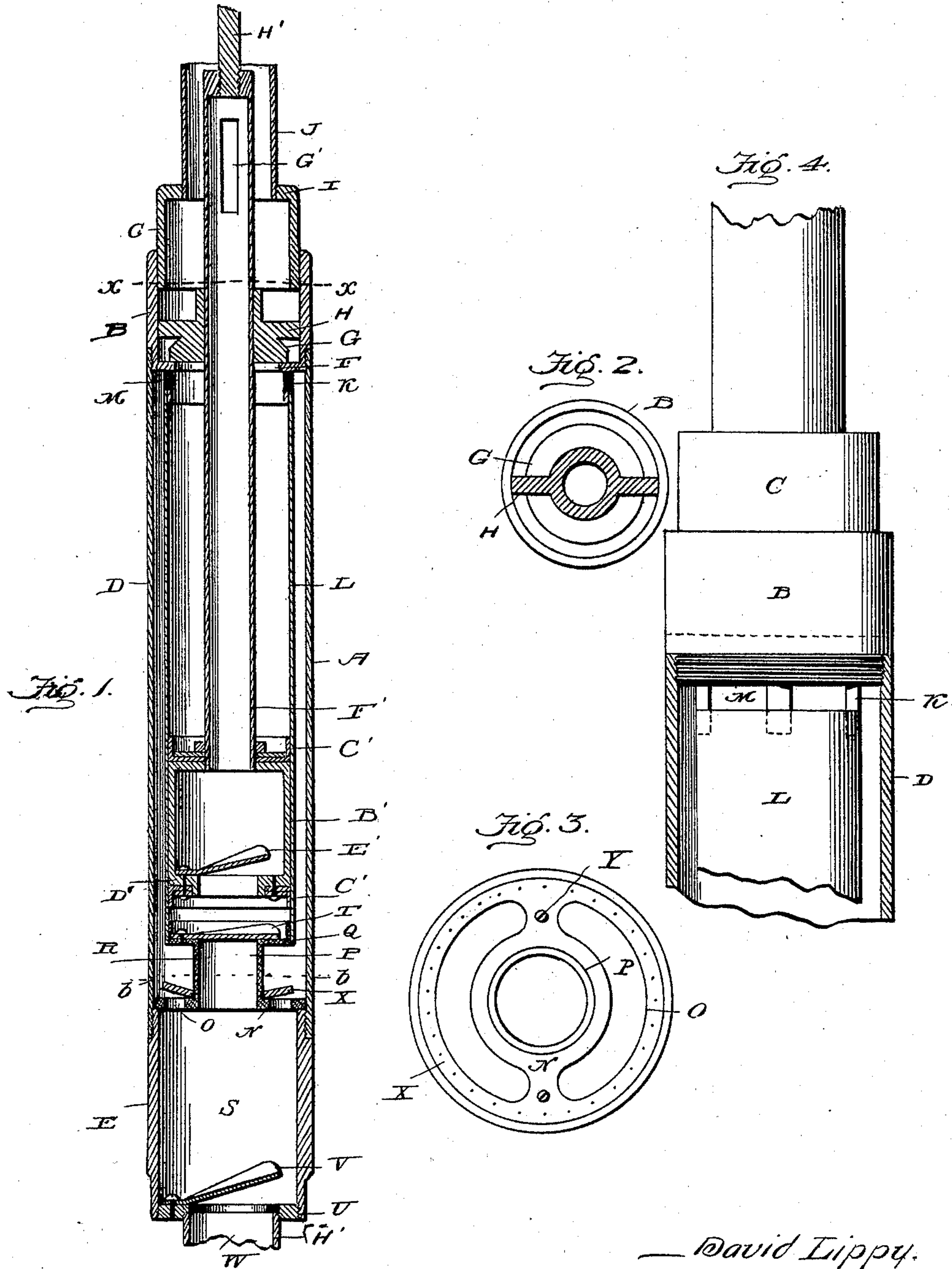


(No Model.)

D. LIPPY.
DOUBLE ACTING FORCE PUMP.

No. 585,961.

Patented July 6, 1897.



Witnesses:

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UNITED STATES PATENT OFFICE.

DAVID LIPPY, OF MANSFIELD, OHIO.

DOUBLE-ACTING FORCE-PUMP.

SPECIFICATION forming part of Letters Patent No. 585,961, dated July 6, 1897.

Application filed July 20, 1896. Serial No. 599,846. (No model.)

To all whom it may concern:

Be it known that I, DAVID LIPPY, 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 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 force-pumps of the class known as "drilled-well" pumps; and the objects of my invention are, first, to provide a pump for drilled wells and other purposes, the said pump being so constructed that the water is supplied above and below the piston from the lower end of the pump; second, to so construct a pump that the pump-cylinder can either be submerged or raised above the water, obviating the necessity of using two cylinders, now in general use in deep drilled wells; third, to make a cheap, durable, novel, and efficient means for the purpose stated.

In the accompanying drawings, Figure 1 is a longitudinal sectional view of my improved pump, showing fully its general construction. Fig. 2 is a transverse view showing more fully the upper check-valve, taken in line *xx*, Fig. 1. Fig. 3 is a transverse sectional view, enlarged, taken in line *bb*, Fig. 1, showing the water-supply ports to supply water to the upper portion of the cylinder. Fig. 4 is a view of upper portion of cylinder-casing, also showing portion of pump-cylinder and inlet-ports to supply the upper portion of cylinder with water.

Similar letters refer to similar parts.

In the accompanying drawings, A indicates a metal case cylindrical in form. The said case is composed of four parts B, C, D, and E, threaded and screwed together, as shown. The part B is cup shape in form, provided in the bottom with the discharge-ports F. A check-valve G is placed within the cup, having a ground seat in the bottom of same, the said valve covering the ports F. The check-valve is provided with the cross-bar H. Its

object is to prevent the check-valve from raising only a certain distance, the bar coming in contact with the lower edge of the upper portion of the case C, the same being reduced in diameter and screwed within the part B. The opening I through the top part C is reduced and threaded to receive the discharge-pipe J.

K indicates posts cast to and forming part of the portion B. The objects of the said posts are to form guides to center the inner cylinder L to hold the upper end firmly in position and also to make induction-ports M to allow the water to fill the upper portion of the inner cylinder above the piston.

The above description is shown fully in Figs. 1, 2, and 4. The lower end E of the outer case A is provided with the head N, having curved slotted induction-ports O and upwardly-projecting sleeve P and cup-shaped flange Q, the flange forming the cup impinging the inner wall of the cylinder L, the lower end of the cylinder resting upon the flange Q. An induction-port R extends from the chamber S, the said port being covered with a tongue-valve T to prevent the water from passing into the chamber S at the downward stroke of the piston. The lower end of the part E is threaded upon the inside, and in which is screwed the disk U, forming a valve-seat for the tongue-valve V, covering the induction-port W. A double tongue-valve X covers the ports O, the said valves being held in position by the screws Y.

B' indicates the pump-piston, which is composed of a hollow cylinder provided upon the upper and lower ends with cup-shaped leather suckers C', the lower end provided with an induction-port D' and tongue-valve E', the upper end provided with the threaded opening, and in which is secured the tubular piston-rod F'. The piston-rod is of sufficient length so that the discharge-port G' will be within the discharge-pipe J, the upper end being plugged and provided with the solid connecting-rod H'.

The above description is fully illustrated in Figs. 1 and 3. I have shown in Fig. 1 the piston at its downward stroke, showing the relative position of the several valves. It is supposed that water is in the lower portion of the cylinder and the compression of the water

between the lower end of the piston and the bottom of the cylinder has opened the valve E' and closed the valve T, the water passing through the port D', thence upward through the tubular connecting-rod and discharging through the ports G' into the discharge-pipe J. At the same time the valve V is raised, also the double tongue-valve X, the water passing upward around the cylinder L through the ports M, supplying the upper portion of the cylinder. A reverse movement of the piston on an upward stroke closes the valve E' and double tongue-valve X, opening the valve T. The compression of the water in the upper portion of the cylinder raises the check-valve G, allowing the water to pass through the ports F into the discharge-pipe J. At the same time the suction of the piston is filling the lower portion of the cylinder by the water passing through the induction-port R.

It will be readily seen by those skilled in the art that the tongue-valve V is not of much importance when the pump is in operation, as it is open at both strokes of the piston. Its main object is to retain the water within the chamber and cylinder when the pump is at rest or if the pump should be suspended any distance above the water. It will also be readily seen that it is not necessary to submerge this pump in deep wells. A pipe can be attached within the lower end of the part E and extend downward any reasonable distance, as it forms a check-valve holding the water within the casing A, making it unnecessary to prime the pump after it has stood any length of time.

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

1. In a double-acting force-pump, a casing composed of the parts B, C, D and E, the part or portion B, cup-shaped and provided

with discharge-ports, and suitable valve, the cup-shaped casting provided upon the under side with downwardly-projecting pins or posts, the inner or pump cylinder, the said posts adapted to center and hold the inner cylinder and form ports for the passage of the water to the upper portion of the cylinder, the casting C, secured within the portion B, the lower edge adapted to regulate the throw of the valve, the upper end provided with the discharge-pipe, substantially as shown and described.

2. In a double-acting force-pump, a casing consisting of the separate parts or portions B, C, D and E, the part or portion E, being the lower end of the casing and forming a hollow cylinder having an induction-port at the bottom, said port provided with a tongue-valve, the pump-cylinder L, secured to the upper portion of the casing and having in its sides near the top three or more induction-ports and having a valved port at its bottom, the pump-piston, the bottom port to supply the portion below said piston, the ports on the sides near the top to supply the portion above said piston, the side ports provided in the bottom of the cylinder D, having a double tongue-valve, a sleeve extending upward from the bottom cylinder D, and provided with a cup-shaped flange, said flange adapted to center and hold the lower end of the pump-cylinder, and a tongue-valve secured upon the top of the flange within the pump-cylinder and adapted to open and close the lower induction-port, substantially as shown and described.

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

DAVID LIPPY.

Witnesses:

WALTER W. WEBB,
H. D. WILLIAMS.