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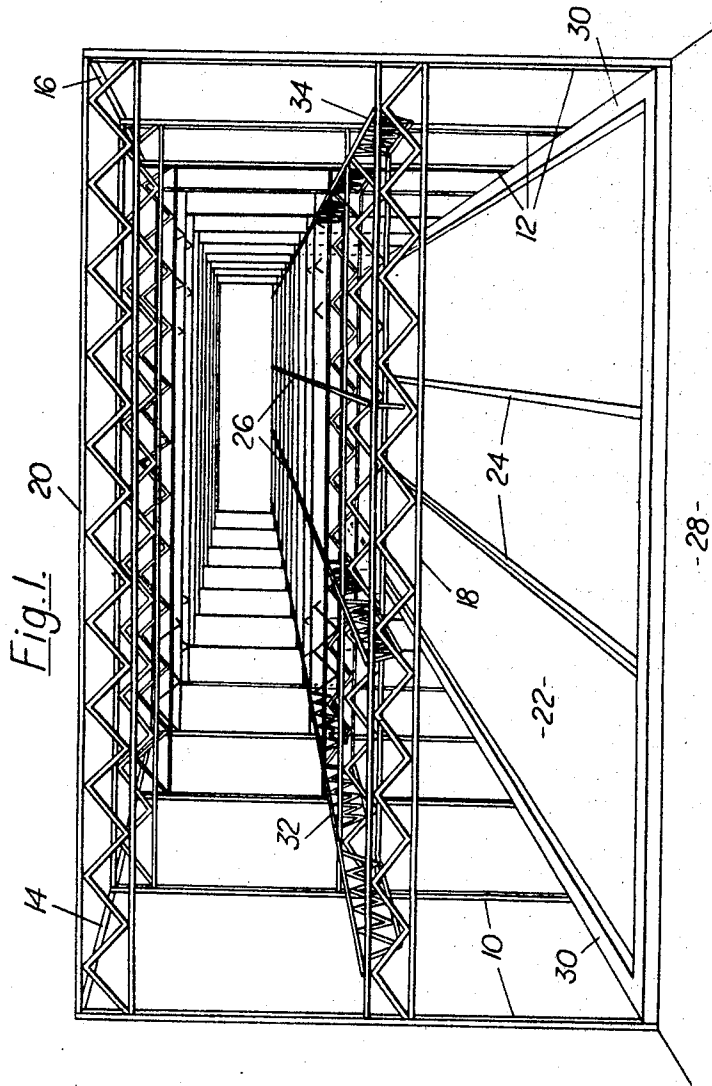
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PREFABRICATED BUILDINGS AND THEIR ASSEMBLY

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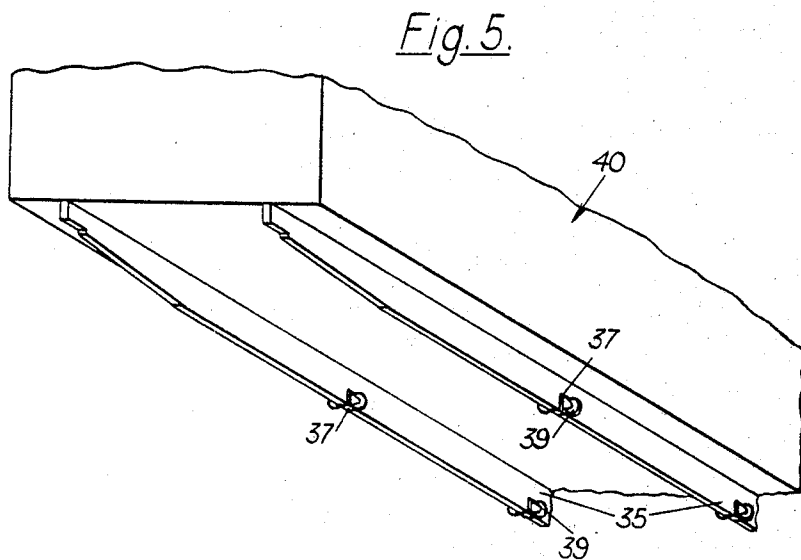
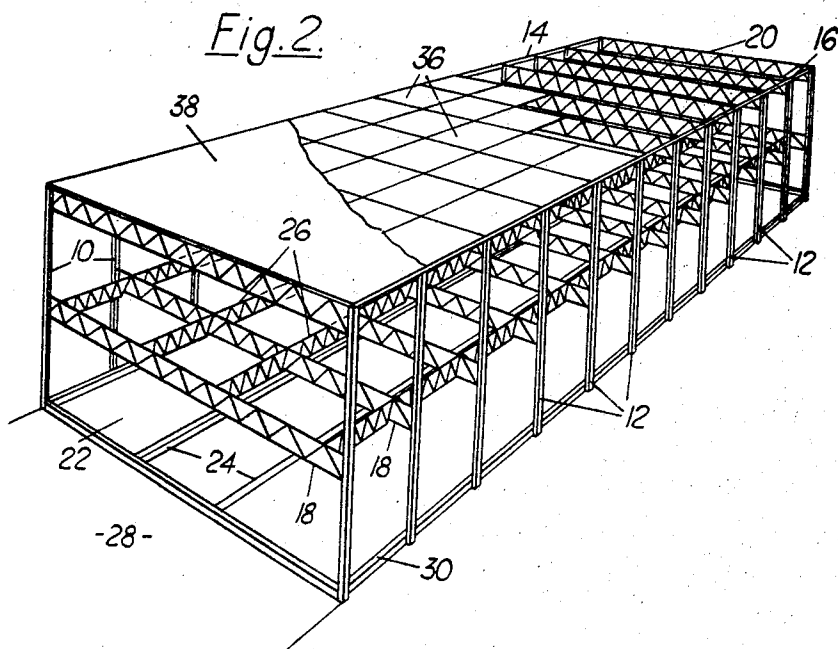
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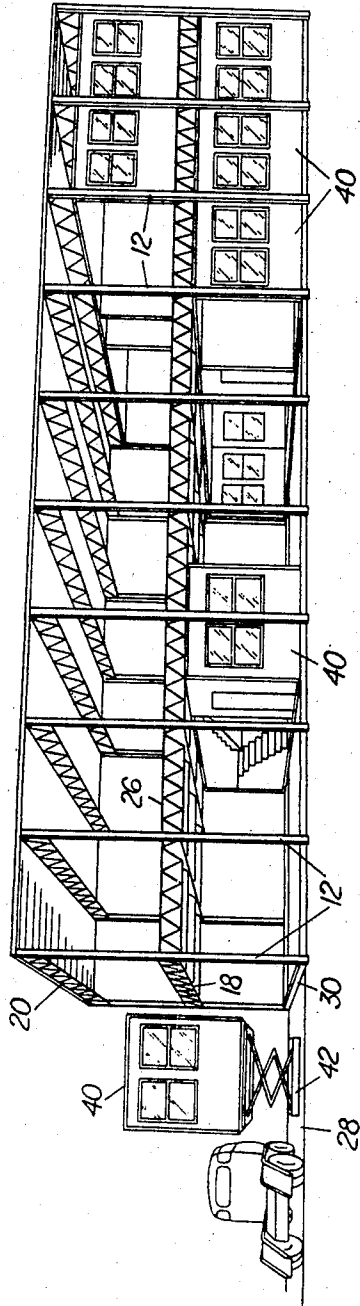
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Fig. 3.



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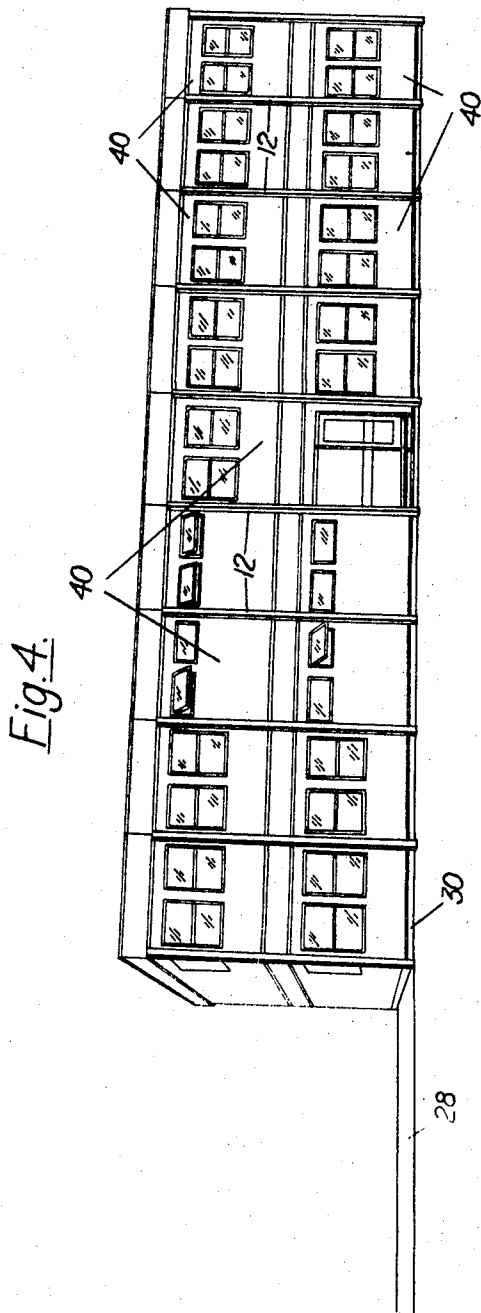
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**PREFABRICATED BUILDINGS AND THEIR ASSEMBLY**

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U.S. Cl. 52—127 3 Claims

**ABSTRACT OF THE DISCLOSURE**

A prefabricated building formed by sliding units forming the rooms and outside walls of the building into a rigid three-dimensional frame constituting the skeleton of the building, the frame having at least one opening large enough to receive these units and having rails or other guide means to permit the units to be slid into position within the frame.

This invention relates to prefabricated buildings and their assembly, its aim being to provide a form of construction and a method of assembly which enables buildings, particularly schools, offices and hospitals, to be erected quickly and economically with a minimum of labour on site.

Broadly, a prefabricated building in accordance with the present invention comprises a rigid three-dimensional frame which supports a number of "slot-in" units forming the rooms of the building, the frame having one or more openings large enough to receive each unit into the frame and having guide means on which the units are movable within the frame, and the units being positioned in the frame as a result of having been inserted through one or more of the said openings and moved along the guide means to their appointed positions.

Preferably each slot-in unit is fully prefabricated and finished prior to leaving the factory so that it is complete on arrival at the site. The units in any particular building will generally be all the same size and of rectangular shape, their measurements being, for example, 30' x 8' x 8'. When joined together the units form the external walls of the building, the internal walls between rooms, the ceilings of the rooms and, where the building has more than one story, the stairway(s) or lift-shaft(s) connecting one floor with the one above it.

The guide means on the frame can comprise two or more parallel rails, girders, beams or channels for each floor of the building, the units each having rollers or wheels which run on these guide means after the unit has been inserted through one of the openings in the frame. This allows the units to be positioned without the need of a large labour force or a heavy crane.

By way of example, a specific prefabricated building in accordance with the invention is shown in the accompanying drawings, in which:

FIGURE 1 is a perspective view of the frame of the building;

FIGURE 2 is a perspective view from above of the frame with the roof partially completed;

FIGURE 3 is a ground-level perspective view illustrating the positioning of "slot-in" units in the frame;

FIGURE 4 is a view similar to FIGURE 3 of the completed building; and

FIGURE 5 is an underneath perspective view of the lower part of a slot-in unit.

The frame shown in FIGURES 1-3 is composed of two parallel lines of upright steel columns 10 and 12, the col-

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umns in each line being at 8 feet centres and the two lines being 30 feet apart. The lower ends of the columns 10 and 12 are embedded in concrete, while their upper ends are joined by steel eaves ties 14 and 16. In this particular instance the frame is for a two-story building, so that transverse steel-lattice beams 18 and 20 extending between the two lines of columns 10 and 12 are fixed at first floor level (the beams 18) as well as at roof level (the beams 20). It is to be understood that a single-story building will have only roof level beams 20, while a building having more than two storeys will have beams 18 at each floor level except the ground floor.

In order that "slot-in" units forming the walls and ceilings of the building may be slid into the frame and be easily located therein without the need of a large labour force or a crane, each "floor" is provided with a pair of parallel guide rails, girders, beams or channels extending the full length of the frame. The ground floor 22 thus has two angle-section guide rails 24, while the first floor has a pair of steel lattice beams 26 the upper portions of which serve as runways. The guide rails 24 and 26 extend parallel to the lines of columns 10 and 12, the two rails of each pair being about eight feet apart.

To facilitate the erection of the frame on site, it is preferable for the concrete floor 22 of the building to be laid before the columns are inserted into the ground. A concrete working apron 28 is also laid at one end of the frame while the latter is being erected. As shown in FIGURE 1, a concrete edge beam 30 at floor level is also provided round the entire perimeter of the building, together with a pair of steel lattice edge beams 32 and 34 at first floor level.

After erection of the frame, a flat roof is laid on the roof beams as shown in FIGURE 2. The roof is composed of 8 feet x 6 feet prefelted timber panels 36 which are fixed along their shorter edges to adjacent transverse roof beams. Two layers 38 of felt roofing material are then laid on top of the panels 36.

The frame is now ready to receive the "slot-in" units which form the rooms and outer walls of the building. The insertion of these units into the frame is shown in FIGURE 3, from which it will be seen that the units 40 are inserted through openings at one end of the frame and are then pushed along the guide rails 24 or 26 to their appointed locations. The slot-in units are fully prefabricated and finished prior to leaving the factory and arrive on site complete. Each unit measures 30 feet x 8 feet x 8 feet and has two plywood box beams 35 (see FIGURE 5) which support the floor structure. Mounted on these beams in a saddle-like manner are four brackets 37, two on each beam, which are each provided with a pair of wheels 39 for use in sliding the units along the guide rails. The eight wheels thus provided can, if desired, be made retractable into recesses within the beams 35, but in the present instance the brackets 37 are rigidly fixed in position. The walls of the units are bonded and screwed to the floor structure, the walls having windows, doors and other fittings according to requirements. Those walls which form the outer walls of the building can be either "Arpax" treated, decorative timber or tile hung.

The slot-in units 40 are bolted together after being placed in position and are also bolted to the abutting portions of the frame. Units to be housed on the first floor are lifted into position by scissor-type pneumatic jacks 42 which incorporate sliding means and centres to match the guide rails 26.

All plumbing, heating and electrical services can be housed in the gaps between the ground and first floor units and between the roof and the first floor units. These gaps also provide a certain amount of sound insulation and give plenty of space for the installation of fire prevention materials such as asbestos wool.

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The invention therefore makes possible the erection of a building in the following stages:

STAGE 1

- (a) Site clearance.
- (b) Site marking out to standard dimensions or template.
- (c) Site excavation.
- (d) Pouring the concrete to form the floor of the building, to reinforce the column bases, and to form the working apron 28.

STAGE 2

Delivery and erection of prefabricated steel frame.

STAGE 3

Location of runways on ground and first floor levels.

STAGE 4

Roof covering and finishing including roof drainage.

STAGE 5

Delivery and location of slot-in units with plumbing and heating services progressing according to the rate of delivery.

STAGE 6

Delivery and insertion of fire prevention and/or sound insulation material in the gaps between the ground units and first floor units and between the roof and first floor units.

It will therefore be seen that the construction of building and method of assembly described above allows excellent use to be made of factory-made prefabricated units without requiring the use of heavy equipment on the site. Further, site works such as landscaping can be carried out prior to arrival of the slot-in units. Yet another advantage is that the building can be readily taken down without destruction of the slot-in units.

I claim:

1. A prefabricated building comprising a rigid three-dimensional frame supporting a plurality of juxtaposed units forming the rooms of the building, said frame including at least two spaced-apart parallel lines of upright columns extending upwards from a ground floor, the length of each line of columns being equal to the combined length of at least two juxtaposed units, at least two eaves ties each joining together the upper ends only of the col-

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umns in the respective two lines, a plurality of crossbeams of open-work lattice construction extending horizontally between the two lines of columns at a level well above the ground floor, and a pair of spaced-apart parallel elongated guideways extending continuously along the ground floor for substantially the full length of the two lines of columns in a direction parallel to said lines and at a location which is between the said lines of columns and spaced away from them, said units being prefabricated rectangular enclosures of the same size as each other which together form all of the external walls of the building except the roof and ground floor, the internal walls between rooms and the ceilings of the rooms, the units each having a floor beneath which are mounted at least two spaced-apart sets of rollers adapted to run along said guideways, the width of each unit being only slightly less than the distance between the two lines of said columns and the height of each unit being only slightly less than the vertical distance between the ground floor and the lower surfaces of said crossbeams, whereby a plurality of units are individually and in turn insertable into and removable from the frame through one end opening between the two lines of columns.

2. A prefabricated building according to claim 1, in which crossbeams of open-work lattice construction extend between the two lines of columns at roof level and at all floor levels above the ground floor, and in which two guideways corresponding to those provided on the ground floor are supported by the crossbeams at each floor level between the ground floor and the roof-level crossbeams.

3. A prefabricated building according to claim 2, in which each story of the building comprises a line of at least three units all inserted through the same end opening between the two lines of columns.

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