

No. 38,334.

PATENTED APR. 28, 1863.

J. A. REED.
DIRECT ACTION STEAM PUMP.

Fig. 1.

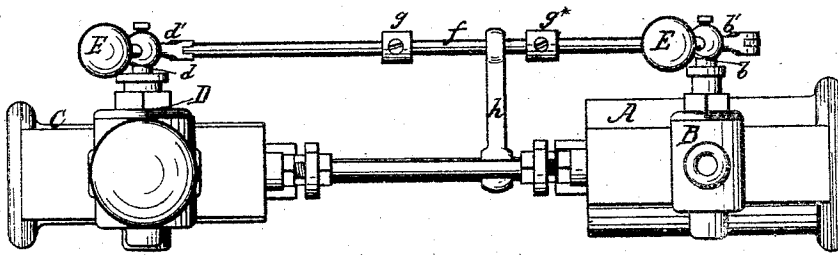


Fig. 2.

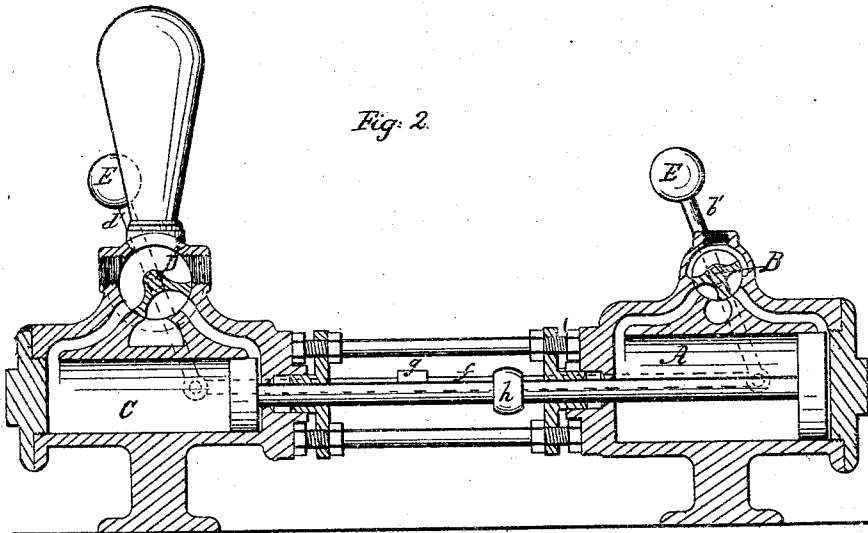
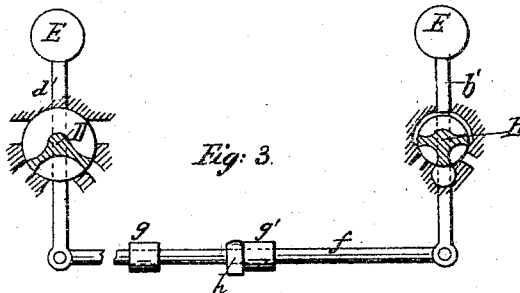


Fig. 3.



Witnesses;
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UNITED STATES PATENT OFFICE.

JOHN A. REED, OF JERSEY CITY, NEW JERSEY.

IMPROVEMENT IN DIRECT-ACTION STEAM-PUMPS.

Specification forming part of Letters Patent No. **38,334**, dated April 28, 1863; antedated January 23, 1863.

To all whom it may concern:

Be it known that I, JOHN A. REED, of Jersey City, in the county of Hudson and State of New Jersey, have invented a new and useful Improvement in Direct-Action Steam-Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top view of a steam-pump with my invention. Fig. 2 is a central longitudinal vertical section of the same. Fig. 3 represents a vertical section of the valves parallel with Fig. 2, showing them in position different from Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to the connection of the water and steam valves so that both shall operate at the same moment to change the direction of the movement of the pistons. I employ but a single valve on each cylinder, such valve being of the rolling or cock kind; and my invention consists in making the connection of the said valves by means of weighted levers and a tappet-rod actuated by a tappet-arm on the piston-rod, whereby I obtain a very simple and very effective system of valves and valve-gear for direct-action steam-pumps.

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

A is the steam-cylinder fitted with a six-way cock, B, for the induction and eduction of steam; and C is the pump-cylinder arranged in line with A and fitted with a four-way cock, D, for the induction and eduction of water. As these cocks have been previously used in engines and pumps independently of each other, it is unnecessary to enter into any particular description of them. The stems or spindles *b* and *d* of the cocks are arranged horizontally transversely to the length of the cylinders and parallel with each other. The spindle *b* of the cock B has secured to it a lever, *b'*, and the spindle *d* of the cock D has secured to it a lever, *d'*, the said levers being so arranged upon their respective spindles that both are upright when the cocks are in their central positions, (shown in Fig. 3,) and all their passages consequently closed to steam and water. The lower ends of the two levers

are connected together by means of the horizontal tappet-rod *f*, and to the upper end of each there is secured a weight, E. The tappet-rod is furnished with adjustable collars *g g**, upon which the tappet-arm *h*, attached to the piston-rod, acts. The movement of the piston in opposite directions alternately brings the tappet-arm *h* into contact with one and the other of the two collars *g g** of the rod *h*, as the piston arrives within a suitable distance of the end of the cylinder, and as the piston continues its movement the arm, pushing the collar before it, moves the rod, which is thus made to act upon the levers to bring the cocks to the central or closed position shown in Fig. 3, and the steam is thus shut off from the cylinder A by the valve B. When the pump is working fast, the momentum acquired by the weights E E in their movement with the levers will carry the levers beyond the vertical position, and the said weights then produce by gravitation a suddenly continued movement of the levers, and so bring the cocks to the position to open the ports at those ends of the cylinder toward which the pistons have been moving, to their respective induction steam and water pipes, and open the ports at the other ends of the cylinders to their respective eduction-pipes; or, if the pump is working so slowly that the momentum of the weights will not overcome the friction of the cocks, the expansion of the steam in the cylinder behind the piston will produce a slightly-continued movement of the latter, which will be sufficient to make the tappet-arm carry the levers slightly beyond the vertical position, when the weights E E will suddenly complete the movement of the levers and bring the cocks to the position to open the ports, as above mentioned. In either of the above cases the completion of the movement of the cocks by the weights E E is effected very suddenly, so that the pistons make no perceptible stop at the end of the stroke, but have their movement quickly reversed. Fig. 2 shows the pistons as having completed their movement to the right, and the cocks as having had their movement completed by the weights to permit the induction and eduction of steam and water for the movement of the pistons in the opposite direction. This system of valves and valve-gear is so positive in its action, and yet so simple in its construction, that it has a great

advantage over all other valve-gear for steam-pumps of which I have any knowledge.

I do not claim, broadly, so connecting the steam and water valves of a steam-pump that the water valve has a positive movement derived from the steam valve; neither do I claim the use of a cock-valve either in a steam-engine or pump; but

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

The combination of the two cock-valves *B* *D* on the steam and water cylinder, the levers *d d'*, weights *E E*, tappet-rod *f*, and tappet-arm *h* on the piston-rod, the whole combined and operating substantially as herein specified.

JOHN A. REED.

Witnesses:

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J. W. COOMBS.