July 7, 1953 J. F. DONAHUE 2,644,203

PREFABRICATED BATHROOM STRUCTURE

Filed Aug. 15, 1949 3 Sheets-Sheet 1

FIG. 1.

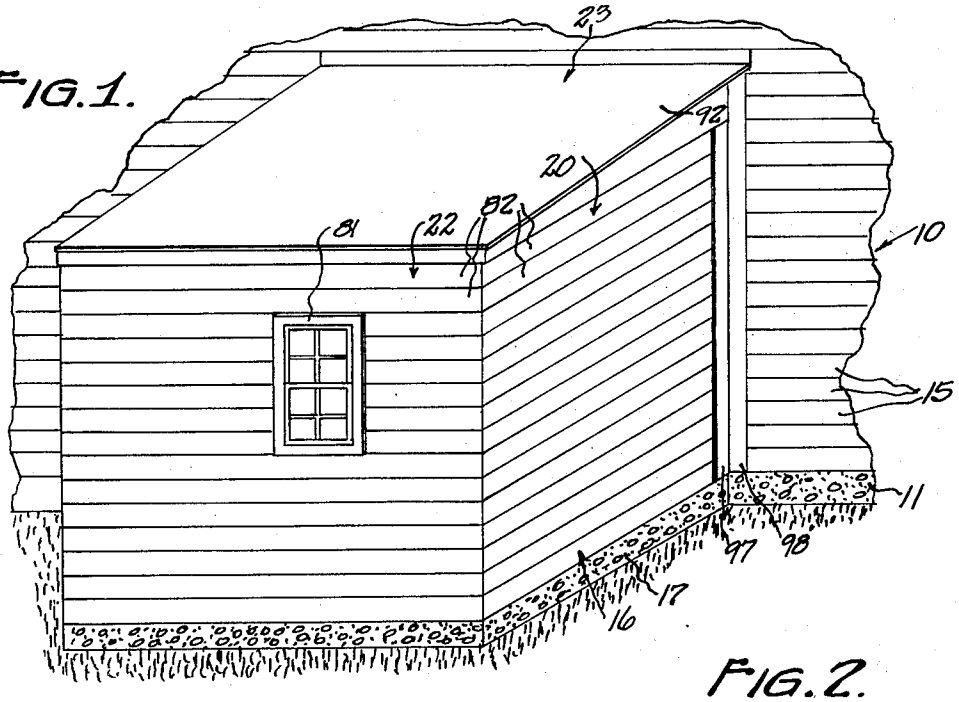
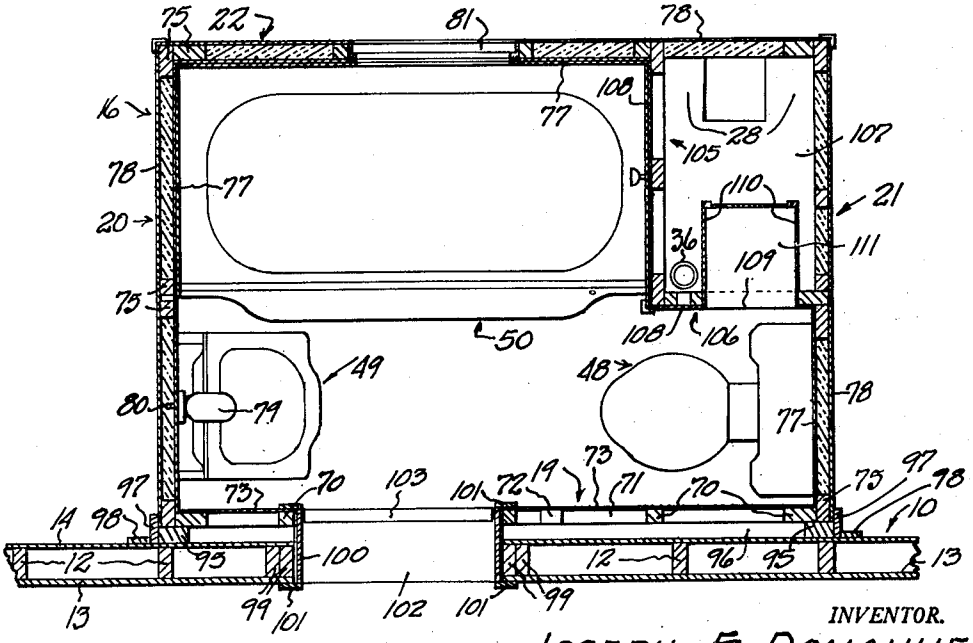


FIG. 2.



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PREFABRICATED BATHROOM STRUCTURE

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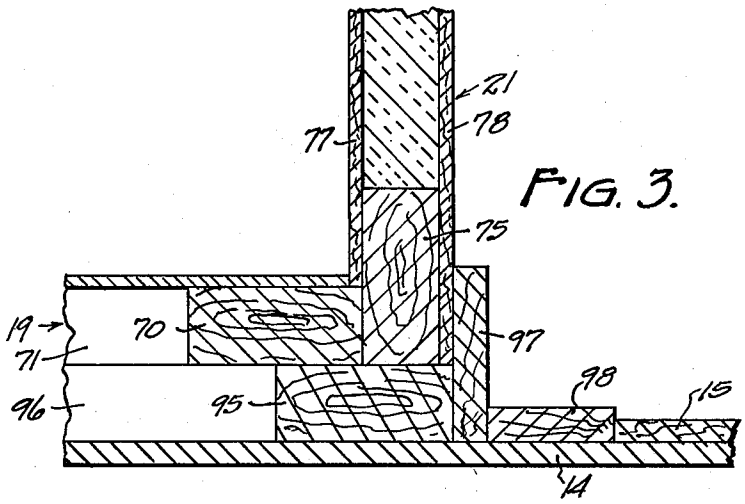


FIG. 3.

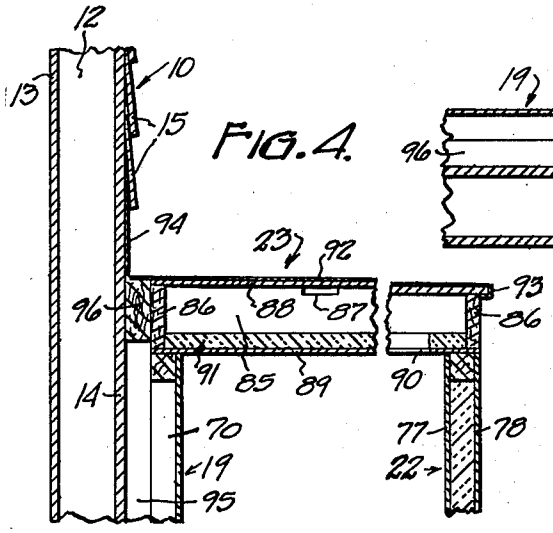


FIG. 4.

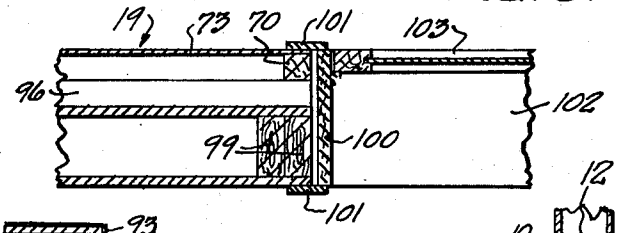


FIG. 6.

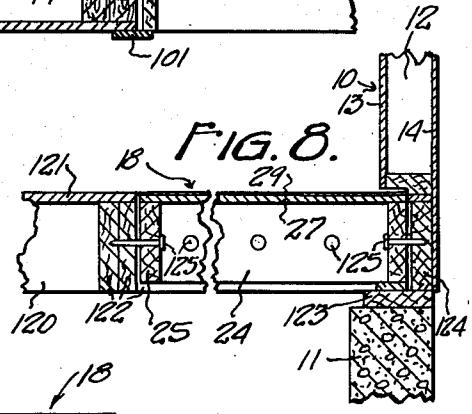


FIG. 8.

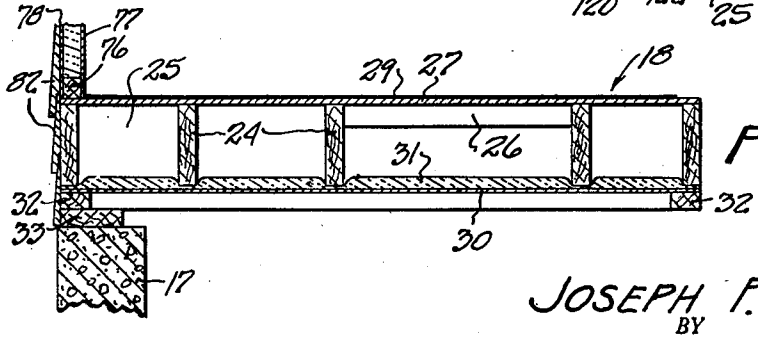


FIG. 5.

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PREFABRICATED BATHROOM STRUCTURE

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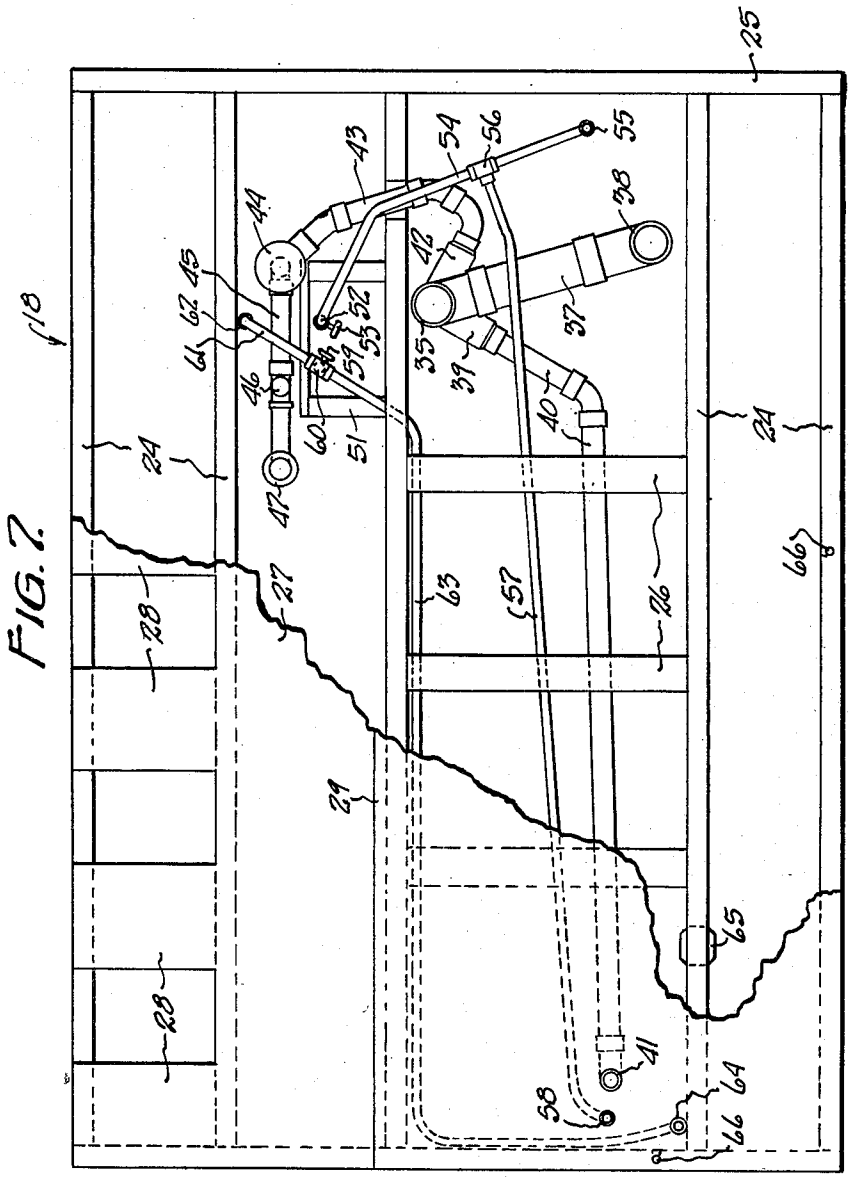


FIG. 7.

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UNITED STATES PATENT OFFICE

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PREFABRICATED BATHROOM STRUCTURE

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Application August 15, 1949, Serial No. 110,420

9 Claims. (Cl. 20—2)

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This invention relates to a prefabricated bathroom structure, and the primary object of the invention is to provide a structure which can be connected to a building, such as a rural residence, not previously provided with a bathroom, to add a bathroom to such building easily, quickly and without the requirement of special skill or the incurring of great expense.

A further object is to provide a novel structure for attaching a prefabricated building structure to an old building structure and for sealing the horizontal and vertical joints between said structures effectively against wind and weather.

A further object is to provide a novel, prefabricated, single room structure adapted to be connected or attached to another building, and characterized by a strong, light weight, insulated construction, which can be transported or shipped conveniently as a unit, and which is further characterized by the incorporation therein of plumbing and electric service lines and plumbing and electric fixtures, so arranged as to be protected against damage during shipment and installation of the structure, insulated against freezing in cold weather, and readily connected with plumbing and electrical lines serving the building to which the structure is attached.

A further object is to provide a prefabricated building structure, including a floor unit provided with plumbing conduits and outlets for ready connection to water and sewer lines, which constitute prefabricated units and are adapted for installation either upon a foundation projecting externally from another building or for installation within an opening formed in the floor of a previously constructed building.

A further object is to provide a device of this character having a floor, side walls and a ceiling which constitute a prefabricated unit and assembled together into a unitary construction which in turn is adapted to be attached to a building at an access opening therein with which a door opening in one of the side walls of the structure is adapted to register.

A further object is to provide a device of this character formed of a plurality of prefabricated panels, each of light weight and including a frame structure, inner and outer panels covering said frame structure and secured thereto by means of cement, the interior of said prefabricated panels containing insulating material.

A further object is to provide a building structure of this character having a floor, ceiling and

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four walls, with plumbing lines passing through the floor panel, and with a stack defined within the interior of the structure, having openings in at least said ceiling panel in communication therewith and serving also as means to afford access to the plumbing lines and to include storage space.

Other objects will be apparent from the following specification.

In the drawings:

Fig. 1 is a fragmentary perspective view illustrating the manner in which the building structure is adapted to be connected with a previously constructed building.

Fig. 2 is a horizontal sectional view of the structure illustrating the construction thereof and the method of attaching thereof to another building.

Fig. 3 is an enlarged fragmentary sectional view illustrating the construction of the vertical joints between the old and new structures.

Fig. 4 is an enlarged fragmentary vertical sectional view illustrating the horizontal joint between the top of the new structure and of another structure to which the prefabricated structure is attached.

Fig. 5 is a transverse vertical view illustrating the construction of the floor panel and one arrangement for mounting the same.

Fig. 6 is an enlarged fragmentary horizontal sectional view illustrating the arrangement of the structures at the access openings therebetween.

Fig. 7 is a top plan view of the floor unit of the device, illustrating the plumbing fixtures carried thereby and with parts broken away.

Fig. 8 is a fragmentary vertical sectional view illustrating the manner in which the floor unit only may be installed within a building within the confines of the walls thereof.

Referring to the drawings which illustrate the preferred embodiment of the invention, the numeral 10 designates the side wall of a building, such as a residence, to which residence it is desired to add a bathroom. The side wall 10 is preferably mounted upon the usual foundation 11 and has framing formed of studs and other structural members 12, being lined with an inner wall panel 13 which may comprise sheathing, lath, plaster, wallboard or any other material commonly used in building structures, and which has an outer sheath or covering panel 14, which may comprise sheeting, siding and any other material customarily used in building. As here shown, the outer portion 14 of the building wall

includes the usual lapped horizontal wood siding 15.

The new prefabricated bathroom structure is designated by the numeral 16 and is adapted to rest upon a foundation 17 projecting outwardly from the foundation 11 and of the same size as the structure 16 to support the same effectively at its margin. If desired, an opening may be formed in the foundation 11, giving access between the basement of the building of which wall 10 forms a part and the space within the foundation 17 and below the structure 16. Likewise it will be understood that, if desired, the ground within the outline of the foundation portion 17 may be partially or completely excavated, and service lines for water, sewage and electricity will extend from the main building, preferably through the access opening (not shown) in the foundation 11 into the space within the foundation 17 and below the structure 16.

The structure 16 comprises a floor panel 18, best illustrated in Figs. 5 and 7, four side panels 19, 20, 21 and 22, respectively, and a roof panel 23, best seen in Fig. 4.

The floor panel 18 is formed as a unit and, as formed, is composed of a plurality of parallel joists 24 and end joists or frame members 25 which are nailed together to form a rigid structure. If desired, this structure may include brace members 26 extending at an angle to members 24 and connected therebetween, which members, as best seen in Fig. 5, may be of lesser thickness or depth than the joists. A plywood panel 27 forms the top covering or floor panel of the floor unit 18 and is preferably so constructed that tongue portions 28 project therefrom at one margin, here shown as the outer longitudinal margin, between the two outermost parallel joists 24 so as to provide access through said floor panel to the space between the joists. The joists 24 will preferably have openings therein of such size, character and location as to facilitate circulation of air throughout the floor unit 18. A floor covering 29, such as linoleum, may be applied over the floor panel 27 at selected parts of the floor panel, said linoleum in each instance preferably terminating at the base of the tongue portions 28 so as to leave openings between said tongue portions.

The bottom of the floor panel unit 18 is spanned by a waterproofed backer board or panel 30, such as paperboard impregnated with asphalt or like waterproofing material and of sufficient thickness to provide a strong but light weight panel covering extending across the bottom of the floor panel 18. Insulating material 31 bears upon backer panel 30 filling a portion only of the interior space of the floor unit 18. The insulation material utilized may be of any form found suitable and preferably will constitute cellulose fibers loosely arranged in sheet or blanket form, although insulating material in rigid panel form or insulating material in loose form, such as rock wool, may be employed if desired. In the form illustrated in Fig. 5 hereof, the insulating material constitutes cotton fibers adhered in any desired thickness in a blanket to the upper face of the backer sheet 30 so as to form a unit therewith. Where such material is employed, it is compressed at the portions engaging the bottom surfaces of the joists or frame members, as best illustrated in Fig. 5. A marginal seal 32 is secured to the bottom of the floor unit extending continuously therearound to provide a bearing surface adapted to rest upon and be secured to a sill member 33 carried by the foundation 17.

As best illustrated in Fig. 7, the floor unit 18 carries electric and plumbing service lines or conduits. The plumbing unit includes a stack fitting 35 with which the conventional vent 36, as seen in Fig. 2, is connected to project upwardly, and which is adapted for connection with a sewer conduit or a conduit or pipe leading to a septic tank. A conduit 37 branches from the stack fitting 35 and has connection with a closet bend 38. The stack fitting 35 has a lateral outlet 39 adapted for connection through a reducing coupling with an elongated conduit assembly 40 which terminates in an elbow 41 positioned remote from the stack fitting 35. The stack fitting 35 has another outlet 42 connected through a reducer with a conduit assembly 43 preferably bent as illustrated in Fig. 7. The conduit 43 leads to and is connected with a drum trap 44 from whose lower end projects a conduit 45 leading to an overflow fitting 46 and a drain fitting 47. The parts 35–47, inclusive, are preferably formed of copper tubing or, in the case of the trap or other fittings, are adapted for connection with copper tubing, and these parts preferably are joined together as a unit prefabricated in a jig to insure the proper shape and relative position and location of each and every one of the parts.

The conduit portion 43 extends through an aperture in one of the joists and this, together with the unions (not shown) by means of which the parts 35, 38, 41, 46 and 47 are connected to the respective utilities, such as the stack 36, the water closet 48, the lavatory 49 and the bathtub 50, respectively, serve to position this conduit assembly relative to the floor unit 18. Thus it will be observed that the elbows or fittings 38, 41, 46 and 47, the trap 44 and the fitting 35 extend upwardly through the floor panel 27. The drain line connected with the fitting 35, which connects to the sewer or septic tank, extends through an opening in the backer board and the insulation.

A boxlike structure 51 is secured to one of the joists, preferably adjacent to the stack 35, as shown in Fig. 7. This structure outlines openings formed in the floor panel 27 and the backer sheet insulation 30, 31, which floor panels and backer sheet are anchored at the box structure to define an opening extending continuously through the floor panel. A conduit 52 extends through the opening defined by the boxlike structure 51, the lower end thereof being adapted for connection with a cold water line (not shown) leading from the building 10 and having a valve 53 interposed therein. The conduit 52 has connection with a substantially horizontal conduit 54 which leads to a fitting or elbow 55 for connection with the water closet or stool 48. A T-fitting 56 is interposed in the conduit 54 and has connected thereto an elongated conduit 57 which extends to an elbow 58 connected with the lavatory 49. The conduit 52 may have a portion connected to the bathtub 50. The parts 52—58 preferably are formed of copper tubing preassembled or fabricated, as by the use of jigs, to insure proper positioning and shaping thereof, and the line with which the same are connected will be a cold water line. A hot water supply line having a valve 59 interposed therein has connection through a T-fitting 60 with a conduit 61 mounting an elbow 62 adapted to be connected with the bathtub 50. The T-fitting 60 also has connected thereto an elongated conduit 63 connected by an elbow 64 with the lavatory 49. The conduit sys-

tem 59—64 constitutes a prefabricated and preassembled unit bent to desired shape and form and is preferably formed of copper tubing or the like and constitutes the hot water line of the bathroom. The hot water and cold water conduit systems extend through openings in one or more of the joists, being positioned thereby and also by the unions which connect them to the respective bathroom fixtures. One of the joists 24, preferably adjacent and below the lavatory 49, has an electric outlet box 65 secured thereto. At one or more points openings 66 are formed in the joists 24 or in members 25 and serve to receive electrical conduits extending from said outlet box.

The inner panel or side wall 19 has a frame comprising a plurality of upright studs 70 interconnected by top and bottom horizontal structure members, such as shoe plate 71 and the head plate securely nailed together. This frame may include at the door opening a header unit (not shown) and may also include intermediate horizontal brace members (not shown), for example, brace members serving as means to mount an outlet or switch box 72 to which an electric line (not shown) extends from one of the apertures 66 of the floor, the same also passing through an opening in the shoe plate 71.

The inner face of the frame comprising the members 70, 71 is spanned by a rigid panel or sheet member 73, such as plywood or composition board, which preferably is both nailed and cemented or glued to the framework at the inner face thereof. The inner panel 19 thus constitutes a shell lined at its inner surfaces only with its outermost surface intended to face the building to which the prefabricated unit is to be attached. The panel 19 will be secured to the floor panel 18 by nailing, for which purpose the shoe plate 71 bears flat upon the inner margin of the panel 27 constituting the top surface of the floor panel unit.

Each of the wall panels 20, 21 and 22 constitutes a unit having upright studs 75, top and bottom structural members interconnecting said studs, such as the sole plate 76 and a header plate (not shown). Each unit also has an inner panel 77 and an outer panel 78 secured thereto, preferably by nailing and cementing. The outer panel will preferably comprise plywood, and the inner panel will preferably comprise composition board or plywood. Where necessary to extend to a light fixture, such as the light fixture 79 shown above the lavatory 49, electrical conduits 80 may pass between the inner and outer panels 77, 78.

Each of these panel units 20, 21, 22 has insulation material incorporated therein. The insulation material may be in any form desired, such as batt form, blanket form, panel form or loose particles, and will be so arranged as to substantially fill the space between the panels 77, 78, which normally will be in the order of approximately two inches. In one or more of the panels, for example, the panel 22, a window unit 81 may be mounted, and in certain units, such as walls 21 and 22, the inner panel 77 may be interrupted, as best illustrated in Fig. 2, for purposes to be described. These panels 20, 21 and 22 are nailed to the floor panel 18 and to each other to provide a rigid and sturdy construction. Each is fully insulated, is of light weight and derives strength from its "stress skin" construction resulting from the continuous cementing or gluing of solid panels to the opposite faces of the frame structure. A certain amount of strength and rigidity of this unit is derived additionally from the conventional lapped siding members 82 which are nailed to the outer sheathing panel 78.

The roof or ceiling structure comprises a plurality of rafters 85 secured at their opposite ends to header or frame members 86, which rafters are preferably slightly tapered along their length and which may also be notched at one or more points, as illustrated at 87. To these rafters and headers are secured, as by nailing and cementing, an outer panel 88, such as a plywood panel, and an inner panel 89, such as composition board panel, said inner panel preferably being interrupted by an opening 90 adjacent one corner thereof. A layer of insulation material 91 spans the ceiling panel, partially filling the interior space thereof, said insulation material being of any type found suitable, such as blanket material, loose particles, web material or rigid panel material.

The weather surface of the roof is provided by a metal sheet or panel 92 which completely spans the plywood panel 88 and is down-turned at 93 at three marginal edges thereof and upturned at 94 at a fourth edge thereof adapted to abut the building wall 10. The panel portion 94 underlies the lowermost siding 15 upon the wall and thus provides a continuous watertight joint or seal, as best shown in Fig. 4. The roof panel 23 is nailed or otherwise fixedly secured to the wall panels 19, 20, 21 and 22.

As best shown in Figs. 2, 3 and 4, the siding 15 upon the wall 10 is removed on a portion of the wall slightly larger than that to be abutted by the prefabricated structure, and vertical frame members 95 are secured to the sheathing 14 of the wall 10, as by nailing, with their outer edges substantially flush with the outer edges of the prefabricated structure. Horizontal frame members, such as the members 96, are secured to the wall sheathing 14 across the top and bottom of the prefabricated structure and the inner wall panel 19, and the inner edges of the wall panels 20, 21 bear against said spacer members 95 and 96, as shown, and are secured thereto. In the event the foundation 17 is not level or horizontal, a gap may occur between the prefabricated building and these spacers 95 and 96. Any such gap which occurs is spanned by the side trim panels 97 at the upright joints and by the sheet metal panel 92, 94, as seen in Fig. 4, at the roof. Vertical trim strips 98 are then interposed between the trim strips 97 and the edges of the cut siding 15 and complete the structure. Thus an effective seal between the prefabricated building structure and the building to which it is attached is secured.

The building wall 10 will have an opening cut therein, as seen in Figs. 2 and 6, reinforced by studs, headers or other frame members 99 and lined by trim members 100 which are of a width or thickness to extend across, not only the thickness of the building wall 10, but also to the inner face of the wall panel 19, as seen in Fig. 6. Trim members 101 will be secured to the inner wall panel 13, to the wall panel 73, and to the edges of the trim member 100 to trim the door opening at its side and top, and a sill plate 102 will be provided to span the structure at its base. A door 103 will preferably be carried by the inner wall panel 19, being suitably hinged thereto and of any suitable construction.

In the preferred form of the invention as illustrated in Fig. 2, a panel 105 and a second panel 106 will be mounted in the structure at a corner thereof to define a stack space 107 giv-

ing access to the bent conduit 36 and to certain parts of the plumbing, such as the trap 44 and the valves 53 and 59. Each of these panels 105 and 106 is prefabricated from vertical studs and marginal horizontal frame members and has an inner panel 108 secured thereto, preferably by nailing and gluing. These panels are secured to each other and to the side panels 21 and 22 and the floor panel 18 and the ceiling panel or roof panel 23.

One of these panels, here shown as panel 106, has an opening 109 therethrough opening into a space defined by vertical walls 110 for supporting shelves 111. The opening 109 may be closed throughout all or a part thereof by one or more panels (not shown) and, in the preferred form, at least the lower part of the opening will be closed by a separate panel (not shown), which constitutes an access panel below the shelves 111, by means of which access can be had to the plumbing conduits as mentioned above.

The structure is commonly formed as a unit having the electrical and plumbing service lines and conduits extending therein and having the fixtures 48, 49 and 50 mechanically secured in proper position and connected with the plumbing fixtures and the electric fixtures, such as the light fixture 79 connected with the wiring system. The unit is strong and of comparatively light weight, and can be transported from point of manufacture to point of use and there installed easily and rapidly as a unit. When the structure has been installed as described, the connection of the plumbing lines and of the electrical conduit place the unit in condition for service.

The stack member 107 may be of other forms and shapes than here shown and, if desired, may have portions of the electric service lines and certain of the plumbing lines, such as sewer lines, connected therein and extending therethrough at a level above the level of the floor. In such cases access to the construction may be had through openings accessible either through the stack wall as at 109 or through an outer wall. In cases where the outer wall has an access opening and the water lines are positioned within the stack above floor level rather than within the floor as illustrated in Fig. 7, suitable insulation must be provided to insure against freezing of water lines in cold weather.

While the invention is primarily intended for use to apply an additional room to an existing building at the exterior of the latter building, it is also possible to use the invention for the purpose of incorporating a bathroom within the confines of an existing building. For this purpose the floor panel or unit 18 only is utilized, and the construction shown in Fig. 8 may be utilized for installing the unit 18.

As best shown in Fig. 8, the floor joists 120 and the flooring 121 of the existing building have an opening cut therein of the size of the panel 18, and the flooring is then reinforced by bracing members or joists 122 secured around the margin of the opening. The unit 18 is then inserted into this opening with its sill 32 resting upon the sill 123 at the top of the building foundation 11. The marginal joists and frame members 24, 25 are then nailed at closely spaced points to the outer floor joist 124 of the building and to the marginal reinforcing joists or members 122, as by spikes or nails 125. It will be understood that the floor panel will be substantially of the construction illustrated in Fig. 7, having all of the plumbing fixtures mounted therein. In this instance, however, it must be necessary that the floor panel be provided with either the backer panel 30 or the insulation 31. Likewise the box structure 51 of Fig. 7 and the access opening therethrough may be omitted, and, in place thereof, the conduits may pass through openings cut in the floor panel 27. Likewise it will be apparent that the notched construction 28 at one edge of the floor panel, illustrated in Fig. 8, is not utilized, the only panel in this instance being continuous. The panel 18 thus forms within the confines of a previously erected building, the floor for a bathroom which may be walled in by other walls either prefabricated or built to fit at the location, as desired. The plumbing fixtures 40, 49 and 50 may be installed after the floor unit has been installed in place, as shown in Fig. 8.

While the preferred embodiment of the invention has been illustrated and described herein, it will be understood that changes may be made in the construction within the scope of the appended claims without departing from the spirit of the invention.

I claim:

1. A prefabricated building structure adapted to be attached to another building structure to form a part of the latter, comprising fixedly interconnected floor, wall and ceiling units, each of said units being preformed and including a rigid frame, at least one rigid surface panel secured to said frame and insulation material within and spanning said frame, and a pair of interior vertical walls cooperating with a pair of said first wall units at a corner of the structure to define a stack extending the height of said structure said floor and ceiling units being hollow and having apertures communicating with said stack.

2. A structure as defined in claim 1, wherein said ceiling unit includes an outer rigid surface panel and a metal panel superimposed on said first panel and bent downwardly therearound at three marginal edges and projecting outwardly from said first panel at the side adjacent said other building to be bent upwardly in engagement therewith.

3. A structure as defined in claim 1, wherein said ceiling unit includes an upper outer metal panel covering said unit and downturned therearound at three edges and projecting laterally and upwardly at a fourth margin to define a flashing element.

4. A structure as defined in claim 1, wherein said floor unit has a vapor barrier panel spanning its bottom, and said insulation constitutes a highly compressible fibrous insulation material coextensive with said barrier panel and interposed and compressed between said barrier panel and said floor unit frame.

5. A structure as defined in claim 1, wherein said floor unit has an upper panel and lower vapor barrier panel, and said upper panel has an opening communicating with said stack, said floor frame having air passages therein for air circulation therethrough.

6. A structure as defined in claim 1, wherein plumbing fixtures are secured to one or more units thereof, and a plurality of plumbing conduits solely carried by and extending through said floor unit and each connected to a fixture and including a connector portion projecting

downwardly from said floor unit and adapted for connection with a plumbing service conduit.

7. A structure as defined in claim 1, wherein a plumbing conduit unit is positioned within and solely supported by said floor unit, said conduit unit being preassembled and including connectors accessible at the top of floor unit and connectors accessible at the bottom of said floor unit.

8. A structure as defined in claim 1, wherein a preformed plumbing conduit unit is positioned within said floor unit and includes fittings accesssible at the top and bottom of said floor unit respectively, at least one fitting being located within said stack and the remaining fittings constituting connectors.

9. A structure as defined in claim 1, and means for connecting said building structures including attaching frame members secured to said other building and engaged by one wall unit at the margin of said wall unit, vertical facing members secured to said vertical attaching frame, members and each abutting the outer surface of a vertical marginal portion of a wall unit perpendicular to said first named wall unit, and

vertical facing members secured flat to said other building and engaging the inner marginal portions of the outer faces of said first named facing members.

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