June 25, 1940. T. P. NEWMAN 2,205,801

FLUSH VALVE OPERATOR

Filed Oct. 27, 1939 2 Sheets-Sheet 1

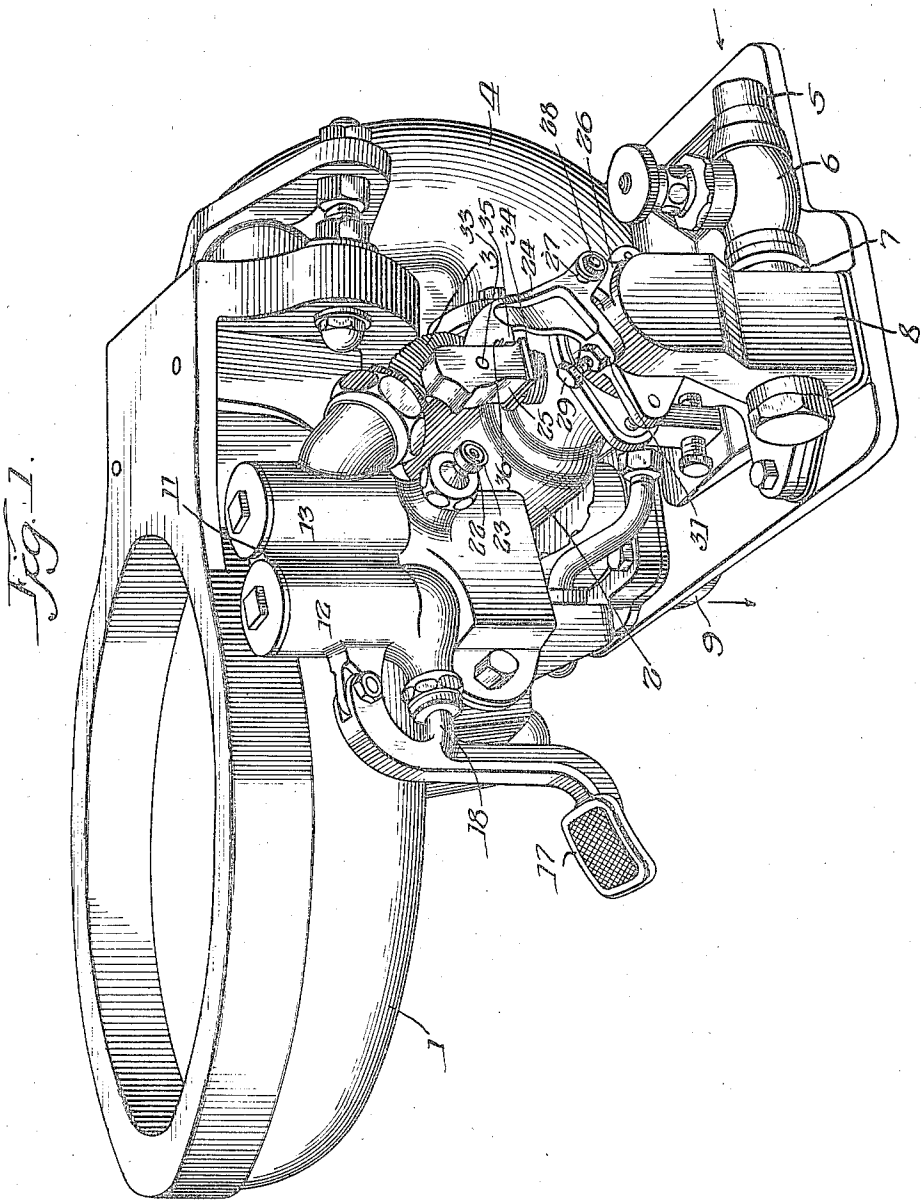


Fig. 1.

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Fig. 1.

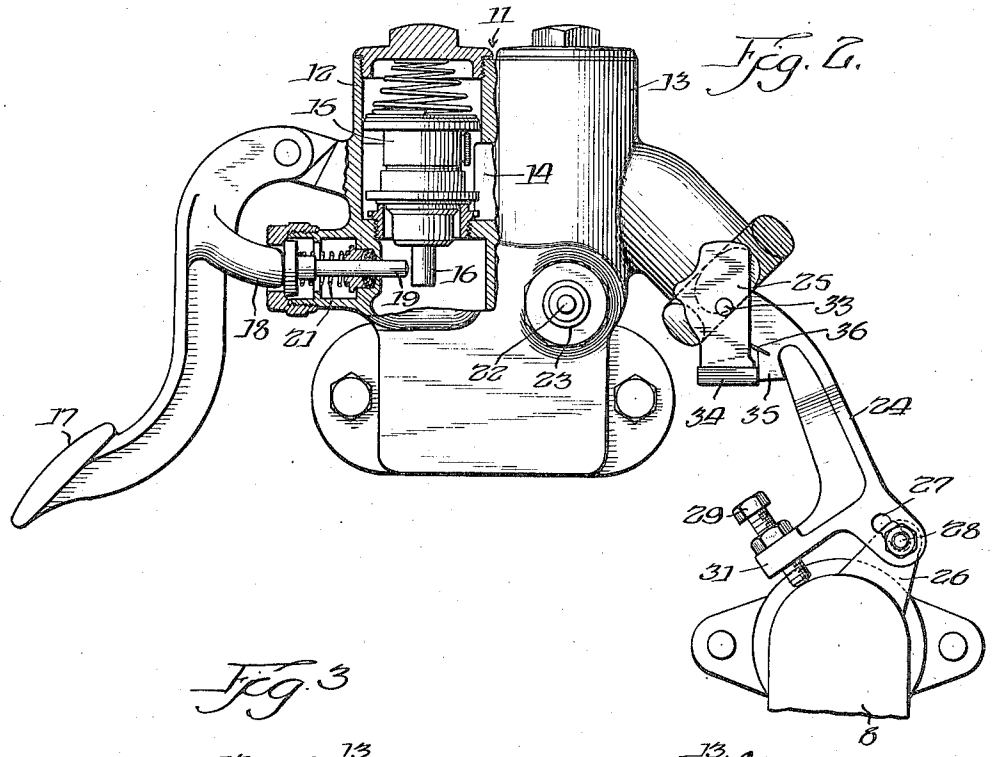


Fig. 3

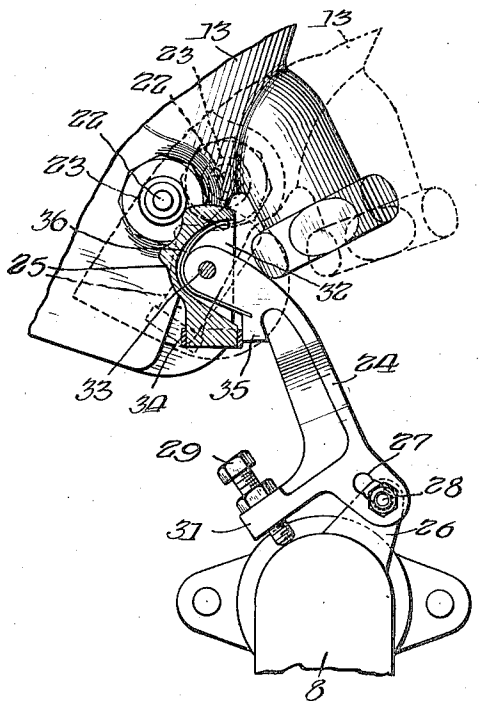
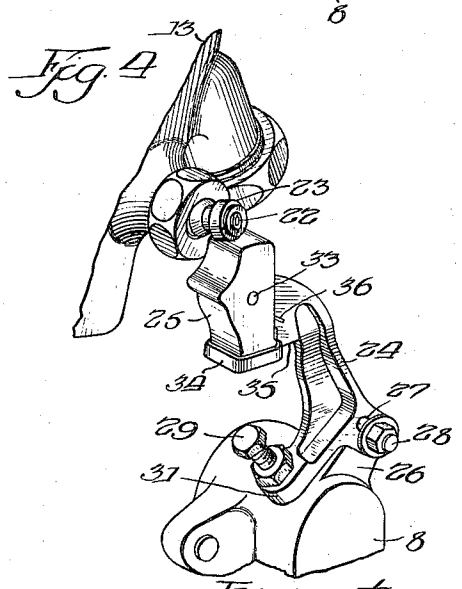


Fig. 4



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2,205,801

UNITED STATES PATENT OFFICE

2,205,801

FLUSH VALVE OPERATOR

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Application October 27, 1939, Serial No. 301,557

4 Claims. (Cl. 4—10)

This invention relates to a mechanism pertaining to flush valve operating or tripping devices, and more particularly, it relates to a novel valve tripping mechanism for use on folding or pivotable water closets where it is desired to supply the closet bowl with a water seal or priming flush upon predetermined movement of the said bowl from an inoperative to an operative position. A folding or pivotable type closet bowl and a dual type flush valve, both of which are referred to in this specification, are more completely illustrated and described in the patent applications Serial No. 214,428, filed June 18, 1938, and Serial No. 253,062, filed January 27, 1939, respectively, in which I am a co-inventor of the first named patent application.

One of the more important objects of this invention lies in the provision of a flush valve tripping mechanism which operates the valve handle or actuator during the unfolding movement of the closet bowl and which, when the closet is in the unfolded or operative position, functions to effect a complete release of the valve handle from the tripped position.

A further object is to provide a flush valve tripping device which preferably is so constructed and so arranged that it positively actuates the valve handle during the unfolding movement of the closet bowl but which does not actuate the valve handle during the folding up movement of the closet bowl.

It is a further object of the invention to provide an easily adjustable and conveniently removable flush valve operating mechanism.

Other objects and advantages of this invention it is believed will be apparent from the following detailed description of a preferred embodiment thereof as illustrated in the accompanying drawings in which:

Fig. 1 is a side exterior view slightly in plan perspective of a folding closet bowl embodying my invention and in which figure the bowl is shown in the operative and unfolded position.

Fig. 2 is a partly sectional view of a dual type flush valve showing the relative positioning of the valve tripping mechanism with respect to the bowl when the valve and the closet bowl are in the operative position.

Fig. 3 is a fragmentary view of the flush valve and the tripping device showing progressively by the solid lines and the dotted lines the manner in which the tripping mechanism permits the return of the closet bowl to the folded position without actuation of the flush valve.

Fig. 4 is a perspective view showing the valve handle in the tripped or operated position during the movement of the bowl and valve from the folded to the unfolded position.

Similar reference numerals refer to similar parts throughout the drawings.

The following brief description of a typical installation embodying a preferred construction of my invention is provided for illustrative purposes only and it is, of course, to be clearly understood that the invention may be applied to other devices in which a similar means of actuation is desirable.

Referring to Fig. 1, the folding closet bowl generally designated 1 is shown in the unfolded or operative position and is mounted upon a pivotable hollow trunnion 2, the said bowl and trunnion being interconnected by the water supply and discharge conduits 3 and 4, respectively. Flushing water is supplied to the fixture for the usual purpose through the pipe 5 having connection with a suitable source of water supply (not shown) and with the direction of the water flow being taken as indicated by the arrow. Preferably, but not necessarily required, in connection with the control of such water supply, a stop valve 6 is provided so that in the event it is necessary to make adjustments upon the assembly, or to make repairs or inspection of the fixture, the stop valve may be used to shut off the water supply to the fixture. The latter valve is attached by means of a suitable pipe connection 7 to the lower portion of the hollow trunnion base or bearing 8.

The trunnion 2 comprises a hollow journaled tube which is preferably internally partitioned to cause one end to provide a suitable passageway for the inlet water supply between the bearing 8 and the conduit 3, and to cause the other end of the trunnion to provide a suitable passageway for the discharge water between the discharge conduit 4 and the outlet 9. The trunnion 2, in addition to providing water passageways for the flushing operations of the bowl, also provides a journaled support for the bowl which permits the upward rotational movement of the bowl about the horizontal axis of the trunnion to the folded or inoperative position.

A dual type flush valve generally designated 11 is preferably, although not necessarily, attached to the side of the bowl 1 and interconnects the inlet conduit 3 with the usual internal flushing water passageways (not shown) of the bowl. A dual type flushing valve is provided in connection with the bowl for the manifold purposes of furnishing the bowl with an automati-

cally supplied priming or sealing water flush upon movement of the bowl from the folded or inoperative position to the unfolded or operative position and, after the bowl has been used, to furnish a discharge flush upon manual tripping or operation of the flush valve in the preferred manner hereinafter described at greater length.

Attention is now directed to Fig. 2. The construction of the dual valve 11 comprises a casing which, as illustrated, is divided into two chambers 12 and 13 both of which are interconnected by means of the port 14. Each of the chambers 12 and 13 is provided with a valve closure member 15 which may be actuated by tilting the stem 16 thereof to one side. The manual means of operation provided to trip the valve comprises the foot pedal 17 which, when depressed, causes the lever 18 to move inwardly, thus forcing the plunger 19 to move forward against the action of the spring 21 to tilt the stem 16. A tiltable handle 22 for independent actuation is preferably provided with a roller 23 near its outermost end and which functions in connection with the chamber 13 for forcing a plunger identical to 19 to move forward and to trip the similarly mounted valve contained in the chamber 13. The complete construction and manner of operation of the dual type flush valve, as has been previously mentioned, appears in another patent application, Serial No. 253,062.

More particularly, the present invention concerns an adjustable and removable mechanism for actuating the tiltable valve handle 22 and comprises the arm 24 and the pawl 25 which are preferably mounted upon the trunnion bearing 8, although these parts may be otherwise mounted with relation to the bowl.

An apertured lug 26 is provided upon the upper portion of the trunnion bearing 8, and the arm 24, which has its lower end provided with the slot or elongated aperture 27, is attached to the lug 26 by the bolt 28. The slot 27 is preferably made elongated in order to furnish a means for the coarse vertical and horizontal adjustment of the pawl 25. Vernier, or more accurate adjustment of the pawl position, is provided for by the set screw 29 which extends through the branch member 31 and with the lower end of the screw 29 abutting the bearing 8.

The uppermost end of the arm 24, as more clearly shown in the sectional portion of Fig. 3, extends into a recess 32 within the pawl 25, the latter member being rotatably mounted and attached to the arm 24 by the pin 33. Rotational movement of the pawl is limited in the counterclockwise direction by a preferably rubber bumper 34 abutting the shoulder 35 to limit such movement, while in the clockwise direction rotational movement is resisted by the leaf-spring 36 and is further restricted by the end wall portion of the recess 32. The spring 36 is provided to effectively index or to maintain the pawl normally in a substantially vertical position.

As shown in Fig. 2, the bowl and flush valve are in the unfolded or operative position and, assuming that it is desired to fold up or to move the closet to the inoperative position, the fixture may be rotated in a clockwise direction about the axis of the trunnion 2 whereupon, as shown by the solid lines in Fig. 3, the roller 23 contacts the upper end surface portion of the pawl 25. Inasmuch as during the folding up movement of the fixture it is not desirable to trip the handle 22 and flush the bowl, the pawl 25 is made to rotate about the pin 33 and, as shown by the dotted lines in Fig. 3, the pawl assumes a rocked position which permits the valve handle to proceed therepast without actuation of the handle 22. Upon further movement of the fixture toward the inoperative position the pawl is released from contact with the roller 23, whereupon the spring 36 then returns the pawl to the indexed position.

As shown in Fig. 4, the bowl and the flush valve are in the process of being moved from the inoperative to the operative position. At this stage of its operation, the roller 23, as shown, contacts with the upper surface portion of the indexing pawl 25 and as the fixture 1 continues to rotate in a counterclockwise direction, the valve handle is tilted or canted upwardly to actuate the valve and to furnish the closet bowl with a priming flush. Further movement of the bowl toward the operative position releases the tilted valve handle 22 and allows the latter to return to its normal untripped position, as shown more clearly in Fig. 1, thus completing its cycle of operation between respective folded and unfolded positions of the closet bowl.

Having thus described my invention in a preferred embodiment thereof, it is to be expressly understood that various changes and modifications may be made without departing from the spirit and scope of the claims appended hereto.

I claim:

1. In combination, a foldable type closet bowl, a flush valve therefor, means for actuating the said flush valve upon unfolding movement of the said bowl, the said means comprising a tiltable valve actuator, tripping means for the said actuator, the said tripping means including an arm fixedly mounted upon a stationary base, a pawl rotatably secured to the end of the said arm in the path of the said actuator, the said pawl providing indexing means, whereby upon folding movement of the said closet bowl the said pawl releases to permit untripped movement of the said valve actuator and upon unfolding movement of the said closet bowl the said pawl is indexed to trip the said valve actuator.

2. In combination, an arcuately movable closet bowl, a flush valve therefor, means for actuating the said flush valve upon movement of the bowl to an operative position, said latter means comprising a pivotally mounted actuator, means for pivotally moving the said actuator, the said latter means including an arm fixedly mounted with relation to the said bowl, an indexing member in the arcuate path of the actuator rotatably secured to the said arm, whereby upon arcuate movement of the said closet bowl in one direction the said valve actuator is pivotally unaffected but upon arcuate movement of the said closet bowl in an opposite direction the said valve actuator is pivotally moved to actuate the flush valve.

3. In combination, a foldable type water closet bowl having a dual type flush valve in cooperation therewith, the said flush valve having respective manual and automatic means of actuation, the said automatic means comprising a tiltable valve actuator and a tripping means for the said actuator, the said tripping means including an adjustable arm fixedly mounted relative to the said bowl, a pawl loosely secured to the end of the said arm in the path of the said actuator, the said pawl having indexing means, whereby upon folding movement of the said closet bowl the said pawl is moved to permit untripped movement of the said valve actuator and upon unfolding movement of the said closet the said pawl is held relatively fixed to trip the said valve actuator.

4. In an arcuately movable water closet bowl having a flush valve in connection therewith, the said flush valve having automatic means of actuation, the said automatic means comprising respective tiltable means and tripping means for the said tiltable means, the said tripping means including an arm mounted upon a stationary base, a pawl in pivotal relation with the said arm and positioned in the path of the said tiltable means, the said pawl having a peripheral indexing means, whereby upon arcuate movement of the said closet bowl in one direction the said pawl is pivotally moved permitting untilted movement of the said tiltable means and upon movement of the said closet bowl in an opposite direction the said pawl is moved to tilt the said tiltable means.

THOMAS P. NEWMAN.