

UNITED STATES PATENT OFFICE.

HENRY J. OLIVER, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO JOSEPH PRACY, OF SAME PLACE.

STEAM-PUMP.

SPECIFICATION forming part of Letters Patent No. 350,763, dated October 12, 1886.

Application filed April 7, 1886. Serial No. 198,153. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. OLIVER, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Steam-Pumps, &c., of which the following is a specification.

This invention relates to improvements in valve-machines for steam-pumps of the kind ordinarily used for feeding steam-boilers and lifting and forcing water for general purposes; and it consists, essentially, in the form and arrangement of the valve of the steam-cylinder of said pump, as well as the combination of parts constituting the mechanism for operating the said valve, the object of this invention being to simplify the construction of the parts, as well as to render more effective their operation, and thus increase the capacity of the pump.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side view of the pump entire, the steam-cylinder portion being shown partly in section to illustrate the form and arrangement of the valve and steam-chest. Fig. 2 is a side view of the operating mechanism of the valve of the steam-cylinder on a larger scale than in the previous figure, these parts especially constituting a portion of my invention.

In both figures the same letters of reference are used to indicate the same parts.

A is the pumping-cylinder, with the details of which the present invention is not concerned.

B is the steam-cylinder, and C is the connecting-frame between.

D is the steam-chest of the cylinder B. It is bored out perfectly cylindrical, and is fitted with the piston-valve E.

F is the entrance-pipe for the steam, and the dotted circle at G shows the exhaust-pipe.

The ports leading in from the steam-chest to the working-cylinder are shown at each end.

The valve fits the steam-chest only at its ends for a distance a little in excess of the width of the ports, the space between being of lesser diameter to give a free exhaust passage-way.

To this valve rod H is in any suitable way firmly secured; the rod, passing out through the

usual stuffing-box, I, extends beyond to rest in and be guided in a bearing, J, provided on the pump cylinder-head.

K is a standing frame rigidly secured to the frame C, and the two side bars, *kk*, which also assist in supporting and guiding the valve-rod, holes being bored in the side bars, through which the rod passes. Between the side bars the rod assumes a yoke shape—that is to say, the rod is flattened out and has a vertical slot cut through as wide as the thickness of the vertical levers L and M. The lever L is pendent from the pin *l* in the top horizontal bar of the frame K, and the lever M is pivoted to the pin *m* on the lower bar. Both levers engage with each other, forming a knuckle-joint between, as in Fig. 2. They are also connected by the spiral spring N, which hooks on the pins *l* × *m*. There may be two of these springs, one on each side of the levers, if preferred. One at least of the levers should have a slotted hole where it hangs on its pin, to give the necessary play as they are vibrated. In the drawings this slotted hole is shown in the upper lever.

On the piston-rod O of the pump and steam-engine there are two adjustable collars, P P, which are secured in any position they may be set in by set-screws, as is usual. As the piston-rod moves back and forth, these collars strike the lower part of the lever M and move it forward or backward, as the case may be, until both levers L and M assume a vertical position—this without moving the valve-rod H. The slightest movement farther throws the levers out of the perpendicular, and then the spring N suddenly acts to throw them still farther out to the full limit of their motion, at the same time throwing the valve-rod and valve attached to the effect of reversing the motion of both engine and pump. The slot in the yoke part of the valve-rod must be made sufficiently long to permit the movement of the levers up to their perpendicular position without disturbing the rod. The levers should be arranged to act upon the rod only at the time the spiral spring enforces a sudden motion at the lower end of the lever M. A friction-roller, Q, may be supplied, against which the collars will strike at the end of each stroke.

In first adjusting the mechanism to throw the valve at the proper time the collars should be placed in such a position as to throw the valve just before the end of the stroke is reached; otherwise the valve would not be
5 thrown at all; but if it should be thrown too easily the experience of the operator will guide him as to this matter.

Having thus described my invention, what
10 I claim, and desire to secure by Letters Patent, is—

In a valve-operating mechanism, the valve-

moving gear herein described, consisting, essentially, of the standing frame K, vertical levers L and M, supported thereon, spring N, 15 slotted valve-rod H, and piston-rod O, with collars P P, arranged and operating substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

HENRY J. OLIVER. [I. S.]

Witnesses:

C. W. M. SMITH,
CHAS. E. KELLY.