No. 663,515. Patented Dec. 11, 1900.

J. POWELL.

GATE VALVE.

(Application filed July 16, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

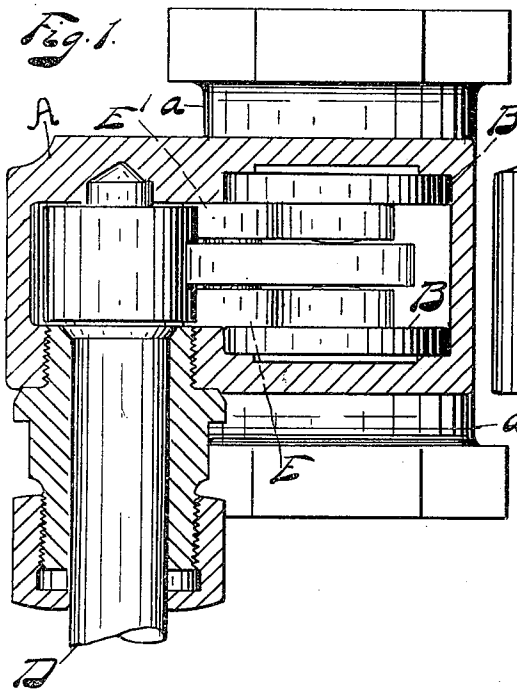


Fig. 7.

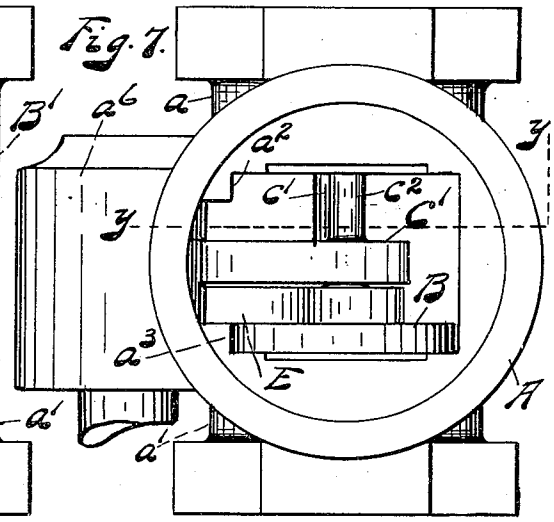


Fig. 3.

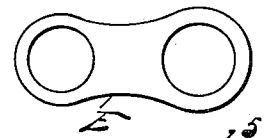


Fig. 2.

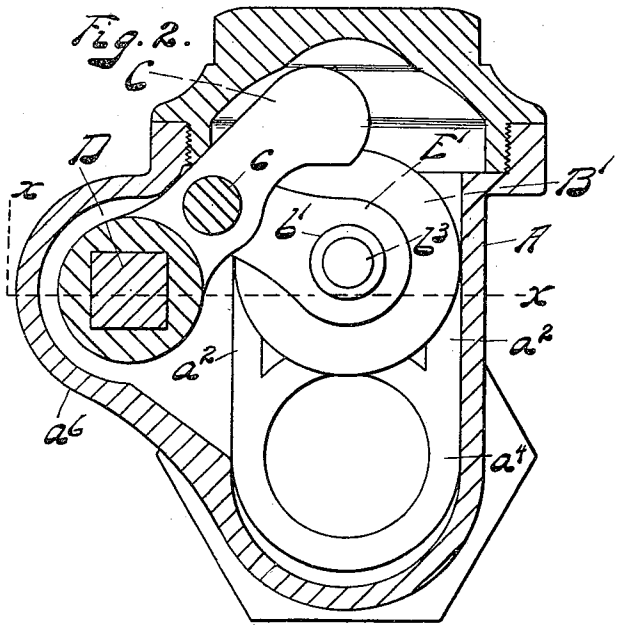


Fig. 6.

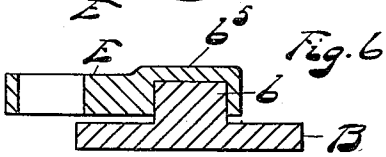


Fig. 4.

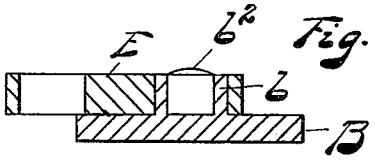
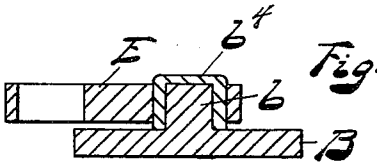


Fig. 5.



Witnesses.
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No. 663,515. Patented Dec. 11, 1900.

J. POWELL.

GATE VALVE

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(No Model.) 2 Sheets—Sheet 2.

Fig. 8.

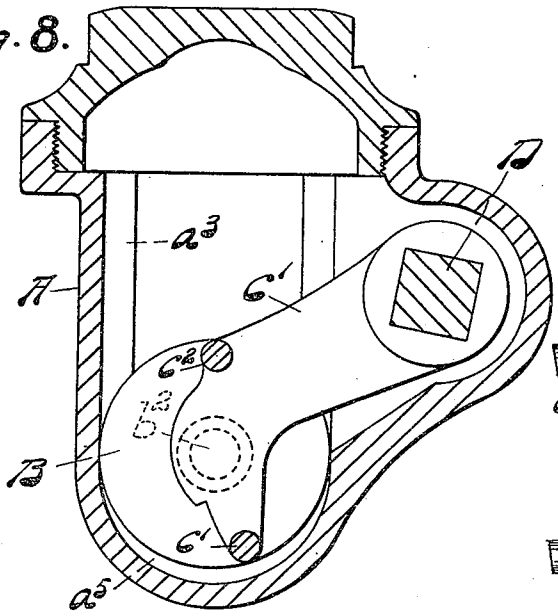
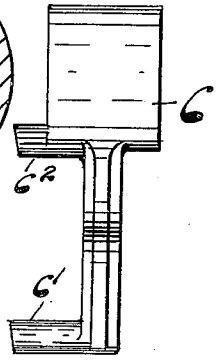


Fig. 9.



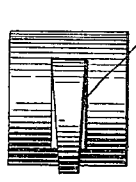


Fig. 10.

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UNITED STATES PATENT OFFICE.

JAMES POWELL, OF CINCINNATI, OHIO.

GATE-VALVE.

SPECIFICATION forming part of Letters Patent No. 663,515, dated December 11, 1900.

Application filed July 16, 1900. Serial No. 23,761. (No model.)

To all whom it may concern:

Be it known that I, JAMES POWELL, a citizen of the United States of America, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Gate-Valves, of which the following is a specification.

The object of my invention is a gate-valve in which is a valve-disk which may be thrown to and from its seat with the expenditure of little force, in which these operations are accomplished with a minimum amount of friction, and also in which compensation for the wearing of the parts may be made readily, so that the valve may always be brought snugly to its seat. This object is accomplished by the means described in the annexed specification and illustrated in the accompanying drawings, in which—

Figure 1 is a horizontal sectional view taken upon line $x\ x$ of Fig. 2, showing a valve embodying my invention, but in its closed position, the rock-shaft and lever being shown in plan. Fig. 2 is a central longitudinal vertical section view of the same, showing the valve in its open position. Fig. 3 is a detail plan view of one of the links for coupling the vibrating lever and the disk valves. Figs. 4, 5, and 6 are detail central sectional views of modifications of the disks and link connection. Fig. 7 is a plan view of a modified form of valve, the cap being removed from the casing to expose the interior thereof. Fig. 8 is a longitudinal vertical sectional view of the same, taken upon line $y\ y$ of Fig. 7. Fig. 9 is a detail rear elevation of the lever in Figs. 7 and 8. Fig. 10 is a detail end elevation of the vibrating lever shown in Figs. 1 and 2.

Referring to the parts, upon opposite sides of case A are external annular extensions a and a' in alinement with each other to receive the intercepted ends of a conduit, thereby forming through the case a straight channel, crossing which are ways a^2 and a^3, formed in the inner walls of the case to guide valve-disks B B′ to and from their seats a^4 and a^5, formed in the walls of the case and encircling said channel. The valve-disks are actuated by a vibrating lever C, which is secured upon a rock-shaft D, which is journaled in an extension a^6 of the case. Valve-disks B B′ are coupled to the lever, one upon each side, by links E E′, which have eyes at each of their ends, at one end to pass loosely over a pin c, which passes through or may be an integral part of lever C at a distance from its end about equal to the length of the links. At the other end said links pass loosely over studs $b\ b'$, which project inwardly from the valve-disks. These studs have cylindrical recesses in their ends, in which wearing-pins $b^2\ b^3$, preferably made of hard metal, are seated, so as to project beyond the ends of the studs.

Near its outer end lever C is wedge-shaped upon the under side. In the raised position of the lever, Fig. 2, the valve-disks depend from it above the channel. When the said lever descends, it carries the disks down in their ways loosely in advance of its end until they reach the lowest point of their ways and stand at rest opposite their seats $a^4\ a^5$. The further descent of the lever then causes the wedge upon its end to bear against wearing-pins b^2 and b^3 and force the valve-disks firmly against their seats.

Instead of the wearing-pins $b^2\ b^3$, seated within a recess in stud $b\ b'$, caps b^4, seated upon the studs, may be used, over which the eyes of the links pass, as shown in Fig. 5, or the link may have a cap b^5, covering the inner end of the eye and formed integral therewith, as shown in Fig. 6. When the parts become worn from use, so that the wedge no longer carries the valve-disks snugly to their seats, small disks of metal may be placed within the recesses within the studs $b\ b'$ below pins $b^2\ b^3$, or in the forms shown in Figs. 5 and 6 these small disks may be placed at the ends of the studs $b\ b'$ within the caps to compensate for the wear. It is thus seen in closing the valve that as the wedging action does not commence until the valve-disks stand at rest opposite their seats there is no sliding friction between the disks and their ways and seats, and in opening the valve that as the wedge is withdrawn from its contact with the disk valves before they are moved the parts do not stick, and that it therefore requires little force to seat and release the valves, and that when the parts become worn compensation is made readily for the wear.

In the modification shown in Figs. 7, 8, and 9 one of the valve-disks, preferably the one

upon the side of the case at which fluid enters it, and its link are omited and projections c' c^2, wedge-shaped at their inner ends, as shown in Fig. 9, are formed upon that side of the lever C', so that as it approaches the lower limit of its travel these projections bear against the walls of the case and force the wedge of the lever against wearing-pin b^2 and carry valve-disk B firmly to its seat.

What I claim is—

1. In a gate-valve the combination of a case having a channel therethrough for the passage of a fluid, a valve-seat encircling the channel, a valve-disk in the case, and a vibrating lever to carry the valve-disk into the channel to stand at rest opposite its seat and terminating in a wedge at its end to impinge against the valve-disk after it has so come to rest to carry it firmly against its seat, substantially as shown and described.

2. In a gate-valve the combination of the case having a channel therethrough for the passage of a fluid, a valve-seat encircling the channel, a valve-disk having an inwardly-projecting recessed stud, a wearing-pin seated within the recess and projecting beyond the end of the stud, a vibrating lever terminating in a wedge, and a link at one end pivoted to the lever and at the other end perforated to pass over the stud whereby the lever carries the valve-disk into the channel to stand at rest opposite its seat and then with its wedge impinges against the wearing-pin to carry the disk firmly to its seat, substantially as shown and described.

3. In a gate-valve the combination of a case having a channel therethrough, a pair of valve-seats in the walls of the case encircling the channel, valve-disks within the case, a vibrating lever between them terminating in a wedge and a link upon each side of the lever coupling the disks thereto so that the lever carries the disks to rest opposite their seats in advance of its end and then impinges against them to force them firmly against their seats, substantially as shown and described.

4. In a gate-valve the combination of a case having a channel therethrough, a pair of valve-seats in the case encircling the channel, a pair of valve-disks in the case each having an inwardly-projecting recessed stud, a wearing-pin seated within each recess and projecting beyond the end of the stud, a vibrating lever between the disks, and a link pivoted upon each side of the lever, and having a perforated end to pass over the studs, whereby the disks are carried to rest opposite their seats and then are forced to their seats by the wedge-shaped end of the lever impinging against the pins, substantially as shown and described.

JAMES POWELL.

Witnesses:
W. F. MURRAY,
EMMA LYFORD.