(No Model.) 2 Sheets—Sheet 1.

# H. M. D. L. BABCOX.

## PUMP.

No. 284,708. Patented Sept. 11, 1883.

FIG. 1.

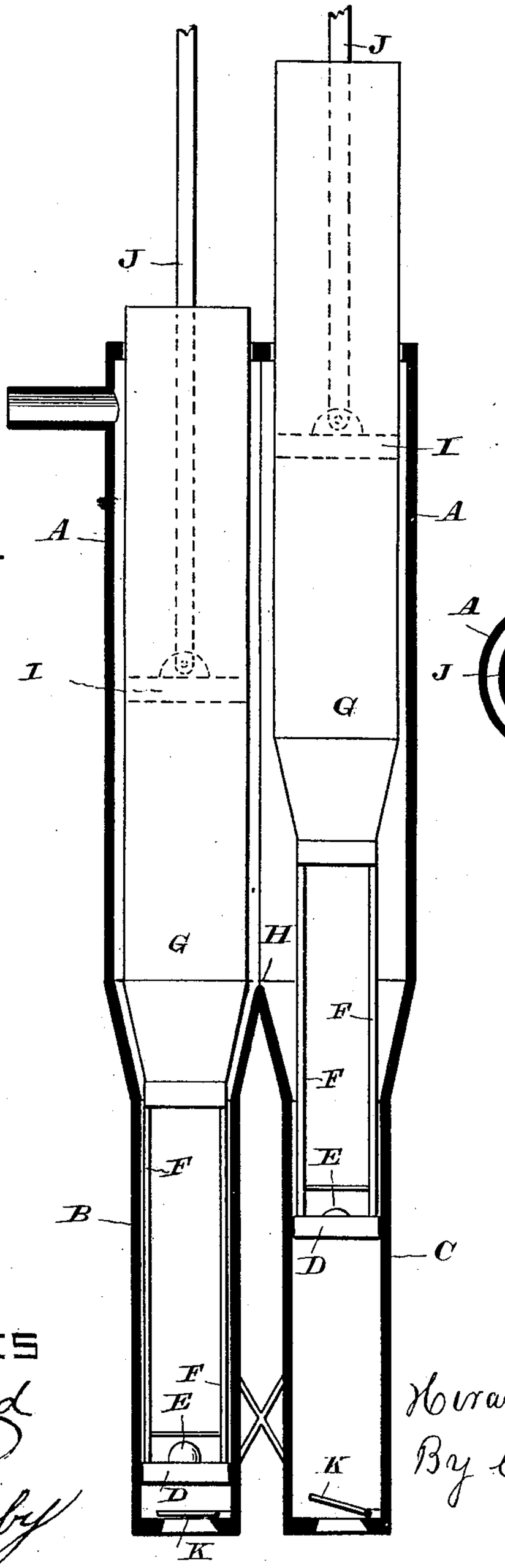
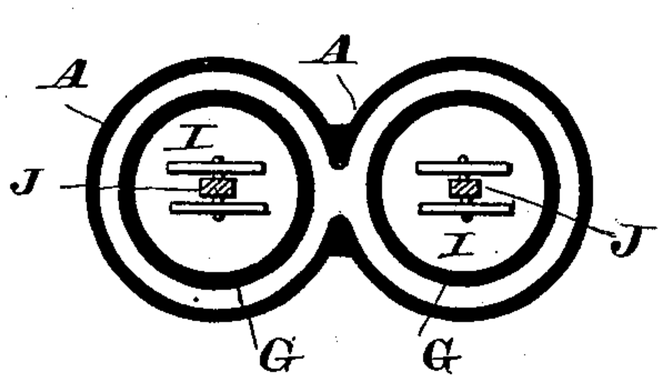



FIG. 2.




WITNESSES

Wilmer Bradford

Edwin Derby

INVENTOR.

Hiram M. D. L. Babcox

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(No Model.)

2 Sheets—Sheet 2.

# M. D. L. BABCOX.

## PUMP.

No. 284,708.

Patented Sept. 11, 1883.

FIG. 3.

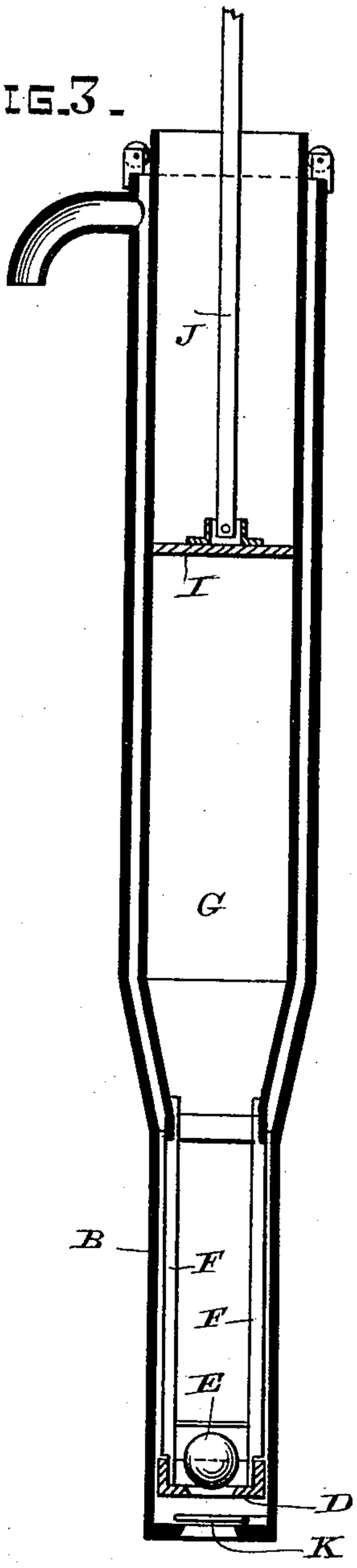
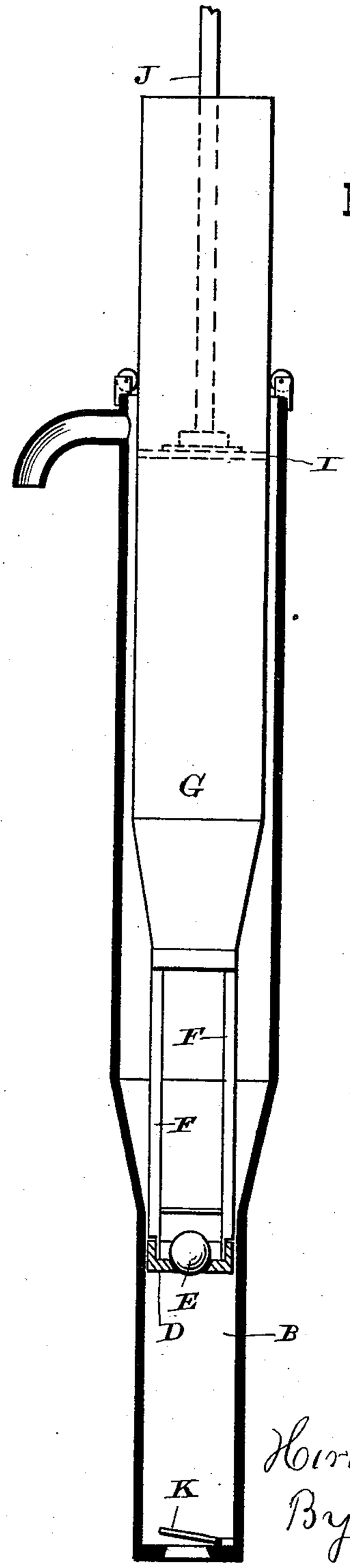



FIG 4




WITNESSES.

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Attorney

# UNITED STATES PATENT OFFICE.

HIRAM M. D. L. BABCOX, OF SAN FRANCISCO, CALIFORNIA.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 284,708, dated September 11, 1883.

Application filed April 5, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM M. D. L. BABCOX, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

The invention is illustrated in the annexed drawings, in which Figure 1 shows in vertical sectional elevation a double-acting pump provided with the improvements constituting my invention. Fig. 2 is a sectional plan view taken through the upper half of the pump-case and hollow piston. Fig. 3 is a vertical section taken through a single-acting pump, and Fig. 4 shows the same when the plunger has completed its upward stroke.

Similar letters of reference are used to indicate like parts throughout the several views.

A represents the pump-case, adapted for a double-acting pump constructed in accordance with my invention. This pump-case is forked or formed in two divisions, B and C, near its lower end, and the chambers are provided with clack-valves K K, and are made perfectly true upon their inner faces, in order to form a smooth guide-bearing for the plungers D D, which reciprocate therein. These plungers also carry or form the seat for the ball-valves E E, and are attached by prongs or arms F F to the open-ended hollow pistons G G, which are formed of sheet metal, cylindrical in form, and are made perfectly air-tight, and of such a length that when the plunger is at the full length of its downward stroke the top of the air-drum will be above the discharge-spout or top of the water-containing jacket A.

It should here be observed that the plunger-barrels are perfectly circular in cross-section, and are separate; yet when the upper part of the working-barrel is reached they merge into one another, so as to leave a free open space above the point H for the circulation of water from one division of the water-jacket to the other.

Midway of the height of the displacer is constructed a solid air-tight diaphragm, I, to which is pivoted the pitman or pump rod J, and by this means I am enabled to obtain a free open space above the diaphragm, while the space below the diaphragm forms an air-compression chamber, into which the water may partially enter upon the downstroke of the piston, thereby compressing the air contained therein, so as to produce a reaction or expansive effect of the air to assist in elevating the hollow piston after the said downstroke has been completed, when the piston makes the upstroke by cushioning upon the water within the pump-chamber.

In the modification shown in Figs. 3 and 4 the construction and mode of operation are the same as above described, save that the water-jacket, instead of being double, as shown in Figs. 1 and 2, is made single, and surrounds at equal distance the floating piston.

I am aware that the piston-rod of a pump has heretofore been made of such size that its downward stroke will displace about the same quantity of water that the piston raises in its upward stroke, so that the flow of water from the pump will be continuous, and so that the displacement of water by the enlarged piston-rod will reduce the weight of water resting on the pump-piston. Such enlarged piston-rods or plungers have also been made hollow, so as to form an air-chamber. This, however, I do not broadly claim.

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

The combination of the pump-case A, having clack-valve K, the open-ended hollow piston G, of a length sufficient to extend above the discharge-spout when the plunger is at the full length of its downward stroke, the air-tight diaphragm I, placed in said piston, the pitman-rod J, pivoted to the diaphragm, and the plunger D, connected to the lower end of the piston by means of arms F F, said plunger being provided with a ball-valve, E, substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand and seal.

HIRAM M. D. L. BABCOX. [L. S.]

Witnesses:
CHAS. E. KELLY,
C. W. M. SMITH.