

Nov. 27, 1934.

M. KAUCHACK

1,982,167

VALVE

Filed May 20, 1933

2 Sheets-Sheet 1

Fig. 1.

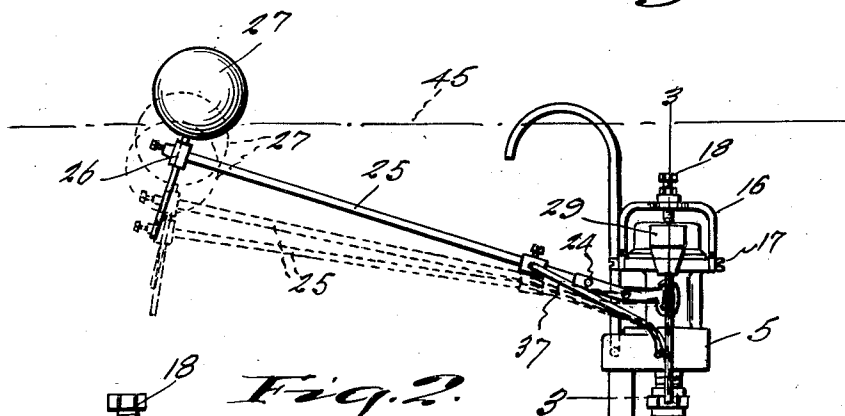


Fig. 2.

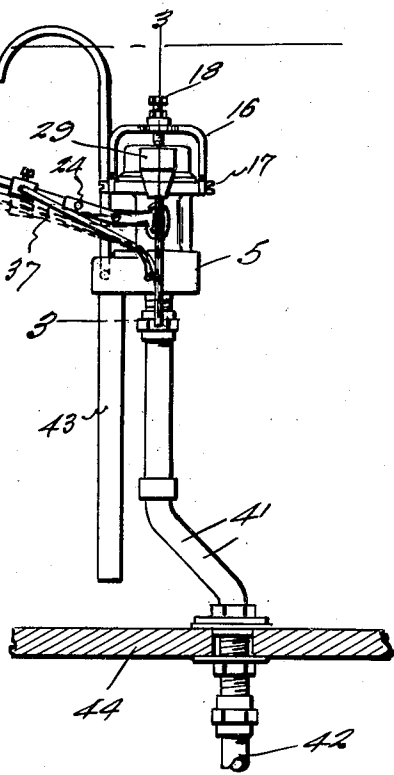
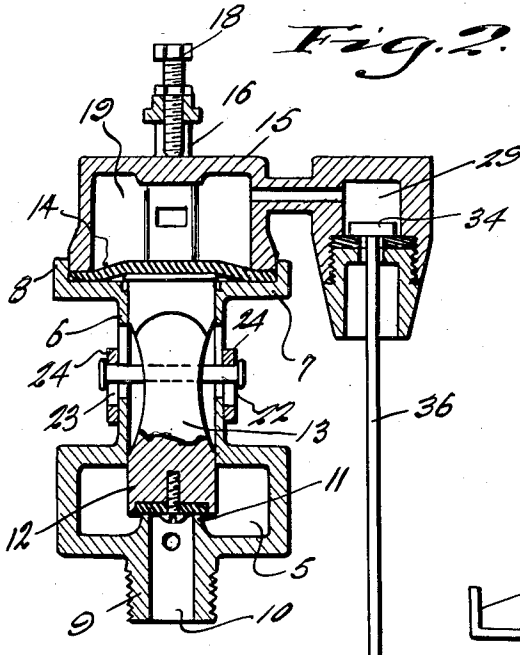


Fig. 4.

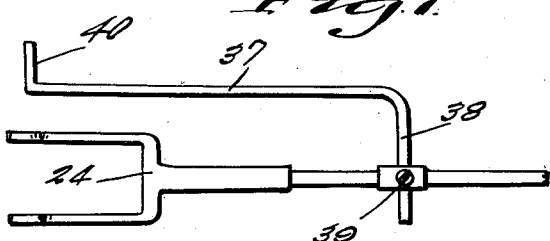
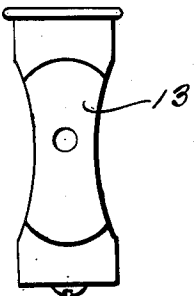


Fig. 5.



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Fig. 5.

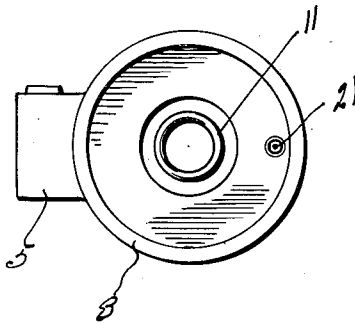


Fig. 4.

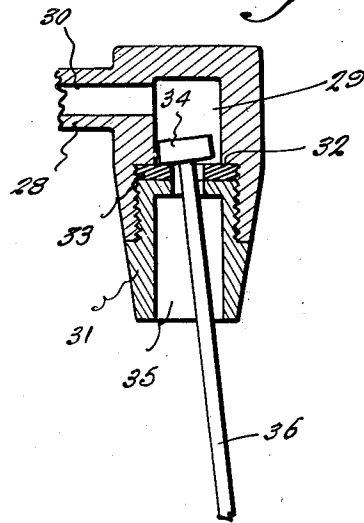


Fig. 6.

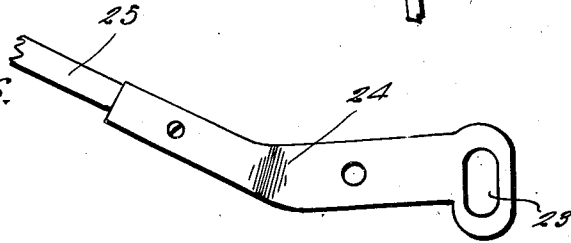
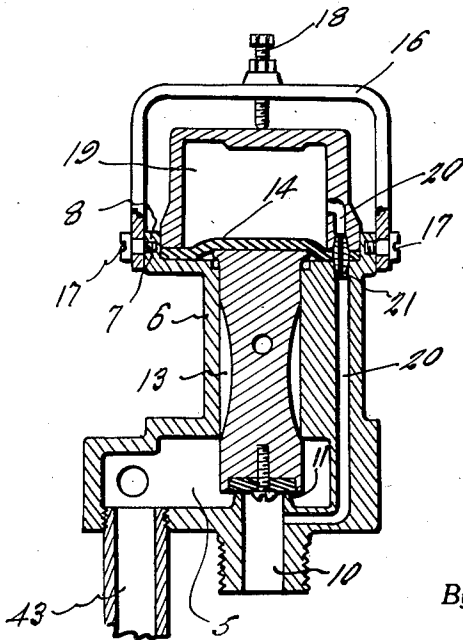


Fig. 3.



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UNITED STATES PATENT OFFICE

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VALVE

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Application May 20, 1933, Serial No. 672,061

2 Claims. (Cl. 137—104)

This invention relates broadly to valves, and has as its object the provision of an improved inlet valve for flush tanks.

In accordance with the present invention, a valve for the purpose above mentioned is provided for automatically controlling the feed of water to the flush tank. Further, the invention comprehends the provision of a valve for the purpose above suggested controlled by both water pressure and float means so that through the medium of the water pressure the valve is positively locked in a closed or seated condition to be released in an automatic manner for replenishing the supply of water in the flush tank when the level of the water in the tank falls due to a flushing of the bowl with which the tank is associated.

It is an object of the present invention to provide a valve of the character above mentioned which consists of comparatively few parts, can be manufactured and retailed at nominal expense and cost, is not likely to easily get out of order, and which will be otherwise well adapted for the purpose designed.

The invention, together with its numerous objects and advantages, will be best understood from a study of the following description taken in connection with the accompanying drawings, wherein is illustrated a preferred embodiment of the invention.

It is to be understood at the outset that it is in nowise intended to restrict the invention to the precise embodiment herein illustrated other than may be necessary to meet the requirements of the prior art and the scope of the appended claims.

In the drawings:

Figure 1 is a side elevational view of the valve and illustrating an application thereof.

Figure 2 is a sectional elevational view through the valve.

Figure 3 is a view similar to Figure 2 but taken at right angles thereto and on the line 3—3 of Figure 1.

Figure 4 is a sectional view through a bleeder forming part of the invention.

Figure 5 is a top plan view of the valve casting with the top removed.

Figure 6 is a side elevational view of a portion of the float arm.

Figure 7 is a plan view of the float arm and a trip rod associated therewith.

Figure 8 is an elevational view of a plunger or piston.

Referring to the drawings by reference nu-

merals it will be seen that the valve comprises a suitable casting having in the lower portion thereof a distribution chamber 5 from the top of which rises a cylinder 6 provided with an enlarged head 7 having an upstanding flange 8. At the bottom of the casting there is provided an externally threaded nipple 9 having an inlet passage 10 therethrough opening into the chamber 5. At the inner end of the passage 10 there is provided a seat 11 against which normally seats the washer-equipped end 12 of a piston valve or plunger 13 mounted for reciprocation within the cylinder 6.

Engaging the upper end of the piston valve 13 is a rubber diaphragm 14 fitted within the confines of flange 8 on head 7. A cap 15 has its lower edge resting on the peripheral edge of the diaphragm 14 within the confines of the flange 8 and the cap 15 is removably secured in place through the medium of a bail 16 pivoted to the head 7 as at 17 and provided with a locking screw 18 that is adapted to be screwed down onto the top of the cap 15 for securing the cap in position, and the diaphragm 14 clamped between the cap and head 7.

The cap 15 forms with the head 7 a control chamber 19 that is connected with the passage 10 through the medium of a passage 20, one section of which is formed in the casting, and the other section of which is suitably formed in the wall of the cap 15 as will be clear from a study of Figure 3. At the joint between the sections of the passage there is provided a suitable nipple 21 to provide a fluid-tight connection.

The piston valve 13 has extending transversely therethrough between the ends of the piston valve an opening for accommodating a pivot pin 22. The ends of the pivot pin operate in vertical slots provided at opposite sides of the cylinder 6 and are engaged in slots 23 provided in the ends of the arms of a fork 24 suitably secured to a float rod 25. On its free end the rod 25 has adjustably connected thereto, as indicated generally at 26, a suitable float 27.

Integral with the cap 15 and extending laterally therefrom is a cylindrical extension 28 that is also integral with one wall of what may be termed a bleed chamber 29. The cylindrical extension 28 has a passage 30 therethrough connecting the chambers 19 and 29. The wall of the chamber 29 at the bottom thereof is internally threaded and a suitable outlet device 31 is screwed into said end of the chamber and cooperates with an internal shoulder 32 for clamping in position an apertured disk 33 that provides a seat for a valve

34 controlling communication between the chamber 29 and a passage 35 provided in the outlet device 31. The valve 34 is provided with a stem 36 that extends through the outlet device 31, and normally the stem 36 is disposed perpendicularly with the valve 34 engaging the seat 33 for cutting off communication between chamber 29 and passage 35.

An angular trip rod 37 has one end 38 adjustably secured to the float arm 25 as at 39, and a second end 40 arranged to engage the stem 36 for unseating the valve 34 upon movement of the float 27 and arm 25 to the uppermost dotted line position shown in Figure 1 for bleeding the chamber 19.

In actual practice, the inlet neck 9 is suitably coupled to the upper end of a pipe 41 usually provided within the flush tank and suitably coupled to the supply pipe 42. The chamber 5 has depending therefrom an outlet tube 43 that at its lower end terminates upwardly from the bottom 44 of the flush tank. The normal water level in the flush tank is indicated by the broken line shown in Figure 1 and designated by the reference numeral 45.

From the foregoing it will be seen that when the level of the water within the flush tank is normal, the float 27 is in the raised or full line position, end 12 of the piston valve 13 is engaged with its seat 11, and valve 34 is fully engaged with its seat 33. When the flush valve of the flush tank is operated for flushing purposes, the water level in the flush tank will, of course, fall and as the level falls the float 27 and associated parts move downwardly to the uppermost dotted line position shown in Figure 1 and this movement of the arm 25 will be sufficient to engage end 40 of the trip rod 37 with the valve stem 36 to shift the valve to the position shown in Figure 4. It will thus be seen that the water in the chamber 15 will bleed therefrom through the passage 30, chamber 29, and outlet passage 35 thus releasing pressure on the diaphragm 14 and consequently on the top of the piston valve 13. As the water level still recedes, float 27 and its associated parts moves to the lowermost dotted line position shown in Figure 1 and thereby initiates upward movement of the valve piston 12, thus permitting water from the source of supply to pass into the chamber 5, and from the chamber through the outlet tube 43 into the flush tank. The force of the water flowing through the chamber 5 to the outlet tube 43 will be sufficient to act on the piston valve 13 to complete the upward movement thereof so as to permit a rapid flow of water through the chamber 5 and tube 43 to quickly raise the water level in the flush tank.

As the level in the flush tank rises, float 27 and associated parts will return to the full line position shown in Figure 1 while at the same time, some of the water passing into the passage 10 from the source of supply will flow from said passage through the passage 20 into the chamber 19 and the weight of the water in the chamber 19

will act on the diaphragm 14 in a manner to assist the float arm 25 in moving the piston valve 13 downwardly to engage its seat 11 for cutting off the flow of water through the chamber 5. Obviously, as the float rises, the stem 36 is permitted to resume its normal perpendicular position for seating the valve 34. The parts are now in position to repeat the cycle of operation just described.

What is claimed is:

1. In a valve of the class described, a distributing chamber having an inlet, a cylinder rising from the top of the chamber and provided at its upper end with a diametrically enlarged head having an upstanding marginal flange, a diaphragm arranged on the head within the confines of said flange, a cap member having an open end engaging the head within the confines of said flange and cooperating with the head for clamping the diaphragm in place, a bail pivoted to the head and adapted to straddle said cap, a locking screw threadedly engaged with the bail and adapted to be threaded home against the cap for securing the latter in position, said chamber and cylinder being provided with a formation having a passage extending there-through from the inlet, said cap being provided on the wall thereof with a formation having a passage formed therein adapted to align with the first named passage for establishing communication between the inlet and the interior of said cap, and a nipple passing through an opening in the marginal portion of the diaphragm and having an end seating within one end of the first named passage, and a second end seated within one end of the passage in said cap; a pressure responsive piston operating in the cylinder, a bleed valve connected with the cap, and float control means operatively connected with the piston and having operative engagement with the valve.

2. In a valve of the class described a casting having in the lower portion thereof a distributor chamber provided with an inlet, a cylinder rising from the upper end of said chamber and provided at its free end with an enlarged head having an upstanding flange, a hollow cap having an open side adapted to engage the head within the confines of said flange, a diaphragm arranged on the head and clamped between the head and said cap, bail means pivotally connected with the head and engageable with the cap for securing the same in position on said head, a piston operating in said cylinder and having an end engageable with the diaphragm, and said casting and cap being provided with bored formations, the bores of which are aligned to provide a passage connecting the inlet of the distributing chamber with the hollow of said cap, said cap having the hollow thereof constituting a control chamber, and a bleed valve for the control chamber associated with said cap.

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