H. A. SIMPSON.

DISAPPEARING PLUMBING FIXTURE.

APPLICATION FILED APR. 11, 1919.

1,367,896.

Patented Feb. 8, 1921.

4 SHEETS—SHEET 1.

Fig. 2

Fig. 1

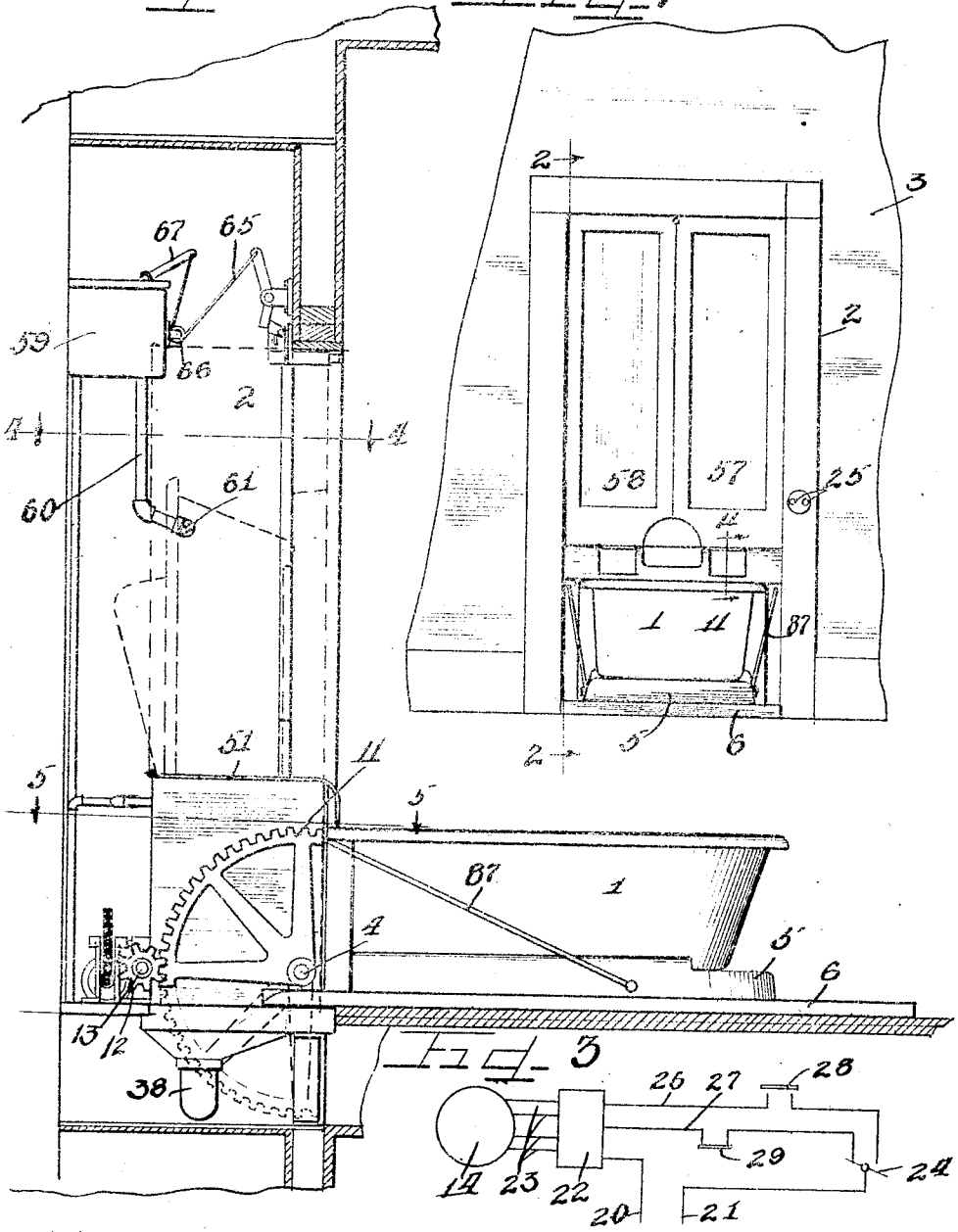


Fig. 3

Witnesses

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4 SHEETS—SHEET 2.

Fig. 4

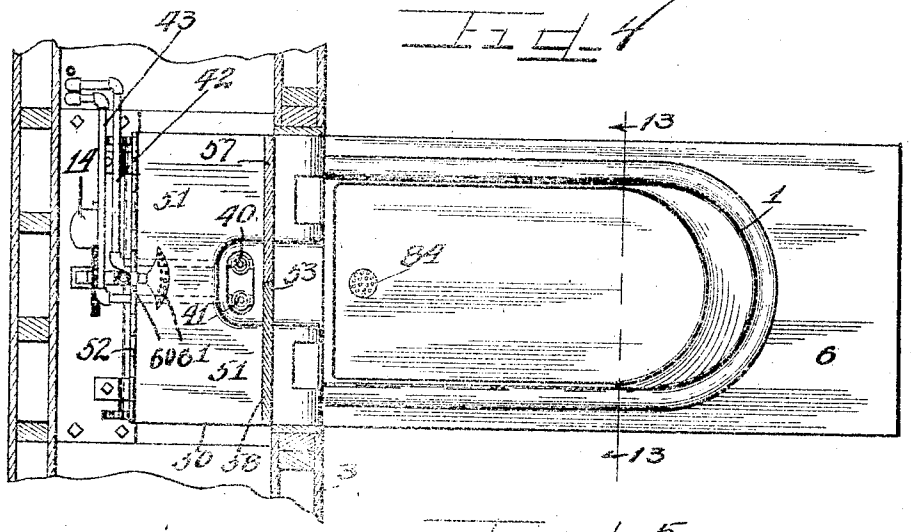


Fig. 5

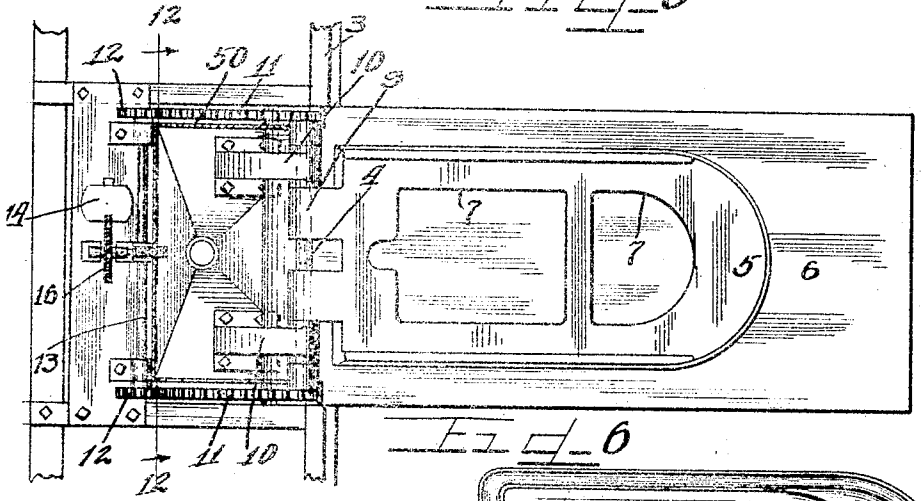


Fig. 6

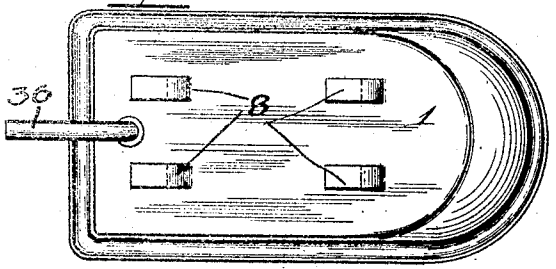
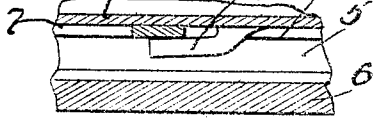


Fig. 7



Witnesses

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4 SHEETS—SHEET 3.

Fig. 8

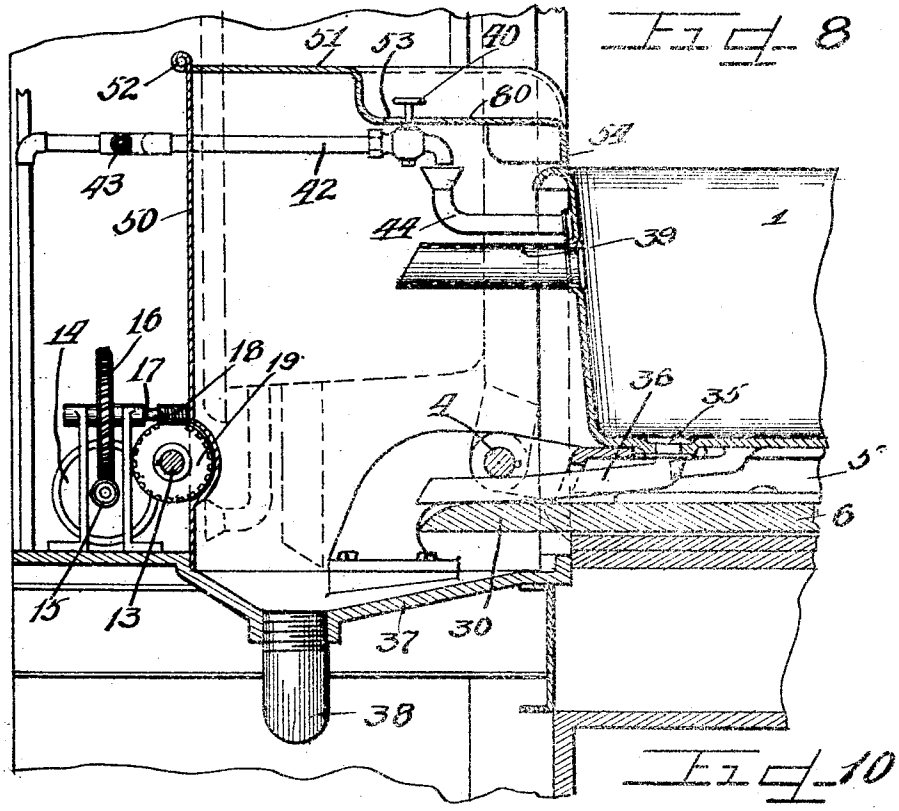


Fig. 10

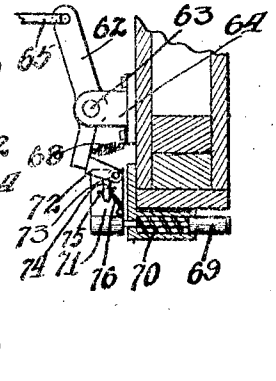


Fig. 11

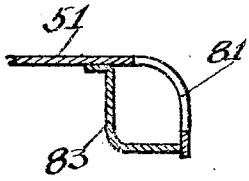
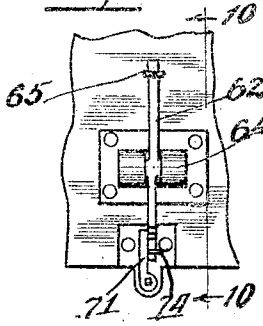


Fig. 9



Witnesses

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4 SHEETS—SHEET 4.

Fig. 12.

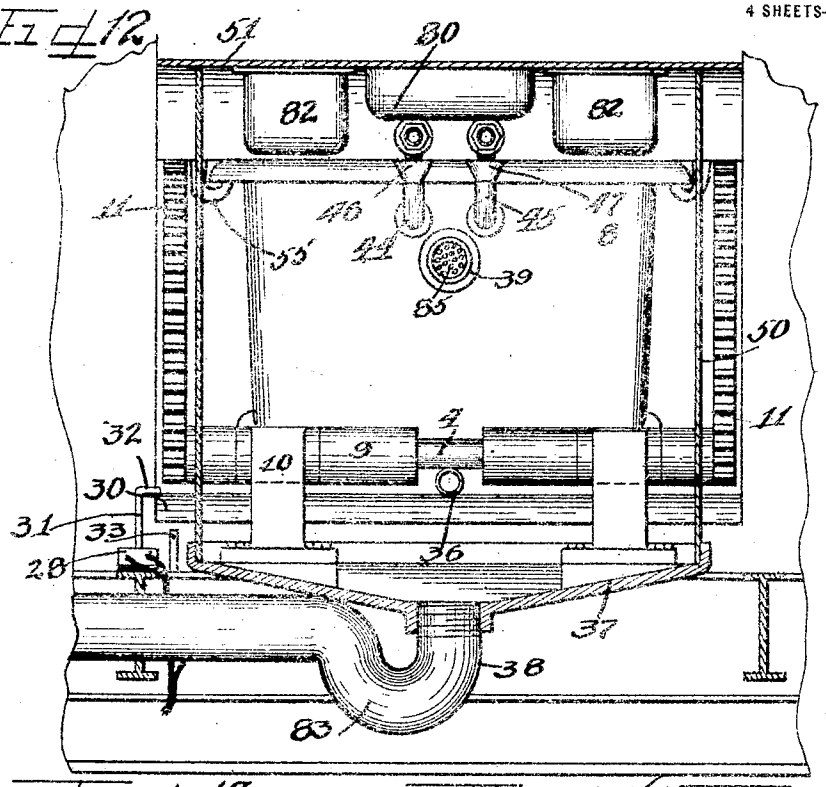


Fig. 13.

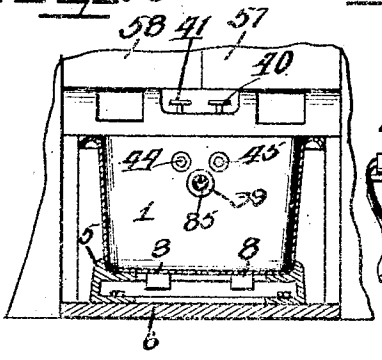


Fig. 14.

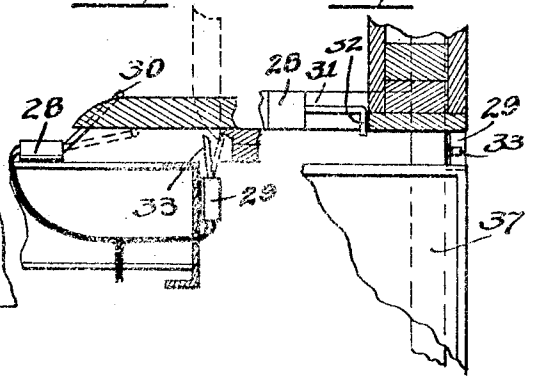


Fig. 15.

Witnesses

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UNITED STATES PATENT OFFICE.

HARRY A. SIMPSON, OF CICERO, ILLINOIS.

DISAPPEARING PLUMBING-FIXTURE.

1,367,896. Specification of Letters Patent. Patented Feb. 8, 1921.

Application filed April 11, 1919. Serial No. 289,431.

To all whom it may concern:

Be it known that I, HARRY A. SIMPSON, a citizen of the United States, and a resident of the town of Cicero, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Disappearing Plumbing-Fixtures; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numerals of reference marked thereon, which form a part of this specification.

My invention relates to disappearing plumbing fixtures and although not limited to such use, is particularly adapted for use in connection with bath tubs.

One of the principal objects of my invention is to provide a simple form of plumbing fixture adapted to be turned on end for concealment in a closet or the like while not in use.

A further object of my invention is to provide means for raising and lowering the fixture into inoperative and operative positions respectively.

It is also an object of my invention to provide connections to supply and drain pipes which will not be interfered with by raising and lowering the fixture.

My invention also has other important objects, which will appear in the following specification an dthe accompanying drawings, in which I have illustrated my invention in a preferred form.

On the drawings:—

Figure 1 is a front view of a bath tub fixture embodying my invention.

Fig. 2 is a section on the line 2—2 of Fig. 1.

Fig. 3 is a diagram of the electrical connections to operating motor.

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

Fig. 5 is a section on the line 5—5 of Fig. 2, with the bath tub removed.

Fig. 6 is a plan view of the under side of the bath tub.

Fig. 7 is a longitudinal vertical section through a part of the bottom of the bath tub and its support.

Fig. 8 is a central vertical section through the rear end of the bath tub and with the parts associated therewith.

Fig. 9 is a front elevation of a trip device for operating the bath flushing apparatus.

Fig. 10 is a section on the line 10—10 of Fig. 9.

Fig. 11 is a section on the line 11—11 of Fig. 1.

Fig. 12 is a section on the line 12—12 of Fig. 5.

Fig. 13 is a section on the line 13—13 of Fig. 4.

Fig. 14 is a detail view showing the motor switch mechanism.

Fig. 15 is a horizontal section through the side of the closet showing the motor switches.

As shown in the drawings:—

The apparatus comprises a bath tub 1, adapted for concealment within a closet 2, inserted in a recess in the wall 3. The bath tub is arranged to pivot about a shaft 4, adjacent the lower front edge of the closet so that it may be moved to a vertical position within the closet and thereby be concealed from view. The position of the bath in its inoperative or concealed position is shown in dotted lines in Fig. 2.

The bath tub is mounted on a support 5, which in turn is secured to the door 6 of the closet. Preferably the bath tub is constructed so that it may be detached from the support 5, if desired, and for this purpose the support 5, is provided with apertures 7 (Fig. 5) through which may be passed lugs 8, on the under side of the bath tub for engagement with the under side of the support 5, as shown more particularly in Fig. 7. As these lugs point toward the shaft 4, about which the bath tub swings, the weight of the bath will hold it in engagement with the support 5, under all normal conditions.

The support 5 is provided with lugs 9, rigidly secured to the shaft 4, so that by turning the latter, the bath may be raised or lowered as desired. This shaft 4, is journaled in brackets or bearing blocks 10, arranged on either side of the lugs 9. Nonrotatably secured to the projecting ends of the shaft 4, are segmental gears 11, in mesh with pinions 12. The gears 11, are preferably connected to the sides of the support 5, by rods 87, to relieve the strain on the connections between the gears 11 and the lugs 9, with the shaft 4. The pinions 12 are mounted on a shaft 13, which is driven from an electric motor 14, by means of the worm 15, worm wheel 16, shaft 17, worm 18 and worm wheel 19, on the shaft 13, as shown

more particularly in Fig. 8. By means of the gearing just described, the motor 14, is adapted to raise or lower the bath tub.

One advantage of employing worm gear reduction is to make the gearing irreversible; in other words, to prevent the weight of the bath tub from rotating the motor when no current is flowing through the latter, while still allowing the motor to move the bath either up or down as desired. With the gearing shown, the bath is rigidly held in any position it may be placed by the motor, irrespective of whether any current is flowing through the latter or not.

The electrical connections for the motor 14, are shown in Fig. 3. The wires 20 and 21 are connected to the mains in any suitable way. One of these wires, as 20, is connected to a terminal box having four leads 23, therefrom, to the motor 14, while the other wire 21, is connected to a double pole switch 24, operated by a pair of push-buttons 25, arranged in the side frame of the closet as shown in Fig. 1. This switch 24, is adapted to connect the lead 21, to the leads 26 and 27, alternatively, and thereby cause the motor to rotate first in one direction and then in the other direction to raise and lower the bath tub as required.

It is desirable that means be provided for automatically closing the motor circuit after the bath tub has been moved into either raised or lowered position. For this purpose, switches 28 and 29, are provided, adapted to be operated by the projecting lower edge 30 of the door 6, on which the bath tub is arranged. The arrangement of these switches is shown more particularly in Figs. 12, 14 and 15. The switch 28 is provided with an operating arm or lever 31, having a lateral extension 32 at its outer end, adapted to engage the upper surface of the part 30, as shown in Fig. 12. This arm 31 is normally held (by a spring, not shown) in the depressed position shown in dotted lines in Fig. 14. In that position, the switch is closed, but when the arm is raised by upward movement of the part 30, the switch is opened. The time of opening is adjusted so that the door and the bath thereon will have been lowered to the floor by the time the motor ceases to operate. Similarly, the switch 29, is also provided with a spring held arm 33, which in the position shown in full lines in Fig. 14, holds the circuit closed. When, however, this arm is moved into the position shown in dotted lines in Fig. 14, by forward movement of the part 30, the circuit is broken. When this occurs, the door is in its vertical position and the tub is wholly concealed within the closet.

The bath tub is provided with the usual discharge aperture 35, communicating with an inclined pipe 36 adapted to discharge water into a catch pan 37, from which leads a discharge pipe 38, preferably provided with a water trap 83. It will be seen that the pipe 36 will discharge into catch pan 37, in any position of the bath tub. An overflow pipe 39, is also provided, the diameter of this pipe being sufficiently large to allow if necessary the entire contents of the bath tub when full to flow out therethrough as the motor raises the bath tub into its upright vertical position.

A pair of faucets 40 and 41, are provided for hot and cold water, respectively, which are supplied thereto by pipes 42 and 43. For conveying the water from the faucets into the bath a pair of pipes 44 and 45 are provided having funnel-shaped upturned ends 46 and 47, arranged to register with the faucets when the bath tub is in its lowered position. As the bath tub is moved upwardly, the pipes move away from the faucet so that there is no interference therewith.

The drain pan and the parts connected thereto are preferably inclosed by a casing 50, having a lid 51, hinged thereto at 52. This lid 51 is provided with an aperture 53, through which the upper parts of the faucets project when the bath tub has been lowered. The front edge 54 of the lid 51 is arranged to rest on the edge of the bath tub so that as the latter is moved up the lid is also pushed back out of the way. Preferably to insure that this lid will move downwardly with the bath tub, an over-hanging lip 55 is provided at the outer edges of the lid 51 for engagement with the edge of the bath tub as shown more particularly in Fig. 12.

One of the functions of the casing 50 is to keep water away from the operating gearing or the motor 14, all of which are arranged outside the casing. Further the lid 51 is preferably extended laterally so as to cover the segmental gears 11.

In order to keep water off the top of the lid as far as possible that part of the lid 80 around the faucets is depressed as shown more particularly in Fig. 8. This depression also enables the hands to be inserted under the swing doors 57, 58 to operate the faucets. On each side of the depressed part 80 soap boxes are formed by forming apertures 81 in the outer part of the lid and securing angular members 82 to the underside of the lid opposite these apertures. The edges of the apertures 81 preferably project beyond the edges of the members 82 so as to form soap retaining ledges in both raised and lowered positions of the lid.

When the bath tub is lowered the flush pan and inlet, discharge and overflow pipes, are thus concealed from view by the casing

50, and its lid 51. At the same time the upper part of the closet is closed by a pair of folding doors 57 and 58, provided with springs which normally hold them in the position shown in Fig. 1 while allowing them to move rearwardly to lie adjacent the side walls of the closet when the door 6, and the bath tub are swung upwardly into the closet.

It is frequently desirable to flush out the bath tub after use. This may be conveniently accomplished by providing a tank 59, in the upper part of the tub having a discharge pipe 60 and a spraying nozzle 61 adapted to project a spray of water from the tank over the inside of the bath tub when the latter is in its elevated or concealed position. Further, it is advisable to furnish means whereby this flushing may be carried out automatically. For this purpose the trip device shown in Figs. 2, 9 and 10, is provided so that the tank 59 is automatically discharged at all times when the bath tub is moved back into its concealed position. This mechanism comprises a rocker or lever 62, pivotally mounted at 63 to a bracket 64, secured to the inner wall of the closet. The upper end of this rocker is connected by a cord or chain 65, passing around a pulley 66, to an arm 67, adapted to operate the discharge valve of the tank 59. Whenever the arm 67 is pulled down by movement of the rocker 62, the tank 59 is discharged. The rocker 62 is normally held in the position shown in Fig. 10, by means of a spring 68. A plunger 69 having an outwardly projecting end of engagement with the outer or upper end of the door 6, is arranged so that it is forced inward by the door as the latter is moved into vertical position. This plunger is normally held in extended position by a spring 70. At the other end of this plunger 69 is a plate 71, carrying thereon a latch 72, pivotally mounted at 73 and provided with a downwardly projecting arm 74 adapted to engage a pin 75, on the plate 71. A spring 76 normally holds the projection 74 in engagement with the pin 75, in which position the latch is in contact with the lower end of the rocker 62. As the plunger 69 and with it the plate 71 and latch 72 are moved rearwardly by the door 6 the latch swings the rocker 62, to discharge the tank 59. Before the end of the path of travel of the plunger has been reached the rocker has moved into such a position that it can slip past the latch to its original position under the action of the spring 68. When the tub is lowered the spring 70 returns the plunger 69 and latch 72 to their original positions, the latch turning about its pivot 73 as it passes the end of the rocker 62 and then under the action of the spring 76 moves into engagement with the rocker 62 as shown in Fig. 10 ready for the next operation. The tank 59 is filled as required by any suitable means such as a float valve of common construction.

The operation is as follows:

The fixture is normally in the position shown in dotted lines in Fig. 1. To bring the tub into operative position the push button 25 is pressed to set the motor in operation to lower the bath through the train of gearing 15, 16, 18, 19, 12 and 11. The motor then continues to operate until the circuit therethrough is broken by the end of the door 30 operating the switch 28. When that has occurred the tub has been lowered to the floor ready for use.

In its downward movement the tub draws down the lid 51 of the casing 50 through the sliding engagement of the edges 55 of the lid with the lateral edges of the tub. When the tub has been lowered the spring doors 57 and 58 are free to swing outward to close the space in the closet above the casing 50 and lid 51 so that the parts assume the position shown in Fig. 1. The tub is then ready for use in the normal way.

After use the tub is preferably drained through the pipe although it may be emptied through the overflow pipe 39 while being raised by the motor. The up push button is then pressed and the motor brought into operation to raise the tub. The motor is then stopped by the operation of the switch 29 by the lower edge 30 of the door 6 as soon as the latter has reached its vertical position simultaneously with the operation of the switch 29 by the lower edge of the door the upper edge of the door acting on the plunger 69 operates the valve of the flushing tank 59 and causes a spray of water from the nozzle 51 to be projected against the upper part of the tub. This water runs down and cleanses the inside of the tub and finally escapes through the drain pipe 38. Toward the end of the stroke of the plunger 69 the rocker 62 slips past the catch 72 carried by the plunger so as to close the valve of the flushing tank and bring the rocker into tripping position again. The tank 59 is then filled again by a float or other valve ready for the next operation.

I am aware that various details of construction may be varied through a wide range without departing from the principles of my invention and I therefore do not purpose limiting the patent granted further than necessitated by the prior art.

I claim as my invention:

1. A device of the class described comprising a closet, a tub, a door for the closet hinged adjacent the lower margin of the closet, means for securing the tub to said door and a pair of swing doors adapted to close the upper part of the closet when the first door and tub are lowered into operative position.

2. A device of the class described comprising a closet, a tub pivotally supported in the bottom of the closet, and adapted to be swung outwardly therefrom, and a pair of swing doors adapted to close the upper part of the closet when the tub is lowered into operative position.

3. A device of the class described comprising a closet, a tub pivotally supported in the closet and adapted to be swung outwardly therefrom, means adapted to close the upper part of the closet when the tub is lowered into operative position, and a water impervious casing adapted to inclose the inner end of the tub when it is lowered.

4. A device of the class described comprising a tub, a pivotal support therefor, a catch pan at the rear of the tub, a casing around the catch pan having side walls spaced a greater distance than the width of the tub, a lid for the casing pivoted to the rear wall thereof adapted to rest on the side walls when the tub is in its lower position and move upwardly with the tub as the latter is raised.

5. A device of the class described comprising a closet, a tub, a door for the closet hinged adjacent the lower margin of the closet, a catch pan in the floor of the closet, a casing around the catch pan having side walls spaced a greater distance than the width of the tub, toothed segments secured to the door adapted to extend rearwardly on either side of said side walls, a shaft at the rear of said casing, gear wheels on said shaft adapted to mesh with said segments and means for rotating said shaft in either direction to raise and lower the door and tub.

6. A device of the class described comprising a closet, a tub, a door for the closet hinged adjacent the lower margin of the closet, means for securing the tub to the door, a catch pan in the floor of the closet, a motor and gearing in the closet for raising and lowering the door and tub, a shield extending upwardly from the catch pan to prevent water reaching the motor and gearing.

7. A device of the class described comprising a closet, a tub, a door for the closet hinged adjacent the lower margin of the closet, means for securing the tub to the door, a catch pan in the floor of the closet, a casing extending upwardly from the catch pan including side and rear walls and a lid pivoted to the latter wall, and inlet discharge and overflow pipes for the tub located within said casing.

8. A device of the class described comprising a tub, a pivotal support therefor, a pivotally mounted shield having a downwardly directed front edge adapted to rest on the edge of the tub in its lowered position and to move upward with the tub as the latter is raised, an aperture in the curved edge of the shield and an angular member secured to the underside of the shield to form a soap box, the upper and lower edges of the aperture projecting beyond the walls of the member to provide soap retaining ledges in both raised and lowered positions of the shield.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

HARRY A. SIMPSON.

Witnesses:

EARL M. HARDINE,

CHARLES W. HILLS, Jr.