE FRONTS—FIREPROOF BUILDINGS**

**STEEL WINDOWS—FIRE ESCAPES—WIRE PRODUCTS—STEEL BRIDGES—ELEVATORS—STEEL  
 CEILINGS—SKYLIGHTS AND CORNICES—MILLWORK AND GLASS—ROOFING**

## "INTERNATIONAL SERVICE"

Means immediate shipment of your orders from one of the largest stocks of steel in the world  
 Plants operate 24 hrs. per day

## INTERNATIONAL STEEL & IRON CO., Inc.

Address Dept. 18

**EVANSVILLE, IND.**

OPERATING

INTERNATIONAL STORE FRONT CO.—INTERNATIONAL WOODWORKING CO.  
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WE OPERATE

STEEL PLANTS—SHEET METAL PLANTS—WOODWORKING PLANTS

INTERIOR VIEW OF STRUCTURAL STEEL PLANT—  
 EVANSVILLE, INDIANA



Kewanee Chute Open  
 Seen from the Cellar

## More Building

Isn't waiting on low prices nearly so much  
 as on a good money's worth. And builders  
 can easily show and prove good money's  
 worth in



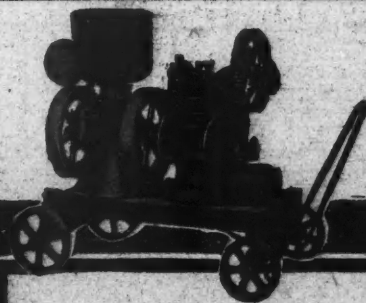
**KEWANEE**  
 ALL STEEL—GUARANTEED  
**COAL CHUTE**

### GUARANTEED

for five years against breakage. No cast  
 iron, no glass. Thousands in use—not one  
 complaint.

Fool proof—simple and convenient.  
 Burglar-proof—positive automatic lock.  
 Write for dealer proposition now.

**KEWANEE MANUFACTURING CO.**  
 410 N. Tremont Street      Kewanee, Illinois



*Reliable  
 Power Means  
 Efficient  
 Production*

Pumping outfits, hoisting outfits, air compressors, ex-  
 cavators, etc., render service only in proportion to the  
 dependability of their power plant.

It is for this reason that so many contractors specify  
 Ideal Equipment. Ideal Engines are noted for their  
 rugged strength and simple construction. They deliver  
 the steady week in and week out service that means  
 efficient production and better profits.

The Ideal catalog shows a complete line of Ideal  
 Engines and Ideal Equipment in various types and  
 sizes. Free copy gladly mailed on request.

## IDEAL ENGINE COMPANY

R. E. OLDS, Chairman

630 E. Kalamazoo Street      LANSING, MICHIGAN

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# IDEAL POWER

Lumber Association to preach the gospel of the necessity for uniform grades and sizes to every manufacturer of lumber in the country. The American Railway Engineering Association, the Western Society of Engineers, and the American Institute of Architects, already have made urgent requests for standardization.



### Consumption of Wall Board Grows Rapidly

**P**RODUCTION and consumption of wall board have increased rapidly during the last few years. Old companies have increased their production immensely, while during the last year a new company was formed and now is in operation.

The war found many new uses for wall board, or, rather, it was more generally used in new construction than ever before. For many years wall board was considered a material well suited to repair jobs, such as in partitions that had outlived their usefulness, for walls in attic rooms, and other such work. During the last year at least 25 per cent, it is estimated, went into new construction for walls, partitions, as insulating material and even as a base for hardwood floors.

Wall board has risen in cost less than almost any other building material. Its present price is only about 30 per cent above pre-war cost, which, coupled with the saving in labor that can be made by its use, makes wall board an economical material to build with.

Wall board manufacturers already have sold practically their entire output for the year, but several of them are building new mills in anticipation of a still further increase in demand.

### Simplicity in Window Displays

**T**HE shop window is said to be the merchant's best salesman. It used to be the practice to crowd the windows with a heterogeneous collection of merchandise, more or less attractively displayed. This is the practice yet in the cheaper stores.

The more pretentious stores are paying more and more attention to elegance and simplicity in their window displays. The ladies' cloak and suit stores will show six or eight suits or dresses in a large bulk window; a millinery shop will display six or eight hats of different shapes all having the same color scheme; a tailor will display four or five suit patterns. The thought now is to concentrate the possible buyer's attention on one article.

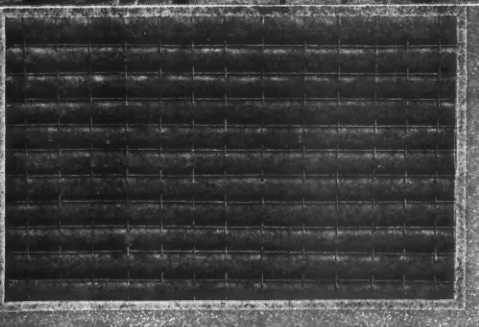
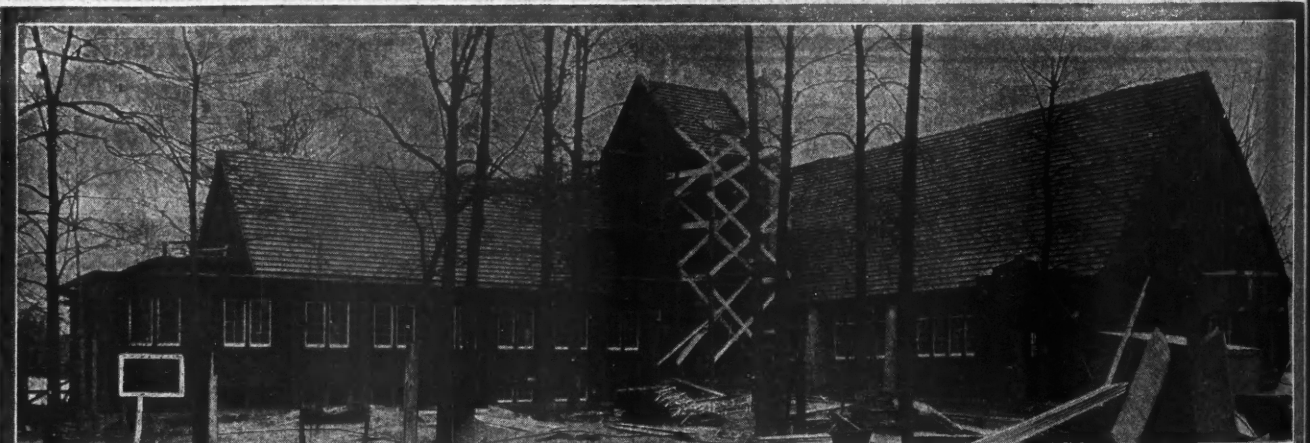
This new idea calls for a window background and floor altogether different from those seen in the old style windows. Parquetry flooring is the rule. The back walls are generally paneled in hard woods treated with penetrating stain and wax finish to bring out all the beautiful effects of the grain of the wood.

Some backgrounds are richly painted in flat or gloss colors, or enameled in white or colored enamels. A gray gloss enamel with blue stripe trim and decorated with moldings, raised figures and medallions in blue and gray or blue and white makes a particularly attractive and elegant window in which to display dainty articles of women's wear.

Of course, it is advisable to keep in mind the class of goods to be displayed and then select a window background that will harmonize with them.



**N**O man was ever an anarchist or participated in the destruction of property which he owned or in which he had interest.



STUCCO IS APPLIED TO E-COD FABRIC

*St. Matthews Episcopal Church,  
Evanston, Illinois*

*E. Norman Brydges, Chicago, Architect*



## Stucco on E-Cod Fabric

gave this new church a reinforced outer wall, weather-proof, water-proof, fire-retardant. It materially reduced building cost because E-Cod Fabric is cheaper in first price and saves plaster and plasterers' time. E-Cod Fabric is the cheapest, durable plastering base on the market today.

*Catalogue and complete data will be sent on application.*

**MacAdams & Call**

Conway Building,

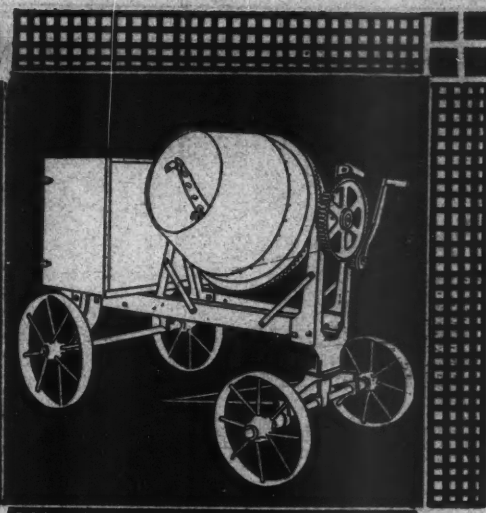
CHICAGO



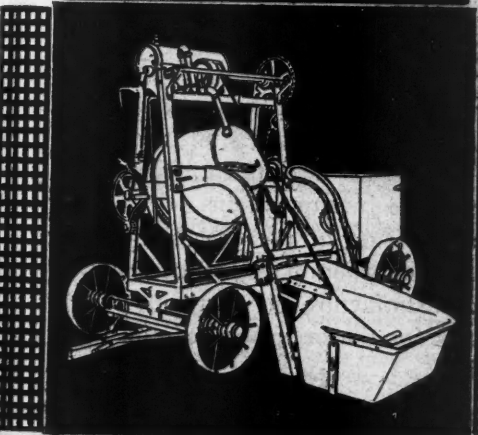
### BOOST YOUR OUTPUT

Stewart Mixers are fast workers—fast and thorough. They mix more quickly—they charge and discharge more quickly—they enable you to put through more work per day and to complete more contracts per season. Write for our free catalog and we will show you just how they do it.

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### CUT YOUR COSTS

Stewart Mixers are remarkable for a uniformly low repair cost—and for a low cost of operation. They save labor in charging and discharging. And they save time on every job. All of which means that they save money. Stewart Mixers are built in several models—and one of them is exactly suited to your requirements. Write today for prices and detailed information.

Stewart Manufacturing Co.  
157 Rath St. Waterloo, Iowa

## WALTER'S & COOPER'S METAL SHINGLES

*The Shingles That Last*

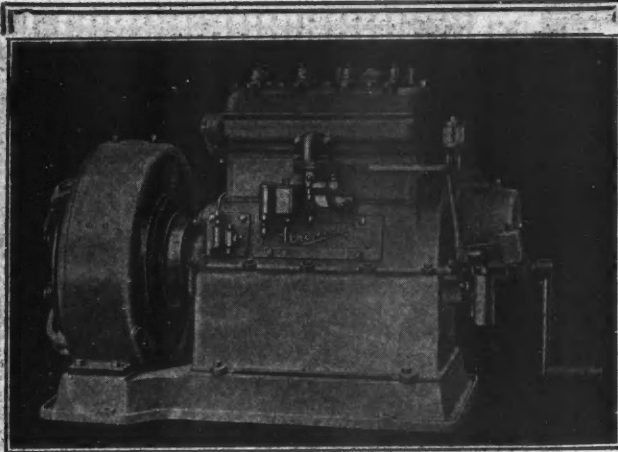


*The Shingles That Last*

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.** 389-345 GRAND STREET JERSEY CITY, N. J.



*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, WISCONSIN

#### American Standardized Houses in France

AMERICAN standardized building methods, have been introduced into France. No less than a thousand standardized homes, built according to American specifications, have been completed in the region of Clermont, and are now occupied. While the neighboring village in Varennes, in which not a house was left standing after the terrific bombardment of German artillery, has been entirely rebuilt and repopulated.

This section of France's devastated area where this American type of construction has been adopted is a year ahead of any other locality in the process of reconstruction.

The buildings—churches, schools, town halls and dwellings—are all frame structures with tile roofs. All partitions, floors, sidings and roofings are interchangeable and composed of standardized units throughout. The homes are so designed that in case of need they can easily be converted from one-room cottages into two, three and even four-room bungalows.

These houses are built according to the specifications of two American architects, Mr. Harold Coke and Mr. Thomas True, of Philadelphia. Materials for the construction of the homes were furnished by the French government, but the actual making of the units and construction of the cottages and bungalows has been done by the relief workers of the Society of Friends Unit of the American Red Cross, helped, in some cases, by local volunteers.

Two factories for turning out the standardized material are operated by the members of this unit, one at Ornana, in the Doubs department, another at the village of Dole, in the Jura mountains.

Under the supervision of the designing architects, the workers, many of whom have had carpentry experience at home, manufacture the parts and then erect the homes, ready for the occupancy of the returning refugee families.

#### Chicago Launches New Housing Plan

ONE of the striking features of the latest housing plan launched in Chicago and backed by more than thirty large concerns in the central manufacturing district is that the homes will be sold to individuals so that the purchaser will at once become not only a home owner but also a landlord, for he will have for rent an extra apartment. Under the name "Home Building Real Estate Improvement Company," these concerns have subscribed to a \$125,000 revolving fund which will be immediately employed in the construction of the first 100 two-flat buildings. Options have been secured on 125 lots; construction will soon begin.

The buildings will be fireproof, of brick, trimmed with terra cotta. It is planned to sell the homes practically at cost and on easy terms. The estimated cost of the homes is around \$7,500. Construction of the homes will include sodding of yards, planting of trees and shrubs and building of fences.



# Edwards' Metal Shingles



Will  
Outlast  
Your  
Building

**ROT-PROOF—FIRE-PROOF—LIGHTNING-PROOF**

We want a good, live man to represent us in each locality—to push our surpassing line of Metal Shingles and other up-to-the-minute metal roofings. Maybe you are the very man to take hold of.

## Edwards' Metal Shingles

*In Ten Popular Patterns*

Edwards' Metal Shingles are attractive, durable, water, wind and fire-proof. There's a design to suit every taste. They are easily laid; the only tools needed being hammer and nails. And the patent Interlocking Device provides automatically for expansion and contraction.



**The Edwards Mfg. Co.**  
401-417 Eggleston Ave. 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. 2

# Save the Wages of 3 Men

## A boy can do it with the Hafa-Hors Brick Cleaner

**T**HE "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.

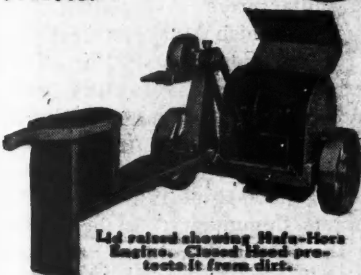


Does the work of 4 men

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 lid protects it from dirt.

**ELGIN GAS MOTOR COMPANY** 60 River Street ELGIN, ILL.



## The "Finishing Touch" That Charms the Ladies and Captivates the Men

Even suppose you can't get plate glass, or shrink at its awful cost, when it is available—

# Athey Perennial

Accordion Pleated Window Shades

will give a "Fifth Avenue Class" to any residence or apartment building, which will make the prospective purchaser or renter forget the wrinkles in the sheet glass.

And when the present sellers' market changes to a buyers' market, the building with *Athey* Shades will be the first to find "takers."

At first glance, either from inside or outside, they give the effect of fine Venetian Blinds, costly drapery or puff shades.

Yet their ultimate cost, measured by years of service, is considerably less than that of the cheapest, flimsiest spring-roller shades.

Buyers and renters appreciate these shades. They can secure air and light, combined with privacy, in a way impossible with the suspended roller shades.

Up from the Bottom—Down from the Top  
Either or Both—By the pull of cords.

Shades are made from first quality, herringbone weave coutil cloth, calendered to a smooth dust-resisting finish which can be dusted off with a cloth or dry-cleaned.

This cloth is an attractive translucent ecru, it admits a cheerful light to the room, even when shades are fully drawn.

Shade is strung on tight piano wires on either side; raising from the bottom and lowering from the top is done by pulling cords at the sides; which open or close the accordion pleats. Pulling *both* cords bunches the folded shade in any position desired.

A complete equipment of *Athey Perennial* Accordion-pleated Shades is inexpensive compared with the annual dividends it pays.

Send for free sample

**ATHEY COMPANY**

6037 W. 65th St.

Chicago



## Guard Your Reputation

**Y**OUR reputation for excellent workmanship is measured by the quality of your work, the material used and the ability of the finished job to hold in the greatest degree and for the longest time the values which characterized its particular worth when first completed.

It is to your interest that this job be one to which you can point with pride—one which will serve as a live testimonial bringing additional business.

*Beware of the higher cost of lower price.* When screening secure the most economical by specifying the longest lasting and the most beautiful. Beware of materials that do not measure up to your good work. In other words—specify PEARL Wire Cloth.

Beware of imitations by looking for the two Copper wires in the selvage and our round tag on every roll of Genuine Pearl Wire Cloth.



**ASK FOR  
OUR PORCH PLAN  
IT'S FREE**

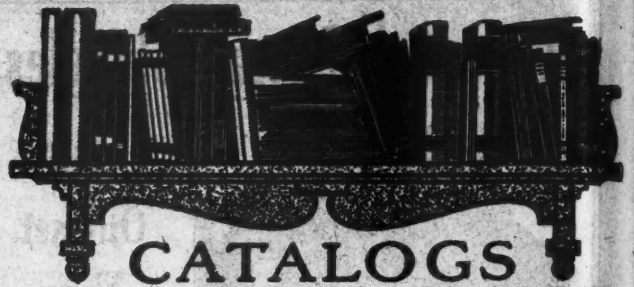
*Call on our local dealer or write direct for samples and literature if you're interested in screen material*

Address Dept. "A"

**The Gilbert & Bennett Mfg. Co.**

New York    Georgetown, Conn.    Chicago    Kansas City

G & B "PEARL" is made in two weights—regular and extra heavy. The best hardware dealer in your city sells "PEARL"



## CATALOGS BULLETINS & BOOKS RECEIVED

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

"Brick for the Average Man's Home" is the title of the latest book published by the Common Brick Manufacturers' Association of America, Schofield Bldg., Cleveland. It is a book of plans of attractive small brick houses and is designed to help the average man build a brick home at an economical cost.

"Patterson Hot Water Service Heaters," is the subject of a new catalog published by the Patterson-Kelley Co., New York City, N. Y. It contains illustrations, statistics and working diagrams of the hot water heater manufactured by that company. The same firm has issued a booklet on "The Utilization of Waste Steam," and the "Kelley Grease Extractor."

"Improving Cement Products and Watertight Concrete," are the subjects discussed in Bulletins 301-302, recently issued by the National Lime Association, Washington, D. C. They deal with the relation of hydrated lime to the development of cement products.

"Neponset Black Waterproof Building Paper," its application and uses, are discussed in a small pamphlet issued by Bird & Son, Inc., East Walpole, Mass.

"A Standard Building Code," to be used in connection with hollow tile construction, has been published by the Hollow Building Tile Association, Chicago, Ill. It is designed to provide for the use of hollow building tile as a structural material in various kinds of construction.

"Breast Drills," is the title of a new booklet issued by the Goodell-Pratt Co., Greenfield, Mass. It gives in detail the list of breast drills manufactured by that concern with illustrations and prices.

"The Thinker—Who Turned Work Into Play," is the title of an attractive little booklet published as a tribute to Wm. H. Voss, president of Voss Bros. Mfg. Co., Davenport, Iowa. It relates in detail his start in the washing machine business, his first invention and subsequent improvements. The latter part of the booklet contains a description of the latest models of washing machines manufactured by the Voss company.

"Paints for Your Home," by Henry A. Gardner, is the subject of a bulletin recently issued by the educational bureau of the Paint Manufacturers' Association of the United States and National Varnish Manufacturers' Association, Philadelphia. It is a compact and clear explanation of the properties of paint, kind of colors, general application, and gives definite information on the kinds to be used on metal, stucco, etc., wood, in the interior or exterior, or any other place where it will help preserve material and improve the general appearance.

"Mooseheart—A Concrete Community," is the title of a pamphlet published by the Portland Cement Association, 111 W. Washington St., Chicago, dealing with the unique industrial and educational community established by the



## You Are the Logical Man to Sell Lightning Rods.

When a man is laying out a considerable sum for repairs or a new building, he is more willing to spend a few extra dollars for lightning protection than he would be to spend the money later as a separate purchase.

He's coming to you for the big expenditure, he trusts your judgment and will listen to you when you recommend

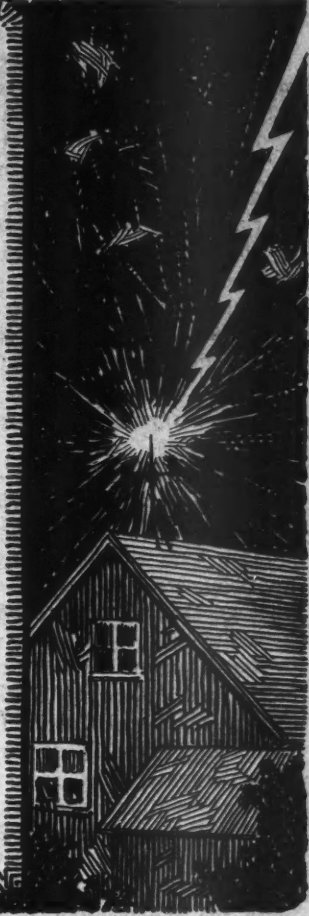
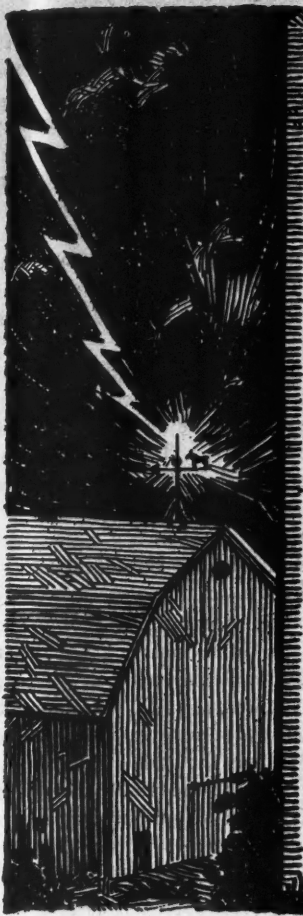
### SECURITY WATER GROUND LIGHTNING CONDUCTORS

The only lightning rod in the world that's grounded in a tube of water. The ground rod has the moisture necessary for high conductivity. That's why the Security never fails to draw the fangs from the thunderbolt.

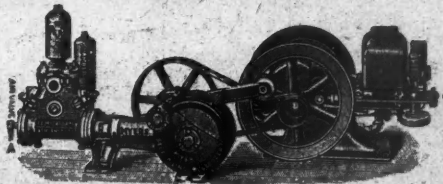
The cable is made from 99.8% pure copper, acid-free and having high conductivity. It is loosely woven to present large surface without adding weight and cost—a special Security feature.

*Write for our interesting proposition. Learn how much extra money you can make selling Security, the scientifically correct lightning rod.*

**The Security Lightning Rod Co.**  
505 Pine Street, Burlington, Wis.



## MYERS SELF-OILING POWER PUMPS



Modern in every detail and designed for economical and efficient pumping service—

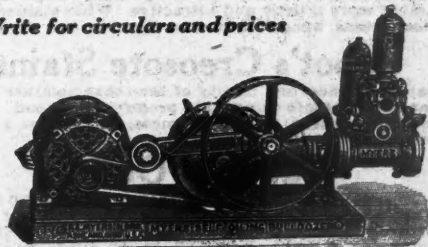
Are self-oiling, have covered working parts, extra large valves and improved method of power application—

Will elevate water, force it against pressure, or pump it any reasonable distance—

Just as practical for pumping gasoline, kerosene, lubricating or other oils—

Operation by any power. Different styles and sizes meet depth and capacity requirements—

*Write for circulars and prices*



**F. E. MYERS & BRO.** ASHLAND, OHIO  
ASHLAND PUMP AND HAY TOOL WORKS

QUICK ACTING *The Taylor* SELF LOCKING

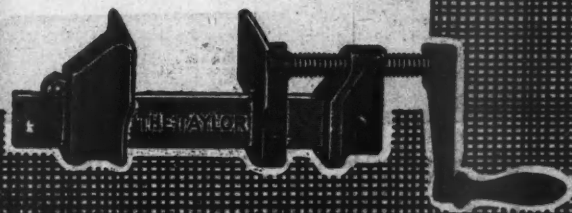
## Clamps

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.



Loyal Order of the Moose at Mooseheart, Ill. In the booklet are several attractive pictures of the buildings which are all built of concrete block. Concrete men throughout the country have been interested in this development and will find the book contains some valuable information.

"A New Electrician's Handbook" has just come from the press of the Norman W. Henley Publishing Co., New York. This reference book has been prepared by T. O'Connor Sloane and sells at \$4.00 retail. It is a condensed electrical encyclopedia, intended for use as a reference book by electrical engineers.

Coburn No-Trac Hangers are described and illustrated in Catalog No. 800, issued by the Coburn Trolley Track Mfg. Co., Holyoke, Mass. It also contains diagrams illustrating carrying track systems for movement of heavy loads.

"Magnestone Products" is the title of a new booklet published by the American Magnestone Corporation, Springfield, Ill. It includes several color photographs of houses built of the magnestone stucco manufactured by that concern, as well as descriptive matter dealing with the preparation of the product and its various uses in construction and decorative work.

Barn equipment of all kinds is described and listed in the new General Catalog No. 50, just published by the Loudon Machinery Co., Fairfield, Iowa. It takes up in detail hay unloading tools, dairy barn equipment, garage and barn door hangers, litter, feed, merchandise, and milk carriers, cupolas, ventilators, drains, and hardware specialties.

"Everlasting Concrete Barns," is the feature article in the latest issue of Alpha Aids, the magazine published by the Alpha Portland Cement Co., Easton, Pa. It deals with the construction of a modern dairy barn, especially the floor, and is illustrated by photographs and architectural drawings. The magazine also contains an article on

"Concrete for the Horticulturist," by H. Colin Campbell of the Portland Cement Association. A pamphlet on "Steps That Stay," with a series of picture of attractive concrete entrances and steps, has also been published by the Alpha company.

"The Wooden Architecture of the Lower Delaware Valley," is the title of No. 3 of the White Pine Series of architectural monographs prepared and published by the White Pine Bureau, St. Paul, Minn. It contains some excellent photographs of old eastern homes that were built of white pine more than a hundred years ago, and a short historical account of each.

"The Modern Home," is a booklet just published by the National Electric Light Association for circulation by dealers in electrical appliances. A space has been set aside for the imprint of the dealer's name. This booklet contains an account with sketches of the modern home equipped with the latest electrical labor-saving devices.



### Consumption of Forest Products in Texas

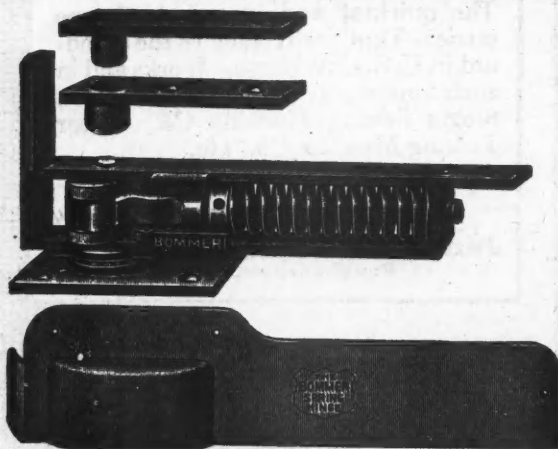
After house construction the most important user of forest products in Texas is the oil industry, according to a table just issued by the State Department of Forestry and the Texas Forestry Association. For dwellings the annual consumption of forest products in this state is estimated at 325,000,000 feet; for the oil industry it is 315,000,000 feet. There are said to be 13,000 producing wells in Texas and about 30,000 feet of lumber are required for each well.

Farm improvements, including all barns, sheds, etc., except residences, consume about 210,000,000 feet. According to the census there are about 8,000 new farms each year. Repairs on the present farms, 50,000 in number, will amount to about 110,000,000 feet.

# 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. Herl, 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 gummied paper substitutes, and they are cheaper, last longer and are incomparably more artistic and attractive. When stained with the soft, moss-green, bungalow-brown, tile-reds and silver-grays of

### Cabot's Creosote Stains

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