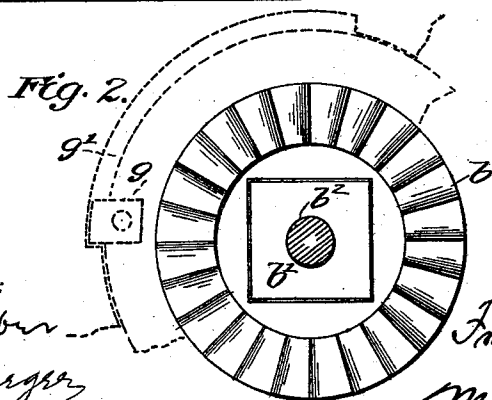
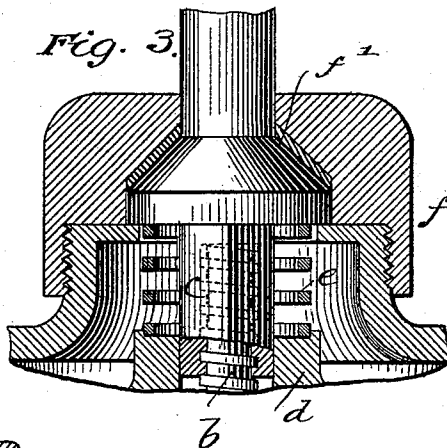
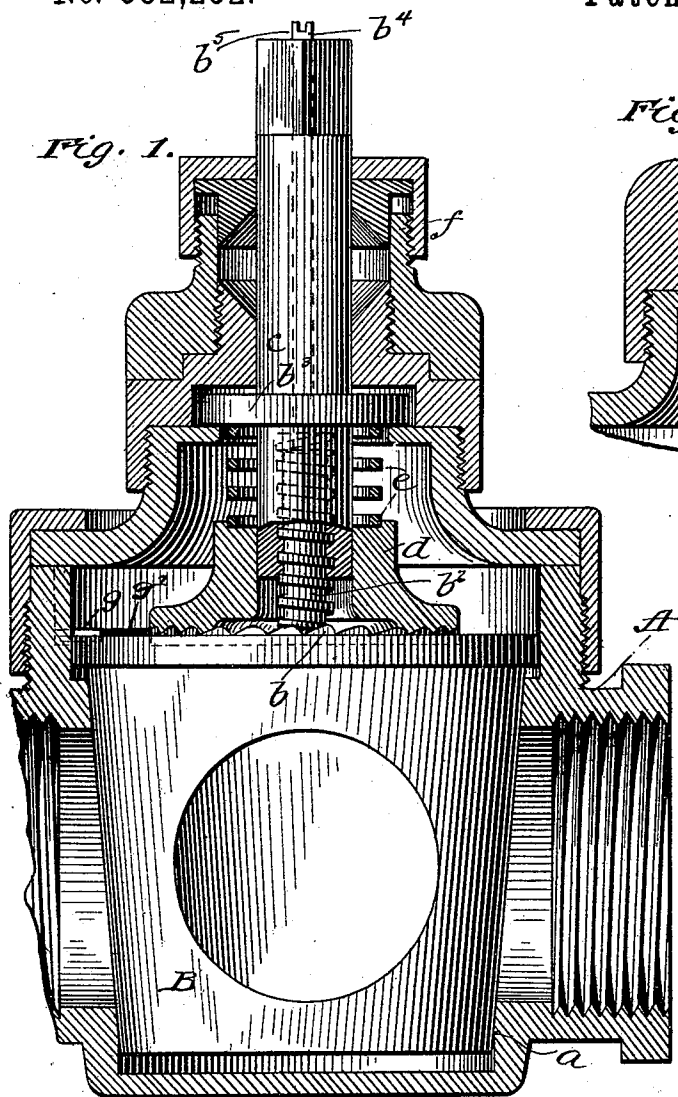


(No Model.)

F. M. ASHLEY.
VALVE.

No. 582,252.

Patented May 11, 1897.



WITNESSES:

Frank E. Ober
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UNITED STATES PATENT OFFICE.

FRANK M. ASHLEY, OF HAWTHORNE, NEW JERSEY.

VALVE.

SPECIFICATION forming part of Letters Patent No. 582,252, dated May 11, 1897.

Application filed August 24, 1895. Serial No. 560,399. (No model.)

To all whom it may concern:

Be it known that I, FRANK M. ASHLEY, a citizen of the United States, residing at Hawthorne, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Valves, of which the following is a full, clear, and exact description.

This invention relates to valves, and has special reference to what are known as "plug-valves," in which a conical plug provided with a passage through it is rotated in a conical chamber or seat for the purpose of controlling the fluid-passage.

The invention has for its object simple mechanical means whereby the valve may be slightly lifted from or forced against its seat by the same instrumentalities which are used to rotate the valve in its seat. A plug-valve when forced into its seat becomes stuck and requires considerable effort to rotate it. In fact, it often cannot be rotated until it is moved longitudinally off its seat. It is necessary that the valve should be tight in the seat normally, and to prevent leakage when the plug is removed from its seat for the purpose of rotating it it is desirable that the movement should be as little as possible.

My invention comprehends automatically-operating devices which, when the valve has been sufficiently lifted from its seat to enable it to be turned, acts to prevent further lifting of the valve and thereafter causes it to rotate. The operator is required to manipulate only one handle in accomplishing this.

The invention will be described in detail with reference to the accompanying drawings, in which—

Figure 1 is a section of the valve and valve-casing. Fig. 2 is a plan of the top of the plug, and Fig. 3 is a partial sectional view showing a modified form of stuffing-box.

Referring to the drawings by letter, A represents the valve-casing, forming a part of the fluid-passage, and *a* the usual conical valve-chamber therein.

B represents the plug-valve. The top of the plug is provided with an annular concentric ratchet *b*, fitted thereto by being dropped loosely over a square projecting table *b'* at the center of the plug, the ratchet having a corresponding square hole, allowing it to pass

over the said table. The teeth of this ratchet are curved, the curve at one end being steeper than at the other. Projecting from the center of the table *b'* is a threaded shaft *b²*, which passes up into a threaded chamber or passage in the lower end of the valve-stem *c*. This lower end of the valve-stem is squared or prismatic externally and passes loosely into a sliding collar *d*. The lower face of this collar is provided with ratchet-teeth corresponding to those on the ring *b* and the collar and ring rest constantly in contact with each other, they being so held by a spring *e*, surrounding the valve-stem and resting at one end upon the top of the collar and at the other end against a fixed collar *b³*. When the valve is rotated, the collar *d* rotates with it, but at the same time is free to slide vertically upon it. Surrounding the valve-stem is any suitable construction of stuffing-box *f*, that shown in Fig. 1 being the ordinary gland for packing, while that shown in Fig. 3 dispenses with the gland and uses a metallic packing-ring *f'*.

The screw *b²* is rigidly fixed in the top of the plug and has attached to it a rod *b⁴*, which extends through an axial passage in the stem and projects through the upper end thereof. The projecting end is provided with a notch *b⁵* or arrow-head, which always stands in line with the opening for fluid through the plug, and therefore indicates the position of said opening. The head of the plug is provided with a lug *g*, that projects into a slot or groove *g'*, formed in the valve-casing. The length of this groove or slot determines the travel of the valve.

The operation of this valve is as follows, assuming the valve to be in its normal position—that is, stuck tightly in its seat—and it is desired to alter the position of the valve: By placing a wrench upon the end of the valve-stem or using a handle provided for that purpose the stem is rotated, thus causing the collar *d* to rotate also. The opposition to this, however, is considerable, owing to the fact of the spring *e* pressing the ratchet-faces of the collar and ring together. Considerable force must therefore be applied to the valve-stem to rotate it, and when the opposition is overcome the collar slides over the teeth of the ring. This rotary movement of

the stem causes the plug to lift from its seat by reason of the threaded connection between the stem and the screw *b*². The upward movement of the plug compresses spring *e* 5 more and more and increases the grip of the ratchets. As soon as this grip overcomes the friction between the valve and its seat the valve or plug rotates bodily with the valve-stem to the full extent of its travel as limited 10 by the lug *g*. To reverse the valve, the stem is turned in the opposite direction. The plug at first travels with the stem until it is stopped by the lug *g*, and a continued movement of 15 the stem causes the collar *d* to drag over the ratchet, and thus force the plug tightly into its seat by means of the screw *b*². In making this reverse movement the ratchets have more difficulty in slipping, because the teeth are steeper. This insures a full travel of the 20 valve before it becomes stuck in its seat.

The operator is able at all times to tell the position of the valve by observing the indicator *b*⁵, which rotates in unison with the plug. It will be observed that unless the 25 plug is positively stopped at the end of its reverse movement by some device similar to the lug *g* it cannot be forced down into its

seat, for it is only when it ceases to rotate with respect to the stem that it moves longitudinally. 30

I claim—

1. In a plug-valve, the combination with the plug and its stem, of a friction-clutch between them, and means whereby when the stem is rotated, the plug is moved toward or 35 away from its seat, and the friction of said clutch is simultaneously and correspondingly varied, substantially as described.

2. In a valve, a plug and stem screw-threaded together and a friction-clutch also connecting them and tending to prevent differential 40 rotation, substantially as described.

3. In a valve, a plug and stem screw-threaded together, a friction-clutch also connecting them tending to prevent differential rotation, 45 and a limiting-stop for the rotary movement of the plug, substantially as described.

In testimony whereof I subscribe my signature in presence of two witnesses.

FRANK M. ASHLEY.

Witnesses:

FRANK S. OBER,
JOHN KRAEGER.