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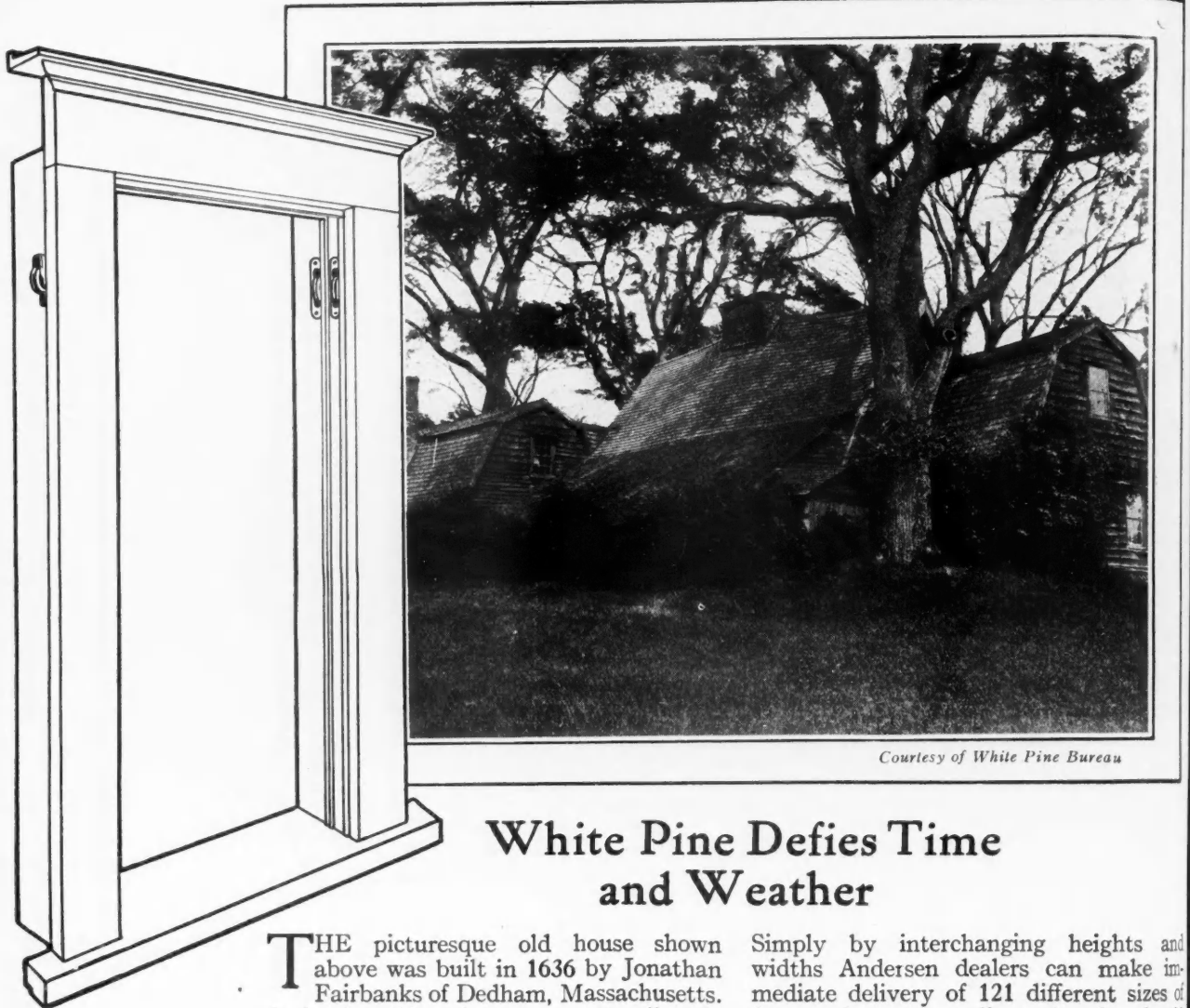
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Courtesy of White Pine Bureau

## White Pine Defies Time and Weather

**T**HE picturesque old house shown above was built in 1636 by Jonathan Fairbanks of Dedham, Massachusetts. It is the oldest house now standing in America. It is a strong testimonial to the weather resisting qualities of White Pine of which it is built.

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# Short Talks by the Editor

## The Building Giant is Awake

FROM Medford, Minn., and Oconoga, Ore., from Paris, Texas, and Miami, Fla., from large and small cities, hamlets and villages comes the word that building has once more become the most active industry. In Chicago and New York, not a house here and there, but solid blocks of buildings are going up.

At the present rate, the building total for 1922 will run between FOUR AND FIVE BILLIONS.

Not a bad omen for the builder who has patiently passed thru the period of readjustment. Not a discouraging sign for the rent payer who has meekly submitted to rents that were entirely out of reason. And certainly not a bad situation for the nation as a whole—which for a time threatened to become a land of nomads. New buildings mean more home owners and home owners mean added stability to the country.

It is particularly encouraging to notice the percentage of residential building. This particular class of construction is running far ahead of any other and the small detached homes seem to be in great favor. People are burning up their rents receipts and acquiring a new batch of notes that represent real collateral. Instead of paying a certain amount each month and getting a rent receipt in return, they are paying the same amount each month and getting a paper that is worth money.

The paint manufacturers have adopted a slogan, "Make 1922 the Greatest Paint and Varnish Year." Why not make it the greatest building year as well?



## Shall This Confusion Continue?

THERE are 1,478 cities in this country of ours with a population of 5,000 or more. Our information indicates that only 410, or 27 per cent, have a building law, and in all probability twenty or more of these laws are included as a part of the original city charter. Other cities claiming codes have what is merely a set of restrictions specifying the area known as the "fire limits." In the majority of cases, where fire limit restrictions only prevail, the ordinance merely specifies the area included within such limits and requires that the buildings erected therein shall have incombustible walls and roofs. They make no restrictions as to the allowable height of buildings. They say nothing about maximum areas between fire walls nor do they mention the character of interior construction. Any kind of a fire-trap interior may be constructed and it may cover any area as long as the exterior walls are masonry walls and the roofs supposed incombustible. In all probability these kinds of laws are the only ones in effect in 65 per cent of these 1,478 cities.

There are 259 cities with a population of over 25,000

and only 223, or 80 per cent of these cities give evidence of having a building code. Thirteen of these cities have no codes with no enforcing officer, while 23 cities have no code whatever but do have a building inspector.

Of the 460 cities with a population of from 10,000 to 25,000, only 116, or 25 per cent, have a building law, and 26 of these have no officer to enforce it. Of the total of 739 cities with a population ranging between 5,000 and 10,000, only 81, or 9 per cent, have building laws, and 25 of these cities have no means of enforcing the law.



## America Leads in Plumbing Improvements

TIMES change, but seldom does anything change for the better more noticeably than bathroom equipment and plumbing fixtures.

Bathrooms, like people, have changed from generation to generation. But Americans enjoy the greatest improvements made in the necessary equipment for bathing. Today we step refreshed and buoyant from bathing in a shining, china-like tub of sparkling whiteness. The older countries, in the main, are far behind in this respect. This, perhaps, accounts for American superiority in other directions.

While nationally inadequate housing is uppermost in everyone's mind, it is well to call attention to the importance of getting proper plumbing equipment in the new homes as built. No more important household utility exists, and no other fixtures in the home will get more use and abuse.

Starting with the plumbing dealer who undertakes the contract, it is best to secure a service that is already recognized for efficient and trouble-proof workmanship. No plumbing contract should be let solely because it is to the lowest bidder. Rather be certain of quality in the job, and see that the successful bidder has included that quality in his estimate.

Plumbing fixtures should be chosen with thought for the years of use they will have. Bath tubs, closets, lavatories, sinks and the smaller appliances can be purchased in matching finishes and designs. Most every homeowner, and especially the woman in the home, may have proper pride in the bathroom, only if it is equipped with modern fixtures. Modern, sanitary fixtures of vitreous china, porcelain or enameled iron, from reliable makers, will not require endless scrubbing and scouring to keep clean, white and inviting.

Medical authorities agree that in homes where there are more than four occupants, there should be more than one bathroom. Modern fixtures and construction allow a complete bathroom to be installed in a space as small as five feet square.

## Nebraska's New Capitol Is Unique

PRAIRIE STATE TO DEPART FROM THE CONVENTIONAL AND ERECT UNORTHODOX BUT MAGNIFICENT STRUCTURE FOR ITS GOVERNMENT.

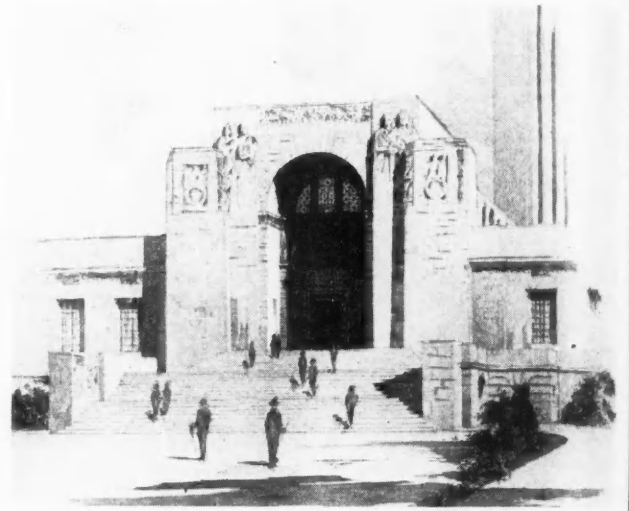
By Dale R. Van Horn

ON April 15 a great throng witnessed the formal sod-breaking ceremonies for Nebraska's new capitol building at Lincoln. The day was ideal and among the guests of honor was Marshal Joffre of France. And since the plans for this building-to-be are so unconventional and far from the custom of years, the incident marks another milestone in the annals of world history. *The Nebraska capitol is the greatest departure ever made in American state house architecture.*

The plan was secured thru a series of competitions given under the auspices of the American Institute of Architects. Three Nebraska men were selected in the preliminary competition in which the economic and political aspects of the problem were considered as well as the architectural requirements. Seven firms of national reputation outside of Nebraska joined the competition and in June, 1920, Bertram G. Goodhue of New York City was chosen architect of the commission.

For one year after its adoption the winning plan was studied and criticized not only by the architect and the staff, but by the capitol commission and the public in general. At first there was a howl of disapproval from many citizens. "It is too radical"; "it is unorthodox!" "Where is the dome, the symbol of all state houses?"

These protests were heeded, and had public opinion been strong enough the plans, of course, would have been changed. Then when the idea became better known and the public began to visualize the grandeur and splendid beauty of the contemplated structure, those standing for the conventional were rapidly swung over to the other side, and today Nebraska as a whole is unanimous in favor of the project. In the meantime some changes have been made, but the essence of the original design remains in all its simplicity and

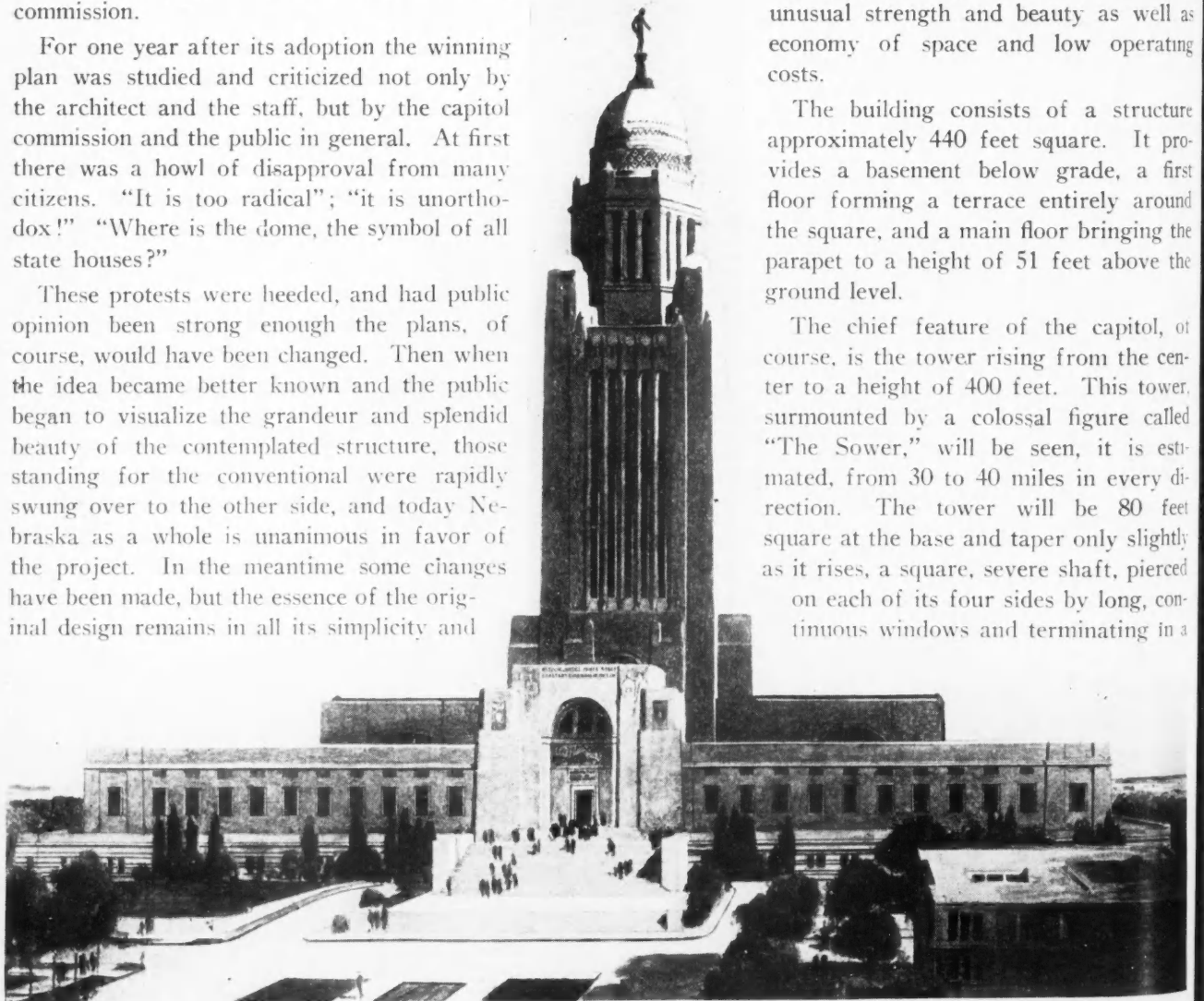


Close Up of Front Entrance, Showing Great Archway 25 Feet Wide and 50 Feet High. The Arch Is Buttressed on Either Side by Pylons Decorated in Relief.

dignity, promising a public building of unusual strength and beauty as well as economy of space and low operating costs.

The building consists of a structure approximately 440 feet square. It provides a basement below grade, a first floor forming a terrace entirely around the square, and a main floor bringing the parapet to a height of 51 feet above the ground level.

The chief feature of the capitol, of course, is the tower rising from the center to a height of 400 feet. This tower, surmounted by a colossal figure called "The Sower," will be seen, it is estimated, from 30 to 40 miles in every direction. The tower will be 80 feet square at the base and taper only slightly as it rises, a square, severe shaft, pierced on each of its four sides by long, continuous windows and terminating in a



Nebraska's Unique Capitol Now Under Way. It Will Be Built in the Form of a Perfect Square, of Which Each Elevation Is 457 Feet. The Main Building Is Two Stories, Built Around Four Light Courts with an 80-Foot Square Tower in the Center Rising 400 Feet in Height. The Court Arrangement Gives All Offices Excellent Light.

# New State House Shatters Building Traditions

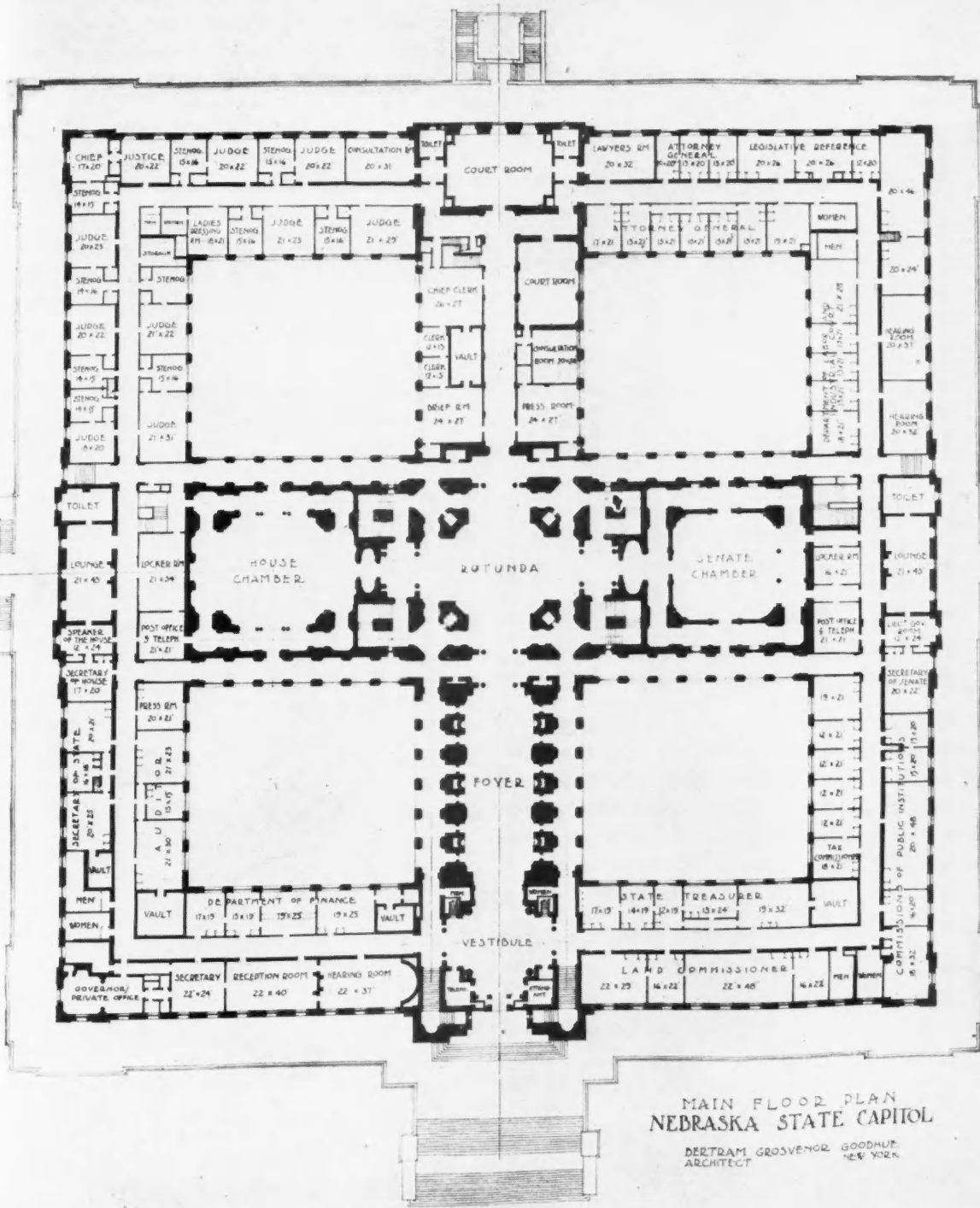
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Main Floor Plan of New Nebraska State Capitol, Showing Arrangement of Outside Office Around Four Inner Courtyards, Insuring Maximum Daylight on All Sides. The Inner Section Is Built Like a Cross, Converging in the Center Rotunda Above Which Rises the Tower.

graceful dome of colored tile. The object of Mr. Goodhue in making this feature, was to furnish the comparatively flat state of Nebraska with an elevated building which would at once be an object of beauty and a source of inspiration.

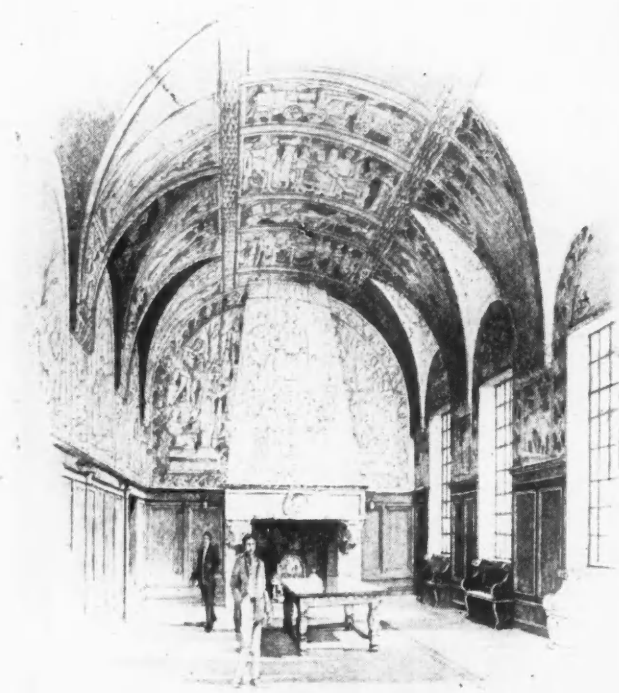
It is interesting to note, however, that despite its singular appearance it is also utilitarian to the very top. The lower portion of the tower will contain the main rotunda. Above the roof it will carry a dozen floors of offices, housing many of the state departments and providing room for an indefinite expansion of storage space for the state library. Directly beneath

the dome at the extreme top will be located the war trophy room.

This tower, supplanting the ornamental but economically useless dome, is by no means the only excellent feature of the Goodhue plan. The basement and first floor will house the service features and many of the state departments. The chambers which distinguish such a building will be located on the main floor. Entering from the north by a broad flight of stairs, the visitor finds himself in the hall of state, a vaulted apartment 50 feet high and containing niches for statues and inscriptions and a number of paintings.

Is 451  
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The Foyer of the Capitol. This Great Hall Leads from the Vestibule to the Central Rotunda Under the Tower. Its Ceiling is a Groined Vault of Tile 50 Feet Above the Floor. Mural Paintings Along the Walls Depict Nebraska's History.

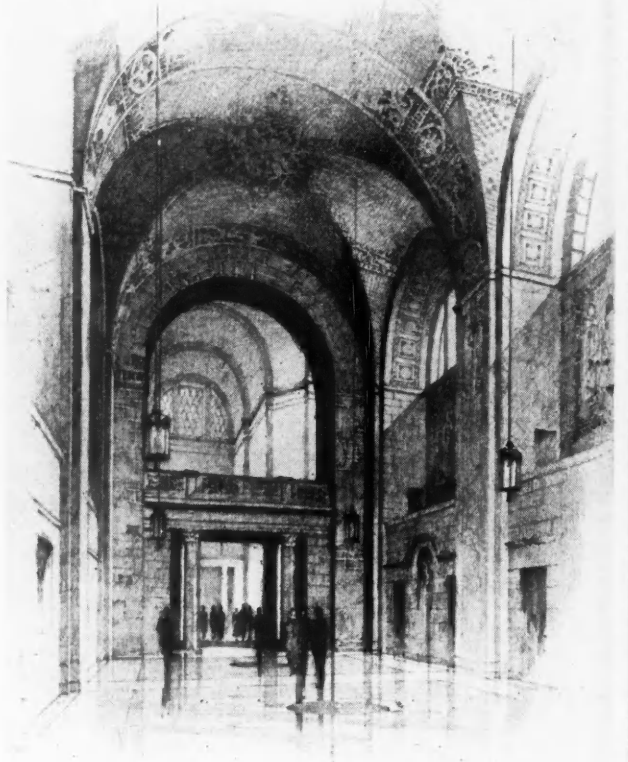
At the left will be found a series of rooms for the governor. Passing directly to the center of the building and standing in the rotunda, the visitor will have at his right a beautifully designed senate chamber, while at his left will be found a somewhat larger chamber, the house of representatives. In front he will see the doors leading to the supreme court with the state library directly above.



Looking Along the South Front from the Terrace. This Terrace is 20 Feet Wide and Extends Around the Building, Giving Access to the Main Floor. Within the Central Mass is the Supreme Court Room and Above the Law Library.

Four courts opening to the sky admit light and air to the whole interior. The arrangement is such that every office in the structure opens either upon the outside or upon one of these courts. The library and the chambers of legislation are lighted by clear-sky windows. And even the rotunda, which in practically all capitols must be illuminated by artificial light, receives its light from windows cut into the tower as it emerges from the roof. The marvel of the design is that it covers so much ground and has so large a capacity yet requires artificial lighting in no department.

The style of the architecture is simple, yet dignified. In fact, simplicity is the keynote. It departs from tradition, but is not futuristic. Nothing is used but



Governor's Reception Room. The Most Elaborate of All Rooms, with High Wainscot of Panelled Wood and Walls and Vault Brilliantly Decorated.

well-established forms. Such criticism as has been offered deals with the severity of the lines. Mr. Goodhue has been bold and original but has not adopted a feature that smacks of the fantastic or the experimental. What he has done is to take the American skyscraper and with pioneer boldness and courage has fitted it into a public building in such a way as to give striking architectural results and at the same time provide convenience, utility and economy to an unexampled degree.

It requires a study of the drawings to give one an idea of the nature of this building. The material is to be of light buff stone. No engineering problems of any serious nature have arisen. Thirty feet below the surface lies an unbroken strata of Dakota sandstone. Piers of concrete will be sent down to this and no

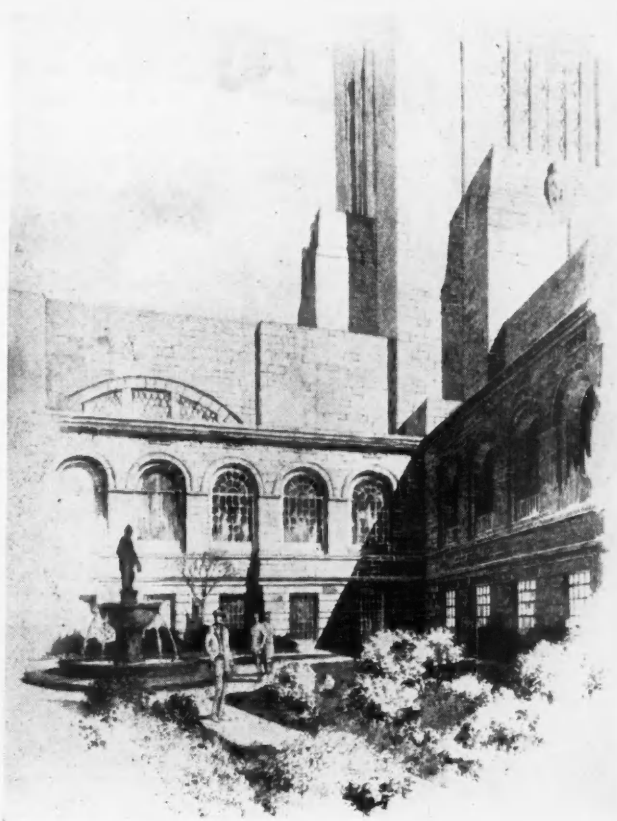
danger of settling need be felt even under the tremendous weight of the tower itself. The tower will be heavily re-enforced with steel and ample wind braces provided to enable it to withstand the strong winds of the prairie state.

Extensive preliminary investigations and research has been accomplished already for the purpose of determining the exact condition of the Dakota sandstone. At a meeting of the Lincoln chapter of the American Association of Engineers recently, Professor Clark E. Mickey, of the University of Nebraska, illustrated by means of lantern slides the results obtained by this investigation. Pits were sunk on the site of the new building and upon the sandstone itself were erected supports for weights of different magnitudes. Delicate instruments were of course inaugurated and the exact weights which would crush the rock determined.

During his talk he mentioned the fact that while six thousand dollars had been spent on this investigation, the results would probably be the means of later saving at least one hundred thousand dollars, since with the results at hand, every bidder knew exactly what the problem was.

At this meeting Edwin S. Jarrett of the Jarrett-Chambers Co. of New York City, explained why it was good practice to go down to bed rock. "The cost of perfect foundations for this structure," he said, "will be only one eighteenth of the total cost, an unusually low figure."

Bids have been received and the chosen contractor has already started work on the foundation. Between



One of Interior Courtyards with View of Corner of Tower. Each of These Courts Is a Rectangle 87 by 100 Feet, Open to the Sky.

five and six years will be required to complete the building. This building is to be erected on the site of the old one and will cost \$5,000,000.

## The Art of Building Camouflage

SCIENCE HAS BEEN DEVELOPED TO HIGH DEGREE IN SUNNY SOUTHWEST, WHICH INSISTS THAT ALL BUILDINGS SHOULD HARMONIZE.

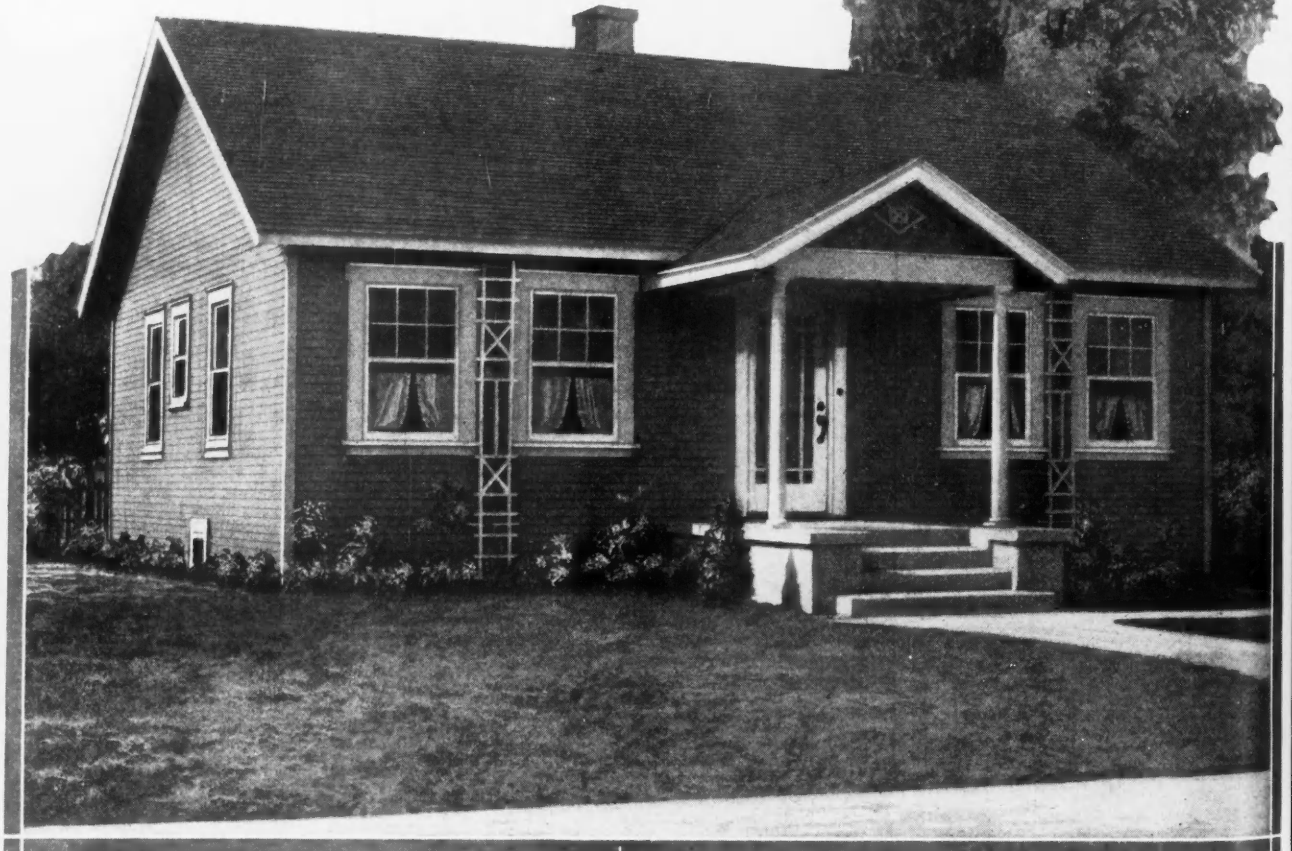
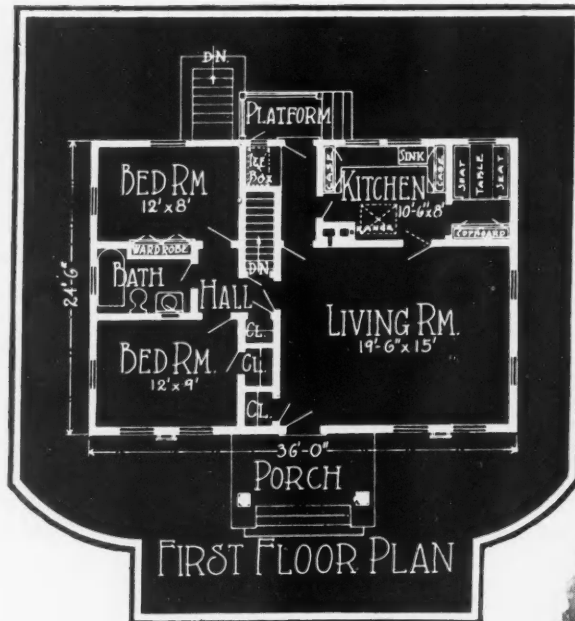
IN the sunny southwest, in and around Los Angeles, the builders excel in a most interesting phase of construction work, that of camouflage. They know how to erect business dwellings that look like cozy, well-designed homes. As a consequence, the visitor does not find the unsightly mixture of build-

ings that he sees in most cities. The building line is uniform and the architectural development of front elevations in splendid harmony.

A striking example of this skillful work is shown in the real estate office illustrated below. A superficial glance would indicate that this is a stucco bungalow.



California Builders Are Quite Clever in Disguising Business Buildings Which Are Located in Residential Sections. This Real Estate Office Does Not in Any Way Mar the General Harmony of the Neighborhood.



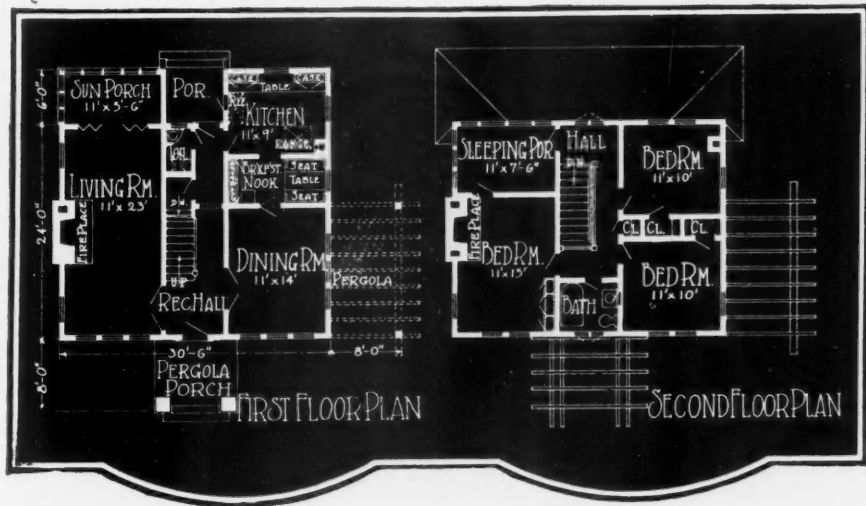
**SIMPLICITY** of DESIGN MAKES THIS DESIGN ATTRACTIVE. There is an air of modest hospitality about this small, well-built home. It will appeal to the family of limited means because of its size, yet it has a charming exterior, not to mention a well-arranged interior. Like the familiar and lovable Colonial house, it gets much strength from the sheer simplicity of treatment, and, of course, because of this, can be built for a reasonable outlay. It is one of the small homes that are in such demand just now. The foundation is of solid concrete, as are the front steps and porch, while the house itself is frame with pleasing white frames and trim. Four cozy rooms make up the interior plan, just the right size for the small family with one or two children. There is a large living room, two bedrooms of comfortable size, unusually bright and airy, because of window area on two sides, and a small compact kitchen with supplementary breakfast nook. Size of house, 36 by 24 feet 6 inches.

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**BLUE RIBBON HOMES**

PRACTICAL & ARTISTIC



**SQUARE TYPE, ECONOMICAL HOUSE OF COMFORT AND PLEASING DESIGN.** The item of cost is important to most homebuilders, and this "box" type home with hip roof is one that will satisfy that requirement. There are no frills in this home, but sturdy construction thruout, with bright stucco walls over metal lath. The floor plans call for six rooms, a large sun porch on the first floor, and sleeping porch, 11 by 7 feet 6 inches, on the upper floor. At one side is a charming pergola terrace giving a splendid outlook from the dining room. The main entrance has also been enhanced by a pergola roof, which, in the summer months, is a mass of beautiful vines or flowers. Large window space is one of the outstanding features. The living room is a delightful recreation room of ample size with open fireplace. Folding doors connect this room with the living porch in the rear. The house is 30 feet 6 inches by 30 feet.

# OUR FRONT COVER HOME

COLONIAL houses, like old wine, become "better with age." Architects and builders have found that this type of dwelling lends itself readily and beautifully to modern innovations and does not lose one spark of its inherent charm. They are a constant pleasure because they embody so many of the finer qualities which make a real home.

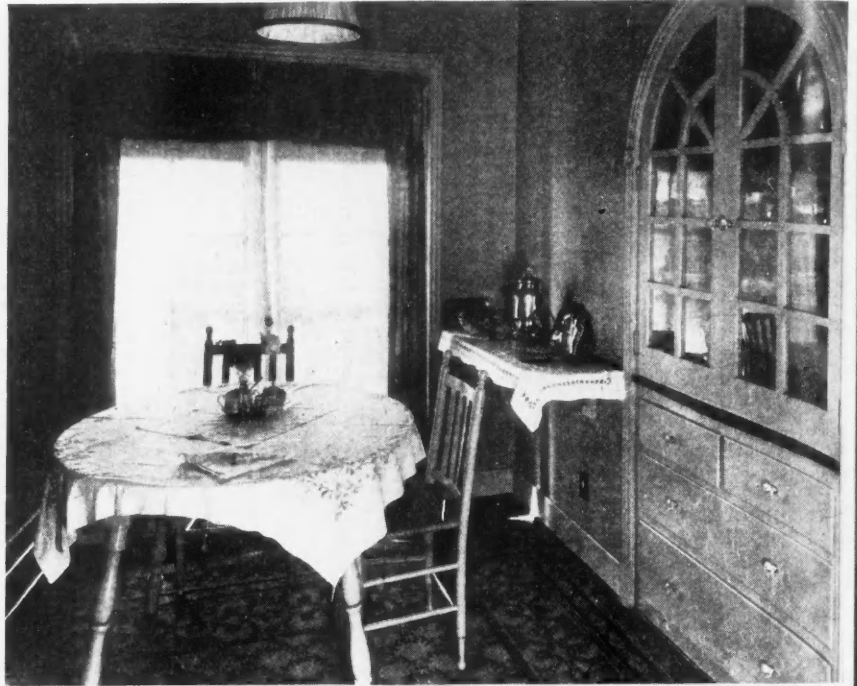
The Front Cover home this month is a Dutch Colonial home of picturesque exterior and informal treatment. Of course, one of the distinguishing marks of this type of Colonial is the gambrel roof with long roof dormers in front and rear. These dormers provide the space to make the second floor full size and also give additional window space that is important from a sanitary and comfort standpoint.

A stucco finished with a colored pebble dash provides the exterior coating for this home, while an added feature, something quite modern, is the steel sash equipment in the basement.

Hospitality personified is represented in the cozy, modest entrance which is all that a true Colonial doorway should be. It is covered by a small gable roof which is supported by white columns. The steps may be either concrete or brick laid on edge. Another pleasing touch in exterior treatment is the slight arch in the roof dormer over the center window.

Seven rooms and sun parlor comprise the interior arrangement. Of these the living room, dining room and kitchen are on the first floor, also a sun parlor off the living room at one end of the house. The front

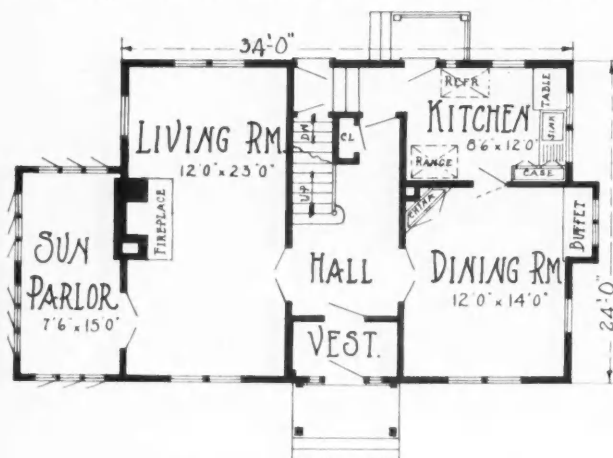
door opens into a small vestibule whence the way leads to all parts of the home. On one side are glass doors opening into the living room, on the opposite similar doors leading into the dining room and in the



Interior Suggestion for Dutch Colonial House of Type Shown on Front Cover. The China Closet Is Designed Along the Simple Artistic Lines of the House Proper.

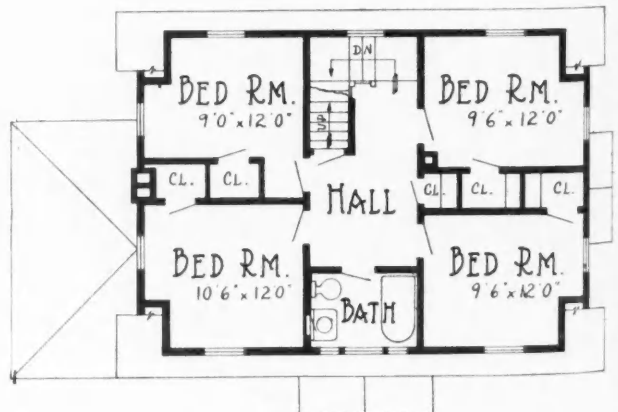
rear is a door into a large hallway which leads to the stair—to the floor above the basement below and also the rear entrance and the kitchen.

A glance at the living room plan reveals a large comfortable room with plenty of light and other "homey" features that will appeal strongly to the true home-lover. There is the large fireplace that burns, a place for a comfortable davenport and large easy chairs, a table for magazines and a piano and phonograph. And there is plenty of room left. It is 12 by 23



FIRST FLOOR PLAN.

First Floor Plan of Front Cover Home, Showing Arrangement of Rooms.



SECOND FLOOR PLAN.

Second Floor Plan, Showing Arrangement of Sleeping Rooms, Bath, Etc.

feet, extending from front to back. The sun parlor which adjoins is 7 feet 6 inches by 15 feet.

Across the hall is the dining room, not quite as large as the living room, but just as bright and comfortable. At the far end is a small bay in which a buffet has been built. Two small windows above this buffet add to the supply of sunshine. Just to the rear of the dining room is a small compact well equipped kitchen.

On the second floor, the sleeping rooms and bathroom are located. Their location around a central hall gives each bedroom the benefit of window space on two sides, which means that the sleepers can have advantage of cross currents of fresh air at night. The bedrooms are practically all the same size.

There is a constantly increasing demand for homes of this type, which are simple and dignified in their appeal. The Dutch Colonial satisfies this requirement as completely as any single type; moreover, it represents an economy in cost that cannot be ignored.



**We Need More American Homeowners**

WHY is it that in some of the larger cities 85 per cent of the homes are owned by those of foreign birth? The desire for a home should be and is just as strong in the American but for the time being other interests for the most part artificially created thru the expenditure of vast sums on publicity, have diverted his attention and funds into other channels.

"The automobile is one of the great factors responsible for this condition, as well as the desire to spend a disproportionate part of the income on personal adornment and pleasure. There is no reason why a person with a small income cannot enjoy all of these things if he takes them up in their proper sequence—that is, by buying a home first and then an automobile rather than buying the latter first and fooling himself into the belief that the home will follow," says T. F. Laist, national secretary Lumber Manufacturers' Association.

"Thirty years ago was the day of Mansard roofs, high basements, large attics, high ceilings, and inadequate heating systems. In fact, these were the dark ages of architecture when buildings were unimaginative and ugly, and in their fixed limitations of style are comparable with the circumscribed life of their intolerant occupants. Houses were not built for comfort during this Victorian age when the good things of life were to be shunned, rather than to be enjoyed.

"We are now going to the opposite extreme in attempting to live in the most diminutive quarters which cannot possibly lead to a successful home life, but the pendulum will swing the other way and it is to be hoped that the house plan of the future will lie midway between those two extremes, and that the habitation of the great majority will be a modest, comfortable home with room to move around in and space for the healthy activity of the children, conveniently arranged and sanitary.

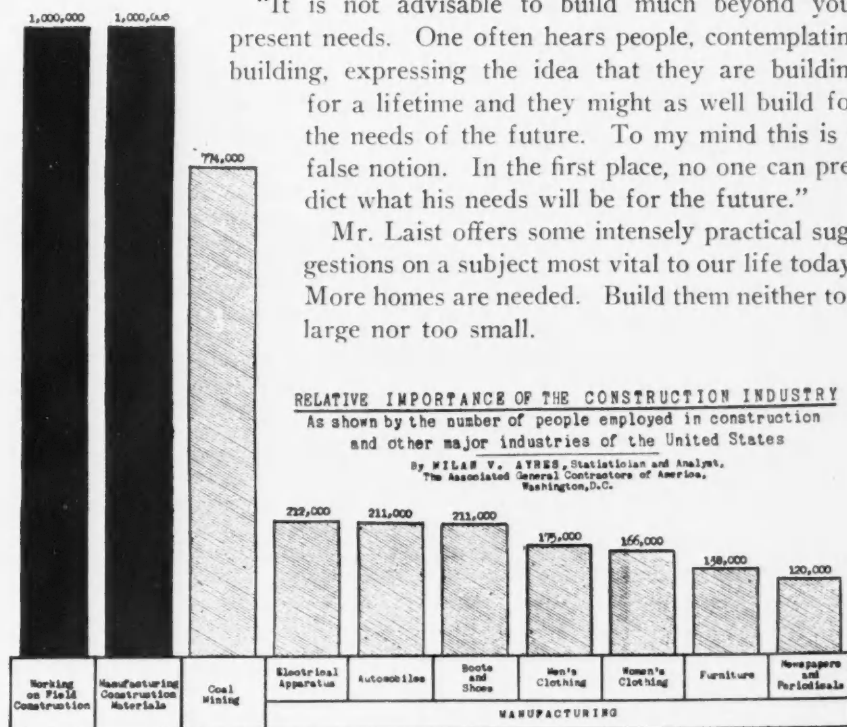
"I do not advocate going back to the attitude of mind of the last generation which was quite as absurd in the days when worth was measured more by the size of the house than the occupants' fitness and culture to live up to it. When women spent their lives in the routine and drudgery of household work, attempting to keep an establishment larger than they could possibly use, in the days when the parlor was kept shut up from Monday to Sunday with the furniture covered to keep off the dust.

"Many a house becomes a burden simply because it is larger than is necessary and entails a great deal of work for the housewife for upkeep and taxes the pocketbook of the owner. Many persons are deterred from building because they want more than they can afford or need.

"It is safe to figure the cost of a home in which one can afford to live by capitalizing the rent which one can afford to pay. That is to say, if you can afford to pay \$50 a month rent or \$600 a year a house costing between \$6,000 and \$6,500 would be a proportionate sum to expend for a home, for the reason that generally 10 per cent is required to cover insurance charges, taxes, maintenance, and depreciation.

"It is not advisable to build much beyond your present needs. One often hears people, contemplating building, expressing the idea that they are building for a lifetime and they might as well build for the needs of the future. To my mind this is a false notion. In the first place, no one can predict what his needs will be for the future."

Mr. Laist offers some intensely practical suggestions on a subject most vital to our life today. More homes are needed. Build them neither too large nor too small.

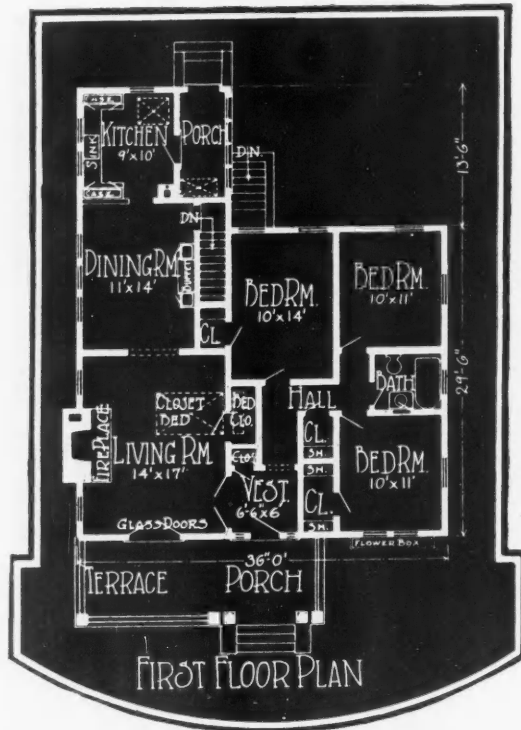


Graphic Illustration Showing How Construction and Affiliated Industries Predominate Industrial Field in United States.



# BLUE RIBBON HOMES

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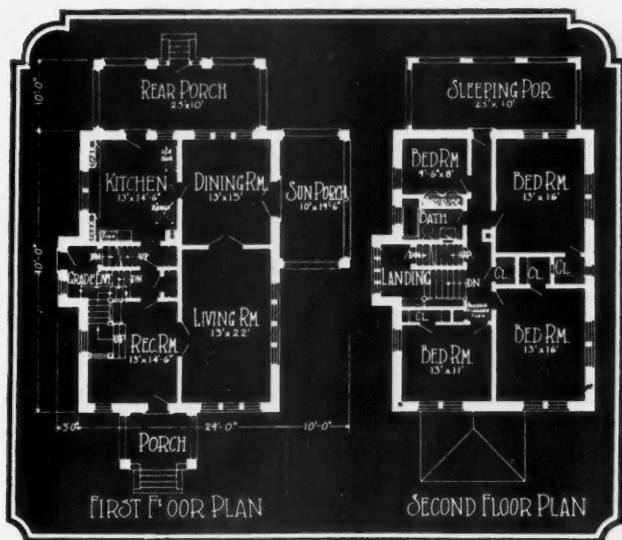


**C**ONSERVATIVE DESIGN IN WHICH COMFORT IS EMPHASIZED. "Give me a good reliable house with a large front porch and plenty of room." How often has the builder been asked to do this? This design will fill those requirements, for it has the large, open front porch with overhanging roof supported by special fitted columns. The porch and house foundations are brick with frame siding above. An unusually wide brick flue takes care of the fireplace in the living room. This room is 12 by 15 feet and is connected by wide glass doors with the dining room, which is almost as large. When these doors are open, the effect is that of one large room. In the far rear is a large breakfast porch connected with both kitchen and dining room. An extra lavatory is located in the hall off the reception room. Three bedrooms have been located on the second floor, all of good dimensions. The house is 24 feet by 30 feet.

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**BLUE RIBBON HOMES**

PRACTICAL & ARTISTIC



**SUBSTANTIAL BRICK RESIDENCE OF PLEASING LINES.** A casual glance at this home does not do it full justice, for it contains many features that make up the ideal home. In fact, a man of considerable wealth has built one just like it and considers it suitable for his needs. Primarily of the square type, the flatness of design has been entirely removed by a distinctive roof treatment. The entrance is quite simple in design, a flat roof supported by square brick columns covering the approach to the house. There are seven main rooms with sun porch on the first floor and excellent sleeping porch in the rear of the upper floor. A grade entry is located at the side of the house, giving access to the basement at this point. The sun porch on the opposite side of the house is 10 by 19 feet 6 inches. Extra rooms are located in the high, well-lighted attic. This house is 29 by 40 feet.

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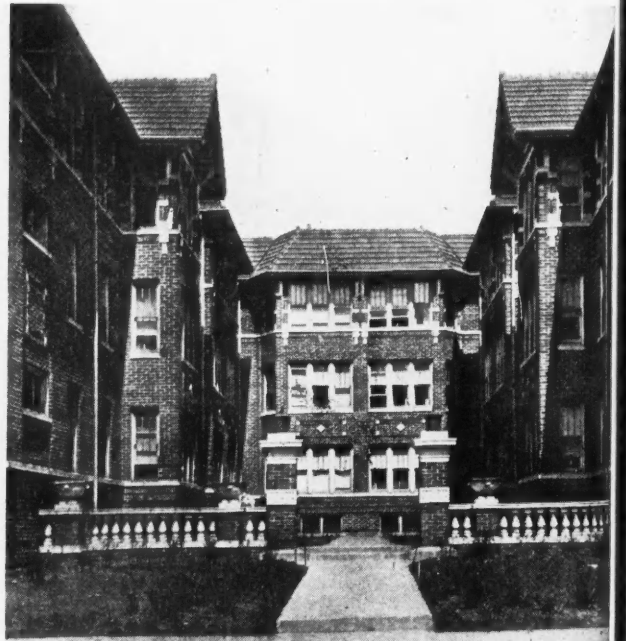
## Variety in Apartment Building Construction

HOME EXAMPLES OF COURT AND CORRIDOR TYPES AND THEIR FEATURES

*Editor's Note: The construction of modern space-saving apartment buildings is one of the liveliest phases of the building business right now. For that reason the AMERICAN BUILDER is showing in detail examples of apartment building construction in different sections of the country, in large cities and in small.*

**C**HICAGO is rapidly becoming a city of cliff dwellers. Most of its two or so million inhabitants dwell in artificial cliffs of brick, stone and concrete, subdivided into small homes of one, two or three rooms, sometimes four or five. And each day sees ground broken for a dozen or more of these large apartment buildings. Block after block is rising simultaneously this spring, more than any year in its history.

There are several reasons for this type of construction which are of interest to every builder. Summarized briefly, they are convenience afforded, shortage of domestic help, increasing social and other activities which keep the housewife busy many hours during the week and leave her less time for housework, and



Looking Into Court of Building Shown Below. Each Apartment Can Have a Sun Parlor Under This Arrangement.



Typical Court Apartment Building. Example of the Architectural Motif Which Chicago Favors Today. The Court Provides Extra Lighting Advantages to All Apartments and Breaks Up the Cold, Unappealing Straight Front Elevation.



the large number of people, married couples, who are both working during the day to keep up their home. When these people return from work they do not care to spend several hours cleaning a large home—their only need is a room or two for occasional entertainment and sleeping quarters.

Chicago has a type of apartment that is peculiar to itself. This is the court type which has many features to recommend it. It is built in Chicago in preference to other types because of rigid fire ordinances which prohibit certain types of corridor apartments. In the court arrangement the building is constructed around a central court or grass plot in which decorative features have been added, such as fountains, attractive gateways, etc.

Because of this arrangement, all of the apartments get plenty of natural daylight and air from both front and rear. And they can all have sun parlors, a feature which has come to mean much in the life of the city people. It is one of the few things left that remind them that there are actually such things as flowers, sunshine, and out-of-doors.

In the typical court apartment building shown here, which carries out the statement about central garden, etc., the arrangement of the apartment is quite apparent. Each apartment either faces the street or the court and each apartment has a sun parlor. The apartments range in size from one to four rooms, not including sun parlor.

How can they live in such a small flat, you ask? That is where the modern science of building comes in. By the use of special devices, such closet or concealed beds, combination kitchenette or "diningette," built-in furniture, etc., the builder can give all of the convenience of three rooms in one or two. The bedroom does not appear on these floor plans for the living room houses the concealed bed. There are no dining room and kitchen, but one room, a combination of the two. The half partition is really two china closets for dishes. A small bath completes the picture. And these are the apartments that are in great demand.

### Central Corridor Type Apartment Building

In contrast to the court apartment type just described is the corridor type, very popular in practically all sections of the country where fire ordinances do not



Detail of Entrance of Chicago Apartment Showing Terra Cotta Treatment on Main Entrance and Windows. The Single Door Is Simple but Dignified in Design and Opens Into Hallway Giving Access to Six Apartments.

prohibit. The fundamental principle underlying both of these buildings is the same, that of saving space.



Looking Into Sunparlor of Highland Apartments, Rockford, Showing How Modern Space-Saving Apartments Are Built.



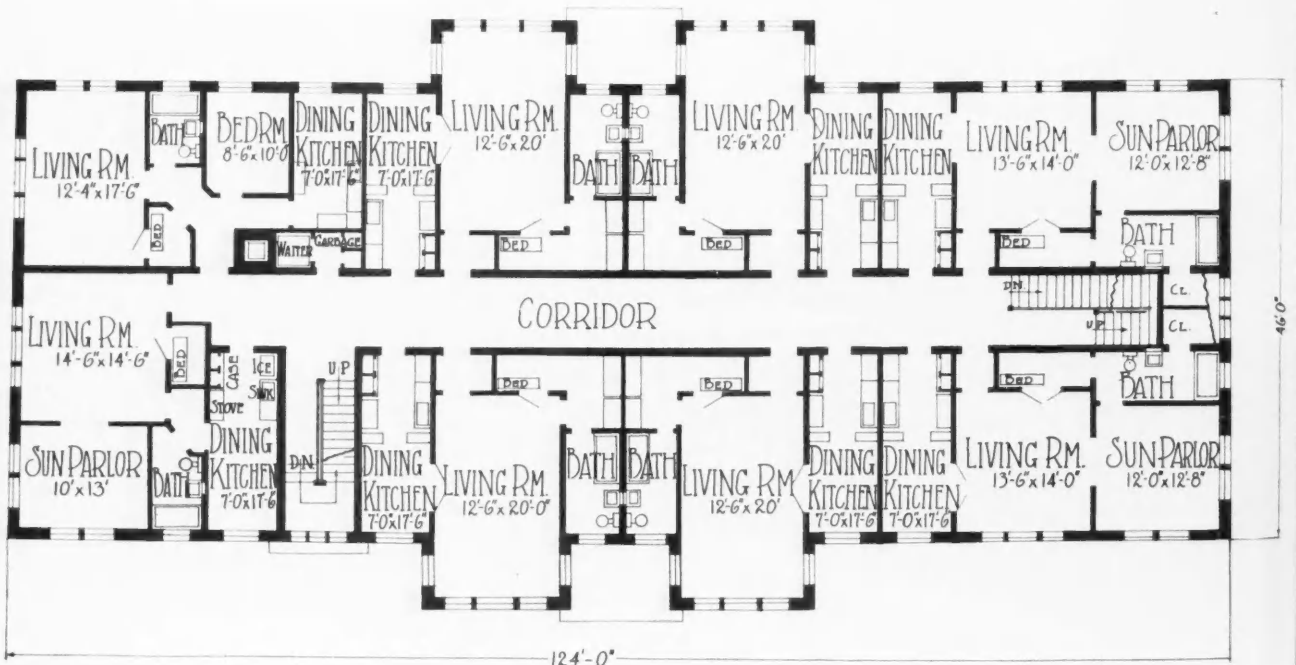
The Highland Apartments, Front and Side View, Showing Difference in Treatment from Court Type in Chicago. This Is Known as the Corridor Type, the Corridor Being on the Inside of the Building with Apartments Along Each Side. This Building Has 11 3-Room and 12 2-Room Apartments.

but the means by which this result is obtained is different. In the corridor type, a long central corridor runs thru the building from the rear as shown in the typical floor plan on this page.

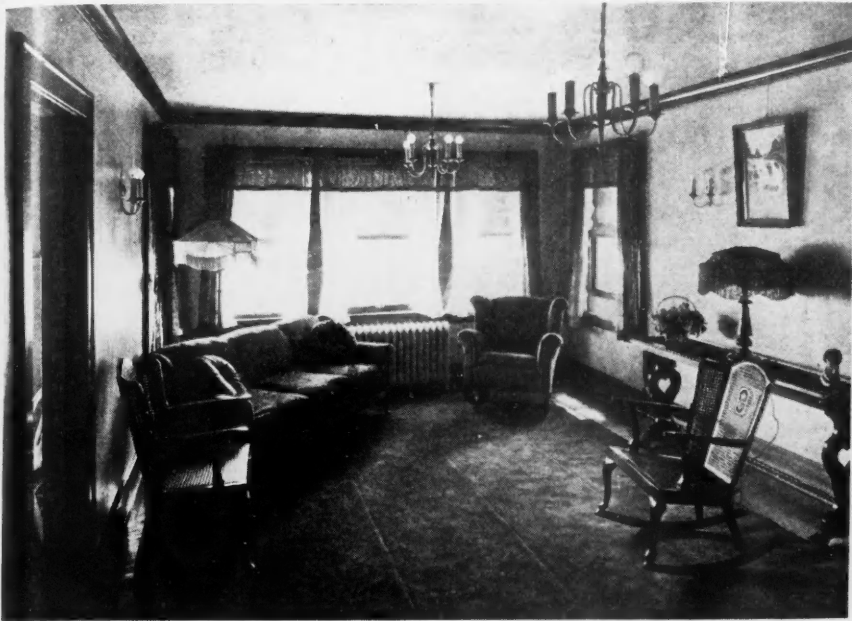
As an example, study the building illustrated, known as the Highland apartments, located in Rockford, Ill., a town with a population of 75,000 people. The building is located within easy walking distance of the main business section, churches and theaters and is also in the heart of a high class residential section on

a beautifully wooded tract.

It covers a total of 6,000 square feet ground area, being 46 feet wide and 124 feet long with 4 by 6 feet sun parlors. These sun parlors give the inside apartments perfect ventilation. Figuring on a basis of 40 feet high, and figuring the cost complete in every detail, the building cost approximately 35 cents per cubic foot. As the building has just been completed, this amount probably represents a fair average cost of similar buildings in towns where labor and material



Floor Plans of Highland Apartments, Showing Arrangement of Apartments with Special Space-Saving Built-in Features. The Building Is 46 Feet Wide and 124 Feet Long, Covering an Area of About 6,000 Sq. Ft.



Living Room as It Appears Looking from Rear of Apartment. This Is the Main Room, Supplemented by a Small Kitchenette and Bath. It Is Also the Bedroom, as You Can See by Looking Below.

building and affording the tenants an easy solution for their food purchasing. Moreover, this arrangement eliminates approximately 90 per cent of the delivery from outside. It is especially valuable to the tenants who occupy this building as they are mostly business people with little time to spare for household work.

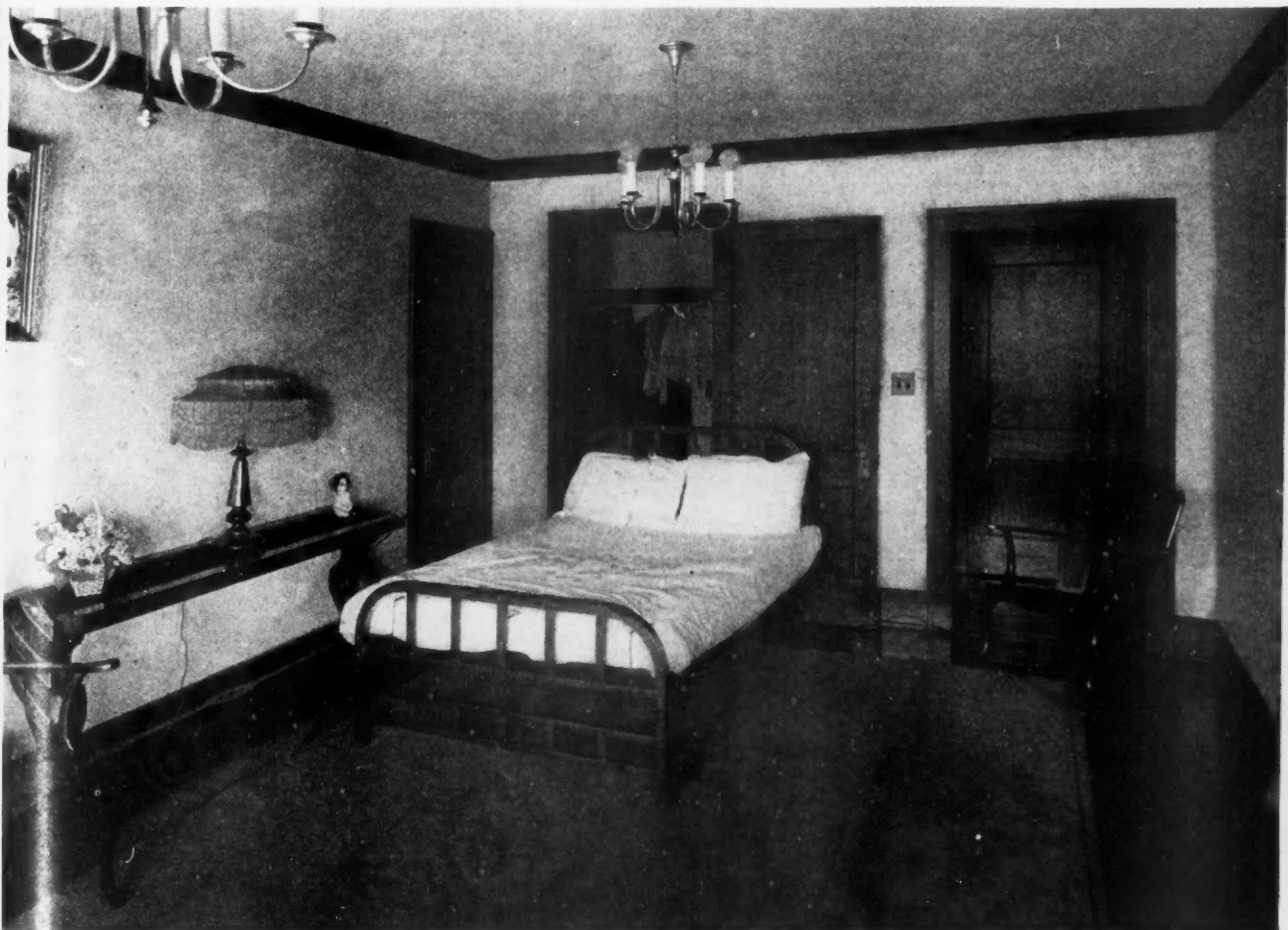
Another innovation which, strictly speaking, is not included in the category of construction work but is a real convenience is the announcement of the landlord that he will furnish extra large extension tables and chairs in the event the tenants wish to entertain for eight or ten people. This has proved to be quite popular.

The building is constructed of solid masonry of walls, face brick

on all sides, backed up with hollow tile, all partitions between apartments and corners are hollow tile. The joist construction are 2x12x18 feet long. The building is trimmed in Bedford stone, oak floors and trim and finished in a rich brown stain. All the painting in the

are the same as in Rockford.

Eleven 3-room and twelve 2-room apartments are provided in the floor plans. As an added convenience the builder has made place for a delicatessen or grocery store in the basement accessible from the inside of the



Where the Bed in the Rear of the Living Room Is Exposed to View. This Is the Closet Type, the Small Room in Which It is Concealed Serving as a Closet for Clothes and Very Often as a Small Dressing Room. In the Highland Apartments There Are No Bedrooms.

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Front Entrance Detail of Rockford Apartments. Artistic Treatment Has Been Made of This Important Part of the Building. Bedford Stone Being Used with Special Paneled Brick Courses.

exterior of the building of walls is in oil tiffany and, of course, all the halls are carpeted.

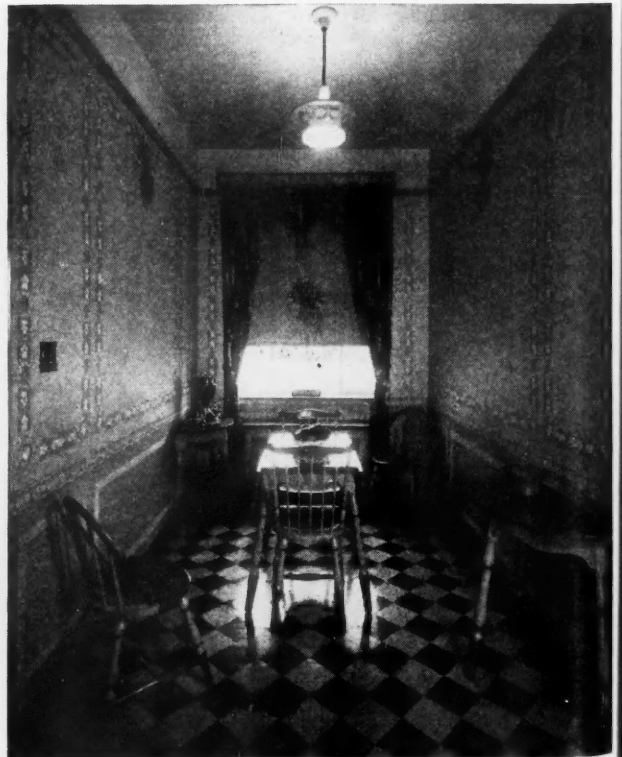
The building has an unusually elaborate electric equipment and special switchboard and the lighting fixtures are solid brass silver plated.

The adaption of this building to the peculiar requirements of its tenants who are in large degree affected by present day mode of living is significant. It is rented by men and women who are engaged in business during the day and who have little time for the routine work of a larger home. These small apartments suit and as a consequence are easily rented at good prices ranging from \$65 to \$85.

The success of this building in Rockford indicates the field available in smaller towns. In small towns as well as in large cities the women are seeking homes that call for less work, particularly the drudgery of housekeeping and more time for recreation. The small apartment also offers a home for people who spend their summers away from the city. It is more economical to maintain than a large home.

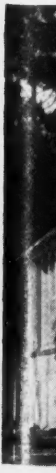


Kitchenette View of Typical Space-Saving Apartment Room. Here a Special Cabinet with Stove and Other Features Has Been Used.



The Diningette View. Showing the Small Space Required, the Odd Furniture and the Bright and Easily Cleaned Flooring. Everything to Reduce the Household Drudgery.

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# Sunshine and Safety in New Alabama Schools

BACKWARD STATE FORGING TO FRONT RAPIDLY—ONE COUNTY HAS 215 ONE-STORY "EFFICIENCY TYPE" BUILDINGS

By J. Stuart Marlowe

There is perhaps no better illustration of the tendency toward better architecture thruout the rural districts of the United States than that which is provided by the passing of the "Little Red Schoolhouse Over the Hill" in rural Alabama.

Five years ago the State of Alabama stood about last in state of preparedness and educational facilities, and Jefferson County was about the poorest of the various counties of that state in the same measures. This condition has changed enormously during the past five years and old ramshackle fire traps have given way to handsome new buildings. Jefferson County alone now boasts 215 up-to-date school buildings in the rural districts, exclusive of the cities of 2,000 or over.

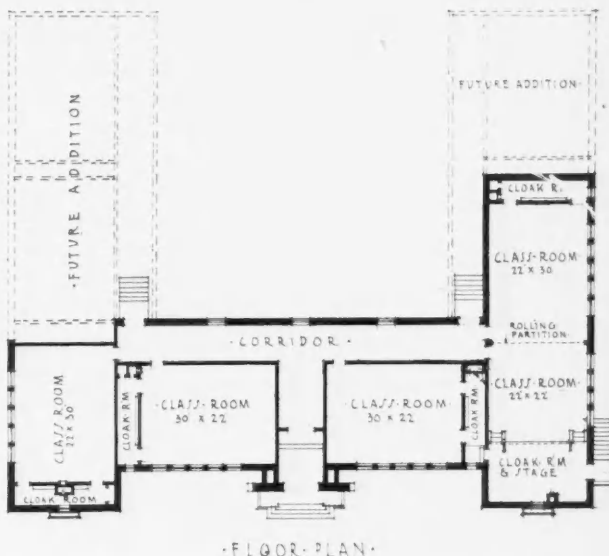
The new school buildings are, with one exception, of one story structure, arranged on the principle of the separate unit hospitals. One central exit is provided at the front of the building, and each room has its separate entry at the back, reducing the life hazard in case of fire to an almost negligible quantity, and insuring adequate ventilation and natural light.

The construction of the new schools has had a widespread influence on the rural population of the county. In the old days they were wont to look at the schools more or less apologetically, and, as the farmer seldom respected an institution that was so poorly housed, attendances were very small. With the new buildings, it seems that rather than living the local school down, they desire to live up to it, with the result that its effect has been shown even in the rural homes, where the incentive and impetus toward better architecture, better sanitation, etc., is shown by the improvements that are constantly being made in that direction. Attendances have grown to almost triple what they were five years ago, and the school buildings are making a decided effect on the rural community life.

Illustrated below is a floor plan of the school at Huffman, Ala., which is quite typical.

Partitions between class rooms in the left wing are metal, rolling to ceiling, making an auditorium of both rooms. All seats face stage at front of building.

Construction in every instance in Jefferson County



Typical Floor Plan of New Type of School Buildings Being Erected in Jefferson County, Ala. Over 215 Buildings of this Type Have Been Erected in That County Alone. Note the Provision for Future Additions.

is of hollow tile, and exteriors are face brick, clinker brick, stucco and rough stone. Windows are of special ventilator type to insure maximum ventilation.

Dr. Baker, county superintendent, intends to enclose all buildings with daylight windows to insure greater light.

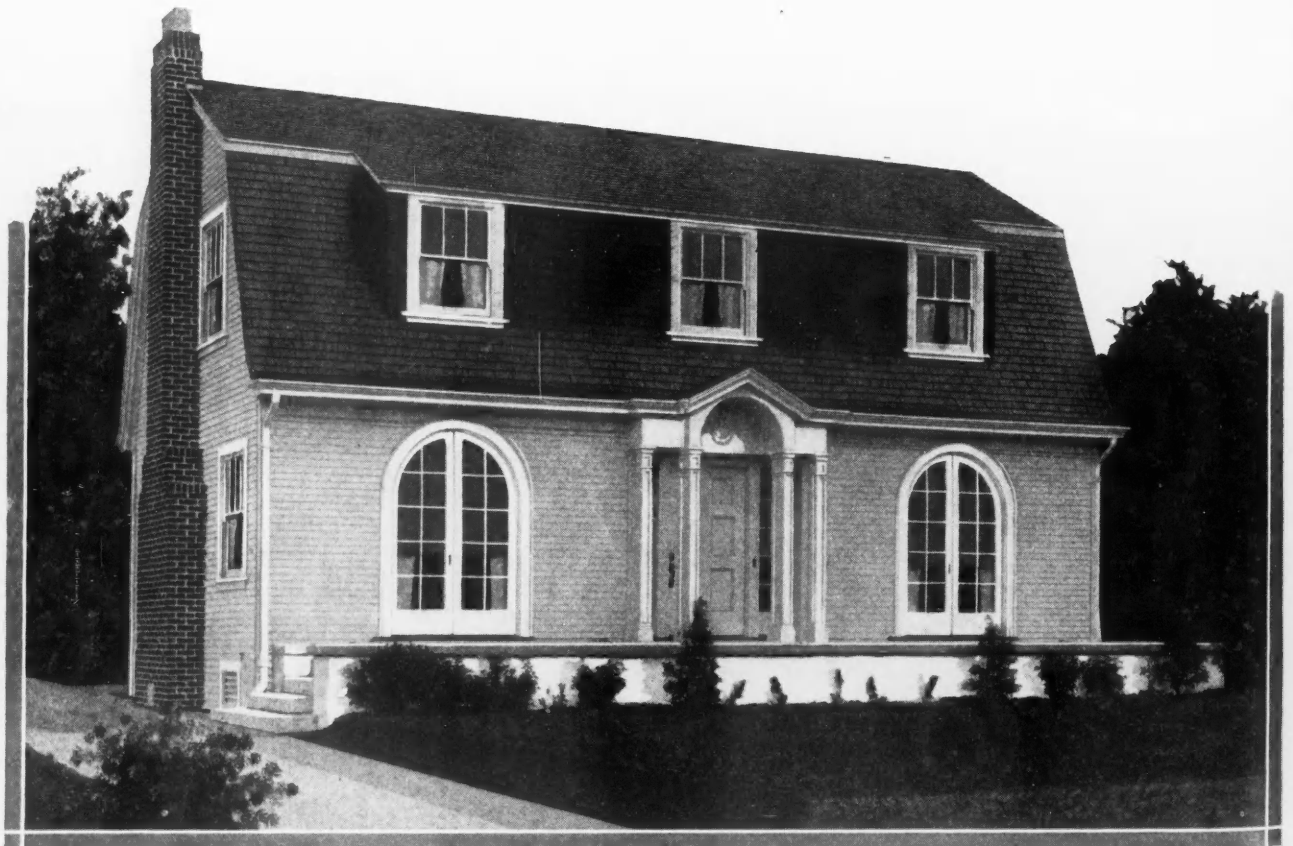
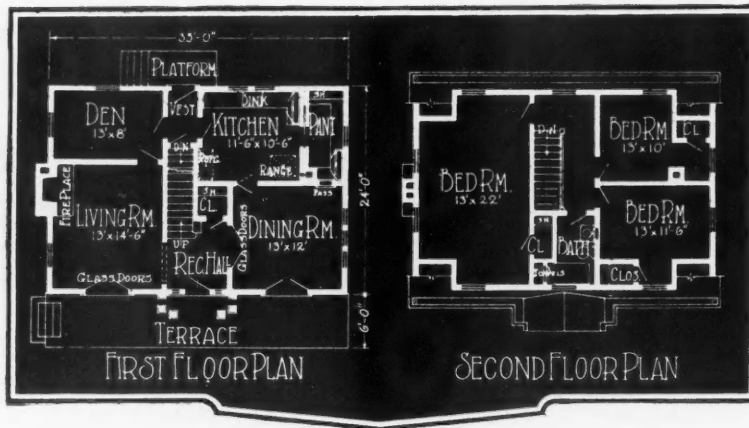
It is estimated that there are in use in this country at the present time 5,175,000,000 feet of leaders and gutters and that about one billion feet is renewed annually.



Junior High School at Mount Olive, Ala., Showing New Type of Individual Unit Building That Is Being Used in This Section. Plenty of Daylight Is One of the Outstanding Features and Additions Can Be Put on Quickly Without Much Expense.

# BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



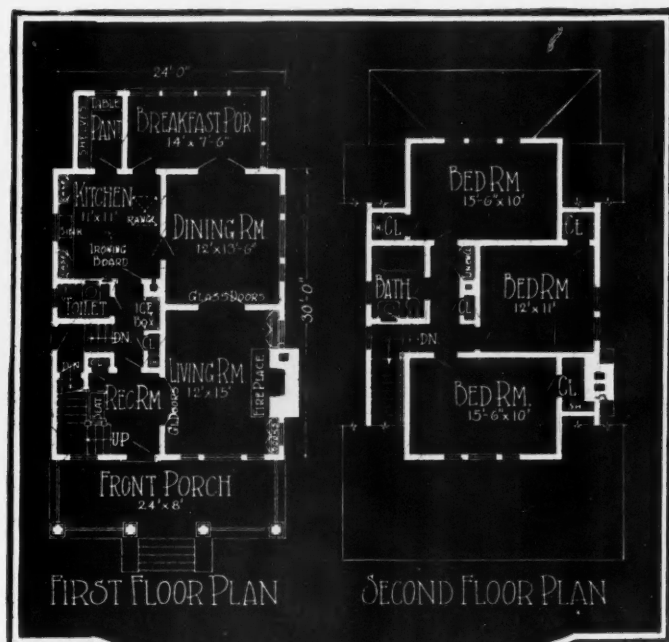
**D**UTCH COLONIAL DESIGN OFFERS COMFORT AND SECURITY. A pleasing modesty of treatment is the distinguishing feature of this cozy home. The simple, artistic entrance, regularly spaced windows, and long roof dormers are always effective in their appeal, while some modern touches have been added in the form of a front terrace of concrete extending the full width of the house, and two double arched windows on the lower floor. Seven good-sized rooms constitute the interior arrangement. Of these, four are on the first floor, viz., living room, dining room, den, and kitchen. Both dining room and living room open out on to the front terrace thru French doors of glass. The den, which is 13 by 8 feet, can be used as a bedroom or library. On the second floor there is a master bedroom and two smaller rooms, the larger being 13 by 22 feet, with windows on three sides, insuring plenty of light and ventilation. The other two rooms have windows on two sides. Size, 35 by 24 feet.

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**BLUE RIBBON HOMES**

PRACTICAL & ARTISTIC



**WESTERN BUNGALOW DESIGN OF PRACTICAL LINES.** The bungalow is not a fad, nor a house of the sunny sections. If it is well built, as this design is, it is quite practical in any climate and certainly pleasing in appearance. The front porch in this design is a variation from the usual practice, and a welcome one. The porch steps and platform are concrete and the footings under the house are of the same material. Part of the porch over the door is covered by a substantial shingle roof, while the rest is merely pergola. French doors open directly into the living room. The number of rooms will cause surprise, as the first impression is that of a small house. There are six rooms, with the added convenience of a closet bed in the living room, in case more room is needed. The grouping of the rooms according to their functions is well handled. The bungalow is 36 feet wide and 43 feet long.

# Trend of Electric Fixture Design in Modern Home

FIRST OF SERIES OF ARTICLES ON APPROPRIATE LIGHTING EQUIPMENT FOR VARIOUS ROOMS

By A. W. Powell and H. A. Smith

**P**ICTURE in your mind's eye the prehistoric man in his cave at night seated by an open fire. That was not only his source of warmth, his medium of cooking food, but it was his light. To get that light was a task that required time, strength and patience. He had to cut down trees, gather up the wood and labor with a flint for the spark that was to start the flame. All of which required energy and exertion.

Or in fancy's flight linger for a moment in the land of ice and snow where the diminutive Eskimaux still hold forth in the manners and customs of ages past. In his igloo of ice he sits about a fire also and burns wicks soaked in whale oil, or a piece of blubber, whale fat. His light too requires infinite pains and labor to obtain.

And then come back to the land of reality about you. You see the child of five accomplish more in the passing of a second than these men of crude civilization. You see the touch of baby fingers upon a button in the wall bring forth a flood of radiant light. There is no preliminary labor, no exertion for that child. Such is the progress of civilization, such is the development of comfort in the home.

Without electricity the home today is but a milestone far back in the path of progress—it is groping as it were for the light which the modern home has found.

There are many phases to the subject of electrical construction in addition to lighting but that is the phase that interests us at this time. And in discussing residence lighting, there are so many ramifications to the question that only the important points can be touched on in this series of articles. So unlimited is

variety in decorative treatments of interior that the keynote of successful home lighting should be individuality.

When we realize the amount of time that we are



Interesting Variety of Hanging Fixtures for Lighting Living Rooms. They Are Direct, Semi-Indirect, and Indirect

dependent on artificial light, it is not surprising that devices which give proper illumination are receiving more and more attention. In the home, the useful and decorative phases of lighting must be combined, neither

one being emphasized at the expense of the other. The decoration of a room may be absolutely spoiled or given the final touch of perfection by the lighting effect. Time, care, and considerable money are spent in establishing harmony of the furniture, hangings and room finish, and avoiding any discord between the styles of furniture used. But of what use are these refinements in the matter of decorations and furniture unless the lighting is such that these elements can be appreciated? It must be remembered that, as a general rule, it is during the hours when we need artificial illumination that we wish the house to appear at its best. Comfortable lighting makes pleasant surroundings enjoyable, but with poor illumination the carefully planned details



Figure 1. The Central Light in This Living Room Is Particularly Adapted to Decorative Schemes. It Is Supplemented by Several Portable Luminaries. A 100 to 150 Watt Lamp Is Sufficient for a Light of This Kind.

of the room are negligible.

Fortunately, with the wide range of sizes of efficient lamps and the number of styles of standard lighting equipment available, it is possible to have extremely effective lighting. The intensity of light desired for any particular purpose can be obtained without the objectionable feature mentioned above. No longer is it necessary to have only one light source in a room. The more reasonable way is to have such a lighting system that it can be readily adapted to the requirements of the people rather than making it necessary for them to adapt themselves to such lighting as happens to be available.

As an example of this, let us consider the living room of an average home. In this home many recreations are enjoyed. Reading requires more light than talking, but music is more enjoyable in what is known as a "half light." If, then, we are able to have the room softly lighted by decorative table lamps with the help of wall brackets, we can produce a general atmosphere of quiet contentment, the portable lamps furnishing illumination for those reading beside them. For a comfortable game of bridge, it is a necessity that each player be able to see his cards easily, without holding his hand to avoid shadows. The most efficient way to furnish equal light for all is to make use of a ceiling luminaire of the semi-indirect type, which will light the whole room to an even intensity. The advantages of variable lighting are readily appreciated, not only in the living room, but in all other rooms of the house.

#### Systems of Lighting

There are three general ways of lighting a room,



A Few Suggestions in Floor and Table Lamps for Living Room and Music Room. Many Pleasing Effects Can Be Obtained Through the Artistic Use of These Portable Lamps.



Fig. 2. Showing a Living Room as It Appears by Day. The Final Touch Has Been Added in the Form of Amber-Toned Lamps in the Wall Brackets. This Touch of Color Causes Them to Blend Well with the Wallpaper.

i. e., by direct, totally indirect or semi-indirect illumination. With luminaries of the first class, shades are used that send the dominating light directly down where it is to be used. The dining room dome, the shower fixtures, the pendant wall brackets and the ordinary table lamp, all are examples of this type of lighting.

Just the opposite effect is obtained by using the indirect system because, in that, all the light is directed to the ceiling which in turn acts as a large reflector and distributes the light throughout the room. No dense shadows are created because the light, being reflected from such a large surface, is well diffused. This type of lighting can be obtained from special portable lamps with inverted reflectors on the tops of bookcases or in wall urns, as well as from ceiling luminaries.

Now, if the inverted bowl instead of being opaque allows some of the light to be transmitted thru it, still reflecting a greater portion to the ceiling, we have an example of semi-indirect lighting, another form of this being a translucent reflector on an upright wall bracket.

As the last two types of lighting depend on the ceiling to reflect the light, it is at once evident that the finish of the room is of great importance. The lighter colors are more efficient as reflectors of light than are the darker ones. The cream colored ceilings most commonly seen are about 65 per cent efficient. That is, 65 per cent of the light that falls on them is reflected back to the room. As a general rule, any loss of light by the indirect system is offset by improved quality of illumination and better conditions for seeing.

#### The Living Room

The living room is the scene of the social life of the house, and the lighting of such a room should receive special attention. It must be agreeable and bring out the special points of the decorative scheme. It will not be a full success if it makes people look tired, old



or unattractive, by bringing out sharp facial shadows. Into this room novel effects may be introduced that vary the monotony of ordinary lighting. Small lamps burning inside translucent vases render them luminous and show beauties that would otherwise not be noticed. The possibilities in the way of special effects can be utilized only when an adequate number of convenient outlets are available. Ingenuity will soon indicate many expedients by means of which the little touches of color, that aid so much in the appearance of the room, can be introduced at will.

For general lighting, when only one outlet is available, a semi-indirect luminaire will more nearly meet the average requirements than any one type. A lamp of sufficient size can then be used to furnish the necessary intensity and the light will be comfortable and devoid of glare, provided the proper design is chosen. The light shown in Fig. 1 with its adaptability to particular decorative schemes is of special service in this connection. An example of its use is given altho in this case the ceiling unit is supplemented by a number of portable luminaires.

A 100- or 150-watt Mazda-C lamp will provide a desirable intensity of illumination with this or a similar luminaire in rooms of average dimensions.

There are innumerable period styles of luminaires suitable for the living room. A few typical examples

are indicated in the accompanying sketches. In choosing luminaires of this nature, the cardinal points in regard to distribution of light, contrast and direct glare must be kept in mind. Very rarely is it feasible to use lamps without some sort of a shade or diffusing media.

With a suitable number of wall and convenience outlets it is good practice to light the living room without a central or ceiling luminaire, and, in this event, table and floor lamps may be used to advantage. Fig. 2 shows such a room as it appears by day. The final touch has been given in this instance by the use of amber toned Mazda lamps in the wall brackets. Unmodified light emanating from these would show them up in rather severe contrast to the background. The touch of color causes them to blend well with the golden tone of the wall paper.

In Fig. 3 is presented another example of how it is possible to light a room without the use of ceiling luminaires. Large mirrored glass reflectors in the table and floor lamps direct the light to the ceiling making it possible to illuminate the whole room without its unity being broken by anything hanging from the ceiling. Small lamps are used to light the shade and furnish some direct light. A number of lighting effects are possible in this room as follows: the wall

(Continued to page 150.)

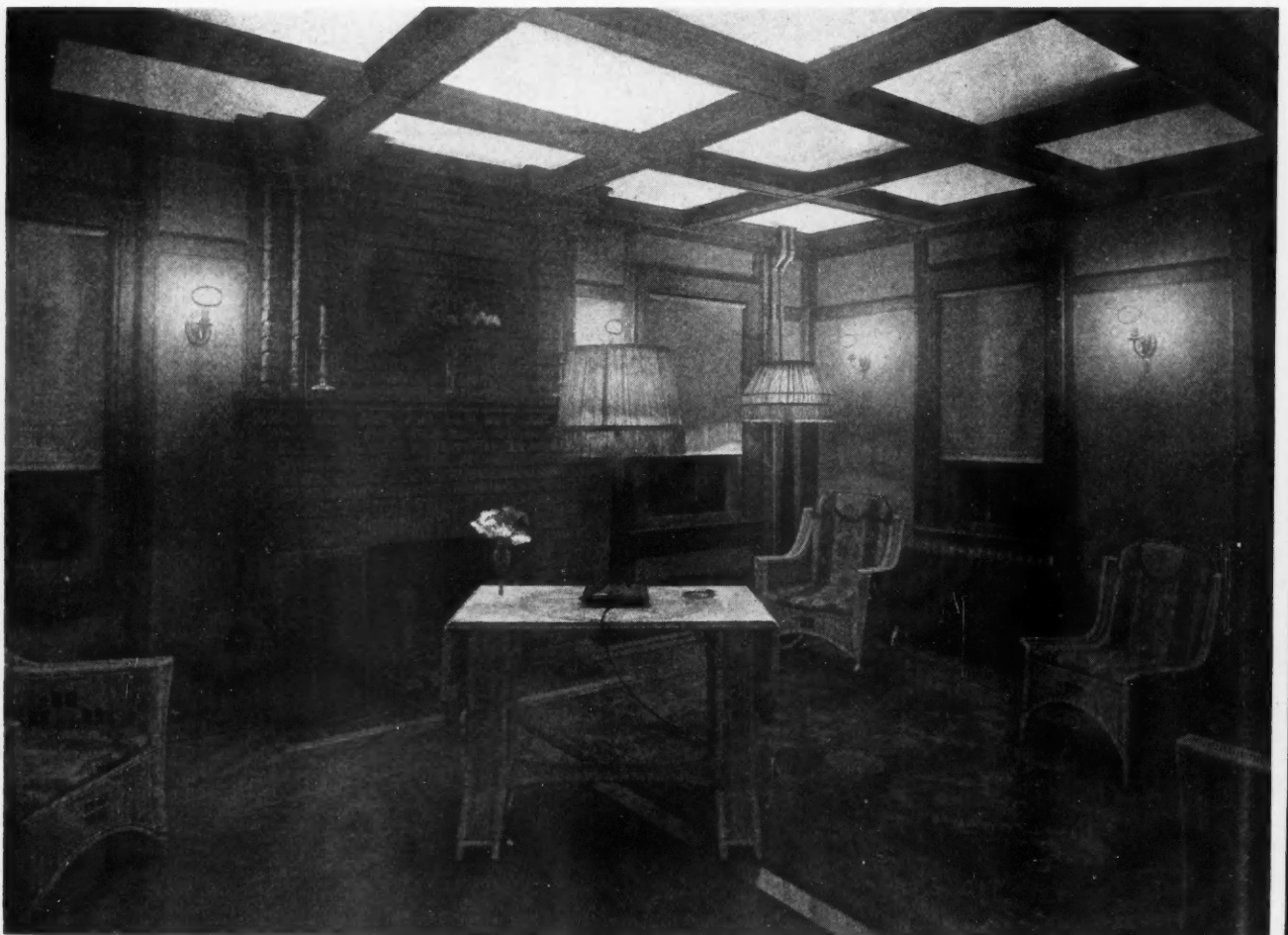


Fig. 3. View of Well Lighted Living Room, Showing How It Is Possible to Light a Room Without the Use of Ceiling Lights. Large Mirrored Reflectors in the Floor and Table Lamps Direct the Light to the Ceiling. The Room Is Lighted Without Any Hanging Fixtures.

## Law for the Builder

RIGHT OF CONTRACTOR TO RELY ON TERMS OF CONTRACT WHERE LATTER'S PROVISIONS ARE IN CONFLICT WITH THE PLANS AND SPECIFICATIONS.

By Leslie Childs

THE question of how building contracts are construed, in relation to the plans and specifications that are usually made a part of them, is one of interest and importance to every contractor and builder. In particular may the point be a source of difficulty where there is a conflict or inconsistency in the provisions of the contract and the provisions of the plans and specifications.

For example, the plans and specifications may prescribe work that is not mentioned nor positively referred to in the contract, tho by the terms of the latter the former is made a part thereof. The question then may arise as to which of the two is to control? Is the contractor bound to comply with the specifications, or will the fulfillment of the terms of the contract alone relieve him from further obligations?

The question has been before the courts upon a number of occasions and the weight of authority appears to hold that the contract controls. In other words where there is a plain conflict between the terms of the contract and the provisions of the specifications, the contractor can only be required to fulfill the terms of the contract. The point is illustrated in an interesting manner in *Cruthers et al. vs. Donahoe*, 85 Conn. 629; the facts involved being in the main as follows:

### Contracts and Specifications in Conflict

*Cruthers et al.* entered into a contract whereby they agreed, for a consideration of \$10,000, to do all mason work, supervise the carpenter work, furnish all labor for scaffolding and cartage, required to build and finish a certain mill building. The work was to be done in accordance with the drawings and specifications which were made a part of the contract.

The specifications, it appears, provided that the roof of the building should be covered with a gravel roof 5-ply quality, finished with certain material, and in a specified way. They also recited that, "All this roof material to be furnished by the contractor." However, the contract itself did not refer in any manner to this roofing.

*Cruthers et al.*, the contractors, entered upon the work and performed all the acts set out in the contract, but they refused to do the work on the roof. The defendant, owner, thereupon had the roofing done and charged its cost, which amounted to \$804.01, to *Cruthers et al.* Thereafter the contractors brought this suit to enforce payment of the \$804.01 that they claimed had been wrongfully deducted from the contract price.

The determination of the suit involved a construction of the contract in relation to the specifications.

The owner claimed the roofing being in the specifications was a part of the contract. The contractors took the position that the roofing not being referred to in the contract it was not a part thereof which would compel them to construct same.

Upon the trial of the cause in the lower court a judgment was rendered in favor of the owner. The contractors prosecuted an appeal to the higher court, who said:

"But in the absence of express provision in the contract, the specifications can neither restrict nor extend the scope of the contract to subjects other than those covered by the contract. The specifications serve the purpose of explaining and amplifying the provisions of the contract to which they refer. In fact, they show what the contract really was. They speak to the contract as it is; they cannot add to its terms unless the intent, as manifested in the contract, so to do, is clear. \* \* \*"

### Contract Held to Prevail

The court next reviewed many authorities in support of the foregoing rule, then addressing itself to the facts involved in the instant case it was said:

"Let us construe this contract in the light of this principle. There is nothing in the contract concerning the construction of the gravel roof, or of anything to be done in connection with the gravel roof, except the obligation of the plaintiffs (contractors) to do all the cartage; necessarily this included that required for the roofing. The plaintiff's obligations under the contract are specific. They were confined to the mason work, the supervising of the carpenter work, and to the cartage. \* \* \* The labor required in constructing a gravel roof by no possible construction can be brought under these several heads comprising the plaintiffs' obligations. \* \* \*"

"Again, the roofing clause of the specifications not being found in the contract, and being inconsistent with the terms of the contract, is to be disregarded upon the familiar principle that in case of conflict in terms the contract prevails over the specifications. \* \* \*"



The Contractor Brought Suit to Collect \$804.01 That Had Been Deducted from the Contract Price.

## Attractive Back Garden Fences

SOME IDEAS IN FENCES THAT BUILDERS CAN USE THIS SPRING IN GETTING ADDITIONAL BUSINESS.

By Charles Alma Byers

A HOME to be truly attractive in outward appearance should, of course, possess attractive grounds. This, in reference to the ordinary little city home, naturally applies more particularly to the space in front of the house. However, altho it is here that either complete neglect or but haphazard treatment commonly prevails, the grounds in the rear surely ought to be made to contribute charm and character to the setting also. An attractively planned back garden, quite regardless of its size, is, in fact, always a big asset in the appearance of any home, as well as of the neighborhood in general.

Doubtless the first requisite of an all-round satisfactory rear garden is something in the way of a fence or wall to enclose the area. The plot thus enclosed naturally affords a degree of appreciable privacy, and, more than that, permits, of more individuality in the matter of planning and planting. Further, the fence or wall itself becomes a charming means of support for climbing rose bushes or other vines, and also constitutes an effective background for various interesting border schemes.

The garden fence or wall, to serve its purpose well, should, undoubtedly, be of itself appropriately attractive. This, too, it may be, even tho it be only a quite inexpensive fence constructed of wood. In fact, the fence of this kind, altho it is more often found utterly devoid of character or style, can be designed in any number of interesting ways, and made a genuinely enhancing feature. The accompanying illustrations show, for example, something of its possibilities in this respect.

The first of these fences (Fig. 1) is of the out-and-

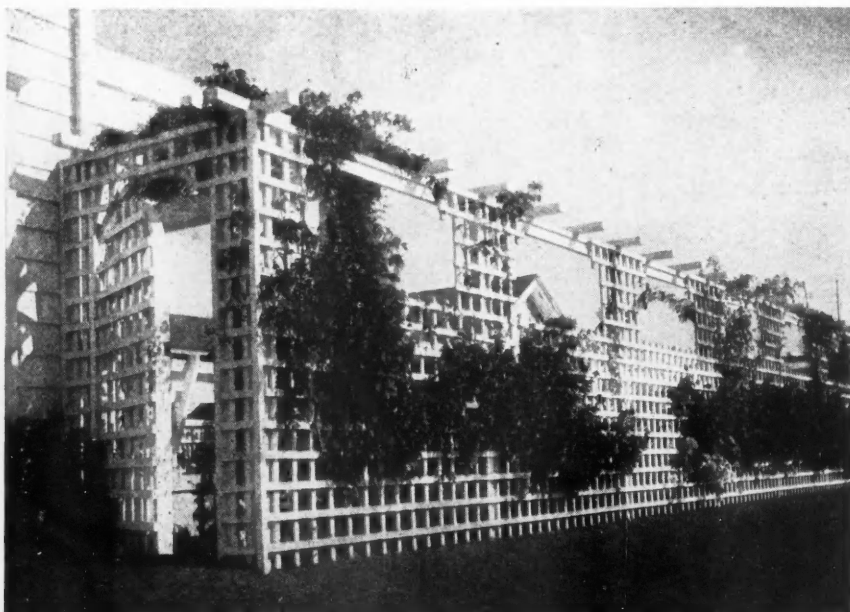


Fig. 1. An Excellent Background for Rose Bushes. A Back Garden Lattice Fence That Is More Than Charming.

out lattice type, and is approximately 7 feet in height. The posts, which are 4 inches square, are set about 7 feet apart; and, while the unbroken latticing reaches only to a height of 4 feet 8 inches, each post is attended by a section of the lattice work that extends to the

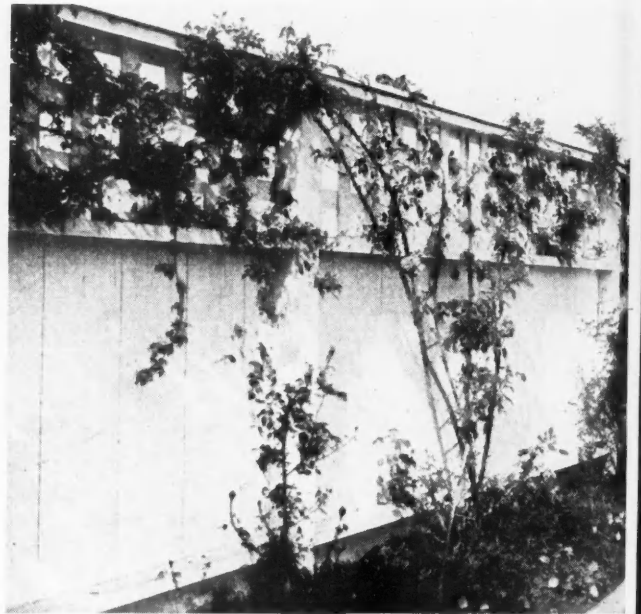


Fig. 2. Back Garden Fence That Insures Privacy, Yet Gives an Ornamental and Decorative Touch to the Picture.

top. The "stringers," or horizontal timbers which support the latticing, consist of a flatwise-set 2 by 4 at each the bottom and the middle and of a T-arrangement of two 2 by 4-inch pieces at the top. The top is further finished with short cross pieces—about 2 feet long—of 3 by 3-inch material, which are spaced 2 feet 4 inches apart on centers. The latticing strips are  $\frac{1}{2}$  inch thick by  $1\frac{3}{4}$  inches wide, and are spaced so as to leave openings of nearly 4 inches square. A similarly constructed gate, with an arched top, will be observed in the end section of fence in the foreground. A fence of this style and height constitutes an especially excellent support for climbing rose bushes and other high growing vines.

The next fence here illustrated (Fig. 2) is solidly boarded at the bottom and finished with a sort of latticed top section. The posts are 4 inches square and set 10 feet apart. The lengthwise-running timbers—three in number—are 2 by 4 inches, and a 1 by 5-inch board is used to cap the top. There is a 1 by 10-inch baseboard, and the vertical boarding above is done with 1 by



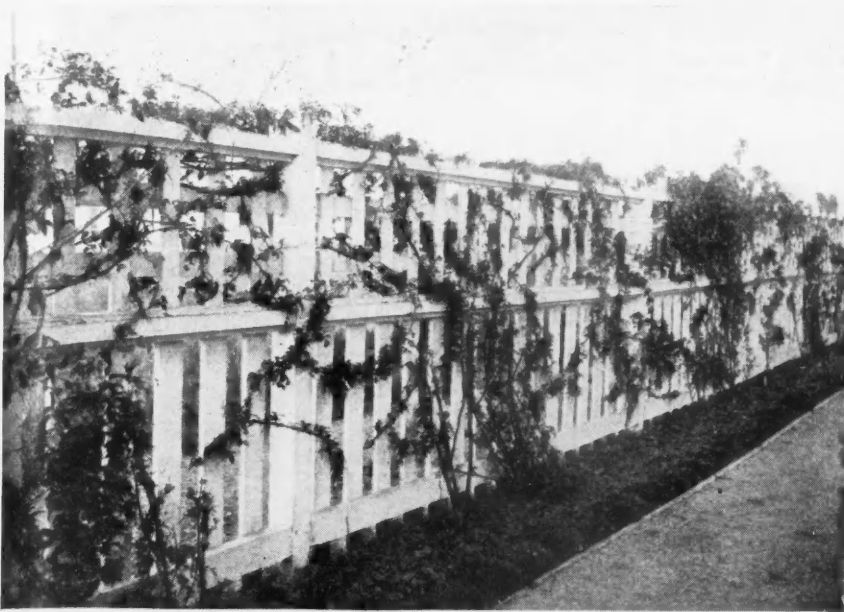


Fig. 3. Inexpensive, Effective Garden Fence Made Up of 1 by 4's Set Vertically with Top Part Made Up in Lattice Effect. The Posts Are Four Inches Square.

strips, and midway between the posts a small circular effect is introduced with good results. The height of this fence is 4 feet 10 inches.

Wooden fences of the kind here shown not only afford charming possibilities in the way of design or style variations, but also may be still further varied in appearance by color treatment. A pure white fence, however, is always very pleasing, and may always be depended on to offer delightful contrast to the green and other colors of the garden planting. All of the fences here shown are painted white, with the exception of the one shown in Fig. 3, which is light gray. ❀

12-inch boards. The top section of latticing consists of vertical and horizontal strips of  $\frac{3}{8}$  by 3-inch material, spaced to leave opening nearly 6 inches square. The fence is about 5 feet 8 inches high, and naturally gives the garden delightful privacy.

The third illustration (Fig. 3) is of a comparatively inexpensive fence, yet one that is decidedly effective. The bottom part of it consists of 1 by 4-inch board strips, set vertically, and the top portion, simulating a lattice effect, is comprised of vertical and horizontal strips of  $\frac{3}{8}$  by 3-inch material, spaced with 6-inch square openings. The posts are 4 inches square, set about 10 feet apart, and there are three 2 by 4-inch supporting timbers. The fence is approximately 5 feet 4 inches high, altho the posts are some 4 inches higher.

The last illustration (Fig. 4) shows a particularly neat and enhancing fence of somewhat novel design. It has a 1 by 6-inch baseboard, and above this the fence is of extremely open lattice work, which is centered both on the posts and on the supporting lengthwise timbers. The posts, spaced about 8 feet apart, are 3 by 4 inches, with a finish of 1 inch square moulding strips to engage the latticing. The top and bottom "stringers" proper are of 2 by 4-inch material, but these are also built up with strips for holding the lattice work on centers. The lattice strips are of  $\frac{3}{8}$  by 1½-inch material, and in the main are spaced to leave openings about 5 inches square. Short strips, however, are extended downward from the top between each pair of full-length

OF every dollar spent in residence construction, 36.1 cents is spent for masonry, 29.1 cents for carpentry, 8.7 cents for heating, 6.5 cents for painting, 6 cents for electrical work, 6 cents for plumbing, 3.5 cents for sheet metal work, 2.9 cents for roofing and 1.2 cents for hardware.

IT is estimated that between four and five billion dollars will be spent this year in new construction, a large part of it residential.

Of this amount, approximately \$240,000,000 will be spent for plumbing, \$140,000,000 for sheet metal work, \$116,000,000 for roofing, and \$48,000,000 for hardware. It is in these items that the largest annual waste for repairs and replacements takes place.

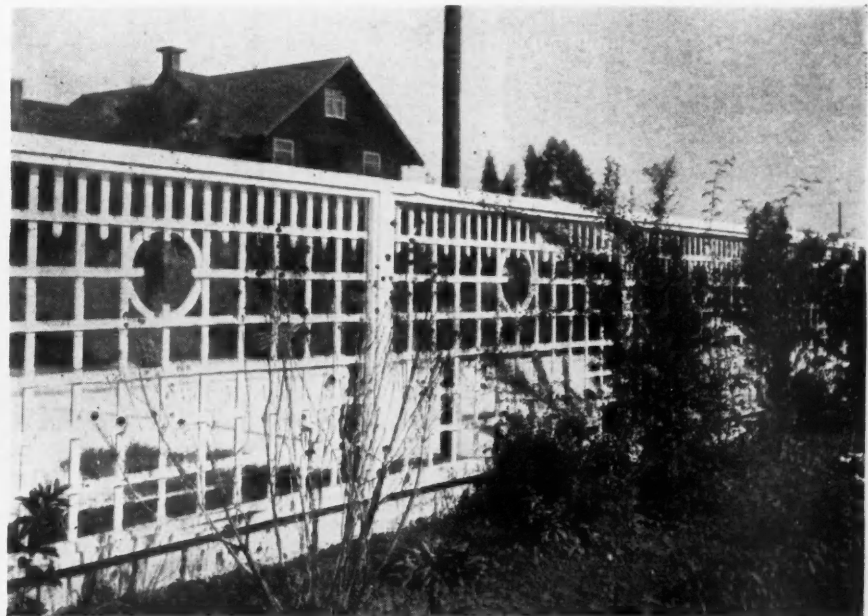
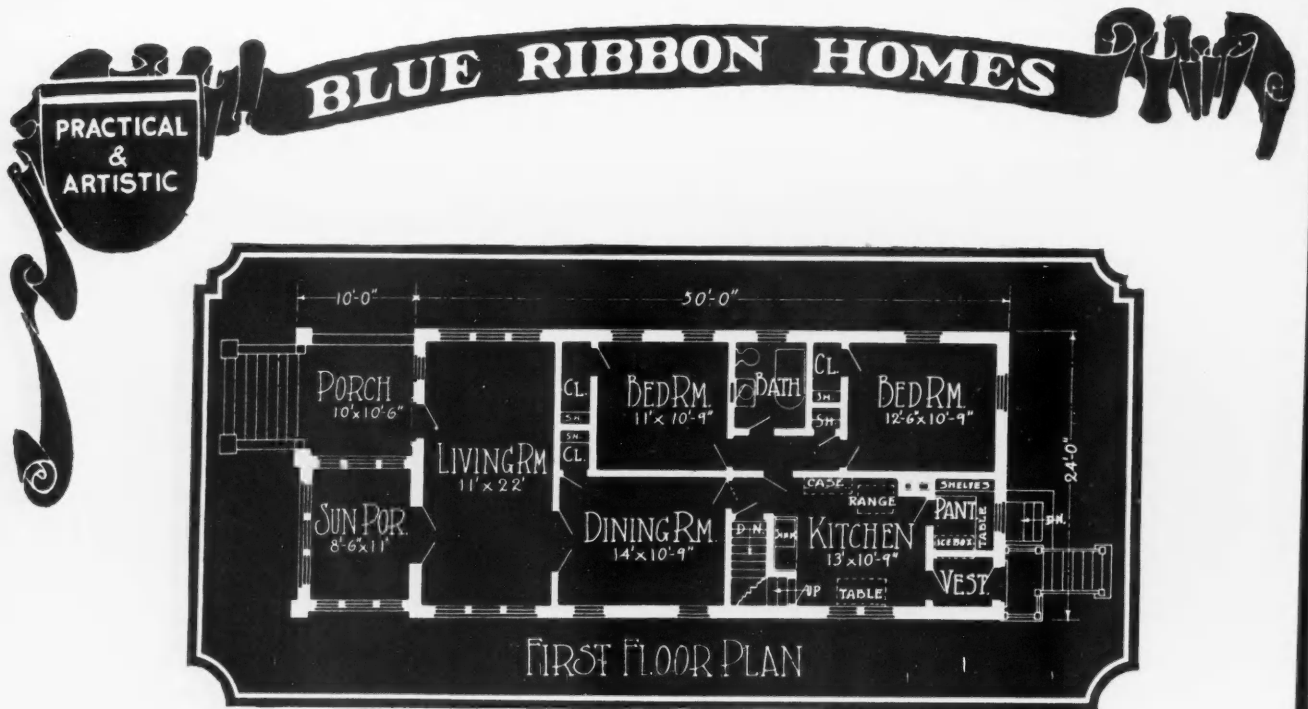


Fig. 4. Particularly Enhancing Fence of Novel Design. It Is 4 Feet 10 Inches High with Posts 8 Feet Apart.

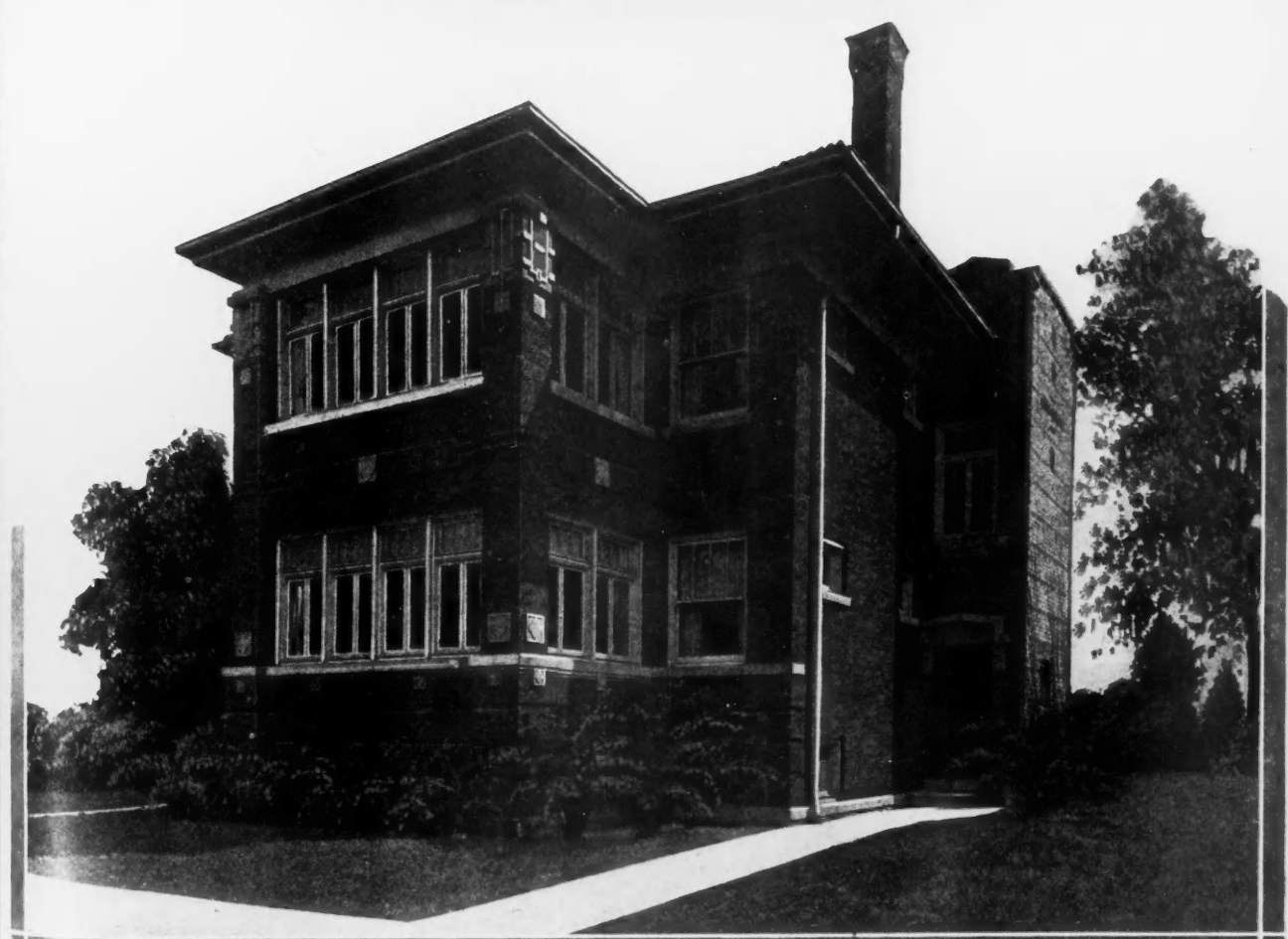
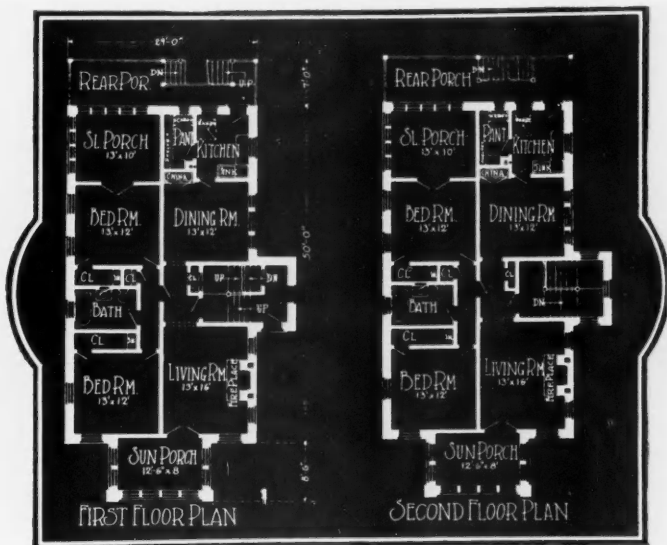


**COMPACT, SUBSTANTIALLY BUILT BUNGALOW.** This type of brick dwelling is quite popular in the large cities because of its practical arrangement, sturdy construction and economy in cost. It is solid brick on a concrete foundation, with concrete porch and steps and stone trim. The roof is covered with asbestos shingles. In keeping with the modern demand, this house has a sun parlor with triple windows on three sides. Abundant sunlight from this room as well as from two triple windows on each end of the living room, make that room exceptionally bright. For a small home the living room is a delightful surprise, 11 by 22 feet. No space has been given over to a vestibule. In addition to the living room and sun parlor, there is a good-sized dining room, 14 by 10 feet 9 inches, two bedrooms and kitchen. Bedrooms and bath have been grouped along one side of the house off a hall which also opens into the kitchen. The house is 24 by 50 feet.

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**BLUE RIBBON HOMES**

PRACTICAL & ARTISTIC



**COMFORT AND PROFIT IN TWO-FLAT BUILDING.** For the home builder who wants to combine the comfort of his own residence and a steady income there is nothing like the two-flat building, such as shown in this design. This building is of the English basement type, the entrance being placed well back at the side, giving the whole space in the front of the building to the best rooms. Each apartment contains five rooms, a sleeping porch and bath. How these rooms are arranged and their size are shown on the floor plans. The first floor usually is occupied by the owner, who cares for the heating plant in the basement. The same foundation and the same roof as a bungalow support and cover a two-flat building, the extra cost being in the extension of the walls another story and the interior finish.



# The Bungalowette



**Two Pages of Suggestions for Those Who Must Have A Home However Small and Modest**

*Here is a very timely chance to do some good. No doubt some of our readers know of little homes like this built in an emergency and successfully lived in. Please write and tell us about them, and send a photo. It will help others.—The Editor.*

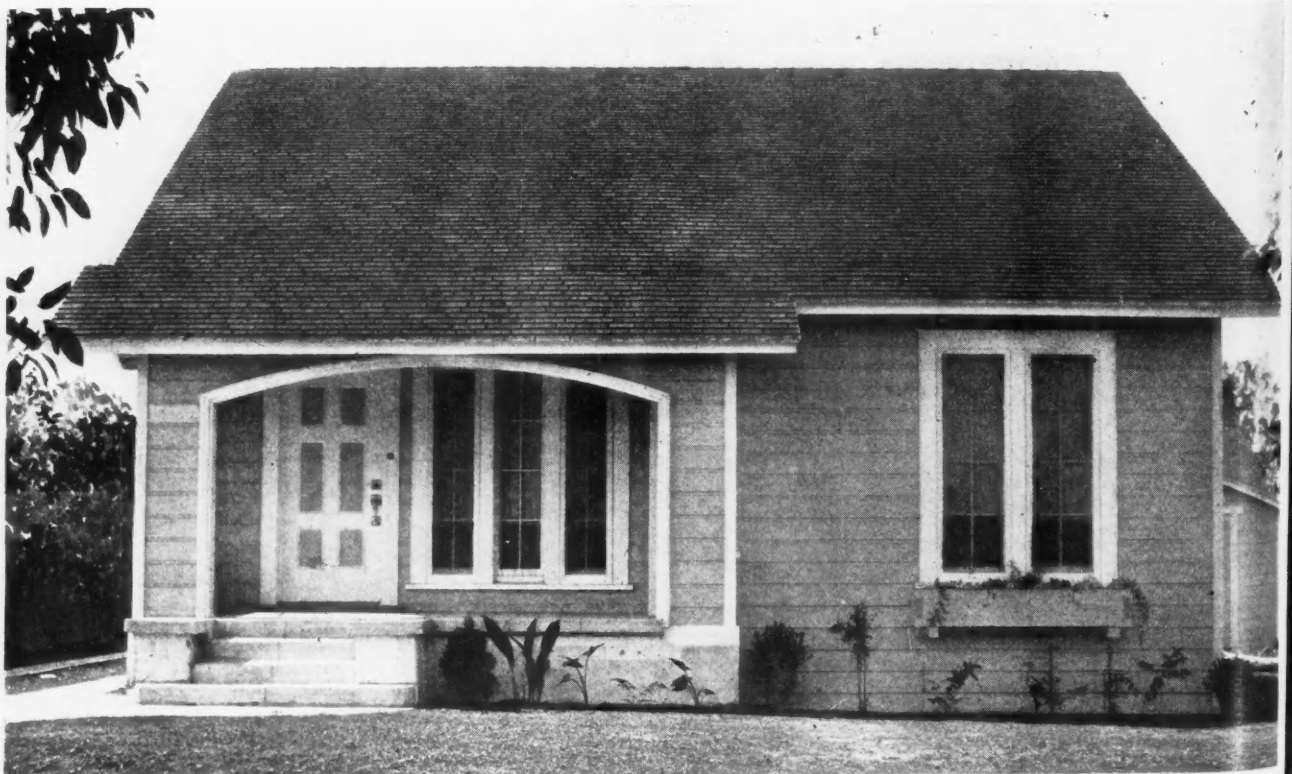
**I**F we are to judge by letters received during the last two or three months the "bungalowette" is a happy thought. Builders in all sections of the country have taken the time to tell us that it is an idea that will help many people become home owners who otherwise would not have the nerve. And these same builders believe that within a few years the people who build bungalowettes now will be in a position to build a regular house in the front of the lot.

In short, they will have tasted of the sweets of home-ownership independence and will want more of it.

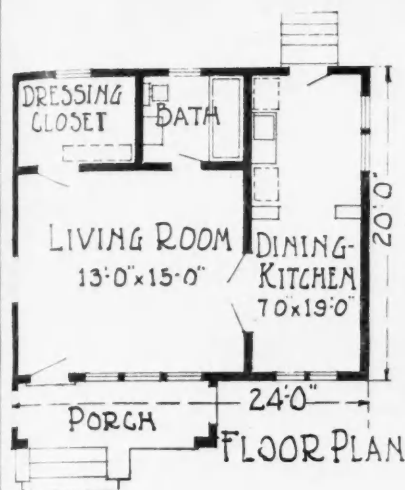
We can hardly conceive of any greater service than

that of helping people to save and build their own homes.

Humble surroundings have marked the stepping-stone to success of many people. The idea of the poor family starting out in a bungalowette calls to mind the story of a Russian peasant who, ragged and penniless, landed in New York harbor some thirty years ago. He had one treasure, ambition, and it is related how shortly afterward he chased a coal wagon half a mile to ask the driver where he could buy some coal. The driver laughed at him. But Stransky, that was his name, found out, and bought some coal and stored it in a basement—



**This Cozy, Well-Appearing Little "Bungalowette" Does Not Occupy More Than 500 Square Feet, Yet It Has Three Delightful Rooms, Modern Bath, Electric Light and Other Household Conveniences. A Wall Bed Solves the Bedroom Problem. It Is Designed for Those of Meager Means Who Seek a Relief from High Rents Until They Can Build a Real Home.**

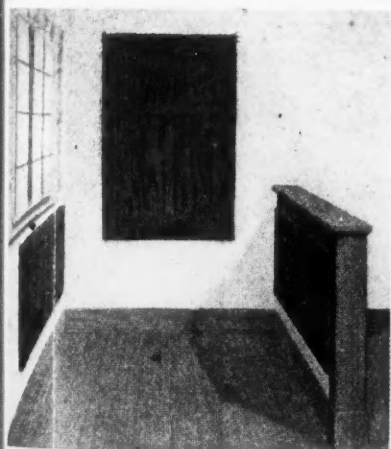


Floor of "Bungalowette" Illustrated on Opposite Page.

by the way, this was his first home. From this place he peddled that coal in small lots and gradually built up a business. He began to buy coal in bigger quantities, bought a horse and wagon and the business grew. Soon more teams were added. To make a long story

short, he acquired control of the coal company from whom he bought his first small lot, a coal company which has a capital of many millions.

Thrift was his religion. Humble surroundings were no handicap nor will they be for any honest family who are anxious to have a home that they can call their own. The bungalowette offers a means of getting this home and stimulating thrift.



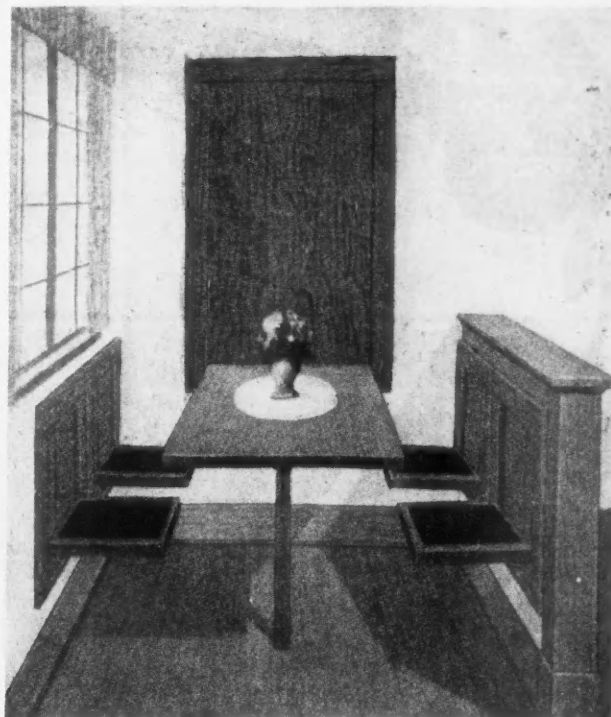
Corner of a Kitchen Showing Breakfast Nook Folded Up Out of the Way.

In the bungalowette plan shown on these pages, the arrangement offers food for interesting study.

The size of this charming little dwelling has in no way detracted from its efficiency as a home. For in the small space of 24

by 20 feet by judicious arrangement and size, three rooms have been provided with the function of four. In short, there is a comfortable living room 13 by 15 feet, with adjoining dressing closet in which a disappearing bed has been installed. At night the living room can be used very conveniently as a bedroom.

To the right of the living room is a combination dining room and kitchen modeled after the latest developments in condensed apartment building construction. The entire room—it is divided by half-height partitions—is 7 by 19 feet, allowing about 70 square feet for each part. The partition contains shelves and cases for china and dishes. An excellent suggestion for furniture for the kitchen end of this room is shown in some of the illustrations on this page. When not in use this furniture can be folded up out of the way and the room used for other purposes.



Same Corner a Few Minutes Later as It Appears All Set for the Family Meal. This Arrangement Is Quite Practical in Small Houses Because of Its Space-Saving Features.

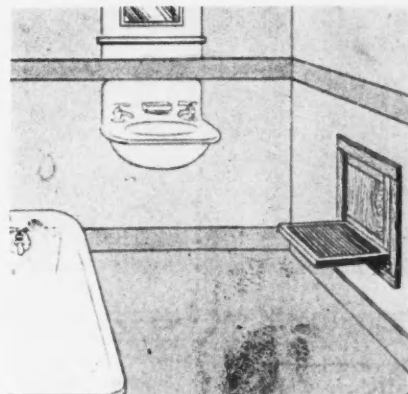
A bathroom completes the floor plan arrangement.

A word for the exterior. This home has been built of inexpensive material, regular lengths being used. The porch steps and foundation are built of concrete, altho this can also be frame. It is about the most efficient use of 500 square feet of material and space that could be devised and offers a complete home at a cost that is within the reach of the family of the most limited means.

### Information on Decaying Posts

**E**MBEDDING posts in concrete is not a good practice, because it creates conditions favorable to decay. When the concrete is first poured around the wood, considerable moisture is taken up by the wood, which cannot dry out rapidly. Additional moisture may come to the wood from time to time thru flushing the floors, water leaks or a generally damp atmosphere. If the concrete is laid on the ground moisture can pass thru the concrete to the wood. While some moisture is required for the growth of fungi some species do not require very much and it is not necessary that the wood be actually wet.

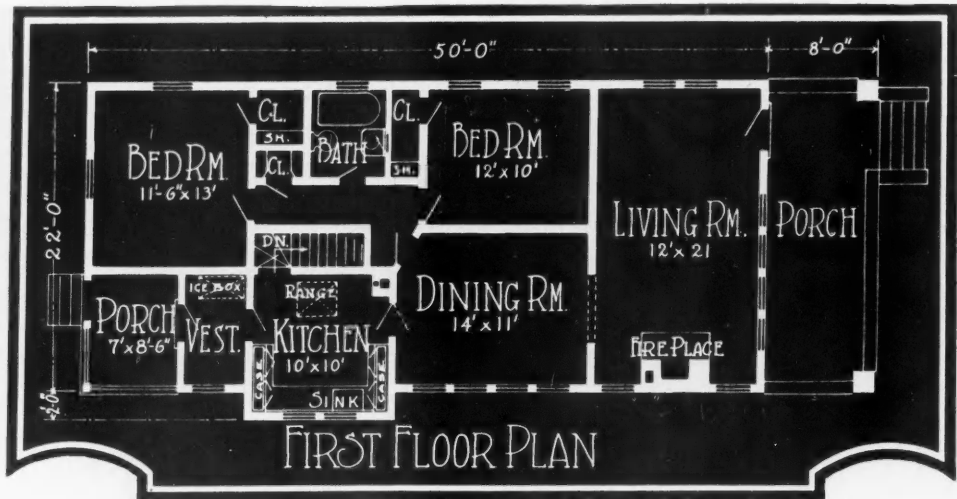
If setting the posts in the concrete cannot be avoided precautions should be taken to use only thoroly dry, sound timber, preferably heartwood. Furthermore, the butts of the posts should be given a preservative treatment before installation, and some means should be taken to exclude moisture.



Handy Built-In Seat in Small Bathroom Which Cannot Hold Too Many Chairs.

**PRACTICAL & ARTISTIC**

**BLUE RIBBON HOMES**



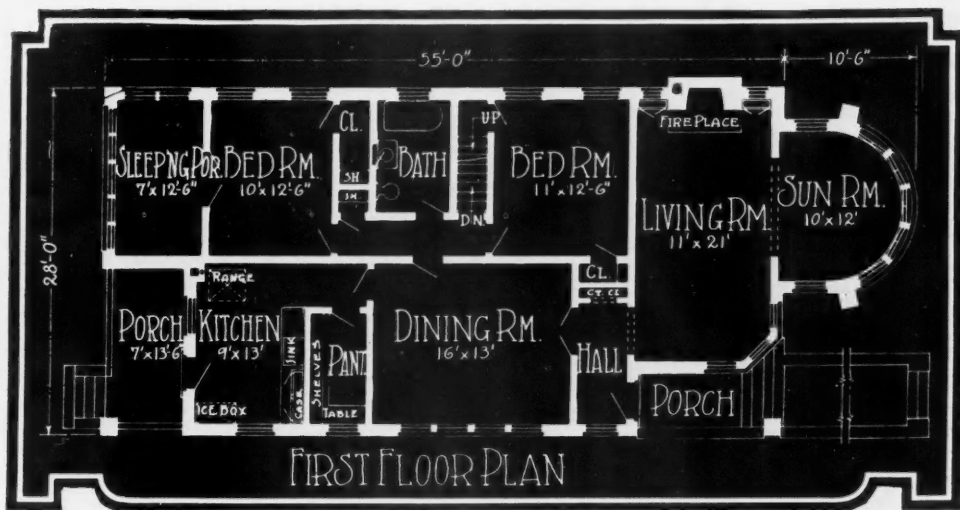
**POPULAR CITY-STYLE BUNGALOW.** Bungalows of four, five and six rooms are popular in the cities for the reason that they do not require large, and consequently expensive lots. The stucco bungalow design shown above is of this type. It is 20 by 50 feet, with an 8-foot front porch projection, and with the exception of the bay in the kitchen walls are unbroken lines. Five good rooms are shown on the floor plan. The living room is a feature because of its size and the fact that it has outside exposure on three sides. The two bedrooms are so located that they are separate from the other rooms, while the bathroom is between them. A basement extends under the whole house. This is a very desirable design for those who want a small house at a reasonable cost.

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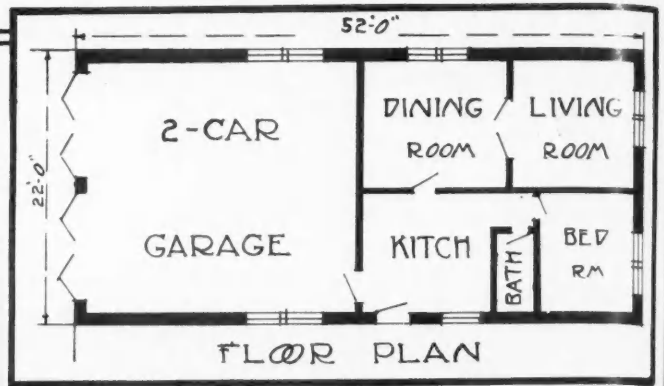
**BLUE RIBBON HOMES**

PRACTICAL & ARTISTIC

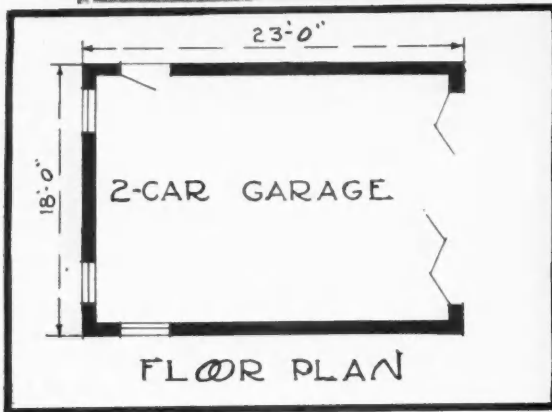


**A REAL HOME!** Designed for the narrow city lot, this attractive dwelling offers the prospective homebuilder a house of which he can truly be proud. The circular sun parlor is an unusual feature that lends distinction to the treatment while the large window area, framed in white trim, makes a pleasing contrast with the brick background. The main entrance has been built at one side in such a way as to give extra window space to the living room on that side. The high basement is another important feature. There are five rooms, not including the sun parlor and rear sleeping porch, and a high attic which may be divided into at least two more rooms, if desired. The room arrangement will meet with instant favor among the womenfolk because of its compactness. The living room is completely shut off from the sleeping rooms, preventing the noise from this room disturbing anyone who may wish to retire early. The house is 28 by 55 feet.

Seven modern garages



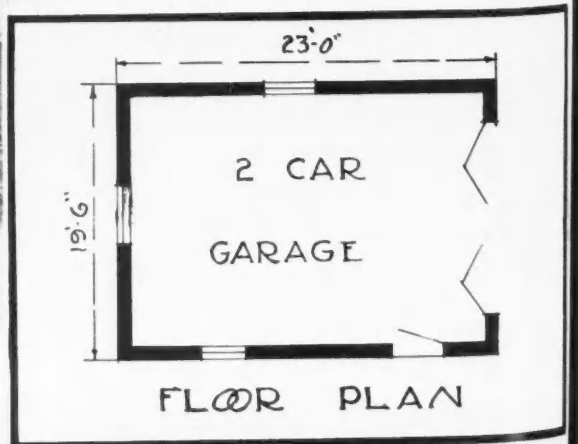
Two-Car Garage with Apartment for Chauffeur. It is Built of Brick and Stucco with Tile Roof and Has Folding Sliding Doors.

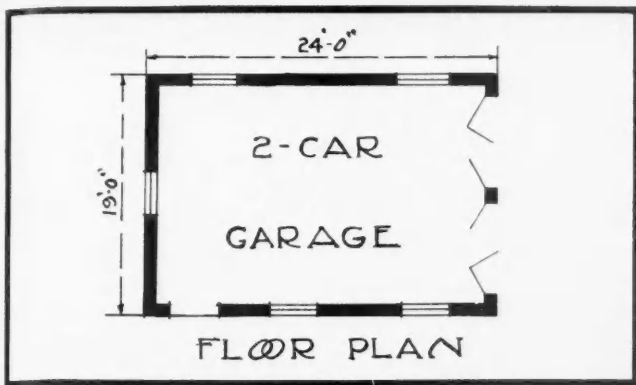


Note the Five-Door Arrangement in This Well Built Two-Car Garage. It is 18 by 23 Feet.

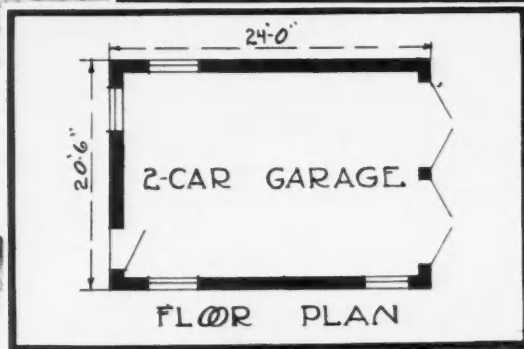
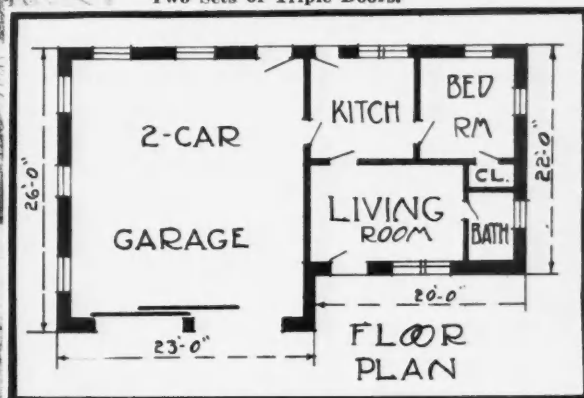
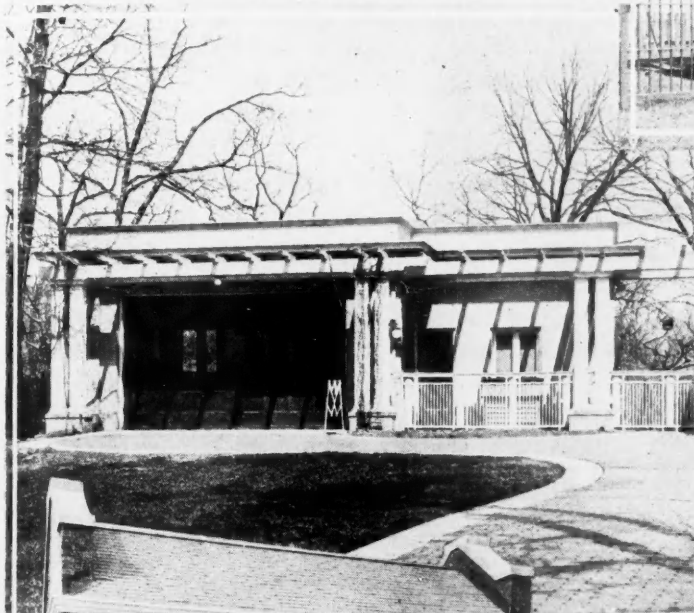


Asbestos Shingles and Roof Dormer Add Variety to This Garage Design. It Has a Hipped Roof and Four Folding Doors.

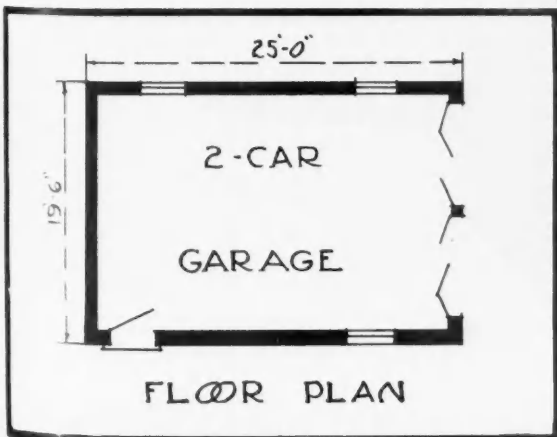




Little Touches Here and There Make This Garage a Building and not a Barn. It Has Two Sets of Triple Doors.



Two Distinctive Garage Designs Showing Variety in Treatment. The Upper One Also Contains a Three-Room Apartment for the Chauffeur and Family.



Garage Design That Is Practical and Attractive. Each Section Has a Three-Door Arrangement, the Inside Door Swinging on Hinges, the Other Two Folding and Sliding Back Against the Outside Wall.



# Fireproof Community Garages Popular

SEVERAL TYPES OF MULTIPLE GARAGE FOR APARTMENT BUILDING TENANTS CAN BE BUILT TO PROVIDE PROFITABLE INCOME

By A. J. R. Curtis

**T**HE fireproof community garage is the logical companion of the modern apartment building. In every modern city district where apartment

is less valuable because not large enough to accommodate an apartment building. Altho a well-equipped, steam-heated garage with electric lights and water can be built for not to exceed 20 per cent or 25 per cent the cost of dwellings of comparable size and the operating cost of the garage is almost nominal, it can be rented ordinarily at from \$12 to \$18 per stall per month, fully as much as the per room rental of expensively built apartments with 70 degrees of heat in winter, decorating expense, hot water and janitor service to be paid for by the owner. The garage has correspondingly lower taxes and scarcely any maintenance.

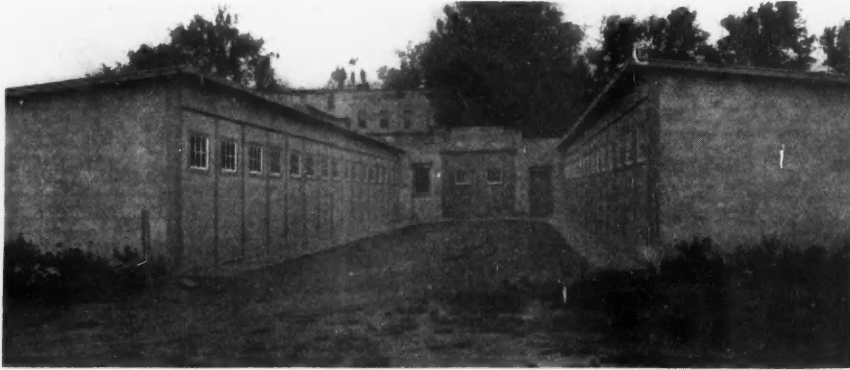


Figure 1. Community Garage with Concrete Block Walls and Concrete Slab Roof at Lancaster, Pa. Mr. H. B. Neff Is the Owner. Eight-inch Cinder Concrete Blocks Were Used.

buildings make up a large proportion of the dwelling houses, community garages can be built and operated at a good profit. Motorists like the community garage idea because of the convenience, for these garages can be built in alleys in residential districts where a commercial garage would not be tolerated or, as in several notable instances, the community garage may be completely concealed by shrubbery and partial depression below grade. The rentals can be arranged on a moderate basis and the motorist who dwells in rented quarters or prefers not to own a garage can get the combined advantages of the public and the private garage at reasonable expense.

As an investment the community garage in the thickly settled city neighborhoods is likely to yield better returns than almost any other kind of building. It may occupy the rear of lots not otherwise used; it may be built upon the small plot in the apartment community which

If built of concrete and other fireproof materials with fire walls between stalls, the owner is justified in

carrying very little, if any, insurance. Another advantage of the fireproof type is found



Figure 2. Circular Community Garage at Morgan Park, Duluth, Minn. It Is Built on the Principle of a Roundhouse and Is Now Entirely Concealed by Means of Terraces and Beautiful Landscaping. Concrete Block Were Used in the Walls.



Figure 3. View of the Garage Shown in Figure 2, as Seen from the Street. An Ordinarily Unattractive Structure Given a Decidedly Pleasing Appearance.

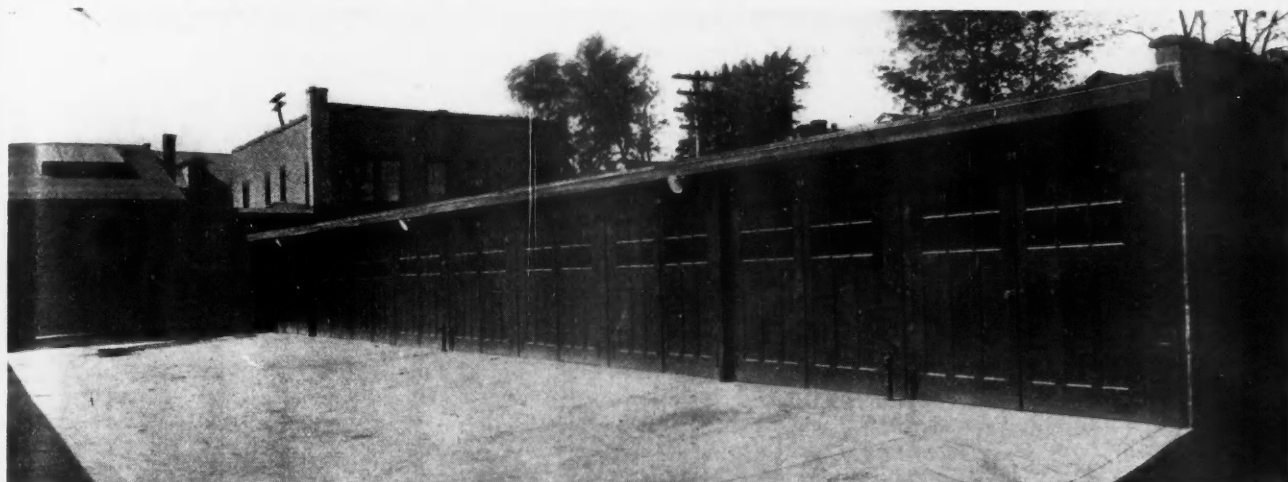


Figure 4. Community Garage of Unusually Good Design with Spacious Driveway and All Modern Conveniences in a Fireproof Concrete Structure.

in the fact that most large city building codes require that garages which are not fireproof must be placed at least one foot inside the property lines. A clear saving of this space is made, if the community garage is constructed in a fireproof manner.

There are two recognized types of community garages—the rectangular building which consists simply of a number of individual stalls adjoining, with space, usually at one end, for boiler and coal rooms and attendants' lockers; and the circular building laid out on the principle of the roundhouse. The rectangular type usually conserves space and is adaptable to a wide variety of circumstances to which the circular type cannot be accommodated.

**Stall Sizes Fairly Well Standardized**

Stall sizes are becoming fairly well standardized so far as passenger automobile storage is concerned, but truck storage necessarily requires space varying with great difference of size of trucks designed for different kinds of service. The extremes of length of passenger cars are well represented by the Ford touring car with a wheelbase of 100 inches and an overall length of about 12 feet 9 inches with front bumper and top down, and the Pierce-Arrow 7-passenger touring car with a wheelbase of 138 inches and an overall length of about 17 feet 4 inches. Stalls intended for long cars or to take all cars interchangeably are made 22 or 23 feet long. Twenty feet is the comfortable minimum. The stall width is usually 12 feet free space from wall to wall. The heating coils, where required, are placed at the end of the stalls opposite the doors and the tool cabinets are placed above the coils. Each stall has ample space for the storage of lubricants, tires and other supplies, an advantage not usually to be had at the public garage. The motorist is thus enabled to buy his supplies in quantities, at considerable saving.

Perhaps the ideal construction would include a fire resistant bear-

ing wall between each stall, not only giving full protection to each individual car but also letting cold air into only one stall when a pair of doors are opened in cold weather. However, for purposes of economy, these partition or fire walls are usually run up between each pair of stalls, using heavily woven wire partitions to divide adjoining stalls of each pair. This greatly reduces the cost of the walls at only slightly reduced protection to each car.

**Concrete Block Structure**

Concrete block construction with and without stucco exterior is being used extensively for the walls of community garages at the present time. These walls are commonly built of 8-inch block, making the main walls about 9 inches in width counting the thickness of plaster (applied directly to the inner surface of the block) and stucco coats on the outside. The wall work is very simple with windows only in one side wall. Concrete roofs on metal lath frames or flat composition roofs on wood frames are the commonest types, the under side of frame roofs being protected by a cement plaster ceiling on metal lath. Some of the recent structures have roofs of rather novel design, sloping away from the doors and toward the center of the building with drains carried down inside. This is to prevent water and melting snow from running down and freezing on the doors.

The proper ceiling height is 9 or 10 feet. Doors for such garages should provide an opening 8 feet wide and 9 feet high in the clear.

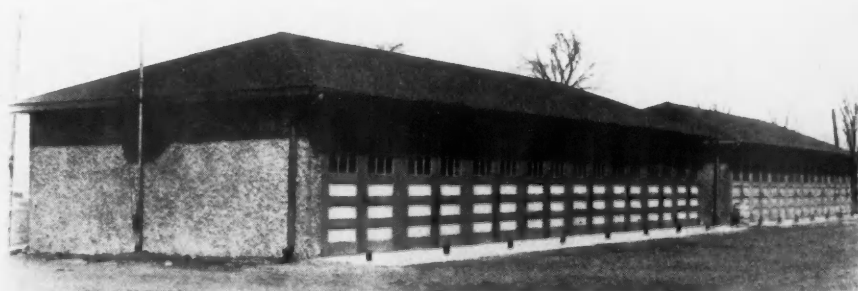


Figure 5. U. S. Malleable Iron Co.'s Garage at Toledo, Ohio—Concrete Block with Cement Stucco Surfacing. An Inexpensive but Serviceable Structure.

# Dutch Colonial Cottage of Quaint Charm

WELL-DESIGNED HOME GETS BEAUTY FROM SIMPLICITY OF DESIGN—SIX COZY ROOMS WITH LARGE PORCH

By R. C. Hunter

**I**T costs no more to build houses that are attractive than it does to build ugly ones.

Every well-designed house is a credit to the owner and to the community in which it is built. There is no excuse for erecting ugly houses, altho every day one sees them going up in no small numbers, to bring discredit on the architect, the builder, the owner and the community at large.

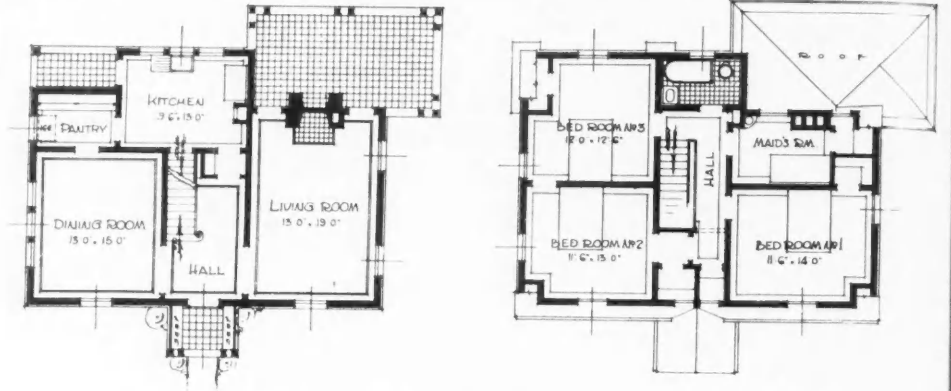
Poor design rests on the shoulders of the architect; he alone is responsible. Why not give a little more thought and study to the problem and have a house that is more than a "freight car"?

The house illustrated herewith is a good example of what can be done along these lines. Note how the architects have used only simple, inexpensive materials and thru good proportions and detail they have attained results that the most lavish materials would not give if not properly handled.

The gambrel roof is well proportioned and the

broad dormer gives full use of the second floor space.

The entrance detail brings out strikingly the clean-cut, crisp mouldings and marks the distinction of this



Floor Plan Arrangement of Dutch Colonial House with Seven Rooms.

house from the commonplace.

The walls are finished with wide white shingles, the roof is shingle, stained green. Blinds and shutters are painted a faded green.

The interior plan is particularly well arranged, calling for six delightful rooms of comfortable size, three on each floor. Three bedrooms are located on the second floor. R. C. Hunter & Bro., architects, New York City, designed the house.



Simplicity of Treatment Makes This House Exceptionally Inviting and Charming. The Rooms are Comfortable and Efficiently Arranged. In the Rear of the House Adjoining the Living Room is a Large Living Porch. The House is 35 by 26 Feet.



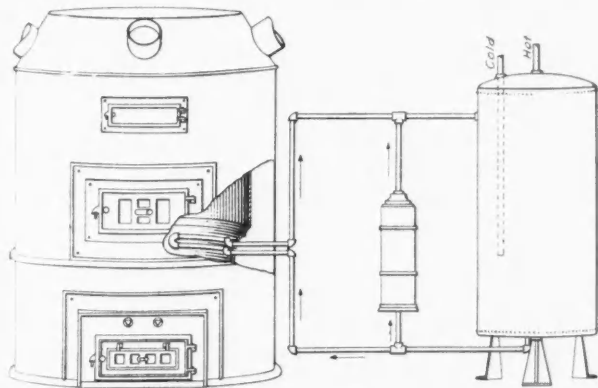
# Hot Water Systems in the Home

VARIOUS TYPES EXPLAINED AND PROPER APPLICATION DESCRIBED—HOW TO INSTALL STORAGE BOILERS

By Ralph G. Harris

IT is not so long ago since the hot water kettle was one of the most important kitchen utensils in the home, if not the most important. For it was "put on the kettle" to heat some water for dishes, and for the bath, and if there were four or five in the family the kettle had to be filled and refilled many times. Hot water is needed in so many operations in the average home that the kettle was on the stove almost continuously.

In the subconscious mind of every housewife this



Small Gas Water Heater Connected Up with Coil in Furnace and Storage Tank. There Are Several Types of Automatic Heaters on the Market.

everlasting kettle was never dismissed but an integral part of her mental process.

Those days, happily for thousands, are "gone forever" for the modern home now has the hot water heater, which, manufactured in many types accomplishes the same happy result, plenty of hot water at all times.

It is the purpose of this article to explain briefly the methods in vogue for heating water and the systems which are used.

Choosing a hot water system is merely a matter of learning to know the various elements that go into the making of a practical, workable system for a regular hot water supply.

The performance of any hot water system is based on the theory that hot water rises. Water heated in one place goes to the top of the storage tank to be drawn off as needed. As the water cools it returns to the heating element and is reheated.

There are several general methods of heating water. The oldest and commonest type is the coil or water-back in kitchen range or furnace. Then there are gas heaters and side-arm coil heaters. There are automatic heaters and non-automatic heaters.

Where facilities for heating are

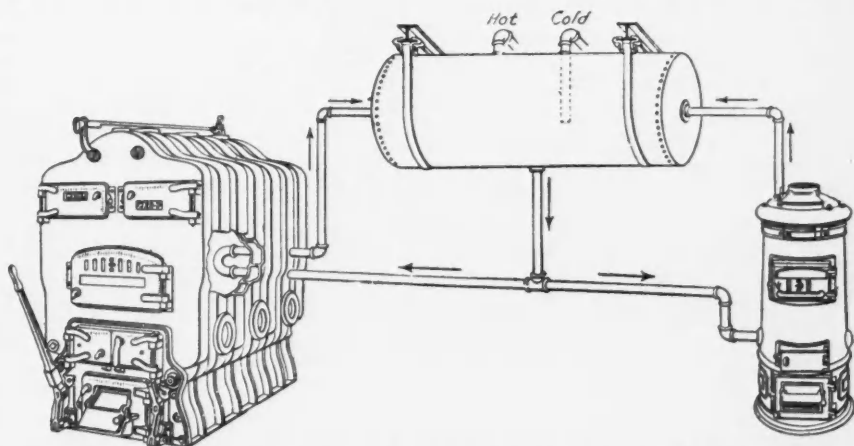
available the more convenient and intricate automatic heaters are installed. There are several types of ordinary heating elements in practical use today. There is the separate cold heater with a coil which can be used independently of any gas heater or waterback in stove or furnace or may be used in connection with such a heating element. These heaters are of great value in suburban homes because of their practicability for use without gas and because of the fact that they may be used when furnace or range fires are out.

Almost all of these types of hot water system with the exception of the instantaneous type use a range boiler or storage tank for the storage of hot water. No matter whether you have a furnace coil, a coil in a separate heater or an automatic heater, a range boiler serves the purpose of storing hot water ready for use.

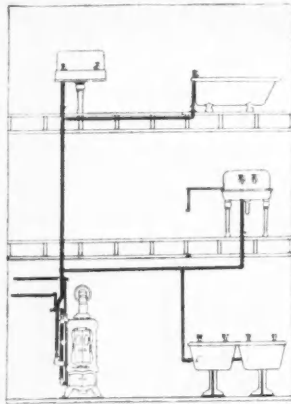
Many automatic heaters operate on the principle of heating water as used. However, even with these automatic heaters the manufacturers recommend the use of a storage tank or range boiler, particularly in the home, because they make the heater last longer and function better.

This is true because the foe of the automatic heater is condensation, which forms a weak acid solution, corrodes the heater and causes repairs. This condensation is caused by cold water flowing in and being quickly heated. The rapid change in temperature causes the moisture in the air to condense on the outside of the heater and pipes. In many desirable systems the water is conducted thru the furnace coil and the supply tank which raises the temperature steadily before it reaches the automatic heater.

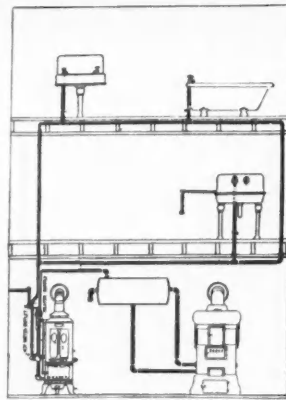
In many cases water is not connected with the coil in furnace or range but is merely brought in thru the storage tank which keeps a supply of tempered water raising the temperature of the water to the temperature of the room which is usually 10 to 40 degrees higher than the temperature in the water mains. In



Heating Water by the Use of Cast Iron Tank Heaters. This Heater Is Connected Up with the Range Boiler and the Coil in the Furnace of Hot Water Heating Boiler.



Direct System of Heating Water in Ordinary Home. In This Method the Automatic Gas Heater in the Basement Heats the Water as Soon as the Faucet Is Turned on.



Re-heating System in Which Heater Is Connected with House Heating Plant. The Water from the Boiler Is Re-heated. This Method Calls for Less Fuel.

addition to reducing condensation this type of installation will pay for a range boiler in coal or gas saved.

There are also combination heaters which are in practice a supply tank and heating device all in one unit. This arrangement is becoming very popular and very practical.

Briefly, the coal heater is most practical in suburban or country homes to be used either independently or any other heater or to be connected with the coil in furnace or stove. If a gas generator is in use, the automatic gas type is suitable.

Where gas is available at all times the two most practical types are the combination tank and heater in one unit and the automatic heater system used in connection with the range boiler.

There is another type of water heater which embodies a different principle of generating hot water in connection with heating boilers. This device is quite simple in construction, consisting of a cast iron shell open at one end. Within this shell is a heavy copper coil. When this heater is used with a steam or vapor boiler, both shell openings are connected below the water line. This allows the boiling water, not steam, from the boiler to flow thru the shell around the coil heating the domestic water which is circulating thru this coil. As the water from the boiler is always near to boiling, it heats the water in the coil and provides a steady source of supply for the family's needs.

There are also several methods of heating water electrically in the home. The more commonly used systems of electric water heating are classified as follows:

(a) Instantaneous. The water is heated at each faucet as it is used. No storage is provided.

(b) Intermittent. A relatively large capacity heater is connected to a storage tank. The heater is turned on some time before hot water is required.

(c) Thermostatically Controlled Heater. A water heater is piped to a storage tank with a thermostat switch in connection. The heater is connected continuously—the thermostat operating to cut off the current when a tank full of hot water has been accumulated.

(d) Continuous Storage Heater. A low capacity continuous heater is connected to a storage tank. Hot water is accumulated during the night and other "off" hours.

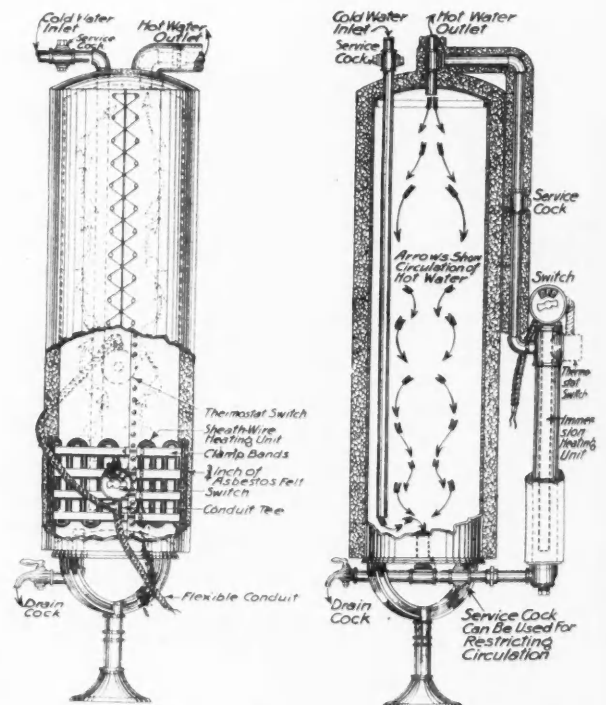
Not only is the selection of a heating method of

interest to the builder but there is also a choice of piping systems. One is called *direct*, the other a *circulating system*. In small homes the *direct* system of piping from boiler to faucets is probably the best system to use. It does not provide hot water so quickly but it is much more economical to install and maintain. In large homes where the distance from the supply tank to the faucets is great, it is usually advisable to install what is known as a circulating system.

The difference between direct and circulating means that the water in the direct system does not continually circulate back to the boiler, while with the circulating system a return pipe is provided to the flow pipe at the highest point, returning to the range boiler, forming a complete loop or circuit around which the water travels continually as it is warmed and becomes cool again. The purpose of this is, of course, to avoid having to draw off a large volume of water at considerable distance from the range boiler before hot water is available. When the water circulates continually hot water is available at the opening of any faucet.

A circulating system is more expensive to install and maintain because a greater volume of hot water must be kept hot to fill the long loop and the larger cooling surface cools the water so rapidly that more fuel is used for heating. In case the home is large and it is advisable to spend the necessary amount of money to get the best system, it is wise to insulate all pipes in the circulating system.

Since a range boiler is such an important unit in practically every hot water system, its purchase and installation deserve careful consideration. This tank is called on to resist pressures varying from 40 to



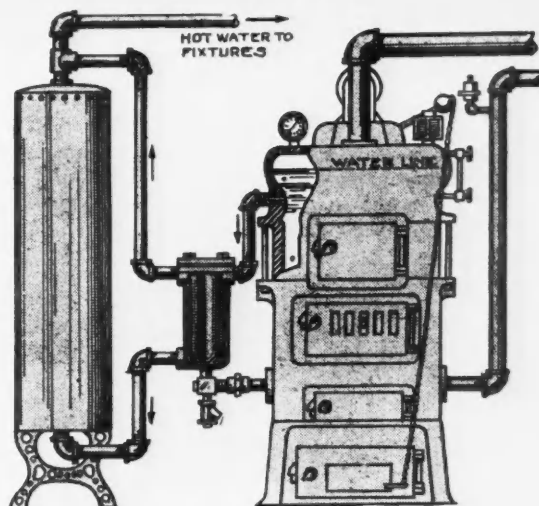
Two Types of Electric Water Heaters. On the Left is a Type Which Consists of a Series of Electrically Heated Bands of Steel-Encased Wire Which is Clamped Around the Lower Part of the Boiler; the Right is the Circulation Type. The Water is Heated as It Passes Thru the Pipe Fitting, Rises, While Cold Water Enters the Heater from the Bottom of the Tank.

200 pounds and to give satisfactory service for a period of years—is called upon to resist the corrosive action of ordinary water and an extremely injurious action from alkaline waters used in some districts. Water treated with chemicals to purify it also has a corrosive action, altho the greatest argument for a good boiler is to get one that will stand up under the pressure caused by heating water and the fact that corrosive action is very greatly increased by increase in temperature.

All boilers are required to be plainly marked with the pressure they are designed to resist. See that you have a safety factor above your local pressure. Your local fire department or water system will advise you what the pressure is and you should install a boiler that would stand at least 10 pounds more pressure than is exerted by water from the main. For instance, a pressure of 75 pounds calls for a boiler that will stand at least 85.

Another important element in buying is to be sure that the range boiler you buy is sufficiently large to store the quantity of water ample for your needs. The following table may be of assistance in choosing the proper size boiler.

Size of Family	No. of Bathrooms	Size of Boiler Recommended
2	1	30 gallons
2	2	40 "
3-4	1	40 "
3-4	2	52 "
5-6	1	52 "
5-6	2	66 "
5-6	3	82 "
6-8	1	66 "
6-8	2	82 "
6-8	3	100 "



A New and Unusual Type of Water Heater Which Supplements the Work of the Furnace Coil or Hot Water Heating Plant. It Is Connected Up with the Heating Plant and the Storage Tank.

It is well to know something of your local water supply condition before you buy your range boiler. In some localities boilers rust out much more quickly than in others, running all the way from a single year in service up to a long number of years, sometimes a life time. If water pressures are high and water is alkaline or treated with chemicals it is always wise to get a heavier boiler.



### Interesting Facts About Early Plumbing

THE first bathtub of record in the United States was proudly exhibited by Mr. Adam Thompson, of Cincinnati, at a Christmas party in 1842. The tub was a mahogany box lined with sheet lead, and supplied with water from a tank in the attic, which tank was filled by pumping. It is also stated that Mr. Thompson had hot water supply for his bath by means of a water pipe that coiled down inside of a chimney.

The news of Mr. Thompson's extreme luxury spread over the country with varying effect. Some of the results seem laughable to us, altho in their day they were undoubtedly regarded with seriousness. By way of example, at about that time, there was an ordinance submitted to the city council of Philadelphia which would have prohibited bathing between the first of November and the middle of March. This ordinance failed of passage by the narrow majority of two votes. Virginia actually placed a tax of \$30.00 per annum on every bathtub made within or brought into the state. Many cities in that day put extra heavy water rates onto people who had bathtubs.

In 1845 the city of Boston actually recorded an ordinance which made bathing unlawful, except under medical advice. There was no bathtub in the White House at Washington until one was placed there by Mr. Filmore in 1850. This old model served the White House until Grover Cleveland's time.

Things moved along, however, so that in 1860 all of the hotels in New York City, that considered themselves first class, advertised that they had at least one bathtub; and a few of the more expensive were able to claim either two or three.



The Luxury of the Modern Bathroom Found in the Most Humble American Homes Is Largely Due to the Constantly Available Supply of Hot Water. This Is Possible Because of the Remarkable Development in Hot Water Heater Manufacture.



# METAL CONSTRUCTION

**EDITOR'S NOTE:** *The American Builder prides itself that it keeps abreast with the latest developments in building methods and materials. Recently some striking changes have been wrought by the introduction of metal materials in varied form. To acquaint our readers with these developments we are inaugurating this new department in which each month will appear an article by some authority on some phase of metal construction. We invite contributions from those who are in a position to give our readers definite and reliable information. Firms and individuals are invited to co-operate.*

## Zinc Shingles—How They Are Laid

SERIES OF DRAWINGS GIVE BUILDER CLEAR IDEA OF HOW NEW METAL ROOFING IS APPLIED

**Z**INC shingles can be safely laid on roofs having a pitch of five inches or more to the foot or any roof where wood shingles or slate can be used. It is important, however, that the roof framework and sheathing be laid properly.

To begin with, the sheathing should grade high, square-edged sheathing boards being recommended. Zinc shingles should never be laid over wet sheathing, and if yellow pine is used plain unsized or oiled building paper should be added. Tarred or rosin paper is never used.

Zinc coated nails are furnished with the zinc shingles and only one is used to each shingle, this nail being driven up tight thru a hole provided for that purpose in the lower right hand corner. If this hole comes over a crack in the sheathing, the nail is put in above it. The half shingle at right hand eave should have the nail driven thru it at the upper left hand corner, but not thru the under shingle. Each shingle or half shingles should contain one nail except those formed at hip joints; when these are cut on a diagonal and bent over the hip an additional nail is necessary to hold in place.

The starting strip on all eaves, gables and the like is placed so that ends butt together securely, nailing it to sheathing with zinc clad nails, spacing nails about eight inches apart. If ordinary gutter hangers are used, they should be nailed in place when eave piece is laid. Valley sheets are nailed with zinc nails and lap each other at least six inches. These sheets are formed narrow at the lower end to slide into the

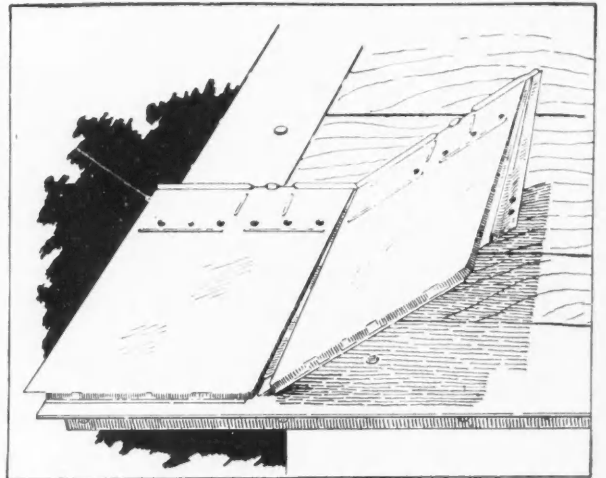


Fig. 2. Second Shingle Being Put Into Place. It Is Slipped Into a Special Locking Lug on the First Shingle.

upper end of the lower section. These sheets are not soldered together. The lower ends of the sheets are extended over the starting strip at the eaves and bent under after the shingles are laid. These valley sheets come in 48-inch lengths.

The various stages in zinc shingle roofing are shown graphically in the sketches. Fig. 1 shows how the start is made, the shingles being laid from left to right. The first shingle is cut to extend over the starting strip of the gable about  $\frac{3}{4}$  inch above the edge of the starting strip of eave.

Fig. 2 shows the next shingle being put in place. This is done by slipping the projecting lug on the lower left corner of the shingle under the lower right

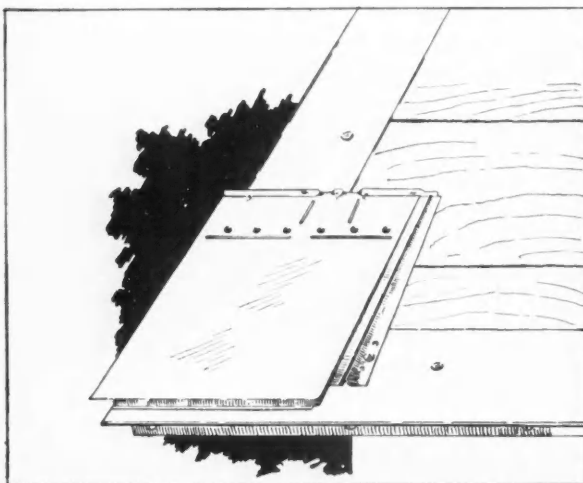


Fig. 1. Showing Starting Strips Along Gable and Eave in Position and First Shingle Ready to Be Laid.

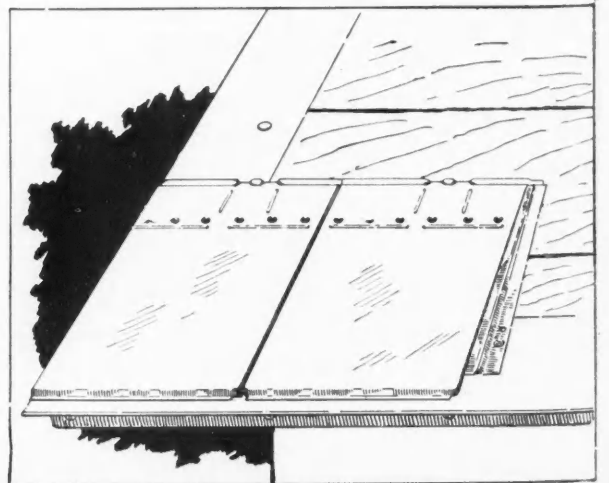


Fig. 3. Second Shingle Nailed at Bottom. This Gives Clear View of Projecting Lug on Edge.

hand corner of the first shingle and bringing into position with butts of shingles on line. The left hand edge of the second shingle should fit snugly into the gutter of the first shingle, and lie flat on the roof sheathing.

In Fig. 3 the second single is nailed at the bottom as before. This holds the first shingle securely in place and the left hand edge of the first shingle is bent over the starting board of the gable to make a finished edge. After the second shingle is nailed, the same method is followed for the rest of the row.

The handling of the second row is shown very clearly in Fig. 4. This row is laid the same as the first row except that a half shingle is used to start with. This new course is lapped over the lower one so that the first course is covered just above the raised rib on each shingle. The raised rib is used as guide for laying. This rib, however, should not be covered by the row of shingles above.

In Fig. 5 the method for covering the roof where

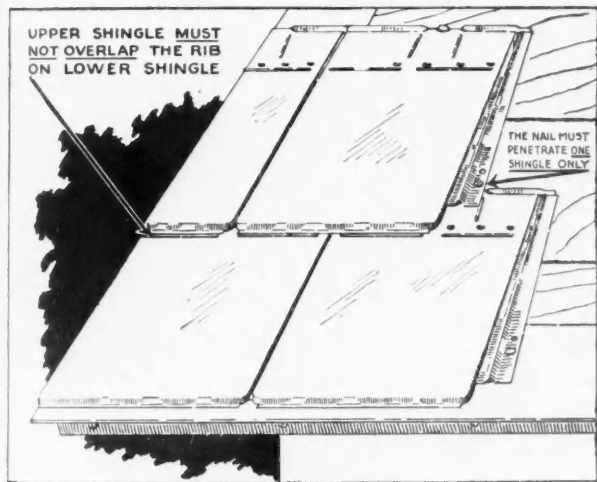


Fig. 4. Showing How the Second Row Is Handled. In This Case a Half Shingle Is Used to Start the Row.

intersected by valleys is shown. The shingles are cut to line of the valley sheets so that when they are in position the edge of the shingle will project about 1/4-inch over the rib of the valley. After the shingle is in position, the projecting edge should be bent under the rib of the valley sheet.

The formed ridge cap is shown in Fig. 6. This ridge cap is furnished in 3-foot lengths with an expansion joint or lap of three inches. The under lap, not exposed to the weather is nailed in place after the ridge cap has been slipped under the small zinc lugs. The lugs are furnished with the ridge cap and should be nailed over and thru the shingle at the ridge, with lower end projecting toward the eave the proper distance from the center line to hook into and to hold ridge cap in place. There should be at least three of these lugs on each side of the ridge to each section of ridge cap.

If the hip frame has not been built up to permit a flashing of shingle against it, then snip the edge of the shingle to a flat position and lap over the hip

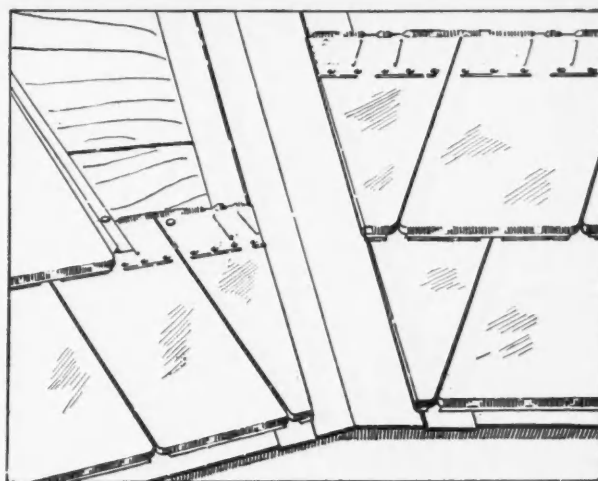


Fig. 5. Method Used for Covering Roof Where Intersected by Valleys.

joint and nail in place. The same method is used on the opposite side of the hip. Then the hip cap is applied as shown in Fig. 6.



**P**LUMBING and bathroom equipment for the modern home is generally recognized as practical "health insurance," besides being an indispensable convenience. Modern plumbing has solved many problems for the family physician, whose work among the sick was, and is, often retarded or rendered futile by insanitary plumbing and primitive bathing facilities.

It is easy nowadays for the buyer of moderate means to enjoy a finer quality of such equipment than that formerly within reach of only those comparatively well-to-do. Modern manufacturing methods produce bathtubs, lavatories, closets, and "bathroom jewelry" of the most brilliant, inviting and durable whiteness. Easy to clean and keep clean, such bathroom appliances have relieved the housewife of the bugbear of having to scour and scrub, ceaselessly, in a hopeless effort to make them appear inviting. Modern bathroom fixtures are as easy to clean as a china dish.

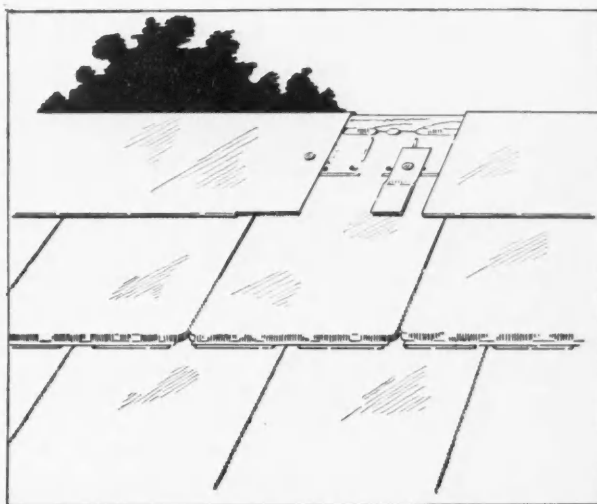


Fig. 6. Showing How Ridge Cap Is Formed.

# SPECIAL PLUMBING CONVENIENCES FOR THE HOME

## Compact Heater for Small Homes

**I**N building small homes the builder has a serious heating problem to consider. He does not want to make it a stove proposition because of the limitations of that means, and he hesitates to specify too large and expensive equipment. A new heater device has been invented as a happy medium.

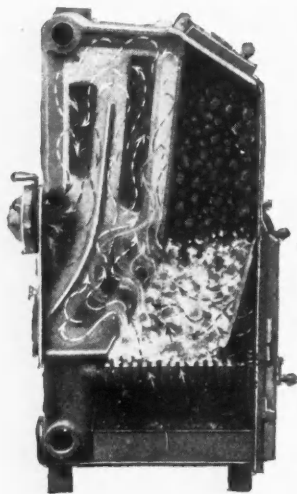


Fig. 1. View of Heater, Showing "Open Fireplace" Arrangement and Magazine Feed Chamber.

This is a small compact heater which burns coal in an "open fireplace" arrangement. It is installed in the living room or any other room on the house floor and is then connected by piping to hot water radiators of any standard type placed in adjoining rooms.

As shown in Fig. 1 above, the combustion chamber containing the fuel and in front of the interior water sections is the magazine or reservoir which holds the fuel. As fuel in the combustion chamber is consumed fresh fuel feeds downward automatically from the magazine providing constant heat and steady temperature.

Fig. 2 shows a typical six-room installation with the piping connecting the central heater and the radiators in other rooms. The warm water flows thru the upper system of piping and returns thru the lower system. The heater may also be installed as an individual heater in any room having a chimney. It is made in five sizes.

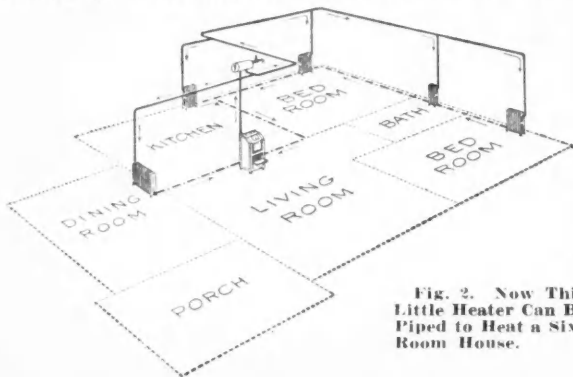
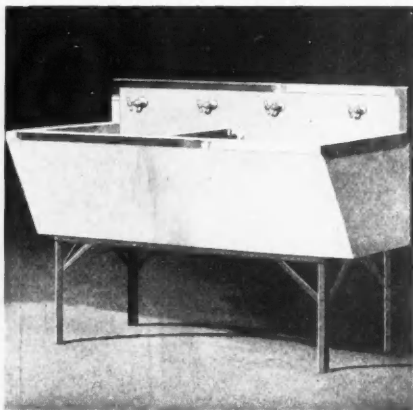


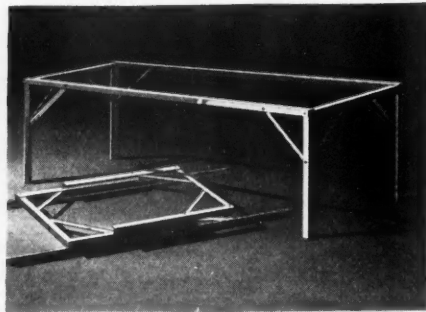
Fig. 2. Now This Little Heater Can Be Piped to Heat a Six-Room House.

## Cement Laundry Tubs Contain Special Feature



Concrete Laundry Tray Mounted on Special Stands. This Tub Is Offered in One, Two or Three Compartment Sizes.

**L**AUNDRY equipment is now an important item in both builders' and plumbers' specifications. As a definite part of the construction work, the laundry tray or tub should have certain qualities which appeal to the housewife, and in the illustration shown here is a tray of modern type embodying several features of interest.



Collapsible Stands Which Are Made to Support Concrete Laundry Tubs.

It is made of cement molded in one piece, and is divided into one, two, or three compartments. These compartments are molded with rounded corners to make cleaning easy. The cement is waterproof and cast without seams. These compartments are made with or without back extensions and are mounted on a collapsible frame which can be quickly dismantled for shipping as shown in one of the accompanying illustrations. Moreover, this frame arrangement permits the use of a third brace under the center of the tray in case it contains three or more compartments. This will prevent sagging and subsequent cracking from unsupported weight.



## Single Pipe Vapor Heating System

**S**PECIAL vapor appliances make the operation of a single pipe vapor system with the same general piping plan as the ordinary pipe steam system, conveniently simple. A system with this equipment now being manufactured has created quite a bit of interest among architects and builders.

The piping plan does not change a steam system into a vapor system—it is the appliances that are used in connection with the system which by quickly clearing the air from the system permit the vapor to circulate under a minimum pressure.

This new system operates under the same low vapor pressure as the two-pipe vapor system, which is from 4 to 12 ounces—except on large installations, where there is a variable increase in pressure according to the size of the system.

The main features of this single pipe vapor system are the air relief valve and lock radiator valve, indicated in diagram. The air relief valve works independently of any thermostatic action. The air passage way is entirely clear and the air is about four times that of the regular automatic air valve. This permits the air to be expelled quickly from the radiator when the supply valve is open, admitting vapor at even the slightest pressure. When the radiator has been cleared of air the vapor instantly closes the inlet opening of the air relief valve. This prevents any water from collecting in the valve.

The lock radiator valve has a full pipe size opening thru the valve, allowing a rapid passage of vapor into the radiator and easy return of water of condensation. This permits of a great saving because if the room becomes too warm it is

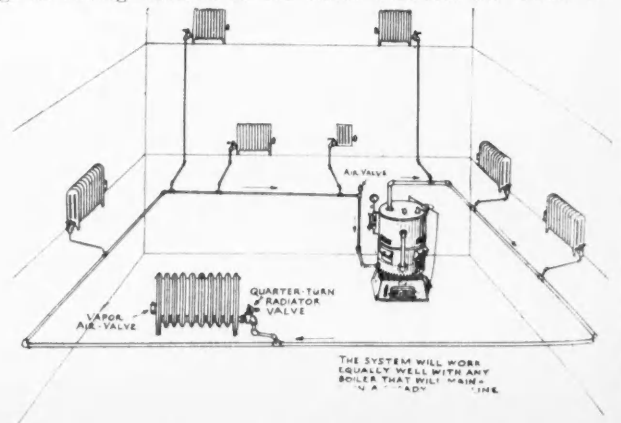


Diagram Showing Circuit Main System of Piping.

THE SYSTEM WILL WORK EQUALLY WELL WITH ANY BOILER THAT WILL MAINTAIN A "STEADY" LINE.



# FREE—This Book on Wood Finishing



This book is full of practical information on finishing new floors and trim and refinishing old work of this kind. Written by experts—profusely illustrated—contains color charts—gives covering capacities, etc. We will gladly send it free and postpaid to contractors and builders.

**S. C. JOHNSON & SON,**  
Dept. AB6, Racine, Wis.

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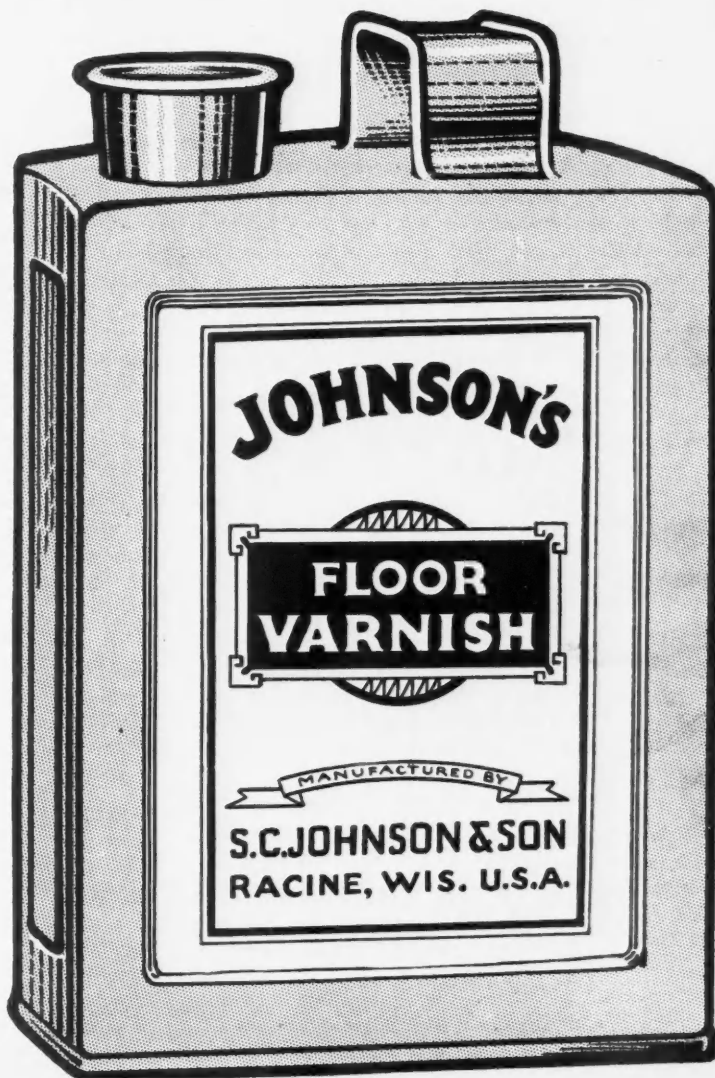
## “Made to Walk on”

Johnson's Floor Varnish dries dust-free in two hours and hard over night. It imparts a beautiful, high lustre—has good body—will give long wear—is absolutely water-proof—and will stand all reasonable tests.

Johnson's Floor Varnish is tough, elastic and durable. It gives a beautiful high gloss which will not chip, check, mar, blister or scratch white. Is very pale in color so can be used on the lightest floors and linoleum. Splendid for furniture, woodwork and trim of all kinds. May be rubbed if desired.

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We will gladly send you a pint of Johnson's Floor Varnish, all charges prepaid, if you will test it in comparison with the brand you are at present using. Write us on your business letterhead—there is no obligation whatever attached to this offer.



# JOHNSON'S FLOOR VARNISH

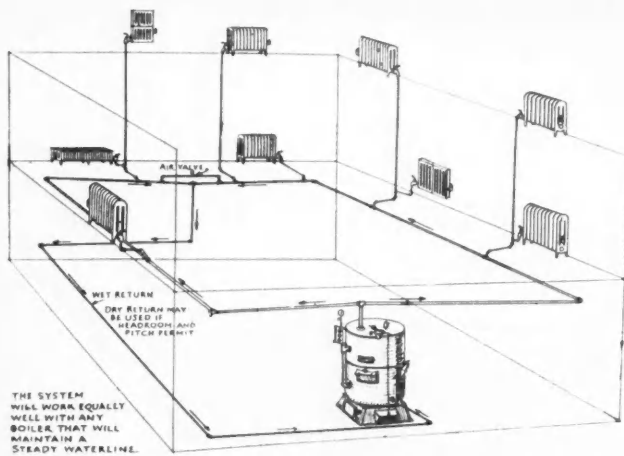


Diagram Showing Steam Main Branching Both Ways from Boiler with Either Wet or Dry Return Back to Boiler.

unnecessary to open a window. A slight turn on the valve turns off the radiator quickly.

The piping plan is the ordinary single pipe system of piping.

### Atlantic Adopt Zoning

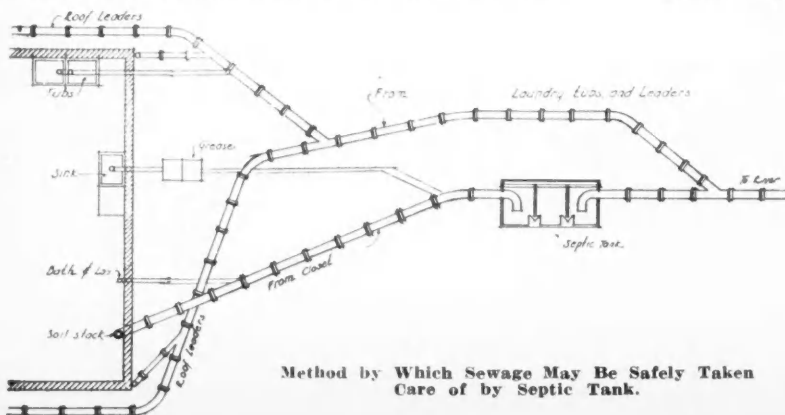
ATLANTA adopted a zoning ordinance April 10, 1922, by a nearly unanimous vote of the Council. The ordinance divides the city into dwelling house, apartment house, business and industrial districts. Three classes of freight districts are established with limits of 50 feet, 100 feet and 150 feet respectively. Building line, side yard and rear yard requirements are established for all buildings in the residence districts. Lot area requirements are based on the number of housekeeping units for which the residence building is arranged; 5,000 square feet of lot area per family is required for much of the dwelling house area and 2,500 square feet of lot area per family for the areas suited to double or two family house development. In most of the apartment house areas only 625 square feet per family is required while in the limited hotel and elevator apartment sections there is no minimum lot area requirement, tho side, rear and front yards are required.

The zoning plan and ordinance was prepared for the Atlanta Plan Commission by Robert Whitten, city planner, Cleveland, Ohio.

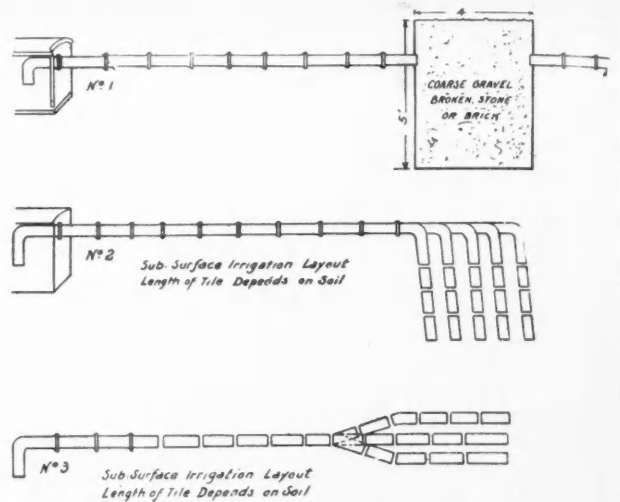
### Waterproof Concrete Septic Tank for Sewage Disposal

AN interesting development in the problem of sewage disposal is a waterproof concrete septic tank which is made in different parts so that it can be easily shipped and quickly assembled. It is made up in fifteen sections, total weight about 2,800 pounds.

When installed it is 7 feet 4 inches long, 32 inches wide and 27 inches deep inside and is sufficient for the requirements of eight people. It offers the farmer or family living in a section where a regular sewage system has not been installed a chance to have a bathroom, toilet and kitchen sink in the house.



Method by Which Sewage May Be Safely Taken Care of by Septic Tank.



Three Methods of Disposing of Waste Liquid After It Has Passed Thru Septic Tank.

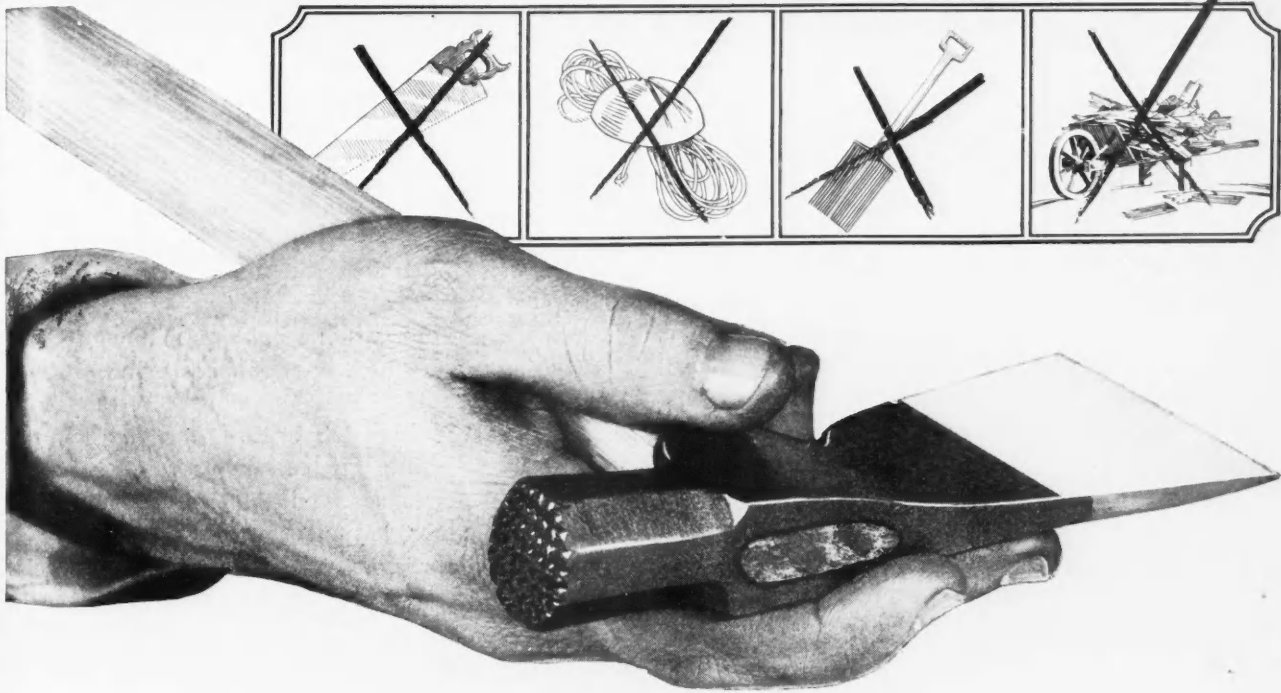
The tank is buried in the ground at any distance from the house desired by the user (see illustration) and is connected with the house drain. As soon as sewage enters the tank the process of destruction is begun by the billions of bacteria contained in the sewage; the sewage is converted to a liquid form, which is discharged from the last chamber to be distributed in the gravel or sand sub-soil, or run into the farm drainage tile system.

### How Asphalt Shingles are Made

THE thousands of tons of rage daily consumed by the roofing industry are obtained thru dealers in all parts of the country and, upon their arrival at the factory, are sorted and reduced to a pulp, similar to that used in the manufacture of paper. This pulp is then transformed into a fabric or felt, of long fibre and great durability. Hot asphalt is forced thru every pore and fibre of the fabric and the combination is then coated above and below with asphalt so as to make it proof against decay and leakage. Because asphalt is a substance that does not dry out, the roll roofings or the shingles which are cut from this fabric do not crack or split. They are resilient and pliable and do not break from their moorings. As they contain no materials that freeze or rust they are also proof against frost. The roll roofings or shingles are covered with a crushed slate or rock surface in attractive colors which shields them from wear and further preserves the fabric against the ravages of the weather. During manufacture the crushed slate or rock surface is imbedded in the asphalt as firmly as pieces of marble are imbedded in a mosaic floor. The shingles are made in different sizes and in three colors—red, green and blue-black. By using appropriate colors or different combinations of colors it is possible for the home builder to get not only a fire-safe and a serviceable roof but one that can be made very artistic and that will blend nicely with the surrounding landscape.

NINETY per cent of all autos are used more or less for business. Sixty per cent of mileage of average car and 78 per cent of farmer car mileage is for business. Thirty-four per cent of average mileage is instead of trolley or railroad or where there is no other means of communication. The average car owner adds 57 per cent to his output thru the use of the automobile; the farmer adds 68 per cent to his efficiency.

California and Iowa lead in the number of cars as compared to population, with one car for every 5.2 inhabitants.



## How's this for a shingling kit?

A lather's hatchet is all you need to re-roof with Johns-Manville Asbestos Shingles.

No need to shovel off the old shingles with their dust and litter—it's just a straight nail-on job from start to finish. The nail-holes are in the shingles and the nails come with them.

Edgings are easy. Score the shingle with the hatchet edge. A reverse snap gives you a clean, straight edge that fits in close to the chimney, skylights, ridge or valley. A quick nick with

the hatchet point starts extra nail-holes when needed.

Altogether, it's a quick, clean job that gets you to the ridge-pole in record time.

You will find many prospects in your locality who will be interested in re-roofing with Johns-Manville Asbestos Shingles. Johns-Manville will help you sell them.

Write your nearest Johns-Manville branch for particulars.

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Madison Avenue at 41st St., New York City  
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*that cut down fire risks*  
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*that make brakes safe*  
FIRE PREVENTION PRODUCTS

# JOHNS-MANVILLE Asbestos Shingles



## Variation in Brick Strength

SOME CODES ALREADY HAVE PROVISION FOR THIS DIFFERENCE AND PREVENT WASTE OF MATERIAL

By W. Carver, Architect

**M**ANY building codes have in them a provision which reads as follows: "All brick walls must be at least eight inches thick." This should be modified to allow, under proper restrictions, the use of four-inch brick walls for bearing and non-bearing partition purposes. Such walls are considered standard construction in various countries in Europe. In England, for instance, over 90 per cent of all houses erected are built with four-inch brick interior bearing partitions, while brick laid on edge are widely used in non-bearing partitions. Hundred of thousands of square feet of the latter wall are built annually all over Europe and partitions thus constructed are found to be satisfactory.

A thoro series of tests on the stability and compressive strength of thin brick walls was recently made by the Building Material Research Committee of the British Government. The results in condensed form are presented herewith.

As the investigation was somewhat tentative, a part only was undertaken in the first place, and a second series of tests was begun after the first results were available.

It is to be noted that the stock bricks used—both soft and hard burned—are below our standards; A. S. T. M. specifications, requiring a minimum of 1,000 pounds per square inch compressive strength for soft brick (the stock brick averaging only 760 pounds) and 2,000 pounds for medium brick. The "hard burned stock brick," with a compressive strength of 1,460 pounds per square inch, would, therefore, be classified as soft burned brick under our regulations. Specimens of the other variety of brick—Fletton brick—used in the 4-inch partitions developed a strength of 3,300 pounds per square inch, just below the A. S. T. M. requirements of 3,500 pounds per square inch for hard brick. Specimens of the same brick as used in the brick on edge partitions developed 3,500 pounds

Thickness	Bricks	Mortar	Crushing Strength 9"x9" Cubes Lbs. per sq. in.	Age of Cubes When Tested Days	Lbs. per sq. in. crushing strength of wall 14" wide 8'-6" high	Age of wall Compression test, Days	Horizontal pull to break wall 3'-6" wide 8'-6" high, lbs.	Tons per ft. run. Vertical load while wall tested under hori- zontal pull	Age of wall tested under horizontal pull, Days
4 1/2 in. ....	Stock . . . . .	3:1 Cement . . . . .	770	26	638	24	895	2 tons	34
4 1/2 in. ....	Stock . . . . .	6:1 Cement . . . . .	720	26	562	23	791	1 ton	41
4 1/2 in. ....	Fletton . . . . .	3:1 Cement . . . . .	1,530	26	1,040	24	781	1 ton	39
4 1/2 in. ....	Fletton . . . . .	6:1 Cement . . . . .	1,250	26	930	23	705	1 ton	36
4 1/2 in. ....	Fletton . . . . .	3:1 Lime . . . . .	1,050	22	330	24	375	1 ton	27
2 5/8 in. ....	Fletton . . . . .	3:1 Cement . . . . .	1,470	29	1,040	23	553	1 ton	44

Table of Results Obtained in Interesting Series of Tests Conducted with Narrow Brick Walls to Determine Strength

The object of the tests was to ascertain the breaking strength of walls 4 inches thick and 2 5/8 inches thick when subjected to crushing loads and horizontal pressure while the walls were held at the top and the bottom. In practice such walls always receive support either at the top or sides or both. The panels as built corresponded roughly to a wall having in it two door openings, the strength of a wall with no openings being somewhat greater. The panels were 8 feet 8 inches high, about the height between floors in a cottage type of building. The specimens were loaded to destruction in three ways:

(1) Small cubes, generally 6 or 9 inches square, were crushed in order to ascertain the strength of the material when not used as a thin structure.

(2) Columns or pillars, 14 inches wide, from 2 5/8 inches to 4 1/2 inches thick and 2 feet 6 inches high. These narrow, thin walls or pillars were crushed, and their relative strengths compared with that of the cubes were ascertained.

(3) Short lengths of wall, 3 feet 6 inches wide, from 2 5/8 to 4 1/2 inches thick and 8 feet 6 inches high, were subjected to a vertical load of about 1 ton per lineal foot of wall, and, while thus loaded, a horizontal pull was applied to the wall at the middle of its height until failure took place.

per square inch, however.

Dr. Oscar Faber, who had charge of the tests, says in his detailed report:

"A remarkable feature of the tests is the fact that these very long, thin specimens gave such very high carrying capacity in comparison to the strength of the materials of which they were composed. As a matter of fact, the mean figure for the whole of the seven tests gives 69 per cent as the ratio to the strength of the long columns to that of the cubes, which is considered to be a surprising result. In regard to the materials used the Fletton bricks appear to have been of good quality and very uniform, while the stock bricks varied considerably, some being hard burnt and some very soft.

"The tests show that brickwork in 3 to 1 mortar is stronger than brickwork in 6 to 1 mortar in the ratio of 100 to 88 in the case of stocks and 100 to 89 in the case of Flettons, which are very consistent results. They indicate that brickwork set in 3 to 1 lime mortar is only about one-third as strong as brickwork in cement mortar when used for long, slender specimens, altho when tested in short cubes it may show as much as 80 per cent of the strength of brickwork in cement.

(Continued to page 158.)

**Working Drawings Available to You**

This home was designed for a private owner by one of the best residence architects in America.

Sometime ago we published a view of it in one of our books and it attracted so much favorable attention that we had hundreds of requests from all over the country for details and plans.

At last we have prevailed upon the architect to grant us the right of supplying complete working drawings and specifications. These working drawings are exceptionally complete and contain many full size details which make them unusually valuable and different from the ordinary.

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This home can be built of Brick (solid masonry) for as low as from \$9,000 to \$13,000 depending upon location and the character of equipment and finish.

After you see the plans in circular No. 705 you should be able to determine the approximate cost of this popular home in your locality. With the complete plans—working drawings—and specifications, which are yours at a nominal price, you can estimate exactly what it will cost to build this home.

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When this home was first built the Ideal Brick Hollow Wall was unknown. Its recent development makes possible the building of this Brick home for even less than the above figures. With the Ideal wall you obtain all the advantages of solid masonry construction at a saving of 1/3 in cost.

The Ideal Wall is thoroughly described in "Brick, How to Build and Estimate"—a 2-page manual of vital information for contractors and builders. It contains 30 tables, 9 full page detail drawings and other information which proves of wonderful assistance in estimating costs quickly and accurately. Only 25 cents postpaid.

The Hiawatha is one of a wide variety of Brick house designs shown in that fascinating volume, "Brick for the Average Man's Home." Here you will find all kinds of homes illustrated and described, together with much helpful information which will prove of great value in interesting prospective home owners, thus helping you to land jobs. The nominal price of \$1.00 is to cover printing and distribution costs only.

\$1.25 brings both books. Address The Common Brick Industry of America, 2127 Cleveland Discount Building, Cleveland, O.



The Hiawatha

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This home is so good looking, practical and economical that it appeals to every one. It is declared by experts to be the finest of its class in America.

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You can now secure complete plans and specifications for this remarkable brick home. Send for free circular No. 705 showing alternate floor plans and giving complete details.



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An honest product, honestly advertised.

*Responsibility—*

A reputation for honorable, prompt and efficient business dealings.

*Service—*

A material of proven integrity with a record of ages of service.

**The Common Brick Industry of America**

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Cleveland, Ohio

*The Ideal Brick Hollow Wall is made of standard brick obtainable everywhere*

**Ideal Brick Hollow Wall**

*"Brick Homes at the Cost of Frame"*

# 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.

### Cast Iron Welding Process Saves \$1,200 on Single Job

OUT of the acetylene welding shops in Newark, N. J., and Chicago, come some of the most valuable examples of modern welding and cutting that American industry affords. An instance that has recently come to public attention is the welding of a 13-ton cast iron tar kettle, which was broken in shipping from the foundry to a well-known manufacturer of roofing materials in Chicago. The kettle is a cumbersome thing, 8 feet in diameter, by 8½ feet in height, and has a flange and wall thickness of 2¾ inches.

When the kettle was removed from the railroad to the welding shop, where it was ordered sent for repairs, it was found that there were two ruptures, one break extending thru the rim and down into the body of the kettle for a distance of 18 inches, and one, similar in character, about 26 inches long. The position and nature of the fractures were such that ordinary procedure in preparing the casting for welding could not be followed. The application of preheat presented an unusual problem, owing to the necessity for keeping the



Huge Tar Kettle Which Was Repaired by Oxyacetylene-Welding Process at a Saving of \$1,200. The Kettle Weighs 1,300 lbs. and Had Two Ruptures in It, 18 and 26 Inches Long.

kettle in an upright position. To afford a base for a temporary furnace, empty carbide cans were piled up to a point just below the lowest zone requiring preheat, a thin covering of light gauge steel sheets was provided, and the furnace of fire brick was set upon the sheeting. Had it been possible to employ customary preparation, it is estimated that there might have been a saving of approximately 40 per cent in time on the job as a whole. Even so, the smaller crack was welded in 8 hours and the larger one in 11½ hours, the work being done by a crew of three. The net saving to the roofing company was \$1,200. Moreover, the job took but three days as against three months, which would have been required for replacement from the foundry.



### Movable Stairway Makes Attic Accessible

IN many homes, years after they have been built, it is often found necessary to use the high attic for extra sleeping rooms. The question of accessibility is the most troublesome to the builder who is doing the remodeling. He wants to make this attic easily accessible, but still he does not want

to use up valuable space in the room below to build a stairway.

This problem has been solved by the installation of a movable stairway. It has been used with satisfaction for several years, in dwellings, offices, garages, store-rooms, schools, etc.

The photograph below is typical of scores of cases where the owner wanted to



How Attic Can Be Used Without Using Up Space Below for Stairway. This Stairway Can Be Pushed Up Out of the Way When Not in Use.

transform the attic into one or more sleeping rooms, but hesitated when confronted with the necessity of sacrificing space in the room below for a stairway. A builder showed him how to do it.

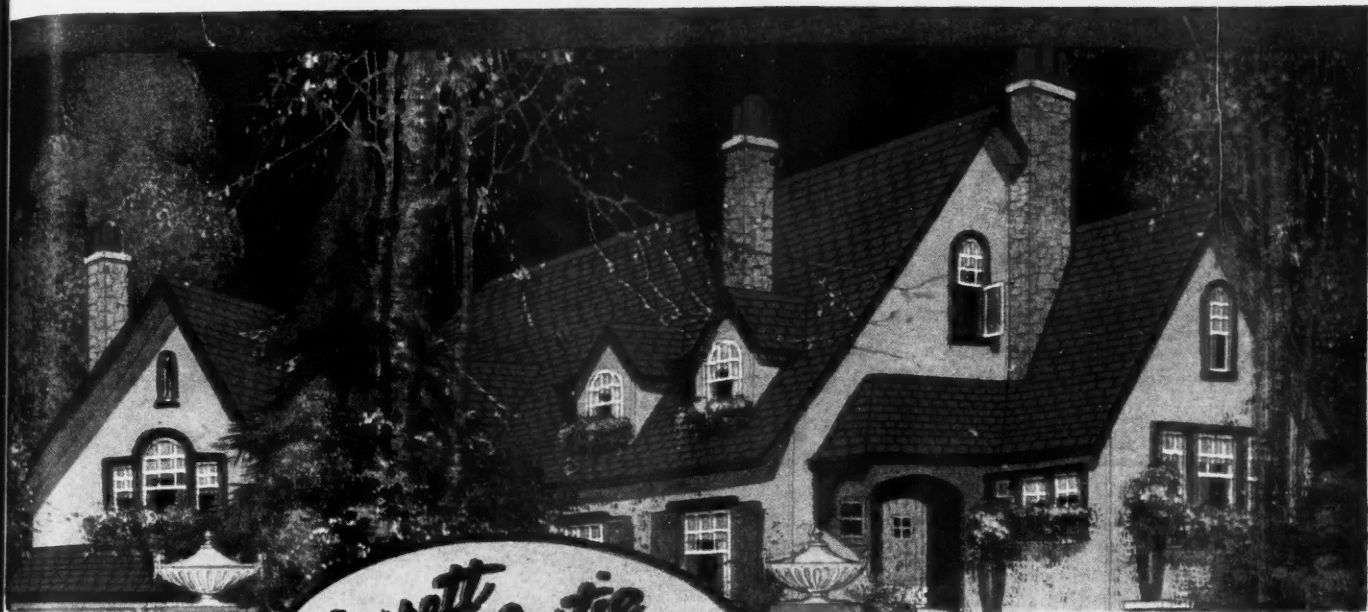
This stairway is also used in new buildings, taking the place of the box or open stairway into the attic. It can be lowered or raised very easily, and when folded up, there is nothing visible in the ceiling except a neat panel of wood. The stair horse slides up and down on this panel. It is operated by two side cables which are connected to a balancing spring barrel. The rod fastened to the inside of the panel is the equalization bar. Its function is to equalize the pull, regardless of the position of the stairway. This is accomplished by pulleys fastened to cables and which move forward as the stairway goes up. This causes the panel to close tightly against the ceiling.

In buildings where the ceiling must be cut out and the opening cased up the job of installation will require less than a day. In a new building where the ceiling has been prepared the work can be done in much less time.



ACCORDING to the North West Farmer (Winnipeg) hail insurance is a rather hazardous undertaking for the various companies operating in the Canadian western provinces, who lost approximately \$2,500,000 during the past season.





An Everlastic-roofed building holds its head high in the landscape, weathers all storms, and emerges refreshed and resplendent after every drenching rainfall.

## Roofings to Suit Every Preference and Every Purse

WITH the two recent additions—Everlastic Octo-Strip Shingles and Everlastic Giant Shingles—the line of dependable Barrett Everlastic Roofings is most complete.

This varied line will satisfy your customers' every requirement as to price and style of roofing. You can also count on the attractive and lasting qualities of these roofs to create more business for you.

From the following description you'll see how fully the "Everlastic Big Six" meets the roofing needs of every type of steep-roofed building.

### Two Kinds of Strip Shingles

**EVERLASTIC MULTI-SHINGLES**—Four shingles in a strip. Made of high-grade waterproofing materials and heavily mineral-surfaced in two rich, permanent colors—red and green. A special waterproof "seal back" protects the underside from air and moisture.

**EVERLASTIC OCTO-SHINGLES**—The newest thing in roofing. Four octagonal shingles in a strip. Mineral-surfaced in fadeless red and green. Because of the unique shape of these shingles, a variety of artistic designs can be worked out in the roof, merely by alternating red and green strips.

### Two Kinds of Individual Shingles

**EVERLASTIC SINGLE SHINGLES**—Red or green mineral wearing surface. Rot proof, waterproof "seal back." The recognized standard—famous for beauty, durability and economy the country over. When a customer is in doubt you can safely recommend Everlastic Single Shingles.

**EVERLASTIC GIANT SHINGLES**—The "big brother" of the Everlastic Single Shingle—"giants" for strength and service. Have thicker, stronger felt base than the Single Shingles, but are the same in every other way. The most rugged, handsome, and durable shingle on the market, and length of service considered, the most economical.

### Two Kinds of Roll Roofing

**EVERLASTIC "RUBBER" ROOFING**—The best known, biggest value plain surfaced roll roofing on the market. Made as well as good roofing can be made—priced as low as good roofing can be priced. Never fails to give satisfaction. Three weights. Light, medium and heavy.

**EVERLASTIC MINERAL-SURFACED] ROOFING**—The "Roll Roofing de Luxe." Made of best quality roofing felt, thoroughly waterproofed and heavily coated on the wearing surface with crushed mineral, in either red or green.

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# CORRESPONDENCE

Questions answered—ideas exchanged

Our Readers are Requested and Urged to Make Free Use of These Columns for the Discussion of all Questions of Interest to Carpenters and Builders

## At Least There Is Plenty of Variety

**EDITOR'S NOTE:** When Bro. E. H. Smith propounded the "rug problem" published in the March AMERICAN BUILDER, he perhaps did not realize how many sleepless nights he was causing, nor the number of weary brains that would be the result of his question. Readers have found this problem most "intriguing" and the answers prove the old theory that "variety is the spice of life." In other words, they do not agree as to method. This problem has been submitted to professors of higher mathematics who, too, lost sleep seeking the answer. With what success we leave to your judgment. We are publishing a few from the avalanche of replies that came to the office. Even from Europe comes word that this problem threatens to overshadow the Genoa conference as far as real interest is concerned.

## And Here Is a Solution from a Local Boy

To the Editor: Chicago, Ill.

Here is my solution of the strip of carpet problem for the 18-foot 0-inch by 12-foot 0-inch room:

From the layout of the room and its measurements, we know that everything will be figured on a ratio of 18 to 12.

18 squared times X plus 12 squared times X equals 36.

18 square plus 12 square equals 21.8632.

To find the value of X we divide 36 by 21.8632, which gives us 1.65.

18 times 1.65 equals 29.7, or the width of one side of the triangle.

12 times 1.65 equals 19.8, other side of the triangle.

18 feet minus 1 foot 7.8 inches equals 16 feet 4.2

inches, length of the long side of the room.

12 feet minus 2 feet 5.7 inches equals 9 feet 6.3 inches, length of short side of room.

$\sqrt{16 \text{ ft. } 4.2 \text{ in.} \times 16 \text{ ft. } 4.2 \text{ in.} + 9 \text{ ft. } 6.3 \text{ in.} \times 9 \text{ ft. } 6.3 \text{ in.}}$  = 18 feet 11.06 inches, or the length of the carpet needed to cover floor as per drawing.

L. R. HUME.

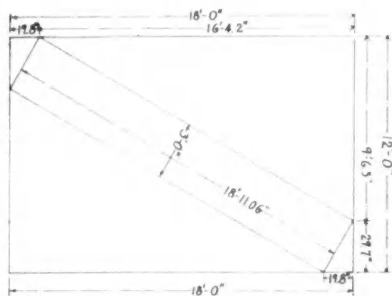


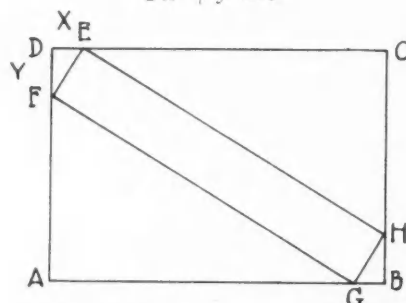
Diagram Illustrating Method Used by Bro. Hume.

## This Comes from Holland

To the Editor: Rotterdam, Holland.

Those who say the problem in angles from W. E. H. Smith cannot be worked are wrong.

$$\begin{aligned} \triangle DEF &\sim \triangle EHC \\ x : y &= (12 - y) : (18 - x) \\ 18x - x^2 &= 12y - y^2 \\ x^2 - y^2 &= 18x - 12y \dots\dots\dots(1) \\ x^2 + y^2 &= 9 \dots\dots\dots(2) \\ \hline 2x^2 &= 18x - 12y + 9 \\ 9 + 18x - 2x^2 & \\ y &= \frac{12}{2x^2 + y^2} = 9 \end{aligned}$$



Peter Vermaas Has Sent This All the Way from Holland.

Now can be written

$$x^2 + \left( \frac{9 + 18x - 2x^2}{12} \right) = 9$$

$$144x^2 + 81 + 324x - 36x^2 + 324x^2 - 72x^3 + 4x^4 = 1,296$$

$$4x^4 - 72x^3 + 432x^2 + 324x = 1,215$$

$$x = 1.48$$

$$y = 2.66$$

$$EH = \sqrt{EC^2 + CH^2} =$$

$$EH = \sqrt{16.52^2 + 9.34^2} = 18.95$$

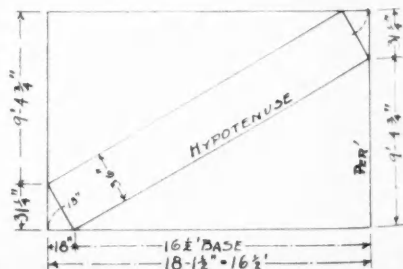
P. J. VERMAAS.

## While Utah Submits This for Approval

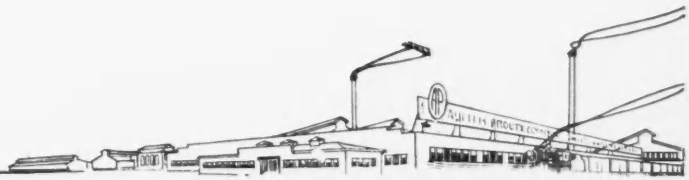
To the Editor: Helper, Utah.

I have gone over your problem of angles in regards to a strip of carpet 3 ft. wide in a room 12 ft. by 18 ft. The problem resolves itself into this:

In order to keep both outside parallel lines straight, you have to take half the width of the rug and measure back that amount from corner of the room. This will apply to any width rug placed in that position. And I am positive that the outside parallel lines can remain the same length only when governed by measuring back from opposite one-half of the width of the rug. In the small triangle I have given the hypotenuse and the perpendicular to find the base



The Same Problem but a Different Way of Illustrating It from Bro. Hanson, Helper, Utah.



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in the large triangle after making deduction of small angle. I have given the base and the perpendicular to find the hypotenuse which is the length of the rug and I find it works out by square root. This is considerable work, and I should find it much easier to draft it out, which is very quickly done by going back from the two opposite corners or on the two parallel lines of room of same length one-half of the width of the rug and the other two corners will just fit within the wall nicely.

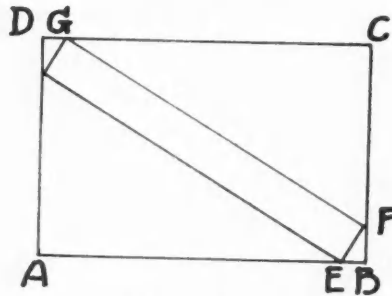
$$\begin{aligned}
 36 - 1,296 \\
 18 - 326 \\
 1,296 - 326 = 970 \text{ or } 31\frac{1}{4} \text{ base} \\
 12 \text{ feet} = 144 \text{ inches} \\
 \frac{31\frac{1}{4}}{12} \\
 112\frac{3}{4} \text{ or } 9 \text{ feet } 4\frac{3}{4} \text{ inches} \\
 16\frac{1}{2} = 272\frac{1}{2} \\
 9\frac{1}{4} = 86 \\
 \frac{272\frac{1}{2}}{86} \\
 358\frac{1}{4} \text{ or } 18\frac{15}{16} \text{ feet} = \text{length of rug.} \\
 \text{THEODORE HANSON.}
 \end{aligned}$$



**Not to Mention This from a Higher Mathematician**

To the Editor: Ada, Hardin Co., Ohio.

In reply to Mr. E. H. Smith's problem in angles in the March issue, I am sending a solution as worked by Prof. J. T. Fairchild, Ph.M., O. N. U., Ada, Ohio. He gave it to a class of sixty students and only one of the class solved it, so the professor



Bro. Smith Got a Professor to Work This One Out.

gave him an Ex for the rest of the term. Some problem, I'd say. I hope this is clear to Mr. Smith.

What is the longest strip of carpet one yard wide, that can be laid in a room 18 feet by 12 feet?

**SOLUTION**

Let ABCD represent the room and EFGH the strip of carpet. Let BF = Y, EF = 3 feet, and X = DG - EB.

AE = 18 - X and HA = 12 - Y.

The triangles EAH and FBE are similar.

Then, EA:AH::FB:EB, or 18 - X:12 - Y::Y:X, or 18X x X^2 = 12Y - Y^2 ..... (1)

We also have X^2 + Y^2 = 3^2, or X = sqrt(9 - Y^2) ..... (2)

Substituting (2) in (1) and reducing,

Y^3 - 12Y^2 + 108Y^2 + 54Y - 708.75

Solving by Horner's method,

Y = 2.607+ and sqrt(9 - Y^2) = X = 1.484+

Therefore EH the length is

sqrt((18 - X)^2 + (12 - Y)^2) = 18.97+ feet

∴ 18.97+ feet is the length of the carpet.



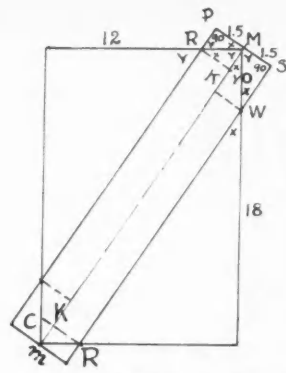
C. J. BOHANNON.

**And a Professor Offers This**

To the Editor:

$$\begin{aligned}
 \tan X &= \frac{2}{3} = 666\frac{2}{3} \\
 L X &= 33^\circ 41' 30'' \\
 L Y &= 56^\circ 18' 30''
 \end{aligned}$$

$$\begin{aligned}
 RM &= \frac{1.5}{\cos X} \\
 &= \frac{1.5}{.83205} = 1.8
 \end{aligned}$$



J. Novotny, Professor of Trigonometry in Chicago High Schools, says It Was a Brain-Teaser. He Submits This Sketch.

$$\begin{aligned}
 MW &= \frac{1.5}{\sin X} \\
 &= \frac{1.5}{.5547} = 2.7 \\
 MM &= \sqrt{144 + 324} \\
 &= 21.6 \\
 OM &= RM \tan X \\
 &= \frac{1.5}{.83205} = 666\frac{2}{3} \\
 &= 1.2 \\
 OW &= 1.5 \\
 MK &= OM \cos X \\
 &= \frac{1.5}{.83205} = .83025\frac{2}{3} = 1.5\frac{2}{3} = 1 \\
 &= .83205
 \end{aligned}$$

Distance KK = 19.6 feet, etc.

Many of these distances can be worked out from similar triangles.



**Good Idea—But Other One Is Practical**

To the Editor: Troy, N. Y. Fig. 7, page 116, of the AMERICAN BUILDER for March, 1922, shows a diagram which is not correct.

In this diagram air will not circulate from outside into the room when a fire is built in the fireplace. Instead of air circulating as indicated by the arrows it will circulate in the opposite direction.

We are all aware of the fact that when air is heated it expands and also that an equal volume of heated air is lighter than an equal volume of colder air under the same pressure.

In Fig. 7 the air is heated to a high degree in the duct behind the metal lining. As this air is heated it expands and rises. The air under the hearth and in the room is many degrees colder.

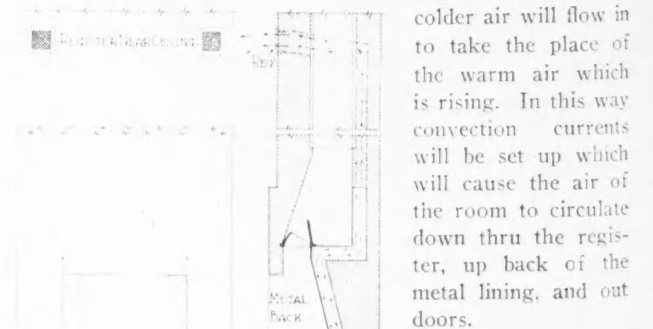


Diagram Showing How Fresh Air Can Be Drawn in from Outside, Heated in the Fireplace and Sent Out Into the Room.

This colder air will flow in to take the place of the warm air which is rising. In this way convection currents will be set up which will cause the air of the room to circulate down thru the register, up back of the metal lining, and out doors. By this system a man would be supplying his neighborhood with warm air instead of his own home. The accompanying diagram is an arrangement which will take in fresh air from out doors, heat it and send it into the room at the proper height. As the oxygen of the air is used and the carbon dioxide gas given off by people in the room; and as the air becomes colder it will settle. This colder impure air will be removed from the room thru the fireplace opening.

J. T. SCROULE.

# Ambler Asbestos Shingles

They solve the burning question. They can't burn, because made of two "unburnable", indestructible materials—selected asbestos fiber and high grade Portland Cement.

They also solve the question of how to keep down the upkeep. They are as permanent as they are attractive, requiring no painting or replacing.

Ask us to show their application to the building in which you are interested.

Fireproof  
Permanent  
Attractive  
Paint-Saving

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BRANCH OFFICES: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Minneapolis, New York, Philadelphia, Pittsburgh, Washington, Wilkes-Barre, Montreal, Canada; Toronto, Canada

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### Suggestion on Air Cooler Construction

To the Editor: Los Angeles, Cal.

In answer to Mr. Clinton Powell's question in the April issue of the AMERICAN BUILDER, I wish to submit the following:

The secret of a good and satisfactory cooler is to build it so it has a good draft, the same as a good chimney.

Make a square hole in the floor 8 by 8 inches and cover with  $\frac{1}{4}$ -inch galvanized wire and screen cloth to keep out flies and insects. Make shelves of slats, leaving them about  $\frac{1}{2}$  inch apart to give circulation. Make a hole in the ceiling about 11 by 11 and cover with screen wire cloth. This allows the hot air to escape. Always make the top hole in the ceiling or outside wall if the building is two stories high, so that it will have an area twice as large as the bottom hole in floor or wall. The cool or damp air from below rises and as it becomes warm or heated expands and passes out of the top hole thru the shelves. The warm air in the cooler rises and leaves a vacuum into which the cooler air or damp air rushes, causing a draft. The better the draft the better the cooler.

Rabbeted doors similar to those on ice boxes are the best kind, as they can be made tight so as to exclude the outside air.

Yours for better co-operation,

H. J. ACKERMAN.



### Are You One of These?

To the Editor: Coffeyville, Kan.

Will you give us the names and addresses of two or three contractors scattered throughout the country that you know have built a four room modern brick house for a cost not exceeding \$3,000?

E. R. DICK,

Secretary Coffeyville Vitrified Brick & Tile Co.



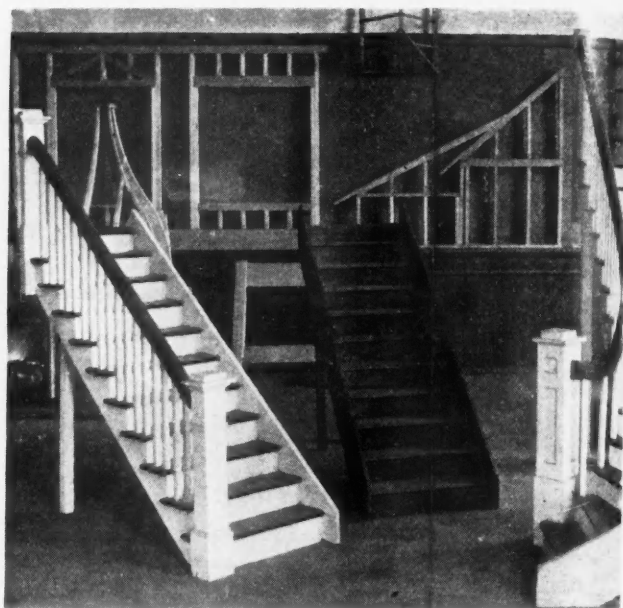
### High School Trains Young Men to Be Builders

To the Editor:

The views I am sending you were taken in the shop of the Trades High School, Columbus, O. Here boys study out their own designs for houses, make their own blue prints and actually build the houses. They are in miniature, of course, but they are built just like larger buildings. The boys also make furniture such as cabinets, tables, chairs. They have practical instruction in stair-building, samples of



Interior of Shop in Trades High School, Columbus, Ohio, Where Young Men Are Taught Building Trades, Particularly Carpentry Work.



Some of the Practical Lessons That Are Worked Out in Stair-building. Students Read the American Builder Every Month.

which are shown in one of the photographs. We have found that this course has turned out many successful builders and carpenters.

The AMERICAN BUILDER is read each month with great interest.

J. D. DEBRA,

Carpentry Department.



### Reducing Excessive Echo in Room

To the Editor:

Inverness, Fla.

There is a lodge hall in our town that is 61 feet wide, 65 feet long, inside measurements, 13 feet high. The officers' chairs are located at each end of the room and during a meeting the echo is so strong that you cannot hear or understand one another. This problem I know comes under "acoustics," but I have been unable to get any information pertaining to it.

I am enclosing a sketch of the room showing the location of the chairs and other details. It is on the top floor of a three-story building of brick construction, with 15-inch walls. The building has trussed roof covered with tin.

ARTHUR M. SMITH.

*Answer*—There are several ways of reducing the volume of sound and echo in a room. Heavy draperies of chenille along the wall or thick carpets on the floor will help. Plaster on wood lath is effective in reducing vibration and preventing sound from being hurled back into the room causing echo.

Upholstered furniture also helps. One open window will greatly reduce the reverberation of sound.—THE EDITOR.



### Here's Your Chance, Mathematicians

To the Editor: Chicago, Ill.

Here is an algebraic equation I came across in a little book accompanying a Starrett level that I would like to see solved, viz.:  $140.78X + X^2 \times \frac{1}{2} \times .24933 = 14677$ . What I wish to see is the method of clearing of fractions and transposing.

JAMES WILSON.



## Expansion and Contraction Shorn of Power

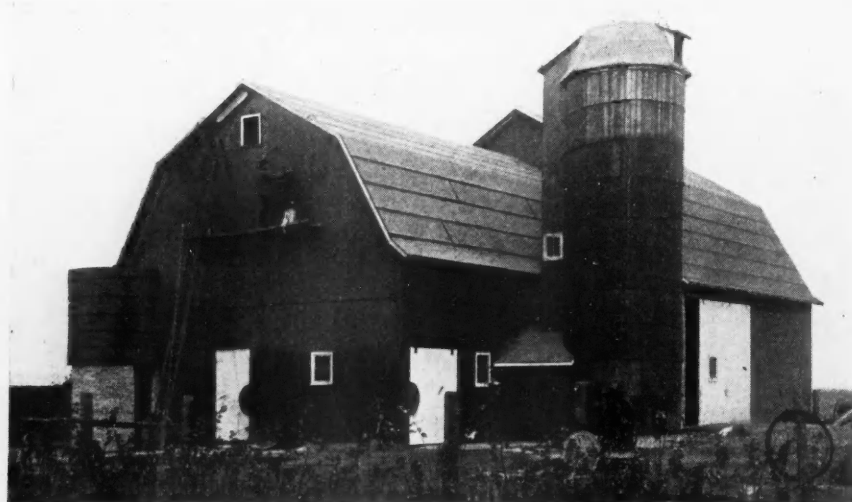
WHEN KELLASTONE stucco powder and the magnesium chloride mixing fluid are combined, the setting reaction results in a chemical crystallization absorbing a majority of the moisture content, thereby eliminating rapid evaporation and consequent high porosity. Accordingly, Kellastone stucco coatings are exceedingly dense, thereby effectively and permanently repelling the entry of moisture. By repulsing the attacks of the most active agency of expansion and also because magnesite by nature is dormant to expansion and contraction, cracking and deterioration caused by these destructive elements and so frequently present in ordinary stucco walls, may be completely avoided by specifying **Genuine Kellastone**.

KELLASTONE Super Plaster for interior walls is built on principles differing radically from any other plastic product. It is fibrous and very light, thereby possessing great volume and spreading capacity. It attains six hundred pounds per square inch tensile strength in thirty days. No plaster in existence can approach its flexibility and water will not damage it. It is highly plastic—works as easy as gypsum—and may be applied over any construction surface.

*Many architects and builders have expressed appreciation for the interesting KELLASTONE publications, copies of which we shall be pleased to send upon request.*

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**KELLASTONE**  
IMPERISHABLE STUCCO



Bro. Bochner Bought an Air Painting Machine a Year or So Ago and Is now Kept Busy Painting Barns in His Locality. He Had to Build an Addition to His Shop to Hold Back Numbers of the American Builder.

### Builds Addition to Shop to Hold Back Numbers of American Builder

To the Editor:

Saginaw, Mich.

I am a charter member of the AMERICAN BUILDER and have saved every number of it. In fact I had to build an addition to my shop to hold them all.

I have bought many machines advertised in the AMERICAN BUILDER, particularly a concrete mixer and an air painting outfit. In the enclosed photo I am using this painting machine on a barn job. I painted this barn a year ago and am now working on another job. I have found this equipment very profitable.

M. BOCHNER.



### Would Like to Exchange Fancy Woods for Inlay Work



End Panel of Inlaid Table Built by F. J. Stein.

To the Editor: Tampa, Fla.

Enclosed you will find the picture of the end panel of an inlaid table I built. The table has 3,682 separate pieces; it weighs 373 pounds. The elk head is walnut inlaid in gum; eyes of white bay and ebony; won first prize at the South Florida Fair. I would like to get in touch with brother carpenters in regard to exchange of different kinds of wood for this class of work.

F. J. STEIN.



### On Building a Cooler

To the Editor:

Sunnyside, Wash.

Replying to Mr. Clinton Powell, Lafayette, Ind., where I learned my trade. Coolers are put in about 20 inches square, plastered on the outside and sealed inside, with a tight door. Shelves are made out of slats about an inch apart. It should be built from the table shelf of the cupboard to the ceiling with two ventilator openings thru the outside wall, a screened one at the top, the other close to the bottom. They should be about 6 inches square.

If you will see Mr. C. W. Cuts, athletic instructor at the Purdue University, he will explain to you how I built one for him in Seattle.

C. A. Bagwell, Logansport, Ind.: I don't like the idea of

your round house. I don't think it is practical. If the kitchen was in the center so the wife could serve breakfast in bedroom, dinner in the dining room and supper in the den and we could be fed like the cows, it would be all right.

J. H. BROWN.



### Cement Block Builders, What Say You?

To the Editor: Greenfield, Ind.

I am thinking of building a house out of cement blocks and would like to hear from some of your readers who have had experience with them. Is this type house too damp? What are the objections, if any, and can they be overcome?

EARL R. GAMBREL.



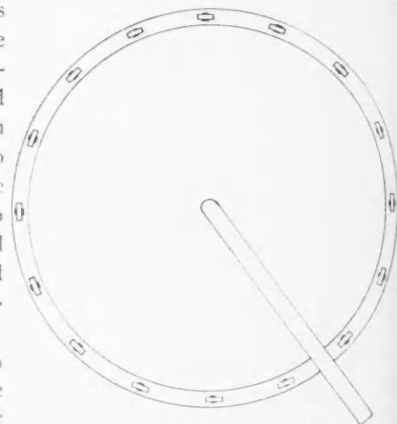
### Goes Brother Bagwell One Better

Ballantine, Mont.

To the Editor:

I saw Bro. Bagwell's round house design in the April issue and noticed that he wanted criticism from brother Chips. His design is almost the same as one I am going to build this summer, only in mine I am going to lay a steel rail around on the foundation and put wheels every 8 feet under the house with a projecting beam as indicated in the sketch. Then whenever we want to take a joy ride, all we need to do is hitch up a long-eared animal from Missouri and start off on our journey.

When we want to come back all we have to do is turn the mule around and go the other way. I am thinking of putting seats around the outside of the house and taking on passengers at ten cents for five minutes, also sell ice cream, popcorn and peanuts.



C. M. Mayo Likes the Roundhouse Idea, but Would Add Wheels as Shown Here.

C. M. MAYO.



### Dry Rot in Floor Causes Troubles

To the Editor:

Prentiss, Miss.

Will you please tell me what causes part of a floor to rot out quickly?

Three years ago I built a brick storehouse, 50 by 110 ft. We excavated the ground to a depth of about 24 inches below the floor line, and the floor is 10 inches above the ground level on the outside. We put five 8 by 14 ventilators on each side of the building and two in the rear end.

We used 2 by 12 hard yellow pine floor joists and sub-floors, then 1 by 4 hard yellow pine flooring, and oiled it.

There is no leakage or drainage of any kind that would cause dampness under the building, that we can find, but to our surprise there is a space of about 300 sq. ft. of flooring, sub-flooring, and joists, that is absolutely rotten. It seems to be dry rot. The rest of the floor seems to be perfectly good.



## The Highest Grade Engine the Cheapest for all Outfits

In the immense "New Way" factory the exclusive time and attention of the entire organization is devoted to the production of only one size and type of engine.

This simplified method of manufacturing makes it possible to see that each part is jigged, tooled and gauged and made uniform throughout, which parts, built into the "New-Way" engine, produce absolutely the world's best made engine of its power.

It is a known fact that quality is steadily improved by specialization, and this is in every sense true of the "New-Way" engine. If the "New-Way" experts spent their time over a multitude of sizes and outfits, the highest quality could not be obtained at such a low cost.

With the "New-Way" engine on your outfit you will obtain the maximum dependable service with the least expense. This means practically no idle men waiting for an engine to go. The "New-Way" always "Goes and Goes Right."

**THE "New-Way" MOTOR COMPANY**  
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The Air-Cooled, Multi-Purpose

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5 Engines in 1

## These Twelve Superior Qualities Should Convince Anyone

1. Air Cooled. No freezing—no boiling—no overheating—no water troubles.
2. Fuel. Operates as successfully on kerosene as gasoline. Select only this type engine.
3. Ignition. Bosch Magneto only—insures ignition reliability. No cheap battery or unreliable magneto used.
4. Power. Variable from 2 to 5 H.P. Controlled by automatic throttling governor. This engine meets eighty per cent of the stationary engine power requirements.
5. Weight. Delivers more horsepower per pound for its operating weight than any other complex engine.
6. Carburetor. Equipped only with float-feed automobile type instead of common mixing valve—insures easy starting, high economy and smooth operation.
7. Lubrication. Dustproof. All wearing parts are enclosed and run in a bath of oil—insures long life.
8. Balance. Mechanically and accurately balanced to eliminate vibration—makes use ideal on light portable machinery.
9. Compactness. Complete in one unit. Can be mounted in small space. With or without sub-base.
10. Dependability. Building one standardized engine only means uniform quality and superior service.
11. Dynamometer Test. Only stationary gas engine we know of using this exacting test.
12. Performance and Satisfaction. Everywhere, manufacturers and dealers of the highest class are recommending the "New-Way" on account of its superior merits and high performance.



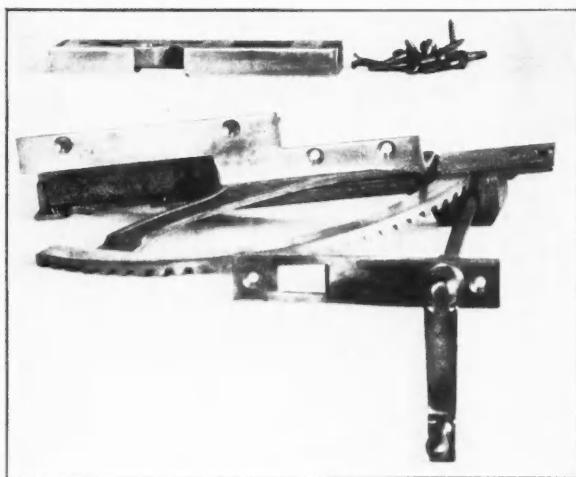


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### Casement Adjuster for Outswinging Windows

**E**ASY and quick installation was the thought in the mind of the designer of the new casement window adjuster illustrated below. It is used in all outswinging casement windows in public buildings, schools, sanitariums, hospitals, etc., as well as on sleeping porches and sun parlors.

It is designed to fit old or new casement sash, single, double, in pairs, or in multiples of four or more. The height of the window does not affect the operation of the hardware, but where the height exceeds 5 feet or width 2 feet, an automatic "pull to" top pivot is recommended. Maximum width of sash should not exceed 34 inches. The hardware is manufactured in two standard sizes for windows  $1\frac{3}{8}$  and  $1\frac{3}{4}$  inches. For greater widths it is necessary to groove the bottom of the sash to permit the metal lip of the adjuster to fit snugly. Complete installation can be made in about 45 minutes.



Detail View of New Casement Adjuster Control Lever and Worm Gear. This Device Is Made of Solid Cast Bronze and Can Be Installed in 45 Minutes.

The adjuster is operated by turning a small control lever which by means of a worm gear opens and closes the window. The gears being in mesh form a lock when in any position from tight closed to full opening. The design affords big leverage, the distance from the pivot point to the teeth of the quadrant being  $5\frac{1}{2}$  inches, while the crank has  $3\frac{1}{2}$  inches leverage, giving a total of 9 inches. The window is balanced on the upper and lower pivot, which are of steel ball-bearing construction. The complete equipment with the exception of the pivot bearing is made of cast bronze.

Insect screens and storm sash are placed on the inside of the window and are not disturbed by the operating window. The adjuster does not interfere with shades or draperies.

### Operating Cost of New Saw Rig is Low

**N**O contractor doing concrete work can afford to be without a saw rig. Its value on work of this kind is readily seen when it is considered how much lumber is necessary in constructing concrete forms for an ordinary building.

The saw rig shown on this page is designed to do the work of five carpenters and do it more accurately. This saw rig can be used for cutting and beveling planks, cutting waste lumber into beveled wall kegs, beveled lagging and other forms.

The cost of operation is estimated at approximately \$1.50 per day, not including the wages of the one operator required.

It is powered by a vertical engine of 4 or 6 h.p.

The frame is all steel and the table is 36 inches by 56 inches over all. Top is made of  $\frac{3}{16}$ -inch steel accurately fitted.

The saw arbor is mounted on a swinging frame which can be adjusted to any position for different depths of cut with-



New Light Saw Rig Designed to Cut Labor Costs, Especially in Form Work for Concrete. It Has Many Attachments.

out disturbing the height of saw table. The saws can be changed from rip to cut-off saw without stopping the engine. The arbor is made of turned steel shafting and provides for attaching an emery wheel to one end which can be used for sharpening various tools such as picks, grinding off rough edges of shovels, forming arch bricks, etc.

The equipment includes a combination rip and cut-off and mitre gauge adjustable to 45 degrees in either direction. This gauge can be quickly adjusted and locked in place, serving as an accurate guide for cutting rafters and braces.



### New Barrel Mixer Operated by Auto Power

**T**HIS concrete mixer is especially built for contractors who have small jobs that will not warrant the cost of a large expensive machine. It is a batch mixer of the continuous rotating barrel type.

The barrel is furnished in wood or steel, is mounted within a formed steel frame or yoke, the bottom end turning on an adjustable ball and socket bearing that prevents possible cramping and straining should the barrel get out of alignment. The adjusting feature provides for taking up wear in the driving gear permitting long service. Surrounding the upper end of barrel is a heavy steel idler roller track which rotates on idler rollers running on hardened steel pins and bushings. These rollers are mounted in special formed nonbreakable steel brackets.

The bevel pinion shaft that drives the gear on bottom of



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FIXTURES of beauty and charm that insure dependable operation, are but a part of the 20,000 products included in the extensive facilities of

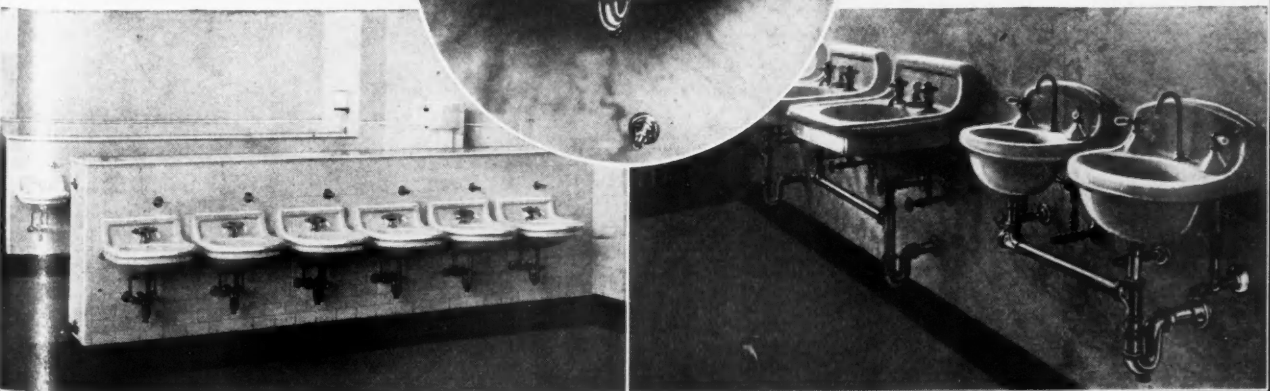
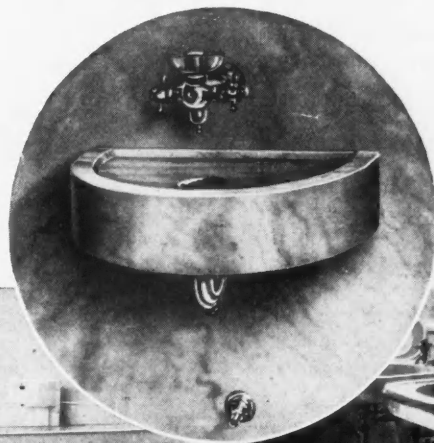
# CRANE SERVICE

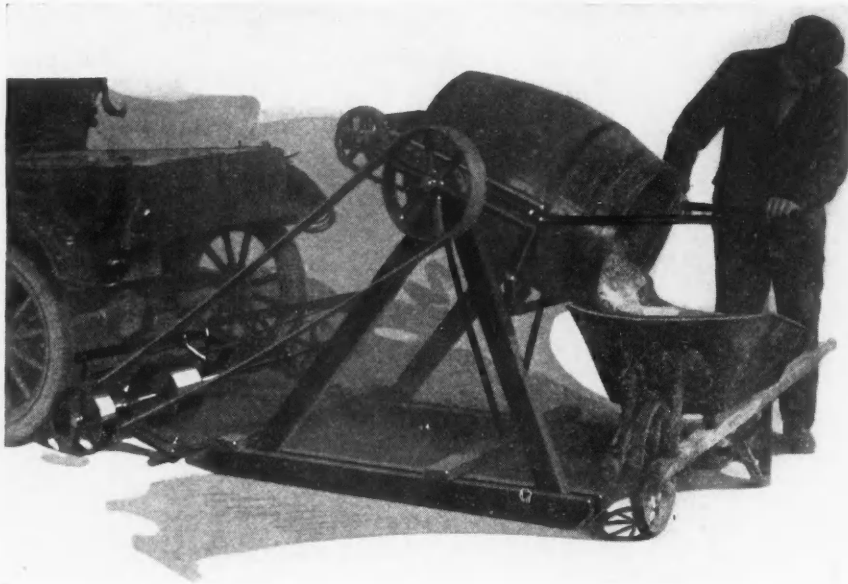
Reliable equipment for heating, ventilating, drainage and refrigeration systems for schools, colleges, universities, and other buildings of any size or character.

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**New Rotating Barrel Mixer Operated by Auto Power. This Mixer Will Mix About 500 Cubic Feet Per Day. The Aggregate Is Churned by Paddles.**

barrel runs in sleeve journals which are held in place by heavy pressed steel brackets securely fastened to barrel yoke. These bearing sleeves can be easily removed and replaced with new ones when worn out.

The barrel yoke swings on steel trunnions held in place by pressed steel U-shaped mountings.

The gear drive for turning barrel is connected by sprocket chain which is in turn operated thru pulley mounted on extended trunnion. This arrangement allows the barrel to rotate in either the mixing or dumping position and provides for it to be thoroly cleaned.

There are two 3-inch flat steel mixing paddles securely bolted in the barrel and mounted at an angle so that they push the mix forward and cut it at the same time, two distant operations which result in fast and thoro mixing.

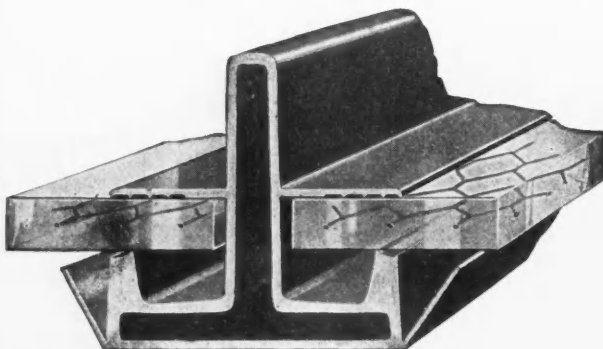
The capacity is a batch every two minutes are about two average wheel barrow loads. This will keep three or four men busy on the job mixing approximately 500 cubic feet per day.



### **New Skylight Bar Increases Light Area**

**A** NEW skylight bar is now on the market that has all the elements of permanency of concrete construction, yet it has the advantages of large light area and simplicity of installation of the ordinary sheet metal constructions at a very slight advance in original cost. This skylight combines the strength of steel with the everlastingness of lead.

The construction is simple, yet very efficient. A steel



**Lead Covered Skylight Bar. The Glass Is Not Set Until All Other Work Is Completed.**

"T" bar is covered with a seamless sheath of lead of a very unique and original design. This peculiar shape is provided to give both a lead seat for the glass and lead strips to hold the glass in place. As can be seen in the picture the heels of the bar are covered with a heavy section of lead, molded into a sharp edge. On this the glass rests.

The sharp edges are to allow for the unevenness in the surface of the glass for the very ductile nature of the lead quickly allows it to shape itself to all little differences in the glass.

You will note on the web of the "T" bar two little lead wings. These are the glazing wings. When the glass is in place on the bar these lead wings are pressed down on top of the glass holding it securely in place and forming a weather tight joint. While these seem thin they are so strong that they can withstand great pressure from below. In fact, a pressure of over 150 pounds

to the square foot of glass failed to cause them to give way in the least.

In forming the heavy lead heel for the glass to rest on there is automatically made a deep gutter which will care for any leakage that might be occasioned by excessive vibration.

In fabrication the bars are cut at the factory to the required sizes and the ends are sealed with lead, making the entire exposed surface nothing but lead.

By means of the very simple construction the metal work on a steel and lead skylight is all finished while the roof is being built and the glass is not set until other work is completed. This obviates entirely all chances of accidental breakage during construction.

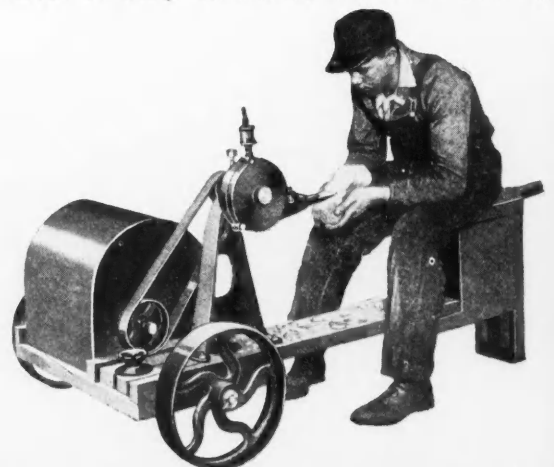


**Pressing Down Lead Wing with Wood Tool.**



### **Brick Cleaning Machine Saves Wages of Three Men**

**T**HE small, handy brick cleaning machine shown in the accompanying photograph was designed to fill the needs of many contractors who often have oppor-



**Machine for Cleaning Brick. Note the Cleaning Chisel Arrangement.**



**Exclusive "FARQUAR" Features and What They Mean**

**Electrically Welded One-Piece Steel Fire-Box**  
Positively prevents combination of air by leaks or fire passages.

**Large Fire-Box with large grate area insures slow combustion and fuel efficiency.**

**Vent and Return System.** Provides a generous supply of gently warmed, pure, fresh air instead of a hot blast of super-heated air.

**Automatic Regulator** actuated by fire box, completely controls fire insuring uniform temperature regardless of weather with surprisingly low fuel consumption.



Drawing of a piece cut from a FarQuar firebox to show the actual thickness of the steel used, also the perfect seamless weld produced by our patented electrical process.

## The Shape of the FarQuar Firebox —and Why!

The only way to keep air fresh is to keep it moving.

Any obstruction merely retards the movement of the air and contributes that much toward stagnation—over-heating, etc.

When the cold air enters the large, roomy air chamber of



it settles directly against the lower surface of the elliptically shaped firebox, as shown in diagram cut below. This part of the firebox is warmed by the extraction of the heat units from ash pan and smoke passage, hence begins to gently warm the fresh air which comes in contact with it.

As this warmed air begins to rise, it passes upward along the smooth side of the firebox, with nothing to retard its movement. The absence of top surface prevents any "pocket" in warm air bonnet in which dead air can collect.

Instead it floods each warm air pipe, and passes into the rooms in a large volume gently warmed and moving at sufficient velocity to keep the rooms at a comfortable temperature in all kinds of weather.

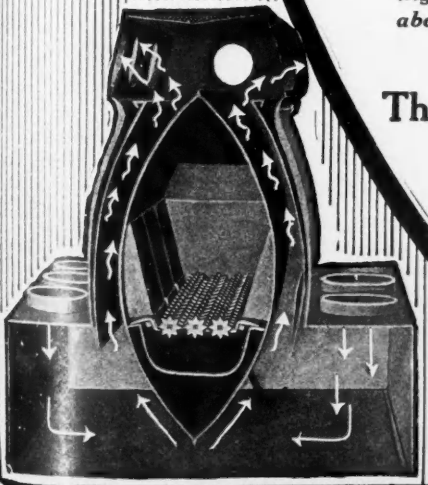
That is why FarQuar Heated Homes are always refreshingly comfortable. The air is never de-vitalized and lifeless from over-heating. Instead it is pure, fresh and energizing.

*Our booklet, "The Science of House Heating" tells an intensely interesting story about the healthful heating of homes. Write for free copy.*

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**Sales Representatives Wanted**

Thousands are becoming interested in better methods of house heating. Sales Representatives are wanted in every locality to take care of these new customers. An unusual opportunity with rare profit possibilities is open to the right parties. Write for details.



tunity to use old brick but cannot spare the time to put them in shape.

This small plant consists of a power plant driving a set of revolving hammers. Into the orbit of these hammers the back end of a cleaning chisel is forced by the weight of the brick itself, when held in the proper position for cleaning by the operator. The strength of blow delivered may be regulated by the operator, increasing or decreasing the pressure exerted in holding the brick against the cutter edge.

This machine is designed to replace four men on the same kind of work. No skill is required to operate it. The hammer action is quite rapid, delivering a minimum of 2,400 blows per minute. The machine may be equipped with an electric motor if desired.

The regular power plant is a  $\frac{1}{2}$  H. P. gas engine. It is estimated the cost of operation is about 3 cents an hour full load.



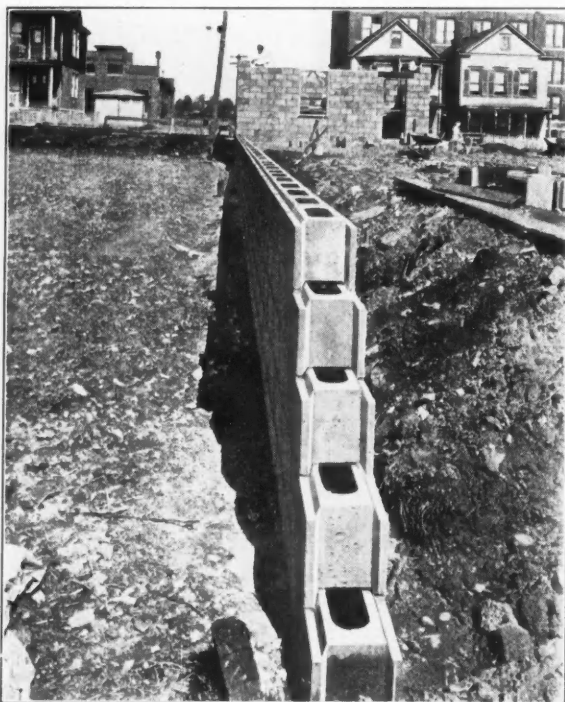
### Poured Interlocking Concrete Building Tile

ONE of the most interesting developments in the building materials field in the last few years has been that of hollow concrete tile. Persistent endeavors has resulted in a practical unit that can be produced in quantities that make it a factor in the building industry.

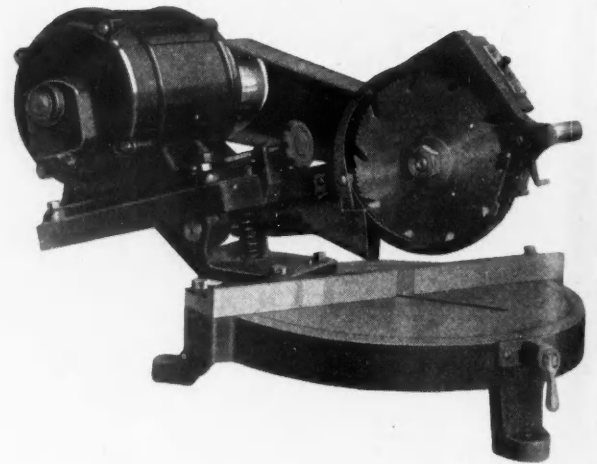
Particularly interesting is a new poured, not tamped, hollow concrete tile with interlocking design. The surface of this tile is smooth and the block can be finished in different colors. Plaster can be applied directly to the tile without furring or lathing. This tile is made in straight blocks, corners, right and left jambs, chimney, half block, and pilaster all designed with the interlocking feature. This feature is intended to make the wall waterproof.

This tile is poured in a steel mould with a one-piece collapsible core equipped with roller bearing casters. The manufacture of this tile is not complicated and does not call for skilled labor.

In Fig. 1 is shown a corner section of the blocks assembled as they would be in a building wall. The interlocking device which holds the tile securely together is shown very clearly.



Section of Wall Made Up of Special Interlocking Concrete Building Tile. Note the Continuous Dead-Air Space in the Wall.



Handy Portable Saw Bench for Light Work. The Saw Can Be Tilted at Any Angle Up to 45 Degrees, Permitting Accurate Angle Cuts.

### Portable Saw Bench for Light Work

THE portable saw bench herewith illustrated is designed for those who have frequent occasion to saw light lumber or moldings of any description. It can be used in the furniture repair shop, the chair factory, pattern shop, or in the interior of a new home where the contractor is completing the interior finishing, and is light enough to be carried from floor to floor.

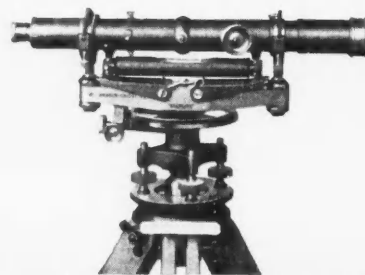
Motor and saw are mounted upon a tilting frame and belted together. This frame in turn is mounted on a swiveling platform which permits the saw to be tilted any angle up to 45 degrees. A flexible spring keeps the saw raised when not in use and furnishes the necessary resistance for accurate workmanship. The saw may be instantly locked at any angle by means of a hand lever conveniently placed in front. A stationary gauge is furnished at the axis of rotation. The saw is so hung that all cuts are radial. A snap switch on the handle piece starts and stops the motor. This machine is equipped with many safety appliances to protect the workman. Angle cuts of all kinds can be made with precision because of the tilting mechanism.



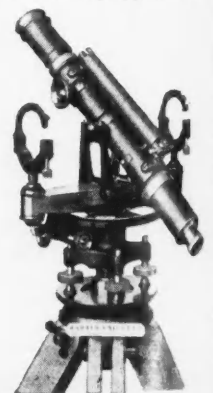
### Combination Level and Transit

OF recent design is the illustrated combination level and transit which should be of interest to all architects, builders and construction engineers. This instrument performs the function of both level and transit without the use of detachable parts.

The time taken for this change is not more than ten seconds, without throwing the instrument out of level. The converting device consists of two permanently attached hinged uprights for instantly converting the instrument into a transit with a range of over 45 degrees elevation or depression in the vertical plane, and is also equipped with spring tension trunnion clips for frictionally retaining telescope in any desired position.



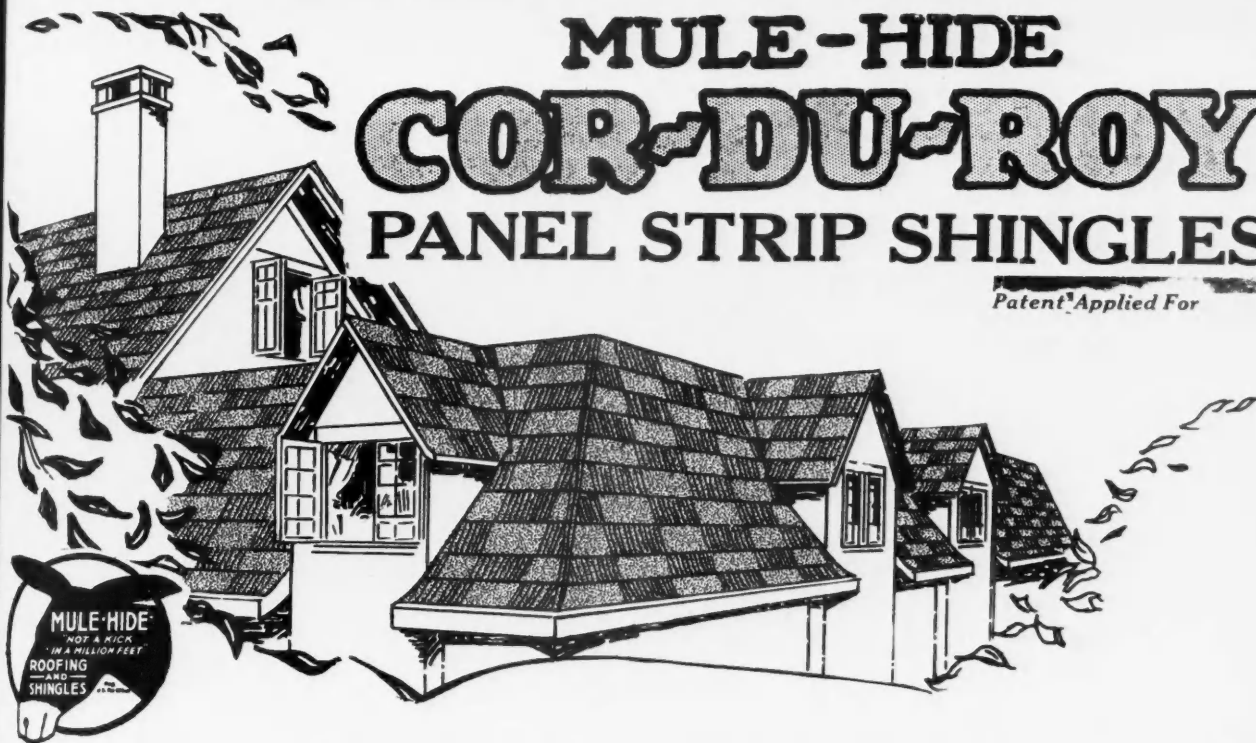
As a Level. New combination Instrument Is Quickly Changed—



Into a Transit as Shown Here.

# MULE-HIDE COR-DU-ROY PANEL STRIP SHINGLES

Patent Applied For



## The Better Overhead Protection

*The shingle that has an inside goodness which makes its outside service superior.*

The **Cor-Du-Roy Panel Strip Shingle** is the crowning achievement of the many Mule-Hide successes. It is a combination of the famous **Cor-Du-Roy** alternated with the plain and combined into a solid block of four.

It has that finished, quiet touch of distinction which has made them extremely popular in residence construction.

**Cor-Du-Roy Panel Strip Shingles** depend upon the **Cor-Du-Roy Panel** for their shadow effect — the ordinary slot of the Four Unit Shingle being eliminated, and with it all "bogy of fear" as to the possibility of this shingle blowing up in the wind. Its solid block construction is visible evidence of the fact that it cannot curl, and provides the most attractive, most enduring and satisfactory shingle that has ever been introduced to the roofing trade.

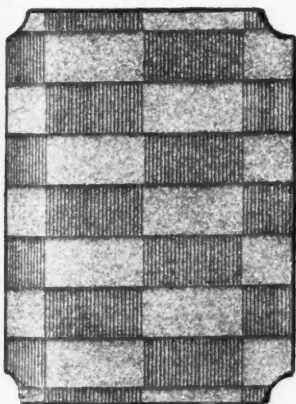
**Mule-Hide Cor-Du-Roy Panel Strip** is 10"x32". There are 112 strips to the square which weighs 230 lbs. This will give a double thickness over the entire roof with 4" to the weather. The super **Mule-Hide Cor-Du-Roy Panel Strip** is 12<sup>3</sup>/<sub>4</sub>" x 32". There are 112 strips to the square which weighs 285 lbs. The super strip assures three thicknesses over the entire roof with 4" to the weather.

In addition to the red and green surfacing we have a blue-black surfacing which is in great demand.

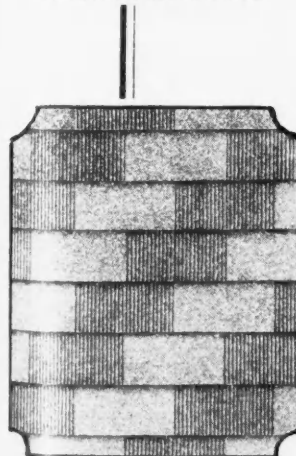
**"Not a Kick in a Million Feet"**

**Dealers—Roofing Contractors!**

Wire or write for sample and complete details of an exclusive proposition that will be profitable to you.



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**COUPON—CLIP AND MAIL TODAY**

I am interested in COR-DU-ROY Panel Strips

Dealer

Check whether

Contractor

Architect

Name.....

Town.....

State.....



## Variety in Steel Sash Design Is Increasing

SINCE THE INTRODUCTION OF ORIGINAL FACTORY SASH MANY NEW TYPES HAVE BEEN INVENTED FOR OTHER BUILDINGS

ORIGINALLY there was only one type of sash—the daylight sash for factory buildings. This called for the small-pane, large-glass-area window of the pivoted type.

But when the boom in industrial building burst early in 1920, other uses for steel sash were sought in order to create new markets. To reach new markets, new designs adaptable for other types of buildings were found necessary. As a result, today there is a variety of steel sash on the market that takes care of practically any kind of building from the home with its basement steel sash to the school house.

It is used in small and large garage service stations, libraries, auditoriums, universities, small shops and farm buildings.

Says Dr. Woods Hutchinson, well-known children's specialist: "I'd like to see our schools built like our modern factories—three-fourths glass and perfectly ventilated."

Thru standardization the manufacturers have been able to make this sash at a price that appeals to contractors. For instance a letter was recently received by one of the companies from a contractor in Minneapolis, Minn., who built a modern building in the small



Plenty of Light for the Workshop Has a Beneficial Effect on the Workmen, Especially in a Shop of This Kind in Which Much Close Work Causing Severe Eye Strain Must Be Carried Out.



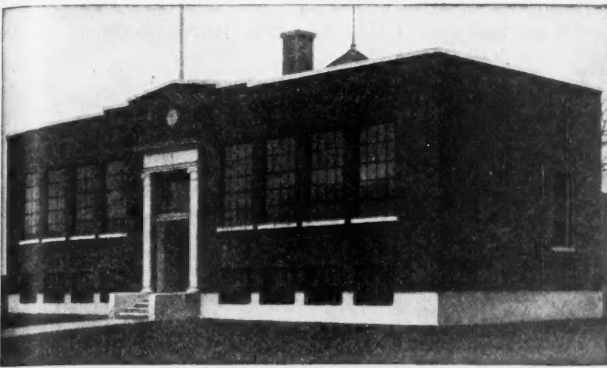
Private Garage Equipped with Steel Sash. This Type of Small Building Is Well Adapted for the Use of This Material.



View of Room in Allentown, Pa., High School, Showing Variation in Steel Sash Design. In This Building the Double Hung Sash Type Is in Use.

town of Medford, Minn. He writes: "The architectural plans of the building which was to cost \$73,000 originally called for wood sash. We substituted steel sash and allowed the school board a saving of \$800."

"After the job was let we not only used steel sash on the exterior but also in the interior partitions and ceiling lights under the skylights. Due to savings on the interior work and unforeseen economy in the erection and painting of steel sash we conservatively say that the total saving amounted to about \$1,200."



**In Schools** More than 1000 schools, large and small, in every part of the country, equipped with Truscon Steel Sash, is proof of their excellence in public buildings.

**In the Store** Truscon Stock Sash glazed with beveled plate glass makes the Genessee Drug Company, Flint, Mich., one of the most attractive community stores.

## A Truscon Steel Sash for Every Job

# TRUSCON STEEL SASH

In the store, school, bank, garage and a hundred and one other places, Truscon Steel Windows are the logical choice. There are types and designs that harmonize with practically every architectural treatment and all types of construction.

Not only is the original cost of Truscon Steel Sash low, but time and labor are saved in installation.

Truscon Steel Sash are anchored directly to the masonry work. There is no framing as with wood windows. They afford 40% to 60% more daylight. They are indestructible, permanent and fire-resisting.

Truscon Steel Sash can be delivered to your job in the shortest possible time, because the most popular types and sizes are stocked in our warehouses in principal cities and by Truscon Dealers everywhere. This is an economical building service for contractors, architects and engineers. You will find it particularly convenient in the construction of small buildings where only a comparatively few sash are required.

*You can buy one sash or a thousand and you will find, in most cases, they actually cost less than wood.*

## TRUSCON STEEL COMPANY

Youngstown :: :: :: :: :: Ohio

Sales and Engineering Offices in Principal Cities — Dealers Everywhere



**In Private Garages** Truscon Stock Sash is the logical choice. They are burglar-proof, weather-proof, never warp or stick and cost less than wood.

**In Public Garages** Standard units of Truscon Steel Sash in solid brick walls makes a fireproof building for the Lorenz Garage, Lansing, Mich.

## Are Your Hauling Methods Reducing Your Cost?

CONTRACTOR HAS CONSTANT NEED FOR TRUCKS WITH QUICK-DUMPING AND LOADING BODIES—SOME DESIGNS FOR LIGHT AND HEAVY TRUCKS

*EDITOR'S NOTE: This is the second article of a series on efficient methods of hauling materials and equipment, emphasizing the importance of special dump bodies.*

**S**AND, gravel, crushed rock, lime, cement, brick, just a few of the heavy and more or less bulky materials the contractor uses constantly in large quantities.

In the smaller cities he must haul this material himself from the track or the material hopper—in the larger city, the building material dealer has the job. In either case, the ultimate cost of the building under construction will be affected.

Once a building job is under way, the chief worry of the builder is to keep his staff going without delays. It is his job to keep them supplied with material, to keep the bricklayers going so they will not delay the carpenters, or vice versa. And to do this material must be on hand at all times.

His problem, therefore becomes one of transportation—and this is divided into two parts:

1. Actual hauling.
2. Loading and unloading.

The first part of the problem has been satisfactorily settled by the motor truck which is available in sizes from one-half ton and up.

The second phase is one that follows inevitably and one that only recently has been getting the attention it warranted. For even with a motor truck on the job,

the contractor was still confronted with costly delays at either end. It is no mean job to load a truck with a few tons of sand, gravel or other bulky material by shovel, and it is just as expensive to unload this same load by the same method.

How to overcome this delay at each end?

The answer has been found in the special dump



Fig. 1. Truck with Special Dual Dump Body in Position Under Gravel Hopper. This Truck Can Be Loaded Quickly and Accurately, as Each of the Compartments Holds a Specific Amount.

body, operated either by a hand lever, gravity or off the truck mechanism. Some typical examples of this equipment are shown in illustrations herewith.

In Fig. 1 we see the truck backed up under an overhead hopper filled with sand and gravel. The truck has been equipped with a set of dual bodies

half the regular size, each operated separately, each holding like amounts. The first one is quickly filled with sand from above, then the other with crushed stone. The whole job requires only a few minutes. Then twenty-five or thirty miles an hour to the job, which in this case happens to be a new concrete road. The big paver is in position. The driver of the trucks backs up, moves the dump body control mechanism and one chamber is emptied into the waiting hopper, then the other chamber, and the truck pulls out away for another load, the bodies coming back into position while the car is in motion. No lost time here, no waste motion. The hopper has swung up and poured its contents into the mixer.

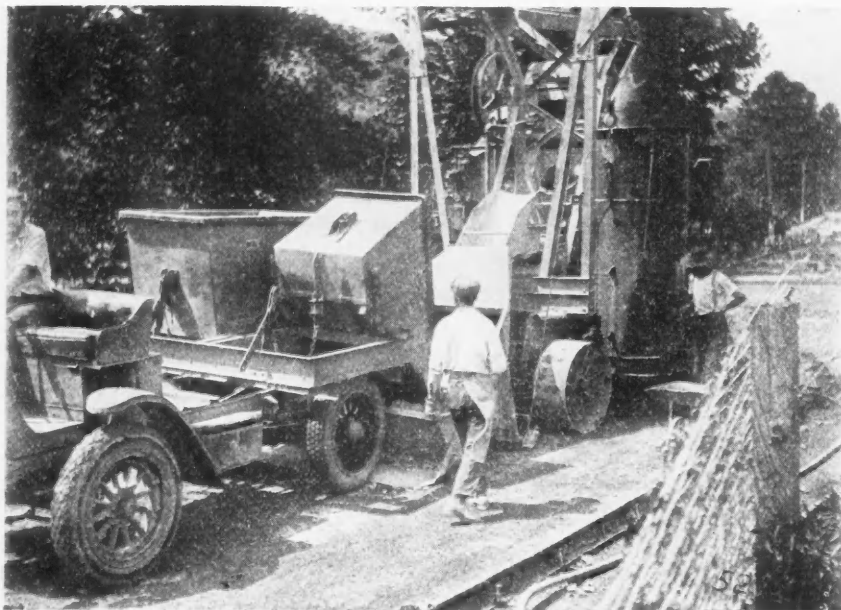
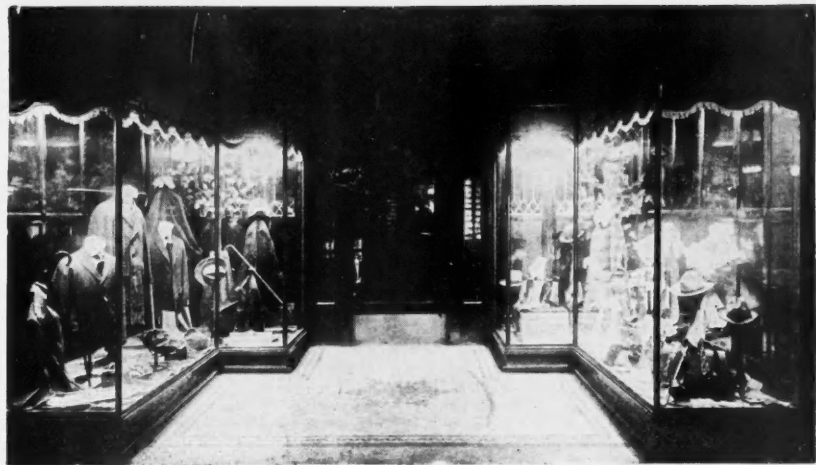


Fig. 2. The Same Truck Discharging the Load Into the Waiting Hopper of the Big Paver. Both Loading and Unloading Operations Are Carried Out with Small Cost of Labor.



# Brasco COPPER STORE FRONTS



## INVITING?

Sure is! And you are just the man who can install Brasco Fronts in the stores of your town that don't have them. Lots of them are going to have new fronts to help increase their business this year. Storekeepers are realizing that the first appeal to a prospective customer is made thru their store fronts. If the front is in poor condition, the first appeal is the last.

### JUST SEND US THE NAME

of the prospective buyer of a new front and we will help land the installation job for you. Get in early on this year's volume of business that is making money for our dealers and fame for Brasco.

### BRASCO MANUFACTURING CO.

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**Mail this coupon today**

Brasco Manufacturing Co.,  
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Send me your booklets on store front construction.

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State \_\_\_\_\_



"Will Outlast Them All"





Fig. 3. Large Capacity Dump Truck Used for Sand and Gravel Hauling.

That is only one phase of the unloading feature. In Fig. 3 is seen a larger type motor truck, holding  $7\frac{1}{2}$  tons. It is unloading this large amount just as easily as the smaller machine. This body is built with an extended platform so that there is room on the sides for the driver to stand on. The tail gate is also double acting. This makes it possible to lower it to a level of the floor and carry long material such as beams, pipe, lumber and other similar material.

The hand hoist type of dump body is adapted to the needs of the smaller contractor who does not have occasion to use it more than two or three times a day but where the truck is in constant service the mechanical hoist is driven off the crankshaft.

Another type of dump body which is especially adapted for the work of the building and road contractor is the gravity dump body for small trucks.

This type body is particularly adapted to work in which wet or dry mix is handled. No power is needed to operate it, this being taken care of by gravity. The mechanism is quite simple. It is held firmly in position by self-locking or latch hooks. The driver can trip the body without leaving his seat. When the hooks are released the weight of the load being slightly in rear of the center of gravity, tips the body backward. The body continues to roll over until the heavy control springs stop its travel without any decided jerk on body or chassis. The large dumping angle combined with the light jerk is sufficient to clear the body of all its contents. This type of body is easily righted after the load has been dumped, in many cases by starting and then stopping the truck or by pulling a line fastened to the body.



### Trend of Electric Fixtures in Modern Home

(Continued from page 104.)

brackets alone, the indirect units alone, the direct lamps in portables alone, and combinations of any of these. Sheets of colored gelatine may be laid across

the inverted reflector toning the color of light as desired. In this instance care has also been used in choosing the material for the silk shades.

All portable lamps should be chosen with particular thought given to the shades. It is always objectionable to be forced to look at a lamp and the shades must conceal the light sources from one sitting near them. The materials used should be dense enough that the filaments do not show thru and as pointed out before, it is always desirable to use diffusing bulb lamps in any kind of a direct luminaire. With skillful selection a

shade will become an integral part of the color scheme of the room in the evening, as it is during the day. Sometimes, however, a color is used that harmonizes well enough with the drapes and furniture covering but when the shade is lighted, the effect is far from desirable. The danger is most likely to be present when green or blue color schemes are employed. The best solution for such a condition is to have the exterior layer of particularly thin material, such as chiffon or georgette crepe and the lining a rather heavy rose, buff or cream. The resultant light will be toned by the lining and ghastly effects eliminated.

A wall switch is most desirable for controlling the lights in the living room, and it is generally advisable to have the central outlet and wall brackets on separate circuits. Absence of a wall switch will not make it impossible to use semi-direct illumination, for small switches can be neatly concealed in the canopy fitting and operated by a fine cord. The living room requires the maximum number of convenience outlets for attaching the portable lamps, electric fan, phonograph motor and special decorative lighting effects.



### Radio Equipment Under Fire Insurance Rules

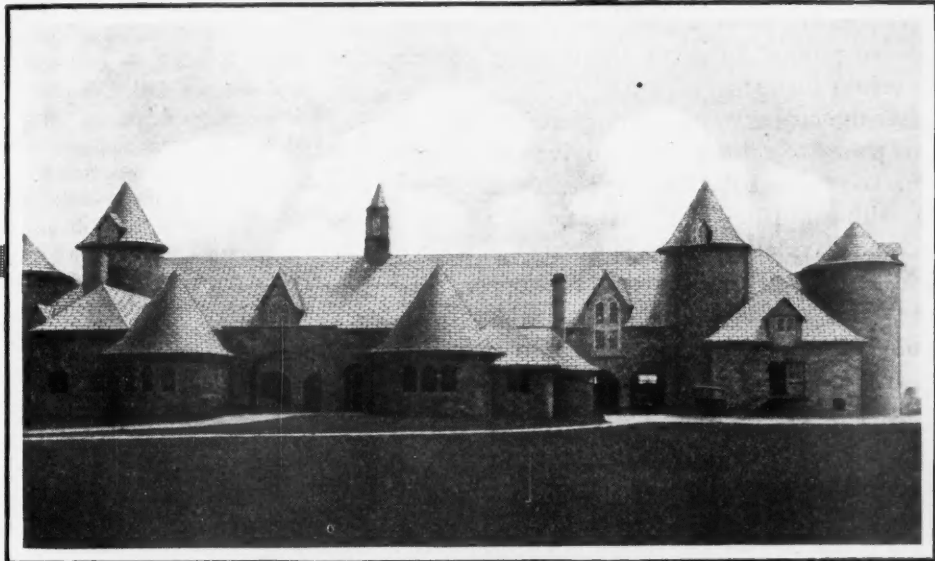
RADIO fans should give heed to fire insurance rules in connection with the "hooking-up" of radio equipment, or the rates on their properties may be raised or the insurance refused entirely, warns the Bureau of Standards of the Department of Commerce in calling attention to the fact that fire insurance regulations governing the installation of radio apparatus are to be revised.



### Facts About the Auto Industry

The automobile industry is now the fifth largest industry in the United States. Cars registered total 7,523,664, or ten for every one in 1911. It is figured that automobiles travel 30,094,565,000 miles annually.

# Carey



## The Loeb Barns and Stables at Charlevoix, Mich.

These farm buildings cost \$250,000.00 and required 200 squares of Carey Jumbo Shingles.

Carey Jumbo Shingles are extra large and extra thick. Their slate surface is sparkproof. They are fadeless and they never curl.

They never curl.

That is the principal reason why they were chosen. It can't be said too often.

They never curl.

Most lumber and building supply dealers sell them. If you don't find them write us.

**THE PHILIP CAREY CO.,** 510-530 Wayne Ave., Lockland  
CINCINNATI, OHIO



### Rich Green Copper Tint Obtained In Twenty Four Hours

"PATINA" is the little-used word which designates the rich green tint produced by oxidization on the surface of copper or bronze. The ornamental effect of this coloring blends happily with modern architectural practice.

The time it takes for copper to assume this color effect varies according to atmospheric conditions. Generally, the time required is from two to three years, altho in some climates copper takes on a brownish hue instead of the beautiful green color.

It is possible, however, by the following simple, inexpensive process, to obtain the pleasing green tint in twenty-four hours:

After the copper work is completed make a solution of one pound of sal-ammoniac to five gallons of water; let it stand for one day and then apply it to the copper work with a brush. This application is allowed to remain one day, after which just enough clear water should be sprayed on to moisten the copper.

The same results may also be obtained by using a solution of one-half pound of salt to two gallons of vinegar.



### Determining Penetration of Wood Preservatives

THE effectiveness of any wood preservation treatment is measured very largely by the depth to which the preservative penetrates. This can be determined by the following

tests, which are used by the Forest Products Laboratory.

The presence of creosote oil is indicated by the dark discoloration, and the degree of penetration may readily be determined by taking a sample at a point free from checks and other imperfections and at a considerable distance from the end. This may be done either with an ordinary 1/2-inch bit, or with an increment borer, which brings out a core of wood that shows in cross section the depth of penetration and is easily examined. The observation should be made at once, because the oil spreads rapidly over the cut surface. In order to prevent infection, the hole in the treated piece should be tightly closed with a creosoted plug.

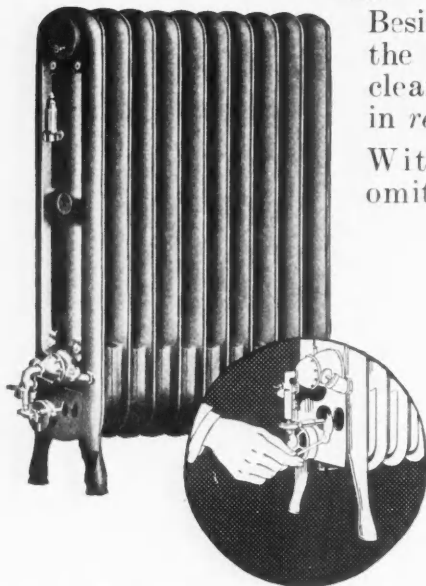
As zinc chloride is colorless, the depth of penetration of this preservative must be ascertained by chemical means. After cutting the stick in two or getting a sample with the increment borer, the freshly cut surface is dipped for not to exceed 10 seconds in a 1 per cent solution of potassium ferrocyanide, and the excess solution is removed by blotting paper. The sample is then dipped into a 1 per cent solution of uranium acetate and dried. The treated portions will be whiter than the natural wood, and those untreated will have a dark red or a maroon color. This method does not give very sharp contrasts on wood which is reddish in color, like red oak, but otherwise is very satisfactory and affords a permanent record.

Another method (developed by Galen Wood) consists in spraying over the freshly cut surface a mixture of equal parts of a 1 per cent potassium ferricyanide solution, a 1 per cent potassium iodide solution, and a 5 per cent solution of soluble starch. This colors the treated portion a very dark blue, but does not affect the untreated wood. Altho the color fades in time, it may be brought back by spraying again.

Sodium fluoride is colorless, and no satisfactory method of showing its presence in wood has been devised.

Mercuric chloride is also colorless, but dipping the wood in a solution of hydrogen sulphide turns the treated area back.

# Heating the Small Home



Besides the economy which CLOW GASTEAM effects in the heating of the small home—besides its healthfulness, cleanliness and its freedom from attention, it is a big factor in *reducing construction costs*.

With CLOW GASTEAM, the following items can be omitted or greatly reduced:

- Excavation of basement.
- Erection of chimney.
- Cost of boiler and piping.
- Installation cost of central heating plant.

If you are engaged in small home construction, it will pay you to look into CLOW GASTEAM. Check coupon attached.

JAMES B. CLOW & SONS

General Offices: 534-546 S. Franklin St., Chicago  
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# CLOW

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Send me details of CLOW GASTEAM.

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### Cause of Creosote in Chimney Flues

CREOSOTE working thru the chimney walls and spoiling wall decorations as well as ruining smoke pipes is a problem that bothers builders frequently. This sticky substance also clings to draft and check lids as well as radiator cleanouts to the extent that dampers are sticking and refusing to operate.

Creosote is one of the products of combustion and is given off from the smoke passing thru the chimney in condensed vapors and is to be found in coal as well as wood and especially in wet green wood.

V. W. Cherwen of the "Warm Friend" has submitted this problem to some of the leading combustion engineers for an opinion and in order to appreciate the problem at hand we must go to the source of these difficulties. Creosote boils at 350 degrees F., and has a very high penetrating value. It will penetrate 24 inches through a block of soft pine wood in twenty-four hours and will also penetrate thru soft red brick a great deal more readily than water. There are very few bricks that would hold hot creosote, or, in other words, would check its working thru the chimney walls, if such chimneys are without flue lining.

For an example, we'll sight the fact that when hardwood is heated in a closed retort (destructively distilled) wood alcohol, acetic acid and creosote vapors are evolved; these vapors are passed thru a condenser and collector in tanks. Therefore when fresh wood is added to a furnace fire and when the fire is low, and there is insufficient air to support combustion, we have the same condition as in the closed retort. The tar vapors travel up the stack and condense on the cooler walls of the connecting smoke pipe and flue. Then later, when the fire is increased the temperature of the flue wall is raised above 350 degrees F., the tar travels on further up the flue, but in the meantime it is penetrating the walls and laths at the point where there is the least resistance. Tar and creosote form an emulsion which seems to penetrate wood better than pure creosote.

If the chimney is large, it naturally will not be warmed up readily, nor will a leaky chimney, or chimneys with offsets and other connections help heat up the flue, especially when the chimney is cold with the result that in some instances the fire can never overcome the chilling effect within the chimney, causing heavy distillation or the condensed vapors gathering on the chimney and smoke pipe and running back into the furnace.

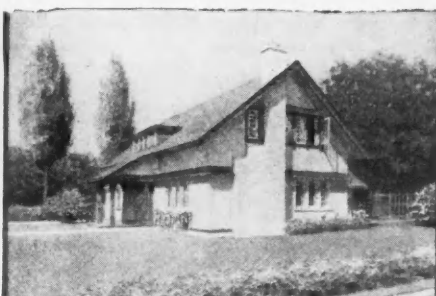
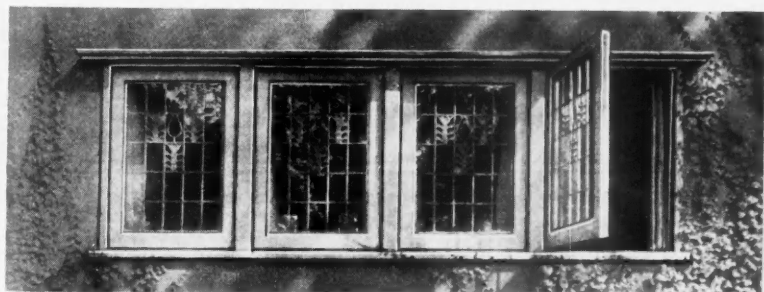
Where wood is used for heating purposes it is apparent that it is necessary to use nothing but dry wood in order to create a hot fire immediately, so these vapors will pass thru the chimney, and it is further necessary to tell the furnace user not to add fresh wood to the fire and allow it to smolder on account of insufficient draft, but to leave the draft open at least until the wood is ignited, for when there is a flame there can be no distillation taking place. To eliminate entirely any possibility of condensation of vapors it is necessary to keep the temperature within the chimney reasonably warm or above the point of condensation, which is approximately 350 degrees F.

This article clearly shows that not only smoking furnaces are caused by chimneys of poor construction, but also products of combustion such as tar and creosote will work thru and ruin the walls as well as smoke pipes, because if the chimney is built on the outside wall of the building or if it is of leaky construction or if there are other connections besides the furnace, they do spoil the flue draft by admitting colder air thru such cracks or openings or because the exposed walls are cold, causing vaporization of the wasted products of combustion, condensed and deposited on inside of flue and are creating trouble.



### Gladioli

IF these bulbs have not been planted do it now. There are some wonderful varieties and none of the bulbs are expensive. Should you not wish to plant the higher priced bulbs, then plant mixed bulbs which cost from \$2.00 to \$5.00 per 100—but plant now.



## A luxury window feature --- brought down to small house costs!

Ever since the invention of adjusters to control outswung casements from inside of screens, this type of window has been growing rapidly in popularity.

In the past their use has been somewhat limited by cost to the more expensive buildings.

Now, Robert C. Spencer, Jr., noted architect and inventor of our pioneer adjusters, has perfected a new principle and design, so economical that it will soon make casements the universal window; and these new adjusters are even more efficient and attractive than our popular Bulldog.

*Send us the name of your hardware dealer or jobber and we will be glad to mail you full details of the new "WIN-DOR" adjusters*

## The Casement Hardware Company

1307 Tacoma Bldg.

Established 1906

CHICAGO, U. S. A.

### Uniting the Construction Industry

THE building industry has united all its elements—manufacturers, labor and the professional branches—in a great effort to raise the standards and efficiency of the industry and improve the service which it renders. The organization will be known as the American Construction Council and is intended for the betterment of understanding and for common action among architects, engineers, labor contractors, materials manufacturers and dealers, bankers and insurance men—all elements concerned with building work of any description. Secretary of Commerce Hoover will preside at the formal organizing meeting in Washington, D. C., June 19 and 20. Franklin D. Roosevelt, New York, former assistant secretary of the navy, has accepted the presidency.

Investigation has shown that the numbers of workers who, together with their families, depend upon the construction industry for a livelihood, totals approximately 11,000,000 persons. It was conservatively estimated that 24 per cent of our annual capital accumulation and over 50 per cent of our national savings are absorbed by this great industry every normal year. Approximately nine-tenths of all iron, copper and zinc and 95 per cent of all the lead produced in this country are consumed in construction.

During the war it was necessary to postpone all but essential construction, leaving us at the close of 1919 with an enormous deferred volume of construction work. In 1920 we began to catch up, to fall back again in 1921; today we have a deferred total valued by students of the industry at \$10,000,000,000. The shortage exists in every line of construction. We have not enough office buildings or schools, railroads or highways, while sewerage, water supply systems and paving are far behind present needs. This shortage has put great

pressure on every branch of the industry and has forced it to study anew its relationship to the whole.

While the organizers have a large program of work mapped out, efforts will be concentrated at the start on a few of the more outstanding problems. Chief among these is the establishment of a code of ethics that will be universally accepted in the industry.

Another great problem stands ready for effective handling. There is a shortage of building mechanics, and the labor organizations need help in establishing the necessary apprenticeship system. Mr. Hoover's department is making a national study of building codes, and when its work is completed there must be a nation-wide activity to carry the recommendations into effect—a type of activity which the new organization is designed to promote.

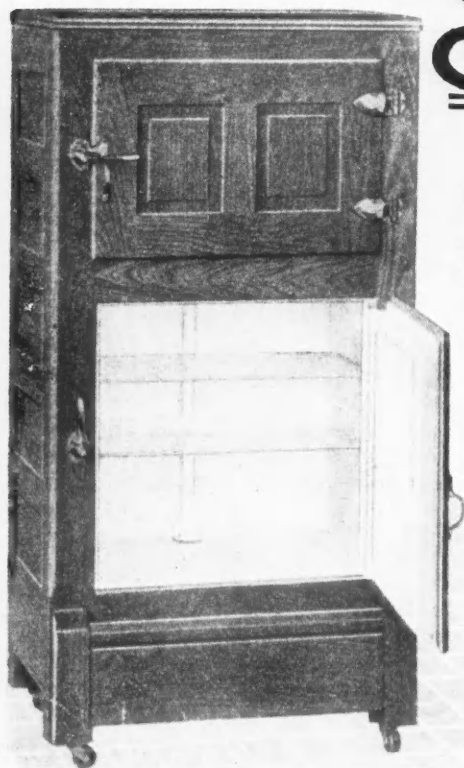
In addition the program of immediate work embraces transportation, encouragement of local building shows, publicity directed at giving the public an adequate conception of the magnitude and work of the construction industry and studies of seasonal employment, with the initiation of efforts to level out the seasonal swings.



THERE are about three automobiles to every railroad freight car. Automobiles are doing about twice as much passenger traffic as the railroads.

About 2,700,000, or nearly 3 per cent of the total population of the United States, make their living from the automobile business. Current production is at the rate of about 2,973,800 cars yearly, the average price being \$745.

The automobile industry now requires about 509,250,000 pounds of crude rubber per annum and 2,011,000,000 gallons of gasoline. Thirty-seven per cent of car owners improve their living conditions because of the automobile.



# Gurney

## REFRIGERATORS

### UNANIMOUS APPROVAL

Builder, contractor and tenant of the popular up-to-date apartments find that Gurney Refrigerators are economical to install, neat appearing, and satisfactory in performance. Well built of fine materials the Gurney is made for a lifetime of service.

Our complete line includes refrigerators for all purposes. Let us figure with you on your next contract.

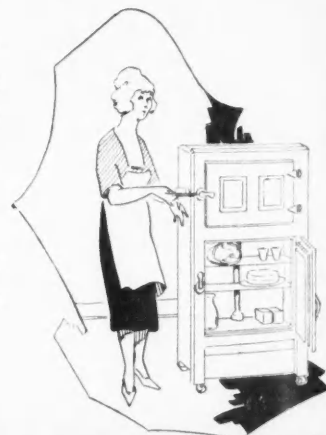
*Send for Catalog*

**Gurney Refrigerator Co.**

FOND DU LAC - WISCONSIN

PERMANENT CHICAGO EXHIBIT

308 N. MICHIGAN

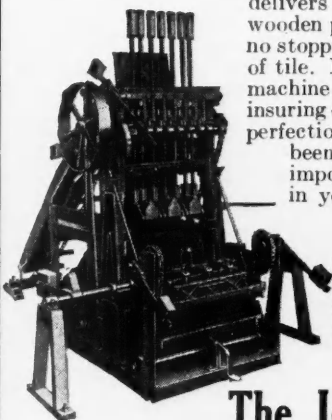




# Stability and Dependability

**T**HE Ideal Concrete Machinery Co. is an old, reliable company manufacturing a complete line of modern equipment for the prompt production of labor-saving specialties in the building field. Our word is our bond; our machinery is backed by a rock-ribbed guarantee which means that the customer's satisfaction is the most important thing in the world to us.

## Our Fully-Automatic Building Tile Machine



delivers three tile on a single wooden pallet, continuously, with no stopping or delay for offbearing of tile. Pallets are changed while machine is working on next batch, insuring continuous operation. The perfection of this machine has been conceded to be the most important thing in the field in years.

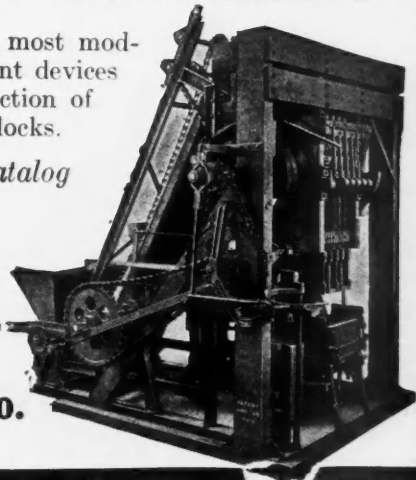
**HEADQUARTERS FOR EVERYTHING YOU NEED**—from hand block machines to complete power plants or automatic tile machines, power tampers, conveyors, molds, etc.

**The Ideal Concrete Machinery Co.**  
1336 Monmouth St. Cincinnati, O.

## *Ideal* Automatic Concrete Block Machines

represent the most modern and efficient devices for the production of square, true blocks.

Write for Catalog 35 today.



"'BOGALUSA' STENCILED ON YOUR SOUTHERN PINE IS LIKE A CERTIFICATION ON A CHECK."

BOGALUSA'S HISTORY-MAKING REFORESTATION OPERATIONS ASSURE A PERPETUAL SUPPLY TO OUR TRADE.

SPECIAL ITEMS DELIVERED PROMPTLY  
ARE THE BEST PROOF OF UNUSUAL FACILITIES.

**EXTRA  
DENSE**

# BOGALUSA

**SOUTHERN  
PINE**

Trade-Mark Reg. U. S. Pat. Office

Our facilities beyond the capacity of any other lumber operation in the U. S. enable every "Bogalusa" dealer to fill any order of ANY SIZE ANY TIME promptly and with exactness.

BIG plus-perfect TIMBERS—for RAILROAD, BRIDGE or other uses, to 1 in. x 1 in. x 12 in.—little sticks for 1002 special uses. (more or less) CRATING LUMBER—BOX lumber—ANYTHING YOU WANT, or think you MAY want, as well as all usual yard and shed stock. Superior standards of manufacturing technique, with strict grading per Factory Mutuals, A. S. T. M. and A. R. E. A., accuracy of count and a simple "good-will policy" are a few among the other factors that have made the trade-mark "BOGALUSA" indeed a synonym for responsibility.

Dealers: Write us for full particulars as to detailed special service on special items. Our response will be personal, candid and prompt.

SALES SERVICE DEPARTMENT

GREAT SOUTHERN LUMBER COMPANY 1600 4th Avenue, BOGALUSA, LA.

"FROM A LATH TO BRIDGE TIMBERS, SPECIFY BOGALUSA TRADE-MARKED PINE AND REST EASY."

### How to Resilver a Mirror

CONSIDERABLE interest has been shown by our readers in the possibilities of resilvering mirrors as evidenced by the numerous letters of inquiry that have been coming in. Undoubtedly this is a lucrative field for spare-time work, as probably in two homes out of every three will be found mirrors in need of resilvering.

Instructions for doing this work are given below but first a word of caution. Those who have had no experience, or very little, should experiment until they feel that they can produce a satisfactory job before undertaking to resilver an expensive mirror. The work is by no means easy and requires great care for good results.

The first step is to remove all of the backing paint and old silver from the glass. Varnish remover may be used to remove the paint but nitric acid or a mixture of nitric acid and sulphuric acid, is usually required to clean off the old silver. To do this tie some cotton batting on a stick, and rub it on the mirror, after dipping the cotton in the acid. Take care not to scratch the glass while the silver is being removed.

For resilvering, prepare two solutions as follows: (The nitrate of silver called for can be secured from your druggist for about \$1 an ounce.

(An ounce is equivalent to 480 grains which means that the necessary 1,674 grains will cost about \$3.50. Ask your druggist to do the necessary weighing. The other materials will hardly cost more than a quarter of a dollar.)

#### Solution No. 1

Dissolve 560 grains of nitrate of silver in 8 ounces of distilled water. Add strong ammonia until the solution turns to a dark brown color while stirring. Continue to add ammonia until the solution again becomes clear. Then add 520 grains of nitrate of silver, stirring until dissolved. This will again turn the solution to a brown color. If

the solution does not color, clear and then color again, your ammonia is weak. Add distilled water to the solution until you have made one quart in all. Then filter into a bottle.

#### Solution No. 2

Dissolve 594 grains of nitrate of silver in 6 ounces of distilled water. Add 394 grains of rochelle salt (sodium potassium tartrate). Place over a gas flame and boil for 5 or 6 minutes. Allow the solution to cool. This solution should be prepared in an enameled iron ware vessel. Make up to one quart with distilled water and filter into a glass bottle. If these solutions do not remain clear, they should again be filtered just before they are used.

After the paint and old silver have been completely removed and the glass is perfectly clean, lay the glass on a table, making it perfectly level. Take enough of Solution No. 1 to give 3 ounces of solution for each square foot of glass to be silvered. Take an equal amount of Solution No. 2 and pour it into Solution No. 1. Mix these solutions and immediately pour the mixed solutions on to the glass plate. Be sure to cover the glass all over clear to the edge. Leave the solution on the glass for about one hour, or until all of the silver has settled to the glass surface. This work should be done in a room having a temperature from 60 to 70 degrees F. After the glass has been silvered, tip it up and pour off the solution which remains, and then stand the glass on edge and rinse carefully with clean water. Allow the silver to become dry, and then give it a coat of shellac. After the shellac is dry, apply one or two coats of black varnish drying with a flat or eggshell gloss finish. The varnish may be made by thinning down lampblack ground in japan with turpentine, or with turpentine to which has been added a small amount of varnish. After the varnish is dry, the mirror is finished, and may be shipped or used as you wish.

# SAGER METAL WEATHER STRIPS

THE TEST of actual service month after month, year after year, by thousands of users everywhere, is a selling argument that's as sound as the Rock of Gibraltar. Products are like men—their value can be proved only by service.

SAGER equipment has stood the test where others failed and is growing more popular every day.

REPUTATION is worth everything in the product you buy because it is the equivalent of an insurance policy protecting your investment.

THE ACTUAL REASON behind popularity is nothing more or less than the concrete proof the product has delivered the goods.

Popularity is the public's PERSONAL RECOMMENDATION

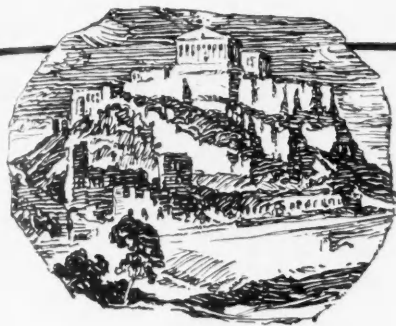
*Some good territory open for live agents*

**SAGER METAL WEATHERSTRIP CO.**

162 West Austin Avenue

CHICAGO, ILLINOIS

# DEMOCRACIES AND MATERIALS



*CENTURIES ago a little Greek city gave the world a democracy whose philosophy, literature, athletic records and architecture have lived ever since. The sculptors of that day took the finest marble from Pentellicus and Hymettus and in the shining stone made permanent record of Athens' achievements.*

**T**ODAY another democracy, our own nation, is making new records in the lines where Athens was supreme, and has added the world's greatest industries.

The permanence of the records of this new age are made possible only through the use of a new scientific basic material—Portland Cement. Giant educational, industrial, transportation, professional and athletic structures are built quickly and permanently with concrete. And the same material is equally desirable for the small job around the house or farm.

A quarter century has seen the growth of concrete's use. A quarter century has justified the increasing popularity of Atlas Portland Cement, "the Standard by which all other makes are measured."

## THE ATLAS PORTLAND CEMENT COMPANY

NEW YORK  
Boston

BIRMINGHAM  
Philadelphia

CHICAGO  
St. Louis

Dayton

Des Moines





### Variation in Brick Strength

(Continued from page 128.)

"The reason of this is, of course, that in a short cube the mortar may crush to a powder and is still capable of resisting compression, whereas in a long column, once this crushing has taken place, the column fails by buckling.

"Tests of single bricks were made and it was found that hard burnt stocks crushed at about 1,460 pounds per square inch and soft burnt stocks about 760 pounds per square inch, i. e., approximately one-half. It will be seen that the cubes of stock bricks in cement correspond to the strength of the weaker bricks of which they were composed. In the case of Fletton bricks the strength of the brick was 3,300 pounds per square inch, somewhat over twice the strength of the cubes made from these bricks.

"Walls 3 feet 6 inches long, 4½ inches thick, 8 feet 6 inches high, were supported vertically in the testing machine between steel joists and felt, and a load of 2 tons per foot run in the case of stock bricks in 3 to 1 cement mortar and 1 ton per foot run in the case of the remaining specimens was put on the machine. This load gives stresses of 82 and 41 pounds per square inch, figures which, of course, are only a small fraction of what the specimens would safely carry, but which were intended to represent approximately the vertical load which might be considered as coming on a wall when used for cottage construction owing to the weight of the wall above and the proportion

of the floor load which it might have to carry. A horizontal load was then applied at the center of the wall by means of a chain attached to a horizontal timber for spreading the load at the back of the wall and passing over a pulley to a large platform which could be conveniently loaded until failure occurred.

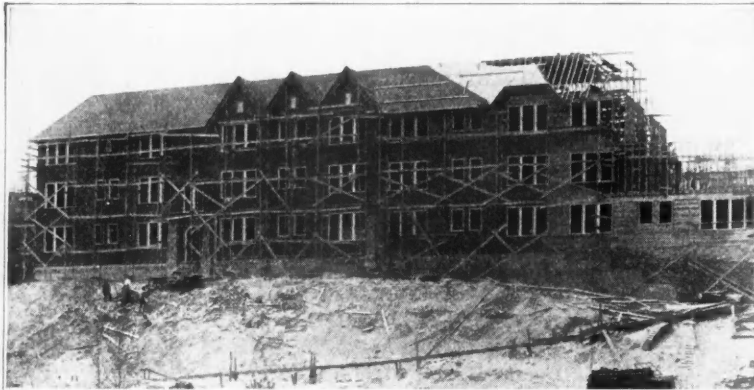
"The results give surprisingly high values and when it is remembered that a single concentrated load at the center would produce approximately the same bending stresses as twice this load uniformly distributed, it will be seen that in the case of brickwork in cement mortar the equivalent horizontal load per square foot producing fracture is of the order of 50 pounds per square foot, and in the case of brickwork in lime mortar approximately half this figure. It will be noticed that the ratio of the strength of brickwork in lime mortar to that of brickwork in cement mortar in bending is approximately the same as that they bear to one another in the case of compressive strength of the long column.

"The thin bending specimen deflected amounts varying from ¾ inch to 1½ inches before failure took place.

"All these tests were done in winter at a temperature of about 40 degrees Fahrenheit, and the mortar would have been much stronger at other seasons."

The second part of his report, which deals with the brick on edge partitions, reads in part as follows:

Two specimens were made, 8 feet 6 inches high and



Hotel for Grand Beach, Rowley Bros., Contractors

GOLFMORE HOTEL,  
Grand Beach,  
Michigan  
Scott C. Dyer, Chicago,  
Architect



30,000 Yards  
E-COD FABRIC  
used by  
Thompson & Smith,  
Plaster Contractors,  
Hammond, Ind.



## 30,000 Yards of E-COD FABRIC

are being used in this great hotel because the architects and contractors are firmly convinced it will produce better walls for less cost. Exterior stucco and interior plaster are applied over E-COD FABRIC. It is the best plastering base on the market today for both uses. Here are some of the reasons:

### E-COD FABRIC is

**Fire-retardant**    **Rust-proof**  
**Damp-proof**     **Sound Deadening**

It insulates. It saves building paper. It can be applied direct to studs. It saves 40% to 60% of the plaster which goes to form the key of any ordinary open-mesh lath.

You can build better for less by using  
E-COD FABRIC.

Send for complete information to

**M. J. MacAdams Corporation**  
111 W. Washington St.    101 Park Avenue  
CHICAGO                      NEW YORK

## OAK FLOORS

(For Everlasting Economy)

### All Kinds of Buildings

Whether you build cottage or coliseum, warehouse, factory or post office, Oak meets every test of modern flooring.

No flooring is more beautiful, more sanitary, more durable, more easily cleaned, more susceptible of fine finish.

Oak Floors increase selling and renting value. Note constant mention of "Oak Floors" in "For Sale and Rent" columns of newspapers.

### All Types of Floors

It may now be assumed that the *modern home* will have Oak Floors. But where a "high duty floor" is required, the *durability* of Oak makes it the logical choice. No. 2 Common Oak Flooring, formerly called "Factory Oak Flooring," is now the cheapest hardwood obtainable, being 25% under any other hardwood.

Cases are on record where this flooring has stood up for over 40 years in a machine shop where heavy, vibrating machinery was in daily use.

### All Stains and Finishes

The adaptability of Oak Flooring to take any desired stain or finish clinches the arguments in its favor, as the builder may take it for granted that Oak may be finished in any desired color.

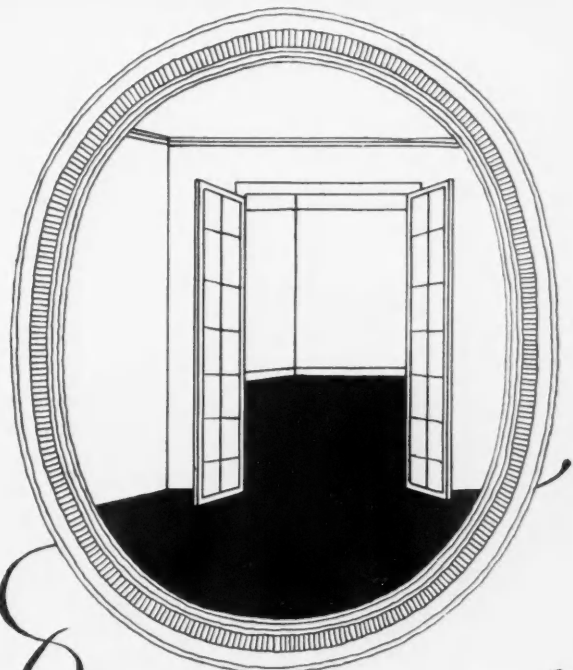
### Oak Floors Over Old Floors

On remodelling jobs the special  $\frac{3}{8}$  thickness for overlaying old, worn floors, at small cost, should be borne in mind.

### Write for Free Booklets

Our informative booklets, in colors, mailed on request.

**Oak Flooring Advertising Bureau**  
1038 Ashland Block, Chicago, Ill.



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Simple—Inexpensive—Beautiful

**N**EW walls and ceilings should be decorated with a finish that will not be affected by the setting of plaster—Muralite.

For two dollars a room you can secure a soft, velvety, beautiful surface—with Muralite.

Muralite is sanitary and simple to apply. It will not rub or chip off. Redecorating is easy and inexpensive—merely wash off the old coating—apply a new one.

The beauty and economy of Muralite make it exceedingly satisfactory to the home owner or tenant. Clean, fresh looking walls are always found in the Muralited home.

It will pay you to find out more about Muralite. Write for a sample color card and full information.

**M. EWING FOX COMPANY**  
New York Chicago

A PAIL · A BRUSH · HOT WATER · AND  
**MURALITE**  
MAKES A PERFECT WALL FINISH

14 feet wide for testing by crushing, and one specimen 48 inches wide for testing under a central horizontal load so arranged as to produce bonding stresses while the specimen was subjected to a vertical load of one ton per foot run.

In all cases 3 to 1 cement mortar was used between the bricks, and they were tested at about 23 days old. The specimens were tested in May, which happens to have been a warm month.

Table (1) of the strength of the materials used shows a result for Fletton bricks of 3,500 pounds per square inch, which agrees very well with that obtained in the first series of 3,300 pounds per square inch.

If the strength per square inch of the long specimens is compared with the corresponding strength per square inch of the same material in the form of cubes, the reduction in strength resulting from the specimen being 8 feet 6 inches long and only 3 inches wide is seen to be very small and much smaller than would have been expected.

It is interesting to notice that the horizontal force diminishes approximately in proportion to the thickness of the wall, not in proportion to the square on the thickness, as might have been expected. Thus if we take the Fletton wall, the 3 to 1, 4-inch specimen gave 781 pounds. Multiplying this by 2 5/8 and dividing by 4 1/2, we get 456; and the actual value found was 553.



### The Successful Bidder

**N**OW figures on cutting his costs in two with a *Tannewitz Portable Bench Saw*

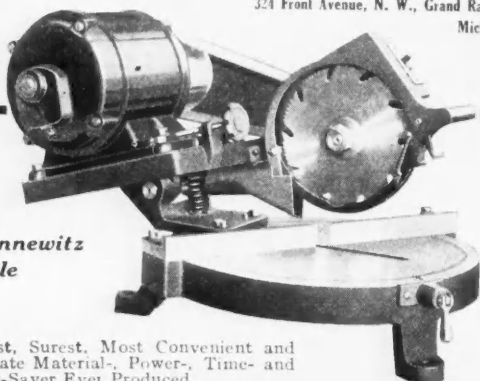
The TANNEWITZ is a high precision tool which cuts any angle instantly to 45 degrees either way. Plugs into nearest lighting socket, and operates anywhere on the job. Accurate gauge and locking device. Will easily quadruple the

speed of your interior finishers and improve their work. Performs thousands of other jobs instantly. Our special bulletin tells the story. Write for it.

*We ship anywhere to responsible parties on approval.*

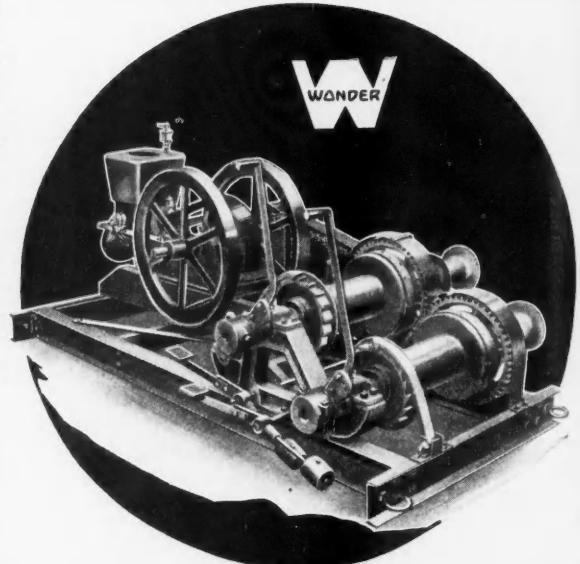
### THE TANNEWITZ WORKS

324 Front Avenue, N. W., Grand Rapids, Michigan



*The Tannewitz Portable Bench Saw*

Fastest, Surest, Most Convenient and Accurate Material-, Power-, Time- and Labor-Saver Ever Produced.



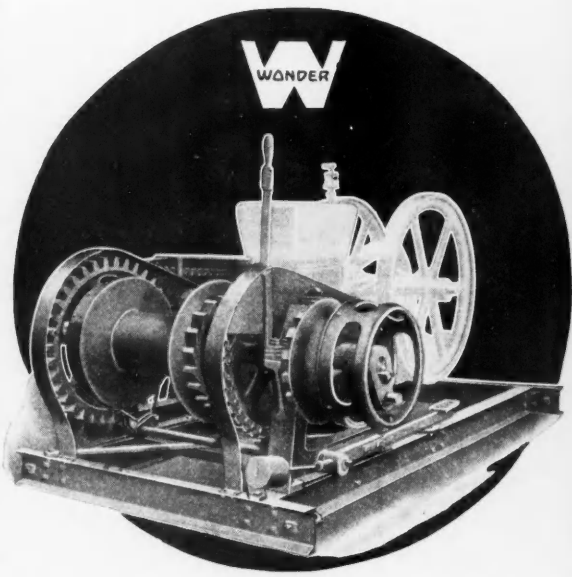
# WONDER HAISTS

are built with the same rugged construction that characterizes all WONDER Equipment.

Built in three different types and various sizes.

It's to your advantage to get the WONDER catalog with its money saving values.

Ask for it today.



**Construction Machinery Co.**  
Formerly Waterloo Cement Machinery Corp.  
103 VINTON STREET WATERLOO, IOWA



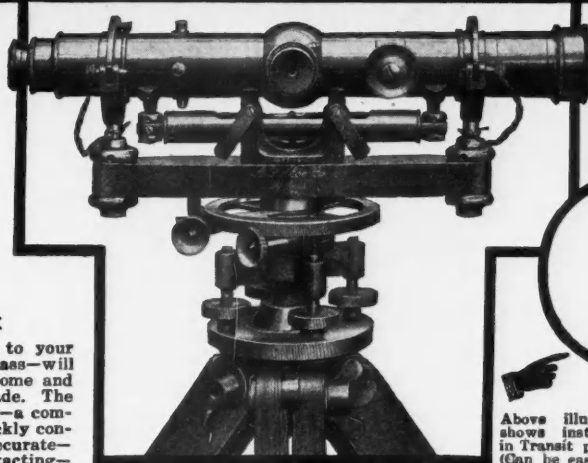
# Level and Plumb With Your Own Instrument

**\$5<sup>00</sup>**

**BRINGS IT TO YOU**

## Better, Quicker Work

This instrument will add immeasurably to your efficiency and put you in the big builder class—will do more to increase your business, income and prestige than any investment you ever made. The Aloe Convertible Level is the world's best—a combination of both level and transit and quickly converted to the use of either. Absolutely accurate—satisfies the requirements of the most exacting—yet so simple that anyone can use it.

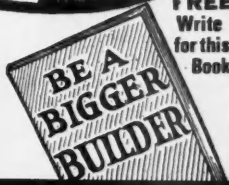


Above illustration shows instrument in Transit position. (Can be easily and quickly converted.)

## Free Trial

Order the Aloe—try it for 10 days—put it to the most rigid tests. If you are not pleased, return it at our expense and your \$5.00 will be refunded.

**FREE**  
Write  
for this  
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No technical knowledge necessary. No previous experience needed. With our simple and complete instruction book, included free with every level, you can immediately put the instrument to work. It is a level and transit combined—takes sights either above or below the horizontal. You can use it for leveling foundations, walls, piers, streets, walks or curbs—boundary lines for fences or trees—surveying lots and fields—plumbing walls, shafts, trestles, posts and pillars.

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Just \$5.00 brings it to you—for a free trial. If perfectly satisfied, pay the balance in small monthly payments. The instrument will be sent at once and from the first day it will be working for you—paying for itself by saving you the cost of borrowing an instrument or the fees you have been paying other men for this work.

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**MAST HOIST**  
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# Concrete Handling Equipment—for the Small Job

Can you imagine anything more simple and less expensive than a bucket which receives its load direct from the mixer, runs up a pole or mast and automatically dumps its load either into chutes or a hopper—no tower to build?

Hundreds of INSLEY MAST HOIST outfits are today saving time and money for up-to-date contractors in connection with the handling of both concrete and materials on schoolhouse, garage, highway bridge and similar classes of concrete construction.

*This simple and efficient plant will do the same for you. Write for illustrated circular.*

**INSLEY MANUFACTURING CO.**

*Engineers and Manufacturers*

**INDIANAPOLIS**

257

### Donley Bros. Conducting Contest on Fireplace Construction

THE Donley Brothers are conducting a contest for the best working drawings of fireplace and chimney throat, offering the following prizes: First prize \$40; second prize \$25; third prize \$15; five prizes of \$10 each.

This is not a competition in external design, but in internal working features and mechanism, to be judged solely from the standpoint of practical heating efficiency and freedom from trouble. It is not even required that the designs be original or exclusive, but contestants must furnish satisfactory assurance before the award is made, that they have a right to submit the design.

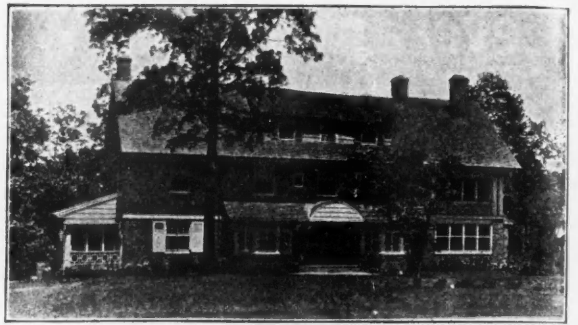
All designs are to be submitted on the condition that the Donley Brothers Co. shall be free to use them. Exclusive right to the use of any design is not desired. Designs whose merit is dependent upon patented materials or mechanism will not be considered. Original drawings, tracings or prints may be sent in. A brief written explanation telling why any feature is desirable, will be welcomed, along with the drawings. The drawings will be judged solely in relation to the problem of making the fire burn easily, brightly, and with minimum fuel for the heat produced, and with total absence of smoke. External design plays no part in the contest.

The committee of judges consists of the following men, all having technical experience in the fireplace field.

E. A. Dodd, of the Art Tile & Mantel Co., a fireplace builder of many years' experience.

W. R. Powell, an architect specializing in fine homes.

Thomas F. Bolton, of the Bolton-Pratt Construction Co., a successful general contractor with long experience in every detail of masonry construction. Address all replies to the Donley Brothers Co., East 74th and Aetna road, Cleveland, Ohio.



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

### Save Half Your Painting Bill

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

### Cabot's Creosote Stains

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

### Cabot's Quilt

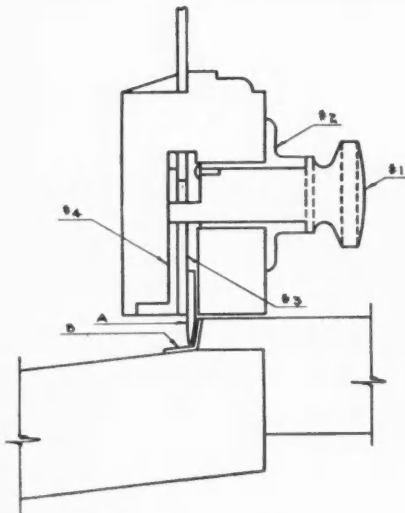
A genuine house-warmer. It's a cushion of dead-air spaces and is 30 times warmer than building paper. Quilt will pay for itself in a short time in saving coal, to say nothing of making the house comfortable for all time. Also a complete sound-deadener.

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

**SAMUEL CABOT, Inc., Mfg. Chemists**  
BOSTON, MASS.

342 Madison Ave., New York 24 W. Kinzie St., Chicago  
Cabot's Conservo Wood Preservative, Stucco Stains, Brick Stains, Damp-Proofing

## Inswinging Casement Hardware



Section Thru Lock

The lock is of an eccentric movement, no springs, governed by one-half turn of knob #1 in part #2. This action moves Joint Strip "A" attached to #3 in part #4 and forces Joint Strip "A" tightly against Angle Stool Strip "B" locking the window and automatically sealing the sill.

L. P. T. CASEMENT WINDOW  
HARDWARE Prevents Rain, Snow,  
Dust and Wind from Entering at the Sill

## LOCKS AND SEALS IN ONE OPERATION

EASY TO INSTALL—Sold in Any Finish Desired

Price \$2.90 PER SET F. O. B.  
Minneapolis

Write for Detail Catalog

**L. P. T. SPECIALTY CO., Inc.**  
120-122 South Ninth St. MINNEAPOLIS

Established 1917

# "ANTI-HYDRO" Keeps a Canal Out of This Building

The concrete basement wall is also the canal wall. Against one side water flows continually. On the inside the concrete is dry as a bone.

This concrete wall was waterproofed with "ANTI-HYDRO" ten years ago. Not a drop of moisture has ever penetrated through it during all these years.

"ANTI-HYDRO" waterproofs concrete permanently against any head of water. It increases both the tensile and compressive strength of concrete and makes it extremely hard, all in one operation.

During a period of 18 years we have yet to find a condition too severe to be met satisfactorily and permanently with "ANTI-HYDRO." You can use it safely on your next job.

**ANTI-HYDRO WATERPROOFING CO.**  
NEWARK . . . . . NEW JERSEY



STOUTENBURGH BUILDING, NEWARK, N.J.  
FREDERICK PHELPS, ARCHT. - M.N. SHOEMAKER, ENGINEER. - B. & W. CONCRETE CO. BUILDERS.



# HELM

Do you know about the Helm Dry Wall System? If you don't, you are losing some of the best jobs. Builders aren't satisfied with the old damp wall construction now that Dry Walls are possible.

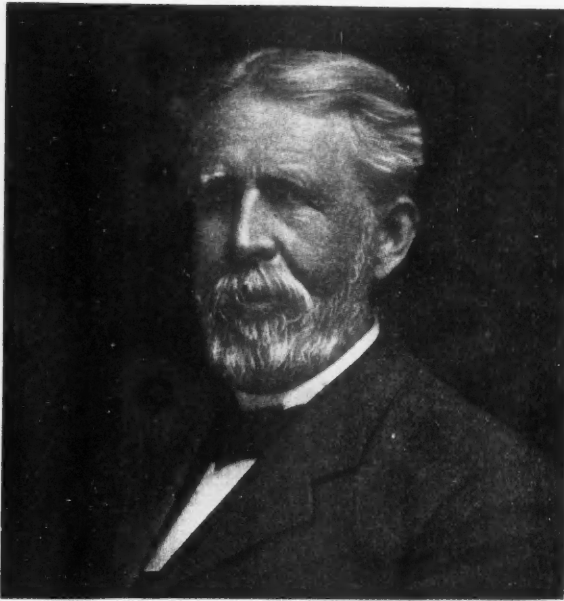
This Helm press has a capacity of 15,000 concrete brick or 1,500 blocks daily. We make them in all sizes from a hand press on up.

Our patented pressure system applies a firm facing of 1/4 in. or thinner in red, brown, buff or many other popular colors.

We'll be glad to send you a catalog.

**THE HELM  
BRICK MACHINE CO.**  
875 Mitchell Street  
CADILLAC MICHIGAN





E. S. Starrett, Manufacturer and Inventor, Who Died Recently.

### L. S. Starrett, Inventor, Dies

**L**EROY S. STARRETT, philanthropist, inventor and founder and president of the L. S. Starrett Co., manufacturers of Starrett Tools at Athol, Mass., died April 23 at St. Petersburg, Fla. Had Mr. Starrett lived two days longer he would have been 86 years old.

In addition to his connection with the L. S. Starrett Co. Mr. Starrett was treasurer and practically the owner of the Athol Machine Co., and was interested financially in the Union Twist Drill Co.

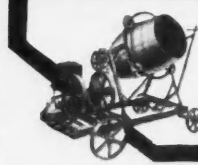
Born in China, Me., April 25, 1836, he was of Scotch descent and one of twelve children of Daniel D. and Anna Starrett. When only 17, he operated a farm of 600 acres in Newburyport. At that time his inventive genius was developing rapidly, and in 1864 he was granted a number of patents and opened a machine shop in Newburyport.

In 1868 he came to Athol, where he combined his business with the Athol Machine Co. in order to manufacture his own inventions. Prominent among them was a meat chopper. For ten years he was general agent and superintendent of the concern, then resigned to begin manufacturing mechanical tools.

The Starrett tools were first made in 1880 when Mr. Starrett hired a single room in the shop of Bennet & Van Balkenburg, where the big Starrett plant now stands.

In 1861 he married Lydia W. Bartlett of Newburyport. She died in 1878. Three daughters survive. They are the wives of Frank A. Ball, Williard G. Nims and Marshall B. Waterman, all connected with the Starrett company.

### The Right Mixer for the Small Contractor



...is the famous mixer with steel barrel that runs two ways. 2-horse power gas engine, all mounted on a stout truck. Easily moved from job to job.

#### ELMCO Handy Mixer

WRITE TODAY for lowest price ever offered and terms that enable you to pay for it from the extra profits it will make you.

E. F. ELMBERG CO., INC., 686 A Main St., Parkersburg, Iowa

## SEND FOR OUR AGENCY PROPOSITION

It's Worth \$5,000 a Year to Many of Our Agents. It's Worth that Much to You, Too

The housing and building situation is more serious now than any time in history. This is the moment of opportunity for the man who wants to get into a business of his own, if ever, and in a field where he makes real money.

The weatherstrip business is an uncrowded field and there are places still where we would like to appoint live agents. Perhaps there's such an opportunity right in your locality.

Write us; you may be just the man who we are looking for and just the big opportunity that has been waiting you.

### Practically No Money Required

Unlike most businesses, the weatherstrip agent needs little money to swing it—practically none.

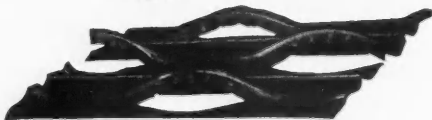
Everything is in favor for the active, energetic man. So write for our co-operative selling plan. You do not obligate yourself in the least.

### ALLMETAL WEATHERSTRIP COMPANY

124 West Kinzie St., Chicago

# Bostwick

"TRUSS LOOP"



BOSTWICK "Truss Loop" effects an actual saving of money for the Contractor and Builder in five distinct ways, viz.: In Time, Labor, Studding, Lath and Waste Plaster. While more expensive in first cost, Bostwick "Truss-Loop" is the cheapest in finished wall cost per square yard, and it endures.

The Bostwick Steel Lath Co., Niles, Ohio

### The Complete Bostwick Line

"Truss-Loop" Metal Lath	Channel Iron
"Diamond A" Expanded Metal	Corner Bead—Rail
	—Standard
"Niles" Expanded Metal	—Truss-Wing
"Lock" Expanded Metal	Base Bead
"Truss-V-Rib" Re-enforcement	Wall Plug
	Wall Ties—Y, No. 1, No. 2

Write for prices and full information

# Bostwick

BUILDING MATERIALS

**7 Years' Success on All Kinds of Contract Work**

## Here is the Fastest Mixer of Its Size in the World

*The reverse gear discharge of the KWIK-MIX is the reason for its remarkable speed.*

**I**T IS the greatest mixer invention in years. Turns out as much thoroughly mixed concrete in a day as most larger capacity mixers. Small investment—low up-keep—fast work. It has no equal for mixing plaster, mortar or semi-dry concrete. The reverse gear discharge quickly forces out the heaviest, stickiest mixture.

### **KWIK-MIX** CONCRETE MIXER

The KWIK-MIX has features found only on high priced mixers, such as gear tilting device, roller bearing, etc.

**Complete Line**

From 2½ cu. ft. capacity to 5½—with Loader, Builder's Hoists, etc.

Before you buy any mixer, investigate—Post yourself—on the most up-to-date mixer—the KWIK-MIX.

Write today for new catalog, New reduced prices and liberal terms.

**Badger Wire & Iron Works**  
1005 Cleveland Ave. Milwaukee



See how back of curved mixing blade throws out mixtures as drum revolves

Dealers Write Us for Agency Proposition

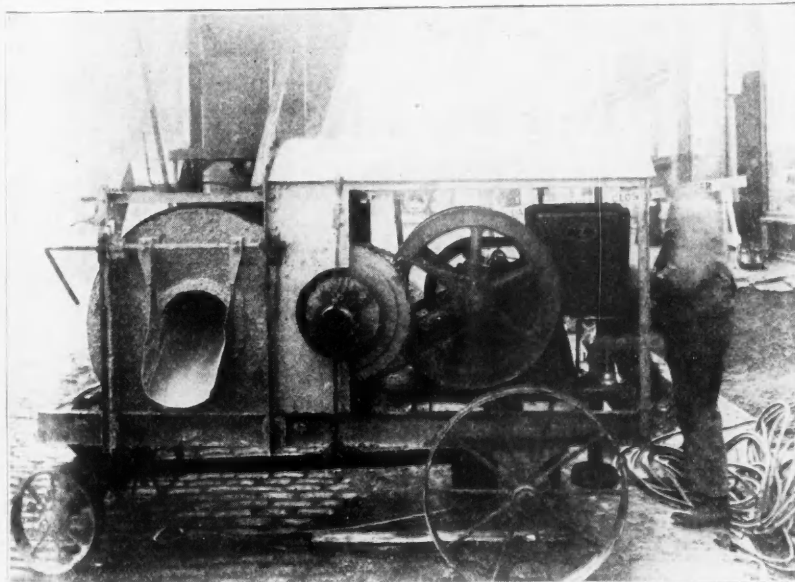
## FAIRBANKS-MORSE "Z" ENGINES

*—a proven power for your work*

Contractors who use "Z" Engines have a steady source of power which requires little attention.

"Z" Engines—sizes 1½ H. P. to 20 H. P.—use kerosene as well as gasoline—have high tension magneto—throttling governor—interchangeable parts. Over 300,000 satisfied buyers endorse "Z" Engines.

Practical power for driving concrete mixers, conveyors, crushers, hoists, painting machines, pumps, sand blast machines.



Thousands of "Z" Dealers Look After Your Service Needs

# Fairbanks, Morse & Co.

MANUFACTURERS CHICAGO



Oil Engines - Pumps - Electric Motors and Generators - Fairbanks Scales - Railway Appliances - Farm Power Machinery

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

**Catalogues, Bulletins and Books Received**

Barrett Everlastic Octo-Strip and Giant Shingles are the subject of two leaflets distributed by the Barrett Co., Philadelphia, Pa. These booklets are printed in color to give the exact shadings of the finished roofs made up of these shingles.

"Built to Endure" is the title of a very attractive booklet by Philip Koehring, president of the Koehring Co., Milwaukee, Wis. This book tells of the romance of concrete from the time of the Romans down to the present day and is illustrated by special etchings in color of ancient and modern buildings and projects of concrete, in which the Koehring mixer has figured prominently.

The 1922 Edition of the American Travel and Hotel Directory is now available. It is published annually by the American Travel and Hotel Directory Co., Baltimore, Md., and contains 2,000 pages listing the hotels in this country, Canada, and South America, with descriptions of many cities of interest to tourists. It sells for \$10.

Porcelain Enameled Bathroom Trimmings are described and illustrated in a new catalog booklet being distributed by the American Enameled Products Co., Chicago, Ill. This booklet lists all of the items in the "Sno-wite" line.

"The Straus Plan of Financing" is the subject of a new booklet issued by S. W. Straus & Co., Chicago and New York. This book contains a detailed description of the plan under which the company operates and makes large loans on real estate.

"How to Build a Better Home" is the title of a book of interest to architects, builders, contractors and home-builders being distributed by the Copper and Brass Research Association, New York City. It takes up in detail the important steps in the process of building a home, laying particular emphasis on the brass and copper features such as roofing, gutter and drain pipes, and plumbing.

"Security," is the name of a booklet now being distributed by the Security Lightning Rod Co., Burlington, Wis. It contains some very interesting data on the action of lightning on buildings of all kinds and the methods to be used for effective prevention. Illustrations of buildings which are protected by Security equipment are also shown.

From the press of the New York Central Lines comes an Industrial Directory and Shippers' Guide. This book contains matter descriptive of communities along the New York Central lines, in addition to classified lists of industries, covering 50,000 names of manufacturers, wholesalers, contractors, merchants, etc. It also contains twenty maps.

**An Easy Way To Cut a Mortise**

Every carpenter knows what it costs to cut a mortise the old fashioned way. It fairly "burns up" time. Ordinarily, fitting six to eight locks per day is a good job;—a dozen is a big day's work, to say nothing of the "slips" which mean costly mistakes and serious delays.

But you can overcome all this and cut your mortises easier and more accurately with—

**The Champion Mortiser**

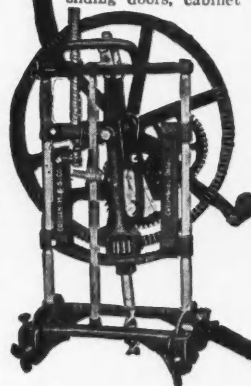
An automatic, ball bearing machine which makes a perfect mortise ten times faster than ordinary hand methods. Easily makes 100 clean-cut mortises per day without the use of brace, bit, chisel, or any other tool,—and every mortise with straight sides and back. Specially adapted for door locks, sashes, sash pulleys, screen doors, folding and sliding doors, cabinet work, etc.

Quickly adjusted from round hole to 6 3/4" slot. Accurately and automatically regulated by graduated scale. Three speeds for working in different woods. Easy and simple to operate. Any workman quickly able to do perfect work. Uses 3/8", 1/2", 5/8" and 3/4" bits, also special sizes up to 1 1/4". Fully guaranteed for one year.

**Owners are Boosters**

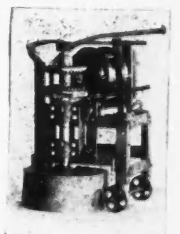
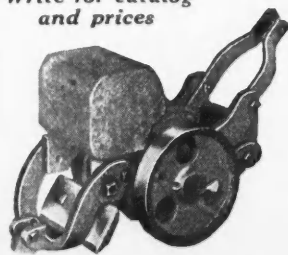
Customers enthusiastic in praise of champion mortiser. H. B. Joseph, Del. says—"Would not be without it. Saved price on one job." Another writes, "Machine giving satisfaction every day. Getting great service out of it." M. Taylor, Iowa, writes, "Second time I used machine, put in 30 locks in 6 hours. Am better satisfied every day." That's how Champion Owners feel; every one a booster. You take no risks. Satisfaction guaranteed or money refunded. Sent C. O. D. on 10 days' trial. Price complete \$35.00 including any two of above bits. Additional bits \$1.50 each. Order today. Don't wait. Our guarantee protects you.

**Colgan Machinery & Supply Co.**  
Dept. A6, 901 Hayden Bldg., Columbus, O.

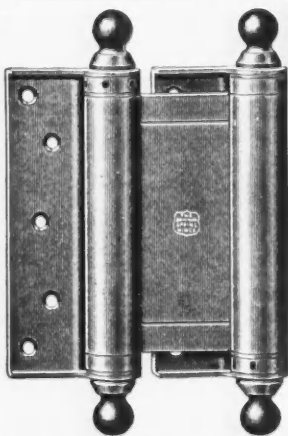


**Floor Scrapers and Reversible Electric Floor Surfer**

Write for catalog and prices



Manufactured by  
**G. J. KEPPLINGER**  
DWIGHT, ILL.

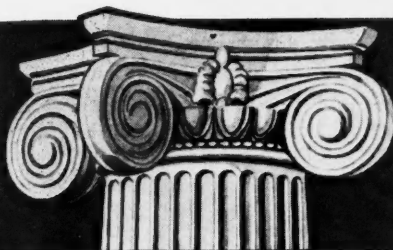


**BOMMER SPRING HINGES**

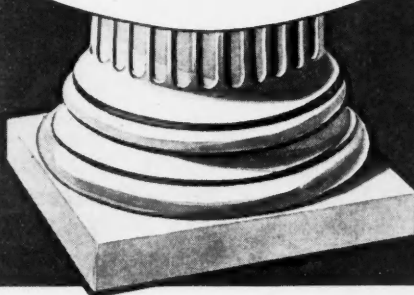
Standard for over 45 years, and steadily improved, retaining superiority over all others. In universal demand. Easiest to apply.

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





Residence on Colorado Avenue  
Washington, D. C.  
N. R. GRIMM, Architect



# UNION

## Metal Porch Columns

Improve the beauty and increase the value of every home and building on which they are used.

If you are building homes for sale the use of Union Metal Columns "the ones that last a lifetime" provide an additional sales argument.

If you are building for the owner, you will have his everlasting gratitude by installing Union Metal Columns that will not split, rot and open at joints.

A job of Union Metal Columns pleases and protects the architect, the contractor, and the home owner.

Send for Catalog 25 and attractive agency proposition.

The Union Metal Manufacturing Co.  
CANTON, OHIO

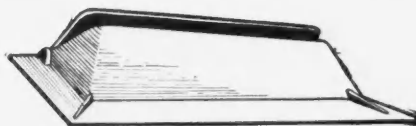
## Build Fireside Contentment Into the New Home



Send for folder  
"Real Home Fires"

**M**ORE than half the open fireplaces are so badly designed and badly built that it's a constant aggravation to try to make a fire burn in one of them.

The family *you* are building for is entitled to a better deal than this. You can give them bright, clean, economical fires and all the contentment which they radiate if you equip the new fireplace with



### The DONLEY DAMPER

It not only controls the draft, but it forms a correct throat. Full direction for fireplace building sent on application.

DONLEY DAMPERS · PACKAGE RECEIVERS · COAL CHUTES · METER BOXES · GARBAGE RECEIVERS

ASH DUMPS AND  
FIREPLACE  
SPECIALTIES

The DONLEY BROTHERS & Co.  
BUILDING SPECIALTIES



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METAL COLUMNS  
AND STRUCTURAL  
SPECIALTIES

DONLEY DEVICES *Modernize the Home*

"Port Towns of Penobscot Bay" is the title of the architectural monograph from the series being distributed by the White Pine Bureau, St. Paul, Minn. The description is written by Charles Dan Loomis and the illustrations show some of the picturesque streets and Colonial details of that old New England region.

**Sohm Electric Clocks** are described and illustrated in Catalogs Nos. 40 and 61 distributed by the Sohms Electric Clock Co., Chicago. The list includes electric self-winding clocks, master clocks and regulators, tower and street clocks, time stamps, and employee time and cost recorders.

"**Smith Pavers**" is the title of a new 32-page catalog just published by the T. L. Smith Co., Milwaukee, Wis. Among the new developments in the manufacture of Smith mixers mentioned in this book are the full caterpillar traction type, made in two large sizes. Smaller sizes with the half caterpillar traction are also illustrated.

"**Atlas Building Mixers**" is the subject of a new catalog, M 23, in colors from the Atlas Engineering Co., Milwaukee, Wis. This book takes up in detail with illustrations the Atlas line particularly the 4-S, 7-S and 10-S mixers. Complete specifications are also included.

"**Slate for Electrical Uses**" is the heading of Chapter 12 of a Series on Structural Slate just issued by the Structural Service Bureau, Philadelphia, Pa. This book contains research data and the results of a series of exhaustive tests made by Lehigh University on the electrical properties of slate. It also contains a tentative standard specification.



### Need for Humidity Control in Dry Kilns

**M**ANY a good kiln turns out poor lumber simply because the humidity of the air in the kiln is not properly controlled. Cases of this sort are continually coming to the attention of the Forest Products Laboratory, Madison, Wis.

The control of the humidity of the air is just as important as the control of the temperature but is often neglected

because it is not quite so obvious. It is well understood that too high a temperature will injure the stock, but it is just as true that too low a humidity may cause an equally disastrous result, even tho the temperature may be well within the safe limits prescribed by the drying schedule.

The rate at which the moisture is removed from the surface of the stock must be nicely adjusted to the rate at which it transuses from the interior to the surface. This transfusion is a comparatively slow process, which can be accelerated by the application of heat. Under ordinary circumstances the heating of the air reduces its relative humidity to such a degree that the rate of evaporation from the surface of the lumber is much too great for good drying (resulting in casehardening and surface checks), and therefore the humidity must be increased to retard this evaporation. The moisture removed from the wood is ordinarily not sufficient to do this, and the method usually employed is to blow live or exhaust steam into the kiln. If the steam sprays or jets are properly arranged they will assist materially in maintaining an adequate circulation of air, especially in ventilated kilns. For any drying in which the best results are desired, a continuous record of the humidity should be kept, by means of a recording wet bulb thermometer, and provision made for accurate control and regulation, either by frequent adjustment of a suitable hand valve or, preferably, by automatic apparatus.

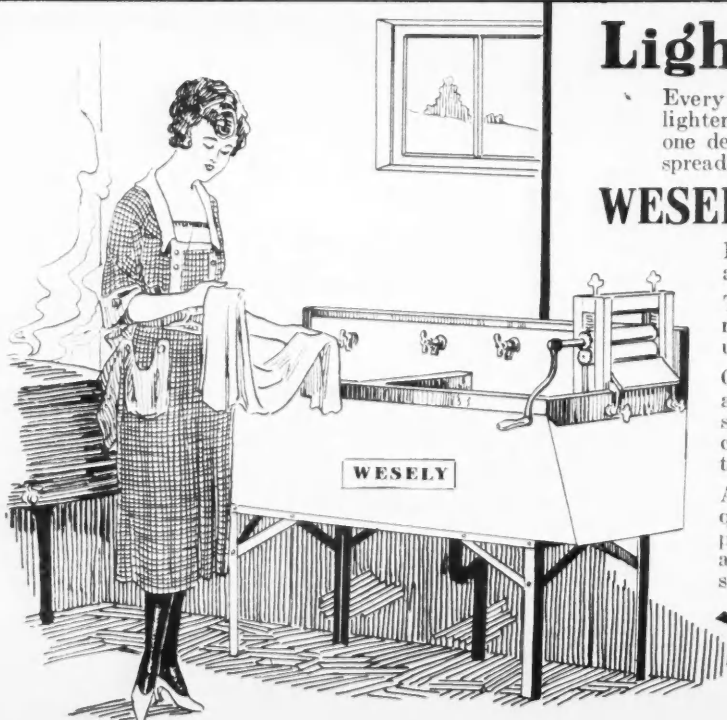


### Include This Septic Tank Right In Your Contract Job

San-Equip Septic Tanks are ready to set up easily, quickly — and PROFITABLY. Water tight — sure working — fully guaranteed, of approved plan recommended by leading health officials. Write for circulars.

**Chemical Toilet Corp.**  
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## Lighten the Burden

Every time and labor-saving utility that tends to lighten housework should be installed. No other one device or appliance has received such widespread endorsement and adoption as the

## WESELY Cement Laundry Tray

It lifts the dread of BLUE MONDAY and does away with the hardships of the old-fashioned tub.

The WESELY Laundry Tub does not stain, will not crack, is not affected by heavy wear and hard usage, is easy to clean and will last a lifetime.

Our all steel collapsible tray stands have many advantages over the old style cast iron leg. They simplify installation, are strong, durable and are constructed to equalize the weight of the tray, thereby avoiding all chance of breaking.

All WESELY products have that same reliable quality that assures absolute satisfaction to the purchaser. We will be glad to furnish information and prices upon request. Most good jobbers stock our products. Write today.

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