

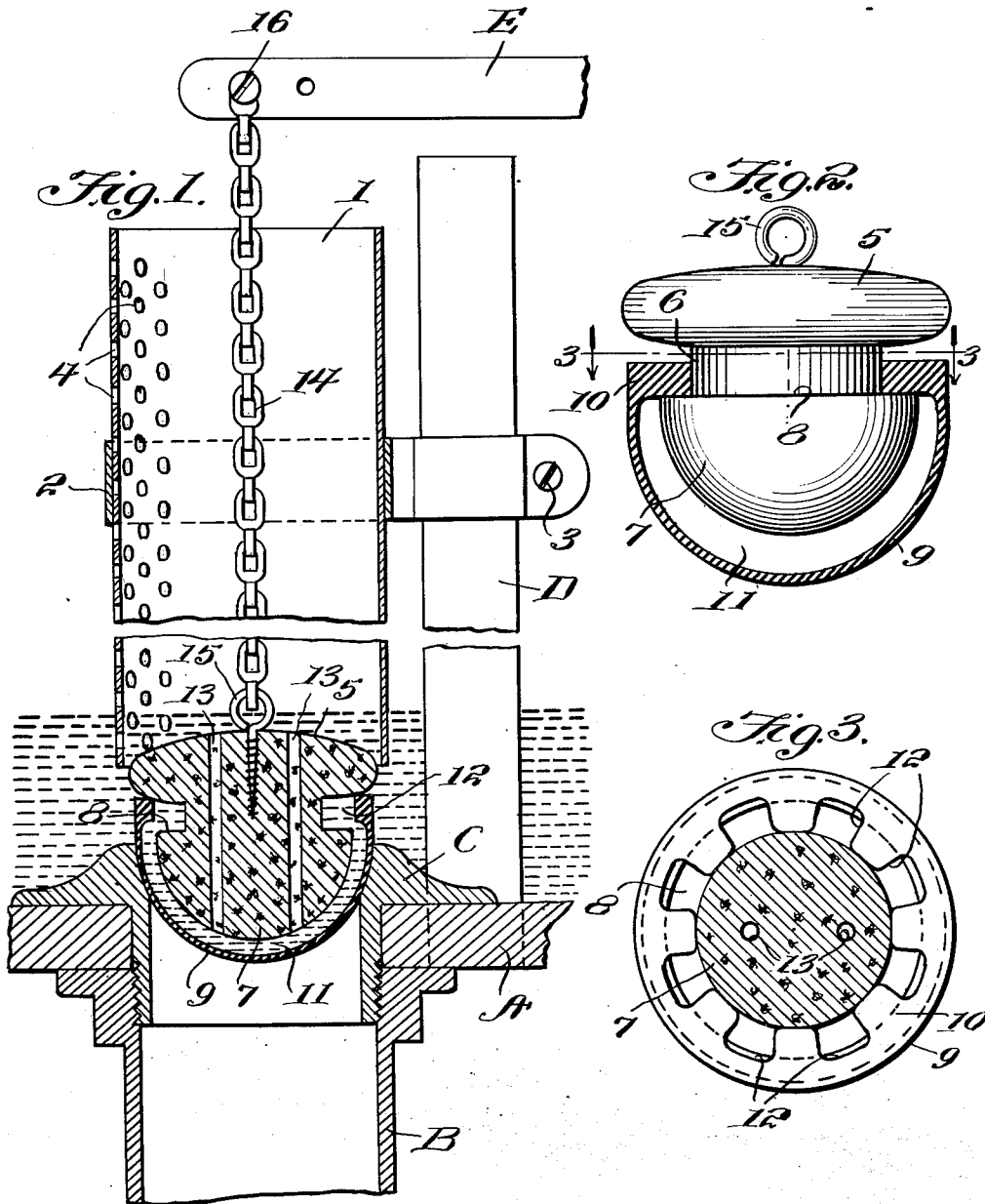
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FLUSH TANK FLOAT VALVE ASSEMBLY

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WITNESSES:

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FLUSH TANK FLOAT VALVE ASSEMBLY

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3 Claims. (Cl. 4—57)

This invention relates to float valve assemblies for flush tanks for toilet bowls or the like, and its general object is to provide an assembly that not only eliminates the conventional hollow rubber ball, the stem therefor, guide for the stem, and the wire member which connects the stem to the operating or trip lever, but also the many troublesome and disadvantageous features of those members, especially the sticking of the stem in its guide, the improper seating of the ball, and the noisy operation thereof, the noise being brought about by the clanking of the metallic parts and the seating of the hollow ball.

A further object is to provide a float valve assembly that is silent in operation, and proper seating of the valve is assured to bring about a watertight seal, as the valve is suspended directly from the trip lever by a flexible element and is directly guided by an enclosure, to its seat, as well as is cushioned by a wall of water, to eliminate the usual audible thump when seating, the water cushion being disposed between companion parts of the valve and is under pressure by the water in the flush tank, thus resulting in a sealed contact of the valve with its seat.

Another object is to provide a float valve assembly that is simple in construction, can be installed in place of the assembly now in general use in an easy and expeditious manner, is inexpensive to manufacture and extremely efficient in operation, use and service.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawing and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawing wherein like characters denote like or corresponding parts throughout the several views, and in which:

Figure 1 is a view of my valve assembly partially in section and installed within a tank.

Figure 2 is a view of my water cushioned valve, with the jacket part thereof in vertical section.

Figure 3 is a sectional view taken approximately on line 3—3 of Figure 2, looking in the direction of the arrows.

Referring to the drawing in detail, the letter A indicates the bottom wall of a flush tank, B the flush pipe leading to the toilet bowl, C the valve seat member which is secured to the pipe, D the overflow pipe and E the trip or operating lever, all of which form no part of my in-

vention and are shown merely to illustrate the association of my assembly therewith.

My assembly includes a hollow cylindrical enclosure 1 having open ends and is supported in a vertical position for disposal in parallelism with the overflow pipe, to overlie the valve seat and in registration therewith, by a clamping bracket which includes a collar 2 surrounding the enclosure in gripping relation therewith, and formed on or otherwise secured to the collar are clamping arms that are removably secured to the overflow pipe by a bolt and nut connection 3.

The cylinder or enclosure provides a guide for the valve which will be later described in detail, and while the side portion of the enclosure adjacent the overflow pipe is imperforate, the opposite or outer side portion is perforated or provided with openings 4 throughout the length thereof to assure free passage of water within the enclosure, as the water rises in the tank. The perforated side portion of the enclosure is arranged remote from the outlet end of the water inlet pipe, not shown, so as to prevent any violent action of the incoming water against the valve, thus assuring proper operation thereof.

The valve is of unique construction, in that it includes a body made from any suitable buoyant material, such as cork, wood, sponge rubber or the like, and the body includes a disk like head 5, a short neck 6 depending centrally from the head and a semispherical lower portion 7 formed on the neck, so that the latter together with the confronting walls of the head and the lower portion 7, provide an annular groove 8. The periphery of the disk like head is vertically rounded and the top thereof is preferably slightly arched, while the upper wall of the lower portion 7 is flat, as best shown in Figure 2.

The body of the valve is preferably solid as shown, and the valve also includes a jacket made of rubber or the like, to provide a hollow semispherical portion 9 having formed on the upper edge thereof, an intumed relatively thick annular flange 10 that is mounted in the groove for free rotation and vertical movement between the confronting walls of the head and lower portion 7, as will be apparent upon inspection of Figures 1 and 2. The hollow semispherical portion 9 encloses the lower portion 7 of the body, but is of a size to be spaced therefrom at all times to provide a water chamber 11, and the flange is notched or recessed at regular intervals about the same, to provide water passages 12 for the chamber. The body of the valve has a pair of spaced parallel vertically disposed bores

13 therethrough which also provide water passages for the chamber, as clearly shown in Figure 1.

The valve is suspended from the trip or operating lever E by a chain 14, in the form shown, the chain having its lower end connected to an eyelet 15 threaded or otherwise secured to the valve body, while the upper end of the chain is connected to the bolt of the bolt and nut connection 16 which has its bolt mounted in an opening in the lever E. The lever is provided with several openings for receiving the bolt, for adjusting the chain relative thereto, to assure free movement of the valve within the enclosure 1. While I have illustrated a chain for suspending the valve from the lever, with the lower end of the chain connected to the valve by an eyelet, it will be obvious that any other like flexible means may be substituted for the chain and the flexible means may be connected to the body by means other than an eyelet, but in any event I want it understood that the flexible means is essential in order to eliminate the clanking noise brought about by the use of the conventional stem and wire member which connects the stem to the lever.

From the above description and disclosure in the drawing, it is believed that the operation of my assembly will be obvious, but it might be mentioned that the lever E is tripped in the usual manner, which results in the valve being pulled from its seat and thus rising to the surface of the water, due to the buoyancy of the valve body, and as the water recedes the valve will be carried thereby as well as is guided by the enclosure 1 to be reseated, to allow the tank to be refilled, as will be apparent. The chamber 11 is filled with water at all times and such performs a dual function, namely it increases the weight of the lower portion of the valve, to prevent undue tilting thereof and thereby eliminating any possibility of the valve sticking in the enclosure 1 and the water in the chamber likewise provides a cushion, to not only eliminate the usual noisy thump when the valve is seating, but causes a positive watertight seal between the valve and its seat, and the sealing action increases as the water rises in the tank, due to the increasing pressure of the water, as will be apparent.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be

made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:

1. In a float valve assembly for a flush tank having a seat therein, a valve comprising a buoyant body including a disk like head, a relatively short neck formed on and depending from the head, a semispherical lower portion formed on the neck for the confronting walls of the lower portion and head to provide an annular groove, an elastic jacket enclosing said lower portion and engageable with the seat, a relatively thick annular flange formed on the upper end of the jacket and mounted in the groove to connect the jacket to the body for vertical and rotary movement relative thereto, said jacket being spaced from said lower portion of the body to provide a chamber, said flange being recessed at regular intervals about the same, said body having a pair of spaced parallel bores extending vertically therethrough, and said recesses and bores forming water passages for the chamber to provide a water cushion about said lower portion.

2. In a valve of the character described, a buoyant body having an annular groove, a hollow resilient jacket spaced from and enclosing the lower portion of the body, and an annular flange formed on and directed inwardly of the jacket and projecting into the groove, the said flange being of a thickness less than the width of the groove to allow limited movement of the jacket with reference to the body and having circumferentially spaced recesses opening into the space between the body and the jacket.

3. In a flush valve, a body of buoyant material having a disk shaped upper portion and a semispherical lower portion, the intermediate portion of the said body having an annular groove, a hollow semispherical jacket spaced from and enclosing the lower portion of the body, an annular flange formed on and extending inwardly of the jacket and projecting into the body groove, the said flange being of a thickness substantially less than the width of the groove to allow limited movement of the jacket longitudinally of the body, the said flange also being provided with a series of circumferentially spaced recesses extending radially outward from the inner edge to provide openings communicating with the space between the lower portion of the body and the jacket.

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