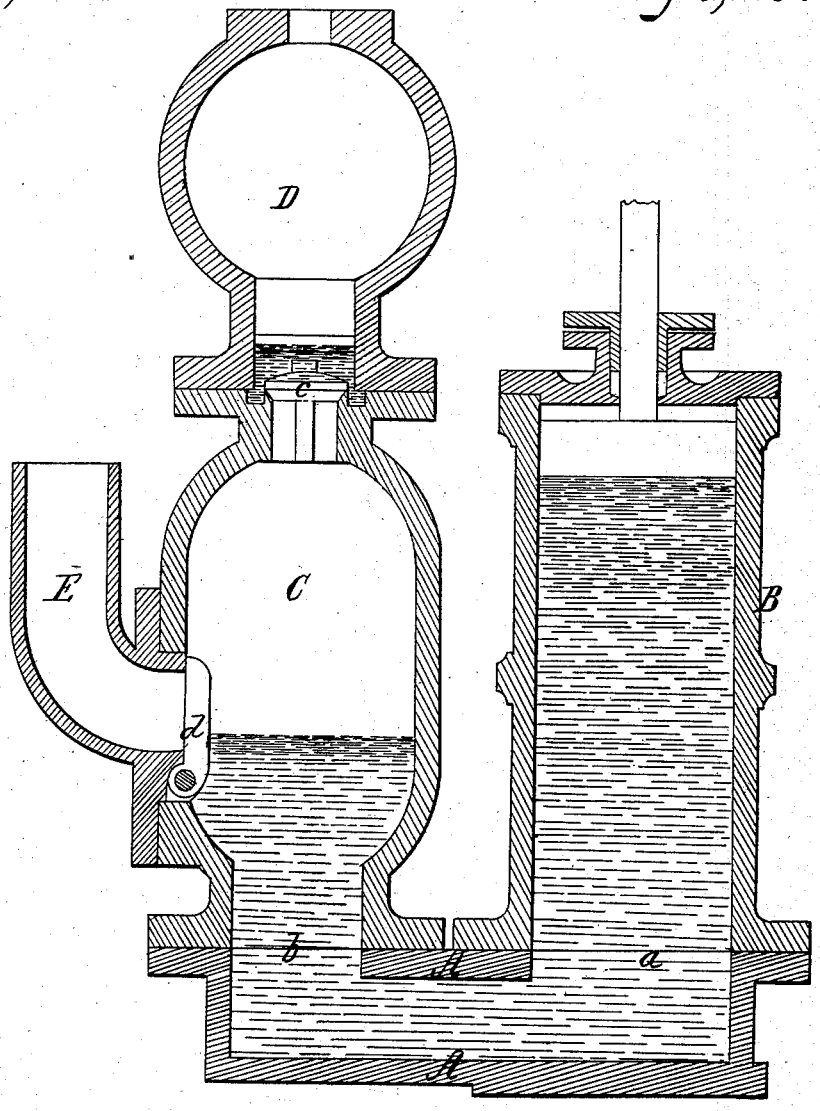
# F. Ransom,

## Air Pump.

No. 49,301. Patented Aug. 8, 1865.

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# UNITED STATES PATENT OFFICE.

FRANKLIN RANSOM, OF BUFFALO, NEW YORK.

## IMPROVEMENT IN AIR-PUMPS.

Specification forming part of Letters Patent No. **49,301**, dated August 8, 1865.

*To all whom it may concern:*

Be it known that I, FRANKLIN RANSOM, of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Air-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 drawing, forming part of this specification, said drawing representing a vertical section of a pump with my improvement.

This invention relates to air compressing or forcing pumps in which water or other liquid is interposed between the piston and the air.

It consists in a novel combination and arrangement of the parts of the pump, whereby the construction is rendered very simple and the operation very effective.

To enable others skilled in the art to make and use my invention, I will proceed to describe it with reference to the drawing.

A is a hollow bed-plate having two openings, *a* and *b*, in the top, over one of which is arranged the upright pump-cylinder B, in which the piston F works, and over the other the suction air-chamber C, a constant communication between the said cylinder and chamber being thus provided through the bed-plate.

On the top of the suction-chamber C is arranged the air-condensing chamber D, and between these two chambers is the delivery-valve *c*, which opens upward, and which may be either of the puppet or flap kind, but which is represented of the puppet kind.

Attached to one side of the lower part of the chamber C is the suction-pipe E, and at the connection of this pipe with the said chamber is the inlet or suction valve *d*, which may be of the flap or puppet kind, but is represented of the flap kind.

Such a quantity of water or other liquid is placed in the hollow bed-plate and chamber C, and in the cylinder B below the piston F, that when the piston is raised to its highest position (shown in the drawing) and the cylinder filled with water up to the bottom of the piston the level of the water in the chamber C will be such that the capacity of the said chamber above the said level will be somewhat less than that of the portion of the cylinder from which the water is displaced by the descent of the piston, and hence when the piston descends and forces the water from the cylinder through the bed-plate and forces the air from the chamber C through the seat of the valve *c* into the chamber D the chamber C will be filled with water, and a sufficient portion of the water will enter the chamber D to submerge the valve *c* to the depth of two or more inches, as shown in the drawing, in which the water is represented in blue color. The lower valve, *d*, is so arranged that when the piston is in its highest position and the water in the chamber C at the lowest the said valve will be partly submerged, as shown in the drawing.

The operation is as follows: When the piston begins to rise the valve *c* closes and the valve *d* opens, and as the piston moves upward the water decends in the chamber C and passes through the bed-plate into the cylinder B, in which it follows up the piston, while air enters the chamber C through the suction-pipe and fills the space above the water left by the descent of the latter. As the piston descends the water passes from the cylinder through the bed-plate into the chamber C, the valve *d* closes and the valve *c* opens, and all the air is forced by the rising water from the chamber C into the condensing-chamber D, so that when the piston rises again no air will remain in the chamber C to keep the valve closed by its expansive force. During the first part of the descent of the piston a portion of the water which was left in the lower part of the condensing-chamber D at the termination of the previous descent of the piston passes back through the open valve *c;* but this is replaced by what passes through the seat of the said valve during the next descent of the piston, so that the said valve is always perfectly sealed by the water against the return of any air when the piston ascends. The valve *d*, being never entirely uncovered by the water, and being completely covered shortly after the commencement of the descent of the piston, is always perfectly sealed against the return of any air through the suction-pipe.

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

1. Combining the elevated chamber C, having the valve *d*, as shown, with the pump-cylinder B by means of a hollow bed-plate, A, through which a constantly open communication between the said chamber and cylinder is maintained, substantially as herein specified.

2. The arrangement of the chamber C, condensing-chamber D, and valves *d c*, substantially as and for the purpose herein specified.

FRANKLIN RANSOM.

Witnesses:

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