G. G. HARTWICK & E. MARX.

Double-Acting Submerged Pump.

No. 160,096. Patented Feb. 23, 1875.

FIG. 3.

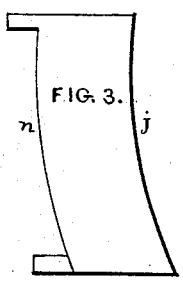


FIG. 4.

FIG. 1.

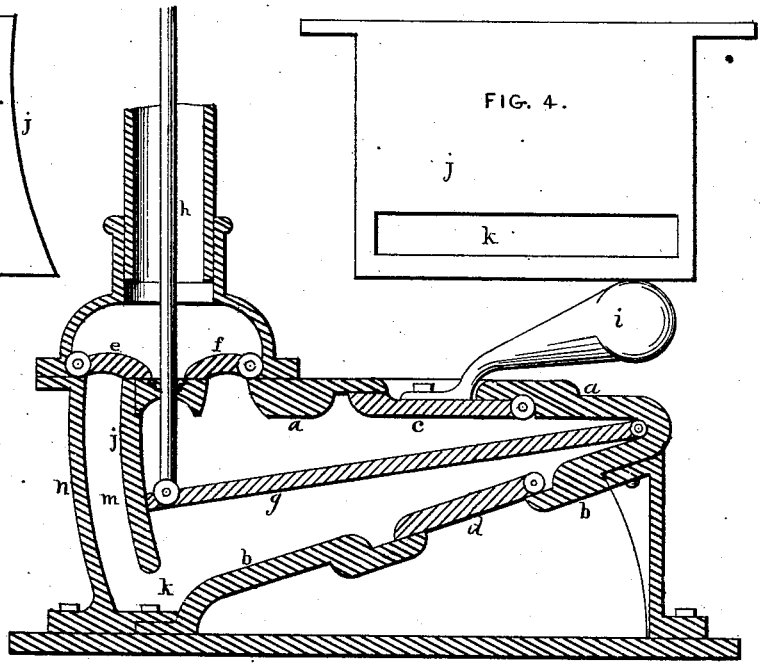
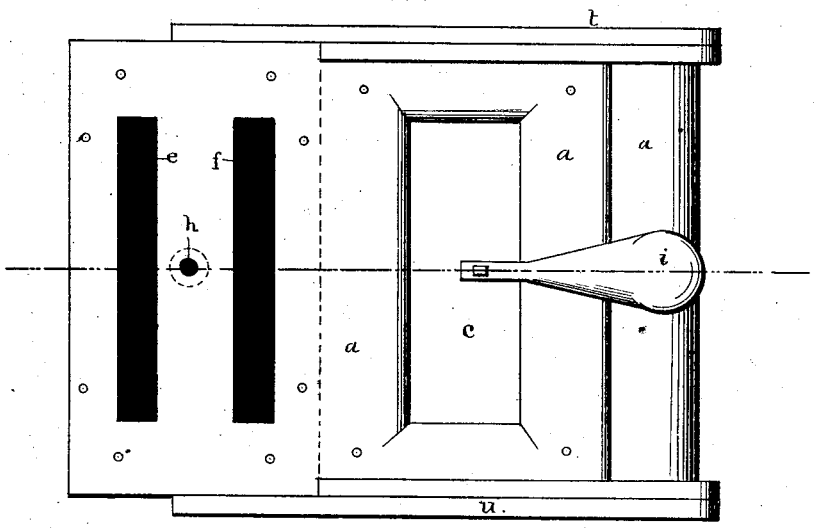


FIG. 2.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE G. HARTWICK, OF JERSEY CITY, NEW JERSEY, AND ERNEST MARX, OF NEW YORK, N. Y.

IMPROVEMENT IN DOUBLE-ACTING SUBMERGED PUMPS.

Specification forming part of Letters Patent No. **160,096**, dated February 23, 1875; application filed July 11, 1874.

To all whom it may concern:

Be it known that we, GEORGE G. HARTWICK, of Jersey City, in the State of New Jersey, and ERNEST MARX, of the city of New York, N. Y., have invented certain Improvements in the Construction of Pumps, of which the following is a specification:

The improvements relate to submerged double-action pumps, as when the areas of openings of ingress, egress, passage and delivery are unobstructedly the same, and the friction of the moving parts is at its minimum, the maximum of delivery of quantity with the least waste in expenditure of force is reached, in so far as pumps are concerned. Our object in our improvements as shown and described has been approximation to those indispensable conditions and desired results.

In the accompanying drawings, Figure 1 is a vertical section of the pump, and Fig. 2 is a top view, the dots indicating the line of section shown in Fig. 1. The top is shown with the dome and delivering-pipe removed. Fig. 3 is an outside end view of a chambered head-piece, and Fig. 4 is an inside face view of the same.

The top *a* of the pump is horizontal; the bottom *b* is at an angle of twenty degrees, more or less; the outer end is the channeled head-piece, Figs. 3 and 4; the side plates *t* and *u* are plane surfaces, these parts being united by suitable flanges and bolts. *c* and *d* are inlet-valves. *e* and *f* are outlets. The upper inlet-valve *c*, opening downward, has a counter-balance, *i*, to keep it closed. A piston-valve, *g*, is hinged in the acute end of the angular box or case, to which a vertical reciprocating motion is given by the connecting-rod *h*. The inner front *j* of the head-piece, Figs. 3 and 4, is an arc of a circle having the same center as the piston-valve *g*. At the lower end of the inner front *j* there is an opening, *k*, into the channel *m*, between the inner front *j* and the outer front *n*, leading to the outlet-valve *e*.

Having thus succinctly described construction and arrangement of the parts, what we claim as our improvement is—

In combination with the angular box or case *a b t u*, the channeled head-piece, Figs. 3 and 4, and the piston-valve *g*, substantially as described, and for the purposes set forth.

GEORGE G. HARTWICK.
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