

June 8, 1971

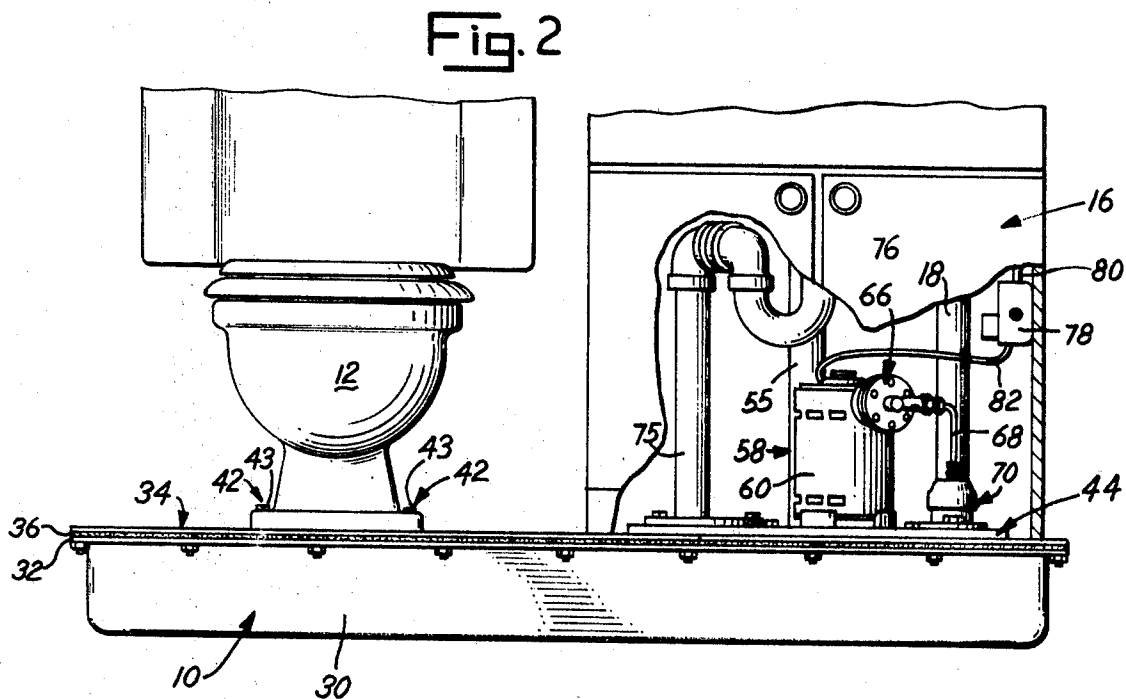
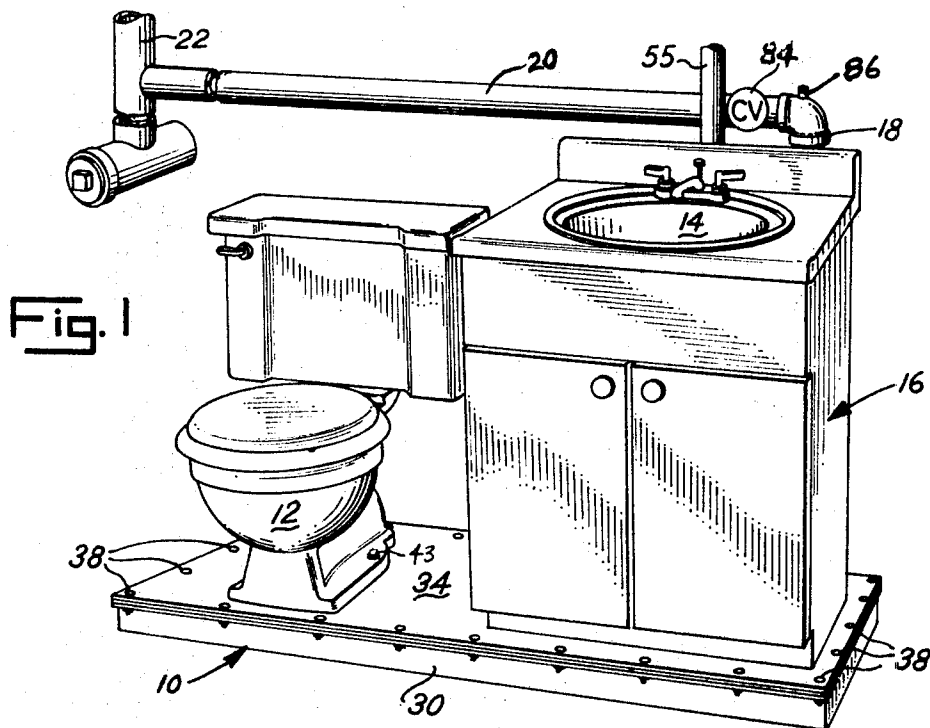
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3,582,995

PREFABRICATED TOILET AND VANITY SUMP ARRANGEMENT

Filed May 26, 1969

3 Sheets-Sheet 1



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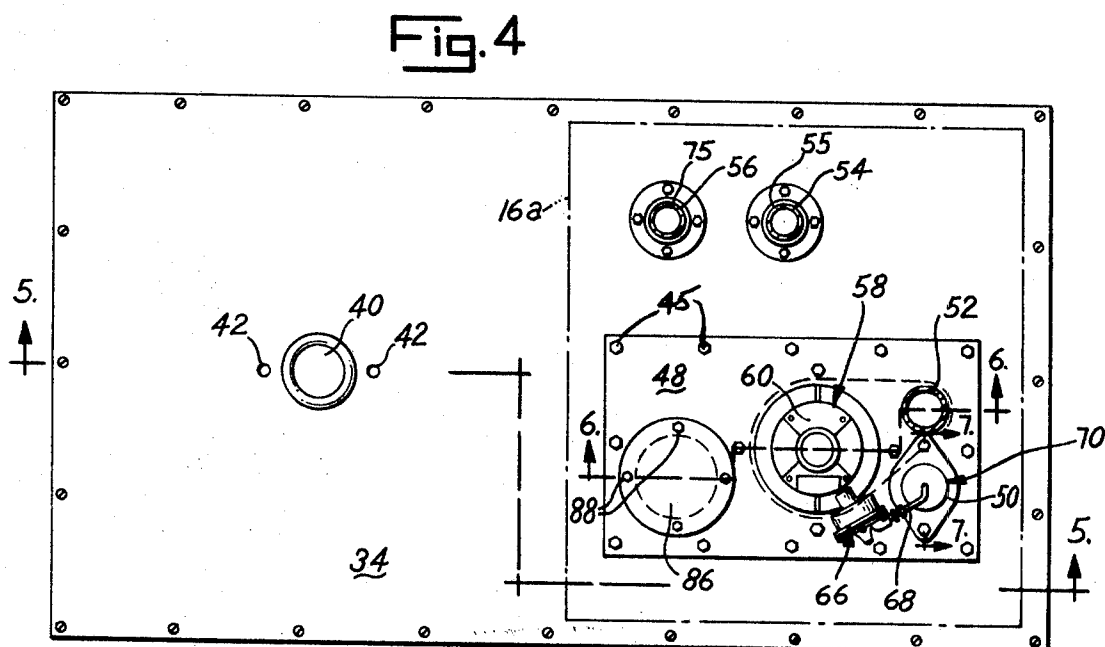
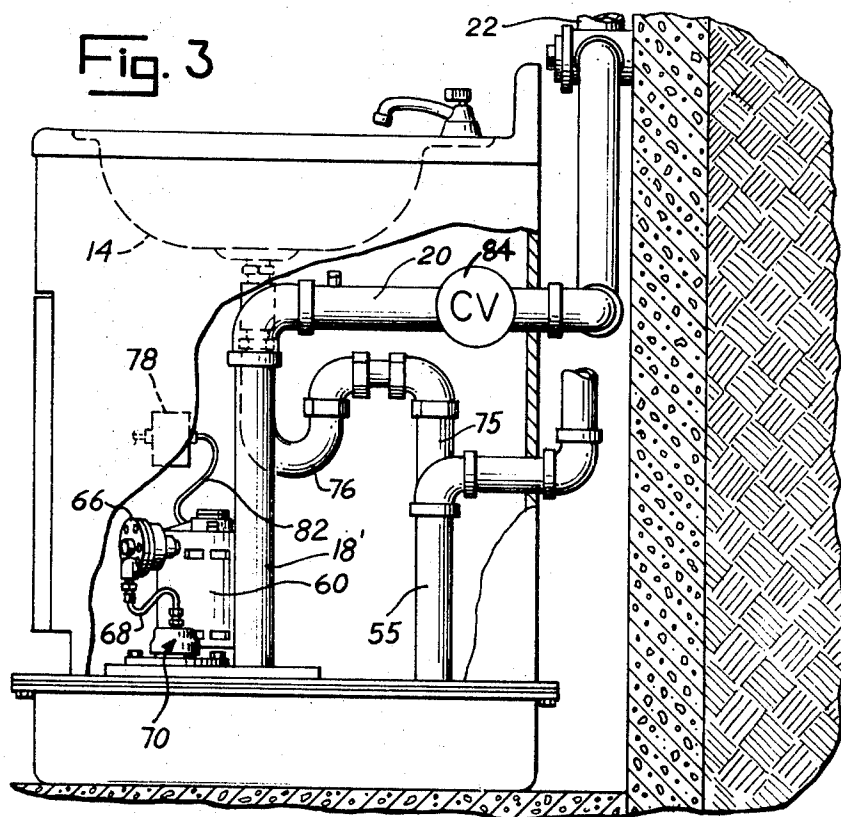
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PREFABRICATED TOILET AND VANITY SUMP ARRANGEMENT

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3 Sheets-Sheet 2



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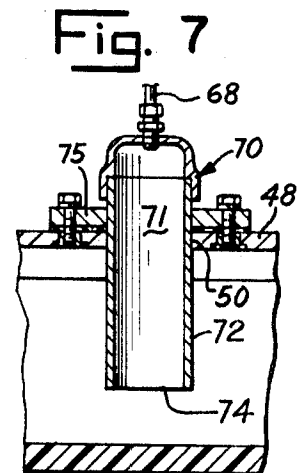
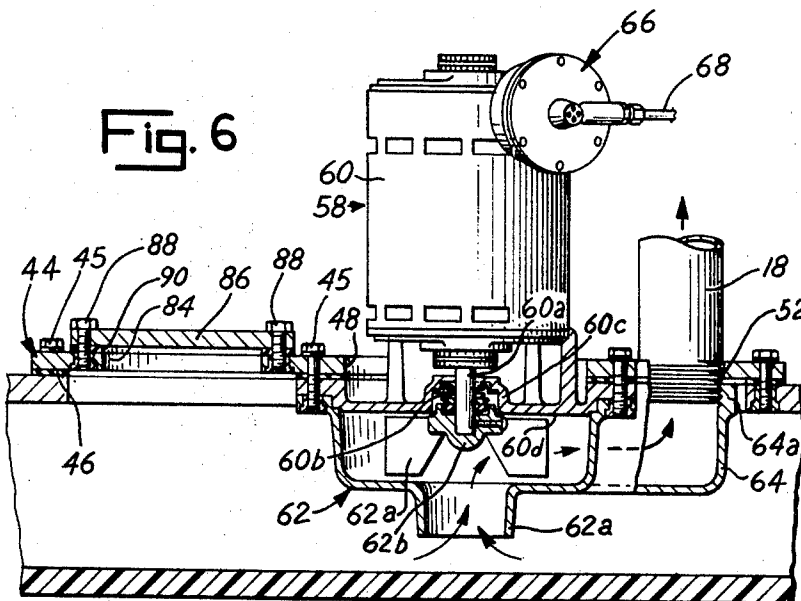
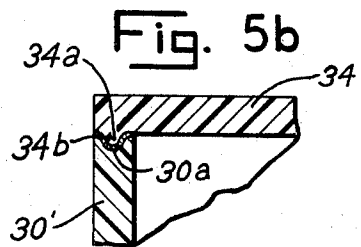
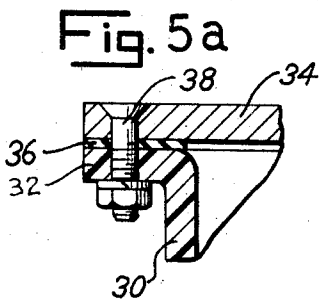
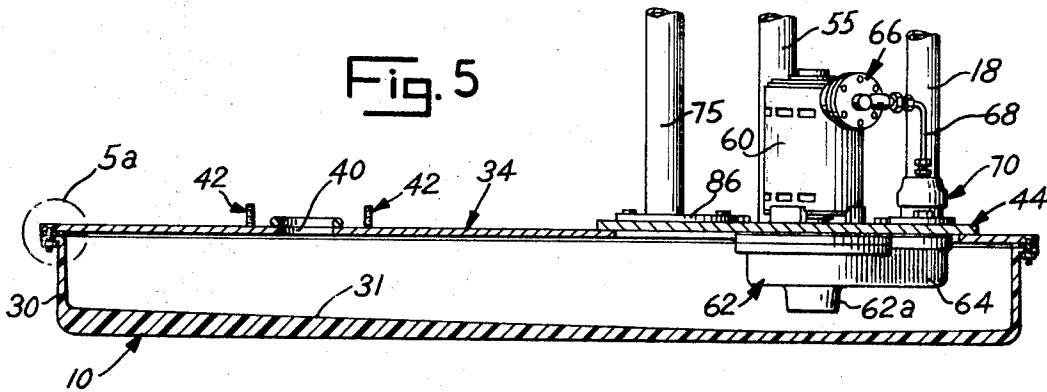
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PREFABRICATED TOILET AND VANITY SUMP ARRANGEMENT

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3 Sheets-Sheet 3



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3,582,995

PREFABRICATED TOILET AND VANITY SUMP ARRANGEMENT

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5 Claims

ABSTRACT OF THE DISCLOSURE

A prefabricated assemblage for facilitating installation of toilet facilities without major structural changes in existing structures is provided by a box-like receiving basin and cover therefor to serve as a lightweight, rigidified sump with a first means on the cover for attaching a toilet thereto and a group of apertures on the cover providing for venting, discharging, and receiving waste and for mounting a sewage ejector pump that voids at intervals the receiving basin when triggered by a control responsive to the level of waste liquid in the basin. The basic is preferably a molded shell of corrosion-resistant plastic. The various pipe connections to the basin are conveniently shielded by a cabinet-like support for a sink to provide an aesthetic installation. The assemblage is usable at any level or location in a home without major structural change, and regardless of whether the waste stack is located above or below the level of installation of the assemblage.

BACKGROUND OF THE INVENTION

The remodeling of pre-existing building structures for the purpose of adding toilet facilities at locations not originally contemplated is a relatively expensive project, as can be attested to by any homeowner who has wanted to install an additional toilet at a location spaced from the waste stack or at a basement location that is at a level below the lowest extent of the existing waste stack.

It has heretofore been suggested in Pats. 2,131,124 and 3,005,205 to pre-assemble a bathroom facility, or to provide a box-like sewage receptacle in Pat. 3,183,525 for use in fallout shelters. Pat. 2,676,666 disclosed the type of digging-out below the floor of a basement that is required where a basement toilet installation is desired. Any remodeling must also meet fairly rigid and complex building code requirements that are intended to prevent improper or health-endangering installations.

One object of this invention is to provide a prefabricated, standardized assemblage that facilitates installation of a new or additional toilet in pre-existing building structures at locations not originally contemplated, and which assemblage meets typical building code requirements and is, at the same time, less expensive and/or complex to install than achieved by existing remodeling techniques.

Another object is to provide a prefabricated assemblage for additional toilet installations whose usage results in a more rapid installation by existing plumbing techniques, thereby causing a less expensive installation that nevertheless is efficient and reliable in carrying out the intended purposes.

Further objects and advantages of this invention will become apparent as the following description proceeds and the features of novelty which characterize this invention will be pointed out with particularity in the claims annexed to and forming part of this specification.

A preferred embodiment of the invention is shown in the accompanying drawing.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a perspective view showing the prefabricated assemblage with a toilet and a sink mounted thereon as in a typical installation;

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FIG. 2 is a fragmentary, enlarged, front elevational view of the assemblage in FIG. 1, and with a portion of the cabinetry below the sink broken away to illustrate the motor of the ejector pump;

FIG. 3 is an enlarged, fragmentary, side elevational view looking from the right of FIG. 2, and with portions of the cabinetry broken away to illustrate the arrangement of elements;

FIG. 4 is a top plan view of the receiving basin of FIG. 2 with the toilet and sink removed and illustrating the assemblage prepared for having the plumbing connections made thereto;

FIG. 5 is a cross-sectional view taken substantially on line 5—5 of FIG. 4;

FIG. 5a is an enlarged, fragmentary cross-sectional detail taken in circle 5a of FIG. 5;

FIG. 5b is a view similar to FIG. 5a but illustrating a modified form of construction;

FIG. 6 is a fragmentary cross-sectional view taken substantially on line 6—6 of FIG. 4; and

FIG. 7 is a fragmentary cross-sectional view taken substantially on line 7—7 of FIG. 4.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring now to the drawings, FIG. 1 illustrates the prefabricated assemblage generally indicated at 10 upon which is mounted a toilet 12 and a sink 14 that is supported above a wooden or sheet metal cabinet 16 that extends between the surface of sink 14 and the upper portion of the prefabricated assemblage 10. As shown in FIG. 1, there is an upright pipe 18 extending from the assemblage 10 to a horizontal pipe 20. The horizontal pipe 20 leads to a vertically disposed waste stack 22 that is located remotely from the point where the assemblage 10 is being installed. As is well known, the waste stack 22 connects at its lower end to a horizontally extending section that leads outwardly of the building in which the waste stack is located.

Now, the prefabricated assemblage 10 is seen in the form of a relatively shallow box of rectangular cross section viewed in plan. Assemblage 10 may be located in any desired place in the building. It may be recessed into the floor or it may be positioned above the existing floor and then surrounded by false flooring that is built to a height corresponding with the horizontal top surface of the assemblage 10. In the form shown, the assemblage 10 has dimensions of approximately 54 inches in width, 24 inches in depth and it is 6 inches high.

Assemblage 10 includes a receiving basin 30 that is in the preferred form as of a molded shell of reinforced, corrosion-resistant polyester. Alternatively the shell could be of other plastic, or of cast iron or sheet metal. The reinforcement is usually in the form of fiberglass strands, and the shell has a completely open top. The side walls of the shell in the preferred form merge into an outwardly extending peripheral flange 32. The assemblage also includes a cover-plate means 34 that is of a dimension to completely overlie the open top of the shell and to overlie the peripheral flange 32. While the cover-plate means 34 may be in the form of a single sheet of wood or steel or other material, it may also be in the form of one or more plates secured together in any appropriate way. Gasket means 36 are provided between the cover-plate means 34 and the molded peripheral flange 32 so as to form a gas-and-liquid-tight chamber within the shell that serves as a sump. Simple bolt means 38, or other connecting devices such as screws, may be used to secure the peripheral flange 32 to the cover-plate means 34. The arrangement provides a relatively lightweight but rigid hollow structure.

In the modified form shown in FIG. 5b, the side wall of the shell 30' provided in the upper peripheral edge

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thereof with peripheral edge connecting means in the form of at least one continuous groove 30a. The cover-plate means 34' is provided with mating, or complementary rib means 34a for effecting a snug fit with groove 30a. A layer of water-and-gas-tight cement 34b, such as an epoxy, serves to rigidly connect shell 30' and cover-plate means 34' to provide a relatively lightweight, but rigid, hollow structure.

With regard to the cover-plate means 34, a portion thereof adjacent the left-hand end, as seen in the drawings, is provided with an opening 40 through which discharge from a toilet will enter the receiving basin. Attachment means 42 in the form of upright studs on plate means 34 or in the form of studs or bolts carried by the cover-plate means 34 are provided adjacent the opening 40, so as to provide for ready connection of a toilet thereto by cap nuts 43 as is well known in the art. The inner or top surface 31 of the base of the receiving basin shell 30 slopes downwardly from left to right as seen in FIG. 5, so that waste entering from the toilet 12 will gravitate to the right-hand end of the receiving basin 30.

Now, the cover-plate means 34 includes a sub-assembly plate 44 which is detachably secured to cover-plate 34 by bolts 45 with appropriate gasketing 46 to prevent gas or liquid leakage. The subassembly plate and apertures in plate 34 are generally clustered so as to be spaced together in generally closer relationship to each other than to the entry opening 40 for the toilet. Adjacent the right-hand end of the cover-plate means 34 there are, in sub-assembly plate 44, a large opening 48, a second opening 50, and a third opening 52. In plate 34 adjacent sub-assembly plate 44 there are provided a fourth opening 54 and a fifth opening 56 (see FIG. 4). The large opening 48 is adapted for connection with a sewage ejector pump 58 that includes a motor 60 and a sewage impeller 62. The motor 60 and impeller 62 are arranged in preassembled axially spaced relation to each other, and suitable gasketed mounting means are provided for attachment in the opening 48, so that the motor 60 is positioned generally above the cover-plate means 34, and the intake tube 62a of the sewage impeller 62 enters into the chamber surrounded by the receiving basin 30. A discharge passage, defined by housing 64, leads from impeller 62 to the opening 52 in the cover-plate means 34, as is illustrated by the arrows in FIG. 6. The opening 52 is the one through which a discharge pipe extends from the receiving basin 30 to appropriate discharge piping. As shown, there is upright discharge pipe 18 which leads through intermediate pipe runs, as required, to the waste stack 22. Preferably, the cover-plate means 34 or parts thereon are provided with threaded attachments which provide for ready connection thereto by piping and the like. In this instance, there is a threaded socket 64a as part of the housing 64 which is adapted for connection to the upright pipe 18 that leads eventually through horizontal pipe 20 to the waste stack 22. It will be understood that other equivalent plumbing connections may be employed.

A controller 66 is provided in operative association with the motor 60. The controller 66 is arranged to be actuated by a gas pressure sensed through a tube 68 which leads from a sensor 70. The sensor 70 is arranged to sense in space 71 the compression of gas by reason of the progressive filling of the receiving basin 30. For that end, the sensor 70 is provided with a downwardly extending tube 72 which in part defines space 71 and is preferably of a length to provide an opening 74 closely adjacent, about 1-1½ inches from the bottom 31 of the receiving basin shell 30 but above the lowermost extent of intake tube 62a. The sensor 70 has a flange 75 for mounting in the aperture 50 to provide a liquid-and-gas-tight seal thereat. The operation of the opening 74 of the sensor 70 is that as the liquid level rises, there is no gas trapped in the space 71 of tube 72 until the level of liquid is above the lower end of the tube, so that with additional liquid entering the basin 30, the gas that is trapped within space 71 above the lower open end 74 is compressed, and the

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compressed air or gas is transmitted through tube 68 to the controller 66 to turn the motor on. Once the motor is turned on, it continues to operate and discharges the accumulated material in the basin 30 until the level of liquid in the basin drops to a level below the opening 74 to the sensor 70.

With regard to the opening 56, that provides for connection to the drain pipe 75 that leads from trap 76 of sink 14 positioned thereabove. It will be readily understood that the use of the cabinet 16 provides a convenient means for shielding the motor 60 and the other openings 48-56, and also shields the trap 76 of the sink so that, when assembled, the installation looks very neat as seen in FIG. 1. In FIG. 4, the broken line 16a illustrates the general location of the upright walls of cabinet 16. The inner wall of cabinet 16 may have a fuse box 78 mounted thereon and interposed between an energizing electric cord 80 which is to be connected to an electrical outlet and the cord 82 that leads from the fuse box to the motor 60. It will be understood that the opening 54 is adapted for connection to a vent stack 55 that must be provided for installations of this type.

The sub-assembly plate 44 is also provided with an access opening 84 normally covered by a cover 86 that is secured together by removable connectors 88. A circumferential gasket 90 prevents gas or liquid leakage. The opening 84 is closely adjacent the intake tube 62a, so that if any large object, such as a hair brush, enters through toilet 12 and lodges against tube 62a, the cover 86 may be removed to permit of access through opening 84.

With respect to the motor-impeller unit, such construction is known in the art and needs no detailed description herein. Suffice it to say that motor 60 provides a drive shaft 60a extending downward through a packing, or gland 60b carried in recess 60c of separator plate 60d. Within the casing 62 is a radial bladed impeller 62a having a cap-type hub 62b secured on the end of drive shaft 60a.

With regard to the use of the assemblage, if the receiving basin 30 is located at a level above the lowest portion of the waste stack 22, then the waste-out aperture 52 may be appropriately connected through piping to conduit which runs therebelow and which leads to the waste stack. When the receiving basin 30 must be located in a basement or the like so that it may be at a level below the lowermost extent of the waste stack 22, then the upright pipe or vertical riser 18 must be used for connection to a horizontal pipe 20 that leads to the waste stack 22. In the horizontal pipe 20 there must be provided a check valve to prevent any back flow of waste into receiving basin 30. Such a check valve is illustrated at 84. The closing of the check valve 84 may cause a partial vacuum condition in the portions of pipe upstream of check valve 84, and in order to insure that there is no vacuum condition that continues to exist, a vent means 86 may be provided in the riser pipe 18.

While there has been shown and described a particular embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications may be made therein without departing from the invention and, therefore, it is intended in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a sanitary tank system utilizing a covered box defining a receiving basin of relatively elongated dimensions of length and width as compared to a shallow dimension of height between the box's support base and the box's cover plate means, the improvement of a pre-fabricated assembly for facilitating installation of toilet facilities in buildings where not originally provided for, said assembly comprising, in combination: a rigid cover-plate means for attachment solely to the periphery of the box and being of a size to overlie the elongated length and width of the box's receiving basin and of strength to provide a

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floor-like support and being the sole mounting for all entry to and exit from the receiving basin, said cover plate means providing a floor-like support for and surrounding a toilet and having an entry opening therein closer to one edge thereof through which discharge from a toilet will enter the receiving basin, attachment means on said cover-plate means adjacent said entry opening adapted to have a toilet secured thereto, a portion of the cover-plate means adjacent a distally spaced edge thereof providing thereon a plurality of apertures in generally closer spaced relation to each other than to said entry opening, a sewage ejector pump having motor and impeller portions, the pump being sealingly mounted on the cover-plate means with the impeller portion extending through one of said apertures in the cover-plate means into the receiving basin and with the motor extending above the cover-plate means, an on-off control operatively associated with the motor, level-responsive means operatively associated with the on-off control and having at least a portion thereof extending through a second of the apertures in the cover-plate means into the receiving basin for automatically determining when to actuate said control to an "on" position, conduit means from the impeller portion of the pump to a third aperture in the cover-plate means through which the receiving basin is to be evacuated by operation of the sewage ejector pump, a fourth aperture in the cover-plate means adapted for venting the receiving basin, and a fifth aperture in the cover-plate means adapted for accepting discharge of additional liquid into the receiving basin.

2. An assembly as in claim 1 in combination with a sink arranged in spaced relation above the cover-plate means and connected to discharge its waste into the receiving basin through the said fifth aperture, and upright hollow cabinet means for both supporting the sink above the cover-plate means and for substantially completely shielding said pump and said plurality of aperture means from view, to provide an attractive installation.

3. An assembly as in claim 1 wherein the conduit means from the impeller portion of the pump to the third aperture is carried below the cover-plate means in the receiving basin space.

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4. An assembly as in claim 1 in combination with a horizontal discharge-conduit spaced above the cover-plate means, a check valve in said horizontal discharge pipe, a riser conduit communicating from the third aperture to the horizontal discharge-conduit, and vent means operatively associated with the conduit portions upstream of the check valve to break any vacuum that may develop upstream of the check valve.

5. An assembly as in claim 1 wherein the "on-off" control is air-pressure actuated, and the level-responsive means operates to build up a control-operating pressure by compression of air in the receiving basin as the receiving basin is filled past a pre-selected level, said level-responsive means including a tubular part carried by the cover-plate means and extending downwardly thereof to a position spaced above the inner surface of the base of the receiving basin, and tube-aperture means in the tubular part opening at a level spaced between the bottom wall of the receiving basin and the cover-plate means to prevent operation to an "on" condition until the level of liquid in the receiving basin completely covers the tube-aperture means.

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