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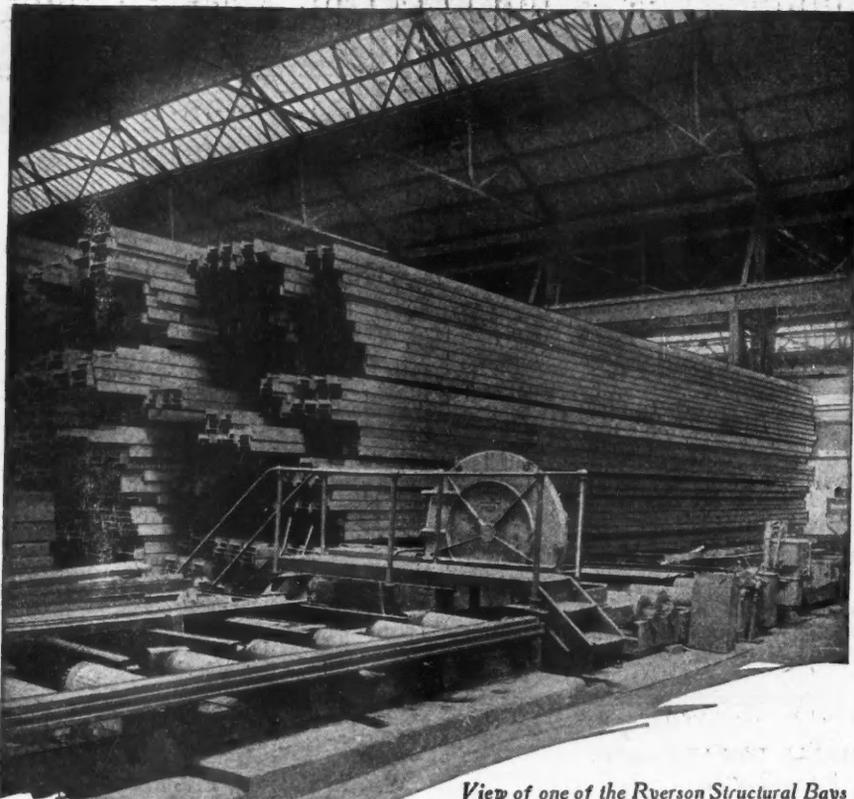
VOL. 30

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No. 2

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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.

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# Short Talks by the Editor



## They Don't Mean Anything

STATISTICS are very valuable if they are inclusive and complete, but when they do not tell the entire story, they are useless and a waste of time. Too often statistics in the building industry have this fault—too often in compiling the records of building activity, too much emphasis is laid on certain localities, such as the large cities.

Were the entire truth told, the activity in the large cities forms only a small part of the building activity of the country at large. This is definitely shown in a recent news letter from Col. W. B. Greeley, for-ester. It is certainly worth the attention of all builders and lumber dealers.

"Agriculture is the greatest wood using industry in the United States," said Mr. Greeley. "Forty-six per cent of all the wood used in the country annually is used on the farms. The yearly lumber bill for farm structures and improvements aggregates 6,750,000,000 board feet."

Yet this enormous part of building activity is often ignored in building records. If the work is slack in the large cities it is taken for granted that a similar condition prevails in the country which is entirely an erroneous conclusion. Rural building is not subject to the same conditions, the same laws of supply and demand, or industrial relationship. This year farm crops are one of the greatest on record. That means there must be ample storage facilities, new barns to house record-breaking herds of dairy cattle, hogs and other meat animals.

The farmer has a housing proposition, but it is slightly different than that facing the cities. He has to provide housing for his cows, hogs and grain, and being prosperous he will not wait, he cannot afford to wait, to build. That is why building in the rural communities must be considered in the reports.



## Never Too Many Homes

"HOME never appealed to me so strongly as it has since the exigency of my private fortune, which is so small as almost to deserve the name of misfortune, has compelled my residence in a hotel while in the city of Washington. On all sides here I see big hotels, fine apartment houses, grand palaces, but none too many homes. I begin to appreciate

Ollie James' statement that he would gladly lay down his life for the preservation of his home, but that he would not shed one drop of blood in defense of a boarding house.

"The English-speaking people may not long survive if the home disappears—and the home is not outward appearance but an inward feeling."—VICE-PRESIDENT THOS. P. MARSHALL.



## Stimulating Home-Building

1. Exemption of interest of all real estate mortgages from the state income tax.
2. Legislative action whereby Congress will be asked to exempt such mortgages from the Federal income tax.
3. Exemption of all new housing construction from local taxation for several years.
4. A law forbidding the remodeling of housing structures into non-essential structures for a limited period.
5. Exemption of income from bonds of the State Land Bank, by both state and Federal governments, and the purchase of these bonds with surplus state moneys.

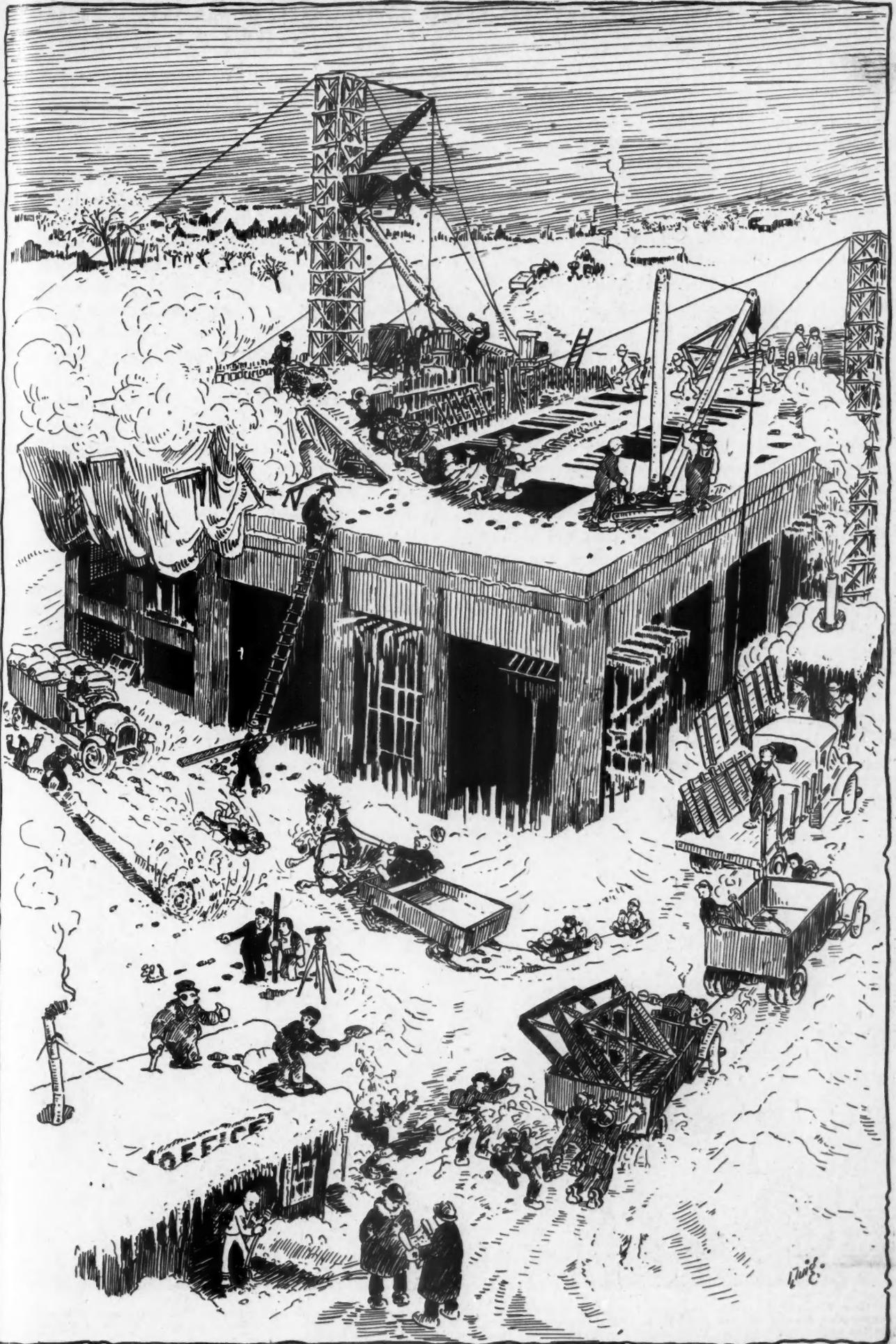
THUS the state of New York opens its campaign to solve the housing problem which is growing desperate in that state. These measures were proposed for the approval of the Senate Committee on Housing. Thru them the leading men of that state hope to deflect to home building some of the money that is being poured in endless stream for the financing of industrial projects, theaters, and other propositions that are willing to pay a premium for money.

As long as municipal securities yield a high rate of interest and are exempt from federal taxation while real estate loans yield only 6 per cent as a maximum and are subject to tax, it is natural that the bulk of money will be used in the way most satisfactory to the man with the money. There are \$14,000,000,000, according to Senator Calder, chairman of the committee, invested in tax exempt securities at the present time, or two and one-half times the amount invested previous to the war. In order to compete with this investment, real estate must require a gross return of 24 per cent.

It seems very likely that within the next few months many states will enact legislation that will help alleviate present housing conditions. The seriousness of the situation has finally been recognized by the powers that be and definite action is not far off.



# Winter, But "Business as Usual"



CARTOON BY ED. QUIGLEY

## Cold Weather Construction is Modern Achievement

WAR-TIME BUILDING OPERATIONS CARRIED ON THRU RIGORS OF NORTHERN WINTER, DEMONSTRATED FEASIBILITY OF 12-MONTHS-A-YEAR CONCRETING FOR PEACE TIME CONSTRUCTION

By A. J. R. Curtis

**T**HE present season has been accompanied by so many unusual obstacles to building that numerous large operations, which should have reached completion before cold weather, are fated to continue far into the winter. A surprisingly large number of instances also have been reported in which new operations are being started in October and November, for completion several months earlier than would be possible were building postponed until the spring.

### Cold Weather Concreting Reduced to a Science

Cold weather concreting has become a part of the regular operating routine of such well-known contracting concerns as Alberthaw Construction Company of Boston, Turner Construction Company of New York and R. C. Wiebolt of Chicago, while many others, including the engineering departments of the leading railroads, prepare each fall to do whatever winter concreting is necessary to complete the season's construction schedule.

Methods and equipment for placing and protecting concrete during freezing temperatures are rapidly becoming standardized to a point where the cost involved may be calculated with some degree of accuracy, and the time required for the work determined as closely as necessary for practical purposes. The greatest discouragement to concrete work during freezing weather is not, as some may suppose, in the expense and trouble of heating materials and protecting finished work; it is usually found in time of men wasted in "warming up" and in removing the encumbrances of

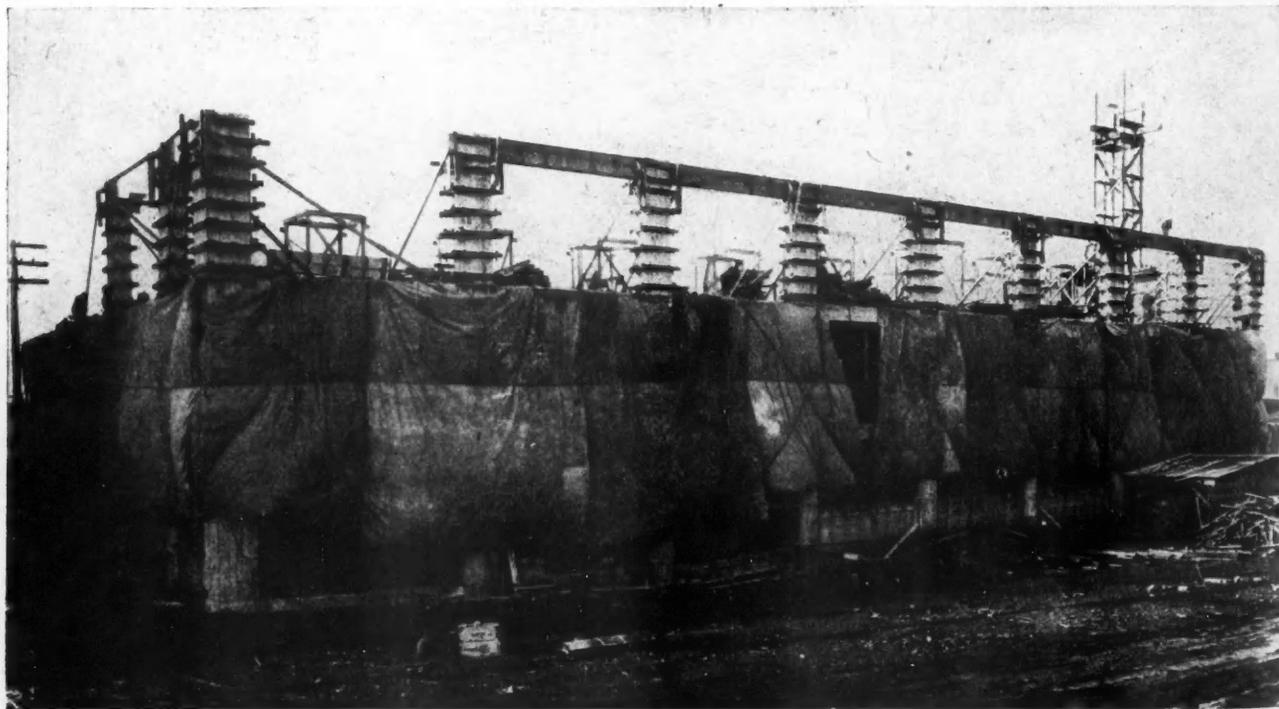
snow and ice which may cover materials, roads and paths, and the work.

### The Materials

Sand and pebbles for cold weather concreting have to be obtained from the pits before the pits freeze up. Gravel pits cannot be economically operated under freezing conditions. A first requisite for the work is an adequate supply of aggregates for the entire operation, delivered on the site. The better the protection of this aggregate against the weather the easier it will be to thaw it out and heat it for use. Cement must be kept in an absolutely weather-proof building, preferably at moderate temperature.

At temperatures of 45 degrees and below, the mixing water should be heated to at least 150 degrees and preferably to the boiling point. The introduction of hot water will serve to heat up the materials in the mixer, hastening hardening. At 45 degrees preparations should be made to heat the aggregates, to provide against sudden drops which might go below freezing. It is generally considered economical to heat these materials at temperatures of 45 degrees, as a precaution, also bearing in mind the fact that heat provided to the mixture at 40 degrees or thereabouts is of great assistance in hastening the hardening.

The materials and heaters should be placed as close to the mixing plant as possible and the latter located for quick delivery of the warm concrete. Sufficient heat should be applied to the aggregates and mixing water (and to the mixer drum, if necessary) so that

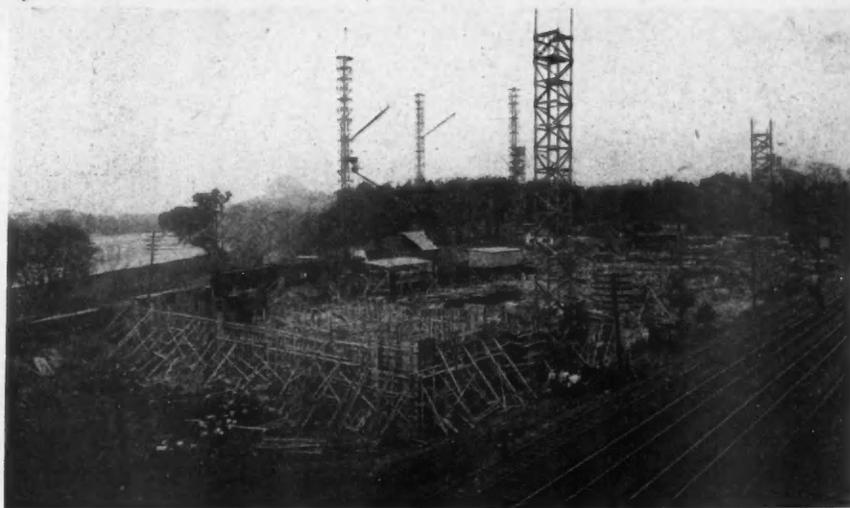


New Three-Story Office and Manufacturing Building for the International Text Book Co., Scranton, Pa., Built Last Winter by the Turner Construction Co. of New York. This Illustration, Which Was Taken on December 10, 1919, Shows the Effective Use of Tarpaulins to Protect Concrete Portions of the Work. Heat Was Furnished by Coke Stoves.

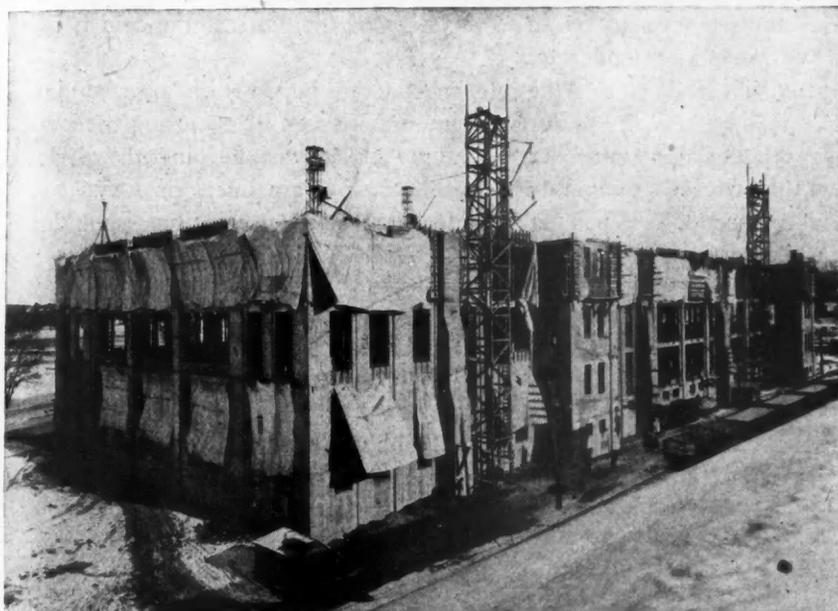
the concrete will be deposited at 70 degrees or higher. It is seldom found economical to deposit it at temperatures above 90 degrees.

### Heating Methods

Hot water is always provided from a steam boiler on larger jobs and usually from large kettles on small jobs unless a running source is available. Aggregates are customarily heated either by means of steam jets (long sections of perforated steam pipe) inserted in the piles, or by improvised circular heaters, usually made of old sections of smoke stack, pipe or similar material, inside of which a fire



International Cotton Mills, Lowell, Mass., Ready to Start Concreting October 27, 1919, with Preparations Under Way for Cold Weather Concreting. Aberthaw Construction Co., Boston, Builders.



International Cotton Mills, Lowell, Mass., Showing Work in Progress on January 12, 1920, at Zero Temperature. Notice the Use of Tarpaulins on the Upper Floor to Protect Concrete from Freezing. Also Similar Use on the First Floor Where Concrete Floors Are Being Surfaced and Plastering Done.

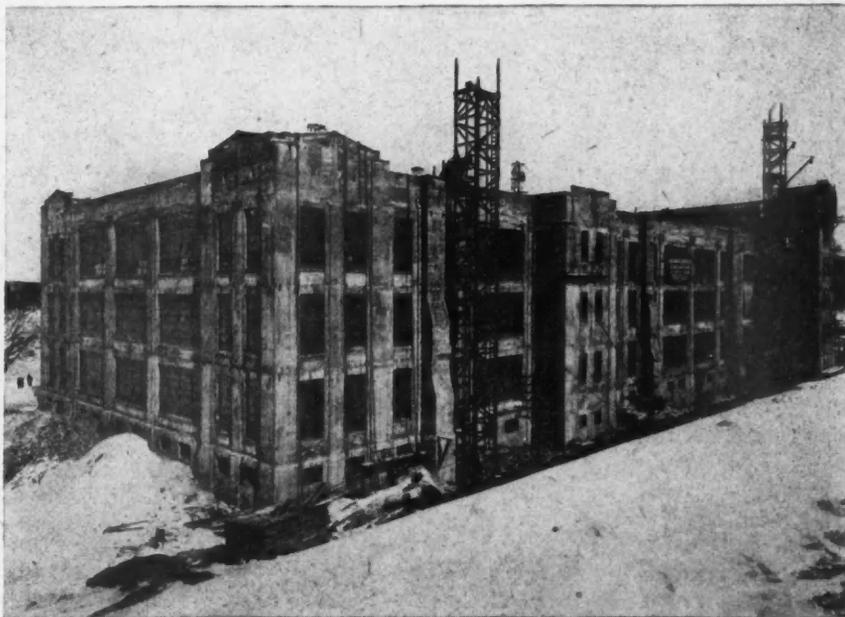
forms are used the possibility of frosting the surface of the newly deposited concrete by contact with cold forms should not be overlooked and the forms heated to a point considerably above freezing. Where the temperature goes only a few degrees below freezing for a few hours each night, the exposed portions may be covered with building paper and straw or tarpaulins.

Floors and walks are usually protected with building paper or tarpaulins covered with straw. Six to 12 inches of straw are used, depending on the temperature. It may be necessary to weight down the covering to prevent being blown

is kindled and over which the materials are piled and frequently raked while heating. As the atmospheric temperature passes below freezing the mixer drum is usually provided with canvas or other "flaps" to reduce dissipation of heat, and at 10 to 15 degrees below freezing, heat may be provided to the drum by means of steam jets or a gas torch.

### Depositing and Subsequent Protection

Before concrete is deposited the forms, of course, must be absolutely free from ice and particles of frozen concrete. Where steel



International Cotton Mills, with Structural Portions Completely Built During the Rigors of a New England Winter. Cold Weather Construction Saved the Owners a Large Sum in Time and Money.



For Jobs of Moderate Size, Where a Steam Plant Is Not Available, Improvised Water and Aggregate Heaters Made of Old Tanks and Pipe Sections as Shown Above, May Well be Utilized for Cold Weather Concreting.

away. At temperatures below 10 degrees Fahrenheit the walk or floor must be covered with a housing of canvas or other material supported on a frame so that live steam, salamanders or other provision for heat may be employed.

When forms are tight and made of heavy material, mass work may require no other protection than covering the concrete exposed at the top. This protection can be given by a layer of hay or straw, while vertical

tion. Forms or earth walls of the trench give enough protection to the sides of the work if the cold is only moderate.

For the interior concrete portions of large buildings the protection required is given by enclosing the structure with tarpaulins or canvas, keeping the desired temperature by means of salamanders or steam coils. When salamanders are used precautions should be

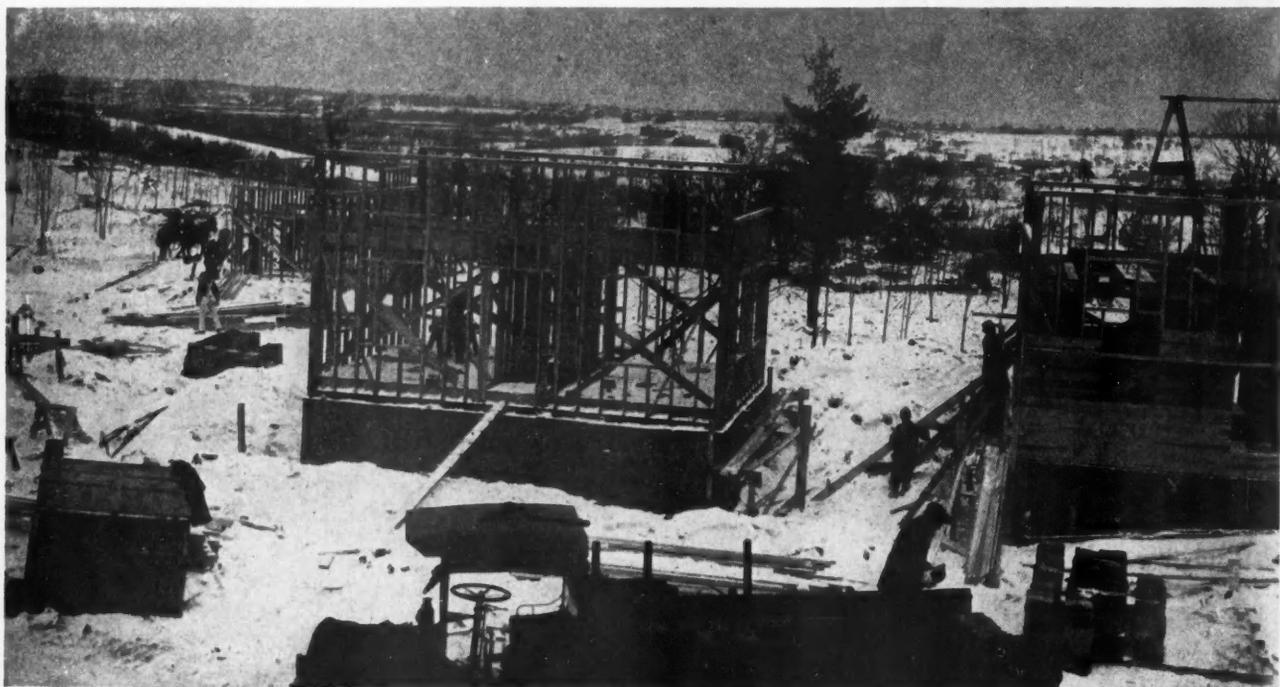
(Continued to page 102.)

## “Build the Year ‘Round”

PROBLEM OF SUCCESSFULLY CONSTRUCTING DWELLINGS DURING WINTER MAY BE SOLVED EITHER BY COMPLETING CONCRETE PORTIONS IN ADVANCE OF THE FREEZE OR BY OBSERVING PRECAUTIONS FOR CONCRETING IN COLD WEATHER

“**B**UILD the Year ‘Round” expresses an idea which will have to become general practice if housing requirements thruout the country are to be met within a reasonable period. Not

only will winter building do much by lengthening the season, but an all-the-year-round schedule of building operations, when put into sufficiently general practice, will prove an attraction to good labor anxious



Frame Dwellings Going Up in the Rigors of a New England Winter, Showing How Home Building May Proceed Almost Regardless of Temperature After Concrete and Other Masonry Portions of the Work Are Completed. Fred T. Ley & Co. of Springfield, Mass., Who Are the Builders of These Little Dwellings at Worcester, Mass., are “all-year-round” Housing Contractors.

to work twelve months a year.

Freezing weather imposes an obstacle to building principally in the shape of decreased efficiency of labor, but also in extra expense for heating and protection of concrete and plaster. These factors, while serious, are usually more than compensated for by the numerous advantages of winter building.

Builders who specialize in the construction of dwellings, may find it possible to lay out a schedule of winter work well in advance, completing the concreting and other masonry before temperatures go low enough to cause freezing. If this is done, the job may usually proceed to the finish, almost regardless of storms and low temperatures. Where it is necessary to place concrete at temperatures approaching freezing, sand, stone and mixing water should be heated moderately and the work protected with straw, building paper and tarpaulins as soon as the concrete has been deposited in the forms. As the temperature falls below freezing point more attention must be paid to the heating of materials, taking particular care that no frozen particles get into the concrete. The concrete may best be deposited at a temperature of 70 and 90 degrees which range is effective and usually most economical.

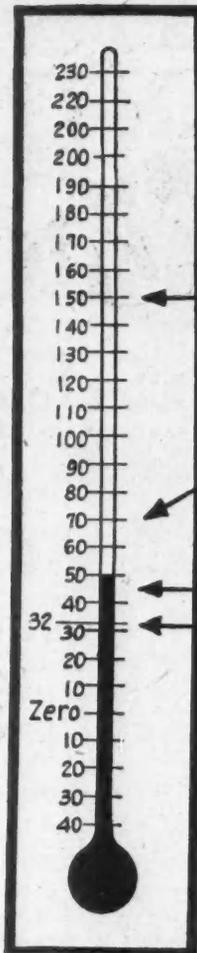
Excavations for concrete foundations should not be made until ready to place the concrete, and then only a short section at a time, to prevent frost under the walls. Excavations must be carried below frost penetration and back-fill made as soon as possible, after the concrete is placed. Little difficulty will be experienced in placing concrete foundations in weather 10 to 20 degrees below freezing if the sides of the walls are protected by immediate back-filling, and the upper portions by cover-

ings of straw, building paper and tarpaulins. In more exposed work it may be necessary to use salamanders or steam under canvas or other covering.

Protection for concrete placed under freezing temperatures is most important during the first 48 hours after placing. At the end of that period artificial heating methods often may be discontinued, allowing the canvas to remain for several days. Concrete placed during cold weather gains strength slowly and, therefore, must not be subjected to heavy loads, abrasion or impact until it gives unquestioned evidence of having acquired practically full strength.

Concrete block and similar masonry construction can be continued successfully at temperatures 10 or 15 degrees below

freezing if the block are heated to a temperature not to exceed 125 degrees and laid.



Thermometer for Concreting in Cold Weather.

Maximum Temperature to Heat Sand, Pebbles and Stone.

Concrete Should Be Placed in the Forms at a Temperature of at Least 70 Degrees.

When the Thermometer Goes Below 45 Degrees, There Is Danger of a Drop Below Freezing. At Temperatures Approaching Freezing Mixing Water, Sand, Pebbles and Stone Should Be Heated and Full Preparations Made to Protect the Finished Work from Freezing.

When the Temperature Remains Continuously Below 32 Degrees, It Is Usually Economical to Heat the Forms and Sometimes to Provide Heat in the Mixer.



Buildings Nearing Completion at Worcester, Mass., Despite the Heavy Snow Banks and Weather. Winter Is No Longer a Slack Season for Progressive Builders.



# Woman and the Home

## Electricity Her Servant

MODERN SERVANTLESS HOME NOW AN ACCOMPLISHED FACT BECAUSE OF DEVELOPMENT OF ELECTRICAL LABOR-SAVING APPLIANCES

By Grace T. Hadley

**S**ATISFIED customers pay big dividends to every contractor and builder—the dividends of increased business—of new business. New business is generally dependent upon the amount of comfort and convenience the builder puts into the home he is building and the added service he places at the disposal of the housewife by installing labor-saving appliances and ideas.

All housewives are highly sensitive to the use of the best appliances and depend upon the architect and builder for the best home equipment. If he fails to recognize this important fact he is not liable to render

complete and satisfactory service—nor is he liable to get increased business nor new business. In short, he cannot overlook the new equation in the building problem. Unless it is considered, algebra, trigonometry, and the higher sciences availeth not. The equation every builder must consider is feminine instinct.

Only those who have been in intimate contact with modern developments in the electrical field, particularly as related to home furnishing and home management, have any adequate idea of the wonderful improvements of recent years.

Ample allowance for a sufficient number of con-



Beautiful, Modern Homes Are Cornerstones of Happy Families and Housewives. Builders Owe It to Themselves and Humankind to Make Homes as Convenient and Drudgeless as Possible. The Contractor Who Built This Delightful Home for Dorothy Phillips, Charming Screen Actress, Has Undoubtedly Succeeded in Making It a Real Home. Look at That Smile!

venient outlets and receptacles permitting the most advantageous use of lighting fixtures and electrical labor-saving appliances, can easily be made in connection with the early planning of the home and will result in the greatest ultimate economy. This is one reason why architects recommend the exercise of due care at the outset in planning the wiring and electrical equipment of a home.

It is only in this way that proper arrangement can be made for the number and location of outlets necessary to provide for the fixtures that will best adorn and light the home and also for the electrical appliances that supply conveniences rapidly becoming recognized as indispensable necessities to modern housekeeping.

#### Different Kinds of House Work

Housework naturally resolves itself into washing, ironing, cleaning, cooking, sewing. The fundamental electric household helps acquired or desired by the modern housewife are the electric washer, electric iron and the big ironer, the electric range, or an electric fireless cooker.

Consider Monday's work in the home and the machinery for Monday now available. Modern washers discard the elbow action and rubbing of the clothes. The operating principle may be the rotating

cylinder or oscillating cylinder; they may be rocking or swinging, they may employ vacuum cups, but whatever the principle may be, the clothes come out cleaner with less wear and tear upon them. This saving alone is an excellent point in favor of the modern washday helper.

In these days of labor-saving machinery, to have laundry work done at home by hand the old way, is positively wasteful. Washing of clothes should be done by machinery. All flat pieces should be ironed by a machine and only fine personal and table linen should be done by hand. Electrical washers and ironers are now within the reach of moderate purses and the saving in laundry bills will soon pay for them; or in case



Electricity — the Housewife's Servant. Untold Hours of Trying Labors Over Washboard, Ironing Board, and Sink Have Been Eliminated by Electric Labor Saving Devices, Some of Which Are Shown Here. The Pleasure Expressed in the Faces of These Women Is Ample Evidence of the Progress in Modern Building Equipment.



of limited space there is no reason why several families should not have such machines co-operatively.

Average persons may think there is little to say about washing and ironing. It is not until one considers laundry materials, water, soap, alkalis, starch, blues, the various laundry utensils, the washing of white, colored and black goods, woolens, blankets, bleaching — how to keep white clothes a nice white, the treatment of table linen,

starching, ironing, glossing of collars, cuffs and fronts; the washing and finishing of silk—that one begins to realize how necessary it is to have efficient laundry equipment.

There is not only the washing of clothes to be considered, but the washing of dishes. While clothes washing occurs about once a week, dishwashing takes place every day and the custom has been in particular households three times a day after each meal. Washing dishes by hand has been a task always relegated to those not in a position to help themselves, to scullery maids. It has been done by hand at a sink in a slipshod manner with dishrags used over and over again. It has always been a disagreeable job.

With a modern electric dishwasher which should be properly installed and connected, dishwashing can be made a once-a-day process, as it is quite immaterial to an electric dishwasher how many dishes it washes. An entire meal for a family of six would entail the use of about 52 pieces exclusive of silver. After the dishes have been cleared of food fragments, they are placed in the electric dishwasher, hot water added and some finely pulverized soap and in ten minutes or less the dishes are washed in a clean, sanitary way. The glasses and silver are almost dry but are polished a bit with a tea towel. By this time the china is dry and needs only putting away.

#### The Industrious Electric Cleaner

The modern electric cleaner has banished the confusion incident to the twice-a-year upheaval formerly known as housecleaning, because it is the thing now to keep the house clean the year round and not wait to remove a winter's accumulation of dirt. The small fan cleaners are sold in increasing numbers, the type used consisting of a motor either horizontally or vertically mounted with fan attached directly to the shaft. The

whole is enclosed in a body mounted upon rollers or rubber wheels and guided by a handle from which a dust bag is suspended. These small machines are not only operated over the floor but carpets and rugs are cleaned daily with them to prevent the old-time accumulation of dirt which was never disturbed by surface sweeping.

#### Harnessing Electricity to the Sewing Machine

The ordinary sewing machine had two disadvantages for the housewife: footwork was necessary to operate the treadle and while it produced power it also made the operator very tired. The second disadvantage was that the machine was always in the way if there was no special sewing room and it was a task to move it. Wherever it was placed there it usually stayed. The first objection was overcome with the advent of the sewing machine motor, but the second objection was still there. Now there is on the market a portable electric sewing



The Housework Done, She's Off for the Afternoon to a Tea or Sewing Circle. One of the Reasons for This Holiday Is Shown Below. There Are Many Others Made Possible by the Development of Electrical Appliances in the Modern Home.

machine which overcomes the second objection. This addition to the electrical household helps weighs only 14 pounds, is compact, simple and easily portable and appeals strongly to housewives who have had any experience with old-type machines.

Almost any woman can treadle a machine for 200 stitches per minute. A very strong woman can do 400 stitches, but she cannot hold that pace thru a long seam. When she harnesses electricity to her needle she can do 1,500 stitches a minute and hold it as long as necessary. She can take a few stitches, then stop, more stitches and stop when turning corners or when working on light material. She can triple her output and not get tired. Sewing ceases to be the drudgery of other days.

### Advantages of Electric Cookery

For years housewives have cooked with an open flame. All the technique of the kitchen has been developed with heat that can be seen, so to speak. In cooking with electricity the heat is directly applied without waste to the cooking operation. Electric cookery solves the problem of easy control, of elimination of waste, and in some ranges there is automatic control of time and temperature. In all the electric ovens the heat can be regulated with a precision heretofore impossible with other fuels.

Some of the advantages of electric cookery are

safety, greater cleanliness, no escaping gases, reasonable certainty as to results to be obtained, adequate means being provided for controlling the temperature; economy in food value, the nutriment being retained to greater extent in all food cooked.

With the advent of electric ovens a revolution in the methods of cookery has become possible. Without a doubt the electric range is a highly desirable addition to every household.

### Complete Electric Service in the Home

Complete electric service in the modern home is dependent upon the flexibility of the wiring system. The installation of extra outlets is of the greatest importance if the family is to have all the benefits available. There are many times when the lamp socket is the logical point for connecting the electric fan or a small appliance, but as a rule these appliances displace illumination and the cord depending from a fixture is unsightly.

For larger appliances consuming over 500 watts, ordinary lamp sockets should not be used but separate receptacles employed in their stead and ample provision should be made for these outlets when planning and building the home. A startling situation often develops when the family settles down to everyday living. The small conveniences which seemed trivial when planned become the very means to family comfort and convenience.

## Building the Fireplace

PROPER THROATING OF FIREPLACE AND DAMPER ARRANGEMENTS ARE IMPORTANT FACTORS IN SUCCESSFUL OPERATION. DETAILS SHOWN ON PAGE 76

**A** REAL fireplace, one that will render the maximum of satisfaction is a combination of beauty and practical efficiency. In fact, a fireplace that will not smoke is even more important than one that is hard to excel from the appearance standpoint. The flue problem and proper throating of the fireplace are very important factors in the successful operation of a fireplace and two factors that should not be overlooked by contractors when considering this particular problem of construction.

Brick is the most popular type of fireplace because of the nature of its composition and manufacture. Burned in a kiln, it is proof against the attack of fire and can withstand terrific heat. Incidentally the same heat produces a variety of delightful colors which make many pleasing combinations. In the last few years the old-fashioned brick fireplace for burning wood has come back into vogue and builders are continually called upon to build them in their houses.

The complete list of material for fireplaces with specifications is furnished by manufacturers and is sent to the job ready to be put up by the contractor. This includes brick hearth, underlining, brackets, etc.

In the operation of the fireplace, however, the important features are the flue and dampers. Unless

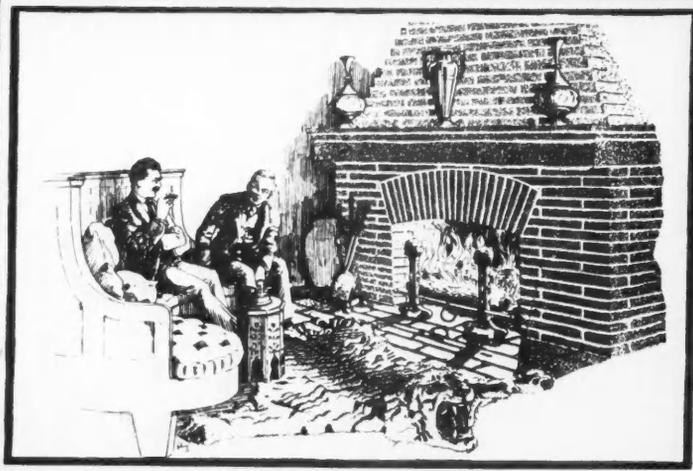
there is proper ventilation, the fireplace will be more of a nuisance than a benefit. The smoke must be carried away promptly and not allowed to get out into the room where it can smudge walls, draperies, and curtains, as well as fill the air with impurities.

On the blue-print detail sheet on page 76 are shown several methods of fireplace construction, with special emphasis on the arrangement of ventilation. At the bottom of the flue this damper is located in the form of a removable valve plate operated by a long handle extending to the front of the fireplace. When this handle is pulled outward the flue is closed by this plate, and vice versa.

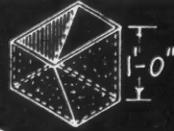
Another important feature of fireplace construction is the installation of a proper ashpit below, where the ash can be dumped and later removed. At the bottom of the chimney a clean-out door is built which gives access to the flue and allows the janitor or home owner to remove the ashes.

In view of the popular demand for fireplaces, many builders are making a close study of the various manufacturers' specification sheets. Unless the fireplace is properly installed it may result in a dissatisfied client and loss of business, whereas to build it costs no more or very little more.

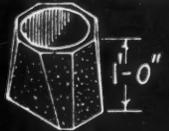
# RECOMMENDED CONSTRUCTION



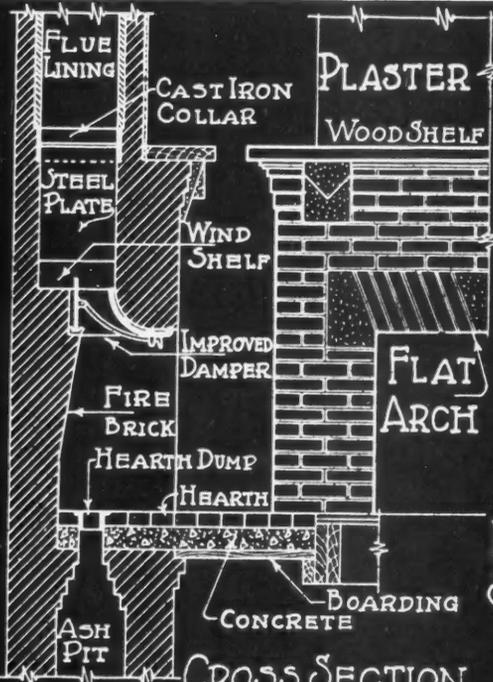
## SMOKE CHAMBER & FLUE FITTINGS



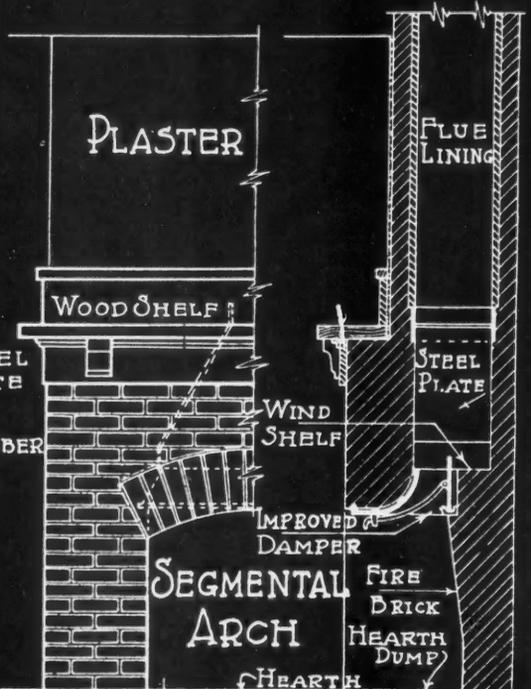
REVERSER



CONVERTER



LONGITUDINAL SECTION

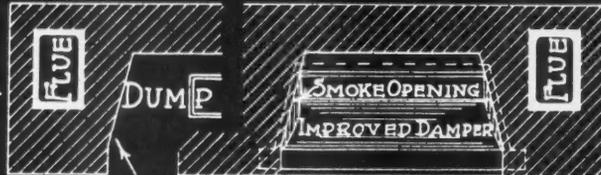


CROSS SECTION AND ELEVATION

CROSS SECTION AND ELEVATION



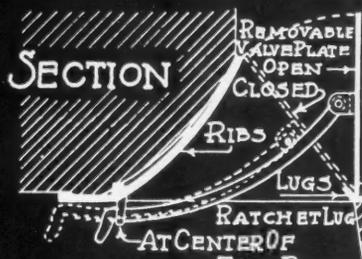
CLEAN OUT DOOR



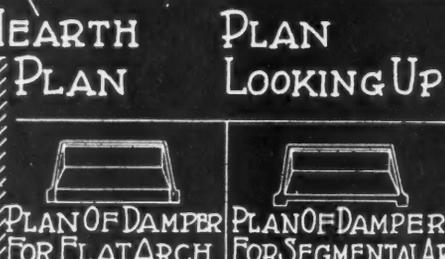
DAMPERS



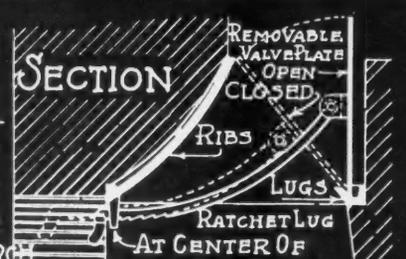
CLEAN OUT DOOR



DAMPERS FOR FLAT ARCH

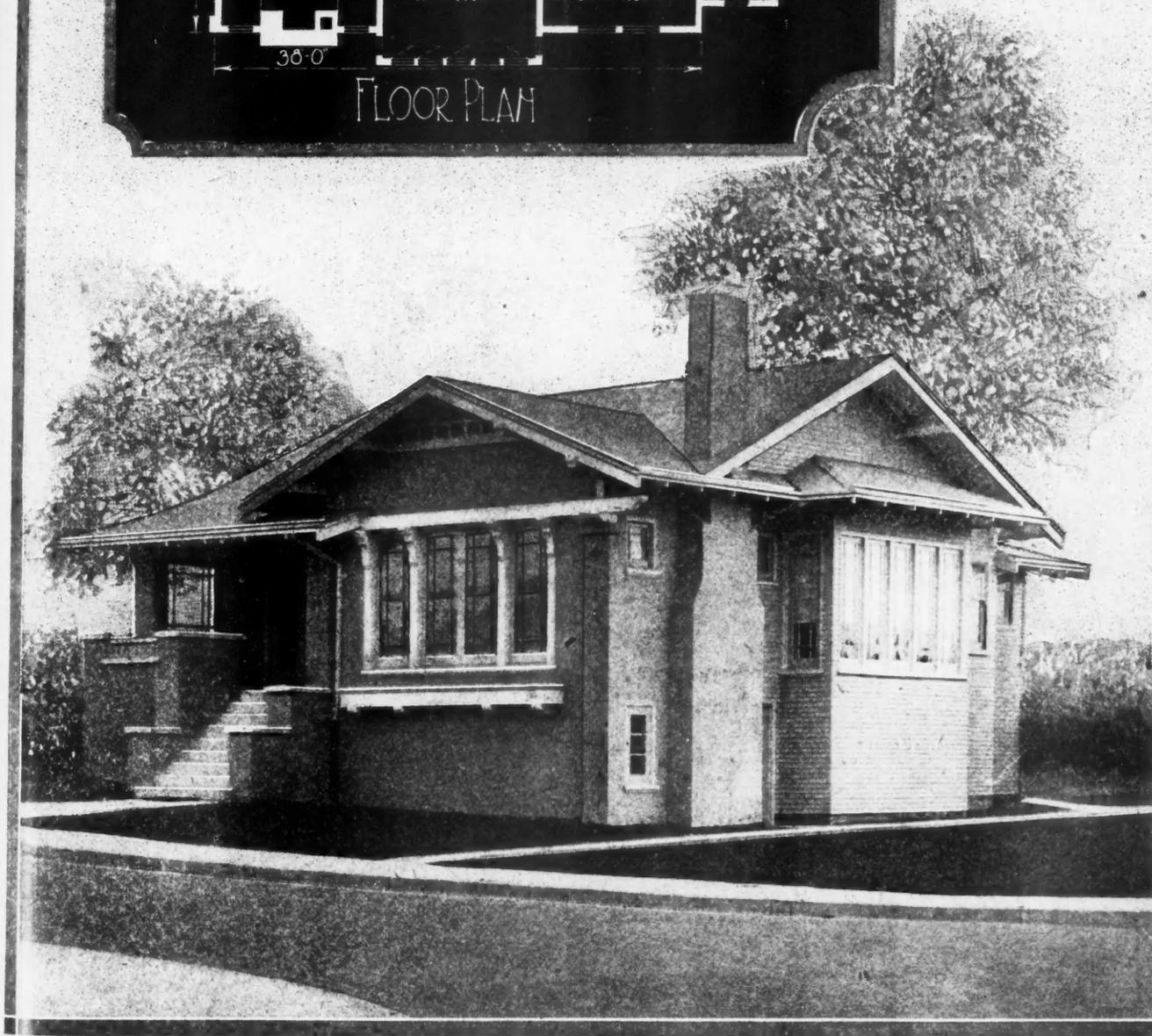
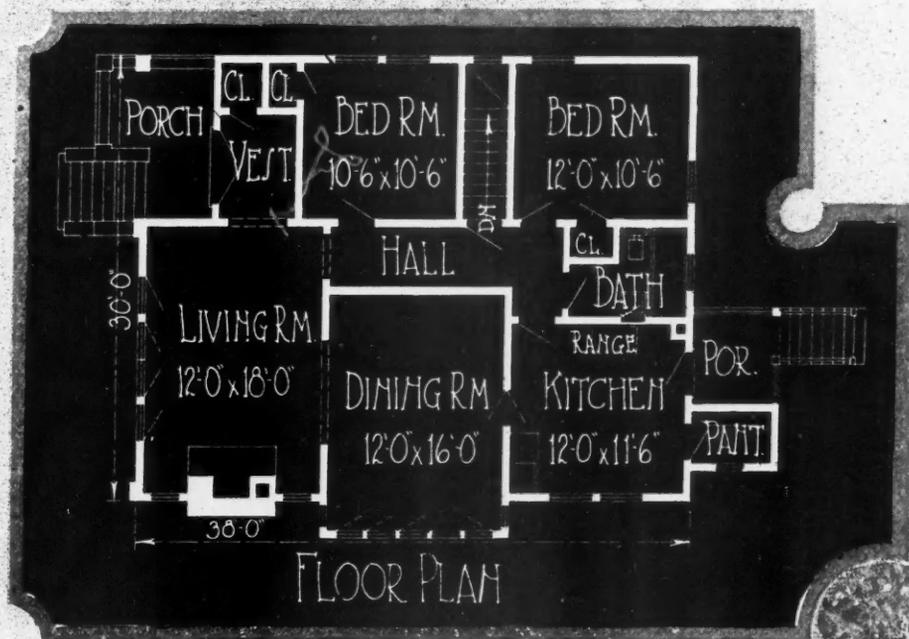


DAMPERS FOR SEGMENTAL ARCH



DAMPERS FOR SEGMENTAL ARCH

# FIRE PLACE DAMPERS



**CHARMING, COMPACT FIVE-ROOM BUNGALOW.** There is something unusually pleasing and distinctive about this delightful little home with its stucco and frame exterior. The long narrow casement windows in living room and dining room afford plenty of light and air to these rooms as well as lend additional charm to the general appearance. The front porch is recessed under a continuation of the main roof and can be screened in during the warm months. The broad chimney indicates an open fireplace, details of which are shown on the opposite page. The five rooms are living room, dining room, kitchen and two bedrooms. The living room is large and cheerful. The bedrooms are well secluded from the rest of the house. The bungalow is 30 feet wide and 38 feet long.

# Beautiful Homes at Reasonable Cost

WESTWOOD PARK, SAN FRANCISCO, A GARDEN SPOT OF "SUNSHINE" BUNGALOWS—OVER 300 COMPLETED COSTS OF DWELLINGS RANGE FROM \$6,250 TO \$10,000

By A. S. Baldwin

**R**EAL ESTATE booms which have occurred at several periods, beginning with 1868, early determined San Francisco as a city of rectangular blocks and 25-foot lots. Up to 1912, this tendency had resulted in the subdivision along these lines of practically every foot of accessible building area, and also the entire district north and south of Golden Gate Park, most of which was only driving sand dunes.

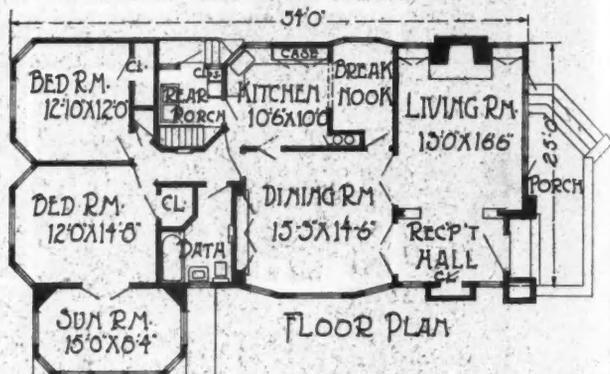
This gridiron form of development led to a number of things, but primarily it gave San Francisco a type of home that was coldly formal, even austere. Cramped between buildings on either side, the formality of this architecture was reflected in the lack of sunshine within and garden, flowers and spaciousness without—all essentials of a real home.

In 1912, Baldwin & Howell conceived the idea of organizing a syndicate to purchase the holdings of the estate of the late Adolph Sutro, comprising about 800 acres, lying west of Twin Peaks. The object was to subdivide the property into lots of more generous proportions than had occurred in other parts of San Francisco.

In other words, the effort was an attempt to break away from the gridiron type of development and create a restricted residence section with winding boulevards and encourage homes beautified with lawns and gardens and yet within the reach of the family of moderate means.

The idea was executed thru the organiza-

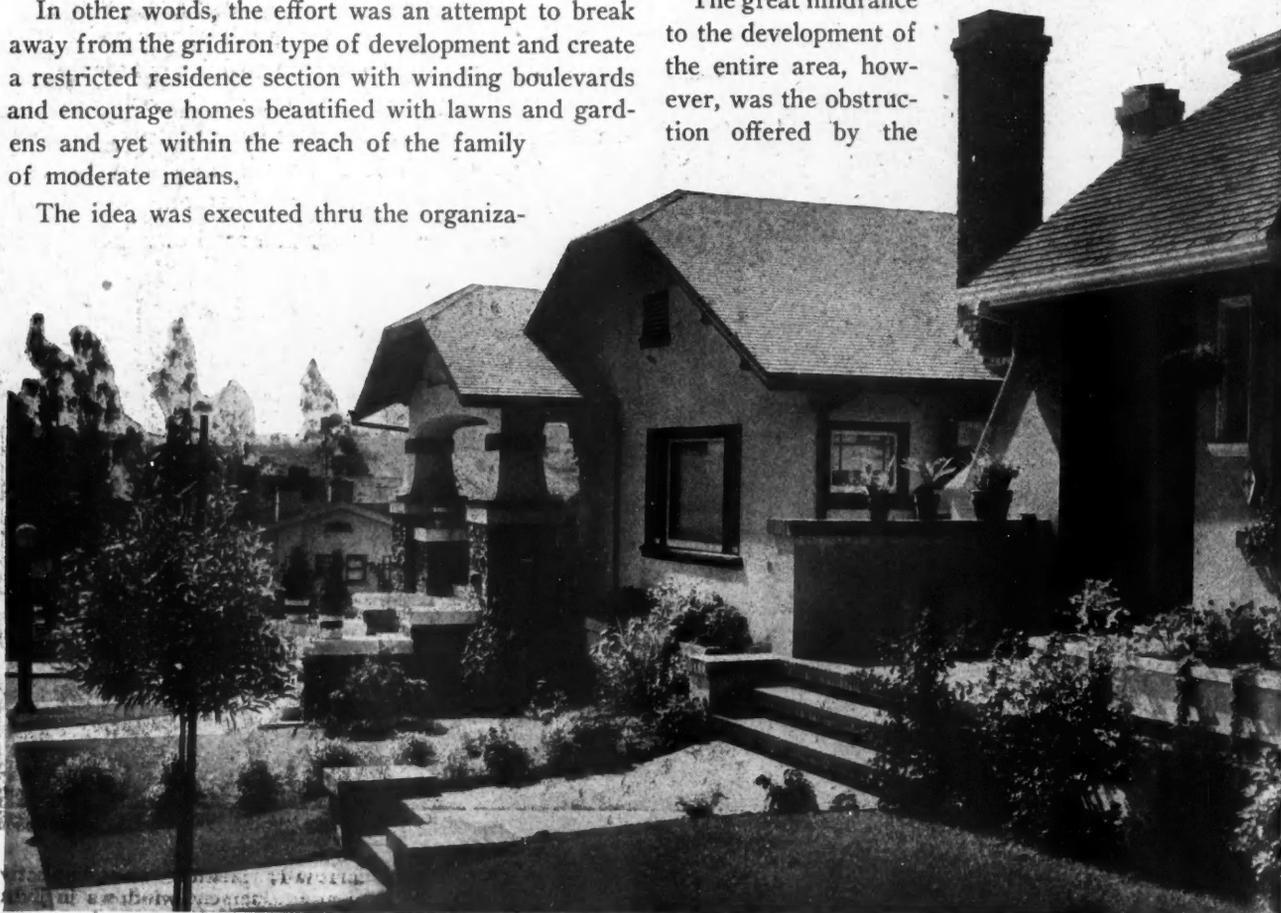
tion of a syndicate in 1912 which purchased the 80 acres belonging to the Sutro estate, the sum paid being \$1,600,000. In order to interest other firms in the development of this large tract, this syndicate sold



Typical Floor Plan of Five-Room Bungalows in Westwood Park.

at wholesale rates between 450 and 500 acres of land to real estate developers. These tracts were subdivided into lots ranging from 30 to 50 feet frontage. The tracts were named St. Francis Wood, Forest Hill, Claremont Court and West Portal Park.

The great hindrance to the development of the entire area, however, was the obstruction offered by the



A Veritable Garden Spot. Fourteen Builders Have Erected 300 Bungalows in Westwood Park, San Francisco, Calif., Since the War. These Homes Are Sold at a Very Narrow Margin of Profit by the Builders, Who Rely on a Volume of Business to Make Their Work Profitable.

Twin Peaks ridge, which running to a height of 900 feet and extending north and south for a distance of several miles, cuts across the upper end of Market Street, dividing the downtown district from the area to the west. This difficulty was solved by the construction of a tunnel two and one-quarter miles long and 25 feet wide, thru which trolley cars are now in operation down Market Street to the Ferry. This transportation has resulted in cutting the running time between the district west of Twin Peaks and the business center of the city by twenty minutes.

The tunnel project was financed by voluntary assessment; the 800-acre tract contributing \$1,000,000 of a total of \$4,000,000, the cost of the project. The Spring Valley Water Company, owning about 1,500 acres lying between the 800-acre tract and the ocean, and reserved for water purposes, contributed about the same amount. A further sum of about \$1,400,000 was levied on property of other owners in adjacent districts west of Twin Peaks. These districts with the west of Twin Peaks section were assessed a total of \$3,400,000, while property to the east of Twin Peaks, extending down as far as the business center, was assessed only \$600,000.

In the latter part of 1916, the directors of the syndicate which had acquired the 800-acre tract, which corporation is known as the Residential Development Company of San Francisco, were advised by Baldwin

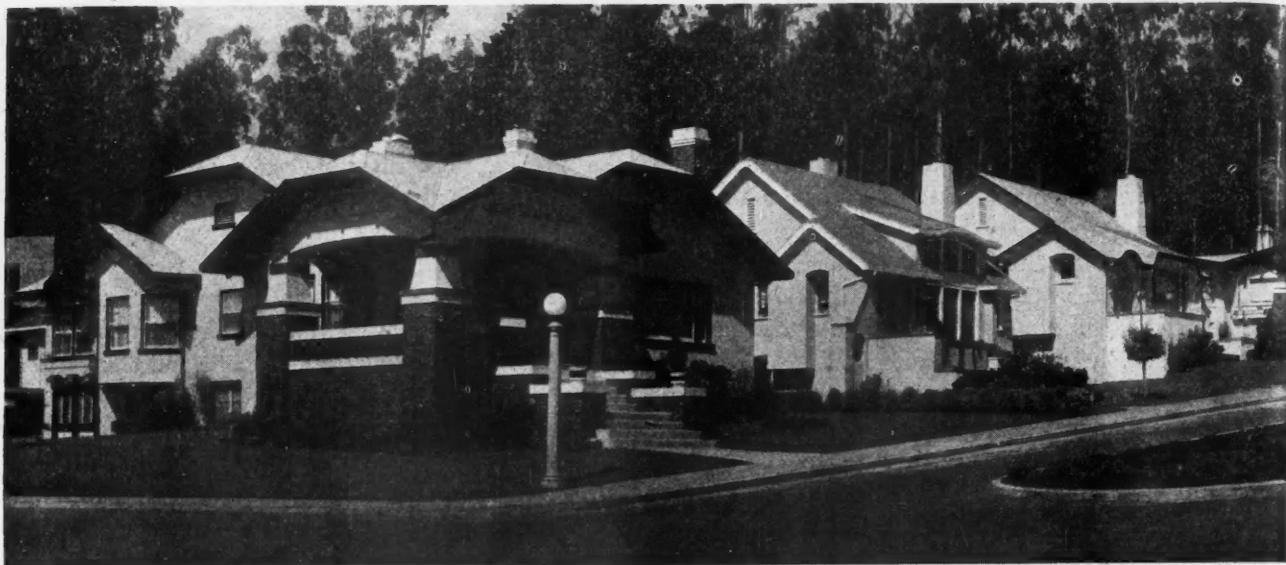
& Howell to set aside ninety acres of the tract and subdivide it into lots averaging 40-foot frontage in order to meet the demand for less expensive homes than those that were being built in other sections of the district. The directors acted on this suggestion, with the result that the ninety-acre tract was plotted into building lots averaging 40 feet and the tract was named Westwood Park. The streets were paved with a concrete base of about 6 inches and an asphalt surface of 2 inches. Concrete armored curbs, cement walks, sewer, water mains, telephone and electric service, and gas mains were supplied to every lot.

The tract subdivided into about 28,000 feet of street frontage and the cost of grading, street work, park strips, etc., was about \$10 per lineal foot, or in the neighborhood of \$275,000. The prices fixed for the lots ran from \$35 to \$45 per front foot, which included payment by the seller of all street work and the Twin Peaks assessment, which on this property amounted to about \$2 per front foot.

The work of constructing the streets, sewers and similar work in Westwood Park was not completed until July, 1917, shortly after the United States had declared war on Germany. This with the prohibition against building which followed shortly afterwards, resulted in practically suspending sales and building in Westwood Park until after the signing of the Armistice in November, 1918. Since that date, Baldwin &



Another Glimpse of This Wonderland Which Has Been Made Possible by the Co-operation of Enterprising Real Estate Men and Building Contractors. These Homes Range in Price from \$6,250 to \$10,000, and Are Built Along the Most Modern Lines. Variety Is One of the Outstanding Features.



**No Wonder These Homes Were Sold Long Before They Were Completed. Notwithstanding the Increase in Building Costs in the Last Few Years, These Builders Have Been Able to Keep Costs Within Reason by Careful Planning on a Large Scale.**

Howell have succeeded in interesting a number of builders to whom lots have been sold at an average discount of 5 per cent. The policy of the firm has been to encourage home seekers and not lot buyers.

There are fourteen builders now operating in Westwood Park and the result of their operations has been the construction during the past two years of about 300 bungalows, practically every one of which has been sold, and in most cases the sales have been made before the houses were completed.

Notwithstanding the fact that building costs have increased more than 75 per cent in the past two years,

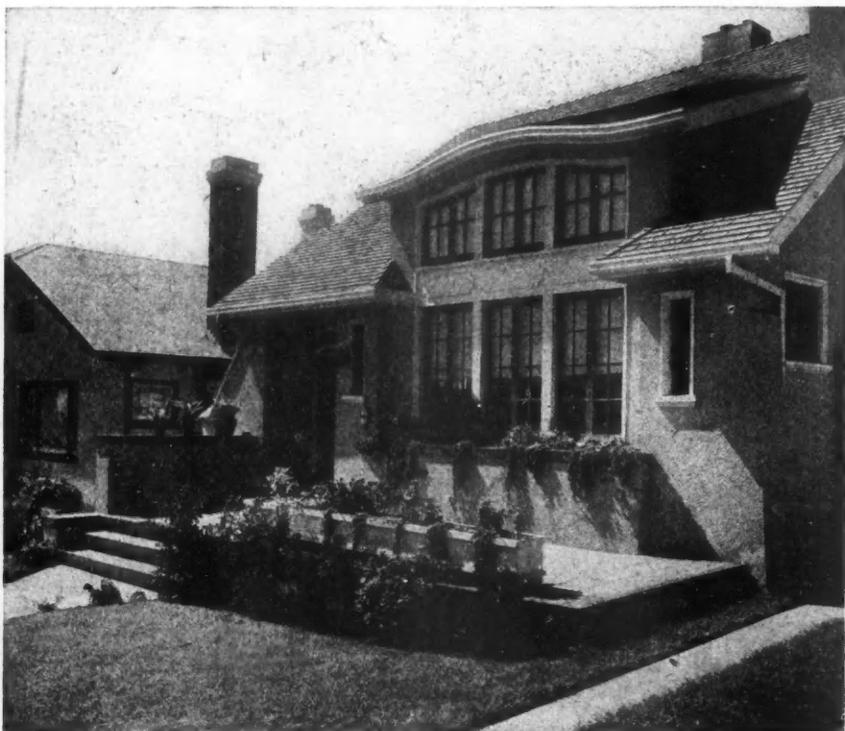
the prices at which builders have been able to purchase lots in Westwood Park have kept the cost of the homes down to a moderate basis.

The quickest selling bungalows have been those ranging in price from \$8,000 to \$10,000. The terms upon which they are sold are about 20 per cent cash and the balance in monthly installments, which are sufficient in most cases to retire the obligation with 6 per cent interest in from seven to ten years.

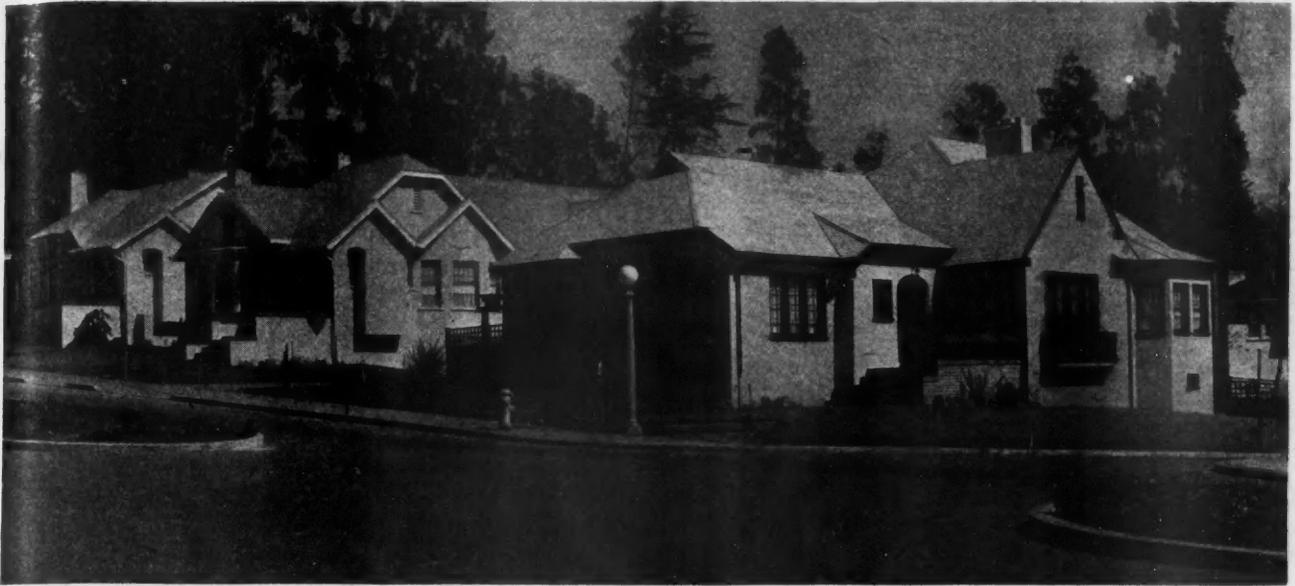
A seven-room bungalow which sells for about \$10,000, including a 40-foot lot, may be briefly described as follows:

Reception hall, living room, dining room, kitchen with small breakfast room or breakfast nook, elaborate bathroom with tile floor, and in some instances tile walls up to a height of about 5 feet, Roman tub, separate shower, two or three bedrooms and what is usually called a sun room, sleeping porch, constructed off one of the main bedrooms and above the garage. In all such cases, the garage is under the house, the entrance to it being under the sun room, which forms an "L" to the bedroom section of the bungalow.

The reception hall, living room and dining room in bungalows of this type are beautifully finished in either southern gum or mahogany. The dining rooms have attractive buffets. The halls and all of the rooms excepting the kitchen have hardwood floors. The bedrooms are beautifully papered and the



**Front View of One of the "300." The Success of This Housing Development in the Coast City Has Demonstrated to the Building Profession at Large That the Housing Shortage Can be Solved. More Real Thought and Co-operation Between Builders and Real Estate Holders Are Needed.**



One of the Pretty Corners in Westwood Park. Because of the Extra Frontage Homes on Corners Cost More Than Others in the Block. English Colonial Designs Were in Favor, While Stucco Was Used Extensively in These Homes.

most attractive designs of electric light fixtures are installed. Provision is made for a gas or hot air furnace, but the purchaser usually pays the cost of the installation of the furnace, which runs from \$125 to \$150.

The less expensive bungalows have a smaller number of rooms and the hardwood finish is curtailed to some extent.

A row of very attractive five-room bungalows is now being constructed on Hamburg Street, the extreme easterly thoroughfare in Westwood Park. About one-half of these bungalows which are built on 36-foot lots have been sold for \$6,250 each. The builder who is constructing these houses is also building ten other bungalows of a more pretentious type which are sold for \$8,500 for five rooms, \$8,750 for six rooms and \$10,000 for two corner houses which contain seven rooms each. This builder was requested to submit to Baldwin & Howell his figures showing the cost of construction of the bungalows which he is selling for \$8,500. This information, which is particularly interesting, is as follows:

Mill work, outside and inside, including sashes and doors .....	\$1,200.00
Lumber .....	800.00
Labor on frame, finish and roof .....	750.00
Plastering exterior and interior .....	850.00
Plumbing .....	500.00
Cement walks and auto runways .....	350.00
Hardwood floors .....	414.50
Painting .....	300.00
Brick work .....	150.00
Electric wiring .....	82.00
Rough hardware .....	48.50
Extra tinning, etc. ....	45.00
Sewer .....	65.00
Patent flues .....	60.00
Furnace piping .....	45.00
Finish hardware .....	75.00
Electric Fixtures .....	85.00
Shades .....	35.00
Lawn .....	40.00
Fire and title insurance .....	100.00
Indemnity insurance .....	20.00
Washing windows, building permit, recording plans, interest on loan during construction, plans and specifications and survey of lot, approximately .....	150.00
Cost of lot .....	1,600.00

Agent's commission when house is sold, 5 per cent on \$5,000, 2½ per cent on \$3,500..... 337.50

Total cost of house and lot.....\$8,102.50

It will be seen from these figures that this builder only receives a profit of about \$397,50 on the sale of an \$8,500 house, but he expresses himself as being satisfied because he anticipates selling the seventeen bungalows he is now building within sixty days, which will leave him a profit of between \$6,000 and \$7,000. This particular builder is a practical carpenter and does a great deal of this character of work, charging his own time against the job on the same basis as the other men employed by him.

The building costs listed above apply to the construction of a five-room bungalow, a brief description of which is as follows:

English Colonial design, exterior cement stucco, tinted gray, shingle roof painted green, also light green tints for window sashes and frame. The interior contains a reception hall, living room, with open fireplace, dining room, bathroom with klingstone floor, walls finished with Keene cement to height of 5 feet, Roman tub, toilet, kitchen with breakfast nook, small porch off kitchen, with stairs leading to basement, wash trays in porch, two bedrooms on an elevation of about 4 feet above the main floor, approached by steps at the end of the main hall. This increased height gives a large basement, a portion of which is used for a garage. The interior woodwork is white enamel finish, and hardwood floors thruout.



**W**HAT do you do to keep the money coming in during the slack months? How do you advertise your business? Tell your brother builders thru the AMERICAN BUILDER. Send us photographs of your workshop, concrete block plant, lumber yard. Don't hesitate to write suggestions and ask questions. The AMERICAN BUILDER is always ready and anxious to serve its readers.

## Recommended Practice for Magnesite Stucco

CERTAIN FUNDAMENTAL POINTS OF INTEREST TO BUILDERS EXPLAINED—IMPORTANCE OF HANDLING MATERIAL ACCORDING TO DIRECTIONS

**F**EW people realize that it is only a little over twenty years ago magnesite stucco made its appearance in this country. Judging by its popularity and extensive use at the present time, this seems hardly credible yet it was in 1893 that the material in the form of a sanitary flooring made its appearance in the Austrian Building of the Chicago World's Fair.

At first of foreign origin, the war forced Americans to take stock of their own goods, and to their surprise they found unlimited quantities of magnesite rock in the West.

Magnesite is a hard substance of varied colors, sometimes brownish, sometimes snow white, or of varied hue, depending on the vein. The magnesite is mined, broken into chunks, and calcined in large kilns, then ground into a fine flour. This powder is then mixed with fillers and made into stucco or composition flooring material.

In making magnesite stucco, formulas vary according to the manufacturers—some using all mineral ingredients for filler and others vegetable fillers.

The important feature connected with the manufacture of magnesite stucco, however, is the fact that the ingredients must be bone dry in order to insure a perfect mixing. Pure white, washed sand is one of the important materials used as a filler and should be thoroly dried before using it in the mix. Magnesite stucco cannot successfully be applied over a wet or damp surface nor over a surface affected by frost. There is a certain danger from using local sand in mixing this stucco because this sand contains mate-

rials which are detrimental and often too damp.

The proper method for the application of a magnesite stucco calls for the following steps:

First—see to it that the surface over which the plastic material is going to be applied is absolutely dry.

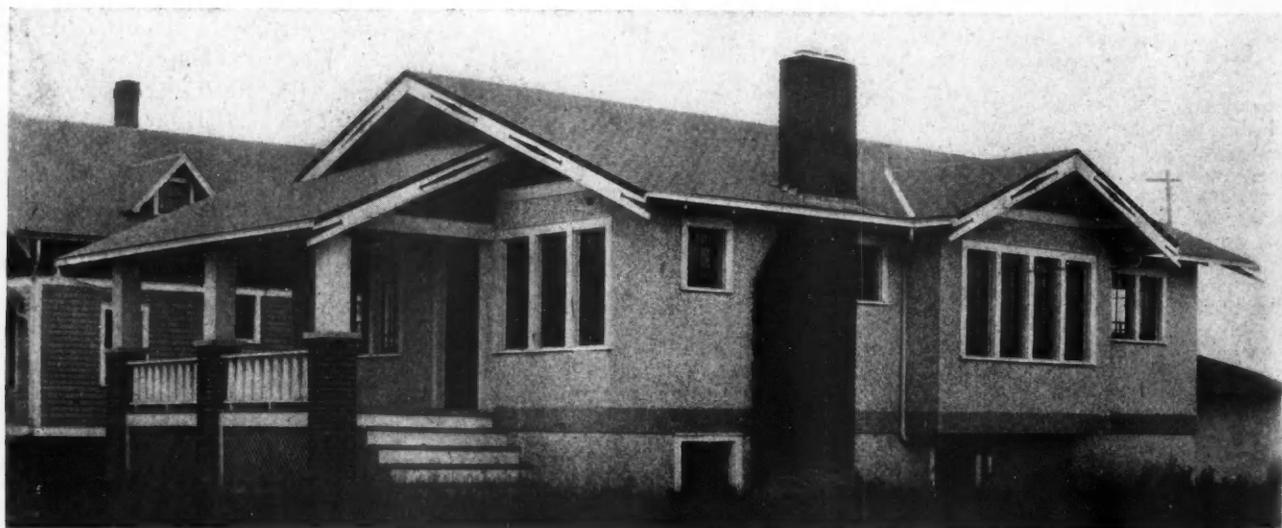


Magnesite Stucco Has Been Used as an Exterior Finish on This Attractive Home. The Success of This Material Depends Upon Its Careful Application According to Specifications. Bailey & Reed, Flint, Mich., Designed and Built This House.

Secondly—see that the liquid solution, the magnesium chloride is 21° Beaume.

Third—the surface over which the stucco is laid should be well wet down with the mixing compound and absolutely wet with the mixing compound at the time of the application of the base or finish coat stucco.

Fourth—the powdered material should be well mixed with the solution of magnesium chloride compound, and a small quantity, two or three sacks, mixed at a time. Many manufacturers of magnesite stucco have prepared very complete specifications for the application of the material. It can be used successfully over brick, cement, tile, metal lath, wood lath, and various patented lath on the market.



Another Example of Magnesite Stucco Application. Variety Can Be Obtained by the Use of Varied Colored Dashes, Floats and Finishes. Formerly Imported from Europe, Magnesite Is Now Obtained in Large Quantities in the Western Part of This Country.

## The Art of Building Camouflage

MANY INDUSTRIAL AND COMMERCIAL BUILDINGS IN THE WEST ARE SKILLFULLY DISGUISED TO PRESERVE BEAUTY OF CITIES.

ONE of the most recent and striking developments in building construction is building "camouflage." To prevent a new commercial or industrial plant from being unsightly and a constant eyesore to the neighborhood, builders are now skillfully disguising them in attractive exteriors of a residential character. This development has been carried out very extensively in the Far West. In Los

Angeles where film studios are as plentiful as orange groves, many ingenious designs have been worked out in their construction so as to preserve the beauty of the neighborhood in which they are located.

An excellent example of this camouflage is shown in the picture here. It looks like a row of delightful homes but in reality is only a false covering for a large studio.



Nowhere is the Art of Building Camouflage More Expertly Practiced Than in the West, Especially in Los Angeles and Other Resorts. This Row of Quaint Homes is Really Charlie Chaplin's Studio

## Hot Water Heating Systems

NOW ONE OF THE MOST IMPORTANT METHODS OF HEATING HOMES, APARTMENTS AND OTHER DWELLINGS—DETAILS SHOWN ON PAGE 84

**H**OT water heating for warming homes has had a phenomenal growth in the last few years. Today it is so important that no contractor or builder can neglect to study its method of operation and above all its installation.

There are two classes of hot water heating generally speaking, low pressure and high pressure. The low pressure type is the most commonly used because of its advantages for residence work. Hot water heating is easily controlled and an even temperature can be maintained. In the consumption of fuel it is very economical.

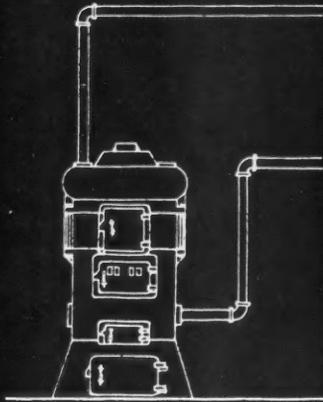
The low pressure system is again divided into three classes: the two-pipe system, the one-pipe system, and the overhead system. The first two are the most popular and the two-pipe system is the oldest and the most frequently used. It is important for the builder to know its workings, especially in connection with dwelling construction.

The flow pipe, or pipes, as it may be are of sufficient size to feed the necessary amount of radiation and are carried to a height above the heater to allow a proper pitch for the main. On the top of this riser an elbow is placed and the lateral pipe is run pitch upward ( $\frac{1}{2}$  to 1 inch in every 10 feet) to the end of the system or to the branch supplying the radiator farthest from the boiler.

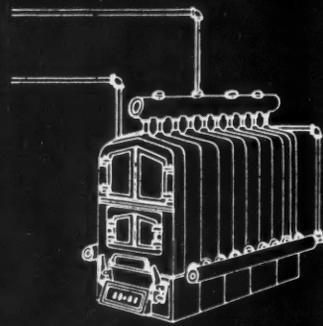
All tees on the mains supplying branches should be tipped to an angle of 45 degrees and the branch supplied by using a nipple and 45-degree elbow. A 90-degree elbow used in hot water work increases the friction and impedes circulation. Great care should be taken not to reduce the main too rapidly.

An essential feature of the hot-water heating system is the expansion tank. As the water is heated to 160 or 180 degrees it expands considerably and it is necessary to make some provision for this expansion. For this purpose they use an expansion tank.

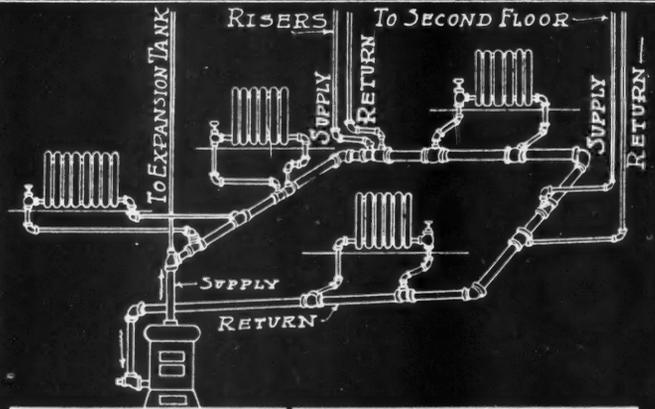
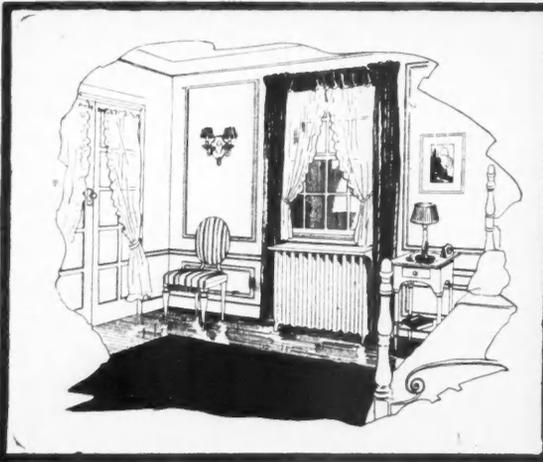
# RECOMMENDED CONSTRUCTION



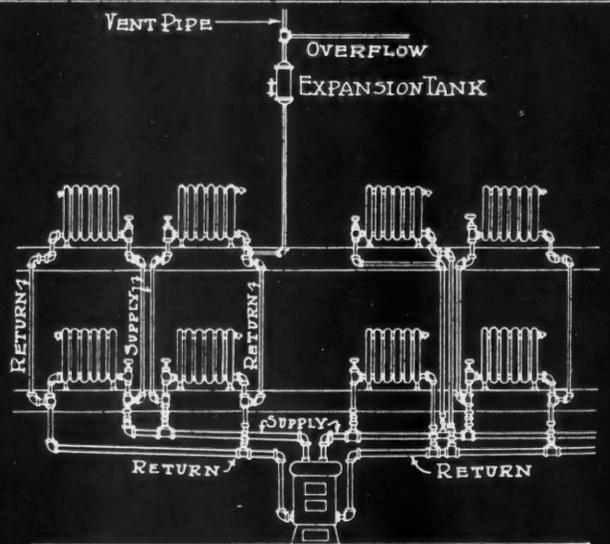
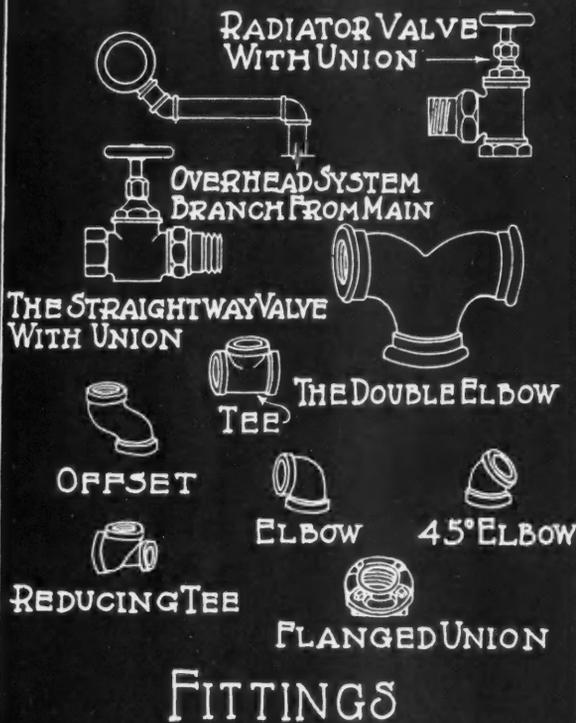
COMMON HOT WATER HEATER



SECTIONAL HOT WATER HEATER

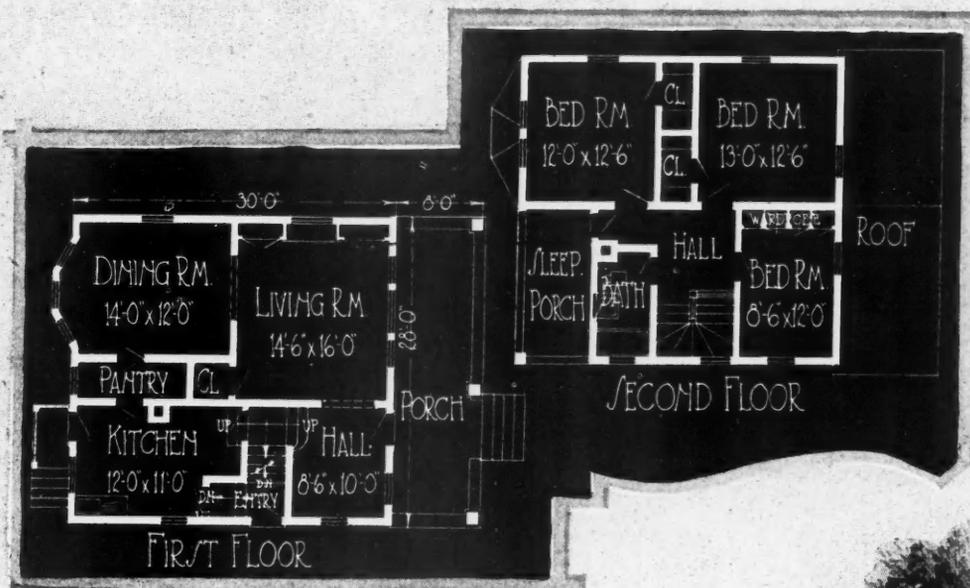


ONE PIPE SYSTEM HOT WATER HEATING



TWO PIPE SYSTEM HOT WATER HEATING

# HOT WATER HEATING SYSTEMS



**C**OMFORTABLE, WELL-BUILT HOME OF PLEASING DESIGN. There is nothing frivolous or freakish about this home. It is built essentially for comfort. This fact does not detract, however, from the attractiveness of its exterior appearance with its broad, open porch and well broken gable roof. The foundation is concrete, rock faced, with frame siding up to the second floor and shingles above. This home contains six rooms, three on each floor. The living room is spacious and well lighted by windows on two sides. Directly to the rear of the living room is the dining room, which gets plenty of light from a bay window in the rear. The kitchen and reception hall complete the first floor plan. Upstairs are three bedrooms, bath and a sleeping porch. One bedroom is fitted with a space-saving wardrobe. Size, 28 by 30 feet.

## Bungalow Court of Six Individual Homes

RESULTS IN ECONOMY OF GROUND AREA AND CONSTRUCTION COST AND PROVIDES LUCRATIVE INVESTMENT

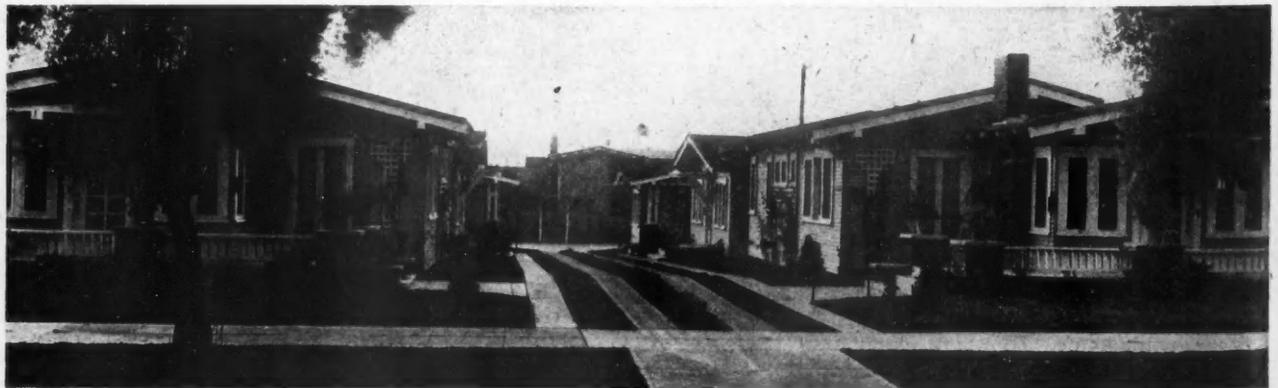
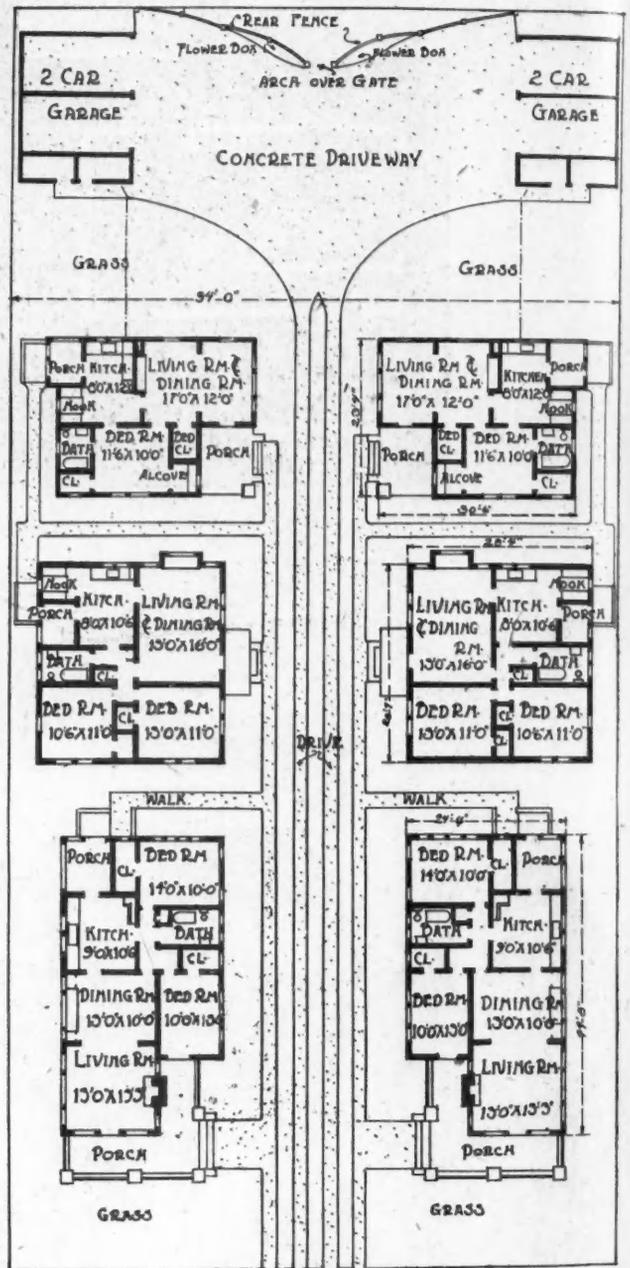
By Charles Alma Byers

**B**ECAUSE of the present scarcity of houses throughout the country, the bungalow or community court becomes especially deserving of attention. From the investor's point of view, it constitutes a rather exceptionally practical building idea for any time, and under today's conditions its possibilities are particularly engaging. Briefly, computed by the unit, it represents economy in respect to both ground area and construction cost, and hence even the present high cost of building materials and labor can hardly prevent it from comprising a reasonably safe and lucrative investment, especially in view of the increase in rental rates.

The bungalow court shown here, occupying a ground plot 94 feet wide by nearly 188 feet deep, contains a total of six little bungalows, or individual homes, grouped about a sort of community garden arrangement traversed by a pair of cement walks and an automobile driveway. The plot also gives space to a couple of two-car garages in the rear. Incidentally, the six bungalows are of three different sizes and designs. In other words, each of the three houses comprising a half of the plot plan is different from the others in that row, and yet is identical with the one directly opposite, save that the plan is reversed.

The outside walls of each house consist of narrow siding, or weatherboarding, painted a light French gray shade; and the trimming is done in white, while the roofs, which are of comparatively slight pitch, are covered with a dark roofing composition. All porches are floored with gray cement, and much of the exposed masonry is of bright red brick, the foundations being of concrete. The two front bungalows have large brick chimneys, of the outside type, and a rather liberal use is made of casement windows.

In addition to a general plot plan, the accompanying illustrations include individual floor plans of each of the three different styles of houses. These, of course, should be referred to for dimensions and interior



Bungalow Court, 94 by 188 Feet, Containing Six Individual Homes. There Are Also Two Garages in the Rear. The Six Bungalows Are of Three Different Sizes, as the Floor Plans Above Show, and Also Vary in Design. The Total Cost Was \$14,000. The Court Was Designed by Myron J. King, Los Angeles, Calif.



Close-up View of One of the Bungalows in the Court. Outside Walls of Frame, Painted Light Gray with Cement Floor Porch. This Home Is Heated by Built-in Gas Radiators and Contains Four Rooms. Built-in Fixtures Are Used Extensively to Save Space.

arrangements. Differing in sizes, the bungalows are naturally rented for different amounts, and also accommodate different sized families.

Pine woodwork is used for the interior finish of each unit thruout, and in all divisions, except the rear entrance porch, is finished in either white paint or enamel. All walls are plastered. Those of all living rooms and bed rooms are also papered; in the dining rooms of the two front ones they are finished with paneled wainscots; in the bath rooms and kitchens they are treated, to a height of six feet, with a hard-finish plaster coat and enameled like the woodwork, and elsewhere they are tinted. Hardwood floors prevail in all living rooms and dining rooms, and also in

one of the bed rooms of each of the two front houses. The bungalows, it will be observed from the plans, are especially well supplied with closets and convenient built-in features, the latter helping to cut down the amount of furniture required.

None of the houses has either a basement or a cellar, but each is equipped with built-in gas radiators for heating, as well as provided with other modern conveniences, including a water heater. The court is located in Los Angeles, Calif., and was designed by Myron J. King, of that city. The total building cost, at present building prices, is estimated to average about \$14,000, including the garages in the rear and all cement work.

## Roofing the House with Tile

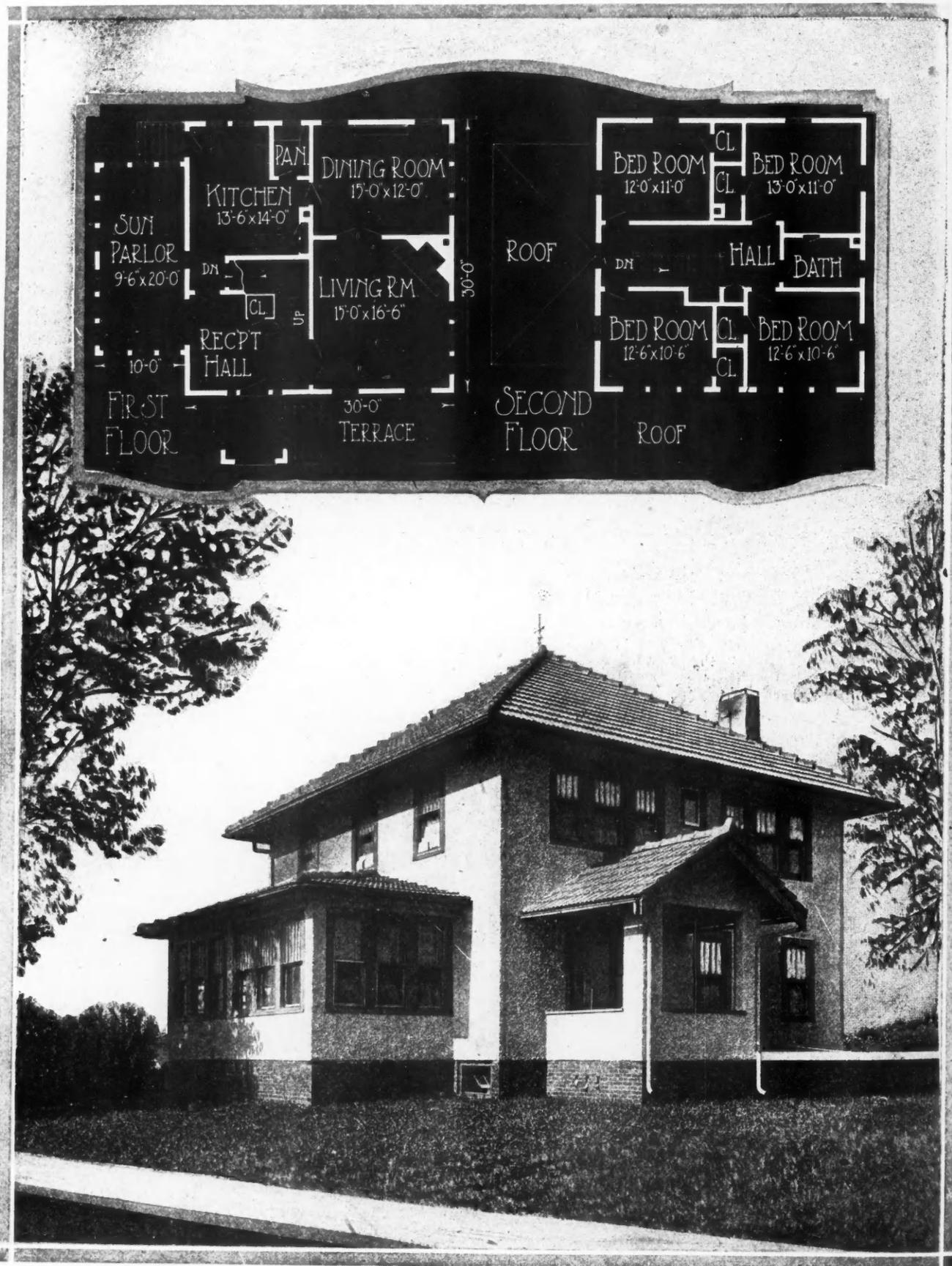
TERRA COTTA TILE USED EXTENSIVELY IN MANY SECTIONS OF THE COUNTRY AND GROWING IN POPULARITY—DETAILS ON PAGE 89.

**T**HE character of a building is in its roof invariably. While the effective shelter for the people within, it is also the decorative feature that attracts people without. Terra cotta tile or clay tile as it is more commonly known is well known for its decorative and ornamental qualities and because of its growing popularity it is a subject of important interest to all builders. Manufacturers of this product furnish complete specifications upon request.

When considering tile the first question which arises is the construction of the roof. The weight of tile averages about 8 to 10 pounds per square foot. Wooden rafters 2 by 6-inch sizes, of average length such as are frequently used in residences, when spaced 18-inch centers are strong enough to support roofing tile. All roofs should be constructed to bear a maximum possible load, which is divided into two parts,

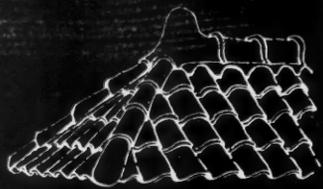
dead load and live load. The dead load is made up of the weight of rafters, sheathing, and roofing material. The live load is by far the greatest load and is composed of wind and snow loads.

Terra cotta tiles are manufactured in several designs and colors as the details sheet on page 89 shows. There is the closed shingle type with a tongue and groove lock, and the Spanish type so extensively used in Southern Europe. This type of tile is mainly used in hip roofs to give either massive or romantic effects. The tiles are formed with a lip-and-lap lock, so designed as to give ample weather guards. The so-called German tile is flat, altho there are convolutions in the surface to afford considerable play of light and shadow. This tile is used extensively on large roof expanse, such as school buildings, churches, and public buildings. It is used on apartment buildings and residences.

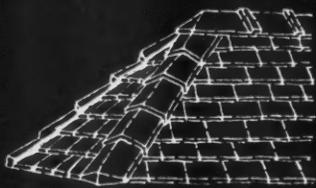


**UNUSUALLY ATTRACTIVE FARM HOME WITH ORNAMENTAL HIP ROOF.** Anyone doubting the progressive tendencies of the rural builder will be surprised to find this home on the farm—and it is typical of the houses that are being built by farmers today. The distinctive feature of this home is the square hip roof of tile, details of which are shown on the opposite page. Built along square, economical lines with brick foundation and stucco exterior, this home is very attractive. It has three large rooms and sun parlor on the first floor and four good sized bedrooms and bathroom upstairs. The location of the fireplace in the living room is rather unusual. Plenty of windows on all sides afford excellent lighting facilities. This home is 30 feet square.

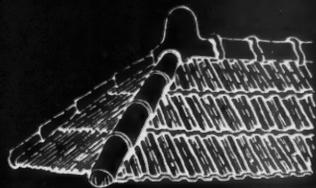
# RECOMMENDED CONSTRUCTION



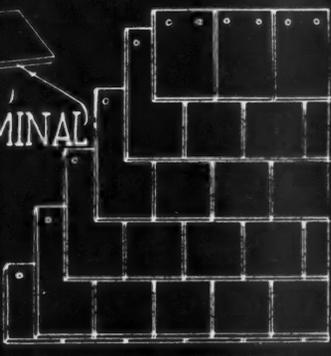
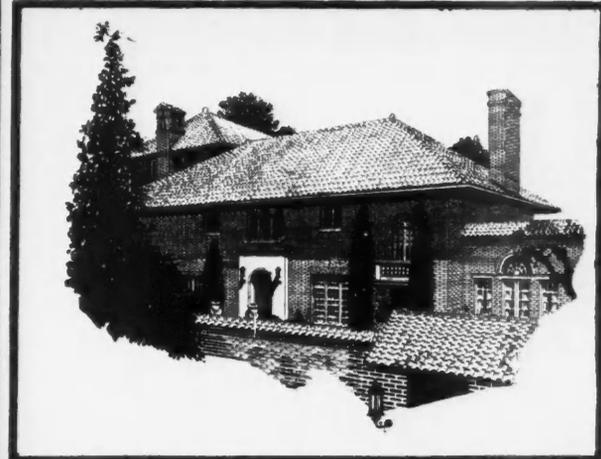
SPANISH ROLL TILE



PLAIN SHINGLE TILE



GERMAN TILE



ROOF SECTION

PLAIN SHINGLE TILES



SPANISH ROLL TILE



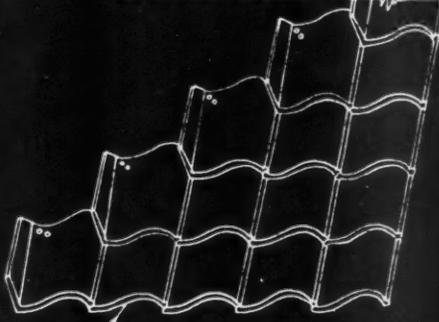
INTERLOCKING TILE



GABLE & HIP TERMINAL TILE



RIDGE TILE



SPANISH ROLL TILES

## CLAY TILE ROOFING

# A Practical Method of Figuring on Wallboard Work

DEFINITE SYSTEM WILL PREVENT LOSS SO OFTEN INCURRED BY SLIPSHOD METHODS

By E. L. Petzing

**M**ANY carpenters and contractors offer unsuccessful bids on wallboard work due to their inexperience in properly figuring on this class of interior finish. Altho wallboard is a recognized staple building material and has been on the market over ten years, there has really been no standard method established for figuring this material as is the case with other building materials. It is, therefore, necessary for the contractor to spend more time in figuring up his material lists and labor to insure a successful bid that will be fair to himself and to his client.

In over six years' experience working with carpenters and contractors on wallboard estimating, I have seen many profitable wallboard jobs lost thru "taking a shot" at some figure which was arrived at without any careful analysis of the material or labor required. What's the use of spending the time figuring at all or of taking up the client's time and patience if one is not interested in landing a contract?

In the September issue, I offered a practical and tried method of laying out a room and taking off a

material list. In this chapter and with the accompanying illustrations you will find a practical and tried method of figuring labor. It is just a simple, common-sense method with nothing intricate about it.

The labor of a job should never be figured as a whole. Every wallboard job has a series of distinct and separate operations and each of these operations should be figured separately as to labor. The figures should be on a basis of one man's labor at the prevailing trade rate per hour in your locality.

Usually there are three operations in finishing a room with wallboard: placing headers where necessary, applying the wallboard and applying mouldings and trim. Illustration No. 1 shows the placing of headers to take care of the panel arrangement selected. Illustration No. 2 shows the application of the wallboard. Illustration No. 3 the finished room after the trim has been applied and, incidentally, the satisfaction and contentment of the man who paid for the result. Always have in mind the man who has to pay; his dissatisfaction always means the loss of future business for you.

Using the working plan shown in Fig. 2 with Mould-

**SECTION-A-A 1/4" SIZE.**

**MATERIAL LIST**

**TRIM**

2	- 3" Spring Mould	- 10' Long	} 62' Linear Feet	} WALL DATTEN
1		12 "		
1		14 "		
2	- 3/8" x 2 3/4"	- 10' Long	} 222' Linear Ft	} 3/8" x 2 3/4" WALL LINE
3		12 "		
4		16 "		

List does not include door and window casings nor baseboard.

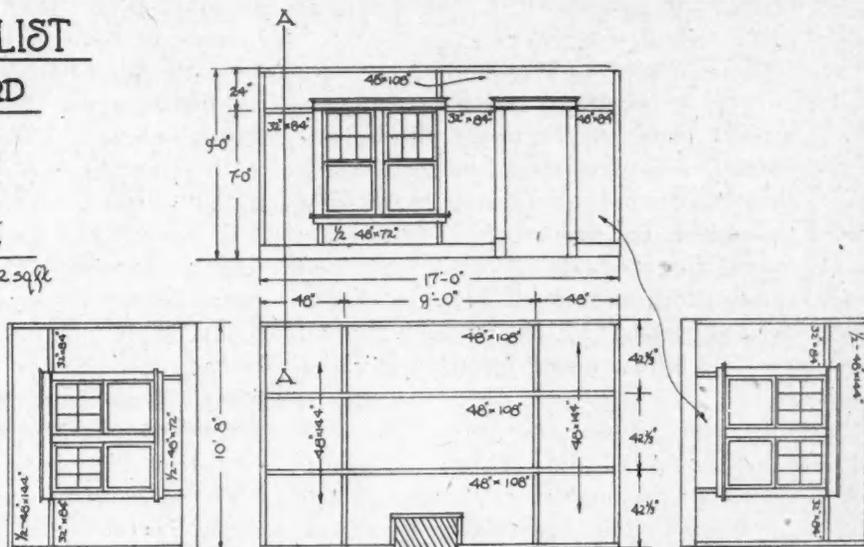
Fig. 1. The Carpenter in the Picture is Placing the Headers to Take Care of the Panel Arrangement Selected, Following the Plan Layout Shown on the Opposite Page. Moulding Detail A is Illustrated at the Right.

## MATERIAL LIST

### WALL BOARD

- 9-32' x 84" = 168
- 2-48' x 72" = 48
- 2-48' x 84" = 56
- 1-48' x 96" = 32
- 4-48' x 108" = 144
- 3-48' x 144" = 144

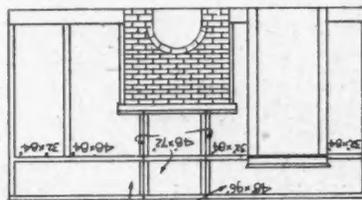
592 sq ft



## MATERIAL LIST

### TRIM

- |                                |                   |  |                 |
|--------------------------------|-------------------|--|-----------------|
| 6 - 7/8" x 3 1/2" - 10' Long   | } 184 lineal feet | 6 - 1" x 1 1/8" Ceiling panel mould - 10' long | } 182 lineal ft |
| 4 - 12" "                      |                   | 5 - 12" "                                      |                 |
| 2 - 14" "                      |                   | 1 - 14" "                                      |                 |
| 3 - 16" "                      | 3 - 16" "         |  |                 |
| 2 - 3" Spring Mould - 10' Long | } 62 lineal ft    | 3 - 1/2" x 5/8" Wall panel mould - 10' long    | } 316           |
| 1 - 12" "                      |                   | 10 - 12" "                                     |                 |
| 1 - 14" "                      |                   | 5 - 14" "                                      |                 |
| 1 - 16" "                      | 6 - 16" "         | 1 - 16" "                                      | 1 - 16" "       |
| 6 - 3/8" x 2 1/2" - 10' Long   | } 122 lineal ft   |  |                 |
| 4 - 12" "                      |                   |  |                 |
| 1 - 14" "                      |                   |  |                 |
| 2 - 3/4" x 3 1/2" - 12' Long   | } 38 lineal ft    |  |                 |
| 1 - 14" "                      |                   |  |                 |



List does not include door and window casings nor baseboard. Wall panel moulds to be used along top of baseboard but not around door and window casings.



Fig. 2. Working Plan with Material List of Wallboard. Moulding Detail B with Material List. In the Small Picture the Carpenter Has Placed the Headers and is Now Applying the Wallboard. Compare Moulding Detail with Detail on Opposite Page.

ing Detail A for trim which constitutes the material list for the room illustrated, let us as a conservative figure say that a steady workman can place the headers for the entire room in eight hours.

The next operation, applying the panels, I am sure can be taken care of by using a conservative figure, one-half hour per panel. That means cutting and fitting and nailing each panel shown in the working drawing. There are twenty-eight separate panels to be cut, fitted and nailed, figuring fourteen hours. My experience in analyzing the labor of a great many jobs of all descriptions and worked by all classes of carpenters, has proven to me that as a fair average, one-half hour per panel is a safe estimate for the application of wall board.

Applying the trim completes the job. (The wall-board, however, should be painted before the trim is applied.) This operation may be subdivided also, to get the work down to the closest labor figure. If Moulding Detail A is used, the labor may be figured on the order in which the trim is applied. The order is as follows: Sprung moulding for cornice, ceiling battens, door and window trim, baseboard, horizontal border moulding and last, vertical wall battens. As most carpenters and contractors have a standard of their own for figuring on casing doors and windows and applying baseboard, it is not necessary to offer a basis for those operations and since applying the wall-board mouldings is work of a similar nature, that operation can easily be figured. If Moulding Detail B is used, necessarily there is the additional labor of applying the panel moulds which can also be easily figured.

Now, for this particular room, we have a working plan which greatly assists the carrying on of the work since everything is laid out in advance. We also have

a selection of two details of mouldings. The labor of placing headers, applying panels and finishing up with the trim has been carefully analyzed. Get a figure on either of the material lists from your local dealer, add the actual labor figures plus the details, if you please, and you have the actual cost of the job to yourself. Now go ahead and add your overhead and fair profit to these figures and if you don't land the job, you certainly don't want it.

In connection with this method of figuring I will relate an example which is one of many in my experience helping carpenters which pulled across a nice profitable little job for a carpenter friend of mine, that he had practically lost. He was a carpenter who was doing a small contracting business, having just broken away from the trade to start building up a business for himself as many carpenters are wont to do.

During his first year business slacked up so that he was obliged to lay off his men and to keep things going he did his own work. He came in contact with a client who wanted a fairly large room finished in his attic with wallboard and as time was valuable to him, he asked me to assist by laying out the job and furnishing a working plan and material list for him.

When my plans were ready I passed them to him and as they gave his client a good idea what the room would be like his prospects looked good to land the job. Unfortunately, however, my carpenter friend was particularly rushed the day he submitted the plans and sizing up the job in a general way, he figured the labor at \$80.00, I would say off-hand. He didn't get the job. When he came to me I asked him what he figured his time at per day under the conditions he was working. The regular carpenter wage for an eight-hour day at that time was \$6.40 per day. He stated that he would be satisfied to clear \$8.00 per day for that job. Necessarily his \$80.00 figure spread the labor over a period of ten days. Then he began to see some light because he knew he could complete the job in less than that time.

We got busy and began a careful analysis of the labor operations, which consisted of framing the room in addition to the headers, applying the wallboard and the trim. The best we could figure up on actual hours of labor, adding each operation, totaled about \$50.00.

He could hardly believe his own figures, but double-checking did not change the results, so he submitted a new figure and got the job.

He completed the work in a little better than four days, did an A-No. 1 job, satisfied his client and made more than he had expected to make on the \$80.00 figure.

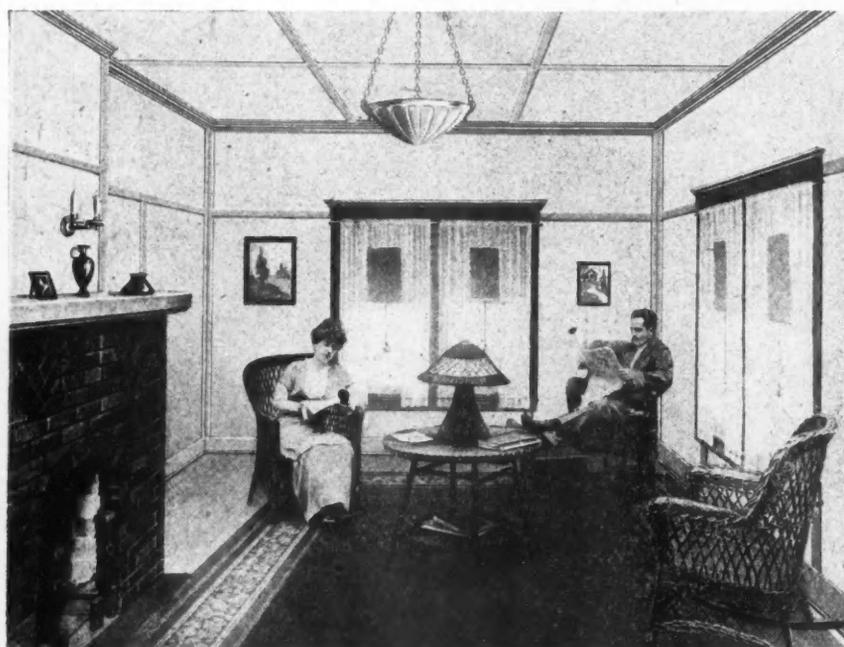
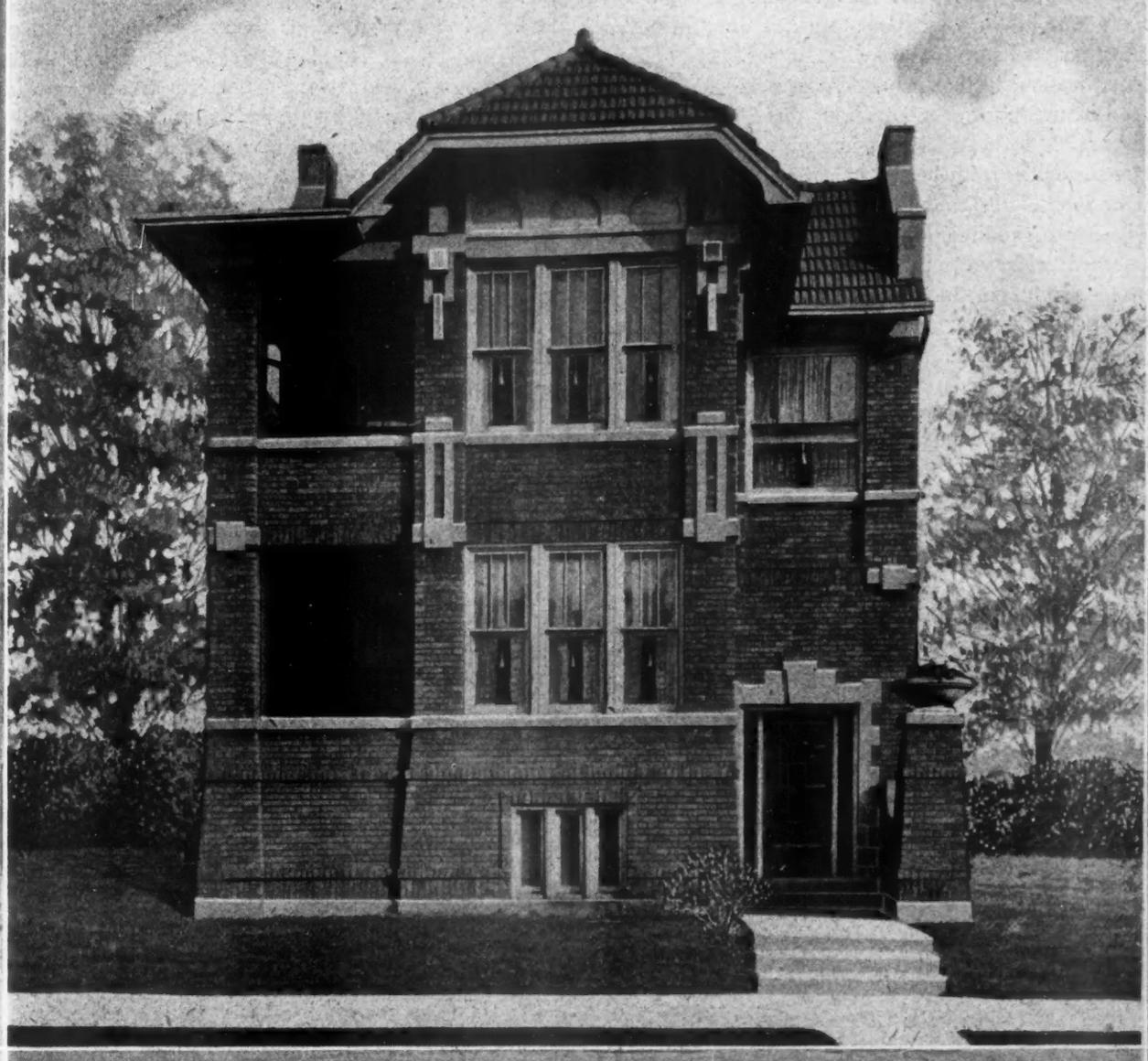
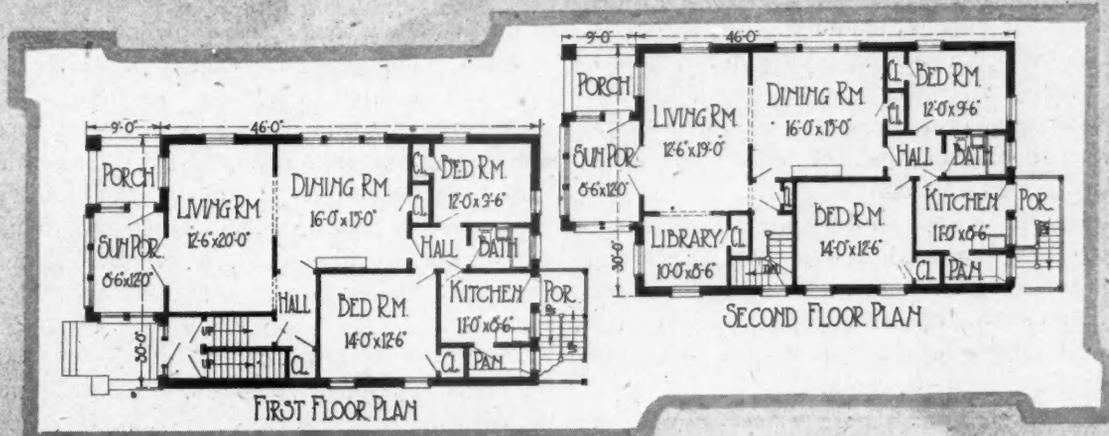


Fig. 3. Finished Room After Trim Has Been Applied. Evidently This Customer and His Wife Are Highly Pleased with the Results Which Were Obtained at a Reasonable Cost.

# Attractive Two-Apartment Building



**TWO-STORY APARTMENT BUILDING OF ATTRACTIVE DESIGN.** This type of building is very popular because of its investment features. It provides a substantial income in addition to a home. The open porch and sun parlor are two features which are seldom found in one home. Their advantages are obvious. By the addition of screens the porch can be made into a comfortable sleeping room. The first apartment has five rooms, while the upper apartment has a library to take up the space occupied by the hall downstairs. The bedrooms have been located at the rear of the apartment convenient to the bath. The large living room has access to the sun parlor, which in turn opens on the porch. Size, 30 by 55 feet, including porches.

## Outdoor Theater Is Unique in Architectural Field

STRUCTURE IN ST. LOUIS FIRST OF ITS KIND TO BE BUILT—EMBODIES MANY UNUSUAL FEATURES

By Samuel F. Larrimore

**A** PHASE of unique building construction, in which the artificial co-mingles with the natural in a way that creates a fusion that is ideal as well as highly practicable, is found in the comparatively new outdoor municipal theater of St. Louis, laid out on a slope in Forest Park.

In planning the theater the architect, Mr. Robert Cole Duncan, of the local Division of Parks and Recreation, had very little precedent to go by. There is ample outdoor architecture and plenty of hillsides to contemplate, but this was, practically, to be the first theater of its kind ever built.

Built on a hillside in an almost perfect lay of land, the only changes necessary being to take a small corner off and fill in an opposite corner, the St. Louis theater possesses a feature that is the envy of all indoor theaters, in that it has almost perfect acoustics. Seated in the extreme rear, about three hundred feet, it is possible to hear all that is said, and many of its patrons credit it with better acoustics than any indoor theater in the city, and that is saying a great deal.

The entire auditorium is constructed of concrete, reinforced with wire mesh of medium weight, and secured firmly on the hillside by legs or crosswalls extending forty-two inches below the top surface. The floor concrete at its thinnest place, in the corner of each step, is seven and a half inches thick. The whole is underlaid with cinders of about ten inches average thickness. The main entrance is flanked on

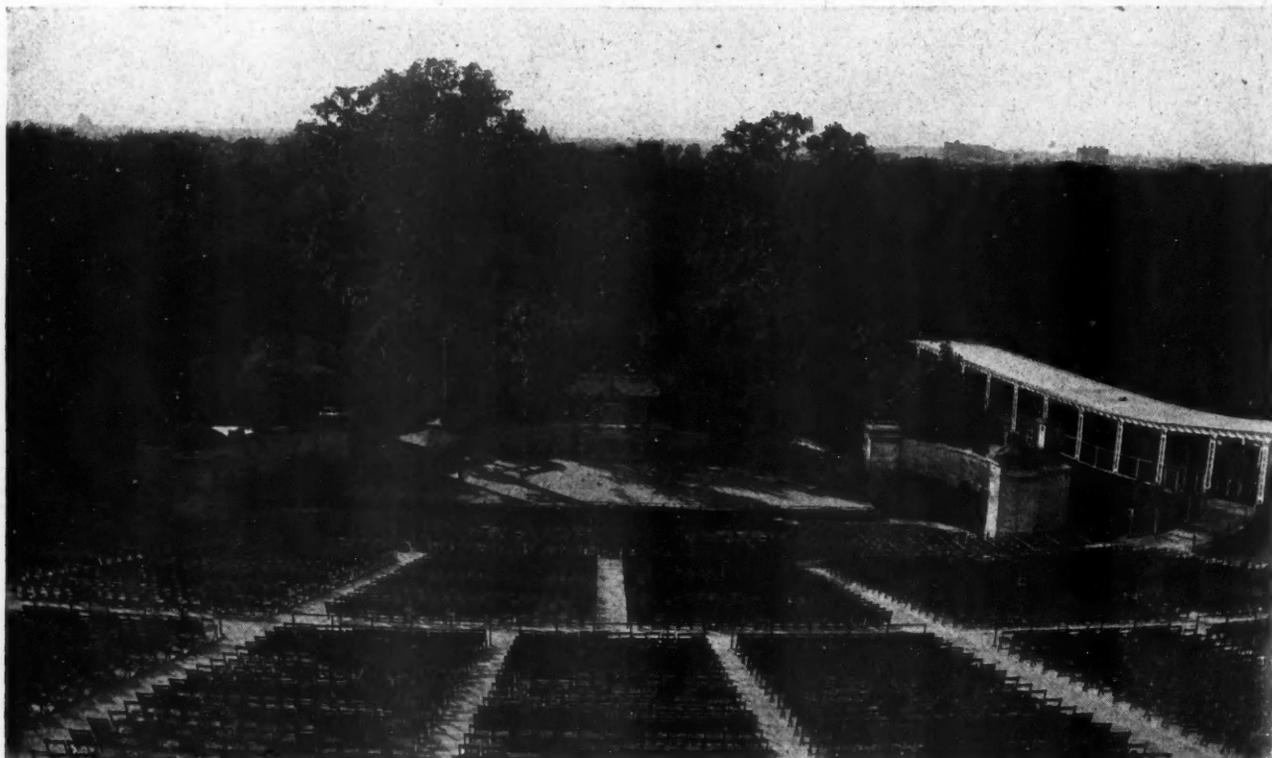
either side by pylons consisting of double Greek Doric columns supporting an entablature, which provides shelter in event of rain.

There is also an entrance to each section on the side leading in from a wide covered sidewalk that was built from the top of the hill past the full length of the theater to provide additional shelter. This pathway also obviates any necessity of passing down through the center of the theater, which has a grade of 21 per cent.

The theater was begun in 1916, two years after the St. Louis Pageant and Masque, to whose stimulus its construction was largely due. Finding on its program several large gatherings during the warm months, and inspired by the tremendous success of the pageant on Art Hill, the St. Louis Advertising Club and the St. Louis Style Show went to the city authorities with the proposal, that if a suitable auditorium were built, they would share a large part of the cost. The authorities agreed to the proposal and the work was begun.

First they built the concrete auditorium, with its seat ledges, and the stage. The next year a better lighting system was installed, and this year shelter has been provided where, in event of rain, the entire audience of nearly ten thousand may find protection.

Previous to this year, much of the stage lighting was furnished by searchlights, mounted on telephone poles at each side of the auditorium, but this proved somewhat unsatisfactory. Two light towers have



Outdoor Theater Built by Municipality of St. Louis, Mo. It Is One of the First of Its Kind Ever Built. The Auditorium Is Built of Concrete and Is Lighted by an Elaborate System of Stage Lighting. Mr. Robert C. Duncan Designed the Structure.

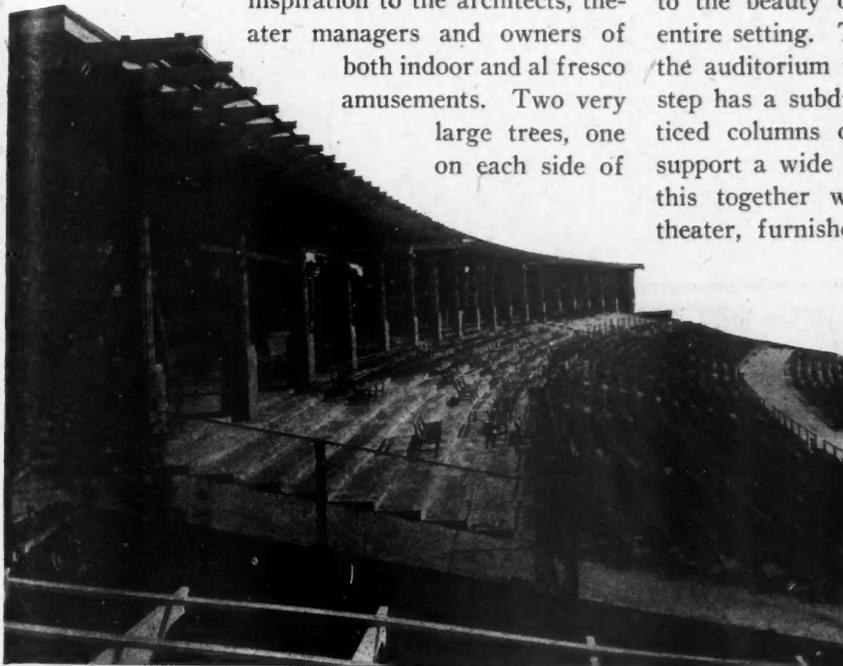
been erected at each side of the stage, one on each side lighting the front, and two a little farther back lighting the back of the stage. The towers on each side are joined by a high wall, shaped so that the sound is deflected to the seats at the proper angle.

The theater has become one of the big show places to visitors in St. Louis, and a source of never-failing inspiration to the architects, theater managers and owners of both indoor and al fresco amusements. Two very large trees, one on each side of

the stage, form a natural proscenium arch, and these are surrounded by other trees and shrubs. A bridge across a narrow river back of the stage connects with the large dressing room, screened mainly by shrubbery from the public.

Aside from the fact that the new shelters are useful in case of rain, they are also a distinct addition to the beauty of the place, and lend charm to the entire setting. There are no columns or light posts in the auditorium to obstruct the vision, and each aisle step has a subdued light to guide the feet. The latticed columns of the covered pathway at the side support a wide roof designed to provide shelter, and this together with the shelter in the rear of the theater, furnishes protection for the entire audience in the event of rain.

The stage is adaptable to any kind of performance, and it is planned to erect an hydraulic screen at a later date. After the show, without any scramble, the entire auditorium can be emptied in ten to twenty minutes, owing to the wide aisle construction and seat arrangement. The theater is of interest to the contractor or architect chiefly as showing the possibility of this type of construction in other cities, and for providing ideas for similar theaters elsewhere.



Shelter Built in Rear of Open-Air Amphitheater to Protect Audiences in Case of Rain. There Are No Posts in Auditorium to Obstruct Vision. Each Aisle Has a Subdued Light to Guide the Feet.

## Installing Cork Brick Floors in Barns

METHOD OF LAYING MATERIAL IN COW STALLS SHOWN IN DETAIL BLUEPRINT SHEET ON PAGE 96.

**T**HE floor of a dairy barn is one of the most important features of its construction because it involves so many important points, such as feed and litter alleys, gutters, mangers, etc. However, a most vital part of the floor is that part upon which the animal stands day in and day out, and on which it rests at night. This is the stall floor. For this purpose a composition material made up of 70 per cent cork, known as cork brick, has been found most effective because of its resiliency, ease under foot, general sanitary qualities, warmth, and non-slippery character, whether wet or dry. Moreover, builders find it reasonable in cost and very easy to install. Complete specifications are furnished by the manufacturers.

To begin with, a foundation setting consisting of at least 3 inches of broken stone, cinders or clay, well tamped, is laid. On this is added a 3½-inch layer of concrete, mixed in proportion of one part portland cement by volume to two and one-half parts of sharp, clean sand and five parts of gravel or crushed stone. The concrete should be well tamped in place until the water comes to the surface. Level off with a straight edge, but do not trowel it.

The surface should be brought up to within 2½ inches of the finished floor level. Care should be taken

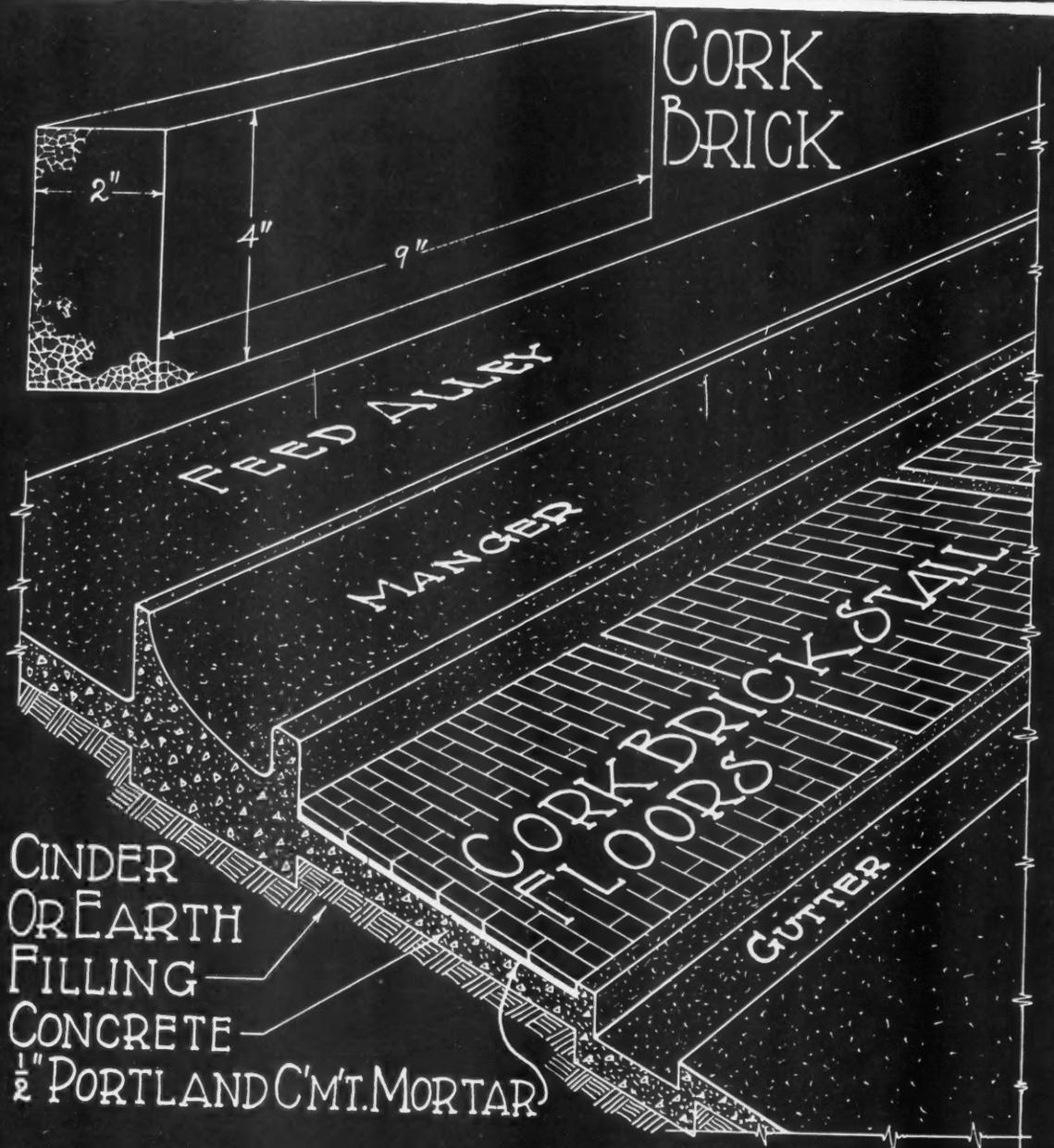
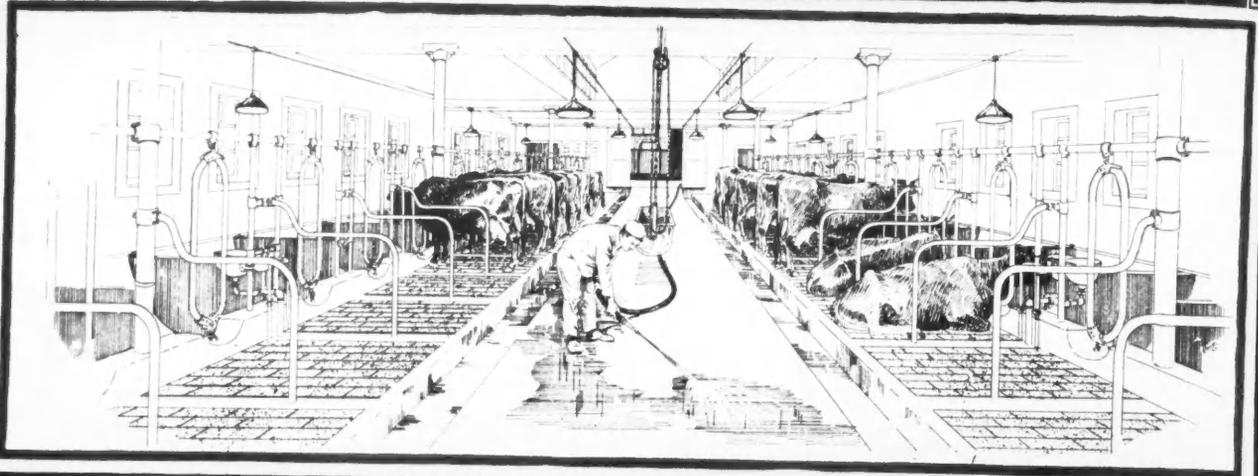
to install a cement curb 4 inches wide and 2½ inches high at the back of the stall, so as to protect the edges of the brick. The brick is then laid before the base is more than eighteen hours old.

The cork brick is laid on the concrete base in a ½-inch bed of portland cement mortar, mixed in the proportion of one part cement to two parts sand. To provide this ½-inch mortar bed and to grout all joints will require 1¼ barrels of cement and ½ cubic yard of sand for each thousand brick. The brick should be laid close together. Break short joints between the different rows with the long side of the brick running from manger to gutter, as shown in the detail sheet on page 96. Before the mortar sets tamp the brick in place, using a wide board.

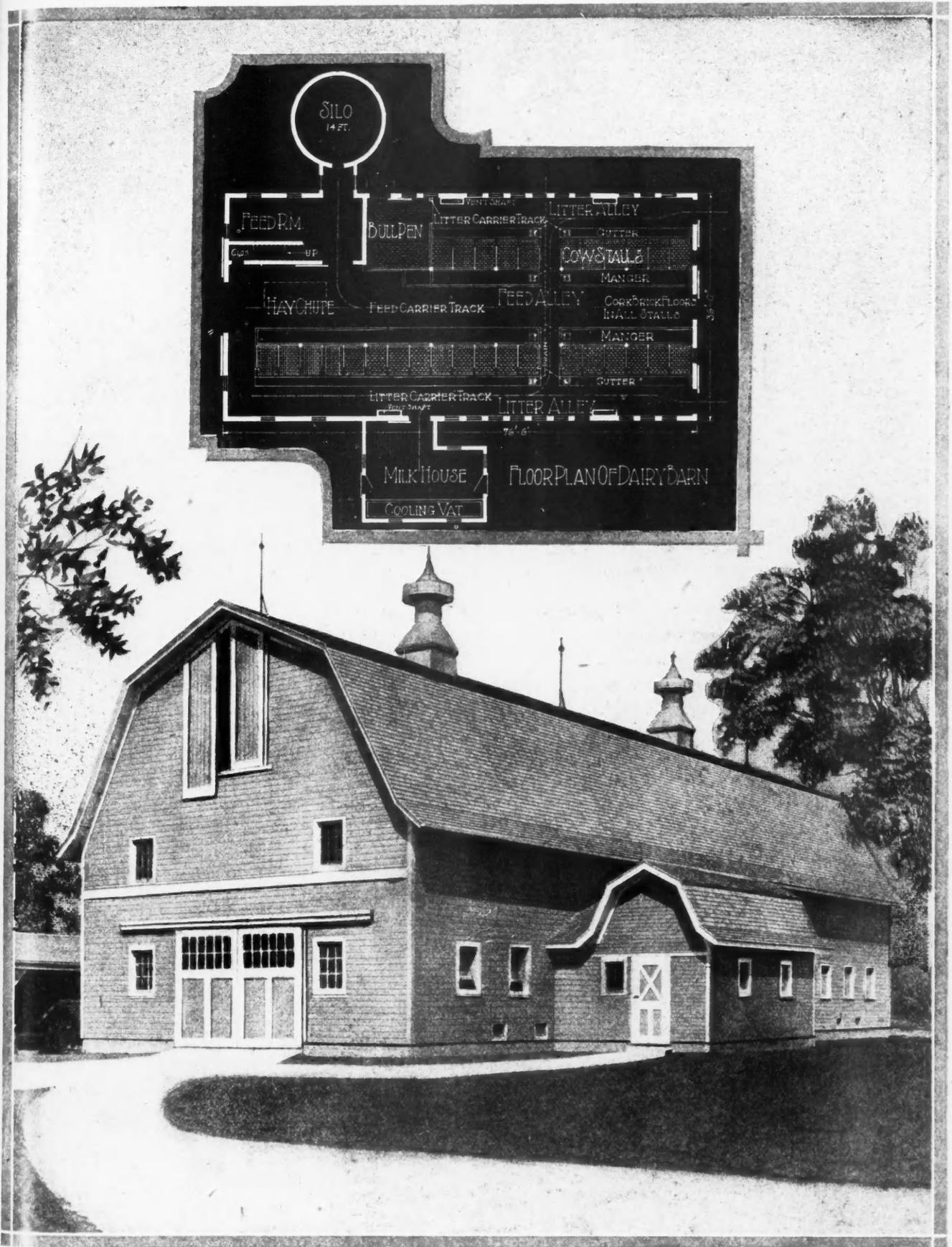
It is important in grouting not to walk directly on the brick, but stand on a board. The surface should be wet thoroly every twenty-four hours for two or three days, to prevent the cement in the joints from cracking. The finished floor should not be used in forty-eight hours.

These cork brick are 9 by 4 by 2 inches and are laid flat. One thousand cover fifteen cow stalls 3½ by 5 feet. To find the number of brick required, multiply the number of square feet to be covered by four.

# RECOMMENDED CONSTRUCTION



## CORK BRICK FLOORS



**MODERN, EFFICIENT DAIRY BARN.** No building is more important than the dairy barn. The builder of this handsome barn was aware of this fact, for the building contains the latest features in construction and equipment. Set on a firm foundation of concrete, it is built of heavy timbers with frame siding and a gambrel roof. Note the ventilators on the top of the barn, also the sliding hay doors and main doors. The milkhouse within easy access of the barn is an added feature that will eliminate waste effort. The floor plans show the stall arrangement and cork brick floors, details of which are shown on the opposite page. Provision is made for carrier tracks in the feed and litter alleys. Well-built, well-ventilated and equipped, it is an excellent type of farm building and typical of barns now being erected by progressive builders. Size, 36 by 76 feet.



How They Travel Thru the Hill Country of India. This Vehicle Is Called an "Ekka." It Is a Two-Wheeled Vehicle, That Has Many Pockets for Carrying Baggage. This Is About the Only Means of Transportation to Many Parts of the Interior.



Elephants Are Used in Ceylon and India as Horses Are in the United States. These Elephants Are the Property of a Rich Native and the Photograph Was Taken in His Dooryard. Incidentally the High Cost of Draft Animals Has Come Down in the Orient, Elephants Now Being Quoted at \$1,200, Whereas \$2,000 Was the Average Price During the War.

## China is Out-Trading America

ORIENTALS HAVE DEVELOPED THEIR FOREIGN TRADE DURING THE LAST SIX YEARS SO THAT NOW THEY HAVE 100 MILLIONS THE BEST OF US.

By William A Radford, Jr.

(On a Trip Around the World in the Interests of American Builder.)

**S**HANGHAI, CHINA, September 25, 1920.—Perhaps in my previous articles I have laid too much stress on the out-of-date methods used in the

Orient that many of the readers have come to the conclusion that there has been no progress in these countries. Nothing could be farther from the truth.

But it is the ancient ways of doing things that attract the attention of the visitor; he takes the modern buildings and building methods as a matter of course.

During my travels thru Ceylon, India, the Dutch East Indies and along the coast of China from Hong Kong to Shanghai, I saw many buildings that are far ahead of anything in America, in point of architecture and construction. In the large cities like Bombay, Calcutta and Singapore, Batavia, and in Hong Kong, China, it is not unusual to encounter business buildings and homes that would attract attention in any American city. But here, set in surroundings that go with the buildings not at all, they startle you. In this city of Shanghai, especially in the business district, it is not uncommon to see a solid building of cut stone that resembles in architectural design and construction some of the better bank and office buildings in Chicago, New York or any other pro-

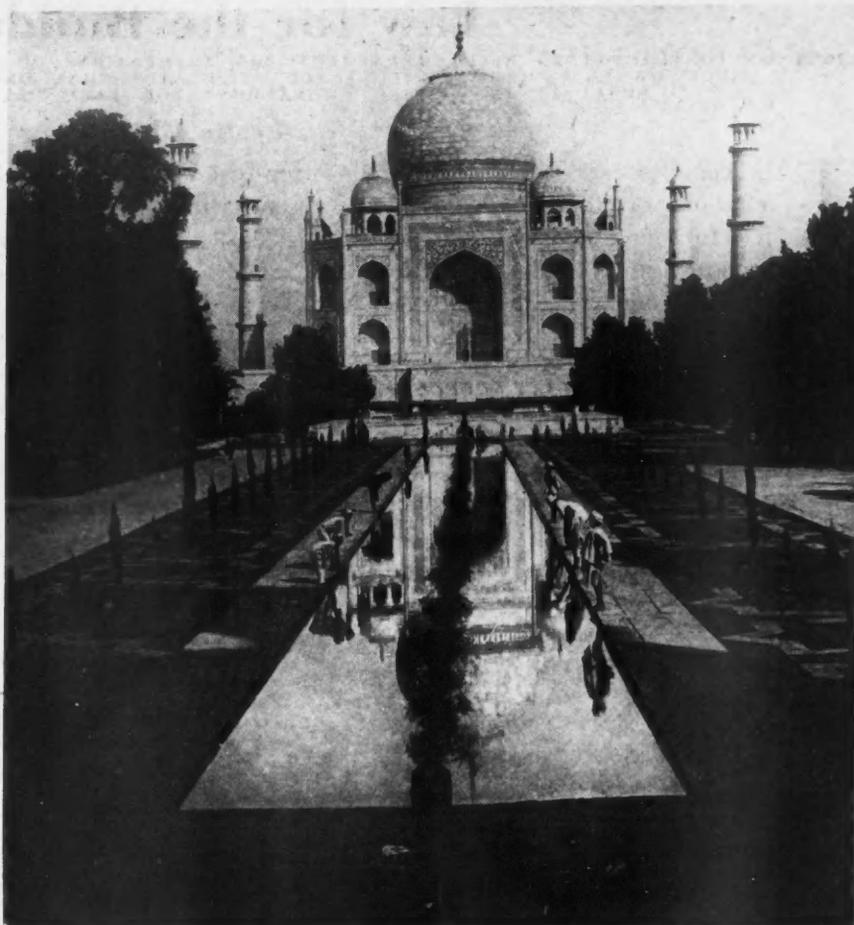


Looking Down the River and Into the Harbor at Singapore, Straits Settlements. Out of This Harbor Go the Ships That Carry More Than Three-Fourths of the Crude Rubber Used in the United States. Many of the Large Automobile and Truck Tire Companies of the United States Have Large Establishments at Singapore.

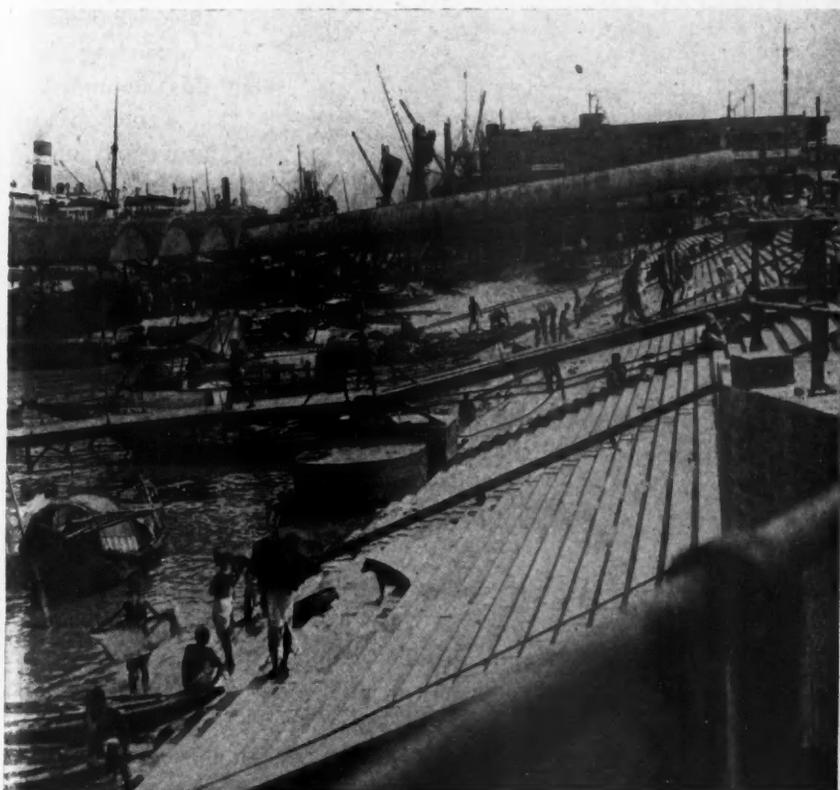
gressive city at home. And it is not unusual, either, to see the native firm, such as "Qu Wong," and after it in bold English lettering the character of his business on the building front.

All of the coast cities, such as Singapore, Hong Kong and Shanghai, are a strange mixture of Oriental and English. Every worthwhile business house has one or more men who speak, read and write English, as much business is done with American and British concerns. I could not help but think that American manufacturers might profit by the example. But what is most important is that American manufacturers and dealers need have no hesitancy about writing to these people in the English language.

China, as well as the other countries I have visited, has profited greatly from the war. Likewise the war and the consequent inability to obtain manufactured articles and materials from European countries, have greatly increased American trade with China. Last year the exports to the United States



The Taj Mahal, at Agra, India. This is the Tomb of an Ancient Ruler and His Wife and is Famed Thruout the World Because of Its Beauty. It took 20,000 Men More Than 18 Years to Build and is of Marble Inlaid with Semi-Precious Stones.



Harbor and Docks at Calcutta, One of the Gateways to India.

amounted to nearly \$160,000,000 and the imports from the same country \$70,000,000, as against \$27,000,000 and \$25,000,000 in 1913. It will be noted by these figures that whereas in 1913 exports and imports about balanced, the balance of trade now is heavily in favor of China, a fact that has much to do with the prosperity here.

However, Americans are alive to the fact that China offers a profitable field for American machinery and manufactured articles. Importers here say that Americans now are beginning to seek their business, but add that the needs of the country are far from being filled.

When this appears in print I will be in Japan, Yokohama being my first stop. There I expect to find an even greater American influence on business than in China, but it is on the Continent here that American manufacturers should seek business.

## Law for the Builder

RIGHT OF CONTRACTOR TO RECOVER PAYMENT FOR ALTERATIONS OR ADDITIONS MADE ON ORAL ORDERS OF OWNER, WHEN THE CONTRACT STIPULATES THAT ORDERS FOR SUCH WORK SHALL BE IN WRITING OR PAYMENT FOR SAME SHALL NOT BE MADE

By Leslie Childs

**T**HE doing of extra work, either in the form of additions or alterations, has always been a fruitful source of dispute between building contractors and owners. Because of this, carefully drawn contracts often contain a clause that limits the owner's liability for "extras" to items which have been requested in writing.

This is no doubt a good method of avoiding after disputes, providing both the owner and the contractor live up to the letter of the written provision. But, as is often the case, where the written contract is no sooner signed than the parties thereto start making subsequent oral contracts, in relation to extras, the written provisions then generally become of little protection.

For, in the absence of a statute, the subsequent oral contracts are of equal dignity to the original agreement, and if the owner thus orally orders extras, at an agreed price, he cannot avoid paying for them on the plea that the orders were not in writing. This for the reason that by thus ordering orally he will generally be held to have waived the written provision relative to such work.

The law books contain a number of excellent cases illustrating the application of this rule, which also point out the dangers to both contractor and owner, in contracting in this double manner. A case of this kind was *Headley vs. Cavileer*, 82 N. J. L. 635, the facts being substantially as follows:

### Contract Provided Requests for Additions, Etc., Must Be in Writing

Samuel H. Headley entered into a contract to erect a building in Atlantic City, N. J., for Walter K. Cavileer. The contract, among other things, contained the following provision relative to the ordering of, and liability of Cavileer to pay for, additions and alterations:

"Alterations.—At any time directed by the owner, the contractor shall make any alterations, additions, or omissions from the plans and specifications without affecting the validity of the contract; but the price of

all work shall be added or deducted from the contract price as the case may be, and the amount agreed upon and affixed in writing and signed by the owner and contractor before such work is begun. Such order for work must be produced and surrendered at the final settlement or no payment for such work will be made."

It appears that Headley completed the contract, and in so doing did considerable extra work on the oral orders of Cavileer, the owner. A dispute arose relative to the payment for this extra work which culminated in Headley bringing an action against Cavileer.

Upon the trial of the cause in the lower court Cavileer contended that Headley, the contractor, could not recover for the additions and alterations, unless he could show a written order authorizing them, as provided in the original

contract. Headley, in opposition to this, introduced evidence to show that during the progress of the work they orally agreed on the doing of certain extra work, and the price therefor. Contending that this amounted to a waiver of the provisions of the

contract requiring orders for extras to be in writing.

The trial court, it seems, submitted the question as to whether or not there had been subsequent oral orders for the extras that would entitle the contractor to pay regardless of the written provisions of the contract to the jury. The latter found for the contractor, and that he was entitled to payment for the extras as orally ordered.

From this judgment an appeal was taken, and the case finally reached the Court of Errors and Appeals for decision. In passing upon the questions raised the court in substance held.

### Subsequent Oral Contracts Valid

That under this contract which provided that extra work should only be paid for when the requests for same were in writing, the mere doing of such work, without such writing, would not cause a waiver of the provisions of the contract. But if it were shown that the extra work was done in obedience to subsequent

(Continued to page 105.)



"— Headley Completed the Contract and In So Doing Did Considerable Extra Work on the Oral Orders. A Dispute Arose Over the Payment for This Extra Work."

# DESIGN OF SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

## Columns

ARTICLE IX OF AN EXTENSIVE SERIES ON STRENGTH OF MATERIALS

A STRUCTURAL steel member, stick of timber, brick post or concrete post with its length at least ten times the least dimension in cross-section is spoken of as a column, when it stands vertically and carries a load at the top. Indeed slanting members with compression loads on the ends are subjected to the same fibre stresses as the above described vertical pieces, and are considered as columns in designing. Such members are formed in the chords of roof and bridge trusses.

Engineers do not agree as to what ratio of length to least dimension shall constitute a column. The ratios used vary all the way from ten to fifteen. Experiment has shown that if the ratio previously mentioned is very small, and the load is applied centrally at the ends, if the member fails, it is by direct crushing. Formulas for safe designs against crushing have been given in previous articles. If the ratio of length to least dimension of cross-section is ten or more and the piece of material is centrally loaded until failure occurs, experiment has shown that the failure is due to a combination

of crushing and bending or buckling sideways. Such a member is called a long column or simply a column. However, to be on the safe side, the designer should not adhere to any hard fast rule for the ratio, but figure for crushing and buckling by a formula to be given in later articles.

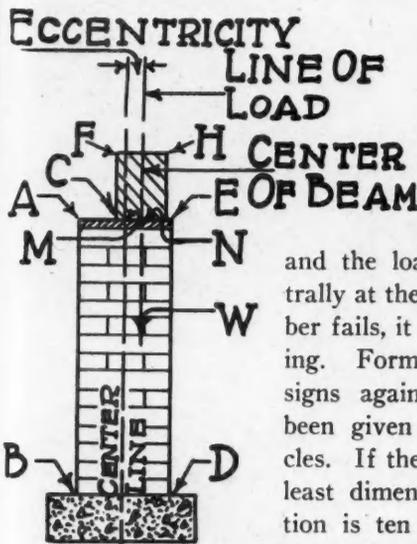


Fig. 1. Brick Pier Resting on Concrete Foundation, Carrying a Beam That Is Not Placed in the Center.

To show what is meant by a column, consider a wooden beam 6 by 8 inches in cross-section. The least dimension is 6 inches. By the rule any part of this beam,  $10 \times 6 = 60$  inches, or five feet in length or greater, is figured as a column.

Before taking up a discussion of columns for buckling I will consider the case of a short column in compression when the load is said to be *eccentric*.

Take, for example a brick pier, resting on a concrete

$$\text{Bending moment} = p \times \frac{I}{e}$$

$$aW_1 = p \frac{I}{e}, \text{ or } p = \frac{aeW}{I} \dots \dots \dots (1)$$

This is the fibre stress in the extreme outer fibres of the pier along the edges perpendicular to the edge BD at B and D. Fig. 2 shows the relations. PI is the neutral axis,  $p_1$  is the compressive stress in the fibre TD, and the tensile stress in SB.

$W_2$  is the total load carried at the bottom of the pier, consisting of the load  $W_1$  and the weight of the pier. The compressive fibre stress  $p_2$  due to this load is

$$p_2 = \frac{W_2}{A}$$

Where A is the area of the cross-section of the pier,

$$C = p_1 + p_2 = \frac{W_1 ae}{I} + \frac{W_2}{A} \quad C = p_1 + p_2 = \frac{W_1}{A} + \frac{W_2 ae}{I} \dots \dots (2)$$

Also at SB,  $c = p_2 - p_1$ .

But in brick or concrete work where the resultant stress must not be in tension  $p_2$  must be greater than  $p_1$ .

The fibre stress  $p_1$  depends upon the distance that the load is from the center. In a design, if  $p_1$  is found greater than  $p_2$ , a

is made smaller—that is, the load is moved nearer the center of the pier. The reader is referred to the October number of

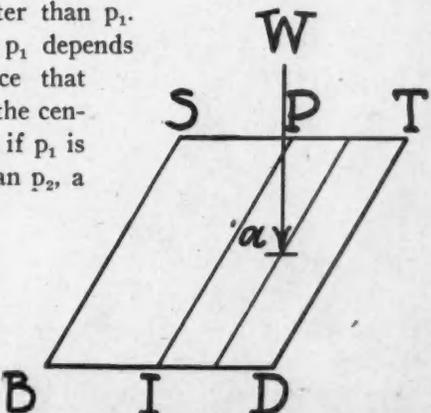


Fig. 2. Section of Pier at the Base.

the AMERICAN BUILDER for a graphical representation of these combined stresses.

Suppose that the beam, one support of which is shown in Fig. 1, carries a uniformly distributed load of

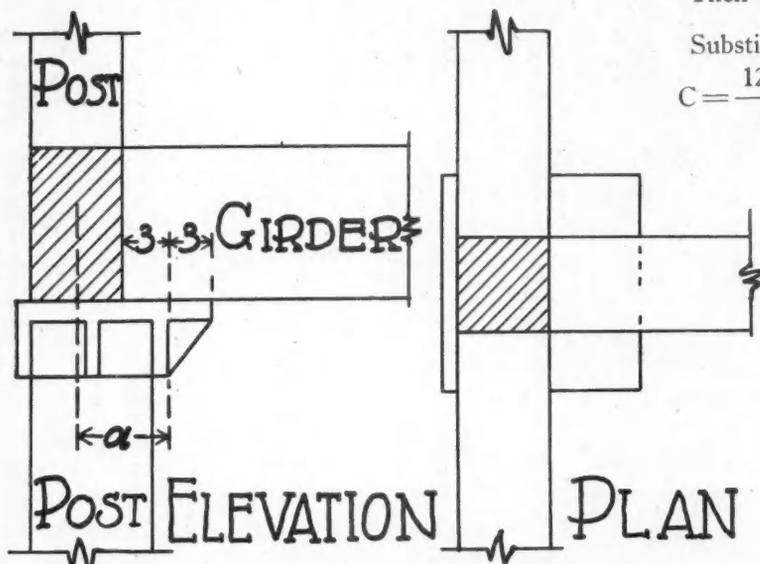


Fig. 3. Short Post Loaded With a Floor Girder on a Side Bracket and Also Carrying Load From Another Post on Upper Floor.

22,000 pounds. The pier is 12 inches square and 8 feet high.

When the end load of the beam is central, the uniformly distributed fibre stress on the base of the pier consists of one-half the total load, or

$$\frac{22,000}{2} = 11,000 \text{ pounds}$$

and the weight of the pier. If brick weighs 120 pounds per cubic foot, the total weight is

$$\frac{12 \times 12 \times 8 \times 120}{144} = 960 \text{ pounds}$$

$$\therefore W_2 = 11,000 + 960 = 11,960 \text{ pounds.}$$

$$\text{Then } p_2 = \frac{11,960}{12 \times 12} = 83 \text{ pounds.}$$

This is seen to be perfectly safe.

Now, if this load is off center, say 3 inches, very different stresses exist. Here  $a = 3$  and  $e = 6$ .

$$I = 1/12 bh^3 = \frac{12 \times 12 \times 12 \times 12}{12} = 1,728, W = 11,000$$

$$\therefore P_1 = \frac{aeW}{I} = \frac{3 \times 6 \times 11,000}{1,728} = 115 \text{ pounds, approx.}$$

Then the maximum compressive stress on DT, Fig. 2, is  $C = 83 + 115 = 198$  pounds per square inch and in BS,  $C = 83 - 115 = -32$ .

This shows that the left-hand fibres have been thrown in tension, which is not safe for stonework or brick work. A safe making compression stress for brick work laid with lime mortar is 110 pounds, and for portland cement 200 pounds. While for rubble stone work laid in lime mortar a safe stress is 75 pounds per square inch, or 140 pounds when portland cement is used. In any case the above loading is not safe. The stresses may be brought within safe limits by reducing  $a$  to less than 2 inches or increasing  $A$  to

the cross-section of the pier, or both at the same time. For example, let  $a = 1\frac{1}{2}$  inches and  $A = 15 \times 15 = 225$  square inches.

$$\text{Then } W_2 = 11,000 + \frac{15 \times 15}{144} \times 8 \times 120 = 12,500.$$

Substituting in Formula (2):

$$C = \frac{12,500}{225} \pm \frac{11,000 \times 7\frac{1}{2} \times 1\frac{1}{2}}{1\frac{1}{2} \times 15 \times 15 \times 15 \times 15} = 55.6 \pm 28.3$$

$C = 85$  pounds compression on one side and 26.3 pounds compression on the other.

The results show that the structure is safe. This principle has a more direct application when considering the effect of floor beams attached to columns, which in general is eccentric loading. Such a condition is shown in Fig. 3, and will be discussed in future articles.



### Cold Weather Contraction

(Continued from page 70.)

taken to prevent the possibility of fire. Where dependence is placed on tarpaulins

as a means of keeping out the cold, it is necessary to close up every tear or opening in this cover to avoid freezing spots on the concrete. Extreme care should be observed in protection of projecting portions of the work around which it is advisable to place double or triple layers of protective covering, such as heavy building paper or canvas.

### Beware Too Early Removal of Forms

Concrete gains strength slowly at cold temperatures. If frozen, the hardening action is entirely stopped until it has thawed out. The process of freezing and thawing shatters the strength of concrete by mechanical action of the water changing to ice, expanding and pushing out substances around it. Concrete work kept above the freezing point for several days after placing in forms is immune from further danger of freezing, but cannot be expected to carry loads or even its own weight for a considerable period thereafter. Forms are usually left in position three weeks or longer and the concrete carefully examined before they are removed.

Concrete which has been frozen has been known to take on the appearance of well hardened concrete and to ring when struck with a hammer. At temperatures below 40 degrees about the only sure way to determine whether concrete exposed to freezing is in a frozen condition is to pour hot water over it and observe its strength after it has had an opportunity to thaw.



HOW are you cutting costs on building? Your friends who read the AMERICAN BUILDER are eager to hear new ideas so that they can push the good work along. What is your experience with labor-saving equipment, machinery, and motor transportation? These facts are worth while.

## White Enamel Effects Are Popular and Practical

VERY SATISFACTORY FINISH ON INTERIOR WOODWORK AND FURNITURE—CAN BE CLEANED EASILY AND FREQUENTLY WITHOUT INJURY

Article 3 of a Series on Painting and Decorating

By C. M. Lemperly

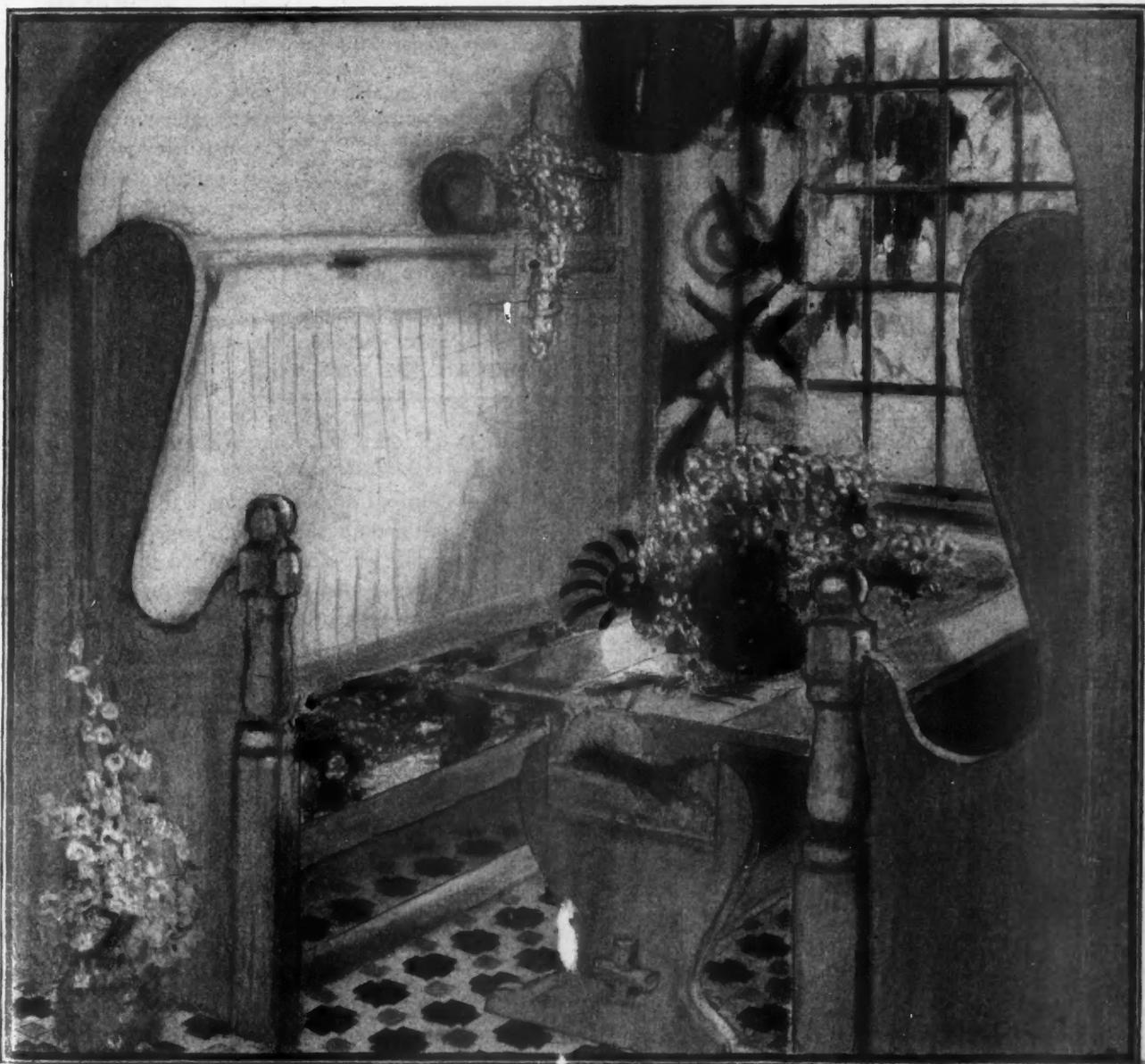
WHEN all is said and done, you can't very well beat white enamel when it comes to an all-around satisfactory finish on interior woodwork or furniture. It is attractive because it sets off the furniture and goes well with most any kind of hangings and decorations. It is practical because it can be washed and cleaned easily and frequently without injury. It is also easily refinished and kept in condition simply by cleaning, sanding, and applying additional flat undercoatings and finishing enamel coats.

White enamel finish used to be popular chiefly among hotels, clubs and large, expensive homes. But its popularity soon spread to all kinds of residential work and today it is used in moderate priced dwell-

ings as well as in the most elegant and costly.

The last few years have witnessed the development of long oil enamels, made from specially treated linseed oil and opaque zinc as the chief ingredients. The long oil enamel produces an elastic finish, and does not dry brittle like some of the varnish enamels, and while these enamels are a little slower drying, they stand for years. The wearing qualities are great in proportion to the quality and treating of the oil as linseed oil is the life of enamel the same as paint.

White enamels are applied principally by painters but any property owner or housewife can enamel satisfactorily with the exercise of a little judgment. I have in mind a certain home where the entire upstairs woodwork was enameled this summer by the lady of the



Delightful Breakfast Nook Just as the Morning Sun Is Beginning to Apply Its Golden Brush. Finished in White Enamel, This Dainty Retreat Is Made Doubly Alluring and Inviting. Attractive Effects Can be Obtained by the Intelligent Use of This Material.

house and the maid. They applied three undercoats of flat paint, and three final enamel coats and the results would defy detection from a professional job. A painter is generally recommended.

Furniture can be enameled easily by women folks and men folks and the only precaution necessary is the preparation of the surface and undercoats, and plenty of strength or elbow grease, as any good enamel "pulls" slightly more than paint.

Attractive effects can be obtained from white enamel on wickerwork, with black enamel stripes on the arms of the chairs, the legs of the chairs, the bands of the flower basket or whatever the surface may be. White enamel trimmed with black enamel is most delightful in contrast.

Exterior work can be enameled if a good quality long oil enamel is used. It takes longer to dry than paint and is a little more costly as a rule, but its long life makes up for the difference. Some pillars and panels on exterior work can be enameled effectively. Enamel can also be used on metal, cement and plaster.

For interior work, birch, on account of its whiteness and delicate grain, is regarded as the most suitable wood for enamel finish and is used on the finest jobs. Select white wood (or poplar) is also suitable, altho sometimes not used for the highest grade work.

White pine is next in suitability. Woods like Georgia pine and cypress are poor woods for enamel finish, as they contain so much resinous matter that priming coats cannot penetrate thoroly, improper drying results and sometimes stains appear on the white coating.

Smooth plaster is an ideal surface for enameling. Cement surfaces are frequently enameled. Metal ceilings and furnishings can be enameled with good results.

Recently, ivory shades have become very popular and occasionally you see some two-toned effects with white enamel woodwork and gray enamel or ivory edgings.

To secure a beautiful white enamel finish, a perfect foundation is necessary and indispensable. Undercoaters of flat oil paint or white lead are satisfactory. Briefly stated, the primer and initial undercoats must contain sufficient oil to thoroly seal the surface and then the surface must be thoroly covered and surfaced by sandpapering.

Priming—(With prepared undercoater) Most surfaces may be sealed thoroly by adding the requisite amount of raw linseed oil to the undercoater. The

amount of additional oil required varies greatly on different kinds of surfaces and materials.

The following suggestions will give a fairly good idea of what is required under different conditions. Remember that the thoro sealing of any surface depends quite as much on liberal and careful brushing as it does on the proper tempering of the primer with oil.

Softwoods—Add one quart raw linseed oil to gallon of undercoater. Allow 24 hours for drying.

Hardwoods—Add one pint of spirits of turpentine and one pint of raw linseed oil to gallon of undercoater. Allow 24 hours for drying.

Plaster—Plaster differs so much in texture that no set rule can be given for thinning the undercoating. However, as much oil should be added as will be taken up by the plaster. In some cases this will require more than is recommended for soft wood, while in other cases where the plaster is very hard, less oil will be required. Allow at least 24 hours for drying.

Intermediate or Surfacing Coats—Thin the undercoater to a working consistency with spirits of turpentine. Apply with a soft, clean brush and avoid brush marks. Allow 24 hours for drying of each coat.

All intermediate coats should be sandpapered smooth with fine paper. Avoid the use of coarse

paper, as all deep scratches will be apparent in the finished work.

Use a sufficient number of coats to secure a solidly covered and smooth surface.

Extreme care should be exercised in laying on the last undercoat, so that no sandpapering will be necessary, and finally, before applying the enamel, see that the surface is absolutely free from dust or lint.

For those who desire to use white lead in oil in building up the surface for finishing with enamel, I have prepared the following condensed specifications.

#### Interiors

New Woodwork—One coat white lead (100 pounds lead in oil, 3 gallons boiled oil, 2 gallons turpentine).

One coat white shellac (very thin).

Two coats white lead (100 pounds lead in oil, 1 gallon oil, two gallons turpentine). (100 pounds lead in oil, thinned with 1½ gallons turpentine).

Two coats enamel.

Old Woodwork—If in good condition, a good sanding is sufficient, followed by as many coats of flat lead as is necessary to cover.

Two coats enamel.

**BRING** your painting and decorating problems to the American Builder. Call on this Department for help. Also pass the word along to your friends, neighbors, clients, that thru the American Builder they can secure **FREE OF CHARGE** color schemes, decoration layouts, painting and wood finishing directions—in fact, a complete consulting service. Mr. Lemperly has consented to serve as Expert in Charge of this Department and Service. With his long experience in this work and his trained business staff, consisting of artists and decorators, chemists and practical painters, he is ideally qualified and equipped to render American Builder readers and their friends assistance. A few questions and answers will be published here; most will be handled direct by mail. This Service is Free. Write us. **EDITOR AMERICAN BUILDER.**

**Varnished Woodwork**—The varnish should be removed with paint and varnish remover and washed clean with benzine—leave 24 hours to dry.

A lead primer (100 pounds lead in oil, 1 gallon oil, 2 gallons turpentine) rubbed in with emery cloth will give good foundation for next coats of flat white and enamel.

**New Plaster Walls**—One coat white lead (100 pounds lead in oil, 3 gallons boiled oil, 2 gallons turpentine).

One coat varnish size.

One coat white lead (100 pounds lead in oil, 1 gallon oil, 2 gallons turpentine).

One coat enamel.

If two coats of enamel are used, the first coat may be reduced a little with turpentine. Final coat should be flowed on as it comes from the package.

#### Exteriors

Prime with lead and oil as would be done for any good exterior painting.

**Second Coat**—White lead in oil (100 pounds lead in oil, 3 gallons boiled oil, 2 gallons turpentine).

**Third Coat**—White lead in oil (100 pounds lead in oil, 1 gallon oil, 2 gallons turpentine).

#### General Directions

All coats should be sanded before applying next coats.

Leave at least 24 hours between coats.

When an egg-shell finish is wanted (100 pounds lead in oil, thinned with 1½ gallons turpentine) should be omitted and (100 pounds lead in oil, 1 gallon oil, 2 gallons turpentine) should be used for as many coats as are necessary under enamel.



### Law for the Builder

(Continued from page 100.)

oral agreements, accompanied by the fixing of a price for same, it was within the province of a jury to find that the provisions of the contract, relative to the ordering of extras, had been waived.

In speaking of the right of contractors and owners to thus enter into subsequent oral contracts in situations of this kind, the court, among other things, said:

"No matter how stringently such clauses (referring to original written contracts) may be worded, it is always open for the parties to agree, orally or otherwise, upon proper consideration, that they shall be partially or entirely disregarded and another arrangement substituted."

The court concluded by affirming the judgment rendered in the lower court in favor of Headley, the contractor. Holding that the question as to whether there

had been subsequent oral contracts for the extras, sufficient to constitute a waiver of the written clause governing the subject, was one of evidence. And as the jury found for the contractor the judgment on its verdict would not be disturbed.

#### Decisions Not in Accord

The decisions of the different states on what will amount to an oral order, sufficient to constitute a waiver of a written provision in a contract governing extras, are not in accord. It is worthy of note, that in the New Jersey case above, the opinion was by a divided court: Justices Swayze, Bogert and Vroom dissenting, tho it is believed that the decision is in agreement with the weight of authority on the question.

Nevertheless, while the contractor in this case recovered, he was compelled to resort to a lawsuit in order to do so. And this very fact tends to illustrate the danger of deviating from a written contract, during the progress of the work. If a clear contract is entered into, its terms should be followed, especially on points relative to extras. If this course is pursued it will tend to eliminate after disputes on the day of settlement, and will in the great majority of cases prove a wise policy for both the contractor and the owner.

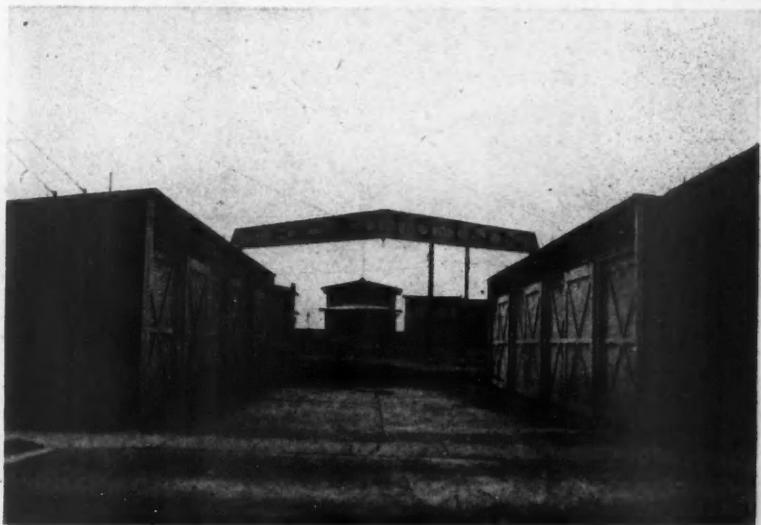


### The Auto-Inn

THEY haven't called it the "Autoteria" yet, but there is no telling when they will, for it is operated somewhat on the cafeteria plan.

There are fourteen stalls in the Inn, and each can be rented separately. The renter of a stall carries the key, and can use it when he wishes. They can be rented by the month, or year, or for whatever period of time desired.

It is situated in East Newport, Calif., and as this is a coast resort, such an arrangement in garages is convenient for week-enders, or those owning cottages.



Automobiles Are Becoming so Important That They Require Inns Just as Much as Human beings. This Unique Structure Is a Lodging Place for Transient Cars.

# OUT ON THE JOB



## What Builders Are Finding Good

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

### Good Profits for Contractors in Building Tile Silos

**C**ONTRACTORS and others equipped to handle mason work are making good profits in building tile silos and grain storage bins. The silo business has developed rapidly during the last few years and of the different classes of materials adapted for silo construction tile has proved to be one of the most satisfactory. It is durable, sightly and easily constructed.

While the silo as a food storage proposition was introduced several centuries ago it did not come into general use until many years ago.

Tile blocks, specially manufactured for silo construction, are made so as to form a ship-lap joint, allowing one end of the block to overlap the other. The design of the top and the bottom of the blocks provides for an extra thick layer of concrete in which twisted reinforcement is laid. This furnishes an extra strong wall with only a thin mortar line exposed on the inside and outside of the silo.

Tests conducted by the Iowa State College in Ames, Iowa, the Ohio State University and Purdue University showed

an average carrying or crushing strength of 180,000 pounds per block. A compression test of blocks laid on face showed an average supporting strength of 95,000 pounds. Moisture tests from the same institutions showed an average of less than 4 per cent increase in weight even with the severe test of boiling the blocks for five hours.



**C**HARRING is of little value in protecting the butts of fence posts and telephone poles from decay. This is shown by service tests made by the U. S. Forest Products Laboratory on fences of charred and untreated posts of various species. The charred posts proved in these tests to be even less durable than the untreated ones.

Theoretically, an area of charred wood around a post should prevent decay, because charcoal does not decay or encourage the growth of fungi. But the charred area around a post is not usually a solid covering. It is checked thru in many places.



### Why Builders Are Interested in Sewage Disposal Tanks

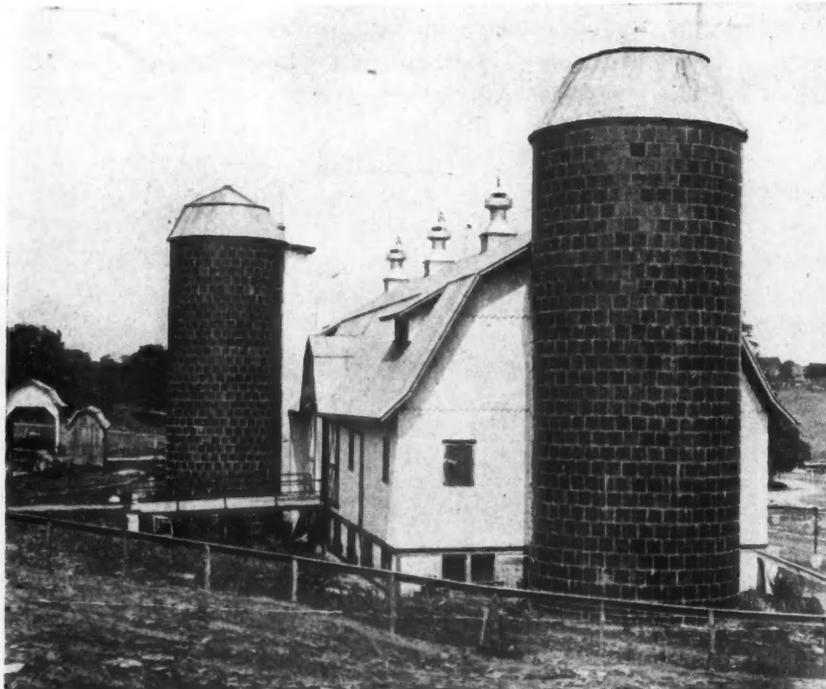
**K**EEPING step with the development of building in the large cities the country builder has introduced, in turn, the running water supply systems, electric light plants and other conveniences that have helped to make rural homes real places to live in. As a natural consequence comes the sewage disposal system, without which no water system is complete.

Tests have shown that the most practical type of sewage disposal tank is made of concrete, and, if properly built, will require no cleaning out and will last indefinitely. The chief requisite is running water to keep it in operation as chemicals are not used. These septic tanks, as they are called, are generally built of three or more compartments. The principle underlying the operation of a septic tank is this: Sewage from the house contains bacteria which develop and multiply rapidly when shut off from air and light. When raw sewage enters the first compartment of the series the bacteria begin to destroy it, breaking down the solids and converting them into water and gases.

Being partially digested in the first chamber the contents pass into the second compartment where the process continues until it finally passes into the third chamber in the form of water. From here the liquid is forced into the drain tile thru which it goes to the disposal bed or ditch and is seeped up into the soil.

While anyone can build a home-made septic tank, builders have found that the manufactured septic tank is more economical and easier to install. As the movement from high-priced apartments to smaller homes on the outskirts of large cities, where sewer systems are not installed, gains impetus, the need for proper sewage disposal becomes more important, and the installation of this system becomes an important part of the builder's program.

The important feature of a septic tank which is now on the market, one that will appeal to contractors and building-material dealers, is the fact that it is built up of pre-cast concrete slabs, heavily reinforced, easy of shipment and easy to install. It is very portable, as each slab weighs less than 75 pounds and can be set up and cemented in less than an hour's time. Building-material dealers can very easily carry these slabs in stock and be able to furnish them to contractors just as they do the drainage tile that goes to complete the job.



Attractive Silos Built of Specially Manufactured Silo Tile Blocks. This Picture Was Taken on a Farm Near Lebanon, Ohio. These Blocks Are Also Designed for Grain Storage Bins.

# CORRESPONDENCE

Questions answered—ideas exchanged



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

## How to Find Cistern Capacity

To the Editor: Benton Harbor, Mich.  
In last month's issue of the AMERICAN BUILDER Mr. Rickey asks for a short rule for round cistern capacity. Here is a short and accurate rule you can give him and all the other readers that may be interested. I discovered it some years ago in David's Lightning Calculator.

Rule to get capacity of a round cistern, or tank:  
Multiply the square of the average diameter in feet, by the depth in feet, and this product by the decimal .1865, and your answer will be the (32 gallon) barrels it will hold. So if you want it in gallons multiple the barrels by 32.

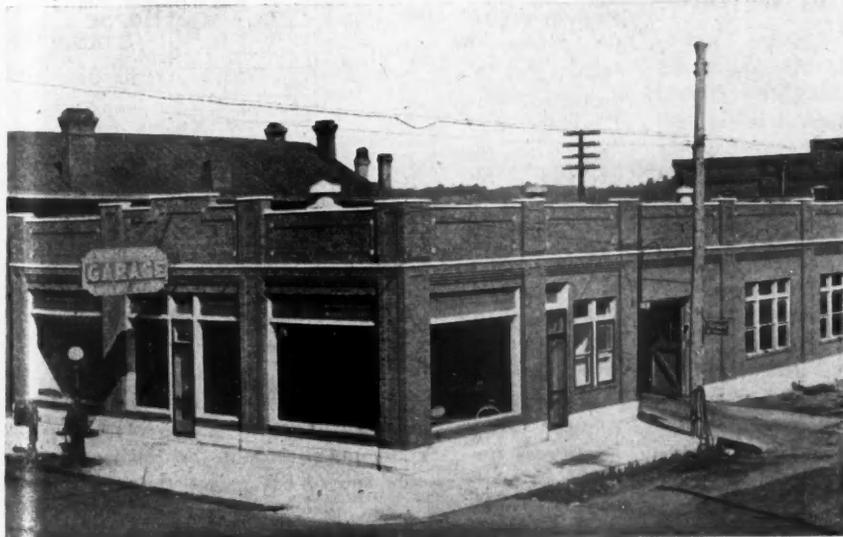
For illustration I will work out an example.  
Say you have a cistern 8 feet across the top (inside measurement), and 4 feet across at bottom; add 8 and 4, which equal 12; divide this 12 by 2, which equals 6, which is the average diameter. The square of six (as you know) is 36, and 36 multiplied by 10 (for the depth) gives you 360, which you multiply by the decimal .1865 for your answer, which is 67.14 (a fraction over) 67 barrels.

The decimal .1865 the author gave as the part of a barrel in one cylindrical foot.  
O. M. SOUTHWORTH.



## Indiana Contractor Builds Modern Garage

To the Editor: Aurora, Ind.  
Enclosed find photo of a garage I recently planned and built. This garage is 53 by 106 feet, with show room 51 by 30 feet. The office is in one corner and parts room in the other, with repair shop and storage room in rear. It has a



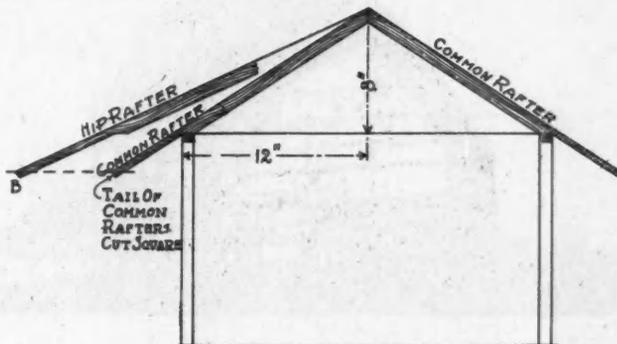
Public Garage Recently Built by Jese H. Trester, Contractor and Builder, Aurora, Ind. It is 53 by 106 Feet, Heated by a Hot Water System and Has a Steel Truss Roof Without Posts and with Overhead Track Bolted to Trusses.

hot water system and steel truss roof without posts and track bolted to trusses which enables the operator to pick up cars anywhere in repair end.  
JESE H. TRESTER,  
Contractor and Builder.



## How Is Cut on Hip Rafter Made?

To the Editor: Ocean Fall, B. C., Canada.  
I would like to ask some of my brother carpenters who are readers of the AMERICAN BUILDER to tell me how they make the cut on the tail end of the hip rafter at B as shown



Sketch Showing Mr. Coeey's Problem. He Wants to Know How to Make Cut on Hip Rafter.

in the sketch. How do they apply the steel square to this cut? I have been working at the carpenter trade for forty years and have never yet met a carpenter who could make that cut direct from the edge of the rafter. I have never met a man who could apply the square directly to the edge of the rafter. They all apply the square to either plumb or level lines. I wish some brother carpenter would show us how he does the trick. I understand Mr. Woods, recognized expert with the steel square, says there is no general rule whereby the cut can be obtained direct from the edge of the rafter, as in the case of other cuts.

WILLIAM COOEY.



## Wants Manufacturers' Catalogs

To the Editor: Hilham, Tenn.  
I am going to start contracting next year, and would be glad if you would give my name to manufacturers of building material and contractors' equipment.  
I would like to receive catalogues from firms dealing in fixtures for bank buildings, as I have to build a bank

building 24 by 40 feet, with corner entrance

JOE MASTERS.



### A Suggestion for Mr. Prather

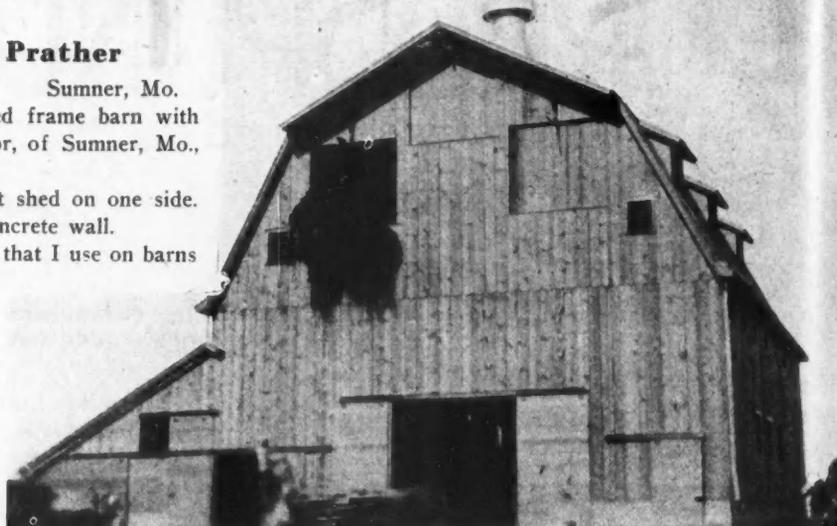
To the Editor:

Sumner, Mo.

I am sending you a picture of a bolted frame barn with gambrel roof that I built for G. I. Taylor, of Sumner, Mo., this summer.

This barn is 46 by 72 feet with 18-foot shed on one side. The main posts are 18 feet on a 4-foot concrete wall.

You will also find sketch of rafter truss that I use on barns wider than 30 feet. I double the rafters over the main post and run the brace parallel to the lower rafter, with top end of brace between the top set of rafters and well spiked and braced as shown. Then cut ribbon of 2 by 6 between double rafters at peak and break



Completed Barn. This Fine Building Is 46 by 72 Feet with an 18-Foot Shed on One Side. The Main Posts Are 18 Feet on a Four-Foot Concrete Wall. It Is Fitted with Modern Stall Equipment.



Bolted Frame Barn with Gambrel Roof Built by G. I. Taylor, Sumner, Mo. Mr. Taylor Believes This Frame Construction Is Better Than That Suggested by Mr. Prather in the September American Builder.

and cut middle rafters to this.

If Mr. Prather, of Memphis, Mo., will try this plan, I believe he will like it better than the plank brace.

A. STOBAUGH.



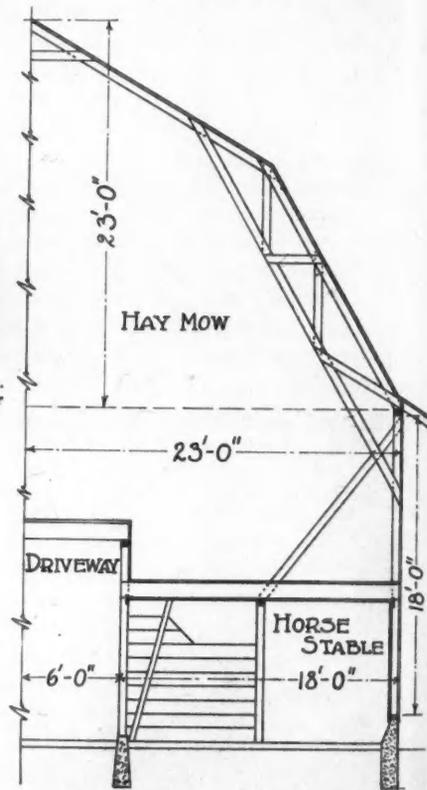
### Finding Cuts and Lengths of Rafter

To the Editor:

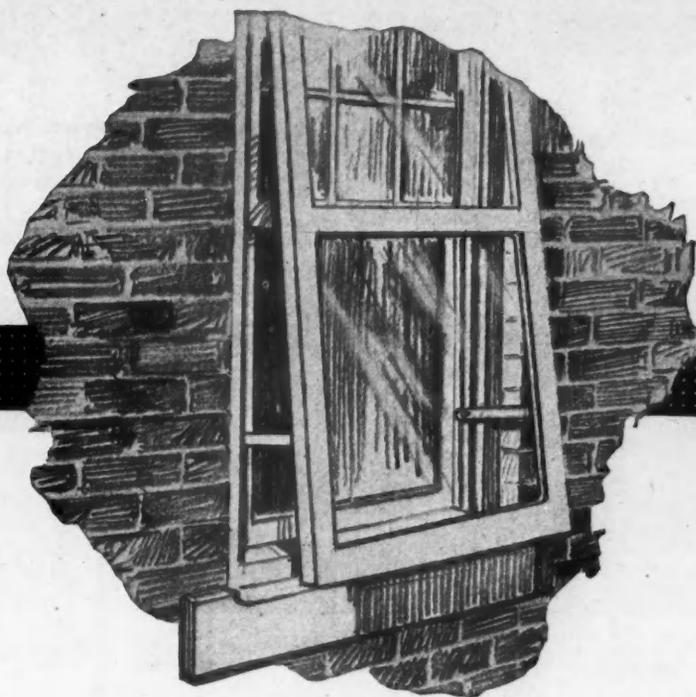
Clinton, Conn.

Being one of the charter members of the AMERICAN BUILDER, I have followed it with interest, especially the difficult problems of roof framing. In the mechanical books and papers which I have taken writers are in the habit of calling for one-quarter, one-third, three-quarters and one-half pitches for roofs and the explanation makes it somewhat difficult to understand how to get cuts and lengths of the rafters unless one is well up in geometry. I'll admit the roof problem is somewhat puzzling in that way, for I used to frame roofs in the same manner. Quite a number of years ago I found it was useless to call the pitches one-quarter, one-third, three-quarters and one-half. When I make my own plans I call the pitches from 1 to 12, or more than 12 if I want a roof steeper than 45 degrees. Of course, I regulate the pitch somewhat by the design and style of building to be erected, but no matter what the pitch is, it will always be some figure up to 12 on the steel square. If I have plans from an architect and no figures or pitch are named, a situation that sometimes occurs, I take my bevel and get the pitch and mark it on a board and then take the steel square and find out what figures are required for the pitch of the roof. Then I take the square and lay it on the rafter, the tongue for the rise, and blade for

the run. The tongue gives the plumb cut and the blade gives the seat or level cut, also the length for the common rafter. For the hips and valleys I use the same figure for the rise and 17 for the run, as 17 is the diagonal of the square of 12 to 12, and proceed the same number of times as with the common rafter. If a ridge pole is used, cut off one-half the thickness of the ridge pole and if sheathing is used cut off at the heel of the rafter the thickness of the sheathing. The cuts for the jacks are found in the same manner as the common rafter. The bevel for jacks may be found by squaring across the jack the plumb cut of the thickness of the jack and bisecting the square cut makes the bevel against valleys or hips. If the building is an odd foot in width when getting the common rafters take one-half of the odd or fractional part where the ridge is out of the center of the building, making one side of the roof longer and changing the pitches square down from ridge to sill and find the pitch with a bevel and proceed with the square as before with the



Sketch of Rafter Truss Used by Mr. Taylor on Barns Wider Than 30 Feet. He Doubles the Rafters Over the Main Post.



When Putting on Hardware for  
**STORM SASH WINDOWS**

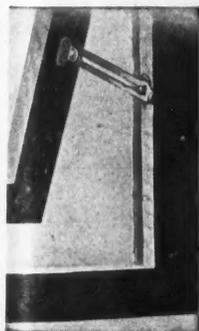
Be sure to apply No. 1718

**STANLEY WORKS**  
**STORM SASH FASTENER**

No. 1718, Storm Sash Fastener, is easily and quickly applied and will mean a lot to your client in the way of comfort and convenience when he has hung his storm windows. It holds the sash open at a convenient angle and can be instantly detached when it is desired to swing the sash further out for cleaning.

Supplied either Japanned or Stanley Sherardized. Packed one dozen in a box with  $\frac{3}{4} \times 5$  screws.

*Send for Storm Sash Folder A11*



Sash Open

**THE STANLEY WORKS**

New York

New Britain, Connecticut

Chicago

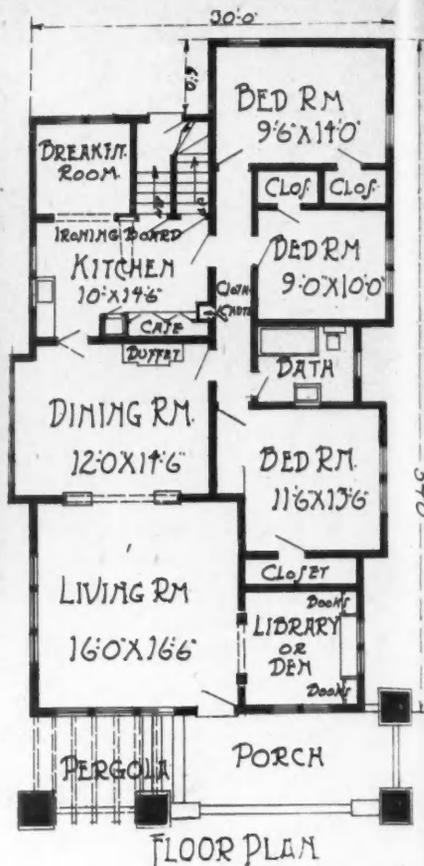


Sash Closed

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Attractive Seven-Room Bungalow Built by L. A. Wordell, Contractor, Brillion, Wis. It Contains Many Built-In Features and Pergola Entrance in Front. It is Shingle-Sided with a Concrete Foundation.



Floor of Wordell Bungalow, Showing Arrangement of Rooms. Note the Modern Equipment in the Kitchen.

figures required. I think this system of roof framing is the simplest and most correct and requires less technical terms. One with little knowledge of geometry can frame roofs. I have had fifty-two years' experience in the building business and find this better than any other I have ever used. If some brother chip does not use or know of it, I think he will be pleased with the system.

ALVA H. PIERSON.

the kitchen. In this house I installed many built-in features, such as ironing board and cupboard in the kitchen, buffet in the dining room, and bookcase in the library. The living room is large and comfortable and is separated from the dining room by an attractive colonnade. Each bedroom has a large clothes closet. I placed them together at one end of the house away from the noise and activity of the living rooms. All of the bathroom and kitchen plumbing fixtures are of the most modern type. A clothes chute has been built in the wall of the hallway connecting the bedrooms and bathroom. The cellar is very well built with plenty of room for a laundry, heating plant, and storage purposes.

I designed and built this home myself. L. A. WORDELL.

**Seeks Information on Concrete Floors and Roofs**

To the Editor: Enid, Okla.

I am writing you in regard to concrete floors and roofs. I am working for a company who place the I-beams six feet on center. I would like to know the best way to put those floors in. The beams are 4 by 6 inches. Is it best to cover the whole or part?

Now in regard to putting corrugated iron on a steel roof, I would like to know how to put in on so it won't leak.

P. S. WELSH.

**Designs and Builds Attractive Bungalow**

To the Editor: Brillion, Wis.

I am sending you a picture and floor plans of a bungalow I recently built here. It is 54 feet long and 30 feet wide and contains seven rooms, not including a breakfast room next to

**Some Problems on Saw Mill**

To the Editor: Atlantic City, N. J.

I am starting to build a mill which will be run by water and I want to know what size the pulleys should be; also the length of belts for a saw mill and size of the shafts.

JAMES MAHONEY.

Mon.	Hrs.	Date .....
Tues.	"	Voucher No. ....
Wed.	"	Farm No. ....
Thurs.	"	Hours .....
Fri.	"	Rate .....
Sat.	"	Due .....
Extra	"	
Total	"	

Mon.	Hrs.
Tues.	"
Wed.	"
Thurs.	"
Fri.	"
Sat.	"
Extra	"
Total	"

**W. S. FRENCH & SON** Labor Voucher No. \_\_\_\_\_

Percheron Horses--Shorthorn Cattle

PAY TO \_\_\_\_\_ \$ \_\_\_\_\_

DOLLARS

For Labor Ending \_\_\_\_\_ Hours \_\_\_\_\_ Date \_\_\_\_\_

Kind of Labor \_\_\_\_\_

Pay to .....

Labor ending .....

Kind .....

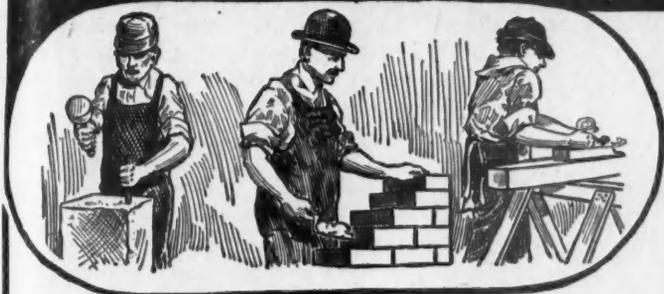
PRESENT AT  
FARMINGTON STATE BANK  
FARMINGTON, IOWA.

Farm No. \_\_\_\_\_

Foreman \_\_\_\_\_

Time Check Used by H. Mulvihill, Contractor in Farmington, Iowa. He Used This on His Barn Job for French & Son. Note the Combination of Time Sheet and Pay Check. Pictures of the Barn Are Shown on Page 112.

# What Is Your Job?



ARE you the man who is bossed—are you doing the hard work while some other man gets the high pay for telling you what to do? Why not be the boss yourself? The only difference between you and the men higher up is in what they know that you don't know. They get their big pay and have the easy work because they know how to direct you and other work-

men. If you could read blue prints, estimate on work, know how to direct construction, you too would be in the big pay class. Read below how you can get this knowledge and be a bigger man in your line.

## Learn In Your Spare Time and Make More Money

At home—in your spare time—you can get instruction *by mail* from the experts of Chicago Technical College. You can learn all the higher branches of your trade and soon know as much or even a good deal more than the man who is bossing you now. If you are a workman, you can train for a foreman's or superintendent's job or you can look ahead to being a contractor in business for yourself. This training doesn't cost much and you can pay on easy terms. Look into this now. Just send the coupon below and get catalogs and full information.

### A Few Things We Teach

#### PLAN READING

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

#### CONSTRUCTION

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

Carpentry: Kinds and uses of woods, cornice, interior details, framing, roof construction, bridging, miter joints butt joints, etc. How plans are made. Complete instructions illustrated by working blue prints. Plans and specifications. Residences, apartment buildings, factory buildings, school houses, hospitals, store and office buildings, bank buildings.

#### ESTIMATING

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

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

#### ARITHMETIC

A complete but condensed course in arithmetic expressly arranged for contractors and builders. Teaches all a man in this business needs to know.

#### ARCHITECTURE COURSES IN DRAFTING

We also offer complete home-study courses in Architectural and other branches of Drafting. If interested in any branch of Drafting, mention subject and ask for special catalog.

## FREE Lesson In Plan Reading

Get this free lesson. See from it how plain every point is made and how easily you can grasp it. Not a cent to pay. This lesson is free—sent to show you how quickly you can advance by taking a Chicago "Tech" home study course in building. All you need do to get it is to send the coupon.

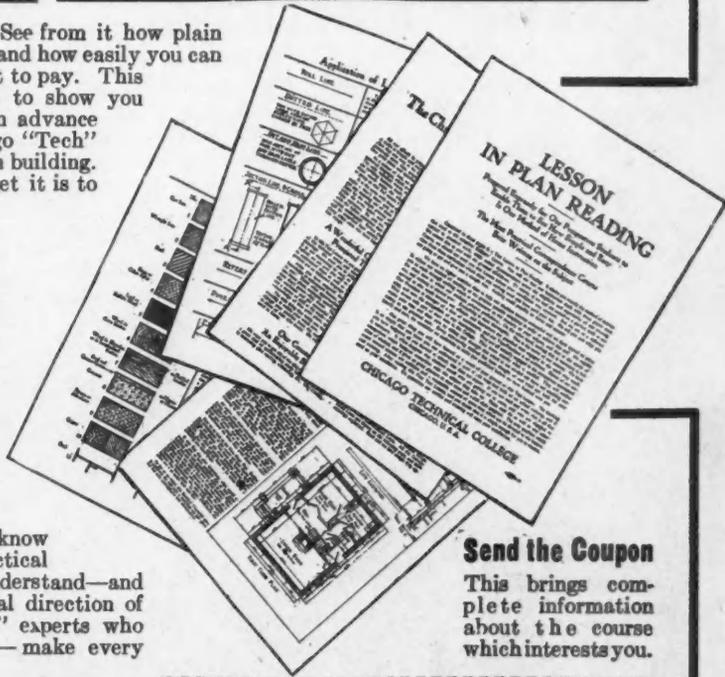
### Complete Builders' Courses

Prepared and taught by experts. No useless theories. Just the practical things you want to know—told in simple, practical language. Easy to understand—and you have the personal direction of the Chicago "Tech" experts who explain everything—make every lesson clear to you.

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You get all this training by mail and you study in spare time. Not an hour taken from your work. Keep on earning while you are learning—then step into bigger pay as a building expert—get paid for what you know.

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Send the Coupon This brings complete information about the course which interests you.

CHICAGO TECHNICAL COLLEGE, 1136 Chicago "Tech" Building, Chicago  
Send information on the course I have marked X below

- Plan Reading and Estimating  Plumbing
- Heating and Ventilating  Architectural Drafting

Name.....

Address.....

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

If inquiry is for Plan Reading and Estimating, free lesson accompanies catalog

**Chicago Technical College**  
1136 Chicago "Tech" Building, Chicago



Completed Round Barn Built of Tile for W. S. French & Son in Southern Iowa by H. Mulvihill. The Barn Is 64 Feet in Diameter, the Silo 12 Feet.

### A Round Barn in Iowa

To the Editor:

Farmington, Iowa.

Here are two pictures of a barn that I built for W. S. French & Son on one of their farms in southern Iowa. I see Mr. L. P. Moss asks for information in the September number of the *AMERICAN BUILDER*. Maybe these will help him. It is 64 feet in diameter, silo 12 feet. Here also is a time check that we use (see page 110). I have seen several in the *BUILDER* lately, but certainly like this one for weekly pay.

I could not get along without the *BUILDER*; it is a good friend.

H. MULVIHILL.

### Where Can He Get Springs for Dance Floor?

To the Editor: Herington, Kans.

I wonder if I could obtain some information from your company on a coil spring floor for dancing. The building to be erected is 40 by 40 feet, the floor to be carried on top of sub-floor on joists, with springs 4 inches outside diameter at base, 15/16 inch inside diameter at top, 2 inches high, made from 3/4 inch by 3/16 inch spring steel, oil tempered. These springs are to be set on a No. 26 gauge C. I. shoe, nailed to floor, top of spring to be held in place by 7/8 inch hickory pin, with an iron washer between spring and floor strip. We have not been able to obtain a quotation on this and if you could furnish us the name of a manufacturer that can furnish us with these springs we will appreciate it very much. COVERT BROS.



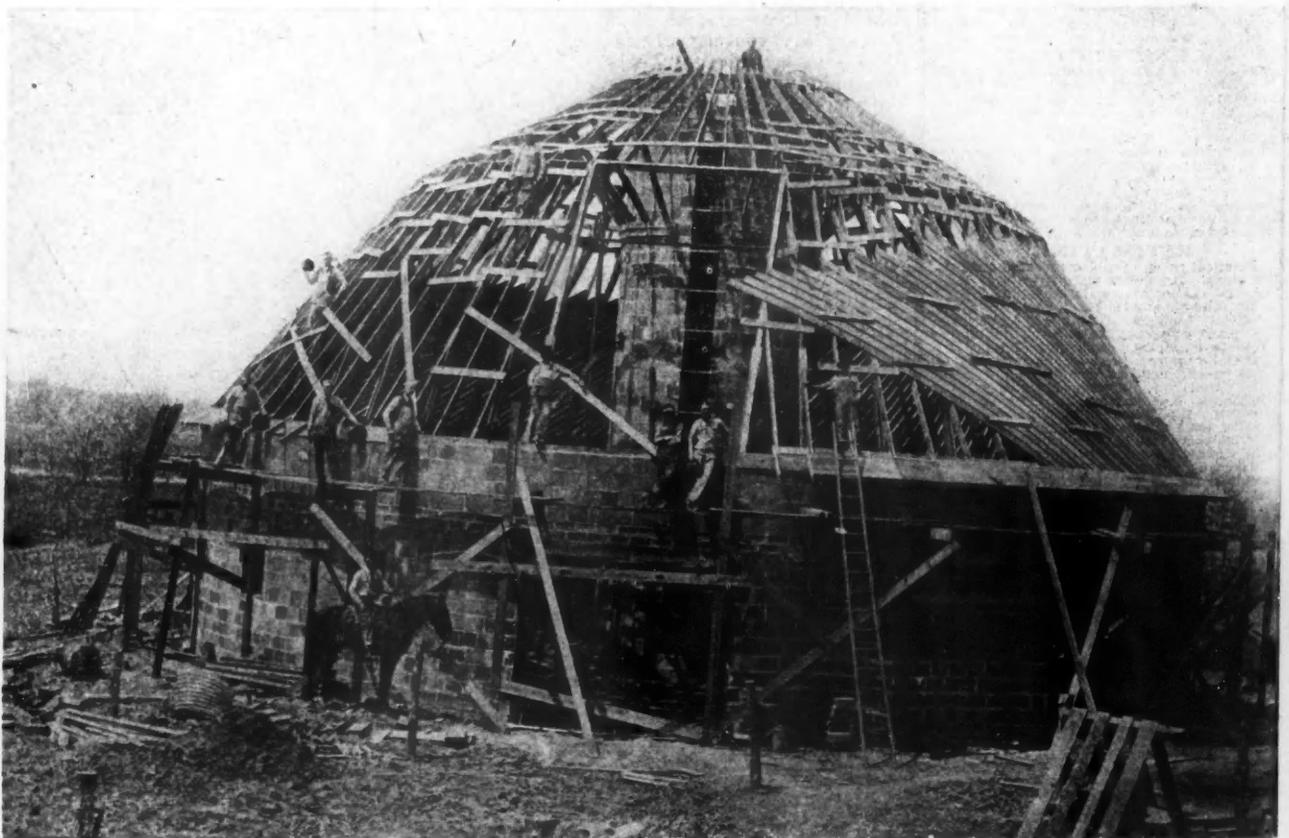
### Blood Will Tell

To the Editor:

Canton, Ohio.

Perhaps you will want to smile at what our little Marjory, aged five, sang the other day. At Sunday School she has learned a little song, "Count your blessings, count them *one by one*," but being a true daughter of her contractor father we caught her the other day singing it by her own version, thusly: "Count your blessings, count them two by fours." Of course, it tickled Daddy, and I thought perhaps it would tickle you, too.

MRS. R. O. BU SHEA.



View of Round Barn During Construction Showing Roof Framing, Hollow Tile Walls and Interior Silo of the Same Material. This Barn Was Built for Horses and Beef Cattle. Hollow Tile Is Used Extensively in Farm Building Construction in Southern Iowa.



## Your town is growing— who's going to do the roofing?

**I**N the next few years there's going to be a lot of roofing done in your town—and the better the roofing you use, the better chance you have of getting the big, profitable jobs.

When you talk roofing to the man who is going to build, tell him why you recommend and lay Johns-Manville Asbestos Roofing.

He may not be interested in the fact that Johns-Manville Asbestos Roofings are, as a class, easy and quick to lay—Johns-Manville Asbestos Shingles in particular.

But he *will* be interested in the fact that Johns-Manville Asbestos Roofings will give unequalled durability—that they protect his home from roof-communicated fire, and that they will make a roof handsome, even beautiful in appearance.

Johns-Manville Asbestos Roofings are made of Asbestos, the fireproof material, which is immune to heat or cold, rain, snow or sleet, and which makes roofings that last as long as the building they cover.

Then too, there's the fact that Johns-Manville Asbestos Roofings are given highest ratings by the Underwriter's Laboratories, Inc.

So whatever the prospective builder is looking for in roofing, whether it's final saving, or durability, or fire safety, or beauty—he can find it in Johns-Manville Asbestos Roofings.

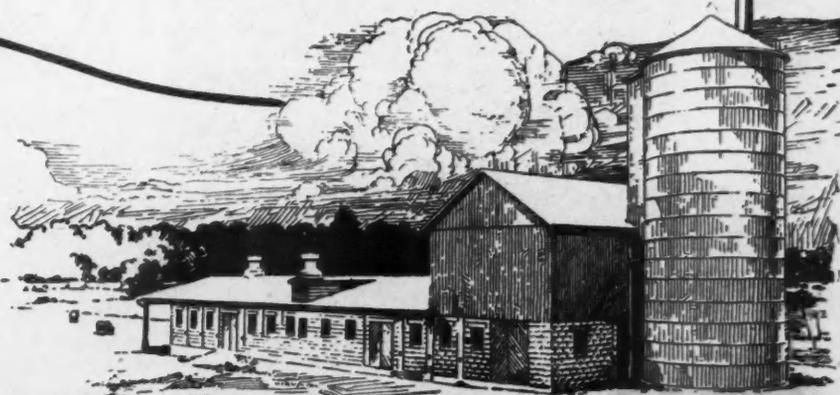
There is a booklet on Johns-Manville Asbestos Roofings that will be interesting reading for you. The nearest Johns-Manville Branch will send it to you on request. Write for it.

**JOHNS-MANVILLE CO.,** Madison Ave. at 41st St., N.Y. C.

*10 Factories—Branches in 64 Large Cities*

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



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

# JOHNS-MANVILLE ASBESTOS ROOFING

## Spacious Brick House of Nine Rooms

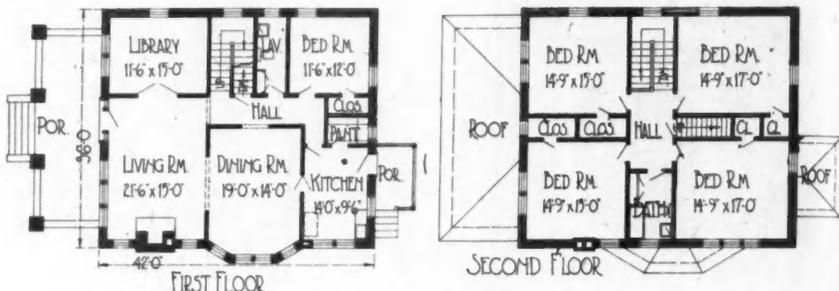
VERY WELL DESIGNED AND CONSTRUCTED DWELLING HAS LARGE FRONT PORCH AND OTHER ATTRACTIVE FEATURES

ONE type of home that never seems to lose popularity in the passing years is the square-shaped, hip-roof brick house. In the first place, it is as economical as any to build because it is free from freakish lines, and, secondly, it is built to last, a home that will shelter the family for a lifetime.

As an example of this kind of dwelling the brick house shown here is hard to excel. Built substantially from the foundation to the roof, it is large, roomy and comfortable. The general appearance is mighty attractive with a broad front porch and imposing entrance. Screened in during the warm months this porch will make an excellent recreation retreat for the family and children. Everything about this home denotes strength and permanency.

The first floor is divided into five rooms: living room, dining room, library, kitchen, and bedroom. The living room is large and cheerful with open fireplace and plenty of windows on front and side. It opens directly onto the front porch. The library is at one side

connected by double doors. In back of the living room is the dining room, 19 by 14 feet, lighted by a side bay window. A few steps away is the kitchen, designed along modern compact lines. A hall leading



Floor Plan Arrangement of Two-Story Brick House. Note the Efficient Arrangement of Kitchen and Dining Room, Also Size of Living Room and Window Space.

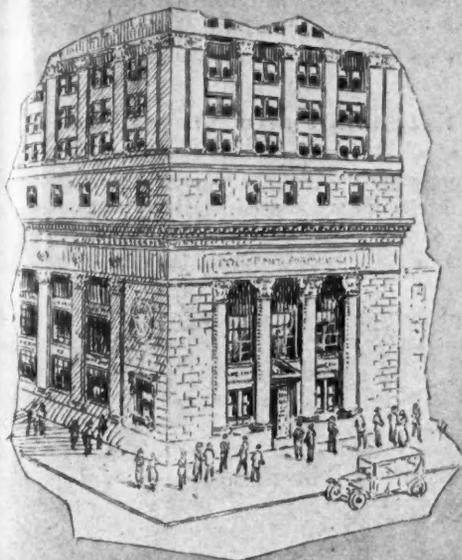
from the kitchen to the living room gives access to the bedroom, lavatory, dining room, and stairway leading to the floor above.

Upstairs are the sleeping quarters for the family. There are four good sized bedrooms, two 14 feet 9 inches by 15 feet, and two 14 feet 9 inches by 17 feet.

Each bedroom has windows on two sides and ample closet room for clothes.



Square-Shaped, Hip-Roof Brick House Containing Nine Comfortable Rooms and Large Front Porch Which Can Be Screened or Glazed in, Depending on the Season. Five Rooms Are Located on the First Floor with the Four Bedrooms and Bath Upstairs. Size, 36 by 42 Feet.



# BANKS grant bigger loans on homes of BRICK (Solid Walls)

**B**BRICK, moreover, is available locally—2,000 strategically located plants deliver it to the job in the desired quantities.

The Brick home is easier to sell, usually at a higher margin of profit.

It is worth most when paid for—depreciation is nil during the first five years; after that only 1 per cent annually.

It is soonest paid for because there is practically no upkeep cost to increase the investment.

Its average life is 100 years; it houses three generations yet is paid for but once.

On the usual monthly payment plan a \$9,000 Brick home is cleared of debt 7 months sooner than a \$8,500 "painted house".

It is fire-safe; insurance costs very little.

There is considerable saving in fuel—solid walls of brick keep out cold and dampness; resist heat in summer.

Alterations are more easily made on the brick home.

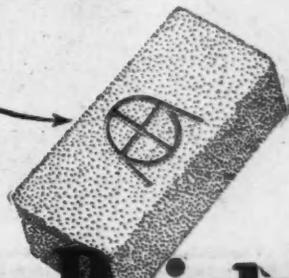
Brick's beauty is permanent; the builder and the owner will always be proud of it.

THE COMMON BRICK  
INDUSTRY OF AMERICA  
1306 SCHOFIELD BLDG.,  
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DENVER  
is a  
BRICK  
(Solid Walls)  
CITY

Send for copies of "BRICK, How to Build and Estimate", used as a text book in 30 schools and colleges; a complete manual for builders, containing tables for computing quantities of material and labor, detailed architectural drawings, etc. And "BRICK for the Average Man's Home", containing 35 designs of modern brick homes for which working drawings are available. Both books for \$1.25.

Demand Brick with this Trade Mark  
Your Guarantee of Quality



For Beauty with Economy

build with Common Brick



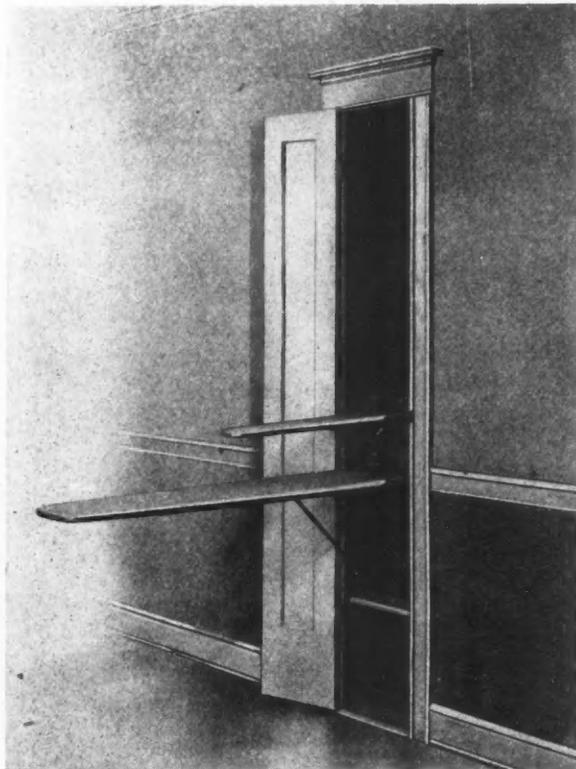
**EDITOR'S NOTE:** The American Builder does not accept payment in any form for what appears in our reading pages. In order to avoid any appearance of doing so, we omit the name of the maker or seller of any article we describe. This information is, however, kept on file and will be mailed to anyone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

### Concealed Ironing Board and Cabinet

**E**CONOMY in space in building means a reduction in costs. This is of vital importance in view of the prevailing high prices of materials. Space-saving beds have done much to eliminate waste space and bring about a saving in construction expense. Now we are introduced to a new concealed ironing board and cabinet built in the kitchen wall. Here all ironing equipment is concealed and out of the way.

The ironing board is securely fastened to the building, always in place and is not in the way. It occupies space that is ordinarily wasted in the home or apartment. It fits snugly in a 6-inch partition between the studding.

It can be installed in new buildings either before or after plastering. To install in old buildings is a simple task. Cut out the lath and plaster and baseboard between two studding whose centers are 16 inches apart, to a height of 6 feet 10 inches from the floor. There should be no obstructions, pipes, etc., between the studding to prevent the cabinet from going back the proper depth. When this space has been cut, door casings, door cap, and hinged door are put in place. There are



Concealed Combination Ironing Board and Cabinet in Position Ready for Use. It Fits in 6-Inch Partition Between the Studding. The Lower Shelf is for the Iron and Other Equipment.

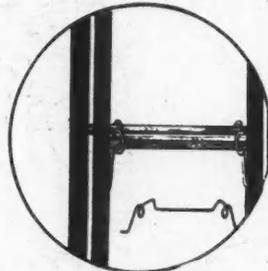
two ironing boards enclosed in the cabinet, one small and the other large. There is a lower shelf for iron and other equipment. The cabinet as it appears with both boards in position ready for use is shown in the accompanying illustration.



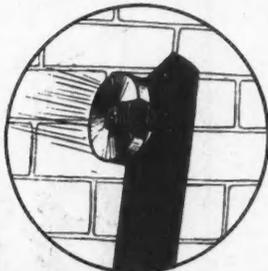
### Safety Extension and Step Ladders

**L**ADDERS of all kinds are used so frequently by builders that it is important that they be made as safe as possible. A great many accidents are caused yearly thru this source. To offset this danger a manufacturer has devised several safety appliances to be fitted on extension, straight and step ladders.

In the case of the extension ladder a concave safety wheel is fastened at the top so that it digs into the wall and prevents slipping and skidding at that point. This solid metal wheel is supported by a heavy brace. Some play is given between this brace and the upright to allow the wheel to adjust itself to any sudden tilt of the ladder.



Safety Metal Guides Prevent Any Separation of Section and Keep Perfect Alignment.

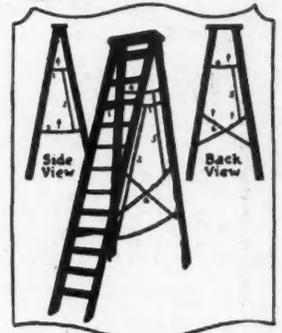


Concave Safety Wheel at Top of Ladder to Dig Into Wall and Prevent Slipping.



Safety Rubber Cushion and Spike. The Spike is Used on Slippery, Greasy Surfaces. On Polished Surfaces It is Turned Up Out of the Way.

Safety metal guides on extension ladders prevent any possibility of a separation of the sections and keep perfect alignment besides giving support where most needed in long ladders. The rungs in this new extension ladder are anchored angle irons. They are forced into uprights under pressure and the prongs clinched in one operation. No holes are bored into the upright to weaken it. The prongs are forced in at an angle so that the rung resists pressure from any direction. These rungs are easy to work on with a 3/4-inch flat surface to stand on.



Step Ladders with Safety Tripod Spreading Arrangement.

At the foot of the extension ladder safety rubber cushions and spikes are provided. The spike is provided for wet, greasy, or icy floors or mud. When the ladder is placed on hard or finished surfaces the spike is pointed up out of the way, pivoting on a heavy bolt which extends thru the metal guard and upright. The ladder then rests on the cushion which is imbedded in the wood.

The safety step ladders are built in all sizes and are fitted with a special tripod spreading arrangement which is designed to secure maximum solidity and prevent tipping. The spread of the back legs is about three times that of the front.



### New Sash Weight Saves Time and Cord

**F**OR many years when sash weights were mentioned the carpenter or builder immediately thought of the familiar cast iron weights. As the cost of material increased



# For Beautiful Interiors

**E**NAMELED woodwork is the "Last Word" for interior decoration. The secret of a fine enameled job is in the under-coat—it's like the foundation to a building—everything depends upon it.

Johnson's Perfectone Under-coat is a perfect foundation—it is elastic, durable, non-porous, has great covering power, works freely under the brush and dries hard in from 18 to 24 hours.

Johnson's Perfectone Under-coat will not run, sag, lap, chip, check, crack nor peel. It has wonderful smoothness and opacity—and will not absorb the Enamel.

## JOHNSON'S PERFECTONE ENAMEL and UNDER-COAT

Johnson's Perfectone Enamel is exactly right for the expert finisher and will always give perfect results for the unskilled workman. It works freely under the brush and dries out to a hard, lustrous, durable surface.

Johnson's Perfectone Enamel is very elastic—it will not fade—chip—check—crack or peel. The stock shades of Johnson's Perfectone Under-coat and Enamel are White, Ivory and French Gray.

Won't you try Johnson's Perfectone Under-coat and Enamel at our expense, so that you can see for yourself what beautiful effects may be procured? Use the attached coupon.

**S. C. JOHNSON & SON, Racine, Wis., U. S. A.**

*"The Wood Finishing Authorities"*

Brantford, Ont. Canada      West Drayton, Middlesex, England  
Sydney, Australia

S. C. JOHNSON & SON, Dept. AB-11, Racine, Wisconsin

Without any obligation to me, I am willing to try Johnson's Perfectone Under-coat and Enamel. Please send me a pint of each Free and Postpaid. The best Dealer to carry your line of

Enamel is .....

NAME .....

ADDRESS .....

CITY AND STATE .....

the cost of sash weights became important. As a result a new sash weight made of a metallic composition, more economical than the iron weights, was designed and is now available.

These new metal double unit sash weights are cast in blocks of suitable size to lift the windows, one on each side, with a clever pulley arrangement in the end, permitting the cord to pass from one sash to the other. Thru this pulley the weight itself travels one-half of the distance covered in the single direct style. This arrangement also increases the smoothness of the travel of the weight, no matter how quick the action of the window.

Four single knots are required in hanging this metallic sash weight, resulting in a saving of about three feet of cord and time taken for tying additional knots.

**Self-Adjusting Wrench Has Extra Gripping Power**

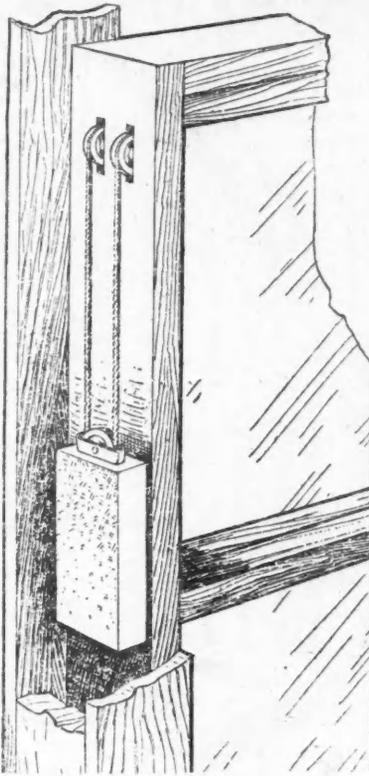


A GOOD wrench is essential to a complete set of tools and no contractor, carpenter or builder can very well be without one. In many cases, however, they find the wrench unsatisfactory because it does not grip strongly or is too large to handle easily.

To get away from these difficulties, a new non-slipping wrench has been designed, which differs from other wrenches in mechanical principles and structure. In this wrench the grip is produced by the gripping of handles as shown in the illustration. There is no strain on the pin except to act as guide. The strain comes on the shoulder. Moreover the fulcrum is right close to the load which gives gripping power to the jaws without much gripping pressure on the handles.

Self-Adjusting Wrench Gets Power from Gripping of Handles. Handy for Corners.

At the junction of the two handles there is a smooth sliding adjustment which eliminates delay. The jaws take a parallel



New Metallic Sash Weight Operated on Double Pulley Arrangement. Travels One-half Distance of Ordinary Weight.

grip on nuts and will grip anything like round bolts as well as square, hexagon, or oblong. This instantaneous grip and release produces a ratchet motion. It is adapted for working in close quarters, and serves as plier, pipe wrench or nut wrench.

**New Space-Saving and Self-Making Bed**

SPACE-SAVING beds are hung on doors, concealed in sideboards, or in other unusual places, but the latest type of space-saving bed, in daytime position, appears as a beautiful screen, the panels of which fold on each side, and bed, panels and all lower easily for night use.

This bed is also self-making, a feature that will appeal to housewives. When the clothing is disarranged it is lifted to day position and when the bed is again lowered the clothing is all spread smoothly on the bed and tucked in at the foot. This feature is a great labor saver. In day position the clothing hangs loosely and altho the bed is screened from view it is all free to the circulation of air. The ventilation feature of this bed is important because the clothing is being aired continually all day long.

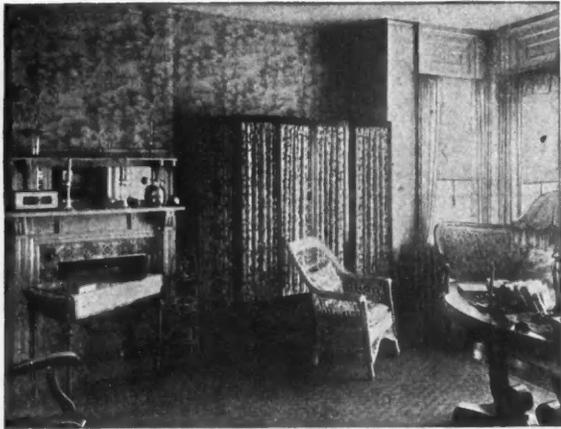
The screen has been adopted for concealing this bed on account of its harmonizing effects with interior decorations.

A new device for holding the mattress prevents it from working loose and falling down. It does not require a high head board on the bed to fold against the mattress when the bed is perpendicular. This feature and a spring produce a very comfortable bed.

This bed is not fastened to the floor and can be placed wherever desired. It was especially invented for apartment house use, but is not confined to apartments.

For built-in work architects are especially interested as this bed adds an attractive piece of furniture to a room by day and a bed by night and saves the expense of a door, for it may conceal a doorway to a clothes closet or dressing room. The doorway is made wider, the bed is placed in front of the opening and the screen closes the opening to view, but permits the free circulation of air.

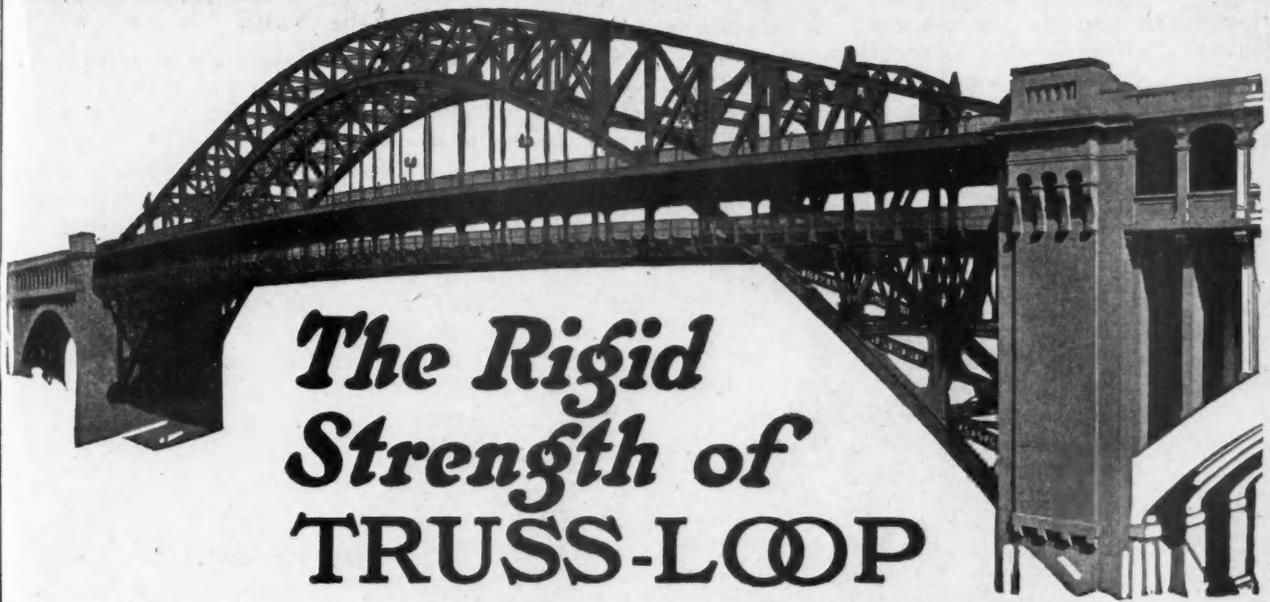
The bed is constructed of iron. Wallboard suitably decorated, or cretonne, is used for the panels. The decorations are such as all decorators are familiar with.



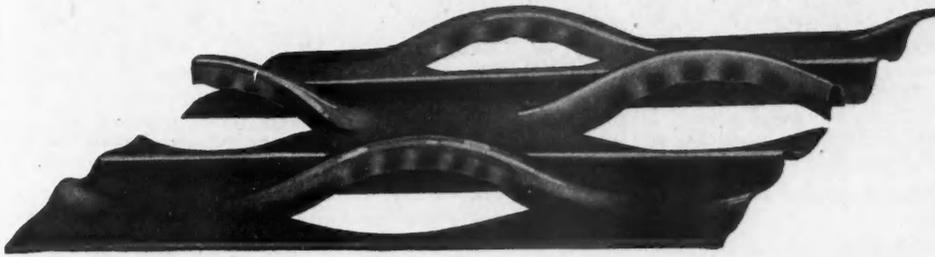
New Space-Saving and Self-Making Bed Concealed Behind Screen Which Harmonizes with Interior Decorations. It Is Not Fastened to Floor and Can Be Moved About.



Here We See an Ordinary Bed in the Same Room as Pictured to the Left.



# The Rigid Strength of TRUSS-LOOP



*Visible*  
**"Grip-able"**  
*Reasons—Why!*

IT does not require the trained mind nor the scientific viewpoint of the architect and engineer to understand why Bostwick Truss-Loop Metal Lath makes plaster more permanent than when applied to any other form of backing.

Any man or woman who once FEELS the steel trusses and SEES them hold a sheet of Truss-Loop rigid will instantly understand why plaster trowelled into it neither chips nor cracks. Then the sale is simple.

*Write for prices.*

# Bostwick

## TRUSS-LOOP

THE BOSTWICK STEEL LATH CO.  
 NILES, OHIO

### Direct Motor Drive Variety Saw Bench

THE winter days are coming and with them comes the builder's interest in his shop equipment. Most builders find when they have their workshop all fitted out that there is little room to spare; often they are crowded. Consequently they will be interested to hear about a variety saw bench that is designed to cut down floor space. It also em-



Direct Motor Driven Variety Saw Bench Designed to Save Floor Space and Eliminate Belt Hangers and Loose Pulleys. It Runs on 220-Volt Current.

bodies several other features of which the most important is the direct motor drive. The saw is mounted on the end of the motor arbor. This saves floor space, power, and care of belts, hangers and loose pulleys.

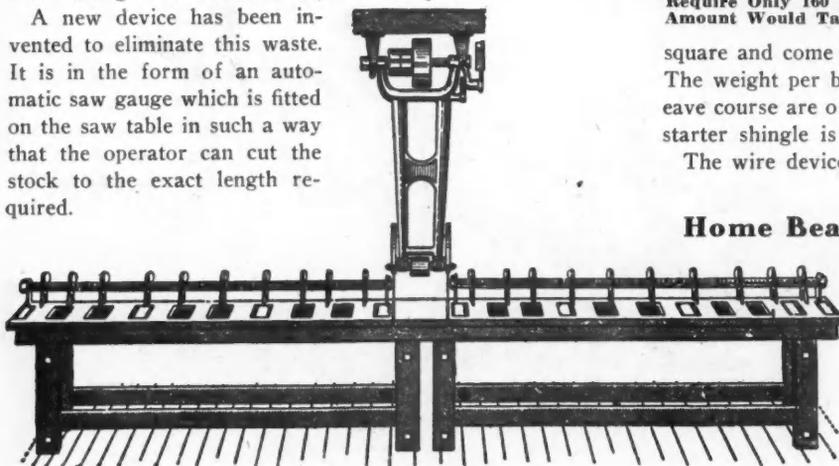
The direct drive eliminates countershaft, belting, hangers, pulleys and line shafting. The danger and loss of time ensuing from slippage of belts is removed under this arrangement. It runs on 220-volt current but can be changed to run on 440 volts. Two 14-inch saws with 1½-inch hole are furnished with the machine.



### Automatic Gauge Eliminates Lumber Waste

AS a rule, a sawyer cuts his stock from one-quarter to two inches longer than necessary to avoid cutting the stock too short. If one thousand cuts a day are made on stock 12 inches wide, with lumber worth \$100 per M. feet, with only ¼-inch waste at each cut, the loss in lumber would amount to \$2, or a yearly loss of \$600. In most cases, the loss averages an inch to a cut, which means \$2,400 loss a year. Most sawyers, carpenters, and lumber dealers would admit they had never thought of it in that way.

A new device has been invented to eliminate this waste. It is in the form of an automatic saw gauge which is fitted on the saw table in such a way that the operator can cut the stock to the exact length required.

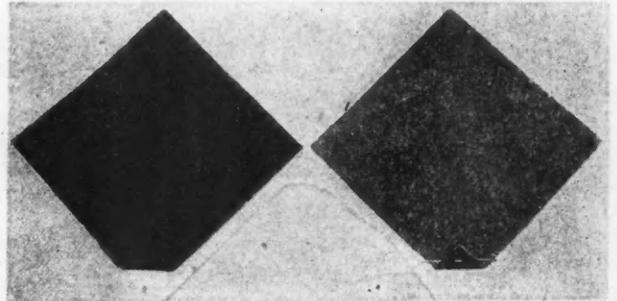


Automatic Saw Gauge Fitted on Swinging Saw Table to Measure Lumber Cuts Exactly. From His Position in Front of the Saw the Sawyer Can Use Any Stop He Wants. Waste Will Be Eliminated.

### Non-Curling Asphalt Shingles Require Few Nails

MANY contractors who have experienced trouble with curling asphalt shingles after they have been laid, will be interested to hear of a new shingle that has been devised to eliminate this trouble.

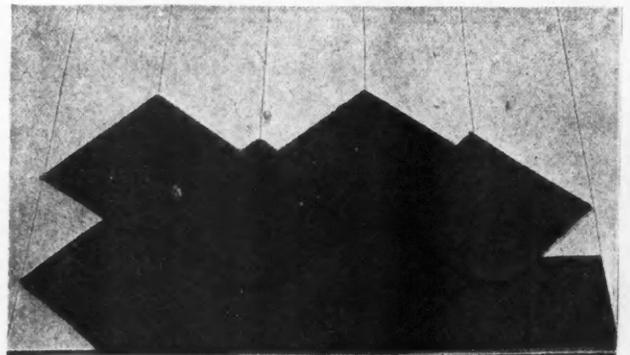
The feature of this asphalt shingle is a wire lock on one corner which prevents curling. The lower point of the shingle is held by a wire lock and not nailed and consequently absorbs contraction and expansion. As nailing is one of the principal costs in laying shingles this feature presents an economical advantage that is attractive to home builders. With this wire lock arrangement 100 square feet of shingles required only 160 nails. Using ordinary shingles 848 nails



New Staple Device in Asphalt Shingles Designed to Cut Down Use of Nails. The Lower Point of the Shingle Is Held Down by a Wire Staple.

would be required for 100 square feet. In view of the cost of nails at the present time this saving is very important.

The wire lock is treated so that it cannot rust and is protected by the asphalt fabric. These shingles are 16 inches



With This New Arrangement 100 Square Feet of Shingles Require Only 160 Nails. Under the Ordinary System, This Same Amount Would Take 848 Nails. Curling Is Prevented.

square and come eighty in a bundle to cover 100 square feet. The weight per bundle is about 110 pounds. The starters or eave course are of double thickness on the exposed side; each starter shingle is 22½ inches long.

The wire device is shown in the photograph.



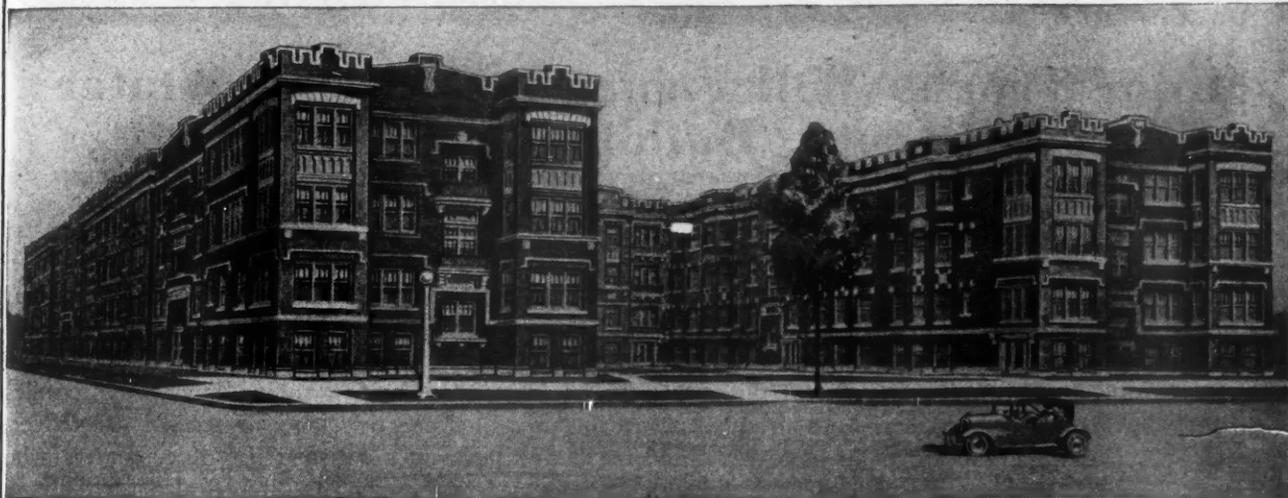
### Home Beautiful Exposition in Boston

BOSTON is taking the initiative by staging the first "Home Beautiful Show" in the United States, to be held April 4-30, 1921.

This exhibition will cover 125,000 square feet of space containing everything in the makeup of a home, from the ground to the roof, including the inside furnishings, equipment, decorations, etc.

A banking department will be a fea-

# APARTMENT HOTEL FURNISHINGS



*The complete equipment for the luxurious Sherburne Beach Apartments was furnished by Albert Pick & Company.*

SHERBURNE BEACH APARTMENT  
CHICAGO, ILLINOIS

**T**HE selection of the furnishings and equipment for an Apartment Hotel is a matter of expert knowledge and experience. In our organization are the country's leading authorities on Apartment Hotel furnishing and equipment, who are always available for planning and consulting service. We can engineer the complete planning, furnishing, interior decorating and equipment of the largest apartment hotel, or handle the smallest supply requirement with equal facility. Our sixty years of successful business life are an ample guarantee of our integrity and reliability.

Furniture  
Wall Beds  
Floor Coverings

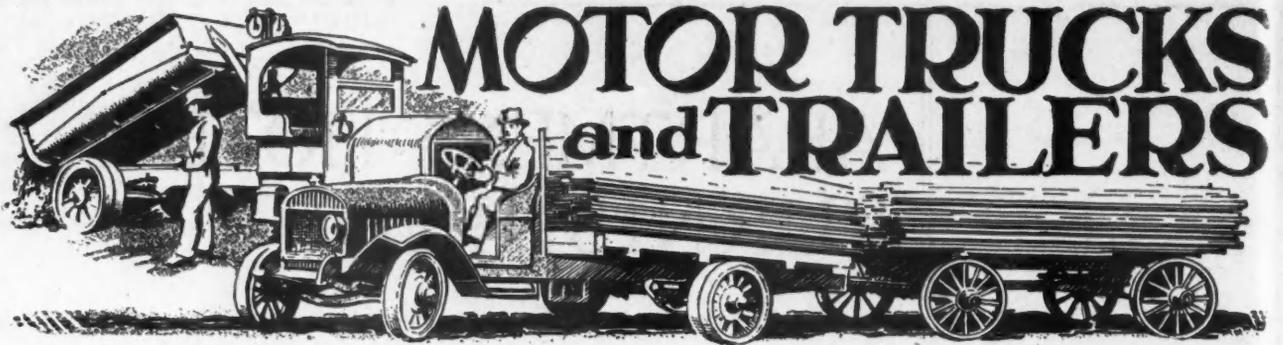


Draperies  
Dining Room Service  
Kitchen Equipment

*Write for Catalogs and Information*

*Shall We Send Our Representative?*

**ALBERT PICK & COMPANY**  
208-224 WEST RANDOLPH STREET CHICAGO, ILLINOIS



## Motor Trucks Will Figure in Fall and Winter Building

SIGNS POINT TO INCREASED ACTIVITY IN CONSTRUCTION WORK—TRANSPORTATION IS VITAL PROBLEM TO BE CONSIDERED

AS the atmosphere gradually clears up, every indication points to a busy fall and winter building program. Naturally this means considerable hauling of material to the job, excavating, and other heavy work in which the motor truck will assume its share most effectively. Because of the slow-up in building in the last few years and the present shortage of homes which only becomes more acute as the work is put off, this season will be a mighty busy one. Every one is getting ready for the big rush in which some of the needed building will be completed.

And when speed is the vital factor, no more effective medium can be employed than the motor truck.

This fact is shown by the number of trucks in use in the building field. All types are used and all sizes. The lumber dealer has his light, speedy trucks for making emergency deliveries and pick-ups and his heavy duty five-tonners for big loads. Many dealers have enlarged their hauling radius thirty or more miles thru the use of one or a fleet of trucks. Moreover, they have built up a satisfied list of customers who have learned to rely upon the lumberman for delivery on time. The essential part of the building business is to have material on the job when needed so there will not be any lost motion causing extra labor expense. The lumber dealer who gets his material to



E. Brooks & Co. Are Progressive Contractors in New York City. They Use the Latest Machinery and Equipment on the Job and Motor Trucks to Get Them There. Here Is a Typical Load of Construction Machinery on Its Way to a New Contract. Consider the Time Saved by This Method of Transportation. This One-Ton "Republic" Loses No Time Getting There.

# DUPLEX TRUCKS

## BUILT FOR BUSINESS

### Is Transportation a Problem In Your Business, Too?

*If It Is, Read This. It is Published in the Desire to be of Help in Meeting a Common Problem*

**H**AVE you ever thought as seriously as you should of the motor truck in connection with your transportation problem?

Not necessarily of the truck *instead* of the railroads, but of the truck *in addition* to the railroads. With the average freight car

travelling only 25 miles per day business is slowed up in spite of itself.

Here is a big field—big with real and potential aid in helping you to do business *without hindrance* and on terms of practical economy.

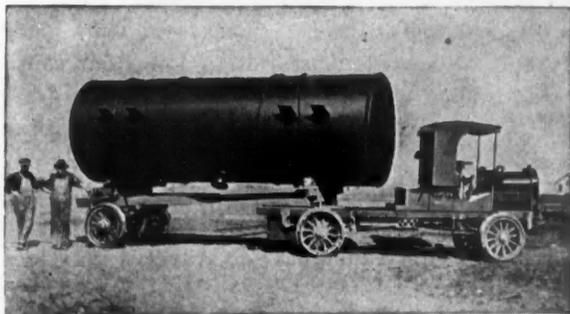
Now, perhaps, you say that this

won't work out. But wait. *It is working out right now.*

Perhaps your observation or your experience has been with the *wrong kind* of truck. Nine times out of ten, so-called trucking disappointments have been remedied by *using the right kind of truck.*

*Maybe you want facts. If you do—write us and we will give you real facts about Duplex Trucks—the famous Duplex 4-Wheel Drive, known everywhere as "America's Leading Heavy Duty Truck"; and also some real facts about the wonderful Duplex Limited—the High Speed, Pneumatic Tired Truck that can really haul 3000 to 5000 pounds at high speed over roads as they are.*

*Read the following and see if it doesn't seem reasonable to believe that these Duplex Trucks are worth knowing about. Write—and do it today.*



### The Duplex 4-Wheel Drive 3½-Tons Capacity

*A Wonderful Truck for Economical Heavy Hauling*

**I**F you have a heavy hauling problem and do not already know the Duplex 4-Wheel Drive, talk to the Duplex dealer and let him give you the facts at first hand.

The Duplex Truck Company is the originator of the 4-Wheel Drive principle and today its most successful exponent.

There is pull and power in every wheel—and the Duplex 4-Wheel Drive keeps going under conditions that are simply impossible for any rear wheel drive trucks.

The Duplex 4-Wheel Drive is setting new records of truck efficiency for Lumber and Logging Companies; Road Builders; Oil Companies; Coal Companies; Mining Companies; Grocery Companies; Trucking Contractors—in fact in all lines where there are heavy loads to be hauled.

The point is the Duplex 4-Wheel Drive is daily proving to be a very *economical truck* for hundreds of owners who used to say it was too big for their needs.

*Write us for folders about the Duplex 4-Wheel Drive. Talk to the Duplex dealer near you. He will give you only facts*



### The Duplex Limited

*High Speed; Full Electrical Equipment; Pneumatic Tires; Capacity 3000 to 5000 pounds at 5 to 25 Miles Per Hour on High*

**H**ERE is a photograph of the Duplex Limited that carried 3060 pounds from Los Angeles to El Centro via San Diego at an *average speed of 34 miles per hour*. No stops during the run. No relief driver. Ran through rain from Santa Ana to Oceanside. *Speed limit observed in all towns in transit.*

Another Duplex running from New Orleans to Baton Rouge with 3750 pounds, 124.6 miles in 6 hours and 55 minutes running time.

Another running from Waterbury, Conn., to Boston—175 miles in 5 hours and 27 minutes.

It fits in exactly with the universal effort to *stabilize schedules*; to obtain *quicker delivery*; and to secure *greater economy*.

*4 Cylinder, enclosed type motor—water cooled—cast en bloc—Bore 4-inch, Stroke 5¼-inch. 3 Point Suspension, Pneumatic Cord Tires, 145-inch Wheelbase. Equipped with Windshield, Electric Lighting and Starting, Ammeter, Boyce Motormeter, Speedometer, Electric Horn, Tools, Jack, Rim Wrench, Front Fenders, Alemite High Pressure Lubricating System.*

*Just the right truck for Delivery, for Inter City Express and for all speed hauls. Get the facts about it*

## Duplex Truck Company

### Lansing • Michigan

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

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



**Battling the Wintry Blasts.** There Was a Time Not So Long Ago When a Scene Like This Was Unknown, but Trucks and Other Improved Machinery Have Helped to Make Winter Building a Reality. This Group of "Federals" Are Fighting the Elements With Great Success. Winter Cannot Stop This Work of Excavation.

the job on time cannot help but increase his business.

The same is true in the case of the building material dealer. He has found the truck one of his most profitable investments. The introduction of special loading bodies has been a boon to him. Just consider the time lost under the old arrangement getting a load of gravel or sand at the pit and then unloading it at the job. These dumping devices have made loading and unloading a matter of a very few minutes. The saving from this source cannot be estimated.

With the coming of the cold season, roads will become rougher and in many cases practically impassable. The power of the truck has been demonstrated very definitely when working under difficult conditions

of this kind. One of the big delays in work under old system of horse transportation has been caused by getting stalled with a heavy load of brick or gravel in some torn up road. Today that is not such a formidable obstacle. Trucks have demonstrated their pulling power in excavation work where they make heavy grades with a big load. In most of these cases the road bed over which they have to travel is very loose and soft.

Combined with trailers, the motor truck will undoubtedly be one of the important factors in this revival of construction which is bound to start soon and alleviate the acuteness of the situation as it exists at present time.

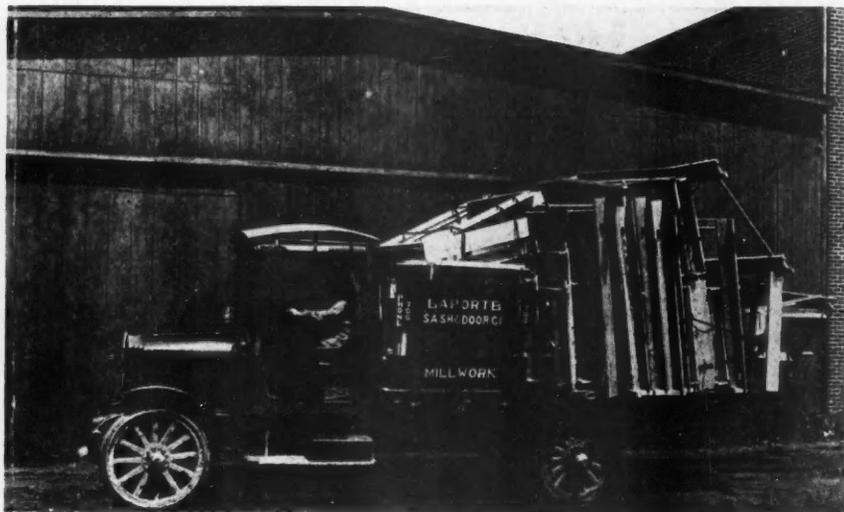


#### Four Trucks Perform Grueling Work at Little Cost

**G**OTTRON BROTHERS, of Fremont, Ohio, are in the business of handling stone, builders' supplies and coal. In this work they use several three and one-half ton trucks. Their first truck is over four years old and their fourth was delivered in September.

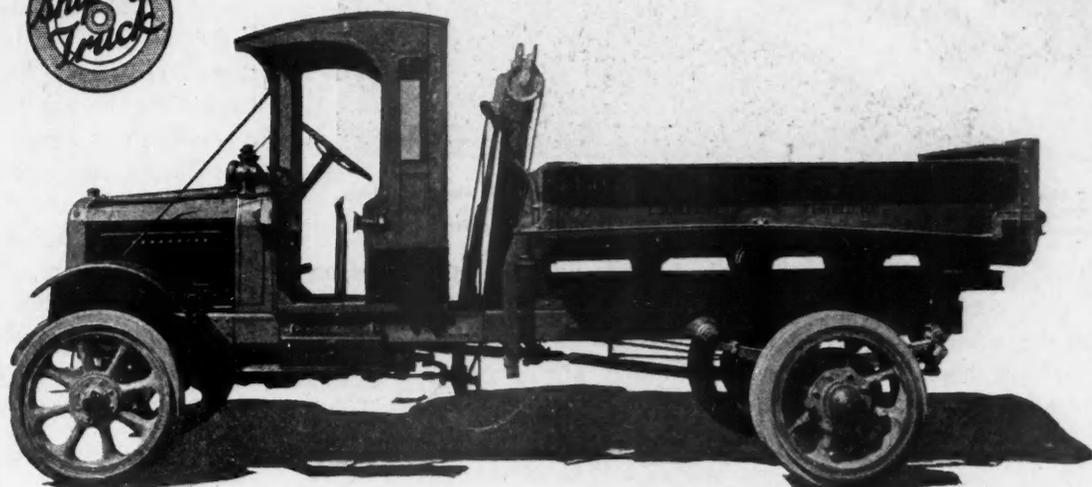
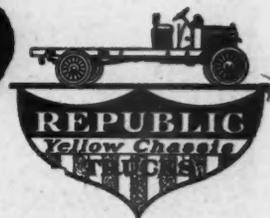
This concern operates its own quarries, where stone is blasted out and loaded on trucks, both by steam shovel and portable electric conveyor.

This is a typical example of the savings effected by the use of trucks over horses. Before the trucks



**When the Laporte Sash and Door Co., Laporte, Ind., Want to Make a Hurry-Up Delivery They Use This Light, Speedy "Acme." It Is Indispensable for This Kind of Work and Has Saved Many a Customer from Expensive Delays. Needless to Say It Has Saved Many a Customer for the Sash and Door Concern.**

# REPUBLIC TRUCKS



## BUY REPUBLIC TRUCKS

Buy them because the emphatic need for more dependable transportation points to Republic as the ultimate truck choice. Buy them because they are economical in operation. Buy them because of their record for reliability. Buy them because there are two thousand fully equipped Republic Service Stations and Seven National Parts Depots. Buy them because these unequalled service facilities, combined with superior construction and quality, assure Yellow Chassis owners uninterrupted truck performance everywhere.

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

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN-BUILDER



**Making the Grade.** One of the "Service" Trucks in the Employ of Gottron Bros., Fremont, Ohio, Building Material Dealers. They Haul Their Gravel from the Pits as Far as Thirteen Miles. These Trucks Average 85 to 100 Miles a Day Over Hilly Country.

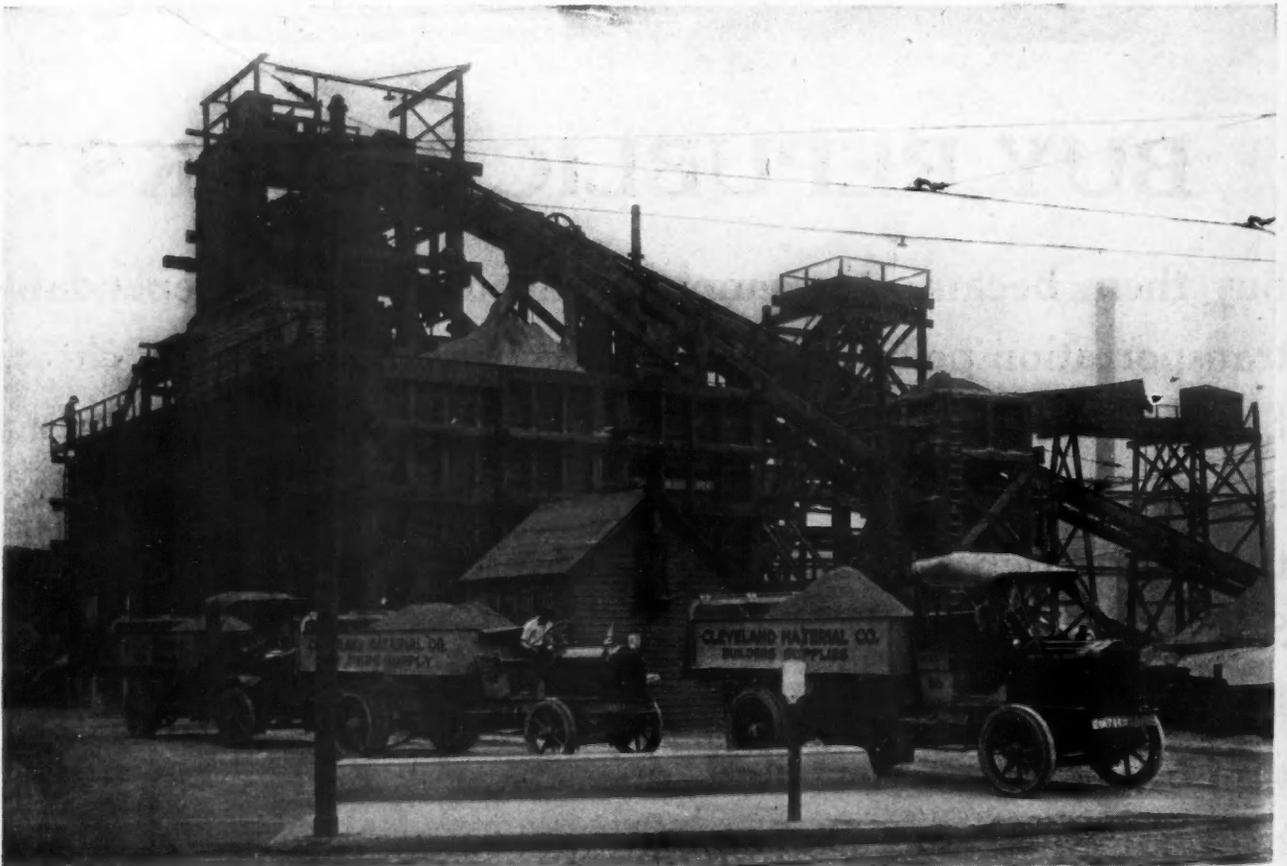
were put in operation, the most that six horses and eighteen men could haul the 200 yards from the quarry to the crusher was from fifteen to eighteen tons of rock an hour. One truck and six men are now delivering forty tons an hour to the crusher.

After being crushed the stone is divided into several sizes, ranging from the fine dust, which is used in making concrete, to sizes as large as four inches, which is used for road work. These different sizes are put in separate bins, under which the trucks are run to get their loads, which are dropped right into the bodies.

The biggest job that these trucks have, however, is hauling from the bins and quarries to the point where the stone is used by the contractor.

From the bottom of the quarry to the point where the trucks emerge at the top is a distance of about 200 feet, in which is a rise of thirty-five feet. Each truck must negotiate the grade anywhere up to twenty times a day. Crushed stone is hauled any distance from one to thirteen miles.

Gottron Brothers figure that their four three and one-half ton trucks averaged from 85 to 100 miles a day, for a ten-hour day, but they have made as high as 106 miles a day for a two weeks' period. This, however, was when the trips were long, and only four round trips were made a day, deliver-



**Hauling is the Big Problem of Building Material Dealers.** The Cleveland Material Co., Cleveland, Ohio, However, Are No Longer Bothered With It. They Have Found the Solution in a Fleet of Heavy Duty "White" Trucks, Three of Which Are Getting Under Way in the Picture.

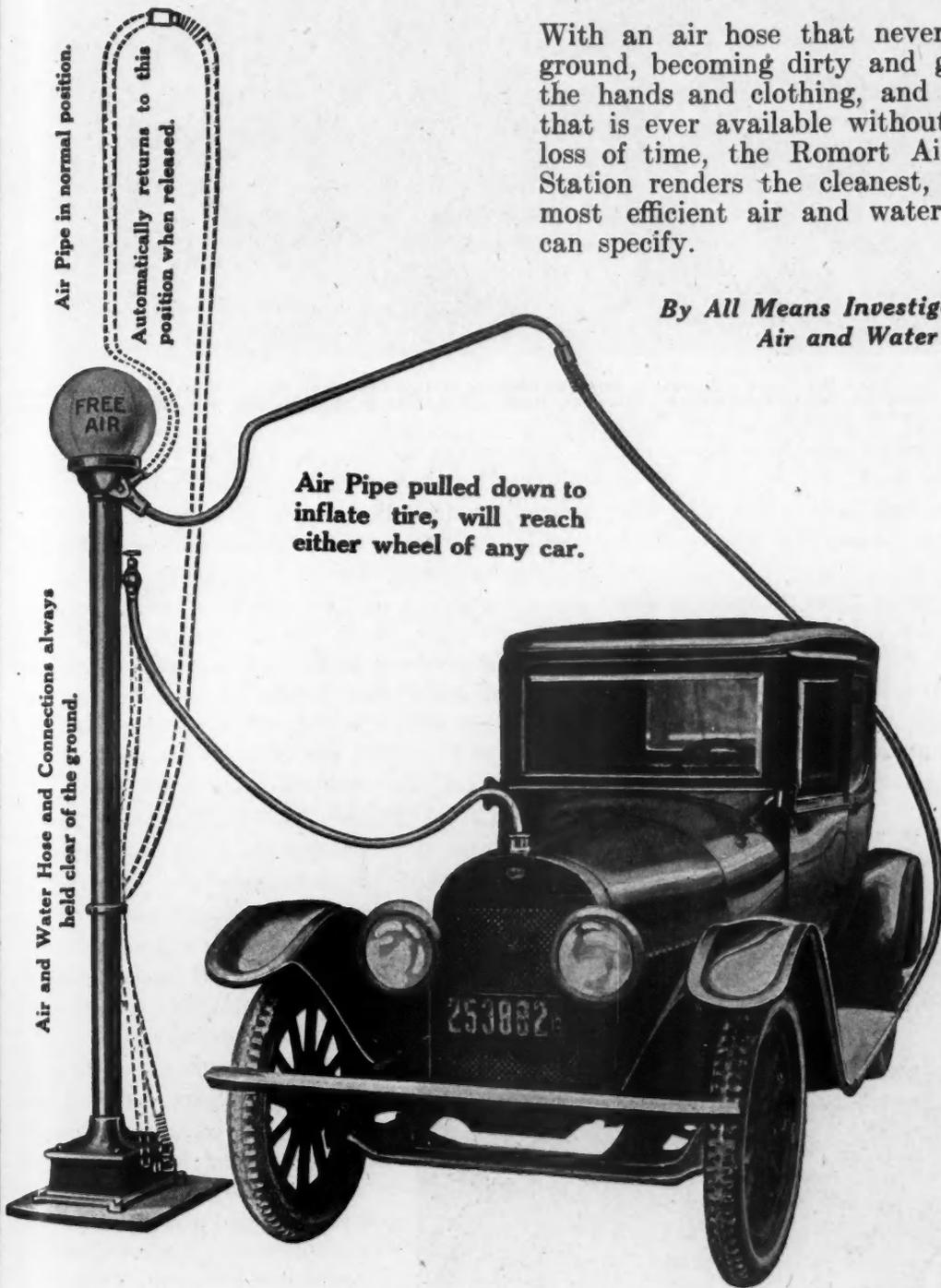
# THE ROMORT AIR & WATER STATION

## IN PLANNING A GARAGE

Don't overlook the paramount importance of an efficient air and water service.

With an air hose that never touches the ground, becoming dirty and grimy, to soil the hands and clothing, and water service that is ever available without trouble and loss of time, the Romort Air and Water Station renders the cleanest, quickest and most efficient air and water service you can specify.

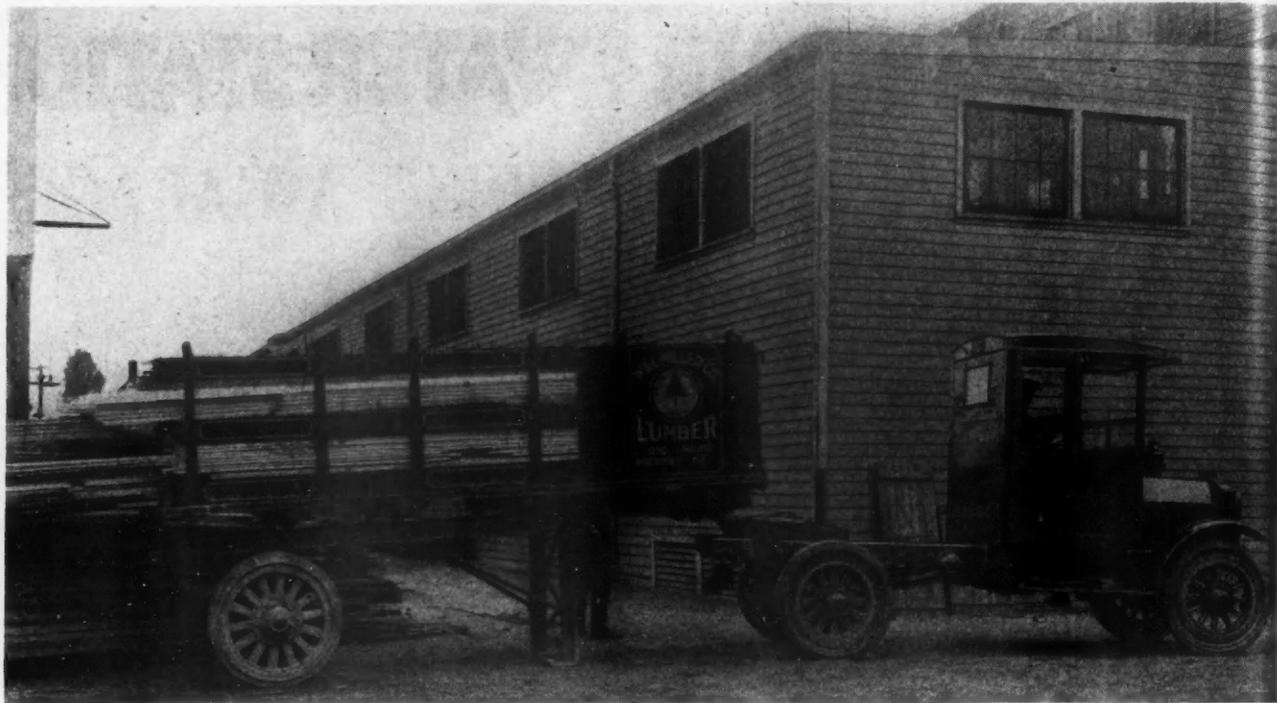
*By All Means Investigate the Romort Air and Water Station*



MANUFACTURERS  
**The Romort Mfg. Co.**  
 OAKFIELD, WIS.

*Write Us Today for Full Details*

SALES DEPT.  
**The Zinke Co.**  
 1323 MICHIGAN AVE.  
 CHICAGO ILLINOIS



Lumber Dealers Find Trailers Are a Big Asset in Increasing Delivery Capacity at Low Costs. This "King" Trailer Is Loaded Ready to Make a Long Trip. W. A. C. Miller Co., Lumber Dealers in Detroit, Mich., Use Several of Them to Save Time in Loading. Note the Device Which Holds It in Position to Be Hooked Onto the Truck.

ing to a job a little over thirteen miles from the quarry.

In addition to the stone work, they have a three or four year contract for hauling stone to Sandusky Bay for riffraffing, or filling in swamp land to preserve it for duck shooting.

Stone for this work is taken from the quarries and hauled to the river, where it is loaded on huge barges and towed about eighteen miles to the dumping ground. Each barge carries about 100 tons a trip.

The oldest of these four trucks is over four years old. It is a three and one-half tonner, and for four years has been hauling regular loads of 10,300 pounds.

Their entire expense for the four years has been less than \$700, which included two repaintings and a general overhaul last winter when work was slack. And this in spite of an accident that happened when this truck, with its regular load, went over a thirty-foot embankment on the highway a little after midnight one night when it was doing day and night service, and turned over twice in rolling down the bank. In three hours' time it was on its feet and started right off. There was not a broken bolt, and the only damage that was done to the truck in any way was a cracked running board.



**T**WO thousand one hundred and thirty-two companies in the lumber industry use 4,964 motor trucks whose value is \$18,863,000. Of the 4,964 trucks, 2,516 are used in fleets, a fleet consisting of five or more trucks.



**T**RUCK owners will find they can save considerable money on depreciation by keeping the chassis of the truck well painted and clean from mud and dirt. As long as it operates satisfactorily little thought is given to the appearance and effect of weather conditions on the chassis and body surface. This neglect allows the surface to deteriorate. The longer this condition is allowed to exist the more rapid the deterioration.



"Business as Usual," Is the Motto of Frank G. Gillingham & Son Co., Philadelphia, Whether It Is Winter or Not. This "GMC" Is All Loaded for a Long Trip Thru the Snowdrifts, but the Driver Does Not Seem the Least Bit Worried.



WONDER 7 WITH FOLDING TRACK LOADER

WONDER 4 WITHOUT SIDE LOADER

## Wonder Mixers are Good Mixers

**R**APID, simple, economical, easily portable and super-strong—there, in a few words, you have the secret of WONDER MIXERS' world-wide success. Contractors who keep check on their per yard costs report that a WONDER can always be relied upon to deliver more yards per man at less expense per yard.

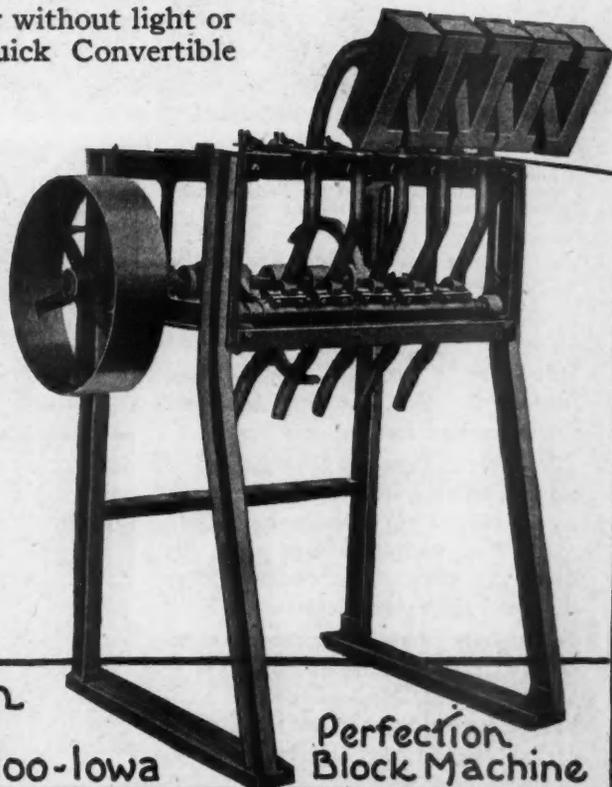
Nine out of ten of all WONDER MIXERS sold within the past nine years are in use today—and their highest average repair cost for any year was \$3.59 per machine.

WONDER MIXERS are built in three, four, five and seven cubic feet capacities, or sizes. The four, five and seven cubic feet sizes can be furnished with or without folding track loaders, with or without light or heavy duty hoisting equipment and as Quick Convertible Discharge mixers.

THE WATERLOO-PERFECTION TAMPER makes dependable concrete blocks and concrete bricks and makes them profitably.

With a single WATERLOO-PERFECTION TAMPER two men can turn out about 400 blocks a day and three men can produce about 500 blocks a day. The output in bricks is just ten times the output in blocks. The cost of manufacturing the blocks is about 12 to 14 cents apiece, and the common bricks can usually be made for from \$10 to \$12 a thousand. Face brick will cost about \$1.00 more a thousand.

Write for our big, new illustrated catalog of Wonder Mixers and descriptive literature on the Waterloo Perfection Tamper.



Waterloo Construction Machinery Company.  
103 Vinton Street — Waterloo-Iowa

Perfection Block Machine



## NEWS OF THE FIELD

### New Meadows Factory Result of Rapid Growth

**T**WENTY-ONE years ago John Roche, founder of Meadows Co., made his first grain elevator on a farm near the little town of Meadows, Ill. This device proved so efficient and practical that some of his neighbors asked him to make duplicates for them.

From this modest beginning the business grew thru the various stages of a small shop on the farm, a larger blacksmith



Warehouse of New Meadows Plant at Bloomington, Ill. It is 80 by 400 Feet. The Buildings Are of the Monitor Type with Brick Walls and Steel Sash.



Executive, Office and Sales Force of the Meadows Manufacturing Co. John Roche, President and Founder of the Company, is Seated in the Center of the Lower Row.

shop, to a small factory which was erected in 1902 when the company was incorporated under the name of the Meadows Manufacturing Co., taking title from the little town where the business was started. In 1909 the first Meadows power washing machine was built.

In 1910 the Meadows Co. expanded to a larger factory located in Pontiac, Ill. In this plant other additions were made to the line, the pitless farm scale, the inside cup elevator, the Gamble binder hitch and the blower elevator.

Within the last few years increased manufacturing facilities became necessary. To meet these conditions the company erected their new plant in Bloomington, with grounds covering fifteen acres.

The factory has a floor space of ap-

proximately 140,000 square feet; there are four main buildings; two buildings each 80 by 300 feet are used for manufacturing; one building 80 by 400 feet is used for the warehouse, sample floor and general offices. The front part of this building is two stories high; the second story is 80 by 80 feet; the foundry is 90 by 260 feet. In addition to these main buildings there are a sand shed 20 by 90 feet, lumber shed 80 by 180 feet, heating plant 60 by 40 feet, garage 60 by 60 feet, and a number of other small buildings, such as the core room, pattern vault, pattern shop and foundry superintendent's office.

The four main buildings are of the



View of New Foundry, 90 by 260 Feet. Twenty Years Ago Mr. Roche Made His First Grain Elevator on a Farm Near Meadows, Ill. The Present Concern Is Named After That Town.

**BUSINESS  
PAYING  
UP A  
BUILD  
CAN  
YOU**

**MAKE CONCRETE BRICK**

Concrete Brick are recognized as the building unit of today. Concrete has definite advantages and when made into the shape of BRICK it is supplied in a *form* building mechanics have handled for centuries with additional features of beautiful facings and water-proof qualities.

**A CRESCENT OUTFIT  
WILL START YOU RIGHT**

The demand for Concrete Brick is increasing every day and you can make money from that demand as you can start with a Crescent Machine on very small capital.

With a Crescent Machine you can supply builders with either face or plain brick of any shade or tint.

You should be the first to get started in this profitable business in your vicinity and in a short while you will have orders booked weeks ahead.

**General Service Corporation**  
13th and Wabash Ave.,  
CHICAGO



monitor type, having steel frame work, brick walls, and steel sash. There are concrete floors in all buildings except the foundry and general office.

Electric power is used thruout and, of course, electric lights. All buildings are equipped with the automatic sprinkler system. The entire plant is heated by steam, which is furnished by a heating plant on the factory grounds.

There were approximately 1,500,000 bricks used; 250 tons of structural steel; 45,000 cubic feet of concrete and 18,000 window lights. The area of the cement floors total over 100,000 square feet.

There are three railroad switches on the factory grounds; two of them being sunken so that the floor level of the car is same as the loading and unloading platform.



### Byron Trailer Makes Debut

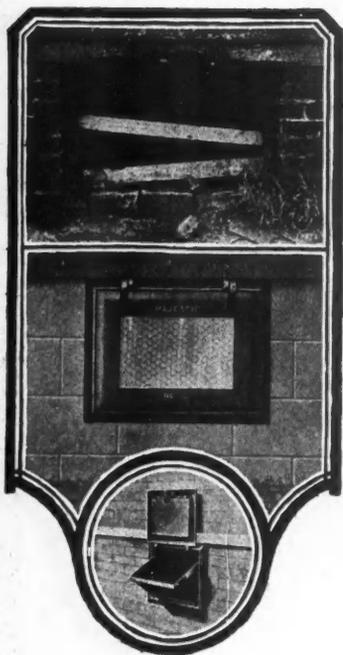
**A**FTER several months spent in building their new factory, the Byron Engineering Works, of Louisville, Ky., is now in full production on a complete line of heavy duty trailers. The new product is known as the Byron Trailer, after the designer, O. E. Byron. Mr. Byron, who is vice-president of the new organization, has been associated with several of the leading manufacturers of trailers during the past ten years.

The other principal officers of the Bryon Engineering Works are Graeme McGowan, president, and Walter



New Factory Recently Completed by the Byron Engineering Works, Louisville, Ky. They Have Started the Manufacture of a New Line of Heavy Duty Trailers for Motor Trucks. The Present Capacity Is 1,000 Yearly.

McGowan, secretary-treasurer. The Byron Engineering Works occupies a modern factory building 80 by 200 feet. The present capacity is about one thousand a year. Additional ground adjoining the present factory has been secured and plans are already under way for increased factory facilities that will make possible a much larger output. Active work is under way to perfect a national distributing organization. Already distributors have been appointed in many of the important centers.



## Don't Let This Happen To Your House

A battered, broken coal-bin window! A damaged foundation—with the disfigurement extending even up the side-wall! That's what happens to a house with a frame-and-sash coal window—every time coal is delivered.

The necessary repairs are costly—and they never end. The illustration above at the left is typical. It shows the result of the shattering force of bounding lumps of coal.

This house is no exception. Still the damage **could** have been prevented. You won't let this happen to your house—if you install a Majestic Coal Chute.

### Contractors

An unsightly, broken coal window—with a damaged foundation and side-wall is a property blemish easily avoided by the use of the Majestic Coal Chute. Installing the Majestic Coal Chute is one sure means of protecting your work down to the last detail. Thus you render an appreciated service to the property owner.

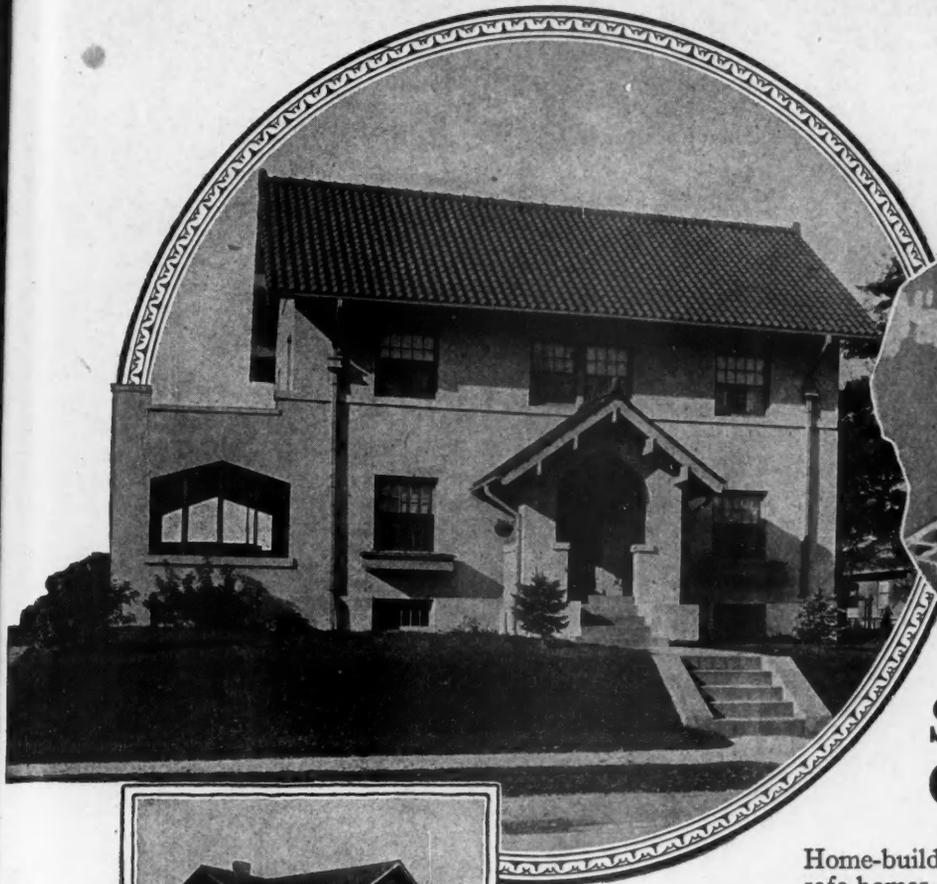
Write for our catalog which shows also the Majestic Milk and Package Receiver and Majestic Built-in and Underground Garbage Receivers.

### The Majestic Company

2202 Erie Street      Huntington, Indiana

# Majestic COAL CHUTE

1. Protects Against Damage.
2. Enhances Property Value
3. Lessens Depreciation
4. Saves Money



## Satisfied Customers

Home-builders who want comfortable, fire-safe homes—that will at the same time be economical—are fully satisfied with Natco Hollow Tile.

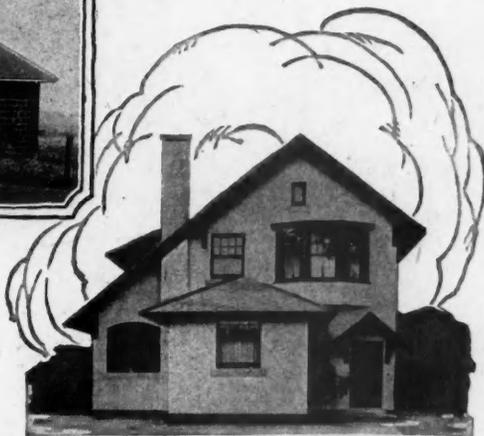
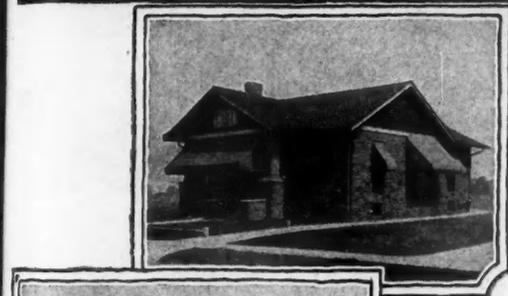
Contractors find their men work much faster and really do better work with Natco Hollow Tile because of its uniformly high quality.

The Building Supply Dealer is satisfied because he deals in a product that is already favorably known to contractors and home builders. He deals with a manufacturer who fully realizes the value of dealer service.

If Natco Hollow Tile is not handled in your own community—write us. We can show you how Natco can make money for you.

A few of the many excellent types of Natco Homes and Garages are shown here. In our new book on Natco Homes we show many others with full description and floor plans. Write for your copy and our prices today.

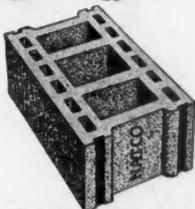
**National Fire Proofing Company**  
912 Federal Street      PITTSBURGH, PA.



# NATCO HOLLOW TILE



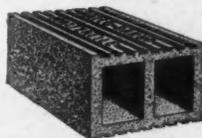
NATCO XXX TILE FOR A STUCCO FINISHED HOME



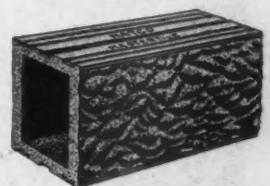
NATCO DOUBLE SHELL TILE FINISHED FACE, ROUGH IN TEXTURE—GLAZED OR UNGLAZED



NATCO DRAIN TILE FOR DRAINING LOW LANDS



NATCO BAKUP TILE USED WITH VENEER OF FACE BRICK

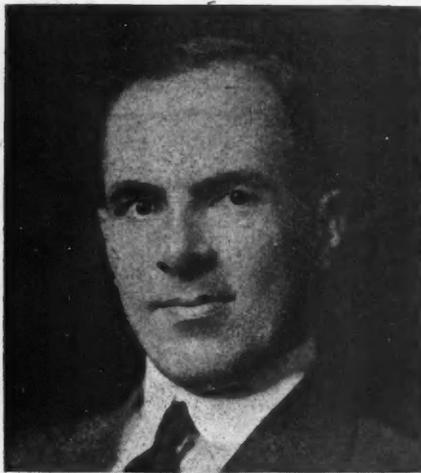


NATCO GLAZED BUILDING BLOCK ROCKFACED, FOR FOUNDATIONS AND BUILDINGS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

### Lime Association Names New Department Heads

AT a recent meeting of the National Lime Association, Washington, D. C., Laurance H. Hart, C. E., was



Laurance H. Hart, C. E., Newly Appointed Manager of the Construction Department of the National Lime Association, Washington, D. C.

appointed head of the construction department, and Major E. Holmes, Ph.D., head of the chemical department. Both men have had considerable experience in their line, Mr. Hart being connected with the Lakewood Engineering Co. and Hunkin-Conkey Construction Co., Cleveland, O., for several years. He will be available for consultation on all phases of building operations in which lime is used.

Major Holmes was research engineer for the National Carbon Co., Cleveland, for many years. He will handle problems connected with the chemical use of lime.



### "Own Your Home" Exposition for Chicago

OWING to the tremendous success and far reaching influence of two "Own Your Home" Expositions held in New

York city, leaders of industry of Chicago and of the Middle West have made plans for the first "Own Your Home" Exposition to be held in the Coliseum, March 26 to April 2, 1921.

A committee of architects, representing the Architectural League and the Federated Arts Clubs of New York, and the Illinois Chapter of the American Institute of Architects and the Illinois Society of Architects, have completed the entire floor plan and installation of the Exposition which will be used at the Coliseum and moved to New York later.

It is planned to have the exposition complete in every detail from the finished model of the prize houses, with grounds laid out, down to the smallest detail of furniture and interior decorating. Every branch of the building industry will be represented, and all affiliated branches will also have representation. The Lee Lash Studios are now at work on an elaborate scenic background which will visualize the "Own Your Home" spirit. Robert H. Sexton, managing director, has as his associates some of the most prominent and influential men in Chicago and New York.

Mr. Sexton, who has so successfully conducted the two expositions in New York, is of the opinion that the Chicago Exposition should be of immense practical benefit to all classes and conditions and emphasizes the idea that the people can, regardless of their present financial condition, learn eventually how to own their homes by attending the exposition. There the prospective builder will learn thrift ideas, financial methods, how to select a site, choice of materials and the best way to furnish the home. Women, prominent in the field of household economics and other affiliated branches, have been named on the committees and will offer the results of their experience and knowledge of the public.



HOW are you going to spend the winter in the most profitable manner? Write a story about it. You may be helping some brother reader.

# Economy

## E-COD FABRIC

Saves in every plastering operation. Allows you to do the best plastering at the lowest cost. Saves from 40% to 60% of the scratch coat required on any ordinary open mesh lath to form the key.

Plaster can be applied faster, saving in time and expensive labor.

## E-COD FABRIC

is the ideal plastering base for interior or exterior use. It is water proof, rust proof, weather proof, fire retardant and sound deadening.

Your client will be well satisfied and you will secure more work by using E-Cod Fabric.

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Scott C. Dyer, Architect Stern-Smith Plastering Company, Contractors

## Lock Out the Storm King

WHEN the piercing frosts and icy blasts of old King Winter battle against your home, then's when he exacts a costly toll of you for roaring fires and soaring coal bills.

Homes sealed tight with walls of

# KELLASTONE

IMPERISHABLE STUCCO

bind the outer walls into one seamless, inseparable lock-like mass. Hermetically seal every joint and corner—make a warm home in winter—cool in summer—reduce fuel bills, fire insurance and general upkeep.

Old houses, time-worn or past fashion can be transformed into modern architectural beauty by overcoating with KELLASTONE. Applied successfully in winter weather—occupants not disturbed. Send for illustrated, descriptive booklet.

*Price advance only 15% in four years*

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Room 515 155 E. Superior Street CHICAGO



# KELLASTONE

IMPERISHABLE STUCCO

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

**Lumber Export and Imports Show Big Total**

FOR the twelve months ending June 30, 1920, the value of wood-industry products exported and imported into this country shows the greatest aggregate values ever obtained in the international trade of lumber and wood products. During this period the imports of all manufacturers of wood nearly equal the exports in value; the lumber imports are about two-thirds of the exports. During the four years preceding the war, the annual imports of lumber and saw logs ranged from 1,100,000,000 to 1,300,000,000 board feet. The volume of annual exports from the United States prior to the war was approximately 3,000,000,000 board feet of lumber and saw logs. The export trade then absorbed about 8½ per cent of the lumber cut.

A substantial increase in wood imports began in 1917. But export trade fell off greatly during the war and the total exports of 1918 and 1919 were about one-third of those in 1913.

The following tables give exports and imports for the calendar year 1917, 1918 and 1919 and for the twelve months ending June 30, 1920. The figures are taken from the reports of the Bureau of Foreign and Domestic Commerce.

EXPORTS

Lumber—	Quantity, 1,000 Feet	Value
Calendar year 1917.....	1,019,649	\$33,870,262
Calendar year 1918.....	1,023,769	49,177,518
Calendar year 1919.....	1,311,210	64,860,806
Twelve months ending June 30, 1920.....	1,518,587	85,569,475
<i>Wood and Manufacturers of Wood—</i>		
Calendar year 1917.....		\$ 71,362,591
Calendar year 1918.....		87,111,202
Calendar year 1919.....		136,802,166
Twelve months ending June 30, 1920.....		168,574,578

IMPORTS

Lumber—	Quantity, 1,000 Feet	Value
Calendar year 1917.....	1,198,388	\$27,600,247
Calendar year 1918.....	1,206,027	34,100,528
Calendar year 1919.....	1,491,507	55,050,097
<i>Wood and Manufacturers of Wood—</i>		
Calendar year 1917.....		\$ 98,606,986
Calendar year 1918.....		98,252,038
Calendar year 1919.....		111,578,988
Twelve months ending June 30, 1920.....		157,367,368

**Gunstock Walnut Beautifies Church**

WALNUT which had originally been specially selected for the manufacture of gun stocks for the use of the Allied armies has been used to make what is probably the most beautiful interior of a religious structure in the country, that of one of the Methodist churches in Kansas City, Mo. The entire interior—trim, furniture and pews—is of black walnut, even the paneling about the side walls and pipe organ being worked from a single walnut log, a specimen of the kind for which experts are always on the lookout, but seldom if ever are fortunate enough to find.

The beauty and grain of the wood conduces to harmony and richness of tone, the soft colors of the walnut being so fitted and blended that they produce the effect of a great painting, where the qualities of simplicity and depth predominate.

THE correspondence department is for the readers of the AMERICAN BUILDER. Here they can offer suggestions, ask questions, and find solutions of problems. Thru these columns Jones, contractor in Los Angeles, can talk to Brown, builder, in Portland, Maine, or Alberta, Canada, and learn something of mutual benefit.



**SAVES 10 FEET of LUMBER and 2 HOURS DAILY**  
**THAT'S \$35. A MONTH OR MORE THAN THE TOTAL COST OF THIS**  
**ALL STEEL Automatic SWING SAW GAUGE**

The Stops are Automatic and Selective. The Operator cuts the various lengths quickly and accurately without leaving his position in front of the Saw.

**WE SHIP ON TRIAL. OVER 5000 IN USE.**

**GUARANTEED AND SOLD BY THE TANNEWITZ WORKS, GRAND RAPIDS, MICH.**

*In Ordering, state Longest Cut and No of Stops wanted.*

# WEST SIDE IRON WORKS

MANUFACTURERS OF

## Motor Driven and Ball Bearing Band Saws

Motor Direct  
on  
Driving  
Wheel



Motor to Wheel  
by Silent Chain,  
Gear and  
Pinion



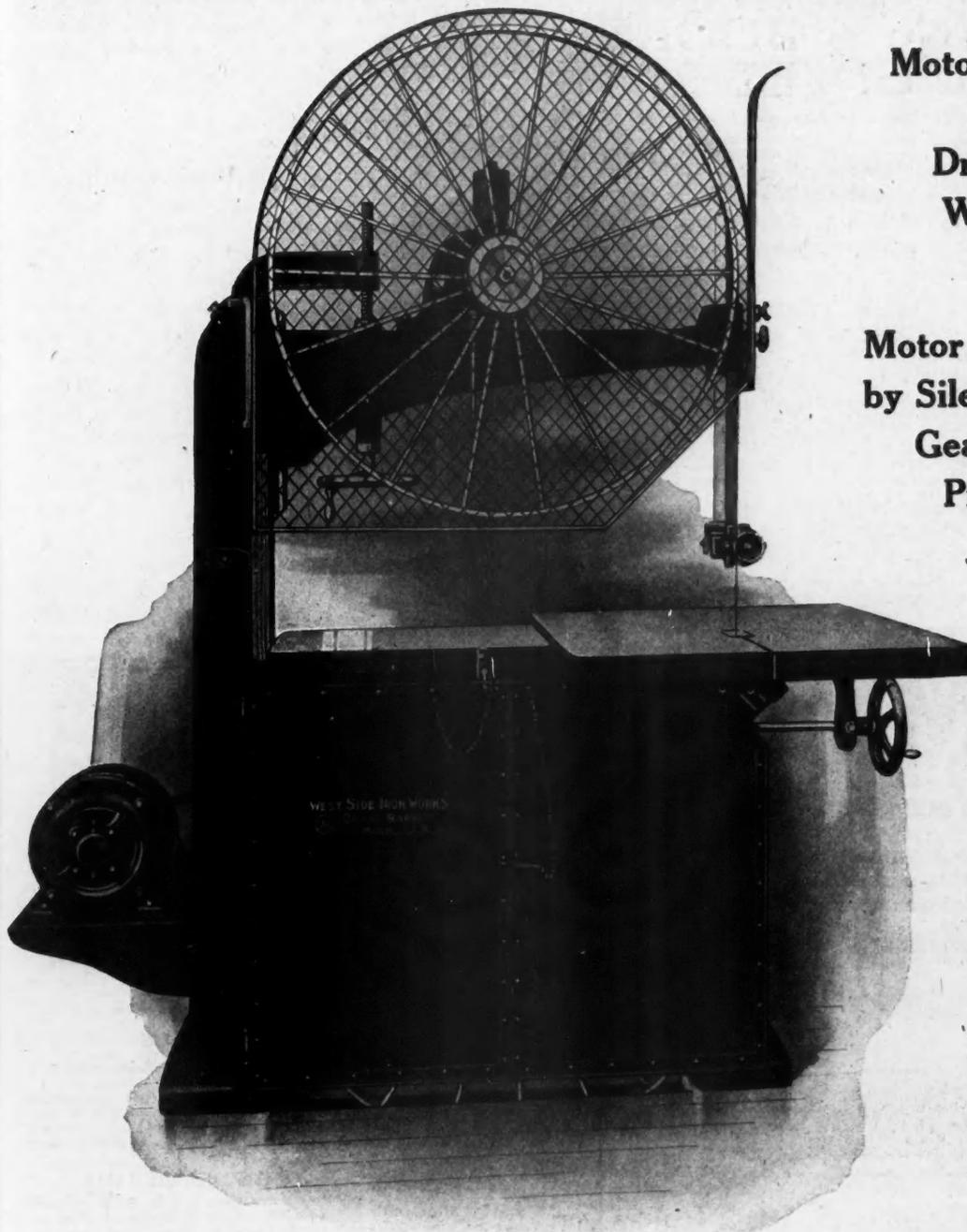
Motor to  
Wheel  
by Short  
Belt



We Save  
Time,  
Power,  
Money

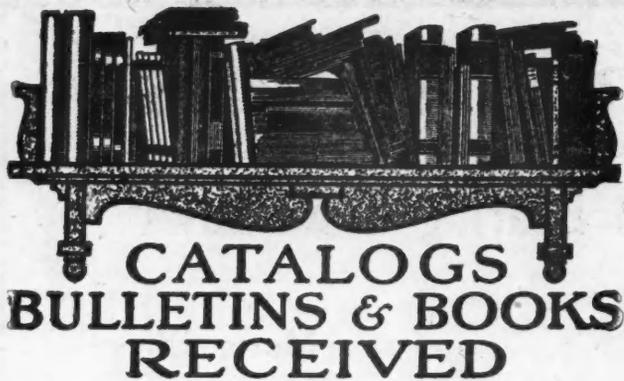


Write  
Us



**General Offices:**  
1227 Washington Boulevard, Chicago, Illinois

**Factory:**  
Grand Rapids, Michigan



## CATALOGS BULLETINS & BOOKS RECEIVED

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

"Link-Belt Silent Chain Drives for Cement Mill Equipment" is the title of a thirty-two page book now ready for distribution by the Link-Belt Co., Chicago, Ill. They have also issued a book on Roller Chain as a Means of Power Transmission, showing it in operation on motor trucks, tractors, and other equipment.

"Tirrill Gas Turns Night Into Day" is the subject of an eight-page folder recently issued by the Tirrill Gas Machine Lighting Co., New York, N. Y. This apparatus produces gas for the farm or country home and is used for illuminating, cooking, and automatic hot water conveniences.

"Red Gum" and "Oak" are the titles of two very attractive booklets recently published by the American Hardware Manufacturers' Association, Memphis, Tenn. They contain thirty-two pages with special covers, and are illustrative of the various uses to which these woods are applied.

The American Society for Testing Materials, Philadelphia, Pa., has just issued its year book, dated August, 1920, also a book covering the A. S. T. M. standards adopted during the year 1920. The year book contains complete data on the history of the organization with names of members, standing committees, and constitution. The supplementary book is illustrated by diagram drawings and presents in detail the changes adopted and conclusions arrived at by various committees.

"Crop Reports and General Business Conditions" is the title of a booklet issued by the Continental and Commercial National Bank, Chicago, Ill. It presents a complete analysis of trade conditions with reports on the crop up to date.

"Reflectolyte" is the subject of Catalog No. 5 distributed by the Reflectolyte Co., St. Louis, Mo. It contains illustrations and descriptions of the various electric lighting fixtures manufactured by that concern.

"Studies in the Economics of Lighting," by E. Leavenworth Elliott, is a new booklet being distributed by the Cooper Hewitt Electric Co., Hoboken, N. J. In this article Mr. Elliott discusses the advantage of efficient electric illuminating in factories and other buildings with the use of the Cooper-Hewitt lamp.

A new net price list has been issued by Kolesch & Co., New York, N. Y., manufacturers of drafting room supplies and architectural accessories. It contains the latest list prices of all their products.

"Equipment for Cafeterias, Lunch Rooms, Restaurants, and Dining Rooms," and "Billiard, Bowling, and Club Room Equipment," are the subjects covered in two new catalogs issued by Albert Pick & Co., Chicago, Ill. They contain many pictures of modern equipped restaurants, etc., in which the Pick equipment is the feature.

# BOMMER

## Floor Surface Spring Hinge

Double or Shingle Action, Holdback, Ball Bearing. Every moving part of this hinge can be oil fed from a single hole on outside of side-plate.



The most durable hinge of its type; holds the door open when swung to 90 degrees at either side

Your Hardware Merchant Can Supply Them

Bommer Spring Hinge Company, Brooklyn, N.Y.



Stained with Cabot's Creosote Stain  
C. M. Hart, Architect, Bay Shore, N. Y.

## Stained Shingles

The Warmest, Most Artistic and Most Economical  
of all House Finishes

Wood shingles are two or three times warmer than the gummed paper substitutes, and they are cheaper, last longer and are incomparably more artistic and attractive. When stained with the soft, moss-greens, bungalow-browns, tile-reds and silver-grays of

## Cabot's Creosote Stains

they have a richness and beauty of tone that no other finish can equal and the creosote thoroughly preserves the wood. Use them also on siding, boards, sheds and fences. Anyone can apply them with best results at least expense.

## Cabot's "Quilt"

makes floors and partitions sound-proof by breaking up the sound-waves and absorbing them. It makes walls and roof cold- and heat-proof by a cushion of minute dead air spaces that prevents the conduction of heat. From 28 to 50 times as efficient as cheap building paper.

You can get Cabot goods all over the country  
Write for samples and name of nearest agent.

## SAMUEL CABOT, Inc.

Manufacturing Chemists BOSTON, MASS.  
1133 Broadway, New York 24 W. Kinzie St., Chicago  
Cabot's Brick Stains, Stucco Stains, Conserve Wood Preservatives, Damp-proofing, etc.

# DRAWING OUTFIT FREE



## Special Offer To BUILDERS

Yes, I will give you this complete drawing outfit absolutely free. The instruments are in a handsome high class, plush lined folding case. They are regular draftsman's working instruments. Besides I will give you absolutely free, a 20x25 inch drawing board, a 24 inch T square, a 12 inch rule, a supply of drawing paper, two triangles, a French curve, pencils, erasers, thumb tacks, etc. The complete outfit is delivered to you at once. You have them to work with from the very first day. Find out about this offer. Write today.

### Be a Draftsman Draw \$3,600 Per Year

There is an urgent demand for skilled draftsmen. Companies are issuing calls every day for men to fill positions paying \$3,600 per year. Builders are peculiarly fitted to make big successes as expert draftsmen. Send the coupon now.

**Pay As You Wish** What I want is the *right kind* of men. Don't bother about expense. I will give you the working outfit free if you get in at once. I charge a very small fee for training you to be an experienced draftsman. You can pay the small cost as suits you best.

### Chief Draftsman Will Instruct You Personally

I am Chief Draftsman of a large and well known firm. I know just the kind of training that is demanded from men who get big salaries. I want to train a limited number of builders to take big paying drafting positions. I train you by giving you actual, practical work, the kind that you must be able to do to hold permanent, high salaried jobs. I give you my individual instructions. If your work is right, I will advance you rapidly. If it is wrong, I will show you where and make you do it right, and do all I can to make you an expert draftsman and designer in a short time.

## Send Coupon for My Big New Book

Put your name and address on the coupon and send it to me today. I will send you my new book "Successful Draftsmanship," and the great special offer that I am now making on which you get the complete Draftsman's Working Outfit **absolutely free**. You assume no obligations of any kind in sending coupon. Get in line for a big paying position. Getting the book and full particulars of the special offer is the first step.

**Chief Draftsman Dobe, 4001 Broadway, Chicago, Ill.**

**Chief Draftsman Dobe**  
Dept. 1658, 4001 Broadway, Chicago, Ill.

Without any obligations on me whatsoever, please mail your book "Successful Draftsmanship," and full particulars of your liberal "Personal Instruction" offer to Builders. It is understood that I am obligated in no way whatever.

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"How to Obtain Beautiful Surfaces" is the title of a folder being distributed by the Velvetile Floor Co., Chicago, Ill. The folder is devoted to a description of Pyramid Stucco manufactured by that company and contains several illustrations of Pyramid dashes.

Parker Trucks are described and illustrated in a catalog issued by the Parker Motor Truck Co., Milwaukee, Wis. It contains illustrations and specifications of the different models of trucks which are now being manufactured by the Parker company.

Saw Mill and Woodworking Machinery, everything for the saw mill, is included in Catalog No. 20, issued by the American Saw Mill Machinery Co., Hackettstown, N. J. Some of the equipment described and illustrated in this book are hoists, saw rigs, log turners, sawdust conveyors, sawdust blowers, heavy saw mills, lath machines, and shingle machines.

"Paasche Air Devices" is the title of a new catalog No. 13 issued by the Paasche Air Brush Co., Chicago, Ill. It contains twenty pages, well-illustrated, with descriptions of the various products which the concern manufactures including portable painting outfits, air brushes, furniture and piano rubbing and polishing equipment, accessories and other painter's specialties.

"Two Famous Structures" is the subject of a folder on electric lighting issued by the Duplex Lighting works of the General Electric Co., New York City, N. Y. These two buildings have been equipped thruout with Duplex-a-lites.

Kawneer Simplex Weightless Reversible Window Fixtures are described and illustrated in a new catalog now being distributed by the Kawneer Co., Niles, Mich. These windows are designed for use in schools, hotels, apartments, hospitals, office buildings and residences.

"Modernize Your Farm" is the title of a sixteen-page

color booklet issued by the Kewanee Private Utilities Co., Kewanee, Ill. It deals with the subject of making the farm modern in every respect by installing Kewanee electric lighting plants, water supply systems, and sewage disposal outfits. These products are illustrated in the booklet and their specifications stated.

Insulation for Cold Temperatures is explained in a book issued by the Union Fibre Co., Winona, Minn. This book describes and illustrates the various materials manufactured by that company for insulation purposes. They are Waterproof Lith, Union Cork Board, Linofelt, and Fibro felt. Specifications for the construction of cold storage plants are also contained in this publication.

Dorman Wave Power Tools, such as rock drills, riveters for mining and construction work, are described and pictured in a catalog from the press of W. H. Dorman & Co., Ltd., Stafford, England. The book takes up in detail the new science of wave transmission thru liquids.



**Stop Burning Up Homes**

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

Why not stop burning up the existing buildings, if there are not enough to go around and more cannot be built under existing conditions? Thousands of homes are burned each month, most of them thru carelessness. If housing is so important, if homes are so hard to find, why not be careful with those that we have? Apply fire prevention methods.



**BORLING  
LINE LEVEL**

**The ONLY LINE LEVEL That Does Not Sag the Line Between Points To Be Leveled**

THE Borling Line Level has a new improvement added so that it can be also used for leveling without a line, by placing it on a surface, such as a timber, joist, shafting, pipe, etc. This new feature is also adjustable.

There is no increase in price. Compare this instrument with any like instrument and consider what you are getting for your money.

All Borling Line Levels sold prior to October 1st, will be exchanged, free of charge, for this last improved level.

Actual length 15 1/2 inches, weight 5 ounces.

Your money will be refunded without a question if the level will be returned within 5 days.

*A check for \$8.00 will bring the Borling Line Level prepaid and insured to your desk*

**H. A. BORLING, Madison, Ohio**

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We want to send you our catalog and literature showing why Brasco Copper Store Fronts are a live issue with you and every other contractor or builder.

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