

# A HOPE IN STEEL HOUSES

THE INDUSTRY HAS A PLAN FOR MASS PRODUCTION

*Probably K.C. Star*

Enamel Residences Could Be Built for \$3,000 With no Wood in Them Except Mantel—Experiments Now Under Way About Van, 1932

(By the Associated Press.)

CLEVELAND, O., Feb. 1.—This steel-minded region, impatient under the "low ceiling" of industry, is looking for mass production of inexpensive steel houses to pierce the clouds now keeping the sun from business.

Near Cleveland two experimental steel houses soon are to be erected and a third is planned. One of the houses is to be of porcelain steel enamel, the other of welded steel sheets without a supporting frame.

### GEORGIAN COLONIAL DESIGN.

The enamel house will have seven rooms in Georgian colonial design, and the welded house eight rooms with an advanced style of flat roof with canopy. Although both types are said to be adaptable to any architectural design, it is claimed by the sponsor the plan may best be applied to mass production of small homes.

In the enamel house colors may vary throughout the ceramic range. A garden hose is all that is necessary for a freshening "paint job."

The walls will be of large enamel "pans" into which are fitted insulation. The "pans" are assembled quickly at the building site into a welded steel framework. The roof is of enamel units.

The welded steel house is like a corrugated paper box. It has no framework. The "carpenters," instead of fitting units together by sawing and cutting, merely lap one piece over another and weld them in place.

### HEAT FROM THE FLOORS.

The floors will be fabricated of sheets bent in "Z" form and covered with fiber board. The floor, therefore, will consist entirely of conduits capable of being used for heating in winter and cooling in summer. A continuous electrical plug will make possible a connection at any point on the baseboard.

The mantel will be the only piece of wood in the building.

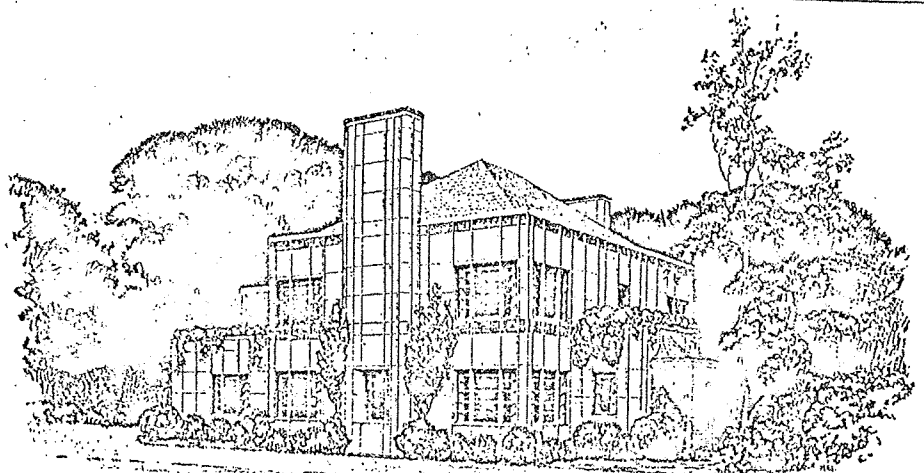
The walls will be of flat corrugated steel with the interstices filled with insulation to prevent rust. New structural adhesives make possible application of a "veneer" of wood, slice brick, asbestos, exploded wood fiber or any other material desired on exterior or interior.

A house for \$3,000, including cost of the lot, may be possible and larger houses may be built for 25 to 35 per cent less than at present. Housing experts estimate 10 million houses could be sold in the country at a price of \$3,000.

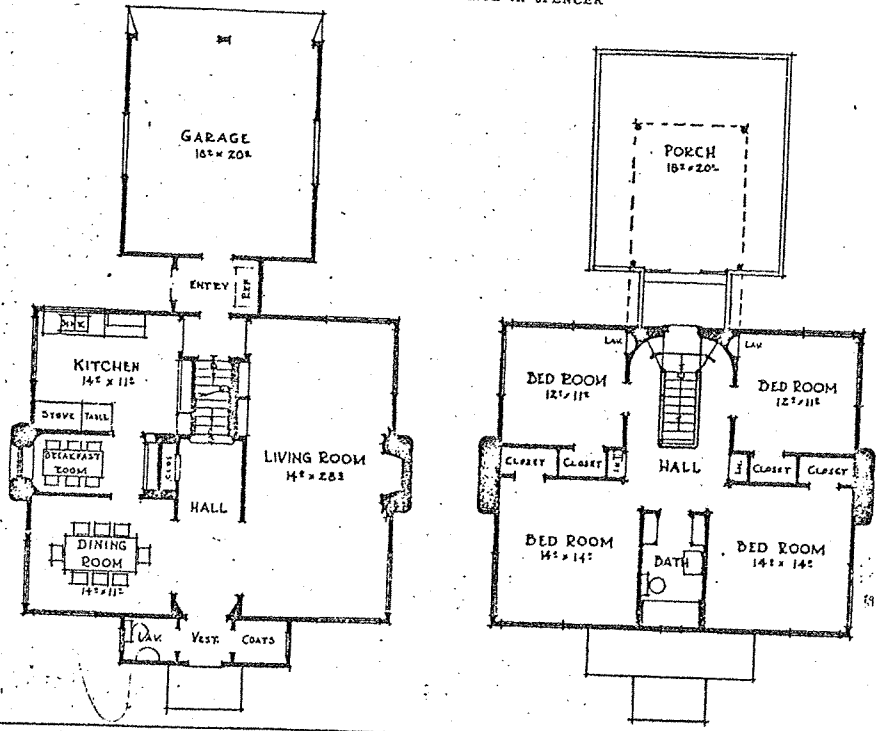
Engineers working on the factory-made house say a dwelling built in forty-eight hours is not impossible.

It is estimated the seven continuous steel rolling mills in operation, and the one now under construction, could turn out a house every minute.

# PENCIL POINTS FOR FEBRUARY



RENDERING BY MEADE A. SPENCER



PORCELAIN ENAMEL RESIDENCE FOR FERRO ENAMEL CORPORATION  
CHARLES BACON ROWLEY & ASSOCIATES, ARCHITECTS, CLEVELAND, OHIO

### A NEW TYPE OF LOW COST METAL HOUSE

The porcelain enamel house shown opposite is to be built in the near future in Cleveland by the Ferro Enamel Corporation as an experiment to sound out the possibilities of manufacturing this type of fireproof house on a mass production basis. Porcelain enamel buildings have already been built, under the L. W. Ray patents, by the White Castle System of Eating Houses of Wichita, Kansas, and have been found satisfactorily weatherproof. The projected house will be opened upon completion to inspection by the general public and by the architectural profession and, if the verdict is favorable, manufacture on a large scale may be undertaken.

The porcelain enamel units on the exterior are to be of a matt glaze porcelain resembling in color a rich buff limestone. These units will be shallow rectangular panels backed with some sort of cellular or fibrous board that has an insulating and sound dampening effect. These will be applied to a framework built up of fabricated sheet metal studding 4" deep, and from 16" to 36" on centers. A special system of bolts will hold the units in place and the joints will be covered with porcelain enameled battens which will keep out the weather. The horizontal joints will be of a special ship lap type.

On the interior, there will be some form of plaster base such as insulating wall board or metal lath. The spaces between these inner and outer surfaces will be filled with

*Revised 1932*

# STEEL-WALLED HOUSE TO BE ERECTED HERE

Cleveland Press  
Ferro Enamel Corporation to Set Up Metal Home in South Euclid 12/22/31

The assembled steel house, its parts manufactured in the plant and put together on the lot, comes a step nearer with the announcement of a Cleveland house of enameled steel sheet exterior.

The Ferro Enamel Corporation of Cleveland, thru a contractor, will erect such a house in January on Campus drive, South Euclid. Charles Bacon Rowley & Associates Inc. are architects.

The steel sheet will be rolled by the American Rolling Mills Co. at Middletown, O., and will be enameled in the plant of the Louisville Products Co., Louisville, Ky., in which Ferro has a stock interest.

**Cuts Time in Half**

The enameled steel materials will be shipped to Cleveland and assembled on the job. Exterior assembly would take a very short time, it is said, but the use of lath and plaster on the inside will lengthen the construction to about half the time an ordinary house takes.

Patents on this type of house are owned by White Castle, Inc., of Wichita, Kas., which used the construction method in developing 120 "hot dog" stands with white enameled porcelain exteriors.

The exterior finish of the Cleveland house will be like the mat glaze used in modern bathrooms—dull finish. Color will be that of buff limestone with gray green under the eaves. The roof, of similar material, will have three or four shades in red.

**Costs Less Than Wood**

No definite figures on costs have been made up, but according to the architect's office the cost will probably be less than that of other types of fireproof house, will probably be in line with, or less than, brick veneer and less than wood of the same insulation and strength.

The exterior steel sheet will be set up in enameled units like shallow pans on end, with a thickness of cane fiber board next the metal, four inches of rock wool behind that, and finally the metal lath and plaster.

Windows and doors will be of chrome-nickel steel. Floors will be of welded steel metal, concrete and oak flooring. Kitchen, baths and recreation room will be lined with steel.

Fabrication of the materials for this type of house will be carried on at the Louisville plant for the present. It was said at the Ferro office in the Keith building, Louisville, Enamel will go after business among contractors after Jan. 1. It was believed that if the construction method proves to be popular, Cleveland would become one of the regional centers for its manufacture.

**Metal Houses**

GERMANS have been erecting houses of sheet copper, but Clevelanders will try one of sheet steel, enameled on the outside.

The house that Ferro Enamel and Architect Rowley will build on the Heights may be to house what Ford's Model T of 1900 was to motor cars, the beginning of mass production. Chairman Ray, Williams of Ferro thinks so.

Five smaller buildings have been erected of these materials by White Castle, Inc., western Hamburg dispensers. (There are no White Castles in Cleveland, despite what you may have seen.) One of the elements used in these structures, White Castle, Ferro and Rowley have evolved the assembled house. The first job, financially backed by Ferro, will aim to show possibilities in middle-priced housing, but Williams thinks the idea of the floor extension to low-priced, or what might be called industrial housing.

# START HOUSE OF FRAMELESS, WELDED STEEL

Cleveland Press  
Builders to Use Sheet Metal in Radically New Home Here 1/20/32 Page 1

The world's first frameless steel house is about to be erected in Solon. It will consist of steel sheets welded together and insulated. It will cost somewhat less than a wooden house.

The American Rolling Mill Co. of Middletown, O., is backing in the Cleveland suburb an initial building job along radically new lines of structural and architectural design.

A Cleveland group working with American Rolling Mill expects to go along with the company in building other houses if the first is successful.

Incidentally the design introduces to Cleveland the international movement in architecture. The builders decided in the first project to realize to the fullest extent the possibilities in the new materials, with the result that the house suggests the work of Viennese, German or Dutch moderns.

**Enough for House-a-Minute**

The same materials can be used in building houses of more traditional lines, and some of these probably will be attempted next.

The building is the product of the vast tonnages of steel sheet which are capable of being rolled on the new continuous mills owned and operated by American Rolling Mills. The seven automatic machines now existing in America, plus the one now building under "Armco" license at Otis Steel, were all running at once, they could turn out material for a complete eight-room house every minute of the day and night. Their chief market at present is the auto industry, but the development of the steel house opens the possibility of locating in Ohio an industry potentially even greater than the motor car.

The house at Solon will consist of eight rooms, two baths and a two-car garage. It was designed for the Insulated Steel Floor & Wall Co., in which American Rolling Mill has an interest, by Charles Bacon Rowley & Associates, Cleveland architects.

**Connected With Project**

Others connected with the project include Joseph A. Schiltz, attorney; J. E. A. Moore, consulting structural engineer; Frank R. Higley, patent attorney and engineer; Mills G. Clark, former president of the Cleveland Real Estate Board, and Robert Smith Jr., consulting architect. The steel company has been represented in Cleveland by Bennett Chapple, vice president, and H. B. Kramer of the research department, both of Middletown, O.

This will be the second house employing steel sheet materials to be erected in the Cleveland district. The other was developed by the Ferro Enamel Corporation and will use enameled steel sheet for the exterior, fastened to a steel frame. American Rolling Mill also is furnishing the sheets for this house.

The exterior of the house at Solon will be asbestos sheet. The interior will be masonite insulation board, a material made of exploded wood fiber. Both will be applied with new structural adhesives.

Between the inner and outer walls will stand a single thickness of steel sheet formed in flat corrugations, the voids to be filled with rock wool insulating material—an exploded slag or limestone.

**Rust Is Prevented**

Rust is to be prevented by insulation that will stop the circulation of air within the walls.

The floor will be fabricated of sheets bent in Z form. When they are overlapped and welded together the floor extends entirely unobstructed. These conduits are capable of being developed later for heating purposes, but these possibilities have not been fully worked out. Eight

been allowed on the floor and walls. Others are in application.

The whole house will use about 14 tons of sheets of 16 to 20 gauge in less than 100 partially assembled pieces. The floors will be built up from 28-inch steel strips, the walls of wider material.

On later houses it is expected the actual erection on the lot will not take more than a couple of days, although the first house will not go so fast as that.

One of its features of the new method, according to the steel plant engineers, is the complete flexibility of the material on the job. Instead of having to saw and fit pieces together, the new steel "carpenter" or sheet metal worker will slide them over one another and weld them where they come.

**Saves Time, Adds Strength**

This slaying of parts of the house is said not only to save a lot of time in construction, but to make for structural strength at the overlap.

"Mass production" housing, by this method, ceases to be something of standard design—standardization is no cheaper than infinite variety, according to Kramer of the "Armco" people. The materials will be available for anybody to build in any form, whether Tudor or Colonial or modern.

While the exterior finish in the first job is to be asbestos board, wide variety of other materials can be applied with the structural adhesives, such as slice brick, ashlar, terra cotta, vitreous enamel sheet, stucco and even wood veneer in almost any variety.

Windows will be of metal standard casement types assembled in the wall as part of the shop work. They will be fitted by standard adapters which overlap the steel wall material and are welded to it. Doors will be handled the same way. The first house will be fitted for metal doors, the wood may be used.

**A Wooden Mantel**

The only other piece of wood in the first building will be a mantel. The stair rail will be polished metal. The roof will have a flat canopy supported by steel columns. The roof itself will be made of the same material as the floors, covered with an asphalt compound. Arrangements will be made for a garden on the roof.

The new continuous floor plug for electrical connections, making it possible to plug in anywhere along the baseboard, will be used if it is on the market in time.

**Another Fire-Safe House**

Another fire-safe house capable of factory fabrication was announced today by J. A. Aitschuler, architect with L. J. Weiskopf, 7016 Euclid avenue. Patents have been asked for.

Aitschuler claims an even greater saving than that proposed for the steel house. His house consists of a frame built of sheet metal containing spaces for standardized slabs of concrete a foot wide, eight feet long and three inches thick. The outside finish could be brick, tile, stucco or similar material.

The Aitschuler house could be built for as little as \$3000 including the lot, according to the inventor.

## MILLIONS ACQUIRE 15 PARCELS HERE

Cleveland Plain Dealer  
Pay \$500,000 Cash; New Steel House at Solon Will be Frameless About 1/20/32

BY JAMES A. MONNETT, JR.

The Mellon interests of Pittsburgh have faith in the future of Cleveland and its real estate and demonstrated it yesterday by putting a half million dollars cash into it.

These interests own the Gulf Refining Corp., which recently entered the Cleveland territory in a big way with a large plant on the Cuyahoga River and numerous retail outlets.

Back in March, 1929, the Standard Oil Co. sold all of its gas stations to the Paragon Refining Co. and with them Paragon acquired an option to purchase seventeen widely scattered parcels of land in fee.

When the Paragon sold the stations to Gulf Refining, the option was passed along.

Yesterday at the Guarantee Title & Trust Co. the Gulf corporation

others, all of which had been bought to a change in local conditions and the other is under lease and cannot be purchased for about ten years.

The parcels are in strategic locations, in all parts of the city and range from 75 to 350 feet in frontage, according to Albert Mendelson of Mendelson, who represented the selling interest in the transaction.

"Most of the parcels purchased are corners and their ability to do that more money will be spent here in the immediate future to improve them for use," Mendelson said.

**Steel House to be Frameless**

The fifth plan in Cleveland to provide a larger order of steel through using it in house construction, three of which were originated here, was announced yesterday for early building in Linden Drive, in the Solon suburb at Solon, which is owned by Mills G. Clark and associates.

First was had the bolted steel frame, then one welded, then a combination of asbestos and clay units all made here, and a few weeks ago the steel frame house with porcelain-enameled on steel exterior announced by Ferro Enamel Corp. The last two

and the new frameless steel house made public yesterday were of Cleveland origin. Charles Bacon Rowley, architect on the new one as he is for the enameled house.

A new company, Insulated Steel, Inc., which shortly will open downtown office, will build the Solon house which will have no steel in which each room will be steel box. The method of construction has been worked out by Clevelanders in connection with the work of the American Rolling Mills Co. at Middletown which owns the continuous roll process. The Otis Steel Co. is licensed to use the process and is installing a mill.

The Solon house will follow the new modern trend in architecture, using a flat roof for garden and porch. It will have two bedrooms and two baths and a built-in garage. Clark says figures obtained show the cost slightly less than for wood.

Walls are to be of a single thickness of sheet steel in flat sections, the interiors to be filled with rock wool insulation. Floors will be concrete in Z form overlapped and welded together with steel columns through which steam and plumbing pipes may be run, with the possibility also of forcing warm air through them in winter and cool air in summer.

Both walls and floors are to be assembled in units in a plant here and taken to the site of the house and welded together. The site of the units is limited only by traffic conditions. On the first house interior walls will be of synthetic asbestos fiber board and the exterior of asbestos tile, both held by the new structural adhesives. Floors will be of synthetic floor board, also held by the same adhesive. In future houses these may be varied to suit the individual owner. Windows will be of cement type and assembled in place. The exterior of the first house will be of metal although wood might be used. The roof will be the only other bit of wood in the house.

The roof will be made the same as the floors with a covering of asphaltic compound. Another feature of the house will be a roof-to-baseboard plug making possible a connection at any point on the baseboard.

The American Rolling Mills Co. is backing the construction of the first house. It is stated that development of the house using this form of construction will open a far larger field for steel than the motor car and make possible erection of an industry in Ohio potentially larger than that of the automobile.

Joseph A. Schiltz of Holden, Dunbar & Leckie, lawyers; J. E. A. Moore, consulting engineer; Frank R. Higley, patent lawyer, and Robert Smith, Jr., consulting architect, are other Clevelanders associated with the project. Bennett Chapple, vice president, and H. B. Kramer of the research department at Middletown, have represented the steel company in working out the house, several of the items in which have been covered by patents.

Patents also are being taken out in Japan, at the urging of Dr. H. Nagao, member of Parliament, who was director of public works at the time of the Tokio earthquake. Dr. Nagao recently inspected the plans and pronounced the idea good for regions subject to quakes.

**Heavy Work Shows Gain**

Heavy construction contracts for the week just ended showed the second and successive gain for the year thus far. The total awarded in the country was \$28,292,000, according to Engineering News-Record. This compares with \$21,150,000 the week before, but is only half the total of the corresponding week of 1931.