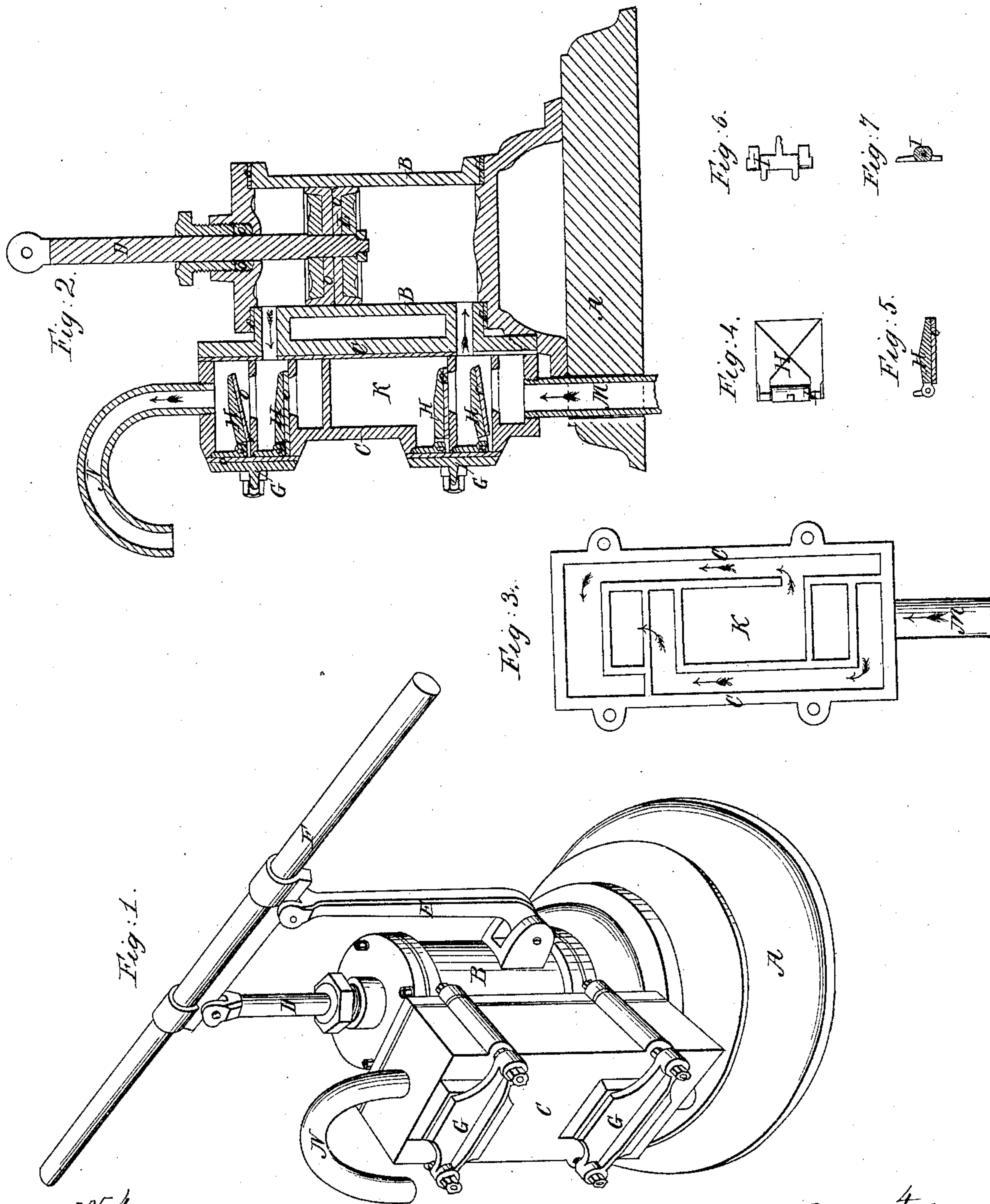


*F. Richter,*

*Force Pump,*

*Patented June 4, 1867.*

*N<sup>o</sup> 65,435.*



*Witnesses;*  
*J. B. Smith*  
*Percy B. Smith*

*Inventor;*  
*Friedr. Richter*

# United States Patent Office.

FRIEDRICH RICHTER, OF MILWAUKEE, WISCONSIN.

*Letters Patent No. 65,435, dated June 4, 1867.*

## IMPROVEMENT IN 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 I, FRIEDRICH RICHTER, of the city and county of Milwaukee, and State of Wisconsin, have invented a new and useful Improvement in Pumps; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a perspective view.

Figure 2, a vertical sectional view.

Figure 3, plan view of valve-chest.

Figure 4, valve.

Figure 5, side view of valve.

Figure 6, back end of valve and hinge.

Figure 7, cross-section of valve hinge.

Similar letters of reference in each of the figures indicate corresponding parts.

The object of my invention is to obtain compactness and efficiency in a double-action pump throwing a continuous stream of water.

A, the wood base; B, cylinder; C, valve-chest; D, plunger-rod; E, brake-rest or fulcrum; F, brake; G, caps over the openings in the valve-chest, through which the valves are inserted; H, valves; I, valve-joint or hinge; K, air-chamber; L, plunger or piston; M, suction pipe; N, exhaust pipe; O, packing.

Operation: When the piston is raised during the operation, as shown in fig. 2, water rushes up through pipe M, lifting the lower valve H, the water passing into the lower end of cylinder B, and at the same time the water in the upper end of cylinder B is forced out, holding the second valve from the top on its seat, and opening the upper valve, through which opening the water passes to discharge pipe N, the water pressing all the time on the air in chamber K. This movement of the water is indicated by the arrows in fig. 2. Upon the reverse motion of the plunger or piston the water is forced out of the lower portion of the cylinder, closing the lower valve and opening the next above it, and through its opening the water passes to the air-chamber, and out and up the side of the valve-chest to the discharge pipe N, water at the same time passing up through suction pipe M into the chamber in the bottom of the valve-chest below the lower valve, and up the side of the valve-chest, opening the second valve from the top, admitting the water to the upper end of the cylinder, the upper valve being closed. This movement of the water is indicated by the arrows in fig. 3. The valves are made to work loose on the hinges, so that they may set evenly on their seats.

What I claim as my invention, and desire to secure by Letters Patent, is—

The arrangement of cylinder B, plunger L, valve-chest C, and valves H, with the water-passages and air-chamber K, as described.

FRIEDR. RICHTER.

Witnesses:

J. B. SMITH,

PERCY B. SMITH.