(No Model.)

H. A. SEDGWICK.

BALL COCK.

No. 603,346. Patented May 3, 1898.

Fig. 3.

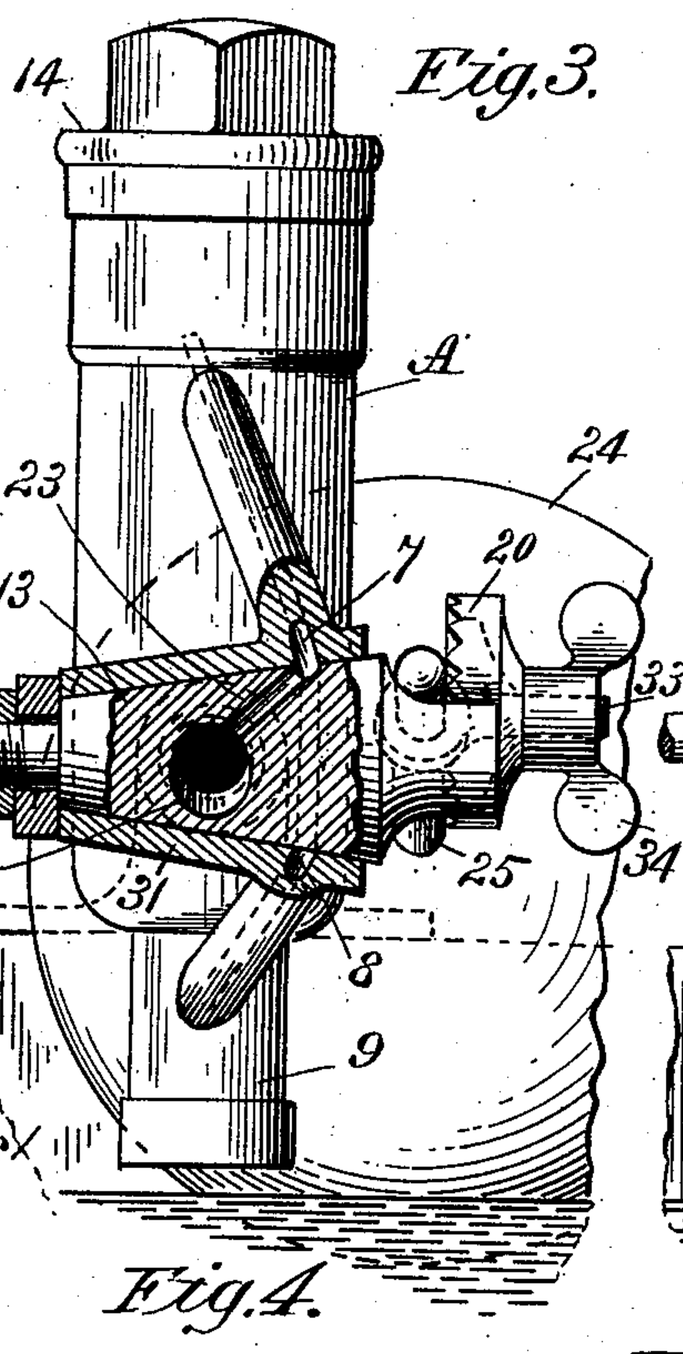


Fig. 4.

Fig. 1.

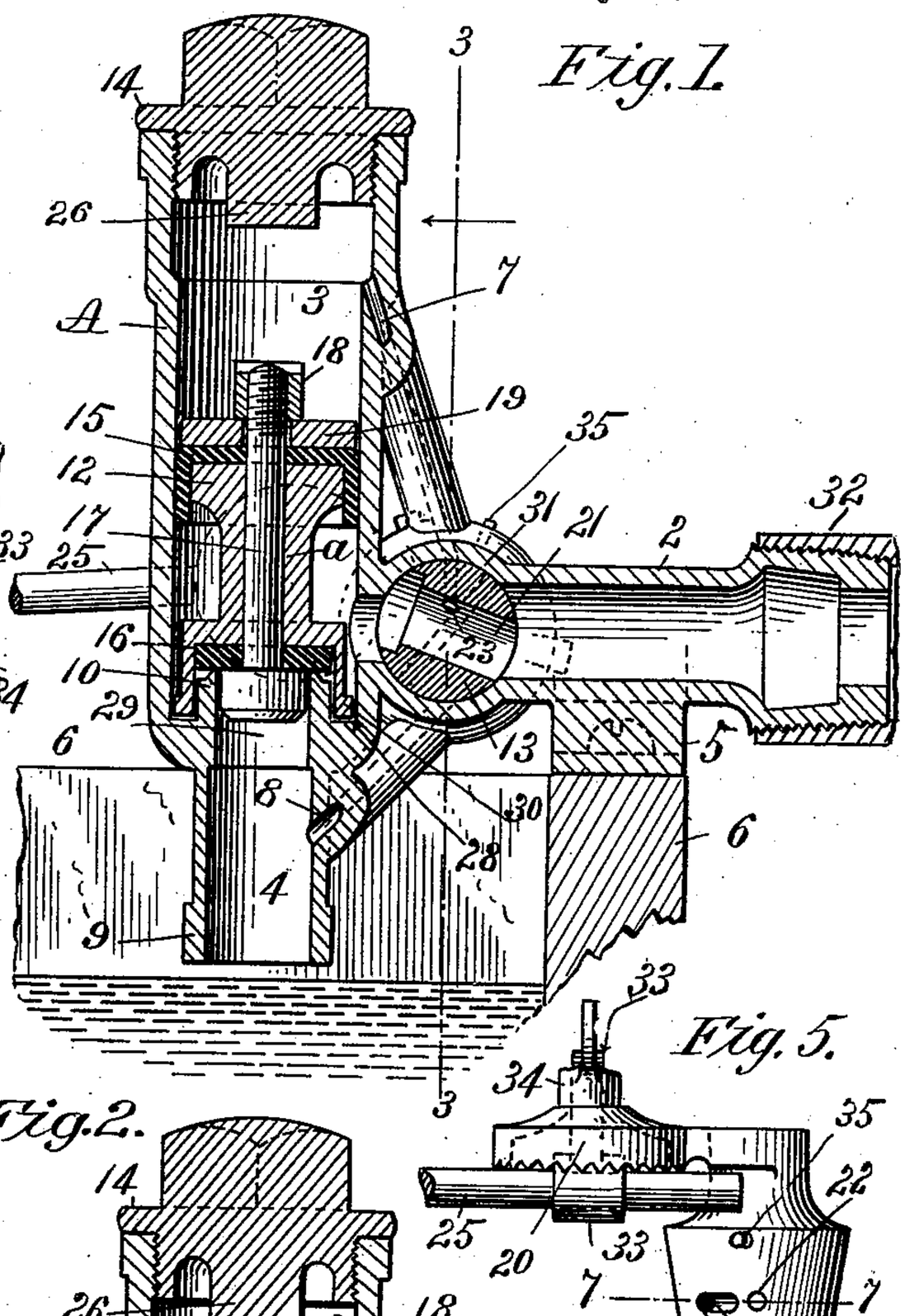


Fig. 5.

Fig. 2.

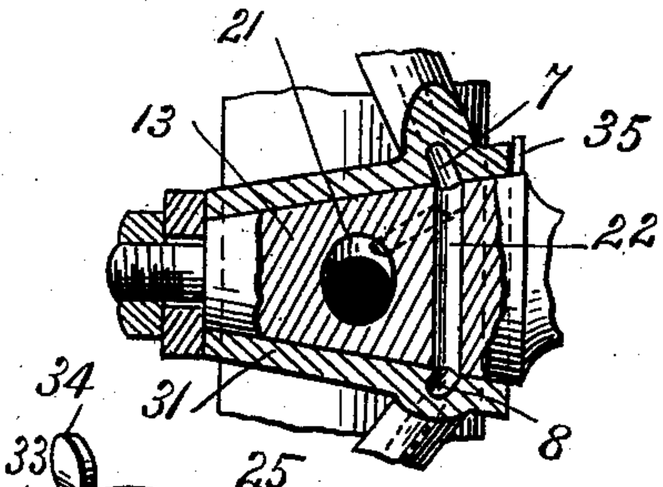


Fig. 6.

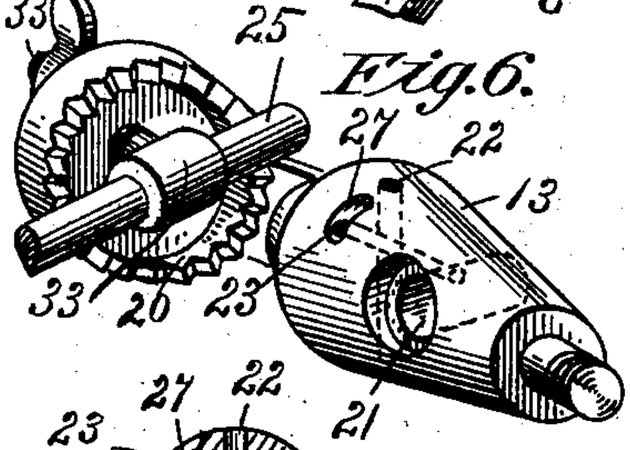
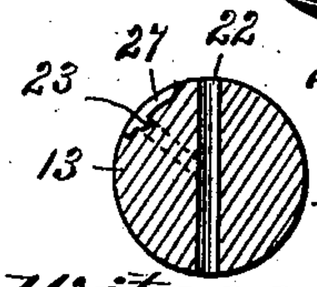


Fig. 7.



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UNITED STATES PATENT OFFICE.

HARRY A. SEDGWICK, OF ATHOL, MASSACHUSETTS.

BALL-COCK.

SPECIFICATION forming part of Letters Patent No. 603,346, dated May 3, 1898.

Application filed September 22, 1896. Serial No. 606,658. (No model.)

To all whom it may concern:

Be it known that I, HARRY A. SEDGWICK, a citizen of the United States of America, residing at Athol, in the county of Worcester and State of Massachusetts, have invented new and useful Improvements in Ball-Cocks, of which the following is a specification.

This invention relates to ball-cocks, the object being to provide a ball-cock of improved construction relative to means for governing the admission of water thereto and the discharge of water therefrom; and the invention consists in the peculiar construction and arrangement of the several structural elements of said ball-cock, all as hereinafter fully set forth, and more particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a vertical sectional view of a ball-cock embodying my improvements, the main valve in this figure being shown closed and portions of the receiving-tank to which the ball-cock is attached being also illustrated in this figure. Fig. 2 is a similar view to Fig. 1, but showing the said main valve open. Fig. 3 is a side elevation of the ball-cock, showing the controlling-valve and the barrel inclosing the same in longitudinal section. Fig. 4 is a side view of a portion of the body of the cock and a longitudinal section of the controlling-valve and the barrel thereof. Fig. 5 is a side elevation of the controlling-valve, the ball-rod-clamping devices thereon, and a portion of said rod. Fig. 6 is a perspective view of the parts shown in Fig. 5. Fig. 7 is a sectional view of the controlling-valve on line 7 7, Fig. 5.

In the drawings, A indicates the body of the ball-cock, which body comprises integrally its main cylindrical portion the intake branch 2 of the cock, the barrel 31, in which the controlling-valve is located, connecting parts between said barrel and said main cylindrical portion in which are water-passages 7 and 8, a valve-seat 10, and a discharge end 9. Into the upper end of said body A is screwed a plug 14, on the inner under side of which is a downwardly-projecting part 26. The interior surface of said body is properly finished for the reception and proper movement of the main valve 12, and near the lower end of said body and within said part thereof which receives said main valve is the upstanding circular valve-seat 10, and surrounding said seat is a circular depression or chamber 28. The water-passage through said intake 2 communicates directly with the interior of said body a little above said valve-seat 10, as shown in Figs. 1 and 2. Said water-passages 7 and 8 are formed through parts of the casting of said body, as illustrated, said passage 7 forming water communication between the upper side of the interior of said barrel 31 and the portion of the interior of said body, just under said plug 14 therein, and said passage 8 forming a like communication between the lower side of the interior of said barrel 31 and the portion of the interior of the lower discharging end 4 of said body. The said tubular intake 2 of said body A may have its extremity screw-threaded for the connection therewith of a water-supply pipe 32, or said pipe may be soldered thereto. A supporting-boss or bolster-block 5 is cast on the under side of said intake branch 2, which provides convenient means for securing the ball-cock on the edge or other suitable part of a water-tank 6, which receives its water-supply through said cock. Said main valve 12 is of such length that when in an upward or downward position in said body, as shown, respectively, in Figs. 1 and 2, a chamber is left in said body opposite said upper or lower end of said main valve. Said main valve consists of a central portion *a*, of less diameter midway of its extremities than at the latter, as shown, thus forming a chamber about the valve and having at its lower end an inverted-cup-shaped form, the borders of which cup 30 are adapted to enter said circular chamber 28 loosely, as shown, surrounding said valve-seat 10 when the said main valve occupies the downward position shown in Fig. 1. A packing 16, of disk form, is placed in the said cup-like socket in the lower end of said main valve 12, which is adapted for action against said valve-seat 10, as shown in Fig. 1. A "hat-brim" packing 15, preferably of leather, is applied to the upper end of said main valve 12, and a metallic washer 19 is applied over and against the upper surface of said packing 15. It will be noted that the upper wall of said chamber has a superficial area greater than its lower wall and that, as

aforesaid, the borders of the inverted cup 30 on the lower end of valve 12 enter the circular chamber 28 loosely. Thus with the parts in position as shown in Fig. 2, in which water may flow into said chamber and water may escape freely from said space above the valve-piston, the preponderance of pressure action is upward against the upper wall of said chamber, and hence said main valve is raised by said preponderance of pressure to the position shown in said figure to permit water to flow into said tank, as hereinafter set forth. A bolt 17, having a head on its lower end, as shown, is passed upwardly through said packing 16, the body of said main valve 12, the packing 15 thereon, and said washer 19, and a nut 18 securing said bolt and several valve parts firmly together.

A "controlling-valve" 13, so called because it controls the action of the main valve, has, as usual in similar constructions, a main water-passage 21 transversely through it from side to side, and it also contains a second and smaller transverse water-passage 22 near said passage 21 and at right angles to the latter. Said controlling-valve contains also a third water-passage 23, extending from the inner wall of said passage 21 in a diagonal direction to the surface of said valve. The surface of said valve 13, at the outer end of said passage 23, may be channeled, as at 27, Figs. 6 and 7, in order, as hereinafter set forth, to obtain a certain variable effect resulting from the flowing of water from passage 21 in valve 13 through said passage 23 into passage 7, and thence into the valve-body above the main valve 12, whereby the frequency of the action of the cock for admitting water to the tank 6 is regulated. Said controlling-valve 13 is cast, preferably, with the serrated rosette 20 integral with its larger end. An eyebolt 33 is provided with a thumb-nut 34. The shank of said bolt passes through said rosette, and said nut is adapted to screw onto said shank after passing the end of the ball-rod 25 through the eye of said bolt, thereby adjustably attaching the ball-float 24 to the controlling-valve.

The operation of the above-described improvement is as follows: Assume that the controlling-valve 13 occupies the position shown in Fig. 2, which is the one which permits water to flow freely through the intake 2, and thence through the passage 21 in said controlling-valve, into the lower part of the body A, and thence into the tank 6. During this time the main valve is in the upward position. (Shown in said last-named figure.) The water thus supplied to said tank gradually rises, and thereby lifts the ball-float, and consequently turns said controlling-valve in its inclosing barrel 31 until it is brought to the position shown in Fig. 1. It will now be seen that the passage 23 in said valve forms a water connection between the main passage 21 and the lower end of the passage 7, which forms communication between the upper inner side of said barrel 31 and the chamber in the body A above the main valve 12. Consequently water under pressure will flow into the chamber above the latter-named valve, thereby forcing the same downward against the valve-seat 10, thereby stopping the flow of water into said tank. The main valve is therefore now held against its said seat under the full force of the supply-pressure. When the height of the water in said tank becomes again lowered, the controlling-valve 13 turns slowly until it again reaches the position shown in Fig. 2; but the main valve 12 remains shut or in the downward position (nearly to that shown in Fig. 1) until the rotary movement of valve 13, caused by outflowing water, has brought the transverse passage 22 in said main valve to a position whereby its opposite extremities register with the end of passages 7 and 8, (see Fig. 2,) which extend from said barrel 31 to the interior of body A above the main valve and to the discharge end 4 of said body. Thus direct communication is formed between the upper end of the main-valve chamber and said outlet. This immediately relieves the pressure in the upper end of said chamber and allows the main valve to rise or open, and as it moves upward it is stopped by the engagement of the upper end of bolt 17 with the projection 26 on the under side of the nut 14. The main valve 12 being down and closing against its seat 10, as in Fig. 1, and the water in the tank 6 being at such a level, as through the ball-float and lever 25, brings the passage 21 in the turning plug 13 to the position shown in said last-named figure. Incoming water under pressure is supplied under said hat-brim packing on said main valve; but owing to a like pressure upon the upper end of said main valve, due to the connection by the water-passages 7 and 23 between the chamber above said main valve and passage 21 in said plug 13, the pressure above and below said hat-brim packing is equalized and the said main valve cannot yet be raised from its seat, for the reason that the chamber above said last-named valve is for the moment filled with water; but when the said water-level in the tank becomes lowered by drawing therefrom and said plug-valve 13 becomes turned to the position shown in Fig. 2 a continuous free water-passage is formed from said chamber above valve 12 to the lower discharging end 4 of the valve-case through the interconnecting passages 7 and 8 in the valve-case and the transverse passage 22 through said plug 13, whereby said chamber is free from pressure. Now the pressure of incoming water from branch 2 through the passage 21 in the turning plug acts to raise the main valve from its seat, as shown in Fig. 2, whereby more water is supplied to said tank. By the use of said rotary controlling-valve containing said water-passages other than the said main passage 21, acting with said passages 7 and 8, as set forth, the ball-cock can

be adjusted to work within any reasonable limits of rise and fall of water in the tank to which it is attached. This is accomplished, as above intimated, by approaching the extremities of the passages 22 and 23, more or less, on the surface of the valve 13 by means of said channeled portion 27 on the surface of said valve.

Hence by means of the above-described construction and using a ball-float with a rod about nine inches long, more or less, it requires a rise and fall of about six inches of water in the tank before the main valve will be opened. Thus the within-described ball-cock, adjustable to any rise and fall of water within reasonable limits and ordinarily operating only about six times daily, presents great advantages as to durability over an ordinary one which operates about thirty times a day, both cocks acting under the same conditions of use as to quantity of water drawn from the tank. The lower end of the main valve is cupped, as shown, to receive the valve-seat, the body A being recessed at 28 to receive the lower end of the main valve. Therefore when said valve descends it carries the head of said bolt 17 into the upper end 29 of chamber 4, which said head fits rather loosely at the lower end of the body A. This same movement of the main valve 12 carries the lower end 30 of said valve into said recess 28 and against the water therein, which water escapes slowly around the said lower end 30 of the valve 12 and around the head of said bolt 17. Thus by the above-described construction a perfect dash-pot or water-cushion is provided which compels the said main valve to be seated slowly, thereby effectively preventing any water-hammer.

When it becomes desirable, for effecting repairs, to completely shut off the water-supply from the ball-cock independently of shutting off the main or street supply, the ball-float 24 may be swung to a vertical position, thereby bringing the main water-passage 21 in the controlling-valve 13 at right angles to the water-supply through the intake 2 and shutting off the said supply. A stop-pin 35 is placed in said valve 13, (see Figs. 1 and 4,) which may engage any convenient projection on the barrel of the valve 13, and thus serve to hold said ball-float in said upturned or vertical position while said repairs are being made.

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

1. In a ball-cock having a hollow body, a suitable outlet from said body, a water-supply branch communicating with said body, a cylindrical valve-barrel between said branch and body, water-passages 7 and 8, forming communication between the interior of said barrel, and the opposite ends of the interior of said body, combined with a moving valve within said body acting to close and open said outlet, a rotary valve acting in said barrel having a transverse water-passage 22, therethrough whose extremities communicate, simultaneously, with the extremities of said passages 7 and 8, within said valve-barrel, substantially as set forth.

2. In a ball-cock having a hollow body, a suitable outlet from said body, a water-supply branch communicating with said body, a cylindrical valve-barrel between said branch and body, water-passages 7 and 8, forming communication between the interior of said barrel, and the opposite ends of the interior of said body, combined with a moving valve within said body acting to close and open said outlet, a rotary valve acting in said barrel for controlling the water-supply to the ball-cock, having a transverse water-passage 22, therethrough whose extremities communicate, simultaneously, with the extremities of said passages 7 and 8, within said valve-barrel, and a main transverse water-passage 21, therethrough, substantially as set forth.

3. In a ball-cock having a hollow body, a suitable outlet from said body, a water-supply branch communicating with said body, a cylindrical valve-barrel between said branch and body, water-passages 7 and 8, forming communication between the interior of said barrel and the opposite ends of the interior of said body, combined with a moving valve within said body acting to close and open said outlet, a rotary valve acting in said barrel for controlling the water-supply to the ball-cock, having a main transverse water-passage 21, therethrough, and a passage 23, forming water communication between said passage 21, and the surface of said rotary valve, for communication with one extremity of said hollow body, through said passage 7, substantially as set forth.

4. In a ball-cock having a hollow body, a suitable outlet from said body, a water-supply branch communicating with said body, a cylindrical valve-barrel between said branch and body, water-passages 7 and 8, forming communication between the interior of said barrel and the opposite ends of the interior of said body, combined with a moving valve within said body acting to close and open said outlet, a rotary valve acting in said barrel for controlling the water-supply to the ball-cock having a transverse water-passage 22, therethrough whose extremities communicate, simultaneously, with the extremities of said passages 7 and 8, within said valve-barrel, a passage 23, forming water communication between said passage 21, and the surface of said rotary valve, for communication between one extremity of said hollow body and said passage 21, substantially as set forth.

5. In a ball-cock having a hollow body, a circular valve-seat in said body, a circular chamber 28, surrounding said seat, a water-supply branch communicating with said body, a cylindrical valve-barrel between said branch and body, water-passages 7 and 8, forming communication between the interior of said

barrel and the opposite ends of the interior of said body, combined with the valve 12, having an inverted cup-shaped lower extremity for free entrance into said circular chamber, and a packing-disk 16, within said cup for engagement with said valve-seat, the rotary valve 13, having the water-passages 21 and 22, transversely therethrough at right angles to each other, and suitable ball-float devices connected to said valve, substantially as set forth.

6. In a ball-cock having a hollow body, a circular valve-seat in said body, a circular chamber 28, surrounding said seat, a water-supply branch communicating with said body, a cylindrical valve-barrel between said branch and body, water-passages 7 and 8, forming communication between the interior of said barrel and the opposite ends of the interior of said body, combined with the valve 12, comprising the body *a*, thereof, having an inverted-cup-shaped lower end for free entrance into said chamber, a packing-disk 16, within said cup for engagement with said valve-seat, a "hat-brim" packing 15, inclosing the upper end of said valve-body, a metal washer lying upon said packing 15, and the bolt 17, having a head for entrance within said valve-seat, and a shank extending through said valve-body, packing-disk, packing, and washer, and means for securing said bolt in said valve, the rotary valve 13, having the water-passages 21 and 22, transversely therethrough, at right angles to each other, and suitable ball-float devices connected to said rotary valve, substantially as set forth.

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