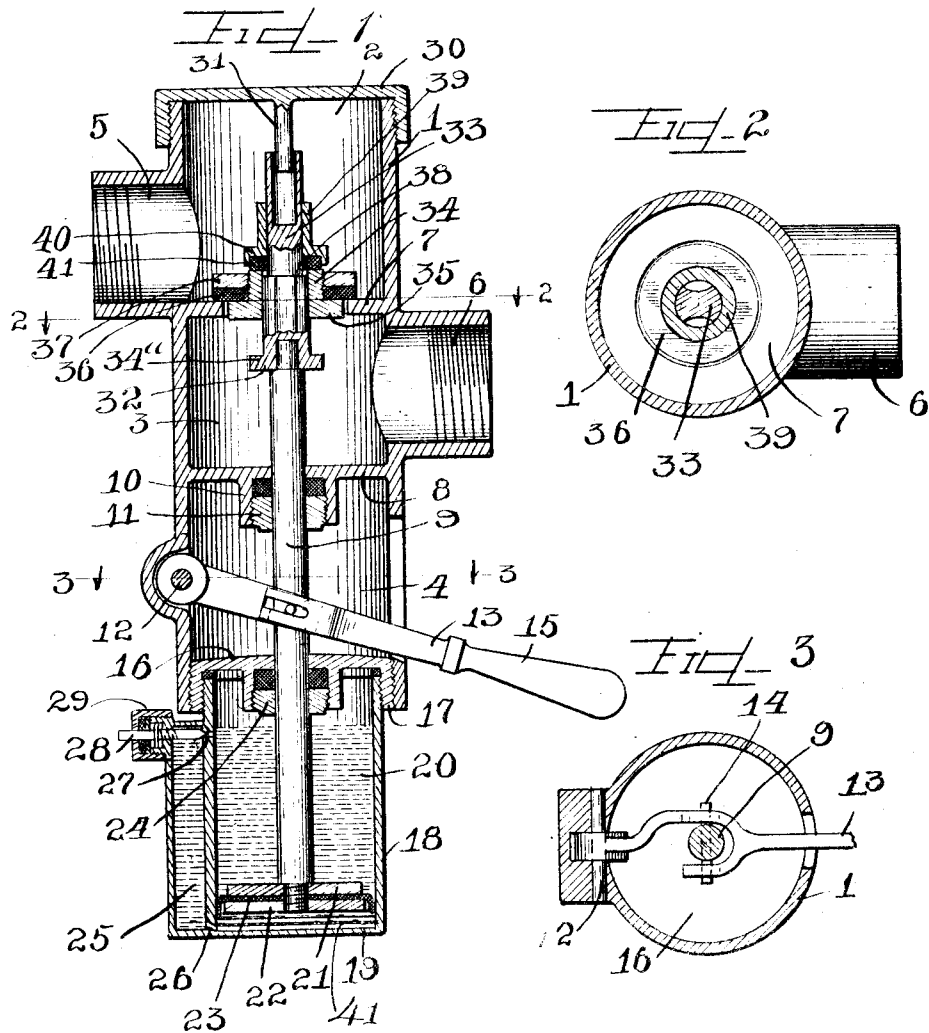


R. A. BROOKS.
FLUSHING VALVE.
APPLICATION FILED JUNE 17, 1911.

1,096,220.

Patented May 12, 1914
2 SHEETS—SHEET 1.



WITNESSES

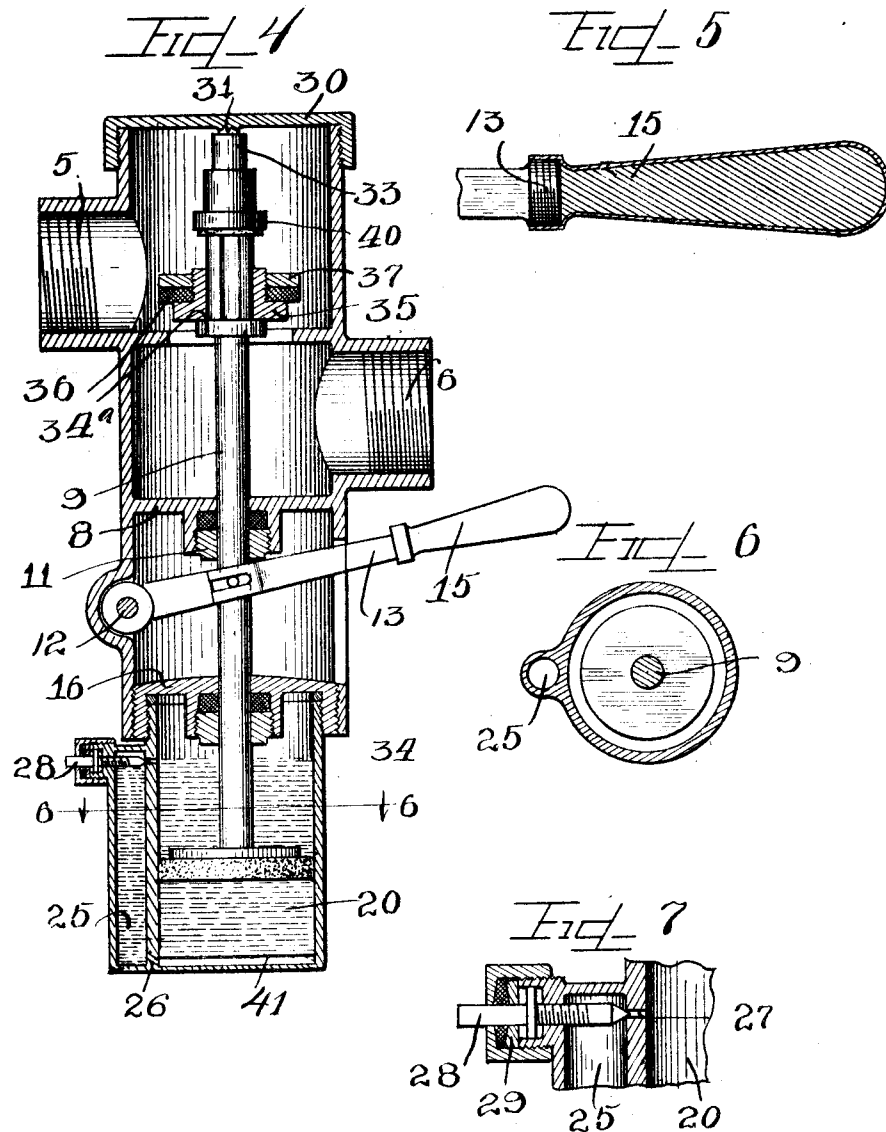
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FLUSHING-VALVE.

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To all whom it may concern:

Be it known that I, ROBERT A. BROOKS, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Flushing-Valves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the numbers of reference marked thereon, which form a part of this specification.

This invention relates to improvements in flushing valves of that class used in flushing water closets and the like.

The object of this invention is to afford a flushing valve in which the flushing fluid is at all times separated from the fluid used in retarding the closing of the valve and in which, by no possibility, can either fluid ever enter the chamber appropriated to the other.

It is also an object of the invention to afford a closing mechanism regulated or controlled by the flow of a fluid other than water and operating in closing partly by gravity.

It is a further object of the invention to afford a construction in which the water chamber for the flushing fluid is separated from the chamber for the controlling fluid by an air space or chamber.

It is finally an object of the invention to afford an exceedingly cheap, simple and durable device of the class described, in which few parts, and those of very simple construction and operation, are required.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a central vertical section of a device embodying my invention, showing the same closed. Fig. 2 is a section on line 2—2 of Fig. 1. Fig. 3 is a section on line 3—3 of Fig. 1. Fig. 4 is a section similar to Fig. 1, but showing the valve open or in flushing position. Fig. 5 is an enlarged fragmentary section of the operating handle. Fig. 6 is a section on line 6—6 of Fig. 4. Fig. 7 is an enlarged fragmentary, vertical section taken through the regulating chamber, and showing the adjusting valve in elevation.

As shown in the drawings: Said valve comprises a tubular casing 1, comprising an upper water chamber 2, an intermediate vent

chamber 3, and a lower air chamber 4. An inlet pipe 5, connected with the source of water supply, communicates with the water chamber 2, and a discharge pipe 6, leads from the vent chamber to the fixture it is desired to flush. The chambers 2 and 3, are separated by a partition 7, integral with the casing, and having a relatively large aperture therein through which said chambers communicate, and the upper surface of said partition affords a valve seat surrounding said aperture. The vent chamber 3, and air chamber 4, are separated by a partition 8, having a central aperture therein to receive the valve stem 9, therethrough, and, as shown, said partition on its under side is provided with an internally threaded flange 10, concentric with said aperture and stem and adapted to receive the packing material therein and a follower 11, affording a gland for said stem.

Pivotaly supported upon the rear side of the air chamber 4, on a pintle 12, is an operating handle 13, which is yoked to receive the stem 9, therethrough and the arms thereof are longitudinally slotted, as shown in Figs. 1, 3 and 4, to receive a pin 14, engaged in said stem, this arrangement permitting said stem to be raised by means of said lever. The outer end of said handle or lever is externally threaded and an ornamental or other suitable handle 15, is threaded thereon, as shown in Fig. 5. As shown, said handle 13, extends at its outer end through a vertical slot in the wall of the air chamber to permit suitable amplitude of movement of the handle in operating the stem. Threaded in the otherwise open end of said air chamber, is a downwardly flanged head 16, in the internally threaded, downwardly directed flanges 17, of which is threaded the upper end of a cup 18, for oil or other suitable regulating fluid. Said cup is cylindrically bored and provided with a lower closed head 19, (preferably integral therewith) and on the lower end of said stem 9, which projects into the chamber 20, thus formed, is secured a piston embracing upper and lower plates 21 and 22, threaded on the end of said stem and between which is engaged a hydraulic packing washer 23, which is flanged at its edges downwardly to permit the same to yield readily when the stem is adjusted upwardly but to permit the same to resist downward movement of the stem.

As shown, a gland 24, is provided on the under side of the head 16, surrounding said stem. A by-pass passage 25, is cored at one side of said regulating chamber 20, and is connected through the wall thereof by a relatively small aperture or vent 26, with the bottom of the regulating chamber below said piston, and a corresponding aperture 27, is provided at the upper end of said passage communicating with the regulating chamber near the upper end thereof, and, as shown, a needle valve closure 28, is threaded through the wall of said by-pass passage in position to be adjusted inwardly or outwardly to vary or regulate the flow through said vent from the by-pass to the regulating chamber. As shown, said needle valve closure is provided with a gland 29, surrounding the same to prevent the leakage of the oil or other regulating fluid, therepast. A head or cover 30, is threaded on the upper end of said casing to afford the top wall of the water chamber and a downwardly projecting stud or guide pin 31, is secured at the center thereof at the axis of said chamber and stem. The upper end of said stem extends into the vent chamber and to near the partition 7, and there is reduced in diameter or otherwise provided with an upwardly directed shoulder 32, and seated on the upper end and bearing on said shoulder, is a stem section 33, provided with an axial aperture in its upper end to receive the pin 31, therein, as shown in Fig. 1. Said stem section is provided at its lower end with a peripheral flange 34, and is of relatively large diameter and at its sides is fluted or cut away rendering the same non-cylindric. Slidably seated upon said stem section is a short externally threaded sleeve 34, provided at its lower end with an outwardly extending flange 35, and having secured thereon a packing washer 36, and a nut 37. Said packing washer and a nut are of a diameter greater than the aperture through the partition 7, and seat to close said aperture except for the water passages at each side of the stem sections, as shown in Fig. 2. Said stem section, approximately at the top of the valve closure thus formed, is reduced in diameter to afford an upwardly directed shoulder 38, and slidably secured on said stem section above the shoulder, is a sleeve 39, provided at its bottom with an integral flange 40, in which is seated a packing washer 41, which seats upon the upper end of the sleeve 34, to entirely close the passages on each side of said stem section and through the sleeve 34, said construction affording a relatively large main closing valve and an auxiliary or vent valve operating therewith to complete the closure.

The operation is as follows: The weight of the handle and stem, as well as the pressure of water upon the valves in the water cham-

ber, acts to hold the valves at all times closed normally. When it is desired to use the valve in flushing, the stem is raised against gravity by means of the handle 15. This simultaneously raises the vent valve closure, opening the ports or passages on each side the valve stem section through the main valve closure, reducing the pressure thereby, and also raises the piston in the bottom of the regulating chamber or compartment, the oil or other liquid flowing freely past the hydraulic washer or packing therefor. As the stem rises, the flange 34, at the lower end of the stem section, engages beneath the main valve closure, as shown in Fig. 4, and lifts the same from its seat wholly opening the valve, and permitting free flow of the flushing fluid to the fixture. The valve, of course, may be held open as long as desired by simply holding the stem in elevated position, as shown in Fig. 4. When the handle is released, the closing movement begins. This is caused by gravity, the handle now acting by gravity to force the stem downwardly, the force exerted, of course, being dependent upon the weight of the parts. Of course, the handle may be made of any desired weight by supplying a heavy material such as lead or the like in the handle 15, if desired.

The rate of downward movement is regulated by the flow of the regulating fluid through the by-pass passage as controlled by the needle valve 28. If quick closure is desired, of course, a larger opening of the port or vent between the by-pass passage and the regulating chamber is permitted. As the stem descends, the main valve closure first seats. This occurs noiselessly and without hammer, owing to the construction described, and the main flow of the fluid is thus discontinued. The water continues to flow through the ports or passages at each side of the stem section, however, until the stem has descended sufficiently to permit the auxiliary or vent valve closure seating. This affords the after fill for the fixture, and, of course, ceases when the vent or auxiliary valve closure seats upon the main valve closure, as shown in Fig. 1.

From the construction described, it is obvious that oil or the regulating fluid can never escape from its containing chamber, as only a sufficient quantity is contained therein to suffice for the comparatively limited movement of the stem. Water can never find ingress to said regulating chamber, owing to the glands before described between the vent chamber and the regulating chamber, and because of the air chamber or compartment arranged between said two chambers. Of course, inasmuch as the air chamber opens outwardly to the atmosphere, any moisture finding its way thereinto evaporates and escapes therefrom. No

springs whatever are used in the construction. The valve is positive and quick in operation, and the rate of closure of the valves may be adjusted at will by means of the valve in communication between the regulating chamber and by the by-pass passage. Said valve, of course, may be placed either at the top of said passage, as shown in Figs. 1 and 2, or at the bottom thereof, as desired. In either position a screen 41, just above the lower port 26, strains the oil, thereby preventing clogging of the regulating valve 28.

Any part of the flushing valve is accessible for inspection and repair without disconnecting from the water system or from the toilet. This is accomplished by removing the cap 30, or the cup 18, containing the regulating fluid. Of course, the water should first be shut off by the usual valve controlling the flow to the flushing device.

I do not purpose limiting the patent granted on this application otherwise than necessitated by the prior art, for very numerous details of construction and operation may be varied without departing from the principles of this invention.

I claim as my invention:

1. A flushing valve embracing a casing comprising a water chamber, a vent chamber and a regulating chamber, said regulating chamber being separated from the remaining chambers by an open air space, a stem extending from said regulating chamber through the air space, and terminating in the vent chamber, a handle secured thereto in said open air space for actuating the same, a piston on said stem in the regulating chamber, coacting valves seated between the water chamber and vent chamber, a stem section supported on said stem and extending through said coacting valves and provided with guiding means at its free end, an inlet pipe for the water chamber, an outlet pipe for the vent chamber, a by-pass permitting a flow of liquid in the regulating chamber around the piston therein, a cap on said casing, and guiding means thereon

adapted to cooperate with said guiding means on the stem section.

2. A device of the class described embracing a cylindrical casing affording inlet and outlet chambers, a valve controlling the communication between said inlet and outlet chambers, a portion of said cylindrical casing extending beyond said chambers, a partition in the outer end of said extending portion, thereby providing an open air chamber, a dash pot chamber secured to said partition, a piston in said dash pot chamber, a cap closing the upper end of said casing, an integral axial lug thereon, and a sleeved valve stem extending longitudinally through the casing and connecting said piston and valve and engaging said lug at one end thereof.

3. A device of the class described embracing a casing comprising a water chamber, a vent chamber, and an air chamber, a connection integral with the walls of said water chamber, for attachment with a water system, a connection integral with the walls of the vent chamber for attachment with the fixture to be flushed, a valve controlling communication between the water and the vent chamber, a regulating chamber secured to said air chamber, a fluid in said regulating chamber other than the flushing fluid, a piston in said regulating chamber, a stem connected with the piston and extending from the regulating chamber into the vent chamber, a stem section supported on the stem for lifting the valve, a lever attached to the stem and acting in part by gravity to close the same, a cap secured to the casing, and a guide member integral with the cap and extending downwardly into the stem section.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

ROBERT A. BROOKS.

Witnesses:

GEORGE R. MOORE,
LAWRENCE REIBSTEIN.