P. MUELLER & A. C. SCHUERMANN.

COCK.

APPLICATION FILED SEPT. 3, 1908.

934,688. Patented Sept. 21, 1909.

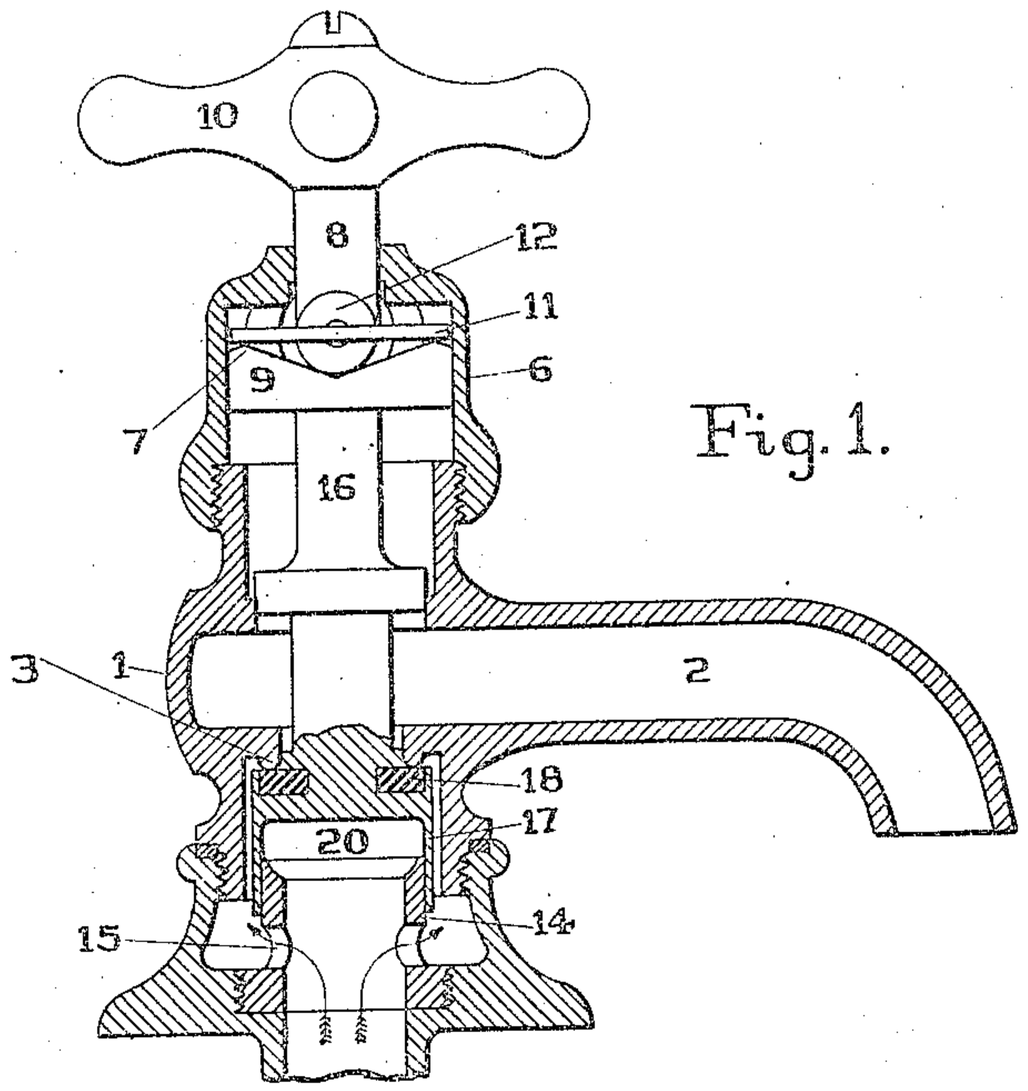


Fig. 1.

Fig. 2.

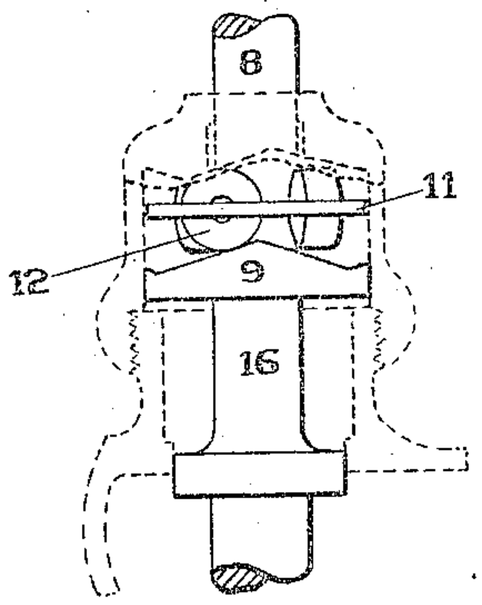
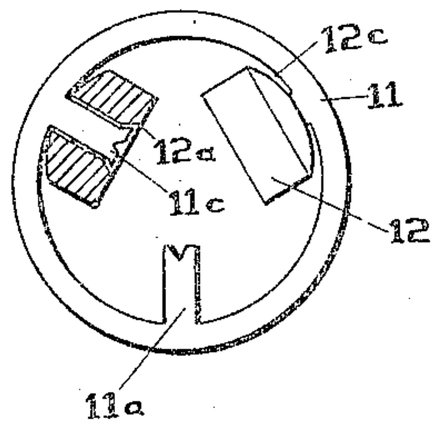


Fig. 3.



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UNITED STATES PATENT OFFICE.

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COCK.

934,688.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed September 3, 1908. Serial No. 451,588.

To all whom it may concern:

Be it known that we, PHILIP MUELLER and ANTON C. SCHUERMANN, citizens of the United States, and residents of Decatur, Macon county, State of Illinois, have invented new and useful Improvements in Cocks; and our preferred manner of carrying out the invention is set forth in the following full, clear, and exact description, terminating with claims particularly specifying the novelty.

This invention relates to water distribution, and more especially to cocks and faucets of that type which have reciprocating valves; and its object is to improve the construction of the roller support in faucets of this character where rollers are employed between two undulating ways.

The invention is exemplified in the structure hereinafter described and is illustrated as applied to a self-closing basin cock, although it will be clear that it would be equally useful in any structure wherein the turning of the shank by its handle is intended to reciprocate the stem to open the valve. It is obvious that the latter need not be closed by pressure and that other details of its structure set forth herein are not essential to the present invention which consists mainly in a ring-shaped spider with three or more inwardly projecting pins on which are mounted the rollers that travel on said ways.

In the drawings—Figure 1 is a central vertical section through a basin cock of one type wherein this invention can well be employed, the parts being shown at rest with the valve closed by pressure. Fig. 2 is a similar section of the cap (dotted) and the shank and its disk depressed therein so as to illustrate the ways; and Fig. 3 is an enlarged plan view of the spider with one roller in place, another removed, and the third in section.

The cock body 1 has a spout 2 and a valve seat 3, and through the latter projects the stem 16 suitably guided so that it may move vertically. At its lower end the stem carries the valve 18 which is here shown as mounted on the top of an inverted cup-shaped shell 17. The latter fits rather closely around a plug 14 having a hollow shank screwed into the base of the cock body and provided with lateral inlet openings 15, and the upper end of the plug is dished to produce a chamber 20 between it and the shell 17. The construction here shown is such that 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 3 as seen in Fig. 1; and when it is desired to open the valve the stem 16 may be depressed by means to be described below, which action forces from the chamber 20 the water that has accumulated therein and drives it outward in a direction opposed to the flow of the incoming water which obviously passes upward through the annular space around the shell. However, as above stated, we do not limit ourselves to the use of the present invention in a valve of this construction, but have illustrated the same as one desirable type of cocks with which it may be used to advantage.

The upper end of the cock body is externally threaded, and screwed thereon is the cap 6 which is perforated at its apex for the passage of the shank 8 which carries a removable handle 10 as shown. Secured to the lower end of the shank and mounted for rotation within the cap is a disk 9, and the contiguous faces at the top of this disk and within the top of the cap are provided with undulating ways 7 in each of which there should be at least three tracks or undulations. Between these ways are mounted rollers 12, and the position and proportion of parts is such that when the valve is closed as seen in Fig. 1 the upper end of the stem 16 is in contact with the bottom of the disk 9 and the rollers lie in the depressions between the two tracks.

Coming now more particularly to the present invention, the rollers 12 are supported in place by a ring-shaped spider 11 of considerably less height than the diameter of any roller and itself of less diameter than the interior of the cap. From this spider three pins 11^a project radially inward, and on these pins the rollers are journaled as shown. For this purpose the inner end of the bore through each roller is countersunk slightly as shown at 12^a and the inner end of the pin is upset into said countersink as shown at 11^c. The outer ends of the rollers are rounded off transversely on a greater curvature than the interior of the ring as shown at 12^c

so that they will rotate on their journals with the least possible friction against the ring. The length of the rollers and pins is such that they will not quite contact with the shank 8, and their diameter and the material of which they are composed are matters which I prefer to leave to the manufacturer. Experiment has shown that the use of a ring-shaped spider in this connection will hold the rollers equally spaced at all times, whether the various tracks of the ways be accurately identical or not, and yet the spider will not rub against the wall of the cap nor the inner ends of the rollers or pins upon the shank. Obviously when the latter is turned in either direction the elevations of the tracks upon its disk 9 cause the rollers to travel at half speed, and when the apex of these tracks comes nearly or quite below the apex of the tracks in the cap the rollers will have forced the disk downward and that in turn will have depressed the stem sufficiently to open the valve. With a valve of the construction shown, there will be no hammering either in opening or closing, both of which actions take place rather slowly; but it is obvious that the present invention could be applied to a valve which was closed by a spring, and we contemplate the use of the same in any place where it would be of advantage.

The parts are disconnected as best illustrated in Fig. 2. First the cap is unscrewed from the cock body and with it is removed the shank and its disk, its handle is then detached and the other parts drawn out of the cap, and finally the spider and rollers are lifted off of the shank. It may not in all cases be necessary to upset the inner ends of the pins, but one advantage of doing so will appear at this time because the rollers cannot become accidentally disconnected from the spider.

The use of a ring-shaped spider eliminates the possibility that one or more of the rollers shall leave the track, keeps them equally spaced and at all times in contact with the undulations and ready for service, prevents them from working radially outward and contacting with the cap against which they might stick or into which they might wear a groove, and the upset inner ends of the pins prevent the rollers from working inward and coming in contact with the shank.

What is claimed as new is:

1. The combination with two members having opposed annular undulated ways, and means for turning one member relatively to the other; of a series of cylindrical rollers disposed between said ways, a ring-shaped spider surrounding the rollers, and pins projecting from the spider radially inward and on which said rollers are journaled, the outer ends of said rollers being rounded off transversely on a greater curvature than the interior of said ring.

2. The combination with two members having opposed annular undulated ways, a shank on one projecting through a central hole in the other, a cap on the latter member surrounding the undulated way of the former member, and means for turning one member relatively to the other; of a series of rollers disposed between said ways, a ring-shaped spider surrounding the rollers and standing within said cap and between said ways, and pins projecting from the spider radially inward and on which said rollers are journaled, the inner ends of said pins being free and out of contact with the shank and having heads for the purpose set forth.

3. The combination with two members having opposed annular undulated ways, and means for turning one member relatively to the other; of a series of rollers disposed between said ways, a ring-shaped spider surrounding the rollers, and pins projecting from the spider radially inward and on which said rollers are journaled, the outer ends of the rollers being rounded off transversely on a greater curvature than the interior of said ring and the inner ends of their bores countersunk, and the inner ends of said pins being upset within said countersinks.

In testimony whereof, we have hereunto subscribed our signatures, this 28th day of August A. D. 1908.

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Witnesses:
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