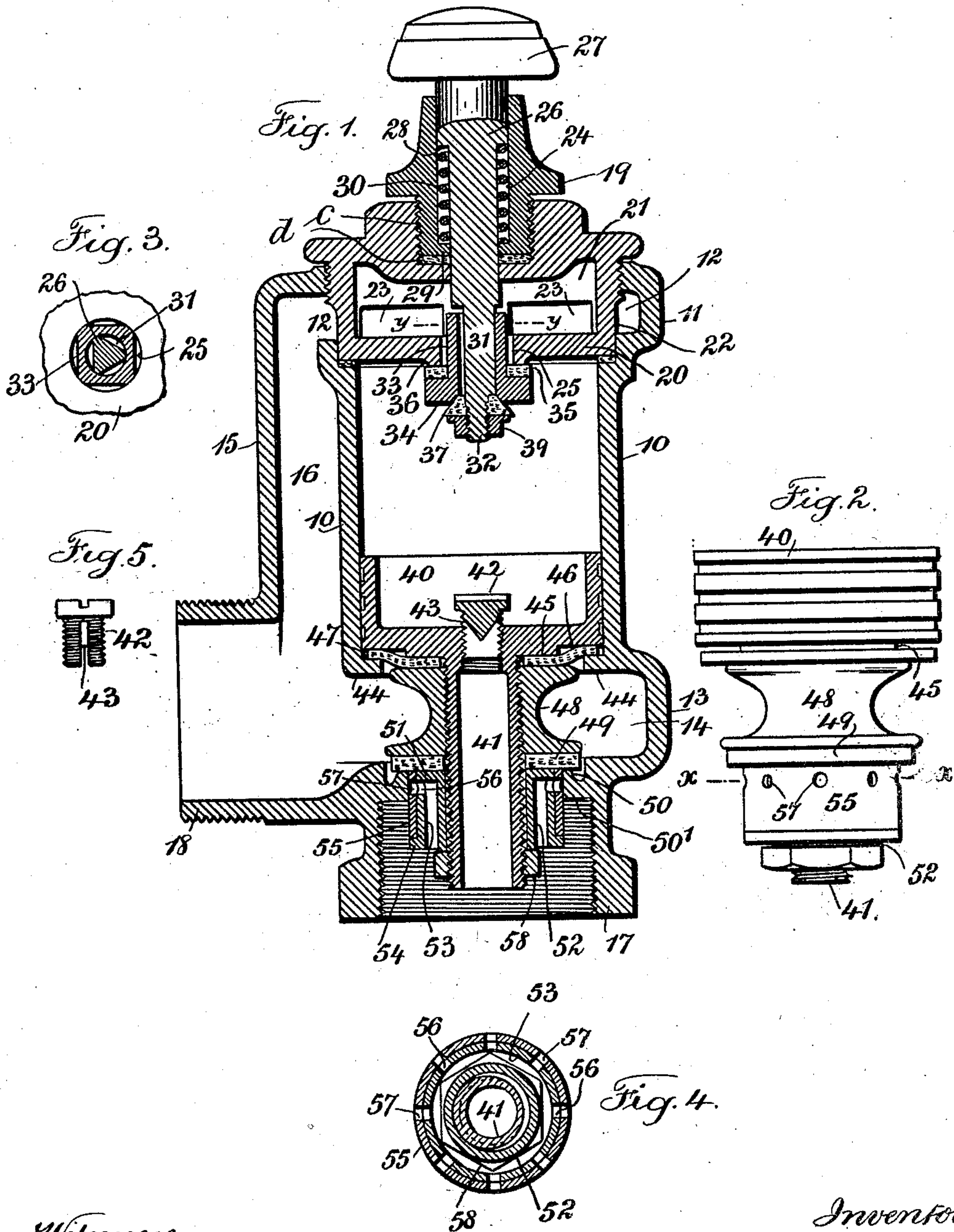


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FLUSHING VALVE.  
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956,158.

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# UNITED STATES PATENT OFFICE.

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## FLUSHING-VALVE.

956,158.

Specification of Letters Patent.

Patented Apr. 26, 1910.

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*To all whom it may concern:*

Be it known that I, ABRAM N. PASMAN, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Flushing-Valves, of which the following is a specification.

My invention relates to an improvement in flushing valves, and the object thereof is the provision of a flushing valve which would serve the purpose of the ordinary flushing tank now commonly employed in connection with water closets and which may be utilized for any other purpose wherein a flow of water is required for a greater or less definite period of time.

My present invention is an improvement on the flushing valve structure shown and described in Letters Patent No. 789,561, granted to me on the 9th day of May 1905, and in carrying out my present invention I preferably employ a casing having a main cylindrical chamber, an inlet connection below the same, a longitudinal and a transverse discharge chamber each arranged exteriorly of the said cylindrical chamber, a piston slidable in the cylindrical chamber and carrying a valve by means of which the flow of the water to the said transverse chamber and to and through the flush pipe under normal conditions is shut off; this valve being maintained on its seat against the pressure of the water in the inlet connection by the water having access to the other side of the piston by means of a passage-way through the said valve and piston, which permits the water to flow to the said opposite side of the piston into the cylindrical chamber where the same under normal conditions is confined and therefore exerts a pressure against the piston to maintain the same on its seat, which is made possible because the sectional area of the piston against which the water pressure is exerted within the cylindrical chamber is greater than that of the valve which normally shuts off the supply of water. I also employ means whereby the water under pressure within the cylindrical chamber may be released and discharged through the said longitudinal discharge chamber to the flush pipe and means whereby after the flushing of the bowl or other receptacle has been effected by the main flow of the water permitted to pass from the inlet connection to the flush pipe,

an auxiliary flow of water is effected to insure a sufficient quantity of water remaining in the bowl of the closet or other vessel to be flushed,—to which latter feature this invention particularly relates.

In the drawing, Figure 1 represents the central longitudinal section of my improved flushing valve. Fig. 2 is an elevation of the piston and the parts associated therewith. Fig. 3 is a section on line *y, y*, Fig. 1. Fig. 4 is a section on line *x, x*, Fig. 2, and Fig. 5 is an elevation of the adjusting screw taken at right angles to the position of this screw as shown in Fig. 1.

Referring particularly to the drawing, my improved flushing valve comprises a casing or body member having a cylindrical portion 10 provided at one end with a circular rib 11, providing interiorly a chamber 12. The other end of the casing is provided with a circular rib 13 preferably larger than the rib 11, the rib 13 providing an interior chamber 14 similar to but larger than the chamber 12. In the casing there is also a longitudinal rib 15 providing a chamber 16.

17 designates an inlet connection or nozzle communicating with the chamber 14 and 18 is an outlet connection or nozzle communicating with both the chamber 14 and the chamber 16, which latter connects with the chamber 12. This casing is provided with a top or cap member 19, with a bottom portion 20 which passes through the chamber 12 into a recess provided therefor within the casing; the bottom portion 20 of the cap member 19 being provided with a chamber 21 inclosed by said bottom portion 20 and the cylindrical walls 22, in which latter there are spaced apart openings 23 providing for a communication between the chambers 12 and 21. Centrally the cap 19 is provided with a bore 24 and the bottom member 20 with a central aperture 25. The cap is also so constructed as to provide a stuffing-box *c* fitted with a packing *d*.

26 represents a push stem adapted to fit within the bore 24 and provided at one end with a suitable button or other device indicated at 27. Adjacent to the end of the push stem 26 to which the button 27 is attached, the push stem is provided with a shoulder 28 and within the bore 24 surrounding the portion of the push stem so reduced and extending between the shoulder 28 thereof and a shoulder 29 in the said cap member, is a spring 30 by means of which



the hereinafter described parts associated with the said push stem are maintained in their normal positions. The push stem 26 extends through the chamber 21 and also through the aperture 25 in the bottom member 20 and that portion of the push stem within the chamber 21 is reduced and preferably of triangular cross section as plainly indicated at 31 in Fig. 3; the extremity of the stem adjacent to this triangular portion 31 thereof being still further reduced and screw-threaded as indicated at 32.

Surrounding the triangular portion 31 of the push stem 26, I employ a sleeve 33 which extends through the opening or aperture 25 in the bottom portion 20 and is preferably square in outline as is also indicated in Fig. 3. This sleeve 33 is provided with a flange 34 and a valve 35 adapted to seat against a valve seat 36 formed by the depending lip surrounding the aperture 25 on the under side of the bottom member 20. I also employ a valve 37 surrounding the screw-threaded reduced end 32 of the push stem and adapted to seat on a valve seat provided in the under side of the flange 34 on the sleeve 33, and this valve 37 as well as the sleeve 33 and the parts associated therewith, are secured on the push stem 26 in their relative positions by means of a nut 39 or otherwise.

Within the cylindrical portion of the casing or body member, I employ a piston 40 which may be of any desired construction. Depending from the piston 40 is a tubular stem 41 which exteriorly is preferably screw-threaded as indicated at Fig. 1. Centrally within the piston an adjusting screw 42 is employed, which adjusting screw is preferably slotted and the base of the slot being tapering as indicated at 43 for the purpose of retarding as little as possible the passage of the liquid through the tubular stem in the opposite side of the piston, and as will be apparent the quantity of water which will be permitted to pass through the tubular stem to the opposite side of the piston,—other conditions being the same,—will depend upon the height or position of the adjusting screw 42.

The under side of the piston 40 is preferably provided with a shoulder 45 against which a gasket 46 of rubber, leather or other suitable material surrounding the tubular stem 41 is secured by means of a collar 48 turned down from the screw-threads of the tubular stem. This gasket 46 is adapted to seat on a seat 47 provided therefor by an internal flange 44.

49 indicates a valve hereinafter designated as the inlet valve. This also surrounds the tubular stem 41 and bears against the lower face of the collar 48 and is adapted to seat against the valve seat 50 provided therefor by means of an annular flange 50<sup>1</sup>.

Surrounding the tubular stem 41 below

the inlet valve 49 I employ a sleeve comprising the concentric inner wall 52 and outer wall 53 and the member 51 connecting the two walls at one of the ends thereof. The outer wall 53 is provided at its lower edge with a flange 54 and surrounding the outer wall 53 and extending between the said flange 54 and the inlet valve 49 I employ a ring 55. In suitably spaced apart positions the outer wall 53 of the said sleeve is provided with holes 56 and in similarly spaced apart positions the ring 55 is provided with a corresponding number of holes 57; the parts being so arranged that the ring 55 may be adjusted relatively to the sleeve so that the holes 57 therein will register with the holes 56 in the outer wall 53 to any desired extent,—or that there may be no communication by way of said holes 56 and 57. The valve 49 and the said sleeve and the parts associated therewith are secured in position on the tubular stem by means of a nut 58 which bears against the lower edge of the inner wall 52 or otherwise.

In the operation of the improved flushing valve, the parts normally are in the positions indicated at Fig. 1, and moreover this construction of valve has been tested and found to operate successfully under any given pressure of water commonly used for the purposes for which the valve is intended. Irrespective of the water pressure in the inlet connection, it will be apparent that by means of the communication by way of the adjusting screw 42 there will be the same water pressure within the cylindrical portion 10 and that because of the valve 49 and the gasket 46 being firmly seated there will be no escape of the water from the source of supply. In operating the valve the push stem 26 is depressed and the valve 37 is first lowered thereby, thereby initially releasing the confined water within the cylinder 10 and by a further depression of the push stem 26, the sleeve 33 drops by gravity and the valve 35 carried thereby opened; it being understood that the initial escape of the water will be by way of the passages between the triangular sides of the reduced portion 31 of the push stem, and the walls of the bore of the sleeve 33, and after the valve 35 is opened, the escape of the confined water will be by way of the passages between the square sides of the sleeve 33 and the walls of the opening or aperture 25 in the bottom portion 20, and water so escaping passes from the chamber 21 by way of the openings 23 to the chamber 12, thence to the longitudinal chamber 16 and to the flushing pipe connected to the outlet nozzle 18; the pressure having become unbalanced on the opposite sides of the piston it will be manifest that the increased pressure on the lower side will force the piston upwardly, thereby unseating both the gasket 46 and



valve 49 and permitting the water or other liquid to flow unobstructed to the flush pipe connected to the outlet nozzle 18 and this condition will continue so long as the valve 35 is kept open by the depression of the push stem 26. Upon releasing the push stem 26 the same will return to the position shown in Fig. 1, by means of the spring 30 to close both the valves 35 and 37, whereupon the liquid from the source of supply will flow through the slotted portion of the adjusting screw 42 to the space within the cylindrical portion 10 of the casing above the piston 40 and this will continue until the piston is forced down positively seating both the gasket 46 and the valve 49 against the pressure of the liquid due to the difference in area between the piston and the valve 49. Now on the return of the piston the main flow of the water is shut off as the lower edge of the sleeve and ring 55 passes within the annular flange 50<sup>1</sup> and this occurs before the gasket 46 or the valve 49 is seated, and in order to effect a supplemental or auxiliary flow of water sufficient to insure the bowl of the closet or other vessel being filled to the desired extent, the water may flow by way of the passage between the walls 52 and 53 of the sleeve and the openings 56 and 57 in the wall 53 and ring 55 for this purpose, and this flow manifestly will continue until the valves are secured against their seats, and moreover, may be regulated by adjusting the position of the ring 55 and the holes therein in relation to the wall 53 and the holes therein. Under low water pressure, three or four pounds for instance, it may be necessary to make the holes 56 57 register, whereas under high pressure, say one hundred pounds or more for instance, sufficient water will probably be forced between the ring 55 and the walls of the flange 50<sup>1</sup> to accomplish the desired purpose if the holes 56 57 are entirely out of alinement.

I claim as my invention:

1. A flushing valve comprising a body member having a cylindrical portion, a chamber at each end thereof, an inlet and an outlet connection, and a longitudinal passageway exterior of the said cylindrical portion and extending between said chambers and connecting the same to the said outlet connection, a piston in the said cylindrical portion of the body member, a tubular member depending from the said piston, a gasket on said tubular member, a device surrounding the said tubular depending member to maintain the said gasket in position, a seat for the said gasket, an inlet valve, a seat for the same, a member surrounding the said tubular member below the said device, a wall concentric with and spaced apart from the said member and connected therewith at one end, the said wall being provided with series of spaced apertures, means for securing the

said member and its wall in position on the said tubular depending member and means for varying the size of the said apertures in the said wall to regulate the passage of a liquid therethrough.

2. A flushing valve comprising a body member having a cylindrical portion, a chamber at each end thereof, an inlet and an outlet connection and a longitudinal passageway exterior of the said cylindrical portion and extending between said chambers and connecting the same to the said outlet connection, a piston in the said cylindrical portion of the body member, a tubular stem depending from the said piston, a gasket on the said stem, a collar surrounding the said tubular stem to maintain the said gasket in position, a seat for the said gasket in the end of the said cylindrical portion of the body member, an inlet valve, a seat for the same, a sleeve surrounding the said tubular stem below the said collar, a wall concentric with but spaced apart from the said tubular sleeve and connected therewith at one end, said wall being provided with a series of spaced apertures, means for securing the said sleeve and wall in position on the tubular stem and means for varying the size of the said apertures in the said wall to regulate the direct passage of the liquid therethrough.

3. A flushing valve comprising a body member having a cylindrical portion, a chamber at each end thereof, an inlet and an outlet connection and a longitudinal passageway exterior of the said cylindrical portion and extending between said chambers and connecting the same to the said outlet connection, a piston in the said cylindrical portion of the body member, a tubular stem depending from the said piston, a gasket on the said stem, a collar surrounding the said tubular stem to maintain the said gasket in position, a seat for the said gasket in the end of the said cylindrical portion of the body member, an inlet valve, a seat for the same, a sleeve surrounding said tubular stem below said collar, a wall concentric with but spaced apart from said sleeve and connected therewith at one end, said wall being provided with a series of apertures, a ring fitting over the said wall and provided with a like series of apertures whereby in coacting with the apertures in the said wall, the size thereof may be varied to regulate the direct passage of the liquid therethrough, and means for maintaining the said sleeve, wall and ring in position on the said tubular stem.

Signed by me this 10th day of February 1908.

ABRAM N. PASMAN.

Witnesses:

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