

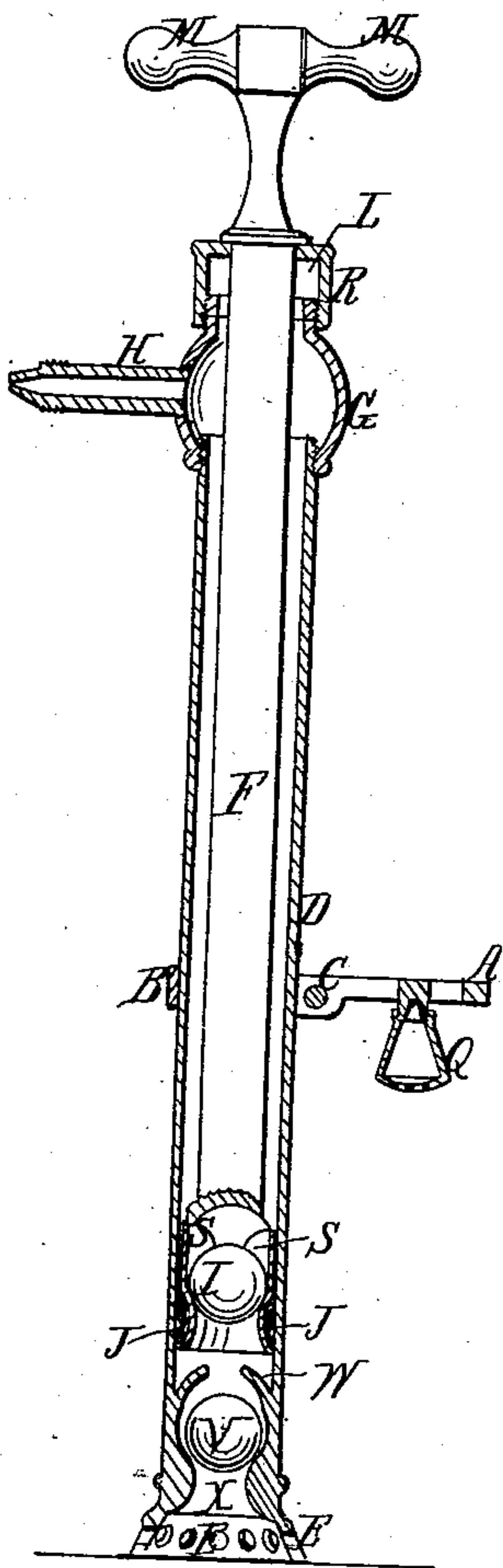
*W. J. Johnson,*

*Pump Cylinder.*

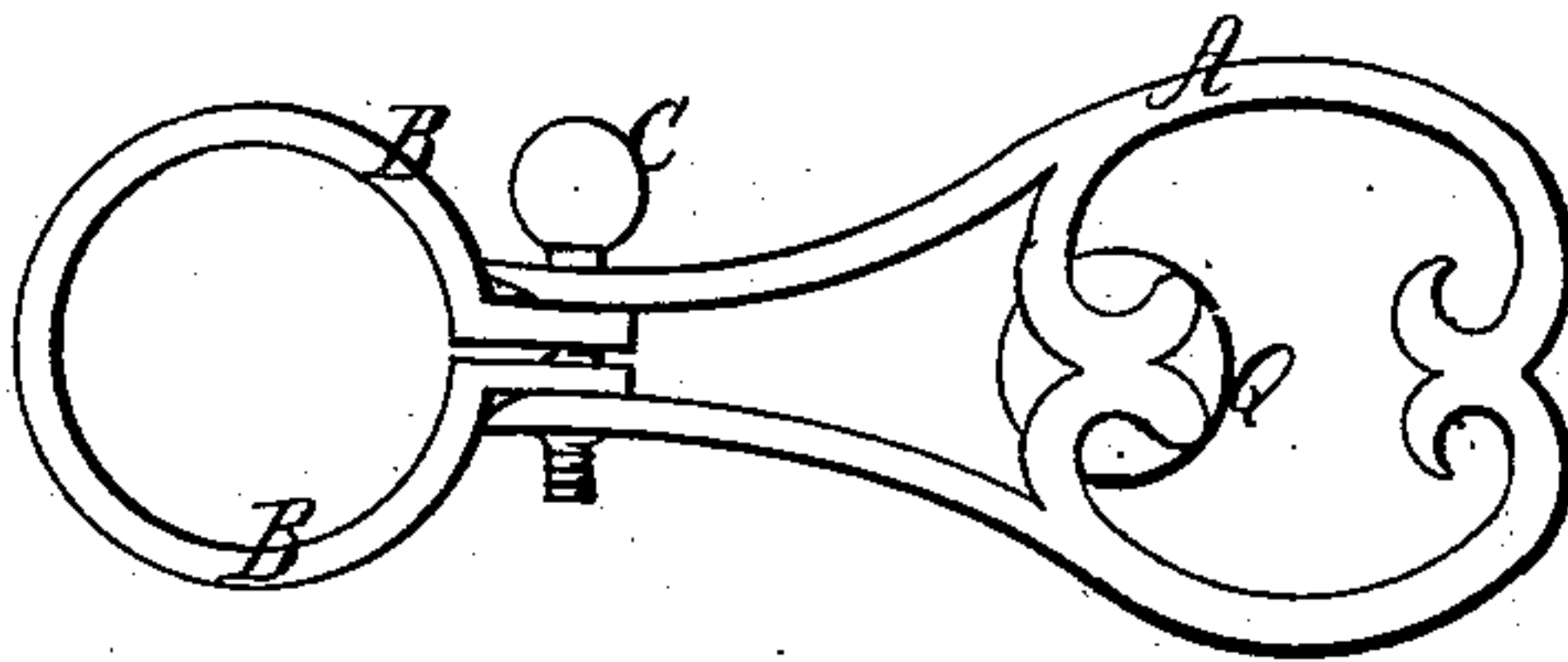
*N<sup>o</sup> 30480.*

*Patented Oct 23, 1860.*

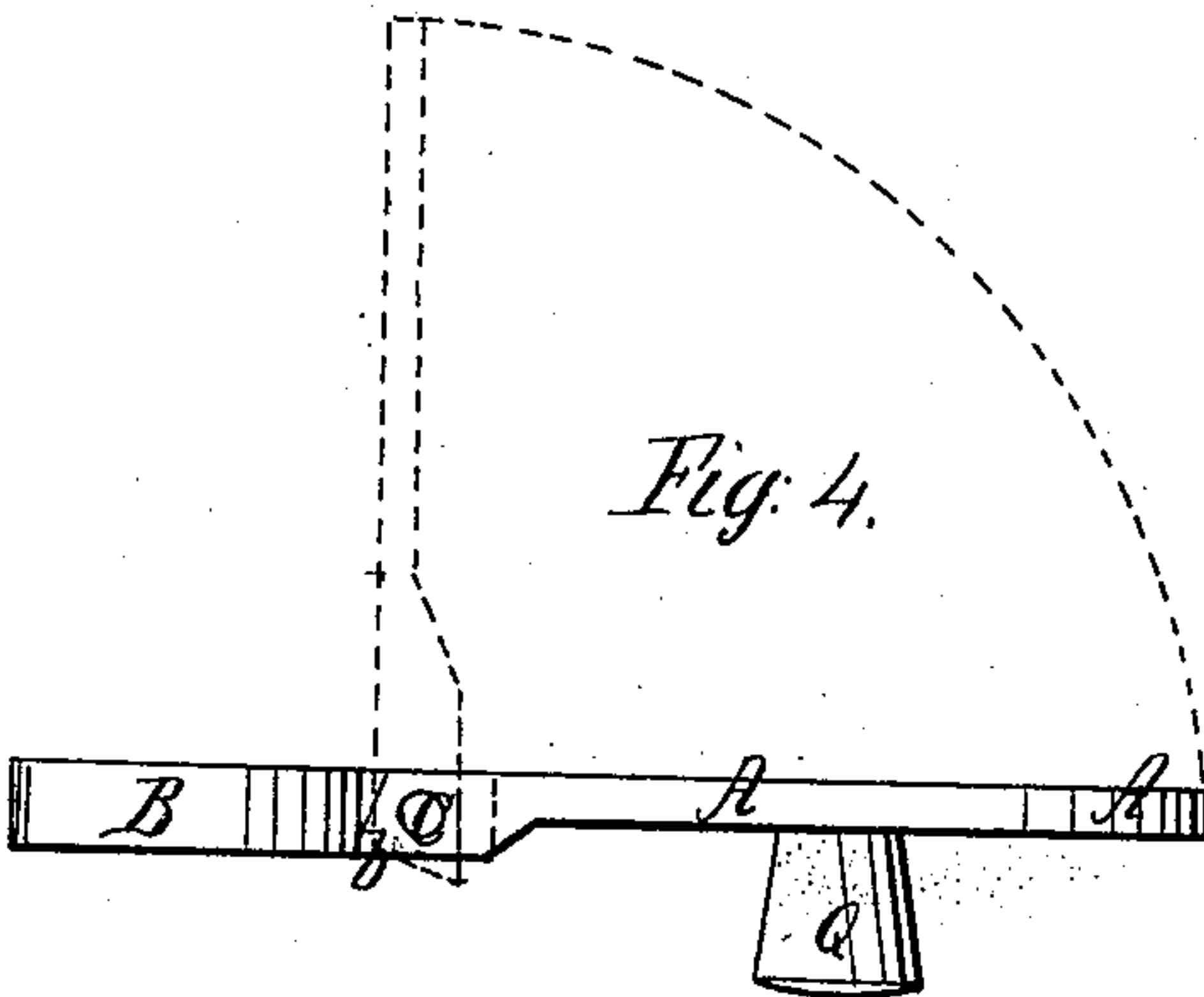
*Fig. 1.*



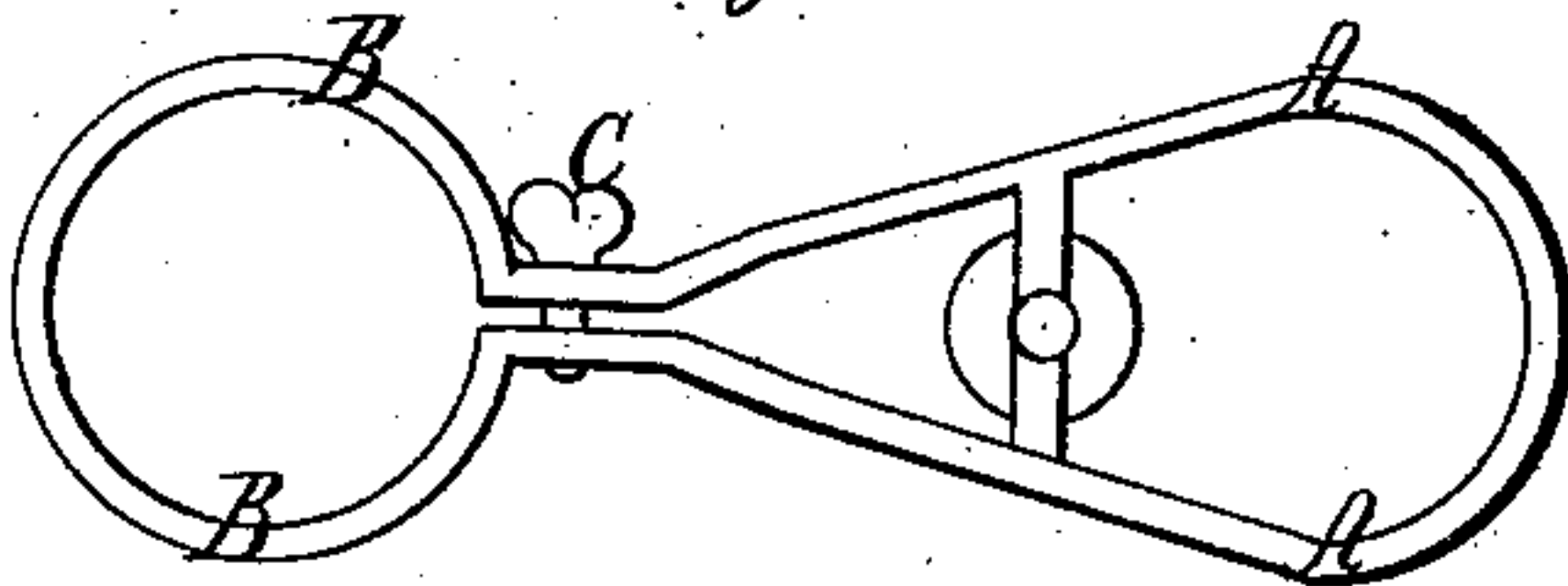
*Fig. 3.*



*Fig. 4.*



*Fig. 2.*



*Witnesses;*  
*Goodman & Co.*  
*G. F. F. Dietrich*

*Inventor;*  
*W. J. Johnson*  
*by Munn & Co.*  
*Attorneys*



# UNITED STATES PATENT OFFICE.

W. J. JOHNSON, OF NEWTON, MASSACHUSETTS.

## PUMP.

Specification forming part of Letters Patent No. 30,480, dated October 23, 1860; Reissued September 21, 1875, No. 6,649.

*To all whom it may concern:*

Be it known that I, W. J. JOHNSON, of Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, represents a central section of the pump. Fig. 2, a plan of a stirrup attached to the pump, and Figs. 3 and 4, represent a plan and side view of a modification of said stirrup.

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

To enable others, skilled in the art, to make and use my invention, I will proceed to describe its construction and operation.

The cylinder D, of this pump bulges out at its bottom end, as seen in Fig. 1, and is there provided with perforations E, through which the water is to be sucked into the cylinder. Immediately above this portion of the cylinder a ball valve V, is arranged which closes the opening X, in the valve seat and cuts off the communication of the space of the cylinder above said ball valve V, with the orifices E, while the piston,—hereinafter to be described—descends. When the piston ascends, the valve V, opens.

A collar G, provided with a discharge orifice H,—to which a hose may be attached—is screwed onto the upper end of the cylinder. A cap K, is screwed onto said collar and packing L, inserted between the cap and the top of the collar. The piston rod F,—the upper end of which is provided with suitable handles M, M—works through the stuffing box thus formed by the cap K, and collar G. The piston J, is hollow and is connected to the end of the piston rod by flanges forming open spaces S, between them. A ball playing in the cavity of the piston serves to close the piston while it ascends. The ball rises and allows the water to pass through the piston and openings S, into the space between the piston rod and cylinder, while the piston descends.

The diameter of the piston rod is made one half of the inner diameter of the pump cylinder, by which means half the water the cylinder holds will be discharged during the ascent and the other half during the descent

of the piston. During the ascent of the piston, the valve I, closes and consequently all the water above the piston and between the piston rod and inner surface of the cylinder—this quantity of water being equal to one half the capacity of the whole cylinder, as above set forth—is lifted together with the piston and discharged at H. During all the time of the ascent of the piston, the valve V, is lifted up and kept by the water rushing through the orifices E, and the seat of valve V, into the vacuum created in the cylinder by the ascent of the piston. During the descent of the piston, the weight of the column of water in the cylinder closes the valve V, and the resistance of the water keeps the piston valve I, open. While the piston and piston rod descend, the latter occupying one half of the hollow space of the cylinder, one half of the water contained in the cylinder will be forced out at the orifice H, while the other half fills the space between the piston rod and inner surface of the cylinder, ready to be lifted and discharged during the next ascent of the piston, as above described. Thus it will be seen, the pump is made to be double acting, and all the water the cylinder holds, is discharged during one reciprocation of the piston.

The operator places the pump with its bottom end into a vessel containing water and keeps it down while operating the piston by putting his foot upon a stirrup A, fastened to the outside of the pump cylinder. To adapt the height of the stirrup to the height of the vessel containing the water, it is made adjustable in the following manner. The foot piece A, terminates into a collar B, which embraces the cylinder and may be slid up and down upon it. It can be secured in any desired situation by turning the clamp-screw C, and thus tightening the collar B, around the cylinder.

A perforated nozzle Q, may be screwed to a little screw projecting from underneath the foot-piece, as seen in Fig. 1, and unscrewed whenever to be used.

Figs. 3 and 4, represent a modification of the stirrup, the foot piece A, being hinged to the collar B, the clamp screw C, serving as the fulcrum of the hinged foot-piece. This foot piece can be turned up into a vertical position—as represented in red lines in Fig. 4—to be out of the way when the

pump is to be packed up or placed aside. When turned down it is prevented from descending below a horizontal line by the edge *b*, of the inclined back *a*, *b*, of the foot-piece, 5 coming to rest against the collar B. By using such an adjustable stirrup it will be seen the lower end of the cylinder can be perforated and placed in any suitable vessel containing water, while if a stirrup is per- 10 manently attached to the bottom end of the cylinder, the cylinder cannot be placed into the water because the operator would then have to stand in the water, and the cylinder must be provided with an additional suc-

tion tube leading into the vessel containing 15 the water.

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

The arrangement with the cylinder of a portable pump having a suction orifice E, 20 at its bottom, of an adjustable stirrup A, B,—whether the part A is hinged or not; substantially as and for the purposes set forth.

W. J. JOHNSON.

Witnesses:

GOODWIN Y. AT LEE,  
ROBT. W. FENWICK.