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ANY DEALER can supply 121 different sizes of Andersen Window Frames the same day they are ordered. Still that dealer only stocks 11 standard sizes. A glance at the above list shows how easily this is done by simply interchanging heights and widths.

The ability to deliver when needed a large number of sizes of a wide variety of uses is a distinct saving to both dealer and builder. This convenience and the time it saves is only one of the many advantages of Andersen Standard Frames over made-to-order frames.

All exposed portions of Andersen Standard Frames are of genuine White Pine—the wood that has for centuries withstood warping, rotting, swelling and shrinking

in America's oldest houses. Accuracy of construction, and the use of White Pine, insure you that windows will always fit snugly yet slide easily in Andersen Frames.

Each frame is packed in two compact bundles containing seven units. These seven units can be nailed up into a complete frame, with pockets and pulleys in place, in 10 minutes. The small bundles, each weighing less than 20 pounds, are easily handled and require less storage space.

Write for Complete Information

An interesting book, giving information about Andersen Standard White Pine Window Frames and the economies of their use, will be sent without charge. Write for a copy.

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Andersen FRAMES

Short Talks by the Editor

Our Birthday

THIS month we are seventeen years old. Naturally when one's birthday comes around, one is inclined to become reminiscent. When we look back over the years we realize what wonderful years they were. Not all pie and honey, to be sure, but years in which we were able to help in the great work of improving building, bettering home conditions in farm and city. We have received wonderful co-operation and support from our large body of readers in the way of helpful criticism and kind words now and then that make us proud yet humble; for we know that still more and better things will be expected of us.

We are glad to say that increasing age is not stooping our shoulders or slowing up our pace. Instead of being "an old dog that will not learn new tricks," we are just about as curious as the growing boy who is always pestering his father with questions. We want to know everything—about the building business and we are passing on the knowledge we get each day to our readers who can use it in their daily work.

So when we say we are going out after new ideas with more vigor than ever before, we want our readers to come right along with us, so as to have the benefit of these newer ideas in their great work of selling the building idea.



Skilled Workmen Shortage

SOME generations ago the building mechanic was, as a regular practice, a graduate of an apprenticeship course. It is probable that in many cases he was given so little mental drill and such narrow training as to have prevented his becoming as skillful and capable as is desirable. On the other hand, he went thru a training period of approximately four years and undoubtedly obtained, as a rule, much sound preparation for his trade. I doubt much the desirability of a return to the specific type of apprenticeship courses of those days, but, nevertheless, it seems apparent that facilities for the specific training for our building artisans are at present so meager as to make action essential as a matter of business economy.

"One of the largest contractors and engineers in the country not long ago stated that the average mechanic whom he employed had obtained his trade training by picking it up thru chance opportunities, and that not uncommonly such mechanics were but little removed from the "hatchet variety." School authorities who have made extended investigation state that a large portion of our young people who leave school from the grades and who are capable of becoming highly skilled workers, float about without

definite direction and locate in various trades or labor without adequate preparation for their work.

"Some of the industries of the country, notably the Typothetae, the merchant tailors and a long list of the best managed of our great manufacturing establishments, have taken up this subject and are now carrying on, frequently at their own expense, schools of high type for preparing workers for their specific requirements. If these establishments find it practical to do this, should not the building trades, which demand mechanics of the highest type for much of their work, take steps in the same direction? The nature of the building business renders it largely impossible for single contractors to handle projects of this kind, but it does look as tho proper co-operation on the part of the construction interests in the various communities of the country would accomplish much. The threatened shortage of building artisans is another warrant for early consideration of this problem."

Mr. Ernest Trigg of the National Federation of Construction Industries has sounded a warning that should be heeded. The Cincinnati building trades have started a practical apprentice school and other cities are planning similar courses under the provisions of the Smith-Hughes bill. Effective action will do much to eliminate the present shortage of trained men.



Spring Building Outlook

CONSIDER these current news items:

"Apartment building permits in Chicago during the month of February show an increase of 58 per cent over January."

"Samuel Untermeyer, prominent New York attorney, counsel for the Lockwood investigating committee, proposes a plan for a gigantic building operation, including 1,500 tenements to house 225,000 persons, at a cost of \$100,000,000."

"Valuation of building permits issued in 163 cities are as follows: January, 1922, \$140,517,763; January, 1921, \$59,433,167; January 1920, \$126,126,080; January, 1919, \$22,889,793."

"Business on the upturn."—*U. S. Chamber of Commerce.*

"Philadelphia—Contracts let for new library and Delaware river bridge."

"Chicago—\$12,000,000 hotel planned; \$50,000,000 Illinois Central terminal under way."

"New York—Macy addition, new Times building annex, Hearst mammoth publishing plant."

Gleanings at random from the mass of information that filtrates thru our hands daily, these items all contain a note of optimism—healthy, mind you, that cannot be denied. They sound encouraging for the building industry, encouraging for all lines of business, for were not business men feeling the new pulse of activity they would not be investing their money in building.

Builder Equips New Homes With Radio

PHILADELPHIA CONTRACTOR FIRST MAN TO MAKE WIRELESS PHONE PART OF HOME EQUIPMENT

By I. L. Gordon

Radio Now—What Next?

EDITOR'S NOTE: How will the radio telephone affect the building field? Ever since this mysterious, remarkable invention has set the world agog, this question has bothered us. But no longer—we have the answer from a practical builder, a man who is one step ahead of the field. The first builder who sold a gas stove with a new house was considered insane—it is now as essential as the kitchen sink. Some builders will think John McClatchy is a fit inmate for the "booby hatch." May be he is crazy—like a fox.

JOHAN H. McCLATCHY, one of the largest operative builders in Philadelphia, is the first man in the United States to apply the radio telephone in house construction. In \$1,500,000 worth of new homes, now under construction in the suburbs of Philadelphia, he is installing complete sets. To say that he has stolen a march on other builders is speaking mildly. It is regarded in the Quaker City as one of the most notable advertising "stunts," to say nothing of the additional merit it adds to the "McClatchy House."

Mr. McClatchy has been building in and near Philadelphia for the past fifteen years. During the war he was the Philadelphia representative of the United

States Housing Association and had charge of erecting thousands of homes for shipbuilders along the Delaware River. In the past he has developed great tracts of land, notably in the vicinity of Delaware County and in the northern portions of Philadelphia. Recently a number of houses constructed by this builder and selling for \$7,000 before the war, brought \$16,000. In Philadelphia the McClatchy House is regarded as a standard. His houses range in value from \$9,500 to \$25,000.

Recently Mr. McClatchy became interested in wireless and in the radio telephone. He obtained figures regarding the number of persons in the city installing the radio telephone and was astonished to learn of the widespread interest. As Philadelphia is within easy ear distance of New York and Pittsburgh, and in view of the fact that only a few weeks ago the city itself became a broadcasting center, the builder realized what a favorable position it occupied to hear "all the news and music in the air." In addition, two Philadelphia department stores only this week (March 17) began a series of aerial concerts and news dispatches.

Now, it was McClatchy who devised the small breakfast room effect in the modern kitchen, and he hit upon another innovation with the radio telephone. He immediately saw the advertising factor plus the additional interest it would create in his houses should he install a wireless telephone apparatus in each house. He set to work drawing plans for individual receiving stations with the telephone connections in living rooms or bedrooms or thruout the entire house, should the home owner desire. At any rate, Mr. McClatchy came to the conclusion that the radio telephone has come to stay and that he would be the first man in the country to make it a part of the standard equipment of a house.

Suddenly one morning, just before the middle of March, the other Philadelphia builders awoke to the fact that "John" had "put another one across." Came the announcement in the newspapers that all his houses now under construction in Cynwyd, Wynnefield, Germantown and in the Sixty-ninth Street Section are being equipped with telephone sets which will permit the housewife to hear Chopin or Gadske or a flash of news or fashion hints or sermons whenever she desired. It was a bold stroke and it has paid.

The McClatchy houses all will be equipped, but whether each house will have its individual aerials has not been determined. There are

Announcement—

Radio Telephone Service Built in These New Homes

The \$1,500,000 worth of new homes which we are now building in the 69th street center; Germantown, Wynnefield and Cynwyd will be **EQUIPPED COMPLETE** with Radio Telephones, connecting with concert service from Pittsburgh, Newark and other centers. This will add greatly to the enjoyment and comfort of these new homes.

JOHN H. McCLATCHY
Builder of Homes
848 Land Title Bldg.

One morning a few weeks ago, Philadelphia builders woke up to find this startling announcement in the newspapers. J. H. McClatchy, well known homebuilder in that city, had made capital of the new radio idea.

some objections to this plan as a definite scheme of wiring must be adopted, not to injure the lines of the dwelling. It is possible that one large aerial may be erected near a group of McClatchy houses and then wires extended into each house. The sets will be of sufficient strength to carry the voice from Pittsburgh and New York, while concerts on ships at sea will be a nightly occurrence.

The practical builder asks: "Will it pay?" Philadelphia competitors of McClatchy say it will. They maintain that the publicity is worth the price of the sets and that the novelty, convenience and interest as well as the education features for children will do much to influence buyers. One of the largest dealers said he remembered the time when the first builder who sold a gas stove with his house was looked upon as little short of insane, while today only the practical man knows the expense of the multitude of appliances demanded by the purchasing people. Moreover, it is contended that the expense is small when placed in numbers and can easily be carried on houses from \$7,500 up.

"It means we all will have to do it," said another builder. "Take two houses of an even price—the one having a radio telephone will sell."

The cost is not as great as might be expected. A small radio telephone including receiving set complete with crystal detector and head telephones will cost \$25.00. The aerial equipment costs an additional \$6.50. This apparatus will receive the human voice over twenty-five square miles. A more serviceable and better set costs \$73.45. This will receive the voice and music up to 500 miles. This cost is divided as follows: Aerial equipment, \$6.50; receiver complete with audion bulb and head telephones, \$65.00; and two batteries, \$1.95. The cost of installation is not great, depending, of course, upon the number purchased. The figures given also may be reduced in quantity purchases. In short, for an expenditure of something like \$100 per house, a Philadelphia builder has obtained national publicity, an abundance of local advertising and has made another big step forward in the house equipment field.



Radiograms

SIX months ago there were 50,000 sets in operation—today there are over 600,000. The "radio" germ is quite contagious.



One of Typical Philadelphia Double Houses Built by McClatchy, Who Is Now Fitting His New Houses with Radio Telephones.

SOME people are scoffing at the new wireless wonder just as their predecessors scoffed and jeered at bathtubs and other plumbing fixtures not so long back. What would a home be today without a bathroom?



Business Going Ahead on New Basis

BUSINESS today is going ahead on the new basis. We know that if the world will not take as much cotton as we produced before 1914, we must produce less; in fact, our production is being adjusted to the decreased world demand and the diminished volume is being marketed at a price level considerably higher than that which prevailed nine months ago. The textile industry, which was in a state of collapse a year ago, has passed thru the crisis and is undergoing a rapid and extensive revival. The huge surplus of copper has been largely absorbed. The livestock industry, which was in great distress last year and which still has its difficulties, has shown distinct signs of stabilization and revival. The building business, which was among the first to suffer in the collapse of 1920, is coming back on a very satisfactory scale all over the country, except where labor difficulties restrain it.—EUGENE MEYER, Head of War Finance Corporation.



ONE of the many evidences of returning business confidence and financial stability is the steady advance in prices of Liberty Bonds.

OUR FRONT COVER HOME

“YOU are an expert on buildings, especially homes,” said a contractor to us the other day. “I have been hearing a whole lot about this built-in garage idea. As a matter of fact, one of my clients wants to build a house with the garage included in the main building. He has a friend who has one and thinks it is the best thing yet. Now he wants me to build a new home, a good one, and he wants a garage in the house. I don’t know much about the proposition and I’m afraid if I don’t get the information, I’ll lose out on the contract.”

“You’re in luck,” we said, turning to a pile of papers, “it just happens that we are going to feature that kind of a house on the April front cover of the AMERICAN BUILDER. I have a proof of it here.”

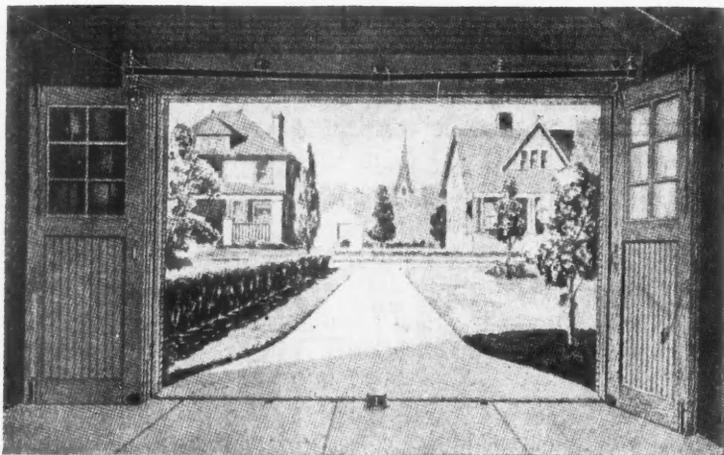
Well, if you look at the front cover of this issue, and you have by this time, for it is a pippin, you will see the house we showed him.

“There is a distinct advantage in this arrangement,” we explained further to the contractor. “Not only can this room be reached without going outdoors, but it can be heated from the plant that heats the home, eliminating one of the troublesome difficulties of the car owner who must protect his car against freezing. This room is just as comfortable as any room in the house. Just suppose you are coming home some cold night when the best place in the world to your mind is bed. Pretty soft to drive up to the house and drive straight in.

Same way in the morning—you step into a warm garage, get the car tuned up quickly and drive out.”

The built-in garage is specially adapted to houses built on inclines or terraces—the driveway can be cut right in from the street.

Aside from the garage feature, the excellent construction used thruout is important. The house is of



Type of Garage Doors Used in Front Cover Home. There Are Four Doors, Each Siding on an Overhead Track and Folding Back Against the Wall.

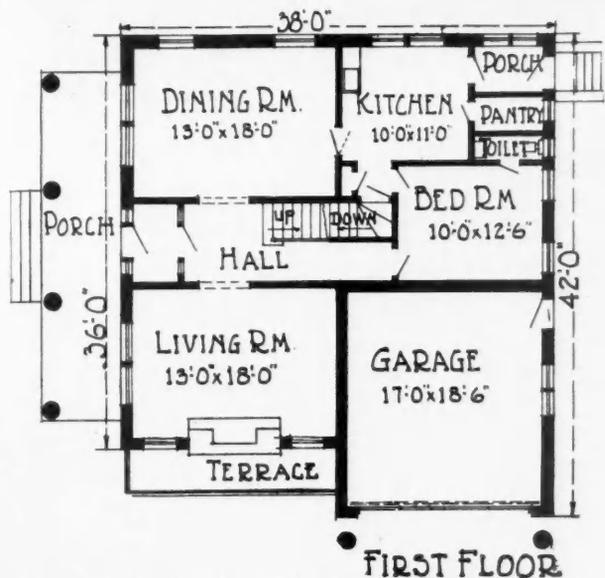
the familiar square or “box” type with hollow tile walls covered by rough finished stucco. As a suitable roof, in harmony with the general design, a hipped roof covered by shingles of an attractive green shade is used. In the picture on the front cover the view is taken from the side giving a close-up of the garage with its special folding and sliding doors. The front of the house is quite impressive and pleasing in appearance with a terrace extending all the way across and part way around the side. An enhancing touch is furnished by an ornamental iron railing along this terrace, while the pergola in front adds to the beauty of the picture.

Square houses of this type always give an impression of size, but an examination of the floor plans often shows that the eye is deceived. While quite comfortable, this front house is far from being really large. One of the outstanding details of this beautiful home is the massive chimney which is fully 8 feet in width. It indicates a large open fireplace in the living room, one that will “burn,” not merely an ornamental feature, and one that will prove a magnet on cold eve-



Small Kitchens Such as They Are Building in Modern Homes Call for Ingenuity on the Part of the Builder. He Must Include All of the Needed Equipment in Reduced Space. That Accounts for the Many Built-in Features Shown Here.

How the Garage is Built in the Home



First Floor Plan of Front Cover Home. Note Built-In Garage. There Are Eight Rooms of Good Size.



Second Floor Plan of Front Cover Home. There Are Four Bedrooms on This Floor and Another on the First Floor.

nings. People, universally, have taken to the idea of the great lounging room with great enthusiasm and a home today without a large living room is a strange one, indeed.

To prevent any possibility of the garage detracting from the pleasing architectural scheme of the house, it has been built to project out about 6 feet, one wall forming a very satisfactory backing for the side terrace. Moreover, this extension of the wall line permits of a short roof and balcony outside the bedroom directly above. Here again an ornamental railing has been added with beautifying effect. The garage is quite large, occupying about 325 square feet and has two sets of attractive glass paneled doors. These doors slide along on an overhead track and while sliding fold into two sections, accordion-like. The garage is accessible from the inside hall also.

Taking up the interior arrangement, you will find a living room 13 by 18 feet, dining room 13 by 18 feet on opposite sides of the hall, kitchen 10 by 10 feet, and a maid's room off the hall, 10 by 12 feet 6 inches. It is interesting to note the size of the kitchen as compared to the other rooms. It occupies 100 square feet where the living room covers a space of 234 square feet, or over twice as large. This is in striking contrast to the arrangement of a house of similar size ten years ago and is due to the remarkable strides made by builders in designing the complete kitchen. They have found that they can place the same kind of equipment in this room, as they did ten years ago, without taking up one-half the space. Built-in cupboards, iceboxes and receptacles of various kinds have been responsible for this change.

Four bedrooms constitute the second floor plan arrangement. They are all of the same size, 13 by 16 feet, with windows on two sides in each room, insuring cross-currents of fresh air for those who are sleeping. In addition, there is a sewing room at one end of the hall opposite the bathroom. It might be added that there is an extra toilet on the first floor off the maid's

room. The bedroom over the garage has the advantage of a row of four casement windows which are used to complete the architectural detail at this point.

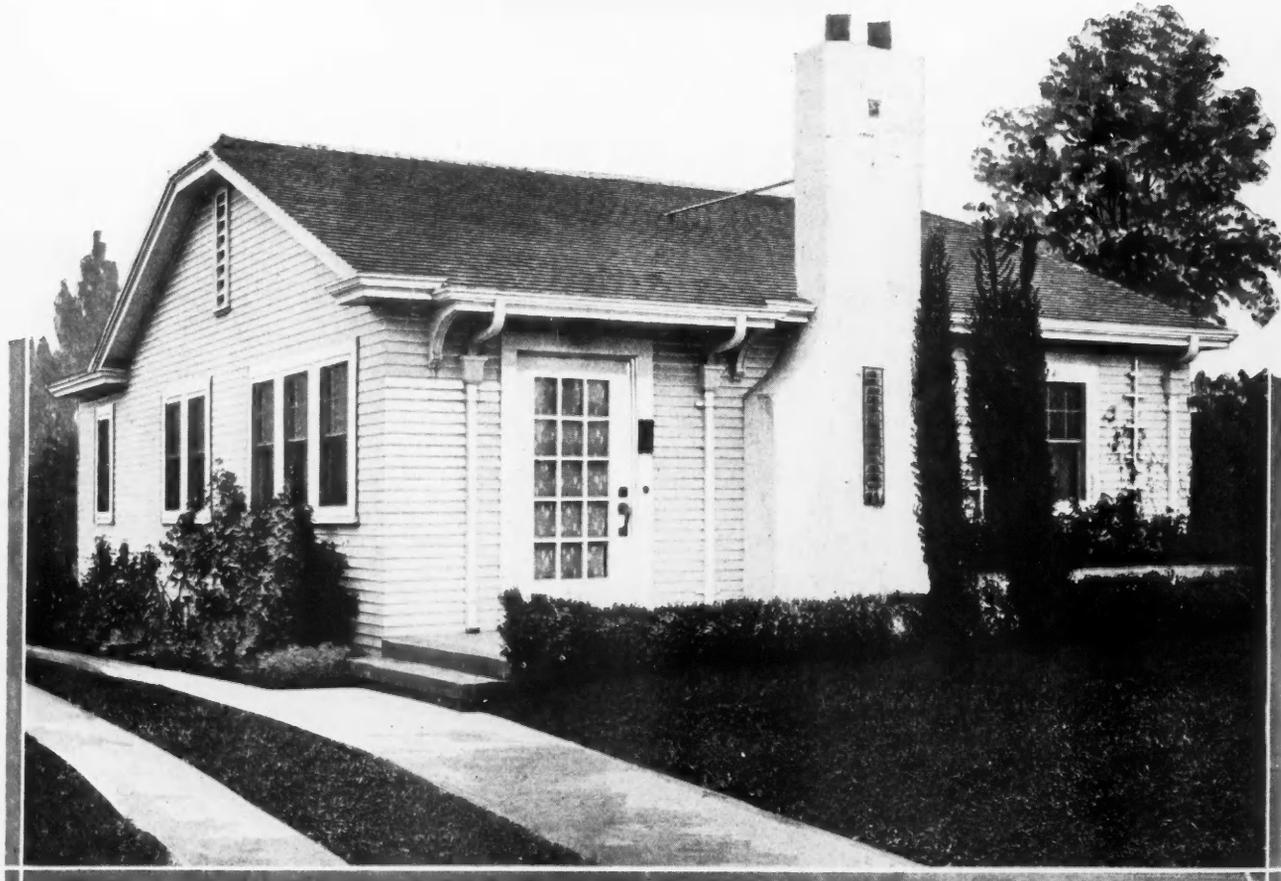
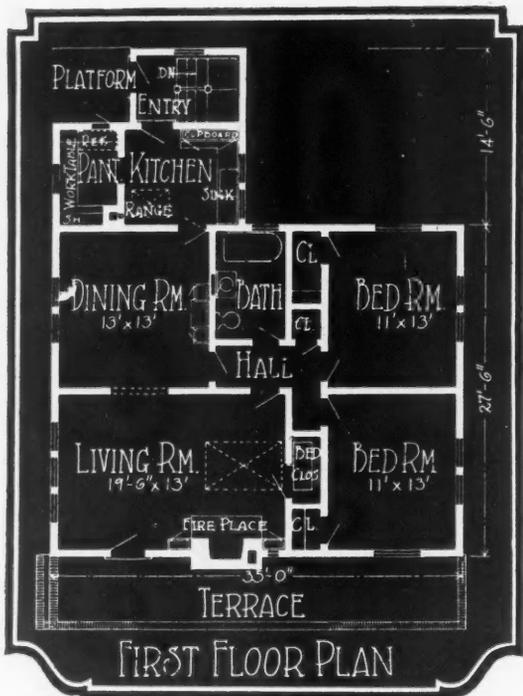
In addition to the comfort which the built-in garage adds to the home, it, of course, represents a tangible saving in construction costs. Here it is incorporated in the building proper, where otherwise it would be a separate building and as such add to the bill. The built-in garage is the inevitable development of the intimate position the automobile occupies in the present-day American family. As a whole, considered a luxury, the automobile has come to be almost a necessary cog in the daily machinery of life and as such can be admitted into the very home itself.



Bright, Spotless Bathroom of Small Size, Showing Building Features of Present Day Home Building. It is Thoroughly Sanitary and Easily Cleaned Because of Tile Floors and Modern Fixtures.

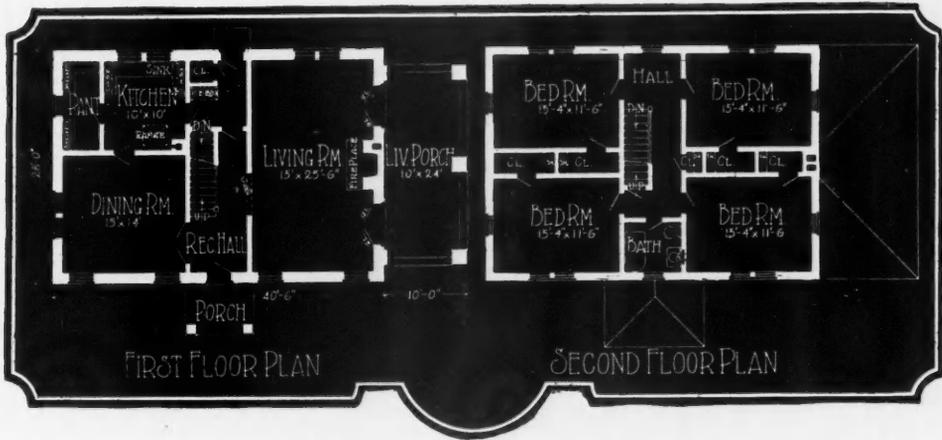
PRACTICAL & ARTISTIC

BLUE RIBBON HOMES



“WHEREIN LIES CHARM AND HAPPINESS.” Are we getting back to individualism? Many builders are asking this question in the face of the popular demand for small distinctive homes. This is one of the typical designs that are in public favor. It is the bungalow type built of frame, with five well arranged rooms of comfortable size. Hominess is the keynote of the large living room with open fireplace. A wall bed has been added in this room to accommodate overflow when necessary. In some climates no excavation for cellar is needed as the heat can be provided from gas radiators and the fireplace—in colder climates a pipeless furnace will suffice. The dining room and kitchen are conveniently situated with regard to each other. Note the compact and complete arrangement of the kitchen. Two bedrooms and bath have been placed on the other side of the hall. Size of house, 35 by 27 feet 6 inches.

BLUE RIBBON HOMES
 PRACTICAL & ARTISTIC



MODERN VERSION OF OLD BUT POPULAR DESIGN. Here we have the Colonial dressed up in different fashion than its usual custom. Brick and stucco have been used in the exterior treatment instead of the frame, but the salient and delightful features of the Colonial house have not been lost. There is the simple, hospitable entrance, the low setting on ground level, and the wide frontage. A large living porch has been added on one end as a supplement to the living room, 15 by 25 feet 6 inches. The porch is screened in. There are seven rooms in all, of which three are on the first floor and four bedrooms are on the second. They are all of comfortable size and well lighted. A high attic can be used if needed. The house is 40 feet 6 inches wide and 28 feet deep. The porch is 10 by 24 feet.

Suitable House for the Small Lot

STUCCO HOUSE OF PLAIN DESIGN WITH ORNATE ENTRANCE—HAS SEVEN WELL ARRANGED ROOMS.
By R. C. Hunter, Architect

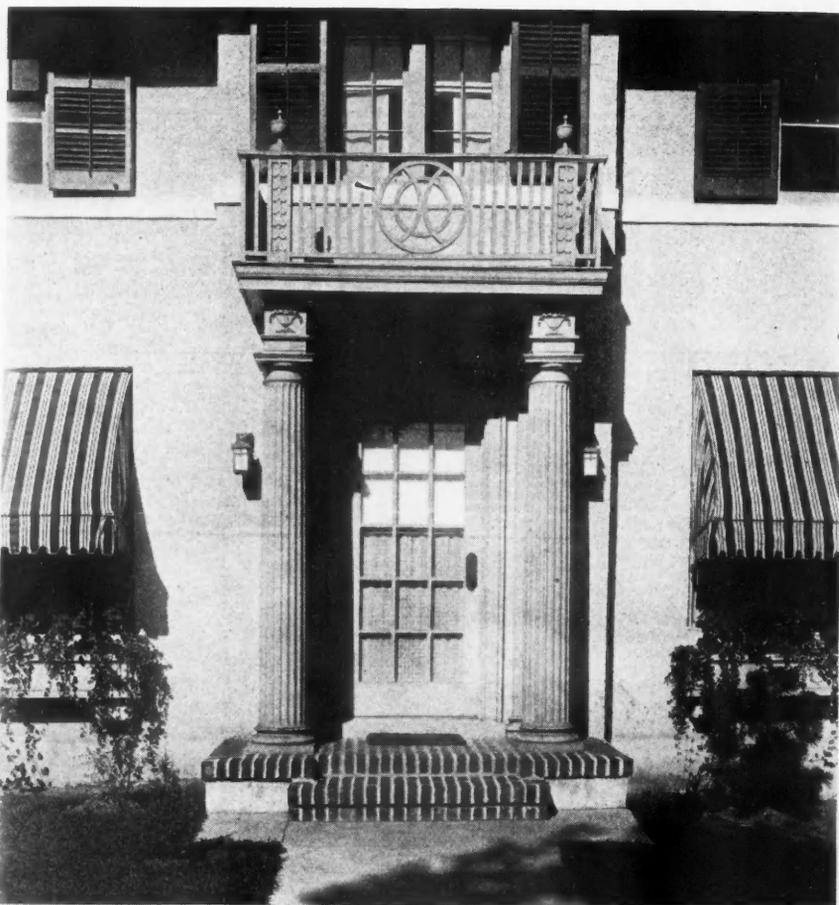
FOR the closely built suburbs or in the city where lots are narrow and often shallow, and where adjoining houses are close on either side, a simple, dignified stucco house fits well.

A rambling Colonial farmhouse would not have an appropriate setting here, as this type of house needs open spacious lawns and should set well back from the street.

With a plain stucco house of the type shown in the accompanying illustrations, it may be set comparatively close to the street without in the least detracting from the appearance. Thus, a house of this type is ideal for a shallow lot.

To relieve any effect of plainness in the front of this house, the architects have designed a pleasing and rather ornate entrance that lends the required dignity to the house without repulsing the visitor.

This entrance detail is worthy of study; note the well-proportioned columns, the refined mouldings, the pleasing detail of the balustrade and the judicious use of orna-



There Is Artistry and Charm in This Detail of Doorway for the House Shown Below. It Adds Dignity to the House Without Losing Any Hospitality.



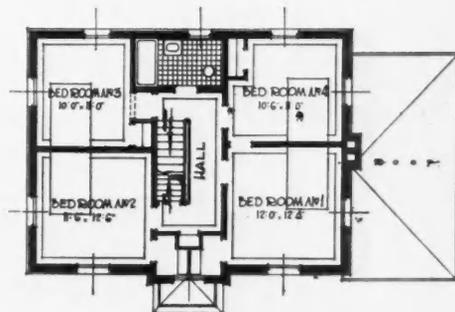
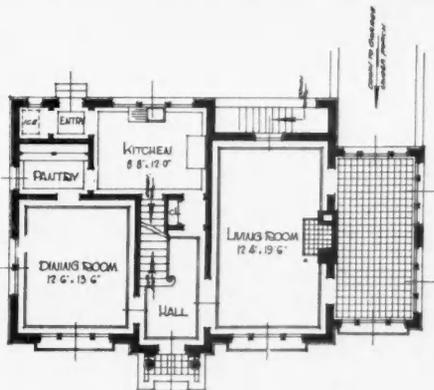
Pleasing Stucco House of Square Type Which Can Be Set Close to Street or Placed in Shallow Lot. The Walls Are Terra Cotta Block Covered with Stucco and the House Contains Seven Rooms and Large Living Porch, Completely Enclosed.

Entrance is Feature of Charming Home

ment. The ceiling treatment is very effective.

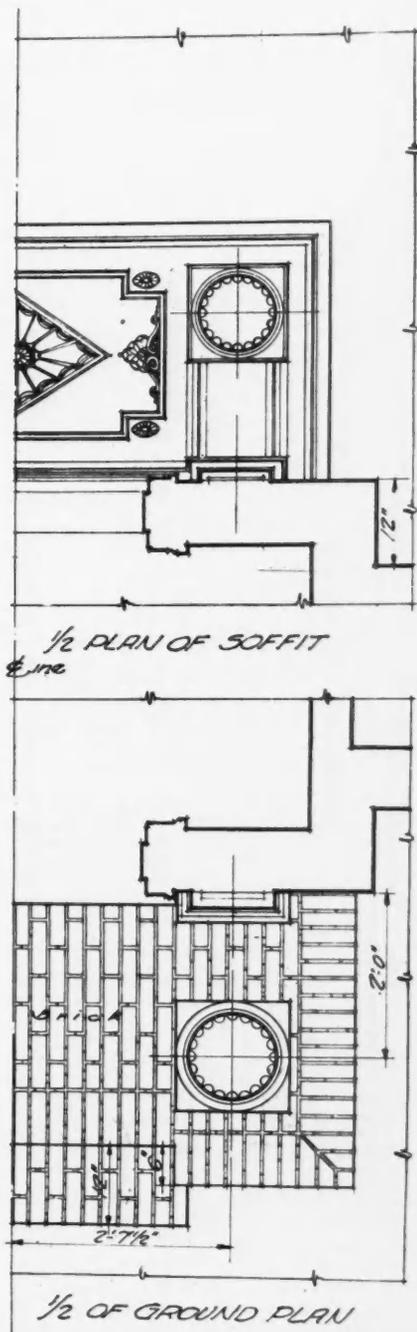
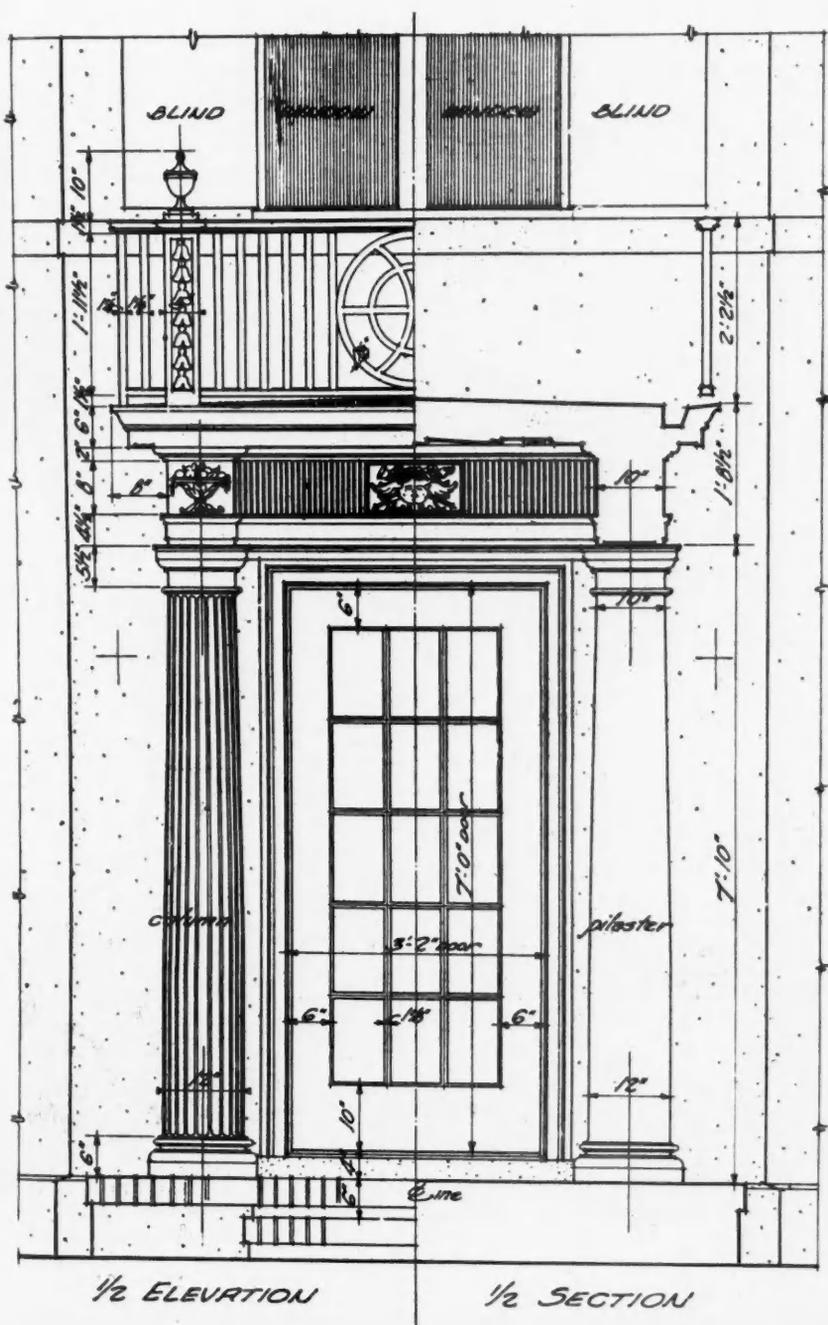
The architects have disposed of the garage in a very convenient and economical manner. It is placed under the living porch and connects to the cellar.

The walls of the house are terra cotta block, stuccoed outside and plastered inside.

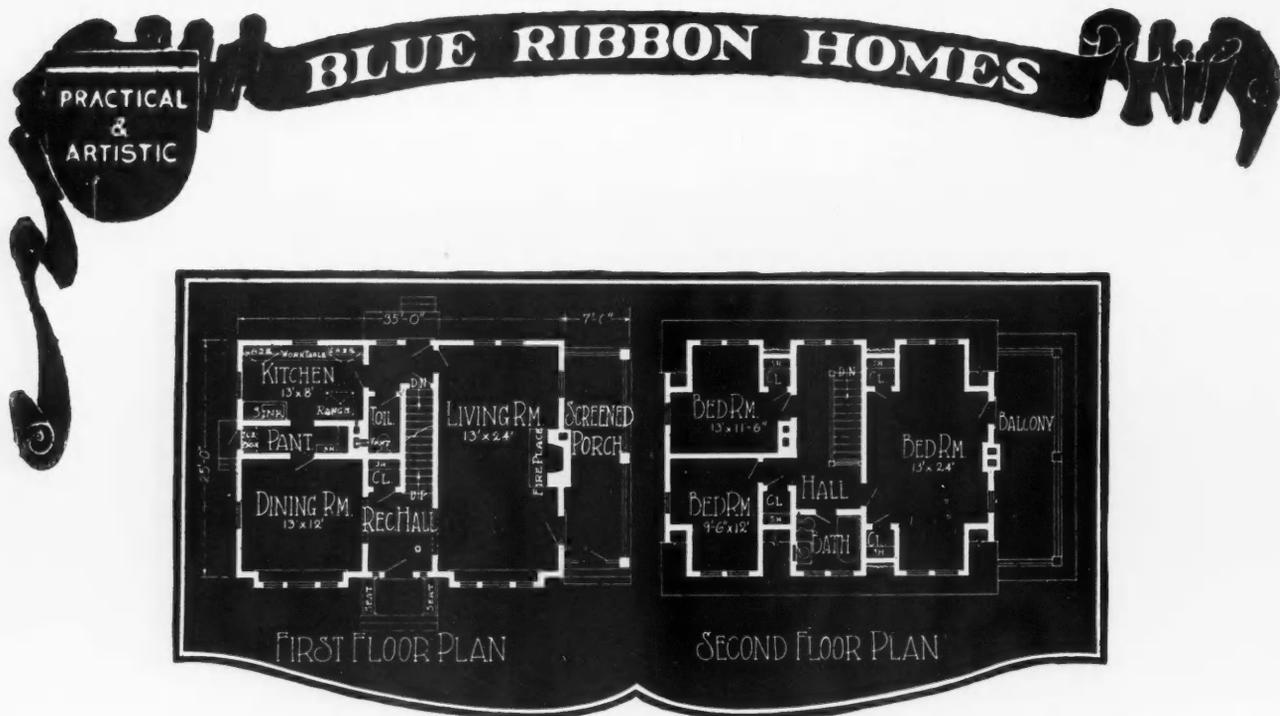


Floor Plans of House Shown on Opposite Page. Note Large Living Room and Four Bedrooms on Upper Floor. Size, 39 by 26 Feet.

The plans show seven rooms, all of good size and closed and heated so that it can be used thruout the well arranged. The living porch is completely en-year. R. C. Hunter & Bro., N. Y. City, architects.



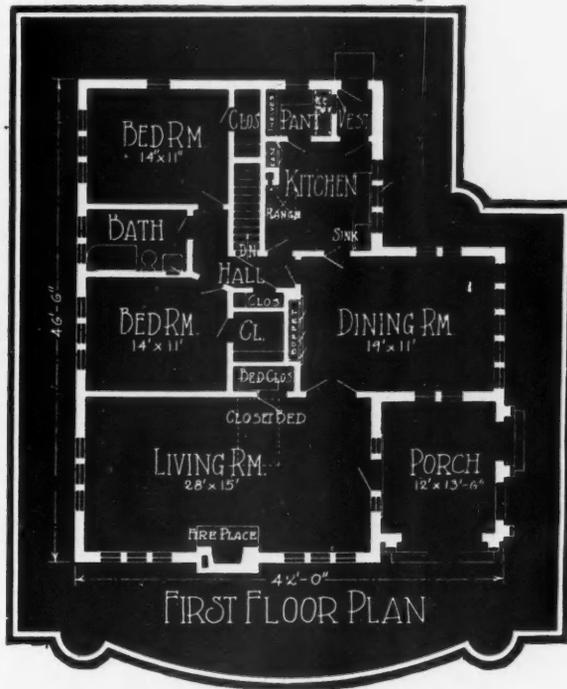
Entrance Details, Showing Elevation, Section, Floor and Ceiling Plans.



TRUE DUTCH COLONIAL DESIGN WITH LIVING PORCH. This is a farm home, excellently adapted to its picturesque setting. Of frame construction, it has a very pleasing front entrance with side seats, and a large living porch on end connected with the great living room. The Colonial house has been long noted for its unusual comfort and hominess, and this home lives up to the true traditions. There is a simple grandeur and dignity about it, yet it has substantial comfort that makes it the home ideal. On the first floor are three rooms, living room, 13 by 24 feet with fireplace, dining room, 13 by 12 feet, and a small kitchen of the latest type, completely equipped and efficiently arranged. On the second floor there are three bedrooms, one a master bedroom, 13 by 24 feet, the other two smaller in size. The house is 35 by 25 feet.

BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



SPANISH MISSION TYPE BUNGALOW. Here the architecture of the old California missions has been carried out even to the details of the flat roof. This attractive little home is very substantially built of hollow tile with smooth finish stucco coating and has five well-arranged rooms of comfortable size. In warmer climates, lighter materials can be used and a gas radiator in the living room will take care of the heating, eliminating cost of excavation for cellar. In colder climates the fireplace will very effectively aid the regular heating plant. An extra bed has been installed in a bed closet off the living room, giving three sleeping rooms in case of emergency. Each room in the house is very bright, having the advantage of triple or double windows. This design will satisfy those who are seeking something distinctive and different. Sizes, 42 by 48 feet 6 inches.

The Rooms in the House

ANOTHER ARTICLE OF SERIES ON ARRANGEMENT, TRIM AND DECORATION OF VARIOUS ROOMS IN THE HOUSE

4—The Bedroom

By Wm. B. Reedy

Oh! sleep! it is a gentle thing:
Beloved from pole to pole.

—Coleridge.

tively separated from the living rooms where the noise
and activity of daily life prevents restful sleep.

Beauty in the bedrooms is derived from two sources,

ONE-THIRD of the average person's life is spent in the bedroom. Which is a very good reason why this room should be made as restful and comfortable as possible. When a contractor is building a home for a client how much thought does he actually give to this phase of the work? Does he try to select a plan where the bedroom has windows on two sides so that the sleeping person can have the benefit of cross breezes at night and light from two directions in the daytime?

In the minds of many people the house is not right unless the sleeping rooms are upstairs. That accounts for the division in most houses containing six or more rooms, invariably three large living rooms on the lower floor and three or more bedrooms upstairs.

To those who have become attached to the "all the rooms on one floor" idea as typified in the bungalow, the bedrooms become a different problem. In this case the ideal arrangement is to group the two or more bedrooms in one corner near the bathroom and effec-



Bedroom of Simple, Pleasing Design. Very Often a Few Well Placed Windows Admitting Plenty of Sunshine Have Saved an Otherwise Impossible House. Note the Plain, Beautiful Trim and Door.

the architectural and the decorative. In the first we include woodwork and other elements inseparably associated with the construction of the house itself. In the decorative category are included the delicately colored drapes, luxurious beds, and Queen Anne or what not style of furniture. Both are dependent upon each other, one alone cannot make the room beautiful or restful.

It is difficult to think at all approvingly of heavy dark rich colors in a bedroom, for we unconsciously feel the need of light, buoyant colors. White and yellow seem to be popular because they are cool and restful. Bedrooms should be rooms of sunshine and if the windows are not such that they can get the full benefit of the natural sunlight, the decorative colors should be selected with an eye to supplementing and enhancing the natural light that is available. That is why windows are so important in a bedroom. As mentioned before, the windows should be on two sides if possible, or if this is not feasible, there should



Does Not Look Much Like a Bedroom, Does It? But See This Same Room at Night and It Assumes a Different Guise. The Bed Comes Out of That Artistic Double Glass Door. During the Day It Is a Dining Room.



Exotic Is a Good Word to Use in Describing This Sleeping Chamber. The Arched Walls Are Different, and the Furnishings Hark Back to the Days of Louis XIV. But There Is Plenty of Light and Air in This Room, Which Identifies It as a Modern Room.

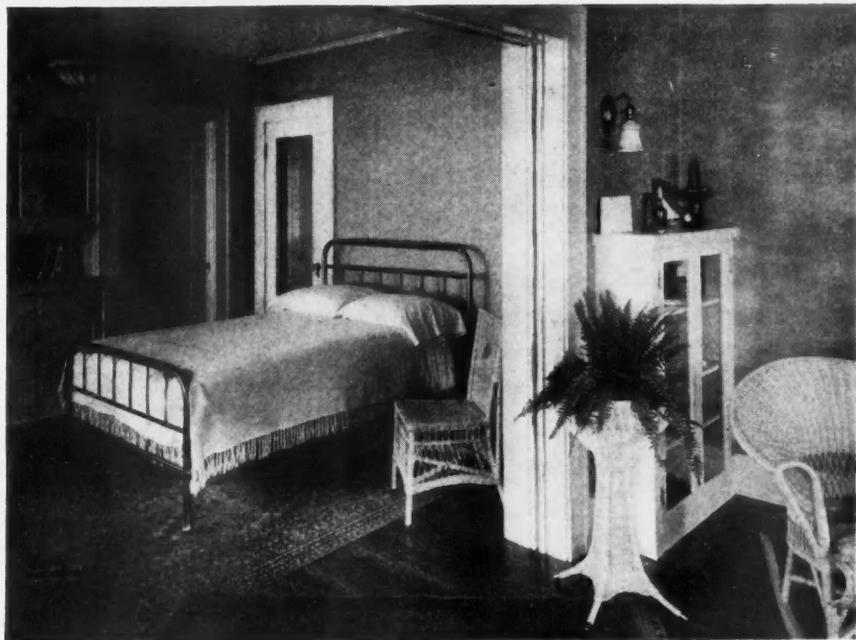
people in the world who want a regular bedroom to make this feature of the home an important subject for study on the part of architect and builder. In fact, the tendency of late on the part of home builders has been away from the large apartments to the real small home and of course there the bedroom is preserved in all its majesty and privacy.

Some ideas of the furnishing of a modern bedroom are shown in the illustration produced on these pages. There have been many innovations greatly increasing the comfort and appearance of this room, and it is not exaggeration to say that they have had an effect upon the size, shape and arrangement of the bedroom.

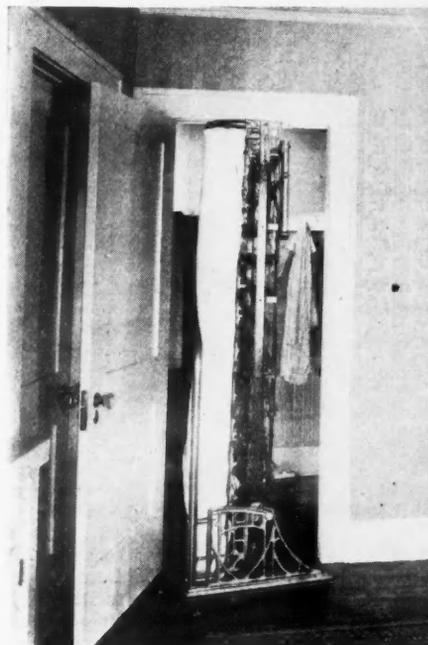


be two on one side, insuring plenty of air for the sleeper at night and for the housekeeper in the daytime.

The introduction of space-saving beds has substantially reduced cost of building, particularly in the large apartment buildings and hotels. When this type of bed is used the living room invariably performs the double function of living room and bedroom and the latter disappears from the floor plans. There are, however, still enough old-fashioned



As the Room Appears with the Bed in Position at Night.



Presto! and It Is Done. This Is the Way They Convert Living Rooms Into Bedrooms in This Fast Age. You Can Have It This Way or a Bedroom with Individuality. Some People Favor One, Some the Other. As a Builder You Are There to Give Service.

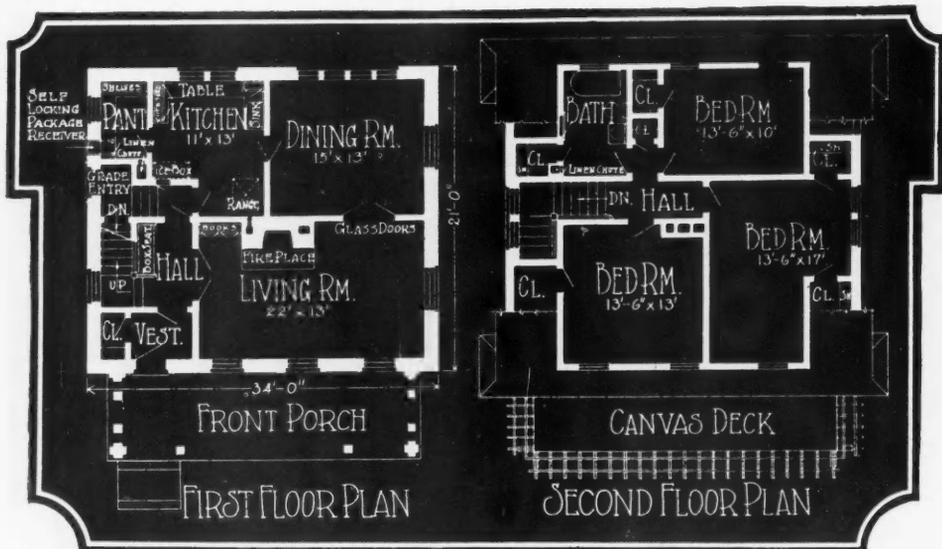
1922 Building Increasing

NEW building operations are proceeding at the rate of \$600,000,000 monthly, according to the latest survey taken by the United States Chamber of Commerce.

Residence construction has taken a commanding lead over all other kinds of building. During 1921 this type of building comprised only 37 per cent of the total; during the first three months of the year 1922, it makes up nearly 50 per cent of the total. Reports from all sections of the country indicate a busy year with an increase of at least 50 per cent over 1920, which showed record-breaking volume. There is also a decided improvement in the demand for building materials, supplies, and house furnishings.

PRACTICAL
&
ARTISTIC

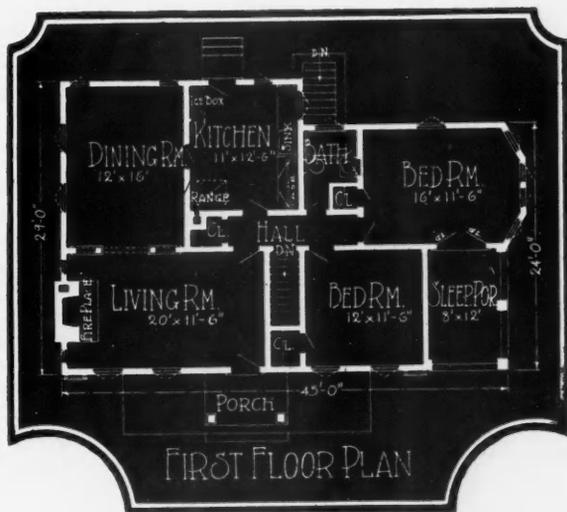
BLUE RIBBON HOMES



ENGLISH COTTAGE DESIGN WITH HALF-TIMBER STUCCO EFFECT. It is a far cry from the Spanish mission bungalow of the Pacific Coast to the old manor of English Tudorial period, yet there is a demand for both in this country. Each has its adherents because each has its merits. There is a simple, almost quaint dignity in treatment, suggestive of real comfort and informality. The pergola roof porch is covered with special canvas roofing and has a brick platform. The interior arrangement bears out the impression given by the outside appearance. There are three rooms on the first floor, of which the living room is particularly important because of its great size and comfort; three bedrooms on the upper floor. Comfort is the keynote thruout. A side driveway leads to a frame garage in the rear. Size of house, 24 by 21 feet.

BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



COZY, LITTLE HIP ROOF BUNGALOW. Five rooms, living room, dining room, kitchen and two bedrooms, all on one floor, is what this delightful small home offers to the prospective builder. Add to this a charming exterior, well handled, with plenty of windows, insuring sunshine and fresh air, and a small sleeping porch, screened in, easily reached from either bedroom, and you have the picture. For the average family this home will be quite practical as well as economical. The exterior is frame with a small brick foundation sufficient for a building of this size. Even in small homes of this type the living room is made as large as possible—in this case, it is 20 by 11 feet 6 inches. The grouping of the bedrooms and bathroom on one side of the house is a point worth noting. They are away from the noise of the living rooms. The house is 45 by 24 feet.

Cold Weather Did Not Stop This Job

BIG HEATER PROJECT IN MINNEAPOLIS, MINN., GOES ON WITHOUT DELAY DURING ZERO WEATHER

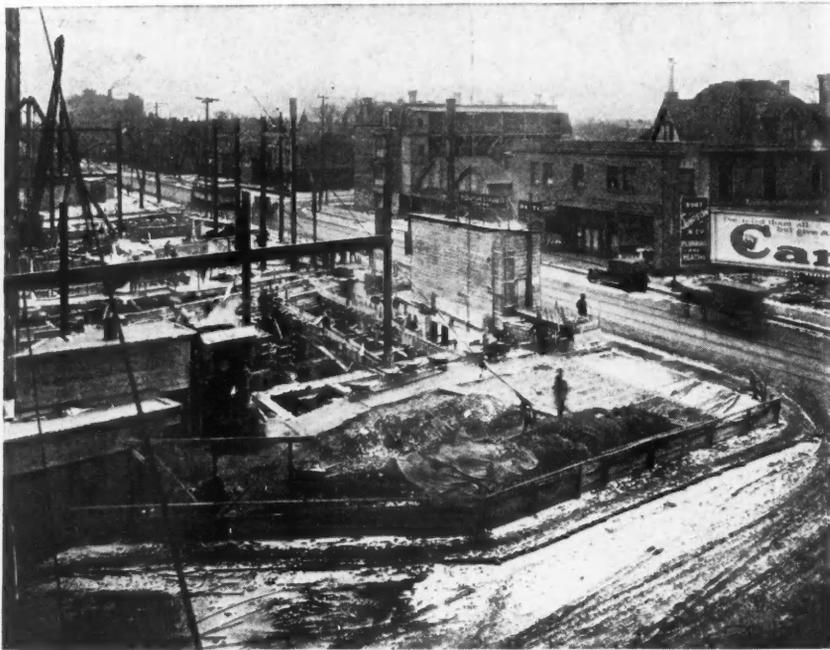
By A. J. R. Curtis

MINNEAPOLIS is located in a section of the country where they know what cold weather means. Minneapolis winters are usually clear and pleasant but no one will deny that they are cold. Minneapolis has both cold weather and enterprise. Many of the largest structures in the city and vicinity, of reinforced concrete, were constructed during the winter, sometimes when the mercury stood considerably below the zero line.

A recent noteworthy job of this kind was the Junior Orpheum Theater Building, erected in the above city last winter by the Thompson-Starrett Co., of Chicago. The work was continued right thru the coldest weather and, according to the builders, without serious interruption.

The water and aggregate heating plant designed for this particular operation is of unusual interest and is well illustrated in the accompanying views. A 100-horsepower boiler was employed to furnish hot water for the mixer and steam for a large grid of steam pipes used to heat the aggregates. The steam pipes were laid on a heavy plank platform approximately 30 feet by 60 feet, using 10 lengths of 3-inch pipe. The system was fitted with return drips to the boiler, making it a full-fledged steam heating plant. With material piled to a height of 3 feet, this

heating platform has a maximum capacity of nearly 200 cubic yards of material. Under ordinary working conditions, however, the plant probably has a capacity of not more than half that figure.



Heating Plant in Operation. The Boiler is Housed in to Conserve Heat and the Tarpaulins Used to Cover the Piles Can Be Seen in the Foreground.

The piles of sand and gravel were kept covered with tarpaulins to retain the heat.



Distribution of Labor Costs in Building

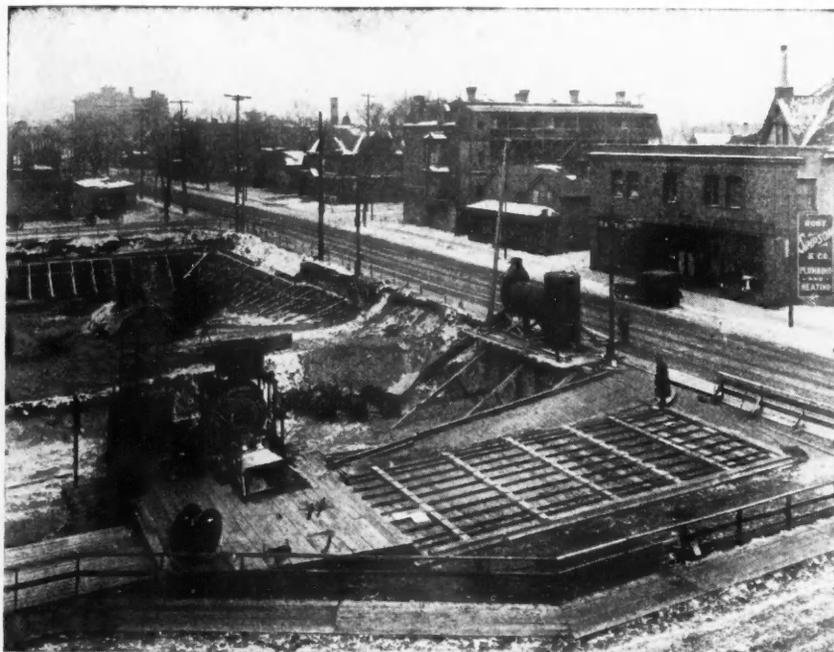
THE division of building and housing of the Department of Commerce has issued preliminary figures showing the percentage which the amount paid each labor group bears to the total labor cost of a six-room house. The following averages have been constructed from reports covering a large number of six-room brick and frame houses thruout the country.

TOTAL LABOR COST 100%

	Frame	Brick
Carpenters	49.6	32.2
Bricklayers	6.2	21.5
Hod Carriers.....	2.2	6.7
Plasterers	7.9	8.8
Plumbers	8.7	7.6
Electricians	2.6	2.5
Painters	10.0	6.3
Common Laborers.....	6.3	9.9
All others.....	6.5	4.5
Total	100.0	100.0



FEW people ever get ahead, ever become financially independent, unless they save patiently, persistently and with a system.



Heating Platform for Concrete Aggregates, Used in Constructing the Junior Orpheum Theater, Minneapolis, Showing Arrangement of the Steam Pipes and Return Drips. Steam Boiler is in Process of Erection.

Law for the Builder

WILL THE FACT THAT THE PLANS AND SPECIFICATIONS FURNISHED WERE FAULTY EXCUSE CONTRACTOR FROM HIS AGREEMENT TO KEEP WORK IN REPAIR A GIVEN LENGTH OF TIME?

By Leslie Childs

IN contracts of a public nature, especially those pertaining to highway, street and pavement work, it is frequently stipulated that the contractor is to keep the work in repair for a given length of time. And, where such a contract is entered into, the question of how the contractor's duty to keep such work in repair is affected, by the furnishing of faulty plans and specifications by the employer, may be one of great importance.

And in this connection it may be stated broadly, that if the contractor has unqualifiedly agreed to keep the work in repair, or, if the prices awarded were made in contemplation of there being more or less of such repair work, the contractor will generally be compelled to keep up the repairs even tho they are made necessary thru following of faulty plans and specifications furnished by the employer. This proposition is illustrated in an interesting manner in Cameron-Hawn Realty Co. vs. City of Albany, 207 N. Y. 377, under the following facts:

Contract Stipulated Repairs for Ten Years

The plaintiff, Cameron-Hawn Realty Co., entered into a contract whereby it agreed to construct a certain pavement for the city of Albany. It was stipulated that the plaintiff should also maintain the pavement, furnishing all the materials and make necessary repairs, to keep it in a prescribed condition for a period of ten years.

As a guarantee of performance, the contract provided that the city should retain a sum not to exceed five per cent of the contract price thru the first two years of the period. The work was completed by the plaintiff and accepted by the city, the latter retaining \$2,491.79, that being five per cent of the contract price.

After the two years, stipulated in the contract that the city should retain this five per cent had expired, the plaintiff, it seems, demanded that it be paid over. This the city declined to do on the ground that it had been forced to spend even a greater sum in making repairs on the pavement that should have been made by the plaintiff.

The plaintiff denied that it should have made these

repairs on the ground that it had constructed the pavement in strict compliance with the terms of the contract. It pointed out that the specifications fixed the size, ingredients and dimensions of the asphalt blocks to be used, and the nature, and form of the foundation upon which they were to be laid. Contending that the repairs were required because the asphalt blocks were not suitable for the pavement where they were used, and that the extra work resulting was caused by defective plans, which were carried out under the contract, for which it should not be held liable.

Upon the trial of the case in the lower court the contractors, Cameron-Hawn Realty Co., recovered a judgment against the city. The case was appealed and finally reached the Court of Appeals, where in passing upon the record, as to the right of the contractors to be excused from making the repairs it was, in part, said:

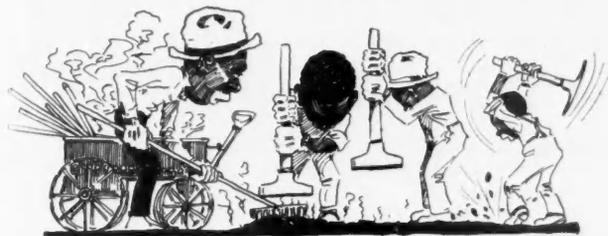
Court Held Contractors Liable for Repairs

"The construction of the pavement in full conformity with the requirements of the contract is conceded. The contract, however, thruout its provisions, contemplated and provided that the prices payable by the defendant (city of Albany) were not only for the laying of the pavement, but also for maintaining it for a period of ten years from the date of its acceptance by the defendant. And the plaintiff (Cameron-Hawn Realty Co.) expressly agreed that thru that period it would maintain the pavement by making the repairs and furnishing the materials necessary to keep it in the prescribed condition. * * *

"It is a well-settled rule of law that a party must fulfill his contractual obligations. * * * Difficulty or improbability of accomplishing the stipulated undertaking will not avail the obligor. It must be shown that the thing cannot by any means be effected. Nothing short of this will excuse non-performance. * * *

"The possibility of defects in the pavement, arising thru its use, after completion, was foreseen by the parties, and express provision for their repair was made in the contract, when by the plaintiff unqualifiedly agreed that the defendant might apply the 5 per cent to making the repairs, if the plaintiff failed to do so. Pursuant to that agreement, the defendant has made the repairs and expended the 5 per cent in doing so, and the plaintiff is not entitled to have it paid to it. * * *"

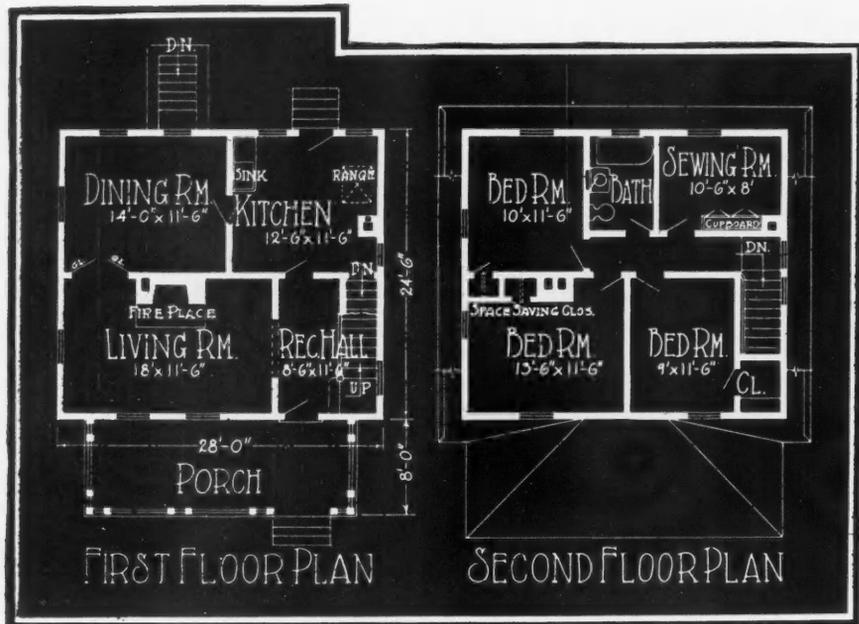
In conclusion, the Court of Appeals reversed the judgment in favor of the contracting company rendered in the lower court. Holding, as stated in the opinion, that under the facts and evidence of record the plaintiff could not recover the 5 per cent.



The Plaintiff Entered a Contract Whereby It Agreed to Construct a Certain Pavement for the City of Albany. They Were to Keep This Pavement in Repair for Ten Years.

PRACTICAL & ARTISTIC

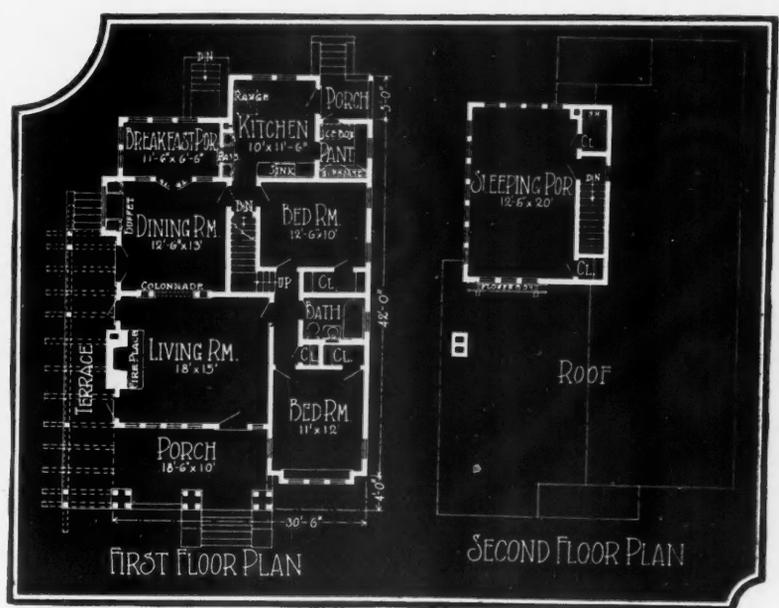
BLUE RIBBON HOMES



SEMI-DUTCH COLONIAL DESIGN WITH LARGE PORCH. A deviation from the regular Colonial design has been made in the handling of the front entrance. Instead of the usual central door set low, a large front porch has been added. The entrance is a little to the side opening into a small vestibule from which the stairs to the upper floor start. To the left is the living room, 18 by 11 feet 6 inches. The fireplace is located in the inside wall center next to the double doorway leading to the dining room. The kitchen completes the lower floor plan. On the second floor are three bedrooms and sewing room, two of the bedrooms fitted with space-saving closets. The exterior is rather odd but practical, concrete block foundation, stucco pebble-dash finish, on the first floor and shingles above to the roof line. Size 28 by 24 feet 6 inches.

BLUE RIBBON HOMES

PRactical & ARTISTIC



ORIENTAL DESIGN OF UNUSUAL TREATMENT. For those who like the unusual this house design will be a magnet. It combines an odd exterior with some of the most recent innovations in interior arrangement, notably the airplane cupola above, which in this case contains a large sleeping porch, 12 feet 6 inches by 20 feet. The house is shingle-sided with projecting roof rafters of pergola design and numerous white square columns grouped as porch supports. Numerous entrances are provided by French and other doors placed at intervals around the front and side which is porch and terrace. The lower floor has five rooms and breakfast porch. The "airplane" sleeping porch is entirely closed and can serve during winter and summer. First impression is one of size, but the house is not big, as shown by the dimensions, 30 feet 6 inches by 42 feet.

Charming Little Stucco Bungalow

TWO FLOOR PLANS TO CHOOSE FROM WITH DIFFERENCE OF OVER 100 SQUARE FEET IN AREA

By Charles Alma Byers

SHOWN in the accompanying illustration is a particularly charming little bungalow with outside walls of cement-stucco. This stucco is of a very light gray shade, while the wood trimming is painted white. The roof is of shingles, painted a grayish-green color, and is designed with a wide overhang at both eaves and gables. It is, in fact, to the roof, with its wide overhang, its clipped gable peaks and its special entrance extension, that is very largely due the quite unusual charm of the house's general appearance. A very delightful and enhancing outside feature of the bungalow also is the roomy cement-paved terrace that extends across about two-thirds of the front and for a short distance back along one side.

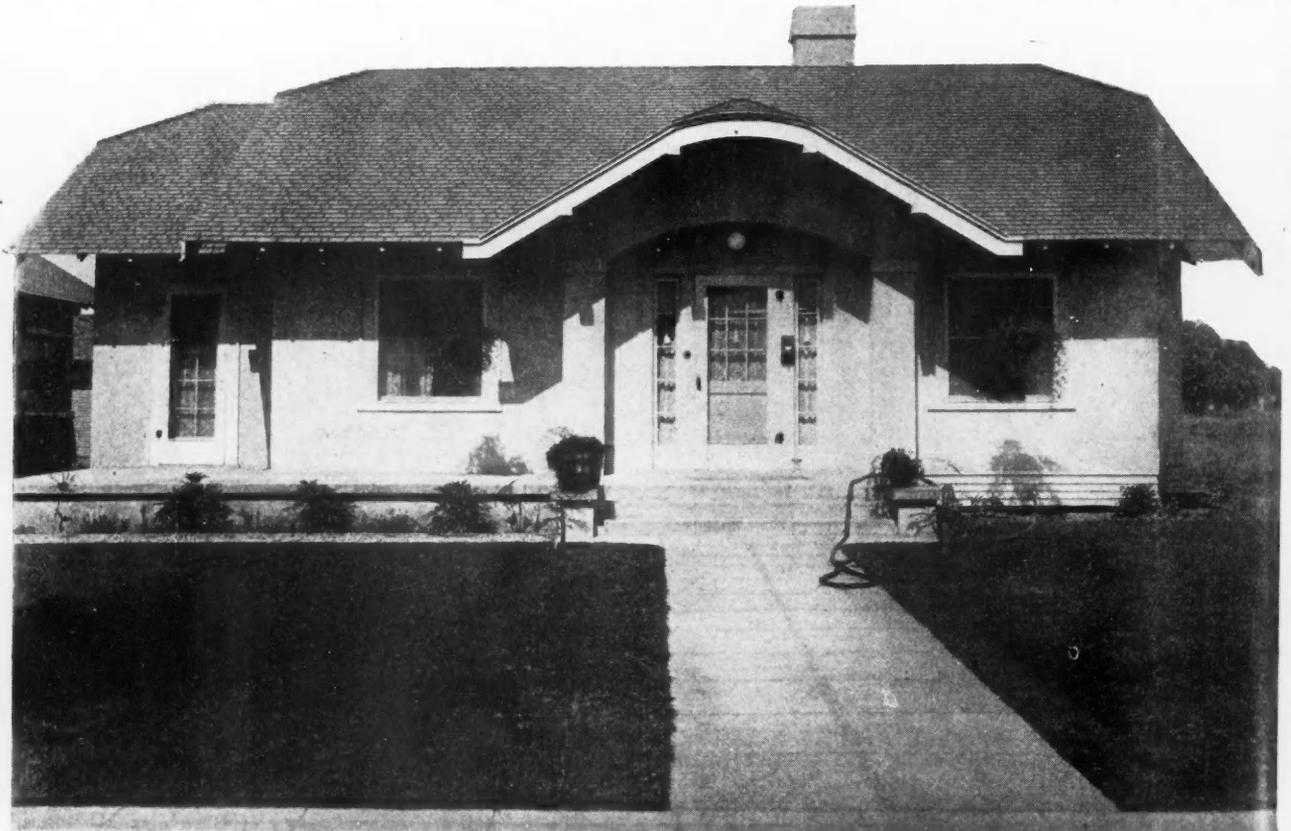
The designer has furnished two different floor plan arrangements to choose from, either of which enables the creation of practically the same front appearance. It is the wider plan, however, featuring a long, narrow screened sleeping porch in the rear, that is used for the particular house here photographed. This sleeping porch, incidentally, is, in this case, separated by curtains only into two divisions, but since it is amply long enough, it might, of course, be permanently partitioned—with perhaps one end of it used for a maid's room or for some other purpose.

This plan, it will be observed, contains living room,

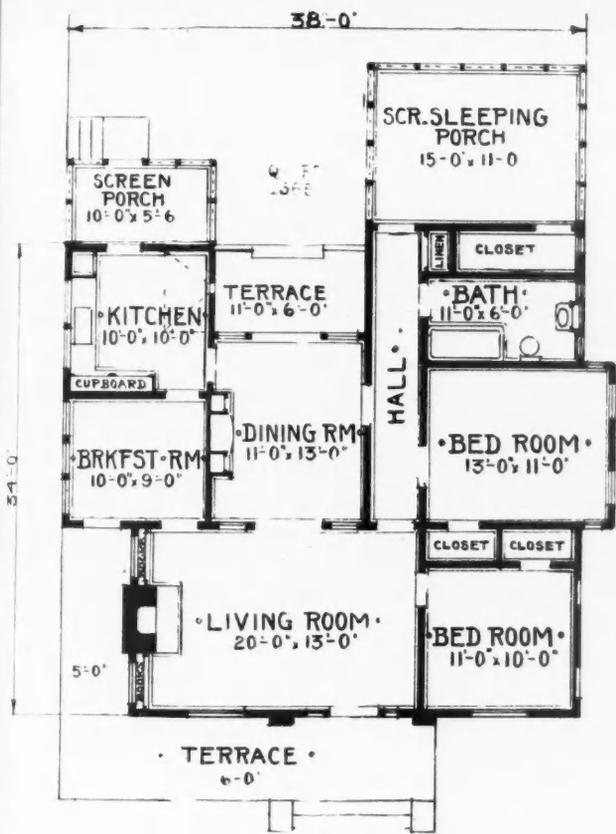
dining room, kitchen, bath room and two bed rooms, in addition to the long sleeping porch. Each of the bed rooms has a good closet, and the built-in features include a buffet in the dining room, a medicine case in the bath room and cupboards and other conveniences in the kitchen.

The other plan is comprised of the same rooms, with a small breakfast room and a rear porch or terrace additional, while the screened sleeping porch in this instance is of usual arrangement. The built-in features here consist of book cases at each side of the living room fireplace, a buffet in the dining room, a linen closet in the hall, a medicine-case in the bath room, and the customary conveniences in the kitchen, while a closet is a feature of the sleeping porch as well as of each of the bed rooms.

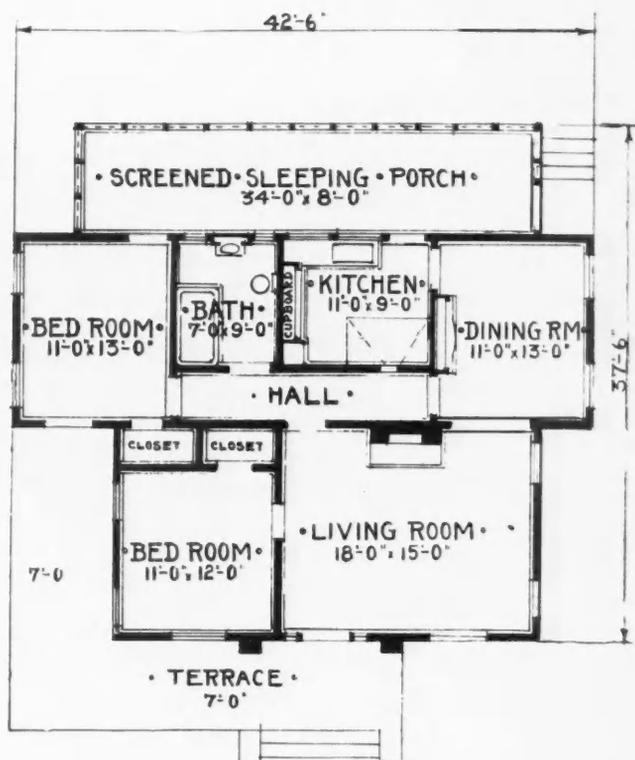
The interior finish is comprised of old ivory in the living room, dining room, hall and two bed rooms, of white enamel in the bath room and kitchen, and of white paint in the sleeping porch. The walls of the living room, dining room and bed rooms are papered and in the bath room and kitchen they are finished, to a height of four feet six inches, with a smooth, hard plaster coat which is enameled like the woodwork, while in the hall and sleeping porch they are tinted. Hardwood floors prevail in the living room, dining



Perhaps It Is the Atmosphere, the Sun-Kissed Hills and Maidens and What Not, But Whatever It Is They Certainly Know How to Build Alluring, Cozy Homes in the Far West. They Have No Cause to Apologize for This Sample. Cement Stucco, Green Shingles—Five Rooms Arranged in Two Ways. See Floor Plans on Next Page.



PLAN NO. 1



PLAN NO. 2.

Take Your Choice—Five Rooms with Breakfast Room and Small Sleeping Porch, or Five Rooms and Large Sleeping Porch. Plan No. 1 Occupies 1,865 Square Feet; Plan No. 2, 1,240 Feet.

room, hall and two bed rooms, and pine flooring is used elsewhere, except in the bath room, which is floored with tile.

The bungalow is located in Los Angeles, Calif., and the plans are by Floyd A. Dernier, of that city. It has neither basement nor cellar, but it is equipped with built-in gas radiators for heating, as well as with other modern conveniences.



Handy Window Icebox for Winter

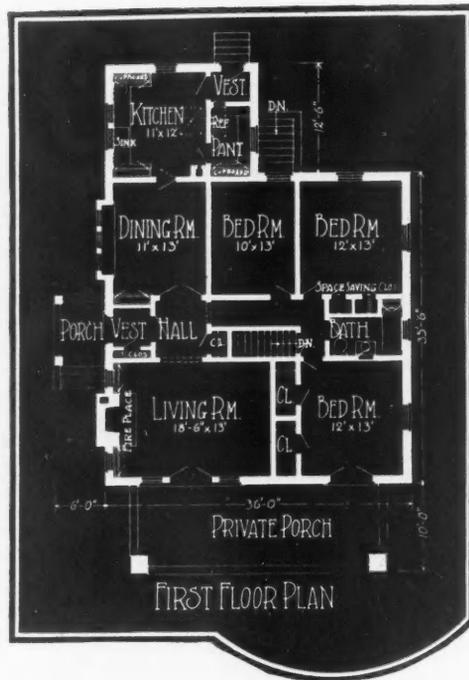
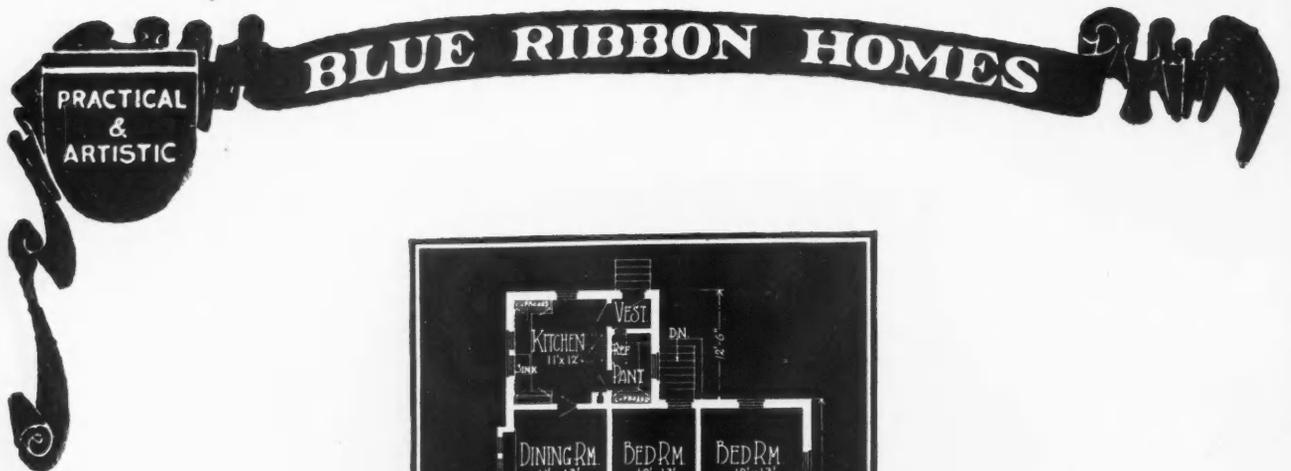
MANY housewives have real need for a handy storage place for foodstuffs during the winter months when they do not buy ice. If kept in a warmly heated house these foods very often spoil and it is to eliminate this that Miss Cornelia Fiske, Baltimore, Md., designed the window icebox shown in the illustration.

This icebox is made to fit the window in which it is to be used, usually one of the kitchen or pantry windows. It is attached to the

window frame by screws or buttons so that it can be quickly and easily removed during the summer. The bottom is made of slats to allow the cold air to circulate thru the box freely and it is provided with shelves that are moveable so that they can be taken out and cleaned. The top is sloped a little to carry off water.



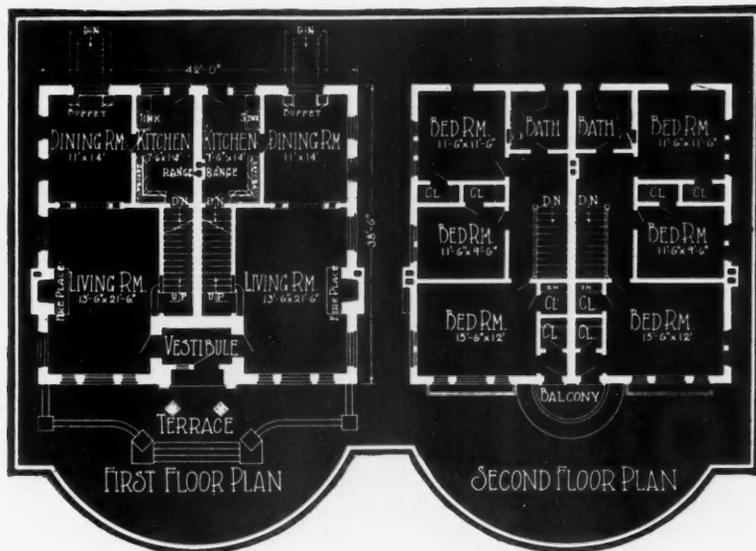
One Way of Keeping Food in Good Condition During the Cold Weather When You Do Not Want to Use Ice.



COZY COTTAGE DESIGN OF BRICK AND STUCCO. Here we have the side entrance the main means of access, the entire front of the house being composed of porch, a broad open front porch connected with the living room by glass French doors and with the front bedroom. It can be screened and serve as a sleeping porch without much trouble. The side entrance opens into a small vestibule and hall which open into living room in front and dining room in rear. Another hall leading from the vestibule gives access to three bedrooms and bath, well separated from the activity of the living rooms and equipped with special space saving closets. The kitchen is located in a rear wing. The exterior is brick up to the first floor plates and half timber above to the gables. Both porch platforms are concrete. The house is 36 by 35 feet 6 inches.

BLUE RIBBON HOMES

PRACTICAL & ARTISTIC



NOVEL IDEA IN APARTMENT CONSTRUCTION. Seemingly a large substantial residence, this building is really a double duplex apartment house. This type of architecture can be used in sections where straight apartment construction is not allowed because of building restrictions. It is an impressive looking house of brick or tile with stucco finish and broad terrace across the front. The main entrance opens into a vestibule, which has doors on either side leading to the two apartments. These apartments are identical in arrangement, viz., living room, dining room and kitchen on the first floor, and three bedrooms upstairs. The living rooms are 13 feet 6 inches by 21 feet 6 inches. This building is attractive from an investment standpoint because of the income from rent. It is 42 feet wide and 36 feet 6 inches long.

Farm Buildings Will Be Needed This Year

ENCOURAGING CHANGE IN MARKET CONDITIONS GIVES FARMER CHANCE TO MAKE NEEDED IMPROVEMENTS ON HIS PROPERTY

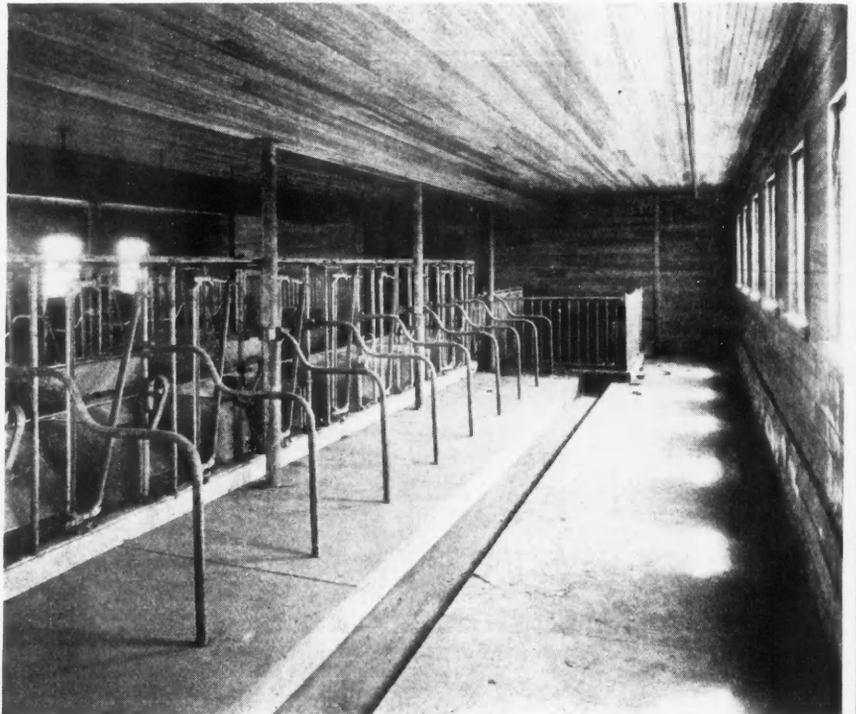
By Wm. B. Reedy

"THINGS are lookin' up." This was the reply I received to the query, "How's things?" which has become almost a password during the last two years.

This is what a farmer downstate thought of the situation. A sight more encouraging than this time a year ago when the same question was put.

"Yes," continued the farmer, "we are beginning to get hold once more. They sure handed us an awful wallop there last year when wheat, corn and hogs slumped below pre-war prices. It looked mighty black, and, of course, we had to sit tight and spend as little as possible.

"But today it is different. Why, only yesterday I sold a car of wheat for a price that will give me a profit. Hogs are up and corn is showing strength. I am planning to go ahead



Interior of Dairy Barn Shown Below. Builders of Barns of This Type Need Not Worry About Future Complaint on the Part of Their Customers. It Includes Everything That Will Help to Make the Farmer's Work Easier and More Productive. Note the Stalls, Floor, Overhead Carrier Track and Stanchions.



Excellent Type of Dairy Barn with Forty Cow Stalls, and Special Bull and Calf Pens. This Is Built of Heavy Timbers, Frame Siding, Solid Concrete Foundation and Has Easy Sliding Doors and Ventilation System. Dimensions, 36 by 106 Feet. The Gambrel Roof Permits of a Large Haymow.

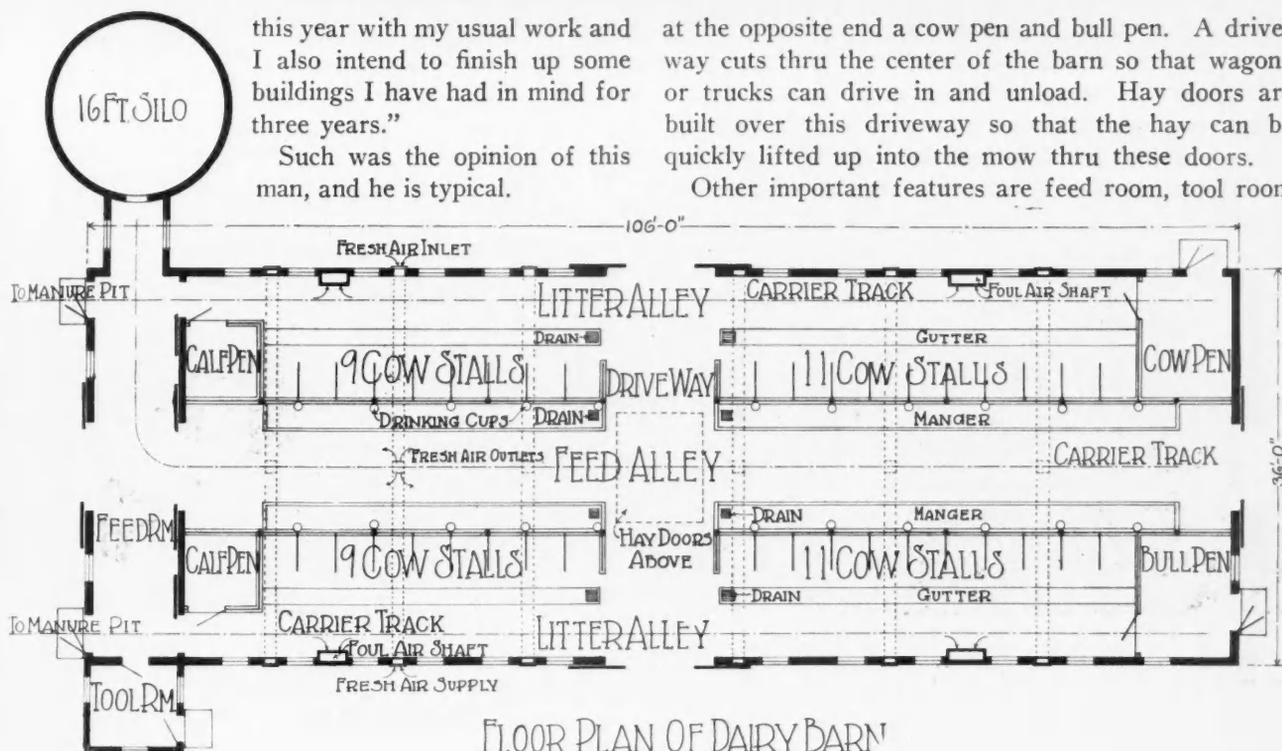
Labor Saving Equipment Key to Satisfaction

this year with my usual work and I also intend to finish up some buildings I have had in mind for three years."

Such was the opinion of this man, and he is typical.

at the opposite end a cow pen and bull pen. A driveway cuts thru the center of the barn so that wagons or trucks can drive in and unload. Hay doors are built over this driveway so that the hay can be quickly lifted up into the mow thru these doors.

Other important features are feed room, tool room



Floor Plan of Modern "Cow Palace." Quite a Contrast to the "Little Old Red Barn" That Used to Dot the Countryside and Drive Many a Farmer to a Premature Grave. Here Equipment Takes the Burdens from His Shoulders and Provides an Environment That Is Beneficial to the Animals Housed Therein.

Things are picking up—and the rural contractor is going to get a fair chance at some real business.

Not a bad time to get acquainted with a few good farm building designs.

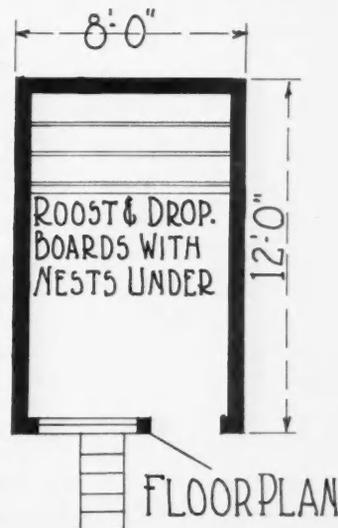
The first is that of a substantial exceptionally well-built and well-arranged dairy barn. It is not often that you see such an all-around efficient structure as this, yet it is the type of barn every farmer with a herd should have. The original cost may be higher than he figures on, but the service it will render in the years to come will more than make up for this expense and the small cost of upkeep will be a real compensation.

The barn is heavy frame on concrete foundation with gambrel roof, permitting a large unobstructed haw mow and feed storage room. Sliding doors have been used thruout and an abundance of windows, not only in the lower floors where the stalls are located, but above, insure plenty of healthy sunshine and ventilation. To supplement the natural elements, a complete ventilation system has been installed as shown by the roof ventilators and the provision in the floor plan for fresh air intakes and outlets.

The capacity of the barn in cow stalls is forty, these stalls arranged in two rows facing inward towards a central feed alley with litter alleys in the rear of each row. The stalls are of the latest sanitary steel type with partitions, stanchions and mangers set in a solid concrete floor. Gutters have been built to allow for the mangers and drains in the rear of the stalls. The floor in each stall proper is covered with cork brick because of the comfort it affords the animals. At one end of the barn are two calf stalls and

and a 16-foot tile silo for storage. Another thing that should not be overlooked is the elaborate track carrier system for carrying feed to the various stalls from the feed rooms and silo, and also for carrying away the litter to the manure pit. This track saves the farmer and his help much unnecessary drudgery and shortens his working time in the barn.

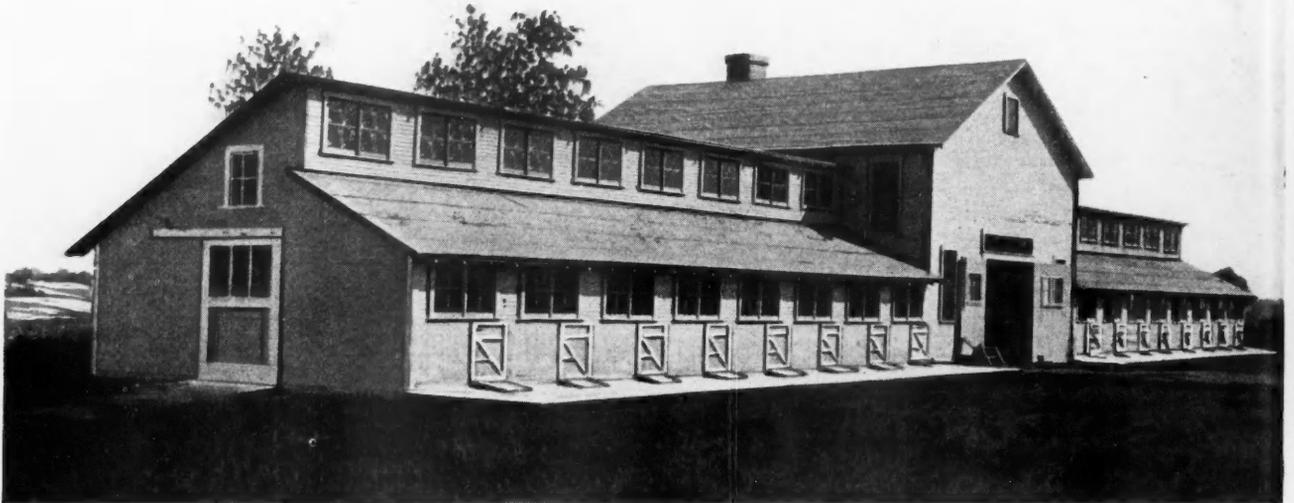
So much for the barn. Poultry is a necessary



Floor Plan of Poultry House.



Small Inexpensive Poultry House Large Enough for an Average Flock with Indoor Scratching Floor.



Large, Well-Built Hog House That Will Do Credit to Any Farming Establishment. It Includes the Latest in Equipment and Provides a House for the Hogs with Plenty of Fresh Air and Sunshine. Note the Concrete Feeding Floors and Runways in Front of the Various Pens. A Two-Story Feed Room Is Located in the Central Section.

adjunct on any farm and there is always a demand for good inexpensive poultry houses. These requirements are met in the design shown here. This is a small open front poultry house, 8 by 12 feet, which can be built quickly from odd pieces of lumber. An appealing feature is the large indoor scratching floor, excellently ventilated. Active hens need plenty of fresh air to keep them on the job and this can be supplied in no better way than thru plenty of window space. Roosts and nests are provided in floor plan.

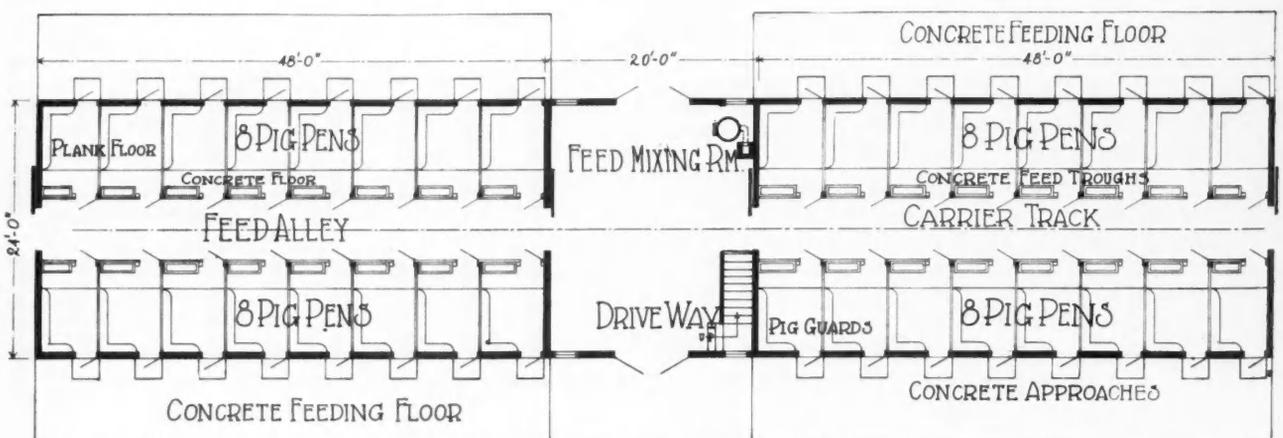
Last, but not least, is the hog house. Now that hog prices show some signs of reviving, there will be a call for this type of building. The design shown here is, fortunately, one of the best there is, combining, as it does, so many features. It has thirty-two pens of standard type, efficient, sanitary and permanent; they are set in a concrete floor, each pen having its door to the concrete feeding boor on the outside. Sixteen pens have been grouped on each side of the central driveway which is located in a two-story sec-

tion. Above the driveway is a feed mixing room. Concrete feed troughs have been placed in front of each pen. As in the case of the barn, all feed and litter is carried to and from via the overhead carrier route, saving man power and time.

In these three buildings an attempt has been made to show what the builder should include in his plans to give his farmer customer a real efficient plant. These designs offer some definite suggestions that can be profitably considered by every builder who may be called upon to do rural work.



THE total amount of lumber imported in 1921 into the United States—830,533 M. feet—was 69 per cent of the total amount of lumber exported the same year, which was 1,204,817 M. feet. In 1920 total lumber imports, or 1,338,530 M. feet, were 86 per cent of the total quantity exported, which was 1,551,358 M. feet.



FLOOR PLAN OF 32 PEN HOG HOUSE

"Hog Parlor" Floor Plan. It Has Been Found by Experience That Hogs React to Favorable Living Conditions Just as Much as do Other Animals, Including the Highest Order. This Efficient Arrangement Permits of Capacity Handling at Minimum Cost and Effort.

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Bird's-Eye View of Camp Roosevelt as It Appears Tucked Away in a Picturesque Setting.

“Camp Roosevelt—Builder of Boys”

HOW YOUTH OF CHICAGO ARE BEING DEVELOPED IN BEAUTIFUL ATMOSPHERE DURING SUMMER MONTHS

By Lillian Ewertsen

AT first glance, it might seem that an article pertaining to the building of boys is hardly appropriate for an architect's journal devoted to building houses. We believe, however, that to help men build and improve themselves is just as important as to build and improve houses.

At Camp Roosevelt, the national educational training encampment for boys, located near La Porte, Ind., the work of boy-building has been begun in earnest. The broad, general purpose of Camp Roosevelt is to take boys off the streets during the summer vacation time, and to make better men and better citizens of them, physically and morally, thru proper training and development. It is unique in that it not only gives the boys in attendance good military training, by combining general physical development with technical military

instruction, but it includes, as well, a serious academic course.

The military side of life at the camp is a magnet to draw and hold the interest and attention of the boy, and to give the camp an effective, cohesive organization for its better management and discipline. There are other values which transcend the military achievements.

One of the most important of these is the splendid summer school course, which includes seventh and eighth grades, and all high school subjects. The instructors are especially selected from the Chicago public schools for their knowledge in handling boys. Boys may here obtain credit on the same status as in the Chicago summer schools, all the while receiving the benefit of a healthy summer out-of-doors. It is felt that school subjects taught in this manner are of great

benefit, not only to the average student, but backward boys catch the interest, and the kinks in their educational viewpoint are straightened out, when their minds are freed of cobwebs by their constant exercise and free play in the open air.

The War Department of the U. S. Government has lent such equipment as cots, mattresses, etc., and assigned officers and non-commissioned officers for military instruction. The American Red Cross maintains a hospital and large staff of doctors and nurses.

Major F. L. Beals, U. S. A., Professor of Military Science and Tactics and Supervisor of Physical Education in the Chicago public high schools, is commandant of the camp. The camp opens on July 5.



One of the Important Courses Given at This Summer Camp Is Woodworking. Boys Are Taught Some of the Rudiments of the Building Art While Getting Wholesome Exercise.

The Need of Lumber Standardization

BENEFITS THAT WILL BE DERIVED FROM THE LIMITATION OF NAMES, SIZES, GRADES AND SPECIFICATIONS ARE OUTLINED.

By David G. White

EDITOR'S NOTE: This is the concluding installment of a timely article of much interest to every architect, builder and lumber dealer.

Before discussing each of the different phases of lumber standardization, I wish to call your attention first to some of the benefits* to be derived by the limitation of the number of names, sizes, grades and specifications for lumber. A standardization product would:

1. Simplify the purchase and sale of lumber by making possible a common language for all.
2. Increase the efficiency, ease and accuracy of lumber inspection.
3. Render possible the substitution of one species for another with assurance of getting the species desired and of the same size and grade.
4. Simplify building design for the architect.
5. Render cost accounting and statistical data more intelligible in analyzing production costs and in comparing prices of competitive species, sizes and grades.
6. Make for uniformity in construction.
7. Make the material more salable by increasing the consumers' good will.
8. Decrease litigation and other factors tending to disorganize industry, the burden of which ultimately falls upon the public.



Bucking the Log—Mighty Western Pine Laid Low. It Is Being Sawed Up Into Sections Preparatory to Shipment to the Mill.

9. Eliminate indecision, both in production and utilization,—a prolific cause of inefficiency and waste.

10. Decrease both selling and buying expenses by focusing on essential patterns and grades.

11. Enable more thought and energy to be put on more essential work by concentrating on fewer lines.

12. Decrease the misuse and waste of lumber.

13. Increase common honesty by decreasing cut-throat competition and the blending or substitution of grades.

14. Help eliminate practices which are merely the result of accident or tradition, and which impede development.

15. Help base competition squarely upon efficiency in production and distribution and upon the intrinsic merit of the product by the suppression of unnecessary patterns, grades and specifications which are merely for sales effect.

16. Act as a powerful stimulus to research and development by bringing out the need for new facts necessary to determine what is best and to secure agreement on moot questions,—and it is thus in decided contrast to crystallization resulting from fixity of mental attitude.

17. Be one of the principal means of getting the results of research and development in actual use in the industries and by the buying public.

18. Be of increasing importance for the maintenance and development of foreign trade. There is strategy in nationally recognized "American" specifications.

19. Thru the efficiency of competing countries, increasing thru national standardization programs, be liable to transfer competition from foreign markets to our own shores.

20. Thru joint effort in bringing about standardization within and between industries be almost sure to lead to better understanding and to beneficial cooperation along other lines,—a step toward the integration of our industries.

Sizes

One of the principal functions of lumber standardization is to bring about uniformity of size between the different kinds of lumber. As you are probably aware, there are considerable variations existing at the present time, such as in the case of 1-inch lumber. For example, 1-inch refers to the nominal size and not necessarily to either the rough green or seasoned size or to the actual size of the material after surfacing. It is customary in the case of southern yellow pine to S1S or S2S to 13/16-inch. In the case

*The writer wishes to extend his appreciation to Dr. P. G. Agnew, Secretary of the American Engineering Standards Committee, for a number of the reasons advanced here as showing the need for lumber standardization.



Loading the Logs. A Train of Flat Cars Getting Their Quota from the Pine Forest of the Far West. Only One of the Phases of the Vast Lumber Industry. Mr. White Cites the Advantages To Be Gained from Standardization in This Business.

of hemlock, white pine, and western yellow pine, the size is usually $25/32$ -inch; in the case of Douglas fir it is $3/4$ -inch, etc. Lumber is usually seasoned to at least a shipping-dry condition before surfacing, altho this is not always the case. For example, the upper grades of Douglas fir are usually seasoned first, while the lower or common grades may be surfaced green. When the lumber is not thoroly seasoned before surfacing, shrinkage may be expected to take place and the consumer ultimately has dry lumber of surfaced sizes which are less than those usually published in the grading rule books of the association. This, together with the practice of manufacturing lumber of scant sizes, has given rise to a great deal of dissatisfaction and results periodically in some state legislature trying to regulate the size of lumber, or in some person requesting Federal regulation.

If all manufacturers would cut their material to the same size, it would not make much difference from the standpoint of profit to the manufacturer whether the material was $3/4$, $25/32$, $13/16$, or 1-inch full. If $25/32$ or any other size less than an inch full meets the needs of the consumers, it is a waste of our natural resources and an added expense to the consumer to use material thicker than that size. Based upon standardization of sizes, competition would fix the price at that point which include the necessary profit required to successfully conduct the business of the lumber industry, and there would be no question as to whether the manufacturer was profiteering to the extent of charging for an inch

board when in reality he was only furnishing a $25/32$ -inch board. There is always a loss due to shrinkage and surfacing and the consumer usually has to pay for this whether the material is one size or another.

There has been a tendency during the last few years to reduce sizes in order to conserve wood, to reduce freight rates, and in some cases to meet competition with woods being marketed under more favorable conditions. In many cases the retailer and not the manufacturer has been responsible for this in that he has felt that he could dispose of the thinner material as well as the thicker and at the same time make a better profit in the purchase of the thinner material.

It is quite probable that the basis on which lumber is sold, and the suspicion which has been laid at the doors of the lumber industry from the standpoint of profiteering, have been responsible for the dissatisfaction over the decrease in lumber sizes. The common American measurement for lumber has always been the board foot, 1 inch thick by 12 inches wide by 12 inches long. It is possible, that if lumber was sold according to surface measurements, that is, 12 inches wide by 12 inches long by the actual thickness instead of the nominal thickness, that the consumer would not feel when he ordered 1-inch lumber that he was being cheated if the actual size which he received was less than that. Steel, veneer, and other materials are sold according to fractions of an inch and it seems logical that for most purposes that "lumber," as the word is commonly used, could be sold in thickness in the same manner.



In This Scene the Motor Truck and Trailer Have Penetrated Into the Forest Fastness and Are Eliminating the Old Method of Floating the Logs Down a Stream to the Mill.

Nomenclature

The standardization of nomenclature refers to uniformity of standard common and scientific names of trees and woods, altho it is sometimes confused with standardization of names of grades and specifications. It is quite obvious that if the grades and specifications were standardized it should be a relatively simple matter to standardize the names of the various grades.

With respect to the names of trees and woods, standardization will go far in clearing up some of the confusion and camouflage now prevailing between competitive and little known species. It will tend to bring out a clearer knowledge of the use to which our various woods are best adapted. Much dissatisfaction with wood in general, resulting in the increased use of substitutes, can be traced directly to confusion in present trade names. Adoption of trade names such as "Arizona white pine," "western soft pine," and "California soft pine" for western yellow pine, the often synonymous meaning of tupelo and gum, local usage of juniper and hackmatack for tamarack, shortleaf pine for any southern yellow pine of low density, etc., are common examples of the present nonstandardized condition.

It is not surprising that there should be a great deal of confusion on this subject when we consider that there must be nearly 1,000 different species of trees native to the United States. Forest Service Bulletin No. 17, entitled, "Check List of the Forest Trees of the United States, Their Names and Ranges," which was published in 1898, lists at least 600 different species, of which there are approximately 100 softwoods and 500 hardwoods. In addition to the woods listed in this bulletin, there are scores of minor species which have been described elsewhere. Of the 600 species which have been listed, there are as many as 35 or 40 species of pine, about 70 species of oak, etc. Counting the overlapping of

names, the 35 to 40 species of pine alone are known by 300 common names, or an average of eight names apiece. Longleaf pine is known by at least 29 local or generally used names, loblolly pine by 23, western yellow pine, 21, etc.

Grades and Specifications

With the rapid depletion of our timber supplies and the shifting of the center of lumber production from the East to the Lake States, then to the South, and now to the West Coast, there have arisen numerous and complex systems of lumber grading. As the various lumber associations have come into existence they have for the most part established and promulgated their own rules for sizes, grades and specifications, and names of the various woods manufactured in the territory covered by each association. There are about two dozen different booklets used by the various associations in describing the hundreds of sizes, grades and specifications. In addition, there are the countless specifications of individual manufacturers, wood-consuming factories, railroads, government departments and others. The situation is complicated by the fact that a number of different woods may be graded under one set of rules in one association and under different rules in the same or different territories.

Most of the associations manufacturing softwoods are regional associations of the National Lumber Manufacturers' Association and express their will thru that body. Associations manufacturing hardwoods have all adopted the rules of the National Hardwood Lumber Association, which now, probably more than ever before, come nearer to representing the requirements of the wood-consuming interests. Even within the hardwood rules, however, there are still considerable variations between some of the species.

A careful analysis is being made at the Forest Products Laboratory of all the commercial grading rules in order that, if possible, none of the practical aspects of the various woods may be omitted in any rules which may be promulgated for the purpose of establishing uniformity between the various grades, and in order that the so-called inherent defects peculiar to the different woods may be given their proper weight in the order of grades.

Standardization of grades and specifications for lumber will necessarily include several subdivisions, so that there will be grades for yard lumber, including finish and common grades, softwood factory grades, hardwood cut-up grades, and structural timbers. Flooring, shiplap, siding, tank stock, and other special products, can be specified according to requirements.

Federal Law Aids Building Trades School

CINCINNATI CRAFTSMEN ESTABLISH APPRENTICE TRAINING SCHOOL WITH AID OF CITY AND FEDERAL GOVERNMENTS

By Felix J. Koch

CINCINNATI builders lay claim to as well-trained a corps of apprentices as may be found any place in the world.

Taking advantage of the Federal Smith-Hughes Law, they have induced the city authorities to provide a unit—\$20 to \$40—units which both the State and Federal Government will add to make the experiment of a course in building trades craft, held daily in one of the down-town public schools.

Twenty-one of the city's most powerful contractors now send apprentices to the school the year round, paying the lads their full wages while they are in class. Other contractors are following their example, and newcomers enroll every day.

Any apprentice, wishing to enter this building trades' course, needs but have his employer assign the morning when he may attend. Tuition is free. Employers pay the lad the wages he would receive otherwise, that he may in no way suffer fiscal loss by attending school. Employers assign employes their respective mornings so that all apprentices will not be absent from a shop or job at one time.

Assuming a lad is granted Monday mornings, he reports, as "at shop," at 7:20 a. m. There are roll-calls, announcements and inquiry-time. At 7:30 he starts squarely at his work. He works till noon, then and every Monday.

Newcomers may enter school any week. Each one progresses as he shows aptitude, especially when he begins to specialize. Very soon he forms a class all by himself.

Newcomers receive drawing-tables and equipment worth \$40. Actual classes never exceed ten persons at one time. Best results are obtained in this way. One teacher, Mr. Bailey, gives all the construction. The work is largely from blueprint lesson sheets. All pupils start with the same elementals—multiplication and division of decimals—to be sure that they all understand these subjects. Fractions and other mathematics are also taught.

After the students have been thoroly schooled in fundamental mathematics and theory, they take up work with wooden blocks and receive some practical instruction in descriptive geometry.

With this knowledge as a basis for their training they select a definite trade in which they wish to specialize. All of them, whether they intend to be sheet metal workers, carpenters, plasterers, or other building artisans, must learn to draw, read blueprints, figure out bills of material and the like. In order that their ingenuity and imagination be given full play, their work is not confined to a single branch, but they are given instruction in the principal problems of other trades as well. For instance, they all learn how to mortise joints, to build tables to fit certain sized rooms,

to build rooms to fit tables, and to plan and build stairs. They are also taught how to locate jack and common rafters and learn the fundamentals of roof framing.

In short, each student is taught to be a practical man in several lines, in addition to being an expert in his own particular branch.

Only when they know all this, do they begin specializing. Every lad embarks then on a course all his own.

If a pupil is absent, his employer is notified and deducts from the lad's pay, as if he were away from work itself. Less mature lads in the classes earn \$19.20 weekly, apprentice, or half a journeyman's wages.

The builders are unanimous in their favorable verdict. As for final results, half a fiscal year has not yet been completed, let alone a full four-year course. But when graduation time comes, every graduate will be able to take hold in any branch of the building-trade, knowing the work there, and being able to adapt himself to it. He will rate as a first-class mechanic and can read any blueprint, can superintend erecting, and take charge of the shop when his employer is away.



Scene in Building Trades School Class Room in Cincinnati. This School is Fostered by the Trades Council and Promises to Relieve Shortage of Skilled Apprentices in that City. These Apprentices Work Part Time and Attend School the Rest.

DESIGN of SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

Stresses Due to Wind Load

ARTICLE 28 OF AN EXTENSIVE SERIES ON STRENGTH OF MATERIALS

IN the March article of this series the analysis of a special type of truss was started. The stresses due to dead and snow load were determined and also the reaction due to the wind on the left wall supported by the column and the wind on the left side of the roof. Fig. 1 shows these wind loads. On account of the knee brace on the column a bending moment is set up, causing additional or secondary stresses. Because of this bending, the solution of the problem becomes difficult. A solution has been offered, however, by Ketchum (I believe he was the first to present it), which simplifies things somewhat.

An auxiliary truss is introduced on the outside of each column as shown. The loads carried at the new joints are calculated as in any roof truss, being proportional to the area of roof supported. This method assumes that the column is made up of two pieces, pin connected to the knee brace, and horizontal member. We may then begin at the foot of the left column, treating all members as straight tension and compression. In Fig. 2, we first construct the force diagram A, B, C,—I, and the reaction IJ and J A. Starting at J, go to A, A to B, and from B draw a parallel to b k, to meet a parallel to k j thru J. This locates point K.

Next take the joint where the 5,400 lbs. acts, starting with K. From K go to B, from B to C. Thru C draw a parallel to c l to meet a parallel to l k thru K. This locates point L. Next take the point formed by k l, l m, m j and j k, starting with K. Go from K to L. Thru J draw a parallel to l m to meet a parallel to m j thru J. This locates M, and gives the stress m j thru J. This locates M, and gives the stress m j of the knee brace.

Now the stresses formed in K J and L M are not the true column stresses. They will be found later. The method has enabled us to find the true stress in the knee brace. In the same way the stresses in the auxiliary truss are merely a means to an end.

We now go to the left vertex of the roof starting with M. Go from M to L, L to C, C to D, and

D to E. Thru E draw a parallel to e n to meet a parallel to n m thru M. This locates point N, e n is in compression and n m in tension.

Take next the second joint of the lower chord formed by m n, n o, o j and j m. Starting from J go to M, M to N. Thru N draw a parallel to n o to meet a parallel to o j thru J. This locates O. For joint n e, e f, f p, p o and o n, start with O and go to N, N to E, E to F. Thru F draw a parallel to f p to meet a parallel to p o thru O. This locates point P.

As explained in previous articles, the kind of stress is determined by passing around the closed polygon for each joint in the stress diagram, and then putting arrow heads on the members of the truss, pointing the same way that the stress was read in the first diagram. For example, take the joint just figured. Going from O to N we travelled down. Then on the truss member the arrow head is placed close to the joint pointing down, showing tension. N E was

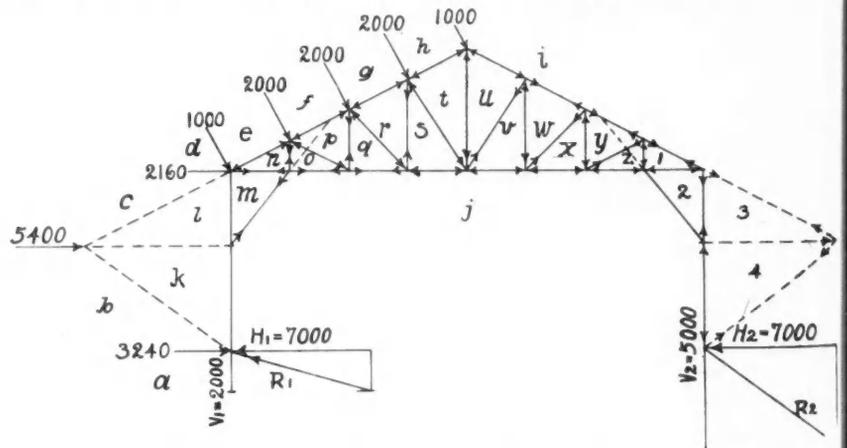
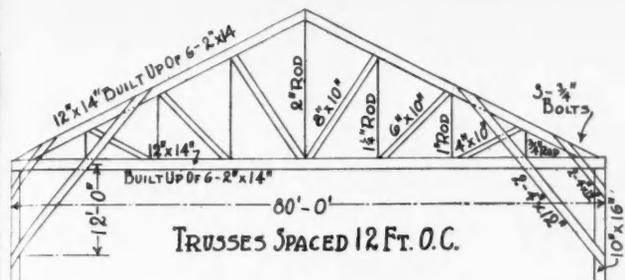


Fig. 1. Diagram of Truss Showing Wind Loads. Note the Auxiliary Truss Introduced on the Outside of Each Column.

travelled to the right and up. The arrow head placed near the joint shows n e acting against the joint, and it is in compression. F P is travelled to the left and downward, showing f p in compression. Proceed with the next two joints where only two unknowns are found, locating Q and R. Now at the joint j q, q r, r s and s j start with J. Go from J to Q, Q to R. Thru R draw a parallel to n s to meet a parallel to s j, thru J. This locates S. The polygon J Q R, S J shows j q in tension, q r in compression, r s in tension and s j in compression. This shows that the



Sketch of Truss Submitted by P. Bousquet for Analysis. The Building Is to Be 80 by 300 Feet, Trusses 12 Feet O. C.

stress in the lower chord has changed from tension to compression. That this was to be expected is evident from the stress diagram. O J scales approximately 7800 lbs. while Q J scales 500, showing a rapid decrease in the stress. The diagram shows quite a rapid increase in the compressive stresses in the lower chord as S, V, X and Z are all to the right of J at increased distances.

Another interesting thing to notice is the rapid decrease in the upper chord stresses e n, f p, g r, h t, the latter being very small. This indicates the necessity of very much stronger members on the panel members at the ends due to the wind load.

The order of the joints to use is n g, g h, h t, t a, then h i, i n, n t. Then s t, t u, u v, v j. In this way points I, U and V are formed. At joint u i, i w, w v, start with V. Go from V to U, U to I, thru I draw a parallel to i w, to meet a parallel to w v thru V. This locates point W. The force polygon shows v u in tension, u i in compression, i w in tension. Here the stress in the upper chord has changed from compression to tension. We next find points X, Y, Z, 1, 2 and 3. The last joint considered is to the extreme right of the figure. Go from 3 to I. Thru I, draw a parallel to i 4, to meet a parallel to 3-4 thru 3. This locates point 4. A check on the drawing is found at the foot of the right hand column. Begin with 4 and go to I, from I to J. Then a perpendicular thru J should pass thru 4.

The stresses in some of the members have been scaled for both dead and wind loads and the results tabulated follows:

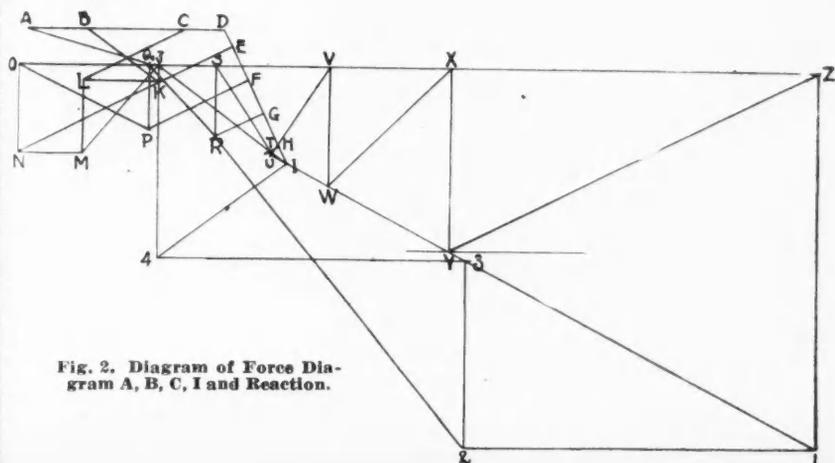


Fig. 2. Diagram of Force Diagram A, B, C, I and Reaction.

Member	NE	FP	GR	HT	IL	IY	IW
Stress, Dead Load..	15800	-13400	-11200	-9000	-13600	-13600	-11000
Stress, Wind.....	13400	-6000	-3000	-500	-33000	-10500	-2700
Stress, Total.....	29200	-19400	-14200	-9500	-17400	-3100	-8300

Member	NM	OJ	QJ	SJ	1-2	ZJ	XJ
Stress, Dead Load..	-14000	-14000	-12000	-10000	-14000	14000	-12000
Stress, Wind Load..	-3650	-7600	-500	-3200	-19500	-36500	-16200
Stress, Total.....	-17650	-21600	-12500	-6800	-4500	-21500	-3800

Member	NO	OP	PQ	IZ	YZ	XY	WX
Stress, Dead Load..	0	-2100	-1000	0	-2100	-1000	-2900
Stress, Wind Load..	-4400	-8000	-3500	-20400	-22800	-10000	-9500
Stress, Total.....	-4400	-10100	-4500	-20400	-20700	-9000	-6600

The stress in the left knee brace M J = +6700 and in Q j the right knee brace is -26600#.

The values in the table should be compared, and the largest of the three is the one to use in figuring the size of the number.

Returning to the columns, the direct stress or load on each is the vertical component of the reaction, and the force producing the bending moment is the horizontal component of these reactions. Resolving the reactions into their components graphically, Fig. 1, we find H₁ = H₂ = 7000, V₁ = 2000 and V₂ = 5000. The assumption is made that the columns are hinged at the top and bottom, and the greatest bending moment is at the foot of the knee brace. It is H₁ = H₂ = 7000 multiplied by the length of the bottom of the column. The writer in sending in this truss failed to give the column length. I assumed 18 ft., which will serve to illustrate the principle. Then moment M = 7000 × 18 × 12 inch lbs. To determine the maximum unit fibre stress in the outer fibre of the column, Johnson, Bryan and Turneaux give the following formula:

$$S = \frac{M y}{1 + \frac{P L^2}{c E}} \quad (1)$$

Where S = the maximum fibre stress.

M = the maximum bending moment in inch lbs.

v = the distance in inches from the neutral axis to the extreme fibre.

I = the moment of inertia of the cross section with respect to the neutral axis.

P = the direct load.

L = the length of the column in inches.

E = modulus of elasticity = 1,500,000 for timber.

C = a constant = 10 for a column with hinged ends.

In this case:

$$M = 1,512,000 \text{ inch lbs., } v = 8 \text{ inches.}$$

$$I = \frac{1}{12} B H^3 = \frac{10 \times 16 \times 16 \times 16}{12} = 3413$$

P = the direct stress made up of one-half the dead load, plus.

$$V^2 = 7950 + 5000 = 12,950 \text{ pounds.}$$

$$L^2 = \text{the length of the column} = 30 \times 12 = 360 \text{ inches.}$$

(Continued to page 126.)

: METAL CONSTRUCTION :

EDITOR'S NOTE: *The American Builder prides itself that it keeps apace 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.*

Life of Spelter Coatings on Iron and Steel Sheets

HOW A COMMERCIAL PURE IRON BASE METAL PROLONGS THE SERVICE LIFE OF BUILDINGS.

By D. M. Strickland

THE man who builds is a man who serves future generations. Whether he is an apprentice carpenter driving nails or an experienced contractor supervising the construction of the entire edifice, he builds so others may enjoy. The success of his efforts are dependent upon his interest, honesty of purpose and, above all, a conscientious desire to do his work that for years and years each completed structure will stand as a monument mutely testifying to his ability to achieve.

Collecting lumber, cement, bricks or sheet metal and carelessly sticking them together is certainly not building for permanency. Not at all. Every building designed for future use is first built in the minds of men. Every detail is graphically illustrated before a stake is driven or a shovelful of dirt removed. Present-day architects find it necessary, not only to draw the plans, but to also specify the quality of the material to be used when erecting the designed buildings.

It is not enough for an architect to say, "This building will require four carloads of brick." Rather should he state, "The brick for this building must be the best grade obtainable and conform to the recognized specifications characterizing such a grade." It is more important to decide on the quality of the bricks required than it is to estimate the numerical quantity.

This is the day of specialization. We study little details and find that they have big influences. A struc-

tural engineer must not overlook the little things. The public is critical in the estimation of his efficiency and measures his ability by the question, "Does he understand the many important details appertaining to his profession?" Even tho a builder feels that he is considering all factors when specifying the quality of his required materials, unfortunately, at times, he makes mistakes. Such errors are usually due to lack of detail information.

To illustrate this point, consider galvanized sheet metal as an example. Naturally, a contractor desires a long service life from this product, so he specifies a certain thickness of metal and weight of spelter coating (say one and one-half ounces per square foot), thinking that such a specification is all that is necessary in order that he secure satisfactory material. He overlooks an important question of quality, a question which means, depending upon his decision, either money in his pocket or expensive repair bills and financial loss. Why burn the midnight oil studying what weight galvanizing should be specified and then give no thought to the nature of the base metal which must carry this coating? The quality of the base metal is of vital importance. In fact, the service life of any galvanized sheet metal installation is as equally dependent upon the quality of the base metal as it is on the weight of the spelter coating.

Today the contractor finds the market well supplied with various grades of galvanized sheet metals. Like all other builders' materials, they differ in quality—poor, medium and best. A builder understands, better perhaps than any other professional man, that the best is always cheapest. He realizes what it means to gouge into the walks and tear up the flooring of a new structure (completed after weeks and months of conscientious effort), just for the purpose of replacing defective materials. Forever after the building would have a scarred and patched appearance.

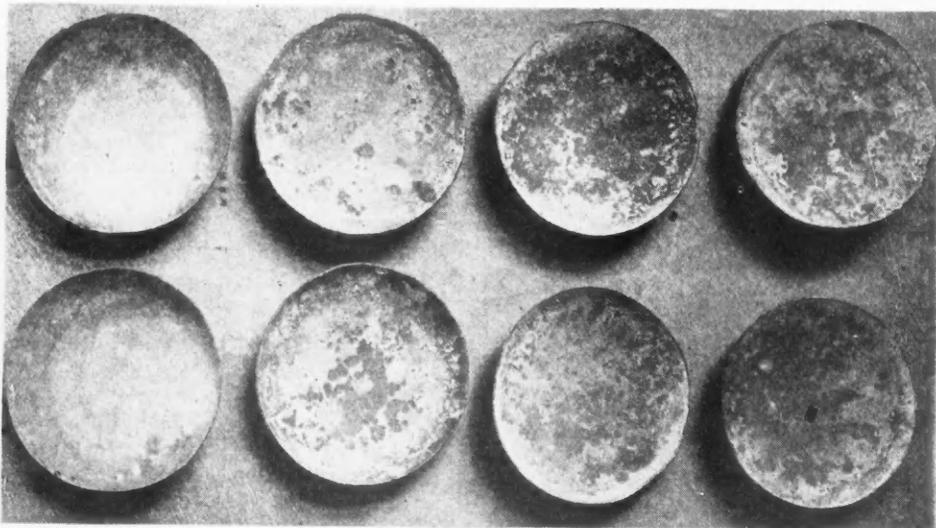


Fig. 1. Galvanized Saucers Which Were Filled with Cinders and Placed on Roof Exposed to All Kinds of Weather. Sixteen Months' Test Shows Effect on Different Kinds of Coatings. The First Pair (Left) Are Commercially Pure Iron.

Pure Base Metal Adds to Life of Material

Marked differences are found in metals when their rust-resisting properties are studied. It is a well-known fact that pure iron is more desirable than steel for all galvanized installations where the metal must withstand corrosive influences. The makers of steel realize this fact and endeavor to better their product by the addition of varying percentages of non-ferrous metals—a practice which is scientifically unsound, often disastrous, and, at best, of questionable benefit. When impurities are added to steel they have a decided tendency to segregate or collect in rust-inviting patches which eat out quickly, leaving a hole in the sheet. On the other hand, a commercially pure iron is uniformly resistant to corrosion, for, indeed, how can appreciable segregation occur when the total of all impurities present is even less than two-tenths of one per cent? Such an iron is especially adaptable when used as the base metal for galvanized roofing, gutters, siding, ventilating systems and all of the other multitudinous uses for which galvanized sheet iron is so applicable.

Before deciding on the iron to be used, the buyer must study the nature of his service requirements and compare them with service-life records of sheet metals which have been installed to meet similar service conditions. Research organizations, testing societies and college professors are impartially studying the relative merits of galvanized sheet metals, and, since they frequently publish the results of their experiments, any architect or contractor can be guided by their findings, remembering, of course, that the tests considered must stimulate the conditions of service for which the galvanized material is desired.

Photograph I pictures the results of such a test. These are galvanized saucers—shaped receptacles which were filled with cinders and then placed on a



Fig. 2. Elbow and Down Spouting Subjected to Same Conditions for Three Years. The Elbow, Which Is Pure Iron, Has Shown Greater Resistive Powers Than the Common Steel.

flat roof where they were equally exposed to rain, snow and other atmospheric conditions. This photograph was taken after the test had continued for six-teen months. There certainly is a decided difference in the condition of the coatings. Two saucers (A), which are free from corrosion, are commercially pure iron; the next two (B) are steel, and the other four (C and D) are steels of various non-ferrous contents.

Another example, this being an actual service installation. The elbow and down spouting shown in Photograph II have been subjected to identical conditions of service for but three years. The corrosion-resisting differences between the commercially pure iron elbow and the common steel spouting are vividly illustrated.

These are only a couple of typical examples. Structural engineers have little trouble in finding hundreds of examples of similar character.

The modern hospital building (Photograph III) was erected by architects and contractors who wanted the



Fig. 3. Hospital Building in Which Pure Iron Was Specified in All Flashings, Spoutings, Etc. Coatings Over Commercially Pure Iron Have Shown Definite Rust-Resisting Properties.

structure to remain in good repair for years to come. They knew that the character of the base metal would have a decided influence on the life of the coating so they specified the quality desired, choosing, in fact, a commercially pure iron.

There is yet another factor which must be mentioned. A commercially pure iron is a homogeneous, degasified metal and consequently has a minimum alloying tendency toward spelter when sheets are galvanized by the hot-dip process. By comparison with ordinary irons and steels, the coating on the pure iron contains less alloyed iron—it is purer. This purity of coating contributes materially to its remarkable corrosion resistance.

The results of many, many tests like those described above, all verify the fact that different metals have different rust-resisting properties. Since this is the case, it is obvious that the builder should understand this fact and consider carefully the quality of the iron to be used for his galvanized sheet metal requirements. A pretty spangle on a defective base metal will not stand the test of time. Examine closely the metal under the coating. If analysis shows it to be a commercially pure iron, the builder can rest assured that such metal is uniform and ductile. Also, the purer coating will satisfactorily meet his service requirements in like manner as it outlasted the steels in the saucer test and the downspout installation.

Are Contractors Overlooking a Superior Roofing Material?

CHOICE OF MATERIAL IS UP TO CARPENTER CONTRACTOR AND VERY OFTEN HE DOES NOT KNOW ABOUT METAL TILE AND SHINGLES

By C. L. Atwood

SHEET metal of good quality is the right kind of armor for the roof on any building, and I believe if the carpenter contractor would study the laying of metal shingles and tiles, they would be more generally used. In some localities there seems to be a hesitancy upon the part of two separate and distinct trades to handle this fireproof roofing material.

The tinner, who is by special training eminently qualified to lay metal tiles, does not as a rule decide what sort of roofing is to go on the building. The carpenter contractor does that, and, tho he could readily do the work, he has had no training along this line and is inclined to lay other roofing, because it, seemingly, presents fewer difficulties in applying.

The detailed drawing on the opposite page shows the various parts of a roof where care is needed in laying metal tiles. Every difficulty that may be encountered is solved for the contractor in this illustration. Any carpenter contractor could lay a water-tight metal tile roof by consulting this drawing. The style of tile shown in the drawing is a very attractive pattern, somewhat resembling cedar shingles—being of wedge-shaped panels which are considerably higher at the butt than at the top and thereby affording a bold, distinctive effect.

I would call your attention to the individual tile which has three ribs at the top of tile to prevent snow or water from backing up between rows of tile, and the side-locking extension makes a water-tight joint

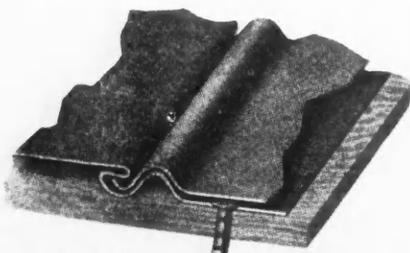
between the tiles, as well as covering up the nails driven in each tile as laid. The detailed drawing on opposite page shows the ridging and hip covering, as well as the finials, valleys and flashings.

Another feature of the metal tile or shingled roof is its lightning-proof characteristics. The electric fluid is quickly grounded thru the spouting or any other metal connection which joins the roof. These tiles are rapidly laid—the one shown in the drawing requiring approximately only 148 tiles to the square. In other words, they will cover the surface which it would take 1,000 wood shingles to cover. Sun will not warp or check them, rain does not soak or swell them and frost has no appreciable effect on them.

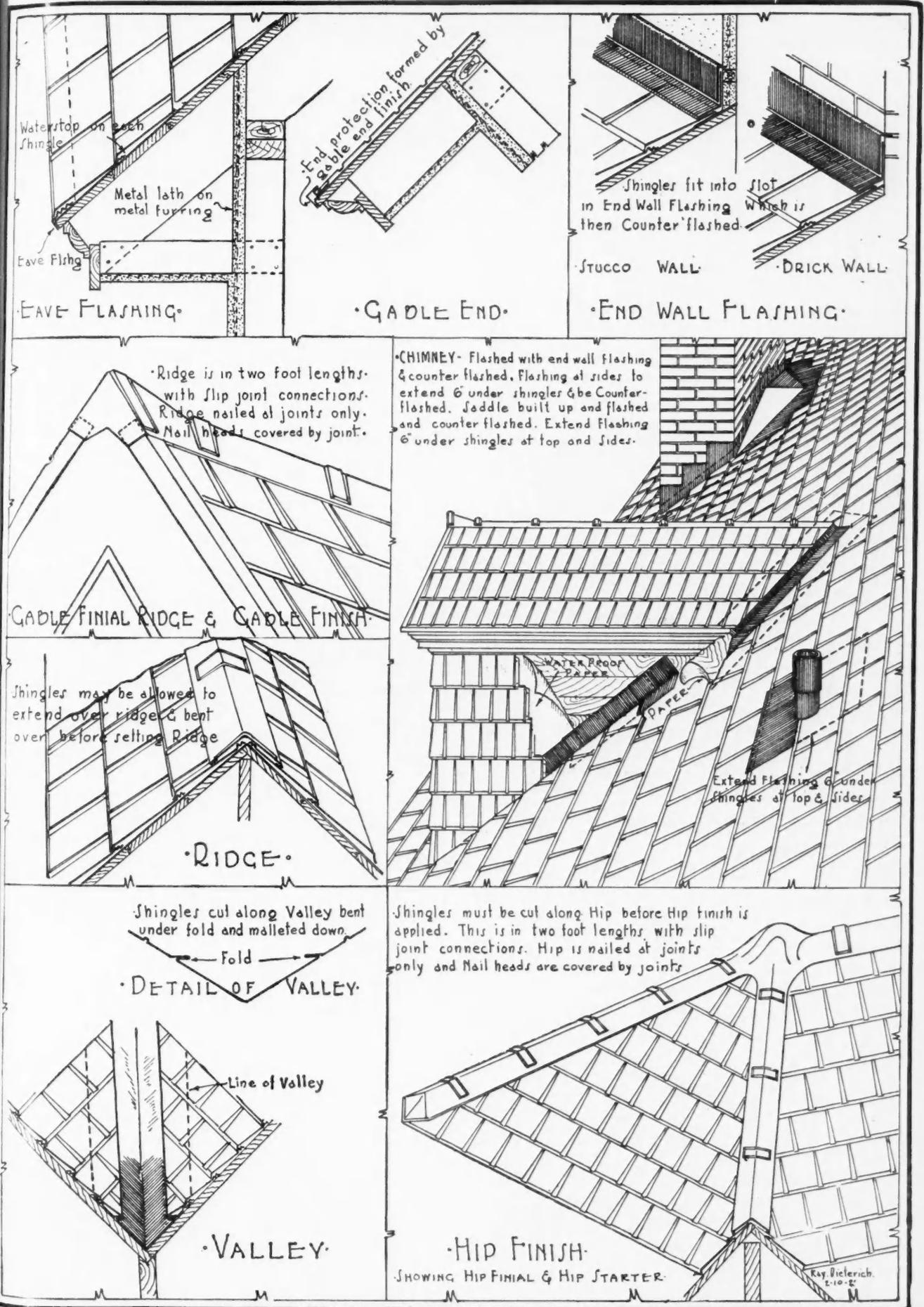
These tiles should be stamped from high grade terne plate and dipped in mineral paint, or galvanized after formed. The galvanizing and also the mineral paint prevent electrolysis and make a roof that is almost impervious to rust and corrosion. A galvanized metal tile, if allowed to season in the weather a short time, can then be painted with the best results, the paint adhering as well as on wood. The metal does not absorb the same quantity of paint as other materials, hence, it is economically repainted at any time.

Of course, there are other fireproof roofing materials, but many require much stronger and more expensive roof support which only adds a big sum to the cost of the roof. The metal tiles effect a saving in this way—also in the matter of freight.

It should be worth something to a contractor to be able to point to roofs that he himself had laid in past years—which had not needed repairs and which had survived many threatening electric storms and neighborhood fires—roofs upon which the sun had concentrated its burning rays and upon which rain and hail had beaten without visible effect.



Individual Metal Tile, Showing Special Interlocking Arrangement to Make Water Tight Joint and Cover Up Nails.



Details of Roof Showing Sections Where Care is Needed in Laying Metal Tiles. This Drawing Shows the Solution for Difficulties Which Are Liable To Be Encountered by Contractor.

Proper Chimney Construction

CORRECTLY BUILT FLUE IS ONE OF CONTRACTOR'S IMPORTANT JOBS — SATISFACTION OF CLIENT DEPENDS ON IT

By A. M. Daniels

Assistant Mechanical Engineer, Division of Agricultural Engineering, Bureau of Public Roads

THE prime function of a chimney is to produce a draft that will cause sufficient combustion and carry off the resulting smoke; incidentally it assists ventilation. Many unsatisfactory heating plants and much excessive fuel consumption are due to improperly constructed chimneys, which are the rule rather than the exception. Altho many of these are more inefficient than dangerous, yet reports of the National Board of Fire Underwriters show that a larger number of fires are caused by defective chimney construction than by anything else. The annual loss resulting from such fires is greater than the fire loss from any other cause. Poor chimney construction is responsible for smoke pollution of the air, waste of fuel, and poor heating.

The draft depends entirely upon the chimney flue. The better the flue the more satisfactory and efficient will be the operation of the entire heating apparatus. The strength or intensity of the draft is dependent mainly upon the tightness, size, and height of the chimney flue.

Shapes and Sizes of Flues

The most efficient chimney is one built perfectly straight with a round or nearly round flue and a smooth interior surface. There is no advantage in reducing



Round Flues Offer the Least Resistance to the Passage of Gases, but Most Residence Flues Are Made Either Square or Oblong for Structural Reasons.

the sectional area toward the top. The cross section and height are determining factors. The transverse area must be sufficient to pass the volume of air required to burn the fuel properly, and the height must be great enough to insure against interference with the draft by adjoining buildings or projections of the same building and to produce a sufficiently strong draft.

Loss in draft strength is due to air leakage, and friction of the gases against the sides of the chimney. A round flue is the most desirable because it offers less resistance to the spirally ascending column of smoke and gases. The elliptical is second choice so far as the movement of the gases is concerned, but the difficulties that it presents in manufacture and construction eliminate this shape. A rectangular chimney either square or oblong is not effective over its full transverse area; for the rising column, being approximately circular in section, does not fill the corners. However, square or oblong forms are far more com-

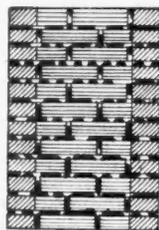
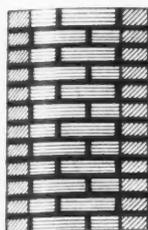
mon than the round, owing to the greater cost of round flue construction. Square flues are preferable to oblong so far as efficiency is concerned, but in the larger sizes of house flues the oblong shape is more generally used because it fits to better advantage into the plan of the house. An oblong flue should never have the long side more than 4 inches greater than the short side. A flue 8 inches by 16 inches is bad flue construction for draft purposes. The sizes given in the Table are recommended by the National Warm Air Heating and Ventilating Association. Like all data for both high and low pressure flues, these sizes are based on experience, not on scientific data, and are subject to modification by further research. The dimensions given are for unlined flues. The actual inside dimensions of flue tile are slightly different because of the lack of standardization. In selecting the flue for a furnace or other large heating unit an 8-inch by 12-inch size should be considered the minimum for a lined or unlined flue, and 12 inches by 12 inches the minimum for a lined or unlined flue whose height is more than 35 feet measured above the grate level. If the chimney is designed for a small unit such as a laundry stove or kitchen range an 8-inch by 8-inch flue may be used.

The proper size of flue depends upon the size of the heater or furnace for which it is to be used. All manufacturers' catalogs contain the size of the smoke pipe for each particular heater, and from this Table (minimum) dimensions for round, square, and oblong flues may be selected; or if the catalog contains stack sizes select the proper one. The flue tile to be used should have a transverse net inside area approximately equal to that of the smoke pipe.

Diameter of smoke pipe or round chimney flue.	Size of chimney flue.	Height of chimney flue above grate.	Diameter of smoke pipe or round chimney flue.	Size of chimney flue.	Height of chimney flue above grate.
Inches.	Inches.	Feet.	Inches.	Inches.	Feet.
8	8 by 12	35	15	16 by 16	45
9	8 by 12	35	16	16 by 18	45
10	12 by 12	35	17	16 by 20	50
11	12 by 12	40	18	16 by 20	55
12	12 by 12	40	19	20 by 20	55
13	12 by 16	40	20	20 by 24	60
14	12 by 16	45			

Height of Chimney

In this Table the minimum height of the chimney above the grate is given as 35 feet. Higher chimneys are



Unlined Chimney Before Use.
Same Chimney After Service. Heat and Weather Cause the Mortar to Disintegrate so That Air Leaks Thru Joints Reducing Draft.

considered more satisfactory, and authorities claim that any flue under 40 feet in height will produce an erratic draft, good on some days but poor on others. The force or direction of the wind may be the cause, or the amount of moisture in the air, or the quality of fuel may be responsible. The higher the chimney the less will be the possibility of counter air currents and stronger and more constant the draft.

The top of the chimney should extend at least 3 feet above flat roofs and 2 feet above the ridge of peak roofs, and it should not be on the side of the house adjacent to a large tree or a structure higher than itself, for these may cause eddies and force air down the chimney. A poor draft will most likely result when the wind is blowing in the direction indicated.

Flue Linings

Altho chimneys are built unlined to save expense, those properly lined with tile are undoubtedly more efficient. Linings prevent disintegration of mortar and bricks thru the action of flue gases.

Linings are manufactured in round, square and oblong shapes, but not in elliptical. The oblong and square shapes are better adapted to brick construction than the round. They permit of simpler and less expensive masonry work. On the other hand, the round shape produces better draft and is easier to clean.

A fireplace flue, if straight, should be lined from the throat continuously to the top. The smoke chamber should be lined with fire clay or cement mortar 1/2-inch thick. In case the masonry in front of the throat is less than 8 inches thick the lining should start at the bottom of the lintel. The hottest part of the flue is at its throat, and if it is not lined at that point or if the masonry is not of sufficient thickness, there is danger of overheating. Careful attention should be given to details of flue construction in order to assure satisfactory operation and reduce the fire hazard.

Location and Wall Thickness

The best location for the chimney is near the center of the building, for when so located its four walls are kept warm; cold winds cannot chill it and cause it to draw poorly. However, it is not always possible to plan the arrangement of rooms so that the chimney may be thus located. The outside wall of a chimney should be at least 8 inches thick in order to reduce heat loss and the chance of air leakage into the flue.

If the flue is lined and the chimney is not higher than 30 feet, its walls, if of brick, may be made 4 inches thick, provided adjacent inflammable material is properly insulated. If unlined, the walls should not

be less than 8 inches thick. It is not good practice to place the linings of two flues side by side. If there is more than one flue in a chimney, the flues should be separated from each other by a division wall of brick at least 4 inches thick, bonded into the side walls, and the joints of the flue linings should be staggered or offset at least 6 inches. This construction insures stability, reduces the chance for air leakage between flues, and prevents the possibility of a fire in one flue involving an adjacent flue. If stone is used in chimney construction, the walls should be at least 4 inches thicker than brick walls.

Openings Into the Chimney

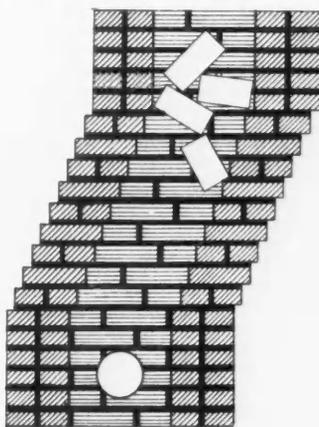
It is not unusual to find an opening into a chimney other than for the smoke pipe of the main heating apparatus. This is a frequent cause of unsatisfactory operation. No range, stove, fireplace, or ventilating register should be connected with the chimney flue built for the heating apparatus. If it should be desired to use an existing abandoned fireplace chimney for a range or stove the fireplace flue should be closed tight about a foot below the place where the smoke pipe enters.

There should be but one connection with a flue, if for no other reason than to decrease the fire hazard. Fires frequently occur from sparks that pass into the flue thru one opening and out thru another. Two stoves, one on the first floor and one on the second, may be connected with the same chimney flue, but if the fire in the upper stove is hotter than in the lower, the lower will have practically no draft.

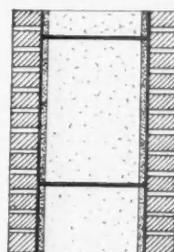
A soot pocket provided with a door for cleaning it out is very convenient. The door should be placed just below the smoke-pipe opening, and care must be taken to see that it fits snugly and is always closed so tight that no air can get in.

Supporting the Chimney

All chimneys should be built from the ground up. None of the weight should be carried by any part of the building except the foundation. Proper foundations should be provided at least 12 inches wider all round than the chimney. If the chimney is an exterior



An Unlined Chimney with Offset Loose Brick or Mortar May Become Lodged at the Offset During Construction or After and Check Draft Completely.



Straight Chimney Showing Terra Cotta Flue Lining in Place.

one, and there is no basement or cellar, its foundation should be started well below the frost line. Otherwise the base of the chimney should be at the same level as the bottom of the foundation of the building.

No chimney should rest upon or be carried by wooden floors, beams, or brackets, nor should it be hung from wooden rafters. Wood construction shrinks, and beams supporting heavy loads always deflect in time. Sagging of the beams injures the walls and ceilings of the house and is apt to crack the chimney and render it dangerous. Chimneys usually extend several feet above the roof, exposing considerable surface to the wind, and unless the support is stable they are likely to sway during a gale with the possibility of the joints at the roof-line opening. Openings in a flue at this point are especially dangerous, for sparks from the flue may come into contact with the woodwork of the roof. This swaying may also cause leaks in the roof.

The brickwork around all fireplaces and flues should be laid with cement mortar, as it is more resistant

than lime mortar to the action of heat and flue gases. It is well to use cement mortar for the entire chimney construction. All mortar used for chimney construction, except for laying fire brick should be proportioned as follows:

Two bags of portland cement, not less than 188 pounds, and one bag of dry hydrated lime, 50 pounds, thoroly mixed dry, and to this mixture should be added three times its volume of clean sand with sufficient water to produce proper consistency. When dry hydrated lime is not available, 1 cubic foot of completely slaked lime putty may be substituted for the dry hydrate.

Capping the Chimney

Brick chimneys should be capped with stone, concrete, or cast iron. Unless a chimney is capped the top courses of brick may become loosened and therefore dangerous. Plain topped chimneys will last longer and are safer than those of an ornamental character. The opening in the cap piece should be the full size of the flue.

Chimney and Roof Connections

Where the chimney passes thru the room the construction should provide space for expansion due to temperature changes, settlement, or slight movement of the chimney during heavy winds. Copper is the best material for flashings. It is easier to handle

than galvanized sheet metal, which is more often used because of its lesser cost, but which will corrode in time, both from inside and outside exposure. Tin or black iron are cheaper but will rust quickly unless frequently painted. Lead and zinc are expensive and should not be used for chimney flashings, for in case of fire under the roof they will melt and leave an opening to create a draft by which the intensity of the fire will be increased.

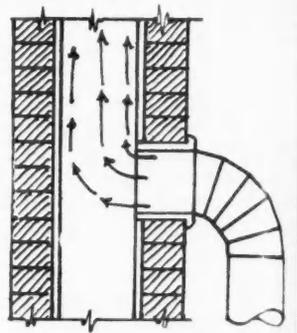


Fig. 5. Correct Method of Chimney Connection. This Produces Good Draft by Providing Free Passage for the Gases.

Chimney Connections

Proper care in setting and looking after smoke pipes connecting with chimneys would greatly lessen the number of fires chargeable to defective construction.

In fitting the smoke pipe no opening should be left around it, and the pipe should not project into the flue lining. The joint should be made air-tight by a closely fitting collar and boiler putty or fireproof cement. The proper construction is shown in Fig. 5, but if the pipe extends into the flue a shelf is formed on which soot will accumulate, the flue area will be reduced and a poor draft may result.

Smoke pipes should enter the chimney horizontally, and the connection thru the chimney wall to the flue should be made with fire clay or metal thimbles securely and tightly set in the masonry. If the walls are furred, no wood should be within 12 inches of thimbles or any part of the smoke pipe. The space between the thimble and wood furring should be covered with metal lath and plaster.

All wooden construction adjacent to chimneys should be insulated. A space of 2 inches should be left between the outside face of a chimney and all wooden beams or joists. This space should be filled with some porous, non-metallic, incombustible material. Loose cinders serve well. Do not use brickwork, mortar, or solid concrete. The filling should be done before the floor is laid, as it not only forms a fire stop, but prevents accumulation of shavings or other combustible material. Baseboards fastened to plaster which is directly in contact with the outside wall of a chimney should be protected by placing a layer of fireproof material at least $\frac{1}{8}$ inch thick between the woodwork and the plaster.

(Continued to page 132.)

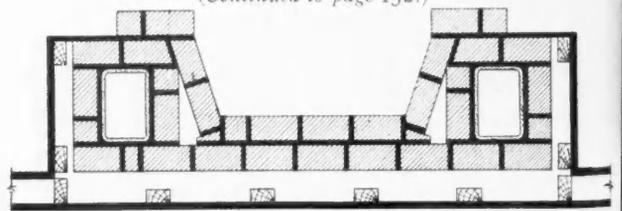


Fig. 6. Proper Construction for Insulation. No Wooden Studding, Furring or Lathing Should Be Placed Against the Chimney.

How to Pile Lumber Properly for Seasoning

SOME SUGGESTIONS TO THE LUMBER DEALER WHO HAS A STOCK THAT MUST BE SEASONED FOR THE TRADE

By J. W. Martin

ONE of the most important problems of the lumber dealer is seasoning lumber. To do this properly he must keep that lumber under certain definite conditions so that the volatile contents will be removed. This calls for temperature regulation; special caution must be exercised during the process to guard against checking, warping, or crooking. And after the process is completed and the lumber placed in storage prior to shipment, additional care must be taken to prevent the development of a fungus that causes the blue sap stain, the most damaging evidence of improper seasoning and handling.

The fungus which produces blue sap stain flourishes best where moisture and a degree of heat from 50 degrees to 120 degrees F. is maintained and very little circulation is present; therefore, the ground on which lumber is piled should be drained, weeds and other growth should be kept down, and avenues of circulation and evaporation should be provided and kept open.

Therefore, if tram platforms or dollyways are used in the yard, the ground should be drained as illustrated in Figure A.

If no dollyways or tram platforms are used, then the ground should be shaped and drained in the manner shown in Figure B.

If platforms are used, the face of the piles should never come nearer than two feet from the edge of the platform, so there can be free circulation under the platform, and up between the platform and the piles; alleys or platforms should run north and south

if possible, so the sun can strike front and rear of piles in the course of the day.

All Piles Should Slope Backward

Piles should be built either straight up in front or the front inclined a little back, say six inches back, from a perpendicular and never incline forward, and the lumber should have a slope of not less than $\frac{3}{4}$ -inch to each foot in length of lumber in the pile, and as this will force all water falling on the pile to run off at the rear, it will drop clear of the pile if the pile inclines to the rear from a perpendicular; whereas, if the pile inclines forward the water drizzles down the rear and wets each piece in its journey to the ground. I am aware that it is almost common practice to incline piles forward from a perpendicular, but it is a bad practice—a practice that has not one redeeming feature to defend it and has many to condemn it; it throws an undue weight on the front foundation skid, which tends to depress that skid, and causes the pile to lose its pitch or incline that is of such importance in quickly ridding it of rain, as well as exposing the rear end of the lumber to the damaging effects of the drip of all water running off the rear.

Reasons for Using Narrow Crossing Strips

The cross strips should never be more than four inches wide. Anything wider makes a broad point of contact which retains moisture and propagates fungus, produces blue stain and in the case of 7-inch, 10-inch or 12-inch crossing strips, produces checks in the crossing strips between the boards, and often in the boards themselves, and in lumber shipped 90 days or less after the pile is finished, adds from one hundred to two hundred pounds more per thousand feet to the shipping weight of the lumber than if four inch crossing strips were used; enough to pay or save all expense of properly piling the lumber and a nice profit besides.

Ends of Pieces Should Project Beyond Skids

Foundations for piles should have a bearing under the skids not less than one every $3\frac{1}{2}$ feet of the length of the skids; the front and rear skids should be $2\frac{1}{2}$ feet less distance apart than the length of the lumber to be piled on them, so that the rear end of the lumber will extend $2\frac{1}{2}$ feet over the rear skid. The rear skid should never be at the rear end of the lumber, or nearer the



Millions of Feet of Lumber Piled Properly. The Foundations Are Concrete and Each Layer Is Carefully Separated to Allow Proper Seasoning Without Warping or Checking.

rear end than 2½ feet, as the pile is built up, as the end of the lumber is seasoned faster than the balance of the piece, due to the facility with which moisture gets out at the end; the end shrinks first in consequence, and if the cross strip is too close to the end, it holds the moisture and prevents shrinkage when it touches the board, the fibres of the wood thereby becoming distorted, as shown in Figure C.

As a check is started at the end, some place in the width of the board where the adhesion of the growth grains is weakest, the fibers start to straighten again and the check is gradually extended to, or nearly to, the cross strip, but if there is 2½ feet in which the distortion of the fiber can distribute itself, the strain is not sufficient to cause a check to start. I admit that if the cross strip is placed at the extreme end, and the end of the board is covered with the cross strip, the lumber will not check, but the rear cross strip and the end of the lumber will be wet every time it rains and will be several days drying out, and the rear end of the lumber will be stained in consequence; whereas, the rear end will dry in half a day if the cross strip is kept well away from it, and will remain bright.

Flat Foundation—Elevation by Cross Strips

Very little of the elevation given to the front of a pile should be built into the foundation. A flat foundation stands better, but the elevation should be built into the pile by putting three cross strips one on top of the other, on top of the first course of lum-



Fig. B. When No Tram Platforms or Dollyways Are Used, This Is the Method of Draining to Be Used.

ber laid down, over the front skid, two over the middle skid and one over the rear skid. Then lay another course of lumber and repeat the operation until the proper elevation of the front is obtained. This method gives loose piling and better circulation in the bottom of the pile where it is needed.

Methods of Covering that Give Best Results

The best way to cover the pile, to best save it, is to have the cover extend over the front one foot, over the rear two feet or more, and six inches over each side. The front should be elevated six or eight inches more than the regular courses in the pile to more readily shed rain, and also provide a space under the cover for the wind to carry out the moisture that rises between the tiers of boards and is arrested by the cover.

Many will want to cover with the same sort of lumber as the balance of the pile. For common grades this is the usual practice, and in that case do not waste any of the cover by letting it project over the front, where no water or rain is shed—let it come just even with the front and put one board crosswise at the extreme rear of the pile, one-half of its width

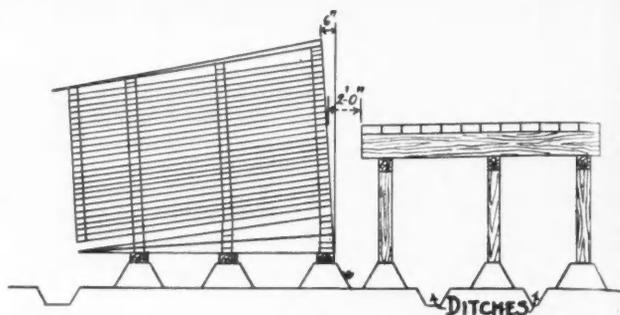


Fig. A. Showing System of Drainage When Tram Platforms or Dollyways Are Used in the Yard.

overhanging and one-half on the pile, to be held by the cover lying on it, thus delivering the water clear of the pile. Lay the first course of the cover one to two inches apart, but never close enough for the boards to touch each other, for if you do, capillary attraction will cause the cover to leak. Lay the second course in like manner, battening the openings in the first course. Weight down, or fasten down, by putting two 2 by 4, two feet longer than the width of the pile across the cover, stick a piece of edging into the side of the pile two feet below the cover and wire the 2 by 4 down to it at each end and your cover will protect your pile until you remove it.

Some people may contend that letting common lumber dry without a cover will dry it quicker, but it is not true. It will become weather beaten quicker, but not dry quicker, and we are concerned with how "best" to save it and how to save it "best."

Proper Distances that Should Separate Piles

As to the distance piles should be separated, I say three or four feet is plenty as it is of much more importance to have large space between the boards in the pile, and the number of pieces in a course should never exceed the number allowed in the subjoined table if you are to properly save Southern pine lumber after soda dipping it, but there should be at least eight feet separating the rear ends of piles.

Pile the following number of pieces in a course, not counting the crossing strips:

Description	NUMBER OF PIECES TO THE COURSE							
	Length of Skids							
	6'	8'	10'	12'	14'	16'	18'	20'
1x4	9	12	15	18	22	26	30	34
1x6 and 2x6	8	10	12	14	16	18	21	23
1x8 and 2x8	6	8	10	11	13	15	17	19
1x10 and 2x10	5	7	8	10	11	13	14	16
1x12 and 2x12	4	6	7	8	10	11	12	13
2x4 and 2x6 on edge	18	24	30	38	42	48	54	60

Raise the front of cover at least six inches and put one board under back end of cover three inches under the cover, balance of the board overhanging in the rear of pile.

Pile Small Dimension on Edge

Pile all Southern pine lumber with the heart face up; it will warp much less. Select cross pieces for

(Continued to page 146.)

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

Answers Fireplace Problem

To the Editor:

Urbana, Ill.

The enclosed drawing is our idea how the fireplace problem in the February issue of the AMERICAN BUILDER can be solved. We shall state that any number of fireplaces can be built one above the other if proper provision is made, but for work in residences, three fireplaces one above the other when no other flues are attached is about the limit, unless the jambs at

the sides of the fireplace are large enough for the passage of two flues. Then five fireplaces one above the other can be built. As the ordinary residence is seldom over four stories, we need go no further. To answer the question as put, the number of fireplaces is not limited if proper provision is made.

The drawing you published in the February issue showed a chute from the upper fireplace to the

upper fireplace, the plug can be pulled and the ashes fall by gravity, the ashpit being hopper shaped and covered with a reinforced concrete slab resting on a corrugated iron form pierced where the ash dump comes.

We have found this method economical and practical. It is much better than corbelling the brickwork and saves the building a trimmer arch and also gives a level ceiling to the basement.

We have lettered no dimensions, as none were asked, but if you wish to ask for more information we shall gladly answer. We are assuming the fireplace as an inside one. We recommend a half turn to the flues so that offsets will be more gradual, and which permit of an 8-inch wall with the same depth of fireplace. We have sent a drawing to the gentleman at Bluffton and trust our interpretation will help those interested.

APEX FIREPLACE CO.



Builds Cozy, Modern Home

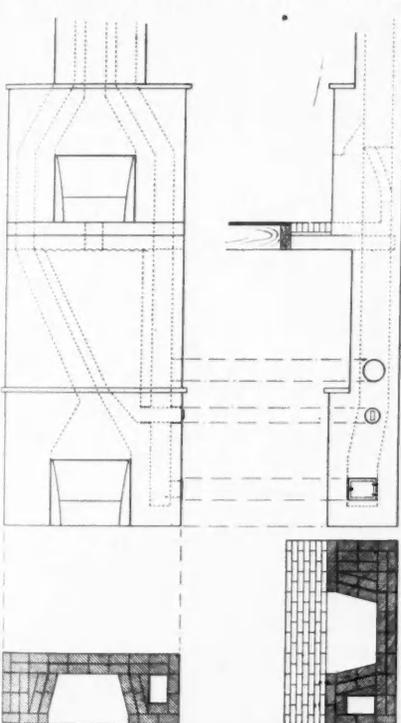
To the Editor:

Patch Grove, Wis.

I am sending a picture of a home I built last summer. The house is 24 by 32 feet and I think is very conveniently arranged. It is small, but large enough for two old people. It is equipped with an air power water supply system driven automatically by an electric motor, pumping, both hard and soft where desired.

It also has electric lights with switches conveniently placed. The thatched effect of the roof was taken from the AMERICAN BUILDER, from which I get a lot of good information, and would not be without as long as I am in the building business.

P. A. MILLIN.



Method of Building One Fireplace Over Another—Drawing Submitted by Fireplace Experts in Answer to Problem Which Appeared in February Number.

furnace floor. Our objections to this is that no ashpit large enough is provided and if gas formed in the base of furnace flue, as it often does, and exploded, the living room would be deluged with dust and ashes, and if the lower door was not tight, cold air would pass up into the upper fireplace and cause poor draft. In the accompanying drawing you will notice that I have arranged two thimbles in the wites and passed a plug thru. This method will permit of an ashpit for the upper fireplace, both dust and air-tight, and does not prevent ash from the furnace falling to the base of the flue. When it is necessary to empty the ashpit from the



Small Modern Home Built by Brother Millin, Patch Grove, Wis. He Got the Thatched Roof Idea from the "American Builder." This Home Has Water Supply and Electric Light.

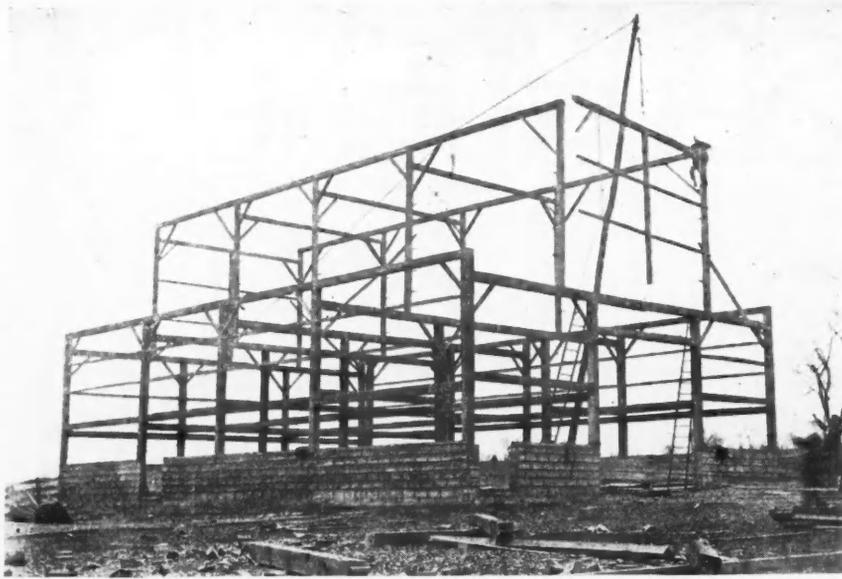


Fig. 1. Three Builders, the Farmer Owner Assisting, Did This Work. The Long Pole Holds the Block and Tackle Which Hoists the Plates Into Place.

Explains Barn Framing Methods in Indiana

To the Editor:

Selma, Ind.

A. A. Tresler's pictures in the February number, showing how they do it in Adams County, Pennsylvania, reminds me that several months ago I promised to send some pictures of mortise frame barns and of raising them. I have so many I don't know which ones to send, as I have been building in rural districts for eighteen years, where conditions have made this style of frame almost the only kind used.

The abundance of smaller size straight hardwood, such as sugar, ash, elm, red oak and beech, found often on the owner's land, made it convenient and also very economical to have this squared into 6 by 6, 8 by 8, etc., as it would not bring much on the market. Besides, the tops make fuel and at the same time give place to cultivation of the land.

Well, the raising bee is a thing of the past here, and justly so. Why take the valuable time of thirty or thirty-five men when four men with a horse, some ropes and pulleys can do the work as quick, much easier and with less danger, instead of "all together, let's go"? We get out of the way and let her go until it is swinging over the mortise, when we guide it and back up the horses. I have used the windlass some, but a team is much faster and saves a man or two.



Fig. 3. Completed Barn and Owner, F. M. Amburn, Parker City, Ind. Lon Brooks Was the Builder, and Tells How They Build Barns in Indiana.

The 3½ or 4-foot wall has become very popular in the last few years making the raising somewhat different from what it was a few years ago. As in Mr. Tresler's case, then with the foot of posts resting on the sill and the tops outward, the bents are put together, half of them lying one way and half the other from the center of barn where the pole is to be raised and the bents just up-ended. The plates are then picked up by the block and tackle and put in place, but on the high wall the bent is put together on the ground. It will lie best near where it is intended to go. Lift it clear with the ropes and set it on the sill. When the bent is wide and the girder in two pieces, we take half a bent at a time.

The pictures are views of a barn 40 by 60 feet, 20 feet to the square, in five bents on a 4-foot concrete wall, 12 inches

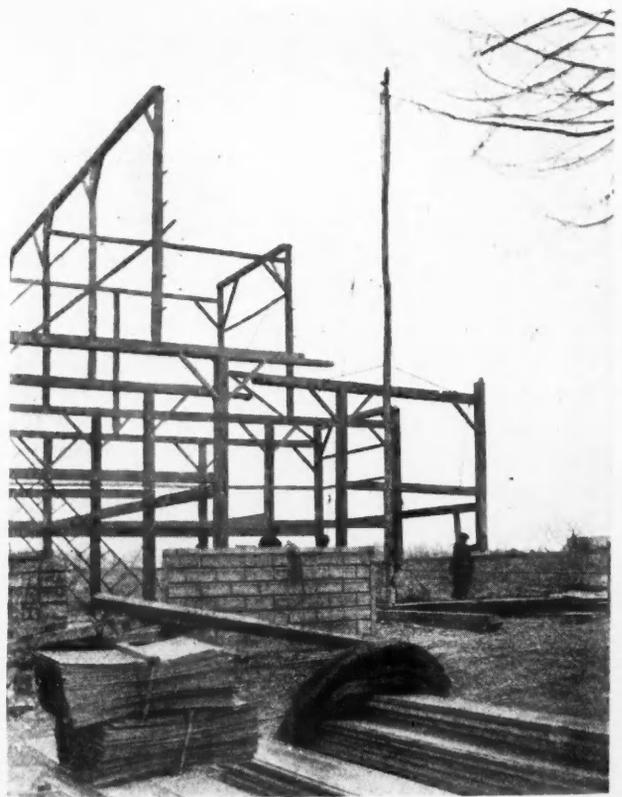


Fig. 2. Left Half of Four Bents and Right Half of Two Bents Up and Purlins in Place. This Barn Is 40 by 60 Feet on a Concrete Foundation 4 Feet High, Paneled to Resemble Blocks.

thick at the ground and tapered to 8 inches thick at the top, also paneled to resemble blocks by nailing concrete mould on forms. The frame to square is 8 by 8 hardwood. Purlins and posts are 6 by 6.

In Fig. 1 can be seen one of my men and the heads of the other two, while I operated the camera.

I had my right hand hurt, so about all I could do at the time was to boss. These three men and the farmer who furnished and drove the team did about

all the work. We dragged all these heavy timbers in place, pinned them together with over 300 1-inch pins and completed the raising as shown in Fig. 1. In Fig. 2 the left half of four bents and right half of two bents being up and purlins in place, the right half of the third bent swinging on the ropes is being let into the mortise in the 4 by 8 sill. Afterward the girder splice was bolted with four 1/2-inch bolts.

In this picture the 46-foot pole of seasoned swamp ash appears to be almost perpendicular, altho leaning slightly over the bent to allow it to swing free.

In Fig. 1, the pole is leaning quite a bit, allowing us to move the top from 12 to 15 feet without disturbing the bottom, and yet having plenty of height, which means a whole lot. We have found that by using a shorter one and lacking 6 inches or so of getting the load high enough we run into trouble!

In Fig. 1, shows the last load, composed of the top girder, 6 by 6, 20 feet; center post, 6 by 6, 13 feet; four nail ties, 4 by 4, 10 feet, and two braces, all fastened together on the ground and shot up, guided with two 1/2-inch ropes by two men.

The man on top is entering the tenon in the mortise in the purlin post. When this was done the other end was pinned and we were glad she was up.

Fig. 3 shows job completed and the proud owner, F. M. Amburn, Parker City, R. R., Randolph County, Indiana.

Contractor and builder, Lon Brooks.

LON BROOKS.

Old Chimneys Unsatisfactory

To the Editor: Broadview, Sask.

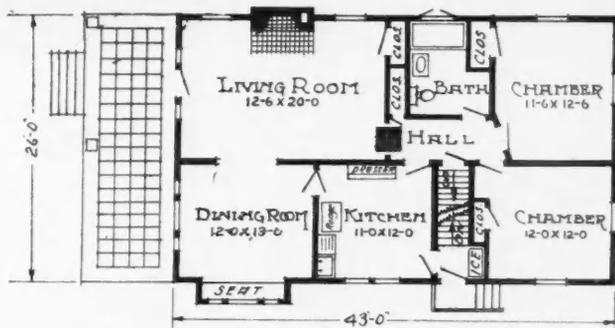
The chimneys of a two-story stone house are too small for its requirements. The owner proposes to build a brick chimney on the outside of the wall from ground to peak of roof and to cut holes thru old wall to connect furnace and stove pipes.

Do you think this would be satisfactory or would the extreme cold which we are subject to in these parts affect the draught in any way? W. G. WELLBELOVE.

Drawing Teacher Designs Attractive Home

To the Editor: Philadelphia, Pa.

Here is a photo of a little 1 1/2 story house designed and built by a teacher of drawing. It endeavors to combine economy of construction with attractiveness. At the same time the centrally located kitchen and easy circulation makes



— FIRST FLOOR PLAN —

Floor Plan of Ulrich Home Showing Compact Room Arrangement.

for labor saving in the housework. The house is readily heated with a small pipeless furnace. The attic has been left unfinished but is provided with numerous windows so that a third or fourth bed room may be added as the needs of the family require. J. ROGERS ULLRICH.

Ventilation for Storage Cellar

To the Editor: Jones, Mich.

I would like to consult your correspondence department in regard to a system of ventilation for a fruit storage cellar, 30 feet by 50 feet, 2 stories high, lower story, 10 feet high, built of concrete into the side of a hill, front end facing south. The upper story, of lumber, is to be used for a tool house. The plan of the lower story, or cellar, calls for a driveway thru the center, 10 feet wide, the whole length of cellar, with posts set every 12 feet on each side of the driveway for support of upper floor. Any service you may render me in this matter will be much appreciated.

CHAS. S. WHEELER.

What Would You Advise?

To the Editor: Lanesboro, Iowa.

I have a hollow clay block building or garage which we use for a house at present, 16 by 18 feet, with a hollow clay block floor covered with a good cement floor. What I would like to know is, would it be safe to dig under this floor and make a basement, and if so, how close and what size beams should I use?

I would like to hear other people's experiences and ideas on this kind of work. C. A. PRATT.

Do You Know of Any Such?

To the Editor: Custer, Wash.

I would like to get the name and address of some firm of furniture dealers, who buy beautiful or odd pieces of furniture, perhaps some art or antique furniture company. I am in the cabinet business and have some beautiful work for sale. GEORGE OTLEY.

Creosote in Chimney Bothers Him

To the Editor: Boothbury Harbor, Me.

I would like to get some information in regard to the action of creosote in chimneys. I have a chimney built about eight years ago and the creosote runs out clear down to the second floor. The plaster was put on the brick, as I did not want a space between laths and chimney. The creosote even gets into the furnace. M. REED.



Design of This Home Was Prepared by J. Rogers Ullrich, Teacher in Drawing in Philadelphia School. The Home Is Heated by Pipeless Furnace and Has a High Attic Which Can Be Finished Later.

Some Questions on Ideal Walls

To the Editor:

Alton, Ill.

I would like to hear from some builders as to which would be the best way to deaden sound between two floors. I have built several houses and flats using different kinds of material, such as deadening felt, mineral wool, cinderfilling (the latter being about the best), but it is a nesting place for all kinds of insects. I, therefore, would like to hear if some of the contractors ever found a way of deadening sound between floors by another method.

Another question I would like to have answered is about the new style of brickwork, called the Ideal rolock wall. Will an 8-inch rolock wall be strong enough for a two-story residence? The foundation is to be a 13-inch solid concrete wall and the brick walls are 19 feet from the foundation to the top. The bricks are standard 2 1/4 by 3 3/4 by 8 inches. Have any of the AMERICAN BUILDER contractors ever had any experience with this type of construction? Would like to hear from some who have had.

FELIX GOEBELER.



What Do You Think About This

To the Editor:

Logansport, Ind.

I am sending plans of a round house I intend to build this spring. It is something quite different from the usual design and I would like to hear comments from brother readers. I intend to build it of frame, 2 by 4 studding lined with shiplap, then lath and stucco.

Inside I shall use lath and plaster with yellow pine trim. The roof will be covered with asphalt shingles and have a cornice about 30 inches wide. Foundation will be brick. The porch will also be brick with cement floor and the porch roof will have a wide cornice about 16 to 18 inches wide. The porch wall is built up from the ground about 30 inches above the porch floor with porch posts of round wood.

The sleepers or floor joists will run as indicated in the sketch.

Many people will wonder why I am planning on such a home. I am doing so because it is something new in the building field. It will be modern in every respect and cozy and easy to heat. We build round barns—why not round houses?

I shall be glad to hear from Brother Chips.

C. A. BAGWELL.

Thinks Criticism Stimulates Thought

To the Editor:

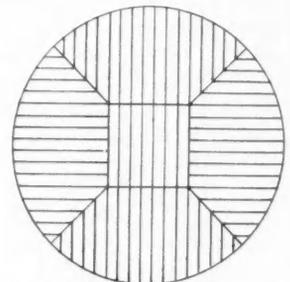
Mt. Vernon, Ohio.

I think Bro. Weber's criticism in the September issue was just fine, not that he made any particular points (in my estimation he criticised the best plan in the bunch in that issue) but it made us think. As for me, it aroused my attention in a plan I have been drafting and planning for the past two years for myself. When I read this article it made me think earnestly about my own plan. Since then I have changed the arrangement of the interior. I only get to work at the plan at odd times. I have always kept the size on the foundation. I have built several houses and never have yet built after someone else's plan, but, in every case, I have taken other plans and remodelled them to suit my taste. I have found several plans in the Blue Ribbon Homes that pretty well suit me, but have the first one yet to find that I would build after without some few changes. I think the Blue Ribbon Homes are just fine, but I do not think they appeal to us all just alike.

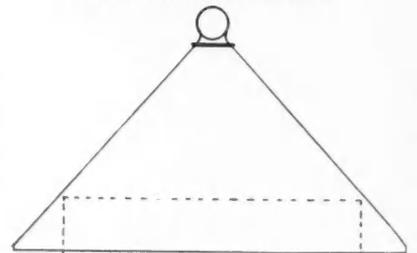
That is one reason the AMERICAN BUILDER is so popular, because it publishes such a variety of plans and ideas.

I expect to build the house that I have been talking about this summer. I will send you a picture of it.

L. M. WORKMAN.

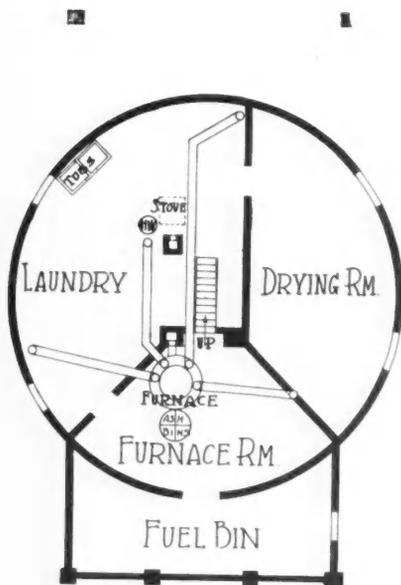


JOIST FRAMING PLAN

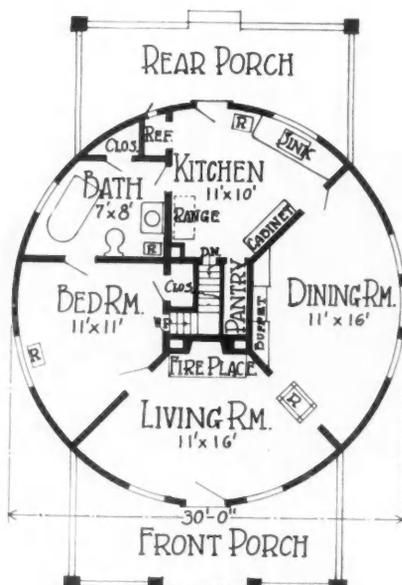


ELEVATION OF ROOF

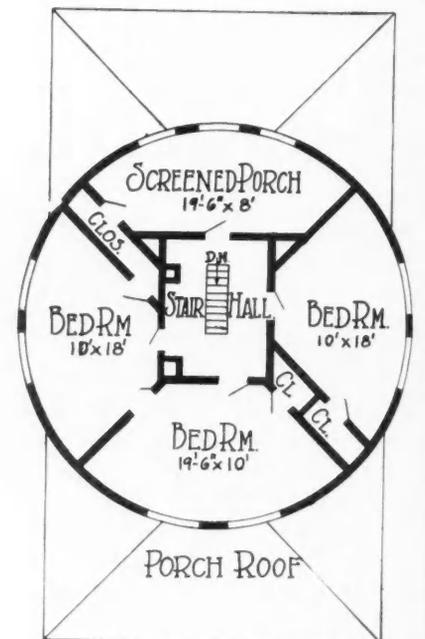
Roof Elevation and Joist Framing Plan of Round House.



BASEMENT PLAN



FIRST FLOOR PLAN



SECOND FLOOR PLAN

Basement and Upper Floor Plans of Unique Round House Which Brother Bagwell Intends to Build This Spring. It Offers Some Interesting Problems in Construction and Bagwell Would like to Hear What Brother Chips Think About the Plan. We'll Say It's "Different."



“Made to Walk on”

You know Johnson's Floor Wax. It is used all over the civilized world. We want you to know and use our Floor Varnish, too. It is of the same high quality as our Floor Wax. To prove this statement we are offering you a pint can absolutely free — all charges prepaid.

Johnson's Floor Varnish dries dust-free in 2 hrs. and hard over night.

It imparts a beautiful, high lustre — has good body — will give long wear — is absolutely waterproof — and will stand all reasonable tests.

JOHNSON'S FLOOR VARNISH

Johnson's Floor Varnish is just the thing for hard and soft wood floors — oil cloth and linoleum. Also for furniture, woodwork and trim of all kinds.

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FREE TO CONTRACTORS

Fill out and mail the attached coupon for a pint of Johnson's Floor Varnish free and all charges prepaid. There is no obligation whatever connected with this offer. All we ask you to do is use it and compare it with other brands.

S. C. JOHNSON & SON, Dept. AB4, Racine, Wis.

“The Wood Finishing Authorities”

Canadian Factory — Brantford

S. C. JOHNSON & SON,
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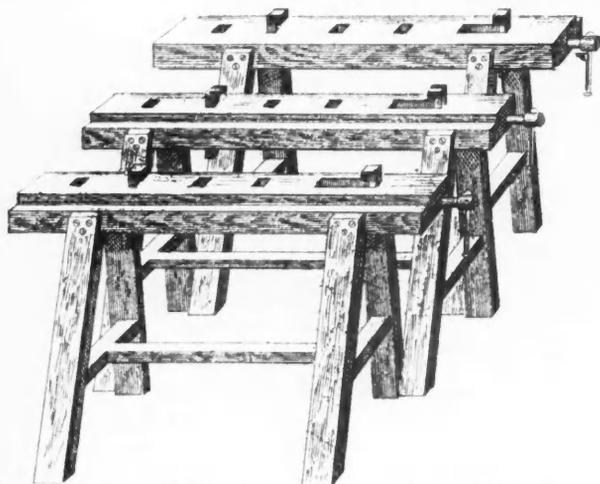
Please send me free, all charges prepaid, one pint of JOHNSON'S FLOOR VARNISH. I will test it and report results to you.

Name

Address

City and State

I buy Varnish from
(Enclose your business card)

Tréteaux pour cheviller

George Brewster, Reader Over in France, Offers This Suggestion for Winter Work—Make Carpenter's Horses.

Suggestion From France

To the Editor: Septeuil, France.
In reading the January number of your magazine I noticed the request by Mr. N. P. Walter for a specialty to manufacture in winter. I am enclosing some catalog cuts of carpenters' horses in which are imbedded clamping screws. I have never seen these tools in U. S., but find that they are very practicable, especially in gluing up panels, etc., and are widely used in France.

While this suggestion may not interest Mr. Walter on account of it requiring some steel parts, I am convinced that they would readily sell in U. S. GEO. F. BREWSTER.

**Advice Needed on Overhead Cistern**

To the Editor: Tom Bean, Texas.
I want to build an overhead tank or cistern of concrete, if it is practical to do so. Here, in the Southwest, we do not often have a cold snap that will freeze open water to a greater depth than 5 or 6 inches. For a cistern 6 to 8 feet in diameter and 18 or 20 feet in height, what is the proper thickness of wall? Would ½-inch rods on 2-foot centers for the perpendicular, tied with a six-strand cable made of 14-gauge galvanized wire every 12 inches for the horizontal reinforcing, be heavy enough for a job of this kind? I am sure some of you have had some experience along that line, so I am putting it up to you to help me out.

I am a country carpenter.

M. L. TAYLOR.

**Some Points on Mirror Re-Silvering**

To the Editor: Weatherford, Texas.
I have tried to resilver some mirrors lately by the formula that appeared in the AMERICAN BUILDER, March, 1920, and also the one that appeared in the August 1921, number, but could not get either to work. I am sure that I did not mix or proportion the different ingredients correctly, and would be very much pleased if you would explain them more clearly. Among other things, I would like to know what optician's rouge and cotton wool are and where I can obtain them. What kind of vessels should I use? Is nitric acid the kind to flow

glass with after old silver has been removed?

W. F. MARTIN.

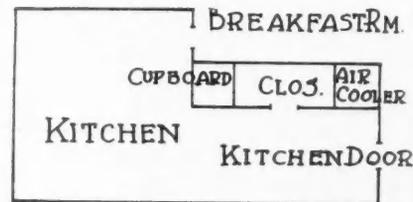
Answer—To make glass chemically clean on the side on which the silver is to be deposited, cleanse first with sulphuric or nitric acid, rinse in running water, then alcohol. Ordinary water should never be used—distill before using. Use glass vessels. You can purchase optician's rouge and cotton wool from your paint dealer, or if there are none in your town, from your jeweler.—THE EDITOR.

**Plans Air Cooler in New Home**

To the Editor:

Lafayette, Ind.

I am planning to build a house for myself with an air cooler in it instead of an ice box. I would like to get the proper details for making it. I enclose a little drawing showing where I plan to put it. I have read about this idea, but have never seen any in homes.



Drawing Showing Where Air Cooler Is to Be Located.

CLINTON POWELL.

**Some Reader Can Help Here**

To the Editor:

Kerby, Oregon.

I have been unable to secure any information on log houses. I am interested in log sizes, and electric illumination. I expect to saw ripe logs on three sides, using the round side outside.

I have written to several places without results. I have been a reader of the AMERICAN BUILDER for some time, and am sure you can furnish data as to treatment of logs—whether to peel, etc. Where can I get a book on log cabins?

N. C. CHANEY.

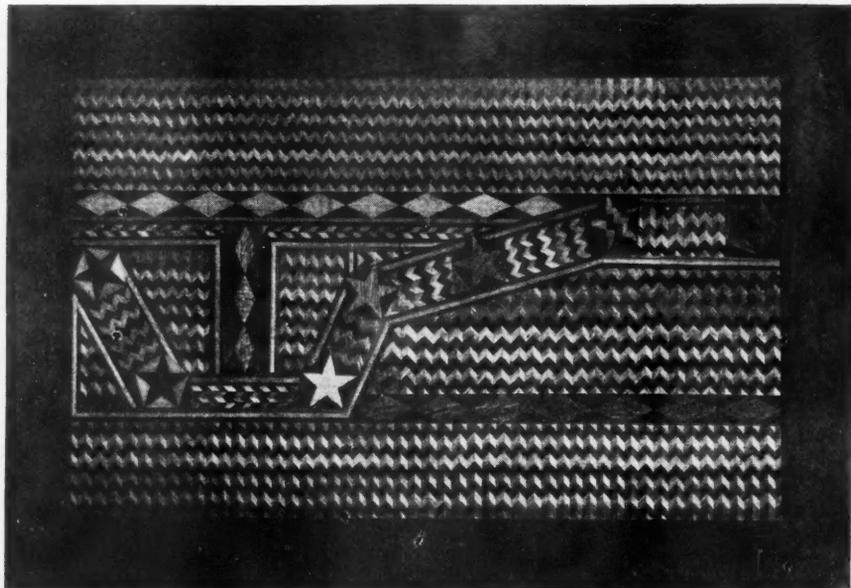
**Six Thousand Pieces of Wood in Table**

To the Editor:

Newman, Ill.

I am sending some photos of a library table that I built during the winter when things were quiet. One of my old friend chips counted the pieces and said there were close to 6,000 in it. I did not count them myself, but know there is 140 pieces in one leg.

J. R. CORDER.



Top of Inlaid Table Which Builder Says Has 6,000 Pieces of Different Woods.

Don't shovel off the old wooden shingles

Lay Asbestos shingles right over them

The thought of a litter of broken shingles on the lawn and flower beds has made many an owner hesitate to re-roof.

Johns-Manville Asbestos Shingles laid right over the old shingles put an end to this dirt and fuss. This fact alone will often make a sale.

Add to this, the advantages of the greater durability, weather-proofness, and fire-safety of these shingles, and you have a proposition that every house-owner will carefully consider.

Re-roofing with Johns-Manville Asbestos is an easy, quick, clean job. The owner appreciates it, and, more than that, he tells his friends about it. And that's how many dealers have made a reputation.

National advertising and sales producing dealers helps will aid you to build up a flourishing business re-roofing with Johns-Manville Asbestos Shingles.

Write now to your nearest Johns-Manville Branch for particulars.



JOHNS-MANVILLE Incorporated
 Madison Avenue, at 41st Street, New York City
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This booklet has been unusually successful in bringing in re-roofing orders. Send it to your prospects.



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 COVERS THIS CONTINENT
 Through—
Asbestos
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 Serves in Conservation
 Heat Insulations, High
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 Asbestos Roofings,
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 Products

JOHNS-MANVILLE Asbestos Shingles

Built-In Conveniences Make House Attractive

COZY BRICK COTTAGE HAS SEVERAL SPECIAL FEATURES THAT ARE WORTHY OF CONSIDERATION

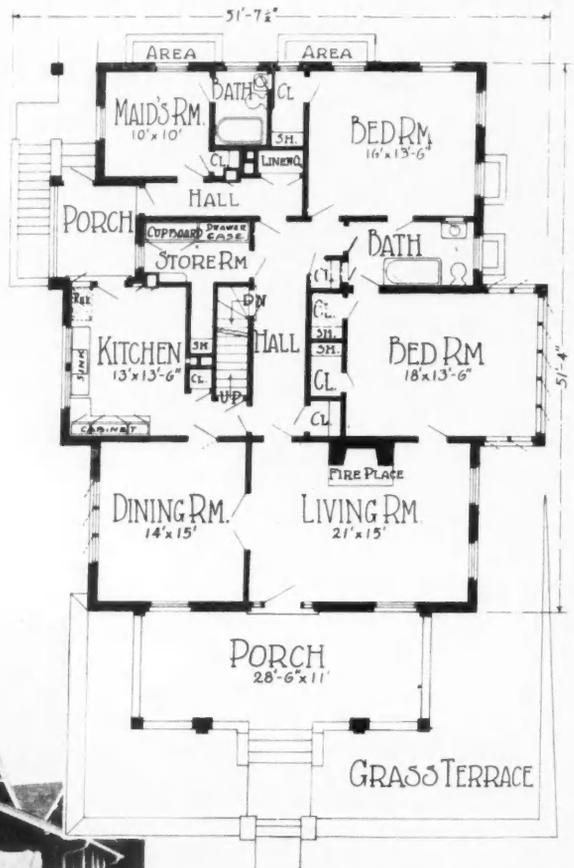
By R. L. Cline

DIVIDED broadly, there are two kinds of men; one who thinks out what he is going to do before he does it and takes into consideration future possibilities; the other who goes ahead and does it and then begins to worry about how he is going to take care of the future.

This is often the case with the man building a home. We are all too well acquainted with many houses that are veritable "crazy quilts" because of additions. The man who gives the matter some thought before going to work will have a home that will be satisfactory without additions. Instead of adding conveniences later, the most economical method is to build them in the house when it is being built.

That is what the builder, architect and owner planned to do in the cozy brick cottage shown in the accompanying illustrations, and from all appearances they have succeeded admirably.

Two of the views show the exterior of the house



Floor Plan of Brick House Shown Below. Note Provision for Electric Outlets and Other "Comfort" Features.

from front and side, the latter also showing the brick garage in rear and sun parlor. The other views show special built-in features which



Front View (Inset) and Side View of Well Designed Solid Brick Cottage With Sun Parlor and Brick Garage in Rear. This House Has Six Rooms and Many Built-in Features for the Convenience of the Housewife. Designed by A. C. Michaelis, Joplin, Mo. Size, 51 Feet 4 Inches by 48 Feet 6 Inches.

Keen Interest Shown in Ideal Wall

Architects and builders everywhere are showing keen interest in Ideal wall construction, described in this publication, "Brick, How to Build and Estimate." They realize the Ideal wall, by cutting the cost of wall construction 33 1/3 per cent, places brick construction within reach of every home seeker. All they have to do is to set the facts before those who need homes, and it is no trouble at all to convince the prospective home owners that they should select brick construction.

How Builders Regard "Brick, How to Build and Estimate"

Two typical letters from hundreds we receive.

"I am in receipt of your valuable book, "Brick, How to Build and Estimate". I have not had time to study this book as I intend doing, but from looking thru it I find that you have presented some very valuable information in exceedingly usable form. This is the best building manual I have had the pleasure to receive in some time. Thanking you for the courtesy shown me, I am

Yours truly,

(Signed) H. M. Douglas"

"Having looked through your book, "Brick, How to Build and Estimate" I find it the most complete manual that a bricklayer could secure.

And I sincerely believe it will be very helpful to me.

Yours very truly,

(Signed) W. A. Hopkins"

The information on Ideal wall and other brickwork makes "Brick, How to Build and Estimate" worth several times its nominal price of 25 cents. You can secure it from The Common Brick Industry of America, 1306 Schofield Building, Cleveland, Ohio.



The Ideal Wall is made of standard brick obtainable everywhere



A house at Phillipsburg, N. J., built of the Ideal wall. Paul R. Smith, architect

Architect Says Ideal Wall a Great Success

Architect Paul R. Smith of Phillipsburg, N. J., says that the Ideal wall is a great success. He believes that in a short time it will come into general use all over the country. (In less than a year it has been adopted in over 100 communities.)

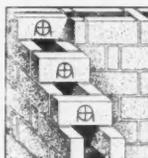
It offers a wonderful opportunity for contractors to build brick homes at the cost of frame. Such homes are bound to have a ready market and yield a very satisfactory profit.



This Trade-Mark Stands for—

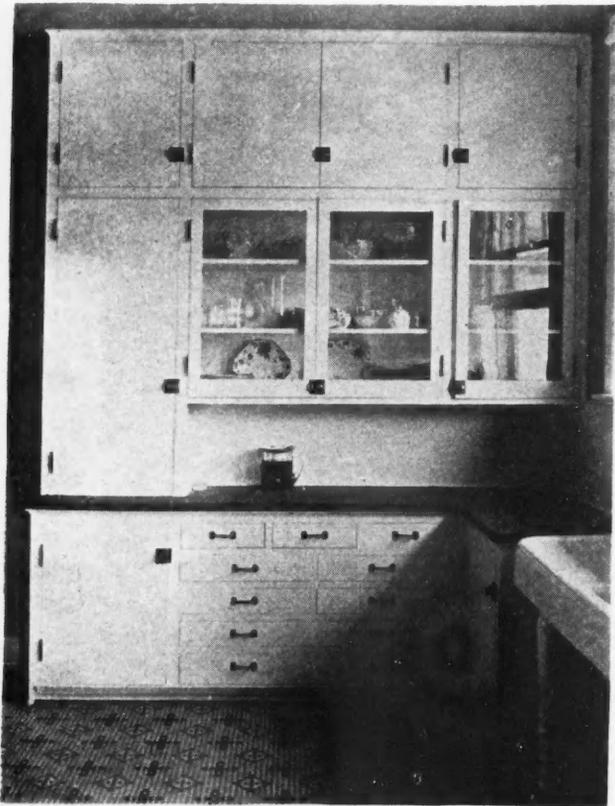
- Quality—**
An honest product, honestly advertised.
- Responsibility—**
A reputation for honorable, prompt and efficient business dealings.
- Service—**
A material of proven integrity with a record of ages of service.

The Common Brick Industry of America
1306 SCHOFIELD BUILDING
Cleveland, Ohio



Ideal Brick Hollow Wall

"Brick Homes at the Cost of Frame"



Built-in Cupboard in Kitchen for Dishes, Cooking Utensils and Foodstuffs. This Compact Cabinet Occupies a Minimum of Space and Enables the Cook to Carry on Her Work Without Much Walking To and Fro.

are practical and convenient. There is a small built-in closet in the kitchen for holding extra table leaves, and next to it is a small closet containing a large and small folding ironing board and place for keeping the irons.

There is also a built-in cabinet in the kitchen for china, kitchen utensils, foodstuffs and other equipment needed in this room. A winter refrigerator with door opening on the outside has been built in just above the

icing door of the regular refrigerator. This type of icebox makes it unnecessary for the iceman to enter the house. In the winter time the auxiliary icebox takes care of the foodstuffs.

These are all small, inexpensive items that add immeasurably to the housewife's satisfaction and comfort and take up very little space.

In construction the house is built of solid brick with low roof cottage effect. Brick steps lead up to a broad open front porch with brick floor and brick columns supporting the roof. The front door opens into a living room, 16 by 22 feet. There is a brick fireplace in the center of the rear wall of this room and plenty of light is received thru three windows on front and side.

Alongside of the living room and connected with it by two glass French doors is the living room, 16 by 15 feet. This room is lighted by a single large window facing the front porch and a triple casement window on the side. It is, in turn, connected with the kitchen, 14 feet 6 inches by 12 feet, equipped with many features, some of which have already been described in detail.

Going back from the living room are two bedrooms and bath, the front bedroom being connected directly with the living room. A hall also runs from the living room back thru the house. In rear of the kitchen are two other rooms, store room and maid's room, and a second bathroom.

An additional feature is a delightful well-lighted sun-parlor off the kitchen. It can be used very satisfactorily as a breakfast room. Everywhere possible, excellent use has been made of the built-in idea. There is a clothes chute in the hall, cupboards in the store room, and built-in electric radiator in the bathroom to supplement the regular heating system. Ample provision for electrical fixtures and appliances has been assured by the liberal placement of outlets in all of the rooms.

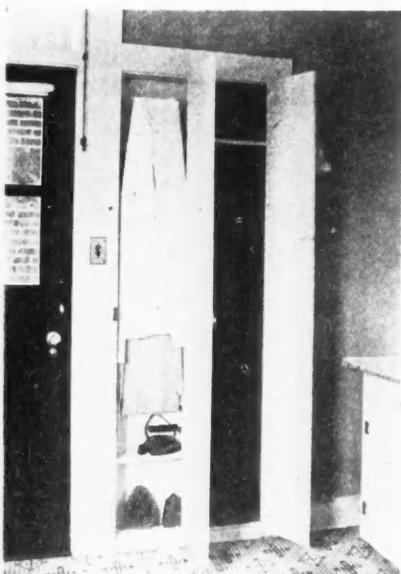
A two-car garage of brick has been built just to the rear of the house. The house was designed by A. C. Michaelis, John, Mo., and cost about \$12,000.

Design of Safe Construction

(Continued from page 107.)

When these values are substituted in (1), it leads to a value of S much too high for a 10×16 timber. For a 30-ft. column it would require at least a 20×20 to bring the stress near 1000# for this building.

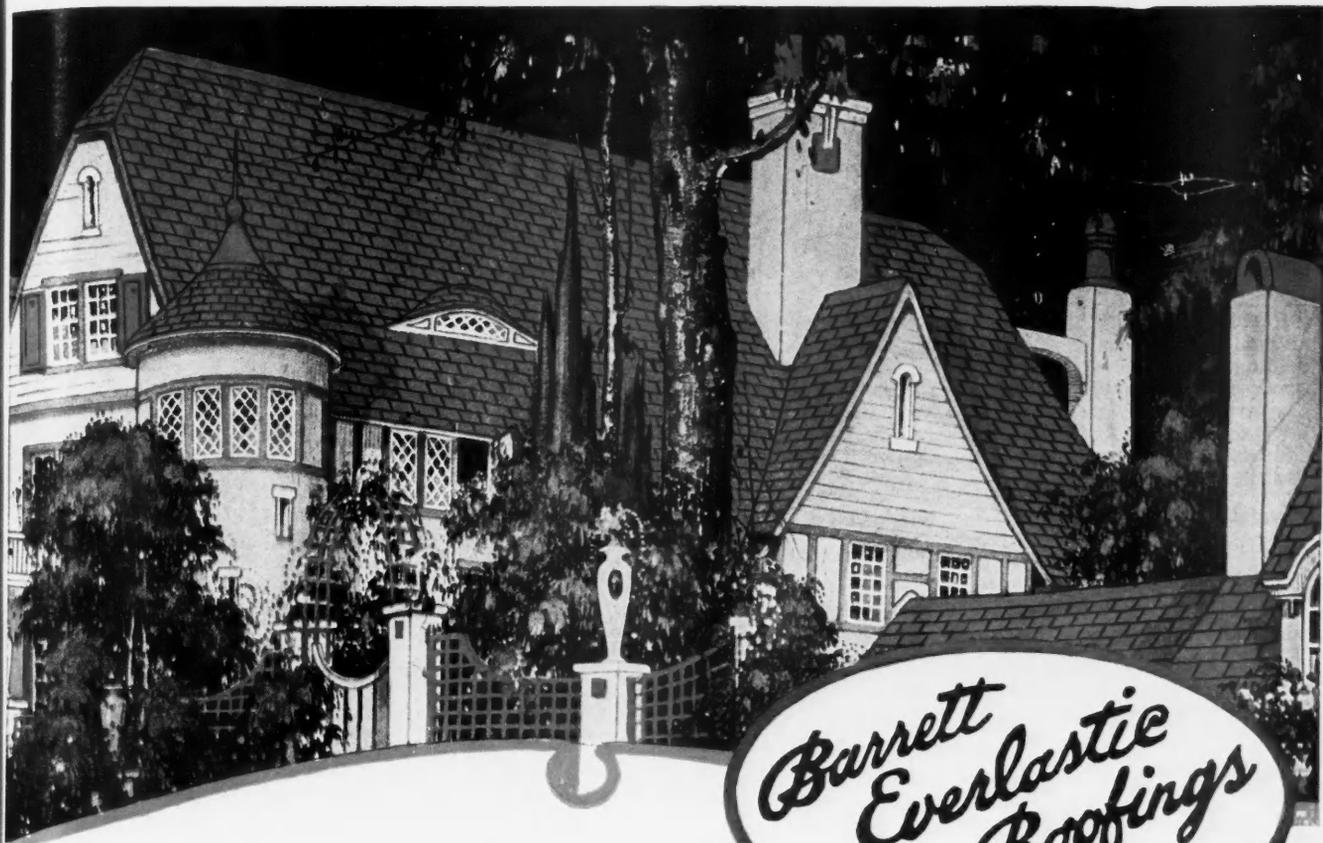
The probabilities are, however, that the column is much shorter, say around 20 ft., in which case the wind load, and, therefore, the bending moment U , would be very much smaller, and the 10×16 would probably be strong enough.



Built-in Ironing Board and Closet for Extra Table Leaves. The Ironing Board Cabinet Has Two Boards, Large and Small, and Shelves for Irons.



Combination Summer and Winter Ice Box Built in Wall. The lower Door (Closed) is the Door for the Refrigerator Thru Which the Iceman Places the Ice from the Outside. The Door Above is the Opening for a Winter Ice Box. Food is Kept Well in this Receptacle Without Ice.



It Takes Good Roofing to Make Good Roofs

Your biggest business asset is your reputation for doing good work.

Our biggest business asset is our reputation for making good roofing.

And we're guarding our reputation just as carefully as you are guarding yours.

That's why you can be sure of good roofs when you use Barrett Everlastic Roofings. They're the best roofings we know how to make—and we've been manufacturing high grade roofing materials for the last sixty years. The low price at which they're sold is made possible only by large scale production and efficient manufacturing methods.

Among the four styles of Everlastic described at the right, you'll find a roofing suitable for any type of steep-roofed building.

Be sure you get Everlastic when you buy. Sold by enterprising dealers everywhere.

Your Choice of Four Styles

Everlastic Multi-Shingles

Four shingles in one. Tough, elastic, durable. Made of high grade waterproofing materials and surfaced with mineral, red or green. When laid they look exactly like individual shingles. Fire-resisting. Need no painting.

Everlastic Single Shingles

Same material and art-finish (red or green) as the Multi-Shingles, but made in single shingles; size 8x12½ inches. A finished roof of Everlastic Single Shingles is far more beautiful than an ordinary shingle roof and costs less per year of service.

Everlastic Mineral-Surfaced Roofing

The most beautiful and enduring roll-roofing made. Surfaced with mineral in art-shades of red or green. Very durable; requires no painting. Combines real protection against fire with beauty. Nails and cement in each roll.

Everlastic "Rubber" Roofing

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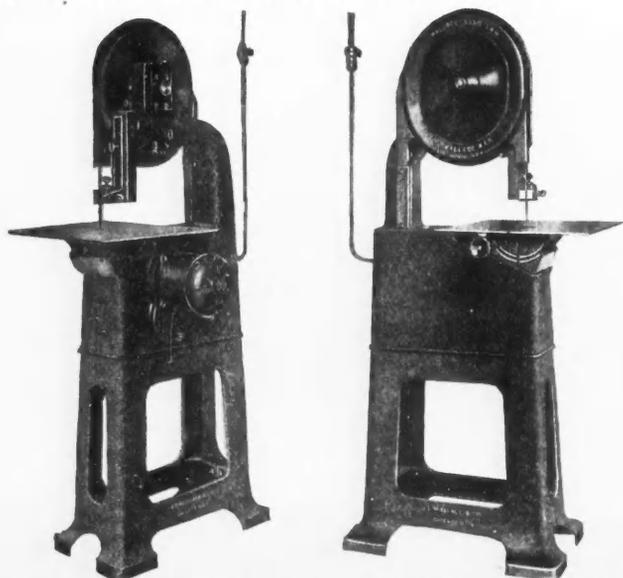
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Band Saw Operates on Lighting Circuit

A NEW band saw designed to operate on the electric lighting circuit has been placed on the market. This new machine has disc steel wheels, and also is equipped thruout with ball bearings—even the upper and lower guides are of the ball bearing type, the saw bearing on the periphery of the roller. Another feature is the totally enclosed electric motor, which is built into the machine and directly connected to the lower wheel by a fabroil gear and steel pinion. Both gears run in oil to insure perfect lubrication and a quiet running machine.

The table is a flattened and ground steel plate 19 by 21 inches. It is mounted on a large rocker bearing, which is adjusted to any angle from 45 degrees to minus 5 degrees. An indicator is provided to show the angle at which the table is tilted. The table is mounted in a very simple manner and can be taken off easily and quickly. Safety guards are built into the machine and are a standard part of it. All adjustments are controlled by hand wheels or thumb screws, without the use of special tools or wrenches. The height of this new bench 16-inch band saw is 5 feet 9 inches over all; the table is 42 inches from the floor; floor space required is only 15 by 29 inches.

The motor, a ½ h.p., is ball bearing, and runs at 1,750 revolutions per minute; the saw runs at 3,150 feet per minute. The blades used are especially made for this machine. They are of special steel properly treated and especially cut so as to serve the greatest number of producing hours on this size wheel. The machine will handle any stock from the smallest pieces to the hardest wood 8 inches thick.



Sixteen-Inch Band Saw Which Will Operate from an Ordinary Light Socket. It Has Disc Wheels and Takes Up Very Little Floor Space.

New Small Batch Mixer

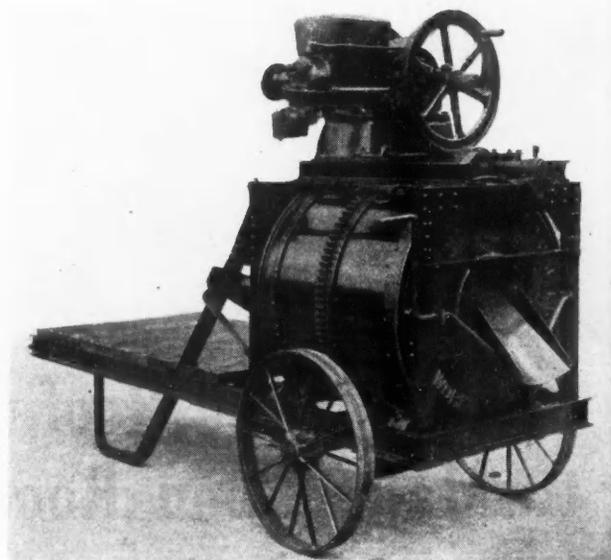
SHOWN in the accompanying illustration is a new small-sized concrete mixer, 3 cubic feet wet concrete capacity per batch.

This mixer is built for everyday service with quick loading, portability, and end discharge features.

It fills a long-felt need among contractors for a batch mixer that can be handled with a small crew—a mixer that is dependable, simple, sturdy, portable, low in operating cost and upkeep, and a mixer that is easily adaptable to varying requirements of the small contractor.

Altho rated conservatively at 3 cubic feet of wet concrete per batch, the drum has sufficient capacity to take care of a half-bag mix on almost any proportion of materials.

The new mixer is equipped with a 1½-horsepower engine is also fitted with clutch and chilled drum rollers.



New Small Batch Mixer of 3 Cubic Feet Capacity, Wet Concrete.

The materials are wheeled on to the low loading platform and dumped directly into the hopper. And in many cases the mixer can be backed up to the forms and the wet mix spouted directly into place, without handling of the concrete.



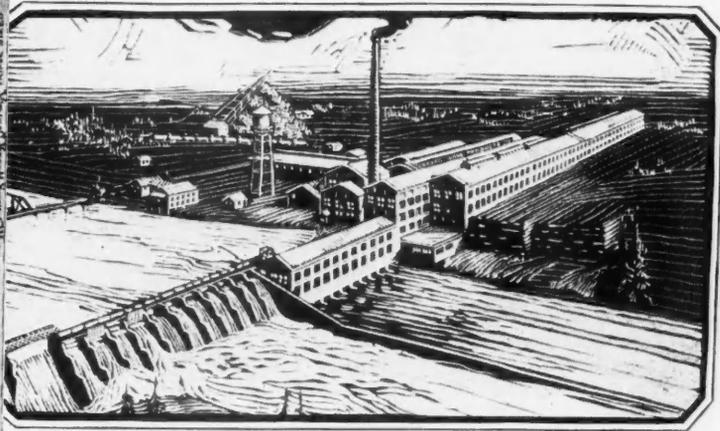
New Light Woodworker

ANOTHER mechanical child of interest to builder has made its entrance into the busy field of construction and as yet has no name. The parents are now in search of a suitable one. But this newcomer is a woodworking machine designed to perform fifteen different woodworking operations. It is small and light so that the owner can take it with him to the job.

Here are some of the things it does: Cuts like a swing saw, dados, grooves and plows for furniture, building screens, window frames, stairs, etc., miters for cabinet makers, routs core boxes, cuts up segments, joints and planes for pattern



Light Woodworker That Can Be Carried Easily from Job to Job.



Cornell's Responsibility is Like a Guarantee Bond Behind Your Job

Use a wallboard of *known* value made by a company of *known* responsibility and you take no chances.

Our process of using pure wood fiber and "Triple-Sizing" with moisture-proof sizing enables us to guarantee Cornell against warping and buckling, if simple directions are followed in nailing it to the joists and studding, or over brick or damaged plaster.

Cornell's "Oatmeal" finish is the handsomest effect in a wallboard of any kind and rivals costly wallpaper. The "Mill-Primed" surface means this board comes all primed for painting, thus saves the work and expense of a priming coat.

Cornell costs less than lath and plaster. It is lighter than plasterboard, so one man can apply it.

It is rigid, *but not brittle*—and does not crack, break or chip in hauling and handling.

Write us for sample board showing "Oatmeal" finish, Book No. AB-2 of Cornell Interiors, and prices. Our Department of Design and Decoration will furnish special drawings of Interior Panel arrangements for any job without cost. Write today or mail the coupon.

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Eight lengths, 6 to 16 ft.—two widths—"Cornell 32", "Cornell 48"

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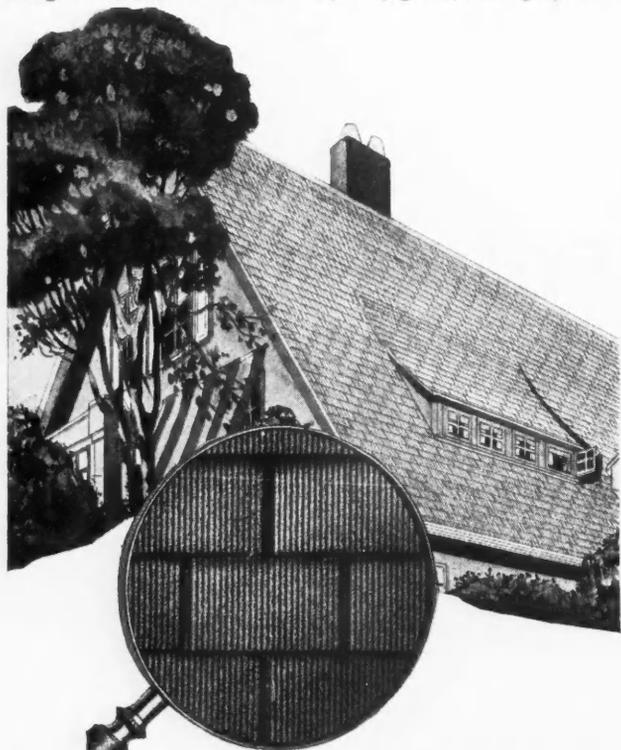
tern makers. It is designed for the carpenter to hook up any light socket in case he is doing some repair work.

The machine weighs 245 lbs. and requires about a square yard of bench space. The saws operate at the rate of 4,200 r.p.m. and are 6, 8 or 10 inches in diameter. They have a capacity for 2-inch hardwood. The base dimensions are 18 by 24 inches. It is operated by a half h.p. motor.

The illustration shows how it is operated.

New Ribbed Asphalt Shingle Offers Variety in Roof Design

BUILDERS everywhere will be interested in a new improved asphalt shingle that was recently placed on the market. The distinguishing feature of this shingle is its ribbed construction, designed to prevent warping and curling, and provide a natural drain to carry off dirt and rain. This shingle is made in three colors, red, green, and gray-black,



Microscopic View of New Corrugated Asphalt Shingle and Also View of Completed Roof of This Material.

in three styles, 4-unit or strip, as it is familiarly known, size 10 by 32 inches, weight 225 lbs. to the square, individual heavy shingle, 8 by 12¾ inches, 280 lbs. to the square, and the individual shingle with a special locking device which automatically spaces and locks the shingles level.

In the illustration above is shown a photographic enlargement of this new ribbed shingle and also a view of it laid on a roof. Another variation has been introduced recently in the construction of 4-unit or strip shingle. This strip is divided into four equal sections with the ribbed and smooth surface alternating. When laid on the roof, this alternating effect gives a variety effect that is attractive.

In laying this shingle, the builder allows four inches to weather so that when the roof is completed it is actually covered by two distinct layers of shingles, insuring a heavy and waterproof covering.

Sectional Kitchen Cabinet Handy for Summer Cottages

BUILDERS who specialize in summer cottage work will find an efficient aid in a new sectional kitchen cabinet that has been used extensively in new apartment buildings of the space-saving type. This cabinet provides the equipment which is needed in the summer cottage in a minimum of space, as the illustration very clearly shows.

It is made up of sections which can be bought separately and placed as desired to fit any space or requirement. The base is a separate table with porcelain enameled top, 25 by 40 inches, and contains two drawers with glass knobs and two doors. The whole base is set on glass siding shoes.

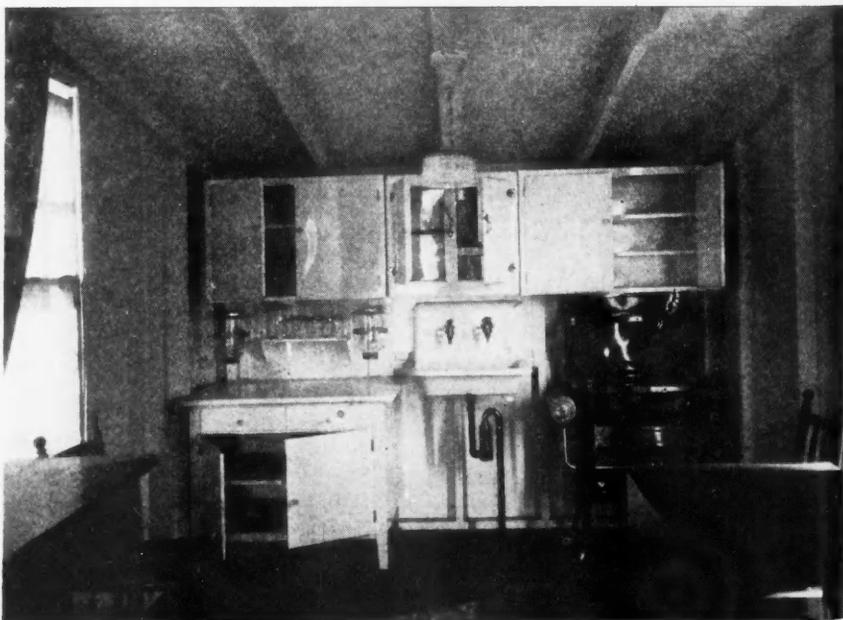
The top can be fastened to the wall to studding anywhere. It is fastened with any angle iron fitted with screw holes every 1½ inches. This section has two doors, 36 by 24 inches, and is 12 inches deep, containing three shelves. The center shelf is about half width, so that tall bottles and pitchers can be placed on the bottom shelf.

The center section is a wall plate adjustable to any height. This is fitted with a shelf 5 by 18 inches and with swinging glass jars for flour and sugar. The entire unit is made of welded steel. This cabinet is the sectional book case idea applied to the kitchen cabinet. All units are designed to be rat and vermin proof.

Built-in Mail Box Adds Protection to Home

ADDING another link in the service chain which built-in receptacles are welding for the housewife is the built-in mail box. You have seen the ice box which keeps the iceman outside, the package receiver which makes delivery of goods and the built-in-electric and gas meters which protects the housewife from fraudulent agents. Now comes the mail box built right in the walls of the house so that the mail can be delivered from the outside and the person receives it in the room inside.

This makes the mail box burglar proof, for to steal the mail he will first have to break into the house. In disagreeable weather, it is not necessary to go outside to get the mail. This mail box is built in various designs for different kinds of buildings; there is the small single box for the home, built so as to harmonize with the exterior of the house, frame, stucco, or brick, the group arrangement for the apartment and office buildings. The space required for the installation of

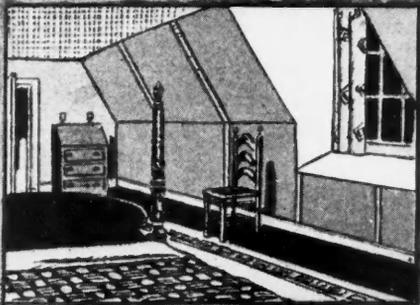


Sectional Kitchen Cabinet Installed in Summer Cottage. It Provides Many Comforts in a Small Space. This Cabinet Is Made Up of Three Sections Which Can Be Moved Without Much Trouble.

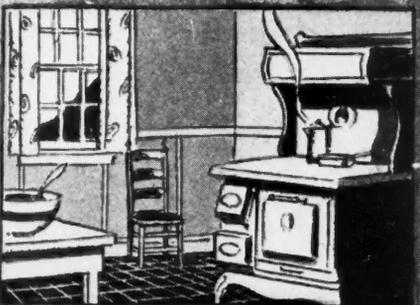
Where Ambler Linabestos Wallboard Meets the need



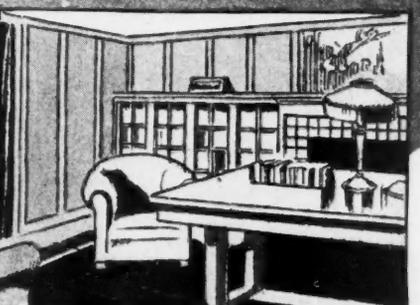
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THIRD FLOOR ROOMS



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LIBRARIES

It has the qualities of permanence and fire-safeness along with attractiveness and convenient use.

Made entirely of the two most indestructible materials—long fibre asbestos and high grade Portland cement—rolled out, with pressure of 3000 lbs. to the square foot, into a hard, non-warping, non-cracking wallboard of permanent buff color that can be cut with ordinary tools. Made 48 x 48 and 48 x 96 to fit standard joists.

Investigate Linabestos Wallboard for every interior lining use—partitions, wainscoting, hallways, libraries, game rooms, attics, bathrooms, kitchens, etc.

For exterior use—half-timbering, paneling, fire doors, trim, and for interior use where unusual strength is needed, call for Ambler Asbestos Building Lumber.

For a snug-fitting, attractive, thoroughly fire-proof roof, use Ambler Asbestos Shingles in the American, French or Honeycomb style.

You may have full information and specimens without obligating yourself.

Asbestos Shingle, Slate & Sheathing Company

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AMBLER ASBESTOS SHINGLES

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



The Modern Way. The Mail Can Be Removed from the Box Inside the House. This Device Also Protects the Mail from Thieves.



The Old Way. This Housewife Has to Risk Cold and Worse to Get the Mail from the Box Outside.

this box is 12 inches wide, 26 inches high and 3½ inches deep. For single residence with small space, all that is required is a space 4 inches wide, 17½ inches deep and 26 inches high.

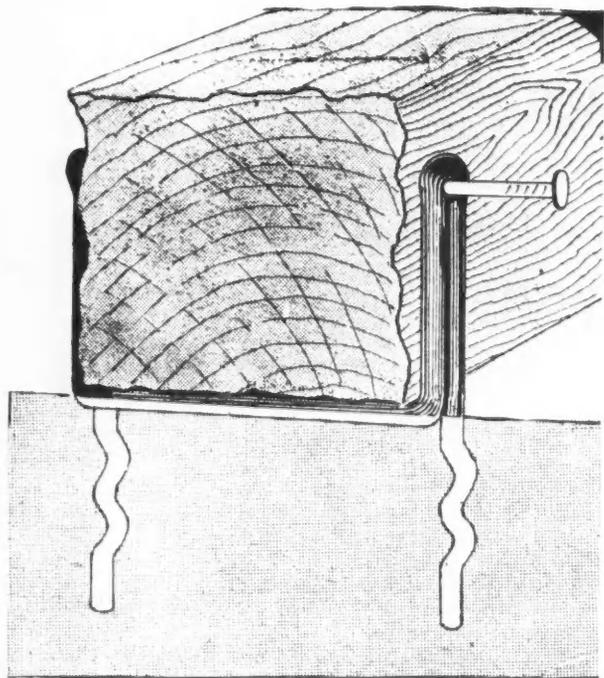


Concrete Floor Anchors Cut Cost of Job

ANY builder will agree readily that the job of laying wood flooring over concrete is no cinch. It calls for concrete or cinder fill for placing the sleepers to which the top flooring is nailed. This work takes time and since time is money in the building field, increases the cost.

Designed to eliminate this trouble is the concrete floor anchor shown in the accompanying illustration. It automatically provides alignment. These anchors are forced easily into the concrete and hold the sleeper rigid. They are made of annealed wire, and bend easily without losing their shape.

These anchors are set along the floor. After the concrete slab has set, if the work is to be done on the floor, the ears of the anchor bend down, one on top of each other, get-



New Concrete Floor Anchor Which Eliminates Costly Cinder or Concrete Fill Around Sleepers.

ting them out of the way. When the floor is to be laid the ears of the anchors are raised by use of a claw hammer or wrecking bar and the sleepers laid in position. Wedges may be driven under the sleepers to level and a nail driven in each ear of the anchor holds the sleeper solid. The legs of the anchors are two inches long crimped, and when the slab is set will withstand several times the stress required. By using these anchors in place of special fill, many tons are lifted from the building load. A special planter machine is used to place twelve of these anchors at one time in a row.



Proper Construction of Chimney

(Continued from page 114.)

Wooden studding, furring, or lathing should not under any circumstances be placed against a chimney. Wooden construction should be set back from the chimney as indicated in

Fig. 6; or the plaster may be applied directly to the masonry or to metal lathing laid over the masonry. The former is the better method, as settlement of the chimney will not crack the plaster. It is recommended that a coat of cement plaster be applied directly upon the masonry of any parts of a chimney that are to be incased by a wooden partition or other combustible construction.

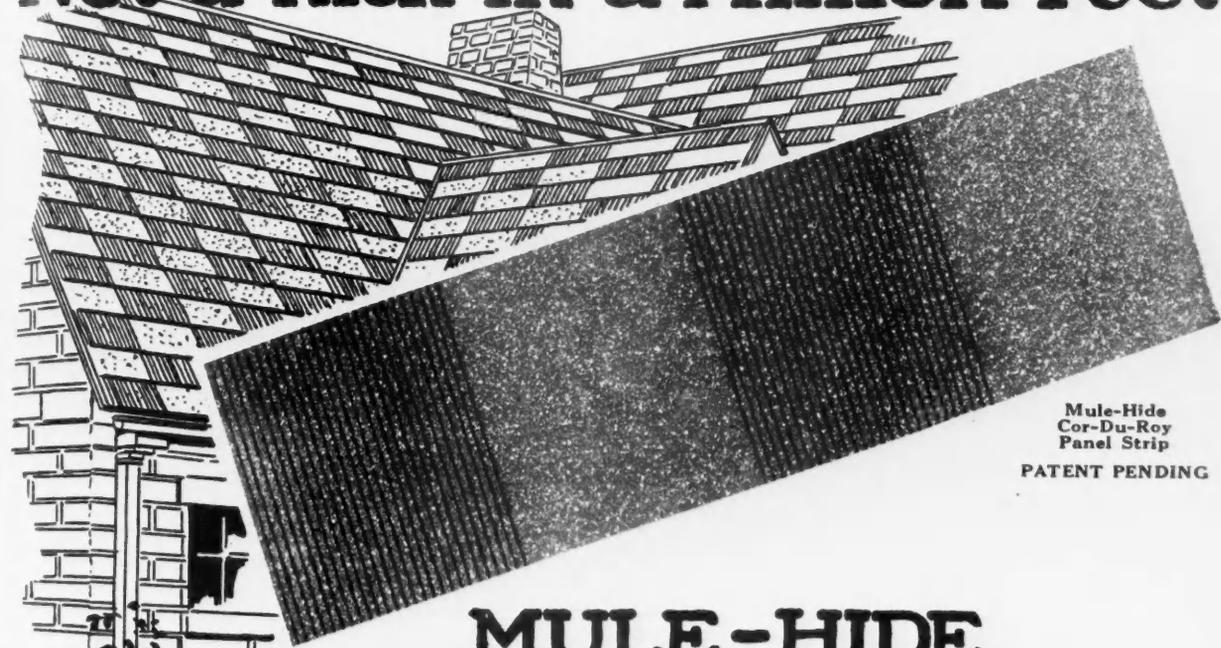
Smoke Test for Leakage

Every flue should be subjected to a smoke test before the heater is connected with it. This may be done as follows: Build a paper, straw, wood, or tarpaper fire at the base of the flue, and when the smoke is passing in a dense column tightly block the outlet at the top by laying a wet blanket over it. If leakage exists at any point it will immediately become apparent by the appearance of smoke at the opening. Flues so tested frequently reveal very bad leaks into adjoining flues or directly through the walls or between the linings and the wall. When the smoke test indicates leakage, the defect should be remedied before the chimney is accepted for use. Remedying such defects is usually difficult, hence it is wise to watch the construction closely as it progresses. Many brick masons say that all flues leak. This is not true; every flue should be tight.

Cleaning and Repairing the Flue

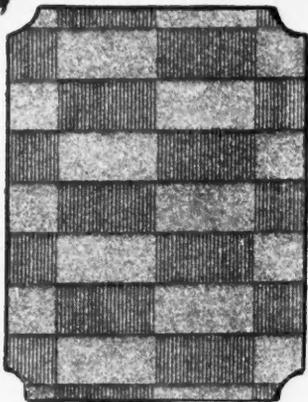
If a smoke test shows no leakage and the flue is straight, a hand mirror held at the proper angle at the base affords a means of examination for obstructions. Usual causes of stoppage are broken tile leaning inward, mortar accumulations, loose bricks, birds' nests, partly burned paper, soot from soft coal, tarry deposits from burning wood, etc. A weighted bag of hay or straw attached to the end of a rope may be passed up and down the flue to clean it if there is not too great an offset in it.

"Not a Kick in a Million Feet"

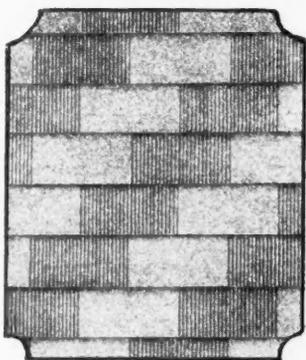


Mule-Hide
Cor-Du-Roy
Panel Strip
PATENT PENDING

MULE-HIDE COR-DU-ROY PANEL STRIP ROOFING



CHECKERED EFFECT



DIAGONAL EFFECT

Still another masterful MULE-HIDE production is this beautiful new Cor-Du-Roy Panel Strip.

It is the result of the unusual success and popularity of the now famous Cor-Du-Roy. In Mule-Hide Cor-Du-Roy Panel-Strip Shingles the beauty of Cor-Du-Roy is doubly enhanced by the contrasting effect of the plain slate surface that forms a background for the Cor-Du-Roy panels.

The alternate plain and Cor-Du-Roy panels make possible the most artistic two-tone, bonded effect in an applied roof, or a diagonal, shadow pattern, that has all the appearance of tile.

Cor-Du-Roy 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 "bogey of fear" as to the possibility of this shingle blowing up in the wind. It's solid block construction is visible evidence of the fact that it cannot curl, while the solid strip further assures a complete two-thickness covering over the entire roof and provides the most attractive, most enduring and satisfactory shingle that has ever been introduced to the roofing trade.

Another Mule-Hide triumph that means more money in Mule-Hide dealers pockets.

Write or wire for your sample shingle of Cor-Du-Roy Panel Strip

The Lehon Co.
45th and Oakley Ave.
Chicago, Ill.



COUPON—CLIP AND MAIL TODAY

I am interested in COR-DU-ROY Panel Strips

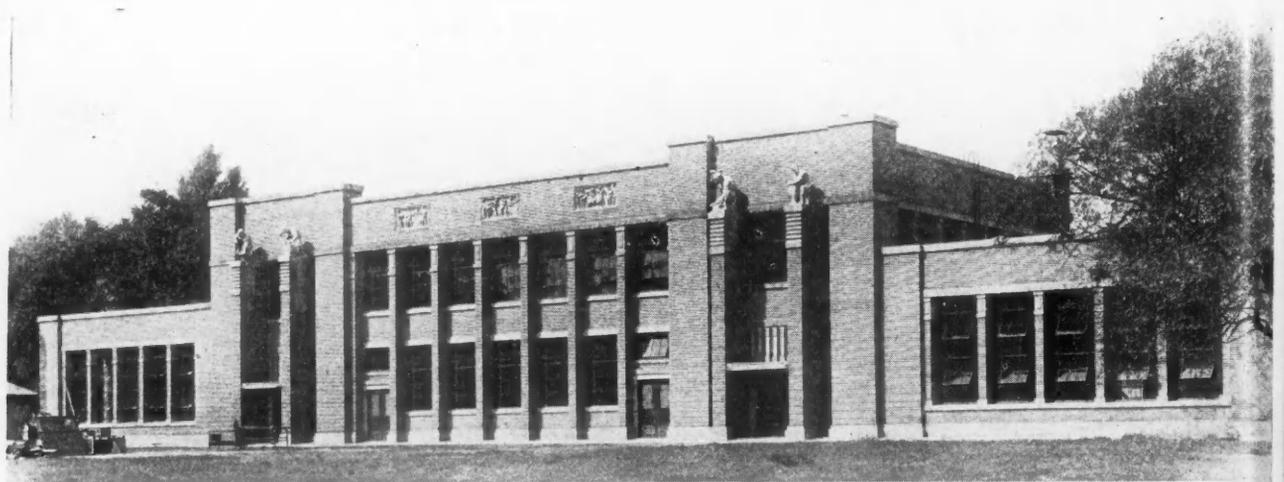
Dealer Contractor Architect

Name

Town

State

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Technical High School, Salt Lake City, Utah. This Building is Equipped Thruout with Steel Sash, Which is Now Being Used Extensively in School Construction.

Standard Units in Building Cut Costs

STEEL SASH IS RECOGNIZED AFTER TEN YEARS' STRUGGLE AGAINST FIXED TRADITIONS

By R. A. Brewer

STANDARDIZATION is a thing that comes gradually.

Particularly is this true in building materials, it seems, for the designer of structures which are to stand for years feels that he is in a sense erecting a monument, and he wants that monument to reflect his own personality and his own ideas. The use of standardized units in a building of this character is on a par with trying to purchase distinctive clothes from a ready-made stock where every model is produced in thousand lots.

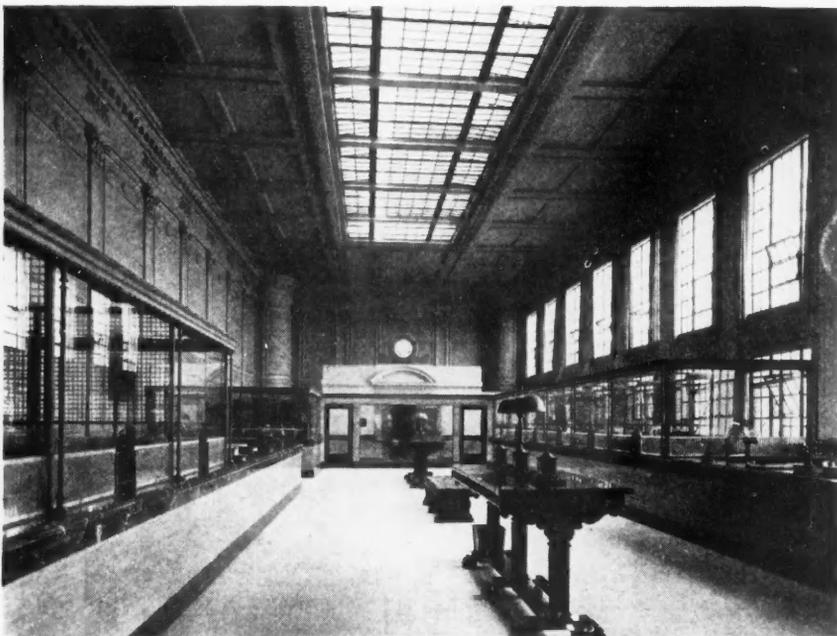
Ten years ago, this feeling against standardized materials was felt when the makers of steel windows endeavored to have certain specific types and sizes adopted for universal use in industrial construction.

Even tho the variety offered was great, there was tremendous difficulty in securing the co-operation of the building profession. Only the tremendously decreased prices, which the manufacturers were able to make on standard sizes, won the day. Even then, it took years to get the idea firmly planted, and it has only been within the past four or five years that standard units of steel sash have come into almost universal use for buildings of this kind.

An even more difficult field is the building which demands certain architectural effects—for example, office buildings, loft buildings, schools, theaters, libraries. Such buildings, being objects of particular public interest, are naturally and rightfully designed with considerable attention to their architectural beauty. The designer very properly feels that each should be a monument complete and individual in itself.

“Factories,” they say, “are, after all, utilitarian.” Their real value is determined by the ratio of their cost to their facilities for efficient production. But schools, for example, are more idealistic. They should stand for something besides economy and efficiency. They should inspire something beyond the goal of a mere money-making institution.

It is interesting, therefore, to see the gradual but steady increase in the use of standard steel sash in school buildings all over the country—interesting because this change in construction does not mean a relinquishment of the designer's ideas of beauty and individuality, but rather the elevation of steel sash to a



Not a Dark Spot in the Place. This is the Interior of the Avenue State Bank, Oak Park, Ill. The Side and Ceiling Sash Are Steel. Ten Years Ago this Type of Sash in a Bank Was Unheard of.



In City - Town - or Country School Fenestra Windows Cost Less Than Wood!

In every city, town, or country school building, facts prove that Fenestra can be installed for *less* than wood sash.

Hundreds of dollars have been saved on many individual installations through the substitution of Fenestra for the originally specified wood sash.

Harmony with architectural designs—more daylight at every desk—vitalizing ventilation—added fire protection—permanence—ease of operation—and finally, *economy*—these advantages secure the unanimous approval of school boards.

Complete Information About Fenestra Steel Basement Windows



This Book Sent FREE

Fully illustrated, showing the various sizes, methods of installation in brick, concrete block, natural stone, and concrete. Every builder should learn about the advantages of this highly-improved type of window for residences, stores and apartments. Send for a copy now!

Fenestra
STEEL WINDOW WALLS

Detroit Steel Products Company

2233 East Grand Boulevard

Detroit

"World's Largest Makers of Steel Windows"



Small Towns Are Not Taking a Back Seat When It Comes to Building Modern School Buildings. This Substantial Structure, Equipped Thruout with Steel Sash, Is Located in Medford, Minn., A Small but Wide-Awake Community.

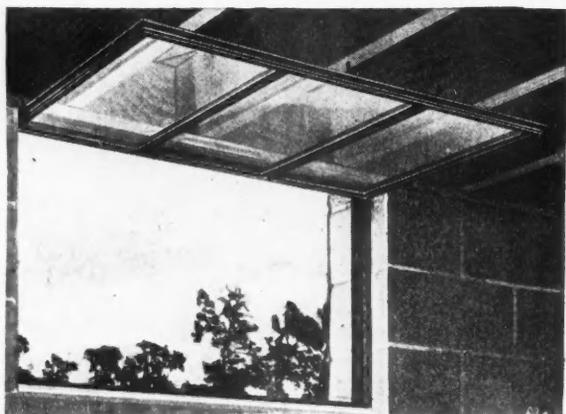
higher plane of artistic appreciation.

Within the past year probably five times as many school buildings were built with standard steel windows as in any previous twelve months. In 1922 it is predicted that last year's record will be doubled or trebled. At that rate five years will see steel sash

as universally specified for schools as it is now for factories.

Of course there have always been excellent arguments in favor of steel windows. They cost no more than wood. They are fire resisting. They afford 20 to 30 per cent more light. They provide more

When You Build—Start Right Install Truscon Basement Windows



TRUSCON
STEEL BASEMENT
WINDOWS

*Truscon Steel Basement Windows are
made in 2 standard sizes, 3-lights
wide for 10x20" and 10x12" glass*

10 REASONS WHY

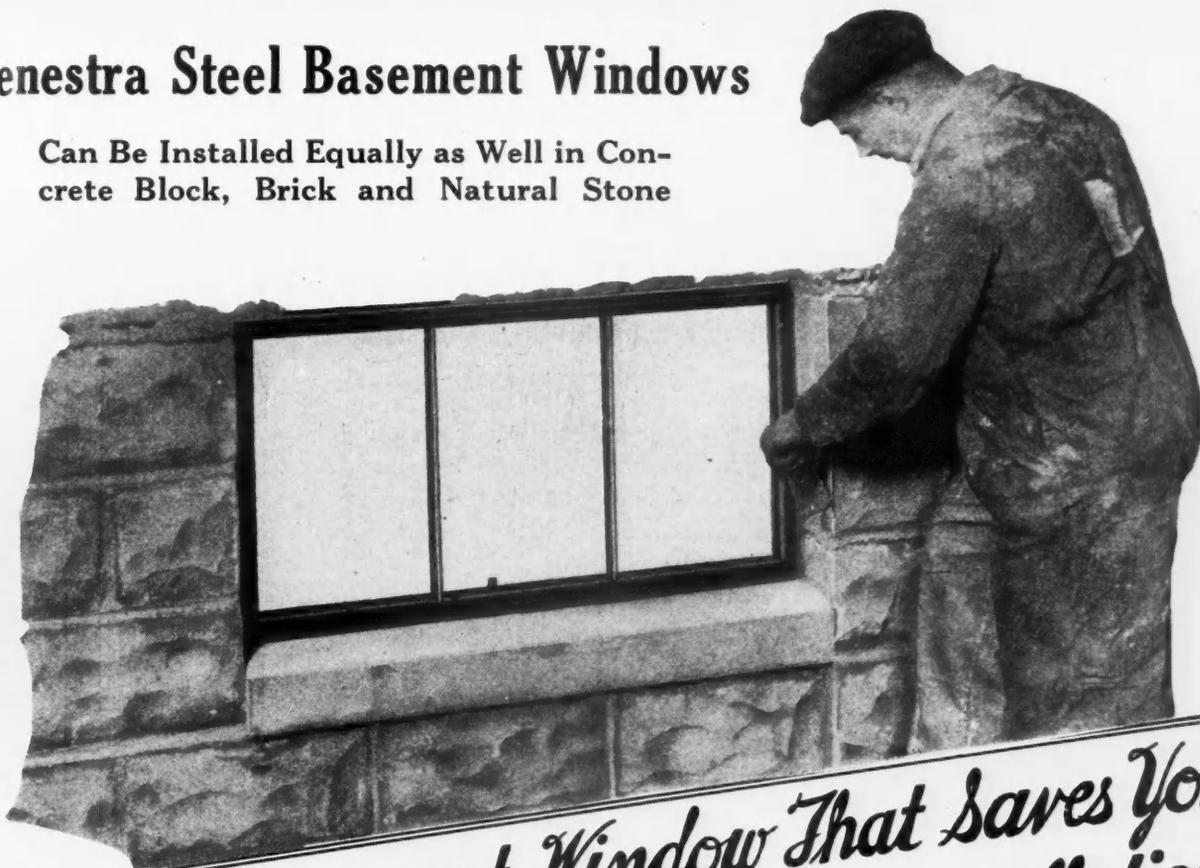
- 1—60% more daylight than wood.
- 2—No warping or sticking.
- 3—Fireproof, burglarproof.
- 4—Easily screened.
- 5—Cheaply installed.
- 6—Double weathering.
- 7—Heavy steel hinges and lock.
- 8—Rugged and indestructible.
- 9—Never need repairs.
- 10—Cost less than wood.

Truscon Steel Company, Youngstown, Ohio

Write for Our Attractive Dealer Plan

Fenestra Steel Basement Windows

Can Be Installed Equally as Well in Concrete Block, Brick and Natural Stone



A Steel Basement Window That Saves You Money in two Ways-Original Cost & Installation



This Booklet Shows You More Facts About How to Install FENESTRA Steel Basement Windows

WE will be glad to send you a copy of this booklet which fully illustrates and describes FENESTRA Steel Basement Windows including the methods of installation. Just clip this corner, sign your name and address, mail it, and we'll do the rest.

FENESTRA STEEL BASEMENT WINDOWS will save you money. They **cost no more than wood windows** and in many cases **less**.

Another worthwhile saving is in installation. First, Fenestra Steel Basement Windows come complete—no extra frames—no planing or fitting of sash—no hardware to buy or attach—no labor to brace up frames—and they're painted.

Second, the methods of installation are simple and practical. They can be installed quicker and better than wood windows. Many contractors have effected a saving of as high as a dollar per unit!

In addition, the many added advantages of steel windows over wood will give your customers greater satisfaction.

Send for the booklet described at the left. Learn the whole story of Fenestra Steel Basement Windows including the details of installation.

Fenestra

STEEL WINDOW WALLS

**Detroit Steel Products Company
2233½ East Grand Boulevard, DETROIT**

and better ventilation. The small panes are attractive in appearance and cut down the cost of glass replacement, which, by the way, is a considerable item in schools. They are easier to install than wooden windows, and when once in place they possess the sturdy durability of steel, which lasts as long as the building endures.

These are not new arguments. They have been used for the past ten years to sell steel sash for factories, and the same men who have built their factory walls almost exclusively of glass and steel have erected just around the corner mammoth school buildings for which steel sash was not even for a moment considered.

Strangely enough, the present movement towards steel window construction for schools is emanating from the architects and builders in the smaller communities rather than from the larger and better known firms in the cities. While the larger architects are more thoroly familiar with the advantages of steel windows, they have, as a rule, larger appropriations, and, therefore, the economy feature, which is one of the main arguments in favor of standard types, is not as serious a consideration as it is in small communities.

How strong a part this economy feature plays is shown by a letter recently written by Mr. P. C. Bracker, of the Bracker Construction Co., Minneapolis, who built a typically modern school in Medford, Minn., a small town just outside Minneapolis.

Mr. Bracker wrote to the steel sash manufacturer

who supplied the windows:

"The architectural plans for the Medford school building, the general contract on which was \$73,000.00, were completely designed for the use of wood sash. For an alternate substituting steel sash for the exterior wood sash, we allowed the School Board a saving of \$800.00.

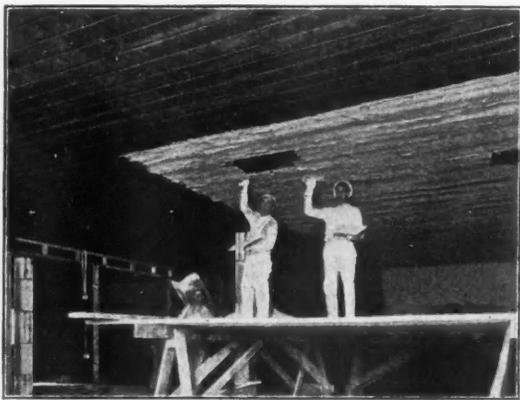
"After the job was let we not only used the steel sash on the exterior, but also in the interior partitions and ceiling lights under skylights. Due to savings on the interior work and unforeseen economy in the erection and painting of the steel sash, we conservatively may say that steel sash were installed completely for \$1,200.00 less than wood sash could have been installed.

"The installation has been satisfactory, not only to ourselves but also to the architect and the School Board."

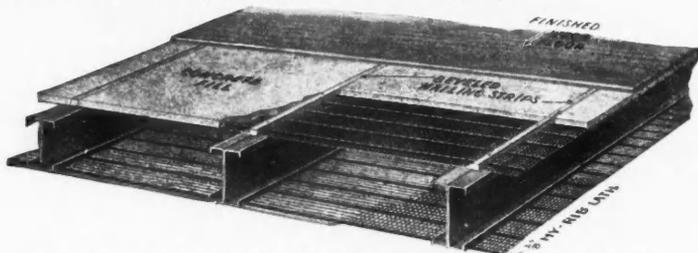
There are, of course, many architects in the larger cities who have specified steel windows in schools for some time. Notable among them are Mr. Frederick B. Barnes and Mr. Huse T. Blanchard, both of New York City. Concerning the Mt. Morris School of Rockville Center, L. I., designed by these gentlemen recently, they wrote:

"We are agreed that in many ways steel sash are extremely satisfactory in school construction, being economical and affording exceptionally fine illumination."

Insure Your Floors and Ceilings



Putting the scratch coat on ceiling lathed with Truscon $\frac{3}{8}$ " Hy-Rib



Cross sectional view of typical ceiling and floor built with Truscon Steel Joists and $\frac{3}{8}$ " Hy-Rib Metal Lath

In the school, apartment, office or public building, floors and ceilings should be fire-proof and soundproof.

Truscon Steel Joists and Hy-Rib Metal Lath make the logical combination to fill the most exacting conditions.

Truscon Steel Joists are designed for all types of construction not requiring excessive floor loads. The Joists are manufactured in sizes and weights that will support single spans up to 24 ft. in length.

Truscon Hy-Rib Metal Lath insures plastered walls and ceilings against cracks. Concrete reinforced with Hy-Rib makes a floor of exceptional rigidity and strength. For sidewalls, partitions, roofs and concrete stucco work of all kinds, Truscon Hy-Rib Metal Lath is unexcelled.

If your estimates are based on quality your customers will be glad that you specified Truscon.

Truscon Building Products means permanence without extra cost.

TRUSCON STEEL COMPANY
YOUNGSTOWN, OHIO

Sales and Engineering Offices in Principal Cities

More Than 300 Dealers Carry Truscon Building Products in Stock

FLEX-A-TILE

H O U S E T O P S



Modern Re-Roofing

IT'S the modern way to lay Flex-a-Tiles right over the old roof and get a better appearing, longer lasting roof than before. Scraping off the old shingles takes time and is an unnecessary expense. No need to litter up the yard and fill the house with dust and dirt. Just lay Flex-a-Tiles over the old roof.

Look at the buildings around you that need Flex-a-Tile Housetops. See the homes, stores, mills, warehouses, farm-houses and public buildings that need new roofs in your own community.

Tell Them About Flex-a-Tile Housetops

Show them the permanent slate roof appearance attainable with Flex-a-Tiles, either fadeless natural green or a beautiful enduring red. Tell them how Flex-a-Tiles last—how they protect buildings from fire and all weathers and above all, how economical it is to lay them over the old roof.

FLEX-A-TILE Slate Surface Housetops

*Offers a Complete
Line for Dealers:*

- Flex-a-Tile Individual Shingles
- Flex-a-Tile Wide Space Shingles
- Flex-a-Tile Giant Shingles
- Flex-a-Tile Style Four Slabs
- Flex-a-Tile Shingle Roll Roofing
- And Richardson Wallboard

Made by

THE RICHARDSON COMPANY

Melrose Park
(Chicago), Ill.

516 Fifth Ave.,
New York City

Candler Bldg.,
Atlanta, Ga.

Lockland, Ohio,
(Cincinnati)

Sales Offices:

Lockland
(Cincinnati), O.

Plymouth Bldg.,
Minneapolis,
Minn.

Canal-Commercial
Building,
New Orleans, La.



Melrose Park (Chicago), Ill.

NEWS OF THE FIELD

Prepared Roofing Makers Solve Slack-Season Problem

THO comparatively new in business, manufacturers of asphalt roofing—shingles and rolls—are thoroly familiar with the old problem of keeping their mills busy during the months of December, January and February. They have been among the many victims of seasonal peaks and depressions. But they have suffered more perhaps than the average manufacturer because theirs has been a fast growing industry, and after the Winter let-down in production it has been a terrific strain to meet the heavy Spring demand.

How to distribute demand more evenly thruout the year seemed to be a more pressing problem last November than at any time in the last few years, for all signs pointed to unusual building activity beginning with the Spring of 1922. What could be done to stimulate Winter buying of roofing?

One of the leading manufacturers in the industry who controls patents covering a widely used asphalt strip shingle which some forty factories are making under license agreements undertook to find the answer. His canvass of the industry showed that the usual slump in orders was impending, and that no one was ready to suggest a stimulant.

His proposal was simple, and in line with popular demand. It was to cut prices to the bone—cut them actually under cost of production—and give the greatest possible publicity to the action. He proposed to force dealers to stock up during the Winter by convincing them it would be profitable to buy with borrowed funds, if necessary, while quotations were at bed-rock.

To licensees, whose factory price of the strip shingle is controlled, this manufacturer proposed a cut from \$4.85 per "square" (enough material to cover 100 square feet) to \$4.25 on the strip shingle, and proportionate cuts in other prepared roofing products. The new prices would be 40 per cent lower than high quotations for 1920, and would be actually below pre-war, or 1913, figures if pre-war freight rates prevailed.

It was proposed to link with the announcement of price reductions the logical and popular argument that by maintaining a flow of orders thruout the usual slack months, these results would follow:

First, factory organizations would be kept intact and tuned up for Spring production.

Second, the manufacturers would assist materially in keeping down the volume of unemployment during the season when the jobless worker suffers most.

Third, tonnage would be kept moving on the railroads during an ordinary slack season.

Fourth, prices of other building materials would probably be lowered, and the expected stimulation of building would sooner take effect to relieve the housing situation.

The plan worked out very successfully, as the following results show:

At the rock-bottom quotations, sufficient orders were taken to keep factories running at full time during December—and at an actual loss. After the first advance in prices, additional orders were accepted for January outturn—and on these manufacturers broke even. With dealers encouraged to buy in anticipation of Spring demand and inevitably higher Spring prices, quotations were moved up so that the February output (still at capacity) showed sufficient profit to more than offset the losses of December.

Manufacturers of asphalt roofing generally fell in line with the reasoning of the leader; and thruout the industry prices were cut, not only on the patented strip shingle, but on every

Riddle

DECORATIVE LIGHTING FITMENTS



Announcing

The RIDDLE FEATURE FITMENT

A typical Riddle achievement—an all cast metal fitment, decorated in Silver Estofado or Gold Estofado, like the finest Riddle products, available at a strictly popular price. *The sensation of the lighting fixture world.*

The FEATURE FITMENT

includes complete installation for major rooms of house, bungalow or apartment.

- | | |
|--------------------------|----------------------------|
| 5-light candle fitment. | 1-drop light wall fitment. |
| 5-light ceiling fitment. | 3-candle fitment. |
| 5-drop light fitment. | 3-drop light fitment. |
| 2-candle wall fitment. | 3-light ceiling fitment. |
| 1-candle wall fitment. | |

Architects, contractors and builders should get full particulars at once concerning this wonderful fitment. *The price at which it can be installed will prove a revelation.* Adds to the beauty and value of any home.

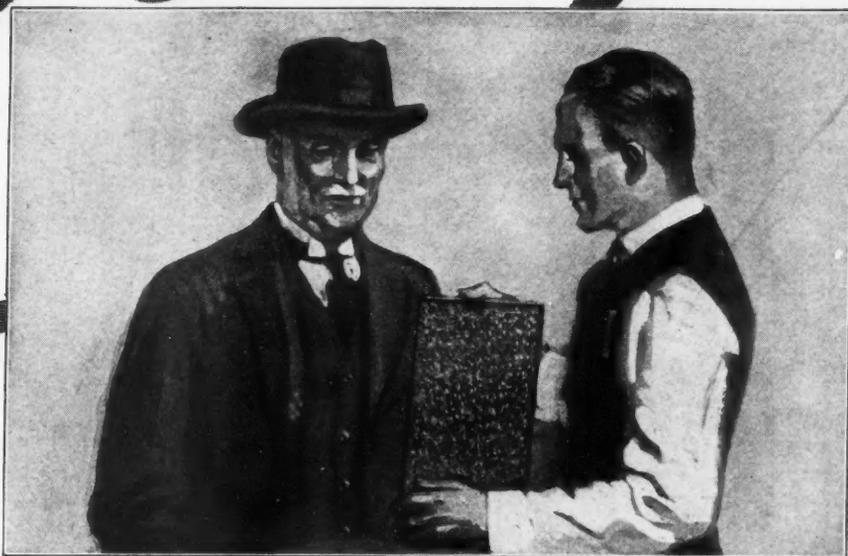
Ask your fixture dealer, or write us today for full details, including illustrated folder showing the Feature Fitment in actual colors.

The Edward N. Riddle Company

Toledo, Ohio

Makers of Lighting Fitments Since 1892

Carey



The Exclusive Non-Curling Feature Makes Carey Asfaltslate Shingles Easy to Sell

You can sell Carey Asfaltslate Shingles with the absolute assurance that **THEY WILL NOT CURL**. They have been proving this fact in every part of the country for the last decade. When you roof a building with Carey Asfaltslate Shingles, you know your customer is going to be pleased with the unusual length of service which they give and with their beauty which lasts as long as the shingles.

Carey Asfaltslate Shingles *never* curl. They are constructed with an extra heavy felt base which absorbs a greater amount of asphalt compound, making them stronger, heavier, and more durable than the ordinary shingle.

If you have never sold Carey Asfaltslate Shingles and are unacquainted with their other important selling points and interesting records of service, write for samples and literature.

"A ROOF FOR EVERY BUILDING"

THE PHILIP CAREY COMPANY
510-530 Wayne Ave., Lockland, Cincinnati, Ohio

Other Carey Building Materials

Carey Built-Up Roofings are built on the job with alternate layers of sheet roofing and coatings of Manco Asphalt. Permanent roofing for any kind of surface.

Carey Board is a Wallboard that is waterproofed internally with asphalt and externally with paraffine. It takes the place of lath and plaster.

Carey Fibre Coating contains asphalt and asbestos fibre. It renews old roofs.

other important line of asphalt roofing. And within forty-eight hours after the announcement of the reductions orders had poured into the factories in excess of the most optimistic predictions.

Manufacturers operated full time thruout the winter and carried on full handed during the entire period of normally slack production. The first small increase in quotations failed to check the flow of orders; and the activity of the roofing plants was reflected in abnormal winter production of felt mills and other producers of the raw materials of prepared roofing.



Austin Corporation Gets \$4,000,000 Brazil Contract

HUNDREDS of tons of Austin machinery is now on the way to Brazil, where it will be employed in driving a tunnel and erecting a municipal market for the city of Sao Paolo. Robert Morris, head of the Austin Machinery Corporation, of Louisiana, recently succeeded in closing a contract amounting to \$4,000,000. The company will probably establish a branch in Brazil, either at Sao Paolo or at Rio.

The story of how the Austin Company happened to connect up with this proposition is an interesting one. Some months ago Admiral Cordeira da Graca, representing the Brazilian Government, was in New Orleans in connection with matters affecting the Lloyd Brasileiro Steamship Line. The Admiral was known to be an enthusiast on good roads, so his business friends introduced him to Mr. Morris, who took pleasure in showing him motion pictures of road building that featured Austin equipment all the way from the preparation of the grade to the finished surface.

Shortly after the Admiral's return to Brazil a comprehensive state plan of public improvements, that had frequently been talked about but never aggressively pushed, began to take definite shape. With a vivid recollection of the favorable

impressions he had formed of Mr. Morris and the Austin line, the Admiral promptly notified him of the opportunity. Mr. Morris boarded the first steamer for Rio where, upon convincing the authorities that he knew how and could deliver the goods, he managed to secure the first of the contracts to be let.



Smith New Head of Republic Truck

AT a directors' meeting of the Republic Motor Truck Co., Inc., held in New York City last month, all officers and directors of the company resigned.

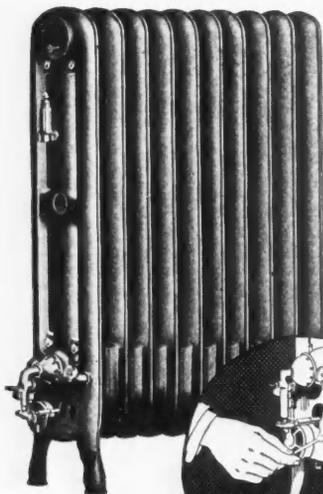
This action followed the passing of control of the company from Eastern interests, headed by Mr. Willys, to Western interests centered in Michigan and Illinois.

The resignation of John N. Willys as president and director of the company, of Walter P. Chrysler as a director and member of the executive committee, and of James E. Kepperley as a director, were accepted, and Colonel Frank E. Smith was elected president, succeeding Mr. Willys, and Messrs. O. W. Hayes, H. D. Minich and Charles G.



Col. Frank E. Smith, New President of Republic Truck Co., Alma, Mich.

Houses Without Basements



BY using CLOW GASTEAM heating you can make lower prices. You save on cellar excavation, chimney, boiler, piping, etc.

CLOW GASTEAM radiators—providing real steam heat *minus* the dirt, annoyance and expense that goes with coal—make an ideal heat for small houses. They are also used in other types of buildings—stores, shops, schools, theatres, churches, etc.

They can be installed very quickly and easily, and can be paid for on installments.

They are economical in operation, because there is no waste of heat and because each radiator is a complete heating unit in itself.

Builders who have acquainted themselves with CLOW GASTEAM are enthusiastic about its possibilities. Let us give you the details.

JAMES B. CLOW & SONS

General Offices: 534-546 S. Franklin St., Chicago
Sales offices in the principal cities

CLOW

James B. Clow & Sons
534-546 S. Franklin Street, Chicago
Send me details of CLOW GASTEAM.

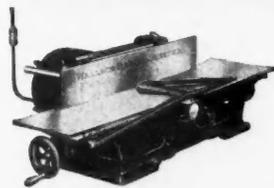
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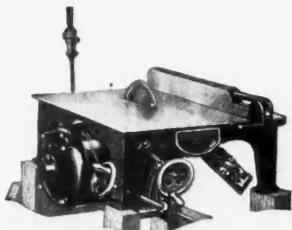
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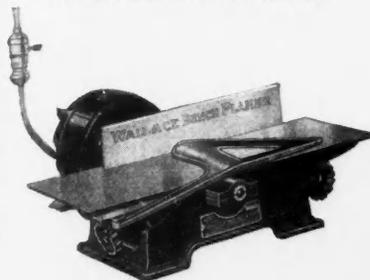
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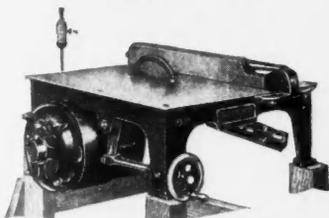
Wallace Bench 6" Jointer



Wallace Bench Universal Saw



Wallace Bench 4" Planer



Wallace Bench Plain Saw



Wallace Bench 16" Band Saw



Wallace Bench Universal Saw

From a heavy cut in large stock to precisely accurate work on small pieces is the every day range of Wallace Bench Machines.

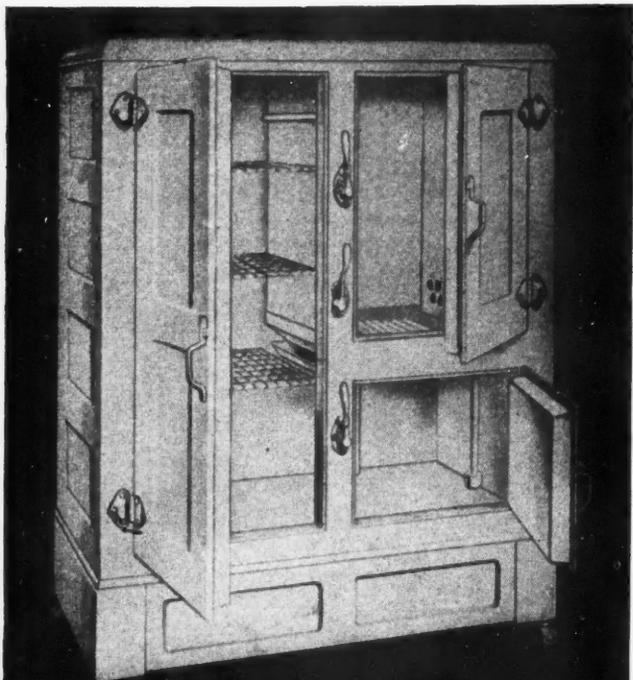
They are portable—take them to the work—they will save time and labor either in the shop or out on the job. Patented guard protects the operator. Operate on electric light circuit, push button or toggle start and stop.

Send for Bulletin No. 207 L and Prices

J. D. Wallace & Co.

1407 W. Jackson Boulevard, CHICAGO, ILLINOIS

Most all machinery dealers handle the Wallace line



ATHERMOS

(absence of heat)

THIS All-Steel Refrigerator is exceptionally practical for installation in apartment buildings and apartment hotels.

It is practically indestructible and finished in white enamel or battleship gray presents a very pleasing appearance.

Some of the finest apartments erected in the past year were equipped thruout with Gurney Standard and Athermos Refrigerators.

This type of refrigerator is not affected by dampness or even by exposure to water, hence it is suitable for any climatic condition.

BUILDERS:—Let us send you complete directions for installing Gurney refrigerators for outside icing in modern residences. Write for the Gurney catalog.

Gurney

REFRIGERATOR CO

Fond du Lac, Wisconsin

PERMANENT CHICAGO EXHIBIT
309 North Michigan Avenue



Rhodes, were elected as directors in the places made vacant by the resignations of Messrs. Willys, Chrysler and Kepperley.

O. W. Hays and H. D. Minich were made vice-presidents of the company, and Charles G. Rhodes was elected secretary.

These changes bring back to the West the control, which was transferred to New York at the time Mr. Willys and his associates purchased the stock of the company from Messrs. Burt, Rhodes, Moore, King and their associates in Michigan.



National Fireproofing Head Sees Big Year

REPORTS of the past few months indicate a steady increase in building operations, promising considerable relief in the housing situation this year, according to H. M. Keasbey, president of the National Fireproofing Company, addressing the annual stockholders' meeting.

During January the company received twice as many orders as for the same month in 1921 and inquiries for building tile are keeping a large office force busy answering them. The company spent \$350,000 during the year on the remodeling of plants and all of them are now virtually rebuilt. The new East Liverpool plant will be the most complete and most efficient in the country.

E. W. Gwinner and E. H. Straub were re-elected directors for three years. The stockholders gave the directors a vote of confidence.



Changes Connections

L. P. LESSARD, formerly assistant sales manager for T. L. Smith Co., Milwaukee, Wis., has been appointed district manager for the Chicago territory for the H. W. Roos Co., Cincinnati, Ohio, manufacturers of adjustable shores for contractors in setting concrete forms.



Learn How To Get More Contracts

with the

KIN-WI-CO SYSTEM

THE Kin-Wi-Co Homes System is a contract winning service—bringing prospects to you—clinching the sale after they arrive.

The-Kin-Wi-Co System is an independent plan service—meant to make **your** business grow.

Kin-Wi-Co home designs are modern—perfectly planned—sure to attract and please. The prospect is shown what to build and told **exactly** how much it will cost.

If you act quickly you can become the exclusive Kin-Wi-Co representative—the **only one** in your town rendering the exceptional Kin-Wi-Co service. This means more money—better business for you this year. Write **NOW**—before it's too late.

KIN-WI-CO HOMES SYSTEM

Middletown

New York

We can PROVE that

HERCULES ENGINES

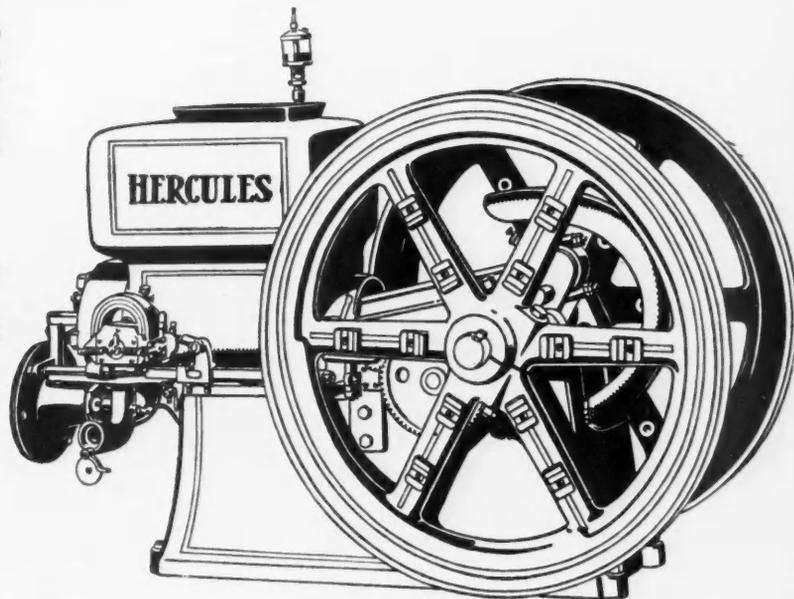
are built to deliver dependable power and we don't want you to believe it until we do.

They are designed especially for contractor equipment and other power driven machinery and while we can point to a number of features that make them particularly adapted to this field, we can **SHOW** you where they are favored for this work.

And you cannot ignore the convenience of our several hundred service stations or the value of our liberal guarantee.

Don't you want to be convinced of their recognized quality?

The dealer will show you where they cost less — Experience will demonstrate their lower operating expense.



The Hercules Corporation

Engine Division Dept. B

Evansville, Indiana



CHICAGO'S "BEAUTIFUL HOME CONVENIENT"

The big feature at the "Own a Home Exposition," held in the Coliseum, was built of stucco applied to

E-Cod Fabric

WOOD - REINFORCED

The two-apartment structure, containing five rooms upstairs and down, was designed by Henry K. Holsman, A. I. A., Architect, Chicago. It was constructed to demonstrate the possibility of securing an attractive, livable home at a moderate cost.

E-COD FABRIC, the Ideal Plastering Base for exterior stucco and interior plaster, helped to make it economical and livable.

E-COD FABRIC is fire retardant, damp and moisture proof, keeps cold out and heat in. It is low in first cost and saves in every operation of plastering. Saves 40% to 60% of the scratch coat.

**Insist upon getting genuine
E-Cod Fabric. Send for
pamphlet, *How to Build
Better for Less.***

M. J. MacAdams Corporation

111 W. Washington St., Chicago
101 Park Avenue, New York



THIS IS THE LABEL—GET IT

Proper Piling of Lumber

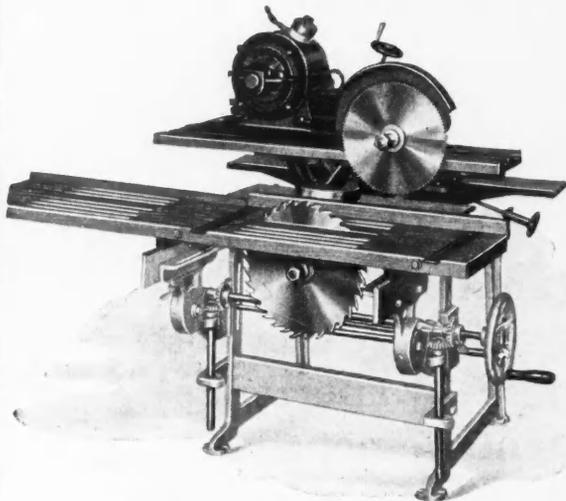
(Continued from page 116.)

each course of the same thickness, so the boards in each course may lie and dry straight; keep the spaces between the boards in the pile evenly divided. Pile all 2 by 4 and 2 by 6 on edge, with a skid and a cross strip every three or three and one-half feet in their length and you will have few claims on crooked dimension. Above all, keep the cross strips one directly over the other; make this an issue whether in yard or kiln. If these instructions are followed you will add nothing to the natural defects in Southern pine lumber by the seasoning process in the air.

What is said above with reference to cross strips and air spaces for drying in the air should be emphasized for kiln drying; cross strips for kiln drying should not be more than 2 inches wide, as the writer has had lumber checked on kiln cars before it ever went into the kiln by the use of 4-inch cross strips, which being devoid of moisture by repeated use, and one on each side of a board, absorbed the moisture at the point of double contact, causing shrinkage and checks under the cross strip in twenty-four hours.

The heat in the kiln rises vertically from the pipes in the vehicle on which the moisture travels away from the lumber; hence ample vertical air spaces should be built into each kiln car load of lumber. Without proper regard for this feature, rapid results cannot be obtained.

The Master Woodworker



Back to Pre-War Prices

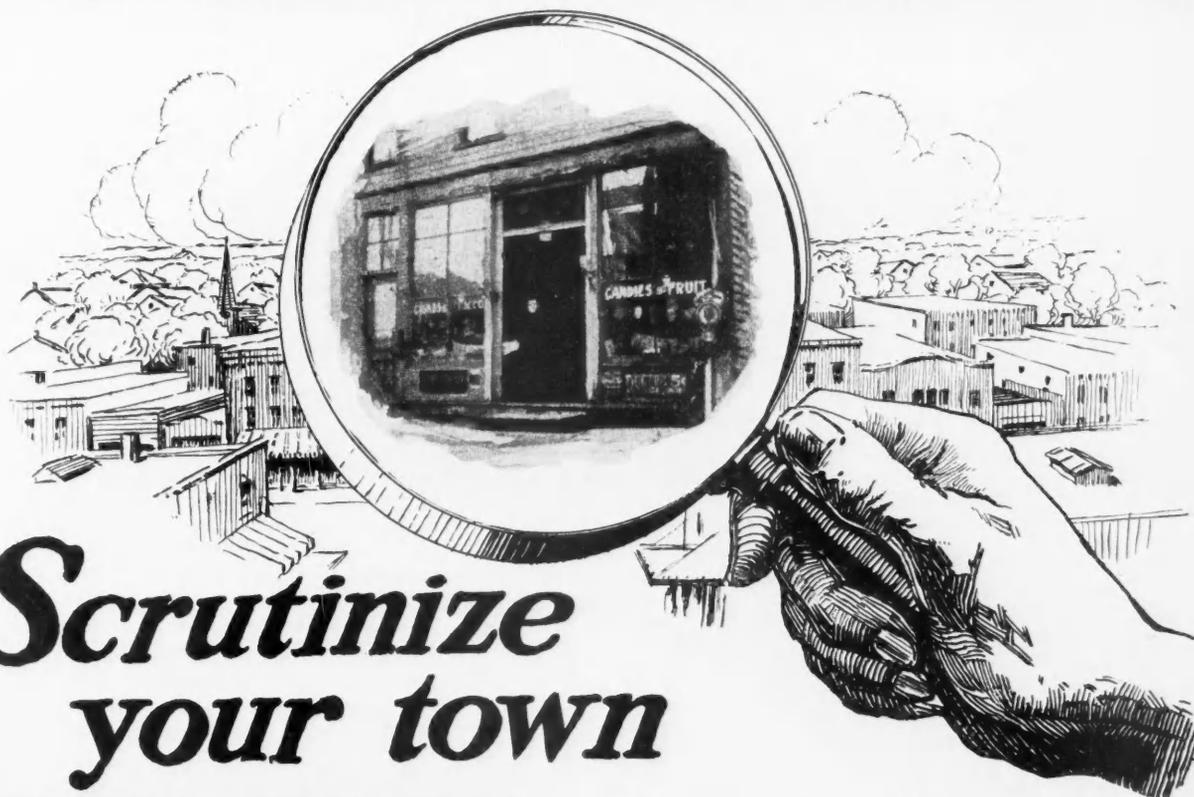
Underslung rip saw, overhead cross cut that works like a swing saw. Bores, mitres, dados, rabbets, planes, moulds, rips and joints on the bevel, makes jackrafters, fire cuts, houses stair strings, and every other cut necessary in building.

Will Rip 4 Inches Thick, Without Over-Lead No Power Wasted On Countershaft

A portable universal woodworker driven by special electric motors, developing 3½ H. P. Can be run from any lamp socket on ordinary house circuit.

Designed to be taken right on the job
Catalogue on Request

THE WOODWORKER MANUFACTURING CO.
Cor. Brush and Congress Sts. DETROIT, MICHIGAN



Scrutinize your town



Look around you and you will see many store fronts like the one above. This front was remodeled by an enterprising carpenter with *Brasco* and today it invites trade which it used to repel.

Many of these merchants retain the old fronts merely because no one has ever realized the opportunity of showing them the proper material, nor made an estimate of the cost.

This Is Your Opportunity

What other builders are doing you can do and we want to co-operate with you in getting your share of the remodeling business this year.

Just send us the prospect's name and we will get in touch with you and provide you with every help in landing the contract. Estimates and suggestions promptly and cheerfully furnished.

MAIL US THIS PAGE

with your address and we will send you our Booklet on Store Fronts and complete details of our selling plan.

Name _____

Address _____

BRASCO MANUFACTURING CO.
5029 S. Wabash Ave., Chicago

Brasco

COPPER
STORE FRONTS



Will outlast them all

Seek Simplification of Building Material

SIMPLIFICATION of building materials as a means of eliminating waste in industry was discussed at a recent conference held between officials of the Department of Commerce and representatives of architectural, engineering and building organizations.

The work of the meeting may be summed up in the following resolution which was adopted:

"WHEREAS the undersigned committee of architects, contractors and engineers are fully in accord with Secretary Hoover's program for elimination of waste as a major means to the stimulation of American business, and

"WHEREAS prominent among the many factors which contribute to such waste in building as evidenced by the high cost of construction are the multiplicity of types and the great variety of dimensions which now abound in many of the component parts which enter construction; and,

"WHEREAS the cost of construction will undoubtedly be thereby lessened, the industry stimulated, and interest of the public conserved by dimensional simplification;

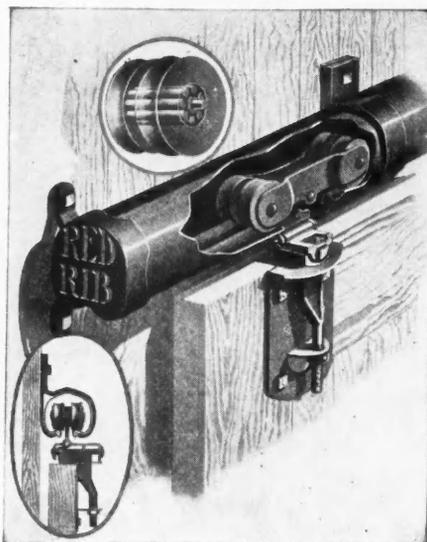
"BE IT RESOLVED that this committee formed to discuss the subject of dimensional simplification recommends to the Department of Commerce that the Division of Simplified Practice study certain essential parts of construction with a view to simplifying the types and lessening the number of different dimensions of those parts."

In selecting the items of building materials to be given attention first, the following were designated: millwork, plumbing, heating, interior wall construction, hardware, lighting fixtures, clay products, the latter including brick, tile of all kinds, terra cotta, sewer pipe, etc.

In giving these items attention, the department will formulate sub-committees to bring together the manufacturers and others having to do with each particular commodity or service.

No Other Equals the "RED RIB"

For *STRENGTH* and *EFFICIENCY*



RED RIB Hangers shed water and are bird proof.

RED RIB Hangers are Tandem and Flexible.

RED RIB Hangers, Frames and Links are made of the best grade malleable iron and the hasp is steel.

RED RIB Hanger Wheels are of high quality gray iron with machined grooves and roller bearings.

RED RIB Hanger Axles are machined with a shoulder at each end which prevents wheel binding.

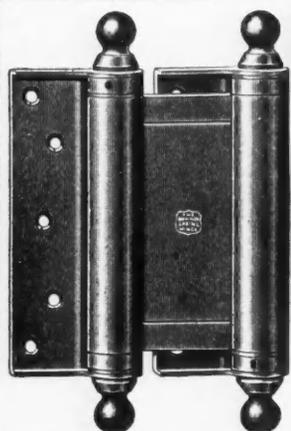
Will not spread on account of Double Grooved Wheel.

The Topping Manufacturing Co.

For 18 Years

SAFETY DOOR HANGER COMPANY

Ashland, Ohio, U. S. A.



BOMMER

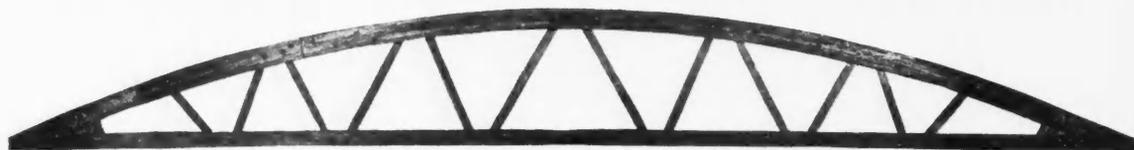
SPRING HINGES

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.

CLEAR FLOOR SPACE

Without trouble or risk is an easy problem if you use **McKEOWN TRUSSES**



Assembled and erected on job or shipped knocked down
For spans from 30' 0" to 130' 0"

McKEOWN BROS. COMPANY, 112 W. Adams Street, Chicago, Illinois
21 East 40th St., New York, N. Y.



Mr. Builder—

ARE you familiar with the RITE-WAY method of saving closet space in your floor plans?

By using RITE-WAY garment fixtures you can save one-half the closet space and gain a decided improvement over the old style closet. This method requires only space enough for the clothes themselves.

In some plans you can save more than \$100.00 by cutting down the size of the floor plan. Figure it out on your own plans. How much space would the use of closets 20"x30" save?

The RITE-WAY kills two birds with one stone. It not only saves space but it provides a much more convenient wardrobe. You don't have to step into a poorly lighted closet to select your clothes. Just pull the easy sliding hanger out into the light and air and PRESTO! the clothes are set before you in perfect condition.

*Write today for full information
Let us show you how you can take advantage of this new idea in closet construction.
This is something worth while looking into.
Write today to*

LAWSON

Manufacturing Company
230 West Superior Street Dept. A-782 CHICAGO, ILL.



The **RITE-WAY**
GARMENT FIXTURE

Catalogs, Bulletins and Books Received

The Story of the Bath, a unique story of baths and bathrooms since the time of the Pharaohs in Egypt up to the present, written by Edwin L. Barker and illustrated by Albert W. Barker, has been published by Domestic Engineering, Chicago, Ill. The story is written in narrative style and covers in detail the progress and history of bathroom plumbing.

"Archer Mixers" is the subject of a new catalog just issued by the Archer Iron Works, Chicago, Ill. The complete line of Archer mixers is shown with good ideas for the contractor to cut down mixing costs and a number of views of the mixer on the job. Views of special equipment for mixers are also shown.

Toggle bolts and expansion shells is the subject matter of an illustrated folder issued by the Paine Co., Chicago. The circular contains views of famous buildings and projects, such as the Panama Canal, in which Paine toggle bolts and expansion shells have been used, and also a series of drawings showing various uses for Paine expansion shells. A price list is also inclosed.

"Hollow Building Tile Manual for Builders and Masons," "Hollow Tile Farm Buildings," "Hollow Tile Hog Houses," and "The Modern Garage of Hollow Building Tile" are an impressive group of attractive booklets now being distributed by the Hollow Building Tile Association, Chicago, Ill. The manual has been revised and contains the last minute developments in tile construction.

"Cement Brick and Its Uses" is one of the leading articles in the latest number of Alpha Aids, published at intervals by the Alpha Portland Cement Co., Easton, Pa. There is also an important article on fireproof school building construction.

"The Red Cross Filter," designed for the home, is the subject of a new booklet issued by the Red Cross Filter Co., Chicago, Ill. This booklet contains a description of the application and uses of the filter in the home, office, factory, laboratory, and hospital.

Two more folders containing halftone prints of brickwork are now available for distribution among architects from the American Face Brick Association, Chicago, Ill. The first folder was distributed recently. This material is designed to be helpful on drafting tables in giving draftsmen details of mortar joint, bond, color and texture of brick, etc.

"Modern Hardware for Your Home" is the title of a very attractive catalog just issued by the Richards Wilcox Mfg. Co., Aurora, Ill. This catalog shows a beautiful home

on the front cover with complete description of floor plans inside. It also shows the many different types of building hardware manufactured under the R. W. brand with interior and exterior illustrations, specifications and working drawings.

"Masterbuilt Floors" is the subject of a new book for architects, engineers, contractors and building owners, published by the Master Builders' Co., Cleveland, Ohio. It takes up three products, "Metallic Hardener" for ornate floors, "Mastermix" and "Saniseal." Specifications for the use of these materials are shown as well as many illustrations of buildings in which they have been used. The book is made up in handy reference form.

BE A WEATHERSTRIP CONTRACTOR

Make \$5,000 to \$10,000 or More Yearly

Prepare for the Spring Building Boom

SELLING and installing weatherstrip is a new and uncrowded business. The spring season is going to be alive with opportunities for the contractor-agent who is equipped to go after this business.

ALLMETAL Weatherstrip is favorably known and preferred by architects and general contractors.

Get Our Selling Proposition Now

Between this and spring you can be equipping old buildings and landing contracts for new buildings to be put up later. Every building is a prospect. Hundreds of buildings right now in your vicinity need weatherstrip.

Get Into a Business of Your Own

Don't get caught out of work again—build up a business of your own and one that pays big. We furnish models and assist you to land contracts. Weatherstrip contractors make good money right from the start.

Write today for complete information

ALLMETAL WEATHERSTRIP CO.
124 West Kinzie Street CHICAGO

Bostwick

"Truss-Loop" Metal Lath
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Eliminating Guesswork in Buying Wire Rope is the message in a new circular just issued by the Williamsport Wire Rope Company, Williamsport, Pa. It explains the new policy of that company to mark all wire rope, indicating clearly the various grades of rope.

Soda Fountains and Supplies is the title of Catalog B-41 issued by the Albert Pick & Co., Chicago, Ill. The catalog lists all types of soda fountain equipment, such as glassware, display stands, etc., as well as fountains, furniture and flooring.

Healthful Helpful Hints, published by the Farquhar Furnace Company, Wilmington, O., is a sixteen-page booklet with covers describing and illustrating the prominent features of the Farquhar furnaces. It also contains a short article on the proper method of building chimneys of practical interest to all builders.

Outspinning the Spider, the story of wire and wire rope, by John Kimberley Mumford, is a very complete and detailed account of the Roebling industry, and is being distributed by John Roebling's Sons Company, Roebling, N. J. It covers the development of this vast enterprise founded in 1848.

Gunite Book No. 7 is a book of views showing recent work done by the Cement Gun Construction Company, Chicago, Ill., and Pittsburgh, Pa. The illustrations show the Nashville reservoir, South Chicago Dry Dock, highway bridge at Newcastle, Pa.; Boulevard link bridge, Chicago, and several other big projects.

The Use of Southern Yellow Pine in Car Construction, written by Geo. E. Strehan, consulting engineer of the Southern Pine Association, is now being distributed by that association among those interested. This booklet traces the history of car construction for 100 years. The book also contains recommendations for the proper storage and handling of lumber and timbers.

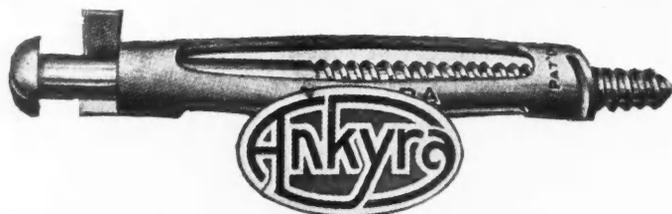
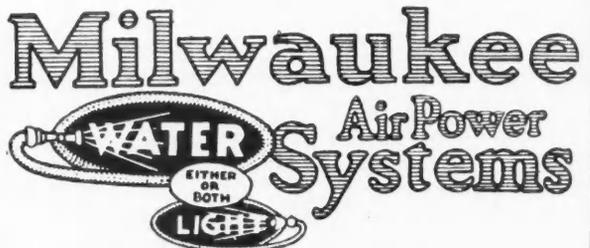
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