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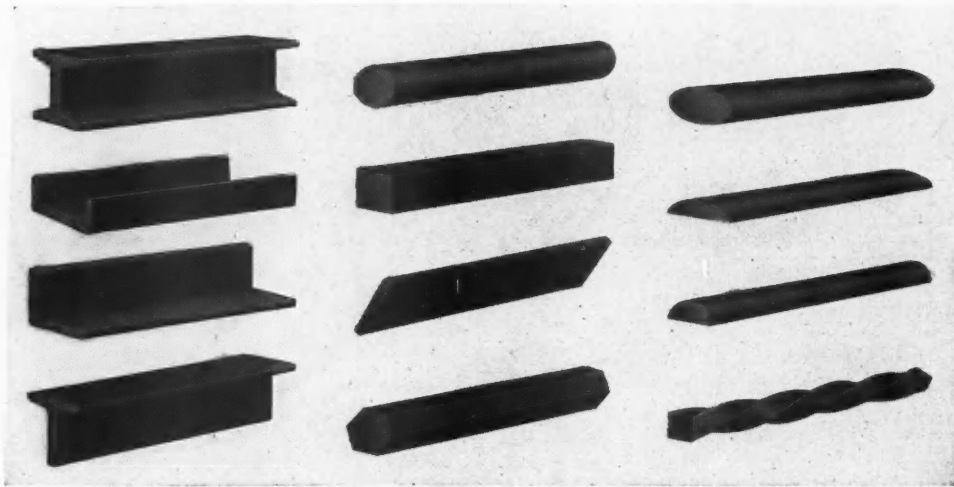
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Short Talks by the Editor



Clarifying the Atmosphere

DESPITE the persistent lamentations of a set of pessimists who seem determined to convince the country that it is balancing on a terrible brink, certain encouraging developments have occurred which will help immensely in clearing away this mist which has been gathering. Within a week two important decisions, in connection with both angles of the railroad situation, have accomplished much in clearing up the transportation problem.

Without doubt the freight congestion and general debility of the railroad systems during the first few months of the year accounted for much of the uncertainty and stagnation in many lines of business, especially in the building line. It was practically impossible to get building material hauled by freight as other materials were on the priority list. With the settlement of the labor controversy and the increase in freight rates giving the railroads increased revenue to operate business, industry will begin to move forward with some of the wartime speed. Undoubtedly building will begin to speed up—a general feeling of optimism seems to pervade the entire business field.

There is no reason for pessimism with production falling far short of the demand, improved transportation facilities, and a pressing demand for homes which **must be satisfied**. There is every reason to expect a large building program thruout the fall and into the winter.



A Serious Aspect of the Housing Shortage

ONE of the most serious results of the housing shortage, one that most people are inclined to overlook, is its possible effect on public health. A recent report by the Board of Health of the city of Chicago reveals the fact that the housing shortage has affected the health of many families. Makeshift shelters such as tents, shacks and houseboats have been found the same as substitutes for food or clothing. Still another evil from the sanitary standpoint has been caused by the doubling-up craze in which two or more families combine to get protection. Naturally space, light and air are inadequate.

This commission hopes by pointing out the seriousness of the situation to stimulate still further build-

ing activity. While the attitude of meeting a problem only when it is upon them is typical of a great many citizens, the acuteness of the present housing situation cannot be too emphatically emphasized. In a report prepared recently, Mr. Wharton Caly, prominently identified with the building industry for many years, says:

"In 1916 there were 20,263,051 dwellings for 23,292,887 families; in 1917, 20,672,051 dwellings for 23,799,275 families; in 1918, 20,808,562 dwellings for 24,305,662 families; in 1919, 20,829,039 dwellings for 24,872,051 families, and for the year 1920, the proportions are 20,900,000 dwellings for 25,319,443 families. This means an existing shortage of 4,419,443 houses for family dwellings and on a basis of five members to a family, 22,097,215 persons in this country today are not being properly or adequately housed."



Home Building to Speed Up

RELIEF is in sight for those whose buildings and homes are being delayed because lumber, cement and other materials are held up by the railroads, according to Daniel Willard, president of the Baltimore & Ohio. He promised at a hearing of the Senate Committee on Reconstruction, of which Senator William M. Calder is chairman, that the railroads would co-operate with the builders and necessary building material would be shipped without delay.

While defending priority orders, Mr. Willard declared that he realized the importance of building homes and other necessary buildings. It was his opinion that the completion of repair of apartments, houses, roads and streets and other similar examples should be classed as an emergency and so far as the railroads were concerned, treated as such.

The practical workings of the plan proposed is as follows: Committees representing the construction industry have been appointed in various districts. In cases brought to their attention, where building material is being delayed, the construction committee will pass upon the necessity for the building, and upon the construction committee's recommendation, a committee of railroad officials will see that the material arrives. W. H. Truesdale, president of the Delaware, Lackawanna and Western Railroad; will be in charge of all the railroad committees.

Homes Must Be Built

DELAY WILL PROVE MORE COSTLY THAN BUILDING AT THE PRESENT TIME BECAUSE OF EFFECT ON LOYAL CITIZENSHIP

WHEN Lenine and Trotsky set about to establish the present government in Russia they revealed a shrewd knowledge of human psychology. They promised the peasants land ownership. Each one that would support the government would be given land. The appeal was tremendous to a people who had been practically serfs. They were promised *home ownership*. With it came a loyalty to the government that has resulted in their rapid growth of power.

And so it applies in any nation under any type of government. Home-owners are loyal to the power that made this home-ownership possible. They are attached to that country because they have an interest in it and it will take strenuous means to dislodge this idea from their minds.

A study of history down thru the ages reveals the same basic fact. Wherever home-ownership was emphasized the nation enjoyed unusual prosperity and power. Loyalty was a foregone conclusion because people are ready to defend their homes to the death. As soon, however, as this priceless gift was taken from them, the people lost interest and national decadence was but a matter of time. Serfs fought when forced to by powerful lords, but free land holders were volunteers and never gave up.

This convincing evidence of ages, this story of the rise and subsequent decline of nations, cannot be ignored as a lesson today. The life and future continuance of any successful government depend upon the mental attitude, which we call loyalty, of its citizens. And this fealty is born of the fact that they have homes to cherish and defend. It is for this reason that the housing question today should take precedence over any other problem. For on it depends the security and stability of the nation.

Despite other conditions, homes must be built to take care of the people. The question might as well be faced squarely now because delay will only emphasize it, and sooner or later it will have to be solved, cost or no cost, and delay will prove more costly than any material that is used.

With the coming of the fall, many leases expire and landlords are again taking advantage of the situation to raise their rents beyond all reason or without regard to fairness. The most effective way to combat this extortion (that is the only word that can be used to describe such practices), is to build homes. More homes will take care of the great number of families who are now facing eviction because they cannot pay the increased rental.

There are many encouraging signs which point to a definite program this fall in the right direction. Municipalities are taking an active interest in the problem. Civic bodies who are aware of the true importance of the situation are organizing home-building companies. It is not likely that a great country which was founded on the principle of individual freedom will allow this menace to peril its safety.

Homes must be built. It is not only the personal but patriotic duty of builders thruout the country to do their utmost to combat the fallacious arguments which are being used to prevent this from becoming a fact.



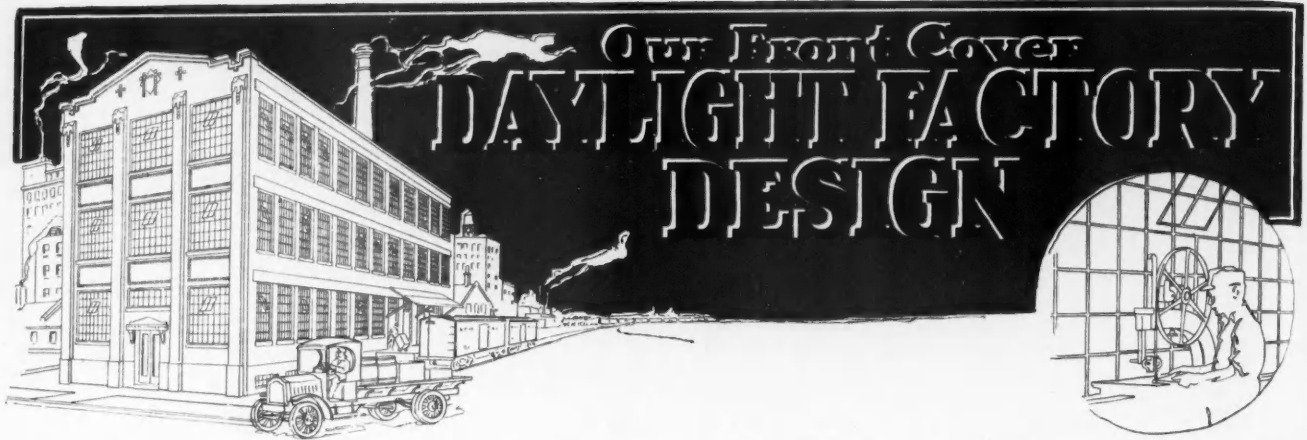
FURTHER deliveries of ships under construction will bring our total sea-going tonnage to more than 12,000,000 tons. Including the Great Lakes vessels there will be, it is estimated, about 13,000,000 tons, and counting river and other craft, a total American merchant marine of about 18,000,000 gross tons.



Less Pessimism and More Action Will Build Streets of Homes Like This. Good Citizenship Is Dependent Upon the Home Ideal. To Offset the Present Shortage and Rent Gouging by Many Landlords More Homes Must Be Built and Quickly.



CARTOON BY ED. QUIGLEY



THE great whistle had shrieked its welcome noon message. Throngs of workers of both sexes poured out of the building to eat their lunch and grab a few minutes of relaxation. Very soon the laughter and shouts of lusty voices were heard from the open lot which was adjacent to the plant. Two men passing by paused and listened.

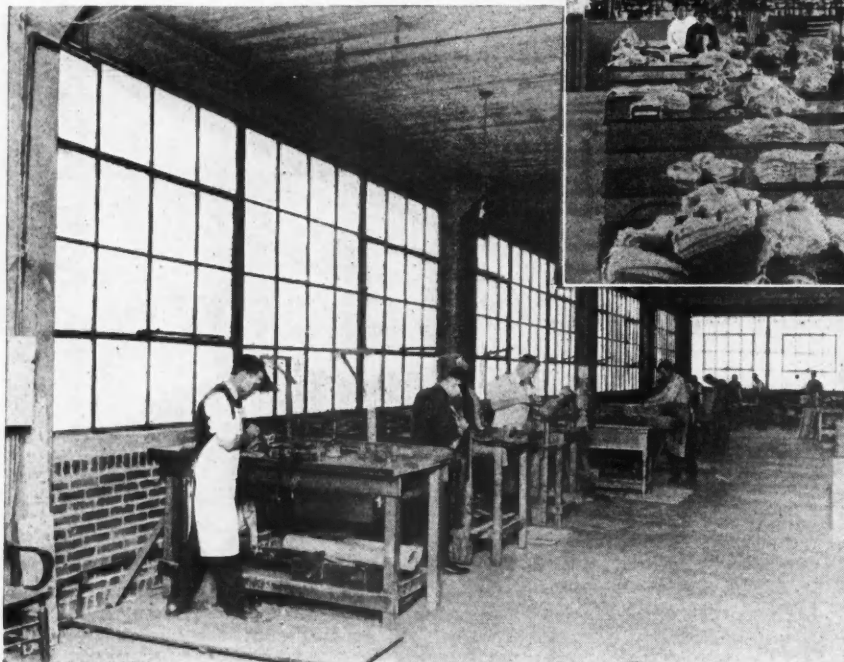
"There's a happy bunch," remarked one. "I wonder how Jones does it? You never hear of discontent in his plant. He has the liveliest, most loyal bunch of workers in town. What's the reason?"

"Simple," answered his friend. "He built his factory on the sunshine plan. Jones is a firm believer in the power of sunlight, both physically and mentally. By building a daylight factory, as he calls it, he drives away the gloom that grows in dark corners and puts ginger into his help. They thrive on real light, not the artificial brand. Plenty of good fresh air keeps them keen, wideawake, not sluggish and mopy. They really enjoy their work and don't shirk. Why, look at that building! It's a wall of windows—not a dark cor-

ner in the place where germs and dirt can collect. I tell you it pays to get as much window space as you can."

The factory they were looking at was like the sunshine factory shown on our front cover—a cheerful, inviting building with attractive exterior and bright sanitary interior. The old dingy loft with small windows barely lighting up a dismal and gloomy interior has passed, just as hundreds of other institutions before the march of building progress. Each year brings a greater appreciation of ventilation and sunlight in buildings. Just as sun parlors and porches have revolutionized private building, so have walls of glass transformed factories into cheerful workshops.

The factory shown on the front cover is of modern



Walls of Windows Are a Valuable Asset in Expert Work. They Provide a Source of Natural Light Which Is Restful for the Workmen Who Have to do Fine Work Involving Continuous Eye Strain.



Against This Cheerful, Well-Lighted and Ventilated Factory the Sweatshop Has Little Chance, and Is Being Gathered Up Into the Shades of the Past. Sunshine and Air Have Done Wonders for the Health of Factory Workers.

mill construction with a brick exterior, and is three stories in height. It is 50 feet wide and 112 feet long. On the first floor are found the office sections consisting of a private office and general offices, stock room, and a large shipping floor opening out onto a long loading platform along the side of the building to the rear.

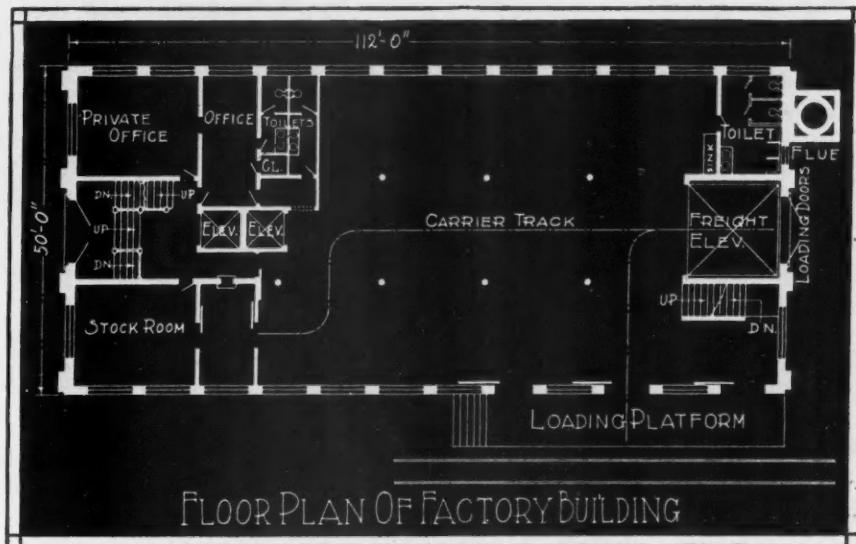
The main entrance is quite pleasing with broad stairways leading up to the main floor and corridor where two passenger elevators are located. A freight elevator in the rear of the building is made accessible to the outside by a loading door. Two large toilets have been provided in the first floor plans. The two upper floors are devoted to factory purposes and are well lighted and ventilated.

The essential features of a modern factory of this type are the windows, ventilating systems, rest rooms and restaurants, floors and toilets. Upon each of these in some measure depends the success of the building, the content and productive ability of the employes. For cheerful, well-lighted, well-ventilated workrooms are bound to react favorably upon their occupants. With the great ventilating systems in operation fresh

air is continually circulating thru the rooms while the putrid air is drawn off. In the summer this air can be cooled



There Are no Dark Corners in This Shop Where Germs and Refuse Can Accumulate. This Mechanic Breathes in Fresh Air Continually and Does More Efficient Work. Sunlight is a Stimulant and Disinfectant.



Floor Plan of Front Cover Factory Showing Arrangement of Main Floor. The Upper Floors Are Given Over Entirely to Manufacturing Purposes. Note the Overhead Carrier System and Other Modern Equipment.

or in the winter vice versa. Despite prevailing weather conditions the atmosphere inside the building is always comfortable and invigorating. Owners of factories who have installed systems of this kind find their production troubles lessened a great deal. They comment on the lack of drowsiness, for the

simple reason that the fresh air is stimulating. In factories where heavy machinery is installed the vibration is terrific and it has been found that wood



Modern Installation in an Up-to-Date Factory. Washrooms and Toilets Are Tremendously Important and Should Bear Close Study on the Part of Architects and Builders. Health and Cleanliness Make for Efficiency.

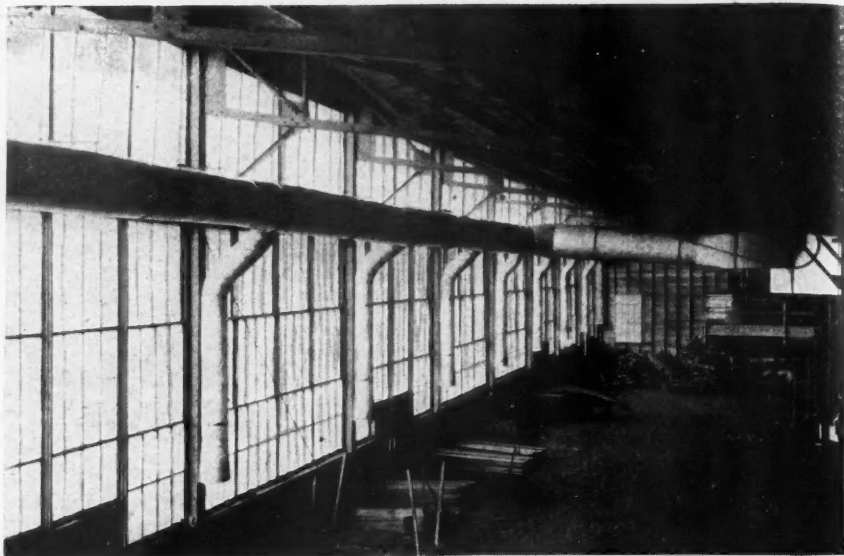
blocks cressed to withstand wear are very satisfactory as a flooring. They tend to absorb much of the vibration, are easy to walk on, and not tiresome for workers who are on their feet continually. Moreover a block flooring gives a grip to the feet no matter how wet the floor is. This is made possible by the vertical grain. The resilient or cushioned surface breaks the shock and lessens vibration and noise.

But as important as ventilation for the general health of the employes and sanitation of the building are the toilets and washrooms. They require the most careful attention to preserve cleanliness at all times.

Adequate facilities in the way of washstands and lavatories must be provided and so arranged that they can be maintained at a high standard of cleanliness. These rooms should be well-lighted and ventilated. Very often the architect makes the mistake of placing the washroom in a very inconvenient corner in the factory. The result of such an arrangement is an undue amount of lost time.

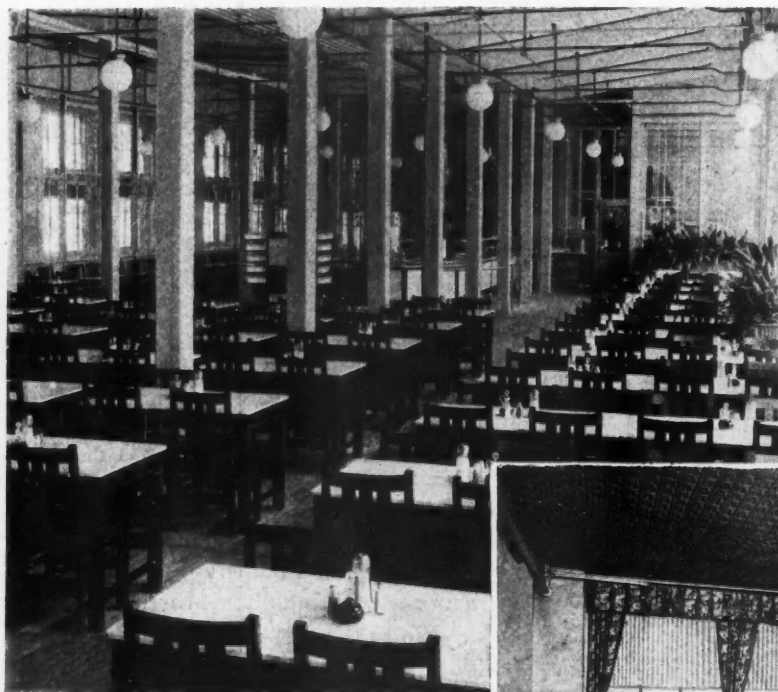
The use of luminous paint on the interior helps considerably in adding to the general cheerfulness and cleanliness of the establishment as well as aiding the efficiency of the worker. In building the modern daylight factory the contractor tries to avoid as much as possible the necessity of artificial lighting. He is able to do this by the use of windows and paints.

But of far-reaching importance in this particular phase of construction is the welfare department which has been gaining in prominence in the last few years. Successful factory superintendents have found that all work and no play makes their employes dull assistants. To offset this rest periods are provided and attractive rest rooms have been provided for the workers. Invariably the management has installed their own restaurant to insure good, clean,



An Important Factor in the Development of the Modern Factory Building. Note the Air Flues Which Supply Fresh Air Constantly and Draw Off the Carbon Dioxide Which Kills Energy and Poisons the System. In Winter This Fresh Air Is Warm. Wood Block Flooring Is Used Thruout.

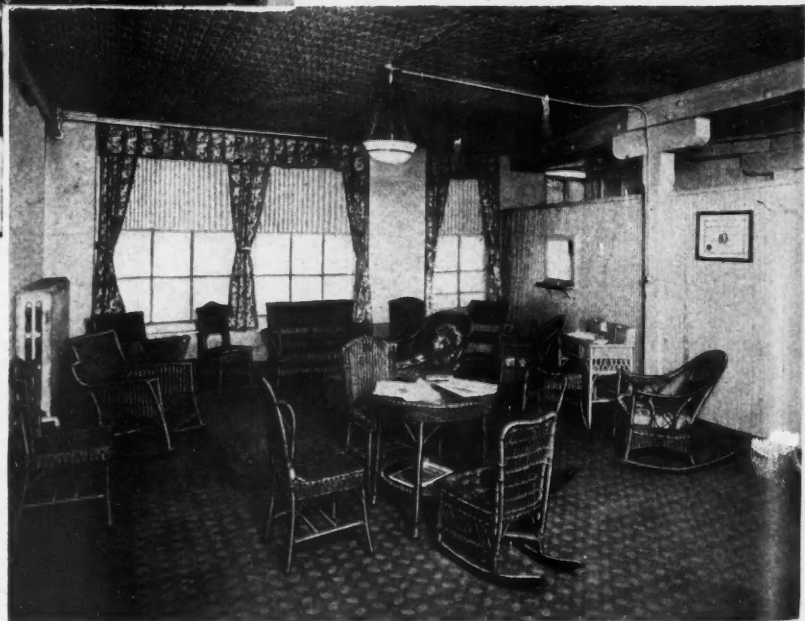
away of the old idea of building factories in the commercial section of the cities more time and ingenuity are spent on the exterior. It is designed to be in harmony with the locality and not a blot. Attractive trim, face brick, imposing entrances are used to make the building dignified and easy to look at. The front cover factory has been built with this in mind. Much of the dirt and smoke connected with industry are being eliminated and there is a noticeable improvement in its architecture. Very often it is difficult to distinguish a building as a factory. Gardens and other exterior touches have helped to make it a harmonious addition to the general building scheme of the neighborhood.



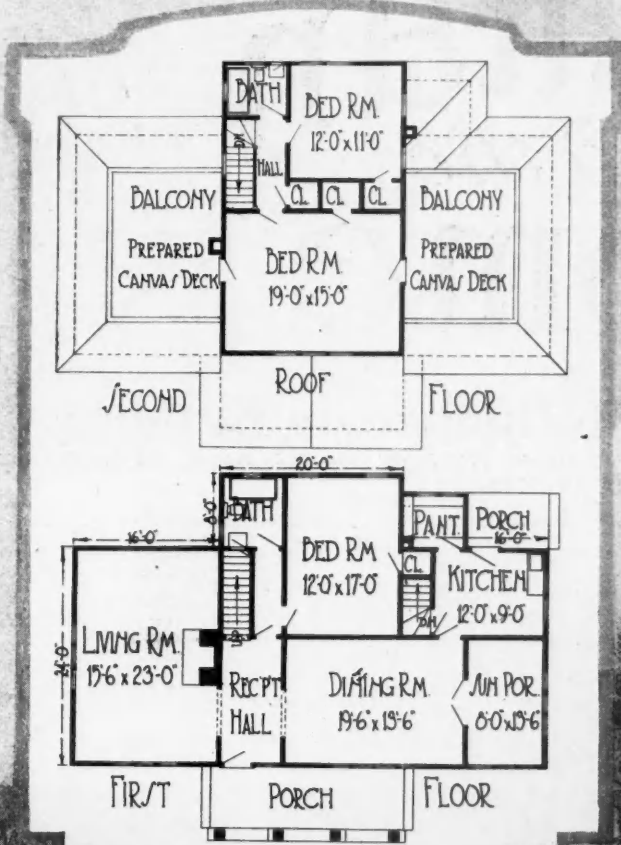
Restaurants Are Being Installed in Many Factories in an Effort to Give the Workers Warm Meals of Well-Cooked Food at Cost.

wholesome cooking at a reasonable cost. This equipment is specified by the architect and contractor who must be acquainted with the many details of this later-day development.

It is not so long since the construction of a factory building merely meant the erection of four walls of common brick with a suitable roof. But times have changed and today the building of a factory is a task of skill. With the breaking



Recreation Is a Vital Part of the Factory Program. Rest Rooms of the Type Shown Here Are Conducive to Content and Increased Efficiency Among the Employes. "All Work and No Play" Is Liable to Make Dull Help.



SIX-ROOM HOUSE OF UNUSUAL DESIGN. Here is home that will appeal very strongly to those who are seeking something different. Built along the so-called "airplane" lines which are so popular in the west, it has many features that tend to make it unique. The cupola effect of the second floor is one of these. At either end is a balcony covered with prepared canvas, a very popular flooring and roofing material. Two bedrooms are located on the second floor. On the lower floor are the living room, ample and comfortable dining room, bedroom and kitchen, also a sun parlor. The chimney has been well camouflaged to conform to the general design of the dwelling. The exterior is frame and stucco. 24 by 52 feet are the dimensions.



Growth of Woman's Influence on Building

SHORTAGE OF DOMESTIC HELP AND INCREASED CIVIC ACTIVITY OF WOMEN HAVE VITAL EFFECT ON BUILDING METHODS.

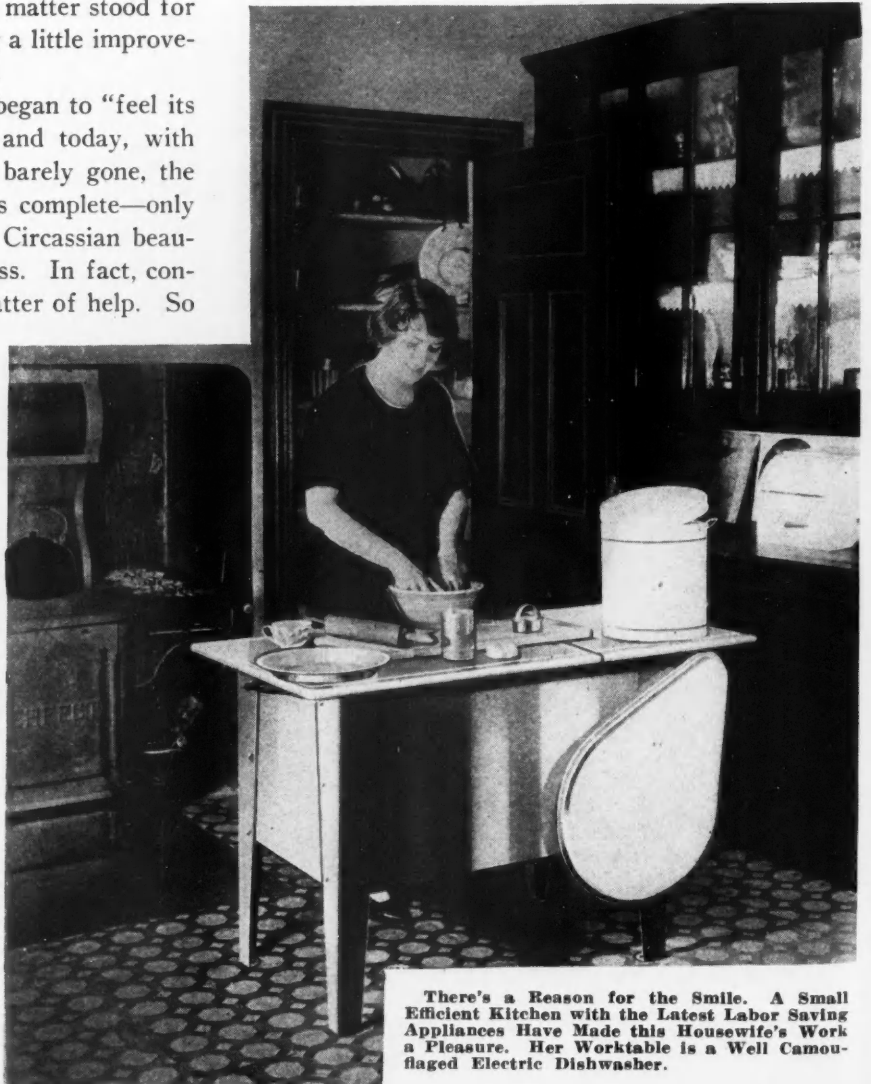
IN the days of Caesar the housewife had but to slap her hands and lo! Nubian slaves sprang forth from every corner to do her bidding. But when the Caesars were succeeded by other clans not so highly civilized the refinements and ease of the Roman days were supplanted by drudgery and serfdom of the middle ages. The women lost their position of luxury and were forced to do not only the household work but work in the fields as well. So the matter stood for centuries, each span of years bringing a little improvement, but not an appreciable amount.

Only when the nineteenth century began to "feel its oats" did the real awakening start, and today, with twenty years of the present century barely gone, the reorganization of social importance is complete—only today there are no Nubian slaves or Circassian beauties to spring to the call of the mistress. In fact, conditions are quite the reverse in the matter of help. So scarce has the housekeeper, cook, maid, and hired girl become that the building profession had to remodel its entire conception of building. The housewife confronted with a shortage of domestic help surpassing any in history, could not conciliate the idea of old-time drudgery with her present free and untrammelled status in society.

So the inevitable result was the obeisance of the architect and contractor to her particular wishes and needs in the arrangement of the home. Since help was not obtainable he had to exercise his ingenuity and skill to build the home in such a way that help was not needed. Hence the evolution of the small space-saving apartment—the one, two, and three-room kitchenette apartment and the apartment hotel.

Rooms have been cut in sizes, in

many cases cut out of the plans entirely. The bedroom is an example of this. Space-saving concealed beds are very excellently concealed behind a mahogany-mirrored door or in an attractive oak buffet. Such has been the effect of eternal feminine once she gained the ascendancy which, after all, no one begrudges. For we can still remember the days of drudgery which



There's a Reason for the Smile. A Small Efficient Kitchen with the Latest Labor Saving Appliances Have Made this Housewife's Work a Pleasure. Her Worktable is a Well Camouflaged Electric Dishwasher.

she endured uncomplainingly for years, as did her mother for years before her.

With the small apartments and space-saving homes came the necessary accessories in the way of labor reducers. Without help many tasks about the home are very tedious even tho the home is compact and the irreducible minimum in the matter of space. Take for instance—washing. Just as many clothes are worn when families live in small flats as when they lived in a home. Washday is just as terrifying. Again ingenuity of man was called in to diagnose the case and prescribed washing machines, electric mangles and glad irons. The work of the housewife has been transferred to the electric machinery which is being installed in modern buildings by contractors. If you will notice floor plans, you invariably find the laundry well provided for. Electric or gas dryers are being built in the basement to eliminate all doubt about the weather. Rain or shine the washing can go ahead.

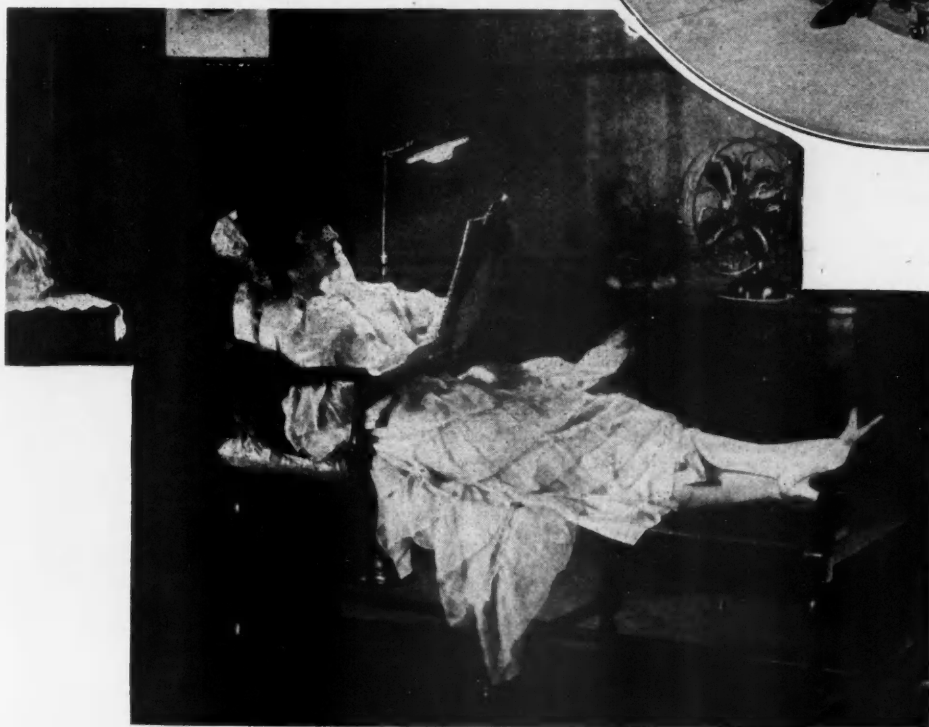
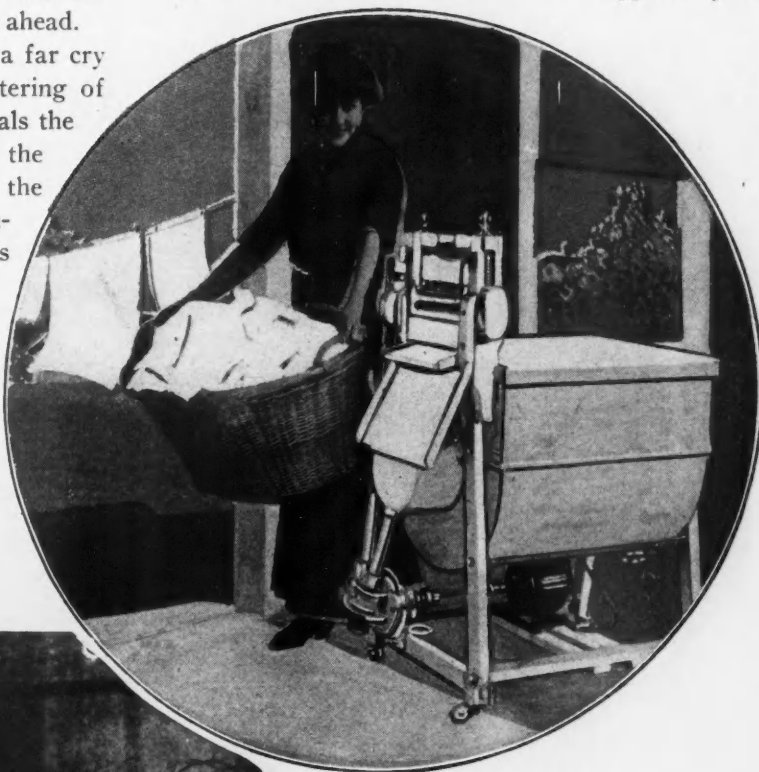
On the surface these appliances may seem a far cry from the actual laying of brick or the plastering of walls but a real analysis of the situation reveals the fact that they are very vitally interwoven in the building profession; in short, the needs of the housewife have become one of the basic principles upon which the builder determines his plans.

You hear, not infrequently, a man say in discussing plans for his new home: "Well, I'll have to see my wife about that." It may be the laundry, the kitchen, the bedrooms, or the heating plant that is being discussed.

Luxuries of a few years ago have become necessary equipment in the modern home today. No matter how small or modest, the

housewife deserves the features which will help to make it a better place to live in. A few years ago scientific housekeeping was unknown. The work was done along certain established lines which had been taught by their mothers before them, without regard to efficiency. The result was a lot of unnecessary exertion. Homes were built without this idea in mind. It is only during the last few years that the large space-wasting and step-consuming kitchen was the vogue. Do you see it in the new buildings today? Hardly!

Today women insist on a certain type of window in their new home because they have definite ideas of what kind of curtains or shades they want to use. They are particularly interested in the number and kind of lighting fixtures because good lighting makes the home more attractive and adds greatly to its comfort. It is the gentle and dainty touches that make a home in the true sense and these are supplied by the



Building Genius and Washing Machines Made this Picture Possible. Between Them, They Have Taken the Drudge Out of Washday—Just Look at that Happy Expression—and Have Cut the Workday In Half So that the Housewife Can Have a Few Hours to Rest and Read. Women Have Had a Tremendous Influence on Home Building and Are Insisting on Modern Equipment.

woman. In this matter she is guided by inherent intuition and taste. There are so many things that only a woman can properly choose.

Each day builders, architects, and manufacturers of all kinds of building appliances, are devising new schemes to make the servantless home more convenient, more comfortable, and more homelike. The growth of woman's prestige, her increasing interest in outside activities, her active entrance into the political field, have had a tremendous effect on the building and cor-

inefficient and incapable of rendering satisfaction, or adds another link in the chain of satisfied clients which is welded together by real service.



Protecting Buildings from White Ants

DAMAGE by white ants is serious to many classes of crude and finished forest products. These insects are especially injurious to foundation timbers and woodwork of buildings and to material stored therein.

The woodwork of buildings can be protected from the attack of white ants by proper construction.

Where possible, make the foundation of buildings entirely of stone, brick, or concrete, including stone columns or pillars in the basement to support the floor above; make walls and



Happiness and Content Are the Direct Results of a Real Home. The Unmistakable Influence of Woman Is Stamped on this Cheerful Scene. We'll Venture to Say that this Happy Housewife Had Something to Say When this Home was Built. And Judging from Appearances it was Something Worth While.

related industries. Today the successful contractor must have a real knowledge of electricity to understand its relation to the construction of a modern home, he should understand plumbing and fixtures, interior decorating and exterior painting, how their selection affects the architectural appearance of a building and a wide scope of other subjects which are closely allied to his business.

A consultation between builder and prospective homeowner is not final by any means unless the wife is an active party. Upon her depends the final judgment and her word either exposes the contractor as

flooring in basement or cellar of concrete, and lay concrete floors on a gravel base.

Where stone or concrete foundations are impracticable, use timber impregnated with coal-tar creosote.

Lay basement window sills and frames over concrete and do not allow woodwork to come in contact with the ground. Never sink untreated timber in ground or moist concrete; let no wood be in contact with the ground.

Complete dryness of the foundation and basement wall and flooring is an important means of rendering buildings safe from attack.

Misuse of Materials Decreases Building Efficiency

METAL LATH ASSOCIATION POINTS OUT MISTAKES MADE IN USE OF MATERIAL AND GIVES RULES

THAT the building world is sadly in need of construction education is being clearly demonstrated as day after day examples of bad practice are reported by the field force of the Associated Metal Lath Manufacturers. Every kind of building material is misused thru ignorance of the craftsmen themselves or the men in charge, and the necessity of wider knowledge to insure good jobs is certainly becoming vital.

Some of the violations of good practice in the use of metal lath and its related materials are so flagrant that they require special comment.

1. In a previous issue the right and wrong way of applying metal lath was emphasized. To prevent waste of plaster, the lath must be applied so that the strands dip down and away from the workmen putting on the first coat of plaster.

2. When the studding is on 16-inch centers, the lath is seldom fastened by tie wires between supports.

3. Then, again, because of failure of the workman to start nailing or stapling at the center and working out to the four edges of the sheet, a chance buckling of the lath gives trouble and causes waste of plaster which could easily have been avoided.

4. Exterior plasters containing high percentages of lime are often used. When rained upon, the stucco weakens, and gives poor results. While lime plaster gives good service on interior work, it should never be used where likely to be exposed to weather. Ten per cent lime in portland cement is the correct proportion.

5. Not enough care is taken to protect stucco, otherwise properly placed, from the weather. Where down

spouts are installed, the section of wall back of them should be thoroly waterproofed with down spouts at least two inches from face of finish.

6. Eaves often do not project out far enough to shed water from the side walls.

7. Stucco should not be run to grade. Not only because of danger from frost, but also to avoid staining from dirt and moisture.

8. Special attention should be given to flashings and drips to prevent unsightly discoloration and possibly more serious defects.

9. Skimped coats of plaster, while cheaper originally, are expensive in the long run. Three-coat work should always be used with metal lath.

10. Metal lath after it is received on the job is often allowed to lie for months, fully exposed to the severest weather. While the protective coating provided is as good as scientific research can make it, metal lath cannot give best results if it is misused before being imbedded in plaster.

11. Proper furring for exterior metal lath is often omitted because of lack of knowledge concerning the part the furring plays. Pencil rods, crimped furring or self-furring lath are recommended because their use will eliminate the evil effect of swelling or warping of the lumber under stucco.

12. Sheathing should be eliminated and metal lath back-plastered.

Many of these points seem small, but their observance will make a reputation for any architect or contractor.

Laying Asbestos Shingles

METHODS OF LAYING AND DETAILS OF FLASHING AND GUTTERS SHOWN IN BLUE PRINT ON PAGE 92

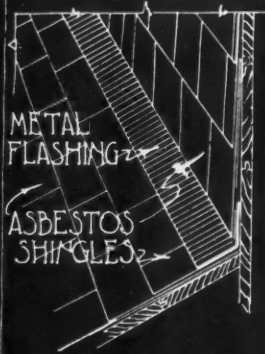
THERE are two general methods of laying asbestos shingles, the French, which is sometimes called the diagonal or honeycomb method, and the American, or straight laid method. Both are applied over a tightly sheathed roof. In each case the roof purlins and trusses are to be covered with well-seasoned, dressed and matched sheathing boards not more than 9 inches wide, laid tight. Over these boards a 1-ply slater's felt is tacked on with a 4-inch lap and on the hips and valleys with at least a 1-foot lap.

In laying shingles according to the French method, a furring strip not less than 3/16 inch thick and 1 inch wide (lath will serve) should be nailed flush with the lower edge of the roof board to give the asbestos shingles the proper cant, then apply one course of shingles, end to end laterally overhanging the eaves 1 1/2 to 1 3/4 inches. A starter course is then laid over this with edge flush with edge of first course. The balance of the roof is covered with shingles

16 by 16 inches, laid diagonally as directed and exposed 13 by 13 inches to the weather. Each shingle should be nailed with two 1 1/2-inch galvanized iron nails designed for the nail holes in the shingles and with a patented copper nail at the tip. All shingles to be laid showing diagonal lines on a forty-five degree angle with eaves.

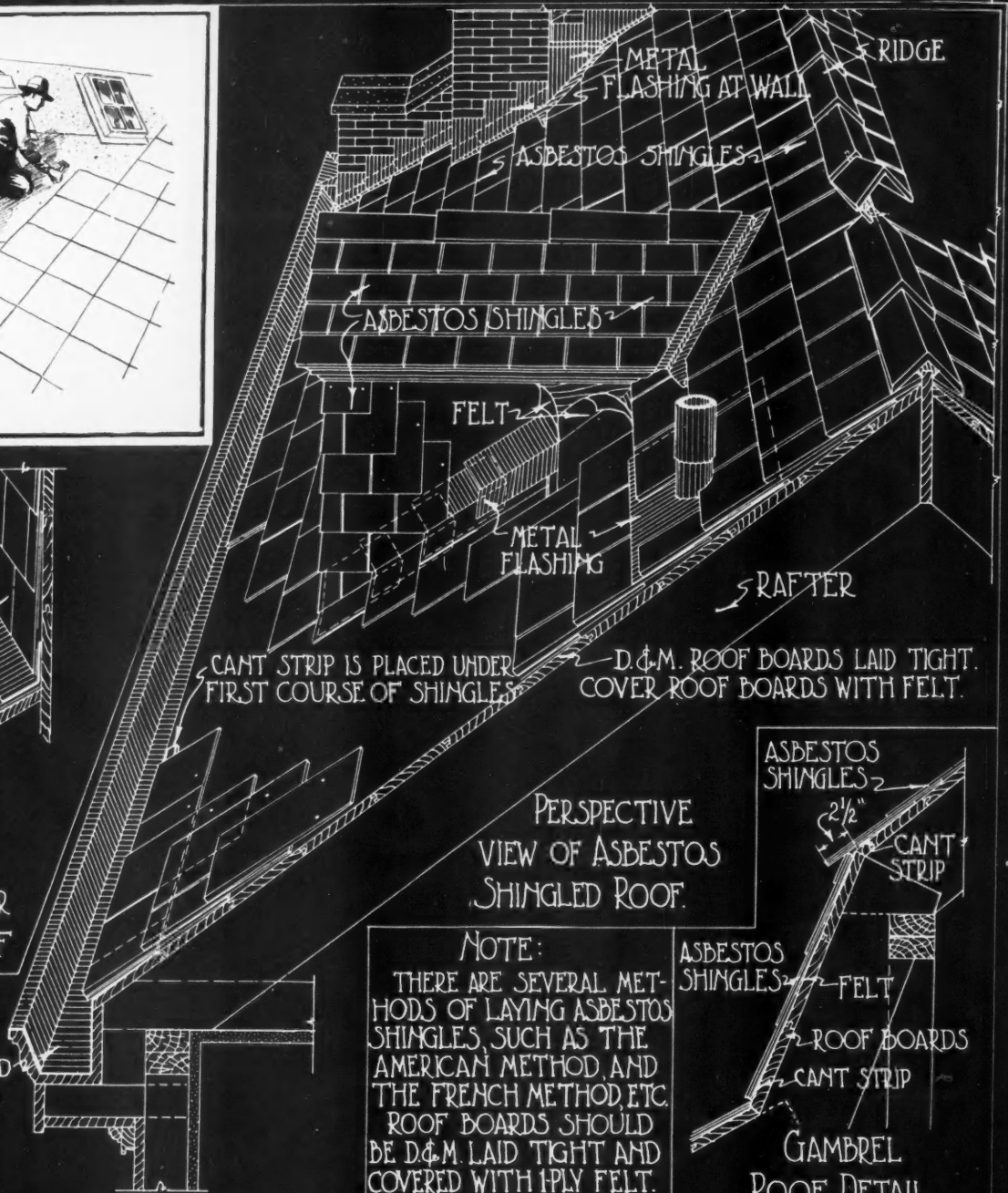
In the American method the same practice is followed in laying the furring strip but in laying the second course of shingles they are placed with the long edge at right angles to the eave line entirely covering the line of starters to the break joints. The next course is laid in the same way only exposing the shingle directly below it 6 inches to allow for the minimum head lap of 2 inches over the shingle in the second course below which only runs up 8 inches. The balance of the roof is covered with shingles laid perpendicularly. Each shingle should be nailed with two nails as indicated by the nail holes in the shingles, but should not be driven too tight.

RECOMMENDED CONSTRUCTION



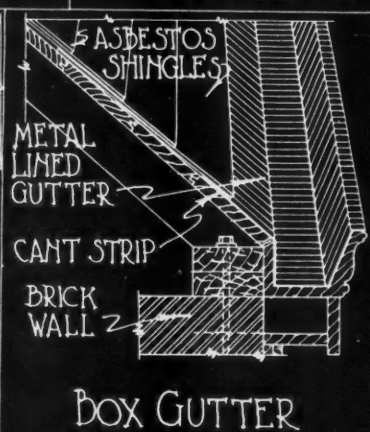
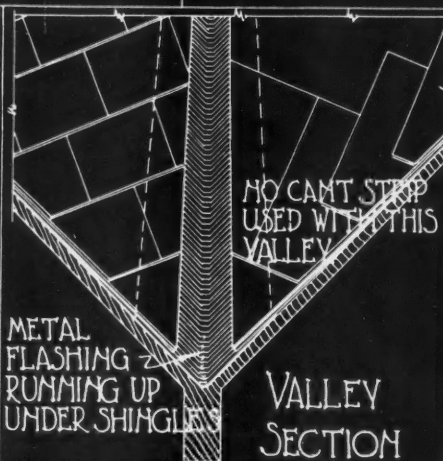
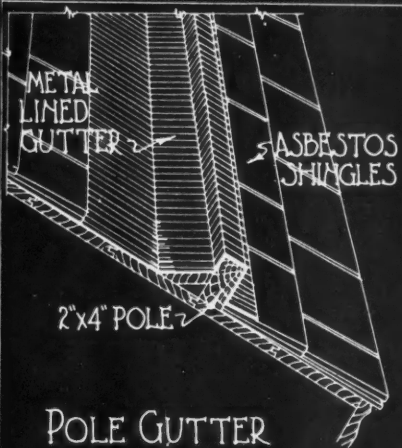
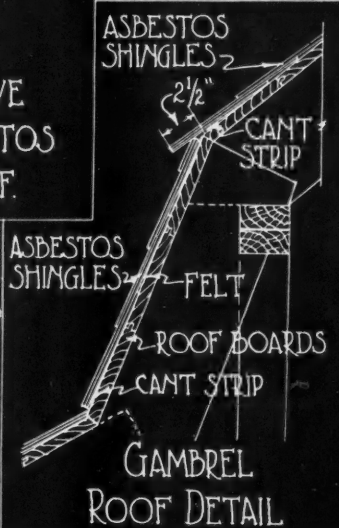
FLASHING FOR LEAN-TO ROOF

METAL LINED GUTTER

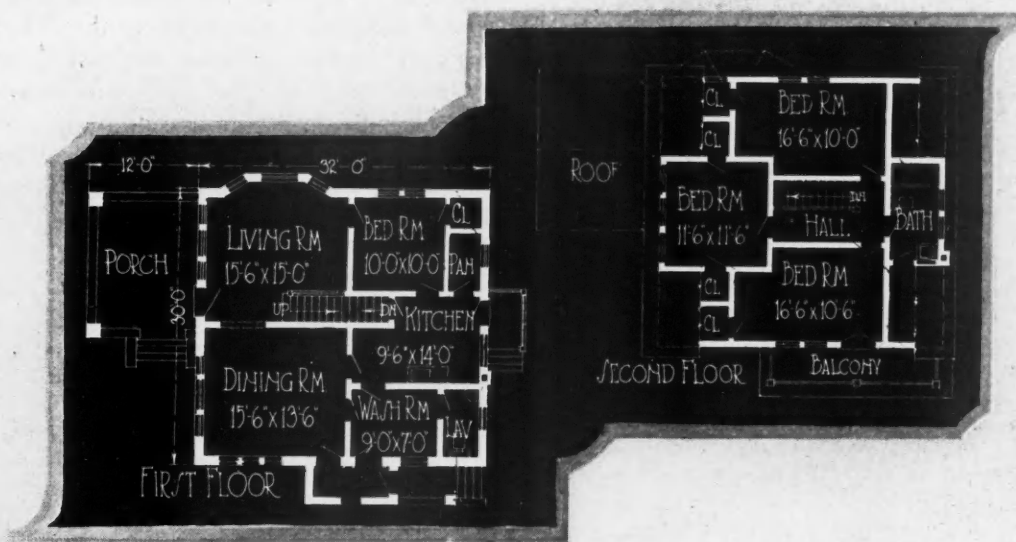


PERSPECTIVE VIEW OF ASBESTOS SHINGLED ROOF.

NOTE:
THERE ARE SEVERAL METHODS OF LAYING ASBESTOS SHINGLES, SUCH AS THE AMERICAN METHOD, AND THE FRENCH METHOD, ETC. ROOF BOARDS SHOULD BE D. & M. LAID TIGHT AND COVERED WITH PLY FELT.



ASBESTOS SHINGLES



SUBSTANTIAL STORY-AND-A-HALF HOME. This type of dwelling continues to hold its popularity because of its convenience for a medium-sized family. Built of brick with stucco on the half story, it is unusually substantial and well designed. The roof has been covered with asbestos shingles similar to those shown in detail on the opposite page. This home contains seven rooms, four on the first floor and three upstairs. The front entrance opens directly into the living room which is well lighted by a triple window facing the porch and a bay on the side. The dining room, kitchen and wash room make up the remainder of the lower floor. The bedrooms, three in number, are above. Two of them are very comfortable being 16 feet 6 inches by 10 feet 6 inches and 10 feet. The house is 30 by 32 feet.

A Practical Method of Figuring on Wallboard Work

By E. L. Petzing

EDITORS NOTE: This is the first of a series of instructive articles by E. L. Petzing, Manager of Builders' Service Department of the Beaver Board Companies, written to give carpenters and contractors a better idea of how to handle wallboard estimates and designing. The author has spent six years working personally with carpenters on wallboard work with the result that hundreds of wallboard jobs have been successfully secured for those carpenters by the careful attention given to designing and estimating; resulting in satisfaction to the consumer and a fair and satisfactory profit to the carpenter. Those jobs ranged all the way from simple remodeling work to elaborate public building interiors.

This first article dwells on the preliminary work necessary for a successful bid—the laying out of a room and the making up of the material list. The figuring of the labor will follow in a succeeding article.

It will be worth any carpenter's time to read and study this and all succeeding articles.

THERE are very few towns today of a population of 500 or over which boast of a building material dealer where wallboard is not carried in stock. These dealers have recognized the demand for wallboard and its advantages, and are increasing their general business by selling it.

Many carpenters have overlooked the long range of opportunities which wallboard gives them for increasing their business and the writer feels that this is partly due to the fact that heretofore there has been no standard worked out to enable the carpenters to figure on wallboard work intelligently to assure them that they will come out "on the right side of the fence."

This lack of a standard way of figuring has led to a hesitancy on the part of carpenters to bid on wallboard work or to recommend wallboard where it could be used to advantage. On the other hand, in a great many cases, to insure "coming out on the right side of the fence" figures too large have been submitted, resulting in the loss of the job in view and therefore discouraging the use of wallboard.



Photo of Room Before Using Wall-Board Which These Sketches and Material Lists Illustrate. Plans A, B, and C Show This Living Room Remodeled with Wallboard in Three Different Ways. Note the Wide Difference in Material Required and Cost.

Wallboard cannot be figured the same way plaster is figured; neither can the cost of one wallboard job be used as a basis for figuring another job, unless both jobs bear a great similarity one to the other in size, design and detail of trim. The safest way is to figure each job individually until such a time when you have done a great many varieties of jobs and kept accurate cost records of them; in which case you might use the cost of a former job as a basis for figuring a similar new job.

In the succeeding paragraphs, the writer will endeavor to explain a method which he has used suc-

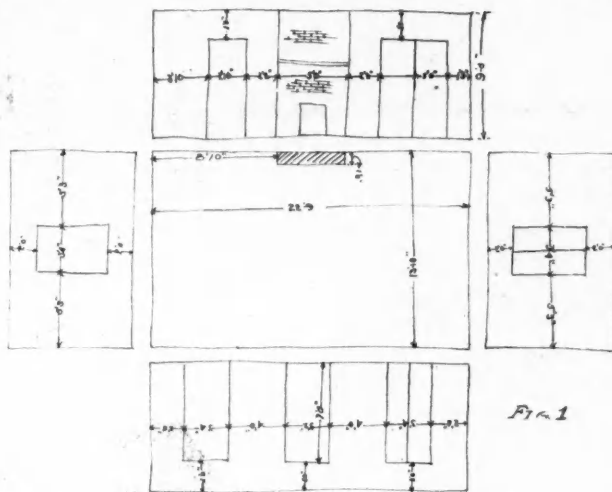


Fig. 1. Rough Sketch of Walls and Ceilings of Each Room.

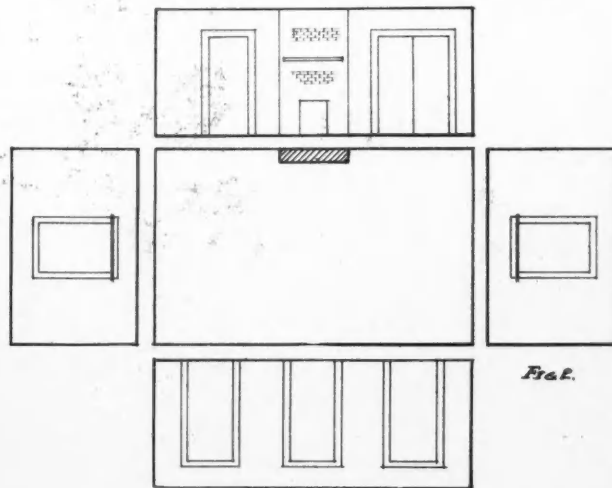
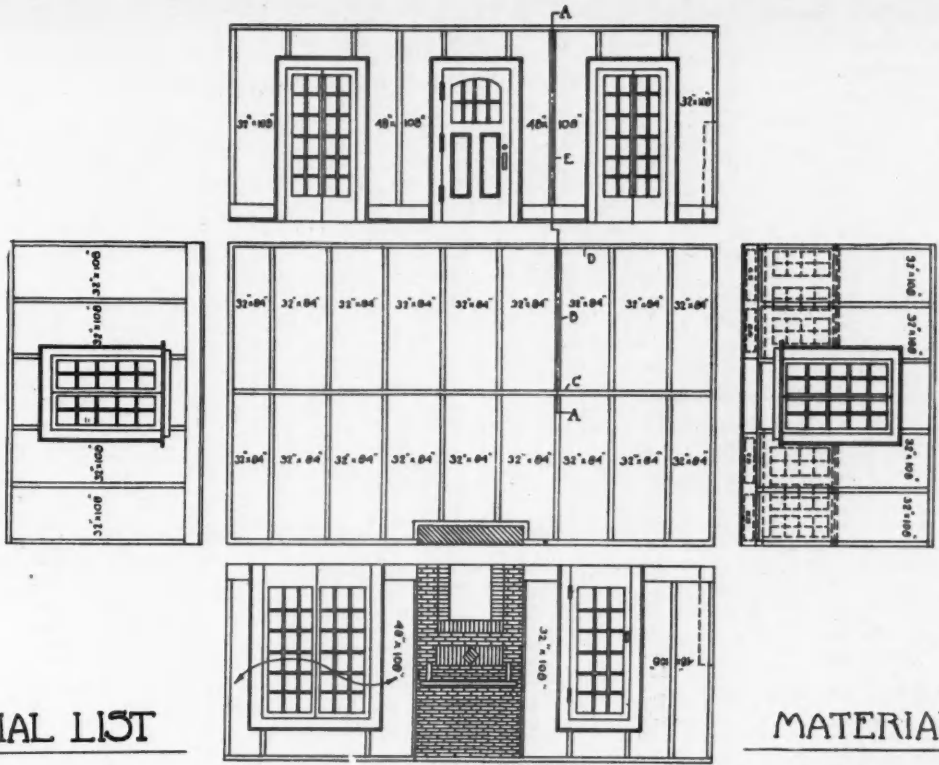


Fig. 2. Finished Sketch Drawn to Scale.

cessfully over a period of six years, figuring only on wallboard work in all classes of buildings.

First, a rough sketch of the walls and ceiling of each room should be drawn. A good method of laying out these sketches is shown in Figure 1. The measurements should be taken and filled in as shown.

From this rough sketch a new drawing should be made and drawn to one-quarter or one-half inch scale, showing all openings in their proper position. See Figure 2. Then a panel arrangement for the



MATERIAL LIST

WALL BOARD

18- 32'x84'	336	SQ FT
11- 32'x108'	264	..
1- 48'x96'	32	..
4- 48'x108'	144	..
1- 48'x120'	40	..
	<u>816</u>	..

SIZE: 22'-9" x 13'-10" x 9'-0"

MATERIAL LIST

TRIM

78- LIN' FT.	3" SPRUNG MOULD
18- Pcs	3/8 x 2 3/4 - 9'-0" Long
4- "	" " 12'-0" "
8- "	" " 14'-0" "

BATTENS

This List does not include door or window trim nor baseboard

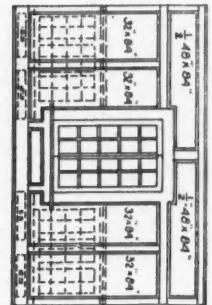
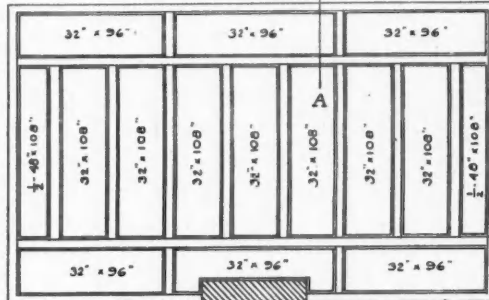
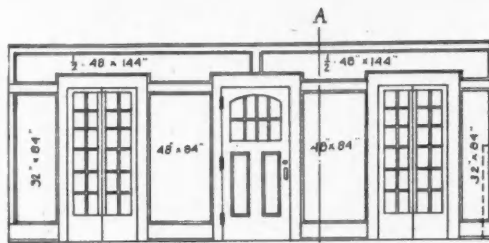
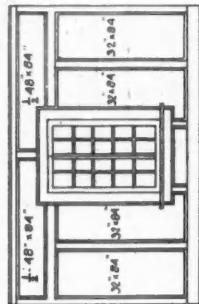


Plan A. See This Same Room Finished According to Plan B or C, Then Compare the Material List and You Will See the Difference in Cost on the Same Job When Different Trim Is Used.

MATERIAL LIST

WALL BOARD

11- 32" x 84"	205 ¹ / ₃	59 FT
6- 32" x 96"	128	" "
7- 32" x 108"	168	" "
6- 48" x 84"	168	" "
2- 48" x 108"	72	" "
1- 48" x 144"	48	" "
<hr/>		
	789 ¹ / ₃	59 FT.



MATERIAL LIST

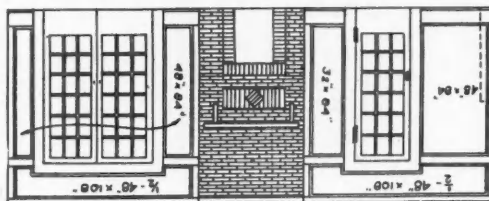
TRIM

WITH FLAT BEAMS

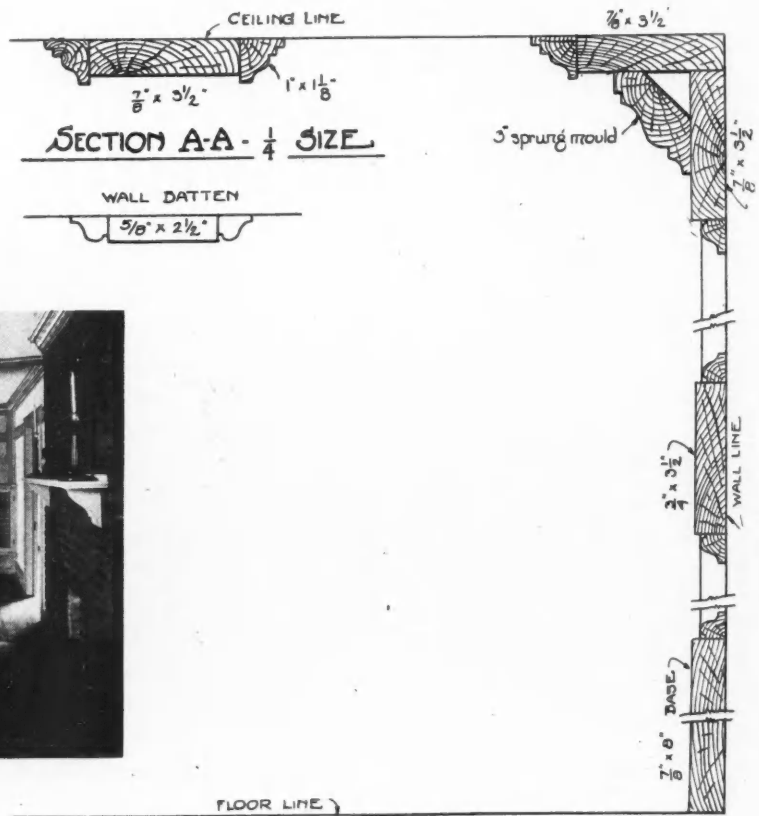
6 Pcs $\frac{7}{8}$ " x $3\frac{1}{2}$ " - 9'	} 282 Lineal feet
12 " " " 12'	
6 " " " 14'	

- 324 lin ft $1 \times 1\frac{1}{2}$ " Cove for ceiling
- 76 " " 3" sprung mould
- 40 " " $\frac{3}{4}$ " x $3\frac{1}{2}$ " Dorder Mould
- 7 Pcs $\frac{5}{8}$ " x $2\frac{1}{2}$ " - 16' long Wall batter.
- 444 lin ft $\frac{5}{8}$ " x $\frac{3}{4}$ " spec panel mould

All door & window trim and baseboard should be square edge material, no moulded edges



SIZE: 22'-9" x 13'-10" x 9'-0"



Plan B. This is the Same Room as Shown in A and C. Note the Difference in Material Cost Thru the Use of Different Trim for the Same Job.

walls should be decided upon. (See Figures A, B, C, D, and E.) The panel arrangement selected should be incorporated with Figure 2 as shown in Figure 3. Stock size panels may be secured in 32 and 48-inch widths and in lengths from six to twelve feet to enable you to carry out any design selected and to arrange the panels in a uniform manner. To obtain a uniform arrangement it is often necessary to trim stock size panels slightly.

The completion of Figure 3 allows the taking off of an exact list of the wallboard in the sizes required; no more, no less than is needed. Figure 3 is then used as a working plan by the carpenter who does the work. This plan will save labor in the work of application so the time spent in making it can well be afforded.

The next step is to decide on the trim or mouldings. The selection of the trim will be the deciding factor in the cost of the job, for the reason that no matter which wallboard design may be decided upon, the actual square footage used in the work will differ but slightly. Where there is a difference in the square footage, it is due to a slight waste in fitting panels which cannot be eliminated, but which is so small that it has no vital influence on the cost of the job.

As stated, the trim is the deciding cost factor, not only its own cost, but also in the labor cost and, next to the panel arrangement, is the most important in producing a plain, ordinary job or an elaborate one. This fact is best illustrated by photographs A, B, and C and the accompanying working drawings showing the same room finished in three different ways.

Observe the difference in the material lists; you will see that there is no great difference in the square footage of wallboard listed but there is considerable difference in the amount of trim needed.

The writer suggests having each of these lists priced by your local dealer to give an idea of the cost difference of the trim. However, the difference in expense of the trim is justified by the finished result of the room.

In view of the fact, therefore, that the trim, to a

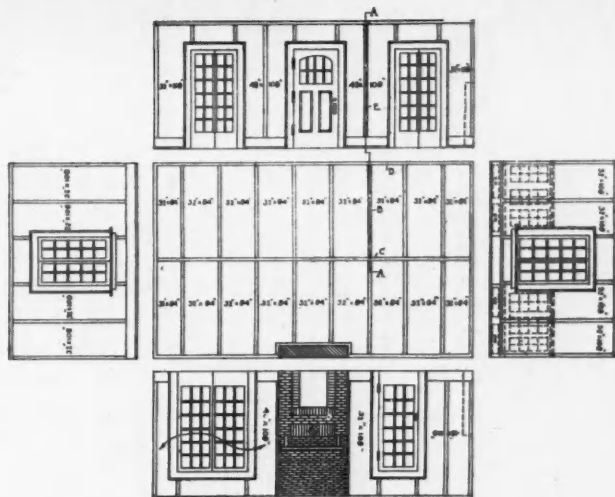


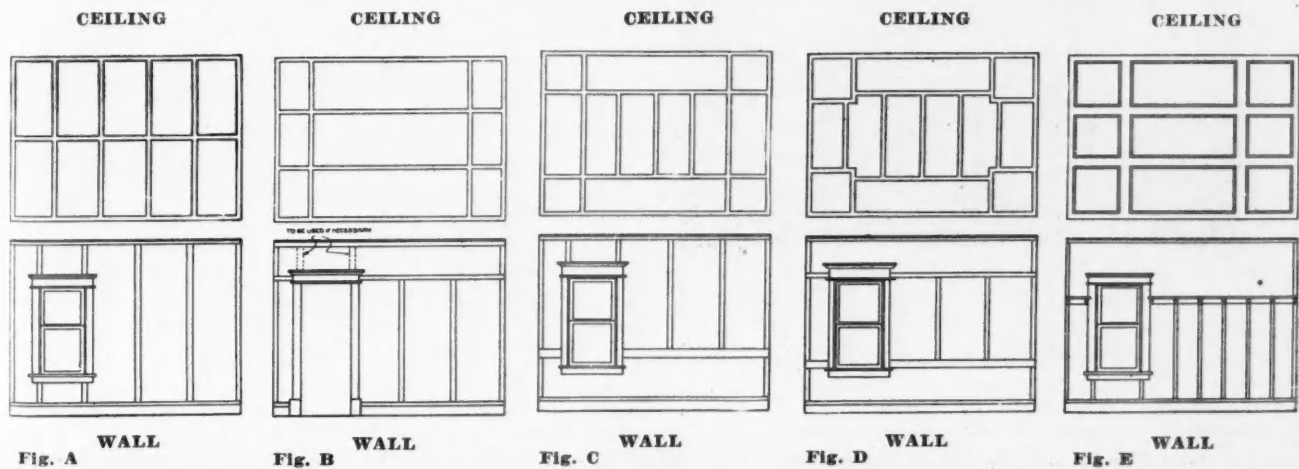
Fig. 3. Showing Panel Arrangement Incorporated in Fig. 2.

great extent, affects not only the appearance of the finished job, but also the cost, the carpenter must discuss this matter thoroly with his client, pointing those facts out to him before deciding on the trim.

It should be explained clearly to the client that plain, light mouldings will produce a neat appearing room but that if a more elaborate effect is desired, a different selection of mouldings will produce it but at a corresponding increase in the cost. The decorations, of course, play an important part and care should be used in selecting the wall and ceiling colors and in the selection of finish for the trim.

When a trim has been decided upon, it is a simple matter to take off a list of the different mouldings needed from the drawing previously prepared.

It will be of interest to the readers to know that most wallboard manufacturers maintain service departments which furnish complete plans and working drawings to carpenters without charge. All that is necessary is to send them drawings of the work in view similar to Figure 1. In addition to working up these drawings, they furnish a list of wallboard needed and offer suggestions for trim and decoration, thus saving the carpenter the time of designing the job and effecting a time saving for him in the labor. These working drawings enable the carpenter to handle the job in a systematic and economical manner.

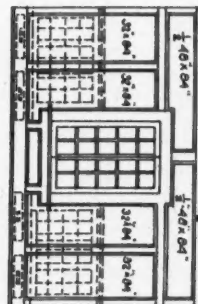
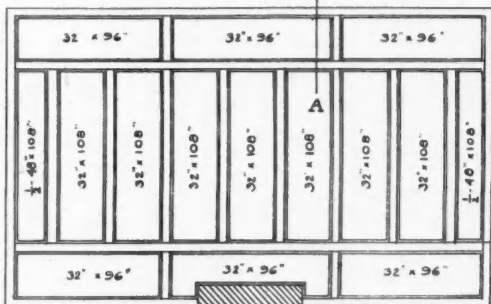
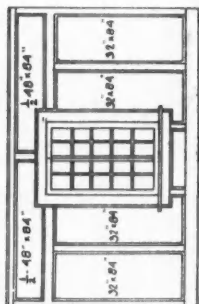
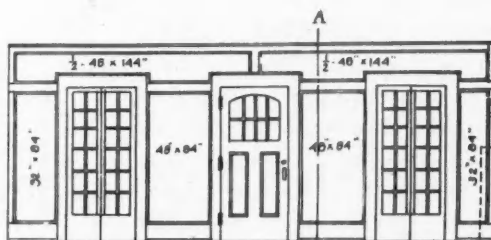


Different Panel Arrangement Which Can be Used.

MATERIAL LIST

WALL BOARD

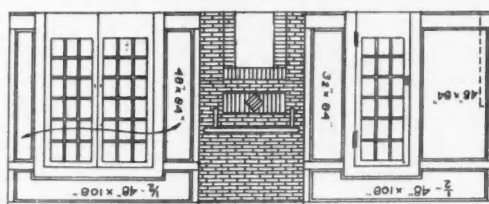
11- 32" x 84"	205 $\frac{1}{3}$	SQ FEET
6- 32" x 96"	120	" "
7- 32" x 108"	168	" "
6- 48" x 84"	168	" "
2- 48" x 108"	72	" "
1- 48" x 144"	48	" "
789 $\frac{1}{3}$		SQ FT



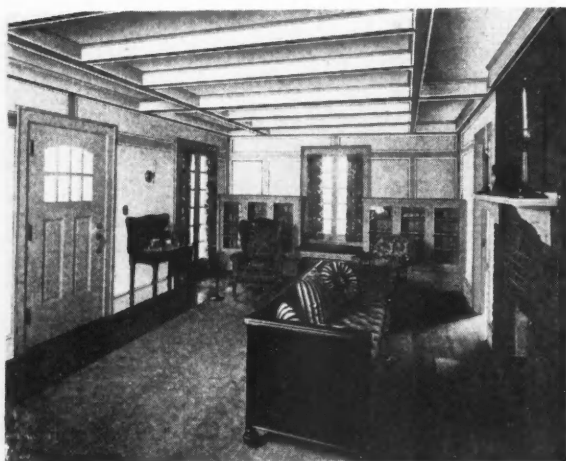
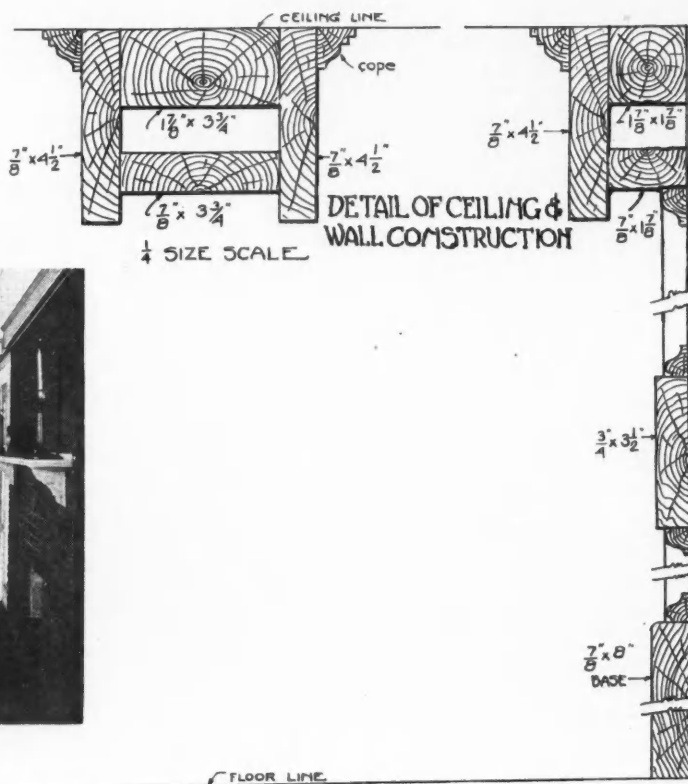
MATERIAL LIST

TRIM
WITH BOX BEAM

76 Lin ft Half-Beam	$324 \frac{1}{8} \times 4 \frac{1}{2}$ $124 \frac{1}{8} \times 3 \frac{3}{4}$ 343 $76 \frac{1}{8} \times 1 \frac{7}{8}$ $124 \frac{1}{8} \times 3 \frac{3}{4}$ $76 \frac{1}{8} \times 1 \frac{7}{8}$
124 " " Full " "	
40 Lin ft $3 \frac{3}{4} \times 3 \frac{3}{4}$ Border Mould	
4- $5 \frac{5}{8} \times 2 \frac{1}{2} \times 12'$	
2 " " " " 14'	} Wall Batten
7 " " " " 16'	
444 Lin ft $5 \frac{5}{8} \times 3 \frac{3}{4}$ spec' Panel Mould	



SIZE-22'-9" x 13'-10" x 9'-0"



Plan C. This is a Further Illustration of the Room Shown in Plan A and B, But with a More Elaborate Panel Scheme. Note the Difference in the Material List on Trim as a Result.

The Largest Stage in the World

ENORMOUS MOVING PICTURE PLATFORM CONTAINS 36,000 SQ. FT. AND WAS BUILT IN FORTY-SEVEN DAYS

By T. B. Brownfield

ALL the world's a stage" is the way Shakespeare said it. If he were living today, he would see a stage that would measure quite near to his idea of size, for at the Robert Brunton Studios, a large moving picture plant, located in Los Angeles, is the largest dark stage in the world, just nearing completion.

The floor space of this stage is 36,000 square feet, 30 feet in clear, interior, which allows for "sets," movie scenery, 30 feet in height to be placed on the stage. On the exterior, the buildings run 51 feet in height to the top.

The stage is set on a concrete foundation and is plastered finished on the exterior, conforming in appear-

ance to the other stages and executive buildings of the Brunton Studios.

This stage has been constructed in just forty-seven days, and within a short time scenes will be made that will flash on the screens of the moving picture theaters of the world, and audiences will soon be enjoying pictures that were taken on this stage.

Many "sets" can be placed on this stage at one time and therefore many scenes can be taken at one time on this immense stage. At one end there may be filmed a cabaret scene, another space may be the interior of a court room, another space may be the waiting room of a railway station, and all these varied scenes will be under this one roof, size 300 by 120 feet.



Largest Stage in the World, a Feat of Modern Building Skill. It Contains 36,000 Square Feet and Was Completed in Forty-Seven Days. It Is 300 by 120 Feet.

Heating by the Pipeless Method

NEW AND POPULAR TYPE FOR COUNTRY HOMES AND BUNGALOWS SHOWN IN DETAIL ON PAGE 101

ONE of the most interesting developments in the heating field in the last few years is the pipeless furnace. It has been received very favorably by owners of small homes, bungalows and farm homes. It enjoys its popularity because of its economy and ease of installation.

In the pipeless furnace the principle is very simple. A large register is placed directly over the furnace. The cool air which lies close to the floor is drawn down thru the outer divisions of this register. It falls to the bottom of the furnace where, becoming heated, it rises into the upper chamber and from there passes out thru the center part of the large register.

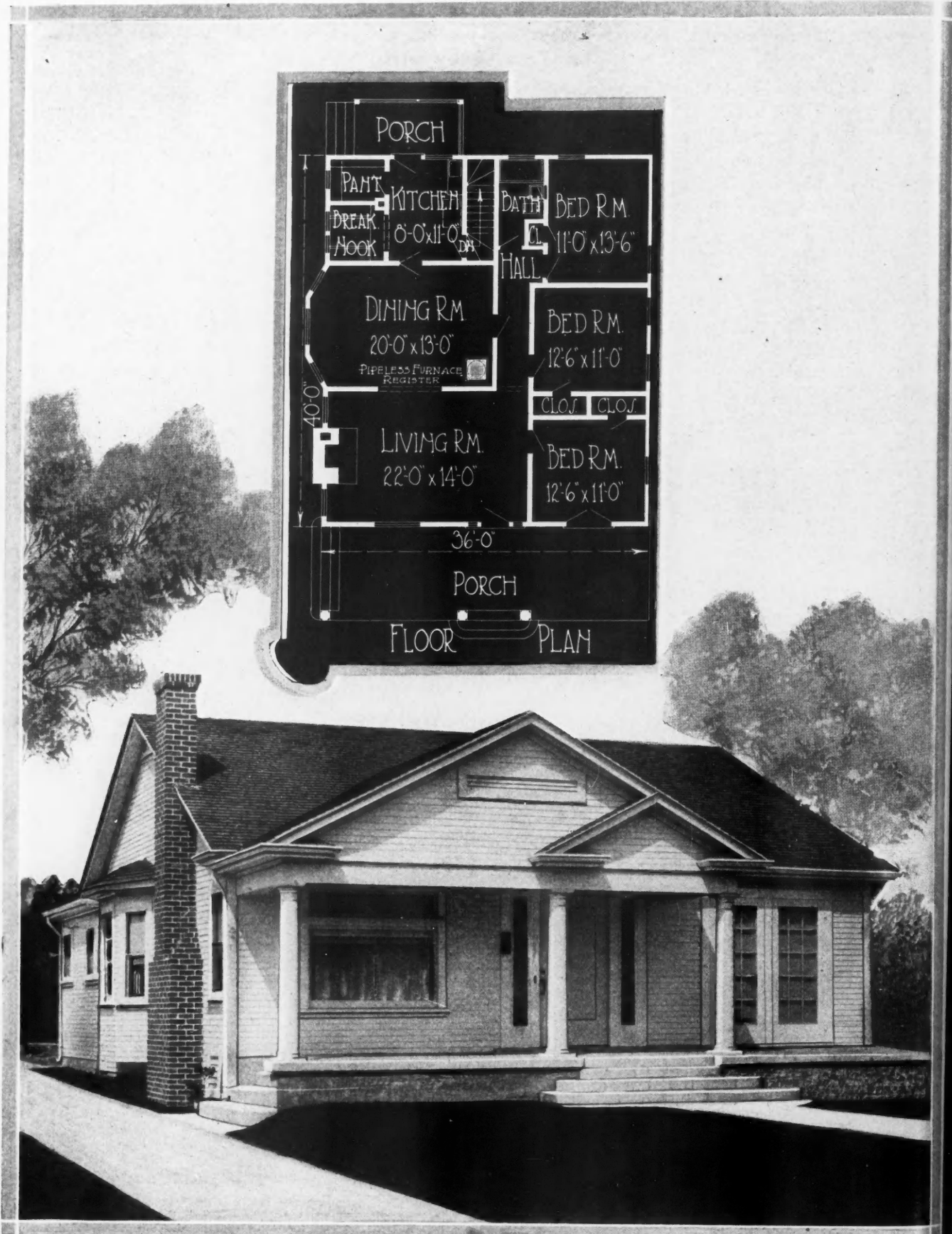
Here the warm air rises and goes thru the house. As there is only one large register furnishing a supply of warm air it is important that the doors between rooms be open to get the benefit of the warm air. When the air cools it falls and descends thru the register into the furnace chamber to be re-heated.

To secure the best results from a pipeless furnace there are two things that should be considered, the location of the furnace and the large register which supplies the entire home with heat. This register should be centrally located so that the warm air rising thru it will strike the ceiling and be deflected to all parts of the house. Naturally the furnace will be located in the same position in the basement as the register is directly above it.

The most suitable location for the opening is between the two main rooms of the house and near an open stairway. Where there is a room that is likely to be shut off, like a bathroom, it is often connected to the hall or other rooms by a wall register placed up near the ceiling where the warm air is circulating.

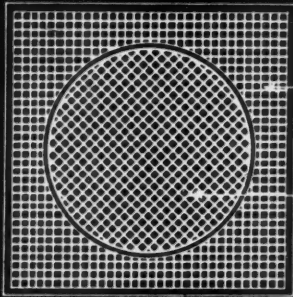
There is considerable choice offered in the kind of register to be used. It may be round or square, flush with the floor, double-faced, set into the wall between two rooms, or a register which can be used as a settee.

Charming Bungalow with Pipeless Furnace Details



CHARMING SIX-ROOM BUNGALOW. A most attractive home with an unusually pleasing exterior and inviting entrance. An open porch and terrace extend the full width of the dwelling. The French doors opening into the front bedroom and the long narrow panels on each side of the door add considerably to the appearance. The floor plan has been designed to provide for six comfortable rooms, of which three are bedrooms. The living room is 22 by 14 feet, and contains the popular open fireplace. Directly to the rear of it is the dining room in which the register for the pipeless furnace is installed. The details of this heating system are shown on the opposite page. The kitchen is small, compact and sufficient for the needs of a home of this size. The bungalow is 35 by 40 feet.

RECOMMENDED CONSTRUCTION

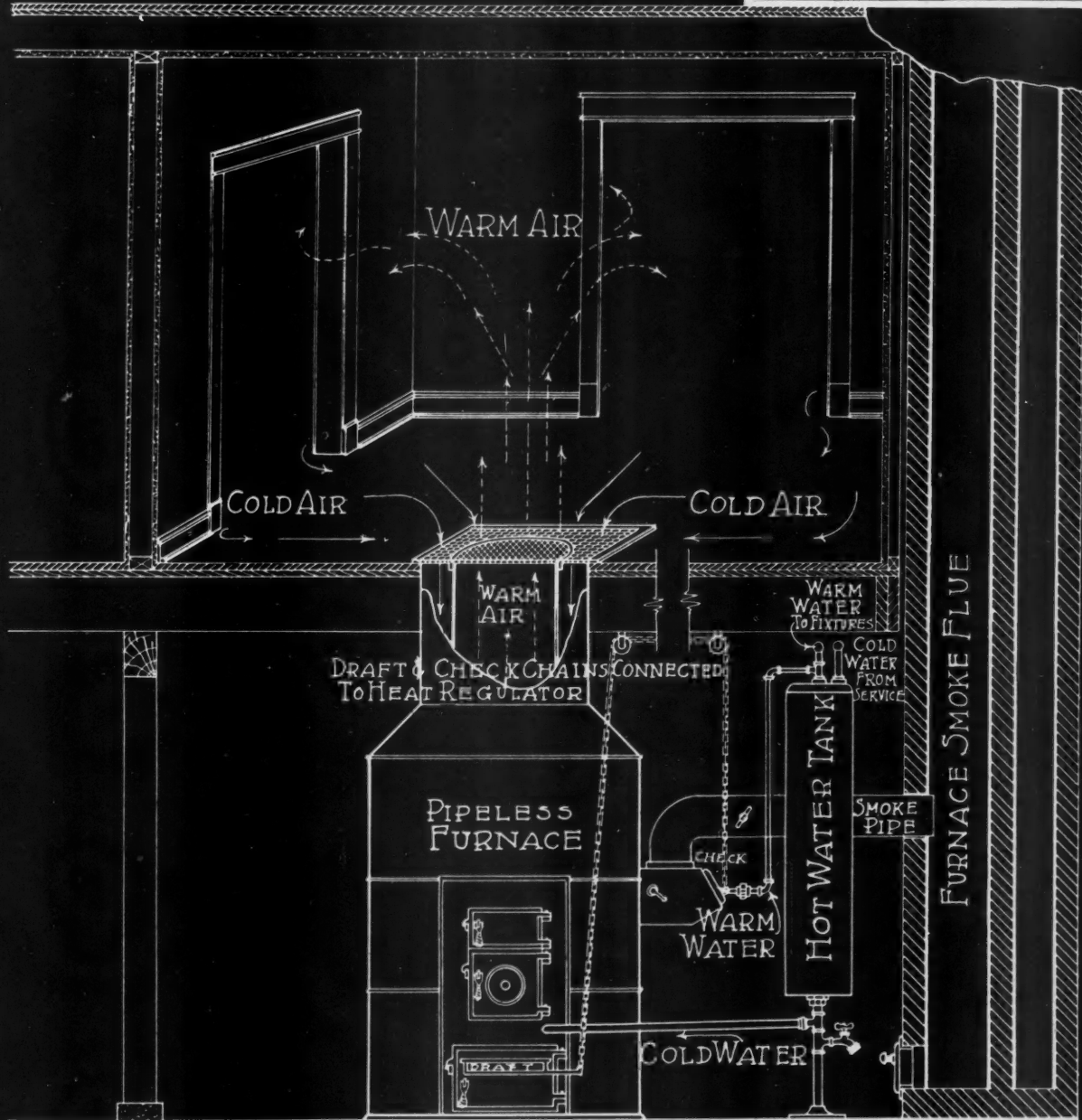


COLD AIR INLETS

WARM AIR OUTLETS



REGISTER FACE OF PIPELESS FURNACE



HOT AIR HEATING PIPELESS FURNACE

ing
the
oor
by
for
hen

Granite Face Concrete Block Cottages

COMPANY SPECIALIZES IN THIS CONSTRUCTION AT PUEBLO, COLO.—RAW MATERIAL NEAR JOB

By A. J. R. Curtis

PUEBLO, the busy steel city of Colorado, has been experiencing much the same trouble as other bustling western cities in the housing of its workmen. There has been an acute shortage of houses. Prominent among the organizations working toward the elimination of this difficulty is the Granitoid Construction Company, which is specializing on cottages and bungalows of smooth granite face concrete block construction. The cement for the product is hauled only a few miles from cement mills near Pueblo.

The houses shown in the accompanying illustrations were built during the summer of 1919. The cottage illustrated in Fig. 1 has six comfortable rooms on the first floor as shown in the plan, Fig. 2. There are also three spacious bedrooms in the attic. The foundations are of concrete placed in forms and walls to the eaves are of 9-inch by 24-inch concrete block, with portland cement stucco on frame above. Since the walls are double with continuous air space between, plaster was supplied directly to the rough interior surface of the block. Sills, lintels, chimney

22½c each, granite face block at 35c each) . . .	\$391.97
Cast pieces, including sills, lintels, caps, columns and fireplace	105.25
Mason labor	173.12
Mortar	17.40
	<hr/>
	\$687.74

The building completed ready for occupancy, occupying lot in good location was fairly priced at \$3,800. The owner is John Roitz.

The dwelling shown in Fig. 3 is similar in general arrangement but has a basement and larger attic, with somewhat reduced plan area.

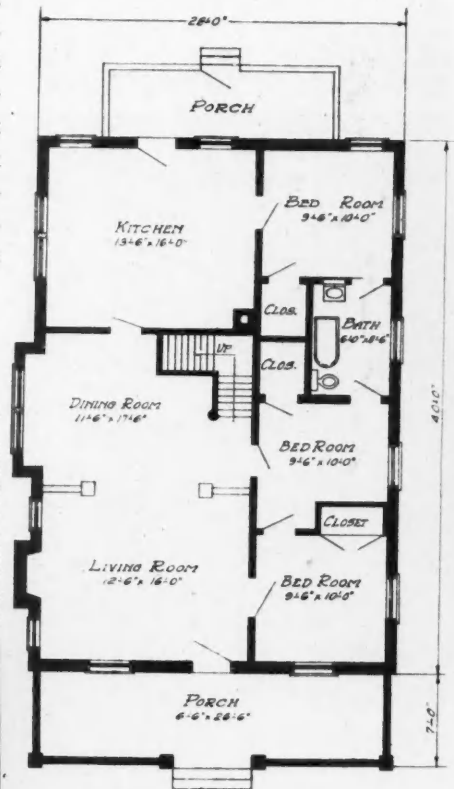


Figure 2.—First Floor Plan of Cottage Shown in Figure 1. In Addition to These Rooms, Three Large Additional Bed Chambers Have Been Provided in the Attic.

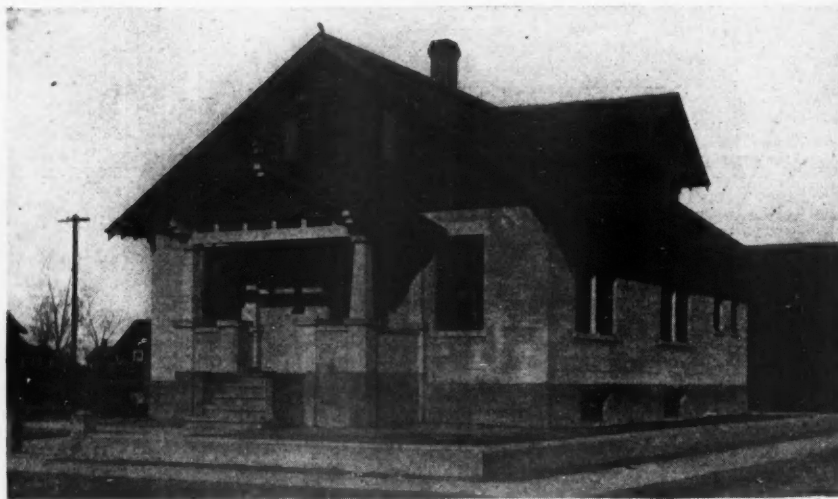


Figure 3.—Home of Louise Auziek, Pueblo, Colo., Also of Double Wall Concrete Block Construction, Similar to the Building Shown in Figure 1.

caps, porch columns and caps and fireplace are of pre-cast concrete units. The roof is of frame and shingle construction.

Actual cost figures on the concrete block portion of this job are particularly interesting and indicate how economical this type of construction has been found. The following figures (May, 1919), do not include contractor's profit nor overhead:

1 two-piece concrete blocks for double wall construction (interior rough block to take plaster at



Figure 1.—Attractive Cottage at Pueblo, Colo. Walls and Chimney Construction Are of Smooth Granite-face Concrete Block. One of the "Home Product" Houses Erected by the Granitoid Construction Company.

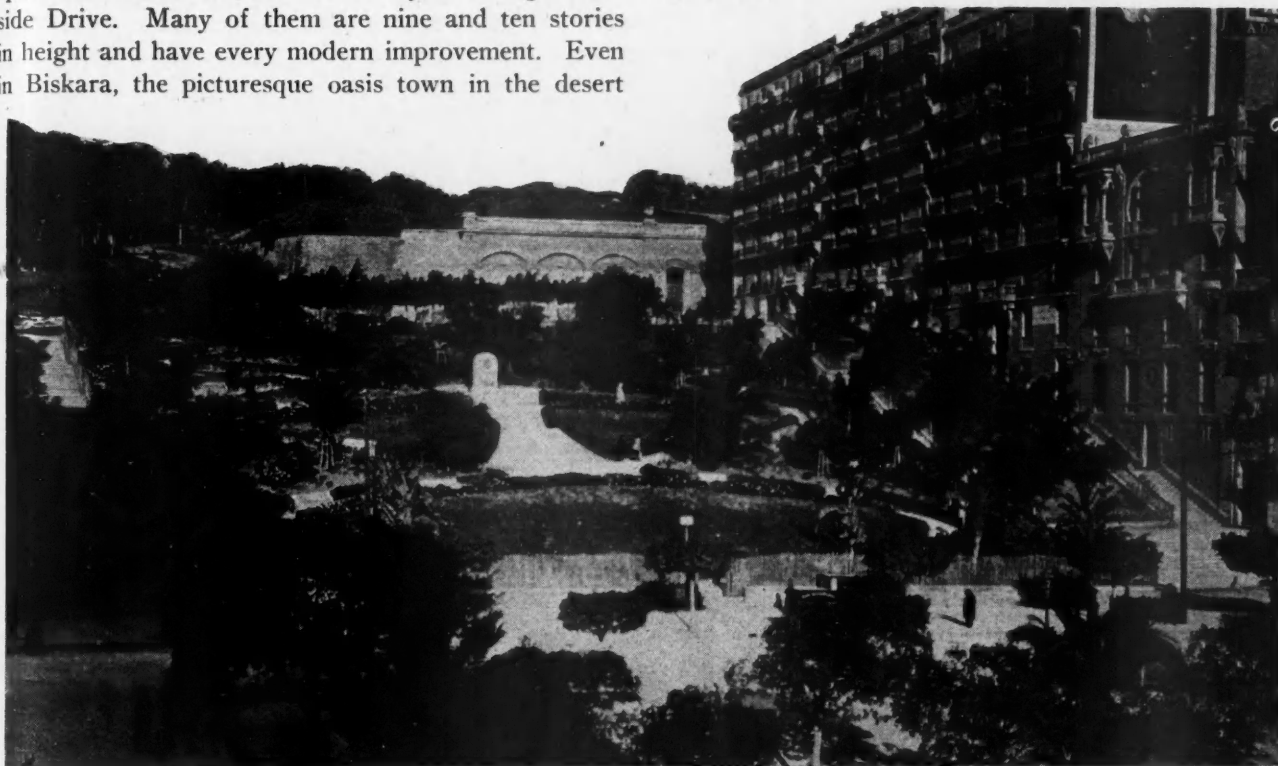
Apartment Houses in Africa

FRENCH HAVE INTRODUCED MODERN BUILDINGS ON EDGE OF SAHARA

THE average American would hardly expect to find modern apartment houses in northern Africa, built on the very edge of the mysterious and barren Sahara, but the French have colonized Algeria and Tunisia, and where the French go they take with them all the comforts of home, even apartment houses. Those in Algiers remind one very much of the newer apartment houses in New York city, fronting Riverside Drive. Many of them are nine and ten stories in height and have every modern improvement. Even in Biskara, the picturesque oasis town in the desert

south of Algiers, are apartment houses.

Recently an American Red Cross camera man visited all of these towns, taking moving pictures. The Arabs had not yet encountered this last refinement of civilization, and when the Red Cross man set up his tripod in the middle of some sun-baked dusty village street, and began to turn the crank, there was generally a scurry for cover.



Some Apartment Houses in Algiers, a French Colony in South Africa. The Buildings Are Quite Modern and Resemble the Latest Buildings on Riverside Drive, New York.

Building the Ash Receiver in the Home

ROTARY DEVICE INSTALLED IN BASEMENT WHEN HOUSE IS BEING ERECTED—DETAILS SHOWN ON PAGE 104

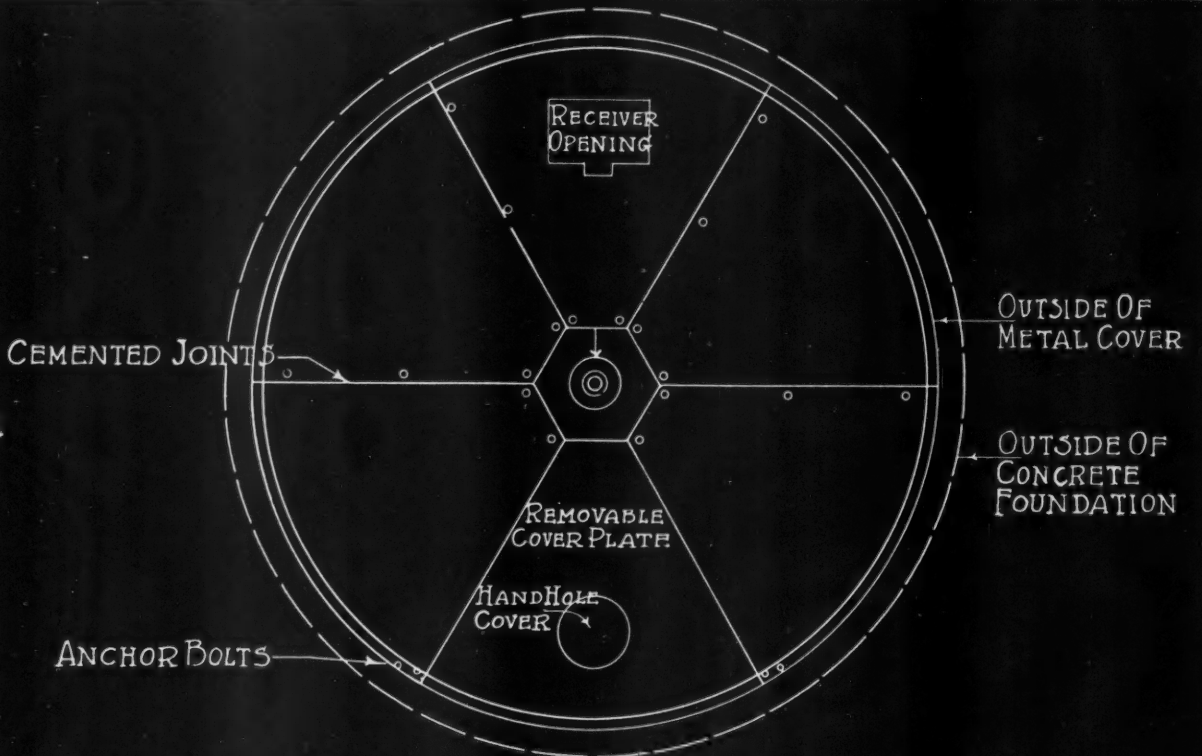
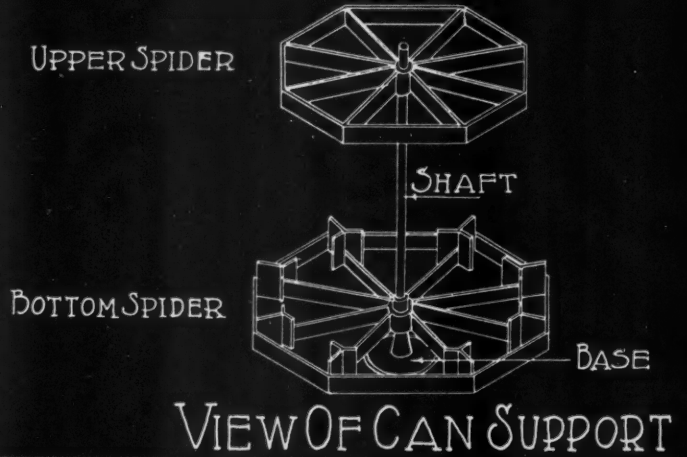
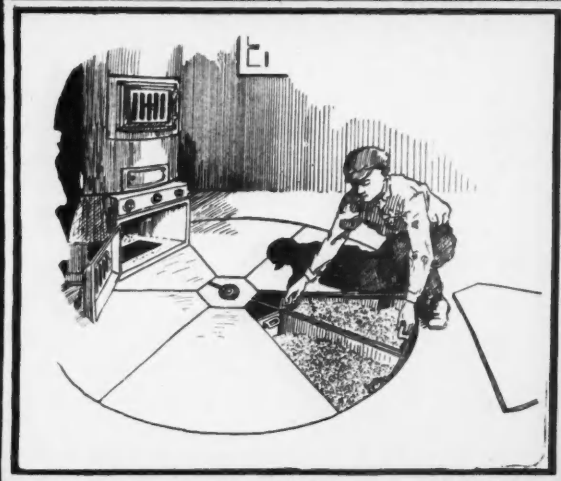
THERE are several things a builder must consider when specifying a heating plant for a home, and among them the method of removing ash is an important one. By providing an ash receiver that will take care of ashes, garbage and refuse, he will do much towards insuring the complete satisfaction of his client. The can system has never been satisfactory because of the labor and dirt involved in taking care of it.

As a permanent substitute which is installed as a part of the building, many builders are now installing rotary ash receivers in the basement under the heating plant. A circular pit is excavated in the cellar bottom so as to extend under the front of the heater above 12 inches. Into this pit is placed the receiver equipment which consists of a metal form containing a series of galvanized cans that revolve on a perpendicular shaft by means of a lever, bringing one can at a time under the ash pit of the furnace. The details of this installation are shown on page 104.

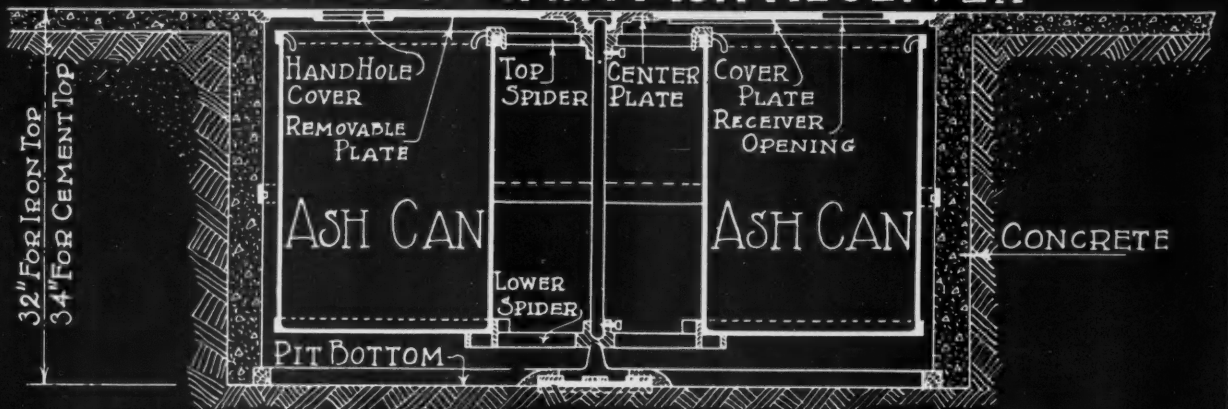
As each can is filled the device is turned until the next can is in position, and so on until all the cans are filled. The whole arrangement is covered with metal plates level with the basement floor, provision being made to receive the ashes thru an opening in the floor of the heater ash pit. One plate is removable and thru this the cans are lifted by block and tackle. Very often a concrete top is used instead of metal.

The installation of this plant is very simple. Any person understanding the mixing of concrete can install one by following the directions issued by the manufacturers. The efficiency of this arrangement is obvious. It increases the basement space by eliminating garbage and ash cans and boxes and cuts the labor of the house owner. It is also used as receiver for garbage and other refuse from the kitchen which can be connected with it by an ash chute. These receivers can hold from 6 to 24 bushels. The cover plates when assembled are airtight to prevent any drafts to the furnace. They are installed in old and new buildings.

RECOMMENDED CONSTRUCTION

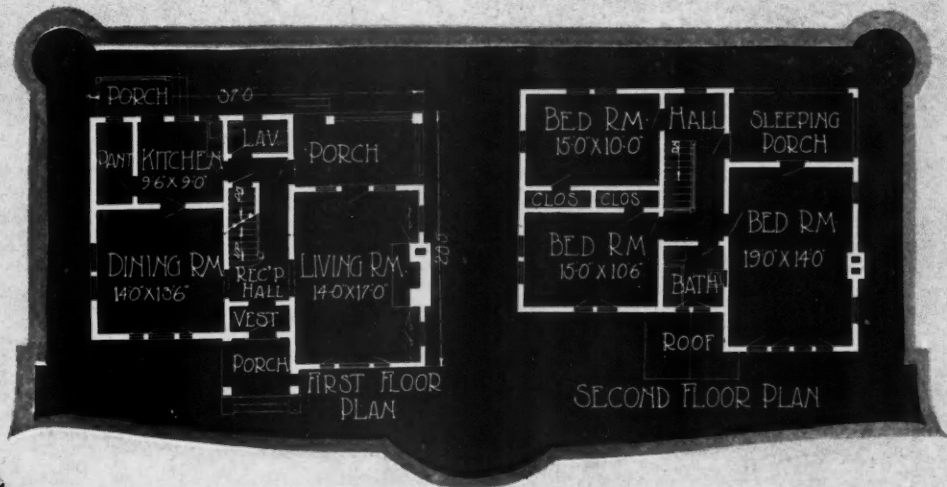


PLAN OF ROTARY ASH RECEIVER



ELEVATION OF ROTARY ASH RECEIVER DETAILS OF ROTARY ASH RECEIVER

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HALF-TIMBER STUCCO HOUSE. Like many other types of houses that originated in England this house is proving very popular over here. It has an atmosphere of comfort and inviting hospitality that is bound to appeal to the real homelover. One of the essential features is the large open fireplace in the living room. There are six rooms in this home with a sleeping porch and sun parlor. The living and dining rooms and kitchen are on the first floor and three bedrooms and bath upstairs. While giving an impression of bigness this home is only 28 by 37 feet.



Mars Hill Housing Project Under Way. The Lafayette Motors Company Are Building 150 Homes for their Employees Near the Plant in Order to make them Contented and Reliable.

Corporation Builds Homes to Hold Employees

LARGE INDIANA MOTOR CONCERN BUILDING 150 HOMES NEAR FACTORY—CONCRETE TILE ROOFS USED THRUOUT

By I. W. Ridge

THE Lafayette Motors Company, at Mars Hill, near Indianapolis, is solving the housing problem for its employees, by a building program for 150 houses, and the first group of houses is now well under way toward completed construction.

The housing of employees, which is one of the serious industrial problems facing manufacturers all over the country because of the general housing shortage, and which has materially added to production costs by increasing the labor turnover, was particularly serious to the Lafayette Motors Company. This plant was established last year, after the general housing shortage had become acute, and at a considerable distance from the heart of the city and with street car service so poor that in order to obtain any kind of service the company had to man the cars with its own employees. Because of these things it was difficult to obtain and hold the kind of employees that were desirable. Few desirable houses were available in the vicinity of the plant, with the result that em-

ployees were living in homes scattered all over the city, in some cases ten miles from the plant.

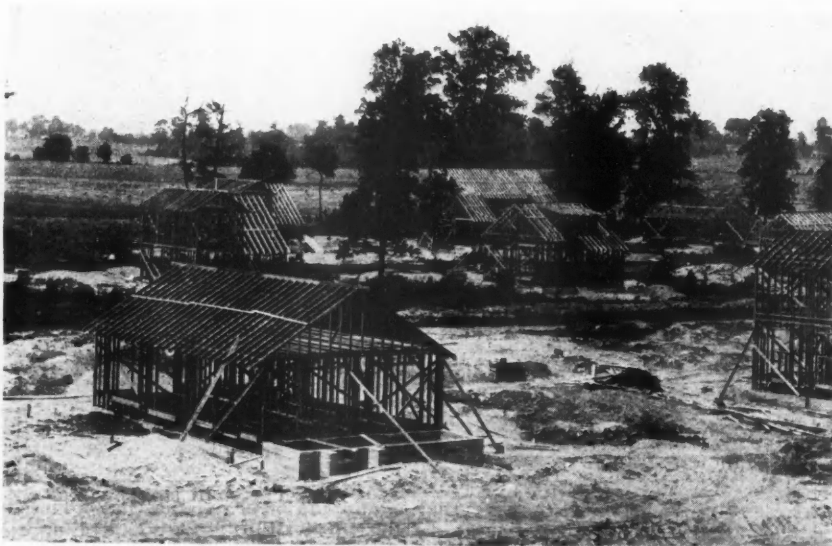
In order to overcome this difficulty, and in order to obtain the type of mechanics and other employees desired, the Lafayette Motors Company started in to provide modern, desirable houses on a plot of ground within easy walking distance of the factory.

The Lafayette Building Company with a capital stock of \$1,000,000, of which \$500,000 was preferred stock, was incorporated to finance and manage the undertaking.

The building company obtained 110 acres of land, formerly the Reardon farm, a short distance west of the factory. The ground was plotted, plans for the houses accepted, a working force organized and the construction of the first group of fifty-three houses started.

Under the present plans sewers will be completed within sixty days and the first of the homes will be ready for occupancy by employees this month. It is the plan of the building company to start immediately on a second group with the completion of the houses now under way.

The houses were designed by J. Edwin Kopf, architect. No two of the houses are alike. They are all modern, well built, and range from a four-room bungalow of disappearing bed type, to a two-story, eight-room house. All will have concrete tile roofs, with basement of poured concrete, laundry, store-room or fruit cellar, furnace, electric lights and electric ranges for cooking. The side walls are of stucco. A number of built-in features are provided, such as mantels, sideboards in the dining room, bookcases and kitchen equipment.



Skeleton Framework in Place Ready for the Lath and Stucco. No Two Houses Are to Be Alike According to the Plan of J. Edwin Kopf, Architect. They Range from the Four-Room Bungalow to the Two-Story, Eight-Room House.



Concrete Tile Roofs Are the Feature of This Housing Project. These Roofs Are of Different Colors. The Homes Are Equipped with Electric Ranges, Light, Heating Plants and Modern Laundry. These Homes Will Be Sold at Actual Cost Plus Carrying Charges.

The layout of the settlement provides for a boulevard system of lighting the streets, and the plans provide small parkways and other means thru proper landscaping to beautify the property.

A short distance to the east of the plot the school authorities of Wayne township plan to erect a modern eight-grade school to serve Mars Hill, Maywood and the new settlement. It will cost about \$100,000. The new county road is to be constructed of concrete.

The building company plans to sell the houses to the employees of the Lafayette Motors Company, on the payment basis. The houses will be sold at the

actual cost of construction plus the carrying charges of the money involved.

Work has been almost completed on 53 of the houses. Each one is to have a concrete tile roof, made by the Indiana Concretile Company.

These concrete roofs come in a variety of colors, altho the silver grey is most preferred. This type of roofing lends itself admirably to varied styles of architecture and the silver grey finish harmonizes and blends with any color scheme.

The weight of a concrete tile roof is 750 pounds to the square.

Hot Air Heating Systems

PRINCIPLES OF OPERATION AND GENERAL METHODS OF INSTALLATION SHOWN IN DETAIL ON PAGE 109

HOT air heating is one of the oldest types of heating used, aside from stoves, in the country and is still very popular. The fundamental principle upon which it is operated is very simple; it provides for the entrance of cold air into the house thru a register. This air then passes thru a pipe or duct into a jacket which surrounds the heating plant. Warmed here, it naturally rises and passes thru large pipes to the various rooms above.

Some of the objections to hot air heating can be entirely avoided if sufficient care is used by the builder in the selection and setting up of the furnace and in its upkeep. The wise location and proper proportion of flues and registers will eliminate complaint arising from odors, etc. The cause in many cases of unsatisfactory heating by this method is due to the refusal of the owner or builder to pay the necessary price for a first class furnace and materials.

In the pipe type of heating system it is important to have the pipes larger and free from sharp bends and turns as any friction will tend to stop the pressure of warm air which is not very strong. Another efficient way to conserve heat in these pipes is to carefully cover them with insulating material, generally an asbestos combination. This covering tends to keep the heat in the pipes and prevents it from being dissipated over

the basement before it reaches the upper floors.

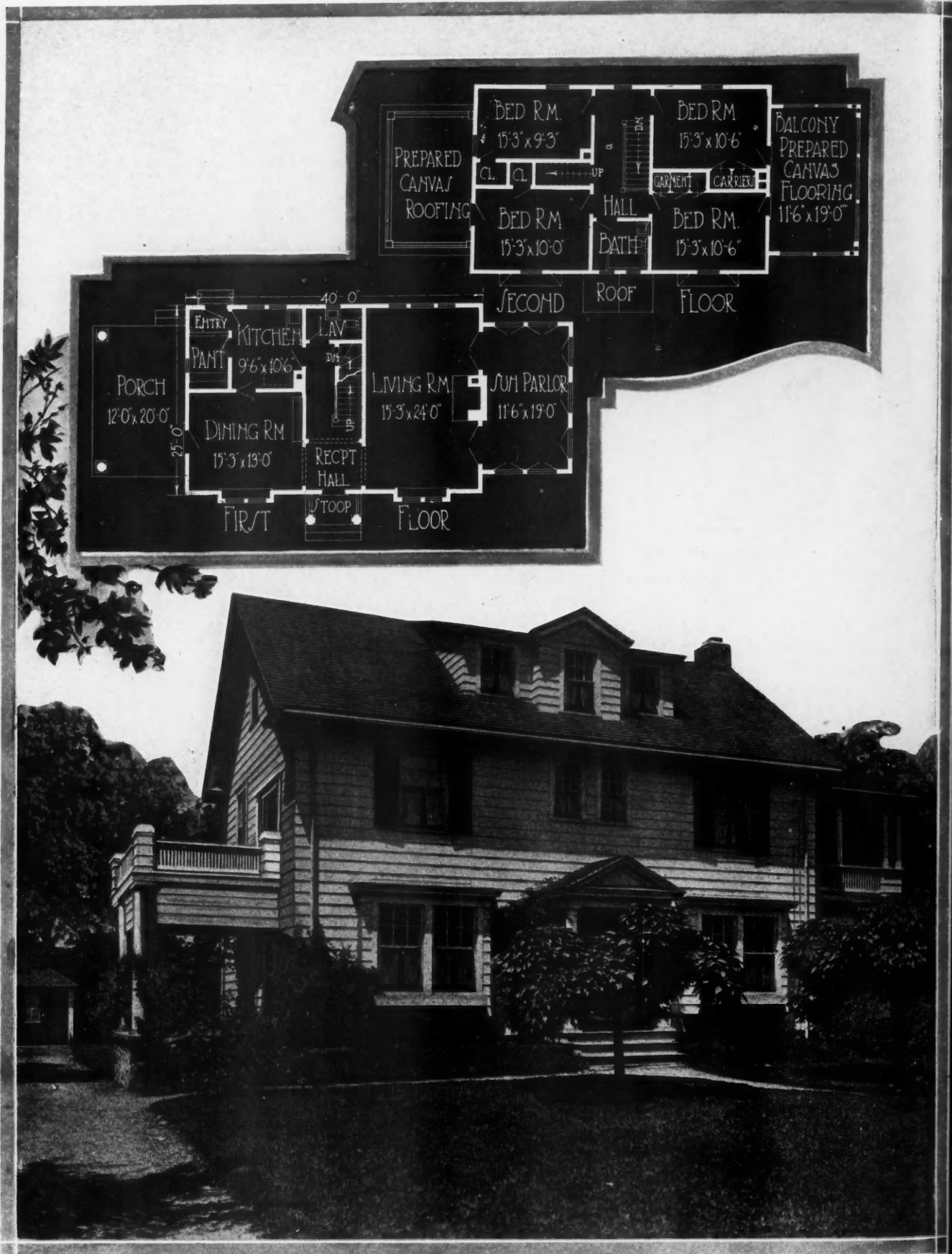
The supply of air enters into the chamber at the bottom of the furnace and as it gradually becomes heated rises and leaves thru the pipes. As this warm air enters the room it rises to the ceiling and spreads out horizontally. It will not mingle with the cool air in the lower part of the room. This cold air is drawn down the register by gravity and furnishes part of the supply of air for the furnace.

In the pipe furnace it is not always necessary to have a separate outlet for each room but very often one large opening in the living or dining room will be sufficient for several rooms.

Builders should bear in mind when planning furnace installation that air moves freely in straight lines and any bends or turns will retard its flow. Also warm air tends to rise vertically and if it is forced horizontally it naturally loses some of its force. The furnace should be so placed as to have as short a pipe as possible and as straight. The height of the cellar in which the furnace is placed has an important effect on its heating efficiency. Seven feet is a good height for better delivery of heat. If it is less than this, it is advisable to place the furnace in a depression in the floor.

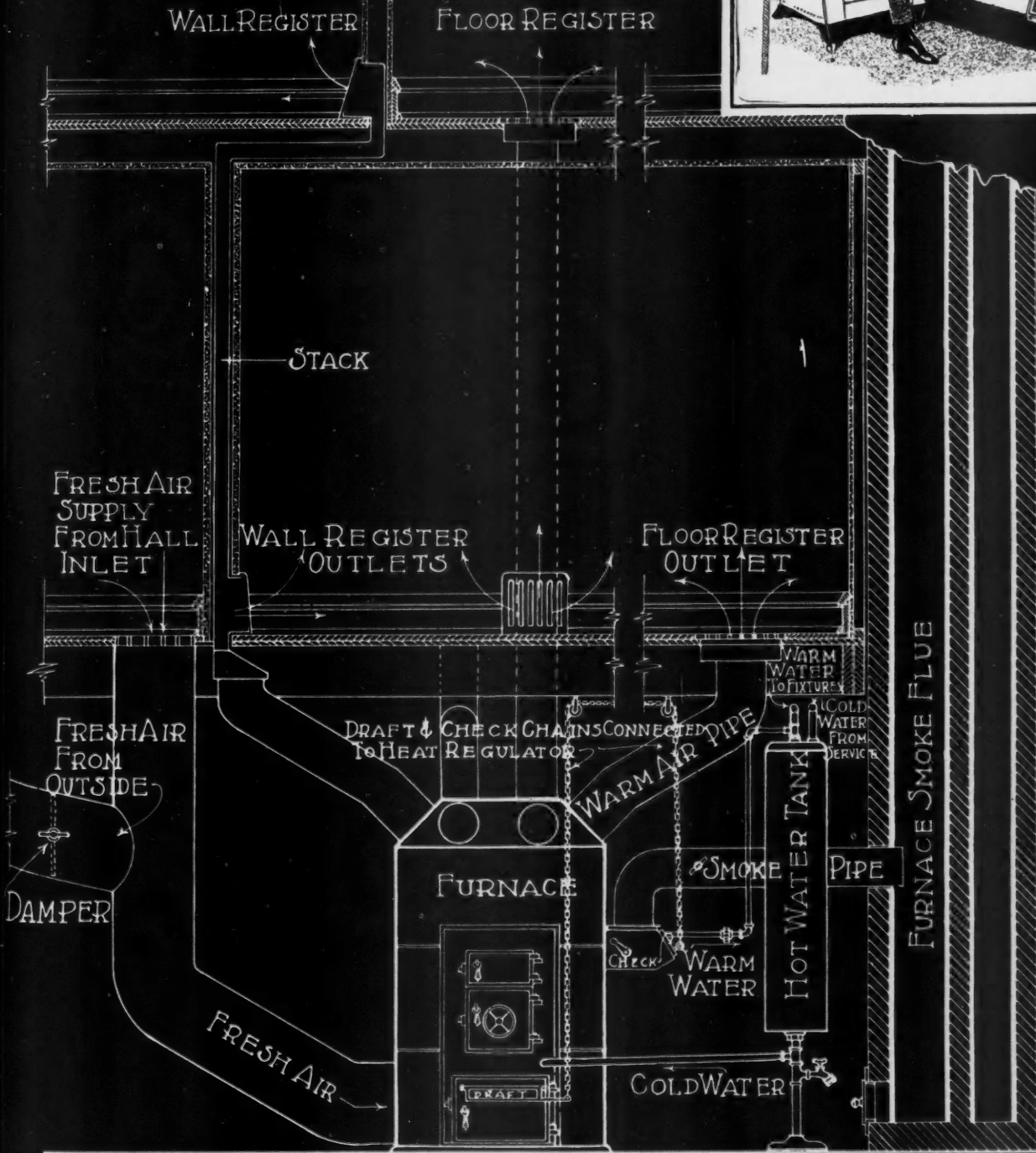
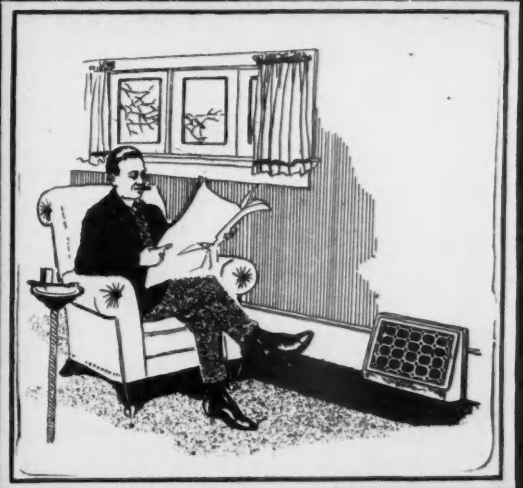
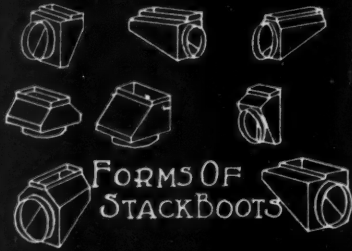
Pipes for upper rooms should be as large as the partitions will permit. No pipes in the outside walls.

Popular Colonial House with Hot Air Heating Details



THE EVER-POPULAR COLONIAL HOUSE. With the passing years it continues to gain in public favor because of its hospitable atmosphere and general charm. In this home an important addition has been made in the way of a double porch in the front, the lower part serving as a sun parlor and the upper part as a sleeping porch. The flooring in this porch is prepared canvas deck which is also used as a roof for the rear porch. Seven rooms exclusive of the sun parlor are provided for in the plans, of which the living and dining rooms and kitchen are on the lower floor and the four bedrooms and bath upstairs. The structure is frame and is 25 by 40 feet. In the living room which is 15 feet 3 inches by 24 feet is an open fireplace. Details of the heating plant are shown on the opposite page.

RECOMMENDED CONSTRUCTION



HOT AIR HEATING PIPED FURNACE

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Some Object Lessons in Barn Construction

ENGINEER EXPLAINS WHY BARN COLLAPSED IN HEAVY WINDSTORM AND GIVES SOLUTION

By Roy W. Carpenter

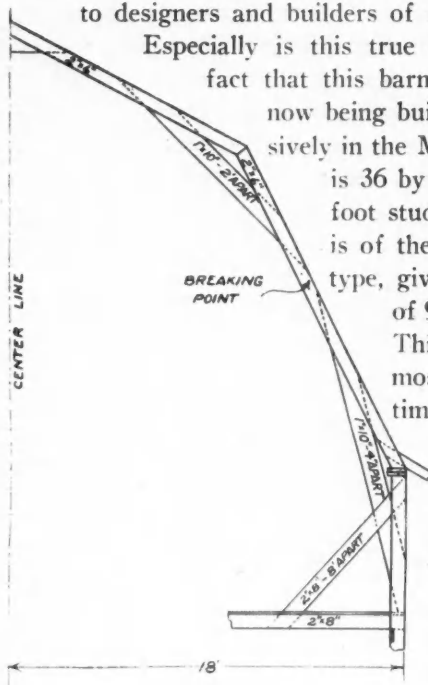
WHEN a structure of any sort is subjected to unusual stresses, and fails in whole or in part to stand up to them, an examination of the wreckage furnishes the best possible information as to the location of the weak points in the structure. The barn pictured in the photograph had the misfortune to stand in the path of a near tornado, with the disastrous and quite unusual results shown. Fortunately this barn was built from blue print plans, a set of which was available. An inspection of these plans, and of the wreckage of the barn, revealed several interesting facts, which it is believed will be of value to designers and builders of farm structures.

Especially is this true in view of the fact that this barn is of the type now being built almost exclusively in the Middle West. It is 36 by 66 ft., with 14-foot studdings; the roof is of the self-supporting type, giving a hay mow of 90 tons capacity. This mow was almost empty at the time of the accident.

Examination of the collapsed portion of the roof showed that the failure was due to two causes, insuffi-

cient bracing and extreme carelessness in construction. Let us first consider the feature of careless construction. Notice that the picture shows just above the hole in the roof, a long straight crack. This was caused by the fact that the roof sheathing boards had been so cut that the ends of five consecutive boards came upon the same rafter at this point, and for the next nine sheathing boards below, the ends of every one came either upon this same rafter or the one just adjacent to it. The joint between any two boards is a weak point. When fourteen such points occur in a group, as in this case, the resulting weakness is great. With a roof 66 feet long, and with this faulty construction directly in the center of it, it is not strange that it gave way under the strain of a heavy wind. Any carpenter, who would allow such a condition to occur, is guilty of extreme carelessness.

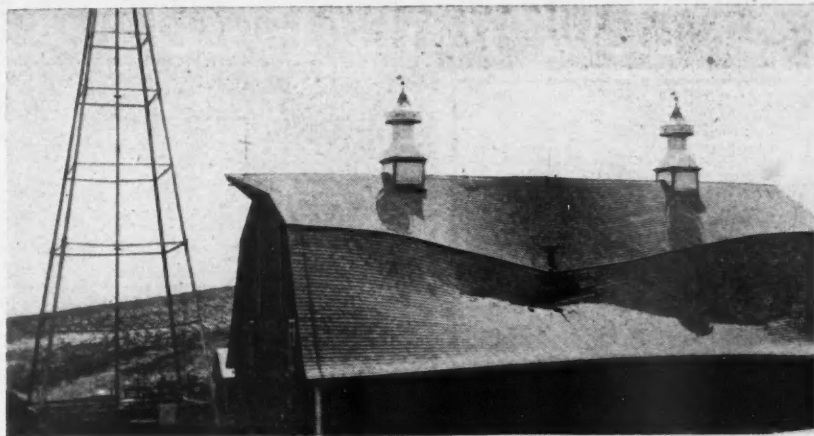
The bracing of the roof is shown in Fig. 1. The upper braces, consisting of a 1 by 10 in. on each rafter, had remained intact, and were apparently strong enough. A cross tie, from the rafter joint to the brace would, however, be good practice. The lower rafter braces, consisting of a 1 by 10-in. on every second rafter, had failed badly. They were twisted, bent or broken. When the rafters broke, at the point between the upper and lower braces, the strain on the lower braces changed from tension to compression and 1-inch material has very little value in resisting compression. In the writer's judgment, safe construction would call for the lower brace to extend from the floor to the lower end of the upper brace. It should be of 2 by 6 in. material and be stiffened by several cross ties to the rafter and studding. The braces



This Barn Was Unfortunate Enough to Get in the Way of a Tornado. The Weak Spot in the Roof Framing Collapsed Before the Terrific Pressure. Above is a Cross Section Drawing Showing Where the Break Occurred. This Type of Barn is Being Built Extensively Throught the West.

extending from the plate to the floor joists should never be omitted. Spaced 8 feet apart they take up surprisingly little room, and are very valuable in stiffening the main part of the barn and in preventing any spreading of the side walls due to the weight of the roof.

Regrettable as the damage done in this case was, it could easily have been much worse. A barn on a neighboring farm was completely blown down by the same wind. Some idea of the force of the wind may be gained by the fact that, tho it does not show in this picture, the plate on the barn was pushed over eight inches out of plumb with the sill. Under such conditions most barns would have blown off their foundations and collapsed entirely. Yet this barn sits as squarely upon its foundation now as on the day it was built. The reason is that when the foundation was made, 72 1-inch bolts were placed in it,



Notice the Long Straight Crack Above the Hole in the Roof. This Was Caused by the Fact That the Sheathing Boards Had Been So Cut That the Ends of Five Consecutive Boards Came Upon the Same Rafter at This Point.

with the threaded ends projecting upward $2\frac{1}{2}$ inches to pass thru the sill plank, and to these the sill was securely bolted down. This is a feature which is often neglected in building work, but it is the cheapest possible form of insurance against the overturning effects of heavy winds.

Corn Crib Elevators

BUILDERS ARE SPECIFYING MODERN EQUIPMENT IN CORN CRIBS WHICH THEY ARE ERECTING—DETAILS ON PAGE 112

CORN CRIBS! That is the word you hear all over the corn belt, especially at this time of the year when the corn is getting ripe for harvest. Farmers are thinking of the building in which they are going to store it and protect it. It is the best time in the year for the builder to talk modern corn cribs because the subject is very close to home and the pocket-book. Unless substantially protected that corn crop will be a loss.

Corn cribs are no longer the makeshift shelters they were a few years back. They have come to be one of the important buildings in the farm group. This development has been brought about largely by the introduction of the power elevator. Successful farm builders have found thru past experience that satisfied customers are their best advertisement. And they find that satisfaction comes from recommendation of modern equipment in buildings. Just as the feed and litter carriers and stanchions and water cups in a dairy barn make for satisfaction so does the corn crib elevator aid the farmer.

The corn crib elevator shown in detail on the next page is one of the popular types that are being installed in cribs in the grain country. It is a cup elevator, in short a series of cups on a chain which moves up one side, passes over the open chute, dumps its load and passes down the other side into the pit.

There are several features of this construction that it is advisable for the builder to keep in mind. In the first place the cupola is a big factor for it provides a place for the chute which leads from the elevator. As the cups are carried to the top of one shaft they pass

over this chute which has a large funnel-shaped opening. The corn or grain is dumped into the chute and carried to the proper bins. This chute can be swung around in any direction so as to fill different bins.

As a rule the modern corn crib has a driveway in the center where the wagons or trucks can drive in and dump their load into the pit into which the elevator descends. On either side of this driveway are the corn cribs. Bins for heavy grain are up above.

The style of pit varies. It may be either a deep pit which has a large capacity, or a shallow pit. In some corn cribs there is a special arrangement for dumping. The wagon backs onto two boards directly in front of the pit. By a lever arrangement these boards are tipped up, the rear end of the wagon lowered, and the corn dumped out.

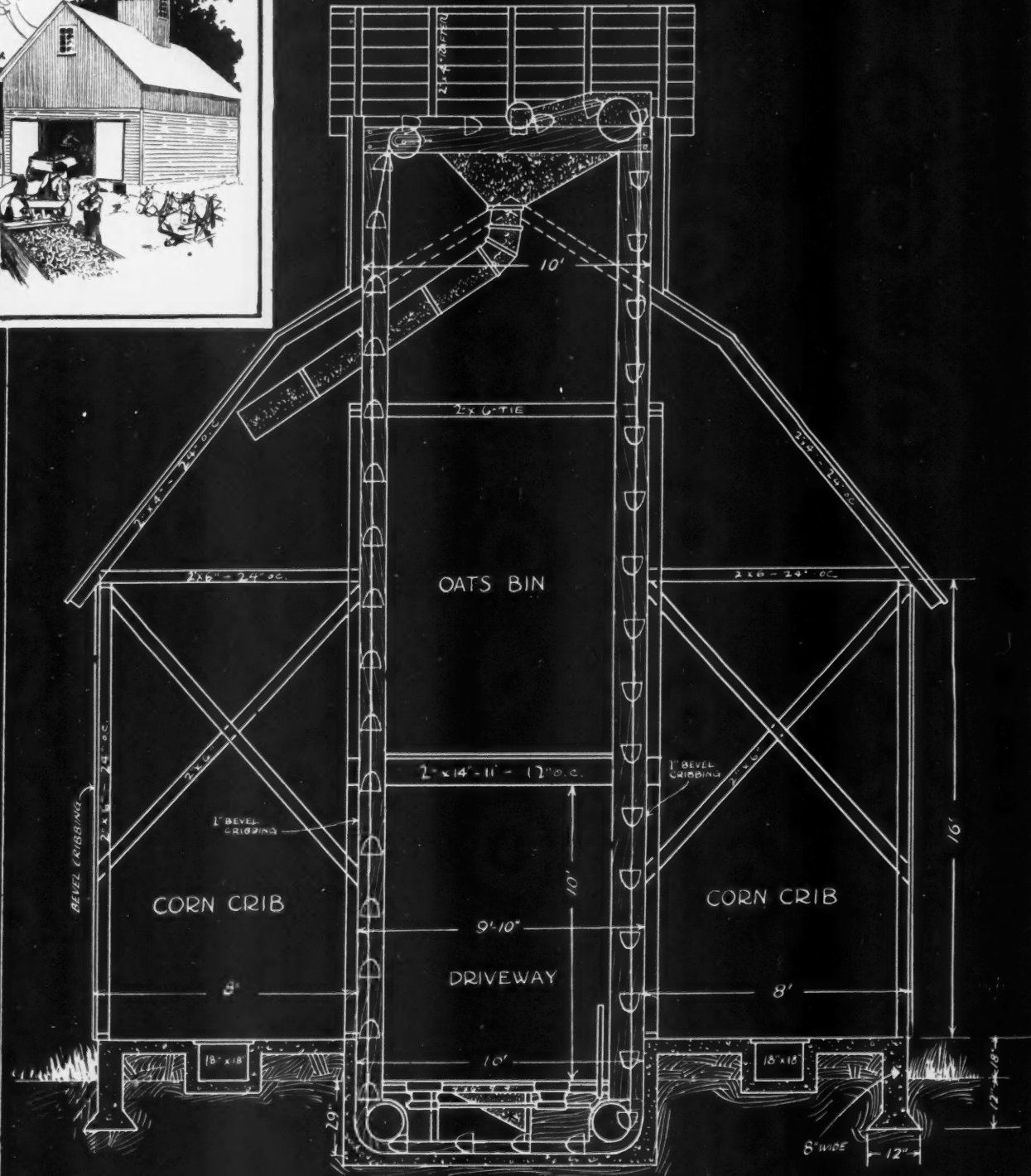
The elevator is operated by a gas engine located in one corner of the crib.

As the efficiency and economy of this type of corn crib with its labor-saving equipment for loading is being recognized the field for the builder, especially in the corn belt, is constantly increasing. Farmers are learning that the best buildings pay in the long run and are consulting with their contractors with this idea in mind.



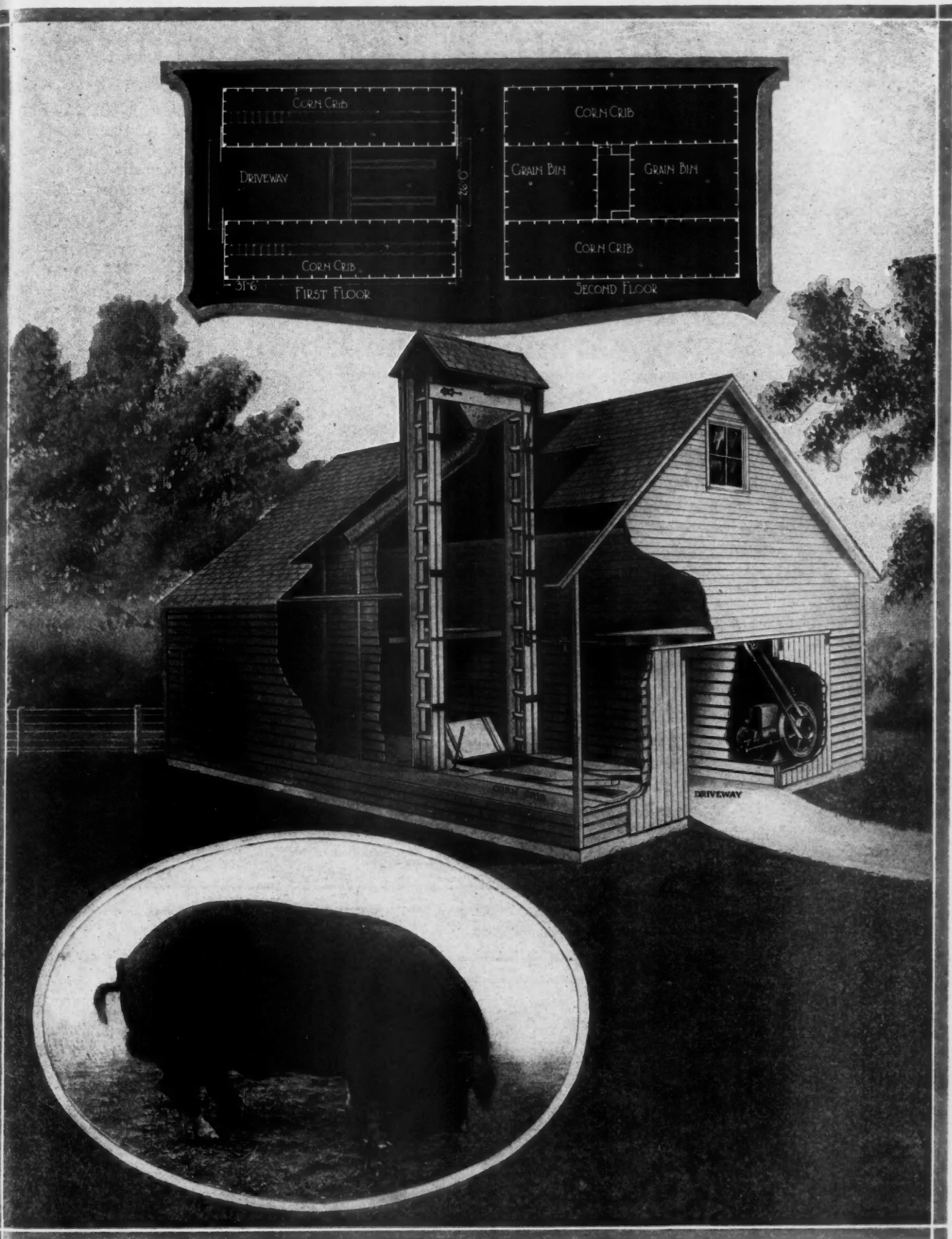
IT should be remembered that whenever the size of lumber is given in whole numbers, such as, 2 x 4, 2 x 6, 2 x 8, etc., standard commercial or nominal sizes are meant; but whenever the size is given as $1\frac{5}{8}$ x $3\frac{5}{8}$, $1\frac{5}{8}$ x $5\frac{5}{8}$, $1\frac{5}{8}$ x $7\frac{1}{2}$, etc., actual sizes are meant, and should always be based on actual size of material used.

RECOMMENDED CONSTRUCTION



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MODERN CORN CRIBS PROTECT THE CROP. There is going to be a bumper crop of corn this year. Farmers who have ordered corn cribs like the one shown here are not going to lose any because of bad weather or inability to get it under cover. The essential feature of this farm building is the cup elevator which the wise builder is specifying and building into his cribs. Details are shown on the opposite page. Modern corn cribs mean good corn and good corn is responsible for prize-winning hogs like "Quality Bot," grand champion Poland China boar, shown in the lower left-hand corner. Notice the arrangement of the bins in the floor plans. The size, 26 by 31 feet 6 inches, is standard for this kind of building.

Helps On Painting and Decorating

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

EDITOR AMERICAN BUILDER.

How Color Selection Influences the Architectural Appearance of the Home

SOME HINTS ON CHOOSING CORRECT COLORS FOR DIFFERENT TYPES OF BUILDINGS

By C. M. Lemperly

WE all know how different colored clothes will affect the appearance of the stout man or the stout lady. For instance, gray, the color of the elephant, never makes a stout lady look thinner, but accentuates her size; whereas some darker color would make her appear much less portly.

Color likewise affects the appearance of the tall man. The right colors will make him appear shorter and broader while the wrong selection will simply add to his already "long" range.

The same freaks and selections of color apply to your home. But most folks don't realize this, or it has never been brought to their attention.

Take some of the types of homes which we have illustrated here just for "types," to point

out and simplify our suggestions and to make them more practical for the builder, the home owner or the housewife.



Fig. 2. Medium or Tobacco Brown Body and Canary Yellow Trim Is Very Attractive on Bungalow Type Like This.

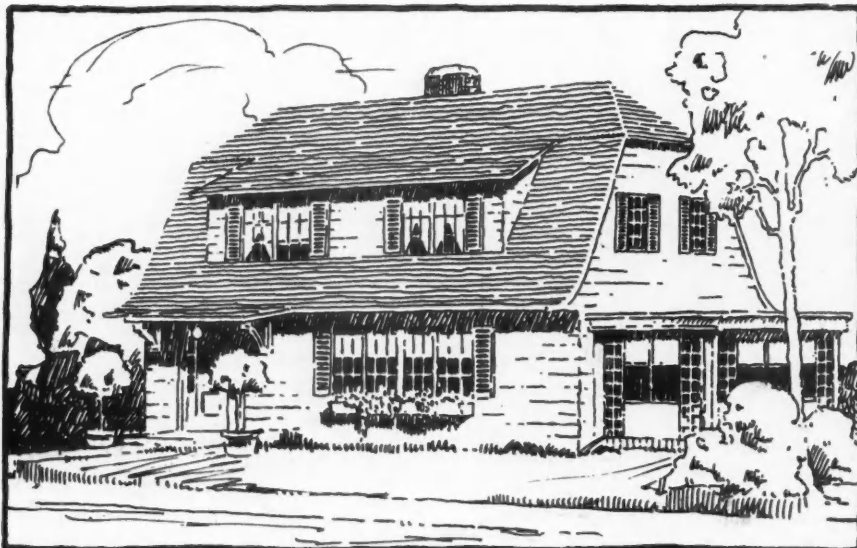


Fig. 1. Strong Color Contrasts Should be Avoided in Houses of This Type. A Combination of Canary Yellow for the Body, White for Trim and Sash, with a Brown Stained Roof Is Recommended.

On a house like type No. 1, strong color contrasts should be avoided. That is, strong contrasts between trim and body. For best all around appearance on this type of home, a combination such as a canary yellow for the body, a white for the trim and sash, with a brown stained roof, can be recommended. It will wear well and will satisfy the owner as well as please the passersby. It will be neighborly.

The bungalow type such as No. 2 can be made attractive with a combination of colors such as a medium or tobacco brown body, a light brown or weathered stained roof, and a trim in canary yellow. This is just one possibility.

A type such as No. 3 has many vertical lines and can be best painted to counteract this appearance, with upper body and roof in dark brown, lower body with a brown drab, and using a modern brown (dark) same as upper body, for gables.

A home like No. 4 needs to be made more distinctive looking. Therefore a suggestion of an upper body painted moss green, a lower body painted a cream gray, a white trim and sash and a green stained roof would be acceptable.

A home like No. 5 could easily present a top-heavy appearance if improperly painted. Therefore the gable must be subdued. A body color of warm drab, a trim of stone color, a sash of rich maroon, with roof and gable on the brown-maroon shade, thereby getting the repetition of the maroon in both sash and roof, would seem to answer well for this



Fig. 3. Houses with Many Vertical Lines Can be Painted to Counteract This Appearance. Dark Brown on the Upper Body and Roof and Brown Drab on the Lower Part Is Very Attractive.

surface appear larger.

Light grays or greens do not change the surface appearance to any extent.



Fig. 4. Distinction Can be Added to a Home of This Type by Proper Selection of Colors. White Trim and Sash, Green Stained Roof, and Gray and Green Body Are Ideal Colors.

type of home.

A straight Colonial house always looks well in white, with green roof and blinds. But even the dignified Colonial can be improved by the use of a Colonial medium yellow on the body with a white trim sash, and a strong green stained roof. There is nothing more pleasing than yellow, and it fits into the foliage beautifully.

In trying to select suitable colors, it is well to ask yourself a few important questions, such as:

“What is the general style of the house and how does it compare with adjoining homes?”

“Is it surrounded with foliage or not?”

“What colors are used on the adjoining homes?”

Then you want to bear in mind that light, warm colors make the

town, street and home which we are all striving and anxious for. Next month I will give some pointers on exterior paints and painting.

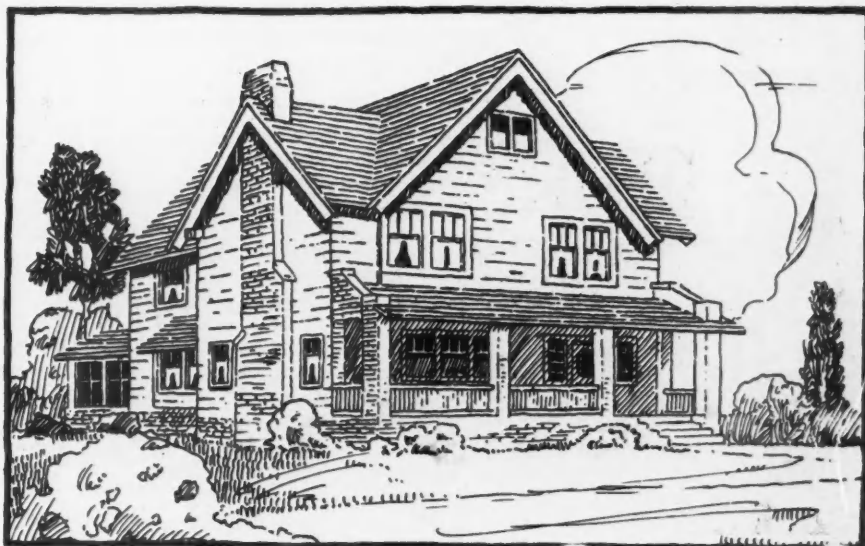
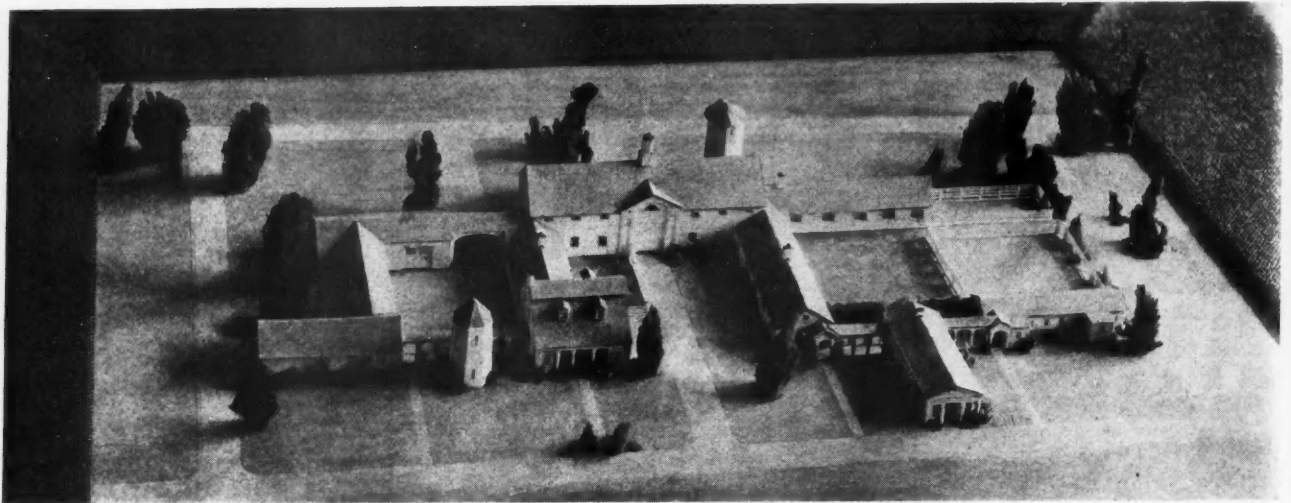


Fig. 5. This House Will Look Top-Heavy if Not Painted Correctly. The Gable Can be Subdued by a Brown-Maroon Shade. A Body Color of Warm Drab Is Very Suitable.



Group of Farm Buildings in Miniature. This Was Prepared by Leslie I. Nicholas as an Architectural Thesis at Cornell University. The Buildings Are Made of Cardboard, While Sponge, Painted Green, Make Attractive Looking Trees.

Unique Method of Presenting Architectural Study

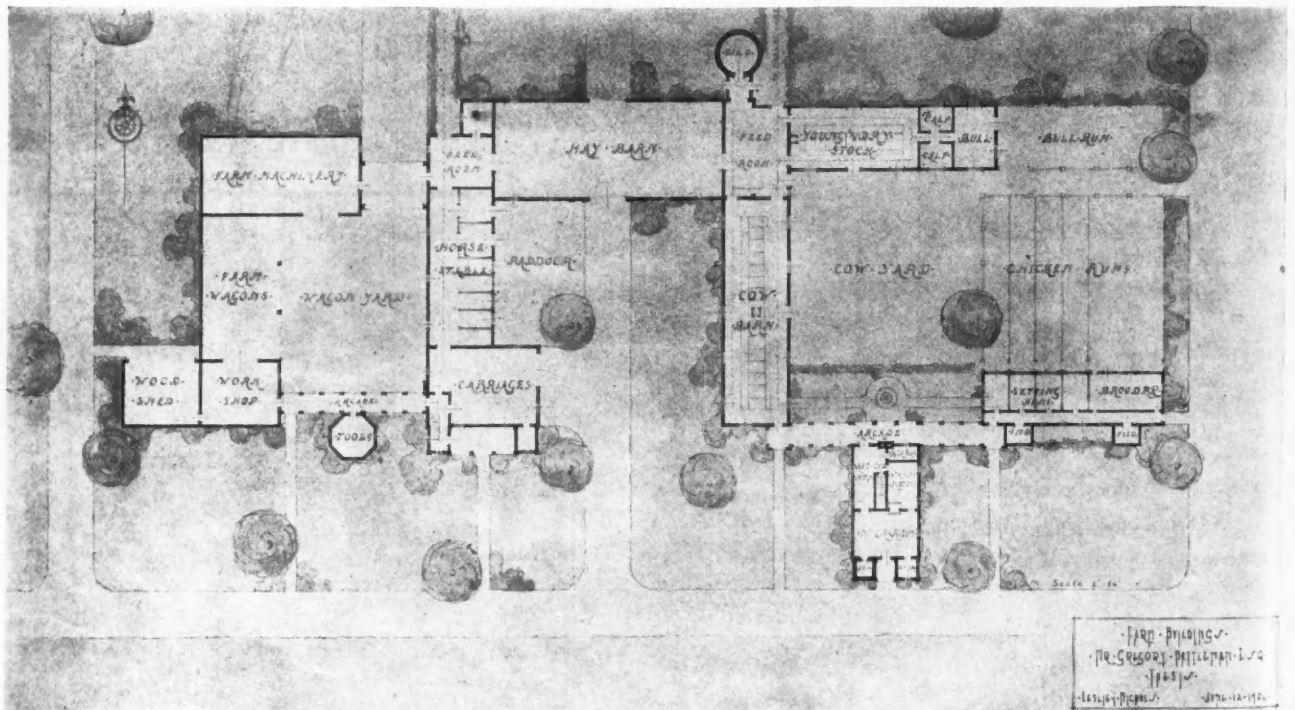
STUDENT IN ARCHITECTURE PREPARES THESIS ON FARM GROUP-BUILDINGS PRODUCED IN MODEL FORM

THE average man who contemplates building has rather a vague idea of architects' plans and elevations. It is difficult for him to read them into the three dimensions in which the building is constructed or to understand the elevations showing the sides of the building.

A novel means of presenting him with a tangible idea that he can grasp as a glance was used by Mr. Leslie I. Nichols, Chicago, in preparing his thesis at the Cornell School of Architecture. His subject was a group of modern farm buildings and Mr. Nichols hit upon the idea of making a model group in miniature instead of following the usual architectural method.

Card board was used for all of the buildings. It was cut out in the proper sizes and glued together. Sponge, colored green, made very satisfactory shrubs and trees as a glance at the photograph reproduced on this page will show. The final result of Mr. Nichols' work reveals a pleasant farm picture which gives the prospective builder a very clear idea of what his plant will look like when actually constructed.

Architects who are looking for an attractive method of window display to attract the attention of clients will find this method of presentation more attractive than the ordinary wash drawing. To the untrained building mind it is thoroly clear and understandable.



Plan of Farm Buildings Shown Above. This Work Was Submitted by Mr. Nichols in Completing His Course at the Cornell School of Architecture. It is a Beautifully Rendered Drawing and Supplements the Cardboard Model.

DESIGN OF SAFE CONSTRUCTION

By Charles W. Leigh

Associate Professor of Mechanics, Armour Institute of Technology

Cantilever Beams

ARTICLE VII OF AN EXTENSIVE SERIES ON STRENGTH OF MATERIALS

THE only type of beams considered in this series of articles has been those resting on supports at each end. There is another type of beam in use called the cantilever beam, which will be considered in the present article. A cantilever beam is one having one end fixed and the other end free to move up or down. Such beams are often used in bridges, balconies, etc. Fig. 1 shows a cantilever with a concentrated load on the free end. Fig. 2 shows a cantilever with a uniformly distributed load.

Suppose that in Fig. 1 the load $W = 1,000$ pounds. To find the depth of a 4-inch timber 6 feet long necessary to carry a load, so far as bending is concerned. Now, the greatest fibre stress is at the wall. The moment of W at the fixed end is the load times the distance in inches or:

Bending moment $= 6 \times 12 \times 1,000 = 72,000$ inch pounds.

The formula for determining the size of simple beams holds for cantilever as well; namely,

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

Use $p = 1,000$ pounds for a safe fibre stress in exposed timber.

$$I = \frac{b h^3}{12} = \frac{4 h^3}{12} = \frac{h^3}{3}$$

$$\text{Also } e = \frac{h}{2}. \text{ Then } \frac{p I}{e} = \frac{1,000 h^3}{3 h} = \frac{2,000 h^2}{3}$$

$$\text{From Formula I: } \frac{2,000 h^2}{3} = 72,000$$

Cancelling the zeros and solving, $h^2 = 108$.

Extracting the square root, $h = 10.3$ inches.

Therefore the depth of beam must be 12 inches, as that is the nearest commercial size larger than 10 inches.

The beam must now be tested for deflection.

The formula for deflection of cantilevers with concentrated load on free end is $d = \frac{w l^3}{3 EI}$, where, as in previous articles, W is the load, l the length in inches, I the moment of inertia about the neutral axis, and E the modulus of elasticity. If the timbers used are oak, the value of E to be used is 1,200,000.

$$I = 1/12 bh^3 = 1/12 \times 4 \times 12 \times 12 \times 12 = 576.$$

$$d = \frac{1,000 \times 72 \times 72 \times 72}{3 \times 1,200,000 \times 576} = .18 \text{ of an inch.}$$

The value of D is obtained thru cancellation. Now the rule for safe deflection is that it must not exceed $1/360$ of the length in inches or $1/360 \times 72 = .2$ inches.

Then the beam is perfectly safe. The next test is for horizontal shear. In previous articles it was shown that the maximum horizontal shear per square inch is equal to maximum vertical shear per square inch which occurs at the support. Also that maximum vertical shear is $4/3$ the average vertical shear. Now the total shear at the support is the load, $W = 1,000$. Average shear $= \frac{1,000}{4 \times 12} = 20$ pounds, approximately.

The maximum horizontal shear $= \frac{4}{3} \times 20 = 26\frac{2}{3}$ pounds.

This is safe, since 100 is a safe working shearing stress.

In Fig. 2, let the uniformly distributed load be 1,000. As in Fig. 1, the maximum bending stress is at the support. But the bending moment is $\frac{1}{2} Wl$ where l is the length in inches.

$$\frac{1}{2} Wl = \frac{1}{2} \times 1,000 \times 72 = 36,000.$$

$\frac{p I}{e}$ is the same as in the problem for Fig. 1, namely, $\frac{2,000 h^2}{3}$

Then from the relation B. M. $= \frac{p I}{e}$

$$\frac{2,000 h^2}{3} = 36,000$$

$$h^2 = 54$$

$$h = 7.5, \text{ approximately.}$$

Then the depth of beam must be 8 inches.

For the deflection of a cantilever with uniformly distributed load, $d = \frac{w l^3}{8 EI}$.

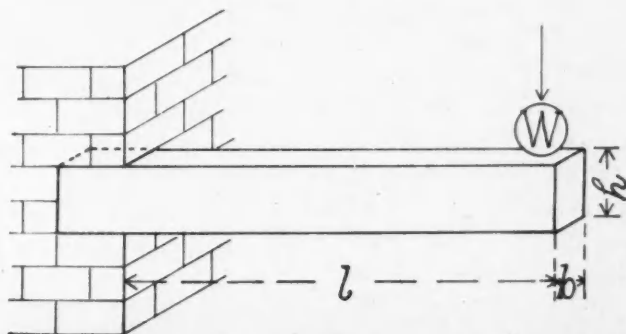


Fig. 1. Cantilever Beam with a Concentrated Load on the Free End.

$W = 1,000, l = 72, E = 1,200,000,$ and
 $I = 1/12 bh^3 = 1/12 \times 4 \times 8 \times 8 \times 8 = 227$ inches.

But a safe deflection is .2, as was found in the previous problem. Therefore the beam is not quite stiff enough. Consequently the safe thing to do would be to use a beam 10 inches deep.

The one thing to notice in the problem of the cantilever is that the maximum shear at the support is the total load W instead of the half load, as in the case of a simple beam. Also the builder should notice that two pieces 2 inches wide could be spiked together to form the 4-inch timber.

Suppose a balcony is to be constructed of I-beams 8 feet long, spaced 6 feet from center to center. The floor is to carry a load of 100 pounds per square foot of surface. To find the size of the beams, each beam must carry a floor load covering 36 square feet, or a total load of 3,600 pounds.

The bending moment is $1/2 Wl = 1/2 \times 4,800 \times 8 \times 12 = 230,400$ inch pounds.

For I-beams, the fibre stress formula is: Bending

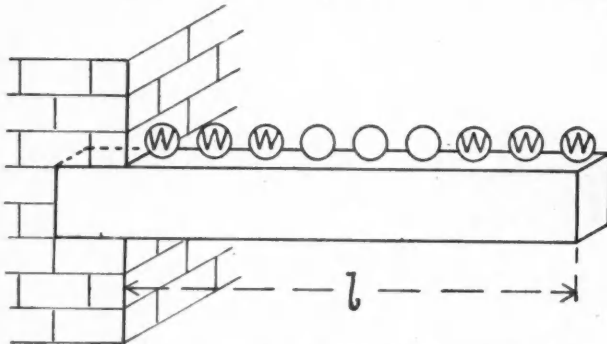


Fig. 2. Cantilever Beam with Uniformly Distributed Load.

moment = $p \times$ section modulus. But for structural steel, $p = 16,000$ pounds.

$16,000 \times$ section modulus = 230,400.

Therefore section modulus = 14.4.

By referring to a handbook for the table of properties of standard I-beams, the value 14.4 for I/e , or section modulus, is between 14.2, corresponding to an 8-inch I-beam, and 18.9, which corresponds to a 9-inch beam. The largest one must be used—that is, 9-inch I-beams will carry the load.

For deflection, $d = \frac{1}{8} \frac{w l^3}{EI}$.

But $W = 4,800$ pounds, $l = 8 \times 12 = 96$ inches, $E = 28,000,000$ and I from the hand book = 84.9.

$\therefore d = \frac{4,800 \times 96 \times 96 \times 96}{8 \times 28,000,000 \times 84.9} = .24$ inch.

In previous articles it has often been mentioned that the nominal size of lumber is always larger than the real size. For example, a 2 by 8-inch will be $1\frac{5}{8}$ by $7\frac{1}{2}$ if planed on all four sides. The reader will readily see that $I, e,$ and area are all changed in value and therefore the strength, stiffness and shear are all modified. Then, if the designer is to be safe in his construction, he must actually figure for the real dimen-

sions. However, the calculations with decimals are tedious, and it is much better to figure the load on a basis of nominal measurements and multiply the result by a per cent corresponding to the particular sizes used.

Two tables will be given. The first containing nominal and real sizes for different planing. The other containing the factor or percent by which the nominal load must be multiplied to obtain the real load that the beam will carry. These tables are from the records of the Southern Yellow Pine Manufacturers' Association. S-I-S-I-E, means that the beam is planed on one side and one edge. S-4-S means that the beam is planed on all four sides.

TABLE 1
For S-I-S-I-E

Breadth	2 in.	4 in.	6 in.	8 in.	10 in.	12 in.
Depth						
4 in.	$1\frac{5}{8} \times 3\frac{5}{8}$	$3\frac{5}{8} \times 3\frac{5}{8}$	$5\frac{5}{8} \times 3\frac{5}{8}$			
6 in.	$1\frac{5}{8} \times 5\frac{5}{8}$	$3\frac{5}{8} \times 5\frac{5}{8}$	$5\frac{5}{8} \times 5\frac{5}{8}$			
8 in.	$1\frac{5}{8} \times 7\frac{1}{2}$	$3\frac{5}{8} \times 7\frac{5}{8}$	$5\frac{5}{8} \times 7\frac{3}{4}$	$7\frac{3}{4} \times 7\frac{3}{4}$		
10 in.	$1\frac{5}{8} \times 9\frac{1}{2}$	$3\frac{5}{8} \times 9\frac{5}{8}$	$5\frac{5}{8} \times 9\frac{3}{4}$	$7\frac{3}{4} \times 9\frac{3}{4}$	$9\frac{3}{4} \times 9\frac{3}{4}$	
12 in.	$1\frac{5}{8} \times 11\frac{1}{2}$	$3\frac{5}{8} \times 11\frac{5}{8}$	$5\frac{5}{8} \times 11\frac{3}{4}$	$7\frac{1}{2} \times 11\frac{1}{2}$	$9\frac{3}{4} \times 11\frac{3}{4}$	$11\frac{3}{4} \times 11\frac{3}{4}$

For S-4-S

4 in.	$1\frac{1}{2} \times 3\frac{1}{2}$	$3\frac{1}{2} \times 3\frac{1}{2}$	$5\frac{1}{2} \times 5\frac{1}{2}$			
6 in.	$1\frac{1}{2} \times 5\frac{1}{2}$	$3\frac{1}{2} \times 5\frac{1}{2}$	$5\frac{1}{2} \times 5\frac{1}{2}$			
8 in.	$1\frac{1}{2} \times 7\frac{3}{8}$	$3\frac{1}{2} \times 7\frac{1}{2}$	$5\frac{1}{2} \times 7\frac{1}{2}$	$7\frac{1}{2} \times 7\frac{1}{2}$		
10 in.	$1\frac{1}{2} \times 9\frac{3}{8}$	$3\frac{1}{2} \times 9\frac{1}{2}$	$5\frac{1}{2} \times 9\frac{1}{2}$	$7\frac{1}{2} \times 9\frac{1}{2}$	$9\frac{1}{2} \times 9\frac{1}{2}$	
12 in.	$1\frac{1}{2} \times 11\frac{3}{8}$	$3\frac{1}{2} \times 11\frac{1}{2}$	$5\frac{1}{2} \times 11\frac{1}{2}$	$7\frac{1}{2} \times 11\frac{1}{2}$	$9\frac{1}{2} \times 11\frac{1}{2}$	$11\frac{1}{2} \times 11\frac{1}{2}$

TABLE 2

Factor for Reducing Nominal Loads to Real Safe Loads
For S-I-S-I-E

Breadth Depth.	2 in.	4 in.	6 in.	8 in.	10 in.	12 in.
4 in.	.67	.74				
6 in.	.71	.80	.82			
8 in.	.71	.82	.90	.90		
10 in.	.73	.84	.90	.92	.93	
12 in.	.75	.85	.92	.93	.94	.94

For S-4-S

4 in.	.57	.67				
6 in.	.63	.74	.77			
8 in.	.64	.77	.81	.82		
10 in.	.66	.79	.83	.85	.86	
12 in.	.67	.80	.84	.86	.87	.88

The table is applied as follows: Suppose it is found that a 4 by 6 beam figured on a basis of nominal size will carry a load of 2,000 pounds. The timber is planed S-I-S-I-E from Table 2, the factor is found to be .80 at the intersection of the row corresponding to 6 inches and the column corresponding to 4 inches.

(Continued to page 132.)

Economy in All-Year Door

COMBINATION SCREEN AND STORM DOOR REQUIRES ONE FITTING AND ONE SET OF HARDWARE

OUTSIDE doors, such as screen and storm doors, are like women's hats—seasonable. In the spring the house comes out in its new Easter trimmings in the way of screen doors to prepare for the annual invasion of the fly and the hot spell. Then as soon as summer has begun to fade and the cold season approaches with its cutting and penetrating winds, the homeowner changes the clothing of his house to withstand the rigors of winter and save fuel. The storm door is installed.

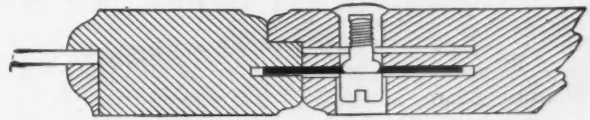
Under this arrangement two sets of doors were needed. In an effort to eliminate some of the expense of the arrangement and still afford the same protection, a door manufacturer has devised a combination screen and storm door that is season-proof. The same frame is used thruout the year but screen or storm panels are inserted and is made to hold screen or storm panels as the season demands.

This frame is fitted with a special patented panel lock. In the spring the screen panel is placed in the frame and the lock fastened. To remove this panel in the fall when the storm panels are to be installed, four patented screws are turned, the new panel inserted, and the screws tightened. This lock is adjustable. Each half turn of the screw operating the lock increases its pressure and holds the panel firmly, preventing rattling. The lock is not visible and by its insertion into the center of the door stiles adds to its strength and removes the possibility of it being tampered with. Another important feature of the door is the position of the inserted panel with regard to the frame. It is flush and does not set out.

The screen and storm panels are manufactured in a variety of designs which can be handled similar to any sash or door stock. Because of the economy of this combination door, many lumber dealers keep a regular stock on hand to fill the needs of contractors and homeowners who want to install them. They are made in stock sizes and possess the advantage of economy in that they require only one fitting and one set of hardware. The storm panels are made up with or without glass.

Builders are finding that this type of door is attracting

the favorable attention of many homeowners who not only want to eliminate the expense of two sets of doors, screen and storm, but also want to get away from the trouble involved in changing them twice a



Cross-Section of Door Stile Showing Panel Lock.

year. With this combination door, one fitting is enough. They are in position as long as they last.



Selection of Materials

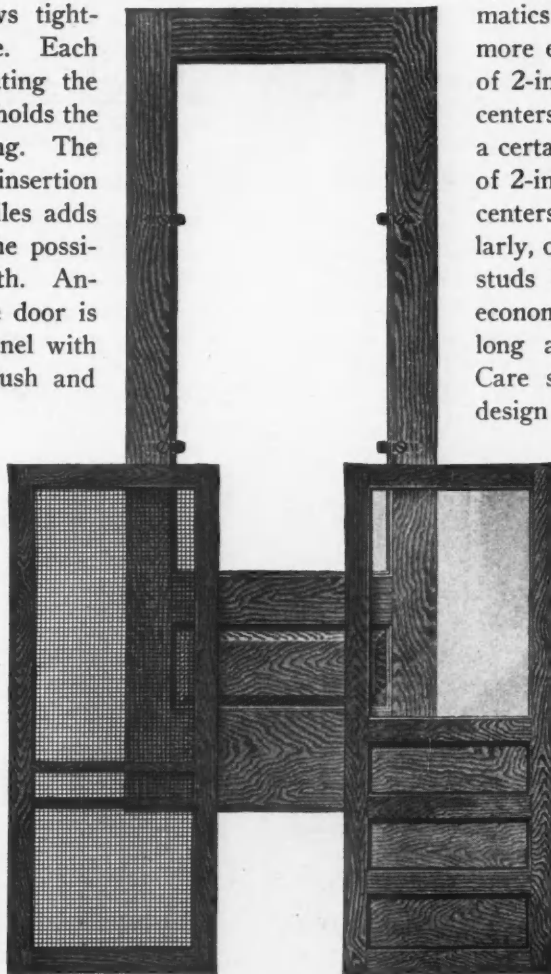
IN the selection of materials, particularly of timbers and wooden beams to be used in building, care should be exercised to select good, sound materials, free from rot, large or loose knots, shakes or any imperfections whereby the strength may be impaired, and of such size and dimensions as are required for the kind of building erected.

Upon ascertaining from your lumber dealer the prices per 1,000 feet of several sizes and lengths of

lumber, it is a simple problem in mathematics to determine whether it will be more economical to use sixteen lengths of 2-inch by 8-inch joists, 16 inches on centers, in the floor construction under a certain room, or to use twelve lengths of 2-inch by 10-inch joists 20 inches on centers, for the same purpose, and similarly, of two lengths of 2-inch by 4-inch studs 8 feet long, can be used more economically than one length 16 feet long and answer the same purpose. Care should also be exercised in the design of roofs, so that the pitch of the roof and the projection of the cornice or eaves is so arranged as to use even lengths of materials for rafters.

As the flooring for porches is generally laid at right angles to the house proper, the width of the porch should be such that material here will cut also to the best advantage.

If these few points are adopted by architects, engineers and contractors, to make more efficient the design and application of lumber in building, much waste can be avoided and a considerable reduction in cost of construction will result.



Combination Screen and Storm Door. The Frame at the Top of the Picture Is Designed to Hold Either of the Panels Shown Here. Note the Panel Locks in the Stiles of the Frame.

CORRESPONDENCE

Questions answered—ideas exchanged

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

Wants American Concrete Machinery Catalogs

Wagga Wagga, New South Wales, Australia.

To the Editor:

Dear Sir—Just to let you know that your paper reaches as far as here, and it is a great pleasure to receive it every month. It might be interesting to some of my brother readers to hear about the building trade in Australia. At present we are suffering like all other countries from the high cost of living and a serious shortage of houses for the people. Most of the people that dealt in building securities before the war are just standing still at present, wondering whether prices are going to drop, or whether they are going to remain as at present. We have a scarcity of skilled bricklayers, plasterers, carpenters. The Government of New South Wales has taken an active interest in the housing problem.

Concrete construction is coming greatly to the fore here as we have plenty of unskilled labor that can readily be taught concrete work. I should be very pleased if the manufacturers of concrete mixers, block-making machines, tile and pipe machines, also hollow tile machines, would kindly forward me their catalogs, particularly the makers of hand-mixing machines.

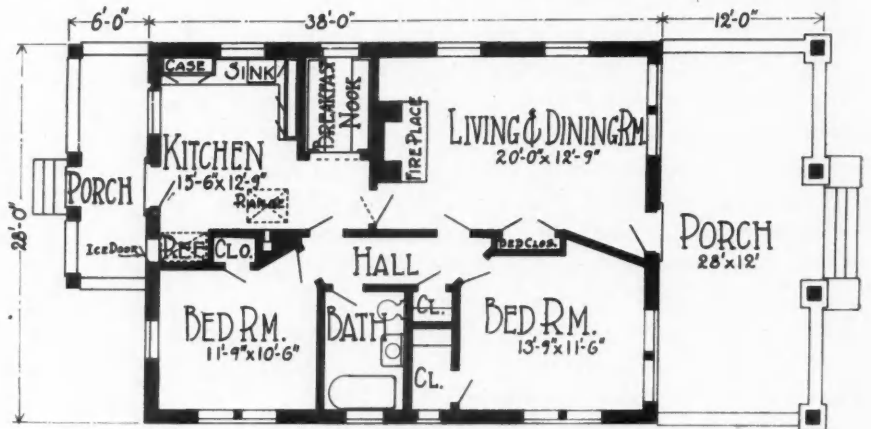
W. F. MAY.

Builds Attractive Florida Bungalow

To the Editor:

Prince Albert, Sask., Canada.

I am sending you a photograph and floor plans of the



FLOOR PLAN

Floor Plan of Florida Bungalow, Showing Wall Door Ice Box and Other Features.

bungalow I recently built at Miami Beach, Fla.

I used natural stone for the exterior with very pleasing results. The house contains a combination living and dining room, two bedrooms and a kitchen with all modern conveniences such as an open wall door ice-box, cupboards and open brick fireplaces.

The bungalow is 38 by 28 feet and the front porch extends the full width of the house.

ACH. RENUART.



Seek New Ideas on Building Display in New Store

To the Editor: Shelbyville, Tenn.

We are moving into our new store and office building, with its three floors, including the basement, and would like to get some ideas and suggestions as to best arrangement of each department, and any new ideas in displays in the show windows.

We would also like to exchange ideas and photographs with some progressive dealers in our line, as we intend to make our store the most attractive building store in Tennessee.

GUNTHER LUMBER COMPANY.

The Editor will welcome photos, plans and suggestions from other lumber dealers, and will publish the best here for information of others.



This Picture Speaks of Warmer Climes. Mr. A. Renuart, Builder in Prince Albert, Canada, Erected This Pretty Stone Bungalow Down at Miami Beach, Florida, Where the Balmy Breezes Blow. It Is Modern in Every Respect and 38 by 28 Feet.

Use THE STANLEY WORKS BALL BEARING BUTTS *To a Door*



*Logical in its principle,
practical in its application.
Using "3 Butts to a Door"
is the correct way to hang
a properly hung door—*

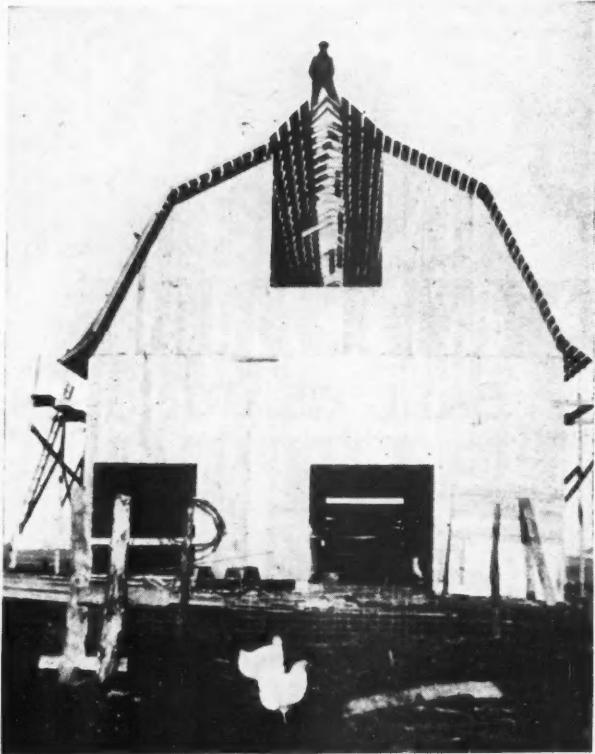
THERE is an advantage when using Butts-packed "3 in a box." They are easier to handle when hanging a large quantity of doors—easier to give your carpenters the correct amount of butts for a given number of doors and also when the job is completed you have a properly hung door ready to give service to the utmost.

Have you seen our folder giving 9 reasons why "3 Butts to a Door" is the one best way to hang a door? Ask for A-9.

THE STANLEY WORKS PRODUCTS



The Stanley Works—New Britain, Conn., New York, Chicago.



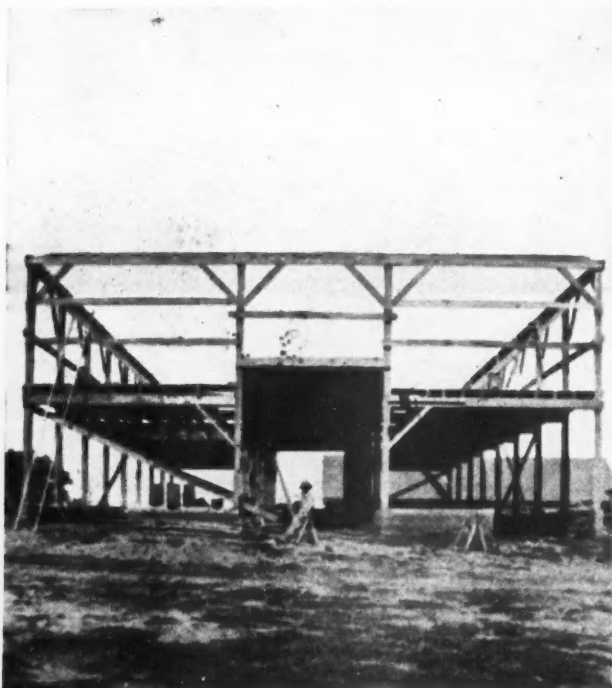
No. 1. Dairy Barn Built by Chas. A. Prather, Contractor in Memphis, Mo. It Is 34 Feet Wide and 42 Feet Long. Mr. Prather Has Built Three Barns Since April and Reports Activity in That Field.

Some New Missouri Barns

To the Editor: Memphis, Mo.

I am a reader of the *AMERICAN BUILDER* and enjoy every number and also profit by the reading of it. We may express honestly to our clients that we take the leading and most authoritative building paper in the U. S.

Owing to present prices of building material there is not much house building being done in this section just now, but barn building is very much in evidence, and as our efforts



No. 2. Hay Barn, 30 by 60 Feet, Built by Mr. Prather. It Has a 20-Foot Shed on Two Sides and One End, Making It 70 by 80 Feet on the Ground.

are centered mostly on barns, naturally our minds turn toward the same subject.

I am sending you pictures of three barns that I have built since April.

No. 1 is 34-foot span with 2 by 6 rafters, with 1 by 6 strapped on each side, and 2 by 6 under knuckle joint and between 1 by 6, then 1 by 6 on each side of this 2 by 6, lapping up on rafters at the joint. This roof is very rigid and strong.

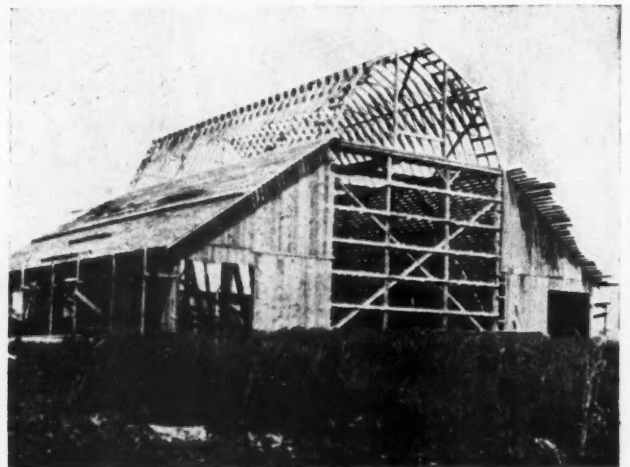
No. 2 is a hay barn 30 by 60 feet, with 8 by 8 posts 24 ft. high, and this span of 30 feet is roofed in the same manner as No. 1, with 2 by 4 rafters and 1 by 6 ties, and is very satisfactory as to strength.

No. 2 also has a 20-foot shed on two sides and one end, making it 70 by 80 on the ground.

No. 3 is 42-foot span, roofed in the same manner as the other two barns, with 2 by 6 yellow pine (selected) and full 1 by 6 braces. Rafters are 15 feet 9 in. long and braces 16 feet.

This roof seems rigid and fully capable of carrying the load imposed, but I would like to have the opinion of some of my brother readers as to whether it is adequate to withstand high wind pressure against the 80 feet of length which it has.

Now we have a barn to build which will be 50 by 70 and we wish to roof it with self-supporting roof, and I claim



No. 3. The Third of a Group Built by Mr. Prather. It has a 42-Foot Span. Mr. Prather Has a Very Important Question to Ask His Fellow Readers About Construction.

that in addition to the manner in which we roofed Nos. 1, 2 and 3 we will have to set in some purlin posts at mow floor and brace same at top of posts of side wall.

The tops of side wall posts are adequately braced in all cases to beams under mow floor.

I am asking you to kindly submit my inquiries to your readers as I wish to know in as short a time as possible about the 50-foot span. An argument has already arisen. I want to know when I take up the matter again that I am right.

I would like also to know the following things:

If a roof like No. 1, 2 and 3 failed from pressure downward, where would it first break? If from side pressure or wind pressure, where would it fail or first break?

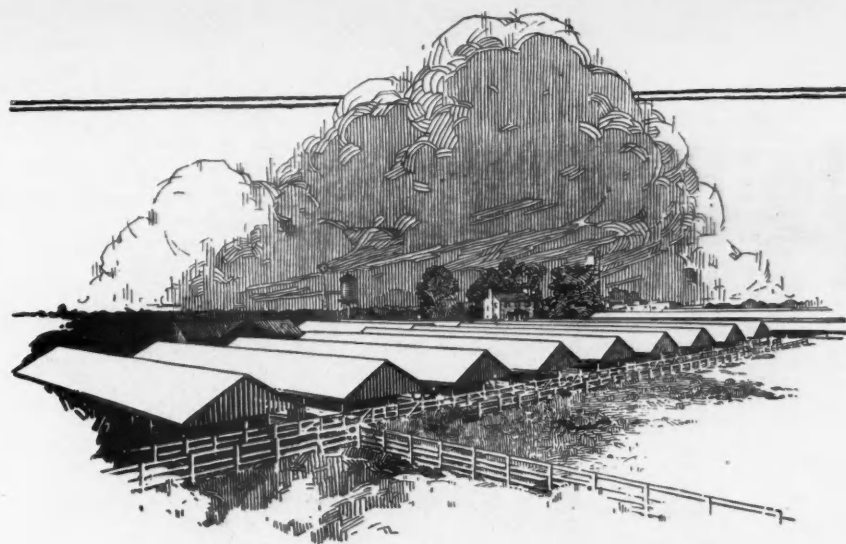
CHAS. A. PRATHER.



Honeymoon Bungalow Built by Idaho Contractor

To the Editor: Kimberly, Ida.

I am enclosing a photo of a fine Idaho ranch home I built for a newly married couple. It is seven miles from town. The house is 28 by 38 feet with an 8-foot porch across each end. The rear porch is enclosed with windows making a



... more than fire-safe

BY A STRANGE provision of nature, the very qualities that make Asbestos fireproof make it the best roofing material.

For ages, Asbestos has repelled the fiercest heats, the shock of quick cooling, and earth's corrosive agents, tests that are far more severe than any roofing ever will have.

No other roofing material has such a history—no other roofing can be more durable. Asbestos means permanency in a roofing.

Asbestos Roofing is immune to heat or cold, rain, sleet or snow, since it cannot decay or corrode; it never needs painting. It lasts as long as the building it protects.

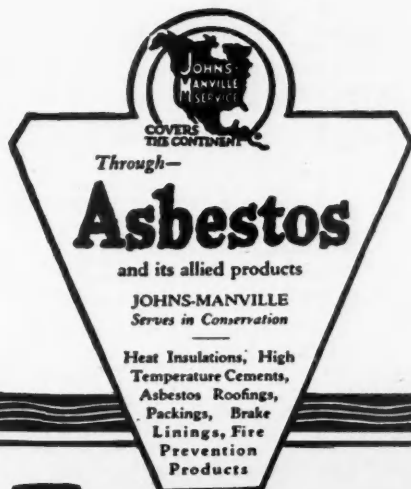
Years ago, Johns-Manville started making Asbestos Roofing. They are specialists, knowing thoroughly not only how to make it, but how it should be applied.

Johns-Manville Asbestos Roofings are made in many types: ready-roll roofings, shingles, "built-up" for flat roofs, or corrugated for skeleton frame buildings.

Johns-Manville Asbestos Roofings are sold through distributors all over the country, under a policy that protects your profits.

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

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



JOHNS-MANVILLE ASBESTOS ROOFING



A Real Honeymoon Bungalow Built on an Idaho Ranch by Arthur H. Fay, Contractor, of Kimberley, Idaho. Among Its Many Features Are an Electric Lighting Plant, Water Supply System, and Hot Air Furnace. Mr. Fay Believes in Modern Equipment for Comfort.

fine room. It has a fine view of the pasture with many head of horses and cattle. The front windows afford a fine view of the mountains some six miles to the south.

The living and dining room has quarter-sawed white oak floor and beam ceilings. These rooms are separated by a colonnade containing a bookcase and china closet. There is also a buffet built in the dining room. A fine cupboard opens between the dining room and kitchen. The kitchen is thoroly built in, having 19 cupboard doors. There are two bedrooms each with a large closet, with a well furnished bathroom between them. There is a full-size basement under the house containing a Delco light and water outfit, also hot air furnace. Water is furnished by a 50-foot drilled well. The living room also has a large fireplace.

The picture was taken before I had the front steps (cement) in place.

I built this without blue prints, just using the floor plans furnished by a carpenter friend of the bride-to-be.

ARTHUR H. FAY.



Explains How He Cuts Hood Rafters

To the Editor: Sesser, Ill.
You will find enclosed sketch showing how I cut hood rafters with the aid of square.

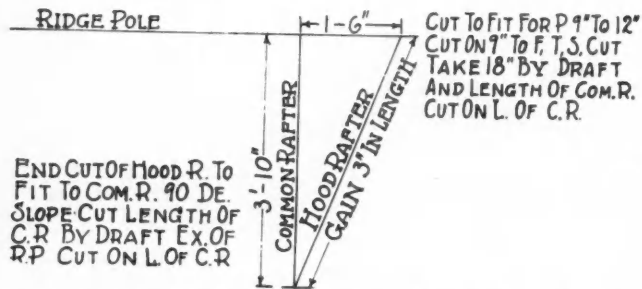


Diagram Illustrating Mr. R. W. Page's Method of Cutting Hood Rafters.

In answer to the inquiry of R. W. in the June number of AMERICAN BUILDER you can see by the sketch how I cut a pattern. It worked very well.

R. W. PAGE.



Question on Plumbing

To the Editor: Brighton, Iowa.
I have a bathroom 6 by 9 by 18 feet located on the second

floor in a south roof dormer.

What I want to know, can I tap the hot water line with the 1/2-inch pipe and run into the hot water radiator and heat the bathroom O. K.? In other words, will this 1/2-inch pipe be large enough to supply hot water enough to heat the room?

E. R. EDWARDS.



Designs a Time Card

To the Editor: Menomonie, Wis.

I saw J. E. Donaho's time card in the May issue of the AMERICAN BUILDER. I am enclosing one which I designed and am now using and find it a great help in keeping the time of different jobs. And, as you will notice, after the owner of the building has signed the card he can never complain about time not being correct when collecting. In contract work, the foreman signs instead of The card covers two weeks, which is

owner of building. between pay days.

I only wish the AMERICAN BUILDER would come once a week instead of once a month as it is certainly good.

H. C. THON.

H. C. THON
Contractor and
Builder

		TIME CARD							
		S	M	T	W	T	F	S	TOTAL
DATE	_____								

DATE	_____								

		TOTAL TIME							

WORKMAN

OWNER OF BUILDING
SIGN HERE



Solution for Board Problem

To the Editor: Webb, Iowa.
In the November issue, 1919, of the AMERICAN BUILDER, I was much interested in the board problem which read as follows:

Where should this board be cut to have as much in one end as in the other?

The solution given was correct but very complicated and hard to work out. I have, therefore, a shorter one to submit, as follows: Square each end separately, add together and divide by two, then extract the square root which will be the diameter (146) = 12,08304" at B. From there



JOHNSON'S PERFECTONE UNDER-COAT AND ENAMEL

YOU can turn out perfect work—satisfy your trade and complete more jobs if you will use Johnson's Perfectone Under-Coat and Enamel for finishing interior trim. The stock shades are White—Ivory—and French Gray, but we are in a position to furnish any other shade for large jobs upon receipt of sample.

Johnson's Perfectone Enamel is exactly right for the expert finisher and will always give perfect results for the unskilled workman. It works freely under the brush and is quick drying. It will not fade, chip, check, crack or peel.

Johnson's Perfectone Enamel is made in Satin and High Gloss. We recommend the use of the Satine everywhere except in kitchens and bathrooms where a High Gloss may be desired. Johnson's Perfectone Enamel Satine has just enough gloss and not a bit too much. It gives a beautiful, artistic hand rubbed effect without the expense of rubbing, but it may be rubbed if desired. Johnson's Perfectone Enamel is elastic and durable. It stands repeated washing with soap and water.

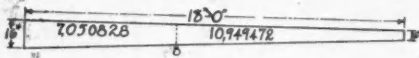
S. C. JOHNSON & SON, Racine, Wisconsin
 "The Wood Finishing Authorities"
 ESTABLISHED 38 YEARS
 Canadian Branch—Brantford, Ontario

Johnson's Perfectone Under-Coat works easily under the brush and can be flowed on and brushed out free from brush marks. Dries hard with a smooth, velvety sheen—requires very little sanding.

Use Coupon for Trial Package
 We'll gladly send a good sized package to interested contractors and builders. Use coupon—it doesn't obligate you in the slightest.

S. C. JOHNSON & SON, Dept. A. B. 9, Racine, Wis.
 I am interested in Johnson's Perfectone Under-Coat and Enamel. Please send me the items checked.
 Finished Wood Panels.
 Sample Perfectone Under-Coat.
 Sample Perfectone Enamel.
 NAME _____
 ADDRESS _____
 I buy from _____

deduct the distance from 6" end to be 10.949472 plus ft.
 $6 \times 6 = 36$, $16 \times 16 = 256$. $36 \text{ plus } 256 = 292$. $\frac{1}{2}$ of 292 is 146;



Sketch Drawn by W. T. New, Webb, Iowa, to Illustrate Board Problem.

the square root of 146 is 12.08304 plus = diameter at cut off.
 W. T. NEY.



How to Resilver Mirrors

To the Editor:

Miami, Ariz.

I should like to know the formula for resilvering old mirrors, also new ones.

CARL MATIS.

Answer—Use the following solution:

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

Silver solution: One part silver nitrate. (AgNO_3) in ten parts of water, adding to this ammonia water NH_4OH until the brown color has disappeared, and the solution again becomes clear, then adding one part caustic potash in ten parts of water at which the solution should again become dark, and finally, sufficient ammonia water to bring it to a straw colored tint. Then place the mirror face up in a suitable dish, and pour the silver solution on it.

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

THE EDITOR.



Advocate of "Better Buildings"

To the Editor:

Scottville, Ill.

Enclosed find a picture of the barn frame I am building along the line of "Better Farm Buildings" as advocated by the AMERICAN BUILDER. This is what I call a real barn frame, to be made of timber. It is 52 by 60 feet. The main posts are 20 feet high and 9 by 9. Hay mow is 10 feet high. Purlin posts are set on the main girts and are 21 feet high, making 31 feet to the top of the purlin plate that you can see men putting on. The main posts are sized to 8 inch, one-half inch sized out on each side to receive full size of timber. Instead of all the weight being on the tenon all

the braces are framed in the same way with a one-half inch toe on them. Under the mow tie are double braces, on the face side of timbers on 3 by 3 foot run, and on back side on 4 by 4 foot run. The purlin posts are braced behind with 6 by 6-in. braces on mow tie and on 6-in. by 6-ft. run and on girt at top of main posts. They are also braced with 6 by 6-ft. braces on the 8 by 8-foot run. In hay mow there will be a space of 26 by 60 feet with no timber across the barn. The mow joists are 3 by 9-in. placed 14 inches on centers. All tenons are draw-pinned with 1-in. pins about 3/16-in. draw. The foundation is of solid concrete about 30 inches high and extends into ground about 3 feet. It is about 30 inches wide at bottom, reinforced with 3-inch woven wire fence and steel rods. There are over 1,300 1-in. pins that hold barn together. This is a very brief description of the barn, but it may give you some idea of what I am doing this summer. It may be an inspiration to some of the boys as some of theirs has been to me.

I am a firm believer in "Better Buildings" and try to make every one better. I hope my friend E. W. Atteberry, of Nebraska, will see this, as we were boys together and never thought either one would be a builder. But I saw one of his churches in the AMERICAN BUILDER a few years ago and would like him to see this.

C. S. PATTERSON.



Builder Installs Lightning Rods

To the Editor:

Peru, Ill.

I have been installing rods only a short time and cannot devote all my time to this work, but have enjoyed unusual success in that work. The last four buildings that we rodged were two large barns valued at \$6,000, one residence valued at \$18,000 (which I put up myself), and a residence in town valued at \$13,000.

One of the barns I rodged belonged to a man in town. When I had the barn rodged he was so well pleased that he wanted his house in town rodged. The peculiar part of it was this man told me every time they had a storm that his lights would go out. We ran three grounds on this house. We also had room to put on eight points. We have had several hard storms since then and his lights haven't been affected since rodging. So what little experience I have had with the rods, I can highly recommend lightning rods, especially for farm buildings.

The most important part is this: Installing the rods properly. We are as careful when installing rods as we are when we put up buildings. Have the work done neatly. Get all points uniformly spaced. Have the points good and plumb, well nailed. Have your rod run nice and straight on roofs and down gables. Make firm connections. Pay particular attention to the grounding.

HENRY VOGT, JR.



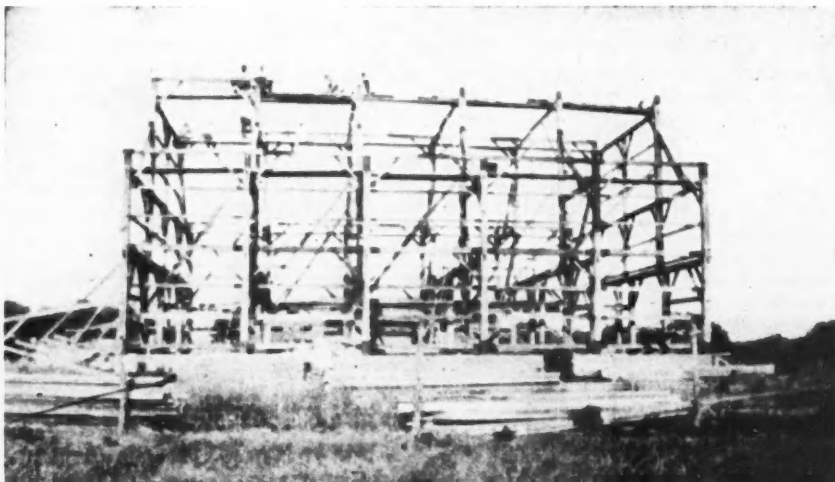
Wants Information on Conical Roof

To the Editor: St. Edward, Neb.

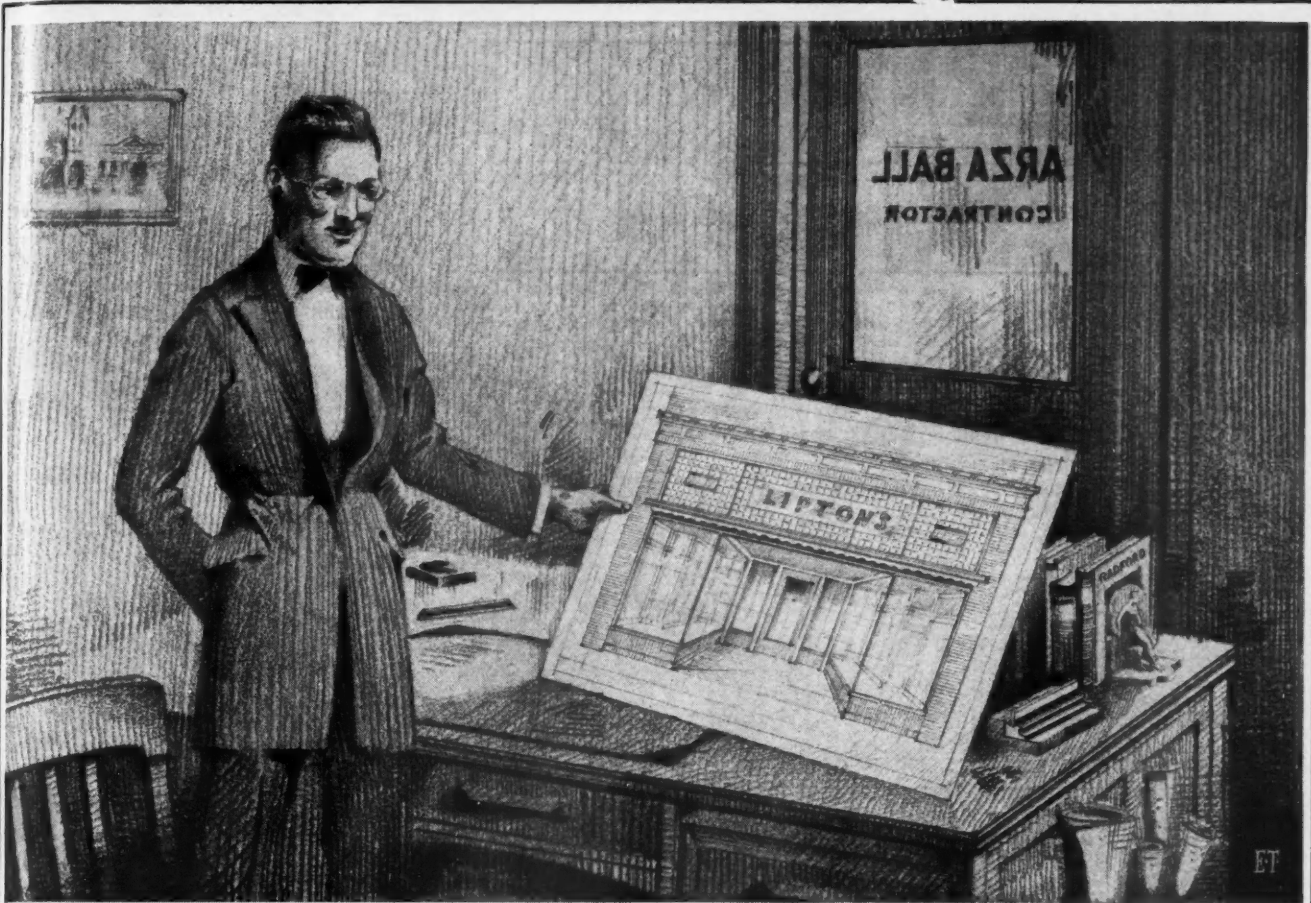
I would like to get some information regarding the erection of a round or conical roof. In the April number of AMERICAN BUILDER there is an article by Ivan D. Wood explaining the framing of a conical roof, but the cornice construction and method of sheathing is what I would like to find out about.

If the sheathing is run on a diagonal would it run at the same angle all the way around the roof and work out?

L. P. MOSS.



Down in Scottville, Ill., There is a Contractor by the Name of C. S. Patterson Who Believes in "Better Buildings" as Advocated by the American Builder. This Modern Barn is Built Along Those Lines. It is 52 by 60 Feet.



You Will Be Proud of Your Work.

Every job you install with the Kawneer Solid Copper Store Front Construction will be a prestige builder and constant advertisement for you—more than 100,000 satisfied customers is your guarantee of this. There are numerous prospects for store front jobs in your neighborhood. Store Front remodeling is always active, even when new construction work is slack. *Kawneer* Store Front work is not difficult. If you can build a house you can handle this work at a good profit. Let us show you how. Fill out the coupon and mail it now before you forget about this opportunity.

Just Pin the Coupon to Your Letterhead

Kawneer
SOLID COPPER
STORE FRONTS

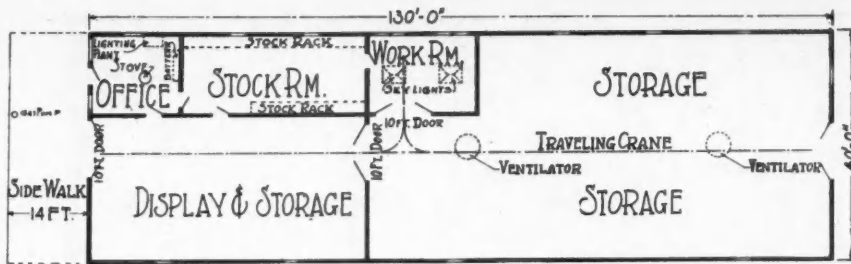
THE KAWNEER
COMPANY

1726 Front St., Niles, Mich.

I am interested in the work named in your American Builder Advertisement, and would like to learn more about it. Please send me your "Book of Store Front Designs."

Name

Address



Floor Plan of Public Garage Built by C. J. Green, Highmore, S. D. He Wants to Know Where to Place Heating Plant. The Stock Room and Office Are Heated by Stove.

Should Put in Steam Heat, Overhead Pipes

To the Editor: Highmore, S. D.
I am enclosing a cut of a public garage that I have just built for Cody & Barnette at Highmore, S. D.
As there was no heating plant specified, I am asking thru the AMERICAN BUILDER suggestions on heating the storage and work room. The office and stock room are heated by a

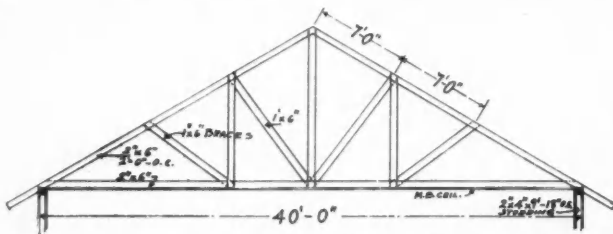
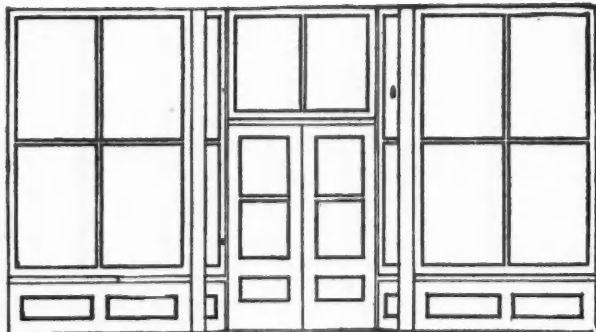


Diagram Showing Truss Construction Used by Mr. Green in Building Public Garage.

stove. Would a furnace heat the rest of the building? Where is the best place to install it and what kind of furnace would be the best?
Some suggest to set it in an 8 by 8 pit, extending outside of the main building, leaving out a small partition. As it does not have to be put in until fall, I am asking the opinion of brother carpenters.
C. J. GREEN.

Seeks Pointers on Store Front Construction

To the Editor: Munsoe Falls, Ohio.
I am building a store, size 30 by 40 feet, with living rooms above, and I would like a few pointers.
The building is to be frame with 10-foot ceiling in the storeroom and 18-foot studding in the outside walls. I would like to know if it would be proper to run the main roof out over the front for a porch on the second floor which we expect to arrange for two families by putting two bedrooms in the attic with two dormers; main roof to be 8-inch per foot rise. Should dormers be gable or shed roof? What kind of posts would be suitable for the front to sit on concrete and



Type of Store Front Mr. E. J. Spriggel, Munsoe Falls, Ohio, Is Planning to Put in His New Building. Builders—Sharpen Your Pencils for Mr. Spriggel Has Asked Several Very Interesting Questions.

run clear up to the soffit of the porch on the second floor? Should there be three posts or how would you support the center?

I also would like to see a sectional drawing thru a store front on this kind of building showing how the front is connected with floor and ceiling and sides. I expect to put in a 24-foot front. This store has a 6-inch partition in the front end in the center running lengthwise, and the front has a recess where the doors are. How will I carry the

joist above at this point?
What size windows should I use and where should they be placed in the storeroom? One side of the store is to be devoted to confectionery, the other grocery.

E. J. SPRIGGEL.

Use of Bark for Building

Clear Creek Ranch,
Lake, Mich.

To the Editor:
We desire to obtain some information in regard to treatment of bark on logs and slabs used for building purposes, both in regard to keeping borers and other pests from working in them and in regard to making bark adhere firmly to logs without falling off.

Our timber is mostly tamarack, balsam, spruce and hemlock. We sawed this spring around 100,000 ft. of logs, and saved out the very best slabs. These slabs we piled with stickers, the same as lumber is piled, in good shape, and they have dried out pretty well and are apparently in good condition. It is now our desire to use these slabs as outside finishing on a frame bungalow, also the garage and outbuildings. We plan to sheath up the buildings on the outside, place tar paper against the sheathing, and then put on the slabs vertically. We wish to get a finish which will be an imitation of a log bungalow. We have seen this same plan carried out apparently with good success, both in the State of Maine and in the Grand Canyon. Our greatest concern has been the bark on the slabs. We would like to ascertain how to preserve it.

A. E. ACHARD.

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

1. Cut timbers late in summer and score on two sides; that is, cut off narrow strips of bark for the entire length. Pile in shade in open pile to allow thoro circulation of air. Allow timbers to season until following spring or summer before using.
2. Proceed as in 1, and in addition coat ends, stripped portions, and knots with coaltar creosote, using one coat a few days after timber is cut and another just before using the timbers.
3. Proceed as in one, but do not score bark. When timbers are in place, tack bark with large-headed nails, placing one to every square foot of surface. Paint heads of nails to resemble color of bark.
4. Tack or nail the bark on without particular attention to time of cutting or other treatment.

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

THE EDITOR.

Building or No Building — here is profit for you NOW



EVERY wood floor, old or new, in your town represents a money-making opportunity for you. Every building going up, or already up, with wood pillars, supports, porches, etc., means continued work, sales and prosperity.

With hardwood flooring selling around \$225 per M, owners are easily convinced they ought to *PRESERVE IT*.

With all lumber scarce and high-priced it is only common sense for owners to completely protect and preserve it.

Sell them VITRIFYL—or apply VITRIFYL yourself on a *square foot price basis*.

Thousands of contractors, agents and dealers are treating wood floors with VITRIFYL for from 2c to 4c per square foot—buying it from us by the gallon. One gallon covers a large area. Our agents are also selling it *by the gallon* at a handsome profit.

Write in today and ask us about it.

WHAT VITRIFYL IS

VITRIFYL is an amber liquid, compounded of certain oils and gums. There is nothing else like it. VITRIFYL takes the place of the original oils and gums that have evaporated out of the wood. It penetrates the flooring, thru and thru—filling the pores permanently and eliminating dry rot, splintering and cracking. It makes floors hard, wear, water and oil-proof; also fire retardant, slightly and as easy to wash as marble.

VITRIFYL absolutely guaranteed by this company to make *floors perfect for five years*—with only *one application*. No other treatment necessary.

“VITRIFYL Wood Preservation” is the livest thing today in the building field. Are you going to make the most of it?

ASK US FOR FULL INFORMATION Your complete proposition is waiting. Let us tell you where VITRIFYL may be obtained and quote you prices. We maintain 50 Service Stations in the United States ready to serve you. Handsome book on the “Art of Floor Preservation” containing valuable facts, free on request.

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We'll help you with advertising, and real co-operation. Liberal margin of profit. ASK US.

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WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER

Building Success With Concrete Blocks

OMAHA FIRM INCREASES BUSINESS 3,000 PER CENT IN 15 YEARS AND HAS TWO LARGE PLANTS

By R. Niehaus

WHEN a manufacturing concern steadily increases its output until it is thirty times what it was at first, there must be merit to the product which it manufactures. The Ideal Cement Stone Company of Omaha, Neb., has experienced this kind of success, a 3,000 per cent increase in their daily manufacture of cement building blocks in 15 years.

This concern started in 1904 behind some sign boards on a vacant lot near the main business section of the city. The company was made up of four stone masons, N. J. Peterson, his brother, Chas. Peterson, and two others who are no longer in the concern. The first year N. J. Peterson, as manager, also superintended the "plant" where one hand machine turned out about 200 8x8x16-in. blocks per day. The mixing at first was also done by hand. One of the other men devoted his time to the mason work for the company, but as the venture was new, small, and as yet uncertain the other two men did not devote any time to the business the first year.

The business grew from the start and its promoters were convinced that cement blocks of good quality would grow in demand as a building unit. They aimed

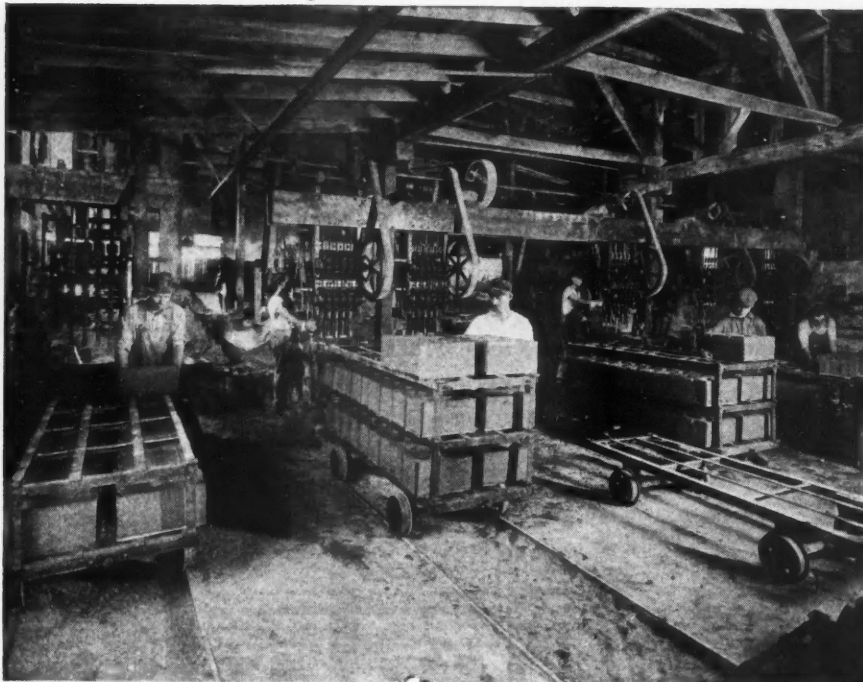
possible, as was also a concrete mixer. Soon other block machines and tampers were added and thus the output was steadily increased. Then all four men took active part in the affairs of the company.

It was evident from the first that most bricklayers were opposed to handling cement blocks for two reasons. First, because of their weight, as cement blocks are heavier units to handle than brick; second, they cut down the hours of labor on each job, for less time is required to build up a wall with the larger units. This opposition proved healthful, however, for the new enterprise, as it was then forced to sell the blocks laid into the wall. The careful and thoro workmanship put into each contract job helped create favor from the first with the building public. It is doubtful whether cement blocks could have been introduced so quickly in any other way.

Now there are many competent masons and cement workers as well as bricklayers who lay cement blocks, so the company has discontinued its construction department and devotes all its time to the manufacture and sale of its products.

It was not many years before the Ideal Cement Stone

Company was compelled to seek a factory site on trackage, and today they have one plant in the north part of Omaha at which plant is also located their office and display room. This is a new building which they moved into March 1st of this year. They also have one plant, also on trackage, in the south part of the city. At the north plant are eight block machines and tampers besides all their other molds for making specials of many kinds, such as copings, sills, lintels and

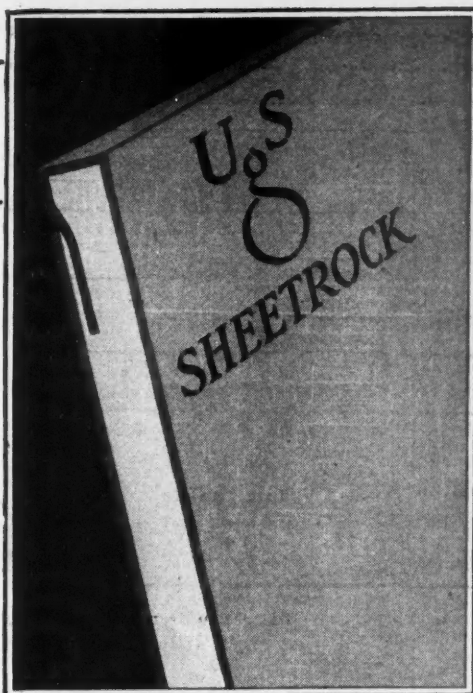


Interior of One of the Peterson Bros. Concrete Block Plants Showing Tamping Machines and Facilities for Large Output. Fifteen Years Ago They Started With One Hand Machine Turning Out 200 Blocks a Day.

at making the best quality product possible. In keeping with this policy it was natural that they should be the first in their locality to realize the need of power tampers. One of these was installed as quickly as



Main Plant of Ideal Cement Stone Company at Omaha, Neb. The Daily Output of Two Factories is 6,500 Blocks in Addition to Special Orders. This Concern Has Increased Its Block Business 3,000 Per Cent in Fifteen Years.



SHEETROCK

**Rigid...
Tough...
Durable**

Nailed directly and securely to the studs or joists, Sheetrock—rigid, tough and durable—retains its original shape and condition year after year.

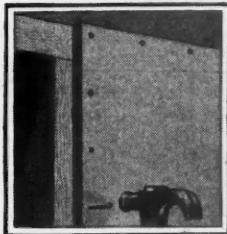
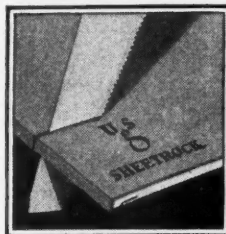
Made of pure Gypsum rock, encased in a heavy protective covering, Sheetrock cannot warp, shrink or buckle. It resists heat, cold and sound. It is fire-proof.

And, Sheetrock is reinforced with the Patented U. S. G. Reinforcement for protection in handling, for extra nailing strength and for a tight, flush joint. It is clean, dry and uniformly surfaced; it takes any decorative treatment—paper, paint, panels.

Sheetrock is quickly put up; it can be sawed and nailed like lumber; it is economical and profitable to use.

National advertising is pointing out to home owners that Sheetrock is the standard wall and ceiling material in unit form.

Sheetrock comes in standard sizes, $\frac{3}{8}$ in. thick, 32 or 48 in. wide and 6 to 10 ft. long



Can be Sawed and Nailed

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MINES AND MILLS

Alabaster, Mich., Amboy, Cal., Arden, Nev., Blue Rapids, Kas., Cleveland, Ohio, Detroit, Mich., Denver, Colo., Eldorado, Okla., Fort Dodge, Iowa, Genoa, Ohio, Grand Rapids, Mich., Gypsum, Ohio, Loveland, Colo., Milwaukee, Wis., Oakfield, N. Y., Piedmont, S. D., Southard, Okla., Plasterco, Va.



View of Shipping Yard of Concrete Block Concern. Last Year They Shipped 1,015,000 Blocks. The Daily Requirements Are 150 Tons of Sand and 600 Sacks of Cement. This Firm Has Established an Excellent Reputation in that Section of the Country.

other building trim, as well as ornamental concrete products, such as flower vases, boxes, bird baths, lawn seats, etc. The south plant operates six block machines and tampers. Both plants are equipped with 50 horsepower boilers and hundreds of feet of pipe leading to steam bins where the cement blocks and other products are steam-cured for 48 hours before being placed into the storage yards.

The output of the two factories is now 6,500 blocks, 8x8x16-in., per day in addition to many kinds of specials. Last year with less capacity than at present the total was 1,015,000 cement blocks, 8x8x16-in., besides a big tonnage in specials. This year bids fair to show a big per cent of increase in both blocks and specials.

The daily requirements of material average about 150 tons of sand and about 600 sacks of cement. Fifty men are employed in the two plants; the weekly payroll, exclusive of the officers, averages about \$1,900.00. They are fortunate in being located within only 30 miles of the Platte River, where there is an almost inexhaustible supply of excellent concrete sand. It is doubtful whether there is to be found anywhere in the world a better sand for cement blocks, clean, sharp and of good color. Most of the sand for winter and early spring operations is stored during the summer months. Drained sand can be secured during the winter, however, if necessary.

Seven years ago the first special efforts were made to introduce the cement blocks to the trade in the territory outside of Omaha thru the lumber and material dealers. A. V. Johnson joined the company at this time to carry on this work. More than one hundred cars were sold the first year. Each year since has shown a gain in this business until now more blocks are loaded on cars for country trade than are delivered to the city jobs by their three auto trucks.

This enterprising company realized that they must have a trade-mark on their product, particularly the cement blocks, if these were to be identified readily by

the trade. After considerable experimenting one was finally adopted, a small star-shaped impression on the back of the block. While this star is not a conspicuous mark it is easily found and readily identifies the product. Along the railroads for 150 or 200 miles in every direction from Omaha, in more than 400 towns, can be seen piles of these Ideal "Star" brand cement blocks in the lumber yards. They are a staple line now in most places.

It has taken many years of close application to business, also increases in capital from time to time, to build this concern to what it now is. It is not now by any means a large concern when compared with many in other industries, nor does it lay claim to having amassed a great fortune. Its members have, however, had great satisfaction in watching the business grow from a "shoestring" to the largest in its particular line in their part of the country, and along with this satisfaction has also come material gain greater than was thought possible when the business was in its infancy.



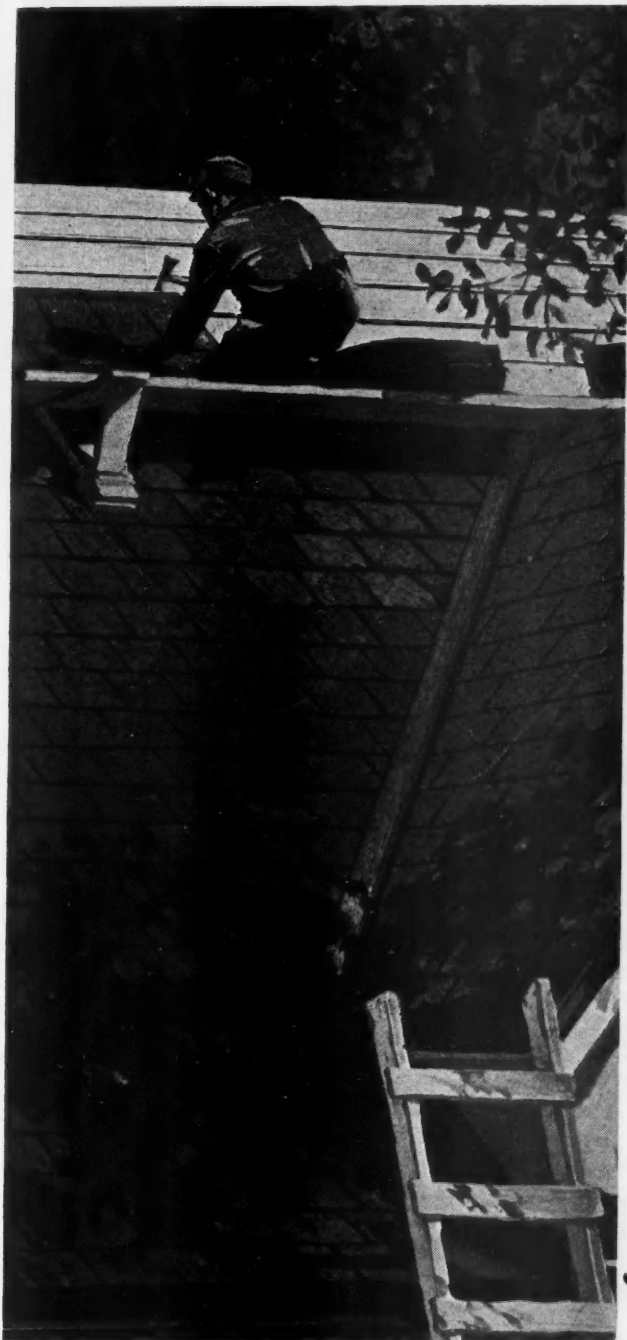
Cantilever Beams

(Continued from page 118.)

The real safe load is then $.80 \times 2,000$ pounds = 1,600 pounds. If the timber is planed S-4-S, the factor is .74. Then the safe load is $.74 \times 2,000$ pounds = 1,480 pounds.

A safe load is always figured with a large factor of safety. Whether the factor from Table 2 is necessary or not, depends on the loading and the quality and degree of clearness in the lumber used. If the material has any loose knots and has any decayed parts no chance should be taken. The factor must be used. Since the deflection increases as the beam weakens, a close approximation to the real deflection may be obtained by dividing the nominal deflection by the corresponding reduction factor from Table 2. While this result may not be exact it will be close enough for practical purposes.

The Confidence of Builders



VULCANITE has the confidence of builders. Using it once has meant using it continuously,

Ability to withstand extremes of weather and to *overcome* the *short-comings* of ordinary roofing materials has given Vulcanite the preference among the most progressive builders. Thousands of Vulcanite roofs in every part of the country furnish tangible evidence of owner satisfaction and builders confidence.

There are two underlying reasons for the success of the Vulcanite process of manufacture: (1) The high quality of the felt base; (2) the superior grade of asphalt used. The felt base is made in the Vulcanite mills under the direct supervision of Vulcanite roofing experts. It is the best obtainable material for the purpose. The asphalt ingredients, too, are specially selected—they are the perfected result of years of research and experiment.

Lasting and uniform colors, available in exclusive designs and in every necessary form of roofing are other noteworthy Vulcanite advantages.

Country-wide distribution is an equally important part of the Vulcanite Roofing Service. Practical literature will be sent upon request.

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BEAVER QUALITY FOR BETTER ROOFS



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Anti-Rust Compound for Saving Machinery

EVERY year rust exacts its toll of millions of dollars in waste from machinery, tools, ordnance and metals. As a large user of an extensive line of machinery such as concrete mixers, saw rigs, hoists and the like, not to mention valuable tools and hardware, the contractor is vitally affected by this damage.

Recently an anti-rust compound has been discovered that is designed for the purpose of cutting down much of the waste due to this cause. Its feature is its great power to resist intense heat. Ordinarily preparations for preventing rust have not been able to resist great heat and as a result, have lost their efficiency. Under test this new compound has demonstrated an effective resistance to heat.

It is applied to the polished surfaces of steel and iron products and forms a coat that keeps out moisture and fumes. A protecting coat on machinery and tools is especially effective in storage or shipping when the products are submitted to all kinds of atmospheric conditions. This compound can be removed by ordinary wipe-cloths.



Stripping Ledger Boards

IN taking off the ledger boards used for staying posts under floor forms, the present cost of lumber makes it exceedingly desirable that these boards should be saved and used again.

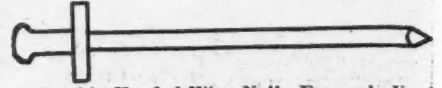


View of New Stripping Device for Removing Ledger Boards Without Damaging the Boards.

For years it has been the practice of the Aberthaw Construction Co. to nail those boards to the posts with double-headed wire nails, somewhat like the appended sketch. This left about half an inch of the nail projecting, and it was a perfectly easy matter to get the nails out and thus take down the boards.

Due to the general condition of the steel market it has recently become impossible to obtain these nails, and they have been

forced in many cases to use common wire nails 10d. Consequently a new device for stripping the ledger boards from the posts has been developed. This consists of a form of lever shown in the two small photographs. It will be noted that the device has a pin thru the handle which bears against the post and permits the arm to push the ledger boards from the post. The action is such that the boards are pushed off without splitting, which would



Double-Headed Wire Nails Formerly Used to Nail Boards to Posts in Concrete Work. They Are Hard to Obtain at the Present Time.

be practically impossible if they were handled with a hammer in the usual way. The device also is so arranged that it can be used from either side of the post—that is, either for pushing the boards off or for pulling them off. The photographs show this clearly.



View Looking Toward Operator Showing How Device Fits Against Support and Board Which Is to Be Removed. It Can Be Used from Either Side of the Post.

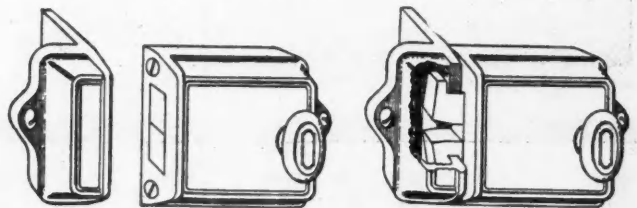
In practice it has been found that this method of removing the boards from the posts results in a much lower cost than knocking the boards off with a hammer. As this removes the boards undamaged, it has the further advantage of conserving the timber supply, and thus making a still greater reduction in the cost of the operation.



New Lock Foils Burglars

WHILE many locks are built to prevent forcing by pushing back the bolt, they have been unable to resist a "jimmy" by which the door can be forced apart from the jamb or the lock from its keeper or strike.

A lock that will resist this method of attack has been designed, and is used largely in entrance doors to apartments



"Jimmy-proof" Lock Recently Devised to Protect Home Against Burglars. Note the Hook Bolts Which Interlock With the Strike. This Arrangement Prevents Forcing.

where this danger is greatest. The feature of the new lock is a bolt device which consists of two heavy, hard bronze hook bolts which interlock with the strike as shown in the diagram, and a third bolt which firmly locks the hook bolts apart. This metal prevents the forcing of the door or lock except by such violence that the door is destroyed.

This lock does not project beyond the edge of the door and when unlocked, the bolts are flush with its front.



Lafayette Motors Company Builds 150 Houses for Employees

The Lafayette Motors Company, at Mars Hill, near Indianapolis, are building 150 houses for their employees.

CONCRETILE ROOFING *Beautiful - Durable - Inexpensive*

No two of the houses will be alike. They are all modern, wellbuilt and range from a four-room bungalow to a two-story, eight room house. All will have Concretile roofs.



"A roof for all time"

- No Wear
- No Repair
- Fireproof
- Waterproof
- Frostproof
- Stormproof
- Low in Cost
- Interlocking
- Light in Weight
- Different Colors
- Permanently Beautiful
- Specified by Architects
- Approved by Underwriters

Size of one Concretile 9" x 14 $\frac{3}{4}$ "
 Weight 5 pounds.
 Surface exposed to weather 8" x 12"
 Number of Concretile to square
 (100 sq. ft.) 150.
 Weight per square 750 pounds.

WALTER CONCRETILE CO.

414-18 Saks Bldg.

INDIANAPOLIS, IND.



Houses for Lafayette Motors Employees, Roofed with Concretile.

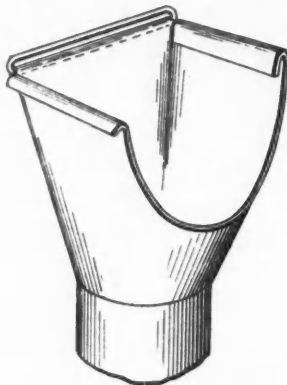
J. EDWIN KOPF, Architect

New Drain Spout Prevents Clogging of Pipe

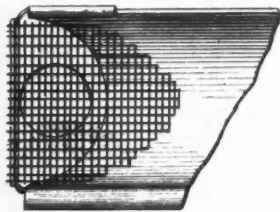
AN eave spout that will help the connection between drain pipe and trough to be made easily and quickly as well as provide a means to prevent leaves and other refuse material from entering and clogging the drain pipe is the purpose of the drain spout which was recently invented and is now on the market.

This eave spout is so designed as to eliminate the necessity of soldering. It is fitted securely into place without mechanical connections.

The eaves trough is supported by the usual hangers secured to the roof of the



Views of New Eave Spout Showing Protective Screen to Keep Out Material from Drain Pipe, the Spout Itself, and Spout Fitted to Gutter Like This Cutout.



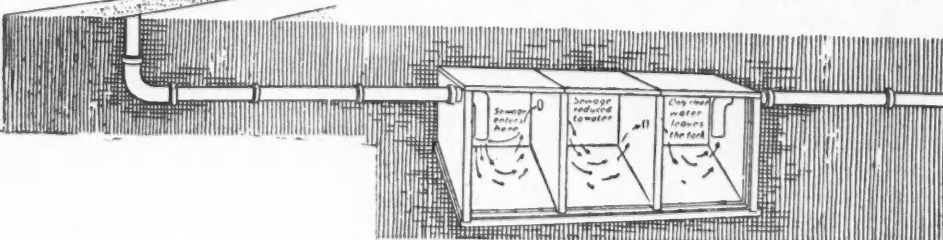
building. This trough is semi-circular and at one of its longitudinal edges is bent upon itself to provide a tubular bead. The drain pipe is connected to the end of the eaves trough by means of the spout which embodies the new invention. This spout is formed from a single sheet of metal which is of substantial conical form and has a flattened side which forms the end wall of the spout.

A piece of wire netting placed over the spout prevents leaves and other material from entering the drain pipe. The illustration shown here illustrates this feature. This matter rests on the netting until eventually removed or blown off by the wind.



Sewage Disposal Without Sewers

ONE of the most important problems of the builder in constructing a farm home is providing efficient sewage disposal when the closet is built in the house. Nowadays very few outhouses are built because state laws prohibit them. In solving this problem of sewage disposal the builder has found the septic tank a great aid.



New Septic Tank Designed for Farm Homes. It Consists of Three Concrete Tanks Thru Which the Drainage Passes and Is Liquefied. It Finally Passes Off Thru the Tile Drain Pipe into a Ditch or Soil.

tanks are built in sections of reinforced concrete which enable them to be adapted for all kinds of installations. They are fitted together with interlocking joints to provide against leakage or absorption.

The sewage is first received in the liquefying compartments where the bacterial action digests the sewage and converts it into water. Then it passes into the effluent chamber. The clear water which leaves the effluent chamber can be discharged thru farm drain tile or into a ditch or dry well or be allowed to seep away in the soil. In this tank no chemicals are used.

New Hardware Increases Window Ventilation

VENTILATION in homes, office buildings, and schools is becoming one of the most important problems of the architect and builder. The main medium thru which it is secured or retarded is the window. For that reason builders

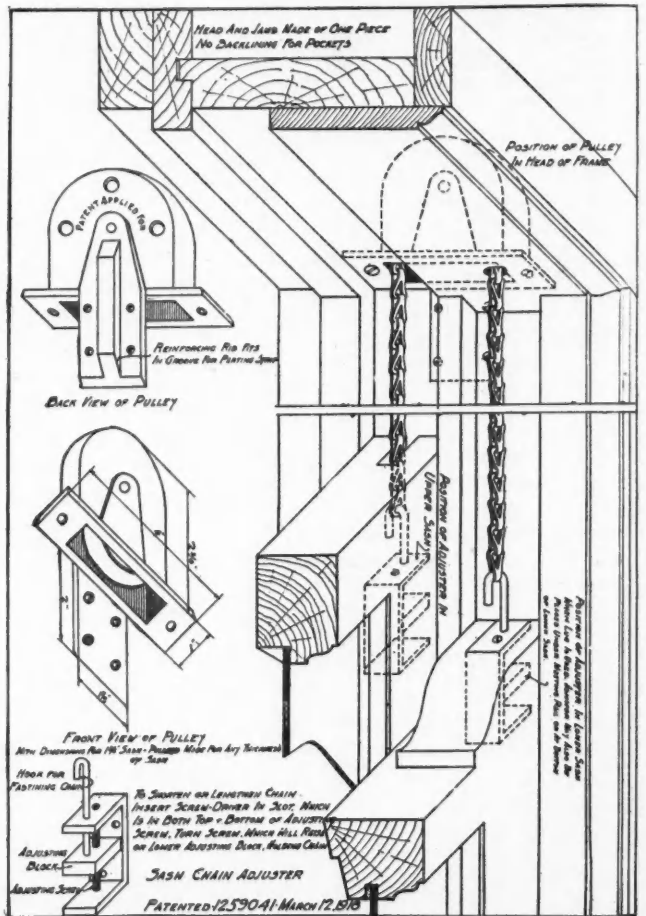


Diagram Showing New Counterbalanced Window Hardware. The Upper Sash Is Lowered as the Bottom Is Raised. Three Inch Mullions Can Be Used With This Hardware.

will be interested in new counterbalanced window hardware which is now on the market. It has been designed to increase light and diminish shadow and increase natural ventilation without unnecessary drafts.

This hardware consists of overhead pulleys and sash-chain adjusters. The adjustment of these pulleys and sash chain is very simple. It is composed of two cast iron pulleys placed in the window head and braced into the frame from which windows are counterbalanced by chains and chain adjusters. These four chain adjusters are placed two in each sash, one on each side.

Attention! Contractors and Carpenters

We announce the new shingle unit—

THE SQUARE

For all brands and grades of Rite-Grade Inspected Red Cedar Shingles.

These shingles are now being packed so that four bundles will cover one hundred square feet (1 square) when laid a standard weather exposure of $4\frac{1}{2}$ inches for 16-inch shingles; $5\frac{1}{2}$ inches for 18-inch shingles.

Only strictly serviceable shingles, free from culls, (such as Rite-Grades) can be packed by this unit and a square covering capacity guaranteed.

Estimating Shingle Requirements Simplified

Estimate area to be shingled in square feet, and you know immediately number of squares of Rite-Grades required.

Should you desire to lay $\frac{1}{2}$ inch more or $\frac{1}{2}$ inch less to the weather than the standard, just subtract or add 10% respectively, and you have number of squares of Rite-Grades required, either on 16-inch or 18-inch shingles.

There are three grades of Rite-Grades—all up-to-grade. Specify the grade you need.



Figure allowances for irregularities or doubled first courses in square feet and add to area.

Estimating shingle requirements is reduced to simplest and most certain terms through the Rite-Grade Square. You'll build an enviable reputation for yourself through demanding Square-Packed Rite-Grade Inspected Red Cedar Shingles.

Send for full descriptive literature on
THE SQUARE

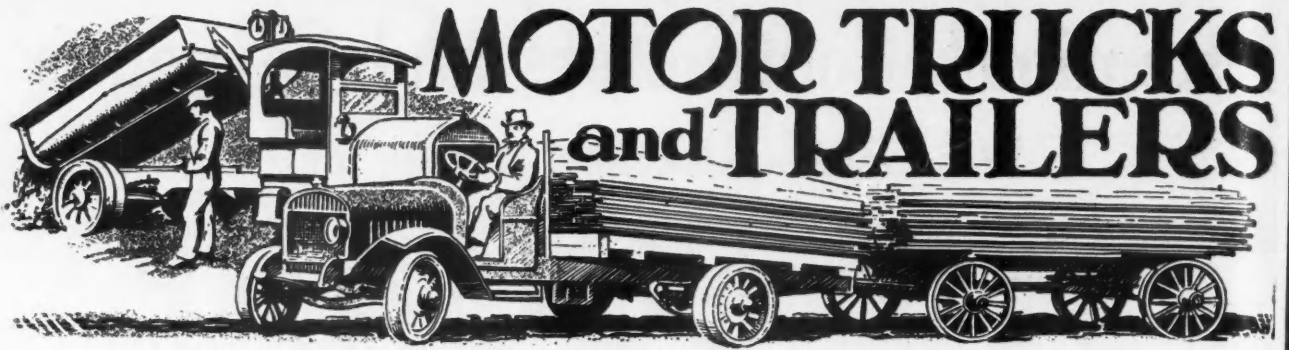
Shingle Branch, West Coast Lumbermen's Assn.
426 Henry Building, Seattle, Wash.

AND

The Shingle Agency of British Columbia
911 Metropolitan Building, Vancouver, B. C.



WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Serving the Builders

MOTOR TRUCKS FIGURE IN EVERY STAGE OF CONSTRUCTION

MOTOR trucks serve builders at every stage of construction. They help, in many instances, to raze older buildings on the locations where new structures are to go up. They haul the engineers to the sites. They haul away the earth from the excavation; haul back the stone and steel, the brick and cement of which the foundations are built. They haul the lumber, the marble, the brass, the hardware, the ornamentation. They deliver the roofing, the heating and lighting plants and fixtures, the plumbing, paints, the furniture and telephone systems. At every point of contact they speed up the process of building and making ready. Altho motor trucks have been generally used by builders only within the last ten years every great city of America boasts of millions of dollars worth of construction in which horses have played but a minor part.

A notable case in point is that of the \$4,000,000 high-level bridge spanning the Cuyahoga River at Cleveland and connecting the eastern and western sections of that great city.

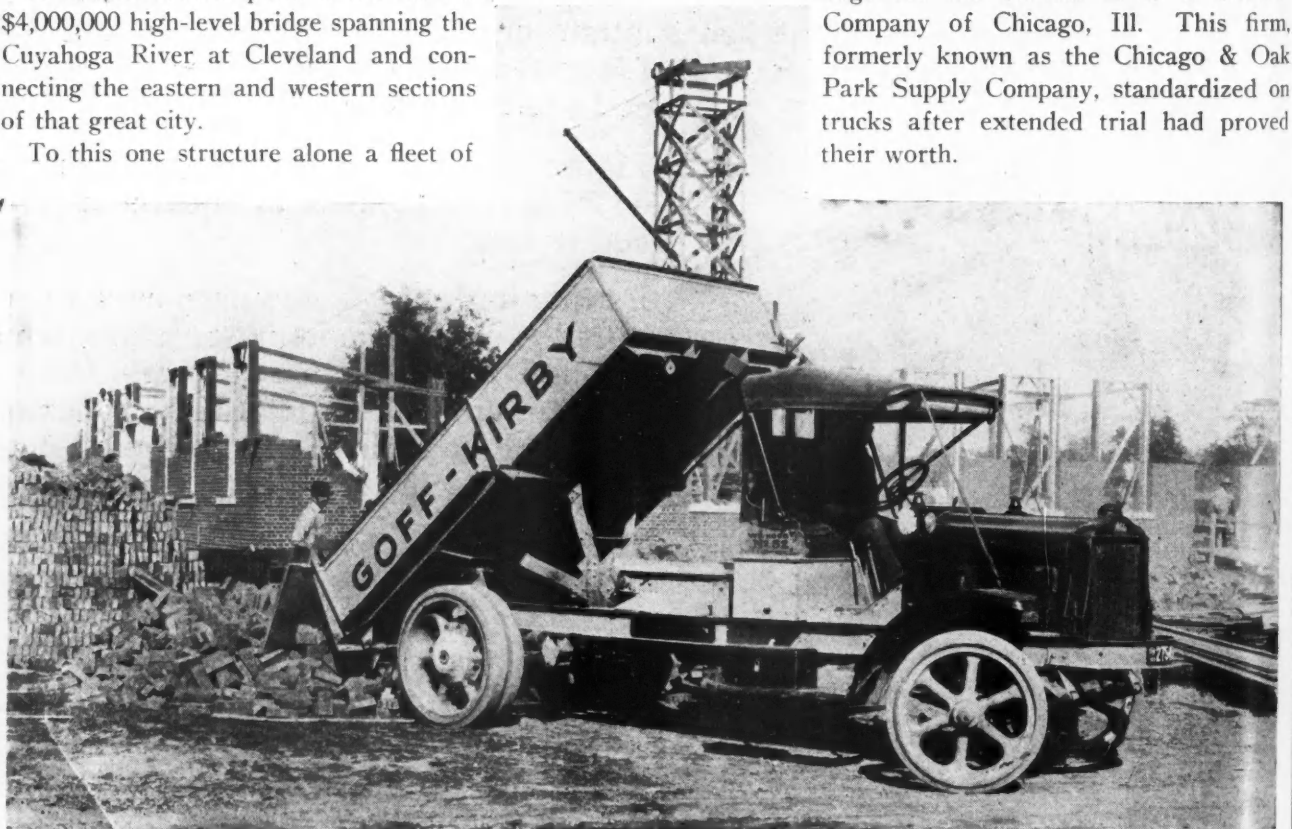
To this one structure alone a fleet of

trucks hauled 543,000 sacks of cement, 69,692 tons of sand, 15,653 tons of limestone, 108,900 cubic yards of mixed concrete, several thousand cubic yards of slag, and many hundred tons of steel, miscellaneous building materials, tools and supplies—a miracle of carrying service which, it is freely conceded, enabled the builders to complete this monumental work many months before it could possibly have been completed without the service of these trucks, saved the city thousands of dollars and materially aided in reducing traffic congestion at a time when each passing day added to the seriousness of traffic problems.

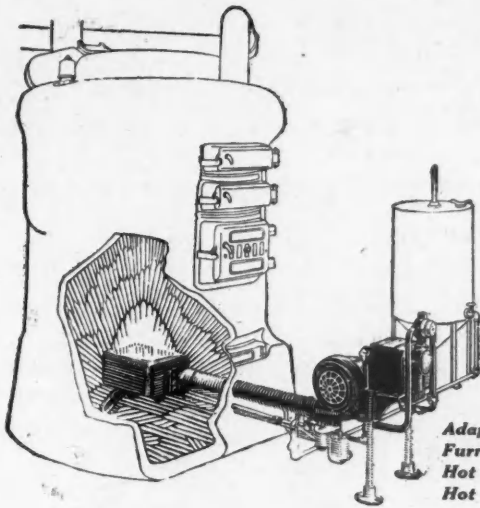


Builders' Supply Company Keeps Five Five-Tonners Busy

UNFAILINGLY on the job, day after day, five five-ton dump trucks have hauled enormous tonnage for the Central Lime & Cement Company of Chicago, Ill. This firm, formerly known as the Chicago & Oak Park Supply Company, standardized on trucks after extended trial had proved their worth.



Speeding Up the Building Job. This 5-Ton "White" Is Equipped with a Dump Body to Eliminate the Delays at the Unloading End. It is Only One of a Fleet that the Goff-Kirby Coal Co., Large Building Supply Dealers in Cleveland, Ohio, Use to Get Material to the Job on Time.



*Adaptable to any
Furnace—Steam,
Hot Water or
Hot Air.*

NOKOL

Automatic Oil Heating

Gives you clean, dependable, controlled heat at any desired temperature

Does away with the annoyance of uneven temperatures, building fires, shoveling coal, removing ashes, dirt, etc.

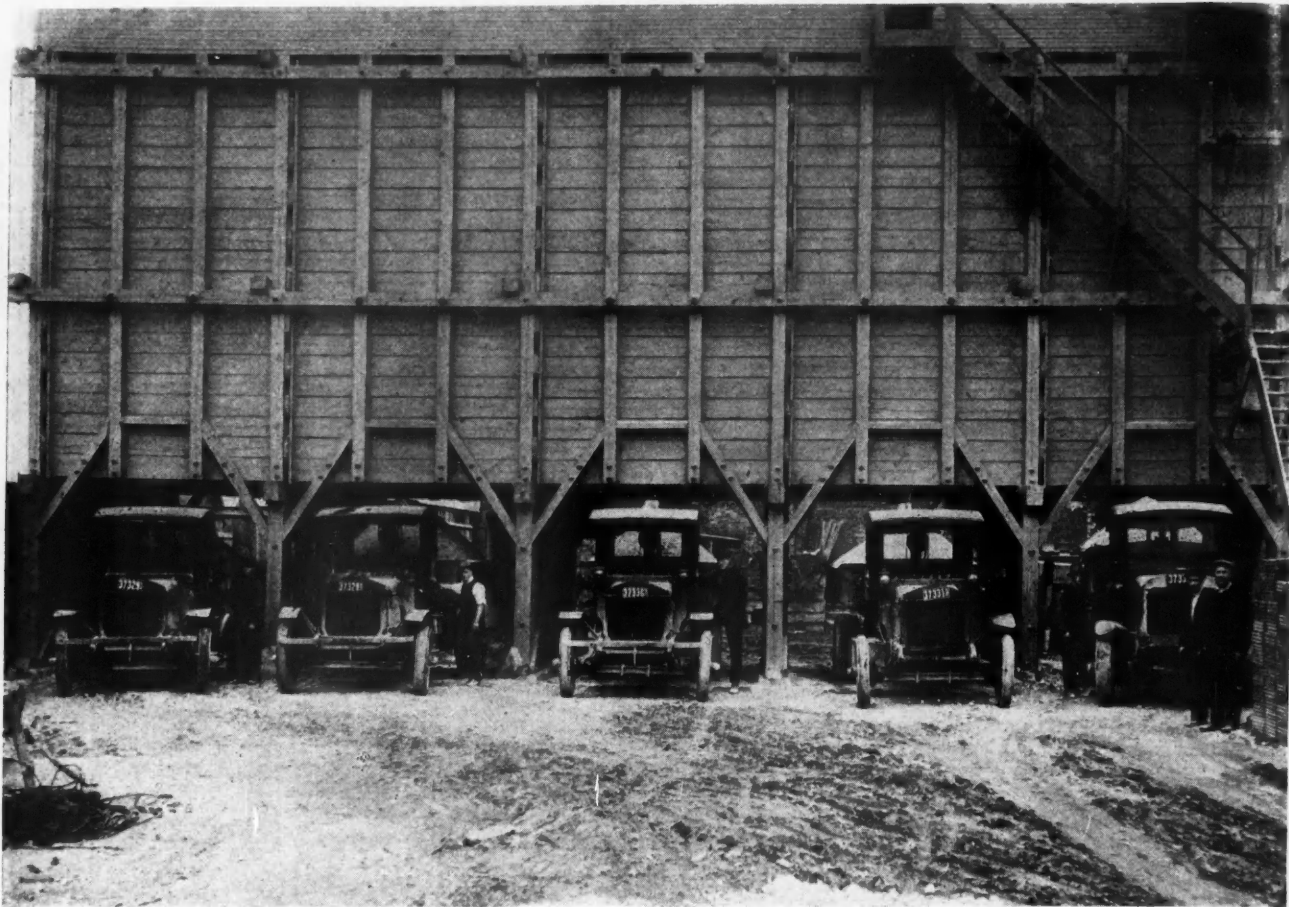
Saves worry about next Winter's fuel supply. Oil is abundant and readily obtainable everywhere. There is nothing new or revolutionary in its use for heating. Nokol merely applies it simplified, and controlled, to the residence furnace.

Nokol is a logical development in domestic heating. It eliminates all the drudgery of the ordinary furnace. It saves time for the man of the house and is a decided boon for women folks. Every progressive Architect and Builder should be thoroughly conversant with Nokol. Complete data and specifications sent upon request.

THE STEAM CORPORATION

DIVISION OF THE
Amalgamated Machinery Corporation
215 North Michigan Avenue Chicago

*Nokol is on the Fire Underwriters'
List of approved appliances*



Five 5-Ton "Pierce-Arrow" Trucks That Have Done Yeoman Service for the Central Lime & Cement Co., Chicago, Ill. The Youngest of the Five Has Over 40,000 Miles to Its Credit, While the Veteran of the Group Has Covered Over 60,000. They Have Worked Night and Day for Several Years.

The company, which deals in paving materials, bought its first truck in June, 1915. The second was put into service the following month. The trucks won the admiration of the firm by proving their ability to

work day and night on rush jobs. Both have passed the 60,000-mile mark.

Two more five-toners were added in August and September, 1916, while a fifth was installed in December, 1918. The former have traveled nearly 40,000 miles, while the latter is approaching the twenty-thousandth milestone.

Each of the trucks long since has proved economy of operation. Low repair cost, ability to stay on the job without letup, economical tire depreciation and low fuel consumption have kept the per-day cost to a minimum. As a result, the per-ton cost is a rock-bottom one.

This is proved by the performance record of one of the trucks for the four months from June to September of 1919. The record of any of the trucks may be taken as typical as their work and performance are almost identical.

The record referred to is as follows:



Excavating Work Requires Endurance and Power. This 5-Ton "Service" Truck Has Stood the Test by Making the Steep Grades up to Street Level for Many Months Without Rest.

DUPLEX TRUCKS

BUILT FOR BUSINESS

AN actual photograph of a Duplex Limited being lifted clear of the ground by a cable around the windshield frame.

This wonderful strength in the cowl, while perhaps startling, is still only typical of the extra strong, rigid construction of the Duplex Limited in every detail and in every part.

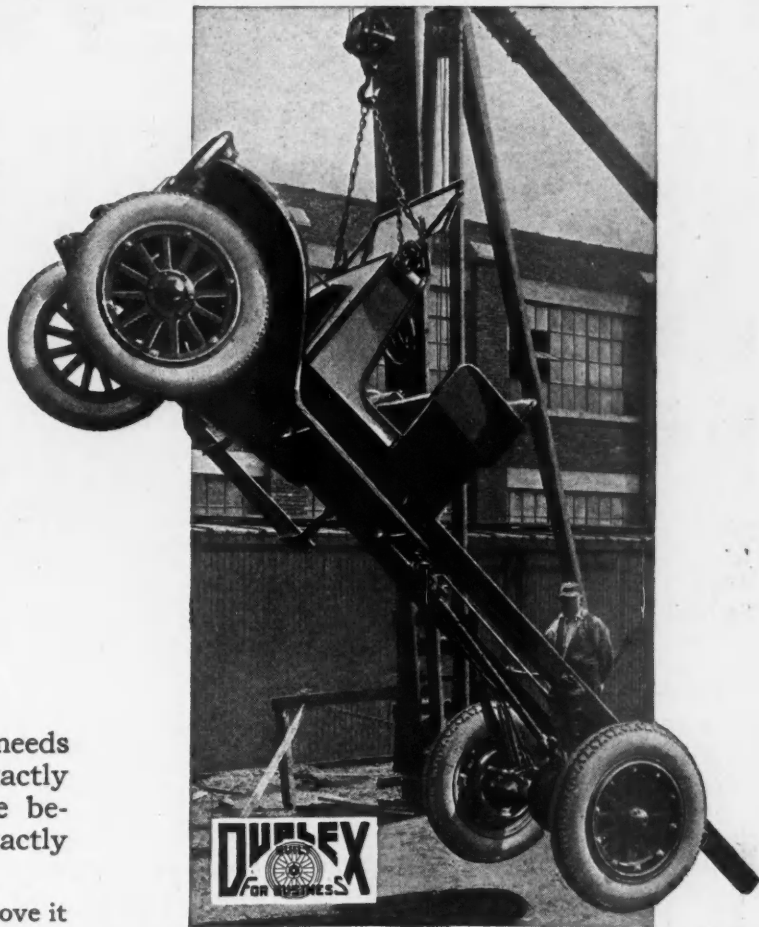
It is this great Duplex strength and honesty of mechanical construction that makes the Duplex Limited a truck that a business man can buy and use on a practical business basis.

The Duplex Limited

Speed and Power to Spare—3000 to 5000 Pounds at 5 to 25 Miles an Hour on High and the Motor Turning Over Only 1300 R. P. M.

* * * *

Free from Vibration—Scientifically Balanced—Electrically Equipped—Pneumatic Tired—Here is a Truck a Business Man Can Buy and Use on a Business Basis



SPEED and staying power are the big needs of the hour in trucks—and here is exactly the right truck for general business use because it is scientifically built for just exactly that kind of work.

Its balance is so perfect that one man can move it over the floor.

Its motor is so large and so powerful that no special gear reductions were necessary. The motor turns over only 1300 R. P. M. to develop rated speed with full load.

It hauls 3000 to 5000 pounds of any kind of freight.

It holds the road in a way you never dreamed possible in a truck. You can ride in it comfortably or drive it easily and without strain at full speed.

Its engine is properly and amply cooled—carries 2½ gallons of water and the water jackets are designed to properly cool valve seats where heat is greatest. Motor meter is seated in radiator shell and cannot be removed.

Complete electric equipment—that means starter too—so your driver won't mind shutting off the motor while truck is standing.

Easiest motor to take down you ever saw in a truck.

Large hand holes give easy access to valve chambers and man size bolts make handling easy.

Lubricating oil is strained twice in its circuit. Scientific hot spot breaks up wet drops into dry gas and makes even the present day gasoline develop full power.

Radiator mounted on patented spring suspension which prevents damage to core and eliminates the great source of leakage.

Standard tread—goes anywhere a passenger car can go and just as fast.

See it for yourself. It is a big, strong, rugged truck—will give you better service than you have ever known.

Any demonstration you want—it's a business truck and will do its work on a business basis. See your Duplex dealer—do it now—he will make the Limited prove itself to you as it is proving itself daily in the hands of users.

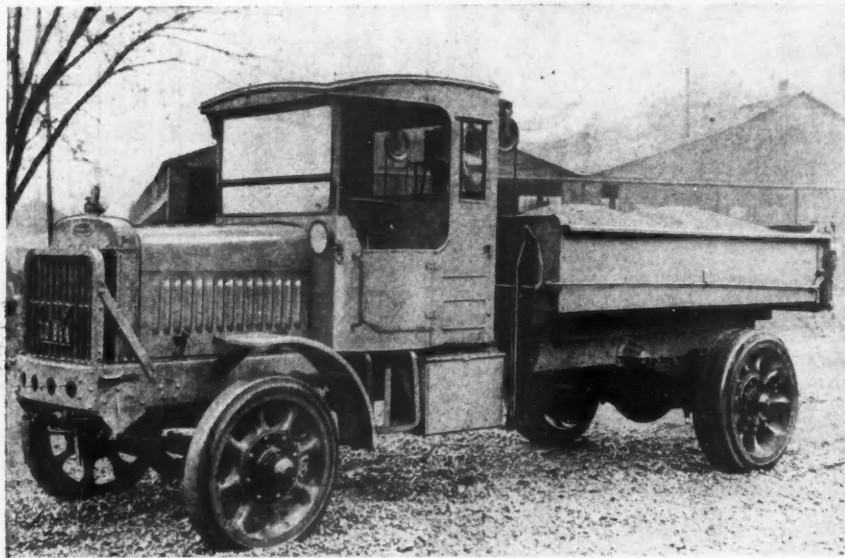
"Duplex Doings"—the Truck Users' Magazine, sent free to any truck user. Tear off a corner of this page, sign your name and we will put you on the regular list.

Duplex Truck Company

Lansing • Michigan

One of the Oldest and Most Successful Truck Companies in America

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Equipped for the Building Job. This "Gram-Bernstein" Has a Special Dump Body Adapted for Hauling Brick, Concrete Blocks, Etc. It Covered 18,000 Miles Over Pennsylvania Mountains With Green Drivers in Charge.

	Mileage	Gasoline (Gallons)	Loads	Hours
June	1441	408	279	234
July	1188	435	301	266
August	1849	497	251	260
September	1482	417	298	260
Total	5960	1757	1129	1020
Average miles per day (10 hours).....	58.4			
Average loads per day.....	11			
*Average tons per day.....	55			

*Less than five tons is never carried.

On the work covered by this truck with its companion units delivered crushed stone and bags of cement from the firm's warehouse and loading bins at Forrest Park to a road-building job about two and one-half miles distant. Loading and unloading, especially of crushed stone, is accomplished rapidly, the trucks driving directly beneath the bins for stone and using the hydraulic hoisting apparatus for dumping.

"Each of our trucks is on the job approximately 300 days a year, our records show," said Mr. Charles O'Laughlin, who is in charge of haulage. "Freedom from break-downs enable them to keep in profitable operation continually."



NO other phase of truck maintenance is more important than lubrication. Running one hour without sufficient oil may cause greater wear than running several years under favorable conditions. If you have a driver who occasionally neglects the renewing of oil and grease, or who fails to tighten up the grease-cups at proper intervals, it will pay you to get rid of him, no matter how valuable he may be in other ways, unless you keep a man to do that work.



Griffith Kelver & Co., Cambridge, Mass., Are Builders and Manufacturers of Sash and Millwork. They Find This Speedy 1½-Ton "Selden" Very Valuable in Making Emergency Deliveries and Building Up a Satisfied List of Customers.



General Motors Trucks

UNQUESTIONABLY more is demanded of motor trucks in the building trades today than ever before, and GMC Trucks are built to meet every demand.

Overcoming obstacles in the day's work is a GMC characteristic, for the good qualities built into these trucks enable them to operate surely and economically under all conditions.

Quality comes first in GMC Truck construction, and this means the best materials and the best workmanship. Builders owning GMC Trucks can expect and will receive the best of service from these trucks.

GENERAL MOTORS TRUCK COMPANY

One of the Units of the General Motors Corporation

PONTIAC, MICH.

(897)



WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



This 3 1/2-Ton "Acme" Truck Averages Seventy-five Miles a Day in the Service of the L. James Lumber Co., Minneapolis, Minn. It Has a Mileage of Over 20,000 to Its Credit. It Frequently Covers Twenty-seven Miles Over Tough Roads, With Four Tons of Cement.

Truck Averages 75 Miles a Day

SEVENTY-FIVE miles a day is pretty fair traveling for a 3 1/2-ton truck. Few trucks of this capacity average more than half that distance throughout a year of service.

But L. James Lumber Company at Minneapolis has a 3 1/2-ton truck that averages 75 miles daily and keeps it up right along day after day without a miss. It has been in continuous operation for over a year and has a mileage of over 20,000 to its credit. A standard

lumber body with steel rollers permits quick loading and unloading operation. Consequently the truck is very rarely idle between trips.

"Our 3 1/2-ton truck is kept busy practically all of the time," says Mr. J. R. James, manager, "as we load the lumber on wooden horses in our yard and when the truck comes in, it backs under these horses and is on its way in about three to five minutes after it came into the yard. This way it is running practically all of the time during the day. It takes about five minutes to unload as we use rollers.

"As you undoubtedly know, we have had very heavy snows in this section of the country and have been giving the truck some hard trips.

"Recently we sent the truck on two trips to Mound, Minn., a distance of twenty-seven miles, loaded with four tons, and the truck made two trips in nine hours. We also sent the truck on several trips to Bloomington, Minn., a distance of about eighteen miles. This was over hills and rough roads and our driver informs us that he made a hill loaded with four tons of cement."



"Loaded for Bear." The Sam Hunter Construction Co., Seattle, Wash., Believe this 3 1/2-Ton "Garford" Truck is One of the Best Investments They Have Made. It is the Logical Means of Transportation on a Big Job Like This Because It Never Gets Tired.



**HAUL
IT IN A
HALL**

*Hall Trucks are the development of forty-six years experience
in the fabricating and transportation of structural steel*

NO other truck, perhaps, ever grew out of such wide knowledge and practical experience as Hall.

Hall Trucks as you may know have an unusual service record back of them—a record that dates back to their use by French and American Armies in the World War.

Their war service attracted the attention of truck users here in America and resulted in a steadily increasing demand for Hall Trucks from all over America.

The completion of our new four acre factory has increased our capacity to 500 Hall Trucks per month.

Write for catalogue and full particulars of our liberal selling agreement.

2½, 3½, 5 and 5 to 7 Ton Models. Any type of body.
See nearest Hall dealer or write for catalogue.

**LEWIS-HALL MOTORS CORPORATION
DETROIT, MICHIGAN**

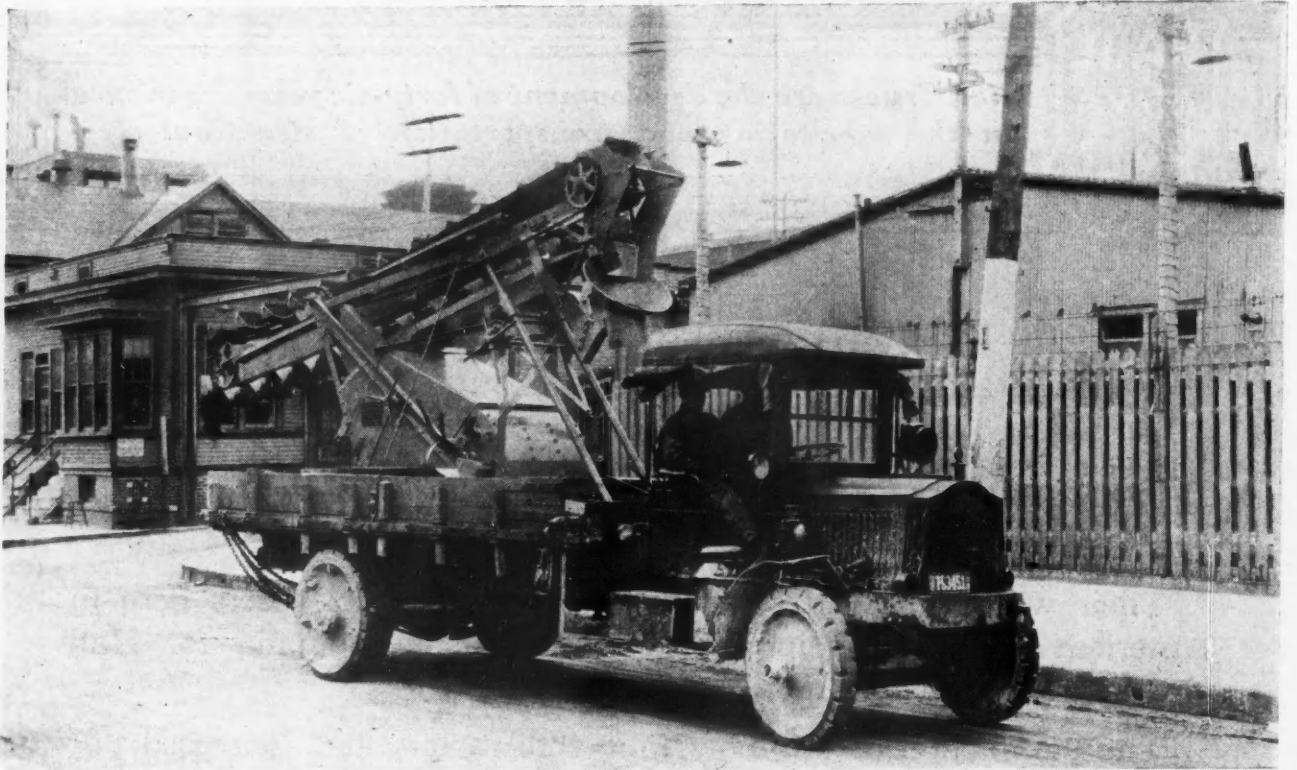
Formerly Motor Truck Division of the Lewis-Hall Iron Works

Address Dept. 13




HALL TRUCKS

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Solving the Hauling Problem. This 5-Ton "Packard" Truck With Its "Jeffrey" Loader Form a Powerful Combination in the Battle to Cut Building Costs. The Motor Truck Has Helped the Contractor to Cut Down Time Waste in Hauling Heavy Machinery from One Job to Another.

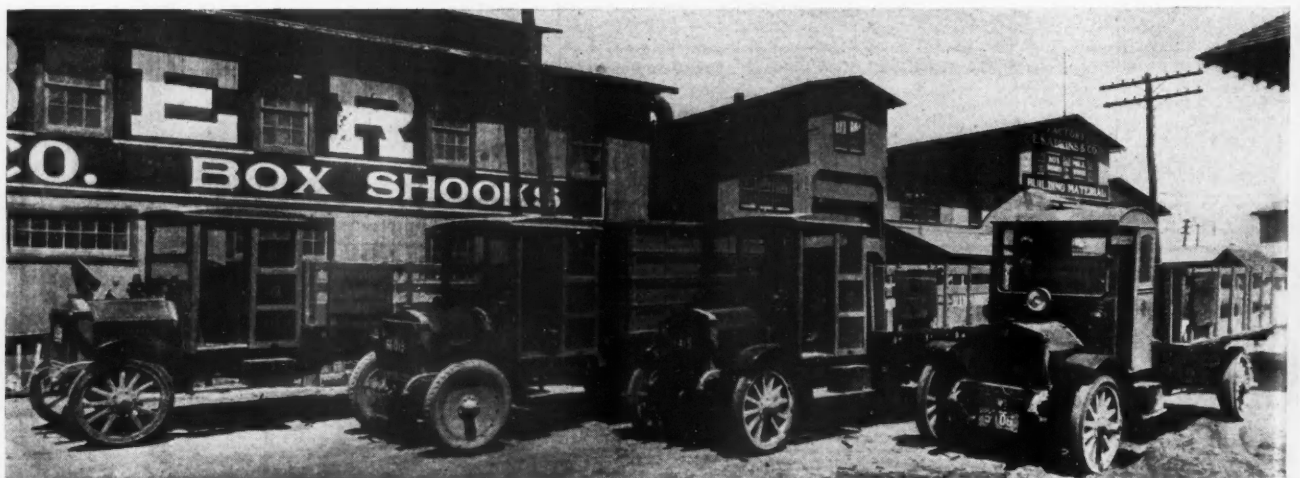
Trucks Factor in Success

MOTOR trucks have helped to make the slogan "Everything Needed for Building" the watchword of success for E. S. Adkins & Co., of Salisbury, Md. These trucks deliver materials on a daily schedule over all the territory within a radius of thirty miles of Salisbury, and they are kept on the job from early morning until late at night.

All of these trucks are equipped with bodies built especially for the efficient handling of lumber. Adkins & Co. build their own bodies, to their own specifications, and for their own use equip them with rollers embedded horizontally across the body, with cranks attached, which greatly facilitates the unloading of the material. Besides their own bodies, Adkins & Co.

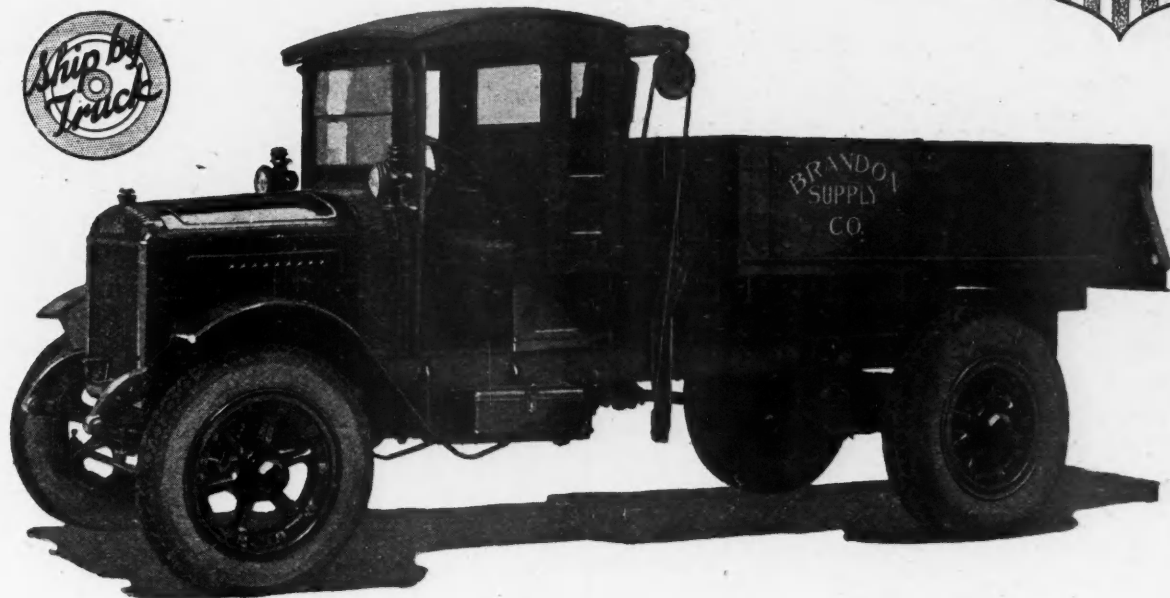
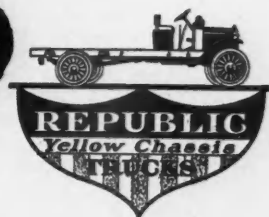
build bodies for other concerns in their special body building department, and they expect to turn out between 400 and 500 bodies this year.

Their truck was put into service five years ago; today there is a fleet. Until recently this old-timer had her original set of spark plugs, and still has the same set of valves with which she was originally equipped. She has covered approximately 60,000 miles during these five years, and has delivered material for between 500 and 600 houses. In this day of housing difficulties, any person who assisted in building this number of houses would be getting front page publicity in every newspaper in the country, but the old truck works along silently and uncomplainingly. S. F. M. Adkins, assistant manager of the company, says she



E. S. Adkins & Co., Salisbury, Md., Maintain a Daily Schedule Over a Thirty-mile Radius with the Effective Help of this Fleet of "Federal's." They Have Been Largely Instrumental in Building Up a Successful Business in that Locality. The First Truck Has Been in Service for Five Years.

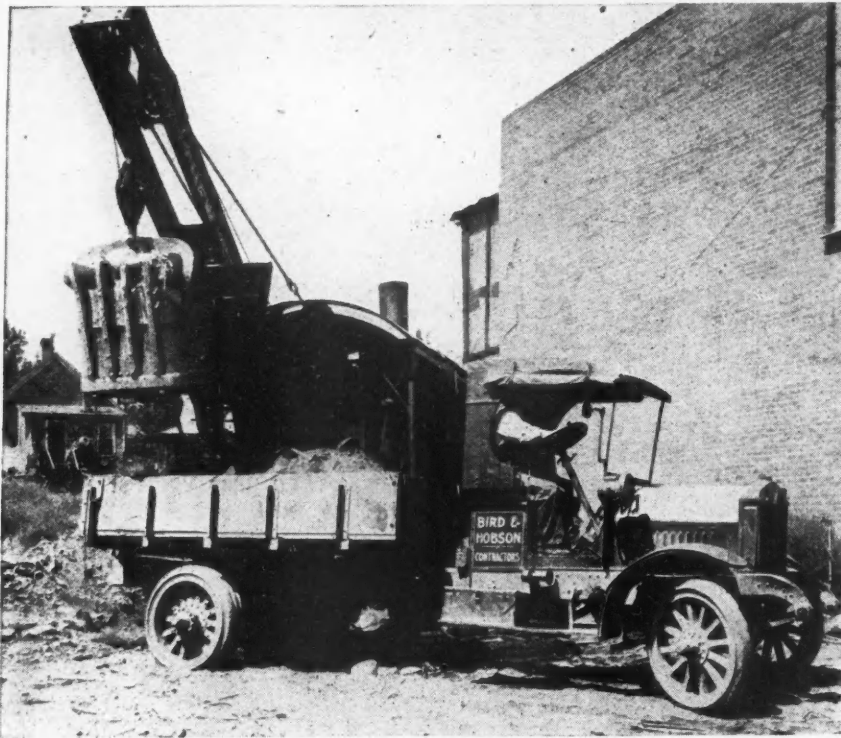
REPUBLIC TRUCKS



Republic owners have distinct advantages in performance and service. The first is assured by dependable, standardized construction. The second is made positive by the maintenance of two thousand fully equipped Service Stations and Seven National Parts Depots. Superior performance and superior service, combined, give Republic Trucks undisputed leadership throughout the world.

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

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



Bird & Hobson, Contractors, Do Not Believe in Wasting Time. For that Reason They Use Several Heavy Duty "Diamond T" Trucks Like the One Shown Here. It is Up and Going at All Hours of the Day and Night and Does Not Fear Steep Grades.

is still in the best of condition, and to anyone not personally acquainted with her, looks as young as the other three, which were just put into service this spring.

Trucks Nos. 2 and 4 are two-tonners with long wheel bases, equipped with 12-foot special Adkins-built bodies, which carry from 2,000 to 3,000 feet of lumber per load. As a result of the five years of excellent service of truck No. 1, these two were put into service this spring to replace some lighter equipment.

The youngster of the bunch, and the pride of the fleet, is the new one-ton, and she needs all her speed and her pneumatic equipment to cope with her job—

hauling shavings and sawdust away from the plant. But she handles twenty-five to thirty loads per day over a distance of one and one-half miles—an indication in itself of the size of the business done by the Adkins company.

Every one of these trucks has had to stand up under the worst conditions—and the demands put upon them by the great amount of building this last spring have been even worse than usual. But they are just one illustration of what trucks are doing along the Maryland shore, where Mr. Adkins says they are recognized today as almost an absolute necessity in every line of business.

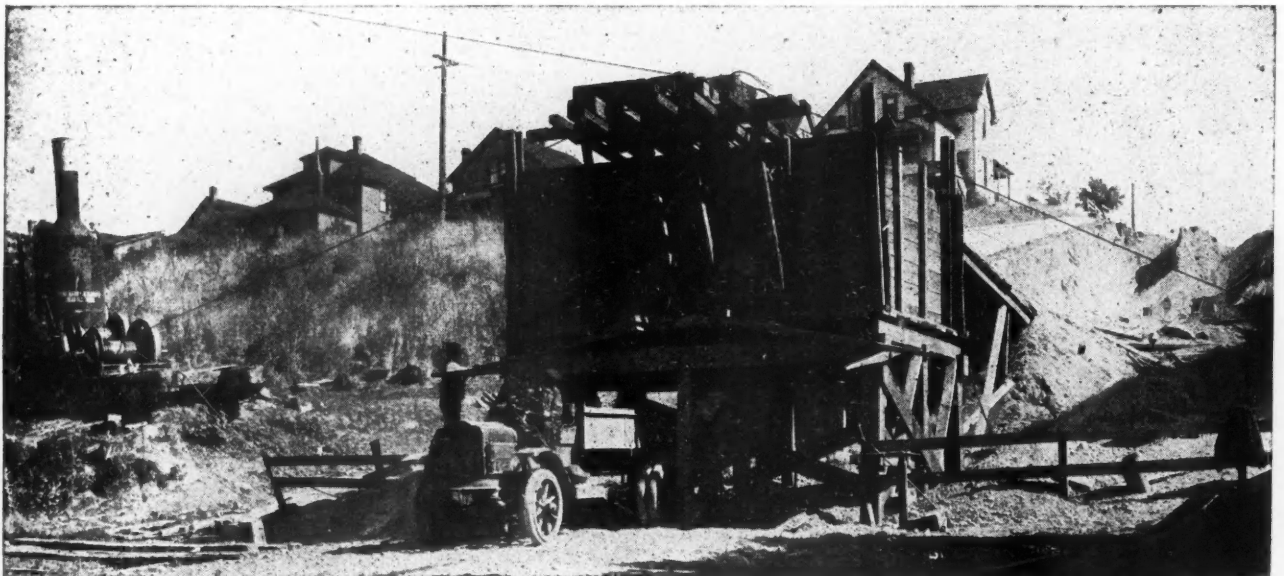


"Ten Commandments" for Truck Driver

WHETHER "experienced" or "green" there are certain

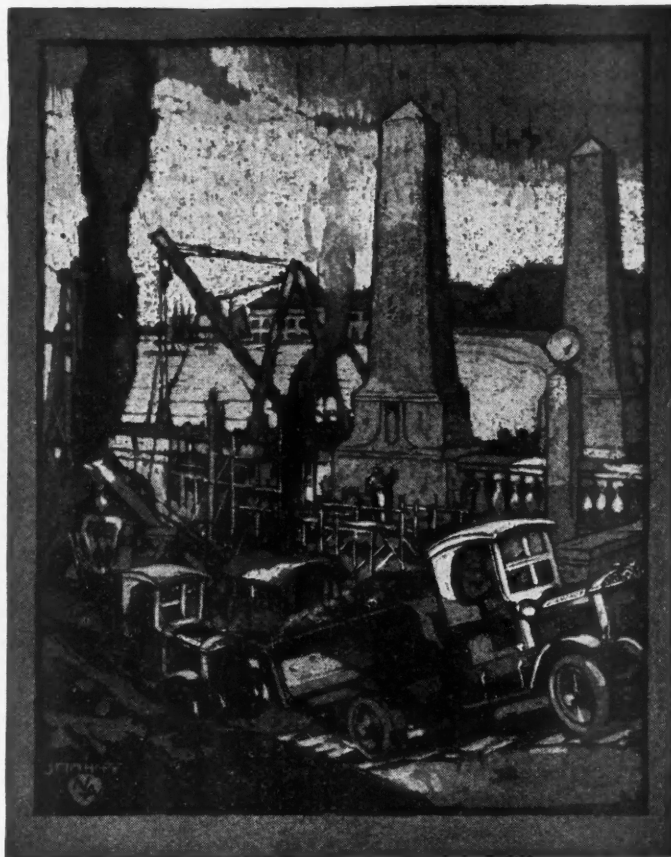
rules in driving which should be observed by every driver of a motor truck. The following, patterned after the Motor Vehicle Law of New York, presents "safety first" principles that every truck driver should remember, particularly where a truck is operated on busy city streets:

1. Don't forget to slow down at street intersections. It may save a human life.
2. Don't forget to look to the right and left before passing a railroad crossing.
3. Don't forget, when signaled by a faster moving vehicle in your rear, to turn slightly to the right and allow such a vehicle to pass you on your left.



Loading Made Easy. The Motor Truck Can Be Driven Directly to the Source of Supply Eliminating Delay at Loading Station. This Big "GMC" Owned by the Bagley Grader Co., Tacoma, Wash., Is Taking on a Supply of Gravel in a Few Minutes. The Dump Body Hurries Up Matters at the Other End.

Before selecting any truck, study the **average** performance of its predecessors over a long period of years. Compare this with the enviable reputation well earned for Diamond T, and then let us give you the sound structural reasons that account for Diamond T dependability and low final cost.



Average versus Unusual

Perhaps other truck builders could cite instances of exceptional performance and remarkable economy that would match anything truthfully claimed for Diamond T. It would, however, be an error of logic to accept these isolated instances as indications of *average* merit.

In 15 years of successful manufacture we have demonstrated that the exceptional and remarkable are expected—and received—by our patrons, as commonplace and typical of the Diamond T product.

DIAMOND T MOTOR CAR CO.

Builders of "The Nation's Freight Car"

4556 W. 26th St.



Chicago, Illinois



A New Stunt in the Lumber Yard. This "Case" Tractor Has Been Found Very Useful in Hauling Around Trailers to Be Loaded. When Ready They Are Brought to the Shipping Yard Where a Motor Truck Takes Them to their Destination.

4. Don't forget the pedestrians. They, too, have rights on the streets and highways.

5. Don't forget to use extra precautions when you see a child crossing a highway.

6. Don't forget that in case of accident you must stop immediately and give your name, address and license number to the injured party or a police officer. If no police officer is in the vicinity report to the nearest police station or judicial officer.

7. Don't fail to see that your truck is equipped with adequate brakes in good working order and adequate horns or other signaling devices.

8. Don't forget that your lights must be lit within half an hour after sunset.

9. Don't forget that Safety First saves life and limb and often your temper.

10. Remember the A B C of truck driving—*always be careful.*

times two or three trailers in a train. With this system of delivery they save the waiting time of truck and driver while the loads are being made up in the yards and unloaded at the job. While one trailer is left in the yards to have a load made up, which may take an hour or two, the motor truck or tractor is on the road hauling another loaded trailer. In this way the trailer greatly increases the amount of work a truck and driver can do and never stop except to couple and uncouple the trailers to and from the truck.

Occasionally when three or four small orders are to go in the same direction, they can be loaded on a trailer in the absence of the truck and delivered at the same time.



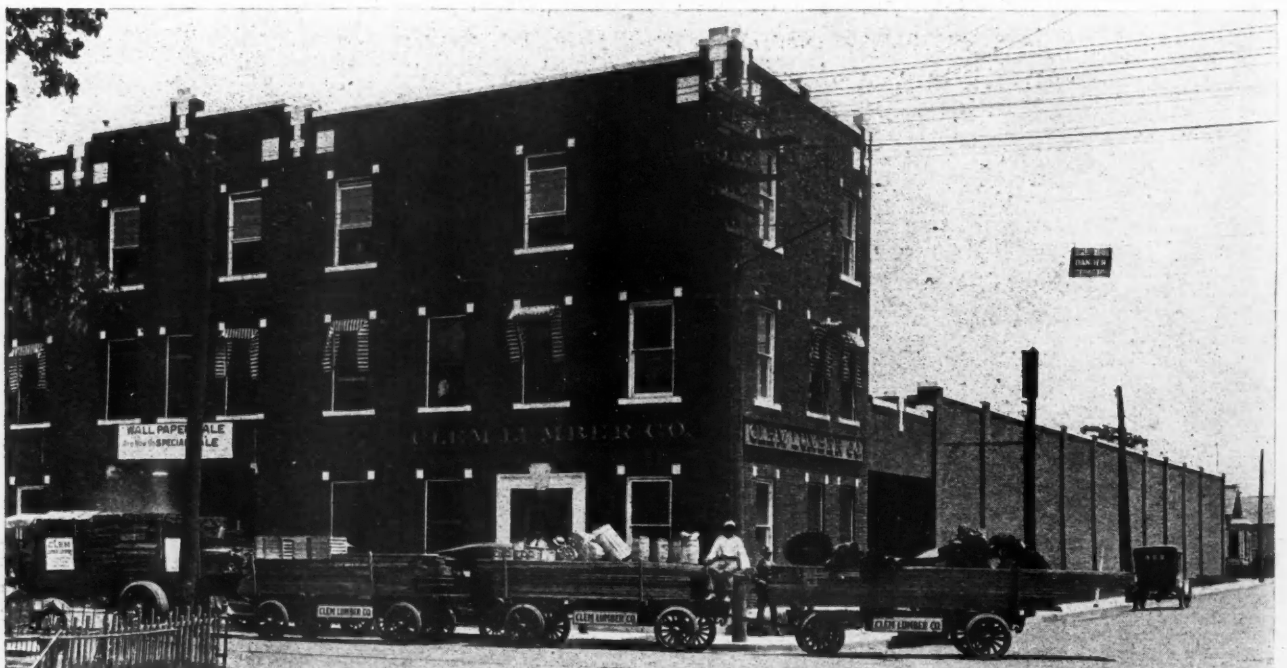
EEP the fan clean and well greased, so that it will turn freely. Make sure that the fan belt is kept tight.

Lumber Dealer Uses Four Trailers in Train

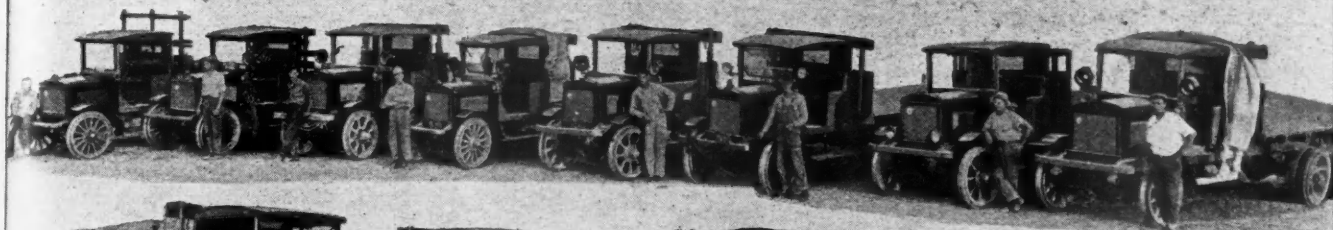
ORE trailers are used in hauling lumber probably than in any other one industry because this is such a large industry and presents such difficulties in transportation.

After trying a number of systems of motor delivery for lumber, the Clem Lumber Co., of Dallas, Texas, have standardized on four-wheel trailers. They find that this equipment satisfactorily solves the whole problem.

In a single day they have delivered as much as 30,000 feet of lumber a distance of two miles from their yards,



A Trailer Train in Operation. The Clem Lumber Co., Dallas, Texas, find they can use two and three "Trailmobiles" as well as one. This load contains about 30,000 feet and is being hauled to a job several miles away.



KISSEL

Engineering Achievements

*designed, constructed and built at the Kessel factories
for specific truck power and performance requirements*

Surmount Transportation Obstacles

For instance — in the Imperial Valley, 119 ft. below sea level, with thermometer 130° to 135° in the sun, and roads of sandy silt, 15 Kessels, equipped with the Kessel-built motor, cooling system and other exclusive Kessel features, are working 15 to 18 hours a day.

Such dependability is due to concentrated engineering and construction efforts along specific lines, plus Kessel factory facilities, organization and 14 years' truck-building experience.

Kessel distributor transportation engineers located in all principal cities.

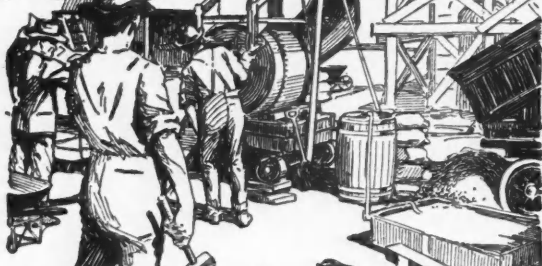
Kessel Motor Car Co., Hartford, Wis., U. S. A.

Originators of the ALL-YEAR Truck Cab.



"Loading the famous Imperial Valley cantaloupes 119 ft. below sea level with temperature 112° in the shade, 130 to 135° in the sun. During the cantaloupe season these trucks work 16 hours a day. No paved streets, but roads of silt deposits from the Colorado river."

OUT ON THE JOB



What Builders Are Finding Good

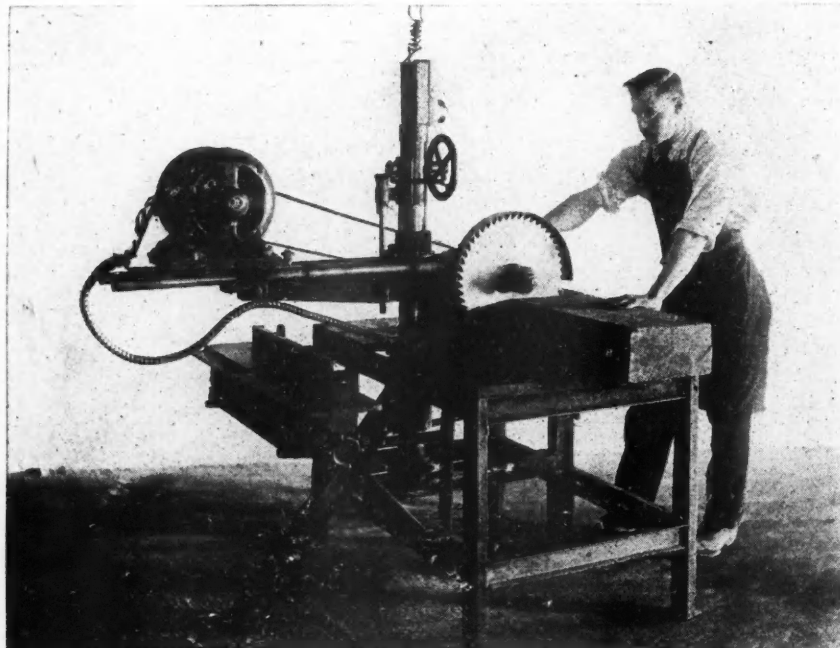
EDITOR'S NOTE: The American Builder does not accept payment in any form for what appears in our reading pages. In order to avoid any appearance of doing so, we omit the name of the maker or seller of any article we describe. This information is, however, kept on file and will be mailed to anyone interested;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

Light, Portable Combination Wood-Worker Speeds Up the Work

WITHOUT doubt the woodworker is one of the handiest machines in the builders list. Especially the type that is light and can be carried from job to job without trouble or delay, yet is powerful enough to do the heavy work as well as the light.

The woodworker shown here is very simple in construction and easy to operate. It is so constructed that it will work at any angle and is equipped for ripping, dadoing, grooving, rabbeting, boring, cutting off, mitering, and sand papering. The material is held in place with an adjustable pressure bar and then the saw is raised or lowered to suit thickness of material.

The table on which it is mounted is cast iron 3 feet 10 inches by 2 feet 6 inches, and the total weight of the machine set in position is 750 pounds. The main supporting column is 3½ inch tubing. To this is fitted a heavy iron bracket which supports the two steel rods carrying the motor and the saw mandrel. The motor is secured to a base plate which is in



Small Portable Woodworker Mounted on Working Table. The Total Weight of the Machine With Table is 750 Pounds. The Table is Cast Iron, 3 Feet 10 Inches by 2 Feet 6 Inches.

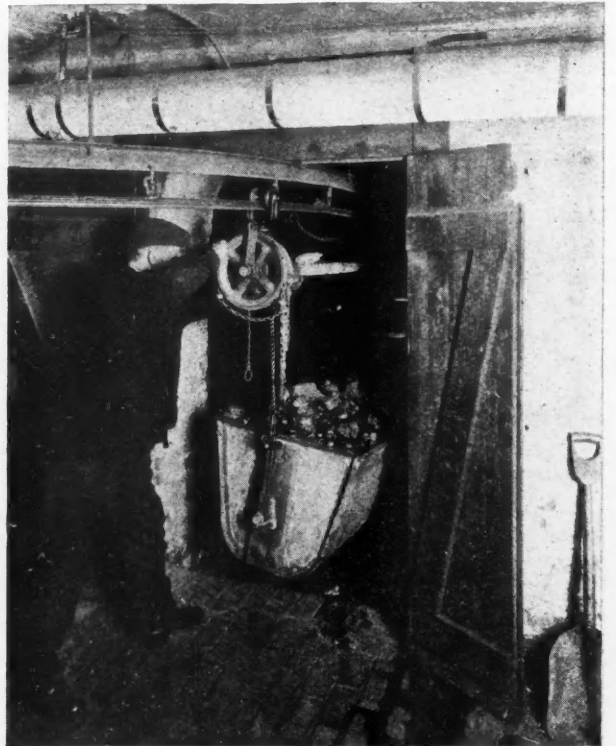
turn bolted to the back end of the steel rods.

The saw is pulled thru the material by means of horizontal bars immediately above the saw itself. The machine is wired ready to connect to the power circuit. The saw operates at any angle. By means of the cone pulley the motor can be used to drive both saw and pony jointer at the same time.



An Ingenious Use of Carrier System

AN Ottawa builder who had been watching the magic results of overhead carrier systems in dairy barns, figured that somebody else ought to get the benefit of that labor-



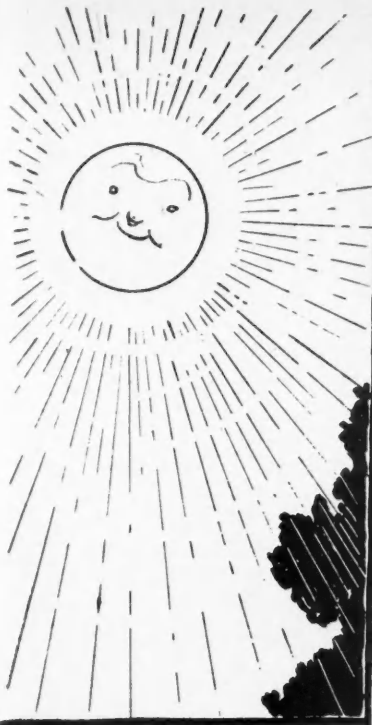
No. This Is Not a Modern Dairy Barn. It Shows How They Are Cutting Down Labor and Delay at the Ottawa Court House, Ottawa, Ill., by Using a Carrier to Haul Coal and Ashes to and From the Furnaces.

saving equipment. There are many jobs outside of hauling litter from stalls that require wheelbarrows—one of these is the feeding and maintenance of a heating plant in a large building.

This was the problem in the Ottawa court house at Ottawa, Ill. The coal has to be hauled some distance from the bins to the boilers and the ashes in turn had to be carried away to the dump. It was right at this point that a novel and practical use of the feed carrier system was employed. Track was installed with carrier leading from the coal bins to the furnaces and another track was provided for an ash carrier.

The happy result of this installation is shown in the picture. After filling the carrier the man easily hoists it into position and without much exertion starts it on its way to the fire, where it is dumped without delay or trouble. In a similar way the ashes are loaded at the furnace and hauled away to the dump.

The overhead carrier system is being used in a variety of forms in warehouses and large factories as well as in barns.



WHEN YOU BUILD A HOG HOUSE

build one that will more than please the owner; build him one that will let in lots of sunlight; one that will insure better and healthier hogs. Do this and it will make new customers for you —leave that to the satisfied owner.

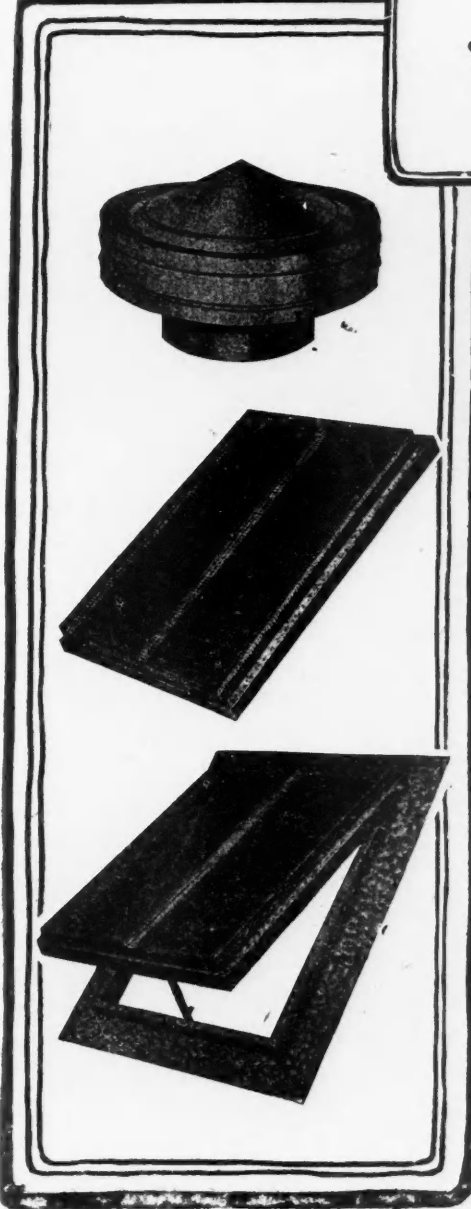
Willis Windows and Ventilators will satisfy your customers in every way; they set off the building in great shape and admit plenty of fresh air and sunlight.

Willis sheet metal products are very quickly and easily installed and will bring you big profits.

Both you and your customer will be satisfied with the Willis line.

Write for our catalog

WILLIS MFG. CO. **GALESBURG, ILLINOIS.**





**Lesson in
Plan Reading**

FREE!

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

**Builders' Course
On Easy Payments**

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

Learn By Mail

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

Some Things We Teach

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

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

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

Arithmetic A complete course arranged especially for builders and contractors.

Architectural Drafting Also other branches of drafting. Send for special catalog on these courses.

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

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 Without obligation on my part, send me the Free Lesson in Plan Reading, also information on your Builders' Course in Plan Reading, Estimating, etc.
 Name.....
 Street.....
 City..... State.....
 Present Occupation.....



NEWS OF THE FIELD

Millers Falls Company Adds Hack Saws to Line

THE Millers Falls Co. has purchased the plant of the West Haven Mfg. Co., at West Haven, Conn., which for twenty-five years has been engaged in the manufacture of Universal and other brands of hack saws, band saws and small tools.

The acquisition of this fully equipped plant, which has been making a blade of highest grade for many years, enables the Millers Falls Co. to add hack saws to its line, having been the originators of hack-saw frames and power hack-saw machines.

The Millers Falls Co. continue the manufacture of Universal saws but it will also make at its West Haven plant a complete line of both hand and power hack saws under the "Millers Falls" brand.

The Millers Falls Co. will operated hereafter thru its plants at Millers Falls, its plant at Brattleboro, Vt., and its new plant at West Haven, Conn.



Furnishes List of Customers

IN its efforts to assist manufacturers in finding a market for what is generally considered mill waste products the Trade Extension Department of the Southern Pine Association is furnishing its subscriber companies at frequent intervals with lists of wood-using concerns. Definite results accomplished in this campaign now are beginning to be seen, according to an announcement from that department.

New lists, which will shortly be available, include the following: Cabinet makers, window blind and screen manufacturers, store front manufacturers, sign board manufacturers and manufacturers of children's sleds, gates, wooden boxes and fences, game boards, chair swings, garden settees, mail boxes, ironing and laundry tables, piano cases and shaving stands.



New Woodworking Machinery Company

THE Hutchinson Manufacturing Co., Inc., was recently organized and has started operations in a factory building at Norristown, Pa., just outside of Philadelphia. They have contracted with Mackintosh Hutchinson for the exclusive manufacturing and selling rights of his machines. These machines were previously manufactured in Toronto, Canada. Four different models are made. The officials of the new company are: G. Dannehower, president, formerly vice-president and sales manager of C. E. Johansson, Inc., Poughkeepsie, N. Y.; Douglas Boyce, vice-president, and Edwin J. Fager, secretary and treasurer.



Suggests Remedy for Transportation Problems

MR. O. W. STILES of the Lakewood Engineering Co., Cleveland, O., suggested several solutions for present transportation ills at a recent meeting of the Material Handling Machinery Manufacturing Association held in New

**"It's More Attractive
With The Tile Floor"**



**AND IT'S MORE
ECONOMICAL, TOO**

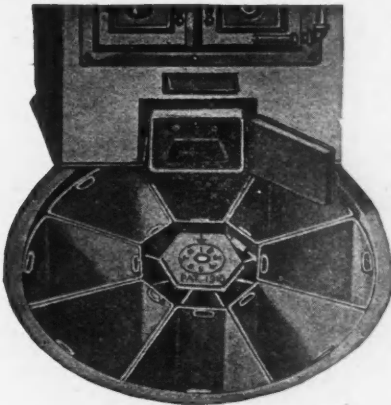
Tile floors and walls for baths, halls and porches, add a touch of distinction to the home. They have a substantial, solid "look." And as for beauty, nothing can compare with them.

Once you put in tile—you are forever through with the painting nuisance that you have with wooden floors. And you no longer need to bother with prepared floorings, with their moldy sub-surfaces.

Send for our attractive catalog showing styles. It's a mighty handy book to have for future reference. Address

Hornet Mantel Co.
1147 Market Street
ST. LOUIS, MO.

**World's Largest
Mantel House**



**The Sharp
Rotary Ash Receiver**

is the only device of its kind. It eliminates the biggest heating nuisance—that of shoveling ashes. Besides this it entirely does away with unsightly ash cans around the heater. Ashes are all out of sight, cellar is always clean—no dust—no dirt—no bothersome furnace work.

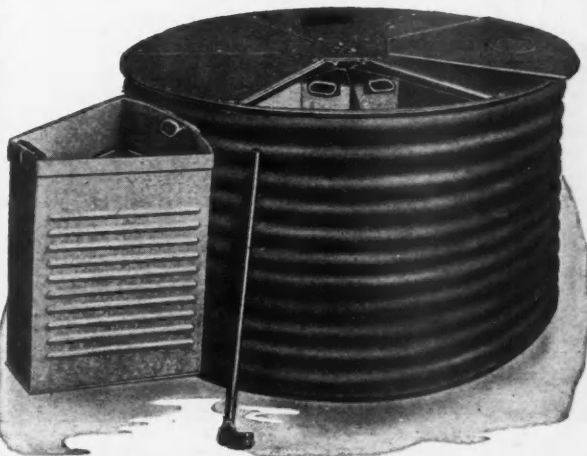
**What It Means to
the Builder**

By getting full information about the Sharp Rotary Ash Receiver builders can understand at once its advantages. Many have inquired for clients and found it to be just what they wanted in their own homes.

If you suggest it to an owner he will know you are looking out for his convenience and comfort. A home owner with a Sharp Rotary Ash Receiver will always show it to friends, and that helps the builder who recommended it. Every builder wants pleased clients, and this is a home convenience that pleases owners. Easily installed, simple to operate.

Blue print specifications of a Rotary Ash Receiver are shown on page 104 of this issue. Write today for full information of the Sharp Ash Receiver.

Sharp Rotary Ash Receiver Co., Inc.
90 Phelps Building Binghamton, N. Y.



All the Products

Advertised in these pages
can be recommended to

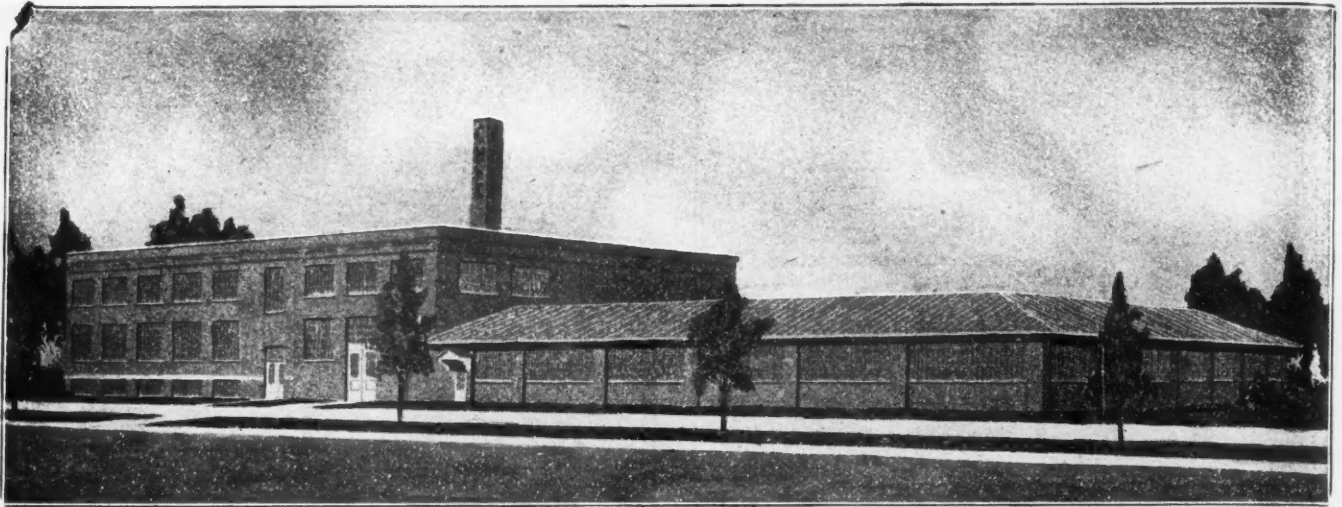
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best fitted to supply your needs.

American Builder
1827 Prairie Avenue, Chicago



New Factory of C. H. & E. Manufacturing Co., Milwaukee, Wis., Now Under Construction. It Is 1500 by 150 Feet, and Will be Ready by Oct. 1.

York. Among the proposals suggested by Mr. Stiles were increased operating efficiency and modern terminal facilities. Delay in loading is a serious problem that can be eliminated by the introduction of modern methods and machinery, Mr. Stiles said.



C. H. & E. Building New Factory Addition

THE C. H. & E. Manufacturing Co., Inc., of Milwaukee, Wis., has broken ground for a 150 by 140 saw tooth factory, being an addition to their present plant, and it is anticipated that this new building will be completed and ready by Oct. 1.

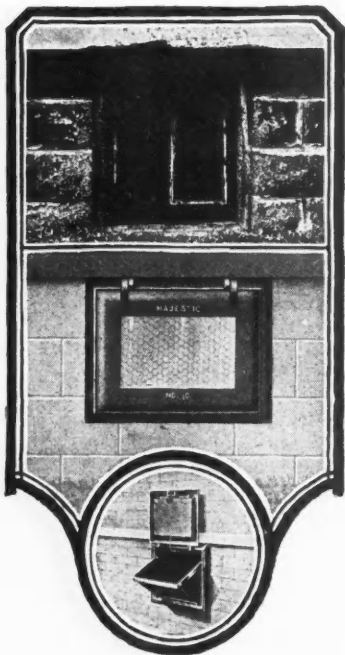
This new modern saw tooth construction addition with concrete floors, brick walls, will be used entirely for an erection floor where the different models of outfits which they manufacture will be run thru in lots on the plan of automobile assembling.

This new factory addition will give the C. H. & E. Manufacturing Co. a full city block of 300 feet long by 140 feet wide. The illustration of the plant shown herewith shows the addition.



T. L. Smith Company Opens Western Office and Warehouse

A WESTERN coast office and warehouse have been opened by the T. L. Smith Co., thru its agents, Norman



Your Coal Window— Is It Insured?

You insure your home against fire, then why not insure your house against rapid depreciation—where it is most certain and costly? The coal bin window in your house—is it insured? It should be—with a Majestic Coal Chute.

The frame-and-sash coal window in your house may look as unsightly and battered as the one illustrated above. And the damaged walls and foundation lessen the value of your property. Necessary repairs are costly—and they never end.

Prevent the damage which is sure to come! Install a Majestic Coal Chute

and protect your property for all time
It is real insurance.

Contractors

Install a Majestic Coal Chute in every new house or building you are erecting. Thus you will increase the value of the property and render a real service to the owner.

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

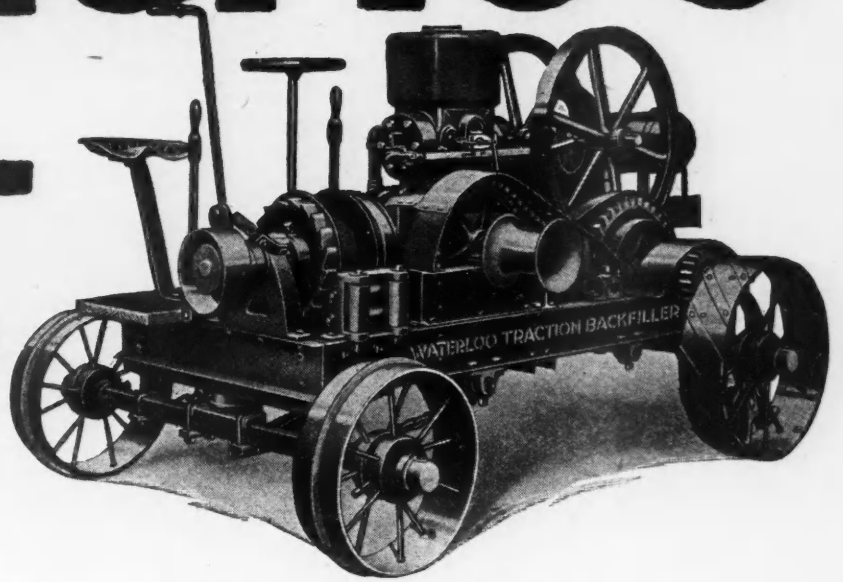
THE MAJESTIC COMPANY
1802 Erie Street Huntington, Indiana

Majestic COAL CHUTE

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

Waterloo

Back-Fillers



*We can furnish both
traction and non-
traction type*

A Waterloo Backfiller hitches right onto any job of backfilling, hoisting, grading, or leveling—killing spare time by pulling, cribbing, snatching teams or placing pipe.

A backfiller of the type we manufacture will be indispensable to you. We have many letters in our files testifying to its efficiency. Read this—

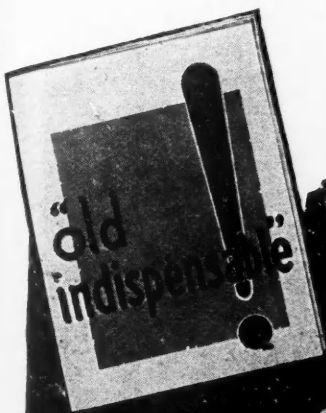
"Dear Sirs:—We have a Waterloo Backfiller that we have used a great deal for the past three years. Hardly know how we could get along without it in building sewers and laying water pipes. Is very handy in a great many other ways, such as filling in low places or pulling dirt over an embankment."

Send for our booklet, "Old Indispensable," and our catalog.

In these you will find a complete description, with illustrations of WATERLOO construction machinery. The catalog carefully explains the principle of concrete mixing; the operation of the Waterloo Backfiller—full description on each machine we make. The booklet, "Old Indispensable," contains pictures of our "Old Indispensable," Backfiller (traction types), taken right on the job. It presents the reader with conclusive evidence of the effective use of this machine on many different kinds of jobs. Complete, concise description accompanies each picture.

Just a card will bring them.

Write today. Department 103. They will be mailed to you promptly.

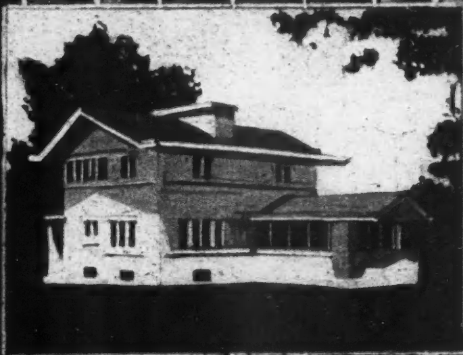


Waterloo Construction Machinery

CO.

WATERLOO

IOWA



E-COD FABRIC

—is a plastering base composed of heavy felt saturated with clear tar and reinforced with No. 14 gauge galvanized wires.

These wires when embedded in plaster and backed by the heavy felt, form a reinforced plaster slab which is rust-proof, water-proof, fire-retardant and sound-deadening.

E-COD FABRIC makes for real economy as it is low in first cost and gives in every way a better plastering job.

E-COD FABRIC is adapted to all styles of construction, exterior and interior. It can be used whenever and wherever a plastering base is required.

Write us for catalog and complete data

**MAC ADAMS & CALL
CONWAY
BUILDING
CHICAGO**

B. Livermore & Co., at 1306 Merchants National Bank Bldg., San Francisco.

A complete stock of Smith tilting and non-tilting mixers, paving mixers, excavators and loaders, pumps, engines and boilers will be carried at these warehouses continually, subject to shipping instructions from any Smith agency located in western territory.

A complete stock of repair parts will also be carried there, so that immediate deliveries on new equipment and A-1 repair service can be maintained at all times in western territory.



New Heppes Factory

The Heppes roofing division of the Richardson Company, of Cincinnati, is beginning construction of a new plant to cost \$750,000. It will be on 24 acres of land recently purchased at Melrose Park, Ill., at the Junction of Lake street and the Indiana Harbor Belt Railroad. Completion of the buildings has been promised in ninety working days, and it is expected to have the new plant in operation by Jan. 1.

Three of the large buildings on this property will be equivalent to 100 by 1,200 feet, 100 by 300, 100 by 200 and 100 by 600, and besides these there will be a boiler house and a paint factory.

The Heppes division, manufacturing roofing known as Flex-a-Tile House Tops, is now at 4500 Filmore street, Chicago, but a steadily increasing demand for Flex-a-Tile and kindred products makes it necessary to greatly enlarge their manufacturing facilities.

This company is also opening a new mill at New Orleans and a slate quarry of its own at Flexatile, Ga., forty miles northwest of Atlanta.

The main office and plant of the Richardson Company at Lockland, a suburb of Cincinnati, covers 125 acres of ground.

Among the features of the new plant will be baseball parks, tennis courts, swimming pools and club houses; also a specially designed laboratory for scientific research, etc.



Truck Makers Get Eastern Agency

The Parker Motor Truck Company, Milwaukee, has closed a contract with the Wilson & Vevera Corporation, New York City, involving the distribution of two thousand trucks.

The Wilson & Vevera Corporation are jobbers and will represent the Parker line in eight Eastern states. Dealers will immediately be established in principal cities, and truck deliveries will start Aug. 1.



Engineer Joins National Steel Staff

Mr. R. C. Trig, formerly with the Berger Mfg. Company, of Canton, Ohio, has joined the National Pressed Steel Company, of Massillon, Ohio, as chief engineer of the sales promotion department. Mr. Trig has been intimately associated with the development of steel lumber sections, since they were first introduced to the building industry in 1905.

The National Pressed Steel Company, which makes steel lumber sections and standard strip steel, have announced the opening of the district offices at Baltimore, Md., 504 Lexington Building, Beverley W. Blake, district manager, and Boston, Mass., 201 Devonshire street, Walter M. Jackson, district manager.



Wood Impervious to Decay

THE wood of the mangrove tree, which grows abundantly in French Guiana, is said to be impervious to rot; at least, it has not rotted under the severest tests given it for four years by a French railway company. The grain of the wood is so close that it practically excludes moisture.

KELLASTONE

IMPERISHABLE STUCCO

Make the Old Building New

WHETHER few or many new jobs are being figured makes little difference to contractors who know the full possibilities of

KELLASTONE

IMPERISHABLE STUCCO

In modernizing old frame and brick houses by overcoating, there is opportunity to keep construction work going.

This attractive, dependable, economical stucco appeals to the owner of a dilapidated, rundown building. It shows him the way out of continually repainting. It eliminated upkeep expense—makes a more comfortable and beautiful home. And all at an expenditure surprisingly low for the results accomplished. Let us tell you what possibilities Kellastone has for you.

Price advance only 15 per cent in four years

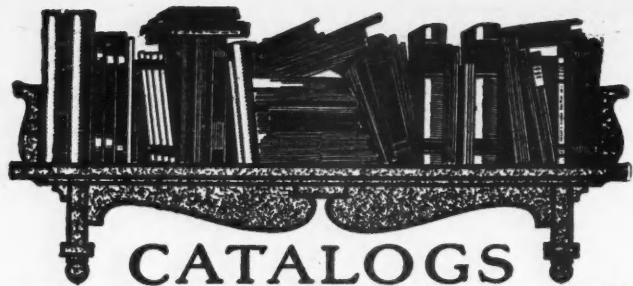
National Kellastone Company, Mfrs.

Room 000

155 East Superior Street

CHICAGO





CATALOGS BULLETINS & BOOKS RECEIVED

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

"Pointers to Profits," the annual catalog issued by the Acme Motor Truck Co., is being distributed. It contains the complete list of the various models of trucks manufactured by the Acme company with illustrations and specifications.

Chapter 2 of a series on Structural Slate contains several interesting articles on the uses of slate. This series is being prepared by the Structural Service Bureau for the Structural Slate Co., Pen Argyl, Pa. This booklet contains the basic specification for structural slate work.

"Velvet, the Faultless Floor" is the title of a booklet on rubber tiling issued by the W. H. Salisbury Co., Chicago, Ill. The method of installing the type of floor is detailed and pictures of interiors in buildings in which it has been installed are shown.

"Modern Wood Finishing" is the subject of a new booklet recently issued by the Bridgeport Wood Finishing Works of the Du Pont Co., Philadelphia, Pa. It describes

and illustrates the uses of the wood finishing materials manufactured by that factory.

The Science of House Heating is explained in a 16-page cover booklet issued by the Farquhar Furnace Co., Wilmington, Ohio. It contains a discussion of the application of the Farquhar heating system.

The Bangor Cast Stone Products Co., Bangor, Me., have issued a new catalog listing their products and explaining the cast stone system. The catalog is illustrated and contains 40 pages with cover. Pictures of houses built from cast stone are shown.

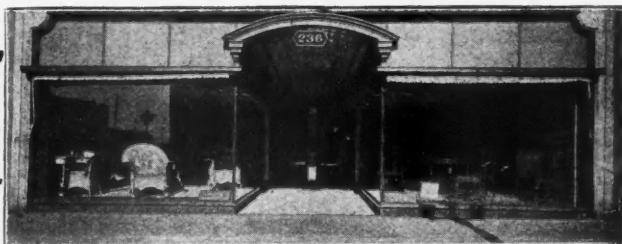
"Linotile in Use" is the title of a booklet on flooring material recently issued by the Armstrong Cork and Insulation Co., Pittsburgh, Pa. It contains a description of the manufacture and use of "Linotile" the cork tile flooring material manufactured by that concern and several attractive interior views of buildings and homes in which this material has been used.

"Planning the Small Home" is one of the interesting articles in the current issue of Expanded Metal Lath, the monthly publication of the Northwestern Expanded Metal Co., Chicago, Ill. It suggests a method of building an attractive home at economical cost to help housing shortage.

"Stonekote," the stucco prepared by the Garden City Sand Co., Chicago, Ill., is the subject of a new catalog issued by that firm. A separate set of specifications for its application is included. The booklet contains several pictures of beautiful homes finished with "Stonekote" stucco.

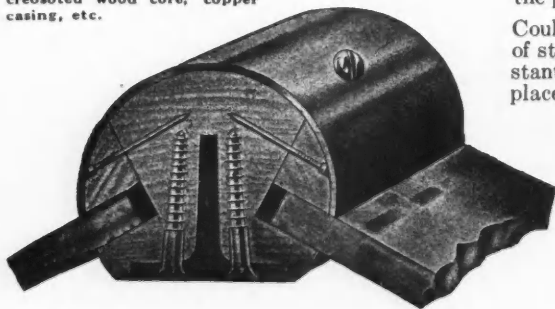
"Delco Light Electricity and Delco-Light Water Systems" are two of an interesting group of booklets which have just been issued by the Delco-Light Co., Dayton, Ohio. These booklets contain many drawings in colors

COULSON STORE FRONT CONSTRUCTION



*Provides a Safe Setting for the Glass—
Produces a Job that will be a Monument of Pride*

Cross-section view of a Coulson Store Front Construction corner showing method of reinforcement by use of steel tees; creosoted wood core; copper casing, etc.



Every Coulson Constructed Store Front installed is a permanent shouting advertisement for the contractor who erected it.

They satisfy the building owner—they please the merchant—they are the pride of the street.

Coulson Patent Store Front Construction can be applied to any type of store front with equal efficiency and satisfaction. Attractive, substantial and durable—easily installed. Furnished already to set in place. They save the contractor time and return him a handsome profit.

The strongest and most durable store front construction made—creosoted wood encased in 18 gauge pure copper and reinforced with steel tees.

Write for our blue print specifications and catalog which describes the Coulson Store Front Construction in detail.

J. W. Coulson & Company

95-107 W. Spring Street

Columbus, Ohio

ATKINS SILVER STEEL SAWS

Smithing, Hammering and Blocking Saws

No mill saw could do the work expected of it until it goes through the *Smithing, Hammering and Blocking* processes. Smithing removes the lumps in the plate as seen under a straight edge, Hammering equalizes the strain in the plate, and Blocking provides the tension for the speed the saw is to run. These operations are performed in the Atkins factories under the supervision of experts—men long in the service—men who know; that's why *Atkins Saws* have built a reputation for quality.

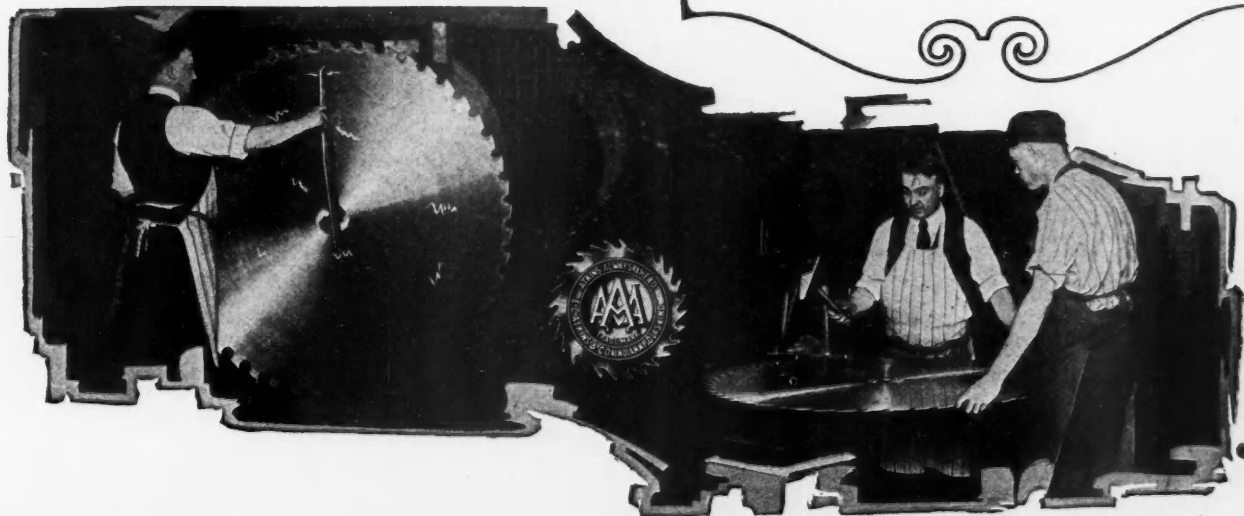
Send 30 cents coin or stamps; receive in return Carpenter's Nail Apron, Carpenter's Pencil and Time Book.

E. C. Atkins & Company, Inc.

Established 1857 "The Silver Steel Saw People"
Home Office and Factory, Indianapolis, Ind.

Canadian Factory, Hamilton, Ont.
Machine Knife Factory, Lancaster, N. Y.

Branches carrying complete stocks in all large centers as follows:
Atlanta Chicago Memphis Minneapolis New Orleans
New York City Portland, Ore. San Francisco Seattle
Paris, France Vancouver, B. C. Sydney, N. S. W.



showing the advantages of having the farm home equipped with electric plants and water supply systems.

The 1920 Edition of Sloanes' Standard Electrical Dictionary has just come from the press of the Norman W. Henley Publishing Co., New York City, N. Y. It contains over 700 pages and 500 illustrations with definitions of 6,000 words used in the electrical field.

"Hot Water Comforts in the Home" is the title of an interesting booklet issued by the Thermal Appliance Co., Inc., New York, N. Y., manufacturers of domestic and industrial water heaters. It describes their "Taco" water heater. It is printed in colors with drawings and illustrations designed for the attention of architects and builders.

Koehring Construction Mixers are very completely described and illustrated in a new 96-page color booklet just issued by the Koehring Machine Co., Milwaukee, Wis. It contains specifications and drawings showing the various parts of mixing machines, bar bending and cutting machines and road machinery.

"Modern Oak Floors" is the title of a booklet being distributed by the Oak Flooring Manufacturers' Association, Chicago, Ill. The laying and finishing of oak floors is described in detail. In addition the booklet contains several interior views of homes in which oak floors are the feature.

"Well Built Farm Homes Necessary for Efficient Agriculture" is the principal article in the current issue of the Concrete Builder, published bi-monthly by the Portland Cement Association, Chicago, Ill. Other articles deal with concrete hog wallows, potato warehouses, aeroplane hangars, tractor sheds and coal pockets. Each article is illustrated.

Housing plans for cities are contained in a booklet distributed by the Southern Pine Association, New Orleans, La. It outlines methods for financing home building thru

loan associations, industrial housing, and describes the progress made in many cities on housing projects.

Proceedings of the National Conference on Concrete House Construction have been compiled and printed in book form by the secretary, A. J. R. Curtis, Chicago, Ill. Containing over 200 pages this book contains the most complete information on the work of this convention that has ever been published. It includes the reports of the various committees with attractive illustrations, floor plans and detail drawings.

"Electricity on the Farm" is the subject of Bulletin No. 9 prepared by Myron Creese, of the Maryland State College of Agriculture, College Park, Md. It is a complete treatise on the value and installation of electric lighting plants on the farm.

"Designs for a Roadside Tavern to be Built of White Pine" is No. 4 of the White Pine Series of architectural monographs issued by the White Pine Bureau, St. Paul, Minn. It contains the winning designs submitted in the contest for the most attractive building.



Cleaning Paint Off Windows

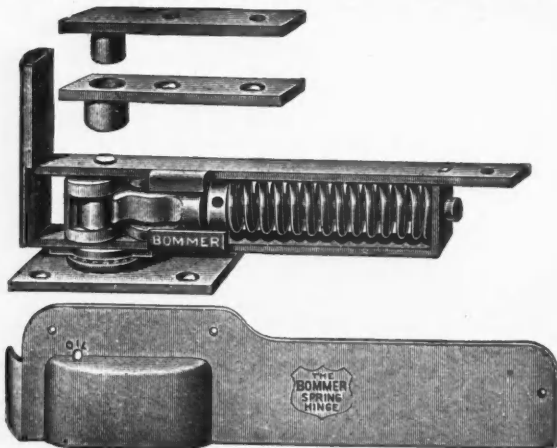
CLEANING the windows of a new house or a newly painted house is no enjoyable job. The paint comes off easily, however, if given a little of the right kind of help.

One would hardly go to an automobile accessory store or a garage to find something with which to clean windows, yet it will be found that an ordinary tar remover, used by motorists to clean up their machines after a trip over newly tarred roads, is one of the best things obtainable for taking ordinary house paint off glass. Once housewives learn this, dealers in tar removers are going to have lots of customers who do not own an automobile and never expect to own one.

BOMMER

Floor Surface Spring Hinge

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



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

Your Hardware Merchant Can Supply Them

Bommer Spring Hinge Company, Brooklyn, N.Y.



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

Stained Shingles

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

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

Cabot's Creosote Stains

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

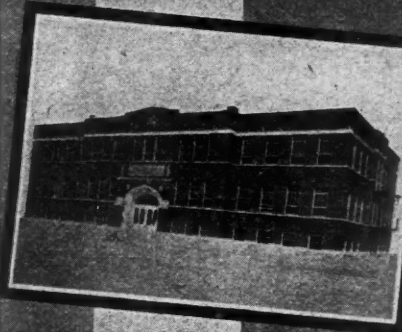
Cabot's "Quilt"

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

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Cabot's Brick Stains, Stucco Stains, Conserve Wood Preservatives, Damp-proofing, etc.



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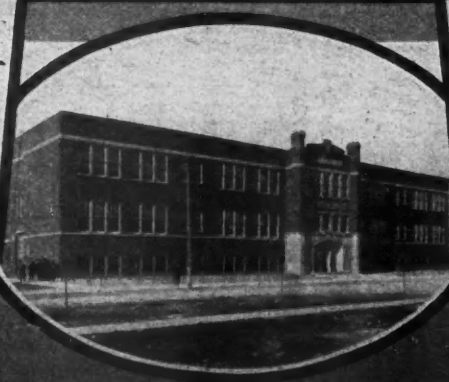
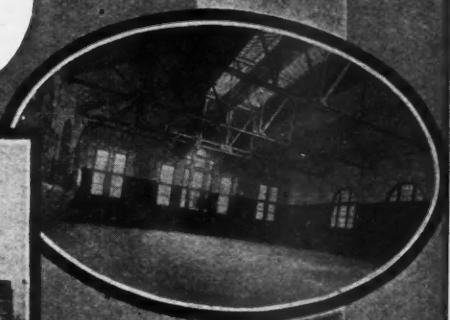
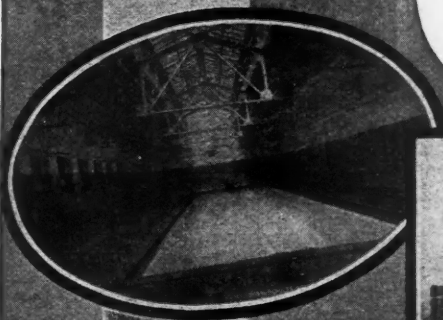
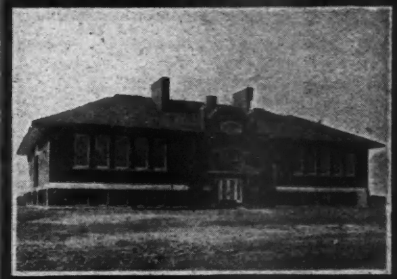
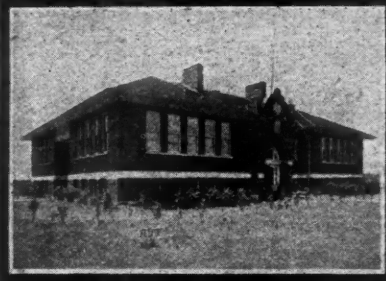
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display a composition of utility, durability and good, pure architecture without any "gingerbread." No buildings are too large or too small for our personal and prompt attention.

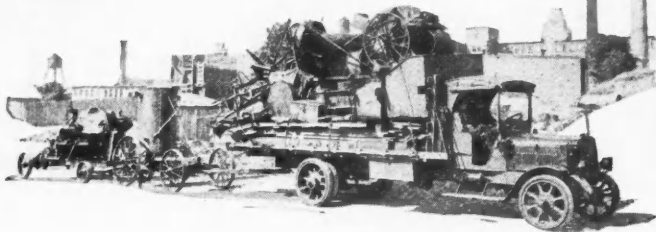
We develop your own ideas into a practical set of plans and specifications which can be executed to the smallest details into a building that can be built within your means and to your entire satisfaction.

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Strength and Simplicity



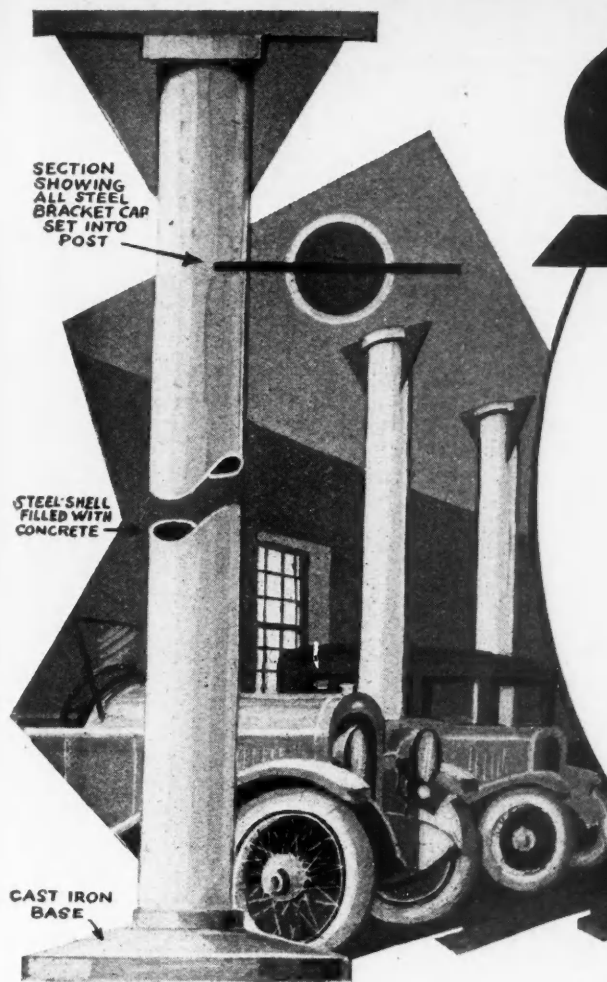
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are easy to operate and adjust. There are no unnecessary parts to get out of order and delay your work. They run smoothly and turn out a thoroughly mixed batch in a hurry.

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THE patented steel bracket cap on Crex steel columns is fitted into the steel and concrete post, and is a solid part of the column making the strongest known support of this class.

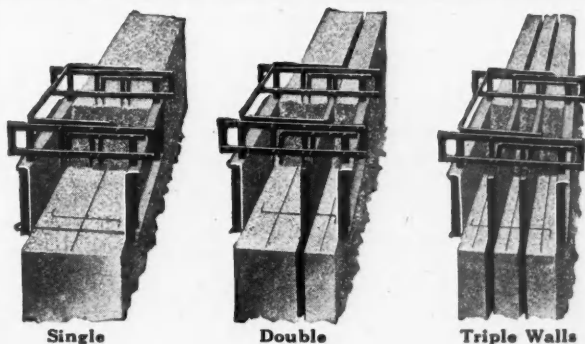
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"We send you by separate cover a photo of a house we built with your Hollow Wall Forms, 32 by 32 feet by 16 feet high. Built in sixteen days, at a cost of \$1612.00 complete ready to move into. We are more than satisfied with your Forms. Send us all the suggestions for such buildings you can afford, and oblige

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It has been amply demonstrated that hollow wall concrete buildings, properly constructed, are economical, storm safe, fireproof and insulated against cold, heat and moisture.

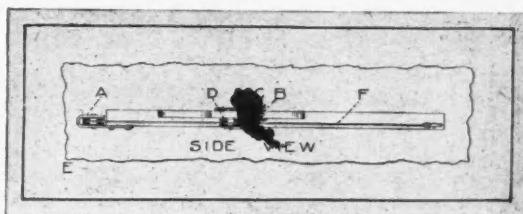
The 2-E Building Equipment will construct any desired type of concrete wall or building design.

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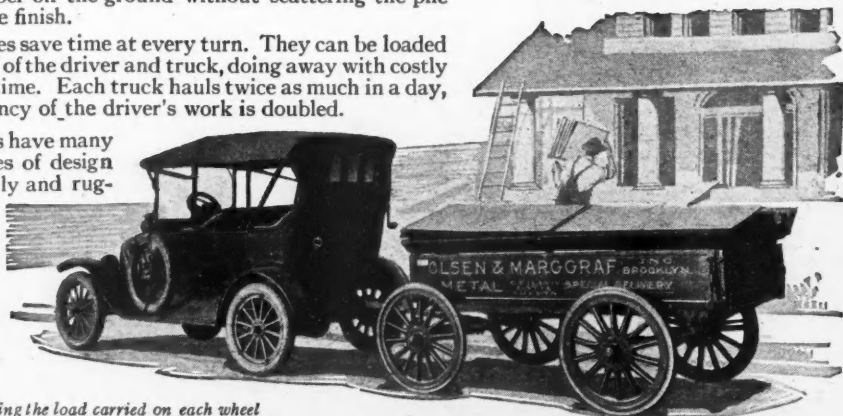
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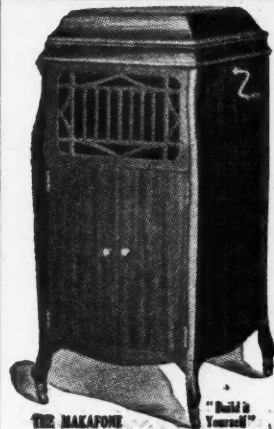
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Always Tell the Truth

The standard of accuracy. And not only the most accurate—but easiest to read, even in the dark. Never rusts—cannot warp, split or crack—and are easily handled.
The lightest levels made—strong and durable because the greatest strength is placed where most needed. Ask your dealer to show you these levels, and also write for our new circulars showing full size levels.

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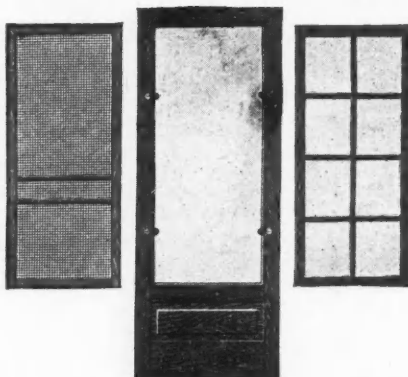
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In Summer—
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Keeps Out Flies
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The demand for Combination Doors is rapidly increasing. The reason is that these doors completely fill a real need. Used as a Screen Door in summer they keep out flies and *conserve health*—as a Storm Door in winter they keep out the cold and *save fuel*.

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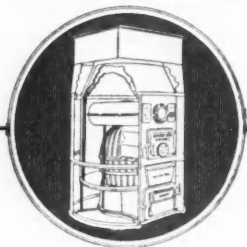
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Continental Combination Screen and Storm Doors are truly All-Season Doors. They are serviceable during all seasons of the year, and offer you an opportunity throughout the entire year for sure sales and substantial profits.

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Detroit, Mich.



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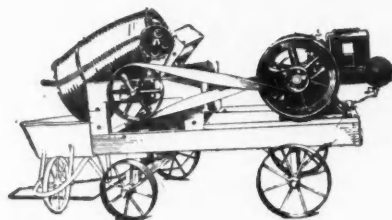
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 "Round Oak Folks" Established 1871

ROUND OAK

MOISTAIR AND PIPELESS HEATING SYSTEMS

Handles Any Job



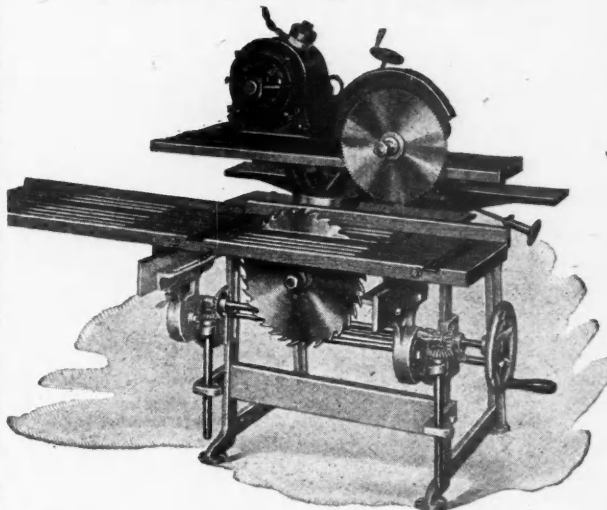
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Sheldon Mixers will do the work on any job you put them on. Ordinary jobs are easy for them. On the big jobs the speed and capacity of the Sheldon turns out the work as fast as needed. It mixes a wheelbarrow full of cement perfectly in from one to two minutes. Many times the Sheldon will return a profit where a big mixer will lose you money.

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The Master Woodworker

saves two expert carpenters' time every day

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

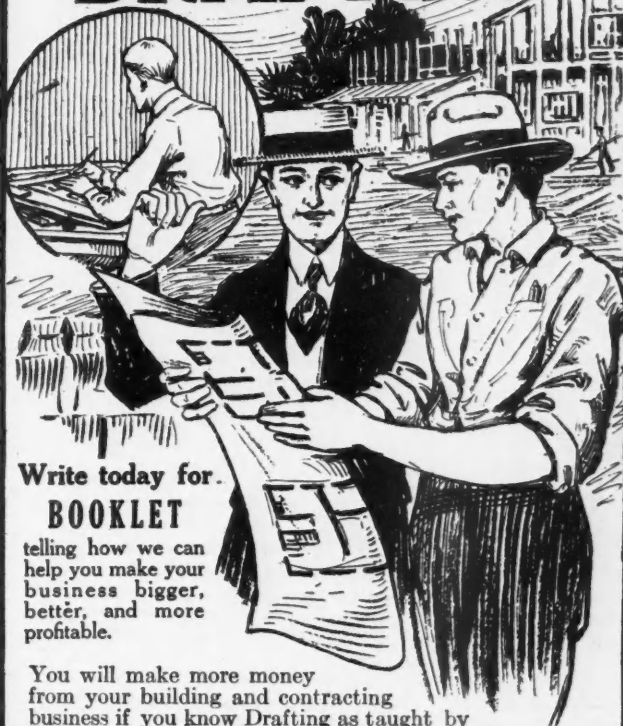
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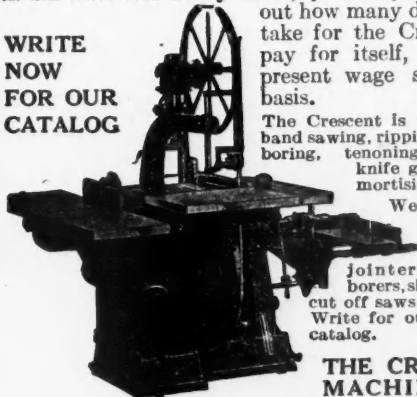
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One man and a Crescent can do as much work as six men can do by hand; just stop and figure out how many days it will take for the Crescent to pay for itself, using the present wage scale as a basis.

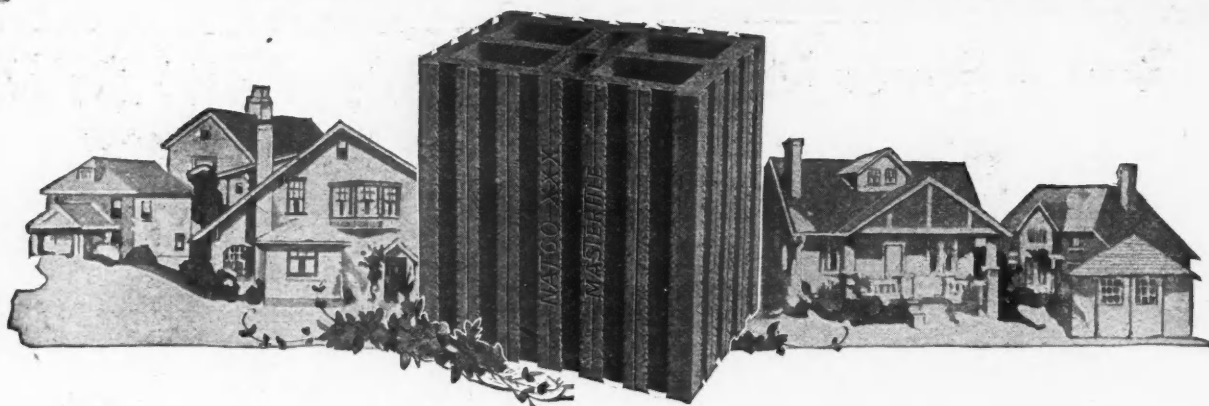
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Better Built Homes with Natco

A Natco Home is permanent, yet economical. The architect, contractor or builder who uses Natco Hollow Tile saves in painting, repairing expense and general depreciation.

The perfect alignment of all shells and cross webs in a Natco Hollow Tile wall — partitions directly

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Do not let the construction of the modern garage worry you. Our garage department will relieve you of these cares.

Steel Roof Trusses

We will submit designs and prices free of charge. Give dimensions of building, style and pitch of roof and kind of roofing.

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Fireproof and giving plenty of light and ventilation are especially adapted for use in garages. We can ship promptly from stock.

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Non-leaking metal skylight frames and standard types of roof ventilators can be supplied promptly.

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Our specialty is the construction of attractive store fronts. Our garage fronts are standard everywhere.

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Complete Store Fronts EVANSVILLE, INDIANA



Fiberlic WALL BOARD

The material from which it is made, the fact that the pulp is *chemically cleansed* and that the *fibre lengths* give the finished product that *natural reinforcement* that is lacking in ground wood boards, is in itself a guarantee of the superiority of Fiberlic for *strong, permanent and sanitary construction*.

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Factory: Camden, N. J.

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They are unlike any other made. The Patent Reverse Spiral Arrangement of the mixing blades is found only on the Blystone.

With this arrangement the batch is carried from one end of the drum to the other twice with every revolution of the shaft and shoveled over forty-four times each minute. The Blystone mixes successfully concrete, mortar, hardwall or the old-fashioned hair plaster.

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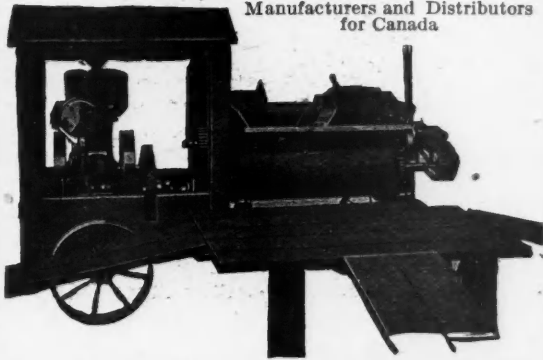
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920 Carpenter St. Cambridge Springs, Pa.

L. & P. MANUFACTURING COMPANY

Niagara Falls, Ontario

Manufacturers and Distributors for Canada



"The proudest moment of our lives had come!"

"It was our own home! There were two glistening tears in Mary's eyes, yet a smile was on her lips. I knew what she was thinking.

"Five years before we had started bravely out together. The first month had taught us the old, old lesson that two cannot live as cheaply as one. I had left school in the grades to go to work and my all too thin pay envelope was a weekly reminder of my lack of training. In a year Betty came—three mouths to feed now. Meanwhile living costs were soaring. Only my salary and I were standing still.

"Then one night Mary came to me. 'Jim,' she said, 'Why don't you go to school again—right here at home? You can put in an hour or two after supper each night while I sew. Learn to do some one thing. You'll make good—I know you will.'

"Well, we talked it over and that very night I wrote to Scranton. A few days later I had taken up a course in the work I was in. It was surprising how rapidly the mysteries of our business became clear to me. In a little while an opening came. I was promoted—with an increase. Then I was advanced again. There was money enough to even lay a little aside. So it went.

"And now the fondest dream of all has come true. We have a real home of our own with the little comforts and luxuries Mary had always longed for, a little place, as she says, that 'Betty can be proud to grow up in'."

In city, town and country all over America there are men with happy families and prosperous homes because they let the International Correspondence Schools come to them in the hours after supper and prepare them for bigger work at better pay.

You, too, can have the position you want in the work you like best. You can have a salary that will give your family the kind of a home, the comforts, the little luxuries that you would like them to have.

All we ask is the chance to prove it. That's fair, isn't it? Then mark and mail this coupon. There's no obligation and not a penny of cost. But it may be the most important step you ever took in your life.

Real Protection

REAL protection from lightning is easy to sell.

Every electrical storm creates a fresh demand. Every new building is a prospect. All agricultural schools and farm papers advocate the use of correct lightning rods.

Sell (BURKETT RODS) THE "BURKETT SYSTEM"

And you have a real lightning protection, approved by the National Board of Fire Underwriters and endorsed by the largest Fire Insurance Companies in the United States.

To insure protection, experts say lightning conductors must either be tape, tube or cable.

Burkett Rods have all three. A spiral copper tape that carries moisture into the ground.

Around this is a tube of woven cable of pure soft copper. **THREE-FOLD PROTECTION.**

WRITE TODAY FOR OUR AGENCY OFFER AND GET STARTED IN PAYING BUSINESS

The Burkett Lightning Rod Co.

Fremont Main Office and Factory Ohio

INTERNATIONAL CORRESPONDENCE SCHOOLS

BOX 8132-B, SCRANTON, PA.

Explain, without obligating me, how I can qualify for the position, or in the subject, before which I mark X.

- | | |
|---|---|
| <input type="checkbox"/> ARCHITECT | <input type="checkbox"/> SALESMANSHIP |
| <input type="checkbox"/> Architectural Draftsman | <input type="checkbox"/> ADVERTISING |
| <input type="checkbox"/> Contractor and Builder | <input type="checkbox"/> Window Trimmer |
| <input type="checkbox"/> Building Foreman | <input type="checkbox"/> Show Card Writer |
| <input type="checkbox"/> Concrete Builder | <input type="checkbox"/> Sign Painter |
| <input type="checkbox"/> Structural Engineer | <input type="checkbox"/> BUSINESS MANAGEMENT |
| <input type="checkbox"/> Structural Draftsman | <input type="checkbox"/> Private Secretary |
| <input type="checkbox"/> Ship Draftsman | <input type="checkbox"/> BOOKKEEPER |
| <input type="checkbox"/> Plumber and Steam Fitter | <input type="checkbox"/> Stenographer and Typist |
| <input type="checkbox"/> Heating and Ventilation | <input type="checkbox"/> Higher Accounting |
| <input type="checkbox"/> Plumbing Inspector | <input type="checkbox"/> COMMERCIAL LAW |
| <input type="checkbox"/> Foreman Plumber | <input type="checkbox"/> Common School Subjects |
| <input type="checkbox"/> Sheet Metal Worker | <input type="checkbox"/> Mathematics |
| <input type="checkbox"/> CIVIL ENGINEER | <input type="checkbox"/> GOOD ENGLISH |
| <input type="checkbox"/> Surveying and Mapping | <input type="checkbox"/> ILLUSTRATING |
| <input type="checkbox"/> ELECTRICAL ENGINEER | <input type="checkbox"/> Railway Mail Clerk |
| <input type="checkbox"/> Electric Lighting and Rys. | <input type="checkbox"/> CIVIL SERVICE |
| <input type="checkbox"/> Electric Wiring | <input type="checkbox"/> MINE FOREMAN OR ENGR |
| <input type="checkbox"/> Telegraph Engineer | <input type="checkbox"/> Metallurgist or Prospector |
| <input type="checkbox"/> Telephone Work | <input type="checkbox"/> Gas Engine Operating |
| <input type="checkbox"/> MECHANICAL ENGINEER | <input type="checkbox"/> Textile Overseer or Supt. |
| <input type="checkbox"/> Mechanical Draftsman | <input type="checkbox"/> TRAFFIC MANAGER |
| <input type="checkbox"/> Machine Shop Practice | <input type="checkbox"/> AUTOMOBILE OPERATING |
| <input type="checkbox"/> STATIONARY ENGINEER | <input type="checkbox"/> Auto Repairing |
| <input type="checkbox"/> CHEMIST | <input type="checkbox"/> AGRICULTURE |
| <input type="checkbox"/> Navigation | <input type="checkbox"/> Poultry Raising |
| | <input type="checkbox"/> Spanish |
| | <input type="checkbox"/> French |
| | <input type="checkbox"/> Italian |

Name _____
 Present Occupation _____
 Street _____
 and No. _____
 City _____ State _____

7-28-12

KOEHRING

THE exclusive Koehring features of design mean higher speed in charging, mixing, and discharging—a big extra daily yardage.

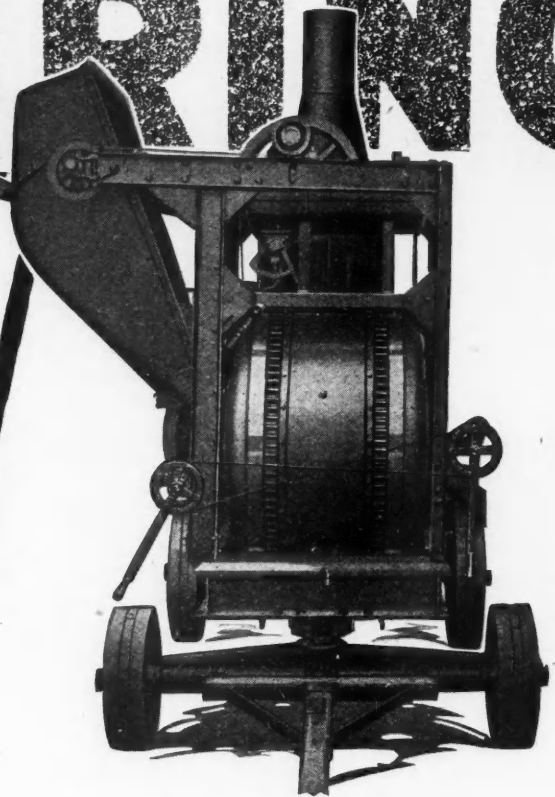
Koehring heavy-duty construction is a guarantee of *maintained* top-speed operation—the surest profit factor you can put on a job.

Koehring *re-mixing* action means dominant strength concrete—concrete that is uniform in distribution of aggregate to the last shovelful of every batch.

Write for Catalog H. D.-

KOEHRING MACHINE CO.
MILWAUKEE WISCONSIN

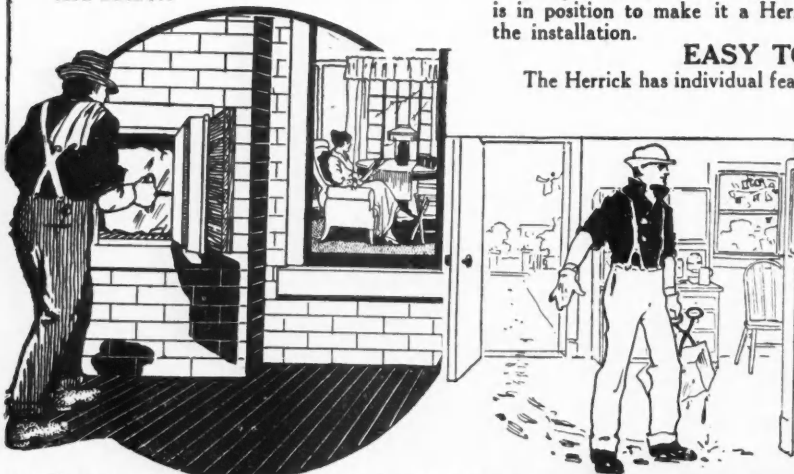
KOEHRING SIZES
In cu. ft. mixed concrete
Construction Mixers: 4, 7, 10, 14, 21, 28, Steam and Gasoline.
Paving Mixers: 10, 14, 21, 28.
Boom and Bucket and spout distribution, Caterpillar traction, loading derrick, steam and gasoline.



Special Notice

Do not cut hole in the wall or make arrangement for outside icing refrigerator until you get Herrick complete plans and instructions. You can save your client money and yourself prestige, time and trouble by knowing exactly how and where to place the opening. Herrick plans sent free to Architects and Builders.

Home Builders. If your architect or contractor can not furnish this information write to us giving their name and address.



The "HERRICK" Waterloo Iowa-Outside Icing

HERRICK

The Refrigerator of Interest to all Builders

The Herrick refrigerator is of especial interest to the Builders—because, by reason of its built-in construction, he is the logical man for the job.

Every modern house must sooner or later have a refrigerator and the Builder is in position to make it a Herrick at a substantial profit both in the sale and the installation.

EASY TO SET IN PLACE

The Herrick has individual features that make it desirable in all cases.

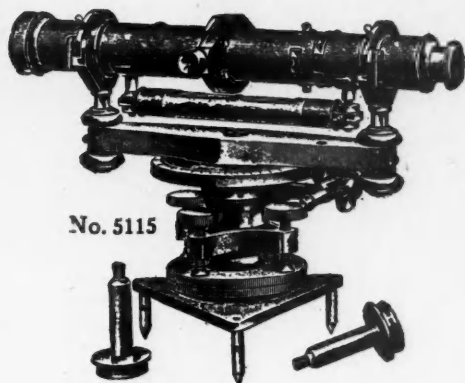
Outside Icing. This appeals to the housewife. Keeps the muddy footed ice man out on the porch.

Herrick System of Dry Air Circulation. Maintains the atmosphere in the ice box that is just as dry and pure as in a room. And requires no ice in cold weather.

Herrick Service Helps You. Answers your refrigerating problems and provides FREE PLANS and selling helps.

Don't put off writing for our catalog and details of our selling services.

Herrick Refrigerator Co.
Waterloo, Iowa



No. 5115

THE Builder who selects a K&E Level or Transit shows good judgment, since he is thus sure of getting a sturdy, reliable instrument, moderate in price and made by a house whose reputation is based on quality and fair dealing.

Send for descriptive circular.

• KEUFFEL & ESSER Co. •
 NEW YORK, 227 Fulton St. General Office and Factory, MANHATTAN, N. Y.
 CHICAGO 211 E. Dearborn St. ST. LOUIS 221 Laurel St. SAN FRANCISCO 2024 Grand St. MONTREAL, 1180 St. Jacques St.
 Drawing Materials • Mathematical and Surveying Instruments • Measuring Tapes

Goods Made by  are Made to Please

Kees Metal Corners

are made to fit and protect all types of siding. They save hours of expensive labor and produce a better job. Heavy gauge galvanized iron assures durability. Chemically treated surface holds paint or stain as readily as wood. All are pierced to take nails easily. Are practically invisible if painted with building—add class if painted as trim. No ornaments to catch dust or moisture. Accurately shaped to fit over the ends of the siding and make a neat and absolutely water-proof job.

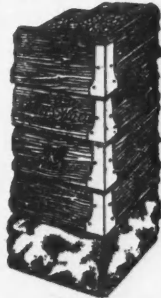
Can't possibly spread or open. They please the builder and the owner.

For Drop and Lap Siding

You can use these satisfying specialties on every job you have no matter what type of siding used. They are made right and work easy. Try them! Ask your hardware or lumber dealer or write Dept. 90 for samples, details and prices.



Applied on Drop Siding



Used on Lap Siding

F. D. Kees Mfg. Co. Beatrice, Nebr.

**Was \$100
Now \$64**

NEW OLIVER NINE FOR NEARLY HALF

This is the most startling typewriter offer of all! A brand new, latest model Oliver for \$64. The identical model formerly priced at \$100.00. We make it possible for you to save \$36 by our new way of selling, ways we learned during the war. We have found out that it is unnecessary to have great numbers of traveling salesmen and numerous, expensive branch houses throughout the country. We were also able to discontinue many other superfluous, costly sales methods. You benefit by these savings.

The Oliver Nine—our latest model—direct from the factory to you. It is the finest, the costliest, the greatest typewriter ever built. Used by the leading concerns.

Who would ever pay over \$64 again for a new typewriter? Especially when we not only make a new low price, but also give the lowest terms—about 13 cents per day—over a year to pay.

STARTLING FACTS

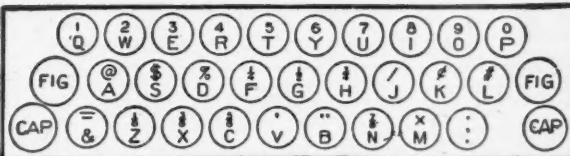
Contractors' Special



For contractors, our Special Oliver Nine is unbeatable. Besides being the best for ordinary correspondence, none can equal it for figure work. It has the characters you need, as shown on the keyboard herewith. And remember, carbon copies of everything written, for your records.

Over 800,000 Sold

Our new price and terms ought to sell an Oliver to every contractor. Longhand writing will be out of date among progressive men.

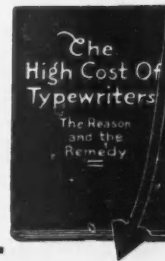


Free Trial—No Money Down

Just send for our amazing disclosure entitled "The High Cost of Typewriters—The Reason and the Remedy." Then ask for a trial. You are not put under the slightest obligation. It is our new-day way of selling. It saves money for both of us. You act as your own salesman—the Oliver itself must convince you. You pocket the \$36.

FREE BOOK

Send in the coupon below today for one copy of this sensational book that exposes the secrets of the typewriter world.



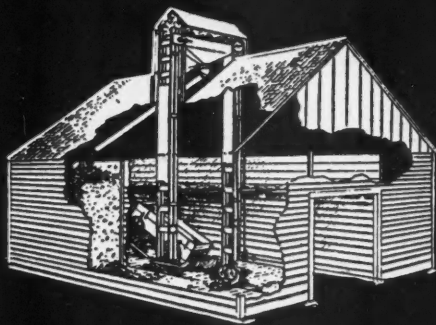
Canadian Price, \$32

THE OLIVER TYPEWRITER COMPANY,
 240 C Oliver Typewriter Bldg., Chicago

Mail me your book and further information—all free and without obligation to me.

Name _____
 Street Address _____
 City _____ State _____

**YOU
SHOULD
BE THE
MEYER
MAN**

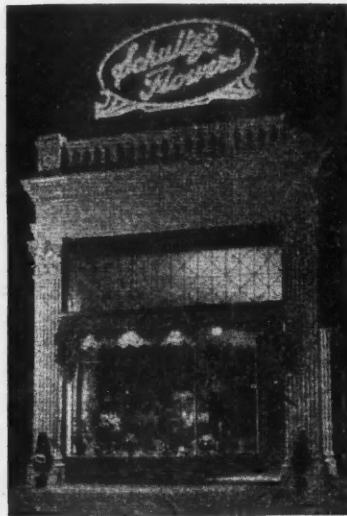


Meyer Elevators are easily sold, easily installed and easily operated. You can interest every farmer and can sell a great number right in your neighborhood; now's the time to get them interested.

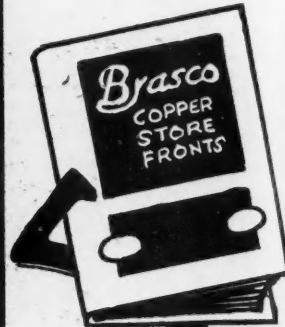
We are on the lookout for reliable wide-awake representatives to further introduce "Meyer" Elevators, and upon request we will send you our money-making proposition

Send for our free Crib Blue Prints and Agency proposition.

THE MEYER MFG. CO.
345 WALNUT ST., MORTON, ILL.



WRITE FOR THIS BOOK



Service

WE offer you not only the best and most profitable store front, but we give you every help possible in putting the job across. The "BRASCO" Book will tell you all about it.

BRASCO MFG. COMPANY
5029 S. Wabash Avenue, Chicago, Illinois

USE THIS COUPON

BRASCO MFG. CO., 5029 S. Wabash Ave., Chicago, Ill.
Gentlemen—Please send me the "Brasco" Book

Name _____
Address _____
State _____



This Concrete Mixer Earns Good Profits

Build
walks, foundations, feeding floors or silos, install barn equipment, etc., with the Gilson and save money.

Gilson None Better

Made of iron and steel. Will handle 2½ to 3 cu. ft. of concrete to a batch, giving it a capacity of 35 cu. yds. in 10 hours, and a batch a minute. Does the work thoroughly. Mixes concrete, plaster or mortar. One-horse engine turns it easily when loaded. **Patented Reverse Unloading Gear** gives greatest speed in unloading by merely tilting drum. Low down and handy, loads one side and dumps on other.

Mounted With Engine, Only \$195.00

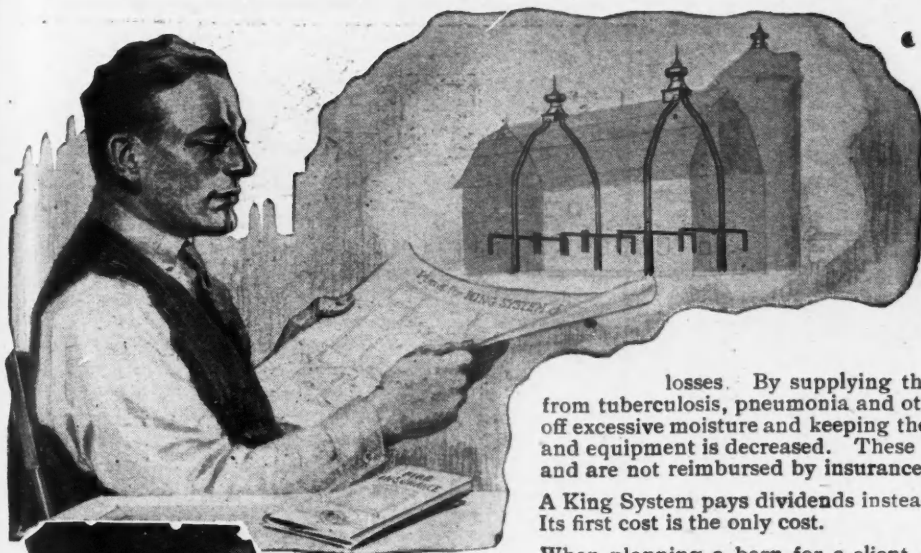
Mounted without engine and housing \$95.00. On skids \$58.50. All prices f. o. b. factory. Lowest priced practical mixer on the market. Guaranteed exactly as represented, a modern, improved Mixer that will save you money. Order today—Send for illustrated circular giving all particulars.

Gilson Mixer Co.
628 7th Avenue
West Bend, Wis.



Showing un-mounted Mixer in working position.

Patented Aug. 14, 1917 Jan. 27, 1920



The Insurance that Prevents Loss

Your customer will doubtless have his new barn insured against loss by fire, but a ventilating system will protect him against far more serious

losses. By supplying the stock with plenty of fresh air, losses from tuberculosis, pneumonia and other diseases are prevented. By carrying off excessive moisture and keeping the barn drier, depreciation of the building and equipment is decreased. These losses, though gradual, are just as real and are not reimbursed by insurance.

A King System pays dividends instead of running into expense for premiums. Its first cost is the only cost.

When planning a barn for a client, point out these things. He will readily see the importance of having the King System put in as the building goes up. By doing so he will get 100 per cent service from his barn.

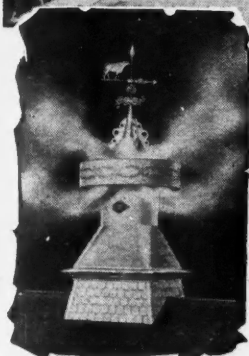
Let us explain our plan. Ask for our Book on Barn Ventilation—it should be in your files for reference.

KING VENTILATING COMPANY

1202 Cedar Street (On the Jefferson Highway) Owatonna, Minn.
Ventilating Engineers for Farm Buildings and Creameries



Be sure this diamond King trade-mark is on the ventilating system you buy.



The King Aerator drawing moisture out of a building. The steam can easily be seen in cold weather. King Aerators can be installed alone and the entire System added later as the farmer may decide.

KING SYSTEM OF VENTILATION

"Makes Good Barns Better"

Years of Patient Endeavor
have Produced

STALWART ROOFING

An Asphalt Roll Roofing
of Typical Flintkote Quality

ATTRACTIVE
IN
APPEARANCE



UNUSUALLY
FLEXIBLE

THE FLINTKOTE COMPANY, INC.
BOSTON, MASS.

NEW YORK CHICAGO NEW ORLEANS

CALCIMINES AND WATER PAINTS

These materials are so much cheaper than wall paper and oil paints, and are so much better than lime wash that every wide-awake builder and owner should investigate them fully, learn which are the most practical, and find out how much they will help to reduce costs.

Calcimines are glutinous compositions intended for decorating ceilings and walls of residences, offices, schools, churches, theatres. The best are called MURALITE and CALCITINE.

Water Paints are caseinous compositions intended for whitening ceilings and walls of factories, mills, sheds, garages, stables.

The best is called PERMANITE.

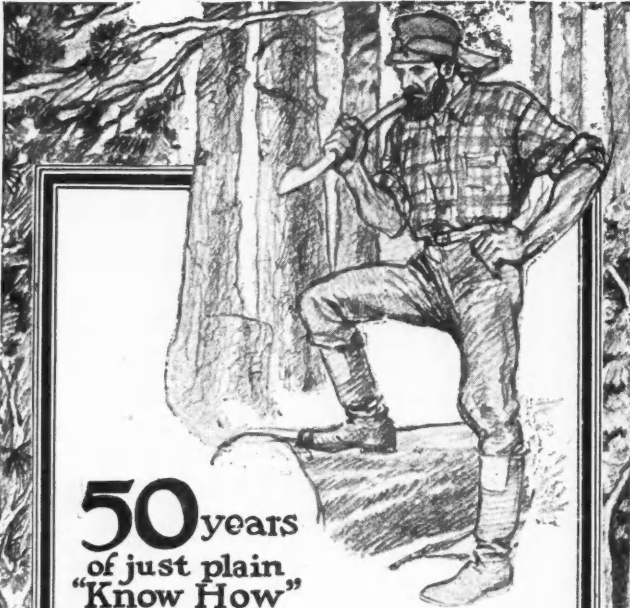
Our products are more practical than any similar ones on the market, and are sure to please you.

Send for descriptive cards and prices

M. EWING FOX COMPANY

Manufacturers

240 East 136th St. 1501 So. Peoria St.
NEW YORK CHICAGO, ILL.



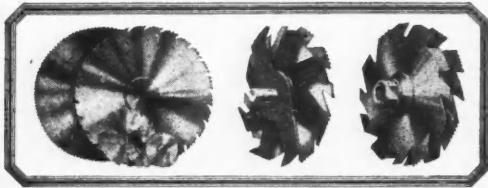
50 years
of just plain
"Know How"

THINK what this means to you when you purchase a Huther Saw. It means that you are buying a saw long past the experimental stages—a saw developed by constant investigation of sawing requirements during our fifty years of manufacturing progress.

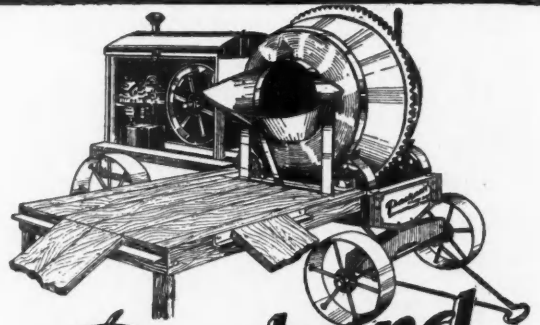
This feature is particularly noticeable in the Huther Brothers Dado Head which is made to facilitate intricate cutting and grooving. This Saw consists of two outside cutters and enough inside cutters to perform the required cut. It leaves no rough edges as is the case when an ordinary saw is used. It has a simple adjustment.

Back of all these features is the fact that we are the originators and patentees of this type of Dado Head.

Write for complete catalogue of this and other Huther Saws that will help bring down manufacturing cost.



HUTHER BROS. SAW MFG. Co., Inc.
ROCHESTER, N.Y.



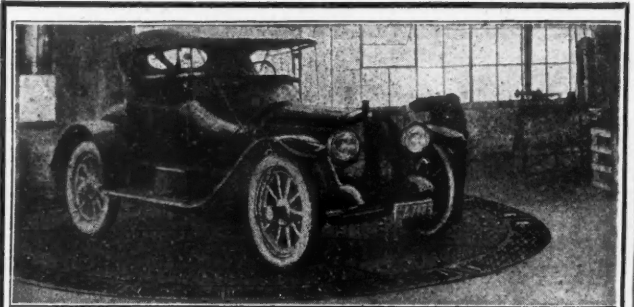
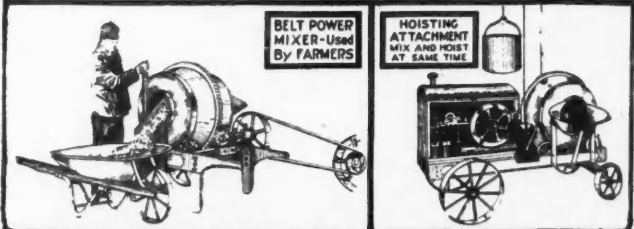
Packard
HANDY SIZE
BATCH-A-MINUTE MIXER

A sturdy, reliable mixer at a price anyone can afford. Sold on 30-day trial offer and absolute money-back guarantee.

Big Reduction in Mixer Prices

A sensational value at the price we quote. Will mix as fast and as thoroughly as any other mixer of same size, regardless of cost. Write today for description and price.

MANUFACTURERS -
CONTRACTORS EQUIPMENT CO.
Keokuk, Iowa
THE 30,000 HP. ELECTRIC CITY
U.S.A.



The Universal Automobile Turntable

For public and private garages regardless of size or number of cars handled. Insures safety to cars and employees by eliminating the necessity for backing out of garages and makes it easier to turn and handle any size car or truck.

The Universal Turntable revolves on ball bearings and can be turned in any direction by anyone. The patented ball race course reduces friction to the minimum. Side binding, tilting or wobbling is impossible and a 12-inch pit is all that is required.

Equipped with washrack extension for easy washing and positive draining off of all water. Hundreds in use giving uninterrupted service and great satisfaction.

Send for catalogue C-K and construction and installation details

CANTON FOUNDRY & MACHINE CO.
CANTON, OHIO
Permanent Exhibit Salesroom, Grand Central Palace, New York

Sole Export Representatives:
INTERNATIONAL PURCHASING BUREAU
203 E. 15th St., New York, N. Y.
Cable Address: "SKYLINE" New York.

Why Don't YOU Install Them?

Other Contractors are installing the efficient and popular

"MILCOR" VENTILATORS

Why don't you do it? Farmers are pleased with them — pleased with the results and pleased with their appearance on their buildings. They are finished in beautiful satin aluminum, which is permanently protective, and are designed for utility and convenience, as well as beauty. The slanting base gives ample room for ventilating flues without obstructing the path of the hay carrier. "Milcor" Ventilators are easily and quickly installed and it is not necessary to get inside the ventilator during the operation, as special sheet metal screws are provided, which eliminates the necessity of nuts. Bases are cut at factory, to fit the roof, whenever pitch is given with order.

"Milcor" Ventilators are unexcelled for capacity and efficiency. They are constructed on scientific ventilating principles and will draw off the excess moisture and inflammable gases from the hay loft, preventing loss from mildewing of hay and from fire resulting from spontaneous combustion or lightning stroke.

WRITE FOR VENTILATION CIRCULARS

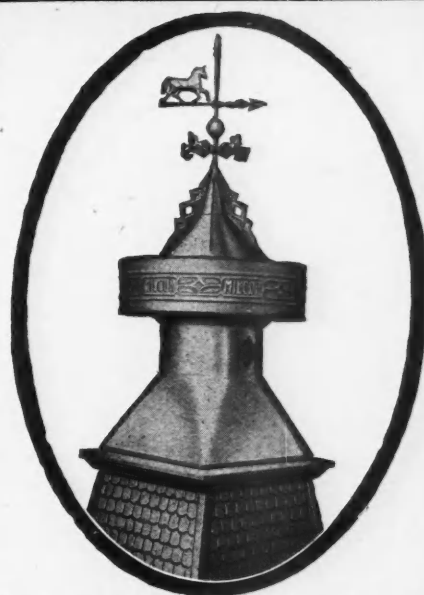
Milwaukee Corrugating Co.

MILWAUKEE, WIS.

Branch Office and Factory : Kansas City, Mo.
Minneapolis Sales Office, Lumber Exchange



No. 12
Hog House Vent.



VENTILATORS

for Barns
Chicken Coops
Hog Houses, Silos
Creameries
AND OTHER BUILDINGS

Bring Your Ventilation Problems To Us



Answers to Wall Board Questions

1. Which wallboard has the fashionable "Oatmeal" finish?

Answer: Cornell Wood Board

2. Which has the "Mill-Primed" Surface that takes paint perfectly without a sizing coat?

Answer: Cornell Wood Board

3. Which is made with the "Triple-Sizing" process that gives triple protection against moisture, expansion and contraction?

Answer: Cornell Wood Board

Write for attractive booklet of Cornell
Paneled Interiors and sample board

CORNELL WOOD PRODUCTS CO.
General Offices: 330 State-Lake Bldg., Chicago

Our modern mills at Cornell, Wisconsin,
and extensive timber lands insure the fulfillment of all guarantees and contracts.

LOCK 'EM OUT

Sell No-Sag Screen Doors, before the flies come. It's an easy and profitable business.

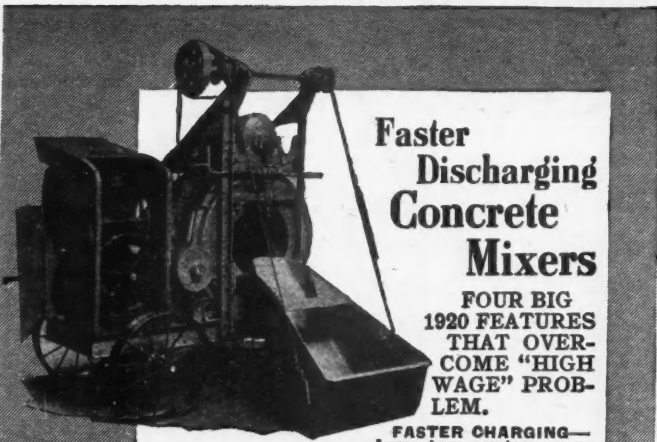
No-Sag doors are carefully constructed of northern pine. The strong sag-resisting qualities make this door serviceable year after year.

Write today for catalog and prices.



Cadillac Lumber Co., Cadillac Mich.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



**Faster
Discharging
Concrete
Mixers**

**FOUR BIG
1920 FEATURES
THAT OVER-
COME "HIGH
WAGE" PROB-
LEM.**

FASTER CHARGING—
Large drum openings—non-
choking hoppers that are steep enough to dump self
without pounding.
FASTER DISCHARGING—7 to 15 second discharge
through patented action—every bucket discharges—
easy to clean.
**BROKEN GEARS AND LOOSE CHAINS ELIMIN-
ATED**—Steel roller pinion drive runs smoother—
quieter and saves power—teeth replaced in 4 min-
utes without taking pinion off shaft.
BEARINGS GUARANTEED FOR LIFE OF MIXER
—Hyatt Roller Bearings—save 17% power—70%
of oil.
Built in sizes to fit all jobs: 1/2, 1, 2, 3, 4 Bag Cap-
acities; Gas, Steam, Electric.
\$325.00 Buys Our 1/2 Bag Low Charger
WITH NOVO ENGINE
One of the many real bargains in our big catalog.



**CONTRACTORS'
HOISTS**

With Hyatt Roller
Bearings

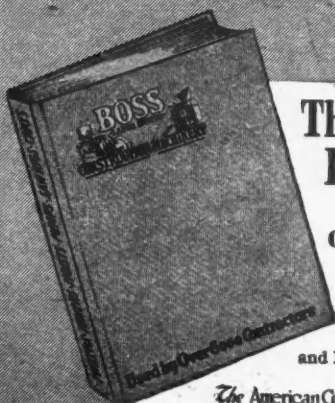
**BOSS
GASOLINE
ELECTRIC
HOISTS**

Commands the Largest Sales
of any Gasoline Hoist. Over
twenty car loads sold in one
order shipped to France.

Widely used for MATERIAL ELEVATORS,
PILE DRIVING, EXCAVATING, DRAG
LINES, CONCRETE TOWERS, GENERAL
CONSTRUCTION WORK.

BUILT IN 7 SIZES—Single or Double Drum—Re-
versing or Two Speed if Wanted.

1920 Features S. F. K. Ball Bearing Thrusts.
Hyatt Roller Bearing. Ma-
chine Cut Steel Engine Pistons. Steel Frames.



**The Nation's
Price Maker
on Construction
Machinery**

Write for Your Copy Today
and New 1920 Prices and Terms.

The American Cement Machine Co Inc

Keokuk Iowa
THE BIRTH OF ELECTRIC CITY

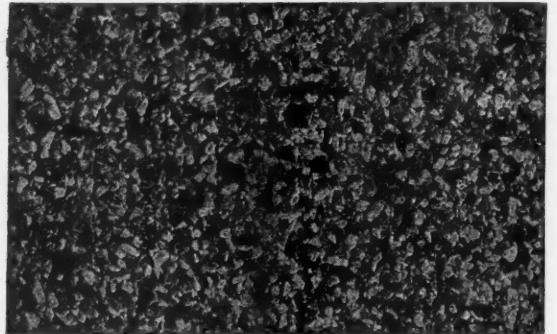
Branch Offices, Warehouses in All Principal Cities

CONCRETE

BLOCKS, BRICKS, BUILDING TRIM,
POSTS, ORNAMENTAL WORK, ETC.

WHEN FACED WITH

MICASPAR CRYSTALS



IS CHANGED INTO

SPARKLING GRANITE

BEAUTIFUL, ARTISTIC and EVERLASTING

Made in six scientifically milled sizes, extremely
hard, sharp and free from dust. Insures strength and
beauty. Every dollar expended on Mica Spars brings
five times its value. Booklet, "Micaspar and How
to Use It," with free samples, mailed on request.

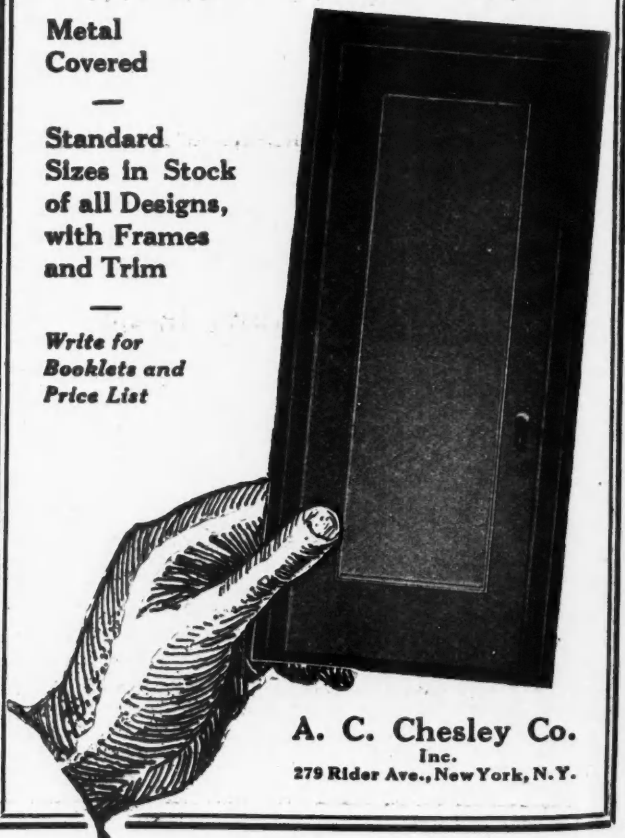
Crown Point Spar Company, Inc.
663 Broadway, New York

STOCK FIRE PROOF DOORS

**Metal
Covered**

**Standard
Sizes in Stock
of all Designs,
with Frames
and Trim**

Write for
Booklets and
Price List



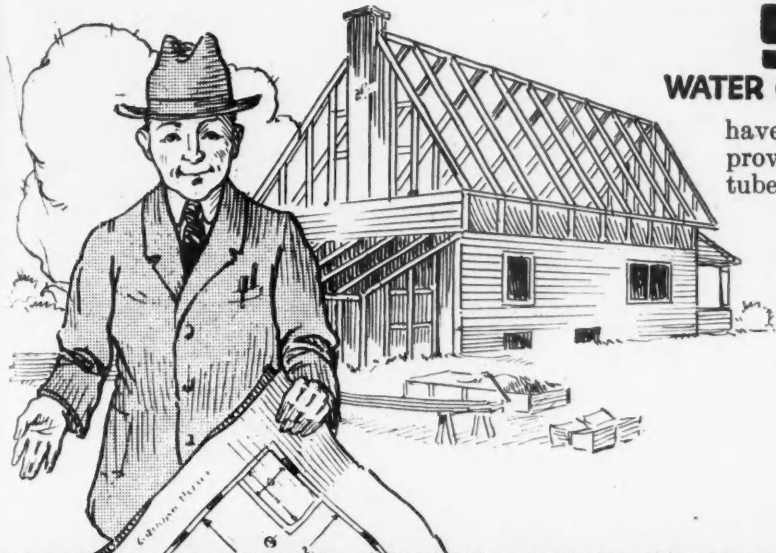
**A. C. Chesley Co.
Inc.**
279 Rider Ave., New York, N. Y.

"Whaddaya Mean, More Money?"

"I've built that house and charged all it was worth. Where have I overlooked a profit? Show me and I'll grab it quick."

That's what a building contractor said to us, and we "showed" him, the same as we've shown hundreds of others.

You can't claim you've made full profit from a building job unless you've sold and installed Security Lightning Conductors. The building needs the protection, some day the owner is going to buy lightning rods, so why shouldn't he buy them from you—right now?



SECURITY WATER GROUND LIGHTNING CONDUCTORS

have a big sales point that's backed by approval of scientists. They are grounded in a tube of water to insure conductivity in the driest weather. No need to pour water on the ground rod when the Security is used.

This, with other big Security features, is described in the catalog which we want to send you, along with our sales-co-operation proposition for building contractors.

*It costs nothing to get the facts.
Why not send a postal today?*

The Security Lightning Rod Co.
505 Pine Street Burlington, Wisconsin

QUICK ACTING *The Taylor* SELF LOCKING

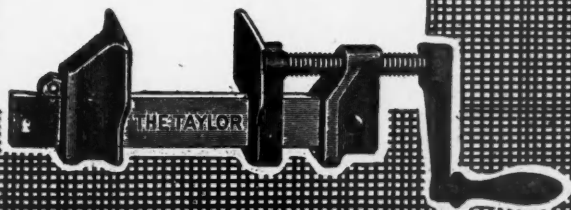
Clamps

An Investment
Not an Expense

The quickest and strongest clamps made. That's why they're the standard in U. S. Government Works and in such concerns as General Electric Co., Singer Sewing Machine Co., Victor Talking Machine Co., etc.

We can PROVE it in your own shop. Write today.

James L. Taylor Mfg. Co.
Poughkeepsie, N. Y.

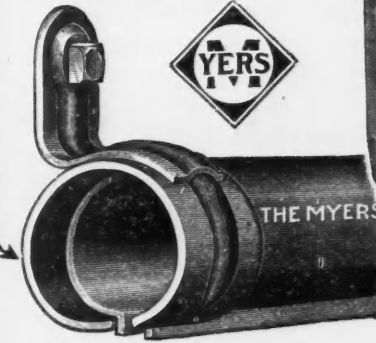


MYERS GIANT

No. 15

HERE, Mr. Carpenter, Mr. Contractor, Mr. Builder, is a picture of the Myers Giant Tandem Adjustable Door Hanger and a sectional view of the Myers Tubular Girder Heavy Steel Track—a combination that has improved sliding door service for thousands of owners of barns, garages, warehouses and other buildings.

They have so many good features and are so uniformly satisfactory, that we recommend them unreservedly for light running, storm and waterproof doorways on the buildings you design or erect. Let us send catalog and quote.



F. E. MYERS & BRO. ASHLAND, OHIO

SOLD ON THE SQUARE

STEWART CONCRETE MIXERS

BUILT ON THE SQUARE

5 SIZES

Long life—trouble-free, service, simplicity and ease of operation are built and engineered into every **STEWART MIXER** so that you will be sure to get absolute satisfaction and perfectly mixed concrete out of it.

You can depend upon your **STEWART MIXER**, absolutely for easy, quick, economical, thorough and profitable mixing. **Always**. On any and every job.

You have five sizes and twenty models from which to select the one which will exactly meet your needs. Stocks carried in most principle cities. Write us today for complete description and prices.

STEWART MANUFACTURING COMPANY
157 Rath St. Waterloo, Iowa

20 MODELS

WALTER'S & COOPER'S METAL SHINGLES

The Shingles That Last

The Shingles That Last

The Most Complete Line of Designs The Best Quality Workmanship and Finish
Made in Painted Tin or Genuine Re-dipped Galvanized Tin
SOLD AT THE RIGHT PRICE
May we send you full-size samples and prices?

NATIONAL SHEET METAL ROOFING CO. 339-345 GRAND STREET
JERSEY CITY, N. J.

WHEN WRITING ADVERTISERS PLEASE MENTION THE AMERICAN BUILDER



You Can Sell Helm Block

In the first place it is made on the correct principle of dry wall construction as the illustration shows.

There is no concrete link between the walls to absorb the moisture, only small metal anchors.

In the second place, blocks and brick made in the Helm press have a solidity and beauty of finish that is unequalled.

Right now is the time, when building materials are so costly, to get started in the manufacture of a building material that is daily becoming more popular because of its low cost and practicality.

Write for Our Special Offer to Builders.

The Helm Brick Machine Co.

774 Mitchell St., Cadillac, Michigan



Equipped with Kernerator
W. O. Goodman Apartment, Chicago
William E. Walker, Architect

Disposing of Waste Without Cost

Waste cans and garbage pails are always an intolerable nuisance and health hazard. No one wants them. Why not eliminate them by specifying a

KERNERATOR
Built in the Chimney

in your residence and apartment building projects? It burns all household waste without the use of any commercial fuel. It efficiently disposes of anything—from waste paper to bottles or tin cans.

The refuse, after being thrown into the handy hopper door in the kitchen or hallway, drops down the flue into the incinerator. The dry waste, in burning, dries the wet waste, so that it, too, readily burns. Non-combustible articles are dried, sterilized and later dropped into the ash pit.

The KERNERATOR is installed when the building is erected under an absolute guarantee. It is found in 85% of all new apartment buildings and fine residences in cities where this company is established.

See Page 1132 Sweet's Catalog

Kerner Incinerator Co.
244 Lapham Street Milwaukee, Wis.

- Sanitary
- Economical
- Convenient
- Odorless



MURPHY BEDS

Murphy In-a-Door Beds are being used the country over in Bungalows, large and small Residences, Apartment Houses, Hotels, Hospitals, Dormitories, Public Buildings (in rest rooms).

For literature, address

Murphy Door Bed Company
22 W. Monroe St., Chicago Chemical Bldg., St. Louis

469 Fifth Avenue, New York	1103 First Avenue, Seattle, Wash.
1435 Blake Street, Denver	659 Leader News Bldg., Cleveland
912 Kresge Bldg., Detroit, Mich.	305 City Club, Kansas City
205 O'Connor St., Ottawa, Canada	111 Murphy St., Dallas, Tex.
Crocker Bldg., San Francisco	204 Peach Tree Arcade, Atlanta, Ga.



THERE IS ONLY ONE IN-A-DOR BED ITS A MURPHY

MORE JOBS TAKEN ON and turned out more satisfactorily, in the same time and with the same crew of men now required for brush-painting one-fourth as much work, is the big advantage offered by the



Portable Painting Equipment

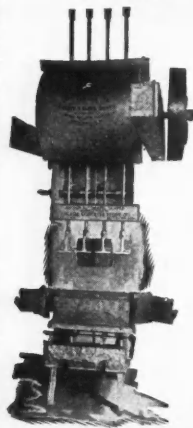
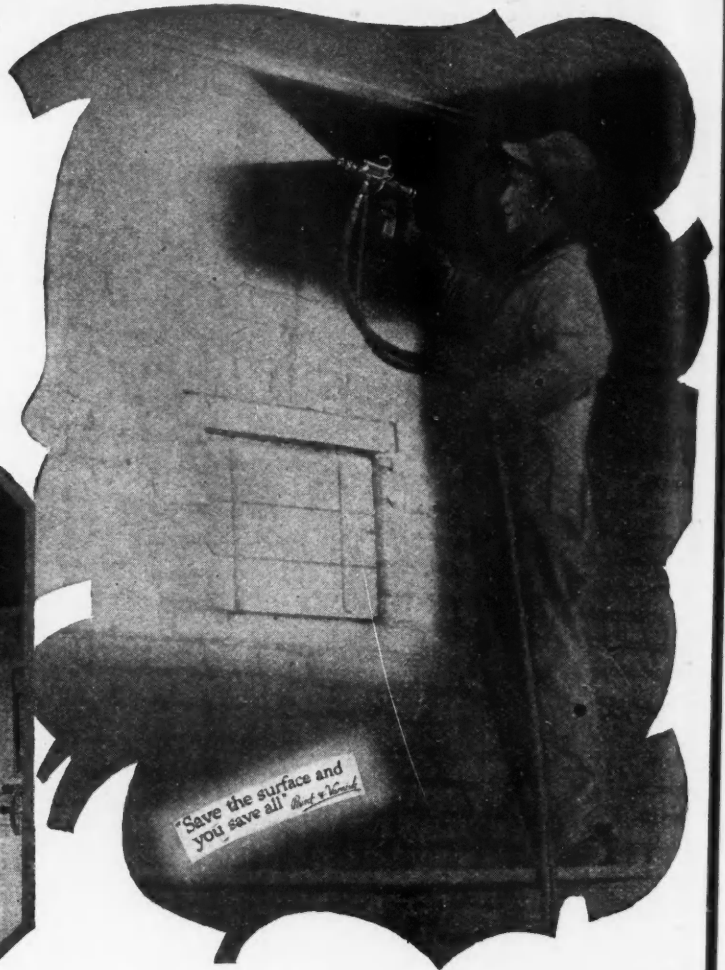
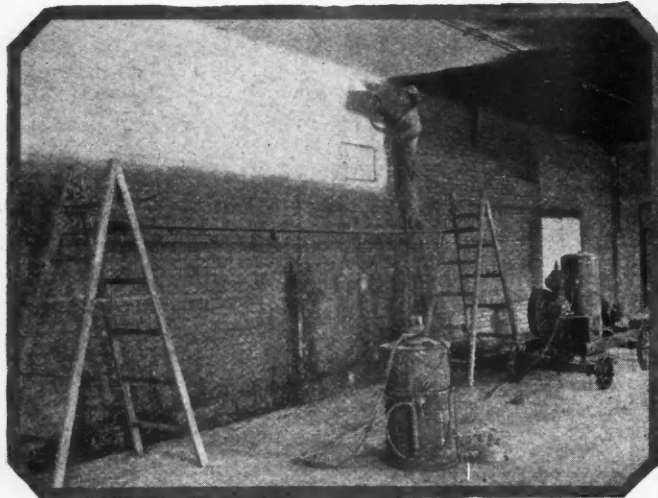
This advantage is to be had on nearly every kind of inside and outside job, and results in solving the scarcity of labor problem.

We'll gladly mail you further particulars and a descriptive folder.

The DeVilbiss Mfg. Co.

3676 Detroit Ave.

Toledo, Ohio



The Demand for Concrete Block Building Units Is Greater Than the Supply

Get into the block making business and be sure that you make only high-grade block.

ANCHOR Continuous Air Space Block Machines

make the only absolutely frost and moisture proof block on the market. A very simple and efficient machine with a large output at a low price.

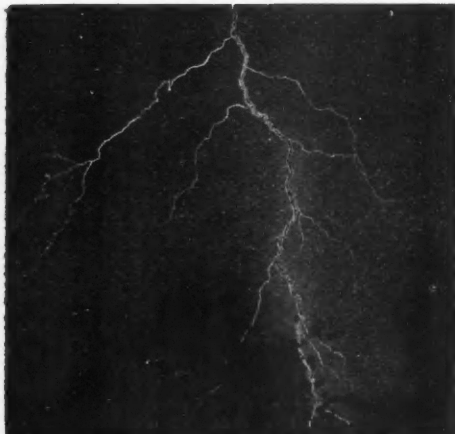
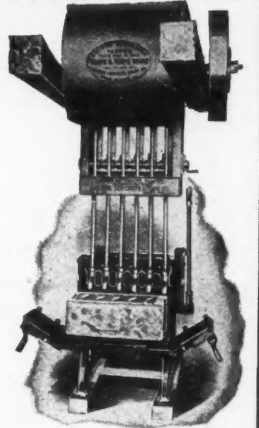
Anchor Automatic Tampers

are made to work over any make of block, brick or stave machine. Double your output and increase the density and uniformity of your blocks with an Anchor Tamper. For prices and information write

ANCHOR CONCRETE MACHINERY CO.

Main Office: Rock Rapids, Iowa

Eastern Office: 180 Lexington Ave., Columbus, Ohio



Taken from Actual Photograph

Lightning Rods

CARPENTERS—BUILDERS

MAKE BIG EXTRA PROFITS WITH

BARNETT SYSTEM GUARANTEED Lightning Protection

Why let the big extra profit go to the other man after you have done the hard work erecting the buildings? This easy profit belongs to you. You are the logical man right on the job to install this protection on every building you erect. The owner's confidence in you will make it easy to secure this additional work and profit on the same job. Why not make \$50.00 to \$75.00 per week extra?

Our Rods are in big demand. Made of pure copper endless cable, no rust (no joints) with attractive fixture. Easily put on buildings. Two hours extra work rods the building, and puts profit in your pocket. Money back guarantee with each job. Hundreds of our Carpenter agents began in a small way, now doing a big business. Secure the agency now. Write today for free Catalog, Cable Samples, and Prices.



Protect Life and Property

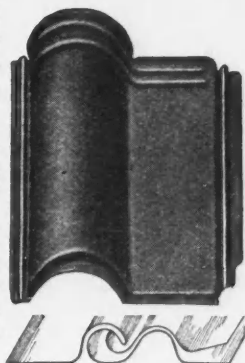
Cheapest Insurance Known

JOS. L. A. BARNETT & CO., Cedar Rapids, Iowa



Edwards Metal Spanish

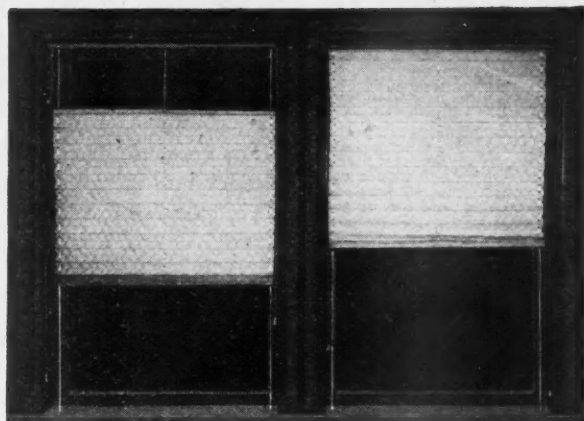
Tile These tiles are the *right red*. They are light, practically imperishable, distinctly correct in design. Wind, weather, storm, fire and lightning-proof. Can be applied without soldering or the use of special tools by any competent workman. In fact, they have every good point of the heavy terra-cotta Spanish roofing tile with none of its disadvantages. Let us send you samples and literature on the subject.



The Edwards Manufacturing Company
401-417 Eggleston Avenue Cincinnati, Ohio

Metal Roofing, Metal Ceilings, Metal Garages, Portable Buildings, Rolling Steel Doors, Etc.

3



For a Quick Turnover of Dwelling or Apartment at Your Own Price

Building is beginning to catch up to the demand. Soon the old days of competition will be repeated. Then the arts of salesmanship will again come into play.

What is it that sells a dwelling or apartment building?

Or that finds the most desirable tenants in the shortest time?

Or that wins reputation and popularity for the contractor?

Why, **FIRST IMPRESSIONS**, of course!

Not the vital and costly things, but the little tricks and touches that catch the eye and tickle the feminine fancy.

Athey Perennial Accordion Pleated Window Shades

may be said to "Tiffanyize" any building dressed with them—surround it with a "halo" of aristocratic distinction—make the feminine prospect exclaim her delight—and at the same time appeal to the practical sense of *personal comfort* of the masculine check-writer.

For these beautiful herringbone-weave, ecru, coutil cloth shades, paneled like Venetian blinds, give the outward effect of costly draperies. And when the "Lord and Master" manipulates them up and down on the taut piano wires, he realizes that a real window shade has been perfected at last.

Send for free sample

ATHEY COMPANY

Also Manufacturers of
The Athey Cloth-Lined Metal Weather Strip
6037 W. 65th St. Chicago

Carpenters Wanted as Special Representatives

Make Extra Money. Just carry a sample of Henry Airtight Weatherstrip and make sales while on your regular job. Every householder is a prospect. It saves coal. Protects health.



for the bottom of doors and hinged windows. It's automatic. Fits tight against worn sills as well as new ones. Keeps out cold, rain, snow and dust. Easily put on—it is a fast seller. Approved by architects, carpenters, and builders wherever known.

Send to-day for our money making proposition

The Henry Airtight Weatherstrip Co.
510 Elm Street, Crawfordsville, Indiana

This attachment automatically shuts the strip tight against the sill



Badger Sheet Metal Building Specialties



GET to know—and use—Badger products. They serve you well. Satisfaction and quality are stamped into every piece. Value goes in before the Badger trade-mark goes on. Being large producers of all kinds of sheet metal products and jobbers of tin plate, black and galvanized sheets, we are in position to quote interesting prices. Our policy is "shipment same day order is received."

Ask Your Dealer for Badger Goods

Look for the Badger trade-mark. It guarantees you quality, satisfaction, right price. Complete catalog sent upon request.

Here are some of the Badger Specialties

- Cornices
- Skylights
- Eaves Trough
- Finials
- Ventilators
- Conductor Pipe
- Sheet Metal Roofing and Siding
- Galvanized Tanks
- Galvanized Culverts
- Galvanized Screw Joint
- Metal Ceilings
- Well Casing
- Hip Shingles
- Metal Shingles
- Ridge Rolls

We Specialize on Farm Building Ventilation

Cupolas, skylights and complete Ventilating systems for barns, hog houses and other farm buildings. We furnish blue prints and complete plans for each individual job.

WRITE TODAY FOR CATALOG

Dealers: Write for discounts and special proposition.

Badger Corrugating Co.
Dept. D. La Crosse, Wis.



BIG MONEY FOR YOU IN THE FLOOR SURFACING BUSINESS

With the demand for highly finished floors greater than ever before and with wages constantly rising, it is impractical and impossible for contractors to finish floors by hand. This condition was foreseen years ago and a has been met by the manufacturers of the American "Universal" Electric Floor Surfacing Machine. With this machine one man can now surface



more floors in a day than five or six men could do by hand, and do it much easier and better. Machine is electrically operated and can be used on any sized floor from a cottage to the largest auditorium. Surfaces floors to walls without hand work—old or new floors makes no difference. Machine is simple, well-built and requires no previous experience to operate.

The American "Universal" Electric Floor Surfacing Machine offers you the chance to get into a big business of your own, with but a small investment. New buildings, old buildings, remodeling jobs offer thousands of prospects. Contractors and Architects will prefer your work because machine leaves no sander waves or chatter marks; leaves job clean—vacuum fan deposits dust and dirt in bag. Machines easily pay for themselves first month and pay a good profit besides.

What Users Say of the American "Universal"

No Trouble to Get Business
The American "Universal" has paid for itself in my spare time in past four months. Have worked up such a business without advertising or looking for work that in the Spring I intend to start in business for myself doing nothing but surfacing floors. I have proved to the satisfaction of several contractors, carpenters and painters that I can do their work better and cheaper than they can so they have promised me all of their work. William B. Panter Mich
DON'T PASS UP THIS OPPORTUNITY TO GET IN A BUSINESS OF YOUR OWN. WRITE TODAY FOR COMPLETE LITERATURE.

AMERICAN FLOOR SURFACING MACHINE CO.

Originators of Floor Surfacing Machines

19 American Bldg.

TOLEDO, OHIO

12,000 Contractors Using "Universals"

Gregertsen Bros & Co Cypress Specialists

Dealers, Millwork Mfrs. Industrial Establishments Manufacturers

Two Million Feet of Cypress

ready to ship from our Cairo, Illinois, yards and an unlimited supply in the South.

Cypress is the best value for your money today. It takes the place of best White Pine or Poplar at a less price.

BUY NOW

We are one of the few parties who can supply the present demand

Write for prices

GREGERTSEN BROS. CO.
McCormick Bldg. Phone Harrison
CHICAGO, ILL. 8610 - 8611

Meadows
TRADE MARK

Meadows Washers Make Happy Families

The ease, speed and efficiency with which a Meadows Power Washing Machine does the week's washing not only makes Mother happy—it makes the whole family feel better. Laundering clothes to snowy whiteness is easy when the laundering is done the Meadows way.

Meadows Power Washing Machines have these features, many of them exclusive: Swinging Reversible Wringer—Foot Pedal Safety Control—All Moving Parts Enclosed—Dolly Type Washing Principle which washes clothes quicker, cleaner, better.

Meadow Washers are well built, strong and sturdy. The first cost is not high and they save money ever afterwards. Supplied for either electric or belt power.

*There's a Meadows Washer for every home.
Write for full descriptive literature.*

Meadows Manufacturing Company
40 Bell Street Bloomington, Illinois



*Hotel Ansonia, New York City: Warren & Wetmore,
Architects; E. Smolka Plumbing Supply Co.,
Jobbers; James McCullagh, Plumber*

KOHLER

And HOTEL ANSONIA

The Hotel Ansonia—member of the world-famous Bowman group of New York hotels—combines the architecture of the Old World with the luxury and convenience of the New. It follows as a matter of course, then, that in the well-appointed bathrooms of this exclusive hostelry, are found 170 Kohler "Viceroy" Built-in Baths. For the beauty and durability of these famous enameled tubs has secured for them the preference of leading architects, builders, master plumbers and the public as well.

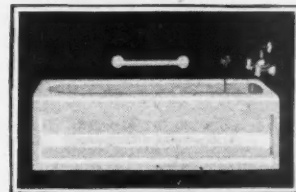
* * *

If your file lacks that convenient handbook, "KOHLER of KOHLER," illustrating and describing in detail the Kohler Enameled Plumbing Ware Products, kindly write

KOHLER of KOHLER

Kohler Co., Founded 1873, Kohler, Wis.
Shipping Point, Sheboygan, Wis.

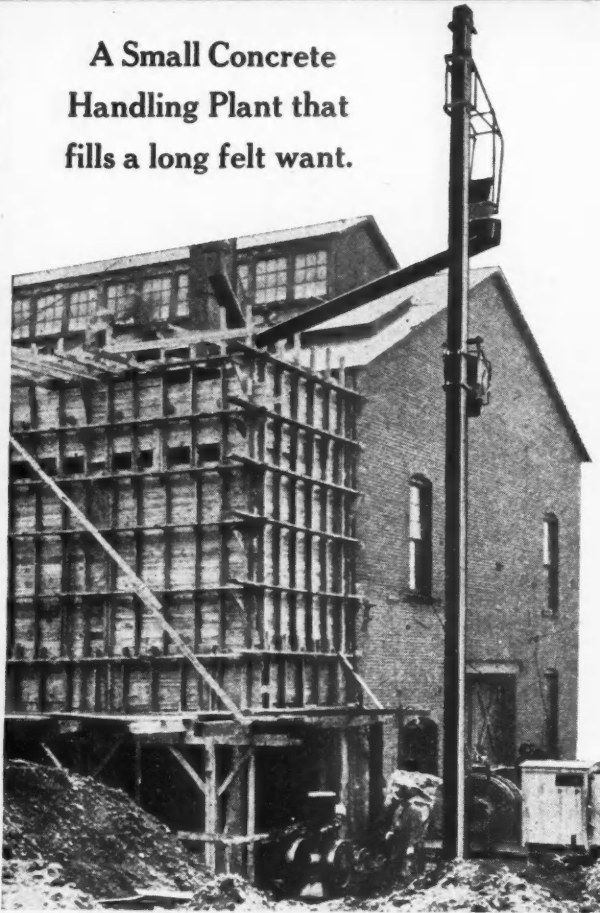
BRANCHES IN PRINCIPAL CITIES



Kohler "Viceroy" Built-in Bath
Recess Pattern

MANUFACTURERS OF ENAMELED PLUMBING WARE AND
KOHLER AUTOMATIC POWER AND LIGHT 110 VOLT D. C.

A Small Concrete
Handling Plant that
fills a long felt want.



The INSLEY MAST HOIST BUCKET PLANT

To those who have concrete work on which a one-half sack or one sack mixer is used, and where the concrete is to be placed above grade level, the Insley Mast Hoist Bucket Plant forms an indispensable item of equipment.

The plant consists of items of comparatively low cost, which can be readily erected and dismantled, and furnishes a set of elevating and distributing equipment which can most advantageously be used in connection with the construction of small buildings, bridges of short span, and on other work of like nature where the amount of concrete to be placed does not warrant a standard tower installation.

Write for descriptive bulletin

CONCRETE PLACING EQUIPMENT
INDUSTRIAL CARS — DUMP BUCKETS
STEEL DERRICKS

INSLEY MANUFACTURING CO.

Engineers

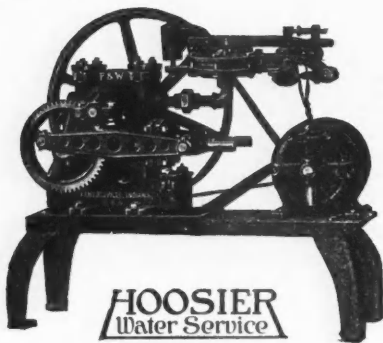
INDIANAPOLIS, IND.

Manufacturers

159

SOFT WATER

may be had as conveniently as hard by using this HOOSIER ELECTRIC HOUSE PUMP for supplying cistern water to the service lines in the home.



The HOOSIER Electric House Pump is of large capacity, automatically controlled, quiet in operation and economical in current consumption.

Bulletin F tells all about this pump, as well as other pumping equipment for home water supply. A copy will be mailed to you upon request.

FLINT & WALLING MFG. Co.
Kendallville, Indiana.

MIGHTY
UPWARD PULL PREVENTS
ALL DRIVE DIFFICULTIES

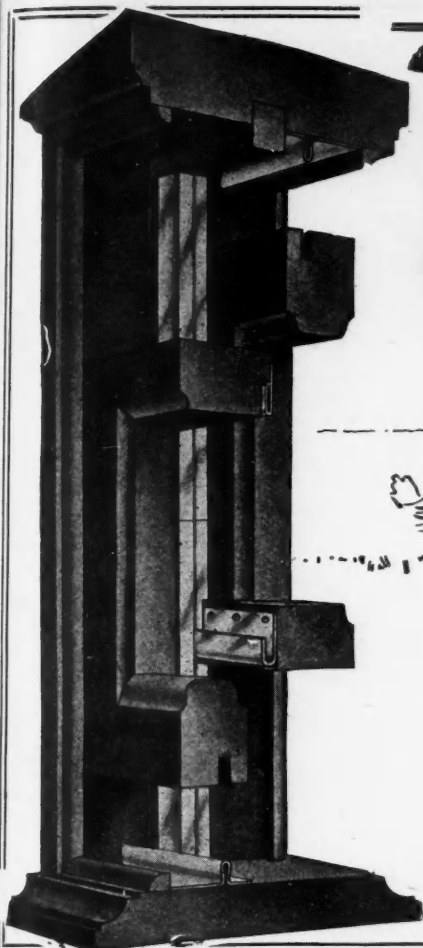
SMITH

THE SMITH
7-S Mixer

The Profit Builder
—is big enough for the big job, small enough for the small job. Its capacity for work and its durability are unequalled.

Write for information on the complete Smith Line.

The T. L. Smith Company
347 Old Colony Building, CHICAGO, ILLINOIS



**"COME ON!
GET IN!"**



Yes, sir, Mr. Builder, right now is the ideal time to get in on the weather strip business.

September and October are just the months in which the windows and doors of your town should receive your attention; it's up to you to get them ready for the coming winter.

Sager Metal Weather Strips cut down heat bills one third and lock out dust, soot and dirt.

**YOU CAN BE A
SAGER AGENT**

There are dozens of houses right in your community that need Sager Weather Strips; you can get in on some big profits; write today and we'll tell you how.

**SAGER LOCK COMPANY
NORTH CHICAGO ILLINOIS**

Are You Getting Part of It?

Contractors and Builders everywhere are making big profits on easy sales of Mueller Pipeless Furnaces. They have arguments to offer for the Mueller which no competition can overcome. They can recommend it without hesitation — stake their reputation upon it because it always makes good.

MUELLER The "Big 3" Pipeless Furnace

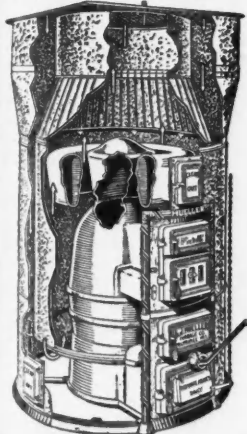
Three big exclusive features: Large and Properly Proportioned Register Face, Spacious Unobstructed Air Passages, Vast and Scientifically Designed Heating Surface have clearly established Mueller superiority — made it unequalled for heating efficiency and fuel saving.

The Mueller will burn any kind of fuel — is guaranteed to heat every room in the house comfortably. Thousands of home owners in houses old and new are installing it — there are hundreds of prospects in your community ready to buy now. These profits you cannot afford to lose.

Write for the Mueller Book on pipeless heating and our special proposition to contractors and builders.

L. J. Mueller Furnace Co.
215 Reed St., Milwaukee, Wis.

Makers of Heating Systems
of All Types since 1857



Write for the Metaform Books

THE enthusiastic words of hundreds of Metaform-equipped contractors throughout America cannot fail to convince you that Metaforms *do* make big cuts in labor costs — that they *do* eliminate form lumber costs — and that they *do* speed up construction.

Can you afford, then, to delay investigating Metaforms immediately?

Metal Forms Corporation

Manufacturers of the original
Reichert Metal Molds

1430 Booth Street
Milwaukee, Wis.





Real Facts About Wood Preservation

(From Forest Service, Bulletin 78. U. S. Dept. of Agriculture, pages 26 and 27)

- Shingles last about 18 years
- Good wood-preserved makes them last about 32 years
- Average good posts last about 8 years
- Good wood-preserved makes them last about 22 years
- Average lumber lasts about 8 years
- Good wood-preserved makes it last about 20 years

Durasote Fills the Bill and Costs Far Less Than Paint

DURASOTE not only preserves the wood of the building to which it is applied, but makes an artistic stain that brings out all the natural beauty of the grain of the wood. It is far cheaper than paint, treats as much lumber per gallon, and is just as easy to apply. Its highly volatile qualities make it penetrate deep beneath the surface of the wood to keep out destructive decay germs that live on the wood fibre. Durasote is for use on both interiors and exteriors of buildings.

Your hardware dealer probably has his supply of Durasote. If not, you can order direct from us. You will want our free booklet anyway. Just send us your name and address, and that of your hardware dealer.

PAGE & HILL Co. 818 Plymouth Bldg. MINNEAPOLIS, MINN.



Page & Hill Co.

818 Plymouth Bldg., Minneapolis, Minn.

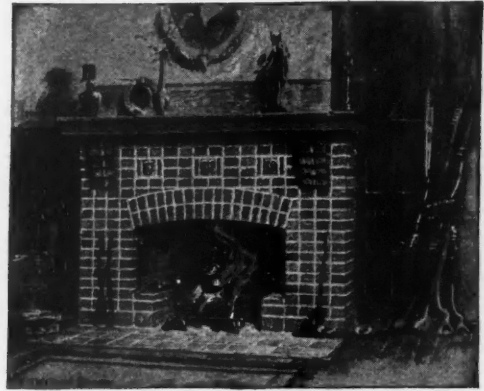
Please send me your free booklet on the uses of Durasote in building.

Name _____

Address _____

My Dealer's Name _____

His address _____



COMFORT AND CHEER

Radiate from the hearth fire. Its charm is irresistible. The value of a good, honest wood-burning fireplace is great, both in comfort and in the selling value of a house. As a ventilator and sweetener of the air it is unexcelled.

But the fireplace must not smoke. It will not smoke and will prove a "thing of beauty and a joy forever" if constructed after our designs and the practical suggestions given in our booklet, "The Fire on the Hearth," sent free on application.

If you want also our portfolio of twelve designs for beautiful brick and tile fireplaces enclose twenty-five cents in stamps.

Agents wanted among first-class dealers in building materials, or manufacturer's agents.

The H. W. Covert Company
Makers of the Covert Fireplace Damper
349 Lexington Avenue New York



A Pair of Hands and a Screw Driver will do the Work

Easy to Install

Costs less than Cords and Weights

The Pullman Sash Balance

PULLMAN Sash Balances are constructed on the Unit System. There are three units K, L and M, adaptable to any style of sash in any kind of a building. Anyone can install the Pullman Unit Sash Balances with ease and rapidity.

Economy—Using Pullman Sash Balances saves money on every window over the old-fashioned cords and weights—besides making a better construction.

Efficiency—All the parts are carefully fitted and, being of pressed steel, are absolutely accurate so there is nothing to rattle or squeak. The sash is so perfectly balanced that a child can operate it.

Durability—The Pullman Unit Sash Balances are practically indestructible. All moving parts are encased. The Pullman Unit Sash Balance carries a ten-year guarantee. Write for illustrated catalog explaining the many money-saving features of this Balance.

PULLMAN MFG. CO.
10 Industrial Street Rochester, N. Y.

Pullmanize Your Windows



Bellevue Stratford Hotel

Manufacturers Club

Union League

Land Title Bldg.

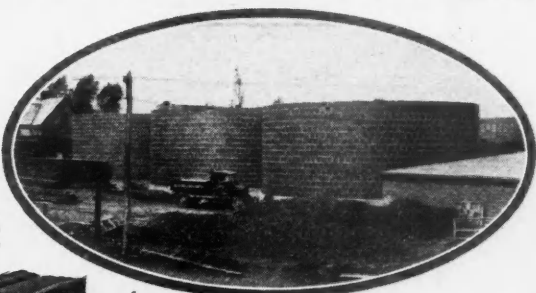
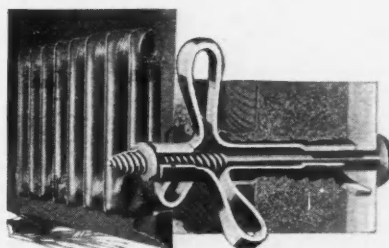


ANKOR BOLTS

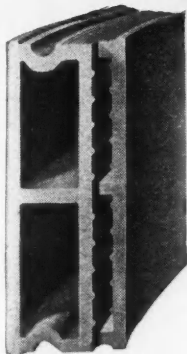
Hundreds of thousands of ANKYRA Anchor Bolts used in the best construction in Philadelphia.

Write for descriptive circular of time, labor and cost saving methods.

ANKYRA MANUFACTURING CO.
151 Berkley St., Wayne Junction, Philadelphia



Three Limestone Bins under construction for Bessemer Limestone Co., Bessemer, Pa.



No Forms

No labor or lumber for erecting forms to figure on. Less contractors equipment needed.

No "Comebacks"

All danger of trouble is precluded when you build storage bins, grain elevators or silos with Preston-Lansing Vitrified Tile. Every job is beautiful, everlasting, proof against fire, rats, rot, moisture and repairs—a tribute to your good judgment. Every owner is a booster for you.

Recommend them. Find out about them today. No obligation. Write—

J. M. Preston Company
Dept. 428 Lansing, Mich.

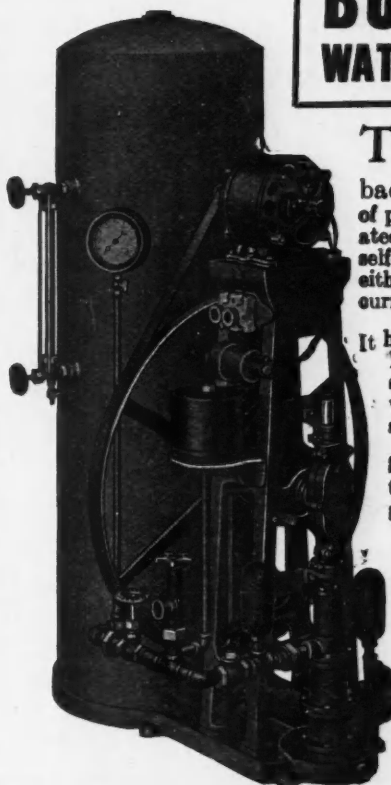
Preston Lansing

Vitrified Tile

STORAGE BINS AND SILOS

EQUIP THE HOMES YOU BUILD WITH

BUCKEYE WATER SYSTEMS



THE Buckeye Electric House Pump is backed by forty years of pump success. It is operated automatically and is self-oiled. Equipped with either alternating or direct current motor, as required.

It has a capacity of 180 gallons per hour, which is sufficient to supply the water demand in almost any home.

Shipped complete ready to install; this insures a good substantial profit to the Builder or Contractor.

Write Today for Details and Prices

MAST, FOOS & CO.

SPRINGFIELD, OHIO
Department K

SLATE for EVERY PURPOSE

Standardized



Installations

U. S. Government Standards

The "Specifications for Plumbing Fixtures, etc., prepared by the Board on Uniform Plumbing Specifications for the Treasury, War and Navy Departments" describe and illustrate various installations, including among many others:

TOILET AND OTHER ENCLOSURES

Pyramid Trademarked Standards

These include the Government types and others developed by this organization of Pennsylvania Slate Producers as illustrated in its Catalog and Series of Chapters now being issued.

THE STRUCTURAL SLATE CO.

PEN ARGYL, PENNSYLVANIA



*A Growing
Number of
People Prefer
Sheldon's Slates
to Any Other
Roofing*

WE are constantly receiving inquiries from owners for names of roofers who lay slate. This shows that

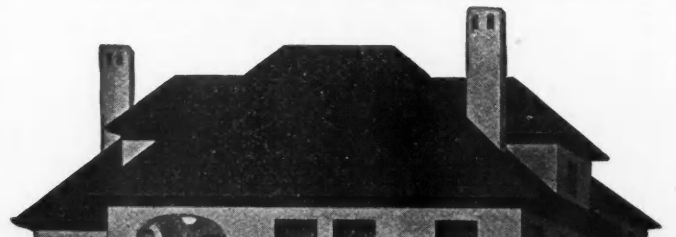
there are a growing number of people who prefer slate to any other kind of roofing. We are selling more Sheldon's Slates than ever before.

SHELDON'S
RED GREEN, PURPLE, BLACK
SLATES

cost no more than an ordinary shingle roof—or a roof of Asbestos or asphalt shingles—and their life is immeasurably longer; they never wear out.

The Booklet illustrated contains interesting facts for the man about to have a new roof put on or an old roof repaired. It is also a splendid thing for the roofer to give to his roofing prospects. Copy on request.

F. C. SHELDON SLATE COMPANY
GRANVILLE, N. Y.



The High Cost of Materials

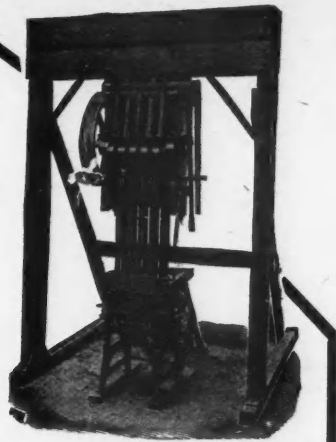
Has no doubt been a detriment to many home builders. We need houses, and need them badly.

The price of a SLATE ROOF is really low—because, no matter what the cost, you have a roof that will last for centuries, making the cost per year very nominal.

VENDOR SLATE CO.
INCORPORATED
DANBORO, PENNSYLVANIA

Gain More Production

through use of our



Concrete Block Machines

Shapely, accurate, square and true. Write for Catalog No. 28—learn how to make Ideal Concrete Blocks by means of an Ideal Hand or Power Outfit.

Make your own building materials by means of **Our Power Brick Machines**
Easy to handle—speedy—adaptable

Use our **Ideal Concrete Mixers** for putting down feeding floors, foundations or walks. Light, portable, rugged. Sizes 5 to 22 cubic feet. Write for Catalog No. 33.

The Ideal Concrete Machinery Co.
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Heating Comfort and Economy



Here's a furnace that enables you to give your customers, at small cost, every advantage of high-priced steam or hot water heating plants. It is easily installed in any home, old or new. Burns cheapest fuels successfully.

THE WATERBURY Seamless PIPELESS FURNACE

pours clean, uniform, healthful moist-air heat, into every part of the house, through a single register. Seamless, welded steel construction prevents escape of gas, smoke or dust. It means satisfied customers, more business and bigger profits.

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The Waterman-Waterbury Co.

1121-57 Northeast Jackson St. Minneapolis, Minn.

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The Starrett name on a tool means long service and absolute dependability. Starrett Tools are made to stay right through years of constant use.

This is why the blade of the Starrett "Reliable" Try Square, is not riveted to the stock but is firmly held by our patent bolt and nut. If the blade becomes worn, the tool can be taken apart, reground, and put together as good as new. Ready for more years of service.

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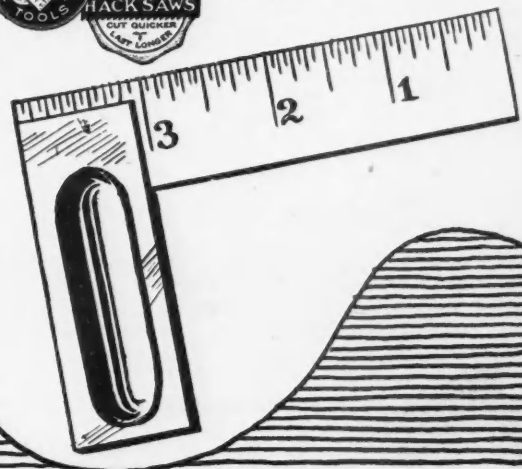
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The World's Greatest Toolmakers
Manufacturers of Hack Saws Unexcelled

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42-90



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PUSH DRILL No. 44

Saves Time at Every Turn.

Here you have a rapid fire drill, with adjustable tension for hard or soft woods and the 8 different size Drill Points furnished with it.

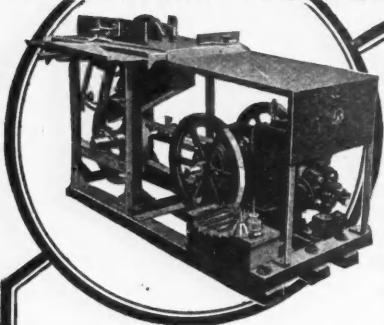


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With attachments for molding, mortising, rabbeting, jointing, matching, boring, sand papering, tool grinding, sawing, irregular shapes and tongue and groove work.

You Just Ought to See the Work It Does

Turns odds and ends of lumber into usable trimmings, makes every working moment give the utmost in production, saves you actual dollars in wages; helps put over the job in record time.

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Architects and builders who install Globe Pipeless Furnaces earn the genuine and permanent good-will of home owners.

Globe Pipeless Furnaces give more heat with 35% less fuel than other systems. One register circulates clean, warm, moist air evenly and thoroughly throughout the house. No dust, no dirt, no gases. No unnecessary heat in the cellar.



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Learn how Globe Pipeless Furnaces operate—how they cut coal bills—how they give permanent satisfaction. Write for full information now.

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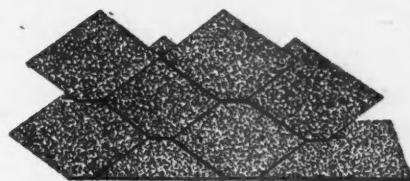


Radiant shingles over old wood shingles



Surface and back of shingle

Impossible to Curl Under Any Condition
 Less Nails Than Any Other Shingle
 Looks Same On Old Wood Shingles as New Roofs

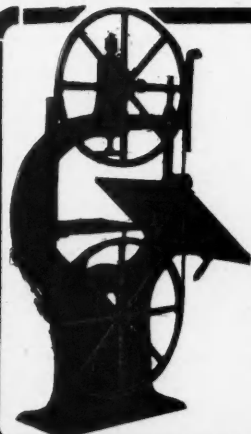


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Radiant shingles just cannot curl—the wire staple prevents. Can be applied at less cost than any other shingle as they require only 160 nails to the square. In addition the first cost is lower. The butt is double thickness at the right place. There are no waves or ripples when applied over old wood shingles. Only the best raw materials are used and these shingles are backed by our 28 years' experience as roofing manufacturers. Write for literature.

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MONARCH ROOFING AND STRIP SHINGLES

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SILVER SAWS embody such principles and improvements as make it possible for them to PRODUCE!

They have proven their superiority by a most remarkable record of satisfying service.

Their praises rise from the lips of half a million enthusiastic contractors all over the United States.

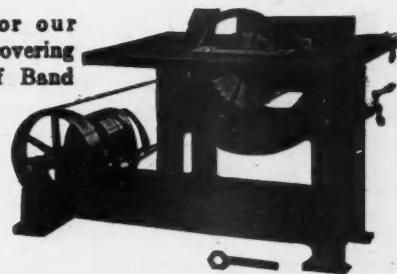
A TIP

Don't let your competitor take

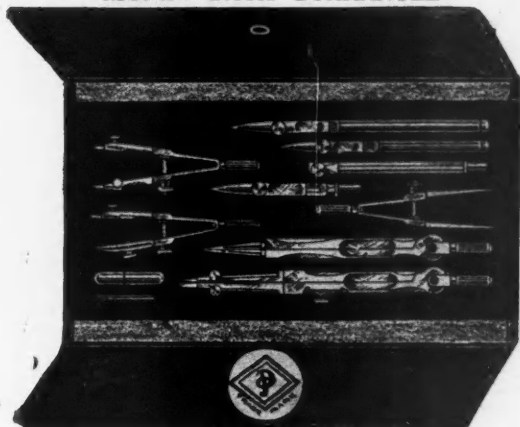
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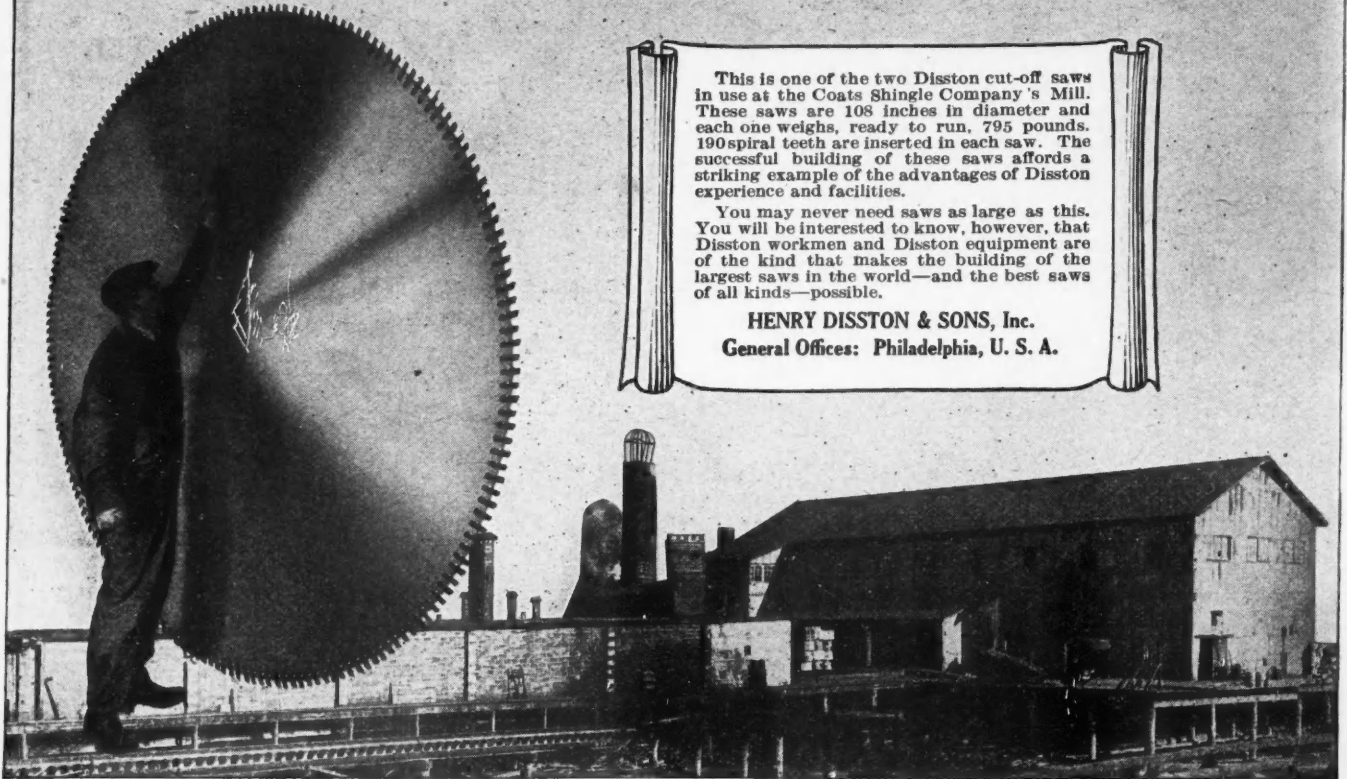
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THE LARGEST SAWS IN THE WORLD



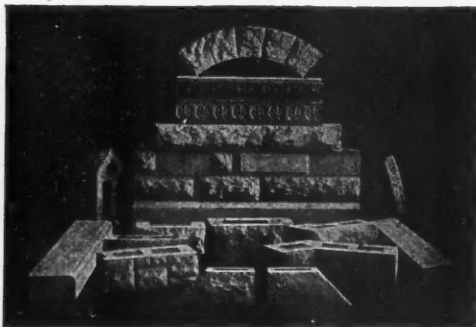
This is one of the two Disston cut-off saws in use at the Coats Shingle Company's Mill. These saws are 108 inches in diameter and each one weighs, ready to run, 795 pounds. 190 spiral teeth are inserted in each saw. The successful building of these saws affords a striking example of the advantages of Disston experience and facilities.

You may never need saws as large as this. You will be interested to know, however, that Disston workmen and Disston equipment are of the kind that makes the building of the largest saws in the world—and the best saws of all kinds—possible.

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The variety of sizes and designs of blocks, and trimming stone that can be made on the

HERCULES furnish material for a complete, balanced and artistic building.



The machine was designed to turn out a true rectangular high grade block, without sacrificing production. It is particularly adapted for using any kind of mineral facing.

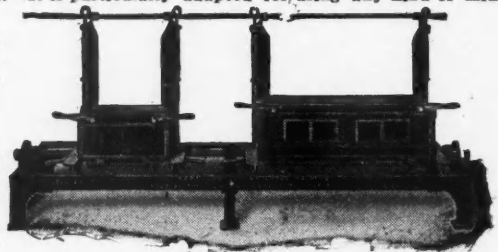
An equipment may be extended to meet additional demands, to get away from the sameness, and to suit distinctive tastes.

Send for catalogue.

Why buy cement and ship it back to the mill?

You can save it by using our Bag Cleaner.

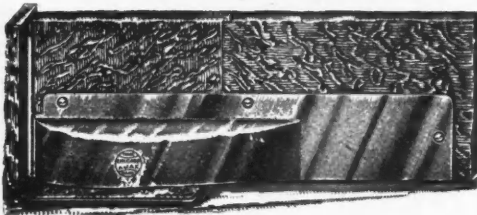
Send for folder on what can be accomplished.



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Appearance — Economy — Durability
The "AJAX"

In the "Ajax" we offer a Floor Spring Hinge with Ball Bearings at the top of the Hinge, away from dust and moisture.

Alignment Adjustment that is easily accessible.

Roller Bearings for the piston, to overcome friction.

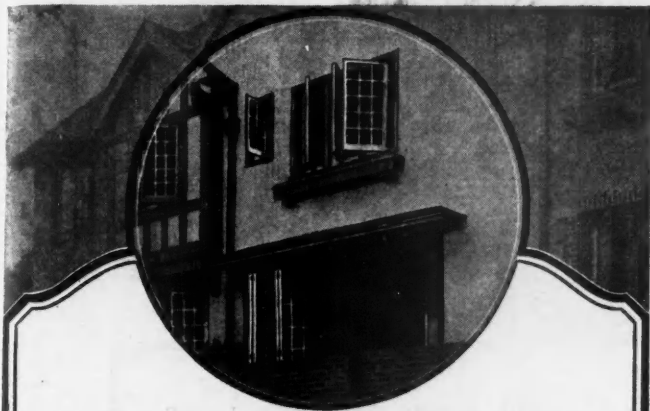
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Whitney Windows

have none of the faults of ordinary windows. They open outward out of the way—slide easily to any point in the opening, permitting wide unobstructed view. Don't interfere with screens. Can't stick, rattle or slam. Storm-proof when closed.

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Sargent Steel Squares are made of the finest tool steel and are carefully tested for accuracy of marking. Five dependable finishes.

Their great variety of markings make them available for almost any purpose. Send for book showing these markings and their use.

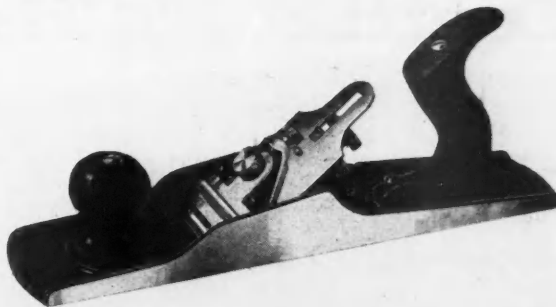
Sargent Auto'-Set Bench Plane

The Sargent Auto-Set Bench Plane cuts true, cuts fast. The beauty of it is you can take the blade out, sharpen it, and replace in exactly the same position for the same depth cut, without readjustment. Made in six sizes. All dependable.

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OAK FLOORS

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ONE of the big objectives of our national advertising is to correct the common error that oak floors are too expensive for structures of moderate cost.

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1036 Ashland Block, Chicago, Illinois

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FLEXIBLE TILE ROOFS



A Roof of Character—with lines and shadows

Adds distinction and value to the home
combining all the beauty and service of clay tile at a cost within the reach of every home builder.

Contractors Flexible Tile roofs with their patented gutter construction, their beauty, serviceability, economy and long life will establish you as a leader along roofing lines.

Dealers Here is an opportunity for you to sell the entire roof with gutters included. There is a nice profit in it for you and one roof installed means many more. There is nothing else like it manufactured. Write us today.

Contractors Flexible Tile roofs with their patented gutter construction, their beauty, serviceability, economy and long life will establish you as a leader along roofing lines.

Dealers Here is an opportunity for you to sell the entire roof with gutters included. There is a nice profit in it for you and one roof installed means many more. There is nothing else like it manufactured. Write us today.

Flexible Tile Roofing Company 334 W. 29th Street CHICAGO

This entire product is fully covered by Statler's U. S. Patents

FREE BARN PLANS!

HERE'S a powerful lever that moves business your way: It's a complete set of modern barn plans, including the four Standard Plans arranged by the A. S. A. E.—the highest authority on modern barn building. Plans adaptable to any requirements, and barns may be enlarged any time without changing arrangement. They mean hundreds of dollars to farmers and more profitable business for you.

CLAY Barn Equipment

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Contractor's Handy Auto Trailer

SPEED—ECONOMY—STRENGTH



Capacity—2000 pounds. Body—8 feet long, 46 inches wide, 12 inches high. Body and under frame built of open hearse steel. Axels—1½ inch square bed, special high carbon steel. Springs—Semi-elliptic, oil tempered and double heat treated. Bearings—Bower roller. Wheels—1½ inch spoke, artillery type, second growth hickory. Tires—32x3, solid rubber. Weight—534 lbs.

Other models with gates at front; also extension tongue which permits carrying lumber, poles, ladders, etc. 30 feet long.

Writes for Catalog C.

Rogers Brothers COMPANY
Albion - - - Pa.

The Little Draft-Man Furnace Regulator

A Visible Selling Feature in the Homes You Build

Prospective purchasers of homes are strongly influenced by visible features which denote completeness of modern equipment. An expensive furnace with a cheap controlling device does not impress them nearly so favorably as a less costly furnace complete with the Little Draft-Man Furnace Regulator.

The Little Draft-Man strikes their eye; its attractiveness pleases them; its service appeals to their desire for comfort, convenience, a warm house in the morning and a lowered fuel cost.

Provide a Complete Heating Plant

No matter how fine a furnace you install in the houses which you build, it is essential that you add to their completeness by equipping each furnace with the Little Draft-Man Furnace Regulator. The Little Draft-Man is a simple mechanical device which is mounted on the wall in any room in the house at elbow height where it can be operated by every member of the family. It opens the furnace draft and closes the damper by means of positive chain connections direct from its control lever to the furnace and employs no complicated mechanism or electrical connections in its operation. The Little Draft-Man is set, as simply as an alarm clock and operates like a self starter on an automobile. By means of its graduated control the Little Draft-Man permits just the right amount of air for perfect fuel combustion to enter the

furnace at all times. Thus it assures completely consumed fuel without half burned coal in the ash pit. The Little Draft-Man provides a constant heat even in the coldest weather and saves coal. It eliminates the necessity of screening ashes. It enables the home owner to keep out of the basement, except when adding coal.

The Little Draft-Man is regular equipment used by manufacturers of high grade furnaces and is supplied by leading dealers in furnace equipment everywhere to modernize old furnace installations and complete the heating equipment of new homes. The Little Draft-Man will operate on any type of furnace, hot water, warm air or steam. It is in general use, favorably known, nationally advertised and demanded by your prospective home purchasers.

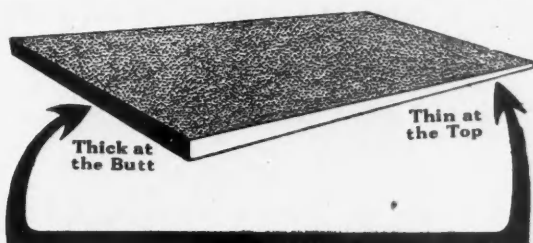
Arrange now to equip the heating plants which you install with the Little Draft-Man Furnace Regulator. It may be procured from the furnace manufacturer who supplies the furnaces which you install or may be obtained direct from us. Write for particulars.

**The Little Draft-Man Costs Only
\$18 East of the Rocky Mountains**



Sahlin Manufacturing Company 31 OTTAWA AVE., N. W. Grand Rapids, Mich.

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Lay Longer Lasting Roofs with

**WINTHROP
TAPERED
Asphalt Shingles**

Send for a Free Sample
Shingle and Prices

Beckman-Dawson Roofing Co.

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Factory: Argo, Ill.

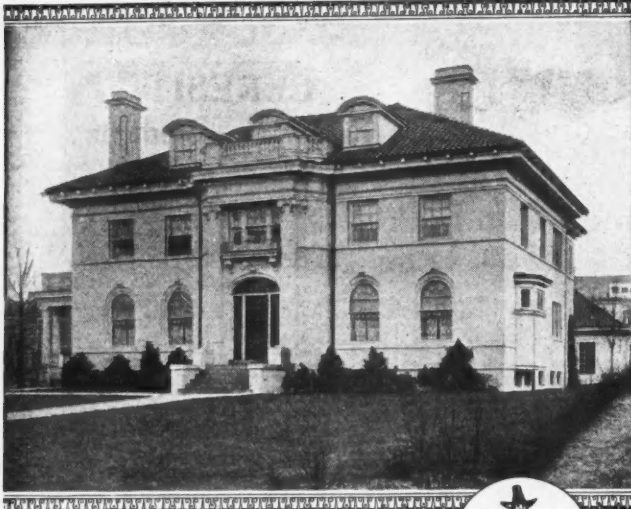
Is to
Concrete
What
Tempering
Is to Steel
Vitri-Flux

As tempering develops desirable qualities in steel, so **Vitri-Flux** develops and improves the quality of concrete.

In concrete floors **Vitri-Flux** is a boon. It not only permits the quicker finishing of the floor, but renders it hard throughout; dustproof, weatherproof and waterproof. A finished floor laid with **Vitri-Flux** has a smooth, tile surface. A **Vitri-Flux** floor is a SUPERIOR floor.

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Gus Bohm, Architect



Weather-Proof Beauty

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This superior coating waterproofs all walls of brick, cement and stucco. It creeps into every pore and settles there. No heavy rains can beat through it. Sun or storm can't even faze it.

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Do all your painting work with Bay State Liquid Paints. There is a paint, stain, varnish or enamel for every kind of job. INOROUT, the all-round varnish, can't be beaten, indoors or out.



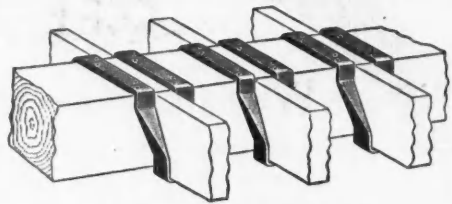
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Lane Double Timber Hangers

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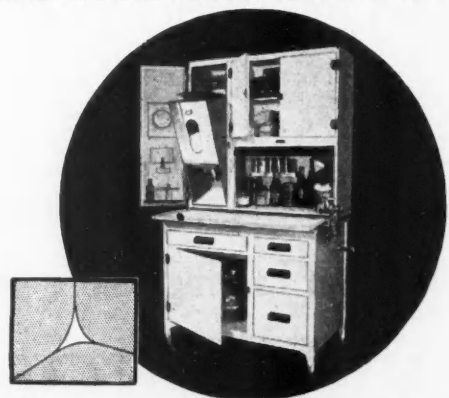
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KITCHEN MAID

THE SMOOTH SURFACE ROUND CORNER
KITCHEN CABINET

Build a Place for the KITCHEN MAID

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There are 18 Ceresit Protective Products for building construction. Literature describing these materials will be sent on request, and our 32-page illustrated catalogue will be mailed if you will send your business card or write on your letterhead.

Ceresit Waterproofing Co.

910 Westminster Bldg.
CHICAGO

CERESIT. Protective Products

Ceresit Waterproofing Paste

A waterproofing for basements, pits, cement stucco, etc.

Cem-bric Covering Compound

A waterproof paint for cement and brick exteriors and concrete floors.

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A pure white paint-enamel for every class of interiors.

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A chemical compound for the protection of concrete floors.

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A transparent waterproofing for cement, brick and porous stone.

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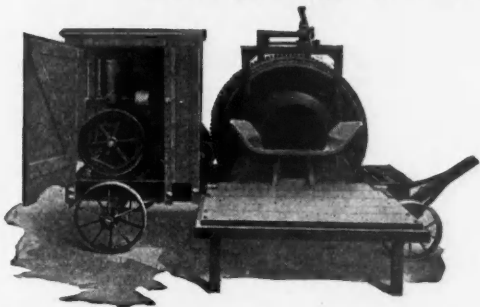
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Hydrolac Asbestos Putty

Mortar Colors

Descriptive price list and literature describing all Ceresit Products sent on request.

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Works Fast Saves Time

The next time you see "The Standard" Mixer at work, just stop a few minutes and watch it "eat up" the work.

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The Standard Scale and Supply Co.

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You can paint it—paper it or kalsomine it. Will not shrink, warp or buckle. Handles and saws like lumber. The name "Compo Board" is printed on it every four feet. Look for the name and the wood core for real wall board satisfaction.

Send for FREE Sample and Interesting Booklet.

The Compo Board Co.

5777 Lyndale Avenue No.
At 44th

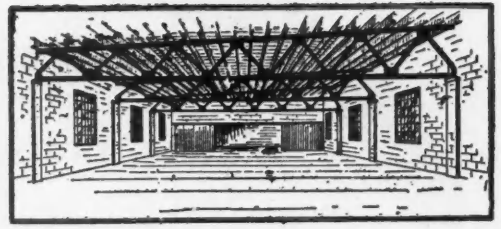
MINNEAPOLIS - MINNESOTA



MODERN GARAGES



GARAGE—ROUND LAKE, ILL.

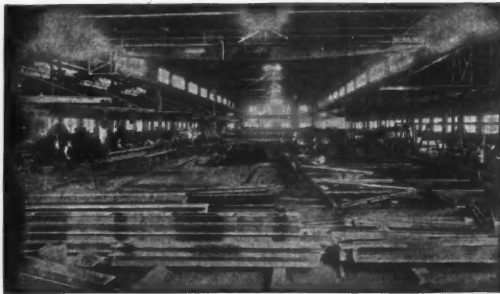


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INTERNATIONAL STEEL & IRON CO., Inc.

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WE OPERATE
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A PERFECT KEY AND A PERMANENT ONE

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

Roebling Wire Lath

(Galvanized after Weaving)

will produce both these results.

Write for Booklet. Made Only by

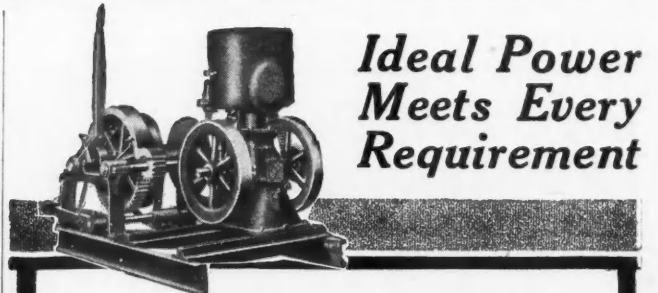
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Principal Office

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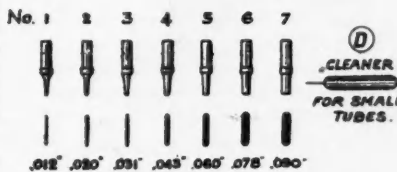
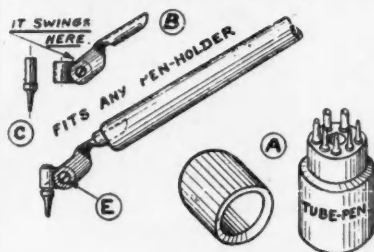
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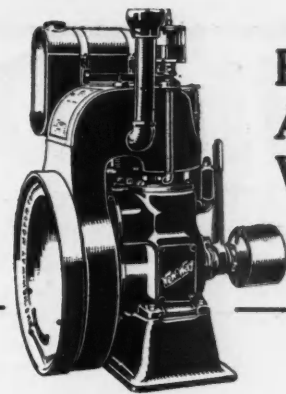
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The Air-Cooled, Multi-Purpose "New-Way" 5 Engines in One

The "New-Way" engine was adopted by the U. S. Army just as the Liberty Motor was, for its absolute dependability under any and all conditions. It is the most dependable engine ever made—never ties up the work by a breakdown.

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THE "New-Way" MOTOR COMPANY LANSING, MICHIGAN, U.S.A.



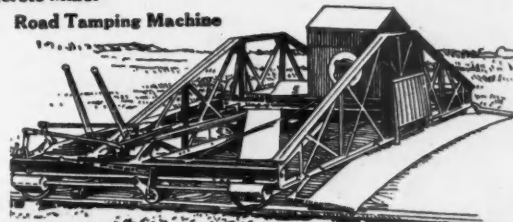
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The "New-Way" Goes and Goes
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Road Machinery	Tamping Machines
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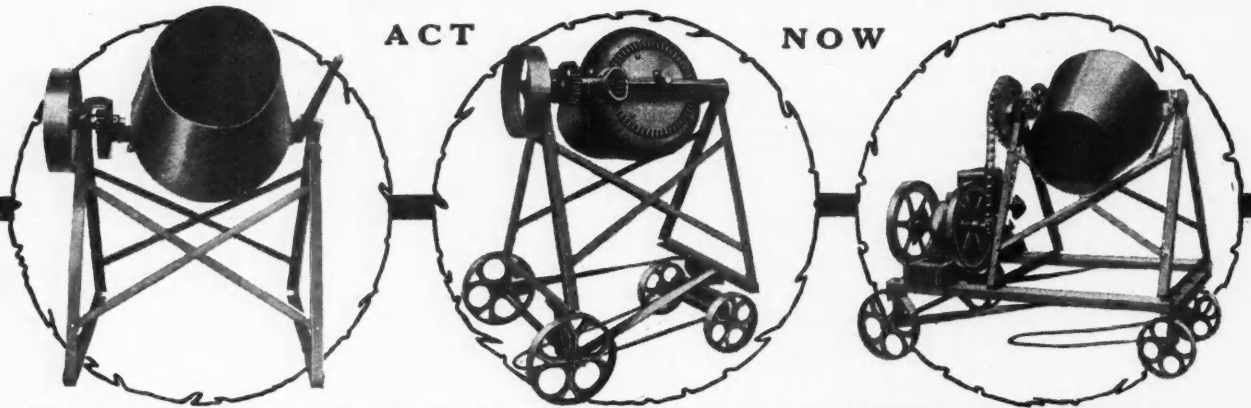
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Just send us \$20.00 at this time and we will immediately ship you the lowest priced GOOD MIXER on the market. The all-steel and iron Jim Dandy Mixer. The biggest mixer value ever offered. You put it to work on your job under your own observation, under your own conditions and use it for five days. If it doesn't prove to be just what you want in every way, send it back and we'll at once refund your twenty dollars.

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A Perfect Floor Scraper

Inexpensive—simple construction.
Easy to operate and leaves a perfect finish.
Nothing to break or wear out.
One man can do more work than five with hand scrapers.



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Every mixer guaranteed.

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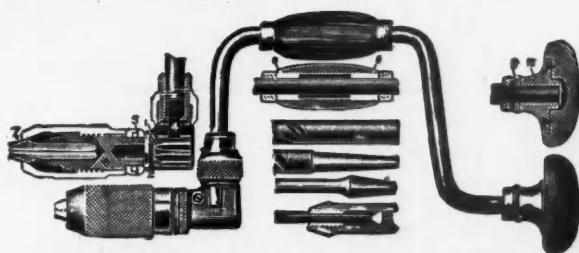
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No. 41-20 oz. 41½-16 oz.
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Same building with stucco over HY-RIB.

Old Buildings Easily Modernized

THERE are countless numbers of old buildings in which the frame work, joists, studs, foundations, etc., are in excellent condition, yet they are of little value because of the dilapidated exterior condition.

Stucco on Hy-Rib Metal Lath will quickly transform such buildings into modern, fireproof structures and will greatly increase their value.

Hy-Rib Metal Lath insures successful stucco and plaster work, because it thoroughly reinforces the stucco or plaster—cracking is prevented and permanence assured.

Economy, fire resistance, freedom from vermin, elimination of frequent painting, and low upkeep cost are a few of the advantages resulting from Hy-Rib Metal Lath construction.

Hy-Rib Metal Lath is furnished in various types and weights, so as to meet every practical requirement. Used successfully in walls, floors, partitions, ceilings, roofs, etc. The complete Hy-Rib line includes metal lath, studs, corner beads, etc.

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An Old Wooden House Transformed into a Modern, Permanent Residence by Overcoating with Hy-Rib Lath and Stucco.



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Its form is such as to give a natural and easy position to the hands and it balances well in working. The handle is adjustable and can be tilted to give the blade any angle desired.

Special blades of different forms and widths can be securely held at any position required, thus permitting the tool to be worked in many places inaccessible to other scrapers.

14½ in. long, 3 in. blade, weight 1¾ lbs.

Manufactured by

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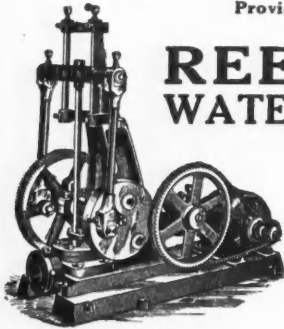
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A Reeco System Pneumatic Tank Installation—an example of the Artistic plus the Practical

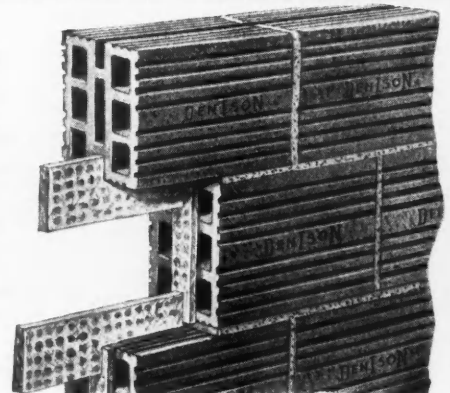
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—make a wall upon which interior plaster may be applied direct without danger of damage to even the most delicate frescoes. This saves all time, labor and material costs involved in the use of furring tile, or furring strips and lath, which are necessary to make other tile walls dry.

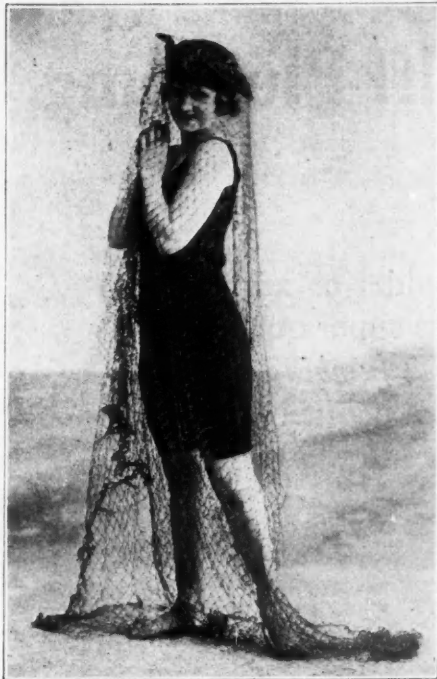
This is made possible by the insulated mortar joint which effectually prevents condensation of moisture on the interior wall. This discontinuous mortar joint and the use of insulating pads in connection with it, is covered by broad patents. These are valuable features not to be had in other tile. Because of them you get a superior wall at a minimum cost by using Denison Load-Bearing Tile.

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MASON CITY, IOWA



Licensed under the Wilson System Bearing Wall Construction—Patented



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A Toothsome Catch!

WHEN you have gone out into the wilds of trade on a fishing trip for garage door hardware, and have tramped the entanglements and underbrush of competitive garage hardware catalogs, and have suffered attacks from armies of mosquitos, deer flies and poison ivy, and have become sun burned by "also ran" garage door hardware, and have watchfully waited long hours—and then finally you "strike"

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Oh, Boy! Ain't it a grand and glorious sensation!

"Slidetite" gives more service to the garage user than any other style of garage door hardware made. Embodies the greatest amount of economy, convenience and ornamental possibilities. Simple to install. Easy to operate. Readily adjustable.

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The machine is simple, easily handled, made correctly, built to last—the result of years of experience in building this specialty.

As QUALITY of work is the first essential in finishing floors, particularly new work in residences, flats, apartments, etc., all roller vibration must be done away with. It is remarkable how smoothly and steadily this ball bearing machine operates.

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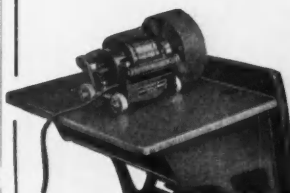
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No bolts, screws or nails. They hook to the studding and your scaffold is up in much less time than it takes to tell you about them.

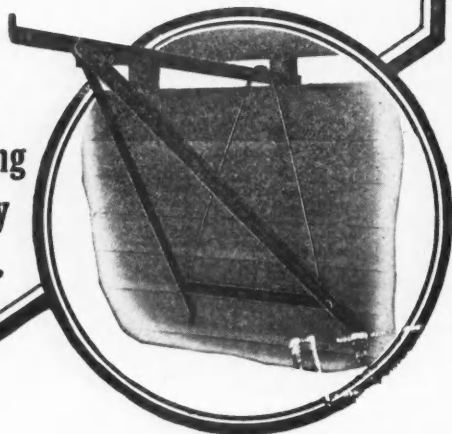
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Use them for 30 days and if you are not extremely well pleased, we will refund your money.

Write today for our proposition.

Steel
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Evansville,
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1869

THOSE handsome doors in high-grade offices, apartments, hospitals and hotels are PENCO "Kalamein" Doors. Made of sheet metal, flat-drawn over white pine cores—with clean-cut ornamental mouldings, and with or without wire-glass.

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Makers of PENCO Metal Lath, Roofing, Ceiling, Fire Doors, etc

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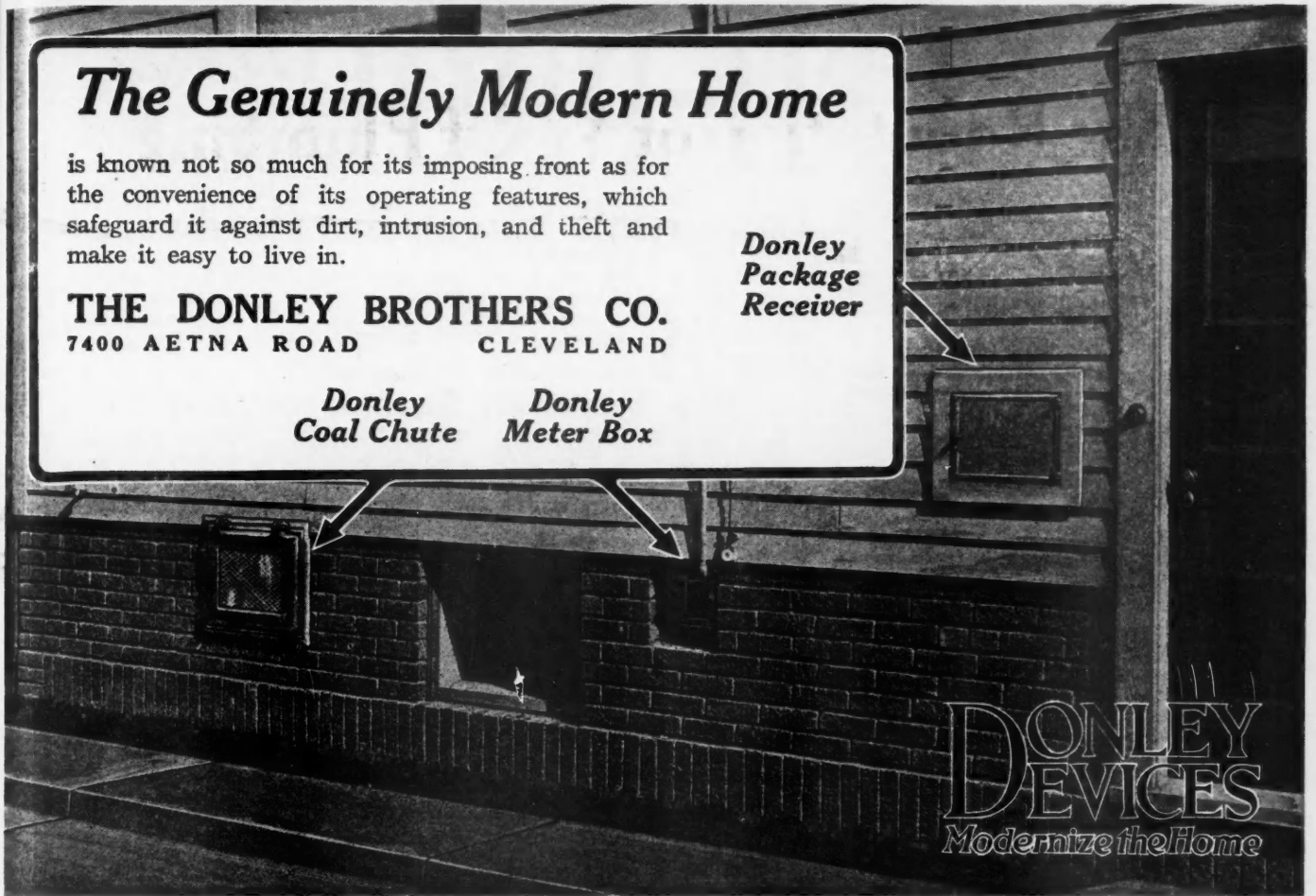
is known not so much for its imposing front as for the convenience of its operating features, which safeguard it against dirt, intrusion, and theft and make it easy to live in.

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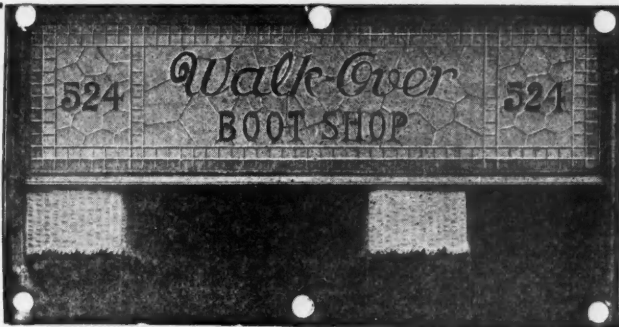
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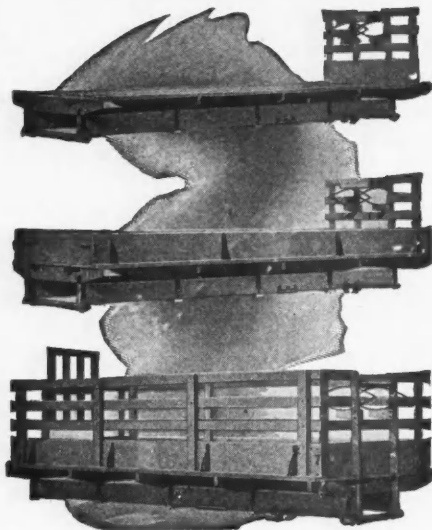
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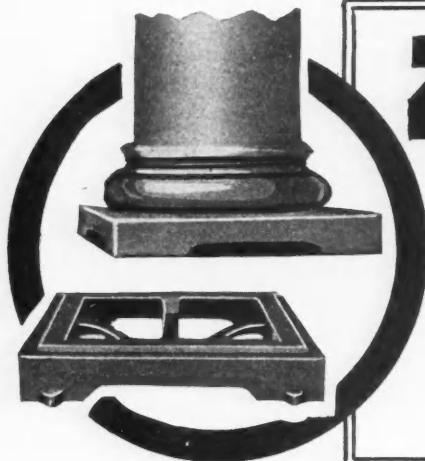
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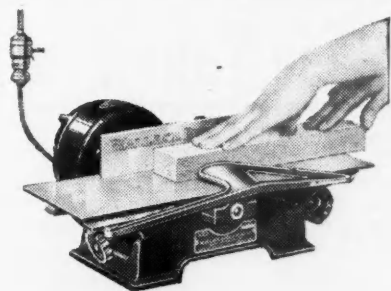
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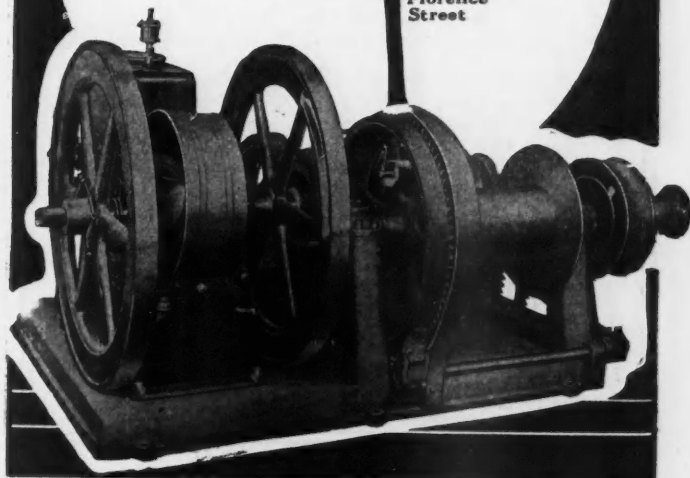
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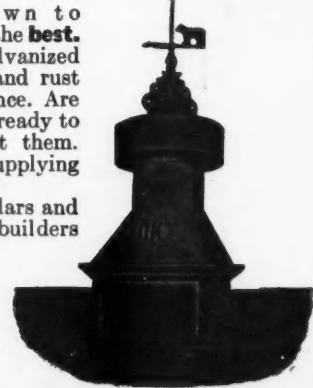
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CUPOLAS

are known to thousands of farmers as the **best**. Are made of heavy galvanized steel; bird, storm, rot and rust proof. Neat in appearance. Are easy to erect—shipped ready to install. Farmers want them. You cash in big by supplying this necessity.

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Made entirely of steel—attached by means of three ten penny nails—instantly removed without withdrawing the nails—folds compactly for transportation and storage—*that's economy.*

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Capacity to resist attacks and to stoutly protect from aggression—

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And because through every step in manufacture, Quality is never sacrificed for cheapness—

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YALE Made is YALE Marked

The Yale & Towne Mfg. Co.
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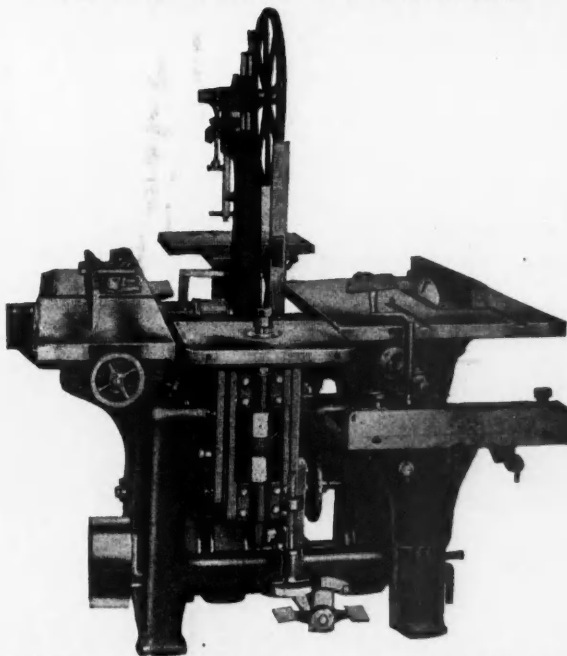
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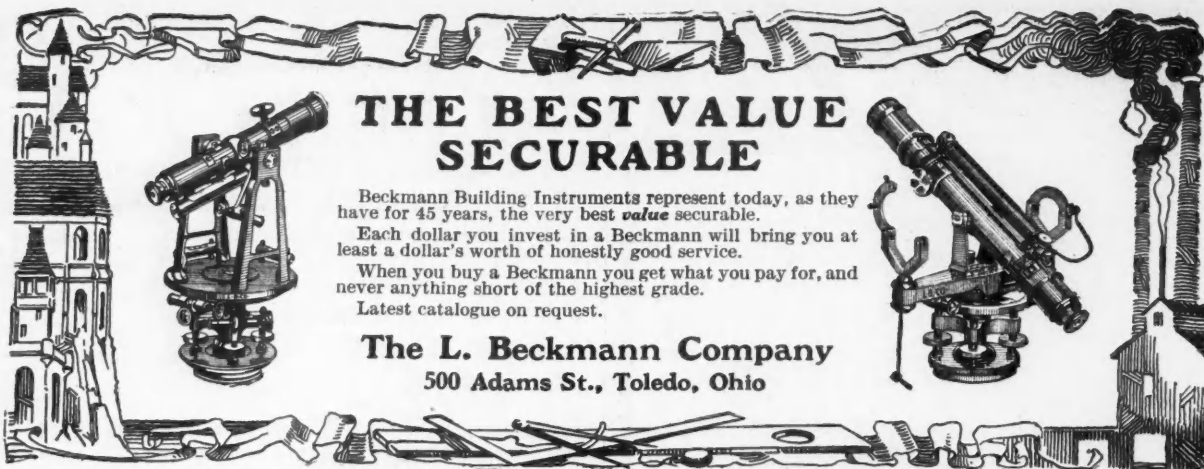
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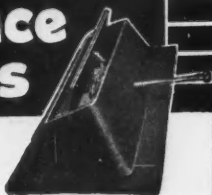
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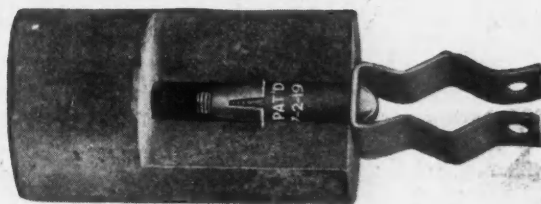
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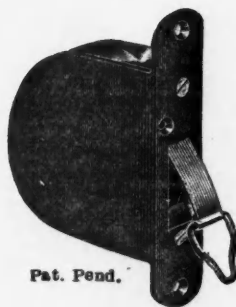
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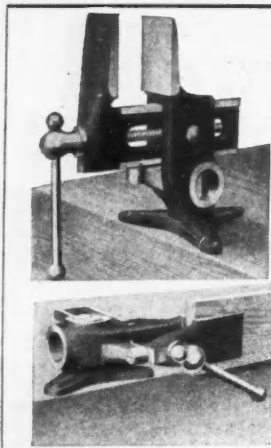


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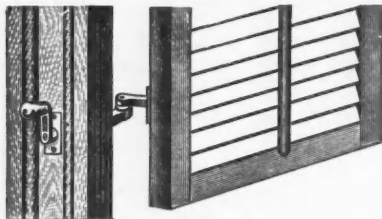
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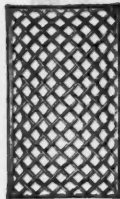
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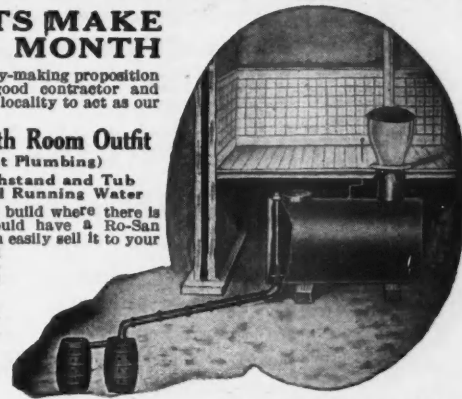
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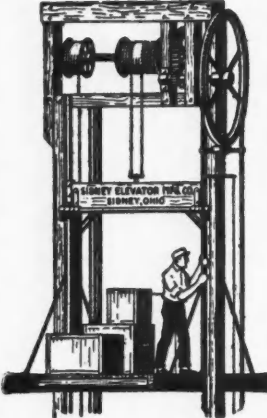
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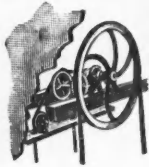


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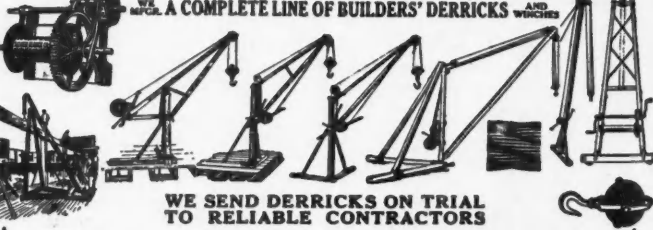
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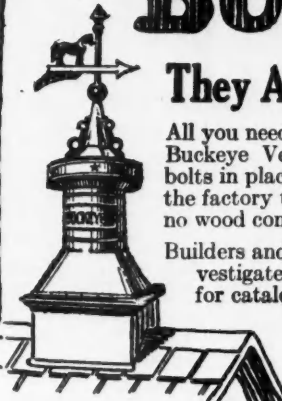
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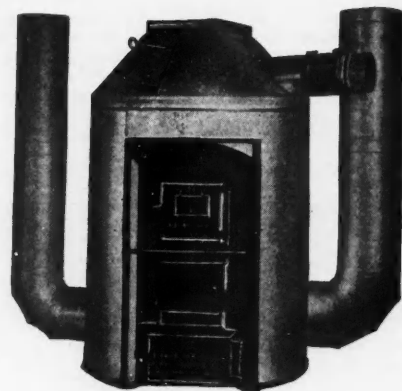
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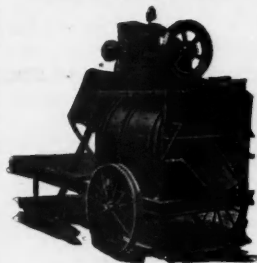


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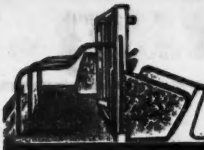


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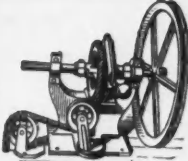
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