

E. RHOADES.

COMBINED PUMP AND FIRE-ENGINE.

No. 175,502.

Patented March 28, 1876.

Fig. 1.

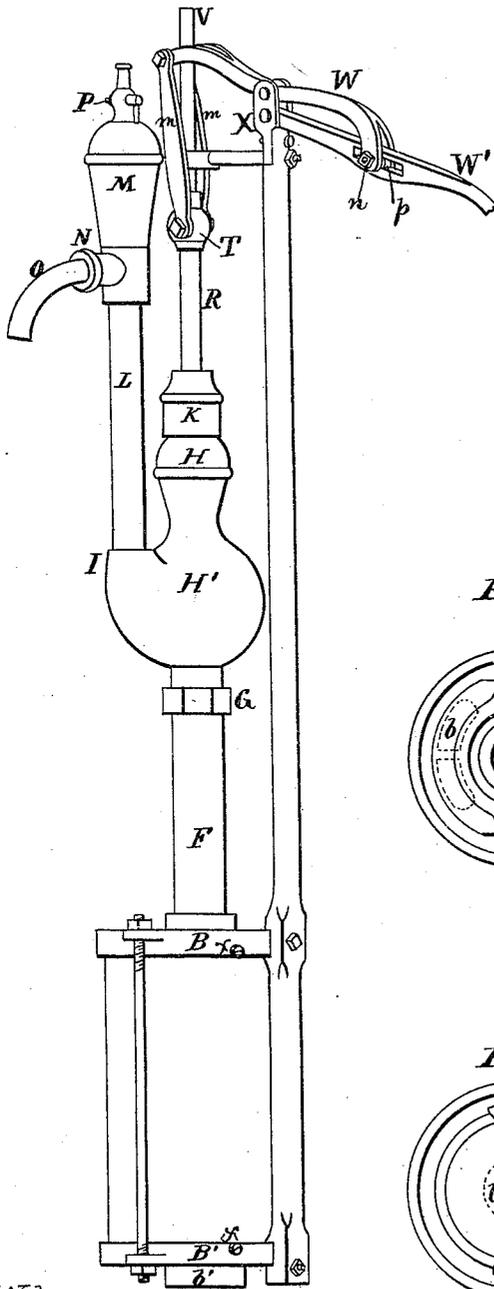


Fig. 2.

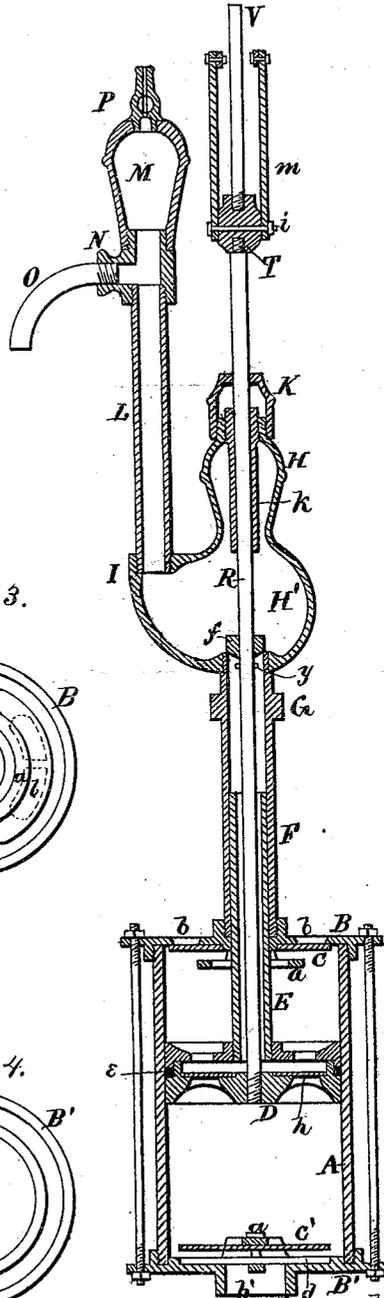


Fig. 3.

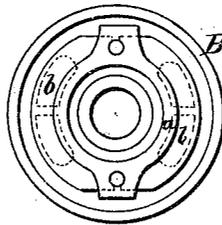
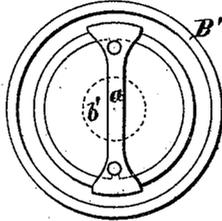


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

ELIAS RHOADES, OF CLYDE, OHIO.

IMPROVEMENT IN COMBINATION PUMPS AND FIRE-ENGINES.

Specification forming part of Letters Patent No. **175,502**, dated March 28, 1876; application filed February 3, 1876.

To all whom it may concern:

Be it known that I, ELIAS RHOADES, of Clyde, in the county of Sandusky and State of Ohio, have invented certain new and useful Improvements in Combination Pumps and Fire-Engines; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

The nature of my invention consists in the construction and arrangement of a double-acting force-pump, which is applicable to and useful for all varieties of steam-engines, fire-engines, bored and deep wells, shallow wells, and cisterns, and for any place where a pump can be used, as will be hereinafter more fully set forth.

In the annexed drawing, Figure 1 is a side elevation of my pump. Fig. 2 is a longitudinal section of the same. Figs. 3 and 4 show detached parts thereof.

A represents the cylinder, provided with the heads B B', having flanges screwed onto the ends of the cylinder, and fastened by screws *a a*. The upper head B has two openings, *b b*, and the lower head B' has only one opening, *b'*, and each opening has a cross-bar, *a*, to prevent the valves from springing or bending. On the inside of each head is a shallow recess, *d*, into which the valve falls, and remains secure from wabbling. C C' are the upper and lower valves, respectively. D is the plunger, with exterior packing-groove *e*. This plunger is made in two parts, and forms an interior box, in which the sheet-metal valve *h* is placed, said valve having a round hole in the center, and used for double action. The plunger is concaved on top and bottom from the edge nearly to the center. The upper side is almost entirely open, with four cross-bars, and in the center it has a hub, into which the ejector-pipe E is screwed, said pipe extending through the upper head into the first section of the exit-pipe F, attached to a hub on the upper head. G represents a coupling, used for extending the tube F, which connects with the combined air-chamber and reservoir H H'. I is an offset, that connects with the second section L of the exit-pipe, at the upper end of

which is another air-chamber, M. N shows the connection of the spout O to the chamber. P is a stop-cock, used for high or low pressure. The piston-rod R is screwed into a hub in the lower part of the plunger, and extends up through the plunger, ejector, and first section of exit-pipe, through a check-valve, *f*, inside of the reservoir H', and through a small tube, *k*, that is screwed into the upper end of the air-chamber H, said tube extending down to the reservoir, as shown in Fig. 2, the rod R passing through the stuffing-box K upward along the line of the exit-pipe L. The upper end of the rod R is, by a coupling, T, connected to a short piston-rod, V, a pin, *i*, passing through said coupling, to connect the lower ends of the stirrups *m m* to it, the upper ends of said stirrups being fastened to the jaws of the short lever or walking-beam W. The other end of this short lever is fastened to the long lever W' by means of a bolt, *n*, which passes through the jaws at that end of the short lever, and through an elongated slot made in the long lever, said bolt also passing through a roller, *p*, in the slot, which relieves the friction. The long lever W' is pivoted to the fulcrum at X. This arrangement of levers gives a powerful compound leverage.

When the cylinder-heads are not screwed on, rods may be used to fasten them, as shown.

To prevent my pump from freezing, a short pin, *y*, is passed through the piston-rod a short distance below the reservoir, the plunger being down, so that when the outer end of the lever is down the check-valve *f* in the reservoir is raised, and the water in the pipe immediately falls back into the well or cistern.

To make this pump very cheap, I will connect the exit-pipe with the upper head one side of the center, and the ejector-pipe a corresponding distance from the center of the plunger, and provide a suitable stuffing-box on the upper head for the piston-rod to work in, will use no air-chamber, but will form a goose-neck for a spout at the upper end of the exit.

The operation of this pump is readily seen. As the plunger ascends the valve C' opens, and the lower part of the cylinder is filled with water. As the plunger then descends, the upper part fills, and at the same time the valve

C' closes, and the water below the plunger forces the valve *h* in the plunger upward, thereby allowing said water to pass out through the ejector-pipe *E*, and so on. When the plunger thus ascends again the water above the plunger forces the valve *h* down, and this water passes out through the ejector-pipe. By removing the valve *h*, and placing a suitable valve on the plunger, it will form a single-acting pump.

For the purposes of fire-engines, two of these pumps are used, the exit-pipe sections *L* being then connected to the same, (enlarged,) air-chamber *M* having one or more nipples for the attachment of hose, and the levers being suitably arranged for operation.

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

1. A head for a pump-cylinder, formed with an interior recess, *d*, and provided with a valve-supporting bar, *a*, for the purposes herein set forth.

2. The combination of the cylinder *A*, plunger *D*, ejector-pipe *E*, piston-rod *R*, exit-pipe *F*, and the combined air-chamber and reservoir *H H'*, all as shown and described.

3. The check-valve *f*, arranged in the bottom of the reservoir *H'*, as shown and described.

4. The combination, in a pump, of the combined reservoir and air-chamber *H H'*, exit-pipe *L*, air-chamber *M*, spout *O*, and stop-cock *P*, as shown and described.

5. The combination, with the piston-rod *R* and stirrups *m m*, of the short lever *W*, the long slotted lever *W'*, bolt *n*, and roller *p*, all as and for the purposes herein set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

ELIAS RHOADES.

Witnesses:

HENRY GRABACH,
WILLIAM W. DUGAN.