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FLAPPER VALVE

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Fig. 1.

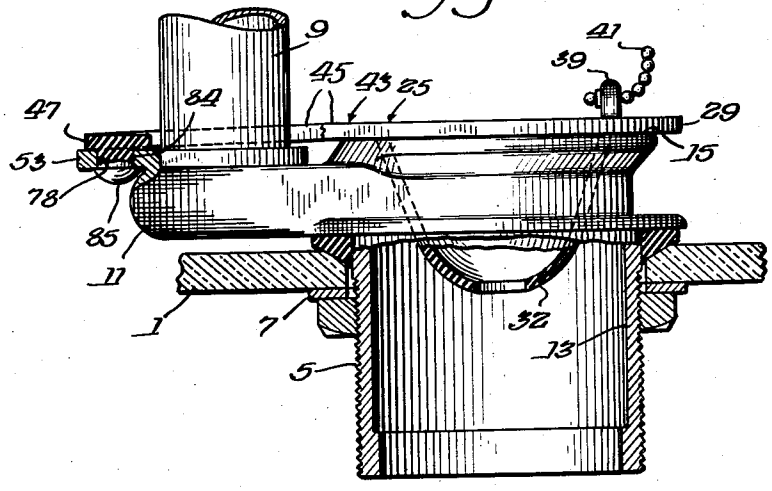
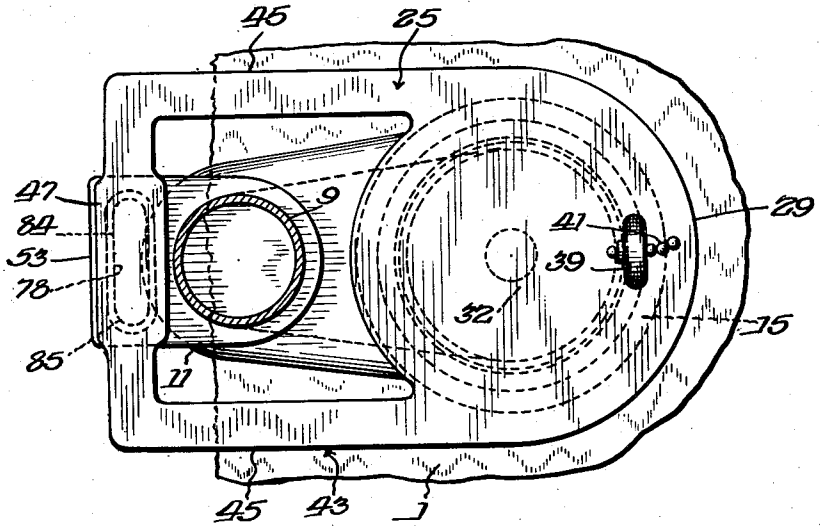


Fig. 2.



Inventors.
Axel B. Nelson,
Edward G. Schmidt, &
Roy H. Zink, Jr.
By Joseph O. Lang Atty.

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FLAPPER VALVE

Axel B. Nelson, Chicago, Edward G. Schmidt, La Grange, and Roy H. Zinkil, Oak Park, Ill., assignors to Crane Co., Chicago, Ill., a corporation of Illinois

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4 Claims. (Cl. 4—57)

This invention relates generally to valves, and more particularly, it is applicable to discharge valves for flush tanks or the like.

The present application is a division of copending application Serial No. 397,456 filed December 10, 1953, now Patent No. 2,774,972.

The present invention accordingly is directed to a simple and convenient mode of attachment and securement of valve members, especially of the flat seating flapper type illustrated. More particularly, the present invention avails itself of the button-on arrangement of the parent application, except that the concept presented herein employs post means integral with the closure member and of elastic, deformable material like the extending means of the closure, said post means being insertable through apertured means on the outlet portion of the flush tank for instance.

Other objects and advantages will become more readily apparent upon proceeding with the description read in light of the accompanying drawing in which:

Fig. 1 is an assembly view of a construction according to the present invention.

Fig. 2 is a top plan view of the same.

Similar reference numerals refer to similar parts throughout two views.

Referring to the drawing in detail, the numeral 1, refers to the outlet portion of a water closet flush tank or the like, shown fragmentarily, said portion being provided with an outlet opening and including a seat surface around the opening at the upper or inner end thereof and overflow means in fluid communication with the outlet opening. Although not necessary, as will be seen from Figs. 11 and 12 of the copending application referred to, a separate member 5 is employed in the form illustrated through which the fluid discharging from the tank actually flows and which contains the seat surface of the tank. This member may be the seat member in common use, as shown, modified to some extent for this invention. It should be understood of course that although the outlet member 5 is employed, the seat surface may be integral with the floor of the tank and also an integral overflow channel may be employed similar to that shown in Figs. 11 and 12 of the parent application.

Further describing the construction shown in the drawing, the outlet member 5 extends through the floor of the tank in fluid sealed relation at 7, providing the seat surface 15 extending around the port 13. The side extension 11 of the member is provided with the usual overflow tube 9 which is in fluid communication with the port 13 through the side extension shown.

A flapper type of flat seating swingable closure member 25 is provided comprising a closure portion 29 and extending means generally designated 43. A float element 32 depends from the lower surface of closure portion, being received within the port 13 of the outlet fitting in the closed valve position as shown. At the front of the closure portion and extending from the upper surface thereof is the raised projection 39 through which the flexible chain 41 extends for raising the valve closure into the open position.

The extending means 43 is illustrated as comprising spaced arms 45 extending along opposite sides of the overflow tube and a rearward crosspiece or bar 47 joining the arms and passing behind the overflow tube in the mounted position of the closure shown.

Whereas in the Fig. 1 form for instance, of the parent application, attachment of the closure member was accomplished by means of an upward extension from the outlet fitting or in the Fig. 11 form from the floor of the tank which passed through an aperture in the closure member providing a button-on arrangement of the closure onto a special post formation of the extension, the present construction is in general a reversal of this arrangement. A similar stem or post 84 is provided in the present construction terminating in an enlargement or button head 85. However, this formation projects from and is integral with the extending means of the closure member, more particularly the cross bar 47 thereof. This post formation extends from the lower flat surface of the said extending means, the enlargement or the button head 85 preferably providing an upper flat surface in spaced relation with the undersurface of the extending portion of the closure.

Preferably the entire closure member but at least a portion of the extending means and the post and button formation should be constructed of resilient, deformable material such as rubber or other similar composition so as to provide flexure for swinging movement of the closure member into the open and closed position and also for attachment of the post formation as will be subsequently described.

Cooperating with the post formation is an apertured extension 53 of the outlet fitting 5 or similar apertured means extending from or integral with any other part of the outlet portion of the flush tank. This extension 53 has opposite upper and lower flat faces for contact by the undersurface of the cross bar 47 of the closure member and top of the button head 85. As shown in Fig. 1, the stem 84 is wholly received within the aperture 78 and fills the entire space thereof. The enlargement or button head 85 is beyond the aperture extending over the marginal portion of the apertured member whereby to retain the stem within the aperture and consequently the closure member in attached mounted relation.

It should be evident that the attachment of the closure member can be quickly and conveniently accomplished by merely placing the enlarged head 85 over the aperture and pressing down on the cross piece 47 so as to force the head through the opening and into engagement with the opposite side of the apertured attachment portion to provide for interlocked relation between the cross piece and apertured portion. The length or the height of the stem 84 exclusive of the head portion or in other words the space between the underside of the extending means of the closure and the top of the enlargement is substantially equal to the thickness of the apertured portion 53 through which the button head is forced. This gives a tight securement of the closure member.

Continuing the description of the present construction, the post formation is of elongated cross or transverse section, the elongation preferably extending laterally or in the direction of the cross bar as shown in Fig. 2. This arrangement prevents rotation of the closure by its point of attachment whereby to retain said closure in substantially predetermined alignment relative to the outlet port 13 for proper seating engagement with seat surface 15. In order to prevent such rotation, it should be noted that the length or height of this post member and of the aperture extends in the direction of or in a

plane parallel to the swinging movement of the closure and that the elongation in the illusrtated form is normal or at right angles to this movement.

Although a single, centrally disposed post means and receiving apertured means has been illustrated, plural means may be employed within the spirit of the invention. Other changes and variations from the form illustrated may also be made and it is accordingly desired that the appended claims be limited only by their terms within the broad spirit of the invention and the prior art.

We claim:

1. In combination with a water closet flush tank or the like having an outlet opening and a seat surface around the opening at the upper end thereof, a valve closure engageable with the seat surface in the closed valve position, said valve closure including hinge means extending therefrom, means for attaching said valve closure to said tank, said attachment means comprising stem means projecting from said hinge means of the valve closure and an apertured portion receiving said stem means, said stem means passing through the aperture in the apertured portion in the attached relation of the valve closure and substantially filling the aperture, enlarged means on said stem means beyond the aperture of the said apertured portion for retaining the stem means within the aperture during normal operation of the valve closure, said stem means and enlarged means being of elastic material distortable for insertion of the enlarged means through the aperture in the said apertured portion for retention of the valve closure, said hinge means of the valve closure being of flexible material for permitting swinging movement of the valve closure into the open and closed positions.

2. In combination with a water closet flush tank or the like having an outlet opening and a seat surface around the opening at the upper end thereof, a valve closure engageable with the seat surface in the closed valve position, said valve closure including hinge means extending therefrom, means for attaching said valve closure to said tank, said attachment means comprising stem means projecting from said hinge means of the valve closure and an apertured portion receiving said stem means, said hinge means being in contact with said apertured portion and the stem means passing through the aperture in the apertured portion and substantially filling the same in the attached relation of the valve closure, said stem means having enlarged means beyond the aperture engaging the marginal portion around the aperture whereby to retain the stem within the aperture and the hinge means of the valve closure in contact with the apertured portion in the attached relation of the valve

closure, said stem means and enlarged means being of elastic material distortable for insertion of the enlarged means through the said aperture for attachment of the valve closure, said hinge means of the valve closure being of flexible material for effecting swinging movement of the valve closure into the open and closed positions.

3. In combination with a water closet flush tank or the like having an outlet opening and a seat surface around the opening at the upper end thereof, a closure member engageable with the seat surface in the closed valve position, said closure member including hinge means extending therefrom, means for mounting said closure member to the tank, said mounting means comprising a single laterally centrally position post projecting from a surface of said hinge means, said post having an enlarged portion spaced from the said surface of the hinge means, said mounting means further comprising an apertured portion, said post of the closure member being received within the aperture in the apertured portion in the mounted relation of the closure member and substantially filling the same, the enlarged portion of the post being beyond and overlapping the said aperture for retention of the post within the aperture during normal operation of the valve closure, said post including the enlarged portion being of elastic material distortable for insertion of the enlarged portion through said aperture for mounting of the closure member, said aperture being transversely and symmetically elongated and said post being correspondingly elongated in section thereacross whereby to prevent substantial pivoting of the closure member about its attachment to the apertured portion, said hinge means of the closure member being of flexible material for permitting swinging movement of the closure member into the open and closed positions, the said post projecting in a plane parallel to the swinging movement of the closure member.

4. The subject matter of claim 3, said closure member having a flat seat contacting portion, said hinge means comprising spaced arms and a crossbar at the ends thereof opposite the seat contacting portion from which the arms extend, said single post means projecting from the center of the crossbar in the lateral direction, all of said seat contacting portion, arms and crossbar being wholly of flexible material such as easily flexible rubber.

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