T. B. SWAN.

DOUBLE-ACTING PUMP.

No. 192,028. Patented June 12, 1877.

Fig. 1.

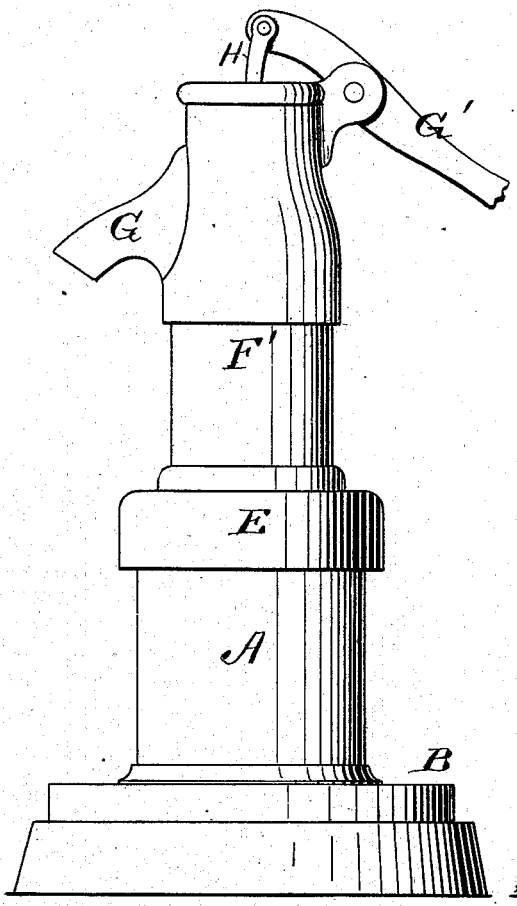


Fig. 2.

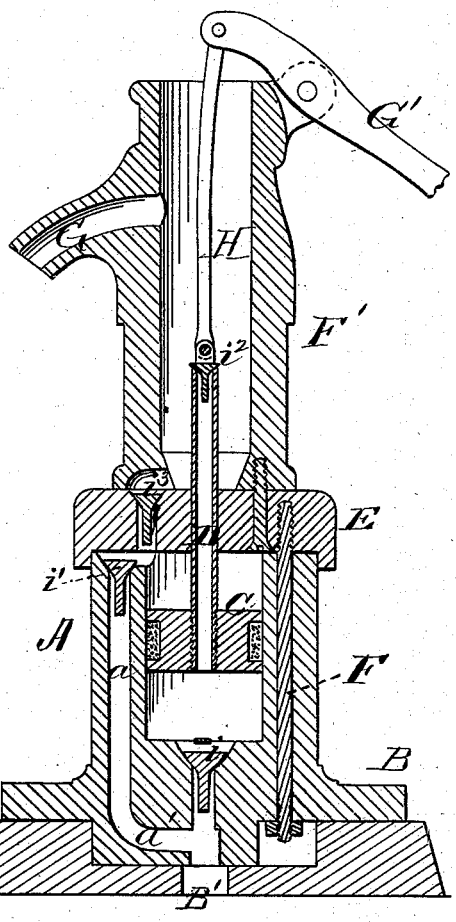
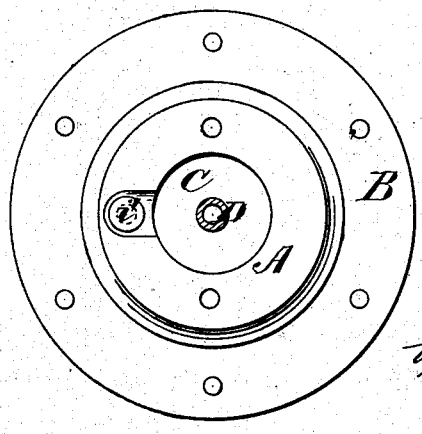


Fig. 3.



Attest:
G. J. Masi
W. C. Masi

Inventor:
Thomas B. Swan,
by E. M. Anderson,
Attorney.

UNITED STATES PATENT OFFICE.

THOMAS B. SWAN, OF MECHANICS FALLS, MAINE.

IMPROVEMENT IN DOUBLE-ACTING PUMPS.

Specification forming part of Letters Patent No. **192,028**, dated June 12, 1877; application filed May 19, 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 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 side view of my improved pump. Fig. 2 is a vertical central section thereof, and Fig. 3 is a top view of the piston-cylinder with the hollow rod in section.

This invention has relation to improvements in pumps.

The object of the invention is to provide a pump of economical construction that will deliver to its spout a constant and forcible stream of water.

The nature of my invention consists in the combination, with a pump-cylinder having a valve opening upward at its lower end and a piston working therein, of a hollow piston-rod extending through the said piston, and having a valve opening upward at its upper end, a supplemental pipe or conduit communicating at its lower end with the feed or suction tube, and with the pump-cylinder at its upper end, and a pump-barrel communicating with the cylinder by means of a valve opening upward, whereby the desired result is attained, as will be hereinafter more fully set forth and claimed.

In the annexed drawings, the letter A designates a cast-metal cylinder, having at its lower end a base-flange, B, by means of which it is secured to the cover of a well or cistern. This cylinder has at one or both sides, separate from its bore, a conduit, *a*, extending from end to end thereof, and communicating by means of an elbow, *a'*, with the feed or suction pipe B'. This latter extends down into the water of the well, and opens at its upper end into the cylinder aforesaid, where it is closed by a valve, *i*, opening upward. The elbow *a'* aforesaid connects with the tube B' below the valve *i*, and the upper end of the conduit *a* opens into the pump-cylinder above the highest point of upward stroke of the piston C by means of an upwardly-opening valve, i^1. In practice, the pump-cylinder, the conduit *a*, and its elbow opening into the suction-tube will be cast in one piece, and may be included in the wall and bottom of said cylinder. The piston C works in the customary manner in the pump-cylinder, and has a hollow piston-rod, D, provided at its upper end with an upwardly-opening valve, i^2, that extends through a diaphragm, E, rigidly, but removably secured by means of suitable rods, F, to the pump-cylinder. This diaphragm is provided with a valve, i^3, opening upward, and is rigidly secured to or forms a component part of the pump-barrel F'. This latter is provided with a discharge-spout, G, and a pump-lever, G', the latter being connected with the piston-rod aforesaid by connecting-rods H. The diaphragm E forms an air-tight joint with both the pump-cylinder and barrel, and the piston-rod extends through a stuffing-box or other equivalent device formed thereon, by means of which it is made to form a like joint therewith.

When the handle is raised the piston is thrust down into the barrel or cylinder A, and the water contained therein, the valve *i* being closed, is forced up through the hollow rod D and its valve i^2 into the barrel F, whence it is discharged through spout G. At the same time and through the same movement, the valve i^1 of conduit *a* being open and that, i^3, of the diaphragm being closed, a partial vacuum will be created, and the water will rush up the feed-pipe through conduit *a* and its valve into the space above the piston to fill said vacuum. If, now, the handle be thrust down, the valve i^1 of the conduit will be closed, that of the diaphragm and that at the lower end of the cylinder opened, and, the piston being raised, the water will be forced into the pump-barrel, whence it will be delivered through the spout. At the same time, a partial vacuum being created below the piston, water will rush up through the pipe B and its valve *i* to fill the same, and upon reversing the movement of the handle will be delivered into the pump-barrel. By this means, as the piston is actu-

ated a double action is produced, and water will be delivered in a continuous forcible stream from the spout.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a pump, the combination, with a cylinder A and its piston C, of the hollow rod D extending through said piston and the valve i^2 closing its upper end, substantially as specified.

2. The combination, with the cylinder A having valve *i* at its lower end, and the piston C having a hollow rod closed at its upper end by a valve, i^2, of the supplemental conduit *a*, opening at its lower end into the feed-pipe below its valve *i*, and communicating by means of a valve, i^1, with the cylinder at its upper end, and the pump-barrel F′ having valve i^3, substantially as specified.

3. The combination, with the barrel F′ having valve i^3, and the cylinder having valve *i*, of the piston having hollow rod D with valve i^2, and the supplemental conduit *a* having valve i^1 and opening into the feed-pipe, 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:
WILLIAM WHITNEY,
E. ADRON GAMMON.