

W. S. COOPER.  
FAUCET.

APPLICATION FILED DEC. 4, 1906.

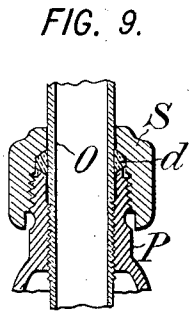
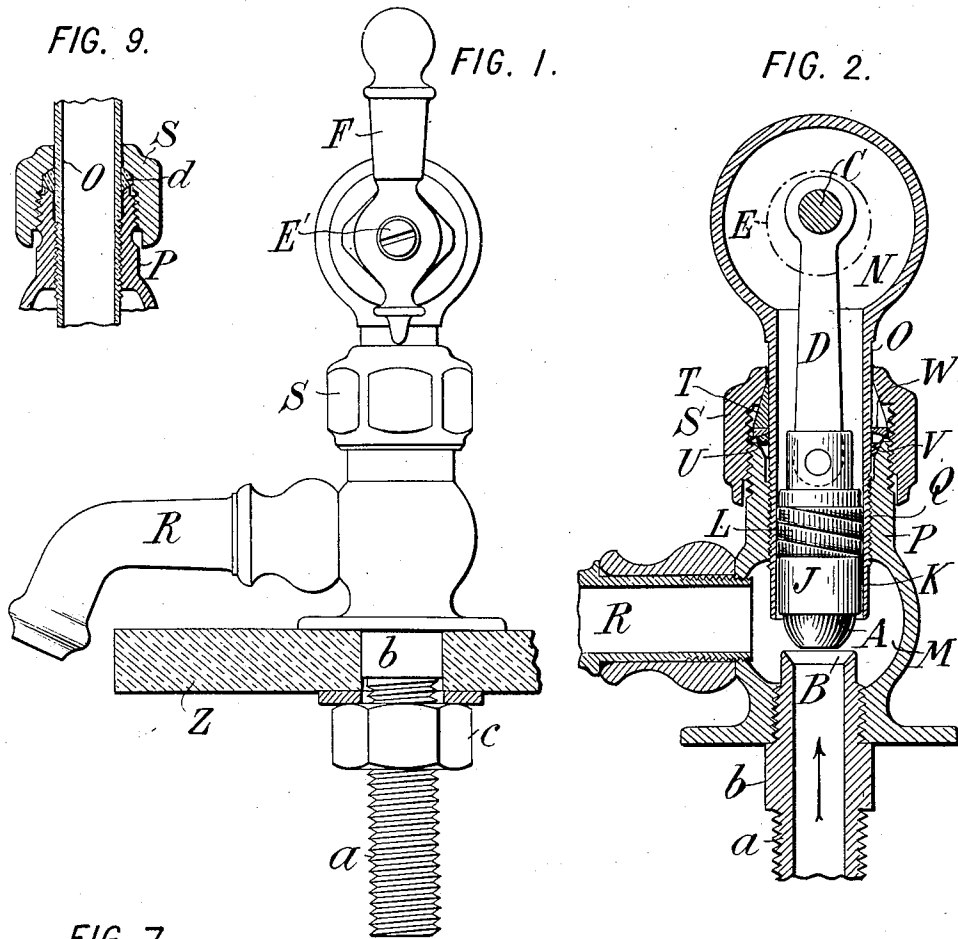


FIG. 7.

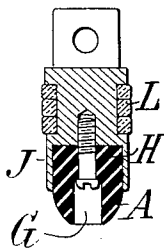


FIG. 3.

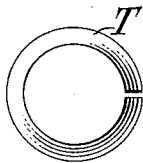


FIG. 4.



FIG. 5.

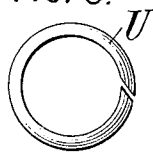


FIG. 6.

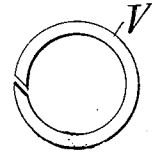
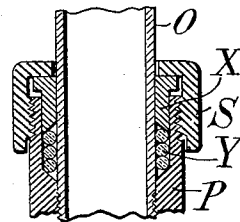


FIG. 8.



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# UNITED STATES PATENT OFFICE.

WILLIAM SAMUEL COOPER, OF PHILADELPHIA, PENNSYLVANIA.

## FAUCET.

No. 865,568.

Specification of Letters Patent.

Patented Sept. 10, 1907.

Application filed December 4, 1905. Serial No. 290,126.

To all whom it may concern:

Be it known that I, WILLIAM SAMUEL COOPER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Faucets, of which the following is a specification.

This invention aims to provide certain improvements in faucets generally, and especially in faucets of the Fuller type, designed to reduce or eliminate concussion in closing, drumming or rattling of the valve when in use, rapid wearing of the crank, eccentric or other mechanism for moving the valve, and designed also to render very simple the making of adjustments or repairs and to adapt the faucet to forms needful in modern plumbing.

Other advantages are referred to in detail hereinafter.

The accompanying drawings illustrate an embodiment of the invention.

Figure 1 is a side elevation. Fig. 2 is a central vertical section. Figs. 3, 4, 5 and 6 are plans of rings used in packing. Fig. 7 is a section of the valve and connected parts. Fig. 8 is a central section illustrating a different style of packing. Fig. 9 is a central section illustrating another style of packing.

Referring to the embodiment of the invention illustrated, the valve A is moved toward and from its seat B by means of a crank pin C connected thereto through a link D, the crank pin C being carried on a transverse shaft E, the outer end of which is shown at E' in Fig. 1, and which is rotated by means of an operating handle F on the outside. On turning the handle F to one position, the valve is lifted from its seat, and on turning the handle to the opposite position the valve is pressed against its seat, as in the operation of the ordinary Fuller faucet.

The faucet differs from the ordinary type, however, in having the valve close against the pressure. The water, for example, moves in the direction of the arrow in Fig. 2, and the valve moves downward against it. By this arrangement a sudden closing of the valve at the end of its movement and a resulting severe concussion, such as occurs with valves closing with the pressure sometimes when they are new and always when they have become slightly worn by use, is avoided. The rate of movement of the eccentric is a minimum at the instant of complete closing, and the water pressure resists the closing movement and tends to prevent the concussion referred to. If there is a slight lost motion in the mechanism for moving the valve, the sudden increase of water pressure at the closing instant tends to take up this lost motion and to relieve the suddenness of closing; whereas when the valve closes with the pressure the sudden pressure arising at the instant of closing hastens the movement of the valve and causes a more or less severe concussion. The valve is also held rigidly in all its positions by the eccentric mechanism, and by a suit-

able guide, so that in the open position there can be no drumming or rattling of the valve. For this purpose the valve is guided to and from its seat by a special guide provided for the purpose, and is packed in said guide. Such a rigid movement has been avoided heretofore, the valve being loose so as to enable it to adjust itself perfectly to its seat. I provide a valve, however, which is hollow and expandible, having an opening toward the water, whereby the latter may enter and expand it, thus providing relief for the pressure at the instant of closing, and at the same time pressing the valve accurately against all parts of its seat so as to insure a tight closure. The hollow space within the valve provides also an air chamber into which the water may flow against an elastic back pressure of air, which further serves to diminish concussion; and this feature of making the valve hollow may be used in unyielding valves for this purpose.

A specific construction is shown in section in Fig. 7. The valve A is of rubber or other yielding composition, with a conical outer face fitting a correspondingly shaped seat, and a hollow space G in the center opening downward toward the water pressure. This valve is fastened, as by a screw H, in the lower end of a plunger J, which moves in a cylindrical guide K. A ring of packing material L is provided in a circumferential groove of the plunger J, which holds the plunger rigidly in all positions and prevents rattling or drumming. At the same time the packing L preferably extends beyond the periphery of the metal plunger J so as to prevent any contact between the metal plunger and its metal guide. The packing is also preferably made substantially water-tight, so that there is no access of water or grit to the operating mechanism above the plunger J, and these parts are accordingly saved considerable wear by being cut off from the chamber M through which the water flows.

The elimination of drumming and concussion relieves the entire plumbing system of a building of its greatest strain, and the improvements provided in these respects are of the greatest value.

An important feature of the invention is the arrangement by which the valve and its operating means are together adjustable toward the seat to take up wear. In the old style faucet, when the valve or mechanism wears, and it is desired to readjust the valve, it is necessary to turn off the water, usually in the cellar of the building or outside, break a joint in the part of the faucet ordinarily subjected to water pressure, and adjust the ball or valve on its stem. This adjustment is effected by guess, after which the parts are replaced and the water again turned on. If the faucet still leaks the process has to be repeated. By adjusting the valve and operating mechanism together according to this invention, there is no need of breaking any joint in the pressure part of the faucet. Preferably there are two parts of the casing, one carrying the valve seat.

and the other carrying the valve, said parts being bodily adjustable toward each other.

In the example shown, the tube K is extended upward and is integral with the upper chamber N carrying the eccentric-operating mechanism and from which the shaft E E' projects laterally, and this upper portion of the casing, which I designate as a whole by the letter O, is adjustable in the lower part P which carries the valve seat. Preferably the upper member O has a screw-threaded connection, as Q, with the lower part. For example, screw-threads of 1/32 of an inch pitch may be used, so that one complete rotation of the upper member O relatively to the lower member P will bring the valve 1/32 of an inch toward or away from its seat; thus providing for a very fine adjustment while maintaining the operating member at the same side of the spout R. This same construction serves to permit an angular adjustment of the operating handle relatively to the spout, so that the handle may be located at the right or left or in front or back as desired. With previous faucets of the Fuller type it has been necessary to construct two patterns, one right-hand and the other left-hand. My improved faucet is universal in this respect. By merely swiveling the part carrying the handle relatively to the part carrying the spout, this particular advantage may be obtained without the necessity for screw-threading one part relatively to the other, and such a construction is within my invention.

It is preferable to provide special means for clamping the two parts together in the desired position of adjustment. For this purpose I may provide an outside nut which serves at the same time to pack the joint between the parts O and P of the casing. For example, the nut S may be provided, rotating freely on the vertical neck of the upper member O of the casing, and screwing down upon the neck of the lower member P; and having within it clamping and preferably also packing rings. Such rings are shown in detail in Figs. 3, 4, 5 and 6. The ring T may be of brass or other hard metal split at one or more points and having a conical outer face engaged by a conical inner face of the nut S, so that as the latter is screwed down the ring T is squeezed together about the neck of the member O and clamps it firmly. The rings U and V are of lead or other soft packing material, split at one or more points, and tapered on their outer faces so as to be squeezed together to make a good water-tight joint. Between the soft ring U and the hard split ring T there is preferably interposed a continuous ring W of brass or other hard metal which serves to prevent the forcing of lead up into the split of the ring T and so interfering with its clamping movement. The upper edge of the neck of the casing member P, and the lower face of the complete ring W are hollowed out to fit the conical faces of the lead rings U and V.

Although the packing arrangement just described has evident advantages in this particular faucet, yet it is possible to employ therewith various other types of packing, such, for example, as that shown in Fig. 8, in which the nut S forces a gland X down against rings Y of any suitable packing material.

The faucet is adapted to be applied to a slab or similar support Z. The base of the casing rests directly on the slab, and the member a carrying the valve seat B

passes up through the slab and through the base of the casing. The valve seat member is provided with a squared portion b for screwing it in place. The faucet is held in place by means of a nut c screwing upon the outside of the seat member.

The construction is specially adapted to the "low down" form shown, and also to the numerous known forms of double or mixing faucets. For example instead of the lavatory arrangements shown, the faucet may be very conveniently arranged for the usual or any suitable piping for kitchen sinks, laundry tubs, bath tubs, and other apparatus. Because of the possibility of the universal adjustment, the parts may be arranged so as to present the minimum projection into the fixture.

Instead of the double packing shown in Figs. 2 to 6, the outer packing may consist merely of a single complete lead ring d having conical upper and lower faces engaged by corresponding faces on the inside of the nut S and the upper edge of the portion P of the casing. I have found by tests that this simple construction packs the casing and holds it rigidly in position.

Though I have described with great particularity certain specific embodiments of the invention, yet it is not to be understood therefrom that the invention is limited to the specific embodiments disclosed.

Various modifications thereof in detail and in the arrangement and combination of the parts may be made by those skilled in the art without departure from the invention.

What I claim is:—

1. A water faucet having an expansible hollow stop valve with an opening toward the pressure, and means for moving said valve toward its seat to close it against the pressure, whereby the water may enter and expand it and relieve the pressure at the instant of closing and insure a tight closure.
2. A water faucet having an expansible hollow stop valve with an opening toward the pressure, and means for moving said valve toward its seat to close it against the pressure, whereby the water may enter and expand it and relieve the pressure at the instant of closing and insure a tight closure, a plunger carrying said valve, and a cylinder in which said plunger moves, the plunger being packed in said cylinder to hold it rigidly in all positions and thus prevent rattling or drumming.
3. A water faucet having a stop valve A of expansible material, with a central hollow space G open toward the pressure, and means for moving said valve toward its seat to close it against the pressure, a plunger J carrying said valve, a cylinder K in which said plunger moves, and a packing L between said plunger and cylinder to hold the plunger rigidly in all positions and thus prevent rattling or drumming.
4. A faucet having a valve, and operating means connected thereto, said valve and operating means being adjustable together toward the valve seat to take up wear, and a packing independent of the adjusting means.
5. A faucet having a valve, a seat, means for moving the valve toward and from the seat to open and close the faucet, and a casing in two parts, one part carrying the valve and the other the seat, said parts being adjustable toward each other, and a packing operating independently of the positions of said parts.
6. A faucet having a valve, a seat, an eccentric for moving the valve toward and from its seat to open and close the valve, a casing in two parts, O and P, the former carrying the valve and the latter carrying the valve seat, one of said parts screwing into the other so as to permit adjustment of the valve toward or from the seat, and a packing operating independently of the relative positions of said parts.

7. A faucet having a casing in two parts, O and P, a valve, an eccentric mechanism for operating the same, and an operating handle therefor carried by said part O, and a valve seat and spout carried by the part P, one of said parts screwing into the other by means of a thread of fine pitch, whereby angular adjustment of the operating handle relatively to the spout may be effected, and also adjustment of the valve relatively to its seat without separating said parts of the casing, and clamping means operable from the outside for maintaining the adjustment.

8. A faucet having a casing in two parts, one part carrying the valve and the other the seat, one of said parts having an extension entering the other and forming a guide for the valve, said parts being adjustable toward each other, and a packing for the joint between said parts of the casing and lying outside of said extension.

9. A faucet having a casing in two parts, O and P, one part carrying the valve and the other the seat, said parts being adjustable toward each other, a nut S engaging the part P, a split tapered ring T within the nut S and adapted to be compressed to engage the part O by the screwing

of the nut upon the part P, soft packing between the ring T and the end of the part P, and a complete ring W between the soft packing and the ring T.

10. A faucet having a casing adapted to rest upon a slab or similar support, a valve seat member *a* having a squared portion *b* and passing up through the slab and the base of the casing, and a nut *c* screwing on the member *a* and holding the faucet in place.

11. A faucet having a casing in two parts, O and P, one part carrying the valve and the other the seat, said parts being threaded one upon the other so as to be adjustable toward each other, a nut S engaging the part P, and a ring of packing material within the nut and adapted to be compressed between the nut and the upper edge of the part P.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

WILLIAM SAMUEL COOPER.

Witnesses:

J. W. RITTER,  
WM. MILLS.