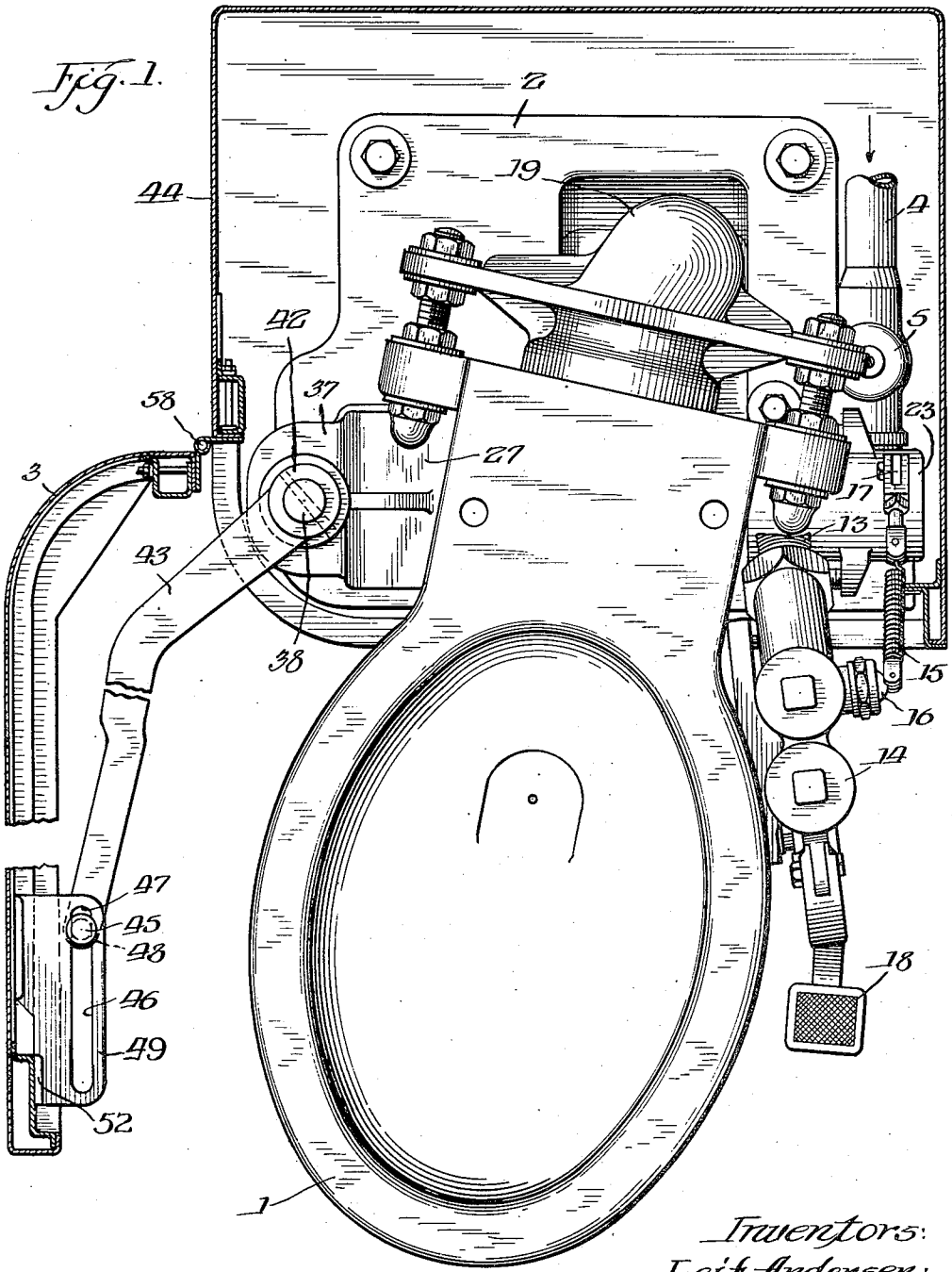
Jan. 30, 1940. L. ANDERSEN ET AL 2,188,562

ACTUATING MECHANISM FOR A PLUMBING FIXTURE

Filed Oct. 28, 1938 4 Sheets-Sheet 1

Fig. 1.



Inventors:
Leif Andersen:
Roy H. Zinkil &
Edward A. Fredrickson:
By: Joseph O. Lange Atty:

Jan. 30, 1940. L. ANDERSEN ET AL 2,188,562

ACTUATING MECHANISM FOR A PLUMBING FIXTURE

Filed Oct. 28, 1938 4 Sheets-Sheet 2

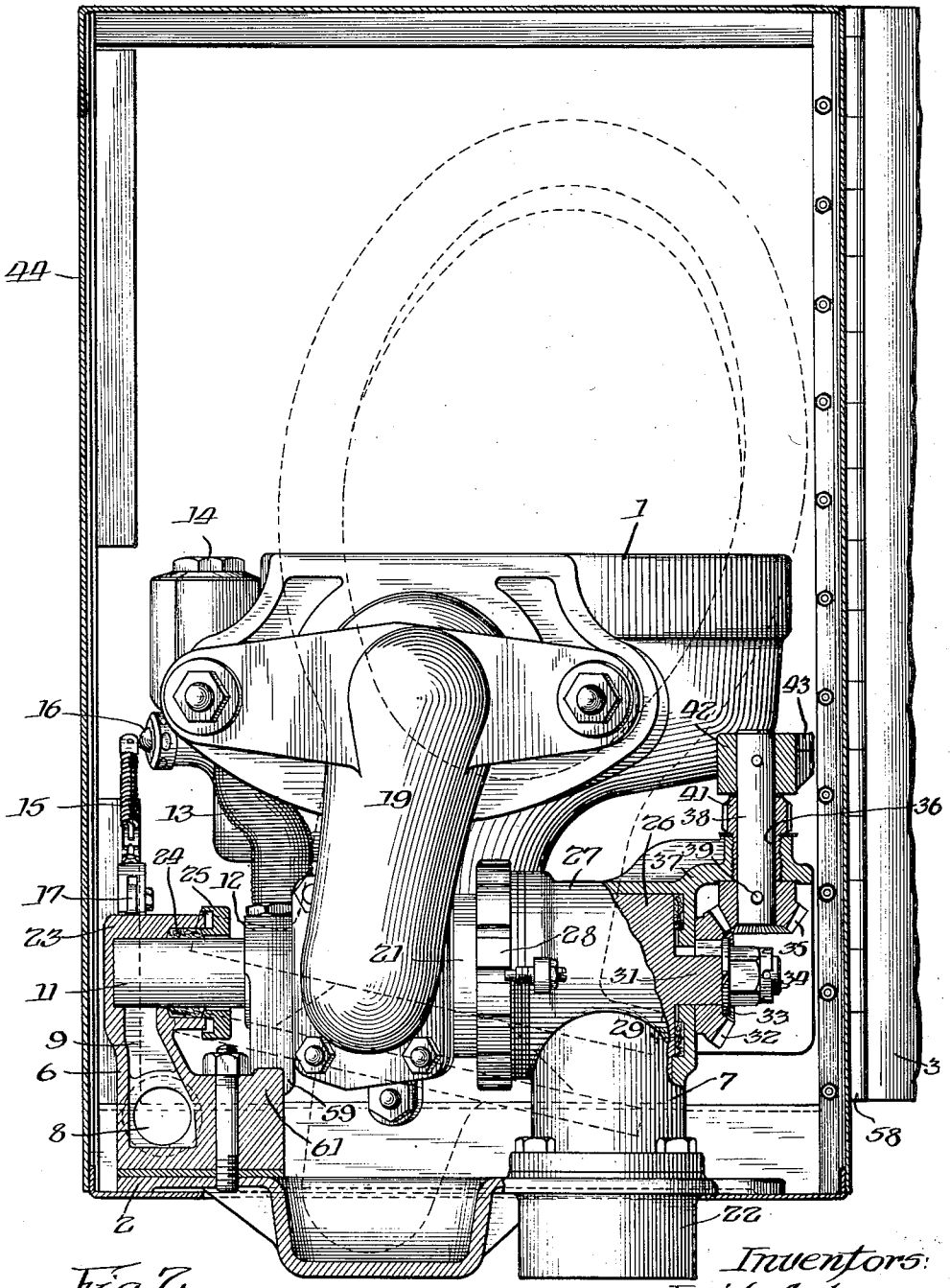


Fig. 2.

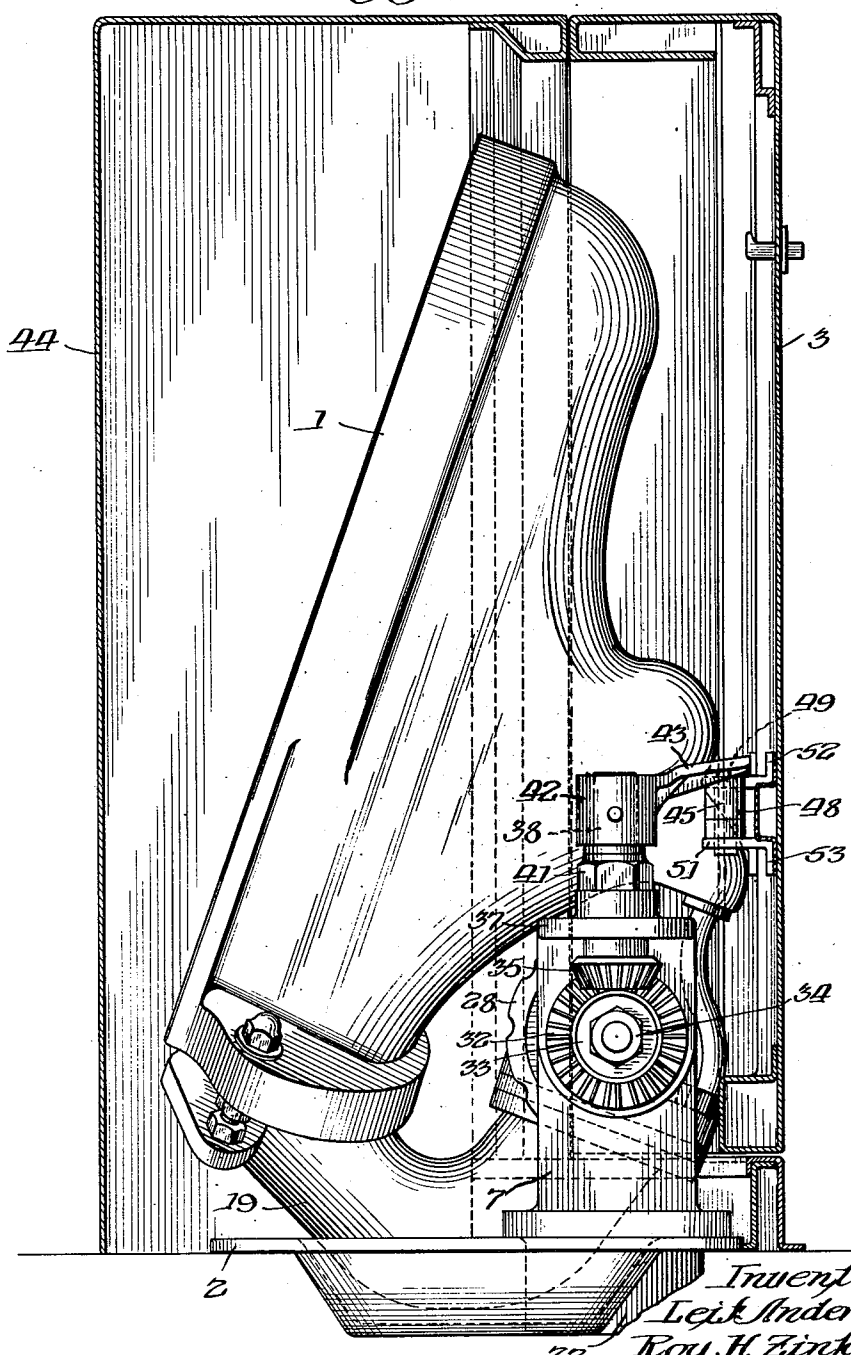
Inventors:
Lejf K. Andersen,
Roy H. Zinkil &
Edward A. Fredrickson.
By: Joseph O. Lange
Atty.

Jan. 30, 1940. L. ANDERSEN ET AL 2,188,562

ACTUATING MECHANISM FOR A PLUMBING FIXTURE

Filed Oct. 28, 1938 4 Sheets-Sheet 3

Fig. 3.



Inventors:
Leif Andersen,
Roy H. Zinkil &
Edward A. Fredrickson:
By: Joseph O. Lange Atty.

Jan. 30, 1940. L. ANDERSEN ET AL 2,188,562

ACTUATING MECHANISM FOR A PLUMBING FIXTURE

Filed Oct. 28, 1938 4 Sheets-Sheet 4

Fig. 4.

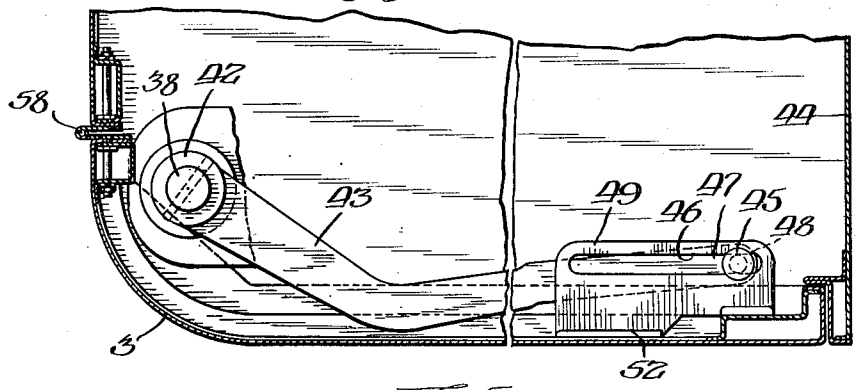


Fig. 5.

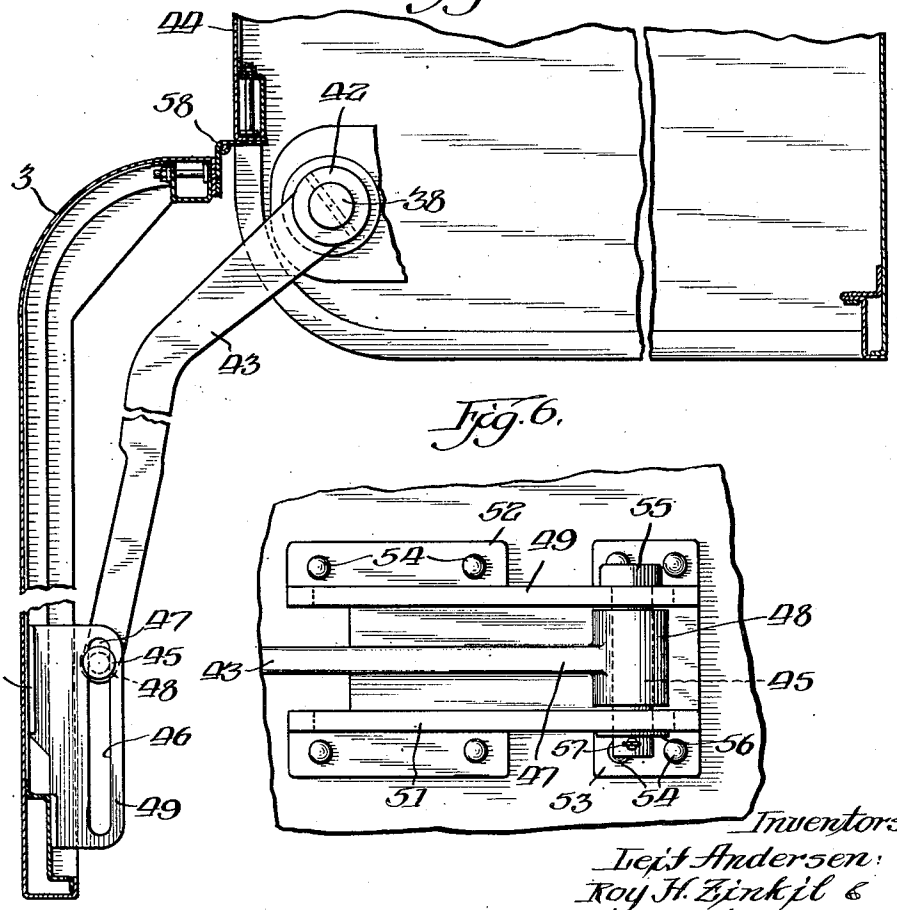


Fig. 6.

Inventors:
Leif Andersen,
Roy H. Zinkil &
Edward A. Fredrickson.
By Joseph O. Lange
Atty.

Patented Jan. 30, 1940 2,188,562

UNITED STATES PATENT OFFICE

2,188,562

ACTUATING MECHANISM FOR A PLUMBING FIXTURE

Leif Andersen and Edward A. Fredrickson, Chicago, and Roy H. Zinkil, Oak Park, Ill.

Application October 28, 1938, Serial No. 237,434

9 Claims. (Cl. 4—10)

Our invention relates particularly to an actuating mechanism for a folding or tilting type of water closet such as may be installed on a railway passenger car, a ship, or in a small apartment where it is desirable to conserve space or to conceal the closet by folding it into an out-of-the-way space. The details of the novel features applying to the folding type closet above referred to are covered in a copending patent application, Serial No. 214,428, filed June 18, 1938.

An object of the present invention is to provide a simple and durable actuating mechanism for moving a foldable water closet from an inoperative position to an operative position, and conversely, for moving it from an operative position to an inoperative position.

Another object of this invention is to provide an actuating mechanism for a tiltable water closet, the mechanism cooperating with a door or hinged cover for the closet enclosure whereby upon the opening and closing of the door respectively moves the closet to operative and to inoperative position.

Another important object of this invention is to provide an actuating mechanism for a tiltable water closet whereby the latter may be moved from an inoperative position to an operative position, and conversely from an operative position to an inoperative position, without the necessity for touching the closet with the hands at any time during the course of its operation.

Other objects and advantages of this invention will become more readily apparent from the following specification, reference being had to the accompanying drawings in which;

Fig. 1 is a partly sectional plan view showing the preferred embodiment of the invention with the water closet in the operative position.

Fig. 2 is a partly sectional rear elevation view showing the water closet in the operative position.

Fig. 3 is a partly sectional side elevation view showing the water closet in the inoperative position.

Fig. 4 is a fragmentary partly sectional plan view showing the position of the actuating mechanism lever when the water closet is in its folded and inoperative position.

Fig. 5 is a fragmentary partly sectional plan view showing the position of the actuating mechanism lever when the water closet is in the operative position.

Fig. 6 is a fragmentary view showing the manner in which the actuating mechanism lever is slidably attached to the door or hinged member.

Like reference characters refer to like parts throughout the various views.

Referring to Fig. 1, the closet bowl, generally designated 1, is suitably mounted for rotational movement in a vertical plane upon the base 2. The rotational movement of the bowl is accomplished by the actuating mechanism, hereinafter more fully explained, cooperating with the door or panel 3 when the latter is moved to the closed or to the open position.

The bowl is illustrated as being provided at its base portion with a conduit 4 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 5 is provided so that in the event it is necessary to make adjustments, repairs or inspection of the fixture, the stop valve may be used to shut off the water supply to the fixture.

Referring now to Fig. 2, the base 2 upon which the bowl 1 is mounted is provided with a pair of trunnion bearings or supports, generally designated 6 and 7. Flushing water for the bowl is supplied through the support 6, its path of flow being from the stop valve 5 (previously mentioned) into the opening 8 in the lower portion of the support 6; from there the path is upwardly through the passage 9 into the hollow end portion 11 of the trunnion 12, then horizontally to the flexible coupling 13 and thence upwardly and forwardly through the flexible coupling to the dual flush valve 14, the outlets of which cooperate with the manifold passages of the bowl. The so-called dual flushing valve 14 is provided in order to automatically supply the bowl with a priming flush when it is moved from an inoperative position to an operative position, the automatic flush being accomplished by the link connection 15 between the plunger 16 of the flush valve and the projection 17 on the upper portion or bearing housing 23 of the support 6. Provision is also made for a manual or discharging flush of the bowl to be accomplished by depressing the foot lever 18 (more clearly shown in Fig. 1). Water discharged from the bowl 1 passes through the return bend 19, the hollow central portion 21 of the trunnion 12, the support 7 and the discharge outlet 22 which is adapted to cooperate with a waste pipe (not shown).

The rotational movement of the bowl 1 is accomplished by reason of its being mounted upon the journaled trunnion 12. The journaled end portion 11 of the trunnion extends within the

enlarged portion or bearing housing 23 of the support 6. The housing 23 has a recess into which a quantity of compressible packing 24 may be placed and compressed by the gland portion of the packing compressing member 25 to prevent leakage of supply water. As to the external mounting of the opposite end of the trunnion 12, in order to accommodate the necessary discharge capacity, the said trunnion is suitably enlarged at its peripheral journal 26 within the opposite trunnion journaling member 27 of the support 7. Similar to the housing 23, the member 27 is provided with a recess, a quantity of compressible packing (not shown) and the nut 28 to assure a liquid-tight seal about the discharge portion of the trunnion 12. In order to further assure a liquid-tight seal at the end portion of the journal 26, a gasket 29 is preferably interposed between the end face of the journal 26 and the inner end face of the enlarged portion trunnion journaling member 27.

Projecting preferably integrally from the end face of the journal 26, an actuating shaft 31 is provided for the transmission of the desired rotation of the hollow trunnion shaft 12. To accomplish such actuation, a bevel gear 32 is mounted thereon and pinned in non-rotatable relation by means of the lock-washer 33 and the castellated locknut 34, meshing with a similar bevel gear 35 suitably mounted, as at 36, with a bushing 41 therebetween upon the extension 37 of the trunnion bearing 27 and held non-rotatably to the shaft 38 by means of the pin 39.

Referring now to Fig. 3, an actuating hub member 42 is non-rotatably mounted upon the journaled rod 38, the said actuating hub having a lever extension 43 which is suitable for attachment to the actuating door 3, the latter being the preferred means employed to rotate the respective bevel gears and in consequence thereof to rotate the hollow trunnion shaft 12 upon which the bowl 1 is mounted in fixed relation. The aggregate mechanism and bowl is preferably encased within an enclosure or housing 44 of suitable sheet material, with the door 3 complementing the housing to complete the enclosure.

Referring to Fig. 4, in which the actuating door 3 is shown in the closed position with relation to the housing 44, the lever extension 43 assumes a position substantially across the front of the enclosure with its attaching pin 45 at the extreme end of the slot 46. In Fig. 5, in which figure the door is shown in the open position, the lever extension 43 assumes a position substantially outwardly from the enclosure with its attaching pin 45 at the opposite or nearest end of the slot 46. The slot 46, therefore, is provided to compensate for the axial misalignment of the hub 42 and the hinge 58 of the door 3.

Referring to Fig. 6, the outer end 47 of the lever 43 has preferably an integral transverse tubular bearing 48 positioned between the upper and lower angular slotted projections 49 and 51, respectively, of the plates 52 and 53 which are fixedly attached to the inside surface of the door 3 by means of a plurality of rivets 54. The attaching pin 45 extends through the slots 46 of the projections 49 and 51, and through the tubular bearing 48 on the end of the lever 43. The pin 45 is secured against accidental removal by the head 55 on its upper end, and the washer 56 and cotter pin 57 on its lower end.

Attention is again directed to Fig. 2, in which the bowl 1 is shown in the lowered or operative position. In order to maintain the bowl in the operative position with its upper surface in substantially a horizontal plane and in order not to subject the actuating mechanism to excessive stresses when the bowl is being used, a projection 59 extending transversely from the trunnion 12 abuts a shoulder 61 of the support 6 thus preventing further downward rotational movement of the bowl.

While throughout this specification only a preferred embodiment of the invention has been shown and described, it is to be understood that many variations of the invention may be applied which are within the spirit and scope of the invention such as the substitution of other types of tiltable plumbing fixtures connected to a fresh water supply. Therefore, we desire to be limited only by the claims appended hereto.

We claim:

1. A plumbing fixture actuating mechanism comprising, in combination, a plumbing fixture having a source of supply and discharge means, horizontally journaled supports for the said fixture, an enclosure for the said fixture, lever means cooperating with the said enclosure and the said supports, whereupon opening of the enclosure pivotal movement of the fixture in a substantially vertical plane is obtained.

2. An actuating mechanism for a folding type plumbing fixture comprising, in combination, a hollow trunnion member having connections respectively to a source of water supply and discharge means, the said fixture being mounted upon the said trunnion member, bearing supports for the said trunnion member, an enclosure for the said bowl, the said actuating mechanism including a hinged enclosure member, gear means cooperating with the said trunnion member and the said hinged member to produce rotative movement of the said trunnion coincident with movement of the said hinged enclosure member.

3. A raising and lowering actuating mechanism for a plumbing fixture comprising, in combination, a plumbing fixture, a journaled trunnion therefor, supporting means for the said trunnion, a hinged enclosure for the fixture, lever means cooperating with the hinged enclosure and with the said supporting means, whereby the said fixture is moved pivotally in a substantially vertical plane from an inoperative to an operative position upon predetermined horizontal movement of the hinged portion of the said enclosure.

4. The combination of an actuating mechanism, a pivotal type plumbing fixture movable in a vertical plane having connections respectively to a source of water supply and discharge means, a trunnion member therefor, the said fixture being mounted upon the said trunnion member, bearing supports for the said trunnion member, an enclosure for the said fixture, the said actuating mechanism being operated by a movable portion of the said enclosure, means cooperating with the said trunnion member and the said enclosure to produce predetermined rotative movement of the said trunnion coincident with movement of the said movable portion of the said enclosure.

5. The combination of a plumbing fixture actuating mechanism, comprising a pivotable plumbing fixture movable in a substantially vertical plane and having a journaled trunnion, bearing supports for the said trunnion, an enclosure for the said fixture, slidable linkage means cooperating with the said supports and the said enclosure, whereby upon opening the said enclosure predetermined rotational movement of the said fixture is obtained.

6. In combination, an actuating mechanism for a folding type closet bowl comprising a hollow trunnion member therefor having connections respectively to a source of water supply and discharge means, the said closet bowl being pivotally mounted upon the said trunnion member, bearing supports for the said trunnion member, an enclosure for the said bowl and the said actuating mechanism having a hinged portion, gear means cooperating with the said trunnion member and the said hinged portion to raise and lower the said closet bowl upon predetermined movement of the hinged portion of the said enclosure.

7. In combination, an actuating mechanism for a foldable plumbing fixture, an enclosure for the said fixture, gear and lever means cooperating with the said enclosure and the said fixture, whereby upon predetermined movement of the said enclosure the fixture is pivotally raised or lowered, the said gear and lever means in the closed position of the said enclosure being totally contained within the said enclosure.

8. An actuating mechanism for a folding type plumbing fixture having connections respectively to a source of supply and discharge means, a trunnion member upon which the said fixture is mounted for pivotal movement, an enclosure for the said bowl and trunnion member, the said actuating mechanism including slidable linkage and gear means cooperating with the said fixture and the said enclosure to produce rotational movement of the said trunnion member upon movement of the said enclosure.

9. In a plumbing fixture actuating mechanism, the combination of a plumbing fixture having a source of supply and discharge means, horizontally journaled means for the said fixture, an enclosure for the said fixture, direct means cooperating with a movable portion of the said enclosure and the said journaling means, whereby upon opening of the enclosure pivotal movement of the fixture in a substantially vertical plane is obtained.

LEIF ANDERSEN.
EDWARD A. FREDRICKSON.
ROY H. ZINKIL.