Jan. 28, 1958 W. B. DEAN ET AL 2,820,967

TOILET BOWL ASSEMBLY AND MOUNTING

Filed July 10, 1956 4 Sheets-Sheet 1

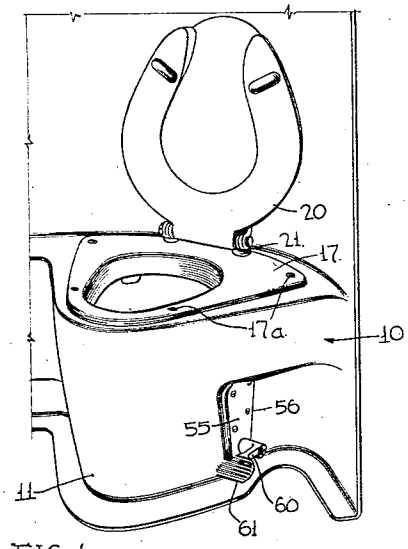

FIG. 1.

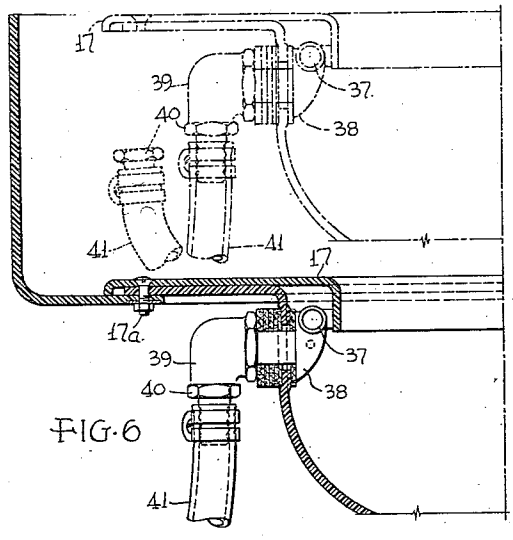

FIG. 6

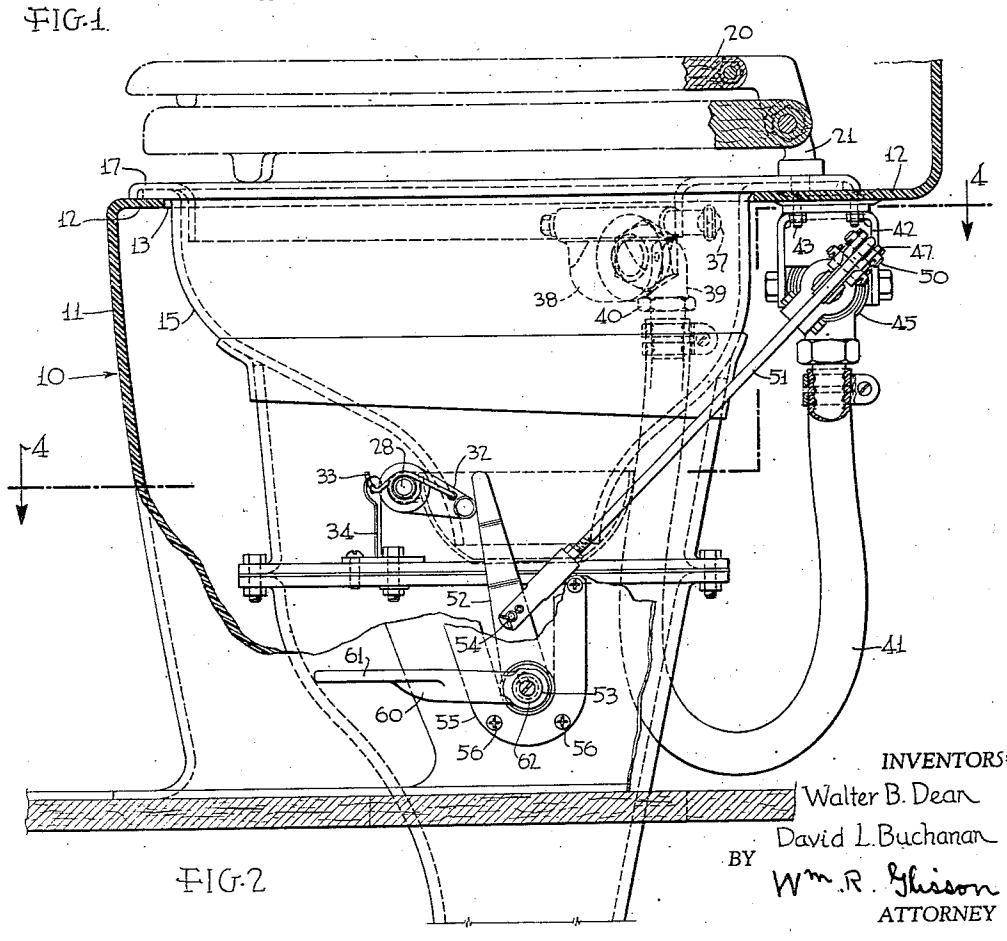

FIG. 2

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Filed July 10, 1956 4 Sheets-Sheet 2

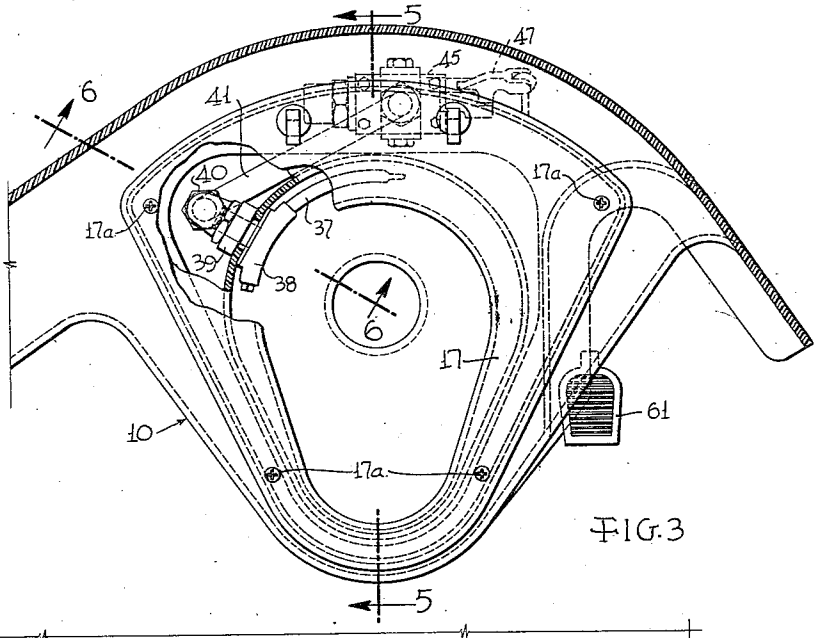

FIG. 3

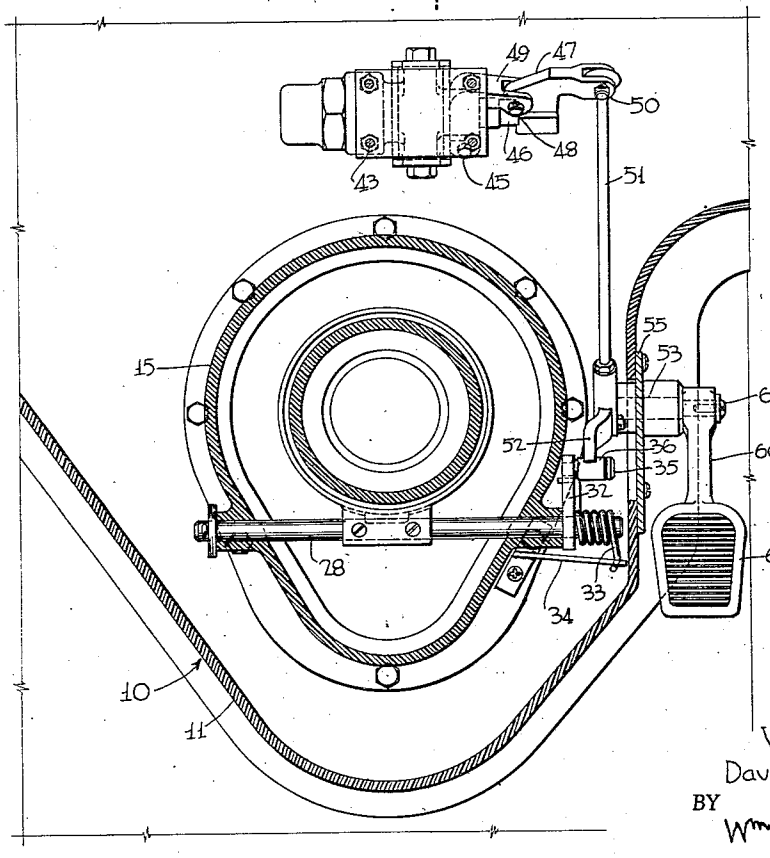

FIG. 4

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TOILET BOWL ASSEMBLY AND MOUNTING

Filed July 10, 1956 4 Sheets-Sheet 3

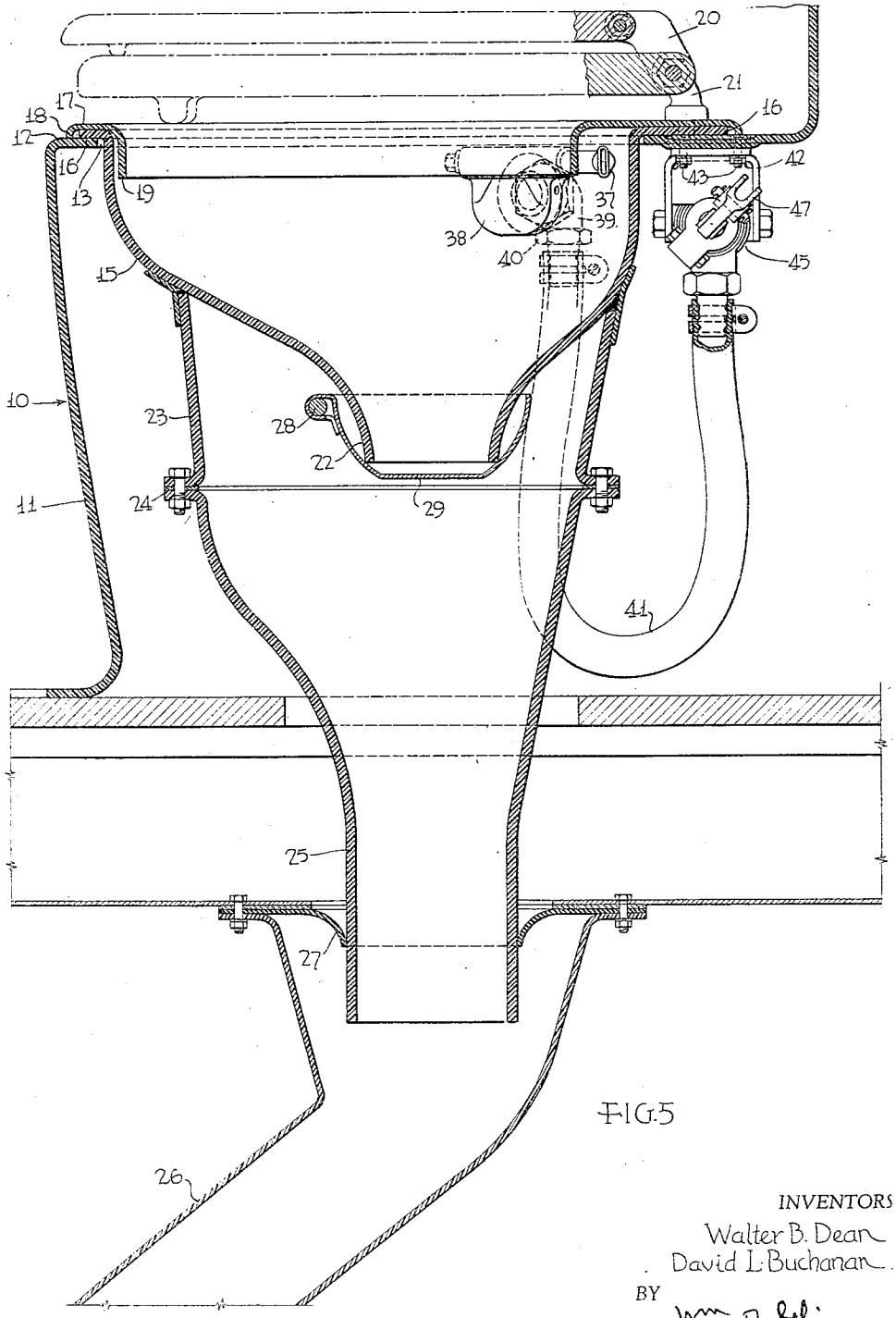

FIG. 5

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TOILET BOWL ASSEMBLY AND MOUNTING

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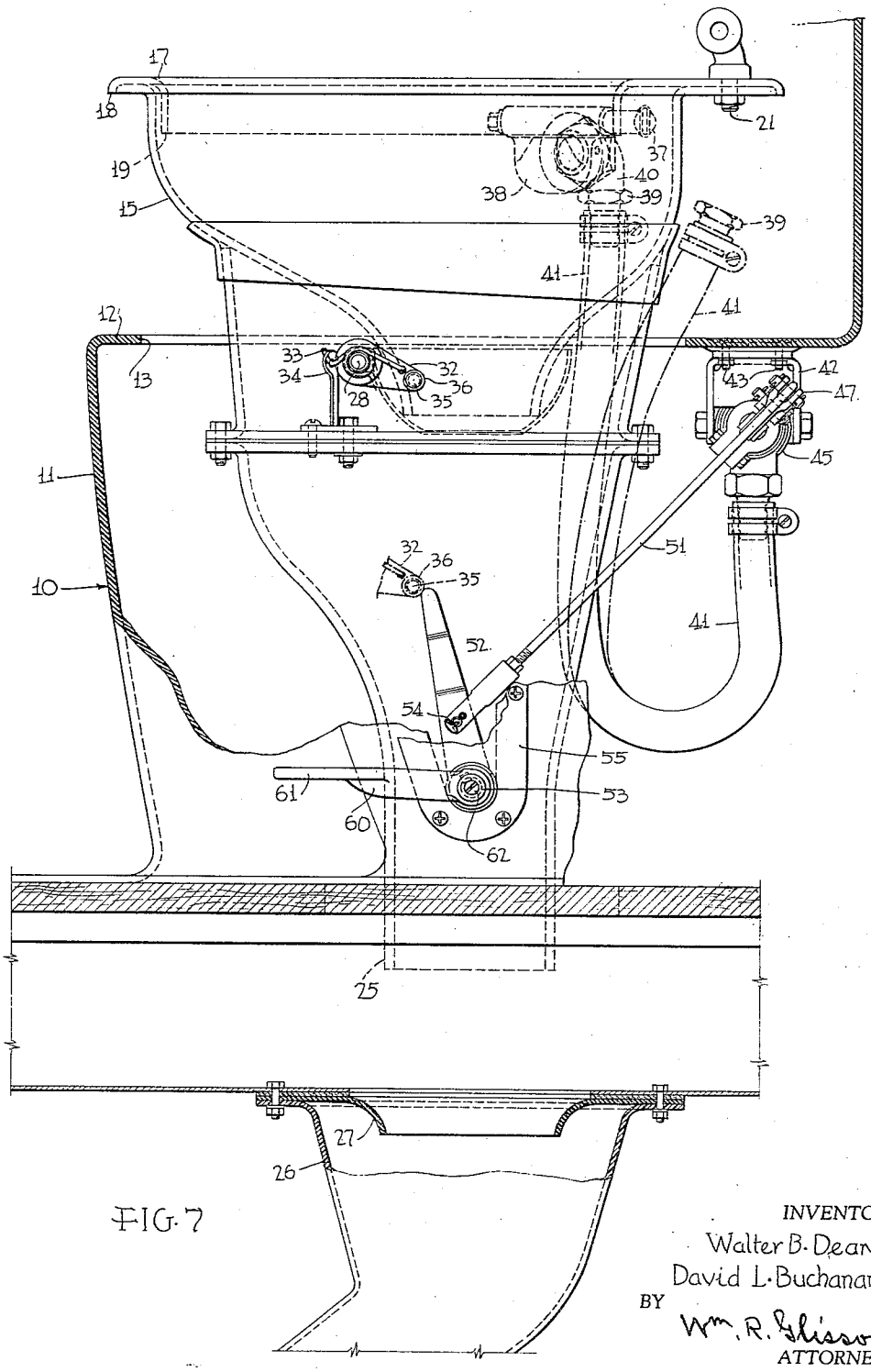

FIG. 7

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TOILET BOWL ASSEMBLY AND MOUNTING

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Application July 10, 1956, Serial No. 596,884

4 Claims. (Cl. 4—8)

This invention relates to a toilet bowl assembly and mounting, especially for railway passenger cars, and has for an object the provision of improvements in this art.

One of the particular objects of the invention is to provide a toilet bowl mounting which permits rapid and easy installation and removal of a toilet bowl.

Another object is to provide operating means on a fixed part for engagement and operation of parts on the toilet bowl without any maintained connection between them so that the interacting association is established merely by placing the toilet bowl in its position for use.

Another object is to provide an outlet tube seal which is established merely by bringing the bowl into its use position.

Another object is to provide a flexible water line connection for the bowl which can be coupled or uncoupled while the bowl is positioned above its assembly position, whereby the coupling can be easily operated.

Another object is to provide unitary operating means for a toilet flush valve and sealing pan, the arrangement being such that if the pan does not return to its normal position there will be no interference with the normal operation of the valve.

Another object is to provide a side opening and closure carrying operating parts, the closure being easily removable for inspection or repair of interior parts.

The above and other objects and advantages of the invention will be apparent from the following description of an exemplary embodiment, reference being made to the accompanying drawings thereof, wherein:

Fig. 1 is a perspective view in front elevation and plan of a toilet bowl assembly embodying the invention;

Fig. 2 is an enlarged side elevation with part of the housing cut away to show parts inside;

Fig. 3 is a top plan view with the seat and seat cover removed and part of the housing cut away to show parts inside;

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 2;

Fig. 5 is an enlarged vertical section taken on the line 5—5 of Fig. 3;

Fig. 6 is an enlarged partial vertical section taken on the line 6—6 of Fig. 3, the view in broken lines showing the parts being separated; and

Fig. 7 is a vertical elevation and section, partly like Fig. 2 and partly like Fig. 5, showing a toilet bowl being inserted or removed from the assembly.

As shown in the drawings, the toilet bowl assembly and mounting comprises a housing 10, which includes a side enclosure 11 and a top cover 12. Preferably the housing is a part of a larger integral form-shaped plastic unit made, for example, of fiber glass and a plastic binder and having various fittings molded in.

The housing is provided with a top opening 13 into which can be inserted a toilet bowl or hopper which is generally indicated by the numeral 15. This bowl also may be form-shaped of plastic and fiber glass. The bowl

has an outwardly extending top flange 16 which rests on the housing top cover.

A trim top 17, also of plastic and provided with a downturned outer flange 18 and a downturned inner flange 19, is secured over the top of the bowl. The usual seat and cover unit 20 is secured to the bowl flange 16 and trim top 17, as by bolts 21, and normally covers the opening therein. The top 17 may be sealed to the housing top by gaskets, caulking compound, or the like in the usual manner. Bolts 17a with nuts attached below the top cover 12 hold it to the housing cover.

The bowl has an inner funnel portion 22 and an outer cylindrical skirt 23 integrally secured thereto. The skirt is somewhat longer than the inner funnel portion and has connected to it at a sealed joint 24, as by suitable bolts, Fig. 5, a lower funnel-shaped tubular extension 25.

When assembled, the tubular extension 25 is sealed to an offtake pipe 26 secured beneath the floor and directed in the desired discharge direction. The illustrated sealing means between the tubular extension 25 and the offtake pipe 26 is formed as an elastic diaphragm 27 into which the end of the extension 25 is forced, stretching the opening as much as required.

Beneath the funnel portion 22 there is mounted, as on a transverse shaft 28, a sealing pan 29 which is adapted to swing open each time the bowl is flushed. At other times water trapped in the pan seals out dirt, dust, odors and sound from below.

The shaft 28 passes through bearings in the cylindrical skirt 23 and at one end has fast thereon an operating arm 32 and a torsion coil spring 33 which by action on the arm and a fixed reaction bracket 34 biases the shaft in the direction to close the pan toward the bottom end of the funnel portion. The end of the arm carries a pin 35 having a roller 36 thereon.

On the rear side and between the inner surface of the bowl 15 and the inner flange 19 of the trim top 17 there is mounted an arcuate-shaped flush tube 37 carried by a fitting 38 secured to and sealed with the bowl 15. On the outer side a pipe nipple 39 and a union connection 40 are provided, the union connecting to a flexible hose 41 which has its other end connected to the casing of a valve 45 of a supply pipe, not shown. The flexible hose 41 has enough free length to permit the bowl to be pulled out of the housing far enough to give clear access for operating the union connection 40.

A mounting 42 secured beneath the housing top 12, as by bolts 43, carries the valve 45 which carries an operating stem 46 which is resiliently urged by interior means, not shown, in an outward direction to close the valve. The stem is moved inward to open the valve for flushing by a bell crank lever 47 pivoted on a pin 48 carried by a bracket 49 of the valve. To the outer end of the projecting arm of the bell crank lever 47 there is secured, as by a joint pin 50, a connecting rod 51 which extends downward to an operating arm 52 carried by a shaft 53. The connection is made by a joint pin 54 and means are provided for adjusting the length of the rod. The outer end of the arm 52 is formed as a cam for acting on the roller 36 of the arm 32 for opening the sealing pan 29. The arm 52 in the off position stands in a general vertical direction so that the roller 36 moves down past its end when the toilet bowl is lowered into position, if necessary the pan being pushed down from above to move the roller clear of the arm.

The shaft 53 is turnably mounted in a bearing of a hub-like formation carried by a plate 55 which is removably attached, as by screws 56, to the side enclosure 11 over an opening which is large enough to permit removal of the arm 52 on the shaft.

On the outer end of the shaft 53 there is secured an

operating arm or treadle **60** having a foot piece **61**. The treadle **60** is removably secured on the shaft **53**, as by an end screw **62**, so that the treadle can be removed to permit the plate **55** to be slipped off the shaft **53**. This provides access and inspection of the interior.

When the treadle is depressed it operates the inside arm **52** which operates both the valve **45** and the seal pan **29** against the action of their springs. If the pan should stick in open position the arm would still actuate the valve.

While one embodiment of the invention has been disclosed for purposes of illustration it is to be understood that there may be various embodiments and modifications within the scope of the invention.

What is claimed:

1. A toilet bowl assembly and mounting comprising in combination, a fixed housing having a side enclosure and a top cover with an opening in the top cover to receive the toilet bowl, a toilet bowl insertable in said top opening by downward movement and having an outwardly extending top flange larger than said opening lying on and supporting said bowl on said top cover, a flexible flush water hose connected between a fixed interior supply pipe and said bowl and being of sufficient length to permit the bowl to be taken out for making connection with said hose, a flush valve between said pipe and hose mounted inside the housing, an operator mounted on and disposed outside the housing with operating connections to the valve inside the housing, a sealing pan movably mounted on and below said bowl and provided with an operating element, the size of said opening being greater than the supported portion of said bowl including said element and pan, and an actuating member included in the valve opearting connections for operating said element when the bowl is in use position, said actuating member being formed as a cam arm having means to move the operating element of the pan to move said pan, said cam arm standing in a generally vertical position when at rest to permit the pan operating element to move into operative relationship with respect to the cam arm when the toilet bowl is brought down into its use position or to be moved up and away therefrom.

2. A toilet bowl assembly and mounting comprising in combination, a fixed housing having a side enclosure and a top cover with an opening therein to receive the toilet bowl, a toilet bowl insertable in said top opening by downward movement and including an outwardly extending top flange larger than said top opening supported on the top cover of said housing, a flush tube carried within the bowl and connected by an over-length flexible hose to a supply pipe mounted in said housing, a valve between said hose and pipe mounted within the housing, an outside operator mounted on said housing, operating connections from said outside operator to the valve within the housing, a seal pan movably mounted on and below said bowl and having an operating member alongside the bowl, the size of said opening being greater than the flange-supported portion of said bowl including said pan and its operating member, and an operating element provided on the valve operating connections alongside said pan operating member in the use position but not connected thereto having means to move it in the use position and allowing it to be moved away therefrom by vertical movement with the bowl without making a disconnection when the bowl is removed.

3. A toilet bowl assembly and mounting comprising in combination, a fixed housing having a side enclosure and a top cover with an opening in the top cover to receive the toilet bowl, a toilet bowl insertable in said top opening by downward movement and including an outwardly extending top flange larger than said top opening supported on the top cover of said housing, a flush tube carried within the bowl and connected by an over-length flexible hose to a supply pipe mounted in said housing, a valve between said hose and pipe mounted within the housing, an outside operator mounted on said housing, operating connections from said outside operator to the valve within the housing, a seal pan movably mounted on said bowl and having an operating member alongside the bowl, the size of said opening being greater than the flange-supported portion of said bowl including said pan and its operating member, and an operating element provided on the valve operating connections alongside said pan operating member in the use position but not connected thereto having means to move it in the use position and allowing it to be moved away therefrom by vertical movement with the bowl without making a disconnection when the bowl is removed, said pan operating member being formed as an operating arm and said operating element comprising a cam arm disposed adjacent said pan operating arm, and means urging said arms toward each other against the action of said outside operator.

4. A toilet bowl assembly and mounting, comprising in combination, a fixed housing having side enclosing walls and a top cover with an opening therein, a toilet bowl insertable in said top opening by downward movement and including an outwardly extending top flange larger than said top opening supported on the top cover of said housing, a seal pan movably mounted on and below a shaft on said bowl, a pan operating arm mounted on said pan shaft, a cam follower pin extending from the side of said pan operating arm, the size of said opening being greater than the flange-supported portion of said bowl including said pan and its operating arm and pin, the side wall of said housing having an opening adjacent said pan operating arm, a closure plate removably secured over said opening, a cam operating shaft turnably mounted on said plate, a vertically disposed cam arm mounted on said cam operating shaft adjacent said cam follower pin in a position to actuate it but being unconnected with the pin, whereby the pin will clear the cam arm when the bowl is removed by upward movement, and an outside operator arm removably secured to the outer end of said cam operating shaft, the opening covered by said plate being large enough to permit removal of said cam arm on its shaft when the closure plate is removed.

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