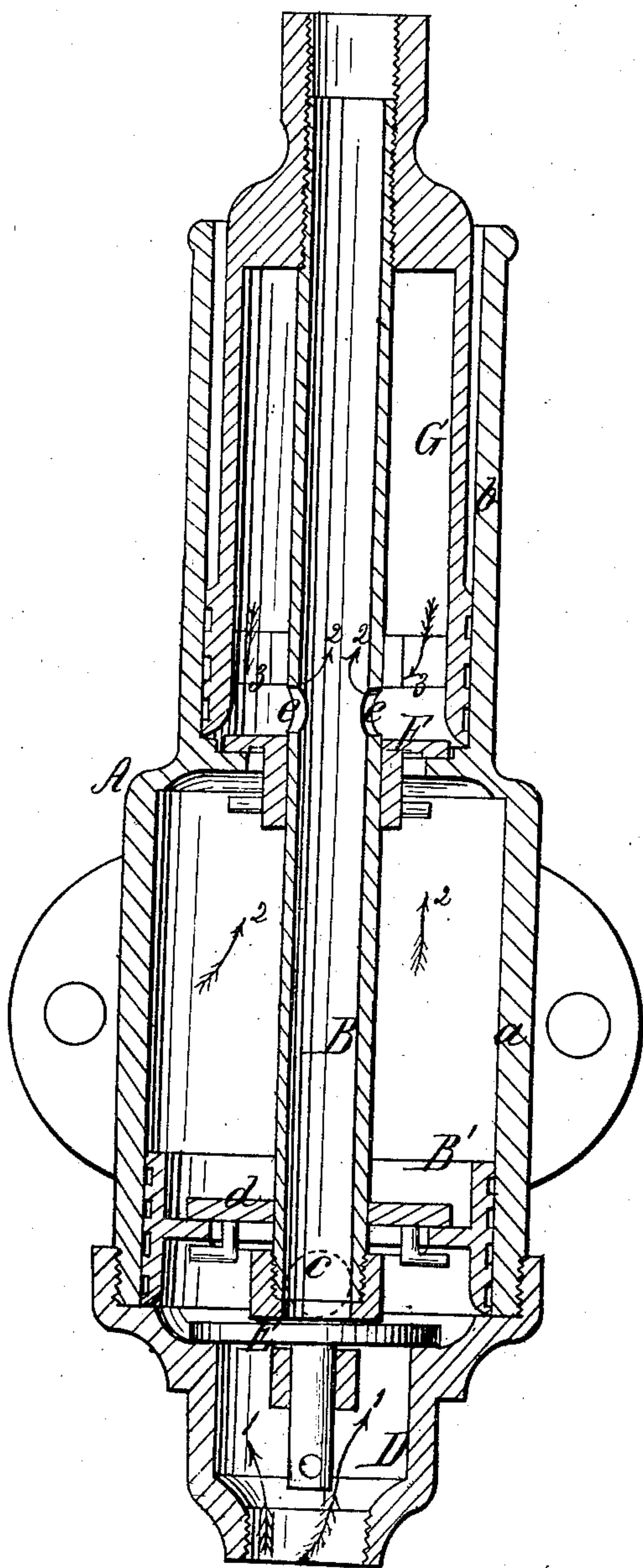


*M. T. Greenleaf,*

*Pump Lift.*

*N<sup>o</sup> 32,831.*

*Patented July 16, 1861.*



*Witnesses*  
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# UNITED STATES PATENT OFFICE.

M. T. GREENLEAF, OF QUINCY, ILLINOIS.

## PUMP.

Specification of Letters Patent No. 32,831, dated July 16, 1861.

*To all whom it may concern:*

Be it known that I, M. T. GREENLEAF, of Quincy, in the county of Adams and State of Illinois, have invented a new and Improved Pump; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawing, making a part of this specification.

10 The drawing represents a vertical central section of my invention.

This invention consists in the employment or use of a hollow piston rod in connection with two pistons, air and water chambers, a receiving valve and check valve; all arranged substantially as hereinafter described, whereby a simple and efficient suction and force pump is obtained.

20 To enable those skilled in the art to fully understand and construct my invention I will proceed to describe it.

A represents the pump cylinder, the lower part *a*, of which is rather larger in diameter than the upper part *b*; and B is the piston or plunger rod which is hollow, and has a ball check valve *c*, in its lower end. To the lower end of rod B, the piston B', is attached, said piston working in the larger part *a*, of the cylinder. The piston B', is provided with a receiving valve *d*, which opens upward of course, as will be seen by referring to the drawing.

35 To the lower part of the cylinder A, the induction or suction pipe D is attached, in the upper part of which a check valve E, is placed. At the lower part of the upper chamber *b*, of the cylinder there is placed a check valve F, and an inverted tube G, is attached to the rod B, said tube working in the chamber *b*, similar to a piston. The rod B, above the check valve F, has openings *e*, made in it, the use of which will be presently explained.

The operation is as follows:—When the

rod B, is elevated the lower part *a*, of the cylinder A, below the piston B', fills with water—see arrows 1—while the portion of part *a*, above the piston which was previously filled by the descent of the piston is forced up through check valve F, within tube G, and through the holes *e*, up through the hollow rod B,—see arrows 2. When the rod B, is forced down, the water in *a*, below the piston B', passes up through valve *d*, into the upper part of *a*, while the water in the tube G, which was filled by the previous ascent of the plunger B', is forced through the openings *e*, up through the rod as indicated by the arrows 3; thus a continuous stream is forced up through rod B, and a suction and force pump combined.

In case only a force pump is required the suction pipe D, and check valve E, may be detached, and the pump placed at the bottom of the well, and just previous to the termination of the descent of the plunger B', the check valve *c*, may come in contact with a pin or projection which will raise it and allow the water to escape from within the rod B, and consequently the freezing up of the rod will be prevented.

The interior of the tube G, it will be seen serves as an air as well as water chamber.

The arrangement of parts is extremely simple and efficient.

75 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is:—

The cylinder A, formed of two parts *a*, *b*, of different diameter in combination with the piston B', tubular piston G, check valves F, *c*, and receiving valve *d*, with or without the check valve E, and suction pipe D, for the purpose specified.

M. T. GREENLEAF.

Witnesses:

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