(No Model.)

E. M. THOMAS.

STEAM ACTUATED VALVE.

No. 256,515. Patented Apr. 18, 1882.

Fig. 2.

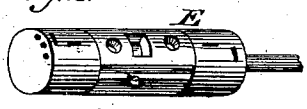


Fig. 1.

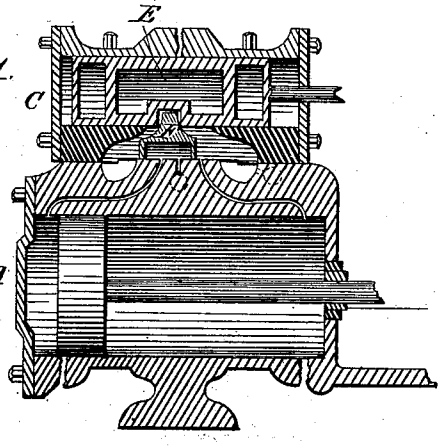


Fig. 4.

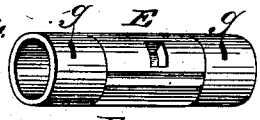
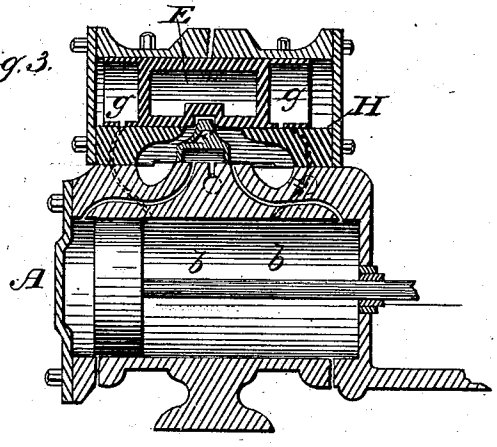


Fig. 3.



Witnesses.
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by A. H. Low his atty

UNITED STATES PATENT OFFICE.

ENOS M. THOMAS, OF DUKE CENTRE, PENNSYLVANIA, ASSIGNOR OF ONE-FIFTH TO ALVIN H. LOW, OF SAME PLACE.

STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 256,515, dated April 18, 1882.

Application filed March 3, 1881. (No model.)

To all whom it may concern:

Be it known that I, ENOS M. THOMAS, of Duke Centre, in the county of McKean, State of Pennsylvania, have invented a new and useful Improvement in Steam-Actuated Valves for Steam-Pumps and other High-Pressure Engines; and I hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and the letters of reference marked thereon.

The nature of my invention consists in providing a steam-pump or high-pressure engine with a new and improved passage for admitting steam directly from the cylinder from a point near each end of the same directly into the corresponding end of the steam-chest, whereby the plunger is caused to act upon the slide-valve; and also in providing the plunger, which works the slide-valve of the steam pump or engine, with hollow or cup-shaped ends, into which holes are made to admit the steam from the cylinder through the passages aforesaid into the ends of the steam-chest in such a manner that when the plunger passes a given point in its beat from one end to the other of the steam-chest it closes the hole and passage from the cylinder to the steam-chest and confines steam in the end of the steam-chest, so as to prevent the plunger from moving or rattling from the jar of the pump or engine until the steam of a greater pressure, acting upon the opposite end of the plunger, forces it back far enough to open the hole and passage, and allows the steam thus confined to escape and exhaust.

By means of the arrangement of the steam-passage above described I have a direct action of steam upon the plunger of my pump or engine, which dispenses with all reverse-valves and reverse-levers having either outside or inside connections, and all other holes, passages, or contrivances for guiding steam upon the plunger, for the purpose of shifting the slide-valve of a steam pump or engine, and also utilize the steam which would otherwise exhaust in steadying and regulating the motion of the plunger and holding in its proper position.

In the accompanying drawings, Figure 1 represents a longitudinal sectional view of the cylinder, piston, steam-chest, slide-valve, and plunger of an ordinary steam-pump without my improvements. Fig. 2 represents a separate and perspective view of the plunger in Fig. 1 inverted. Fig. 3 represents a longitudinal sectional view of the cylinder, piston, steam-chest, slide-valve, and plunger of an ordinary steam-pump as improved by my invention. Fig. 4 represents a separate and perspective view of the plunger in Fig. 3 inverted.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

I construct my steam-pump or high-pressure engine in any of the styles in use, except as to such parts as are supplied by my invention, as shown in the accompanying drawings.

From a point on the inside, and near each end of the cylinder A, a distance from the steam-port equal, or nearly equal, to the thickness of the piston, I make another port or passage, *b*, extending from thence into the steam-chest C at or near its end corresponding with that of the cylinder. Then, as the piston moves from one end of the cylinder to the other and passes the port *b*, live steam passes through the port or passage *b* into the steam-chest C and acts upon the plunger E, moves it to the opposite end, and shifts the slide-valve F, which thus admits steam through its other port, near the same end of the cylinder, into the cylinder ahead of the piston and drives it back to the opposite end of the cylinder, where the like action takes place, and the piston is thus caused to repeat its stroke.

In order to secure a more steady motion of the plunger E, I construct it with hollow or cup-shaped ends. Through each of the cups or hollow ends I make a hole or opening, *g*, which, by the motion of the plunger, is made to play over and across the steam-chest end of the passage *b*. Then, as the steam enters the steam-chest through the passage *b* and hole *g*, it fills the cup in the end of the plunger and drives the plunger to the other extreme of its stroke, cuts off the steam at *g*, and confines it until the plunger returns and again opens the passage and allows it to escape. By this means the plunger is always held firmly to its place and prevented from false motions or rattling by any jarring or peculiar pitch of

the pump or engine. When the hollow or cup shape of the ends of the plunger is dispensed with and the ordinary shaped plunger is used, I make the passage *b* to open into the steam-chest at any convenient point other than that shown at *g*, as at H.

What I claim as my invention, and desire to secure by Letters Patent, is—

In a single-acting steam-pump or high-pressure engine having a single piston, the direct steam-ports *b b'* of the steam-actuated valve, so arranged as to each serve alternately as an induction-port to the valve-plunger at one part of the stroke and as an eduction-port at another part of the stroke, substantially as described, and for the purposes specified.

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Witnesses:

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