H. MUELLER & A. SCHUERMANN.

SELF CLOSING LIQUID SHUT-OFF.

APPLICATION FILED JAN. 24, 1906.

917,639. Patented Apr. 6, 1909.

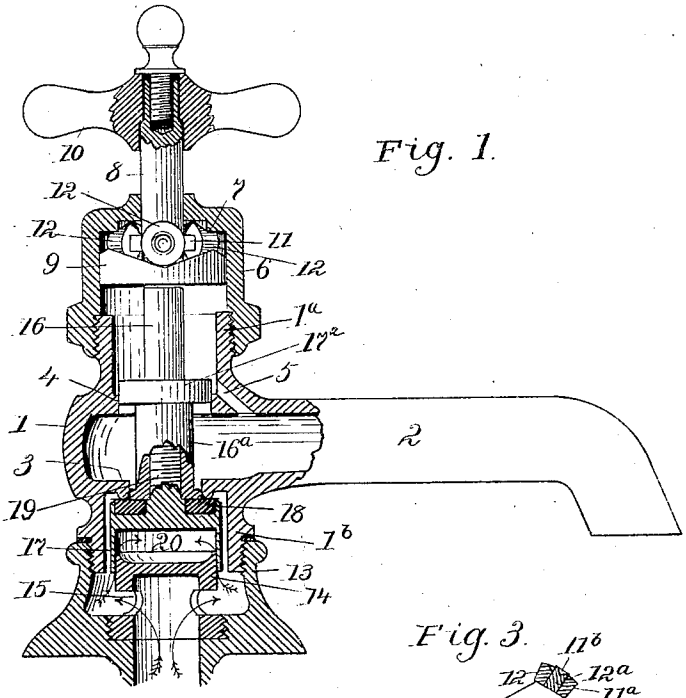


Fig. 1.

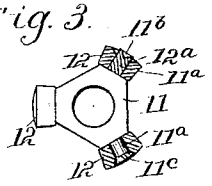


Fig. 3.

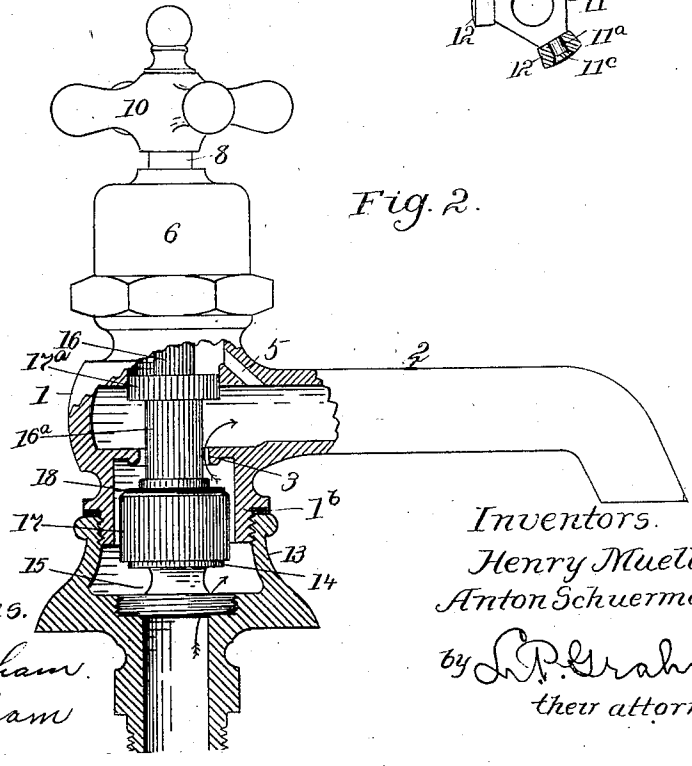


Fig. 2.

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UNITED STATES PATENT OFFICE.

HENRY MUELLER AND ANTON SCHUERMANN, OF DECATUR, ILLINOIS, ASSIGNORS TO H. MUELLER MANUFACTURING COMPANY, OF DECATUR, ILLINOIS, A CORPORATION OF ILLINOIS.

SELF-CLOSING LIQUID SHUT-OFF.

No. 917,639. Specification of Letters Patent. Patented April 6, 1909.

Application filed January 24, 1906. Serial No. 297,707.

To all whom it may concern:

Be it known that we, HENRY MUELLER and ANTON SCHUERMANN, residents of the city of Decatur, county of Macon, and State of Illinois, have invented certain new and useful Improvements in Self-Closing Liquid Shut-Offs, of which the following is a specification.

This invention is particularly applicable to self-closing basin cocks and its objects are explained in the subjoined detail description.

The invention is exemplified in the structure hereinafter described and it is defined in the appended claims.

In the drawings forming part of this specification Figure 1 is a vertical section through a basin cock embodying our improvements; the valve of the cock being shown closed. Fig. 2 is a broken section through the cock, showing the valve open, and Fig. 3 is a detail of the roller bearing with which the cock is preferably provided.

General features of the cock are as follows: The cock body 1 has the upward extension 1^a, the downward extension 1^b and the laterally-projecting spout 2. A partition is placed between the downward extension 1^b and the spout chamber and a passage way is formed through the partition. A valve seat 3 is formed around the passage way on the under surface of the partition. A cap 6 is screwed onto the upward extension of the cock body and it is apertured centrally at its upper end to receive the shank 8. The shank 8 has a handle 10 on its upper end and a disk 9 on its lower end. The disk 9 has a set of inclines on its upper surface and the upper end of cap 6 has a corresponding set of inclines 7 on its under surface. A set of rollers 12 is interposed between the opposing inclines, in a manner to be hereinafter explained, and they provide means for converting rotary motion of the shank 8 into longitudinal motion thereof. A base 13 is screwed onto the downward extension of the cock body and it has an inlet opening through which the fluid flows upward, or toward the valve seat.

The novel features of the structure comprise the following details: Centrally within said base 13 is disposed a plug 14 which is somewhat smaller than the interior of the downward extension 1^b so as to leave an annular space between them, and as shown herein the plug has a tubular shank which is screwed into the base and has lateral inlet passages 15 connecting the bore of the base with said annular space, while the upper end of the plug is closed and made cup-shaped to form a chamber 20. Fitting slidably and somewhat loosely around the plug is a shell 17 which is also smaller than the interior bore of the downward extension 1^b so as to leave the annular inlet passage. This shell is closed at its upper end as by a partition from whose center rises a connection, here shown as a screw 19 which projects through the valve seat and takes into the enlarged lower end 16^a of the valve stem 16; and the valve proper 18 (which may be of rubber) is clamped between said partition and the lower end of the stem and is adapted to close against the seat 3. Between the larger portion 16^a and the smaller portion 16 of said stem is formed a shoulder which supports a collar 17^a, the latter fitting slidably but closely within the bore 4 of the upward extension 1^a of the body, and a by-pass 5 leads obliquely from the chamber above said collar into the spout 2 so as to discharge through the latter whatever water may accumulate above the collar as well understood. With this construction, the parts of the valve stand closed as shown in Fig. 1, and the pressure of water flowing through the inlets 15 and passing between the plug and shell into the chamber 20 will hold the valve tightly closed against its seat. Rotation of the handle 10 in either direction will depress the disk 9 in a manner to be set forth below, and its first movement is to push the stem 16 downward and positively open the valve, the water which has accumulated within the chamber 20 being forced out between the shell and plug in a direction opposed to the flow of the water passing upward through the annular space around these elements, past the valve, and out the spout. Thus it will be seen that the opening of the valve is retarded by the escape of water from the chamber 20, as water is incompressible. The parts then assume the position shown in Fig. 2, and when the handle is released the inflowing water again passes between the plug and shell and slowly fills the chamber 20 and gradually closes the valve in a manner which will materially aid in the prevention of water hammer. It should be observed that there is no tendency to create a vacuum in either the opening or

closing of the device, that both motions are retarded by the speed with which the water may pass the annular space between the plug and shell, and that the only inlet to and escape from said space is in a direction opposed to the flow of water through the device.

While any suitable means may be employed for depressing the stem 16 to open the valve, we prefer that illustrated herein and which is substantially the same as shown in application 288,489 filed by one of us Nov. 21, 1905. That is to say, the handle 10 is secured to a shank 8 which projects through the upper end of the cap 6 that is screwed to the upward shank extension 1^a, and fast on the lower end of the shank is a disk 9 which has on its upper face a movable roller-way consisting of an annular track having a series of undulations; within the upper end of the cap is a fixed roller-way comprising a similar track 7; and journaled on the shank between these ways is a spider 11 having radial pins 11^a on which are journaled rollers 12 corresponding in number with the depressions in the tracks. Thus when the handle is turned in either direction for approximately one-sixth of a revolution the movable way is depressed by the rollers which travel at half speed, and the disk 9 impinges against and bears downward on the upper end of the stem. The present application includes a slight improvement over the other application in the detailed construction of the spider; to wit: Each roller 12 has the outer end of its bore countersunk as shown at 12^a, and each pin 11^a has its outer end initially countersunk as shown at 11^b so that it may be upset or riveted as shown at 11^c and the head thus formed will fit into the countersunk portion 12^a of the roller and prevent the latter from accidental displacement. This detail we consider of advantage in a device of this character where the annular channel for the rollers is necessarily small, because it permits the use of rollers which occupy substantially the full width of the channel and hence have bearing surfaces as wide as possible, it prevents centrifugal movement of the rollers which would cause them to scrape against the outer wall of said channel, and when the parts are disconnected it avoids accidental loss of the rollers. Moreover, in the present instance we consider an upset end preferable to a nut, pin, or other detachable head because it cannot become displaced while in use and thus fall onto the rollerway and clog the device to its possible injury.

What is claimed as new is:

1. In a self-closing liquid shut-off, the combination with a cock body having a valve seat, and a fixed plug therein on the inlet side of the seat; of a shell opening toward the inlet and slidably surrounding said plug, the shell having a closed partition, a valve carried by the latter and adapted to engage said seat, and means for moving the shell against the pressure to unseat the valve.

2. In a self-closing liquid shut-off, the combination with a cock body having a valve seat, and a fixed plug within and smaller than its bore and located on the inlet side of the seat; of a shell opening toward the inlet and slidably surrounding said plug, the shell being also smaller than said bore and having a closed partition, a valve carried by the latter and adapted to engage said seat, and means for moving the shell against the pressure to unseat the valve.

3. In a self-closing liquid shut-off, the combination with a cock body having a valve seat, and a fixed plug within and smaller than its bore and located on the inlet side of said seat, the end of the plug being cupped; of a shell opening toward the inlet and slidably surrounding said plug, the shell being also smaller than said bore and having a closed partition so that with said cup it forms a water chamber, a valve carried by the shell and adapted to engage said seat, and means for moving the shell against the pressure to unseat the valve.

4. In a self-closing liquid shut-off, the combination with a cock body having a valve seat, and a fixed plug therein on the inlet side of the seat; of a shell opening toward the inlet and slidably surrounding said plug, the shell having a closed partition, a connection rising centrally from the latter through said seat, a valve surrounding the connection and held upon the partition, and means for depressing the connection to unseat the valve.

5. In a self-closing liquid shut-off, the combination with a cock body having a valve seat, and a fixed plug therein on the inlet side of the seat; of a shell opening toward the inlet and slidably surrounding said plug, the shell having a closed partition, a screw rising centrally from the latter, a valve upon the partition around the screw, a valve stem engaging the screw and clamping the valve in place, and means for moving the stem to unseat the valve.

6. In a self-closing liquid shut-off, the combination with the cock body having a valve seat beneath its spout, a valve, a valve stem, and a handle for moving the latter in one direction only; of a shell within the body and spaced from it to leave an annular passage between them, a solid partition across the shell supporting the valve and leaving the open end of the shell projecting toward the water inlet, a rigid connection between said partition and valve stem, and a plug fixed in the base of the body, having lateral inlet openings, and projecting loosely into said shell and cupped at its upper end, for the purpose set forth.

7. In a self-closing liquid shut-off, the combination with the cock body having a

valve seat beneath its spout, and upward and downward extensions beyond its spout chamber, a valve stem guided in the upward extension and having an enlarged lower end, means for depressing said stem, and a valve; of a shell within said downward extension and spaced from it so as to leave an annular passage between them, a solid partition across the shell leaving its open end projecting toward the water inlet, a screw rising from said partition and taking into the stem so as to clamp the valve between the partition and said enlarged lower end of the stem, and a plug rigidly supported in the base of the body, having lateral inlets, and projecting loosely into said shell, for the purpose set forth.

8. In a self-closing liquid shut-off, the combination with the cock body having a valve seat beneath its spout, and upward and downward extensions beyond its spout chamber, a valve stem having a shoulder, a collar supported by the shoulder and guided in the upward extension, a by pass from the chamber in the latter to the spout, and a valve; of a shell within the downward extension and spaced from it so as to leave an annular passage between them, the shell being closed at its upper portion and having its open lower end directed toward the water inlet, means for clamping the valve between the closed portion of the shell and the valve stem, and a plug mounted rigidly in the base of the body, having lateral inlets, and projecting loosely into the open end of the shell.

9. In a self-closing liquid shut-off, the combination with a cock body having a valve seat, and a tubular plug fixed within its bore and having lateral openings; of a shell slidably surrounding the plug and directed toward the inlet, a closed transverse partition in the shell between the seat and plug, a valve carried by said partition and closed by the water pressure, and external means for unseating the valve.

10. In a self-closing liquid shut-off, the combination with a cock body having a valve seat, and a tubular plug fixed within its bore and having lateral openings and a cupped extremity directed toward the seat; of a shell comprising a closed transverse partition between the seat and plug and a wall slidably surrounding the latter and directed toward the inlet and with said cup forming a water chamber for retarding the movements of the shell, a valve carried by said partition on the side thereof opposite from said chamber and adapted to be closed slowly by the water pressure, and external means for unseating the valve.

11. In a self-closing liquid shut-off, the combination with a cock body having a spout, a valve seat between the spout and inlet, and a fixed plug within its bore between the inlet and seat; of a shell slidably surrounding the plug with its open end directed toward the inlet, a valve carried by the closed end of the shell between the plug and seat and adapted to be seated slowly by the inlet pressure, and external means for opening it against said pressure.

12. In a self-closing liquid shut-off, the combination with a cock body having a spout, a valve seat between the spout and inlet, and a fixed plug within its bore between the inlet and seat; of a shell slidably surrounding the plug with its open end directed toward the inlet, a valve carried by the closed end of the shell between the plug and seat and adapted to be seated slowly by the inlet pressure, and external means for opening it and simultaneously moving the shell toward the plug against said pressure.

In testimony whereof we sign our names in the presence of two subscribing witnesses.

HENRY MUELLER.
ANTON SCHUERMANN.

Witnesses:
ANNA MURPHY,
JOHN L. WADDELL.