

(No Model.)

H. D. B. WILLIAMS.
SUBMERGED DOUBLE ACTING FORCE PUMP.

No. 577,545.

Patented Feb. 23, 1897.

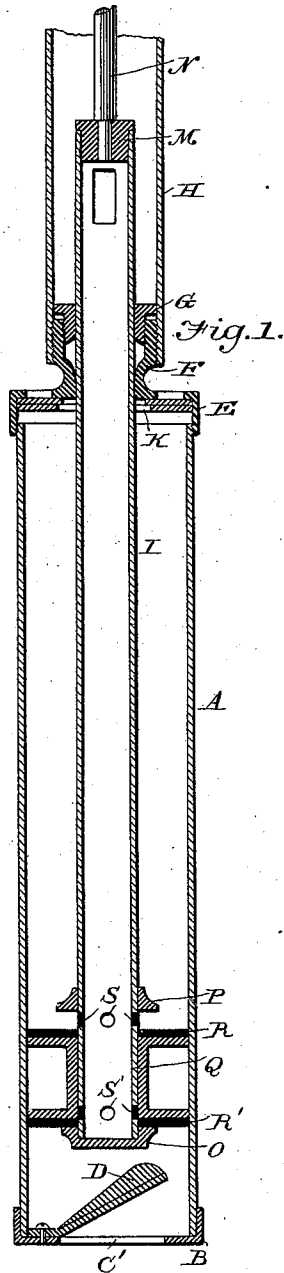
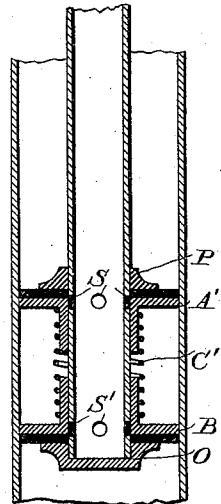


Fig. 2.



WITNESSES:

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HUBBARD D. B. WILLIAMS, OF MANSFIELD, OHIO, ASSIGNOR OF THREE-FOURTHS TO ARNOLD KALLMERTEN AND CARL GREUNINGER, OF SAME PLACE.

SUBMERGED DOUBLE-ACTING FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 577,545, dated February 23, 1897.

Application filed June 30, 1896. Serial No. 597,546. (No model.)

To all whom it may concern:

Be it known that I, HUBBARD D. B. WILLIAMS, a citizen of the United States, residing at Mansfield, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Submerged Double-Acting Force-Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to improvements in submerged double-acting force-pumps; and the objects of my invention are, first, to provide a force-pump for drilled wells and other purposes, the water at both strokes of the piston to be forced upward through a tubular piston-rod and discharged into the discharge-pipe; second, to so construct and arrange the piston that it will form a double valve and operate simultaneously with the action of the piston-rod and to allow the discharge of the water from the cylinder at each stroke of the piston; third, to so arrange the piston upon the tubular piston-rod that it will have a sliding movement upon the piston-rod by the pressure of the water in the cylinder in the opposite direction to which the piston-rod is moving to open the discharge-port; fourth, to make a cheap, durable, and efficient means for the purpose stated.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my improved submerged double-acting force-pump, showing all the parts composing the same. Fig. 2 is a sectional view of portion of cylinder and improved piston and portion of tubular piston-rod constructed somewhat differently from the piston shown in Fig. 1, but to accomplish the same result.

Similar letters of reference indicate like parts throughout both views.

In the accompanying drawings, A indicates the pump band or cylinder.

B is a cap forming the bottom of the cylinder. The said cap is screwed upon the end of the cylinder and is provided with the inlet-

port C and tongue-valve D. The upper end of the cylinder is provided with the cap E, tubular sleeve F, and stuffing-box G. The sleeve F is threaded upon the outside and inside. The discharge-pipe H is screwed upon the outside and the stuffing-box upon the inside. The cap E is provided with a number of holes I, passing through the top into the interior of the cylinder to admit the water into the upper portion of the cylinder. A leather valve J is placed upon the inside of the cap, the full size of the interior of the same. A hole K is made sufficiently large to allow the passage of the water into the upper portion of the cylinder around the tubular piston-rod L. The upper end of the cylinder only screws a short distance within the cap, the end of the cylinder forming a ledge upon which rests the valve J when water is passing into the cylinder at the downward movement of the piston. The tubular piston-rod L is of sufficient length to reach from the bottom of the cylinder into the discharge-pipe H. The upper end is provided with the solid metal plug M, in which is received the connecting-rod N. The lower end of the tubular piston-rod is provided with the threaded cap O. A collar P is also secured upon the piston-rod.

The collar and cap form the stops for the piston Q. The said piston is spool-shaped, having a neck and provided with flanges on the top and bottom. The said flanges are in diameter the full size of the interior diameter of the cylinder, and provided upon the top and bottom with leather washers R and R'. The objects of the washers are to form packing for the piston, and at the same time obviate all metallic sound when the piston comes in contact with the collar P and cap O. The piston is shorter than the distance between the collar P and the flange of the cap O to the extent that the ports S and S' will be opened upon the upward and downward strokes of the piston, respectively.

In the drawing Fig. 1 the piston is shown in its upward movement, the upper portion of the cylinder filled with water drawn through the inlet-ports I by the downward movement of the piston. The lower portion of the cylinder is now filling through the in-

let-port C. The water in the upper portion of the cylinder is forced by the pressure of the piston through the discharge-ports S into the tubular piston-rod L, thence upward through the discharge-port T into the discharge-pipe H. A reverse movement of the piston closes the valve D, opening the valve J. The compression of the water between the valve D and lower end of the piston forces the piston upward until it rests against the collar P, closing the discharge-ports S and opening the discharge-ports S', allowing the water to pass from the lower portion of the cylinder into the tubular piston-rod and into the discharge-pipe.

I have shown in Fig. 2 a slight change in the piston from the one shown in Fig. 1. This piston is made in two parts, A' and B'. The said parts are held in position by a right coil-spring C', pressing the two parts against the cap O and collar P. The operation is the same as described in Fig. 1.

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

1. The pump herein shown and described, consisting of the barrel having the exterior threads at the upper and lower ends, the cap screwed on the lower end and having the valve-inlet, the cap screwed on the upper end

having the inlets and the reduced portion formed with exterior and interior threads, the valves for the inlets, the flanged packing-ring engaging the interior thread of the reduced portion of the cap, the tube fitting the exterior threads of the cap, the hollow piston-rod passing through the cap and packing, the collar screwed on said rod, the cap screwed to the lower end of said rod, and the movable spool-shaped plunger adapted to slide upon the piston-rod between the ring and cap.

2. The pump herein shown and described, having the valve-inlets at its upper and lower ends, the hollow piston-rod having the openings in its lower portion, the caps secured on the lower end of the rod, the ring secured to the rod above the cap, the spool-shaped plunger made in two parts adapted to slide or play between the ring and cap and the coiled spring surrounding the two sections of the plunger and having its free ends bearing against each section of the plunger to hold the sections in their proper positions.

In testimony whereof I affix my signature in presence of two witnesses.

HUBBARD D. B. WILLIAMS.

Witnesses:

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