

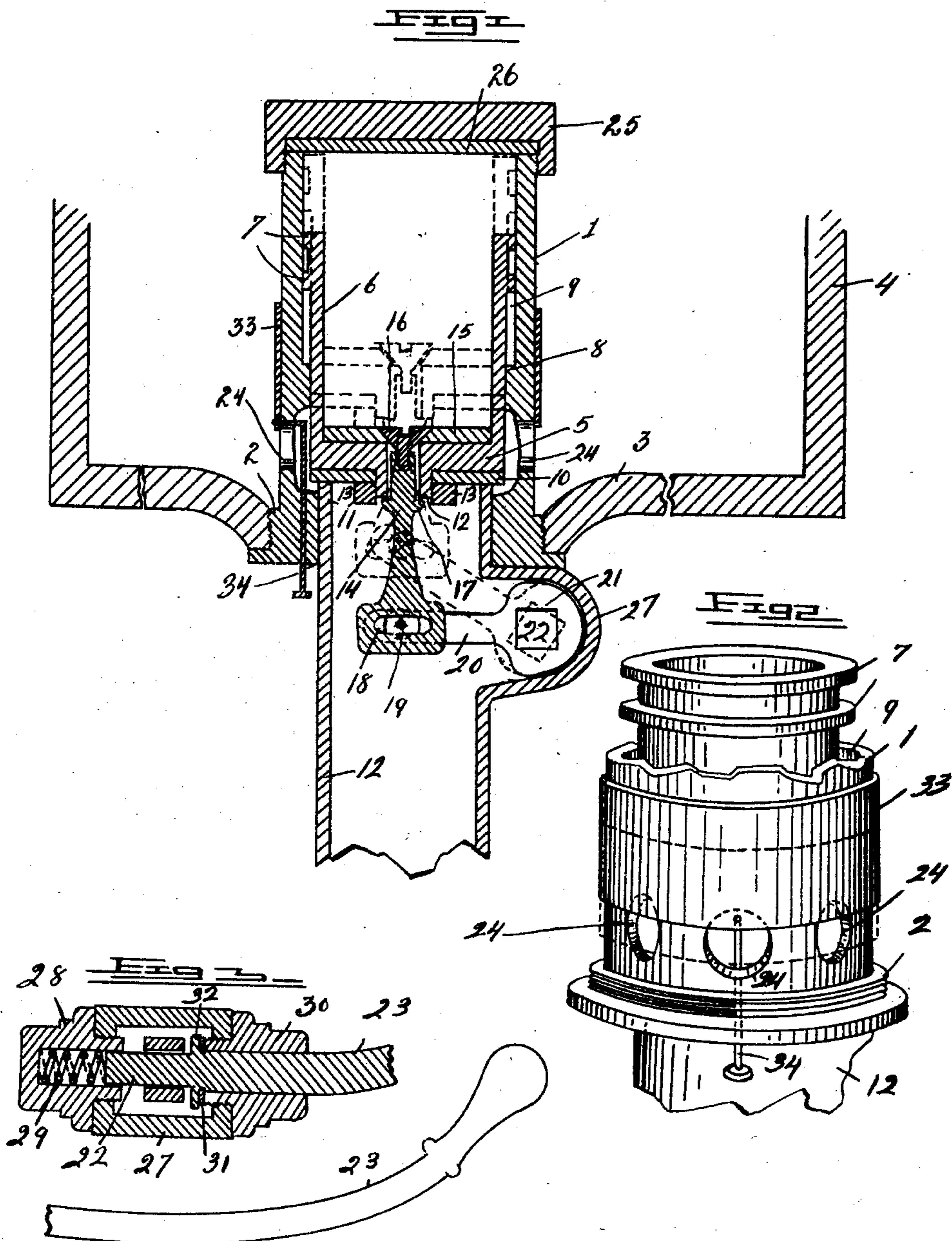
No. 771,221.

PATENTED OCT. 4, 1904.

E. K. ASCHER.
TANK VALVE.

APPLICATION FILED JAN. 12, 1903.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

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TANK-VALVE.

SPECIFICATION forming part of Letters Patent No. 771,221, dated October 4, 1904.

Application filed January 12, 1903. Serial No. 138,646. (No model.)

To all whom it may concern:

Be it known that I, EDWARD K. ASCHER, a citizen of the United States, residing at Columbus, in the county of Franklin, State of Ohio, have invented certain new and useful Improvements in Tank-Valves; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to a balanced valve for water-closet tanks; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The object of the invention is to provide a valve of the character described, of comparatively simple and inexpensive construction, in which the arrangement is such as to balance the valve and allow it to gradually return to its seat, to relieve the pressure upon the valve before it is raised from its seat, to provide for a free full opening when the valve is raised for the outflow of the water, and to provide for regulating the flow of water independently of the valve.

The above object is attained by the structure illustrated in the accompanying drawings, in which—

Figure 1 is a central vertical section through a valve and case embodying my invention and through the discharge-pipe leading from the valve-case, part of the tank in which the valve is located being shown in section and other parts being broken away. Fig. 2 is a fragmentary view in perspective of the valve and case. Fig. 3 is a longitudinal sectional view through the coupling which unites the handle or operative lever with the valve, a portion of said handle appearing in section and the remaining portion appearing in elevation.

Referring to the characters of reference, 1 designates the valve-case, which is preferably cylindrical in form and which at its lower

end is provided with a threaded shoulder 2, adapted to be screwed into a tapped aperture in the bottom 3 of the tank 4. Within said case is the valve 5, having a cylindrical wall 6 concentric with the case 1. Formed upon the upper end of the cylindrical wall of the valve are the projecting rings 7, which lie contiguous to the inner circular wall of the case. Projecting from the inner wall of the case is an annular shoulder 8, the inner face of which snugly embraces the cylindrical wall of the valve. Between the shoulder 8 upon the case and the lower of the rings 7 upon the wall of the valve is an annular water-space 9, adapted to fill with water, which forms a water column that prevents a too rapid descent or closure of the valve after it has been raised. Upon the lower face of the valve is a suitable washer 10, which is adapted to seat upon the upper end 11 of the discharge-pipe 12, which projects into and is secured within the lower end of the casing. Depending centrally from the under face of the valve is an annular boss 12, which is threaded and onto which is screwed a nut 13, which confines the washer 10 in position.

Formed centrally through the valve and through the boss 12 is an aperture into which the upper end of the link 14 extends. Lying upon the upper face of the valve within the annular wall thereof is a washer 15. Passing centrally through said washer and screwed into the upper end of the link 14 is a beveled screw 16. Said washer forms a valve-seat for said screw, which when the main valve is on its seat serves to close the central opening therethrough. Upon the link 14 below the boss 12 is formed an annular shoulder 17, of greater diameter than the opening through said boss, whereby a limited upward movement only is permitted said link independently of the movement of the main valve. This limited upward movement of the link, however, is sufficient to raise the screw-valve 16 from its seat upon the washer 15, thereby relieving the pressure upon the main valve sufficiently to allow it to be easily raised from its seat.

The main valve is raised through the medium of the link 14, which is provided in its lower end with a horizontal slot 18, through which passes a bolt 19, that is screwed in the inner end of the arm 20. In the opposite end of said arm is a square aperture 21, through which passes the square stem 22 of the curved operative handle 23, whereby by a movement of said handle the arm 20 may be actuated to raise the valve 5 from its seat and allow the water to flow from the tank through the openings 24 in the case and out the discharge-pipe 12.

When the valve is raised to discharge the water from the tank, the annular space 9 between the cylindrical wall of the valve and the surrounding wall of the case fills with water, which can only escape slowly from said space, whereby the valve after the operative lever is released is prevented from closing quickly, thereby giving ample time for all the water in the tank to pass therefrom before the valve returns to its seat. The water which forms in a column in the space 9 upon the raising of the valve is allowed to gradually escape from said space between the face of the shoulder 8 and the cylindrical wall of the valve, the parts being so fitted that the escape of said water is timed coincident with the passage of the water from the tank. It will be understood that when the tank is filled with water said water is under considerable pressure, which pressure is exerted upon the valve to forcibly maintain it upon its seat. To raise the valve against this pressure would require considerable effort and render the opening of the valve difficult. By the arrangement shown, however, the initial movement of the arm 20 through the operation of the handle 22 raises the pilot-valve 16, which allows of the escape of a sufficient quantity of water to overcome the pressure within the tank, when by a further movement of said handle the main valve may be easily raised from its seat to quickly discharge the contents of the tank.

Upon the upper end of the case is a cap 25, which screws thereon against a washer or packing-disk 26, which serves as a buffer to limit the upper movement of the valve and deaden the noise of its operation.

It will be observed on referring to Fig. 3 that the inner end of the operative handle 22 lies in a semicylindrical housing 27, formed in the wall of the discharge-pipe 12. In one side of this housing is screwed a blind nut 28, having a recess therein in which lies a compressible coiled spring 2. The squared portion 22 of said handle enters said recess and bears against said spring. In the opposite side of said housing is screwed a nut 30, which embraces the handle and is adapted to bear against a washer 31, lying against the annular shoulder 32 upon said handle. The nut 30 as it is screwed into place forces the end 22 of the handle against the spring 29 so as to com-

press it. The tension of said spring is therefore continually exerted against the end of the handle to compress the washer 21 against the nut 30 and prevent the passage of water out of said housing around that portion of the handle which is adapted to rotate within said nut, as clearly shown in Fig. 3.

Upon referring to Fig. 2 it will be seen that there are a number of discharge-openings 24 through the wall of the case 1, through which the water flows in its passage from the tank when the valve is raised. To regulate the flow of water through said discharge-openings, a vertically-movable sleeve 33 is mounted upon and caused to embrace the exterior of said case. Attached to said sleeve is an operative stem 34, which passes through the lower end of the case and projects therefrom free of access, as shown in Figs. 1 and 2. By means of said stem the sleeve 33 may be raised or lowered to regulate the size of the discharge-openings 24 at will, so that the volume of water which may be allowed to pass through the valve-controlled opening may be regulated independently of the movement of the valve.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a valve of the character described, the combination of a suitable casing having an opening in the wall thereof, a hollow cup-like valve vertically movable in said case adapted to be seated by gravity, a water-egress leading from the case adapted to be controlled by said valve, lateral rings around the upper end of the valve and a ring around the inner wall of the valve-case at the bottom, said rings standing in the same vertical plane and forming a water-space between them adapted to contain a column of water which cushions the return of the valve, a valve of relatively small area seated in and opening through the main valve, and means for raising the small valve from its seat in advance of the main valve by the operation which opens the main valve.

2. In a valve for the purpose set forth, the combination with a water-tank, of a valve-case screwed vertically into said tank, said case having an opening through the wall thereof, an egress-pipe leading from said valve-case, a valve to close the opening through said pipe, means for actuating said valve, a non-rotatable but vertically-movable sleeve embracing the valve-case adapted to slide over said discharge-opening, and means for operating said sleeve from the exterior of the valve-case independently of the movement of the valve.

3. In a valve of the character described, the combination of a case having an opening through the wall thereof, an egress-pipe leading from the case and communicating with said opening, a vertically-movable cup-like valve adapted to seat upon the upper end of said egress-pipe, a valve of relatively small area

seated in said main valve, a link movably connected with the main valve and rigidly attached to said small valve, an arm attached to said link and an operative handle attached
5 to said arm, and means consisting of coacting parts upon the main valve and valve-case for timing the return of the main valve to its seat.

4. In a valve, the combination of a suitable case, a valve movable therein, a housing communicating with the valve-case, an arm for
10 actuating said valve located in said housing, a rotary handle upon which said arm is mounted, said handle projecting into said housing, a nut screwed into said housing having a recess therein, a spring in said recess bearing
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against the inner end of said handle, a shoulder upon said handle, a compressible washer lying against said shoulder, said housing having an opening through which said shoulder may pass, a nut surrounding and rotatable
20 upon said handle screwed into said opening in the housing against said washer to compress said spring and at the same time retain the handle rotatably in place.

In testimony whereof I sign this specification in the presence of two witnesses.

EDWARD K. ASCHER.

Witnesses:

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