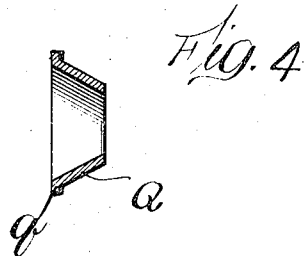
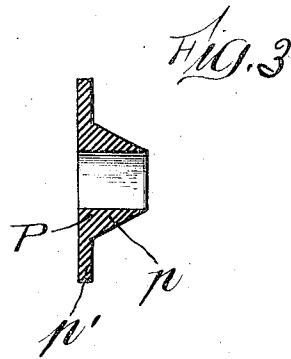
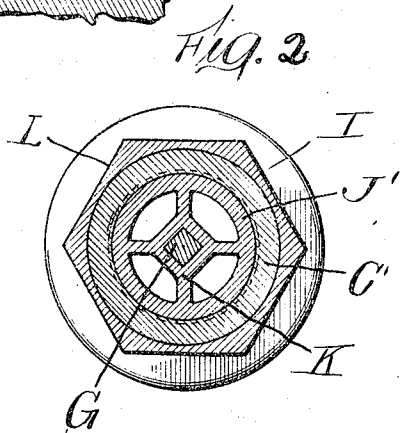
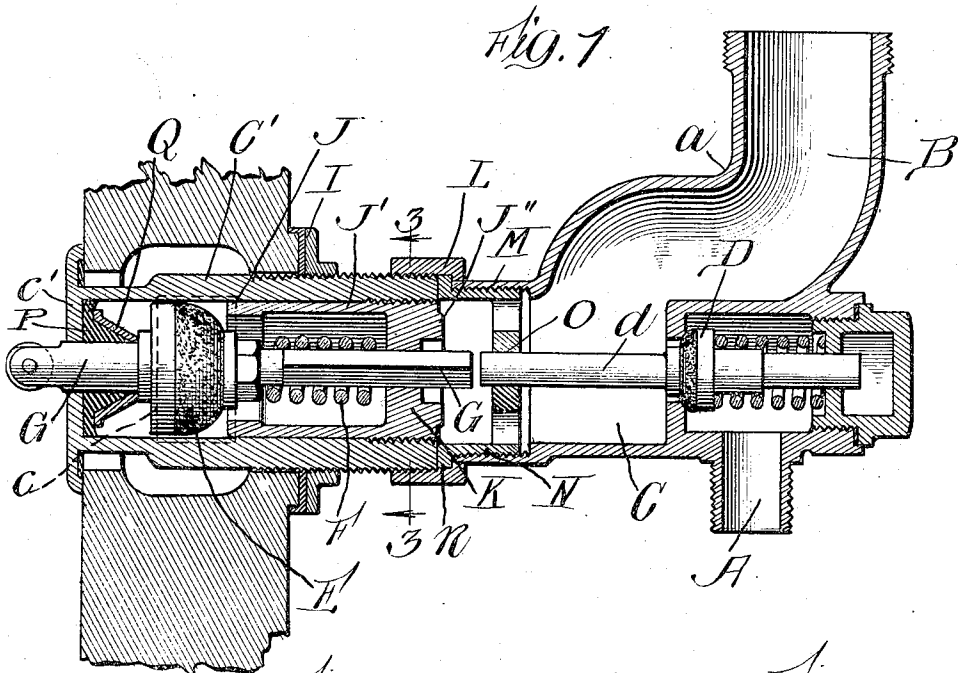


P. J. MADDEN.
VALVE DEVICE FOR PLUMBING FIXTURES.
APPLICATION FILED JAN. 15, 1907.

931,939.

Patented Aug. 24, 1909.



Witnesses:
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UNITED STATES PATENT OFFICE.

PATRICK J. MADDEN, OF CHICAGO, ILLINOIS.

VALVE DEVICE FOR PLUMBING-FIXTURES.

931,939.

Specification of Letters Patent. Patented Aug. 24, 1909.

Application filed January 15, 1907. Serial No. 352,419.

To all whom it may concern:

Be it known that I, PATRICK J. MADDEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Valve Devices for Plumbing-Fixtures, of which the following is a specification.

The present invention relates more particularly to a packing for valve stems of valve devices and I therefore do not claim in this application the construction of the valve device which is shown, described and claimed in my pending application, filed May 28, 1906, Serial No. 319,102.

The object of the invention is to provide an improved packing, and to this end the invention consists in the features of novelty that are hereinafter described with reference to the accompanying drawing which is made a part of this specification and in which:

Figure 1 is an enlarged vertical longitudinal section of the valve-device. Fig. 2 is a vertical transverse section thereof on the line 3-3, Fig. 2. Figs. 3 and 4 are axial sections of the elastic packing ring and its protecting shield.

In its general construction, arrangement and mode of operation the valve-device of the present application does not differ from the valve-device of my aforesaid patent.

The valve-device shown in the drawings has a fitting *a* provided with three branches, one (A) leading from a source of water supply, one (B) leading to a flushing tank, and one (C) leading to the bowl or hopper through a valve-casing *C'*. Communication between the branches A and B is controlled by a spring seated valve *D* seating with the water pressure and communication between the branch C and the bowl is controlled by a valve *E* which seats against the water pressure, in opposition to the force of an unseating spring *F* when pressure is applied to its stem *G* by a seat connection *H*. The casing *C'*, which contains the valve *E*, passes through an opening through the back of the bowl on other fixture and is provided with openings *c* (one of which is indicated by dotted lines) which open into the hollow rim of the bowl. On the inside of the bowl the casing *C'* has a flange *c'* which prevents its backward displacement and its rear end, at the back of the bowl, is threaded on its exterior for the receiving of a nut *I* which is adapted to bear against the back of the

bowl and draw the casing backward, whereby the back wall of the bowl is clamped between the nut *I* and flange *c'* and the casing *C'* firmly held in place. The seat *J* for the valve *E* is formed on the end of a tube *J'* threaded on its exterior and screwed into the casing *C'* so as to be adjustably carried thereby, and the tube carries also a spider *K* which guides the valve stem *G* and against which the spring *F* reacts in one direction. It reacts in the other direction against the valve itself, or a shoulder on the valve stem, and holds the valve normally unseated. The seat for the valve *E* and the spider for the valve stem *G* being both carried by the casing *C'* makes the mechanism of said valve a self-contained device that may be handled freely without dislodging any of its parts, and permits the casing *C'* and fitting *a* to be separated without releasing the tension of the spring *F*. A further and very important advantage is that it greatly facilitates adjusting the valve relatively to the valve seat. This may be done before the fitting is coupled to the valve casing by the application of a suitable tool to the rear end of the tube *J'*, to facilitate which the tube is provided with lugs *J''*. With the construction shown in my former patent, the casing and fitting may have to be repeatedly coupled and uncoupled before the proper adjustment is reached. This is because the valve is carried by the casing and its seat by the fitting.

The casing and fitting are secured together by a union coupling *L* which is preferably swiveled to the fitting and has threaded engagement with the casing. The fitting has a neck *M* which is surrounded by the reduced portion of the coupling and a tube or sleeve *N* is screwed into the branch *C*, the sleeve being provided at its outer end with a radial flange *n* providing a shoulder which engages the shoulder on the interior of the coupling. This sleeve carries a spider *O* which guides the stem *d* of the valve *D*. It will be understood, of course, that the extremities of the stems *d* and *G* are in contact, or practically so, so that in operation they engage each other with practically no lost motion.

The stem *G* of the outlet valve *E* passes through an opening in the casing *C'* and extends into the bowl in position to be engaged by the seat connection *H*, so that when the seat is depressed the stems *G* and *d* will be forced

rearward thus seating the valve E and unseating the valve D, and when the seat is released the reverse action will take place, under the influence of the springs. The joint between the stems G and the walls of the opening through the front end wall of the casing through which it passes is made tight by an elastic packing P, located within the casing, which has a portion p in the form of a frustum and a portion p' in the form of a radial flange at the base of the frustum the frustum being provided with an opening through which the valve-stem G passes. The frustum tapers to a feather edge so that the pressure of the water surrounding it tends to press it tightly against the valve stem and prevent leakage past it. It is found that such a packing is easily injured unless it is protected and this is particularly true if it is used in the position shown in the drawing because of the repeated blows to which it would be subjected by the valve E. To prevent its being injured, a shield in the form of a complementary hollow metallic frustum Q is interposed between it and the valve E the base flange q of the metallic frustum resting upon the base flange of the elastic frustum. The elastic packing serves also to cushion the stroke of the valve and lessen the noise incident to the operation of the valve. Furthermore the shield completely covers and conceals the elastic frustum, the opening through the shield being just sufficient to receive the valve stem so that when the valve is bearing against the hollow frustum, the pressure of the latter upon the elastic frustum serves to compress it and thereby more firmly force it against the stem G.

The radial flange of the elastic packing fits the valve casing tightly so that it cannot slide therein as the valve stem moves back and forth and the elastic packing fits the

valve-stem tightly so that the valve-stem cannot slide relatively to the packing. As a result of these two tight fits, as the valve stem moves inward the central portion of the elastic packing will move inward with the valve stem and the face of the elastic packing will bulge, assuming a concave. The inward movement of the valve stem is so slight as to permit this action of the elastic packing. The result of it is that there is no sliding friction between either the valve stem or the casing and the elastic packing, and in addition to this it makes an absolutely watertight joint between the casing and the packing.

The mounting of the adjustable valve-seat-tube directly upon that part of the casing which carries the valve and the mounting of the spider, for guiding the valve-stem, upon the valve-seat-tube are not claimed in this application, being part of the subject matter of my co-pending application filed May 28th, 1906, Serial No. 319,102.

What I claim as new is:

In a valve-device, the combination of a valve-casing, a valve within the casing, a stem extending through the end of the casing and carrying the valve and an elastic packing located within the casing and surrounding the stem, with a tight fit, between the end of the casing and the valve, said packing having a portion in the form of a frustum and a portion in the form of a flange radiating from the base of the frustum and, at its periphery, engaging the casing with a tight fit, whereby sliding friction between the valve-stem and packing and between the valve casing and packing is prevented.

PATRICK J. MADDEN.

Witnesses:

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