J. F. HESS.
Pump.

No. 210,122. Patented Nov. 19, 1878.

Fig. 1.

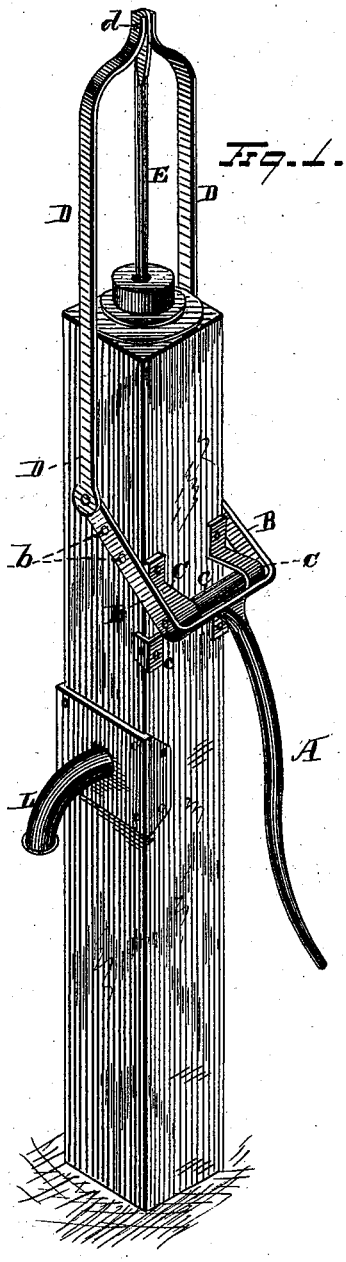
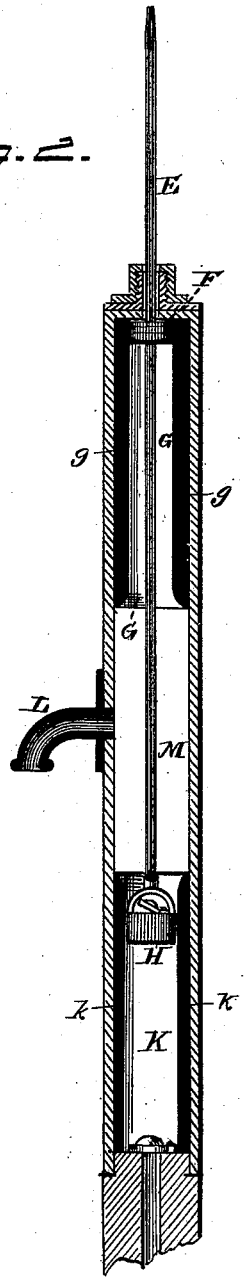


Fig. 2.



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UNITED STATES PATENT OFFICE.

JACOB F. HESS, OF MASSILLON, OHIO.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **210,122**, dated November 19, 1878; application filed June 26, 1878.

To all whom it may concern:

Be it known that I, JACOB F. HESS, of Massillon, in the county of Stark and State of Ohio, have invented certain new and useful Improvements in Pumps; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to certain improvements in that class of pumps which operate as a combined force and lift pump; and it consists in a construction as follows:

The handle is pivoted to the pump, and formed with arms, which, respectively, embrace opposite sides of the latter. These arms are each provided with a graded series of holes at their free extremities, by which the two rods which vertically depend from their pivotal engagement with the plunger-rod are adjustably connected with said handle-arms. The plunger-rod has a straight vertically-reciprocating movement, and is provided with both an upper and a lower plunger, which work respectively in chambers formed above and below the discharge-spout, said chambers being provided with bushings or packings, and of less diameter than the central portion of the pump-cylinder.

The discharge-spout is of such size relative to the pump-bore that the full volume of water drawn therein cannot be emptied by said spout, and hence the upper solid plunger acts as a force-pump, while the lower valve-plunger serves as an ordinary lift-pump.

In the drawings, Figure 1 is a view of my improvement as applied to a pump. Fig. 2 is a vertical sectional view of pump-cylinder.

The handle A is formed with the two arms B, which are secured by horizontal pivotal connection *c* with the braces C, by which latter they are fastened to the side of the pump. These arms embrace, respectively, opposite sides of the pump-casing, and are each provided with a graded series of holes, *b*, by which adjustable connection may be had with the two rods D, which vertically depend from their pivotal engagement *d* with the top of the plunger-rod E. By this means a long stroke of the plunger-rod with its two pistons is obtained, while the sweep or leverage of the handle is comparatively small. In this manner also the stroke of the plunger-rod may be changed in adjustment as desired, without varying the stroke of the actuating-handle; and the connection of the vertically-depending rods is such that the plunger-rod has a vertically-straight reciprocating movement.

The solid plunger F, which works in the chamber G, acts as a force-pump, as stated, while the valve-plunger H, which works in chamber K, serves the usual function of a lift-pump, the discharge-spout L being of capacity such as to be unable to carry off the water as fast as the same is drawn up through the bore of the pump-stock.

Both the plunger-chambers are, respectively, provided with bushing or packing *g* and *k*, made independent of and readily removable from the pump-cylinders, so that the same may be replaced as the old bushing or packing becomes worn and inoperative. These plunger-chambers are of unequal diameter relative to each other, and both of less diameter than the central portion M of the pump-cylinder, and during the operation of the pump the said central portion M is kept constantly filled with water at a pressure which causes the discharge-spout to empty with a constant stream.

At the commencement of the operation the upper plunger-chamber is filled with air, which becomes compressed between said solid plunger and the volume of water which passes up into said chamber. This compressed air acts as an elastic cushion upon the water, and tends to maintain the discharge even and steady.

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

1. The combination, with the plunger-rod and the two vertically-depending connections, of the handle formed with arms which are pivoted to the pump-cylinder, and embrace opposite sides of the latter, said arms having a graded series of holes for adjustable engagement with the connecting-rods, substantially as set forth.

2. The combination, with upper and lower cylinders, G and K, provided with packing *g* and *k*, and their respective plungers F and H, secured to a single plunger-rod, of cylinder M, formed in vertical line between the said plunger-cylinders and final discharge-spout L, directly communicating with the same, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 22d day of June, 1878.

JACOB F. HESS.

Witnesses:
A. G. SIBILA,
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