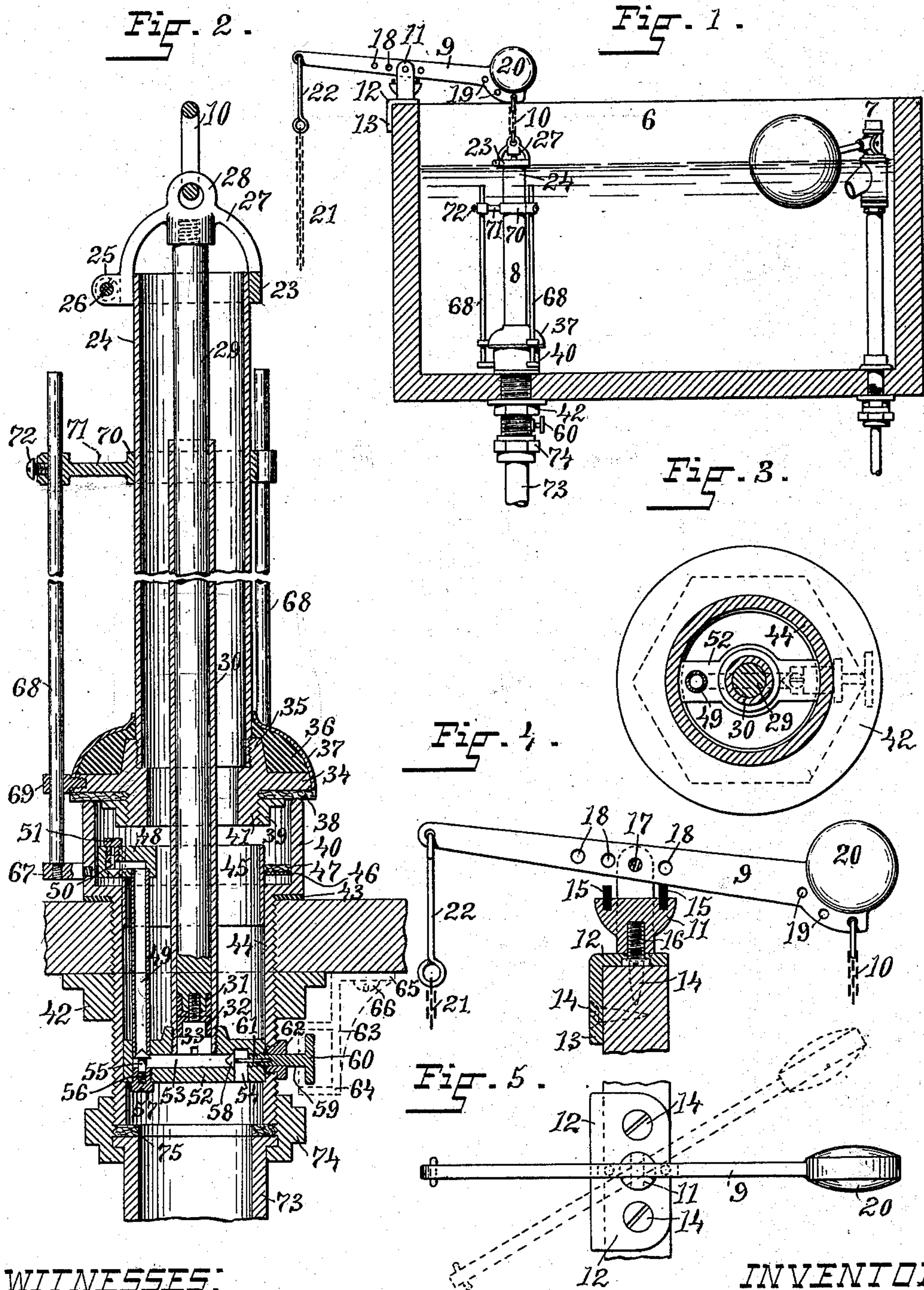


(No Model.)

P. W. MEEHAN.
VALVE.

No. 384,056.

Patented June 5, 1888.



WITNESSES:

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UNITED STATES PATENT OFFICE.

PATRICK W. MEEHAN, OF PROVIDENCE, RHODE ISLAND.

VALVE.

SPECIFICATION forming part of Letters Patent No. 384,056, dated June 5, 1888.

Application filed February 9, 1888. Serial No. 263,489. (No model.)

To all whom it may concern:

Be it known that I, PATRICK W. MEEHAN, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Valves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to valves such as are used in tanks for flushing or supplying water to water-closets, or for other purposes where it is desirable to have a predetermined flow of water from the tank.

My invention consists in the peculiar and novel construction of the discharge-valve proper, the piston by which the descent of the valve is controlled and the discharge of the water regulated, and the adjustable stop by which the quantity of the water discharged is regulated, as will be more fully described hereinafter.

Figure 1 is a sectional view of a tank, showing my improved valve in operative position, and also the automatic water-supply valve. Fig. 2 is a sectional view of my improved valve, showing the piston in full view, with the exception of the lower part, which is shown in section to more clearly illustrate the double packing. Fig. 3 is a sectional view through the cylinder on the top line of the check-nut by which the device is secured to the tank, showing the central tube with its piston and the bridge-piece to which the tube is secured.

Fig. 4 is a side view of the operating-lever, the adjustable support carrying the sound-deadening pins and supporting-bracket being shown in section. Fig. 5 is a top view of the operating-lever, showing in dotted lines the position in which the lever may be swung by means of the adjustable support.

Referring to the drawings, 6 is a tank of the construction commonly used for supplying water to water-closets.

7 is an ordinary form of water-supply valve having the floating ball for operating the valve and controlling the water-supply.

8 is my improved valve, shown secured within the tank.

9 is the pivoted lever connected with the valve 8 by means of the short piece of chain

10. The lever 9 is pivoted in the support 11, mounted on the bracket 12. This bracket is made with a downturned lip, 13, so that the bracket may be secured not only to the top, but also to the side of the tank, by means of the screws 14, as is clearly shown in Figs. 1, 4, and 5.

In Fig. 4 the adjustable support 11 is shown in section, so as to clearly show the sound-deadening pins or stops 15. These stops may be made of rubber, leather, or any other substance which will deaden the noise incident to the operation of the lever 9. They also act to prevent the valve being pulled too high from its seat. Also, in Fig. 4, is shown the screw 16, by means of which the support 11 may be adjusted so as to bring the lever 9 in the desired angle. This adjustment of the lever is a very desirable feature, as it frequently happens that on account of pipes entering the tank or the location of the water-closet it is necessary to place the outlet-valve 8 to the right or left of the center line of the tank, and at the same time retain the lever pivoted approximately in the center, so as to obtain the desired amount of leverage. It will be readily seen that by simply loosening the screw 16, which has a large head countersunk into the under side of the bracket 12 and is screw-threaded to enter a screw-threaded hole in the bottom of the support 11, the support in which the lever 9 is pivoted at 17 may be set at any desired angle.

The lever 9 has a number of holes, 18, by means of which it may be adjusted in or out from the side of the tank, so as to obtain more or less leverage. The lever 9 also has a number of holes, 19, at its inner end to correspond with those at its center, so that there will be a hole approximately over the center of the valve in which to attach the chain 10. Said lever 9 is also weighted at its inner end by means of the ball-shaped enlargement 20, so as to counterbalance the chain 21 and whatsoever said chain may be connected with, whether a common handle for pulling down the lever and thus operating the valve or the seat of the water-closet, or any other means. The chain 21 is connected to the lever 9 by means of the link 22.

23 is a split collar, which encircles the upper

part of the overflow-tube 24, and has at one side two ears, 25. Through a hole in one of the ears is passed a screw, 26, which screw is screw-threaded into the other ear and by means of which screw the collar can be made to pinch and hold fast to the tube 24. The split collar 23 has the yoke 27, in the upper side of which the ring 28 is formed, to which one end of the chain 10 is attached. On the under side of the yoke 27 is formed an enlargement, into which is screw-threaded the piston-rod 29, working in the cylinder 30 and carrying the packings 31 and 32, which are held in operative position by means of the shouldered screw 33, which passes through the said packings and is screw-threaded into the lower end of the piston 29. The packing 31 is made to surround the lower end of the piston 29, so that upon the piston being pulled upward the packing 31 will expand and perfectly fit the interior of the tube 30 and thereby create a suction. The packing 32 is formed to surround the reduced portion of the screw 33 and to fit the tube, so that on a downward motion of the piston 29 the said packing will be expanded and thereby force the water out of the tube 30. To the lower end of the tube or casing 24 is attached, by means of the screw-thread 35, the circular valve-disk 34, which may be properly called the "valve," since it carries the packing 38, the weight 36, and the tube 24. On the upper side of this valve-disk 34 is placed the weight 36. This weight may be of lead or any other heavy substance. Over this weight is placed the casing 37, for protecting the weight from the action of the water and also as a finish to that part of the apparatus. On the under side of the valve-disk 34 is placed the leather washer or packing 38, for forming a tight joint with the seat 40. The washer 38 is held in place by means of the screw-threaded nut 39, which screws up onto the flange 41 on the valve-disk 34 and against the washer 38, securely holding the said washer in place.

The bottom of the seat 40 is made to extend inward and downward through the bottom of the tank 6, and is shown in the drawings, Figs. 1 and 2, as being screw-threaded into the tank-bottom and carries the nut 42, by means of which it is forced downward against the packing 43 on the inside of the tank-bottom, and thereby forms a tight joint, so that the water of the tank cannot leak out. This packing may be of lead, leather, or any other good packing substance.

The threaded cylinder 44 being of less diameter than the diameter of the seat 40, a space is left inside the seat, and by forcing a ring, 45, of about the same diameter as the cylinder 44 into the upper end of the said cylinder a reservoir is thereby formed, the ring 45 forming the inside wall and the seat 40 the outside wall. This reservoir is intended to hold sufficient water to supply the piston in its upward motion. In the reservoir is forced the

fine gauze 46, which is intended as a support for the filtering material 47, for which purpose I prefer to use a thick piece of felt. The screen 46 is forced about half-way down into the reservoir. At one side of the reservoir and into the ring 45 is fastened the oblong block 48. This block has a channel which connects with the reservoir under the gauze 46 and also with the tube 49, and inside of the block, directly over the inlet from the reservoir, is placed the valve 50, which is held in place by means of the screw 51, which has a hole in which the shank of the valve may play. This valve 50 is a simple gravity-valve, and is intended to rise from its seat with the inflowing water upon the piston being lifted, and to close the inlet upon the descent of the piston.

The tube 49 is securely fastened to the cross-bar 52, either by being forced into a hole on its upper side or by means of screw-threading. This cross-bar 52 also has a boss on its upper side, so as to give additional metal into which is screw-threaded the cylinder 30, which is thereby securely held in upright position inside the tube 24 and in which the piston 29 works. In the cross piece or bar 52 there is a channel, 53, which connects the tube 49 and also the outlet 54 with the inside of the cylinder 30. In this channel and directly under the hole in the tube 49 is placed a valve, 55, which valve is seated against the bottom of the tube 49 and is forced to its seat by means of the coiled spring 56, which spring is placed in a socket in the top of the screw 57 and may be made to exert more or less pressure on the valve 55 by means of the screw 57. All that is necessary is that the valve should be held to its seat with a very slight pressure. At the other end of the channel 53 and next to the outlet 54 is placed the outlet-valve 58. This valve is seated against the end of the channel 53. The stem of this valve plays in a socket formed in the inner face of the regulator 59. The regulator is screw-threaded at 61 into the cross-bar 52, and by means of the circular head 60 can be screwed in or out, so as to allow more or less play to the valve 58, thereby controlling the water escaping from the outlet 54. If found more desirable, small coiled springs may be placed back of the valves 50 and 58, so as to assist in keeping said valves to their seats. Surrounding the smooth part of the regulator is a nut, 62, for forming a stuffing-box. This nut is screw-threaded into the side of the cylinder 44, and has its inner face slightly concaved, so that a packing of any fibrous or other material may be placed partly therein, and on being forced up against the cross-bar 52 will be caused to completely surround the smooth part of the regulator 59 and thereby prevent any water leaking along the sides thereof.

The cap 63 is made with the cup 64 for covering and protecting the regulator 59 from the interference of unauthorized persons, and has a flange, 65, by means of which it is secured to the bottom of the tank 6 by the screws 66.

In ordinary cases no further guide will be necessary for the tube carrying the valve at the bottom thereof than the cylinder 30, in which the piston 29 works, particularly if the cylinder is made sufficiently long to at all times give a good support and guide to the said piston. However, I have illustrated in the drawings a guiding mechanism in connection with my apparatus. To the seat of the valve-cylinder 40, I attach three small lugs, 67, by means of screw-threading them into holes in the sides of the cylinder 40, as is clearly shown in the drawings. Rising from the said lugs in a perpendicular line are the rods 68. These rods are each formed with a screw-threaded portion, by means of which they are attached to the lugs 67. I use a corresponding number of guide-lugs 69 for the number of rods employed, each of which guide-lugs are attached to the valve-disk 34 by means of a screw-threaded portion at one end, and at the other end is a hole of a diameter that will allow them to slip readily on the rods 68 upon the valve-piece 34 being lifted from its seat. Surrounding the tube 24 is a ring, 70, which has three arms, 71, extending out therefrom and provided with bosses on the outer end thereof, through which pass the rods 68. This ring 70, with its arms, may be set so as to limit the upward motion of the valve-piece and tube by means of the screw 72, which is screw-threaded into one of the bosses at the outer end of the arms 71, so as to pinch the rod 68, and thereby firmly secure the ring to the rod, so as to form a stop for limiting the upward movement of the valve-disk 34. If found desirable, each of the three or more arms may be provided with a screw, 72.

The ordinary and well-known flange coupling, 73, carrying the coupling-nut 74 and having the packing-washer 75, for making a tight joint between the bottom of the cylinder 44 and the said coupling, is used to connect my improved valve with the pipe for conducting the water to the place of use.

The operation of the apparatus is as follows: In the normal or closed position the valve acts as an overflow for the tank. To operate the valve for flushing, the chain 21 is pulled downward, thereby pulling the outer end of the lever down and causing the inner end to rise and carry with it the tube 24, to the lower end of which is attached the valve-disk 34, thereby raising said valve-disk from off its seat and allowing the water of the tank to enter the lower cylinder. At the same time that the tube 24 ascends, the piston 29 is also pulled up in the cylinder 30 by reason of its being connected to the yoke-piece 27, which is also attached to the tube 24. Upon the raising of the piston a suction is created, causing the valve 58 to close, the valve 50 to ascend, the valve 55 to descend, and the water from the reservoir to be sucked up into the cylinder 30 by the piston until it has reached its limit of travel. Upon the chain 21 being allowed to

rise, the lever 9 will resume its normal position by reason of extra weight in the ball 20, thereby allowing the valve to descend and the piston 29 to exert a pressure on the water in the cylinder 30, closing the valve 55 and opening the valve 58 and allowing the water to escape through the outlet 54 into the lower part of the cylinder 44, either slow or fast, according to the movement allowed by the regulator, and accordingly allowing the valve-disk 34 to descend to its seat 40 and close the discharge-opening.

The gauze and filtering material are intended to filter the water from the tank caught in the reservoir during the flushing, so that the piston may be at all times supplied with clean water.

Various modifications may be made in the construction of my improved apparatus without departing from the spirit of my invention. Instead of the inner wall of the reservoir being formed by the ring 45 being forced into place, the same may be cast solid with the bottom of the reservoir, and also instead of using the two valves 50 and 55, the valve 50 can be dispensed with and the pipe 49 made to enter directly into the reservoir.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination, with the tube 24, provided with the annular valve, of the reservoir formed within the cylinder 40, the tube 30, connected with the reservoir by passage-ways 49 and 53, provided with valves 50, 55, and 58, and the piston 29, connected with the tube 24, constructed to draw water from the reservoir into the tube 30 when the valve is raised to act as a cushion to control the descent of the valve, as described.

2. The combination, with the outlet secured in the bottom of the tank provided with the bridge 52, having water-channel 53, and a reservoir formed within the cylinder 40 by means of the ring 45 and provided with the block 48, connected by tube 49 with the bridge 52, of the tube 30 and piston 29, connected to and moving with the main valve and check-valves 50, 55, and 58, constructed to admit water to the tube 30 when the valve is raised and discharge the water when the valve descends, so as to regulate the descent of the valve and the quantity of the flushing-water, as described.

3. In a tubular flushing-valve, the combination, with the valve, of a reservoir connected with the tube 30 by water-ways 49 and 53, controlled by check-valves 50 and 55, the piston 29, connected to and moving with the valve, and the adjustable discharge-valve 58, as and for the purpose herein described.

4. The combination, with the tank and lever 9, one end of which is connected with the flush-valve, of the tube 24, provided with the valve-disk 34 and packing 38, the cylinder 40, forming the valve seat, and the sleeve 45, forming a reservoir connected by water-ways with the bridge 52, the tube 30, piston 29, and

valves controlling the water supply and discharge, the rods 68, and the stop 70, as and for the purpose set forth.

5 In a flush-valve, the combination, with the tube 24, provided with a valve, the tube 30, and piston 29, of the cylinder 40, forming the valve-seat and discharge-outlet, the ring or sleeve 45, forming an annular reservoir between the cylinder 40 and sleeve 45, and pas-

sages connecting the said reservoir with tube 30 of the strainer 46 47, as described.

In witness whereof I have hereunto set my hand.

PATRICK W. MEEHAN.

Witnesses:

J. A. MILLER, Jr.,

M. F. BLIGH.