(No Model.)

2 Sheets—Sheet 1.

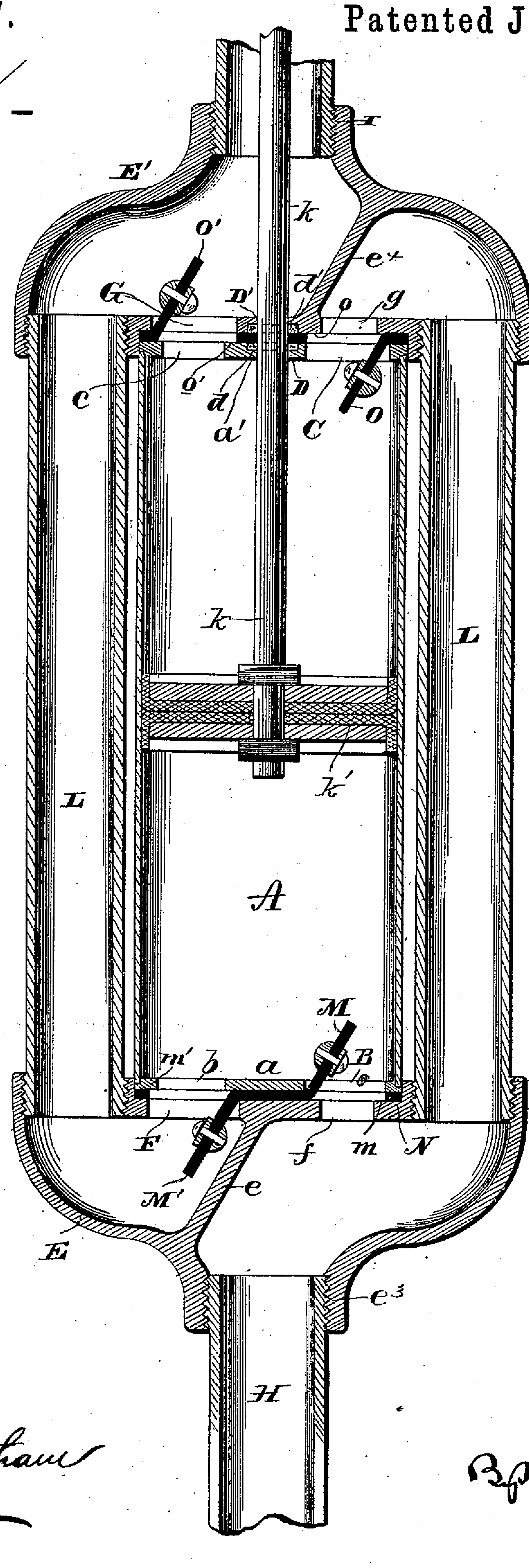
C. B. WYLIE.

DOUBLE ACTING PUMP.

No. 345,657.

Patented July 13, 1886.

Fig. 1.



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(No Model.)

2 Sheets—Sheet 2.

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DOUBLE ACTING PUMP.

No. 345,657. Patented July 13, 1886.

Fig. 2.

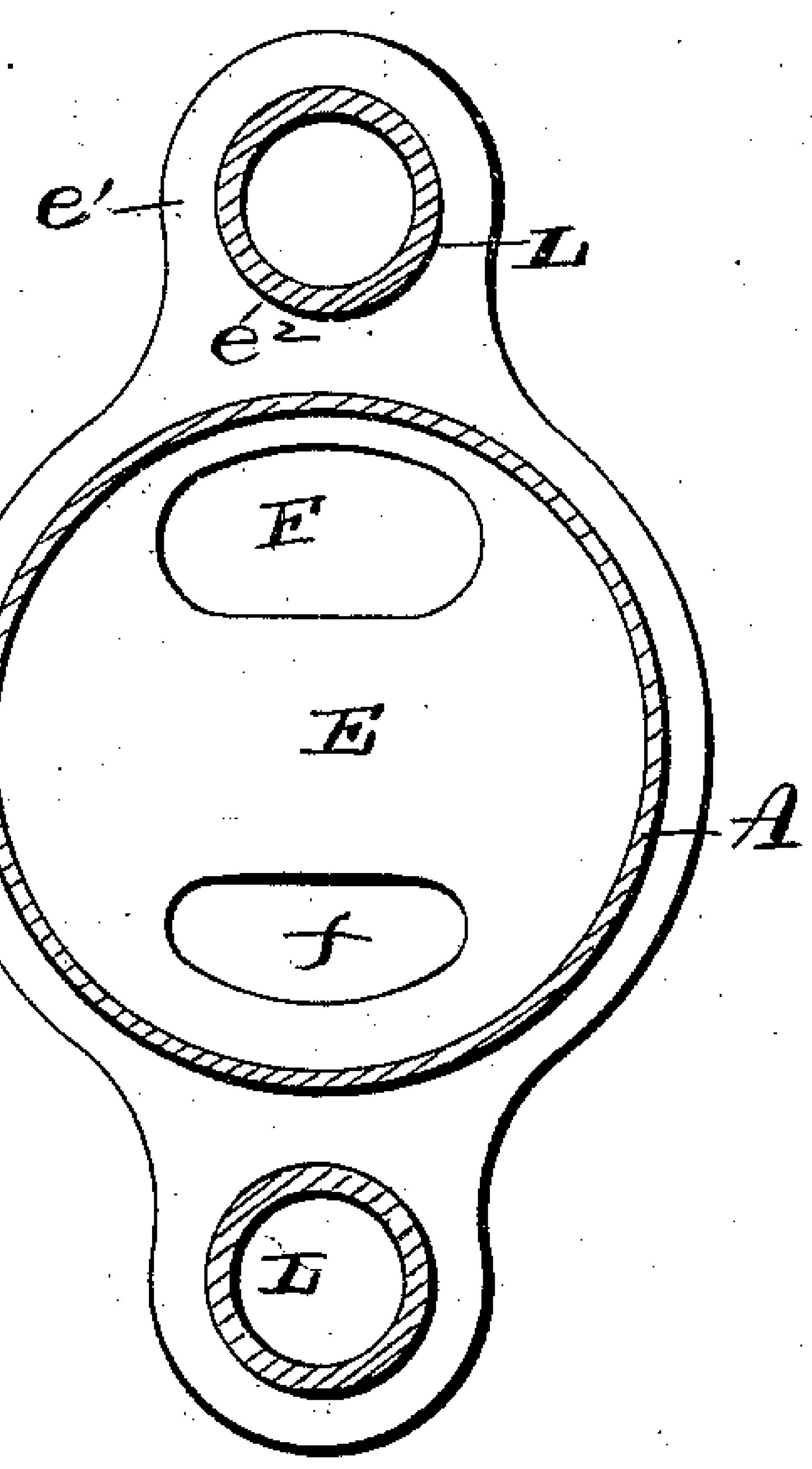


Fig. 4.

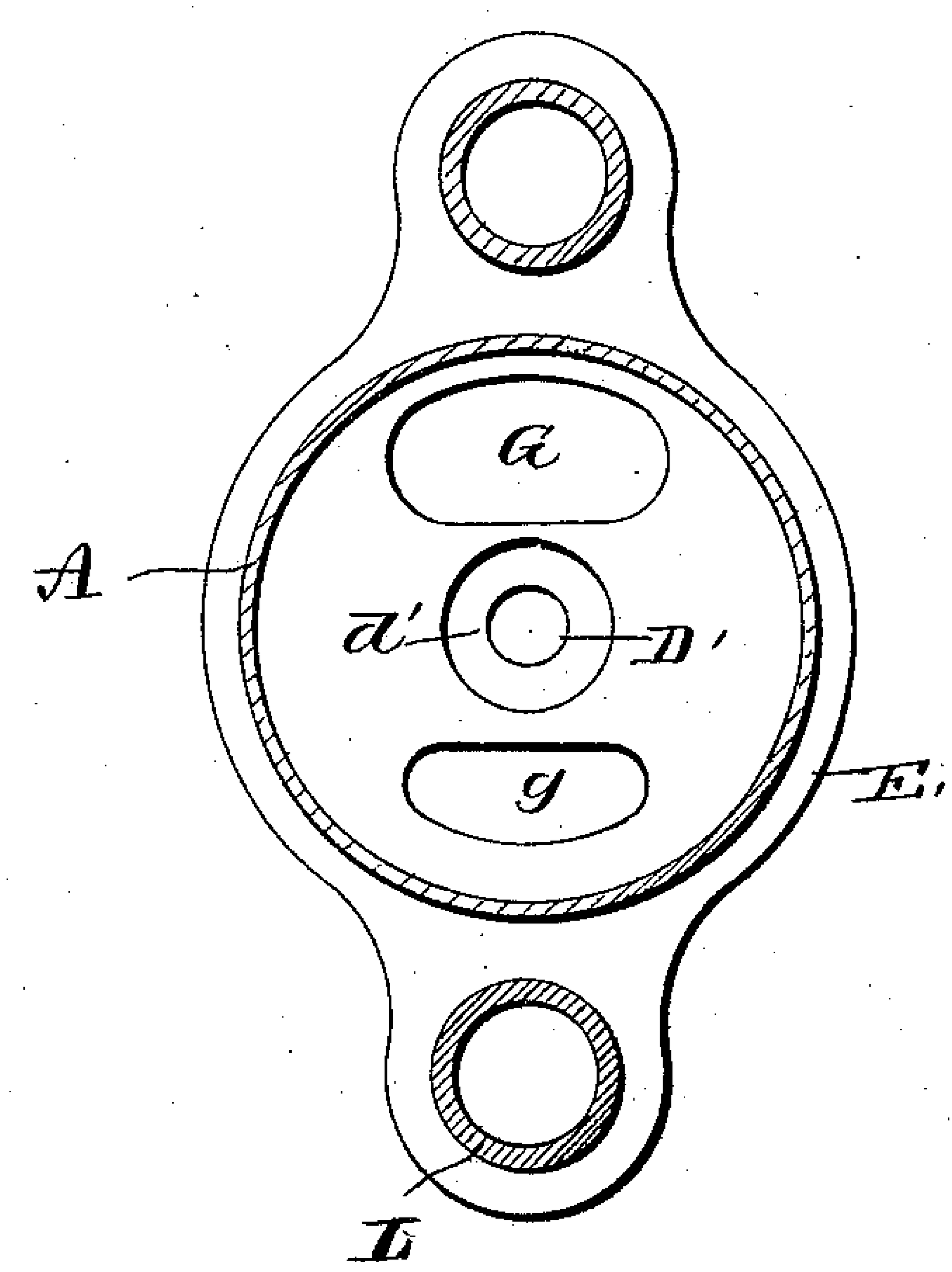
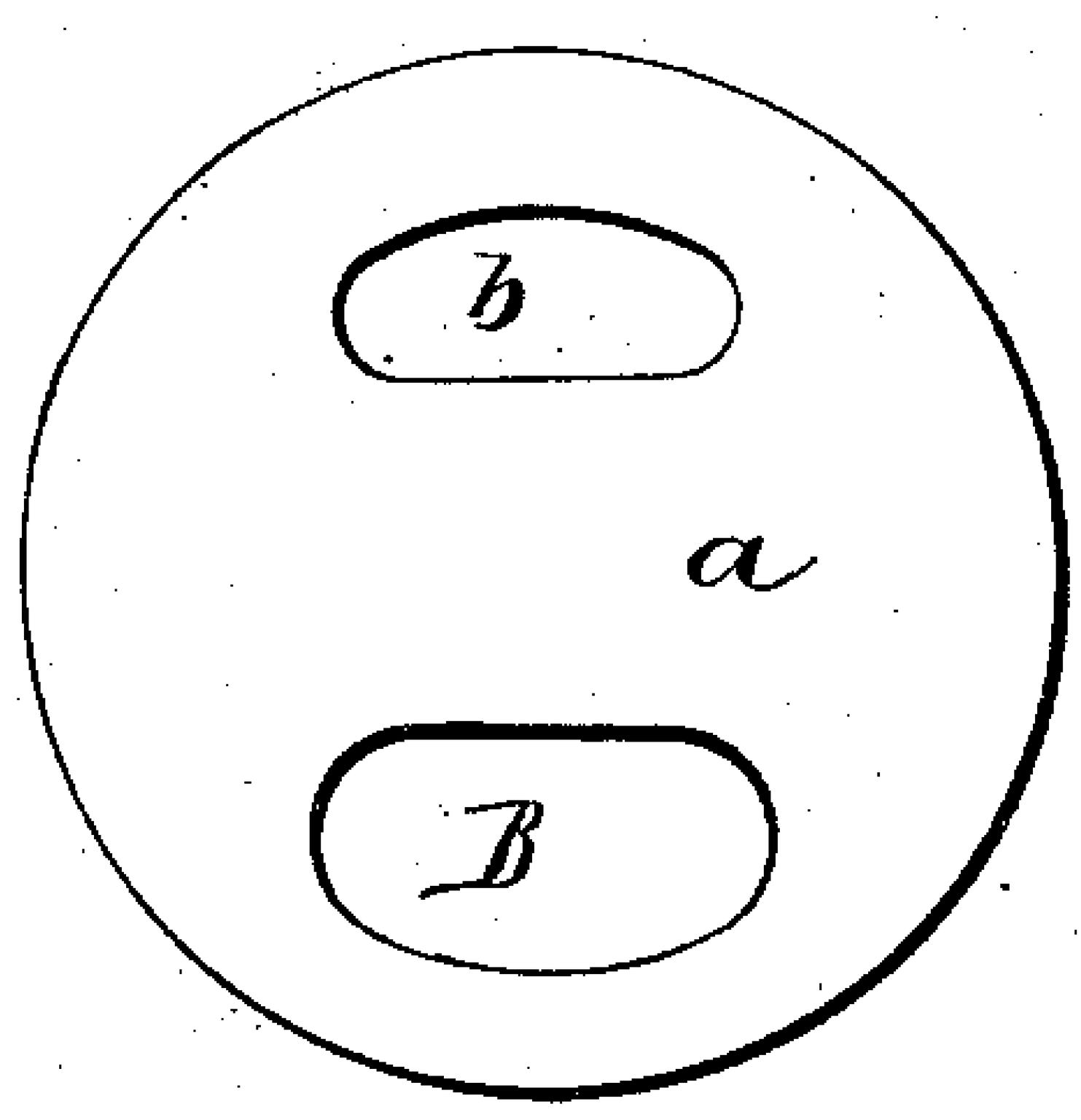


Fig. 3.



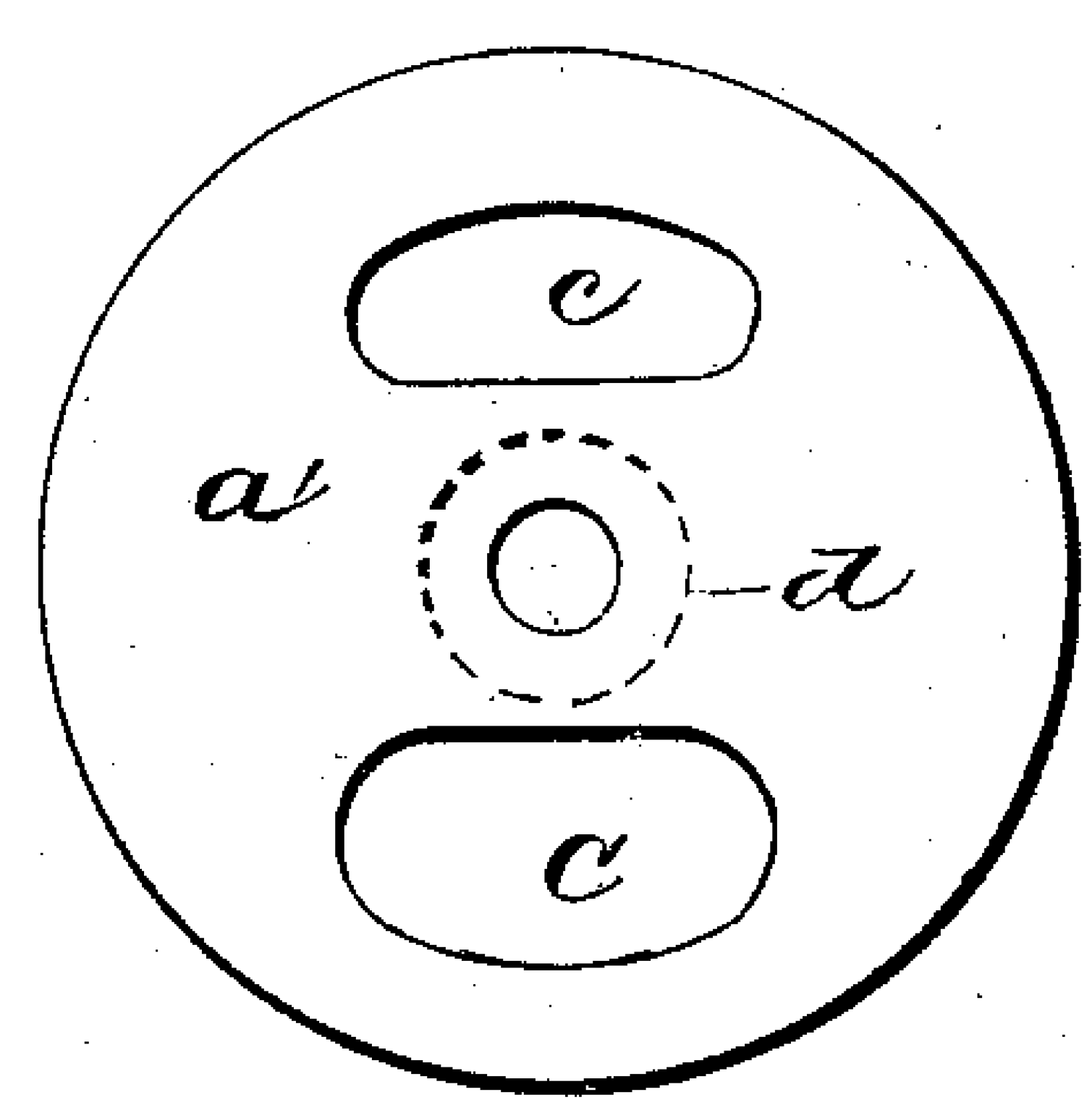


Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLIE B. WYLIE, OF PITTSBURG, PENNSYLVANIA.

DOUBLE-ACTING PUMP.

SPECIFICATION forming part of Letters Patent No. 345,657, dated July 13, 1886.

Application filed April 6, 1886. Serial No. 197,992. (No model.)

To all whom it may concern:

Be it known that I, CHARLIE B. WYLIE, of Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Double-Acting 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 appertains to make and use the same.

My invention relates to an improvement in double-acting pumps.

The object is to provide a simple and economical construction of cylinder tubes and valves, whereby a steady flow of water may be obtained.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a view of the pump in vertical longitudinal section. Figs. 2 and 3 represent, respectively, top plan views of the lower cap and lower head of the cylinder; and Figs. 4 and 5 represent, respectively, bottom plan views of the upper cap and upper head of the cylinder.

A represents the pump-cylinder, provided with a lower head, *a*, and an upper head, *a'*. In the lower head, *a*, are the lesser and greater valve-openings, *b* and B, and in the upper head, *a'*, are the lesser and greater valve-openings, *c* and C, and the central perforation, D, for the piston-rod.

E represents a hollow cap, the interior of which is separated into two compartments by a partition wall or web, *e*. The side of the cap E toward the end of the cylinder is flat and provided with valve-openings F and *f*, the larger of which, F, is adapted to center in a line with the lesser opening, *b*, in the lower cylinder-head, and the lesser of which, *f*, is adapted to center in a line with the greater opening, B, in the said cylinder-head. The side of the cap E away from the cylinder-head is preferably rounded, as shown, and the said cap is provided with wing-like extensions *e'*, projecting from opposite sides of its center, in the flat sides of which are formed the female-threaded openings e^2. The rounded side of the cap is provided at its central portion with a female-threaded opening, e^3, in which is secured the pipe H, leading to the water-supply.

The upper cap, E', is constructed in a manner quite similar to that just described with reference to the cap E, and has a partition wall or web, e^4, and greater and lesser openings, G *g*, having their centers on lines with the centers of the openings *c* and C, respectively, and has female-threaded openings in the flat faces of its extended wings, corresponding to the openings e^2 in the cap E. The central portion of the rounded side of the cap E' is also provided with a threaded perforation, I, in which is screwed the end of the delivery-pipe. The piston-rod *k* enters the cap E' within the delivery-tube, and extends through a central perforation, D', in the flat side of the cap, corresponding with the perforation D in the upper cylinder-head. The lower face of the cap E' and the upper face of the cylinder-head are recessed around the perforations D' D, as shown at *d d'*, to receive suitable packing.

The piston K consists of a pair of rigid plates, between which are secured a pair of flexible disks *k'*, their edges folding in opposite directions against the interior surface of the cylinder; or the piston may consist of any other well-known or approved construction.

The caps E E' are secured in contact with the ends of the cylinder by means of the side tubes, L, the ends of each of which are provided with male screw-threads cut right and left on the opposite ends, and adapted to register with the threads in the perforations e^2 e^5. The adjustment of the caps E E' to the cylinder also secures the valves in their positions.

The valves M M' at the lower end of the cylinder are conveniently formed of one piece of flexible material—tough leather, for example—the central portion of which is pressed between the central portions of the cap and cylinder-head, while the weighted ends, which form the valves proper, extend over the openings *b* and *f*, respectively, the part M' over the opening *b* being adapted to open downwardly and rest, when closed, on a shoulder, *m'*, formed by the projection of the cylinder-head *a* around the lesser opening, *b*, beyond the edge of the greater opening, F, in the cap E, and the part M being adapted to open upwardly and rest, when closed, on the shoulder

m. Packing N, the thickness of the valves M M′, is also inserted between the edge of the cylinder-head *a* and the cap E. The valves O O′, also conveniently formed of some flexible material, are secured between the edges of the upper cylinder-head and the cap E′, the valve O opening downwardly and resting, when closed, on the shoulder *o*, and the valve O′ opening upwardly and resting, when closed, on the shoulder *o*′. By turning the tubes L in the proper direction the caps E E′ may be drawn snugly into contact with the valves, packing, and cylinder-heads.

It will be observed that the opening of the valves and slant of the webs or partitions *e e*′ are such that the water flows with the least possible interruption from the tubes into the cylinder and from the cylinder into the tubes.

In Fig. 1 the piston is supposed to be on its upward stroke. The valves M′ and O are closed and the valves M and O′ open. The water flows from the supply through the openings *f* B into the cylinder beneath the piston, and the water above the piston is lifted up through the openings *c* G into the delivery-tube. When the piston begins its downward stroke, the valves will assume the positions shown in dotted lines. The valves M and O′ being closed and M′ and O being open, the water will now be drawn from the supply up through the tube L and down through the openings *g* C into the cylinder above the piston, and the water below the piston will be forced through the openings *b* F and up the tube L into the delivery-tube. Thus the flow of water continues during both the upward and downward strokes of the piston, the time required for changing the stroke from up to down being so short that it will produce little or no effect upon the uniformity of the stream.

The caps E E′ may be cast in one piece, and the cylinder-heads *a a*′, if made to rest on the ends of the cylinder and provided with an annular shoulder or lugs adapted to engage the interior surface of the cylinder, may be locked in their positions by the pressure of the caps E E′ thereon. The whole constitutes a simple and inexpensive pump, compact and effective.

It is evident that slight changes might be resorted to in the form and arrangement of the several parts described without departing from the spirit and scope of my invention; hence I do not wish to limit myself strictly to the construction herein set forth; but,

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

1. In a double-acting pump, the combination, with a cylinder having a pair of valve-openings in each of its heads, of a pair of double-chambered caps secured on the ends of the cylinder by means of a pair of side tubes, and valves adapted to open and close the openings in the cylinder-heads as the piston is reciprocated, substantially as set forth.

2. In a pump, the combination, with a cylinder having valve-openings in its heads, of a pair of double chambered end caps having valve-openings corresponding to the openings in the cylinder-heads, and a pair of side tubes having right and left male screw-threads on their opposite ends adapted to engage female threads in the caps and lock the caps on the heads of the cylinder, substantially as set forth.

3. In a pump, the combination, with a cylinder and cylinder-heads, the latter having openings therein, of the valves resting against the outer surfaces of the cylinder-heads, the chambered caps, and the tubes, the latter being secured directly to the caps, for locking the caps and valves to the cylinder, and also for forming direct passage ways between said caps, substantially as set forth.

4. In a pump, the combination, with a cylinder having a lesser and greater opening in each head, the valves, and the chambered caps, each having a greater and lesser opening, the greater and lesser openings in the caps being in a line with the lesser and greater openings in the cylinder-heads, thereby forming valve-seats, of valves and the side tubes connecting the caps and locking them in position on the cylinder, and also forming direct passage-ways between said caps, substantially as set forth.

5. In a pump, the combination, with the cylinder, of the double-chambered end caps, each consisting of a single casting, the right and left threaded connecting-tubes adapted to lock the caps to the cylinder, the supply and delivery pipes connected with the caps, and the piston and valves, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLIE B. WYLIE.

Witnesses:
WM. A. HOOK,
FREDRICK ALTENHAF.