W. B. FARRAR.

PUMP.

No. 184,603. Patented Nov. 21, 1876.

Fig. 1.

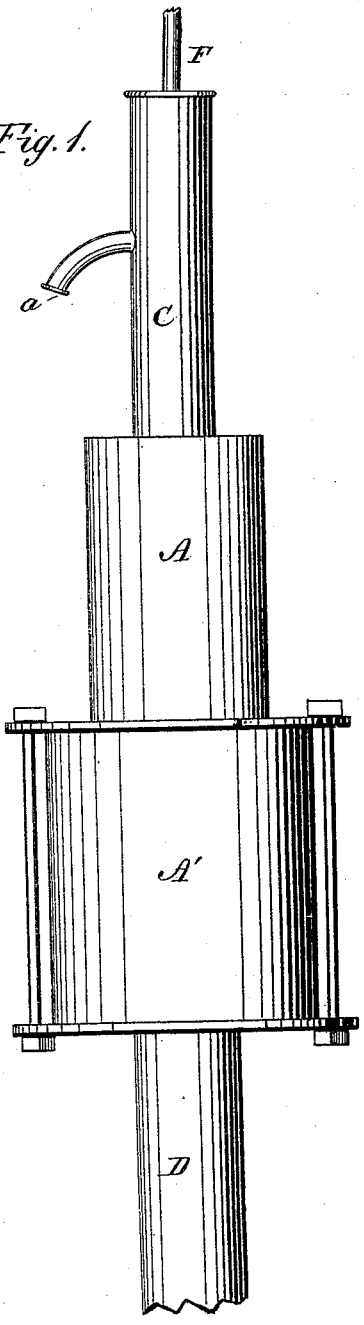
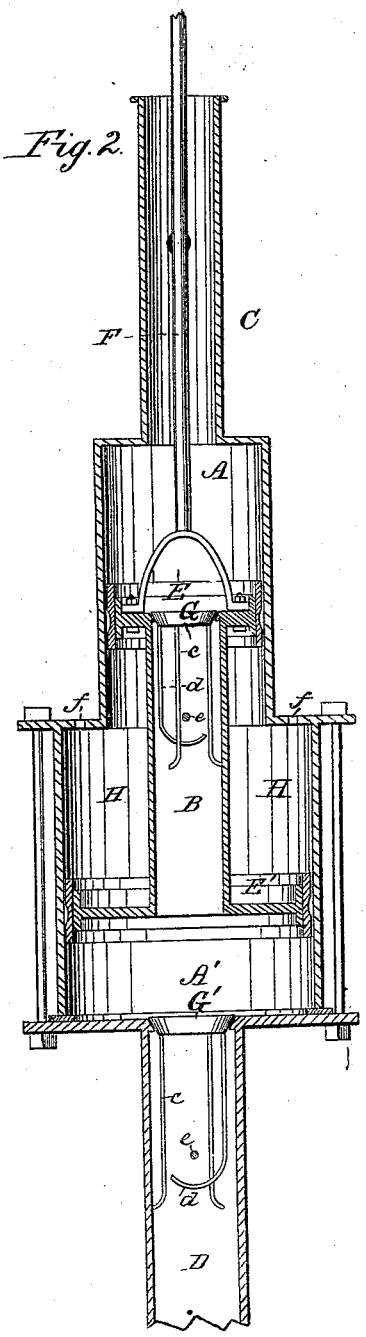


Fig. 2.



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WILLIAM B. FARRAR, OF GREENSBOROUGH, NORTH CAROLINA.

IMPROVEMENT IN PUMPS.

Specification forming part of Letters Patent No. **184,603**, dated November 21, 1876; application filed September 18, 1876.

To all whom it may concern:

Be it known that I, WILLIAM B. FARRAR, of Greensborough, in the county of Guilford and State of North Carolina, have invented a new and Improved Double-Acting Pump; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification, in which—

Figure 1 is a side elevation. Fig. 2 is a vertical longitudinal section.

My invention relates to an improved construction of double-acting pump; and it consists in two cylinders of different diameters opening into each other, and having a check-valve at the bottom, combined with an upper piston fitting in the smaller cylinders, and a lower piston fitting in the larger one, and both connected by a pipe also provided with a valve.

The two pistons are operated simultaneously and together by the piston-rod, so that, upon the upward stroke, the water above the smaller piston is lifted out at the spout, and water is drawn beneath the lower large piston into the larger cylinder, while upon the downward stroke the water beneath the large piston is forced upwardly, through the tubular opening, into the upper cylinder, and, by reason of the difference in the capacity of two cylinders, is also forced out at the spout.

In the drawing, A represents the upper and smaller cylinder, and A′ the lower and larger cylinder, which are connected together in any suitable manner.

The upper cylinder communicates with the hollow pump-stock C, having the discharge-spout *a*, while the lower cylinder communicates, through the check-valve G′, with the supply-pipe D, the lower end of which is submerged in the water of the well.

E is the smaller piston, connected with the larger piston E′ by means of a central pipe, B. Both these pistons are tightly packed within their cylinders, and are operated simultaneously by the piston-rod F, to which the pump-handle is attached.

G G′ are valves, the first of which is contained in the upper piston, closing the tubular opening formed by the pipe B, and the second of which is located at the bottom of the cylinder A′, and in the upper end of the supply-pipe D. Both these valves open upwardly, and are guided and controlled in their movements by pendent rods *c* and retaining-hooks *d*, which catch beneath the cross-rod *e*, and prevent the permanent dislocation of the valves from their seats.

The operation of the pump is as follows: When the pistons are raised by the pump-handle, the upper piston lifts the water above it, which runs out at the spout, while the lower piston produces in the lower cylinder a partial vacuum, which opens the valve G′, and allows the space in the cylinder below the said lower piston to become filled with water. Now, as the pistons descend, the valve G′ is closed and G opened, and the water is forced from the lower cylinder, through pipe B, to the upper cylinder, which latter, being of less capacity than the lower cylinder, a corresponding overflow at the spout is produced for the alternate stroke of the pump-handle.

To prevent the alternate vacuum and pressure in the annular space H, around the tube B, and between the two pistons, holes *f* are made in one or both of the cylinders, near the point of their junction, which holes permit the air to be alternately drawn in and forced out.

This disturbance of air may be utilized for the ventilation and purification of the air in the well, while the water which may leak into said annular space is, from time to time, as it accumulates, thrown out by the movement of the pistons, and, in falling upon the water in the well below, produces an agitation of the surface-water, which tends to its purification.

The pump, as thus described, although double-acting, has but two valves, is of simple and cheap construction, and is adapted to be applied to, and used with, any ordinary single-acting pump-stock.

Having thus described my invention, what I claim as new is—

1. The combination, with the two communicating cylinders A A′, of different sizes, having a check-valve at the bottom, of the

two different-sized pistons E E′, connected by a pipe, B, and having a valve in said pipe, which alternately opens and closes communication between the two cylinders, substantially as described.

2. The combination, with the two different-sized pistons, connected by a central pipe, of the two different-sized cylinders, having holes *f*, substantially as and for the purpose described.

W. B. FARRAR.

Witnesses:
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