

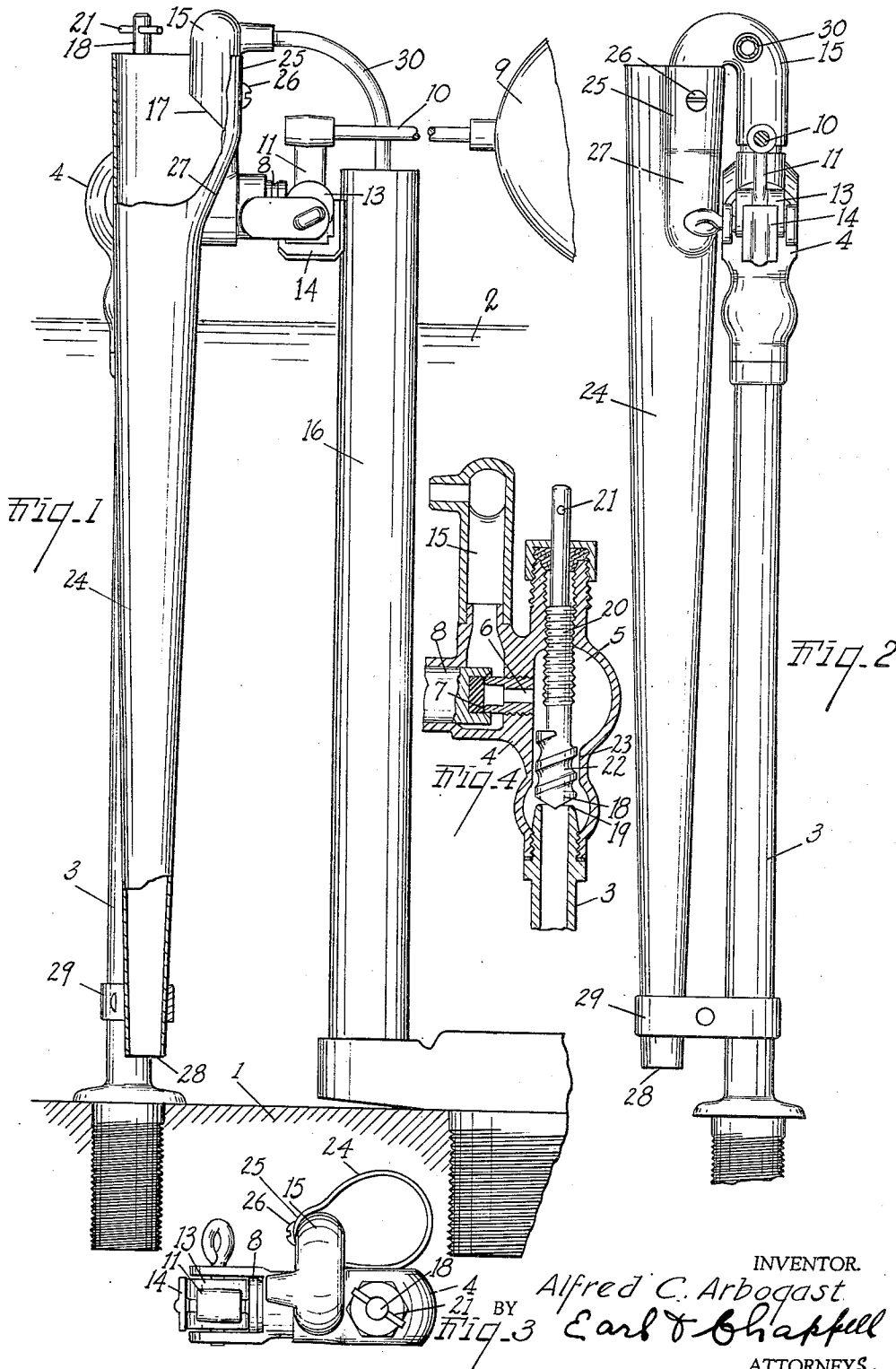
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BALL COCK

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BALL COCK

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The main objects of this invention are:

First, to provide a ball cock or valve assembly for flushing tanks which eliminates the possibility of back siphonage of water from the tank into the supply system.

Second, to provide a valve assembly for flushing tanks which is very quiet in its operation.

Third, to provide a valve assembly having these advantages which is readily adjusted for successful operation on water systems of different pressures.

Fourth, to provide a valve assembly having these advantages which is quite simple and economical and very durable in structure.

Objects pertaining to details and economies of my invention will definitely appear from the description to follow. The invention is defined in the claims.

A structure embodying the features of the invention is clearly illustrated in the accompanying drawing, in which:

Fig. 1 is an elevation of a valve assembly embodying the features of my invention, portions being broken away for convenience in illustration and to disclose structure.

Fig. 2 is an elevation looking from the right of Fig. 1, the overflow pipe being omitted and the refill tube and float arm being sectioned.

Fig. 3 is a top view, the overflow pipe, refill tube, and float being omitted.

Fig. 4 is a fragmentary view partially in vertical section showing details of the valve structure.

In the embodiment of my invention illustrated in the accompanying drawing 1 represents a flushing tank and 2 the water therein when the tank is filled to a normal depth. The supply pipe or riser 3 projects upwardly within the tank and is connected to a suitable source of water supply such as a city water system. The valve casing 4 is mounted on the upper end of this supply pipe and in the embodiment illustrated is provided with a delivery chamber 5 having a lateral delivery passage 6 terminating in a valve seat 7 with which the reciprocating valve 8 coacts. This valve is controlled by the float 9, the arm 10 of which is connected to the upwardly projecting arm 11 on the valve actuating cam or eccentric 13 which coacts with the yoke 14 on the outer end of the reciprocating valve 8. The valve is provided with a return bend delivery pipe 15.

The tank is provided with the overflow pipe 16, the discharge end of the delivery pipe 15 being substantially above the upper end or the plane of the upper end of the overflow pipe 16. The de-

livery end of the delivery pipe is preferably cut on the bevel as shown at 17 in Fig. 1.

In advance of the inlet valve 8 I provide a regulating valve 18 which coacts with a valve seat 19 provided on the upper end of the supply pipe 3. This regulating valve 18 is threaded for adjustment at 20 in the valve casing and provided with a finger piece 21 to facilitate adjustment. As a means for quieting the flow of water from the supply pipe into the valve chamber 5 and coacting with that chamber in quieting the flow of water, the valve 18 is provided with a spiral groove 22 which coacts with the internally cylindrical wall 23 of the valve casing and in general imparts to the water a rotary or swirling motion. The valve and its quieting means prevent a gushing flow of the water when the ball cock valve 8 is opened.

The delivery pipe 15 delivers to a downwardly tapered discharge tube 24 which is of such length that it receives the delivery end of the delivery pipe and its lower end terminates adjacent the bottom of the tank. This discharge tube has a lateral offset or enlargement 25 at its upper end of such dimensions as to fit against the side of the delivery pipe 15 and secured thereto by the screw 26. The bottom of this offset is inclined inwardly and merges into the inclined wall of the discharge tube so that the water discharged from the delivery pipe is discharged downwardly on this inclined surface 27, that is, at the bottom of the offset and against the inclined wall of the tapered tube into which the inclined bottom 27 merges.

The diameter of the lower end of the discharge tube or the delivery opening 28 at the bottom thereof is such that normally the water supplied from the inlet valve exceeds the discharge 28 with the result that the tube fills and there is some overflow at the top resulting in submerging the delivery end of the delivery pipe, thereby further silencing the discharge of water. However, the amount of overflow should not be excessive; otherwise, splashing results as the water falls from the top of the tube into the tank. It is merely desirable to insure that the tube be filled and slight overflow is not objectionable as the water runs down the wall of the tube. The regulating valve 18 is an important factor in securing silent operation as it can be adjusted for various water pressures to secure the proper flow of water through the inlet valve 8.

The return or gooseneck delivery pipe has an added feature other than the matter of proper delivery to the discharge tube, namely, that when

the valve 8 closes it is entirely submerged, and this acts as a silencer, particularly when the valve is nearly shut off, as at that point very fine streams of water are projected between the valve seat and the plunger, but in this embodiment they are projected into the surrounding water and this acts as a silencer. Inasmuch as the delivery tube 24 is open at both ends, and the delivery water from the valve thereto is above the level of the overflow pipe, there is no possibility of back siphoning, which is a very valuable feature.

I am aware that several attempts have been made to provide anti-siphoning ballcocks but so far as I am aware none of them other than the structure of this application has definitely met the approval of the health authorities or plumbing inspectors of certain leading cities.

The tube 24 is easily mounted, its lower end being supported by the bracket or clip 29 projecting from the lower end of the supply pipe. The refill tube 30 is connected to the delivery pipe 15 near the top thereof.

I have illustrated and described my invention in a highly satisfactory embodiment thereof, one which secures the advantage of being positively anti-siphoning, and also a structure which is very quiet in operation, always a desired feature in ballcocks. I am aware however that structural details may be substantially varied and still maintain various advantages of my invention.

Having thus described the invention what is claimed as new and desired to secure by Letters Patent is:

1. In a valve assembly for flushing tanks, the combination with a supply pipe and an overflow pipe, of an inlet valve and casing therefor mounted on said supply pipe and provided with a gooseneck delivery pipe, the discharge end of which is substantially above the top of the overflow pipe, a downwardly tapered discharge tube open at both ends and having a lateral offset at its upper end receiving the discharge end of said delivery pipe, the bottom of said offset being inwardly inclined and merging into the inclined wall of the discharge tube so that the water from said delivery pipe is discharged downwardly against said inclined wall, the lower end of said discharge tube being of such diameter as to restrict the delivery of water therethrough so that in the normal tank filling discharge of the valve

the discharge tube becomes filled with water above the level of the discharge end of the delivery pipe, and a refill tube connected to said delivery pipe at a point above the discharge end thereof.

2. In a valve assembly for flushing tanks, the combination with a supply pipe and an overflow pipe, of an inlet valve and casing therefor mounted on said supply pipe and provided with a gooseneck delivery pipe, the discharge end of which is substantially above the top of the overflow pipe, and a downwardly tapered discharge tube open at both ends to which said delivery pipe discharges, the lower end of said discharge tube being of such diameter relative to the discharge of said delivery pipe as to restrict the delivery of water through the discharge tube so that in the normal tank filling discharge of the valve the discharge tube becomes filled with water above the level of the discharge end of the delivery pipe.

3. In a valve assembly for flushing tanks, the combination with an overflow pipe, of an inlet valve provided with a downwardly directed delivery which opens substantially above the top of the overflow pipe, and a discharge tube tapered downwardly throughout the length thereof and open at both ends operatively associated with the discharge of said inlet valve so that the water discharged from the valve is discharged within the tube against an inclined wall thereof.

4. In a valve assembly for flushing tanks, the combination of an inlet valve provided with a downwardly directed delivery pipe, and a discharge tube open at both ends and having a lateral offset in its upper end receiving the discharge end of said delivery pipe, the bottom of said offset being inwardly inclined and merging into the wall of the discharge tube so that the water from said delivery pipe is discharged downwardly against said inclined surface.

5. In a valve assembly for flushing tanks, the combination of an inlet valve provided with a downwardly directed discharge, and an open ended discharge tube to the upper end of which said discharge delivers, the delivery opening in the lower end of said discharge tube being restricted so that it is less than the normal delivery capacity of the valve.

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