

W. G. BLACK.
PUMP VALVE.
APPLICATION FILED SEPT. 5, 1907.

936,233.

Patented Oct. 5, 1909.

Fig. 1.

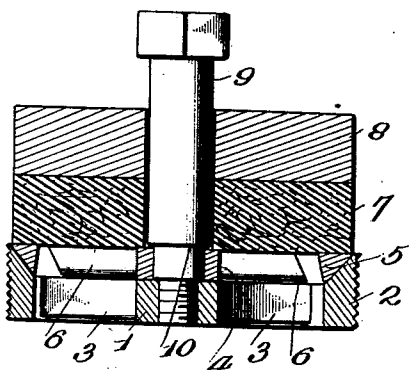


Fig. 2.

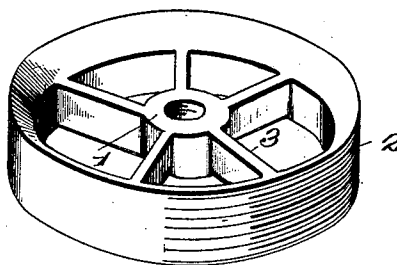


Fig. 3.

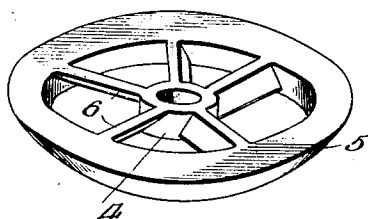
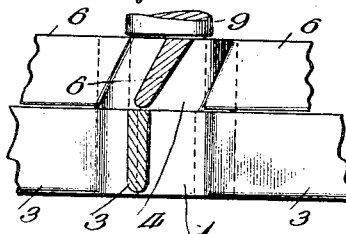


Fig. 4.



Inventor

Wm. G. Black

Witnesses

W. A. Williams.

W. F. Hodson.

By

J. A. Barry, Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM G. BLACK, OF NEW PHILADELPHIA, OHIO, ASSIGNOR OF TWO-THIRDS TO
HOWE H. FISHER, OF CLEVELAND, OHIO.

PUMP-VALVE.

936,233.

Specification of Letters Patent.

Patented Oct. 5, 1909.

Application filed September 5, 1907. Serial No. 391,515.

To all whom it may concern:

Be it known that I, WILLIAM G. BLACK, citizen of the United States, residing at New Philadelphia, in the county of Tuscarawas and State of Ohio, have invented certain new and useful Improvements in Pump-Valves, of which the following is a specification.

This invention is designed to prolong the period of usefulness of pump valves, of the puppet or reciprocating type, and to secure a uniform wearing of the surfaces between the valve and its seat to insure a firm seating of the valve and thereby prevent a waste or leak which materially detracts from the efficiency and effectiveness of pumps and is otherwise objectionable.

The invention consists of a rotary member intermediate of the valve and its seat and adapted to be intermittently actuated at each stroke of the pump causing the fluid to pass through the valve.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details for construction and the means for effecting the result, reference is to be had to the following description and accompanying drawings.

While the invention may be adapted to different forms and conditions by changes in the structure and minor details without departing from the spirit or essential features thereof, still the preferred embodiment is shown in the accompanying drawings, in which:

Figure 1 is a vertical central section of the valve embodying the invention. Fig. 2 is a perspective view of the valve seat. Fig. 3 is a perspective view of the rotary member. Fig. 4 is a detail section.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The valve seat comprises a hub 1, rim 2, and connecting webs or arms 3, the latter being arranged at a right angle to the plane of the seat so as not to obstruct the free passage of fluid therethrough. The rim 2 is extended and beveled upon its inner side to cooperate with the outer beveled edge of the rotary member. The rotary member consists of a hub 4, rim 5, and webs or arms 6. The webs or arms 6 are inclined in the same direction with reference to the plane

of the rotary member so as to receive the impact of the fluid passing through the valve and thereby produce rotation of said member, whereby it constantly changes its position with reference to the valve seat and valve to insure a uniform wearing of the engaging surfaces, which is essential to the attainment of the objects in view. It is to be understood that the connecting webs or arms 3 and 6 are of such construction as to minimize resistance to the passage of the fluid through the valve and yet at the same time insure a stable and durable construction, particularly when the valve is designed for use in connection with heavy or large pumps employed in water works. The valve 7 consists of a disk of rubber and is mounted upon the rotary member and is prevented from rotation and reciprocates simply. The valve may be seated by any usual means such as a weight or spring, a weight 8 being illustrated and placed upon the valve. The several parts, that is, the seat, rotary member, valve, and the valve closing means are held in place by means of a bolt 9, or like device, said bolt being threaded into the hub of the valve seat and having the rotary member, valve, and valve closing means loose thereon, the valve being adapted to reciprocate whereas the rotary member is confined between the valve seat and a shoulder 10 formed at the base of the reduced portion of the bolt.

The chief intent of the rotary member is to effect a truing of the valve and valve seat to insure a firm and square seating thereof to prevent any possible leak which materially detracts from the efficiency of any pump. At each throb or impulse of the pump causing it to draw fluid through the valve the latter is unseated and the rotary member turns thereby changing its position with reference to the valve and valve seat and causing new surfaces to come into contact at the next seating of the valve, with the result that the parts wear evenly and uniformly and prevent the cutting away of the valve in places and the consequent leak and waste of energy as commonly experienced in the use of reciprocating valves employed in pumps of large capacity. It is observed that the fluid has a direct passage through the openings of the valve seat as well as through the rotary member the slight resistance offered by the inclination

of the webs or arms 6 being of no consequence as compared with the resultant advantages and in practice not to be reckoned with because the movability of the rotary member enables these webs or arms 6 to be pushed aside by the fluid, the latter having direct action upon the valve parallel with the axis thereof to insure positive unseating of the valve. The rotary member is automatic in its action and self-truing, both with respect to the valve and the valve seat, hence the valve may be used until quite or nearly worn through.

The valve seat, rotary member, and valve may be constructed of any material and of any size or form depending upon the particular use of the valve and according as said valve is to be used in connection with liquid or fluid of any nature. The character of valve closing means will depend upon the relative position of the valve according as the same is to close upward or downward. In the former the weight must be replaced by a spring, both being common and recognized equivalents.

Having thus described the invention, what is claimed as new is:

1. In a valve of the character specified, the combination of a valve seat, a valve movable toward and from the seat, a member interposed between the valve and its seat for truing same and adapted to have an intermittent rotary movement imparted thereto at each movement of the said valve, means for holding said member upon the seat, and other means for normally seating the valve upon the rotary truing member.

2. In a valve of the character specified the combination of a valve seat, a cooperating reciprocating valve, a rotary member interposed between the valve and the valve seat and adapted to be automatically turned by the fluid in its passage through the valve,

and means for holding the rotary member upon the said valve seat.

3. In combination a valve seat having direct openings therethrough, a reciprocating valve, a rotary member interposed between the valve seat and valve and having openings therethrough and provided with webs or arms inclined to the plane of the seat to receive the impact of the fluid passing there-through the valve whereby said member is automatically turned to effect a uniform wear of the valve and the valve seat, and means for holding the rotary member upon the said valve seat.

4. In combination a valve seat comprising hub, rim, and connecting webs or arms, the latter being set at a right angle to the plane of said valve seat, a reciprocating valve, and an automatically actuated rotary member located between the valve and valve seat and comprising a hub, rim, and webs or arms, the latter being inclined to the plane of the rotary member to receive the impact of the fluid in its passage through the valve.

5. In combination a valve seat having direct openings therethrough and provided with a projecting rim beveled upon its inner side, a reciprocating valve, and an automatically actuated rotary member interposed between the valve seat and valve and having webs or arms inclined to the plane of the rotary member to receive the impact of the fluid in its passage through the valve, the rim of the rotary member being beveled to correspond to the beveled rim of the valve seat.

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

WILLIAM G. BLACK. [L. S.]

Witnesses:

W. N. WOODSON,
V. B. HILLYARD.