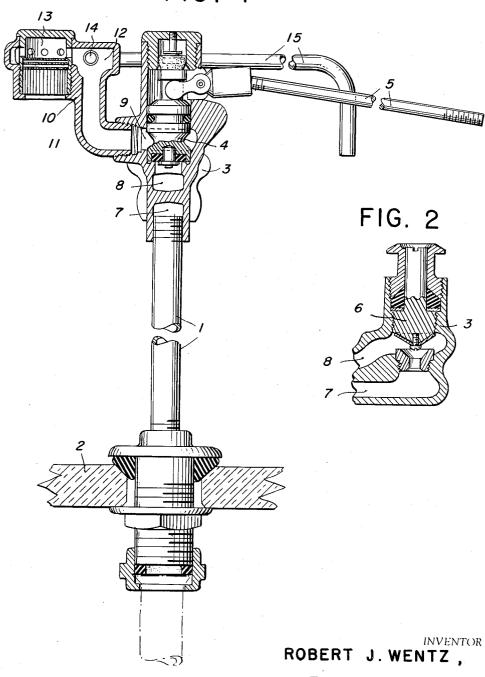
ANTI-SIPHON DEVICE FOR FLUSH TANK VALVES

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BY K. Close Court.

ATTORNEY

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2 Sheets-Sheet 2

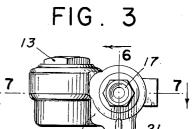
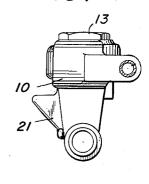


FIG. 4





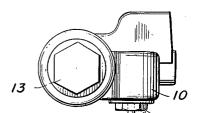


FIG. 6

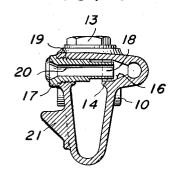
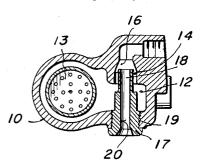


FIG. 7



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## 2,722,229

## ANTI-SIPHON DEVICE FOR FLUSH TANK VALVES

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> Application May 29, 1953, Serial No. 358,229 5 Claims. (Cl. 137-216)

This invention relates to a simple and novel arrangement of anti-siphon device for water closet flush tank valves and preferably to flush valves of the float operated ball cock type, but it is also applicable to other devices requiring a back flow preventer.

Most plumbing regulations require a closet bowl flush- 20 ing apparatus that will not permit the contamination of the water supply system by a back siphoning into said system of water from the closet bowl or the flush tank.

This has given rise to the development of various types of anti-siphon devices associated with flushing valves for 25 water closet flush tanks and the present invention has been designed for use in connection preferably with the ball cock type of flush valve, although obviously it can be used with any preferred type of water closet flush valve either as an integral part of the valve body structure or as an adapter or replacement where the type of valve or valve body will permit such a conversion.

Specifically the preferred form of the invention relates to an anti-siphon device or unit for ball cock valves for water closet flush tanks and more particularly to what might be called an anti-siphon attachment or adapter to be used in connection with most of the conventional types of ball cock valves now in use where there is provided a fitting in communication with the discharge outlet of the valve body, said fitting comprising a water discharge outlet for filling the flush tank and a water supply passage adapted to receive a refill tube for the closet bowl.

In some instances all of these parts are more or less integral formed with the ball cock valve body and it is to be understood that applicant's invention is also applicable to this type of apparatus, but applicant's preferred form is particularly directed to the first mentioned type where the refill for the tank and refill for the bowl are contained within a separate-fitting removably secured to the ball cock valve body.

The principal object of the present invention is the production of a simple yet practical and efficient device including in a single unit a water discharge outlet for the filling of the closet tank, a water supply passage for  $_{55}\,$ connecting with the refill tube for the closet bowl and an anti-siphon means interposed therebetween, said unit adapted to be connected, as such, to the water discharge outlet of the ball cock valve body, either as an original installation or as an adapter or substitute for an original 60 fitting not provided with an anti-siphon arrangement.

Another object of the invention is to produce an antisiphon device, for the purpose indicated, at little additional expense over the conventional type of fitting having no anti-siphoning feature and one that can be carried 65 by the trade as a replacement or adapter, the conversion being made with little or no trouble and at little additional expense.

A further object is the production of a fitting of the type  $_{70}$ indicated that would require in use and function no change whatsoever in the flush valve structure per se, so long as

there is a control valve for admitting water to said fitting to perform the necessary flushing action.

The preferred embodiment of the invention is illustrated in the accompanying drawings in which-

Figure 1 is a view partly in section and partly in elevation of the improved anti-siphon device or adapter as applied to the conventional ball cock valve for water closet flush tanks.

Figure 2 is a vertical sectional view of the usual volume 10 or water-pressure control valve associated with the ball cock valve body illustrated in Figure 1.

Figure 3 is a view in side elevation of the adapter unit per se provided with applicant's anti-siphon means.

Figure 4 is an end elevational view of the adapter unit illustrated in Figure 3, and

Figure 5 is a top plan view thereof.

Figure 6 is a vertical sectional view on line 6-6 of Figure 3, and

Figure 7 is a horizontal sectional view on line 7—7 of Figure 3, both more clearly showing the improved anti-siphon feature of applicant's adapter unit.

Referring to the drawings in detail, 1 indicates the conventional water supply pipe mounted in the bottom 2 of a water closet flush tank with the usual gasket and clamping nuts as clearly shown in Figure 1.

The upper end of the water supply pipe 1 carries a valve body 3 provided with a reciprocating valve 4 controlled by a float (not shown), carried by the rod 5. This valve body also includes a manually set or controlled valve 6 for regulating the volume and pressure of the water passing therethrough, said water, when the valve 4 is open, passing up the water supply pipe 1 into the passage 7, past valve 6 (Figure 2) into passage 8, past the ball cock or float control valve 4 and out through the port 9, to refill the flush tank.

In many installations the port 9 is connected to a tank refill tube or pipe, extending downwardly to a point adjacent the bottom 2 of the tank and in other forms this outlet port 9 is connected to various types of fittings for refilling said flush tank from a point above the water level in the tank and the present invention relates more particularly to this latter type of fitting.

Referring again to Figure 1, applicant's improved fitting consists of a unit 10 provided with an inlet channel 11, the outer end of which being in communication with the outlet port 9 of the ball cock valve 4 and its housing 3.

The inner end of this inlet channel 11 is in communication with a chamber 12 which chamber in turn is in communication with a water outlet plug 13 for refilling the 50 flush tank and a passageway 14 connected at its outer end to a refill tube 15 for the closet bowl. This outlet plug 13 is provided with water restricting means for producing a coherent stream to thereby silence the discharge of water therethrough into the flush tank in a well known manner.

To more clearly set forth applicant's invention and the improved features of the herein set forth arrangement, attention is directed to Figures 3 to 7, inclusive, with particular reference to Figures 6 and 7 wherein it will be noted that the inner end of the passageway 14 is provided with a tapered bore 16 whereby the passage of water therethrough is restricted to a certain degree as it flows to the outlet end of said passageway and into the refill tube 15 (Figure 1).

To further control and restrict the passage of water from the chamber 12 into and through the passageway 14, and as the main feature of applicant's invention, there is provided a tubular bushing 17 having a reduced inner end 18 extending into or to a point adjacent the tapered bore 16 of said passageway 14.

The outer end of this tubular bushing 17 is provided

with screw threads 19 for securing the same in the wall of the fitting or unit 10 as more clearly shown in Figures 6 and 7.

With the construction and arrangement as shown, the tubular bushing 17 not only provides the necessary restriction to the water passing from the chamber 12 around the reduced end of said bushing into the passageway 14 and refill tube 15, but also provides a novel and simple means through its bore 20, for venting to the atmosphere the refill tube 15 so that there will be prevented a siphoning of any water from the closet bowl back into the water supply system. Furthermore, this tubular bushing 17 will provide means for carrying off any back-pressure water not able to pass through the passageway 14 into the refill tube 15, said water passing out of said bushing 15 and down over a water deflector or lip 21. The flooding of bore 20 brought about by the restriction between the end of tubular bushing 17 and the chamber 16, produces quiet operation of the unit and eliminates asperation noise.

In addition, it will be noted that there are no moving parts in the herein described vacuum breaker or antisiphon device and the tubular bushing 17 can be easily removed for cleaning in the event of sediment clogging the opening or said bushing can be replaced if excessive corrosion occurs without the necessity of shutting off the water supply. Further, if any part is removed or left out or wrongly assembled, there will be a noticeable spilling of water to indicate that repairs or adjustment should be made.

The fitting as illustrated in Figures 3 to 7, inclusive, may be used in an original installation in combination with the ball cock valve as shown in Figure 1 or as a replacement or adapter substituting for an original fitting not provided with an anti-siphon means or arrangement.

What I claim is:

1. An anti-siphon adapter for flush valves for water closet flush tanks, comprising a combination fitting including a water inlet channel, a water discharge outlet, and a water supply passage adapted to be connected to a refill tube, all in communication with each other, and means for restricting the flow of water through said water inlet channel to said refill tube, said restricting means also comprising an air vent for said combination fitting.

2. An anti-siphon adapter for flush valves for water closet flush tanks, comprising a combination fitting including a water inlet channel, a water discharge outlet and a water supply passage adapted to be connected to a refill tube, all in communication with each other, and tubular means for restricting the flow of water around said tubular means and through said water inlet channel to said refill tube, said restricting means also comprising an air vent for said combination fitting, and also means for the discharge of back pressure water not able to pass through said refill tube.

3. An anti-siphon adapter for ball cock valves for

water closet flush tanks, comprising a combination fitting including a water inlet channel adapted to communicate with the discharge outlet of said ball cock valve, a water discharge outlet and a water supply passage adapted to receive a refill tube at its outlet end, both in communication with said water inlet channel, a removable tubular bushing having its inner end concentrically positioned within the inlet end of said water supply passage with slight clearance for restricting the flow of water through said passage, the outer end of said bushing extending through a wall of said combination fitting and secured therein, providing a vent to the atmosphere and also means for the discharge of back pressure water not able to pass through said inlet tube.

4. An anti-siphon adapter for ball cock valves for water closet flush tanks, comprising a combination fitting including a water inlet channel adapted to communicate with the discharge outlet of said ball cock valve, a restricted water discharge outlet and a water supply passage adapted to receive at its outlet end a refill tube, both in communication with said water inlet channel, a removable tubular bushing extending through a wall of said fitting and threaded therein and having its inner end concentrically positioned within the inlet end of said water supply passage with slight clearance, for restricting the flow of water through said passage, said tubular bushing providing an air vent for said fitting and also means for the discharge of back pressure water not able to pass

through said refill tube.

5. An anti-siphon adapter for ball cock valves for water closet flush tanks, comprising a combination fitting including a water inlet channel adapted to communicate with the discharge outlet of said ball cock valve, a restricted water discharge outlet and a water supply passage having a tapered bore at its inlet end and adapted to receive at its outlet end a refill tube, both the discharge outlet and water supply passage being in communication with said water inlet channel, a removable open ended tubular bushing extending through a wall of said fitting and threaded therein and having its inner end concentrically positioned within the tapered bore of the inlet end of said water supply passage with slight clearance, for restricting the flow of water through said passage, said tubular bushing providing an air vent for said fitting and also means for the discharge of back pressure water not able to pass through said refill tube.

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