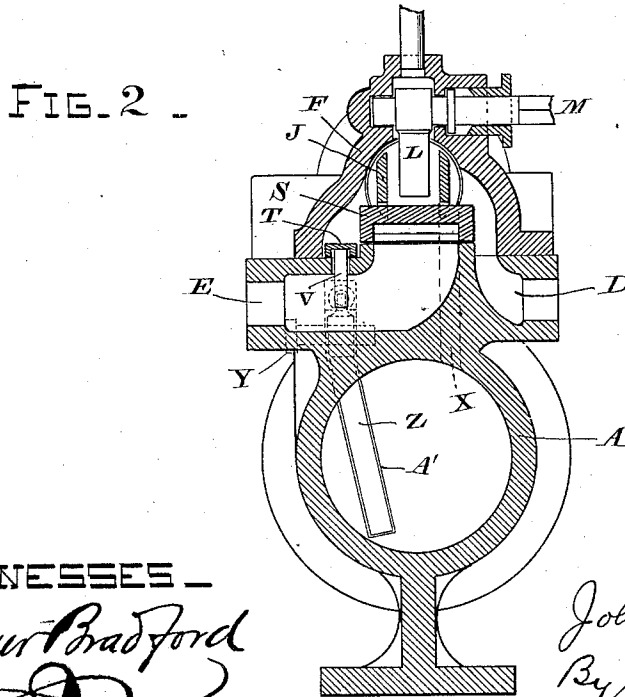
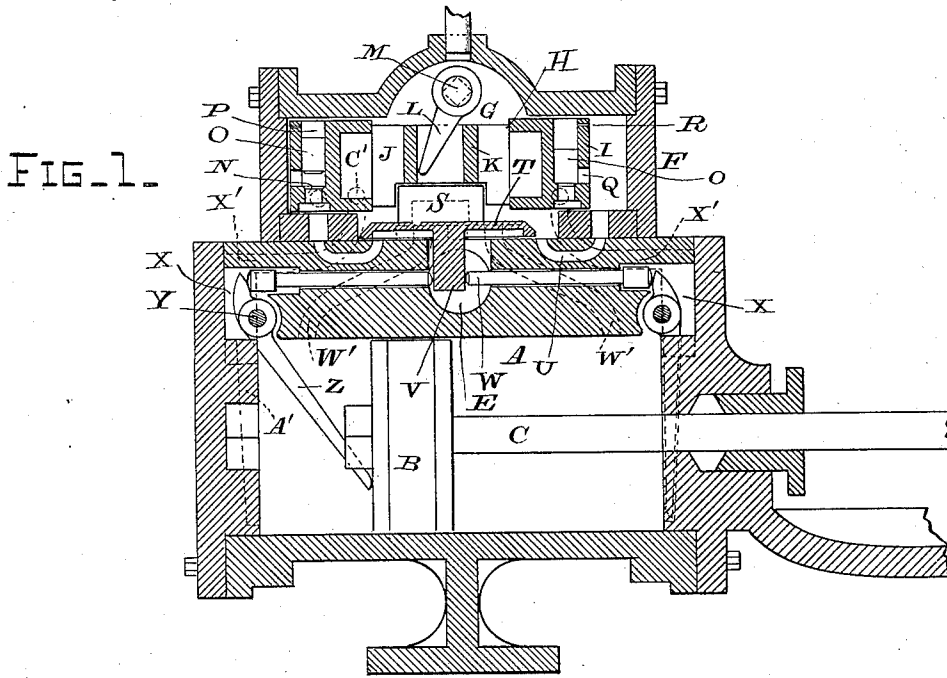


(No Model.)

J. J. REILLY.  
STEAM ACTUATED VALVE.

No. 340,819.

Patented Apr. 27, 1886.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

JOHN J. REILLY, OF SAN FRANCISCO, CALIFORNIA.

## STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 340,819, dated April 27, 1886.

Application filed October 1, 1884. Serial No. 144,472. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. REILLY, 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-Actuated Valves, of which the following is a specification.

My invention relates to improvements in steam-actuated valves; and the object of my improvements is to provide the operating-engine of a direct-acting steam-pump with an improved arrangement of the steam-passages, steam-ports, and valves controlling the same, and also the mechanism or means for operating the said valves for the purpose of insuring a more steady and uniform action of the pumping mechanism, avoiding thumping of the piston, and also securing greater economy in the use of steam. This object I accomplish by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section, through the operating-engine, of a steam-pump. Fig. 2 is a cross-section through the same.

Similar letters of reference are used to indicate like parts throughout the several figures.

In Fig. 1, A represents the cylinder of the operating-engine of a steam-pump. B is the piston, and C the piston-rod.

D is the induction and E the eduction passage for steam to and from the cylinder or engine.

F is the steam-chest, and S is the slide-valve, which is operated in a manner to be hereinafter described.

Within the steam-chest I place a plunger, H, which consists of two cylindrical heads, I I, connected together by two longitudinal strips, J J, which are cross-braced by two transverse strips, K K, and between these last-named strips or braces is contained a pawl, L, depending from a shaft, M, the squared end of which projects outward from the wall of the steam-chest to permit of the moving of the plunger by hand-power, should it become desirable to do so.

Within each head of the plunger I form a valve-seat, N, for the reception of the plug-valve O, which moves up and down within

the vertical valve-chamber P. These valve-seats N are located in the chambers P at a short distance from their lower end; hence there are constantly-open steam-spaces formed immediately beneath these seats. Near the base of this chamber, but above the valve-seat, I drill a hole, Q, through the head or outer face of the plunger, and at the top of the chamber I also drill another but smaller hole, R, which likewise extends through the face of the head of the plunger. The longitudinal strips J of the plunger are recessed out on their under edge to receive the slide-valve S, as shown in Figs. 1 and 2.

At the center of the length of the steam-cylinder, but to one side of the slide-valve, I place the auxiliary valve T, which covers the steam-ports U U, leading from the valve-seat in a somewhat diagonal line to the center of the under side of the steam-chest. The valve T is provided with a depending lug, V, which extends down through the exhaust-port covered by the valve and enters the opening formed by the eduction port or passage E, and is operated against by two headed rods, W W, adapted to form valves, one upon each side of the depending lug and extending lengthwise of the cylinder. The heads of these rods are formed upon their outer end, and enable that part of the rod to fit closely within its passage, so as to form a valve. The outer or headed ends of these rods extend to or within a steam-space, X, formed at each end of the cylinder, and within which is pivoted by a bolt, Y, the lever-arm Z, the upper end of which is formed with a short pawl or or prong engaging with the headed end of the rod W. The lower end of the lever extends down within the cylinder, and when forced back by the piston-head enters a recess cut in the cylinder-head, as shown at A' in Fig. 2, and permits the piston to make its full stroke.

Steam-passages X' (shown by dotted lines in Figs. 1 and 2) lead up from the interior of the cylinder through the top of the cylinder-head and case or shell and through the steam-chest, and through these passages communication is formed at certain intervals through apertures C', formed in each end of the side of the plunger H, with the interior of the said steam-chest and the live steam contained there-

in, and for a purpose to be hereinafter set forth.

When in operation, steam is admitted to the pump through the induction steam-passage D, and fills the steam-chest, and passes through the ports W', (shown by dotted lines in Fig. 1,) and produces reciprocation of the piston and pump-plunger. As the piston-head moves back and forth, it engages alternately with one or the other of the two levers Z Z, and these produce, through the medium of the headed rods W, a reciprocation of the auxiliary valve T, opening and closing the steam-ports U and admitting steam to either end of the steam-chest between the heads thereof and the heads of the plunger H.

In Fig. 1 the plunger is shown moved over to the left-hand side of the steam-chest, and the port or passage for live steam to the chamber at the end of the plunger is open. When the auxiliary valve has reversed, the steam will then be admitted through the opposite port U, and, passing upward, will raise the valve O and pass out through the hole Q and force the plunger over to the opposite side of the steam-chest, thereby operating the slide-valve S and opening and closing the main steam-ports W'. As soon as the opening to the valve O has passed the line of the steam-passage X' then the steam will enter directly to the space or chamber at the end of the piston, and, passing through the small hole R, will enter the valve-chamber P and close the valve-plug down upon its seat.

As the holes C' in the plunger align themselves with the steam-passages X', a small quantity of steam is momentarily admitted to the cylinder behind the piston-head sufficient to permit the piston to cushion upon, and also to force it backward far enough to permit the steam from the main port to enter the cylinder.

Another application for Letters Patent filed September 7, 1885, Serial No. 176,326, embodies an invention which was originally included in the same case with the subject-matter of the

present application. The steam-valve of the present case therefore is intended in general to be used with the pump in the application just referred to.

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

1. In a steam-pump, the combination, with the main slide-valve S, of the auxiliary slide-valve T, the rods W, provided with heads to form valves, and levers Z, contained within the steam-cylinder and operated by the piston-head B, substantially as shown, for the purpose set forth.

2. In a steam-pump, the plunger H, having contained therein straight plug-valves O O, working in valve-chambers P P, and provided with valve-seats N N, which are so located within the plunger as to have steam-spaces constantly below them, the said plunger having also steam-passages Q and R, communicating through the end of the plunger with chambers P P, in combination with steam-ports X', controlled by the plunger H, substantially as shown and described.

3. In a steam-pump, the plunger H, having steam-passages C C', communicating at intervals with the steam ports or passages X' in the main cylinder, substantially as shown and described, for the purpose set forth.

4. In a steam-pump, the combination and arrangement of the main steam-ports W', controlled by the slide-valve S, and the auxiliary steam ports or passages U, controlled by the auxiliary valve T, having a lower depending lug, V, which valve T is operated by the rods W W, provided with heads to form valves, and the levers Z Z, substantially as shown and described.

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

JOHN J. REILLY. [L. s.]

Witnesses:

WILMER BRADFORD,  
CHAS. E. KELLY.