3 Sheets—Sheet 1.

# C. E. SMITH & L. KINGSBURY.

## PUMP.

No. 183,427. Patented Oct. 17, 1876.

*Fig. 1.*

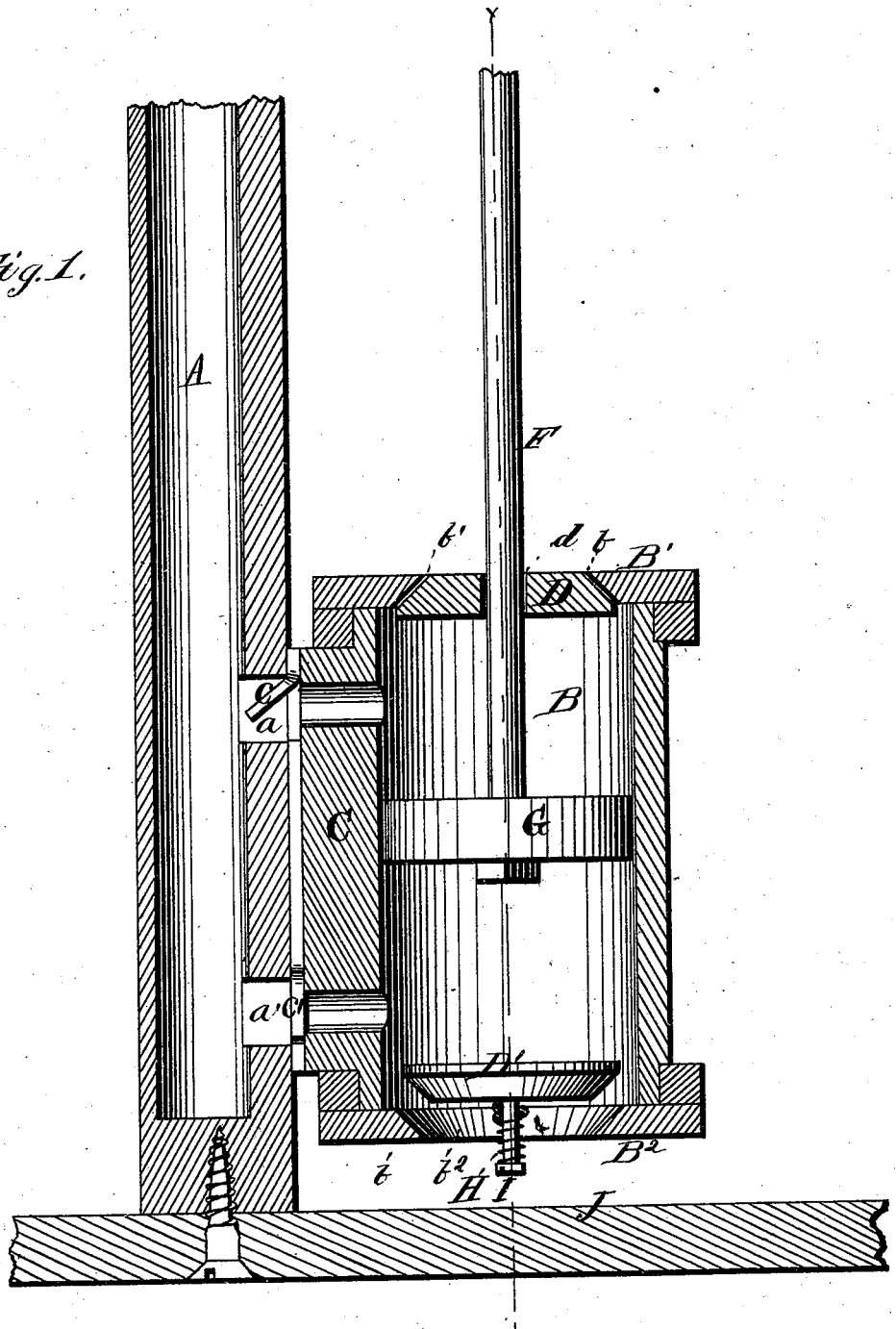


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Fig. 2.

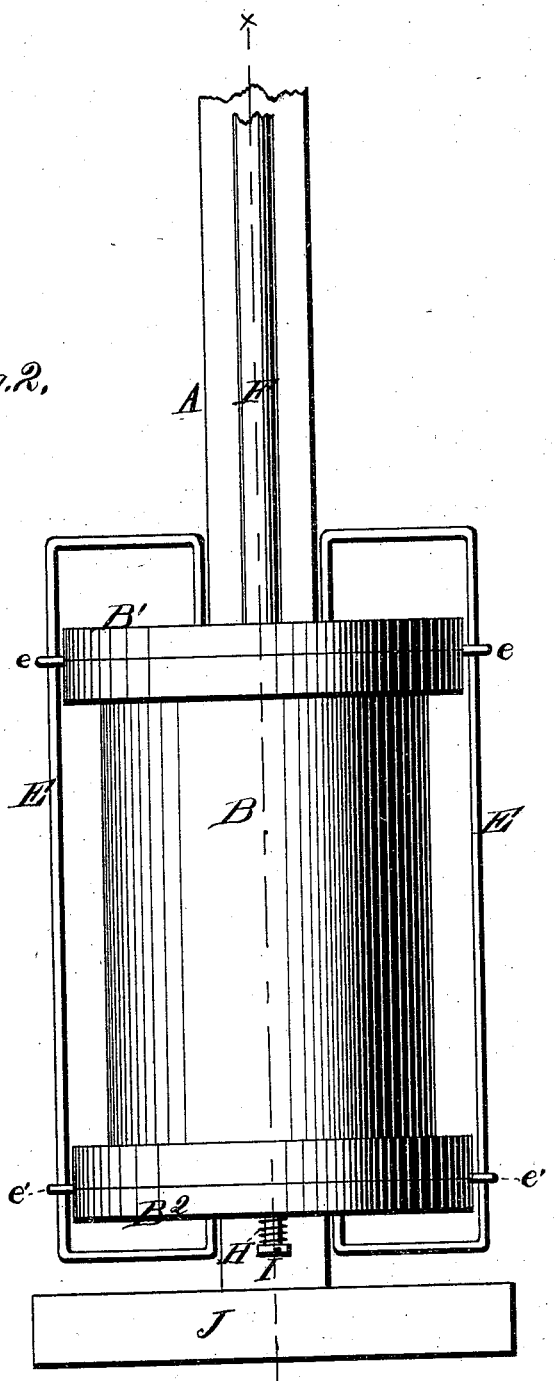


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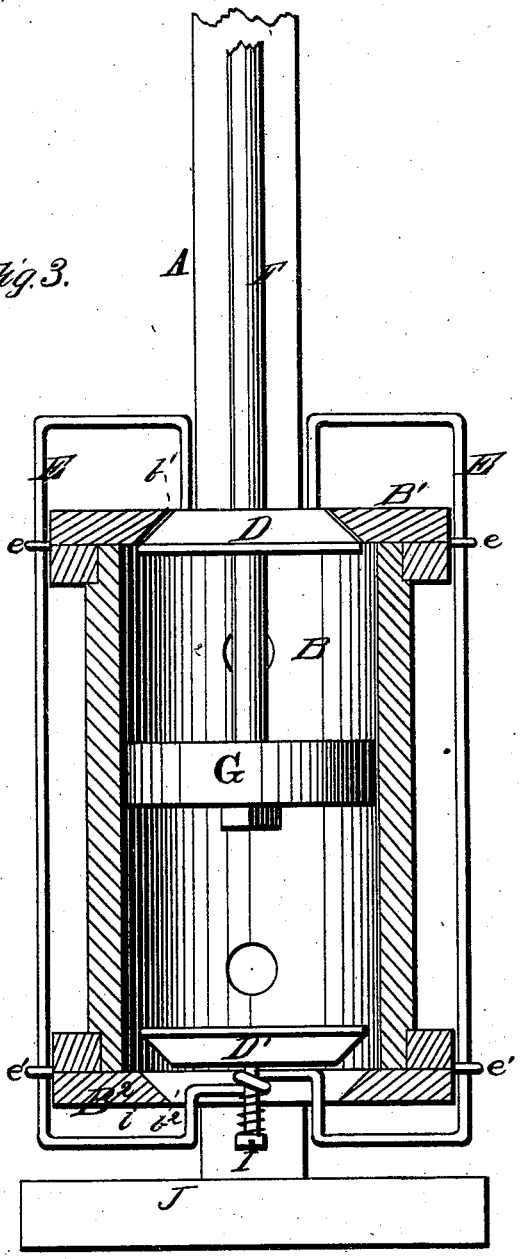
Fig. 3.

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# UNITED STATES PATENT OFFICE.

CLARENCE E. SMITH AND LEMUEL KINGSBURY, OF COUNCIL BLUFFS, IOWA; SAID KINGSBURY ASSIGNOR TO HENRY HOLLINGSWORTH, OF SAME PLACE.

## IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **183,427**, dated October 17, 1876; application filed September 9, 1876.

*To all whom it may concern:*

Be it known that we, C. E. SMITH and L. KINGSBURY, of Council Bluffs, in the county of Pottawattamie and State of Iowa, have invented a new and valuable Improvement in 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 representation of a central vertical sectional view of our pump, and Fig. 2 is a front elevation of the same. Fig. 3 is a sectional view taken through line Y Y of Fig. 1.

This invention relates to submerged double-acting force-pumps. The nature of said invention consists, mainly, in the combination, with a pump-cylinder, of two cone-seated valves, (one being at each end of said pump,) which are connected by a sliding frame so as to operate alternately, as hereinafter set forth.

In the annexed drawings, A designates a tube or pipe, communicating through exit-openings *a a'* with the interior of pump-cylinder B. Said cylinder is vertically arranged, and secured to the side of said tube by a suitable fastening-block, C, through which pass the said exit-openings. Upper exit-opening *a* is provided with an inwardly-closing valve, *c*, and lower exit-opening *a'* is provided with a similar inwardly-closing valve, *c'*. Pump-cylinder B is provided with two heads or end enlargements, $B^1$ $B^2$. Said heads are centrally perforated at $b^1$ $b^2$, the inner edges of said perforations being obliquely cut away, so as to form inwardly-flaring or conical valve-seats *b b*, for conical valves D D'. Said valves are connected together by a frame consisting of two bent rods, E E, the upright parts of which rods play vertically in eyes or staples *e e e' e'*, secured to cylinder-heads $B^1$ $B^2$ on opposite sides thereof.

A single rod may be substituted for the two above described, and connected with valve D by winding about rod I, attached thereto or otherwise.

Upper valve D is centrally perforated at *d*, so as to allow the vertical play of reciprocating piston-rod F, which carries a piston, G, that operates in the part of cylinder B which lies between upper exit-opening *a* and lower exit-opening *a'*. The induction is through the openings closed by valves D D'. The ejection is through the openings closed by valves *c c'*.

The operation of the device is as follows: Cylinder B being submerged, when piston-rod F and piston G are depressed, (as they may be by an ordinary pump-handle or any other suitable mechanism,) lower valve D' is forced down upon its seat, closing the lower induction of said cylinder, and the water between piston G and valve D' is forced outward through lower exit-opening *a'* into discharge-tube or pipe A, opening lower valve *c'* in its passage. At the same time, upper inlet-valve D is drawn down from its seat by the depression of lower inlet-valve D' and frame or bent rods E E, thus allowing the induction of water or other fluid through the upper induction-opening of said cylinder, while the upper exit-valve *c* is closed by the suction created by the depression of said piston. When said piston is raised, all these movements are reversed, the water being drawn in below and expelled above. In this case the opening of lower inlet-valve D' is facilitated by a coiled spring, H, around a rod, I, connected to said valve. Said spring bears at the bottom against a base-plate, J, which is secured to the closed bottom of pipe or tube A.

The various parts of this apparatus are preferably constructed of metal; but wood and various other materials may be substituted, if desired.

Frame E may be either constructed of two separate rods bent into the form shown, or it may consist of a single piece. Various other modifications may be made without departing from the spirit of our invention.

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

1. A pump-cylinder having a conical inlet-valve and valve-seat at each end, said valves being connected by a frame or rods, so as to act alternately, substantially as set forth.

2. The combination of tube A, cylinders B, inlet-valves D D, frame E, discharge-valves *c c'*, piston-rod F, and piston G, substantially as set forth.

3. The combination of cylinder B, valves D D and *c c'*, piston-rod F, piston G, frame E, and spring H, substantially as set forth.

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

CLARENCE E. SMITH.
LEMUEL KINGSBURY.

Witnesses:
FINLEY BURKE,
CLEMONS WESLEY.