

G. M. Woodward,
Air Pump.

N^o 18,009.

Patented May 30, 1865.

Fig. 1.

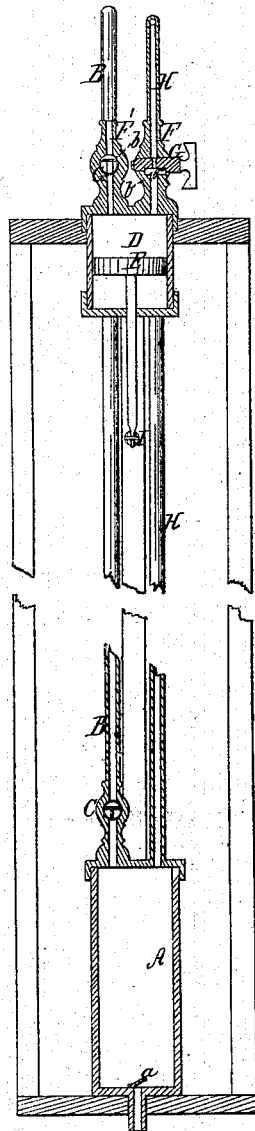
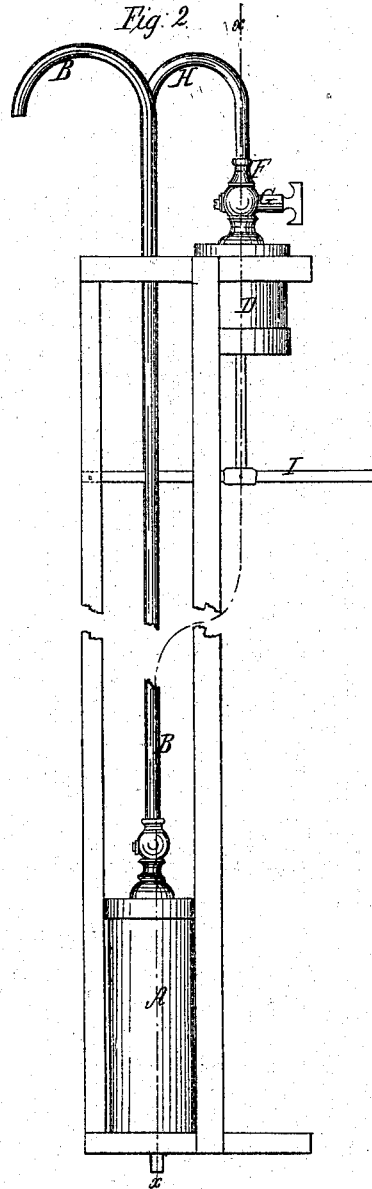


Fig. 2.



Witnesses;
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UNITED STATES PATENT OFFICE.

G. M. WOODWARD, OF NEW YORK, N. Y.

IMPROVEMENT IN AIR-PUMPS.

Specification forming part of Letters Patent No. 48,009, dated May 30, 1865.

To all whom it may concern:

Be it known that I, G. M. WOODWARD, of the city, county, and State of New York, have invented a new and Improved Combined Hydraulic and Pneumatic Pump; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical section of my invention, taken in the line *x x*, Fig. 1; Fig. 2, an elevation of the same.

Similar letters of reference indicate like parts.

This invention relates to a new and improved pump for raising water and other fluids from deep wells or reservoirs, and is more especially designed for oil-wells, mining purposes, &c.

The invention consists in the employment or use of an air-pump in connection with a fluid-receiver arranged in connection with valves and pipes in such a manner that water and other fluids may be raised from great depths by a means more simple and less expensive than the force-pumps now used for such purposes.

A represents a receiver, which is submerged at the bottom of the well or reservoir from which the water or other fluid is to be raised. This receiver has a valve, *a*, in its bottom, opening upward, and it is provided with an eduction-pipe, B, which extends up above the surface of the well, or to a point where the fluid is to be discharged. The eduction-pipe B is provided with a valve, C, opening upward, and said valve may be in the lower part of pipe B.

D represents an air-pump, which is placed above the well, or at any point above the receiver A where it would be most convenient to have it. This air-pump is provided with a single piston, E, and it has two nozzles, F F', which are provided each with a valve, *b*, said valves being fitted in cocks G, by turning which the valves may be changed in position, so as to open either upward or downward, as may be desired, as will be fully understood by referring to Fig. 1. The nozzle F communicates

with the receiver A by means of a tube or pipe, H. The piston E may be operated through the medium of a lever, I, or any other suitable mechanism.

The operation is as follows: The cock G of the nozzle F' is turned so that its valve *b* will open upward, and the cock G of nozzle F turned so that its valve *b* will open downward, as shown in Fig. 1. When the valves *b b* are thus adjusted, the air will be exhausted from the receiver A by working the piston E of the air-pump, the air from A being at each descent of its piston E drawn up through pipe H and discharged at each upward movement of the piston through the nozzle F'. By thus exhausting the air from A, the latter, by atmospheric pressure, is filled with the fluid, in which it is wholly or partially submerged, and when the receiver is filled the cocks G G are turned so that their valves *b b* will have a reverse position to that which they formerly occupied, the valve of the cock of nozzle F' opening downward and that of the cock of nozzle F opening upward. The air-pump, when operated with the valves *b b* in the last-described position, will force air down the pipe H into the receiver A and cause the fluid therein to be forced up through the pipe B. Thus by this simple arrangement fluids may be drawn and ejected from deep wells and reservoirs with the greatest facility and with but a moderate expenditure of power. The comparatively expensive force-pump is avoided, with its frequent and vexatious repairs, while the invention possesses the advantage of a ready adaptation to its work in any situation or under any circumstances with but a trifling outlay or expense.

I claim as new and desire to secure by Letters Patent—

The air-pump D, provided with adjustable or reversible valves *b b*, in combination with a receiver, A, the latter communicating with the air-pump, and provided with an eduction-tube, B, and all arranged substantially as described.

G. M. WOODWARD

Witnesses:

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