April 8, 1958 A. B. NELSON ET AL 2,829,378

FLAPPER VALVE

Original Filed Dec. 10, 1953

Fig. 1.

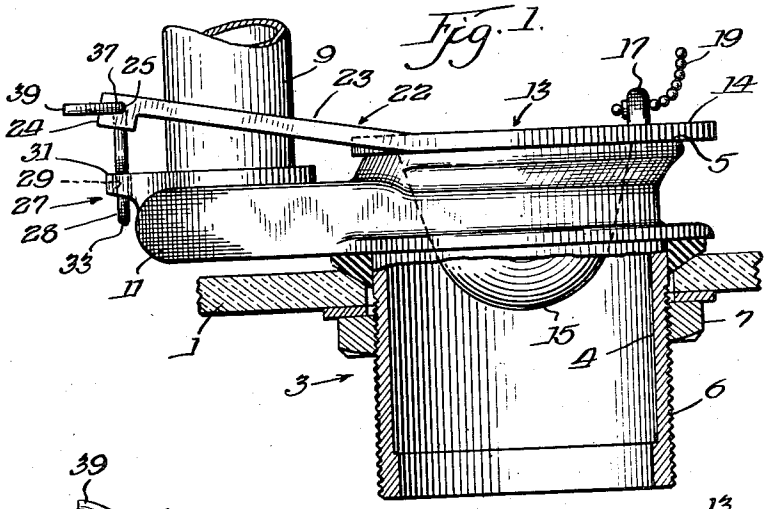


Fig. 2.

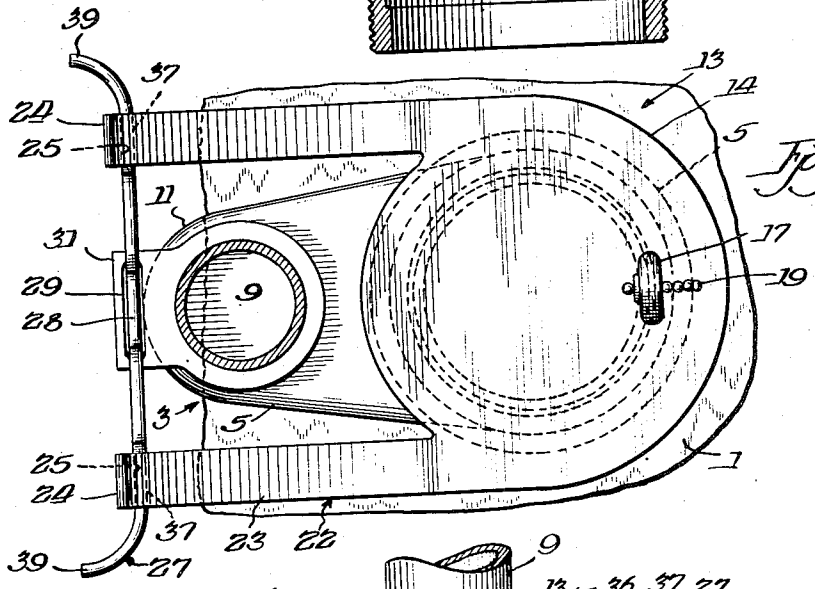
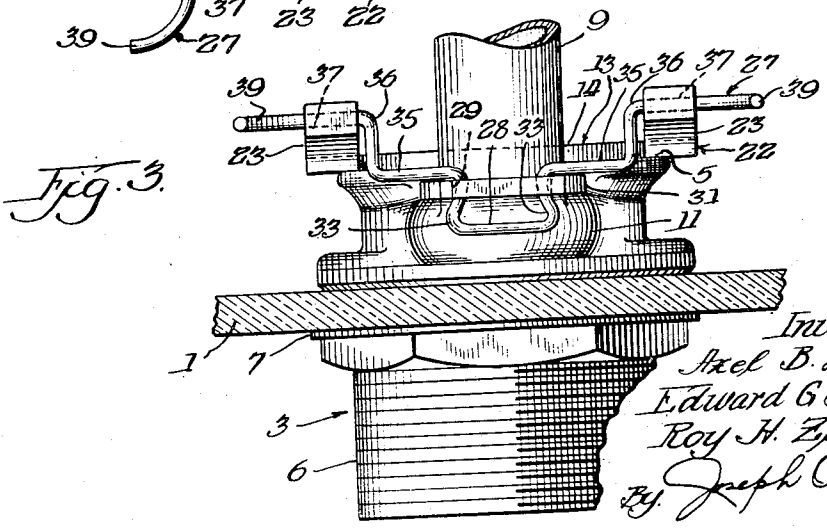


Fig. 3.



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2,829,378

FLAPPER VALVE

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Original application December 10, 1953, Serial No. 397,456, now Patent No. 2,774,972, dated December 25, 1956. Divided and this application May 25, 1956, Serial No. 587,338

4 Claims. (Cl. 4—57)

This invention relates generally to valves, and more particularly, it concerns 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, issued December 25, 1956.

The present invention is directed to a simple and convenient mode of attachment and securement of discharge valve members for water closet flush tanks or the like, especially of the flat seating flapper type such as is illustrated in the drawing. More particularly, the present invention avails itself of a simple one-piece wire mounting member adapted to resiliently snap within a central transverse slot in a portion associated with the outlet portion of the tank, while supporting the closure member for free pivotal movement into the open and closed positions.

One of the advantages of this type of mounting is that it can be quickly and easily made without the necessity of drawing the closure member downwardly over the length of the overflow tube as is the case in a prior art construction which relies on a rubber collar gripping the outer surface of the overflow tube for positioning the closure member in operative relation. A further advantage and objective of this construction is to prevent sidewise rotation of the closure member out of operative position by means of the elongated nature of the engagement between the attaching portion of the wire member and the slot within which the same is received.

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

Fig. 1 is the assembly view of a preferred form of the present invention.

Fig. 2 is the top plan view of the same, and

Fig. 3 is an elevation of Fig. 2 as seen from the left.

Similar reference numerals refer to similar parts throughout the drawing figures.

Referring more particularly to the drawing, the numeral 1 refers to the outlet portion of a flush tank for water closets 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, a separate member 3 is employed in the illustrated construction 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. This member is accordingly provided with the usual port 4 constituting the outlet passage from the flush tank and the seat surface 5 at the upper or inner end of this port. The outlet member extends through the floor of the tank at 6 having the usual fluid sealed type of connection therewith at 7. The overflow tube 9 is connected to the side extension 11 of the outlet member in the usual relation.

The numeral 13 generally designates a flat seating type of valve member adapted to overlie or extend over the top of the seat surface 5 for fluid sealed relation therewith in the closed valve position shown. The portion actually so extending over the top of the outlet fitting is designated by numeral 14.

Depending from the closure portion is a suitable float element 15 such as of hollow rubber construction. A projection 17 extends upwardly from the front of the upper surface of the closure member through which passes a flexible chain 19 for lifting of the closure member from the seat into the open position during actuation of the valve. Extending from the rear of the closure portion 14 is an extending means 22 herein comprising the spaced parallel arms 23 terminating in thickened portions 24 through which aligned apertures 25 extend, as more clearly shown in Fig. 2.

The positioning or mounting member 27 of the present invention is preferably formed of resilient wire or rod stock and comprises an elongated attachment or offset portion 28 adapted to snap resiliently into position within the slot or elongated opening 29 in the rearwardly extending portion 31 of the seat member. It should be understood at this point that the extending portion 31 represents merely stationary means on the outlet portion of the flush tank and does not necessarily have to be an extension of the outlet member 3 but may otherwise be associated with the outlet portion as being removably connected to the overflow tube 9 or being an integral part of the floor of the flush tank as a raised slotted portion thereon.

The central portion 28 is of open loop formation with reentrant sides 33 resulting in at least a slightly broader part at the bottom of greater size than the length of the slot 29 for the yieldable snap action reception therewithin. This mounting member extends outwardly or laterally at each side at 35, resting on the upper side of portion 31 of the seat member which in conjunction with the engagement of the reentrant portions 33 with the opposite side or undersurface of the portion 31 provides for tight securement of the attachment member 27 on the slotted portion 31.

The attachment member extends upwardly at 36 and then outwardly at 37 to form aligned supports or pivot pins for passage through the openings 25 of the closure member for free pivotal rotation of the latter. It should be noted that the pivot pin supporting portions are at right angles to the upwardly extending portions 36 of the mounting member so as to prevent the resilient arms 23 of the closure member from moving inwardly off of the pin portion. The wire attachment member terminates at each side in rearwardly curved portion 39 over which the resilient rubber or the like arms of the closure member must be passed in the process of attaching the closure to the mounting member and which portions prevent the resilient arms from slipping off in an outward and rearward direction in the course of normal valve operation. The upwardly extending portion 36 together with rearwardly curved outermost portions 39 therefore comprise means for retaining the resilient arms of the closure member in proper position during operation of the valve.

Preferably the arms 23 are assembled onto the attachment member 27 first and then the closure member and attached mounting member are loosely passed over the overflow tube, after which the central open offset portion 28 of the mounting member is pressed within the slot 29 for the interlocked retained position of the mounting member relative to the outlet portion of the tank.

It should be understood that certain variations and modifications, can be made within the broad spirit of this invention and it is therefore intended that the said

invention be limited only by the appended claims construed within such broad spirit of this invention.

We claim:

1. In combination with a flush tank or the like having an outlet portion provided with an outlet opening, the latter portion including a seat surface around the opening at the upper end thereof and overflow means in fluid communication with the outlet opening, a valve closure engageable with the seat surface in the closed valve position, support means on said outlet portion of the flush tank, said support means having a portion with a slot therethrough, means attaching the valve closure to said support means, said attaching means comprising a member having opposite side portions joined by a portion extending within and through said slot, said joining portion having a narrow portion adjacent the opposite side portions for extension within the slot and a portion beyond the narrow portion of greater size than the length of the slot for retention of the narrow portion within the slot, said side portions and portion of greater size than the slot simultaneously engaging the opposite surfaces of the portion through which said slot extends for tightness of securement of the attaching means to the slotted portion, at least the joining portion of the attaching means being or resilient flexible material for passage of the portion of greater size than the slot through the said slot into interlocked position.

2. In combination with a flush tank or the like having an outlet portion provided with an outlet opening, the latter portion including a seat surface around the opening at the upper end thereof and overflow means in fluid communication with the outlet opening, a valve closure engageable with the seat surface in the closed valve position, support means on said outlet portion of the flush tank, said support means having a portion with a slot therethrough, means attaching the valve closure to said support means, said attaching means comprising a member having a portion of elongated material formed into an open offset extending within and through said slot, the offset portion having opposite side sections extending beyond the end limits of said slot and engaging opposite end edges of the slot at one surface of the slotted portion for retention of said offset portion within the slot, the member comprising the attaching means also having portions extending from the side sections of the offset portion engaging the opposite surface of the slotted portion, said offset portion being of resilient material permitting flexure of the same through the slot into interlocked mounted relation.

3. In combination with a flush tank or the like having an outlet portion provided with an outlet opening, the

latter portion including a seat surface around the opening at the upper end thereof and overflow means in fluid communication with the outlet opening, a valve closure engageable with the seat surface in the closed valve position, support means on said outlet portion of the flush tank, said support means having a portion with a slot therethrough, means attaching the valve closure to said support means, said attaching means comprising a member having laterally extending portions joined by a central portion, said central portion being of elongated material formed into an open offset extending within and through said slot, said central portion having a reduced portion adjacent said laterally extending portions for extension within the slot and a portion beyond the reduced portion of greater size than the length of the slot for retention of the reduced portion within the slot, said laterally extending portions and portion of greater size than the slot simultaneously engaging the opposite sides of the slotted portion for tightness of securement of the attaching means to the slotted portion, at least said central portion being of resilient material permitting flexure of the same through the slot into interlocked relation.

4. In combination with a flush tank or the like having an outlet portion provided with an outlet opening, the latter portion including a seat surface around the opening at the upper end thereof and overflow means in fluid communication with the outlet opening, a valve closure engageable with the seat surface in the closed valve position, said valve closure including extending portions, support means on said outlet portion of the flush tank, said support means having a portion with a slot therethrough, means attaching the valve closure to said support means for swinging movement into the open and closed positions, said attaching means comprising a mounting member constructed of resilient wire or the like, said mounting member having laterally extending portions passing through said extending portions of the closure for pivotal movement of the latter thereabout and a central portion formed into an open offset connecting said laterally extending portions and extending within and through said slot, said central offset portion having a reduced portion adjacent the laterally extending portions for extension within the slot and a portion beyond the reduced portion of greater size than the length of the slot for retention of the reduced portion within the slot, said laterally extending portions and portion of greater size than the slot simultaneously engaging the opposite sides of the slotted portion for tightness of securement of the attaching means to the slotted portion in the mounting relation.

No references cited.