Feb. 3, 1925. 1,525,334

C. STENGEL

FLUSH TANK COCK

Filed Jan. 4, 1923

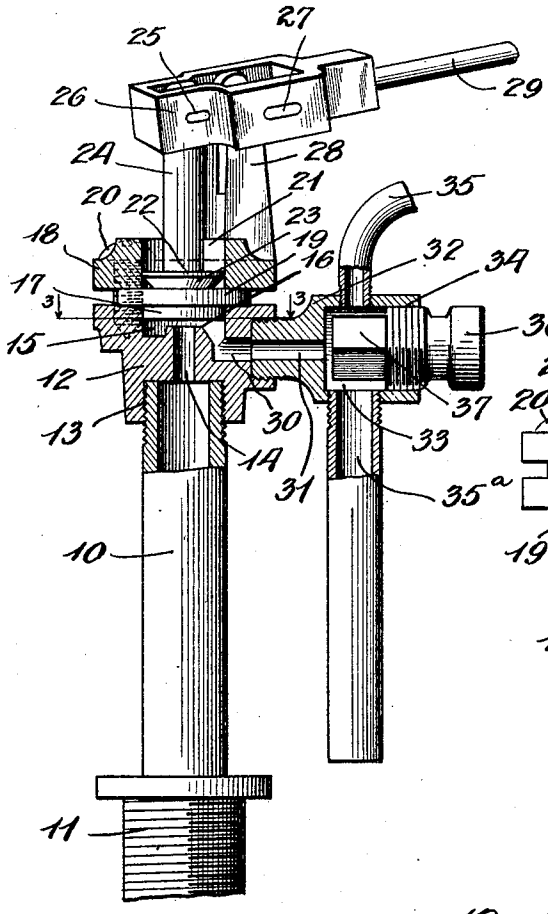


Fig. 1.

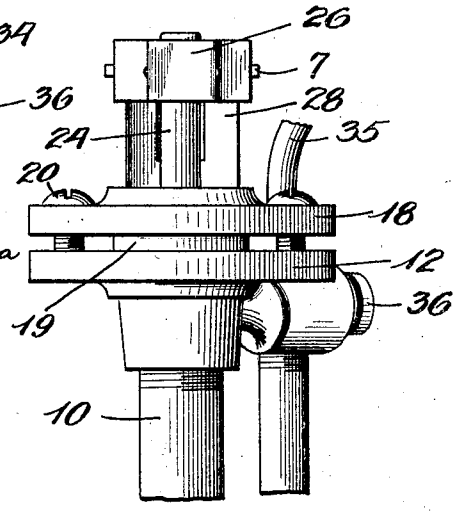


Fig. 2.

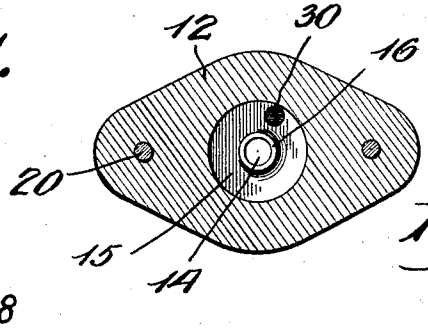


Fig. 3.

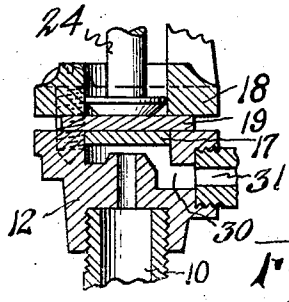


Fig. 4.

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UNITED STATES PATENT OFFICE.

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FLUSH-TANK COCK.

Application filed January 4, 1923. Serial No. 610,682.

To all whom it may concern:

Be it known that I, CHARLES STENGEL, residing at Hamilton, county of Butler, State of Ohio, a citizen of the United States, have invented certain new and useful Improvements in Flush-Tank Cocks, of which the following is a specification.

This invention relates to cocks for toilet tanks and particularly to those cocks designed to operate silently.

The primary object of my invention is the provision of an improved silently operating cock for a toilet tank.

Another object of my invention is the provision of a silent cock for a toilet tank having a valve which is separate from, but operated by, a plunger operated diaphragm.

Another and further object of my invention is the provision of an improved silent toilet cock having a silencer in the delivery line from the main valve.

Referring to the drawing wherein I have illustrated an embodiment of my invention,

Figure 1 illustrates an elevation, partly in section,

Figure 2 is a partial elevation at an angle to the view of Figure 1,

Figure 3 is a cross section on the line 3—3 of Figure 1.

Fig. 4 is a fragmental cross sectional view of the valves and valve seat shown in Fig. 1, showing the valve separate from the diaphragm.

10 designates the stem or upper end of the water supply pipe having a suitable bushing 11 located at its lower end. 12 designates the head casting having a threaded opening 13 to receive the upper end of the stem 10. A duct 14 passes through the head and connects the interior of the stem 10 with the chamber 15. The opening of the duct 14 is through a ledge 16 which extends into the chamber 15 and acts as a valve seat in a manner to be described, a freely movable valve 17 fits the chamber 15 so loosely as to have free vertical and lateral movement and is preferably made of soft rubber or similar material. The thickness of the valve 17 is such that when the top is even with the top of the chamber 15, there is a slight clearance between the lower side of the valve and the ledge 16. Closing the chamber 15 at its upper side and held between the upper side of the head 12 and the retainer 18 is a diaphragm 19 which may be made of any suitable material as rubber.

The retainer 18 is held in place by the screws 20. In the center of the retainer 18 is an opening 21 in which travels a plunger 22 which latter impinges against the diaphragm 19. The plunger 22 is provided with a conical surface 23 which relieves the pressure upon the diaphragm 19 when the plunger is forced downwardly. The plunger 22 is provided with a stem 24 which is pivoted at its upper end at 25 to a lever 26. The lever 26 is fulcrumed at 27 on a standard or support 28. To the lever is attached the rod 29 which carries the usual float (not shown) for controlling the flow of water through the cock.

Connected to the chamber 15 through a passage 30 is a passage 31 of the body 32 of a silencing and pressure control device. The body member 32 is provided with a chamber 33 having a screw threaded opening 34. The usual refilling pipe 35 is screw threaded into the body member 32 and connects with the chamber 33. The discharge pipe 35ª, to deliver the water into the tank, is screw threaded into the bottom of the body member 32 and has its interior connected to the chamber 33. A metal plug 36 is screw threaded to fit the threads 34 and has a silencing member as the comparatively soft rubber cushion 37 attached to its end in any suitable manner. This cushion member 37 is resilient and of smaller cross section than the chamber 33 and is here shown as being square. This cushion member 37 is made of sufficient length relative to the end of the threaded plug 36, that it can be adjusted inward to restrict the opening of the passage 31 so as to vary pressures and is small enough transversely to leave a clear passage to the pipe 35, for water after it has entered the chamber 15.

I will now describe the operation of my silent flush tank cock. Let us assume that the flush tank is empty. The water rises through the pipe 10 and passage 14 to the chamber 15, the diaphragm 19 being in raised position due to the fact that the float ball on the rod 29 has caused the plunger 22 to be raised. The water passes into the chamber 15, down into the passages 30, 31, against the silencing cushion member 37, into the chamber 33 and out the pipes 35 and 35ª.

As before stated, the valve 17 is free to move in the chamber 15 and will take up vibrations coming from the water and which would otherwise be communicated to the metal of the head 12. The cushion member 37, by means of the adjustable feature of the metal adjustable plug 36, can be moved sufficiently toward the passages 31 so as to obtain the required pressure. The extent of this movement for the desired pressure is easily determined by trying it at different positions, the plug 36 being turned to place the silencing cushion member 37 at different adjustments. The water after passing the silencing member 37 enters the tubes or pipes 35, 35ª and the bowl and tank are filled to the required level. The silencing member 37 not only retards the water and thereby reduces the effective pressure but it also takes up the vibrations of the water and practically eliminates all noise from the inrushing water. As the water rises to such a level that the float (not shown) on the end of the rod 29 is raised, the plunger 22 is forced downwardly. This in turn forces the diaphragm 19 downwardly and causes the valve 17 to be seated on the ledge 16. This shuts off the water when the proper level is reached.

It will be noted that this construction of the valve 17 and its relation to the ledge 16 is such that a relative lateral movement is permitted. This permits of a taking up of vibrations of the water with consequent lessening of the noise and also permits the valve to seat in a different place each time, thereby prolonging its life.

While I have described an exemplification of my invention in detail, I desire to have it understood that I do not limit myself to the exact form shown and that modifications and changes may be made without departing from the spirit of my invention and within the scope of the appended claims.

Having described my invention, what I claim is:—

1. A flush tank cock comprising a water supply passage and an outlet for delivery into the tank, a freely mounted resilient valve for controlling the passage of water therethrough, a float controlled device for operating the valve and a yielding silencing member having its end in the direct path of the water.

2. A flush tank cock comprising a water supply passage and an outlet for delivery into the tank, a valve for controlling the passage of water therethrough, a float controlled device for operating the valve and a yielding silencing member in the path of the the water and adjustable to restrict the passage of the water.

3. A flush tank cock comprising a water supply passage and outlet for delivery into the tank, a valve for controlling the passage of water therethrough, a diaphragm separate from the valve for controlling the movement of the valve and a float controlled means for moving the diaphragm.

4. A flush tank cook comprising a water supply passage and an outlet for delivery into the tank, a resilient valve for controlling the passage of water therethrough, a diaphragm separate from the valve for controlling the movement of the valve and a float controlled means for moving the diaphragm.

5. A flush tank cock comprising a water supply passage and an outlet for delivery into the tank, a chamber between the inlet and outlet and in communication with both inlet and outlet, a valve seat at one side of the chamber, a valve freely movable in the chamber and in position to engage the valve seat, a diaphragm controlling the closing of the valve and a float controlled means for moving the diaphragm.

6. A flush tank cock comprising a water supply passage and an outlet for delivery into the tank, a chamber between the inlet and outlet and in communication with both inlet and outlet, a valve seat at one side of the chamber, a valve freely movable in the chamber and in position to engage the valve seat, a diaphragm controlling the closing of the valve, a float controlled means for moving the diaphragm and a resilient silencing member between the valve and the outlet.

In testimony whereof I hereunto affix my signature.

CHARLES STENGEL.