

[54] **UTILITY MODULE FOR APARTMENT-
TYPE DWELLINGS**

[72] Inventor: **David Unger, Highland Park, Ill.**
[73] Assignee: **Midweco-Enterprise, Inc.**
[22] Filed: **Aug. 14, 1970**
[21] Appl. No.: **63,680**

[52] U.S. Cl.**52/34, 52/79, 52/125,
52/220, 52/236**
[51] Int. Cl.**E04b 5/48, E04c 1/39, E04f 17/08**
[58] Field of Search....**52/34, 79, 221, 220, 127, 125,
52/234, 236**

[56] **References Cited**

UNITED STATES PATENTS

3,457,848	7/1969	Pankow.....	52/221
2,037,895	4/1936	Gugler.....	52/221
3,143,744	8/1964	Greer.....	52/34 X

FOREIGN PATENTS OR APPLICATIONS

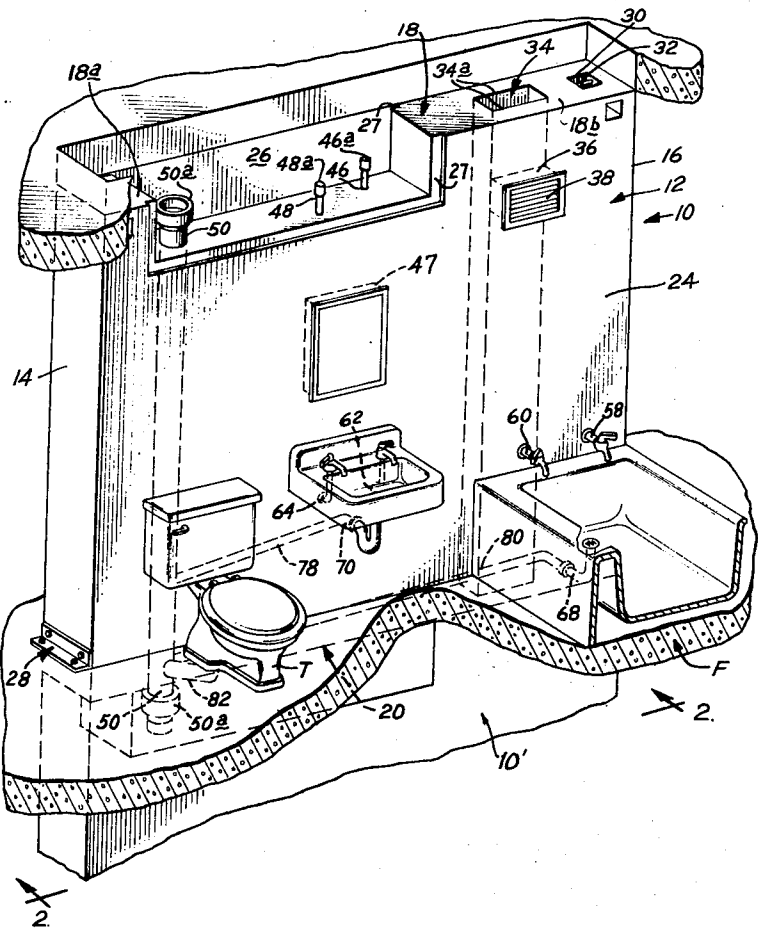
277,579 12/1951 Switzerland52/221

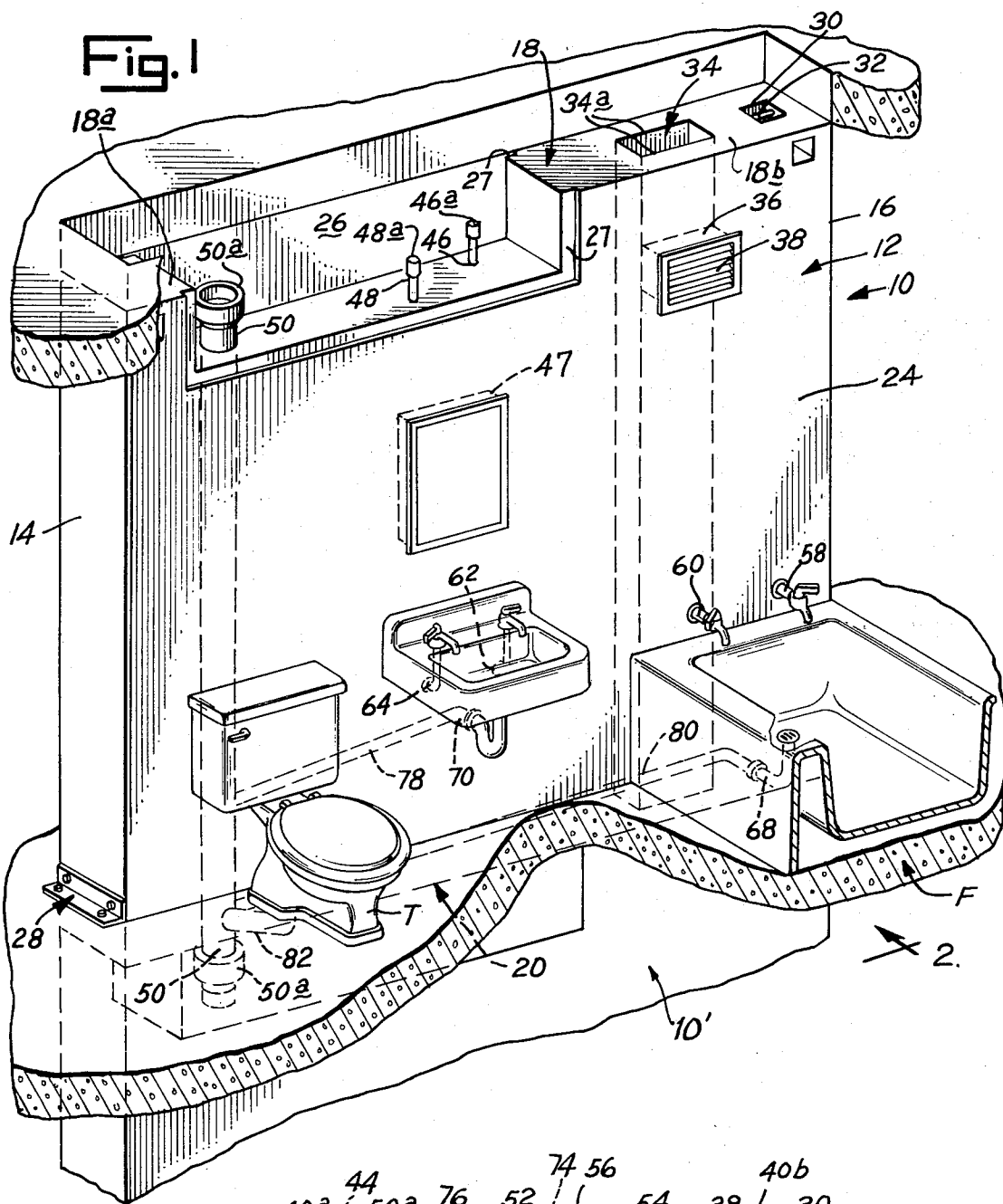
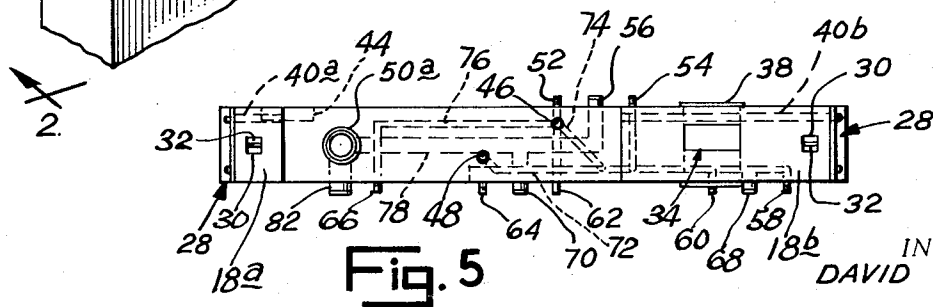
Primary Examiner—Price C. Faw, Jr.
Attorney—Lettvin and Gerstman

[57] **ABSTRACT**

A utilities-containing structural module for high-rise apartments is provided in which a precast concrete block is used to provide an insulated structural wall between the bathroom and kitchen of the apartment. Spaced risers are embedded in the concrete block for effecting continuous utilities communication between vertically arranged blocks, and the upper edge of each block defines a recess which is used as an access where connection may be made between the risers of vertically aligned modules. Laterally and transversely extending conduits are also embedded in the concrete block for operative connection to various room fixtures.

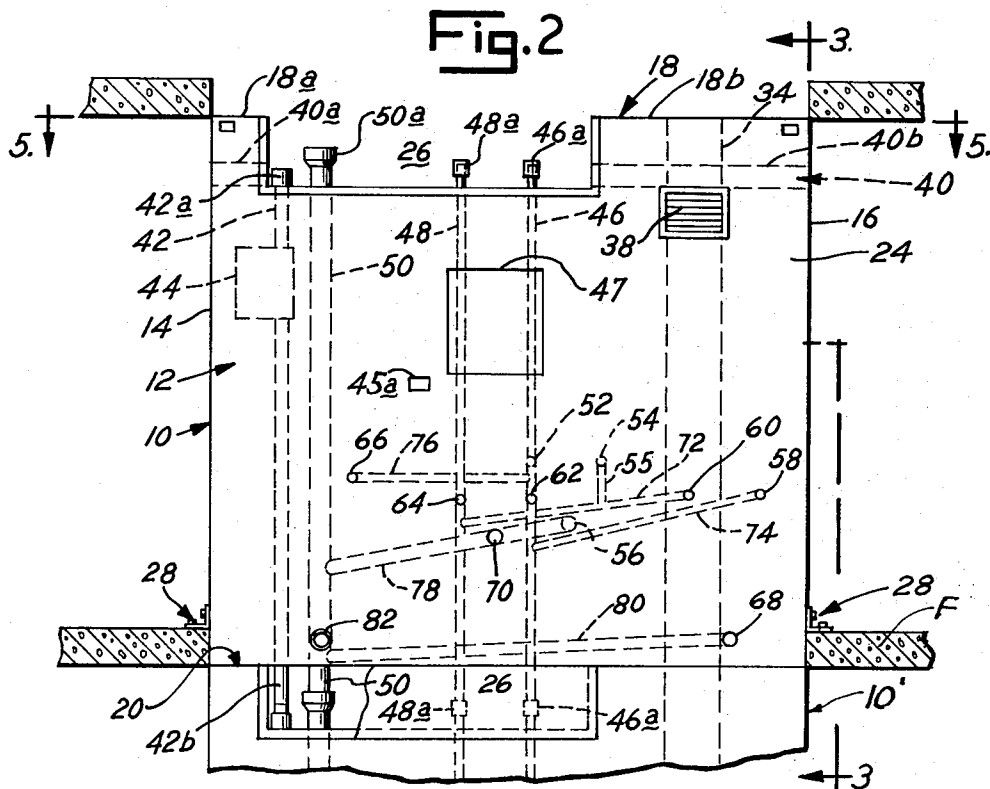
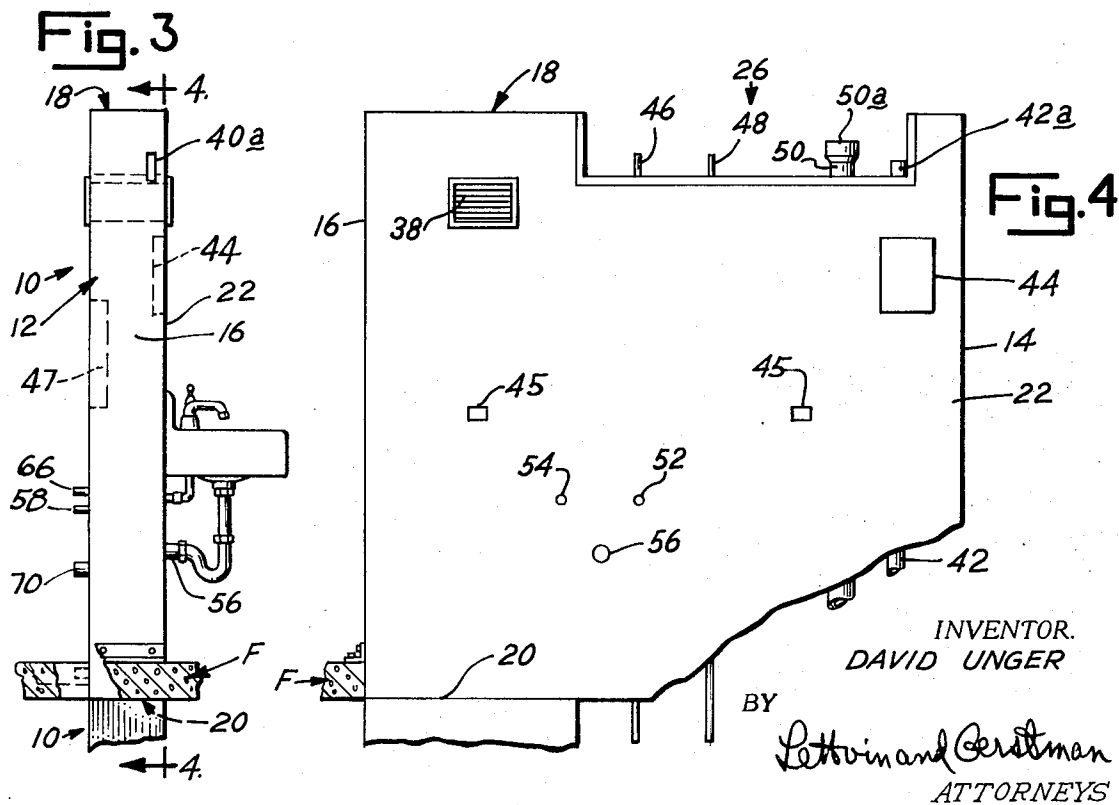
7 Claims, 5 Drawing Figures





INVENTOR.
DAVID UNGER

BY
Lehrman and Gerstman
ATTORNEYS



UTILITY MODULE FOR APARTMENT-TYPE DWELLINGS

FIELD OF THE INVENTION

This invention relates to precast construction elements for high-rise apartment buildings.

BACKGROUND OF THE INVENTION

In view of the greatly increasing cost of building high-rise apartments, many types of prefabricated building constructions have been proposed as cost-saving systems. Prefabricated structures have the general benefit of being at least partially constructed off the site, in an area where such construction can be handled more efficiently than at the building site. However, notwithstanding the off-site basic construction, many prior prefabricated structures still require a relatively large amount of assembly at the construction site, including the roughing in and connection of risers required for drain, ventilation, water, exhaust, electric service and natural gas. Such roughing in and connection is time consuming and detracts from the natural benefits of prefabricated construction.

In this invention, I propose that a cast concrete module for high-rise apartment buildings be produced containing within it the utility risers and other pipes so that after the module is prefabricated in an off-site area, it can be placed in the apartment building as the structure is being erected and the local journeymen would only have to do minimal work to connect the fixtures and appliances in place. It is apparent that the amount of field labor required in constructing an apartment building formed in accordance with my invention is materially reduced. Further, by utilizing modules which are precast inclusive with utility risers and other pipes, apartment building erection time is reduced.

Modules constructed in accordance with my invention can be connected to similar modules to effect continuous communication between the vertical risers of vertically arranged modules, and access for connection of the vertical risers of one module with the vertical risers of another module is simplified by my invention.

BRIEF DESCRIPTION OF THE INVENTION

In accordance with my invention, there is provided an upright precast structural block, preferably of concrete, that is substantially rectangular in elevational view. The block is of a thickness to provide the desired heat and sound insulation wall between the apartment's bathroom and kitchen that are separated by the wall. The upper and lower edges of the block are shaped to provide for bearing engagement of and support by a similar block.

A plurality of spaced, tubular conduits are embedded in the concrete block between the planes of the large rectangular sides for effecting continuous communication between vertically arranged blocks. Means within each block are provided for operative connection through each large side of the block, for connection on one side to bathroom plumbing appliances and for connection on the other side to kitchen plumbing appliances.

In the illustrative embodiment of the invention, the module includes a laterally elongated recess defined in the upper edge of the block between spaced bearing

portions of the block. At least three of the spaced tubular conduits extend vertically through the block within the vertically projected confines of the elongated recess, so as to provide upper conduit ends which terminate exposed from the concrete in the open recess space below the uppermost edge of the concrete block. Lower conduit ends in each module are spaced below the lower edge of the concrete block to enter the open recess space in the next lower adjacent concrete block. The lower conduit ends are adapted for connection to a mating end of a conduit in the lower adjacent block.

A more detailed explanation of the invention is provided in the following description and is illustrated in the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view of a vertical module constructed in accordance with the principles of the present inventions, and illustrates how one such module is positioned above another module;

FIG. 2 is a sectional elevational view thereof, taken substantially along line 2—2 of FIG. 1 and showing the side that bounds a bathroom area;

FIG. 3 is a sectional elevational view thereof, taken substantially along line 3—3 of FIG. 2 at one edge of the module;

FIG. 4 is a sectional elevational view thereof, taken substantially along the line 4—4 of FIG. 3 and showing the side of the module that bounds a kitchen area;

FIG. 5 is a top plan view of the module in reduced scale.

DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENT

Referring to FIG. 1, there is shown a construction module, generally 10, constructed in accord with this invention, located in position to have various plumbing appliances connected thereto and supported, in part, by a similar module 10' in edgewise alignment below the lower edge of the module 10.

The module 10 includes a monolithic block 12 having laterally spaced upright edges 14 and 16, a top edge 18, a bottom edge 20 and spaced planar sides 22 and 24 intended to serve as at least part of room walls. As shown in the figures, the top edge 18 has an elongated recess 26 depressed below the level of edge 18 and located spaced between the edges 14 and 16 to leave spaced bearing portions 18a and 18b of the top edge adapted to engage and firmly support the bottom edge 20 of a similar module. The edges of block 12 adjacent recess 26 may be pre-formed with a peripheral indentation or groove 27 for accommodating removable access-panels (not shown) that will lie flush with the planar sides 22 and 24. Typically, the depth of recess 26 is about 12 inches.

Each of the upright edges 14 and 16 carries thereon an angle bracket 28 of which one leg abuts and is secured to the edge and the other leg extends outwardly to provide a downwardly facing bearing face spaced above the level of the block's bottom edge 20. While this spacing is variable, depending upon the thickness of the floor selected for the building in which the module 10 is to be used, a typical spacing is 6 inches. The outwardly extending legs of the angle brackets are intended to bear upon adjacent floor

structure F that may be cast or the like, to effect at least partial support for the module 10.

A pair of spaced depressions or recesses 30 are provided in the top edge 18 spaced inwardly from the edges 14 and 16 and spaced equidistant between sides 22 and 24. Within depressions 30 at a level below top edge 18 are lifting hooks, or bales 32 which provide means for lifting the entire module 10 during assembly operations.

We turn now to the facilities that are included in the module 10. Initially it is noted that the module 10 is intended to provide services to a kitchen or a bathroom and preferably to both rooms. Thus, it is desirable to do the following: vent, or exhaust, air from the rooms; bring in fresh water and remove waste products; bring in electricity for energizing appliances used in such rooms.

To vent air from the rooms, the module 10 is provided with a vertical through duct 34 spaced centrally between sides 22 and 24 and extending through the entire height of block 12 between edges 18 and 20 so that the vent ducts of vertically aligned modules will be aligned. Each duct 34 communicates with transverse feeder stub-ducts 36 that open through sides 22 and 24. An appropriate entry grill 38 is provided at the junction of the stub-duct 36 and the respective sides 22 and 24. The size of duct 34 is selected so that the sides 34a thereof are spaced from sides 22 and 24 permitting location of one or more cross conduits in module 10 extending between upright edges 14 and 16.

A cross-passageway, or conduit-trough means 40 is provided as part of the electrical service in the module 10. More specifically, conduit-trough segments 40a and 40b extend cross-wise in module 10 substantially horizontally on a line between upright edges 14 and 16 and located between duct 34 and kitchen-side 22 of block 12. The conduit-trough segments 40a and 40b are located a relatively short distance below top edge 18 so that such segments each open at one end to the recess 26 in which space electrical connections between conduits may be effected by electricians both at the time of the installation and later during service calls. Since electrical service requires substantial interconnection with adjacent building units, while still providing for individualized control, the module 10 includes, as an additional portion of the electrical service, a vertical conduit, or duct, 42 which is of a length to have the upper end 42a enter recess 26 and to have its lower end 42b extend as a stub approximately of 6 inch length below bottom edge 20 of the block 12. The duct's upper end 42a is provided with a sleeve type connector adapted for connection to a stub of the next higher module 10. The duct 42 is preferably positioned substantially in the vertical plane of conduit-trough means 40 and is arranged to intersect or communicate with an enlarged recess 44 that opens through side 22. The recess 44 serves as a mounting for an electrical fuse box or circuit breaker cabinet. One or more recesses 45 in one or both sides 22 or 24, such as the ends of small through bores in block 12, are provided as a mounting space for an electrical convenience outlet, and electrical connections may be fished from box recess 44 to such convenience outlets through block 12 in a manner well known in the art. At least one recess 45a is provided on side 24 adjacent a central region

that is provided with a rectangular recess 47 adapted to receive therein a mirrored storage cabinet for medicine or the like.

Finally, plumbing facilities are also provided in module 10, and preferably the facilities provided are sufficient to accommodate at least a bathtub, sink, and toilet adjacent side 24, and at least a kitchen sink adjacent side 22. The plumbing facilities include three vertical through pipes, including pipe 46 serving as a cold water riser, pipe 48 serving as the hot water riser, and larger diameter pipe 50 serving as the waste stack and vent. The pipes are each of a length to have their lower ends extending as stubs of about 6 inch length, below bottom side 20 of the block 12. Appropriate coupling sleeves 46a and 48a serve to interconnect the aligned ends of risers. The upper end of stack pipe 50 is provided with a belled receptor 50a as is well known in the plumbing art.

A network of piping interconnecting the risers and stacks with studs opening through sides 22 and 24 is provided and preassembled prior to being embedded in block 12 that is cast therearound. Considering side 22 first, there is provided a cold-water stud 52, a hot water stud 54 to the left of stud 52, and a drain stud 56 substantially equidistant between studs 52 and 54 and below the level of said inlet studs. The studs 52 and 54 respectively are for supply of water to a kitchen-type sink, and drain stud 56 is of typical size for receiving discharge from a sink and/or dishwasher, etc.

On side 24 there are the following studs: tub cold-water 58, tub hot-water 60, sink cold-water 62, sink hot-water 64, toilet tank supply (cold) 66, tub drain 68, and sink drain 70.

As shown, kitchen cold-water stud 52 and bathroom sink cold-water stud 62 are respectively teed off directly from riser 46 in opposite directions with stud 52 higher than stud 62. Sink hot-water stud 64 similarly is connected directly to riser 48. However, an upwardly inclined branch 72 from hot-water riser 48 extends to locations to serve as supply to hot-water stud 54 through short vertical riser 55 and to supply tub hot-water stud 60. An inclined cold-water branch 74, parallel to branch 72 but offset from same, supplies tub cold-water 58. Another cold-water branch 76, substantially horizontal, runs from a level between studs 52 and 62 to supply toilet tank supply stud 66.

The waste connections 56 and 70 connect to an inclined drain pipe branch 78 that connects at its downstream end to stack 50 and runs substantially parallel to supply branches 72 and 74, with kitchen discharge 56 located higher than and upstream of bathroom drain 70 to help avoid undesirable back up of bathroom waste to the kitchen sink region, although the presence of traps primarily serves such a purpose. Another drain pipe branch 80, at a lesser slope than drain pipe 78, connects tub outlet 68 to stack 50. Since tub outlet 78 is close to the floor level, the 6 inch spacing between floor level and bottom edge 20 provides sufficient room for the slope to permit all of drain pipe 80 to be embedded in block 12 with pipe 80 connecting to stack 50 closely adjacent to edge 20. Finally, the discharge from a toilet T is arranged to directly enter stack 50 through a lateral stud 82 which opens through side 24 and connects, substantially within the thickness of the floor, to stack 50 just above the connection of drain pipe 80.

In order to provide the network of pipes in the block-like module 10 without interference therebetween, the waste stack and vent riser 50 and the inclined drain branch 70 are located spaced centrally between planar sides 22 and 24, and risers 46 and 48 are located in planes spaced from each other toward walls 24 and 22 to accommodate drain branch 70 passing therebetween. In this way the lateral branches 72 and 74 are also located offset from the vertical plane through drain branch 70 and toward wall 24 to thereby avoid interference with the drain 70.

From what has been disclosed it will be understood how the various tubes, pipes and conduits may be sub-assembled in frames, or on jigs, before being embedded in a block 12 that is cast therearound. The material of block 12 is preferred to be a concrete type material although various filler materials may also be used to reduce the total weight of the module without substantially affecting the structural strength of the module.

Although an illustrative embodiment of the invention has been shown and described, it is to be understood that various substitutions and modifications may be made by those skilled in the art without departing from the spirit and scope of the present invention.

What is claimed is:

1. A construction module for high-rise apartments comprising, in combination: an upright, substantially rectangular in elevational view, monolithic block of a thickness to provide an insulation wall between the apartment's bathroom and kitchen that are separated by said wall; the upper and lower edges of the block being shaped to provide for bearing engagement of and support by a similar block; a plurality of spaced, tubular conduits embedded in the block between the rectangular sides for effecting continuous communication between vertically arranged blocks; means within each block adapted for operative connection on one side of the block with a toilet, wash basin and bath appliance and drains from each appliance, and on the other side of the block for operative connection with a kitchen sink and the drain therefrom; a single laterally elongated open recess defined in the upper edge of the block between spaced bearing portions, at least three of the spaced tubular conduits extending vertically through the block within the vertically projected confines of the elongated open recess, so as to provide for each of said tubular conduits an upper conduit end which terminates exposed from the material of the block in the open recess space below the uppermost

edge of the block and a lower conduit end exposed and spaced below the lower edge of the block and entering the open recess space in the next lower adjacent block adapted for connection to a mating end of a conduit in the adjacent block; and means provided in the block opening through opposite sides of the block for venting both rooms for which the block serves as a wall.

2. A module as in claim 1 including a pair of conduits in the block extending transversely to each other and adapted for passage of electrical service elements therethrough.

3. A module as in claim 1 including a support clip secured at each upright edge of the block at a level spaced above the lower edge of the block and adapted for securement substantially at the level of the floor for the apartment in which the module is to be used.

4. A module as in claim 1 including a pair of symmetrically spaced lifting bales embedded in the block, and positioned in recesses defined in the upper surface of the block so that the lifting bales do not interfere with the vertical bearing engagement between adjacent blocks.

5. A module as in claim 1 wherein one of the tubular conduits is a vertically extending drain-and-vent riser located substantially equidistant between the upright rectangular sides of the block, two inclined drain conduits, one for the bath appliance, the other for both the wash basin and kitchen sink, embedded in the block in the plane of the drain riser, the connection of the kitchen sink drain being at a height above the connection of the wash basin drain to the common inclined drain conduit, and two additional tubular conduits being vertically extending risers for hot and cold water and being located on opposite sides of the vertical plane in which the two inclined drain conduits are located.

6. A device as in claim 5 wherein the hot and cold water risers supply water to outlets extending transversely outwardly of the rectangular sides of the block through inclined feeder conduits that are embedded in the block at an attitude substantially parallel to the common inclined drain conduit.

7. A device as in claim 5 wherein a vertical exhaust riser is provided extending through the block substantially centrally of the spaced rectangular sides of the block, and cross conduit means communicating the exhaust riser with the two rooms for which the block is a common wall.

* * * * *

50

55

60

65