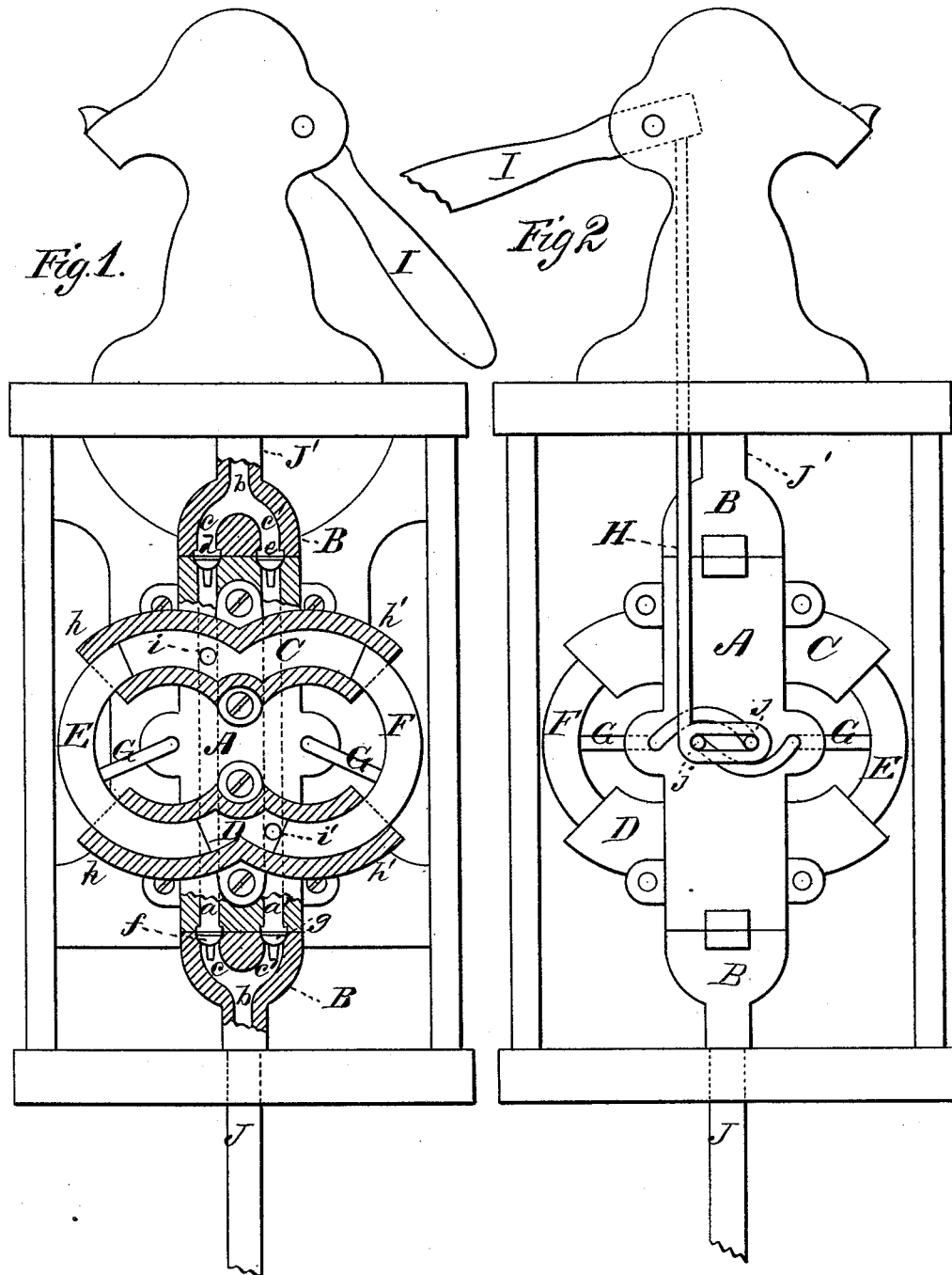


T. B. SWAN.  
 SUCTION AND FORCE PUMP.

No. 189,518.

Patented April 10, 1877.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

THOMAS B. SWAN, OF MECHANICS FALLS, MAINE.

## IMPROVEMENT IN SUCTION AND FORCE PUMPS.

Specification forming part of Letters Patent No. 159,518, dated April 10, 1877; application filed March 14, 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 Double-Acting Suction 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 partly sectional front elevation of my invention, and Fig. 2 is a rear view thereof.

This invention has relation to improvements in pumps for lifting and forcing water.

The object of my invention is to produce a pump of a very simple and economical construction, which will possess both lifting and forcing power, and cause water to be thrown in a continuous stream.

The nature of my invention will be fully understood from the following description:

In the annexed drawings, the letter A designates the body of my improved pump, having two parallel ducts, *a a*, extending from end to end thereof, and leading, both above and below, into a channel, *b*, common to both. Channel *b* is formed in a detachable cap, B, and has two branches, *c c'*, leading, respectively, into the ducts *a a'* aforesaid, and communication is had or cut off, under circumstances hereinafter explained, between the branches and ducts at the upper end of the body A, by means of valves *d e*, and at the lower end thereof by means of similar valves *f g*, all of which valves open upward and in the same direction. C D represent metallic barrels, arranged the one above the other, and rigidly secured to body A. These barrels are in form sections of an annulus, and are tubular; or they may be made, as shown in Fig. 1, of two short annular sections, *h h'*, joined together end to end, forming a scalloped outline. E F represent curved plungers of a size to snugly fill the bore of the barrels, and each engaged as to its ends with the same. These plungers or pistons, being of precisely the same curvature as the barrels in which they are engaged, are susceptible of

a free endwise movement relative thereto. Barrel C is connected to duct *a* by means of an orifice or short pipe, *i*, but has no direct connection with duct *a'*, while the latter duct has no communication with the barrel C, but is connected to barrel D by a similar orifice or pipe, *i'*.

As shown in Fig. 1, the pistons E F extend through metallic plates *j* on the ends of the barrels, and form air-tight joints therewith; but I may use any of the approved forms of packing for this purpose, if I so elect.

G G' represent strong metallic levers, connected at one end rigidly to the pistons at or near the middle of their lengths, by means of which the pump is operated. These levers are journaled to vibrate vertically in the sides of the body A, extending through which they reach nearly across the said body at its rear side, and are terminated by spurs *j*. These latter engage with an oblong slot formed in the lower end of an operating-rod, H, that is caused to reciprocate rapidly by means of the usual pump-handle I, or other suitable mechanism. When this handle is worked a reciprocating movement is imparted to the said rod, and the plungers actuated to raise the water through a feed-pipe, J, and deliver it through a discharge-pipe, J', at the point required. When rod H moves downward the circular pistons E F move toward each other in the barrel C, and valve *f* being closed water is forced through the valve *d* into the tube J'. At the same time the pistons move from each other in the barrel D, and the water is drawn up the tube J' to fill the partial vacuum thus produced, through valve *g*, into barrel D aforesaid, and, when the movement of the said pistons is reversed, is forced up duct *a'* through orifice *i'*, and, passing through valve *e*, is delivered into the pipe J'. During the reverse movement of the pistons a partial vacuum is created in barrel C, and water is drawn up, through tube J and valve *f*, into the duct *a*, whence it passes into the said barrel, from which it will be forced by the return movement of the pistons.

It will be seen from the above description that the barrels C D discharge the functions of a suction or forcing pump, according to the movements of the piston, and that the barrel

C is sucking up water while barrel D is forcing it, and the reverse. It will also be seen that there are no valves in the barrels or on the pistons, such simple devices of this nature as I use being in situations where they can be readily got at should repairs be required.

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

1. In a combined lifting and force pump, the body A, having ducts *a a'*, and valves *d e* and *f g*, respectively, at the upper and lower ends of said ducts, the curved barrels C D, communicating the one with duct *a*, and the other with duct *a'*, the curved pistons E F, engaged in said barrels, and, as described, for operating said pistons, combined substantially as specified.

2. The curved endwise-reciprocating pistons

E F and curved barrels C D, combined with the body A, having ducts *a a'*, valves *d e* and *f g*, and orifices *i i'*, respectively connecting the barrels C D with their ducts *a a'*, substantially as specified.

3. The combination, with the valved and channeled body A and the curved barrels C D, communicating therewith through passages *i i'*, of the curved reciprocating pistons E F, 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:

E. ADRON GAMMON,  
ANDREW A. KEENE.