

(No Model.)

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

No. 572,783.

Patented Dec. 8, 1896.

Fig. 1.

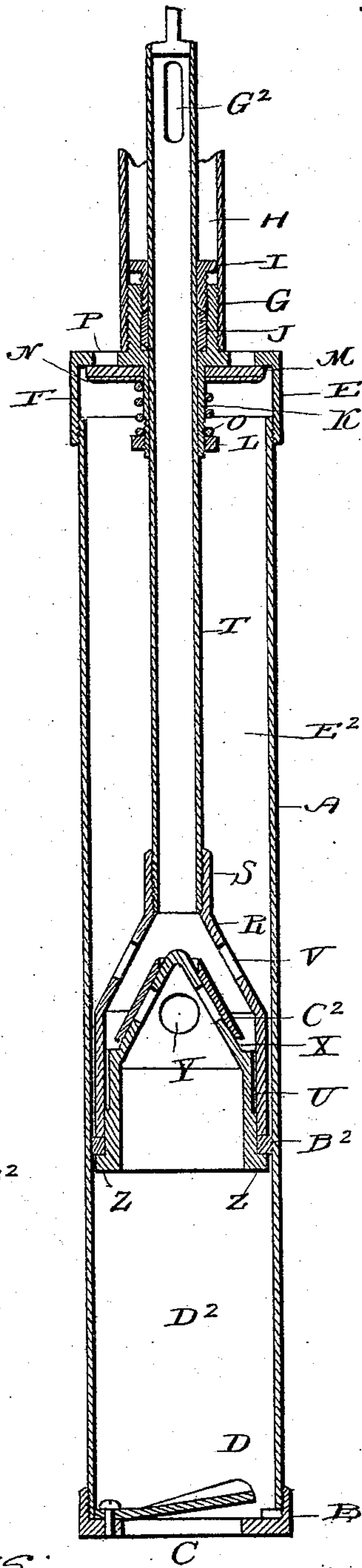


Fig. 2.

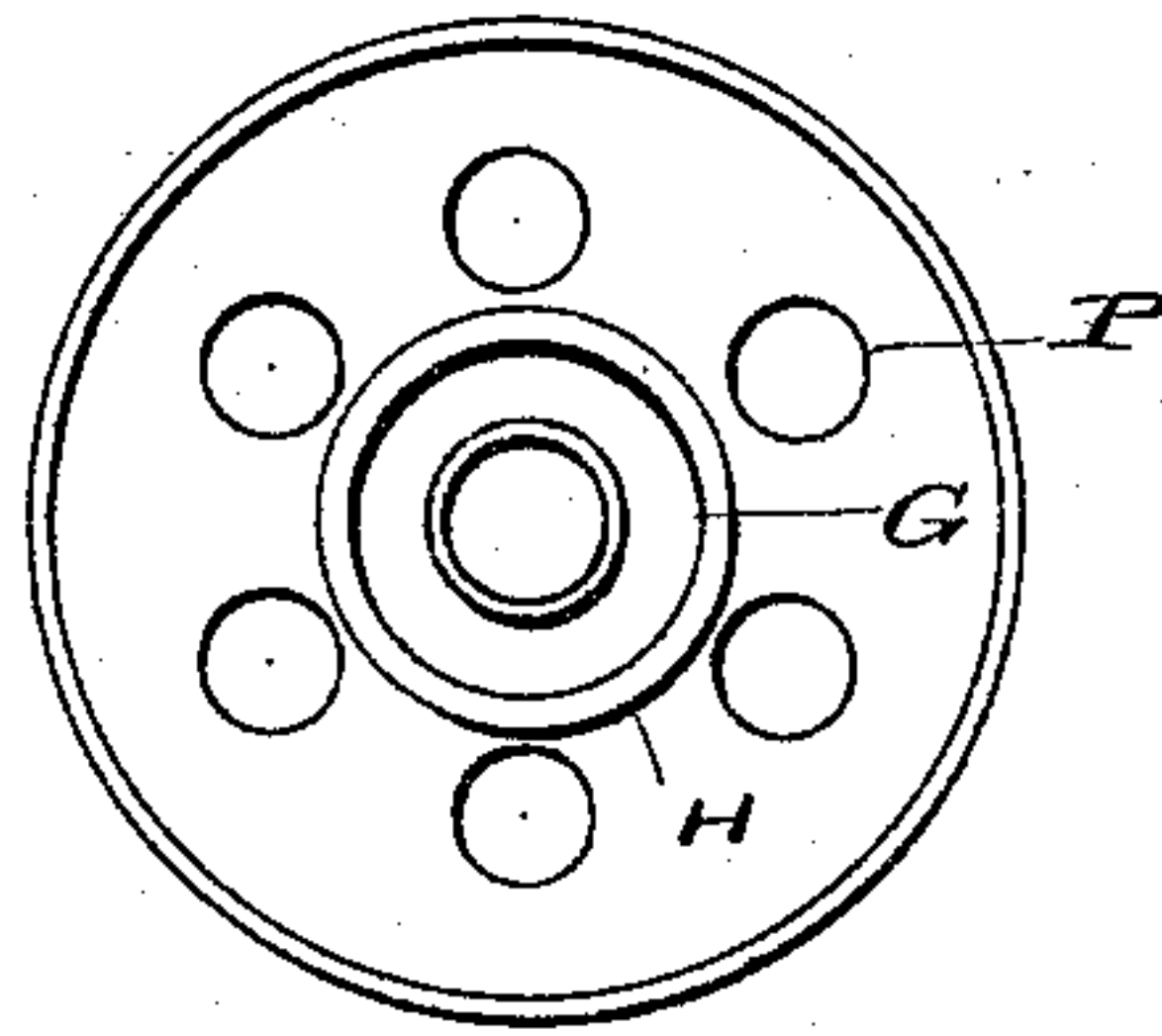
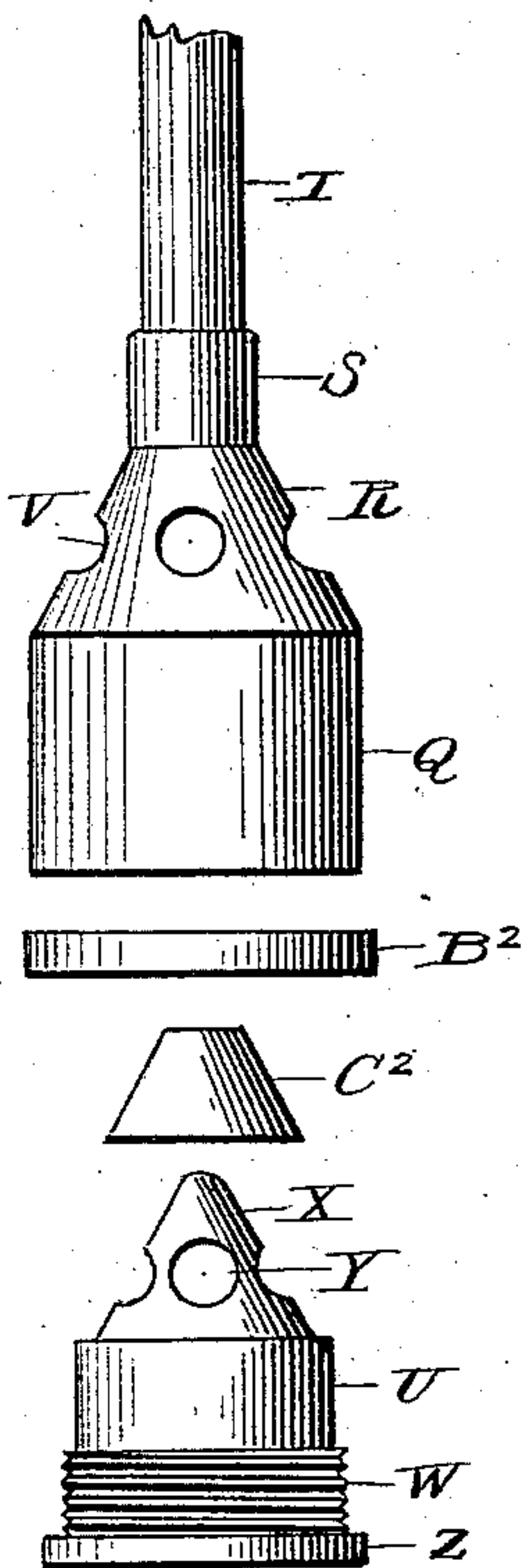


Fig. 3.

Witnesses:

J. M. Moore

Wm. C. Ashlee

Inventor:

Hubbard D. B. Williams.

- BY - Thomas E. Barrow,

Att'y.

UNITED STATES PATENT OFFICE.

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

DOUBLE-ACTING SUBMERGED FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 572,783, dated December 8, 1896.

Application filed August 7, 1896. Serial No. 602,052. (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 Double-Acting Submerged 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 double-acting submerged force-pumps; and the objects of my invention are, first, to provide a force-pump of a novel construction; second, to so construct the piston that the water from the upper as well as the lower portion of the cylinder passes into the interior of the piston and is forced upward through a hollow piston-rod; third, to so arrange the upper induction-port valve that the same will be efficient no matter how slow the piston is moving; fourth, to make a novel, cheap, durable, and efficient means for the purpose stated.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my improved double-acting submerged force-pump, showing the general construction of the same. Fig. 2 is a view of the pump-piston, showing each part separated and showing more fully the construction and form of the same. Fig. 3 is a top plan view of the pump-cylinder cap or head, showing the general outline of the same, also the induction-ports.

Similar letters of reference indicate the several parts throughout the several views.

In the accompanying drawings, A indicates the pump-cylinder, which is composed of a seamless drawn-brass tube, but may be a cast cylinder finished upon the inside, but brass being preferable.

B indicates the bottom cap, which is provided in its center with the induction-ports C and tongue-valve D. The said cap is screwed upon the cylinder A. The tongue-valve is for the purpose of admitting the water into

the lower portion of the cylinder at the upstroke of the piston and retaining the same when the piston is in its downward movement.

E indicates the cap or top of the pump-cylinder. The said cap is threaded upon the inside and secured upon the top of the cylinder by the threads passing a short distance within the cap. By this method a chamber F is made the size of the exterior of the pump-cylinder.

G indicates an upwardly-projecting sleeve forming part of the cap E. The said sleeve is threaded upon the outside, and upon the same is secured the discharge-pipe H. The said sleeve is also threaded upon the inside, and in which is placed the screw-threaded gland I and packing J. The cap E is also provided with the downwardly-projecting sleeve K, threaded upon the lower end and provided with the adjusting-nut L.

M indicates a flat leather valve placed loose upon the sleeve L and is provided upon the under side with the metal washer N. The object of the washer is to retain the leather valve in its proper form and bear level against the inner side of the top of the cap by the pressure of the coil-spring O. The cap is provided with suitable induction-ports P to supply the upper portion of the cylinder.

Q indicates the pump-piston, which is composed of a hollow cup-shaped cylinder. The said piston is straight a certain portion of its length, then tapers cone shape R, and provided upon the top with the straight sleeve S, threaded upon the inside to receive the tubular piston-rod T. The lower end of the piston is threaded upon the inside, and in which is secured the hollow cone-shaped valve-seat U. The piston is also provided with a number of induction-ports V. The portion U is provided with threads W to conform to the threads in the lower end of the piston and by which the part U is secured within the piston. The upper end X is cone-shaped and provided with ports Y and the lower end provided with the flange Z, and upon the same rests the piston-packing B², which is held in position by the pressure between the flange Z and the bottom of the piston Q.

C² indicates a cone-shaped metal check-valve so constructed that the inside and outside are the same shape, the inside ground to fit perfectly the cone X, the outside ground to fit the taper R upon the inside of the piston Q. When the check-valve rests upon the cone X, it closes the ports Y at the upward stroke of the piston and at the downward stroke of the same closes the ports V, making a perfect cut-off at each stroke of the piston.

It will be readily seen by those skilled in the art that when the piston is moving upward within the cylinder A the valve D is then open, allowing the water to fill the lower portion of the cylinder D², the check-valve C² resting upon the cone X, closing the ports Y. The induction-ports P are closed by the valve M. The water in the upper portion of the cylinder E² is forced through the ports V into the interior of the piston, thence upward through the tubular piston-rod T, and discharged through the openings G² into the discharge-pipe H. A reverse movement of the piston closes the valve D, opens the valve M, the water in the lower portion of the cylinder D² being compressed between the valve D and metal check-valve C², which forces the check upward, closing the ports V in the piston Q, allowing the water to pass through the ports Y and through the opening in the top of the check-valve, thence upward through the piston-rod T, through the ports G², into the discharge-pipe H.

The description I have fully illustrated in the accompanying drawings.

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

1. In a double-acting submerged force-pump in combination with a cylinder having induction-ports at the upper and lower ends, and tubular piston-rod, a piston composed of

a hollow cylinder having a cone-shaped top, the said cone provided with induction-ports, a sleeve formed upon the top of the piston and threaded upon the inside, a sleeve having a cone-shaped top, provided with induction-ports, the said sleeve provided with a flanged bottom, leather packing placed upon the flange and adapted to be held in position by clamping the same between the flange and lower edge of the piston, a cone-shaped valve placed upon the top of the inner cone the said valve having a port through the center of the top, to allow the water in the lower portion of the cylinder to pass through the same, the said valve so arranged to open and close ports at each stroke of the piston, the piston adapted to receive the water into the interior of the same from both strokes of the piston, substantially as shown and described.

2. A double-acting submerged force-pump, consisting of the cylinder or barrel having the valved inlet at the lower end and the inlets at the upper end, the cap at the upper end of the cylinder having the depending sleeve, the ring-valve fitting on said sleeve, the spring coiled around the sleeve and having its upper end bearing against said ring-valve, the flange on the sleeve against which the other end of the spring presses, the tubular piston-rod passing through the sleeve, the conical plunger secured to the lower end of the piston and having openings, the conical cap fitting in the plunger and having openings, and the conical check-valve fitting on the conical cap within the plunger.

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

HUBBARD D. B. WILLIAMS.

Witnesses:

O. P. F. RISCH,
T. Y. McCROY.