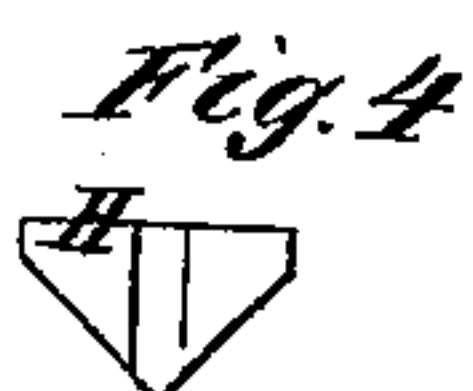
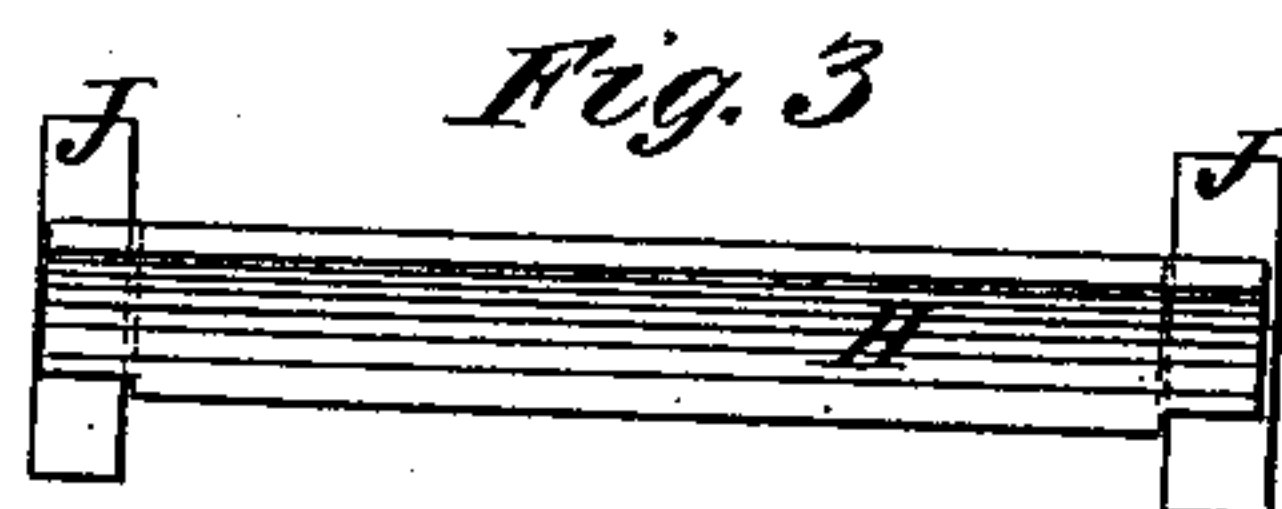
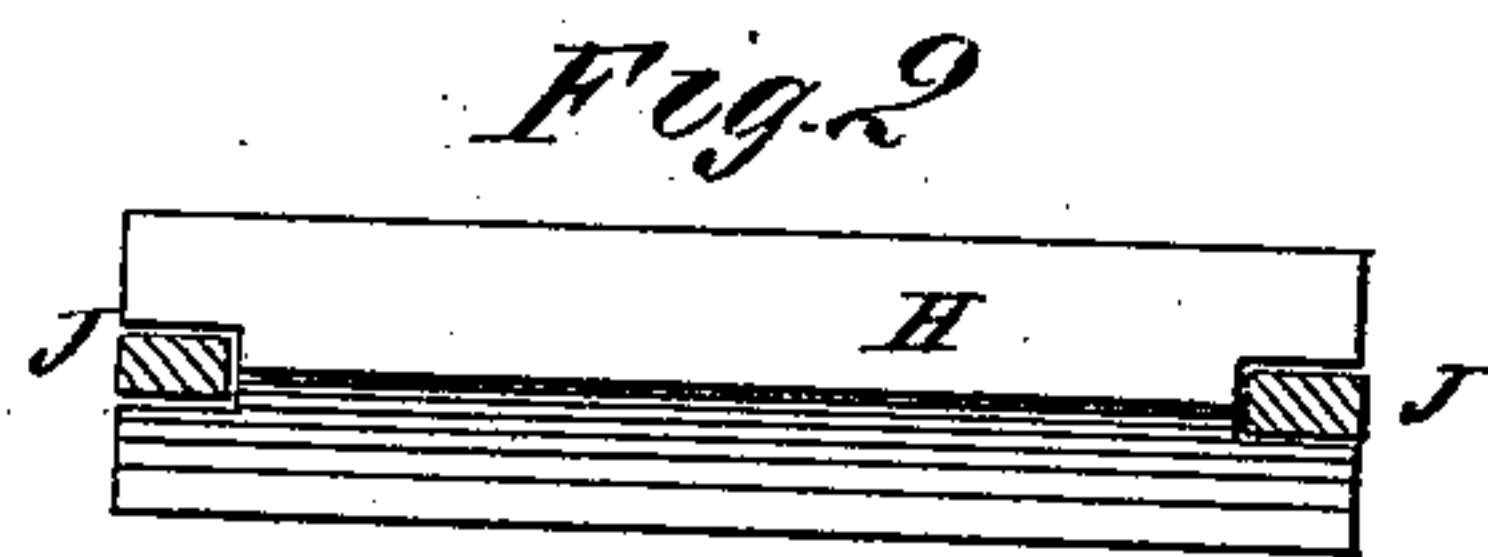
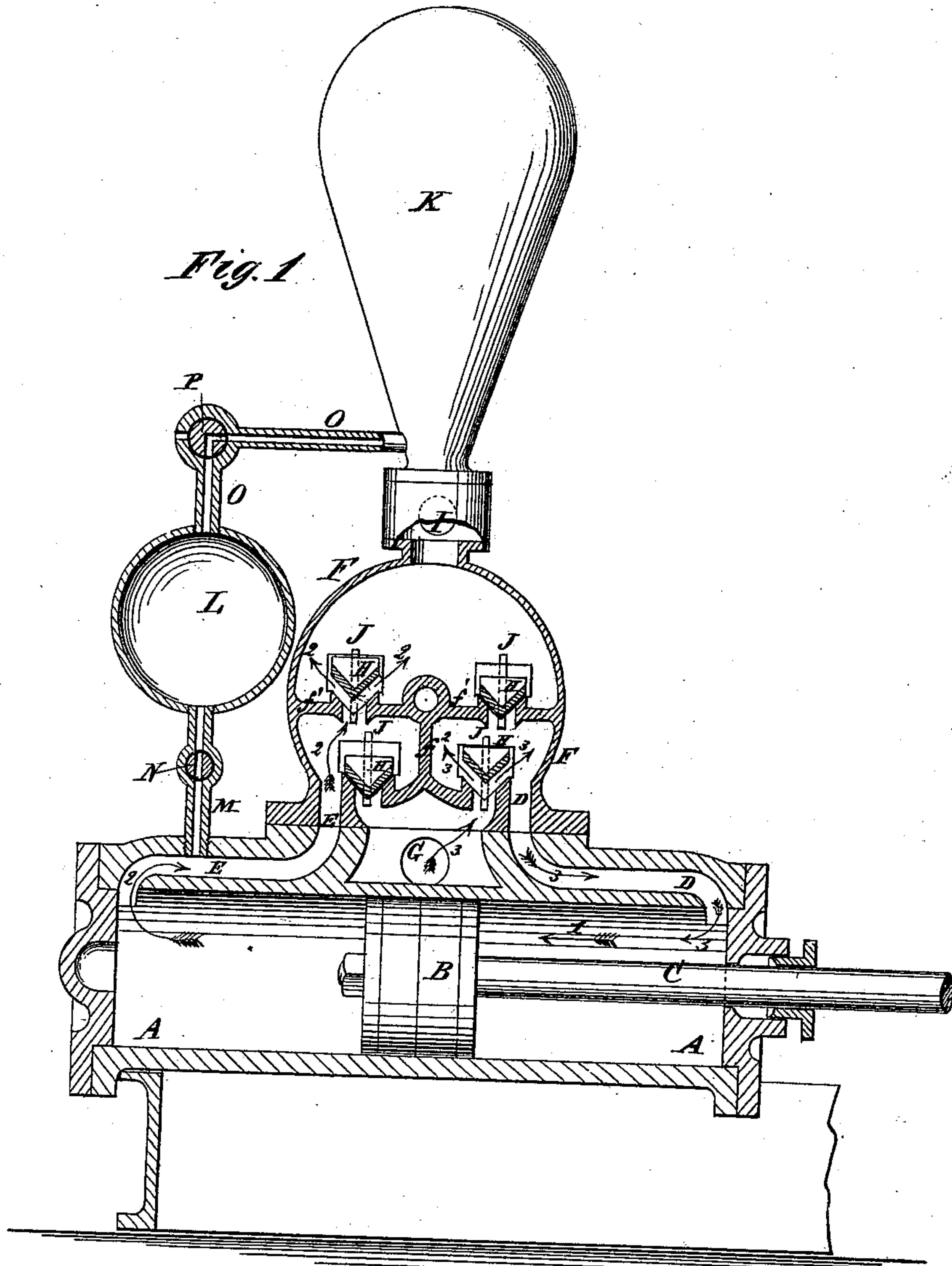


J. W. MATHIESON.  
VALVES FOR STEAM-PUMPS.

No. 189,370.

Patented April 10, 1877.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

JAMES W. MATHIESON, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN VALVES FOR STEAM-PUMPS.

Specification forming part of Letters Patent No: **189,370**, dated April 10, 1877; application filed December 23, 1876.

*To all whom it may concern:*

Be it known that I, JAMES W. MATHIESON, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Pumps, of which the following is a specification:

Figure 1 is a vertical longitudinal section of my improved pumping-engine. Fig. 2 is a bottom view of one of the valves. Fig. 3 is a side view of the same. Fig. 4 is an end view of the same.

Similar letters of reference indicate corresponding parts.

The invention will first be described in connection with the drawing, and then pointed out in the claim.

A is the cylinder. B is the piston, and C the piston-rod. D E are the ports or passages leading from the end parts of the cylinder A to the valve-chest F. The valve-chamber is divided into two parts by a horizontal partition,  $f^1$ , and the lower and smaller part is divided into two compartments by a vertical partition,  $f^2$ , into which compartments the ports or passages D E open. In the bottom of the valve-chamber F, upon the opposite sides of the vertical partition  $f^2$ , are formed openings leading to the inlet G, which openings are closed by two valves, H. In the horizontal partition  $f^1$ , upon the opposite sides of the vertical partition  $f^2$ , are formed two openings leading from the lower to the upper compartments of said valve-chamber, which openings are closed by two valves, H. The four valves H are made long, extending from side to side of the valve-chamber F, and are made V-shaped in their cross-section, as

shown in Figs. 1 and 4, so that they may offer the least possible obstruction to the passage of the water.

In working the pump, when the piston B is moving in the direction indicated by arrow 1, the water in front of said piston will be forced out through the passage E, will raise the upper left-hand valve H, and flow out through the discharge-opening I, as indicated by arrows 2. At the same time the vacuum formed in the rear of the piston B will cause the water to be forced in through the inlet G by atmospheric pressure, which water will raise the lower right-hand valve H, and pass through the passage D to the cylinder A, as indicated by arrows 3, to be forced out again by the return stroke of the piston, the diagonal valves thus working together. The ends of the valves H are notched, as shown in Figs. 2, 3, and 4, to receive the guide-bars or keys J, upon which the said valves move up and down, and which, when the valves become worn, can be removed and replaced by new ones, so that the said valves can be readily kept tight.

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

A pump whose valves and valve-seats extend from side to side of chamber F, and are made of V shape, substantially as and for the purpose specified.

JAMES W. MATHIESON.

Witnesses:

JAMES T. GRAHAM,  
C. SEDGWICK.