(No Model.)

H. F. FRISBIE.

VALVE FOR PUMPS.

No. 491,543. Patented Feb. 14, 1893.

Fig. 1.

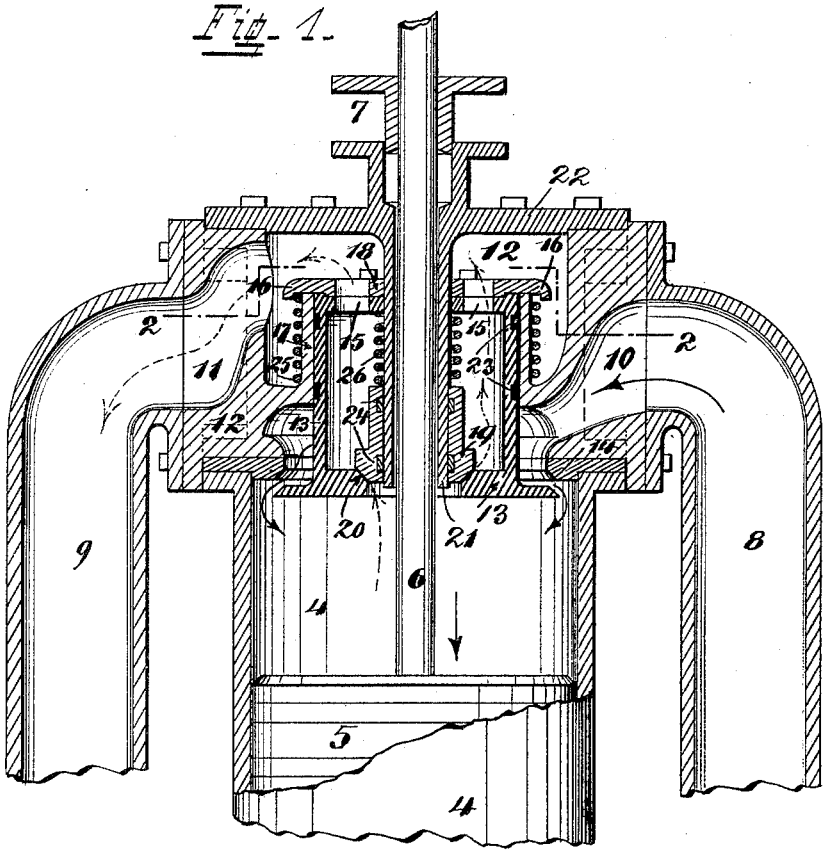
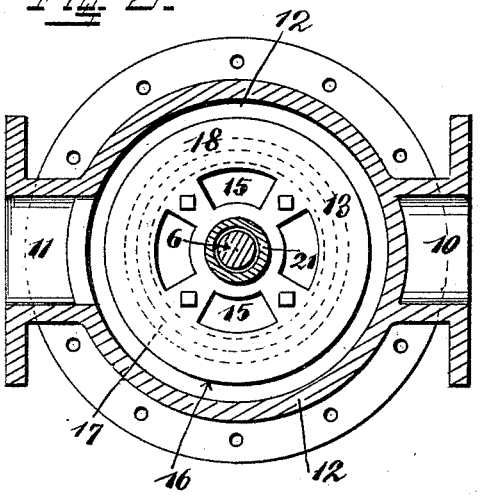


Fig. 2.



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VALVE FOR PUMPS.

SPECIFICATION forming part of Letters Patent No. 491,543, dated February 14, 1893.

Application filed March 10, 1892. Serial No. 424,371. (No model.)

To all whom it may concern:

Be it known that I, HAMLIN F. FRISBIE, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Valves for Pumps; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to valves for pumps in general and irrespective of the particular use to which they are put, or in other words my improved valve may be used in connection with pumps for operating liquids, air, gases, or vapors.

The essential features of my improved valve consists of certain details of construction which will be more fully described in the following specification and pointed out in the claims concluding it, as well as illustrated in the accompanying drawings in which:

Figure 1, is a vertical, central section of one end of a pump, showing my improved valve in position. Fig. 2, is a horizontal section on line 2—2 of Fig. 1.

4, is the pump-cylinder, 5, the piston, 6, the piston rod, and 7 the stuffing-box in the end of the pump-cylinder.

8, is the feed or ingress-pipe, and 9, the egress or discharge-pipe, connecting to the ingress and egress-openings 10 and 11, respectively of the valve-chamber 12.

13, is the feed-valve, preferably of cylindrical shape and seated against the lower edge 14, of the valve-chamber. It is open at its upper end at 15, and has a flange 16, which, when the valve opens, rests against the upper edge of guide-way 17, which forms a part of the valve chamber and guides this valve and also limits the extent of its opening or lift. To permit the valve 13, to be put in position during the manufacture of the pump, flange 16 must be separable and therefore forms part of a head 18, which is open and which openings register with openings 15 in the valve. It is bolted to the latter and to the solid parts between the openings of the same. The egress or discharge valve 19, rests on the interior valve-seat 20, connected to valve 13, and is guided by a boss 21, which extends down from the head 22. When the piston moves as shown by arrow in Fig. 1. valve 13 opens, being impelled to do so in addition to the suction caused by the piston which moves away from it, or by the pressure of the substance entering the lower part of the valve-chamber from pipe 8, by the back-pressure of the compressed substance above this valve and in the upper part of the valve-chamber which bears against the interior and top of valve 13 and acts instantly and unfailingly. This same pressure also causes valve 19, to keep its seat and follow valve 13, so that any escape of the pumped substance back into the cylinder, after once forced out of the same, is prevented. On its return-stroke, piston 5, compresses the substance which has entered the pump cylinder through the open valve 13, and through opening 10, and causes said substance, by its reaction against valve 13, to close the latter, whereby any escape out of opening 10, and pipe 8, of the substance which fills the cylinder is prevented. In its progress on such return-stroke, the piston next overcomes the back-pressure laying against valve 19, and moving onward, lifts this valve off from its seat on valve 13, and by the pressure of the substance now passing through the space between the two valves, holds valve 19, open until all the matter in the pump-cylinder has passed out, respectively until the piston has completed its return-stroke. Meanwhile, in case of a double acting pump and in which case the other end of the pump-cylinder is similarly constructed, the part of the latter below the piston has been filled through the open valve 13, and will be emptied when the piston moves down again. In such case boss 21 at this end must be closed, as there is no piston passing through it, which would serve to close the same.

To prevent leakage between the valves and their guide-ways, it is advisable to provide customary packing rings 23, and 24. Springs 25, and 26, are provided to aid the valves in finding more quickly their seats, their use however is only precautionary, as the back-

pressure of the compressed substance is principally relied upon for the accomplishment of this purpose.

For the purpose of ready and convenient renewal and repairs, valve-seat 14, of valve 13, is contained in a separate piece and independently removable from the valve-chamber casting.

Having described my invention, I claim as new:

1. In a valve-construction for pumps, a valve-chamber having both ingress- and egress-passages 10, and 11, and provided with a valve-way 17, a valve-seat 14, located at one end of the valve-chamber, a valve located within this valve-chamber and provided with a flange 16, which when coming in contact with the upper edge of valve-way 17, limits the drop of this valve and a second valve seated within and against the first valve and guided by an interior boss forming a part of the pump-head, all as substantially shown and described.

2. In a valve-construction for pumps, the combination of a pump-cylinder, a valve-chamber, having both ingress- and egress-openings connected to it, a removable valve-seat annulus 14, located between the two former elements and held in place by them, a valve-way 17 located in the valve-chamber, a valve provided with a projecting flange 16, occupying it and limited in its movements by the upper edge of said valve-way and annulus 14, and a second valve seated within and against the valve first mentioned, all as substantially shown and described.

3. In a valve-construction for pumps, a valve-chamber having both ingress- and egress openings 10, and 11, and valve-way 17, a valve-seat 14, at one end of the valve-chamber, a valve located within this valve-chamber and having connected to it an open head 18, part of which projects over the valve and forms a flange 16, which when coming in contact with the upper edge of valve-way 17, limits the drop of the valve, and a second valve seated within and against the first valve, all as substantially shown and described.

4. In a valve-construction for pumps, a valve-chamber having ingress and egress-openings and provided with a valve-way 17, a valve-seat 14, a valve located within this valve-chamber and provided with a flange 16, a second valve seated within and against the first valve, a spring 25, surrounding the exterior of valve-way 17, and engaging with the underside of flange 16, for the purpose of keeping the first valve normally closed and a spring 26, interposed between the two valves for keeping the second valve normally closed, all as substantially shown and described.

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

HAMLIN F. FRISBIE.

Witnesses:
SAMUEL M. QUINN,
CHAS. SPENGEL.