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VALVE.

APPLICATION FILED MAY 25, 1917.

1,278,713. Patented Sept. 10, 1918.

Fig. 1.

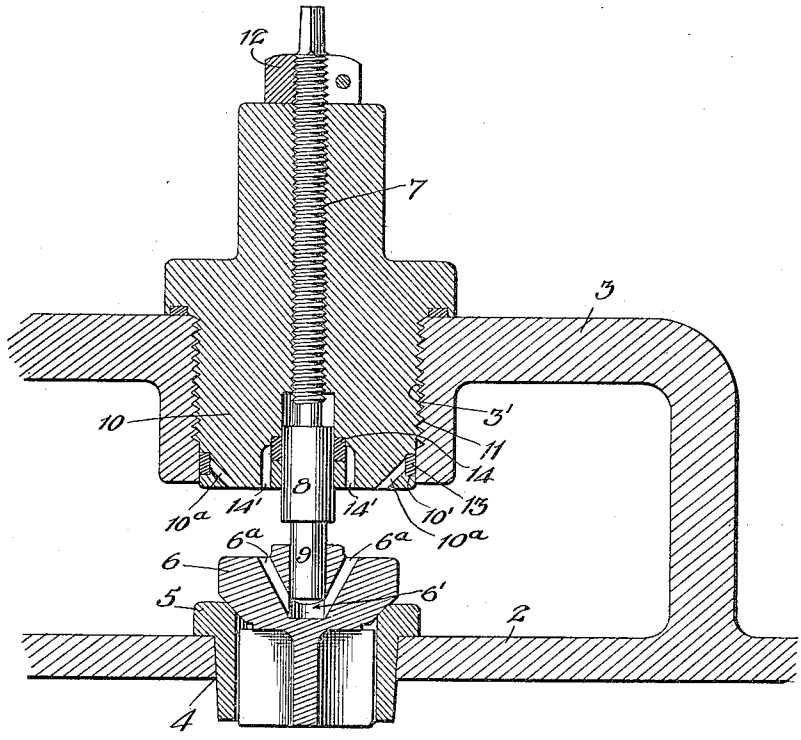
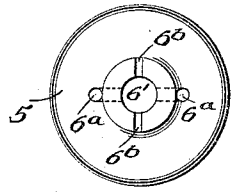


Fig. 2.



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VALVE.

1,278,713. Specification of Letters Patent. Patented Sept. 10, 1918.

Application filed May 25, 1917. Serial No. 170,945.

To all whom it may concern:

Be it known that we, HENRY H. MOORE, MICHAEL J. PUSHCAR, and WILLIAM BROWN, citizens of the United States, residing at Dover, in the county of Morris and State of New Jersey, have invented certain new and useful Improvements in Valves; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to valves, and more particularly to pump valves.

It is one of the objects of the present invention to provide in a valve means for guiding and limiting the lift of the valve disk from its seat, and also to provide a valve device for use in pumps having spaced walls upon one of which is adapted to be arranged a valve seat and upon the other of which is adapted to be arranged a plug which when removed from the wall will permit the removal of the valve seat from the lower wall.

Another object of the present invention is to provide for the ready and simple adjustment of means for controlling the lift of the valve disk from its seat; also to provide for the efficient packing of the plug and the means for controlling the lift to eliminate leakage.

With these and other objects in view as will be rendered manifest in the following specification, the invention consists of a detachable plug carrying an adjustable stop adapted to be arranged in suitable position with relation to the movable disk of the valve so that the movement of the disk is controlled in alinement with its seat.

There is illustrated in the accompanying drawing one embodiment of the invention, in which drawing:

Figure 1 is a central longitudinal section through the device, and

Fig. 2 is a plan view of the valve disk.

The present valve device is particularly designed for use in pumps in which there is usually provided a valve chest having a seat wall indicated for instance at 2, and above this is an outer wall of a pump chest as shown at 3. The wall 2 is herein illustrated as being provided with an aperture 4 upon which there may be applied a suitably shaped and sized and removable seat ring 5 preferably of such diameter as to be freely insertible in the aperture 4 of the seat wall 2 by insertion through and removal from an aperture 3′ in the adjacent valve chest wall 3. The passageway or aperture of the valve seat 5 is adapted to be closed in operation by a suitable form of valve disk indicated at 6 and which may have downwardly extending lugs or flanges slidably fitting the aperture of the valve seat 6.

The present invention relates particularly to means for controlling, guiding and adjustably varying the lift of the valve disk 6 from its seat during the operation of the pump, and to accomplish this guide and control the invention contemplates the provision of a suitable stop which is adjustably mounted, for instance, in the adjacent valve chest wall 3 so that one end of the stop may be suitably arranged with relation to the valve disk 6 so as to limit the lift of this disk from its seat. In the embodiment of the invention herein illustrated the stop is shown as comprising a rod having a threaded shank portion 7 and a cylindrical and slightly enlarged portion 8, and may have its lower end portion 9 below the body 8 turned down if desired, though this is not essential. The threaded portion of the shank 7 of the rod is adjustably engaged with complementary threads of a removable plug 10 having exterior threads 11 to engage the threaded aperture 3′ of the valve chest wall 3. The plug 10 is of suitable length, and its threads, which receive the threaded shank 7, extend to its upper end and permit the shank to project thereabove so that access may be had to the end of the shank and the latter adjusted longitudinally in the plug 10 so as to determine and vary the relative position of the inner end 9 of the stop with relation to the valve disk 6.

After the stop rod has been adjusted in its desired position with relation to the valve disk 6 it may be locked in such position by any suitable means, such for instance as a lock nut 12, which is applied to the upwardly projecting threaded portion of the stop rod.

One of the features of the present invention resides in providing means to reduce or eliminate the tendency of the fluid under pressure in the pump from leaking past the threaded joint between the plug 10 and its wall 3, and also to eliminate leakage past

the threaded portion of the adjustable rod stem 7, and to accomplish this the lower end of the plug 10 is shown as circumferentially grooved as at 10′ to receive a packing 13 of suitable nature which may be arranged in the groove 10′ and is adapted to bear against the cylindrical adjacent portion of the aperture 3′. To increase the packing efficiency of the packing ring 13 preferably means are provided to utilize the pressure in the valve chest to force the packing ring 13 outwardly in snug frictional engagement with the adjacent cylindrical surface of the aperture 3′, and for this purpose the lower end of the plug 10 is shown as provided with apertures 10^a which lead into the bottom of the groove 10′ so that fluid under pressure may be applied to the inner surface of the packing ring 13 and the latter pressed outwardly against the adjacent surface of the wall. In a similar manner packing is secured between the plug 10 and the central and cylindrical body portion 8 of the stop rod by the provision of an internal packing ring 14 arranged in a groove therefor in the bore of the plug 10. If desired pressure of the fluid in the pump may be conducted into the groove in which the ring 14 is placed so that the pressure may act on the packing ring 14 to force it into snug bearing on the cylindrical body 8 of the stop rod, apertures 14′ being provided for this purpose and opening through the lower end of the plug 10.

For the purpose of preventing the wabbling and to secure a true movement of the valve disk 6 to and from its seat 5 preferably the valve disk is provided with a central cylindrical or other suitable chamber 6′ of suitable depth into which the lower and reduced end 9 of the stop is adapted to be inserted, and along which the valve 6 slides to and fro as it lifts and seats during the operation of the pump, and for the purpose of preventing any back pressure around the lower end 9 of the stop device suitable vents are provided to permit the outflow of fluid from the bottom of the chamber 6′ as the valve moves upwardly, such vents being indicated as inclined apertures 6^a leading from the bottom of the chamber 6′ upwardly and outwardly to the top of the valve 6. To further aid in the relief of back pressure of fluid beneath the stop end 9 the top of the valve disk 6 may also be provided with channels or recesses 6^b to permit the outflow of liquid from past the stop end.

From the foregoing it will be seen that we have provided a simple means for controlling the lift and movement of the valve disk, and an advantage of which is that by limiting the upward movement of the valve disk 6 from its seat unnecessary movement of the disk is eliminated, and also the pounding of the valve disk upon its seat is avoided, and by providing for the true guiding and alinement of the valve as to its seat the wear of the valve disk and its seat is maintained uniform and even due to the causing of the valve to move in true position toward and from its seat during its vibration.

What is claimed as new is:

1. In a pump valve, a movable disk, an adjustable stop, engageable with the disk to limit its movement and having a threaded shank, and an enlarged cylindrical intermediate body, and a plug in which the stop is threaded and from which it is accessible at the outer end, said plug attachable to a pump wall adjacent the disk, and provided with an enlarged bore below the threads to receive the stop body and having packing to eliminate leak thereabout and around the stop-body.

2. In a pump valve, a movable disk, an adjustable stop engageable with the disk to limit its movement, and having a threaded shank, and a large cylindrical body, and a plug in which the stop is threaded and from which it is accessible at the outer end, said plug attachable to a pump wall adjacent the seat, and provided with an enlarged bore below the threads to receive the stop body, said disk having an axial, vented bore in the body thereof in which the stop end is slidable.

In testimony whereof we affix our signatures.

HENRY H. MOORE.
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WILLIAM BROWN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."