T. B. SWAN.

LIFT AND FORCE PUMP.

No. 192,950. Patented July 10, 1877.

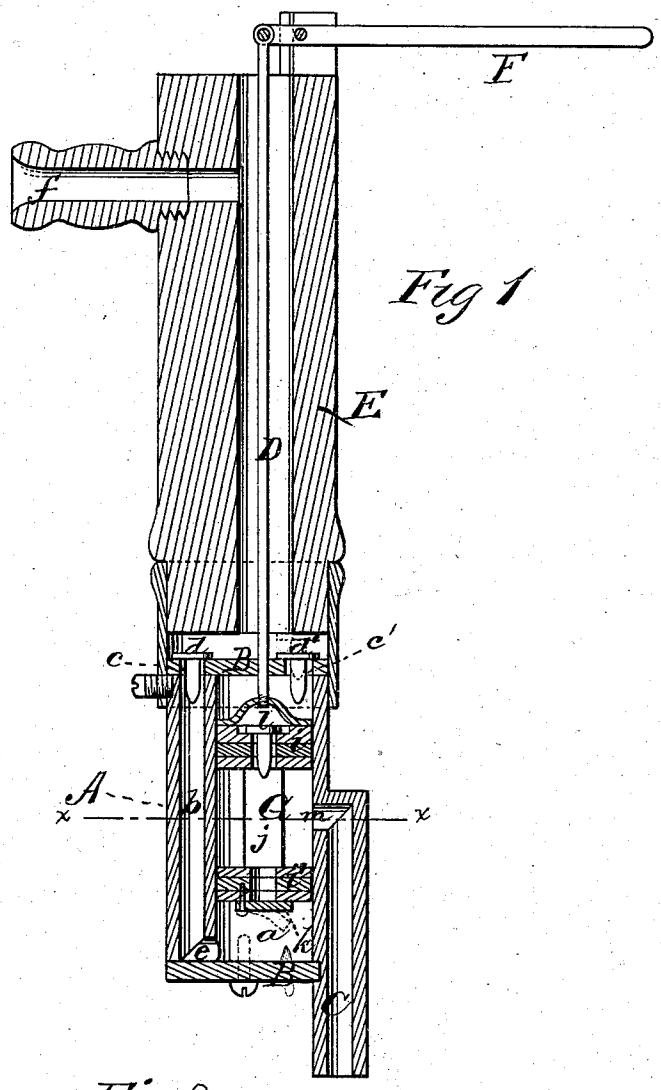
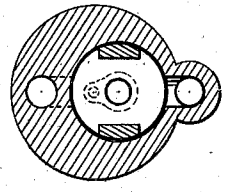


Fig 1

Fig: 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

THOMAS B. SWAN, OF MECHANICS FALLS, MAINE.

IMPROVEMENT IN LIFT AND FORCE PUMPS.

Specification forming part of Letters Patent No. **192,950**, dated July 10, 1877; application filed June 23, 1877.

To all whom it may concern:

Be it known that I, THOMAS B. SWAN, of Mechanics Falls, in the county of Androscoggin and State of Maine, have invented a new and valuable Improvement in Lifting and Force Pumps; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawings is a representation of a longitudinal central section of my improved pump; and Fig. 2 is a horizontal section thereof, taken through the line *x x*.

This invention has relation to improvements in double-acting force and lifting pumps; and the nature of the invention consists in the combination, with a pump-barrel closed at its lower end, and provided at its upper end with a valve opening upward, a feed-pipe opening into the bore *a* of said barrel midway of its length, and a lateral conduit closed at its lower end, and provided at its upper end with a valve opening upward, of a double piston having in its lower end a valve opening downward, and in the upper end a valve opening upward, whereby a pump of exceptional excellence is obtained, as will be hereinafter more fully described.

In the accompanying drawings, the letter A designates a preferably cylindrical barrel, having an eccentric bore, *a*, that is open at both ends. This barrel has in its thicker wall a conduit, *b*, extending from end to end of the barrel, as shown in Fig. 1. This barrel, with its bore and conduit, is preferably cast out of any suitable metal in one piece, though I do not propose to confine myself to this especial construction. The ends of the barrel are closed by means of caps B, which are secured thereto by screws, or any other equivalent device, the upper cap having apertures *c c'*, leading, respectively, into the conduit and into the barrel, as shown in Fig. 1, that are closed by valves *d d'*, opening upward. The conduit *b* aforesaid communicates with the bore *a* of the barrel at its lower end by means of a passage, *e*.

C designates the feed-pipe, extending by means of suitable connections into the well or cistern from which the water is to be drawn, and opening into the bore *a* of the barrel midway of its length.

The lower end of the barrel is closed by a head or cap, B, that, like the other head, forms a tight joint with its end of said barrel. The upper head B is provided with an aperture provided with a suitable stuffing-box, or other equivalent device, though which extends a metallic piston-rod, D. This latter device extends up through a wooden or metallic pump-standard, E, having a discharge-spout, *f*, and provided with a vertically-vibrating lever, F, which, being pivoted to the end of the piston-rod aforesaid, will impart a reciprocating movement to the piston when it is operated.

The piston G is composed of two spaced suitably-packed disks, *i i'*, connected by metallic rods *j*, and they are, respectively, provided with proper seats for valves, of which the lowermost, *k*, opens downward, and the uppermost, *l*, upward. These disks are so proportioned to the length of the stroke of the rod D, in their distance apart, that the lower disk never rises above the lower edge of the opening *m* of the feed-pipe into the pump-barrel, and the upper disk never descends below the upper edge of said opening. In other words, its length is never less than the length of the stroke of said rod. This latter is connected in any suitable manner to the piston aforesaid.

When the operating-lever is thrust down, the piston moves up in its barrel until the lower disk *i'* reaches the opening *m* from the feed-tube into the barrel. The water is sucked up the feed-tube into the barrel, the valve *l* in the upper disk, and that at the upper end of the conduit *b*, being closed, and that in the lower disk open. When the downstroke of the piston commences, the valve in the upper end of the said conduit opens, that in the lower end of the piston closes, and a partial vacuum being created above said piston, water rushes up the feed-pipe into the upper part of the pump-barrel, while that in the lower part thereof, raised by the upstroke, is forced up conduit *b*, through valve *d*, into the upper part of the pump above said valve. While

the lower disk is forcing, the upper disk is raising water, and a continuous stream of water will pour from the spout.

It is evident that it is not essential that the lateral conduit should be within the body of the pump-barrel, provided its lower end opens into said barrel, and its upper end into the upper part of the pump, and is provided with a valve opening upward.

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

1. The pump-barrel consisting of the bore *a*, having opening *m* midway of its length, for the reception of the feed-pipe, a closed lower end, and a valve, *d'*, in its upper end opening upward, in combination with the lateral conduit *b*, having at its lower end a passage, *e*, communicating with the lower end of said barrel, and at its upper end a valve, *d*, opening upward into the body E of the pump, substantially as specified.

2. The combination of the bore *a* of the barrel A, closed at its lower end, and provided at its upper end with a valve opening upward, a feed-pipe opening into said barrel midway of its length, and a lateral channel communicating at its lower end with said bore, and having at its upper end a valve, *d*, opening upward, with a piston, G, having at its lower end a valve, *k*, opening downward, and a valve, *l*, opening upward at its upper end, substantially as specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

THOMAS B. SWAN.

Witnesses:
JOHN D. CURTIS,
CHARLES F. BROWN.