July 8, 1941. J. V. SCHAFER 2,248,126

WATER CLOSET LIFT ARM ASSEMBLY

Filed Feb. 10, 1941

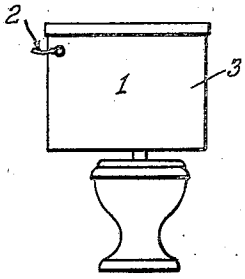


Fig. 1.

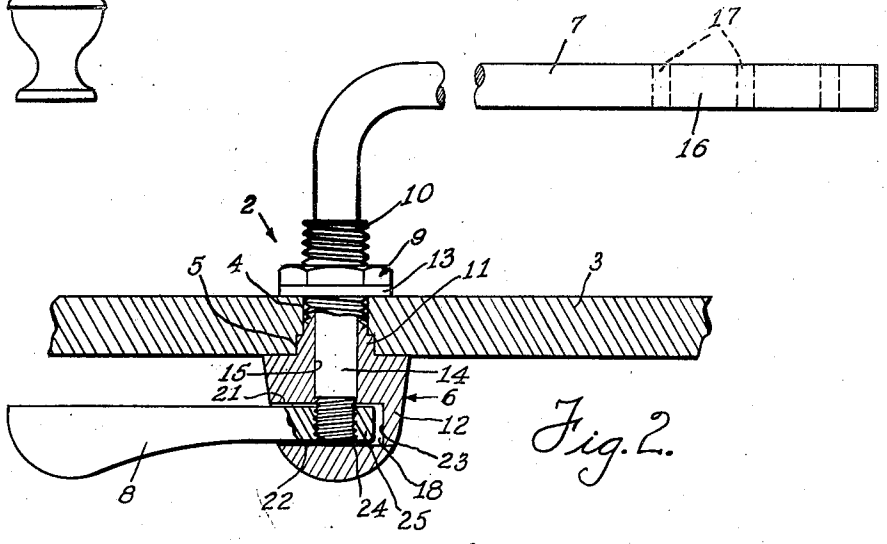


Fig. 2.

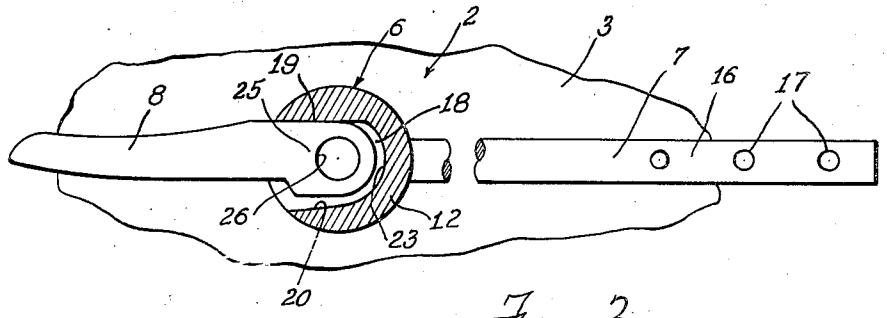


Fig. 3.

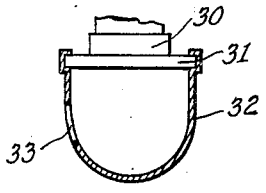


Fig. 4.

John V. Schafer.
INVENTOR.

BY

Charles S. Penfold ATTORNEY.

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WATER CLOSET LIFT ARM ASSEMBLY

John V. Schafer, Bronson, Mich.

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11 Claims. (Cl. 4—67)

This invention relates generally to a plumbing fixture, and more particularly to a tilting device adapted for use in conjunction with a reservoir or flush tank of a water closet for operating the float valve mechanism thereof, which mechanism controls the flow of water into the closet bowl.

One important object of the invention is to provide a device of the character stated, consisting of a minimum number of durable parts which may be economically manufactured and assembled together on a production basis.

Another object is to provide a device which as a unit may be easily and quickly installed or assembled with respect to the reservoir.

A further object is to provide a construction which is very positive and effective in action, and which is not likely to get out of order when subjected to hard and long usage.

Other objects and advantages of the invention will become apparent after considering the description hereinafter set forth in conjunction with the drawing annexed hereto, wherein:

Figure 1 is a relatively small front view of a toilet or closet, showing the invention attached to the reservoir thereof;

Figure 2 is a horizontal section taken through a part of the reservoir and portions of the device, clearly illustrating the relation of the various elements or parts of the combination;

Figure 3 is a front view in elevation of the structure of Figure 2, depicting other details of construction; and

Figure 4 is a modified embodiment of a part of the device, to which the invention is susceptible.

Referring to the drawing, numeral 1 represents a reservoir or tank of a conventional water closet containing the usual valve mechanism (not shown), which is adapted to be actuated by the operating means of the device generally designated 2, detachably connected to the front wall 3 of the tank. The front wall of the vast majority of flush tanks or reservoirs for toilets are preferably provided with a generally squared opening adjacent the upper left-hand corner of the tank, but as herein illustrated, the front wall is preferably provided with a round opening 4, having a countersunk square recess 5. Obviously, the device may be connected to the tank at some other convenient location than that just referred to.

The device generally designated 2 is of a unitary character so that it may be easily and quickly assembled, within a very few minutes, with respect to any of the numerous conventional standard tanks now in use. The device, as set forth above, is comprised of a few durable parts, and these, among other things, include a generally tubular member generally designated 6, disposed in the round opening 4 in the wall of the tank; a tiltable lever 7, journalled in the tubular member for actuating the float valve mechanism in the tank; operating means, in the form of a handle or trigger 8 connected to the lift lever for actuating the same; and fastening means 9, whereby the device may be quickly attached to the tank.

The member generally designated 6, provides a bearing and mounting for the lever 7, and among other things, includes a tubular extension or stem portion 10, which more or less fits quite snugly within the round opening 4; a squared portion 11, which is seated in the recess 5 of corresponding shape whereby to prevent rotation or movement of the member 6 relative to the wall 3 of the tank; and an enlargement or head portion 12, which, among other things, provides a stop abutting the frontal surface of the wall to limit movement of the member in one direction. The threads on the stem or extension 10 constituting a part of the fastening means 9 are preferably left-handed, and the other part is preferably in the form of a hexagonal nut cooperable with the stem for securing the device to the tank and limiting its movement in an opposite direction. In view of the provision of left-handed threads, the tendency is for the nut to tighten itself upon the stem whenever the trigger and lever are tilted or otherwise moved with respect to the tubular member 6 to actuate the valve mechanism. A gasket 13 is preferably interposed between the wall of the tank and the nut 9 in order to prevent any possible leakage of the water in the tank outwardly through the aperture 4. Obviously, means other than that illustrated and described may be employed to prevent movement of the tubular member 6 relative to the wall 3, and that any other form of fastening means suitable for the purpose may be used.

The lever or arm 7 may take any form suitable for the purpose intended, but as herein shown, is preferably made round in cross-section, and includes an extremity 14 rotatably mounted in the aperture 15 provided in the tubular bearing member 6, and an offset extremity 16 arranged at a right angle to the extremity 14. The free end of the extremity 16 is preferably provided with a plurality of holes 17 through which means may be extended through either hole desired for connecting the lever or arm to a part of the valve mechanism which controls the outflow of water from the tank into the closet bowl. Obviously,

the lever may be otherwise constructed to accomplish the results desired.

The enlargement or head 12 of the tubular member may be of generally cone shape, or any other shape desired, to correspond with the design of other fixtures. As clearly illustrated in Figure 3, the head is provided with a recess 18 preferably entering from one side thereof to intersect and communicatively connect with the aperture 15. This recess 18 is preferably arranged at a right angle with respect to the axis of the aperture 15, and is defined by upper and lower walls 19 and 20, of which the lower is declined; parallel side walls 21 and 22; and a curved bottom or end wall 23.

The inner end 24 of the extremity 14 of the lever is located within the recess 18, and is preferably tapered and provided with left-handed threads. The inner extremity 25 of the handle or trigger 8 is also arranged within the recess, and is preferably provided with a centrally disposed tapered round aperture 27 having threads cooperable with the threaded end 24 of the lever. In view of the left-handed threaded connection between the lever and handle, the connection tends to tighten whenever the handle is depressed to actuate the valve mechanism. The weight of the lever and float valve connected thereto maintains the trigger in a substantially horizontal position with the upper surface of the inner extremity of the trigger in engagement with the upper wall of the recess 18, and downward movement of the trigger is limited by the lower surface of the extremity engaging the lower declining wall 20. Obviously, means other than the threaded connection between the handle and lever may be employed.

As stated above, the device is primarily adapted to be assembled as a unit with respect to any tank, but it is of course to be understood that in certain applications, the tubular member 6 may be first firmly secured to a tank, in which event, the inner extremity of the handle 8 is inserted into the recess in the tubular member, whereupon the inner extremity of the lever is slid into the axial aperture of the tubular member and rotated into connection with the handle.

Referring now to Figure 4, there is clearly illustrated a modified form of a tubular bearing member. In this construction the tubular member is preferably comprised of two parts, a bearing member 30, having an annular flange 31, and a cap or hollow shell 32, the wall adjacent one extremity thereof being fashioned about the flange 31 to firmly secure the parts together. An aperture 33, more or less, the equivalent of the recess 18 in the member 6 above referred to, is provided in one side of the shell 32, for receiving a trigger or handle. This modified construction offers the advantage of a wide selection and application of caps of different shapes and designs whereby the general design of the device may be made to correspond with the general design of other equipment, including fittings and fixtures within a bathroom.

In view of the foregoing description, it will be evident that improved operating means have been provided, which is comprised of a minimum number of inexpensive, yet durable parts which may be easily and quickly assembled with respect to each other, and which when assembled, may as a unit be readily connected to a tank with very little effort. Also, it will be apparent that the device is very efficient in operation and not likely to get out of order when subjected to hard and long usage. Moreover, by reason of the character or shape of the two types of enlargements provided on the tubular members, the connection between the lever and handle is entirely concealed from view, thus enhancing the general appearance of the device.

Having thus described my invention, it is obvious that other modifications may be made in the same without departing from the spirit of my invention; hence, I do not wish to be understood as limiting myself to the exact forms, constructions arrangements, and combination of parts, herein shown and described or uses mentioned.

What I desire to obtain and secure by Letters Patent is:

1. In apparatus of the kind described, a reservoir, an aperture provided in a wall thereof, a tubular member secured in said aperture, said member having an end wall, a lever disposed in said reservoir and having a part extending into said member at least to a point in advance of the front side of said wall, an opening provided in a side of said tubular member, and means projecting into said opening and connected to that part of the lever extending in front of said wall for operating said lever, the connection between said means and said lever being concealed by said end wall.

2. Operating mechanism for the valve apparatus of a reservoir, including in combination: a reservoir, an aperture provided in a wall thereof, a tubular member disposed in said aperture, an enlargement having an end wall provided adjacent one extremity of the member and disposed on one side of said wall for limiting the movement of the member in one direction, means provided adjacent the other extremity of said member disposed on the other side of said wall for limiting the movement of the member in an opposite direction, a lever having a part disposed in said reservoir, for connection with the valve apparatus and a part extending into said tubular member and said enlargement, an opening provided adjacent a side wall of said enlargement, and operating means projecting into said opening in back of said end wall and connected to that part of the lever disposed in said enlargement whereby movement of said operating means will actuate said lever.

3. In apparatus of the kind described, a reservoir provided with an aperture, a tubular member disposed in said aperture, an enlargement provided adjacent one extremity of the member disposed adjacent one side of a wall of the reservoir, said enlargement having a side wall and an end wall, connection means including cooperating means provided adjacent the other extremity of the tubular member and a separate element interlocking with said cooperating means disposed adjacent the other side of said wall, a lever disposed in the reservoir and having a part extending into the tubular part and said enlargement, an opening provided in the side wall of said enlargement, and a trigger member projecting into said opening and connected to said lever for operating the latter.

4. In a plumbing fixture of the kind described, a generally tubular member having means at one extremity whereby the member may be secured against movement to a mounting, a lever having a part extending into said member, an opening provided in a side wall of said member, and a trigger member projecting into said opening and connected to that part of the lever extending

into said member whereby the lever may be moved relative to said member.

5. In a device of the kind described, a tubular member adapted to be secured against movement relative to a mounting, said member including a shank portion open at one extremity and closed adjacent its other extremity by a head portion, an opening provided in a side wall of said head portion and communicating with the open end of said one extremity, means extending into the opening provided in said head, and a lever insertable into the open end of the shank portion and connected to said means whereby said means may actuate said lever.

6. In a plumbing fixture of the kind described, a generally tubular member having an enlargement at one extremity, said enlargement having an end wall and a side wall, a movable element journalled in said member, an opening provided in the side of said enlargement intermediate said end wall and the other extremity of said member, and a handle projecting into said opening and connected to said element for actuating same, said other extremity being of a character to seat in the aperture of a mounting to support the member.

7. In a plumbing fixture of the kind described, a generally tubular member having an enlargement at one extremity, said enlargement having an end wall, a movable element journalled in said member, a recess provided adjacent the side of said enlargement substantially at right angles to the longitudinal axis of the latter, a handle projecting into said recess and connected to said element for actuating the same, and means within the recess providing a stop for limiting the movement of the handle at least in one direction, the other extremity of the tubular member being provided with means whereby the member may be secured to a mounting.

8. In a plumbing fixture of the kind described, a body member adapted for support within the aperture of a mounting, operating means associated with said body member, said body member having an end wall at one extremity, and a handle having integral means whereby the handle and said operating means may be directly connected together at a point intermediate said end wall and the other extremity of said body member to conceal the connection.

9. In a device of the kind described, a generally tubular member, a movable element journalled on said member, an opening provided in the side of said member intermediate its ends, a handle projecting into said opening and threadedly connected to said element whereby the connection will be tightened when pressure is applied to the handle.

10. In apparatus of the kind described, a reservoir, an aperture provided in a wall thereof, a tubular member having one extremity secured in said aperture and its other extremity enlarged and disposed adjacent one side of said wall, said enlarged extremity having an end wall and a side wall, a lever disposed in the reservoir and having a part extending into said member to a point in advance of the said one side of the wall, an opening provided at least in one side of the side wall of the tubular member, and handle means projecting into said opening and connected to the lever at said point, the connection between said handle means and said lever being concealed by the said end wall of the enlargement.

11. In apparatus of the kind described, a reservoir having a wall provided with an aperture, a body member having a part disposed in said aperture with means for securing the member in place, a tubular enlargement provided on said body member and disposed adjacent one side of said reservoir wall, said enlargement having a side wall and an end wall, operating means arranged in the reservoir having a part carried by the body member, an opening provided in the side wall of the enlargement, and a handle projecting into said opening and connected to said operating means for actuating the latter.

JOHN V. SCHAFER.