



# UNITED STATES PATENT OFFICE.

DAVID F. CASEY, OF HARRISONVILLE, OHIO, ASSIGNOR OF TWO-THIRDS OF HIS RIGHT TO MATTHEW WILSON AND CALVIN REEVES.

## IMPROVEMENT IN DOUBLE-ACTING FORCE-PUMPS.

Specification forming part of Letters Patent No. **147,102**, dated February 3, 1874; application filed December 27, 1873.

*To all whom it may concern:*

Be it known that I, DAVID FRANKLIN CASEY, of Harrisonville, in the county of Meigs and State of Ohio, have invented an Improved Double-Acting Force-Pump, of which the following is a specification:

The drawing represents a vertical central section of my improved double-acting force-pump.

This invention relates to a new submerged pump of simple construction and great efficiency; and consists in the combination of two cylindrical chambers, that project from and communicate with the pump-stock, and contain each a valve, with a cylindrical plunger that partly embraces the said chambers, and has the requisite supply-openings.

In the drawing, the letter A represents the pump-stock or main tube. With its lower part are connected two cylinders, B and C, whose axes are in line with each other, as shown. The cylinders B and C connect by pipes *a b*, respectively, with the stock A. D is an open-ended cylinder arranged between B and C, and embracing part thereof, as shown. Suitable packing is provided at the ends of the cylinders B and C, that enter the cylinder D, so that the latter may work tight on the former on being moved to and fro between the same. By a rod, E, or otherwise, the cylinder D is connected with a suitable working-lever, F, or other mechanism whereby reciprocating motion is imparted to it. The cylinders B and C have apertures in the ends that enter the cyl-

inder D, as shown, said apertures being closed by valves *d e*, respectively. *f* is a diaphragm across the cylinder D, between B and C. *g* and *h* are water-supply openings in D on opposite sides of the diaphragm. These supply-openings are closed by suitable valves, as shown. When the cylinder D, which acts as the plunger of the pump, is moved toward B, the valve *d* is forced open and *g* closed, while the valve *h* is sucked open and *e* closed. Water is thus drawn into the space between the diaphragm *f* and the cylinder C. When next the plunger D is moved toward C, the valve *h* will be forced closed and *e* opened, and the water formerly drawn in will be forced into the cylinder C, and thence into A. At the same time, the valve *g* being sucked open and *d* closed, water will be drawn into the space between *f* and B, to be forced into B during the next reversal of motion of the plunger. Thus a continuous action can be kept up, and it will be seen that the cylindrical plunger acts at once as a collector and propeller of water.

I claim—

The combination of the reciprocating cylindrical plunger, having the diaphragm *f* and the valves *g h*, with the cylinders B and C on the stock A, said cylinders having, respectively, the valves *d* and *e*, as set forth.

DAVID F. CASEY.

Witnesses:

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