Concrete

Concrete for Permanence

A Combination of *Cement Age* of New York, *Concrete* of Detroit, and *Concrete Engineering* of Cleveland.

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In This Issue

Industrial Housing

¶ The United States Chamber of Commerce on Dec. 13 adopted a resolution urging government action in the matter of an industrial housing program. It is in part:

"We, therefore, most vigorously urge upon the head of every department of the Government that immediate action be taken to solve this (housing) problem by, if necessary, diverting money from less immediately needed activities to the purpose of housing, knowing that the country will endorse and sustain such action. The necessity is for prompt and perhaps unprecedented action."

¶ Concrete is a relatively permanent material; fireproof, sanitary and weatherproof.

¶ Concrete is a more nearly local building material than any other, its use relieving overtaxed transportation facilities.

¶ Concrete is more nearly on an equal basis as to first cost with the cheapest type of construction now than ever before.

¶ Concrete is particularly desirable in large operations where re-use of equipment in group housing enterprises insures maximum economy.

146 Unit-Built Concrete Dwellings at Youngstown

Housing Enterprise for Youngstown Sheet & Tube Co., by Unit Construction Co.

By Harvey Whipple

Forty acres of fireproof houses and community buildings, in a hill-top setting that has been worked out with an eye as well for attractiveness as utility, are included in the housing scheme of the Youngstown Sheet & Tube Co., East Youngstown, Ohio.

The initial contract was given to the Unit Construction Co., St. Louis, for terraces and double houses, with walls, partitions, floors and chimneys of pre-cast concrete units, to include apartments for 146 families. The work is well under way at this time—begun in July, 1917—with buildings already near completion, having ten apartments, and the "parts" cast and in the yard, practically ready for setting up 50 more dwellings. It is proposed to complete the work now under contract in the coming summer.

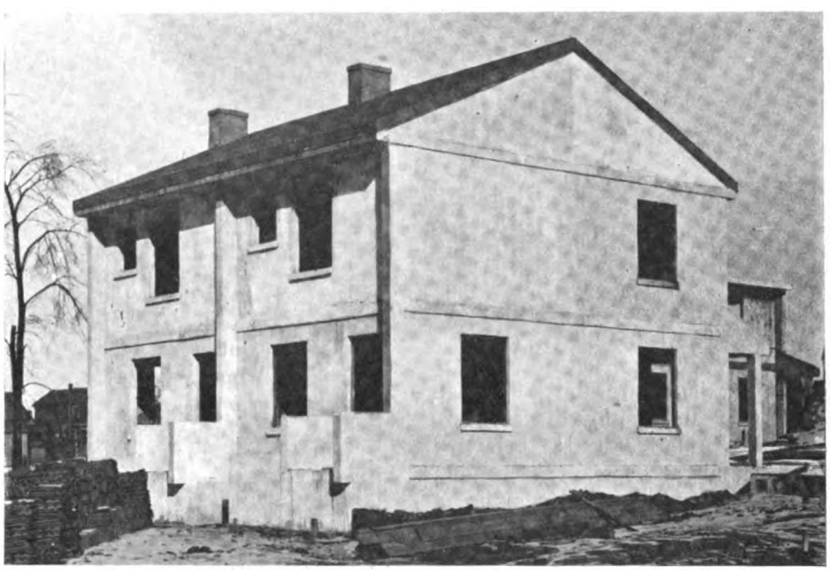


Fig. 1—The Double Unit Built House, Nearest Completion—Rear View

While the unit method of construction has been successfully applied to industrial structures, to train sheds and in varied applications of the principle, to railway bridges and numerous other works, the Youngstown enterprise is the first use of the Unit Construction Co.'s patents and methods in dwelling house construction. The idea was, however, applied and worked out with notable architectural success, if not to a complete economical triumph, under Grosvenor Atterbury, at Forest Hills Gardens, Long Island, N. Y.[1] In this connection it is particularly interesting that the Unit Construction Co. has now also taken hold of house construction at Forest Hills Gardens for the Sage Foundation Homes Co., developing the methods of Mr. Atterbury and adapting them in a measure to the Unit Construction Co. methods as in use at Youngstown.

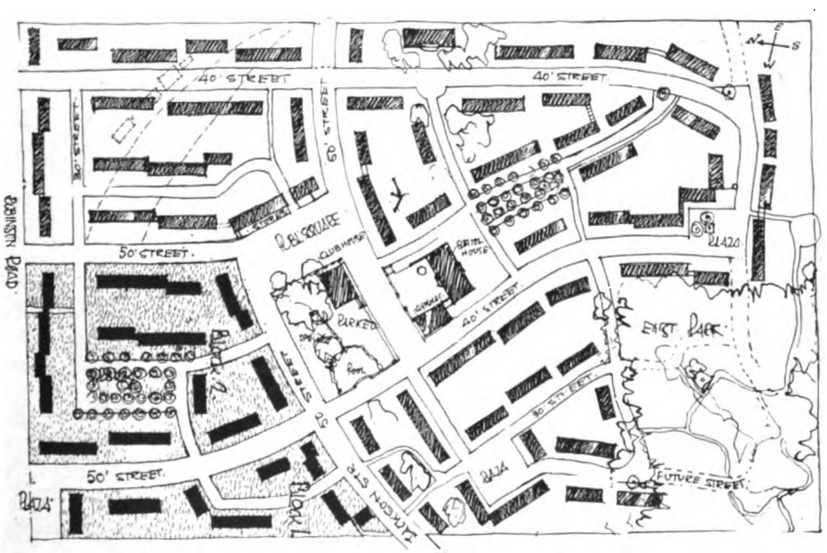


Fig. 2—Layout of Housing Scheme for Youngstown Sheet & Tube Co. Shaded Portion Shows Part Under Contract—Faint Dotted Lines Above Indicate Layout of Construction Plant

The first of the Youngstown unit built houses—the one nearest completion—is shown in Fig. 1. Other apartment groups well under way are shown in other illustrations. Fig. 2 shows, in rough outline only, the scheme of this housing development, and Fig. 3 more details of the group of buildings now under contract to house 146 families. Fig. 4 shows three typical plans, and Fig. 5 suggests the final appearance of the dwellings.

The Scope and Purpose of the Development

The Youngstown Sheet & Tube

[1] Concrete, January, 1915, p. 8, and in previous issues. See also *Concrete Houses and How They Were Built*, p. 49.

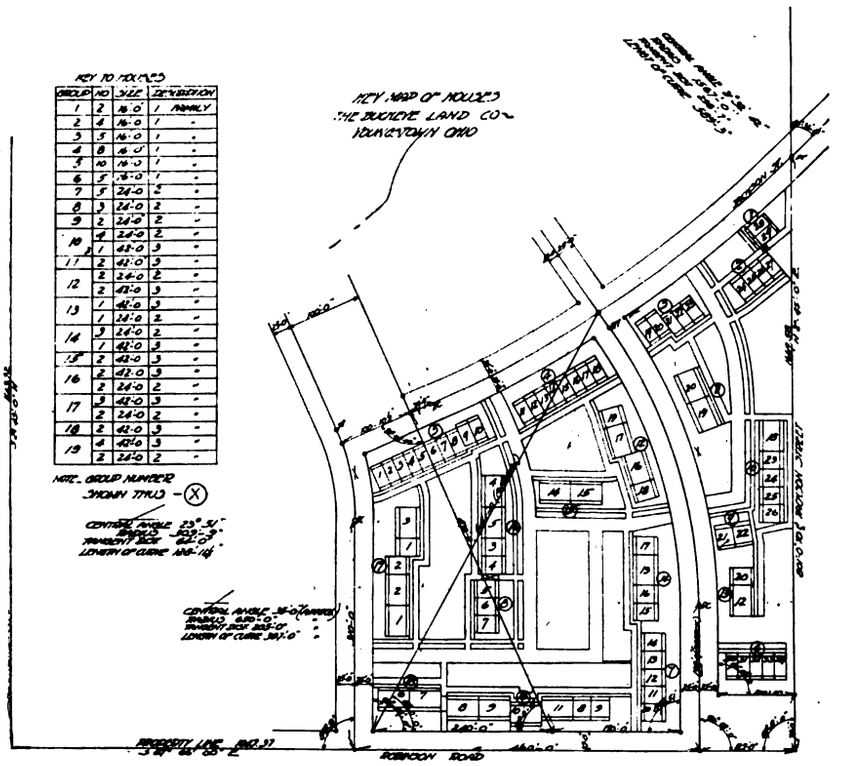


FIG. 3—DETAIL LAYOUT OF PART OF HOUSING DEVELOPMENT NOW UNDER CONTRACT WITH SCHEDULE OF ACCOMMODATION IN FAMILIES PER BUILDING

Co.'s operations are large; great numbers of its employees are not thoroughly Americanized; their living conditions are not always conducive either to working efficiency or to the best citizenship. Many of them have to go too far to and from work; many are in crowded quarters, where houses are so planned as to inflict the necessity—due to their traditional standards of living—of a horde of boarders, to the great detriment of the best domestic development.

To remedy these conditions—to bring the workers closer to their work, to house them comfortably and economically, and under such an arrangement as to minimize the tendency toward overcrowding; to induce a more nearly normal, a more American recreational expansion of the individual, to inculcate a sense of appreciation of the better things in home and community life—with no less ambitious an idea, the problem was undertaken by the Youngstown Sheet & Tube Co.

The Buckeye Land Co. was organized; the Blackburn farm, at the head of Robinson road, about four miles out from the center of Youngstown, was purchased and work was begun. Dudley R. Kennedy, assistant to the president of the Youngstown Sheet & Tube Co., was at the outset in a position of general supervision, with Paul Kuegle in actual management of the subsidiary land company operations. The initial contract was let to the Unit Construction Co., John E. Conzelman, chief engineer. In working out the architectural details, the general housing arrangement and the ultimate development of the work as a community, complete, the burden falls on Conzelman, Herding and Boyd, of which organization Mr. Herding, the architect, has been a specialist in such community problems. H. A. Bankes is superintendent in charge of construction, and R. A. Conzelman resident engineer.

Streets were first laid out, curbed and macadamized, but left without final surface treatment until construction is complete. Sewers were put in, water supply provided. The site is at the top of and on the side of a commanding hill. Grades, therefore, complicated the problem, but they add the feature that must ultimately contribute largely to the attractiveness of the community, in obviating monotony. The variety is enhanced by the irregularity also of the streets, as shown in Figs. 2 and 8. While the plans of individual apartments keep very close to the stand-

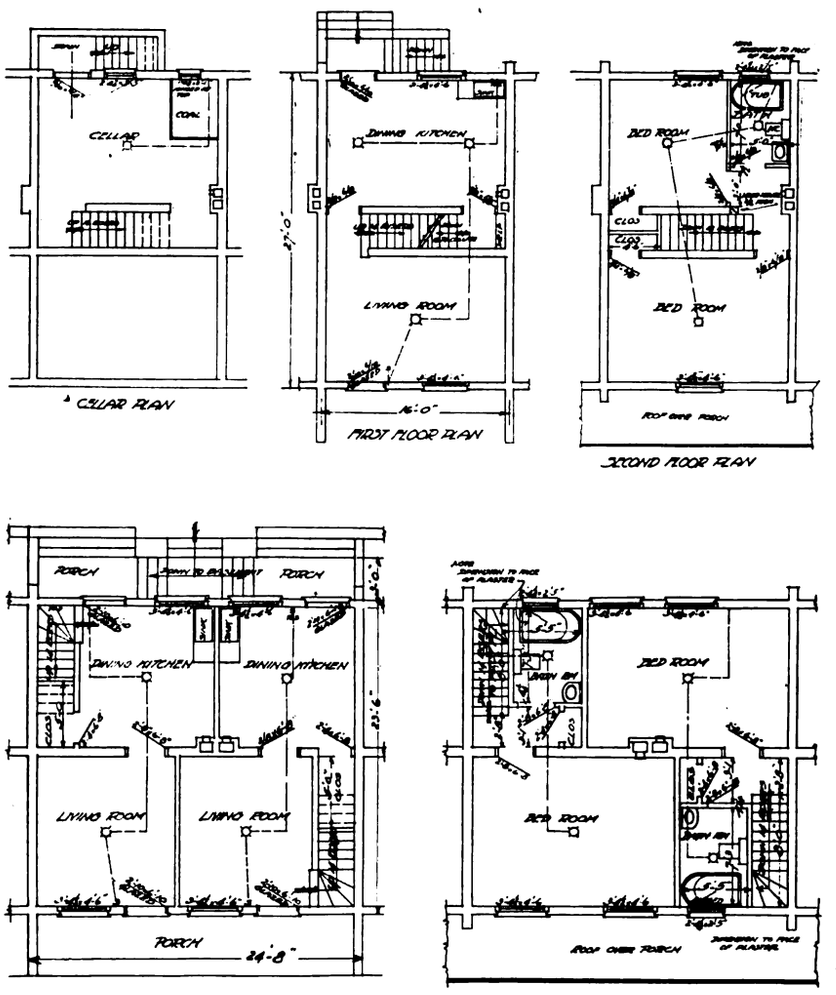


FIG. 4—A AND B—TYPICAL FLOOR PLANS. (A) SINGLE FAMILY UNIT. (B) DOUBLE HOUSE. (C) SEE NEXT PAGE—TRIPLE FAMILY UNIT

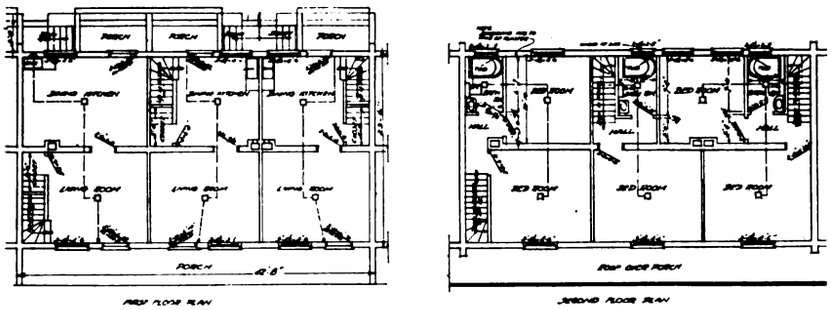


FIG. 4—(C) FLOOR PLANS, THREE-FAMILY TERRACE

FIG. 5—FROM DRAWING TO SHOW COMPLETED APPEARANCE OF A GROUP OF UNIT BUILT DWELLINGS

ards shown in Fig. 4, these occur as double houses and as terraces of various lengths, interspersed, and not always in a straight line, but with offsets or steps in the front and back line. The variety is still further enhanced by the grades encountered so that in a row of six terraces, floor and roof lines step up 3′ for every second house in a row, and with all this variety the units necessary for the construction of the houses are fairly standardized with a very large duplication to effect economy. A single apartment of four rooms, bath, closets, cellar and porches involves less than sixty separate pieces of concrete. One entire wall for a story height comes in one piece; the floor of the largest room, about 16′ by 12′, is in one slab. Chimneys are hoisted into place in one piece.

PLANT LAY-OUT—MANUFACTURE OF UNITS

The center of manufacturing operations is the mixing plant—a half-yard Ransome mixer[2], tower[3], electric hoist[4] and chute, feeding to a car[2] on a tramway, on both sides of which are the casting beds (see Figs. 6 and 7).

Scarcity of good gravel in the vicinity led to the use of slag as the coarse aggregate in the proportion of 1 cement, 2 sand and 4 slag. The cement is about 20% in excess of good gravel aggregate. Six per cent of hydrated lime is added.

The concrete is dumped from a 6 cu. ft. push cart, hand operated by two men, on the tramway to short chutes, conveying the mix by gravity to the unit molds on either side of the track, through several hundred feet of casting alleys. As a part of the plant are office building, cement storage building, pump house, supplying well water, and a wood working shop.

THE UNITS

The houses are of pre-cast units, except for 8″ footings cast in place. Units are reinforced to sustain the loads in the structure and to withstand the strains in lifting, loading and placing.

Exterior wall slabs are of ribbed design (see Figs. 11 and 12). They are usually of story height and of a length equal to a room or entire side wall dimension. They are rabitted at the ends so that the adjacent slabs as set provide a space for sealing with grout. At present these slabs are cast with the outside down. Ribs, giving a total maximum wall thickness of 7″ are formed by boards set in the slab forms. The panels between have a thickness of 3″. Furring strips, asphaltum painted on the back side, are anchored by nails to ribs when the slab is cast. Partition walls are tubular, the vertical coring being provided by means of form boxes set in the slab forms as the concrete is poured, these being withdrawn, the spaces filled with sand and the other side of the slab troweled on. Sand is removed later by washing with a hose.

Floor slabs are beamed (see floor

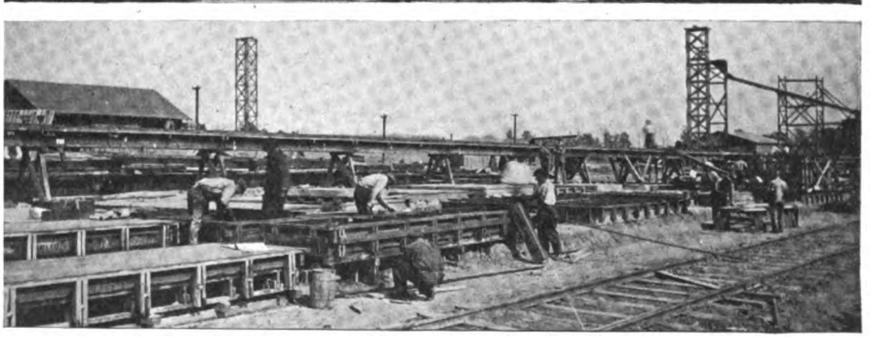


FIG. 6—CASTING YARD; TRACK FOR LOCOMOTIVE CRANE AT LEFT; CASTING AREA AND TRAMWAY AT RIGHT WITH TOWER IN BACKGROUND

FIG. 7—A NEAR VIEW OF MOLDS FOR UNIT SLABS

[2]Ransom Concrete Machinery Co., Dunellin, N. J.
[3]Insley Mfg. Co., Indianapolis, Ind.
[4]J. F. Mundy, Newark, N. J.

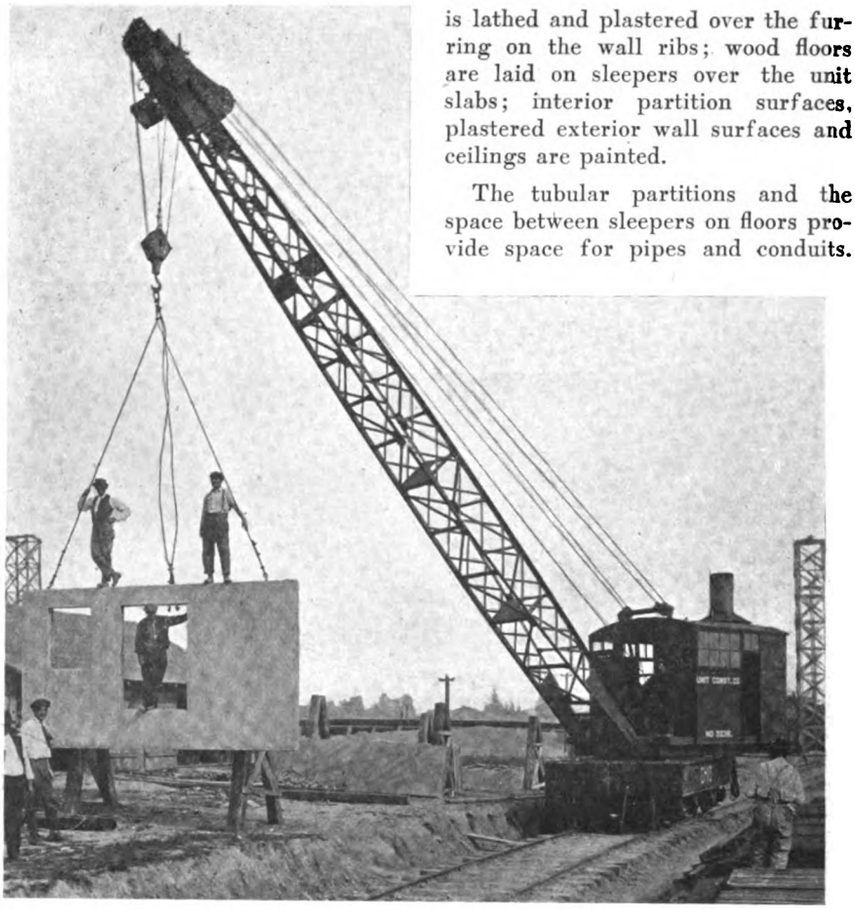
slab being placed, Fig. 11), the central panels being only 2½″ thick. These are cast ceiling side down over well finished wood cores designed to give a molded trim around the edge of each panel adjacent to the beams. It will be noted that floor slabs are so rabitted at the outer edge as to fit over the wall slabs, anchoring the work (Fig. 12). Window and door openings are rabitted and provided with wood nailing blocks, cast in. Sills, to get a better finish, are separately cast. Chimneys are cast vertically with vitrified flue in place, rabitted to anchor with the unit slabs when grouted in.

Cold Weather Concreting

Severe cold and snow caught the plant unawares. The casting beds were deep in drifts before a winter shelter could be completed. The present enclosure has plank sides and a hip roof of 8 oz. canvas-covered panels laid on joists. These panels are all readily removable at any place in the sheltered casting area where cured units are to be lifted out. A boiler has been installed and steam pipes run between forms. Laborers spent several days removing snow. A gas blow-torch has been installed in the mixer, and hot gauging water is used. Except in the severest weather, concreting will continue through the winter. Even in such weather, it is anticipated that the temperature within the enclosure will not fall to a point to endanger the integrity of work done.

Handling Units

Hooks for lifting are cast in the units and cured parts are lifted by a locomotive crane[5], operating on a track throughout the casting area (see Fig. 8) to a "bus," which is Superintendent Bankes' special pride. It has wide steel-bound, solid wood wheels. a 40 h. p. engine, and a capacity of 11 tons (see Fig. 9). This was largely built on the job. It will take 11 tons of concrete units to a load—some single units weigh as much as 5 tons; travel the ups and downs of the winding roads, and deliver from the casting yard to the farthest corner of the building area, a distance of about 1,000′, as much as 90 tons a day. A crane operating on rails was regarded out of the question on this particular hillside site. Mr. Bankes' "bus" solves the problem. At the building site the bus is unloaded by a hoist[6] (see Figs. 9 and 10), each of whose three legs is set on rollers, and counterweighted with gravel by means of the cylindrical hoppers shown in the illustration. A floor unit about to be set by the hoist is shown in Fig. 11.



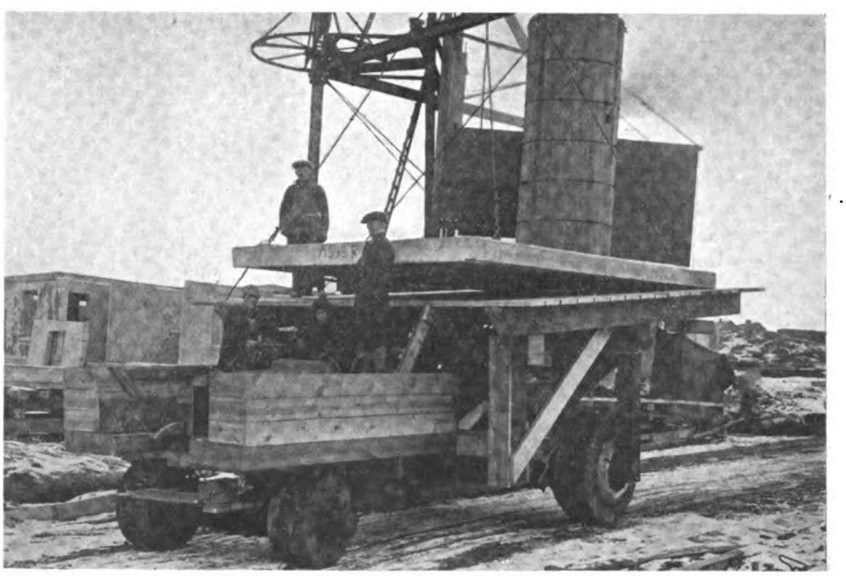


Fig. 8—Crane Taking Unit of Side Wall from Casting Area

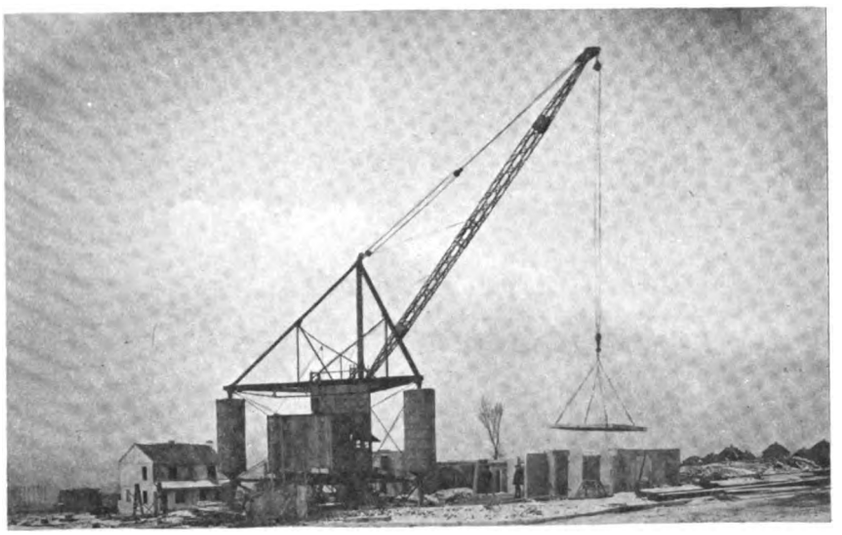
Fig. 9—Hoist Taking Slab from the "Bus"

Finish

When the house units are assembled, set, anchored and grouted, the finish is not elaborate. Frames are nailed to the blocks provided at openings, wedged, calked with oakum and plastered over to a neat finish. The inside surface of exterior walls is lathed and plastered over the furring on the wall ribs; wood floors are laid on sleepers over the unit slabs; interior partition surfaces, plastered exterior wall surfaces and ceilings are painted.

The tubular partitions and the space between sleepers on floors provide space for pipes and conduits. Registers are provided in second floor slabs for heat from below. Provision is made for heating with stoves, but a central heating plant is under consideration. There is a bathroom in each apartment, simple but adequate. Stairs are of wood. Exterior walls are given a brush coat of grout (see Fig. 1), and will be painted with special concrete paint of cream tint. Another note of color will be in the red tile roofs, which

[5]Ohio Locomotive Crane Co., Bucyrus, Ohio.
[5]Ohio Locomotive Crane Co., Bucyrus, Ohio.
[6]Am. Hoist & Derrick Co., St. Paul, Minn.



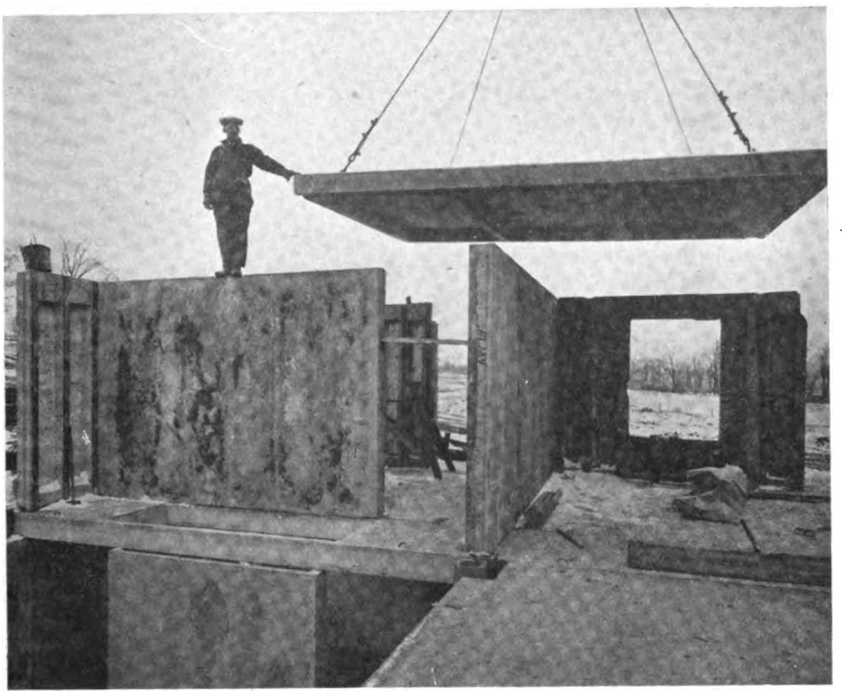


FIG. 10—HOIST PUTTING SLABS IN PLACE IN HOUSE
FIG. 11—A NEARER VIEW OF OPERATION SHOWN IN FIG. 10

are to be laid on wood frame. In spite of this departure from the fireproof material, the fireproofness, to answer most practical purposes, still remains, since a complete fire seal is provided in the attic floor of concrete. Ventilation of this roof space is provided by metal mesh covered openings under the eaves.

These houses, most of them with two rooms upstairs and two rooms below, with small basements, closets and bath, with garden spaces in the rear and a depth of 18′ in front for lawn, are to rent for from $12 to $18 per month. With them go liberal plantings of trees, shrubs and vines, shops, public playgrounds, a school, gymnasium, pool and other park and service features as indicated in the general plan.

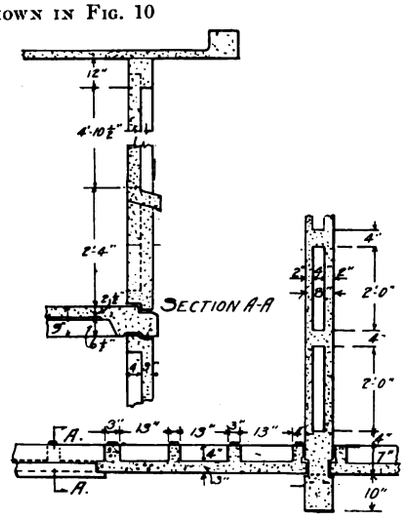


FIG. 12—DETAIL OF UNIT SYSTEM FOR HOUSES
Below is a horizontal section of cored party wall or partition and ribbed exterior wall slab; above is a vertical section of wall and floor slabs

Do the readers of CONCRETE realize that Congress has passed a bill which will increase the postage cost on this and other magazines from 50% to 900%, depending on where the reader lives? It will make the student of current history and technical information pay several times as much for his knowledge in San Francisco as in Pontiac, Mich. Many Representatives and Senators in Congress who let that bill "get by" because it was a part of the big war revenue measure, are ready to reconsider. This "zone system" of postage increase on the periodical press, saddled on the public — on YOU—as a war measure, is folly, because it will kill the goose that lays the golden egg. See advertising page 24.

Concrete Cottages at Ludlow, Mass.

The illustrations show some neat little concrete cottages. They are at Ludlow, Mass., and were built by J. B. Haviland.

These houses have double 4" walls stuccoed and are built with a wall machine.

DOUBLE WALL COTTAGES AT LUDLOW, MASS.