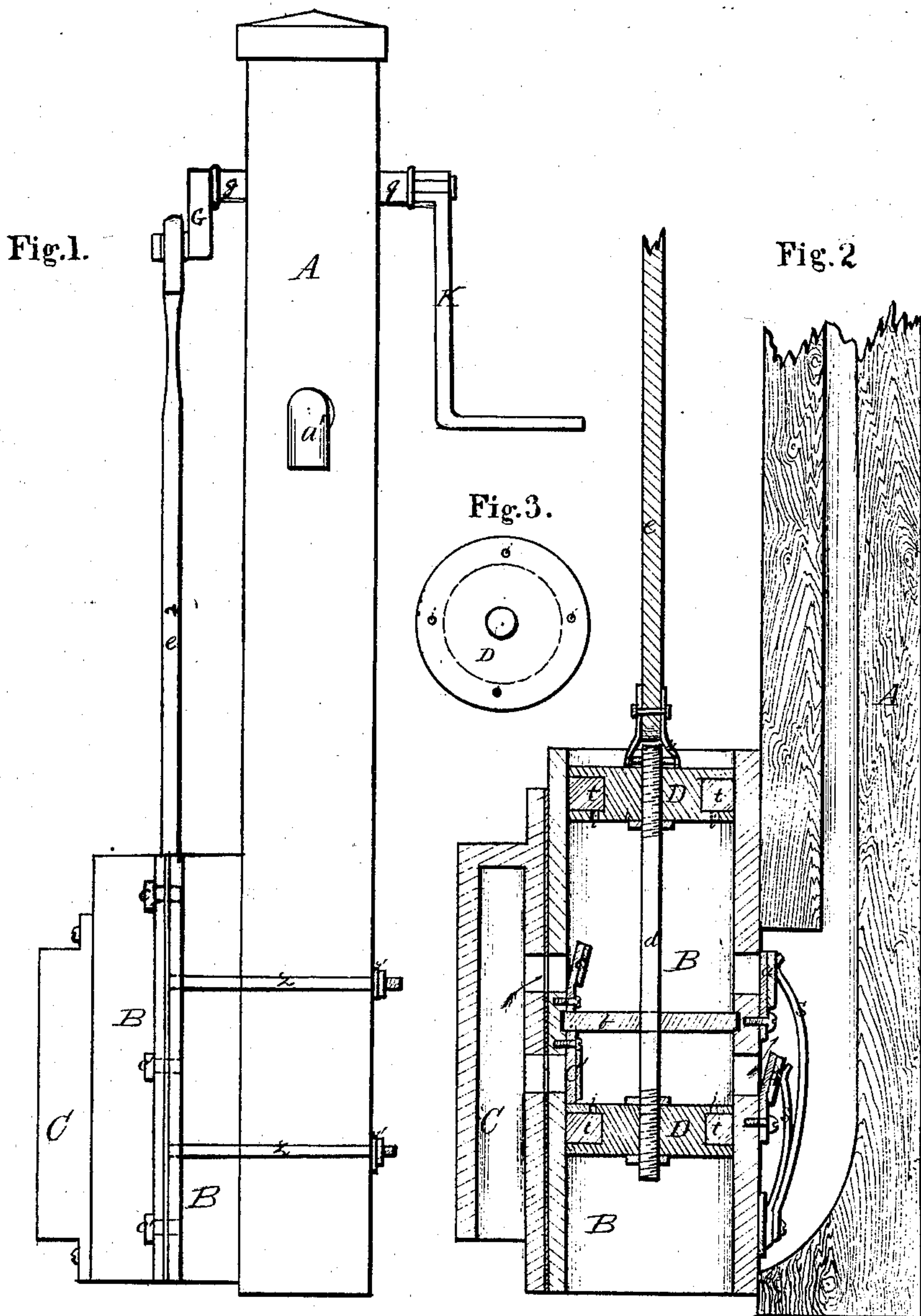


Beers & Raynor,

Force Pump.

No. 98734.

Patented Jan. 11. 1870.



Witnesses
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WILLIAM BEERS AND WILLIAM RAYNOR, OF MILAN, OHIO.

Letters Patent No. 98,734, dated January 11, 1870.

IMPROVEMENT IN FORCE-PUMPS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, WILLIAM BEERS and WILLIAM RAYNOR, of Milan, in the county of Erie, and State of Ohio, have invented a new and valuable Improvement in Double-Acting Force-Pumps; and we 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 side view of our invention.

Figure 2 is a central vertical section of the same.

Figure 3 is a representation of the inner surface of one of the plungers.

Our invention relates to force-pumps, and consists, mainly, in the construction and novel arrangement of devices, whereby a pump of this class is enabled to work in the shallowest water.

The letter A, of the drawings, designates the body of the pump, formed of wood or suitable metal, through which the water from the piston-cylinder B is forced, passing out at the spout *a'*.

To the lower part of this conduit A is firmly secured the cylinder B, by the bolts and nuts *z z* and clamps *z' z'*.

The cylinder B is formed in two sections, bolted together longitudinally by screws or bolts, as shown at *c' c'*, and the joints suitably packed.

To the outer section of cylinder B, or the section farthest from the conduit A, is fastened by screws, the conduit C, through which the water enters the pump. Both the cylinder B and conduit C, are generally made of metal.

The cylinder B is open at each end, and divided centrally by the disk *b* of iron, whose edge fits into a groove, *g*, formed in the wall of the cylinder, and suitably packed. Above this disk two openings are formed, through which the cylinder communicates, on one side with the conduit A, and on the other side with the conduit C.

To these openings are fitted the valves *a* and *c*, respectively arranged to admit water into the cylinder B from the conduit C, and to allow of its passage from the cylinder into the conduit A, but preventing a reverse movement.

Below the disk *b*, two similar valve-openings, *C'* and *A'*, are formed, establishing a like communication between the cylinder B and the conduits A and C.

D D designate the plungers or piston-heads, attached, one to each end of the piston-rod *d*, which passes through a nicely-fitting opening in the centre of the fixed disk *b*.

Each piston-head D is grooved around the edge deeply, and the groove packed with rubber packing *t*.

Four small openings, *i*, are made through the inner wall of each groove, forming a communication between the base of the groove and the cavity of the cylinder, in such a manner that a pressure on the water in the cavity of the cylinder will force it through these openings into the groove behind the rubber packing, thus causing it to fit more closely the wall of the cylinder.

To the staple *n*, fastened above the upper piston-head, to the end of the piston-rod, is pivoted the lower end of the pitman *e*, whose upper end is pivoted to the crank G, whose shaft, *g*, passes through the upper part of the body A of the pump, and is turned by means of the hand-crank K.

The springs *s s* are employed to assist in the closing of the valves *a* and *A'*, which are usually fastened at the lower sides of the openings in such a manner that they will open upward.

It is apparent, that if this pump be placed upright in water of sufficient depth to immerse the mouth or lower end of the conduit C, and the piston worked by turning the hand-crank K, as the plungers D D ascend, valves *a* and *C'* will be closed, valve *c* will be opened, and water will rush in to fill the partial vacuum formed above the disk *b*, while the valve *A'* will be opened by the pressure of the water as it is forced out of the compartment below the disk *b* by compression. In like manner, as the plungers D D descend, the valves *A'* and *c* will be closed, water will enter the lower compartment of the cylinder B through valve *C'*, and will be forced out through valve *a* by compression in the upper compartment.

When, as in case of a bored well, it is not convenient to introduce the pump-stock and cylinder, a pipe may be attached to the mouth of the conduit C, and communication thus established between the pump and the water. It will thus act as a suction-pump.

What we claim as our invention, and desire to secure by Letters Patent, is—

The force-pump, herein described, having stock A, cylinder B, open at both ends, descending conduit C, dividing-disk *b*, grooved plungers D D, with openings *i i*, and expansible packing *t t*, valves *a c A' C'*, when arranged as specified.

In testimony that we claim the above, we have hereunto subscribed our names, in the presence of two witnesses.

WILLIAM BEERS.
WILLIAM RAYNOR.

Witnesses:

HORACE STODDARD,
DARWIN FAY.