

J. R. Mills,

Double Acting Pump.

N^o 36,665.

Patented Oct. 14, 1862.

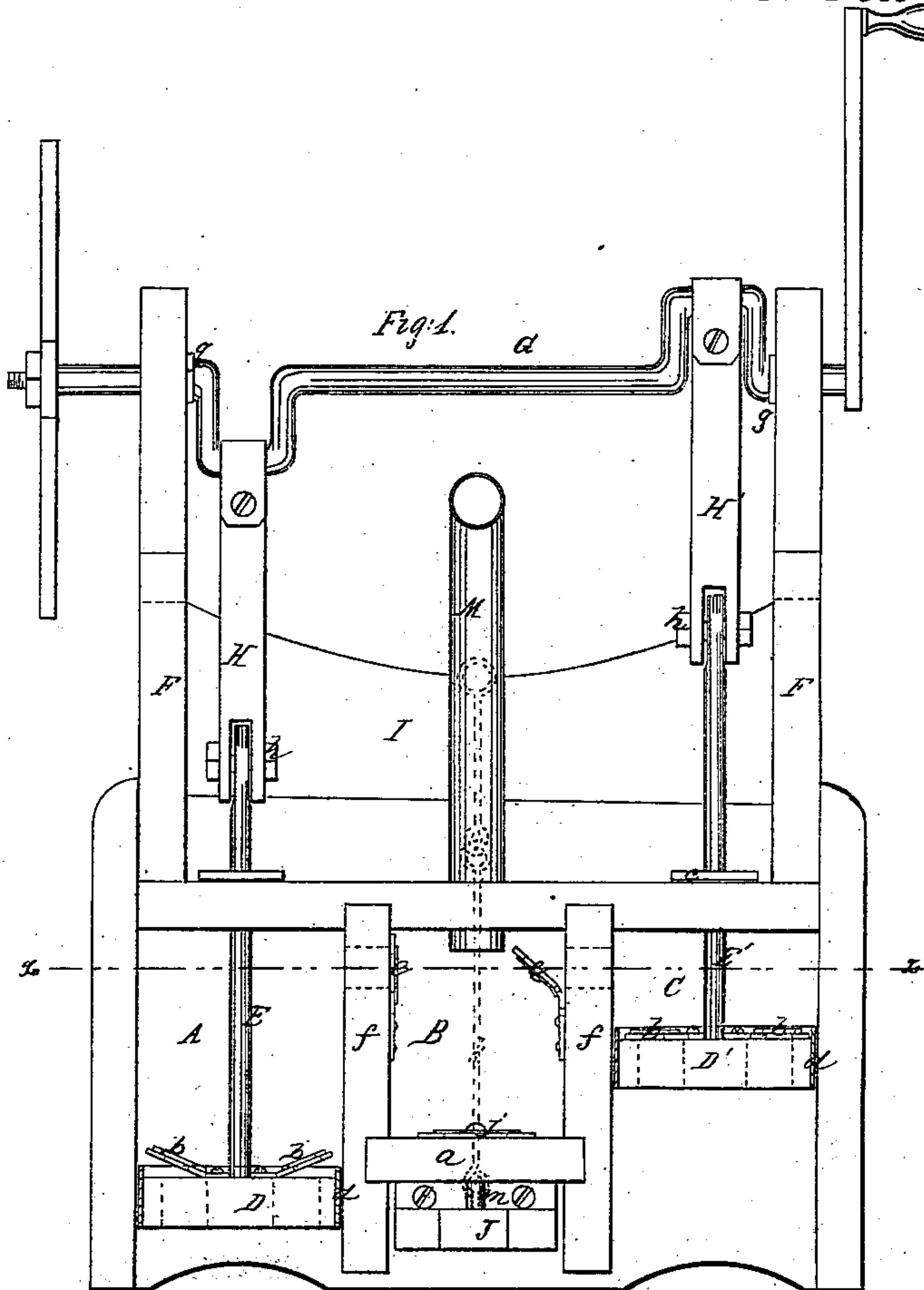
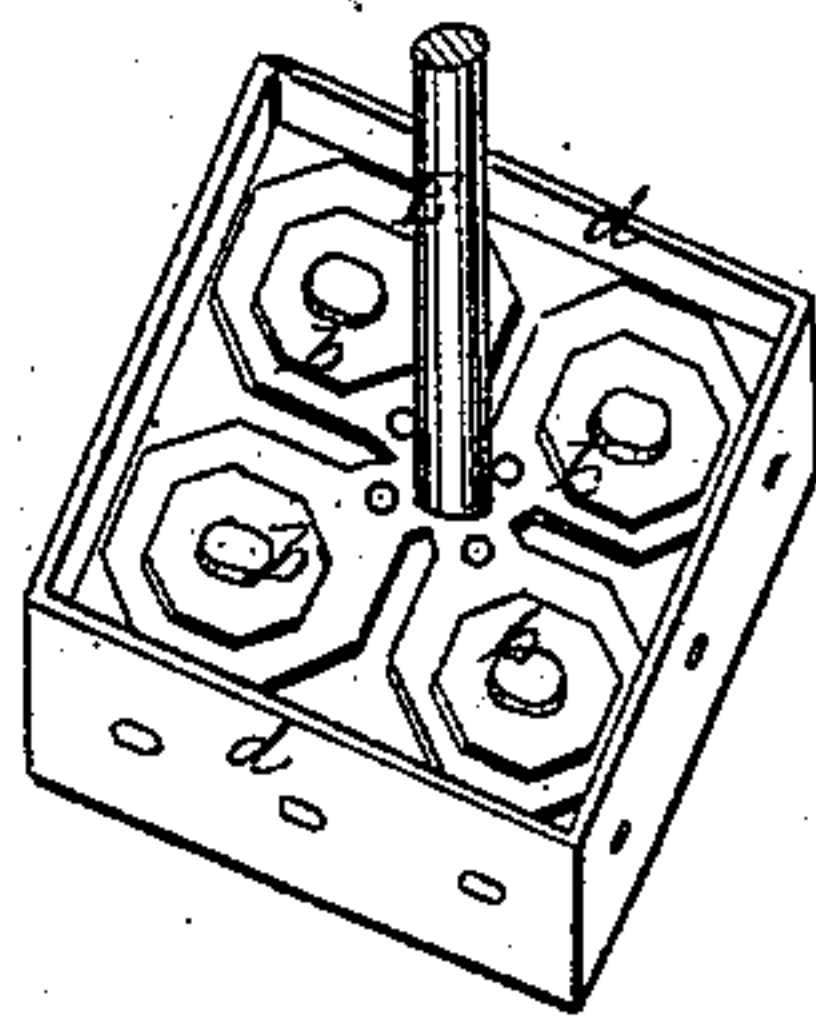
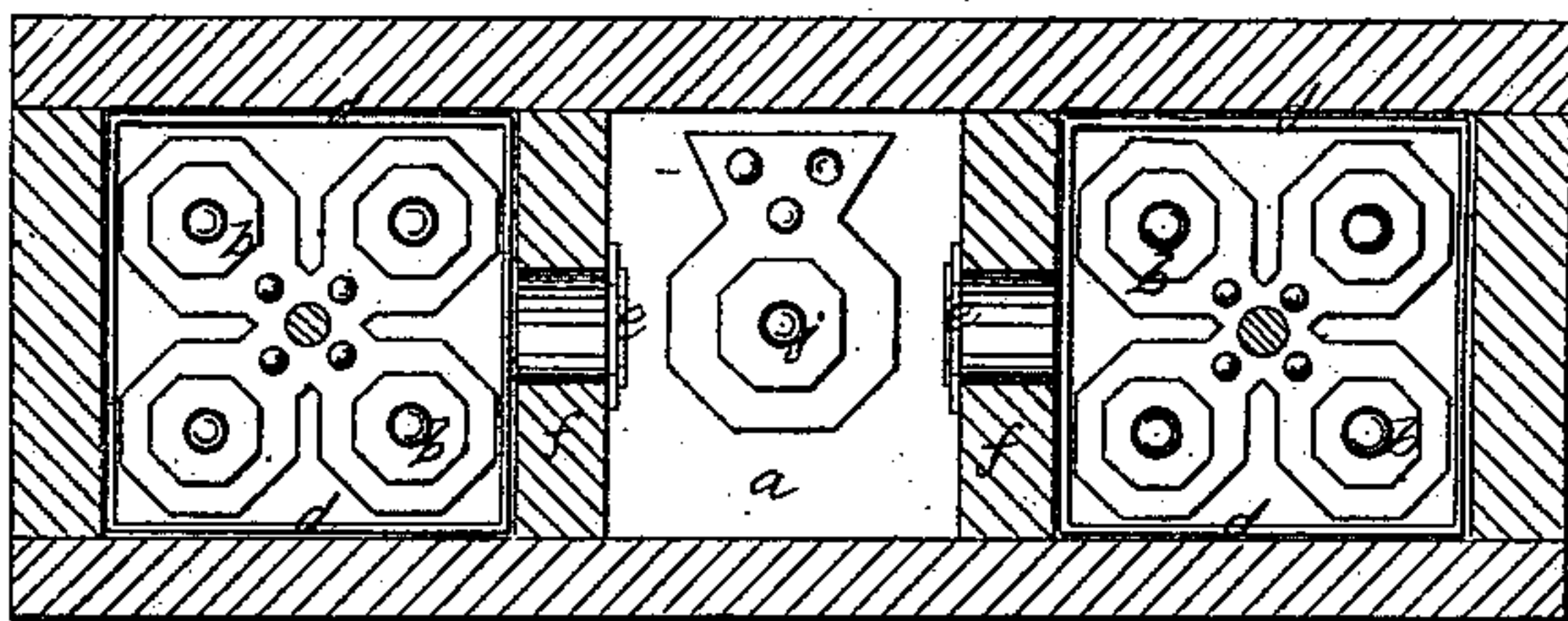


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

JAMES R. MILLS, OF BLOOMFIELD, IOWA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. 36,665, dated October 14, 1862.

To all whom it may concern:

Be it known that I, JAMES R. MILLS, of Bloomfield, in the county of Davis and State of Iowa, have invented a new and Improved Pump; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front elevation of a pump embodying my invention, the front side being removed to show the interior. Fig. 2 is a horizontal section of the same in the line *x x* of Fig. 1.

Similar letters of reference indicate corresponding parts in the two figures.

This invention relates to that class of pumps which are known as "lifting-pumps," and which are used principally for raising water from wells, cisterns, &c.; and it consists, first, in an arrangement for packing the plungers by means of the action of water resting upon them acting upon flexible rims, and, secondly, in a device for returning the water remaining in the discharge-pipe after every operation of the pump into the well or cistern, and thus prevent its freezing up and obstructing the pump in cold weather, all as will be hereinafter fully explained.

To enable others skilled in the art to fully understand my invention, I will proceed to describe its construction and operation.

A B C represent three compartments or chambers of a strong wooden box, which may be constructed in any of the usual modes of joinery. This box, which is open on its under side, is designed to be partially submerged in the well or cistern and supported on suitable masonry; or, if the water in the well be shallow, the box may rest on the bottom. The lower edges of the box, being in arched form, allow the water to pass under them and to rise in the chambers A and C to its level on the outside thereof. The water is prevented from ascending in the middle chamber, B, above a certain level by a partition, *a*, which forms the seat of a valve, hereinafter to be explained.

Fitted to work up and down within the chambers A and C are plungers D and D', respectively. These plungers have each four holes made through them, (shown by dotted lines in Fig. 1,) and an equal number of valves,

b, attached to them on their upper side and covering the said openings. The valves *b* are each formed of a strip of leather, with a metal plate of little larger diameter than the holes attached to its upper side. The plungers D and D' are attached to the lower end of rods E and E', which play up and down through an opening in the top of the box, each of said openings being made fluid-tight by a packing of any suitable fibrous material, which is clamped between a metal plate, *c*, and the top of the box by two screws, which pass through the said plate and fibrous material into the box. The plungers E and E' are each encompassed on their outer edges by a strip of leather, *d*, which may be attached to them in any suitable manner. The upper edges of these strips extend above the upper surface of the plungers and form thereon a flexible rim, which as the plungers ascend in their respective chambers is pressed outward by the weight and elasticity of water upon them, and thereby made to form a close-fitting joint between the plunger and its chamber.

On the inside of the chamber B, and near the top thereof, are two valves, *e e*, which are attached, respectively, to the inner sides of the partitions *f f'*, and cover openings passing transversely through them. These openings form the communication between the chambers A and C and discharge-pipe M, which latter at its lower end opens into the chamber B, and, extending upward to a suitable height above the surface of the ground, terminates in a nozzle.

In Fig. 1, I represents a curb, which is simply a rectangular box provided on two opposite sides with uprights F F', into the upper ends of which a double-crank axle, G, is fitted to revolve in suitable bearings. This axle G is prevented from longitudinal movement in its boxes by collars *g g*, which are formed on the axle and work against the inner sides of the boxes. One end of the axle G terminates in a winch, and the other has a lever secured on it, which enable a person to operate the pump by means of either winch or lever. The upper ends of the plunger-rods E and E' are attached by bolts *h* and *h'* to rods H and H', which connect the plungers, respectively, to the offsets of the crank-axle.

The curb I in the accompanying illustra-

tions is shown resting on top of the chambered box. In practice, however, this would only be the case when the well or cistern in which the pump is placed is so shallow as not to allow the box to sink below the surface of the ground.

In deep wells the curb rests on the surface of the ground, and is only connected to the parts submerged by the rods *H* and *H'*, which connect the plungers *D* and *D'* to the double crank-axle *G*.

The valve *j*, which is constructed precisely the same as the valve before described, is attached to the upper side of the partition *a*, so as to cover the opening (shown in dotted lines) formed therein.

J is a lever or bridge-tree, which is attached at its back end by a hinge-joint to the inner back side of the chamber-box, and at its front end is suspended by a chain or rod, *k*, from a hook on the curb above the ground. A projection, *m*, is formed on the upper side of the bridge-tree immediately under the opening in the partition. By raising the front end of the bridge-tree by means of the chain or rod, the projection, coming in contact with the valve, lifts it from its seat, and allows the water remaining in the chamber after pumping to return into the well, and thereby prevents it freezing up in the pump in cold weather. As the crank-axle is revolved the plungers are

alternately moved up and down. The valves of the descending plunger, as it passes down in the water, are opened by the partial vacuum which is created behind it in its chamber. At the same time the valve covering the opening between the same chamber and the middle chamber is closed by the same means. The water continues to rush into the chamber above the plunger until the plunger has reached its lowest point, when immediately upon its commencing to ascend its valves are closed by their gravity and the weight of water upon them, and simultaneously therewith the exit-valve is opened by the rush of water through the opening into the middle chamber. The water, after the middle chamber is filled, is forced upward in the pipe *M* and discharged at its upper end.

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

The valve *j*, partition *a*, bridge-tree or lever *J*, projection *m*, and rod *k*, when combined and arranged to operate in the manner and for the purpose specified, and, in combination with the above, the piston-packing, constructed and operating substantially as described.

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Witnesses:

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