(No Model.)

J. W. DOUGLAS.

PUMP.

No. 306,679. Patented Oct. 14, 1884.

Fig. 1.

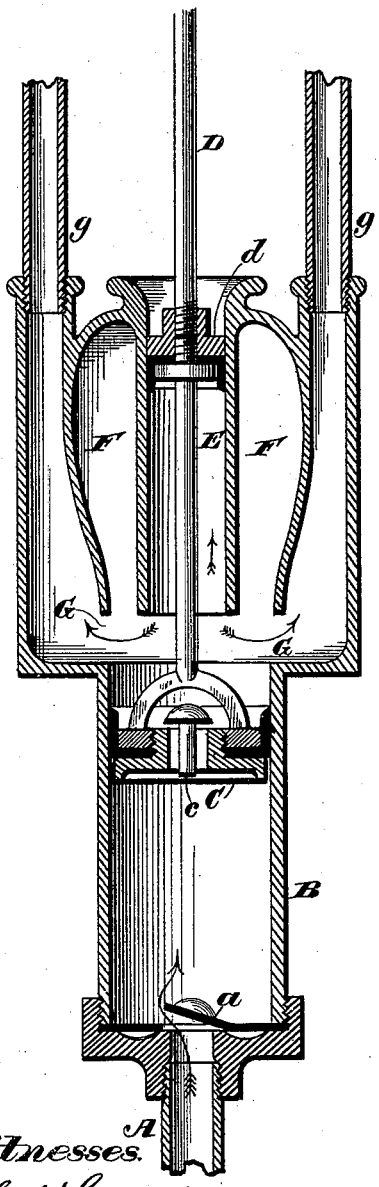
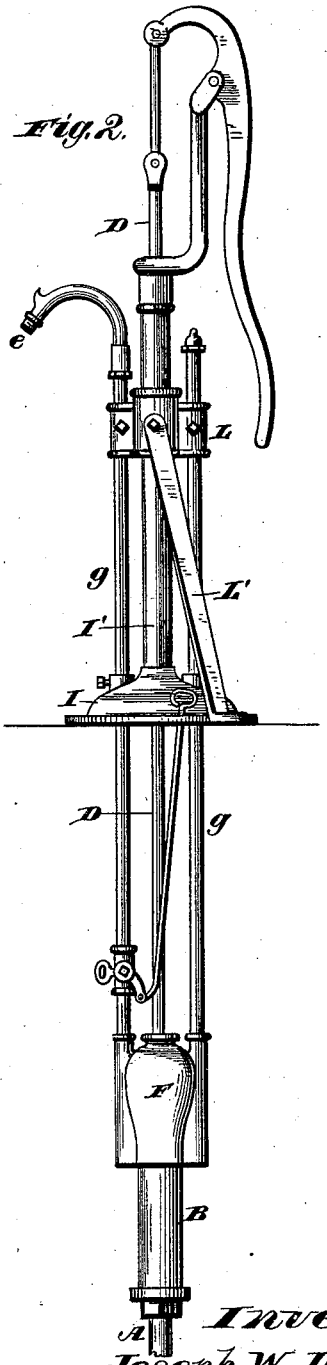


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOSEPH W. DOUGLAS, OF MIDDLETOWN, CONNECTICUT, ASSIGNOR TO HIMSELF AND W. AND B. DOUGLAS, OF SAME PLACE.

PUMP.

SPECIFICATION forming part of Letters Patent No. 306,679, dated October 14, 1884.

Application filed September 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH W. DOUGLAS, a citizen of the United States, residing at Middletown, in the county of Middlesex and State of Connecticut, have invented new and useful Improvements in Pumps, of which the following is a specification.

My invention relates to force-pumps, and has for its object to simplify and cheapen the construction of the same, and to provide a double-acting force-pump which shall possess great strength and durability, and in which danger of leakage from imperfect joints is obviated.

To this end, therefore, my invention consists in a pump having two working-cylinders, one above the other, and each having a piston carried by the same rod, the upper cylinder being surrounded by an air-chamber, and having two eduction-ports, the whole being cast in a single piece, whereby great strength and durability are secured and danger of leakage from imperfect joints is avoided, while the cost of manufacture is at the same time reduced to a minimum.

Referring to the drawings forming part of this specification, Figure 1 represents a central vertical section of the pump-cylinder and air-chamber surrounding it, and Fig. 2 is a side elevation showing the pump with its operating parts.

A in said drawings represents a suction-pipe leading from the well or other water-source. Upon the end of this pipe is mounted a cylinder, B, the entrance to which is covered by an upwardly-opening clack-valve, *a*.

Within the cylinder B reciprocates a piston-head, C, having a puppet-valve, *c*, which opens as the piston descends and allows the water in the cylinder B to flow in above said piston. The latter is mounted upon a piston-rod, D, which is reciprocated by a pump-handle in the usual manner.

Above the chamber B, and concentric therewith, is formed a second working-cylinder, E, of less diameter, having its lower end open. Within this cylinder reciprocates a piston, *d*, mounted upon the rod D, and operated thereby.

F indicates an air-chamber surrounding the upper cylinder, E, and opening downward around the lower end of the latter. Upon each side of the air-chamber is formed an eduction-port, G, in the upper ends whereof are tapped pipes *g g*, which may unite above in a single discharge-tube.

The parts composing the lower cylinder, the upper cylinder, the air-chamber surrounding the latter, and the eduction-ports are all cast in a single piece, whereby greater strength is obtained, all joints are avoided, and the cost of production is materially decreased.

It is well known that in force-pumps where the water is under heavy pressure in the working-cylinders there is constant danger of leakage through the joints, and frequent attention and renewal of the packing between the joints is necessary. My invention obviates these difficulties, besides securing other advantages.

The operation of the device is clear from the drawings. As the piston C moves downward, the clack-valve *a* closes, the puppet-valve *c* in the piston opens, and water flows in above it. At the same time the descent of the piston *d* in the upper chamber, D, drives the water out of the latter through the eduction-ports *g g*. As the piston C rises, the valve *c* closes and the water above it is driven out through the discharge-pipes, while at the same time the chamber B is filled, through the valve *a*, by water flowing from the suction-pipe A. In this manner the forcing mechanism acts upon both the up and the down stroke, giving a continuous stream through the discharge-pipe.

In Fig. 2 of the drawings I have shown the attachments belonging to the parts hereinbefore described. In this figure I designates the base which forms a portion of the cover for the well, and upon which is placed the tubular upright I′. The discharge-pipes *g g* pass upward through openings in this base-piece, and lie upon each side of the tubular upright I′, being coupled thereto by an adjustable bridge-piece, L, which encircles all three and is supported by a brace-rod, L′, the lower end of which rests upon the base-piece I, or upon the parts surrounding the same. It will be seen that by making the bridge-piece L adjustable upon the tubular upright and pipes the former

may be adjusted to any point within certain limits, as may be required by the depth of the cistern or other circumstances.

Having thus described my invention, what I claim is—

1. A force-pump having two pump-cylinders, one above the other, the upper cylinder being cast integral with a surrounding air-chamber, and a discharge-port at one side of the air-chamber, substantially as shown and described.

2. The combination of the base I, the tubular upright I′, the discharge-pipes *i*, the bridge-piece L, adjustable on the pipes and tubular upright, and a brace-rod, L′, connecting the bridge-piece with the base, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JOSEPH W. DOUGLAS.

Witnesses:
JOHN N. CAMP,
GEORGE A. CRAIG.