J. O. Joyce,

Force Pump.

No. 83,858. Patented Nov. 10, 1868

Fig: 1

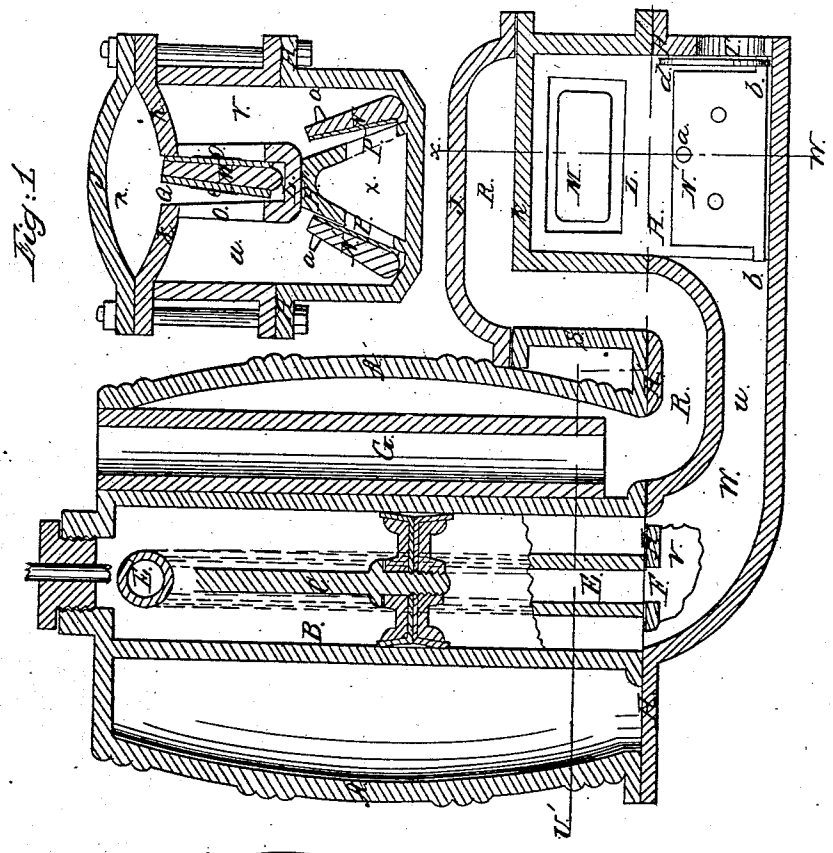
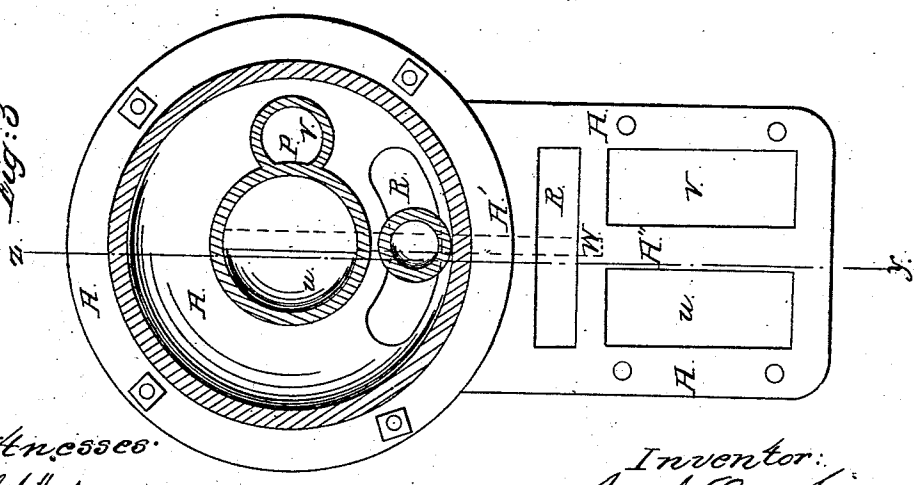


Fig: 2

Fig: 3



Witnesses:

Inventor:

Jacob O Joyce

United States Patent Office.

JACOB O. JOYCE, OF DAYTON, OHIO.

Letters Patent No. 83,858, *dated November* 10, 1868.

IMPROVEMENT IN PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, JACOB O. JOYCE, of the city of Dayton, in the county of Montgomery, and State of Ohio, have invented certain new and useful Improvements in Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a vertical cross-section of the valve-chamber;

Figure 2, a vertical longitudinal section; and

Figure 3, a horizontal section on line V′ U′.

Like letters refer to the same parts in all of the figures.

My invention relates to double or continuously-acting force-pumps, and consists in a novel arrangement of the chambers, passages, and valves, and in placing the piston in the air-chamber, and the valves at one side thereof, and in the several combinations hereinafter set forth and claimed as new.

To enable others skilled in the art to make and use my improved pump, I will describe its construction and operation.

I make the principal portion, or frame-work, of my pump, A, the air-chamber. As shown, it is made in form of a barrel. Into this barrel or chamber, I insert the discharge-pipe G, which reaches nearly to the bottom thereof, so as to make it operate as an air-chamber. It is inserted one side of the centre or middle. In the centre, I place the piston-chamber or cylinder B, which passes down to the bed-plate H, and is connected with or attached to it. On one side of this piston-cylinder I cast, or otherwise attach, a tube-partition or cylinder, E, which opens into the piston-chamber near the top, and also passes down to plate or bed H. In cylinder or chamber B, I place the piston or plunger D, which is suitably packed, and is operated by the rod C. The bed or bottom H covers the bottom of the barrel A, and also extends out at the side, and forms the lower half of the valve-chamber. It is also made of sufficient depth to contain the passages from the valves to the air-chamber or plunger, the partition-plate W, and the bottom plate I, being cast with H.

The space between plates H and I is divided into two equal or nearly equal parts by the partition-plate W, which leaves two passages, U and V. This plate, W, is simply a partition from the piston-cylinder to the valve-chamber, as shown by the dotted lines in fig. 3. From that point out, at H″, it is double, with side inclines, as shown in fig. 1. These inclined sides form a chamber, *x*, between them for the entrance of water, which enters, at the opening T, into chamber *x*, and passes through the openings or passages P or P′, according to the stroke of the pump. These passages, P P′, are closed by the action of the valves N and N′. These valves, N, are made to rock on the lower edges as shown, or they may rest on pivots *b b*, if desired, and in order to insure their action upon the return-stroke, and prevent them from turning too far, small pins, *a*, are attached near their upper edges, which strike against the walls before the valves reach a vertical position, so that they will always fall into the proper position, and they are held down by the stop *d*, or by other suitable means. Above these valves, I place the double-acting valve M, which rocks in plate L, or may be supported at the ends like the valves N. The plate L is attached to or cast with plates K, and on each side is provided with openings, O, which are so arranged with valve M, that when one is closed the other will be opened. The passage Q opens up between plates K, and may also open out, at the inner end, into the discharge-passage R, or open up and out both.

The curved plate J is bolted on above the plates K, as shown at fig. 1, which leaves between them the chamber or discharge-passage R. The air-chamber A and bed or plate H are fastened by bolts passing through the flanches, as are also plates S and H, and S and J. The other plates and partitions I usually cast in. As the pump is made of cast-iron, or other suitable metal, water may be admitted directly through the hole or opening T, but I usually place the pump above the well-cistern or reservoir, and screw in, or otherwise attach, a pipe to this opening, and extend such pipe down into the water, so that, so far as the first or principal elevation of water is concerned, the pump is a suction-pump, and from the point of entrance into the pump out of it, a force-pump, which makes it, in its usual action, a combined suction and force pump.

In operation, the piston or plunger-rod C is operated by a lever, or crank, or by any other suitable means. Two strokes will fill the pump with water. An up stroke of the piston will then draw the water through valve N′, passage U, up into the cylinder B, and will force the water in the upper portion of B, out through E′, down through pipe E, opening F, passage V, openings O and Q, into passage R, and through R into the air-chamber A, and from that into discharge-pipe C, from which it is discharged with great force. A down stroke operates the same way, simply changing the sides of the operation. All of the joints which are to be tight, and the valves, are to be properly packed to prevent leakage. This construction makes a powerful pump, as I have found from testing it.

Having thus fully described my pump,

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination and arrangement of the valves N N′ and M with the openings U, V, and R, substantially as and for the purposes specified.

2. The combination and arrangement of the piston-chamber B, piston or plunger D, tube or cylinder E, and discharge-pipe G, with the flues or passages R, U, and V, substantially as specified.

3. The combination and arrangement of the air-chamber A, piston-cylinder B, piston or plunger D, tube or passage E, and pipe G, with the passages R, U, and V, valves N N′ and M, with their openings T, substantially as and for the purposes specified.

JACOB O. JOYCE.

Witnesses:

E. A. WEST,

L. L. BOND.