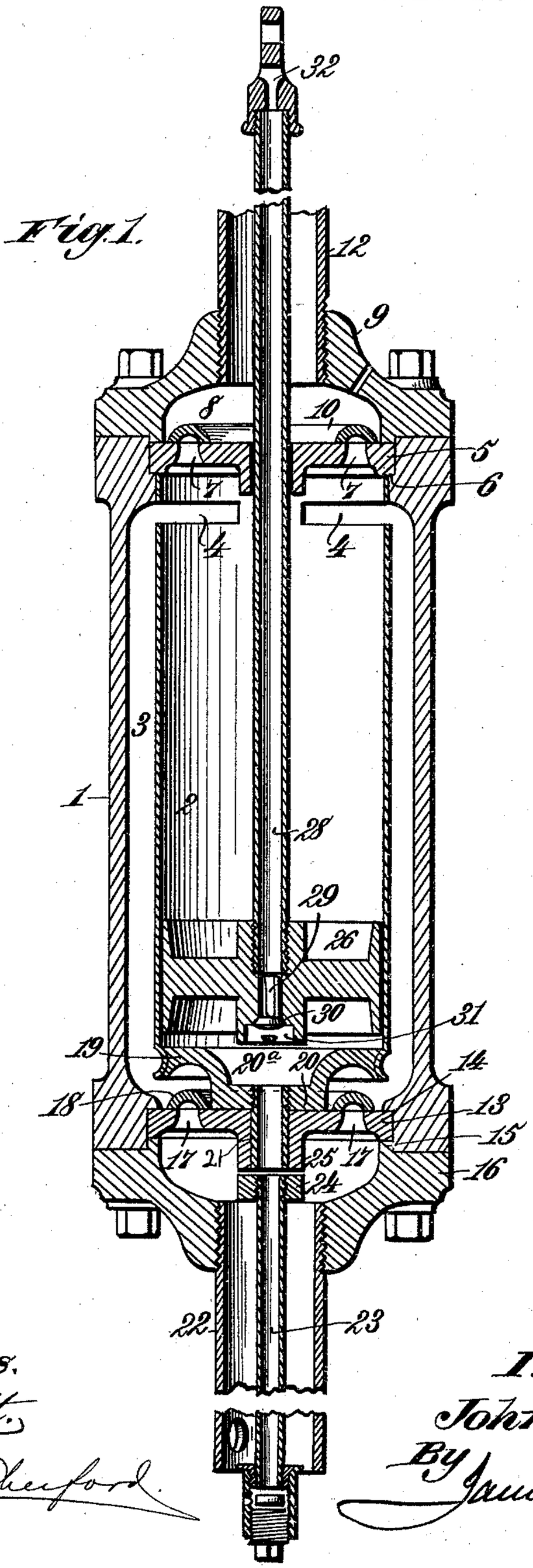
(No Model.) 2 Sheets—Sheet 1.

J. NORTH.

PUMP.

No. 477,569. Patented June 21, 1892.

Fig. 1.



Witnesses.
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J. A. Rutherford.

Inventor.
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Abby.

(No Model.) 2 Sheets—Sheet 2.

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No. 477,569. Patented June 21, 1892.

Fig. 2.

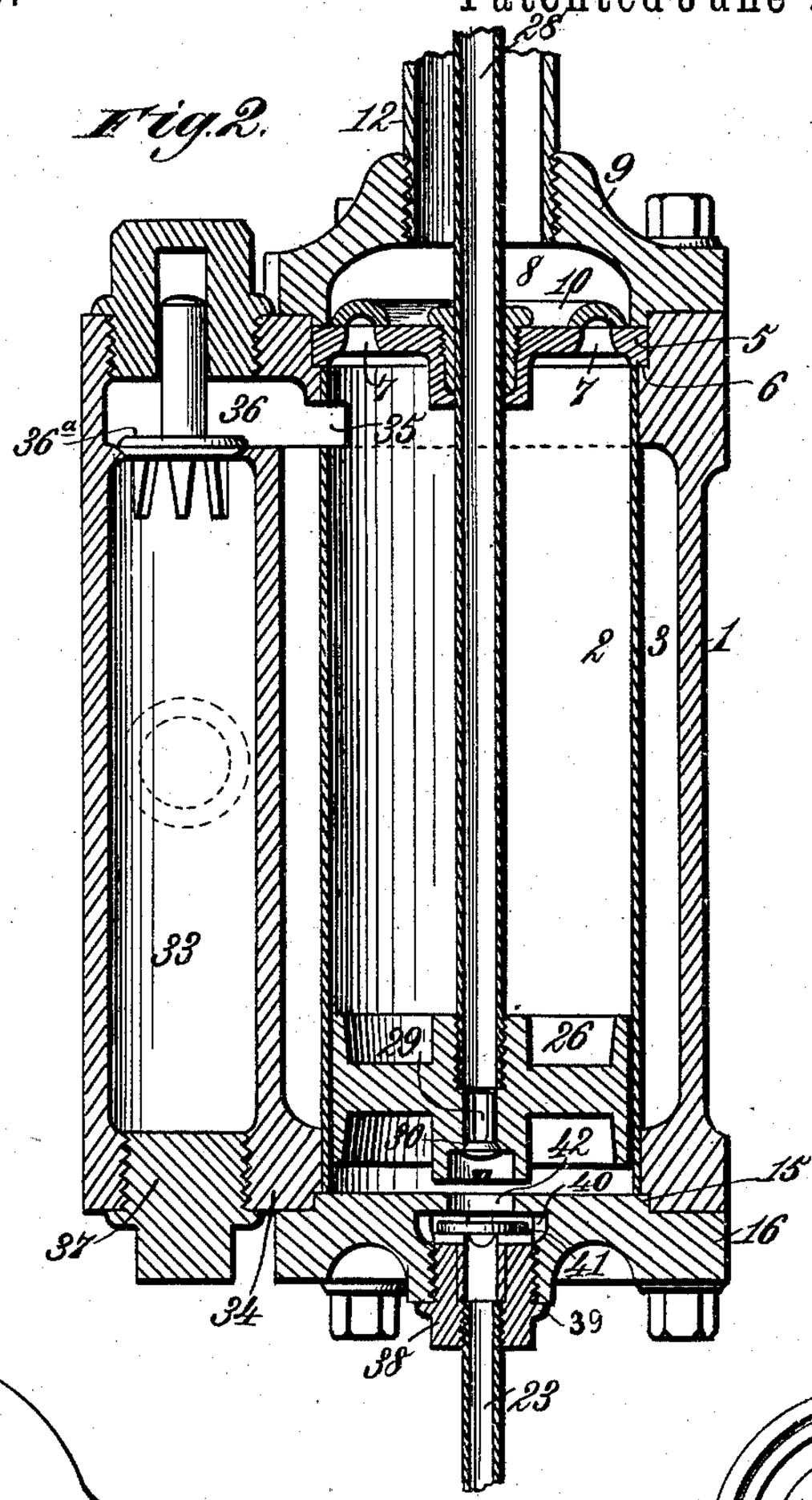


Fig. 4.

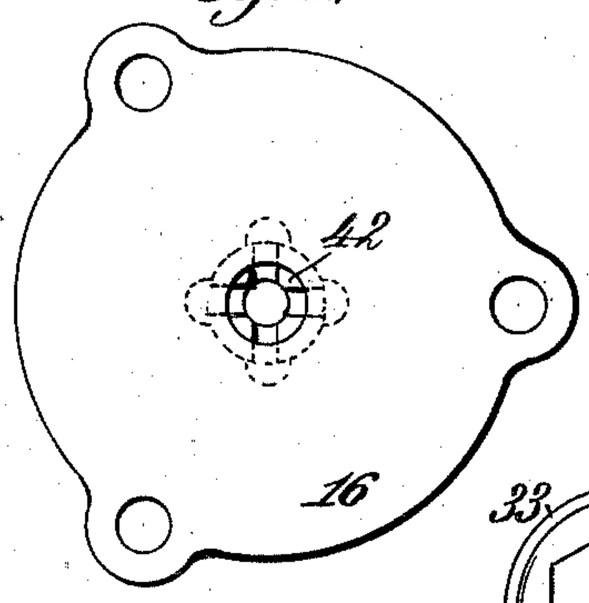


Fig. 3.

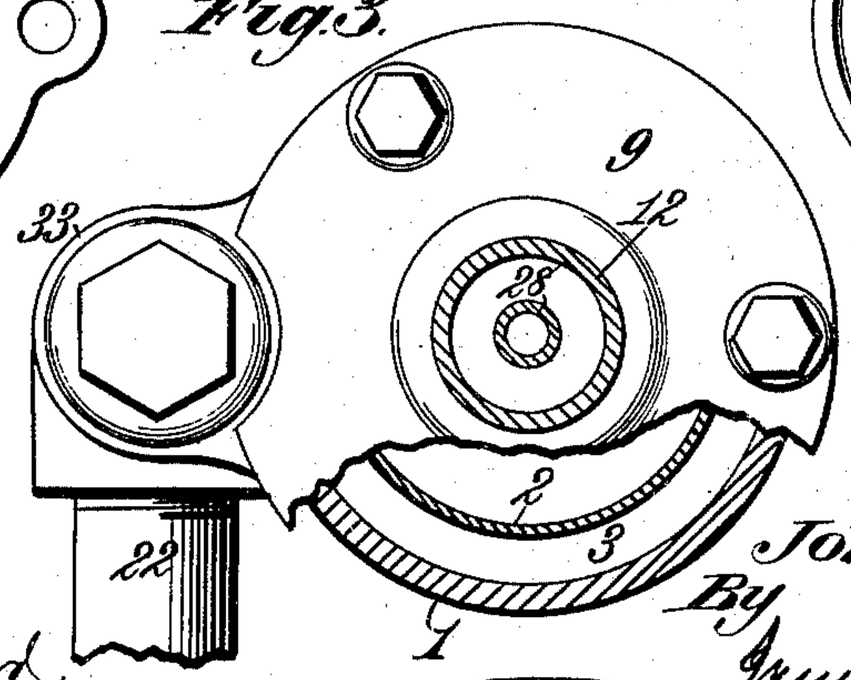
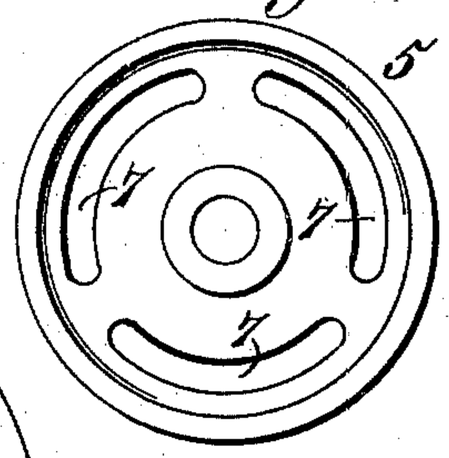


Fig. 5.



Witnesses.
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UNITED STATES PATENT OFFICE.

JOHN NORTH, OF SOUTHINGTON, CONNECTICUT.

PUMP.

SPECIFICATION forming part of Letters Patent No. 477,569, dated June 21, 1892.

Application filed April 6, 1892. Serial No. 428,084. (No model.)

To all whom it may concern:

Be it known that I, JOHN NORTH, a citizen of the United States, residing at Southington, in the county of Hartford and State of Connecticut, have invented new and useful Improvements in Pumps, of which the following is a specification.

The object of my invention is to provide a new and improved pump of simple and durable construction, efficient in action, and susceptible of forcing atmospheric air downward in a well or cistern and liberating it at a suitable depth in the water to prevent the formation therein of sporadic growths and to preserve the purity and sweetness of the water.

To accomplish this object my invention involves the features of construction and the combination or arrangement of devices hereinafter described and claimed.

To enable others skilled in the art to make, construct, and use my said invention, I will proceed to describe the same in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a central longitudinal section of a pump-cylinder in which my invention is incorporated. Fig. 2 is a similar view showing a modified form. Fig. 3 is an end view partly in section. Figs. 4 and 5 are detail views of separated parts.

In the said drawings the reference-numeral 1 indicates the outer barrel or cylinder of the pump, which may be of iron, brass, or other material suitable for the purpose. Within this outer cylinder is arranged an interior cylinder 2 of such diameter that an annular water-charging chamber 3 is formed between its outer cylindrical face and the inner face of the outer cylinder 1. This annular chamber 3 has communication with the inner cylinder 2 at the upper end by way of ports 4 in the wall of the inner cylinder, at the upper end of which is a removable disk or head 5, resting upon an interior shoulder 6. This head is provided with ports 7, opening into a valve-chamber 8, lying between the upper face of the head 5 and the cap 9, which is bolted upon the end of the outside cylinder 1. Upon the head 5 rests a valve-ring 10, which closes the ports 7 against any descending current of water, thereby preventing escape from the pipe 12, tapped through the cap 9 of the outer cylinder. At the lower end of the cylinder is a head or disk 13, its periphery lying between a circular shoulder 14 on the inner face of the contracted lower end of the outside cylinder 1 and a flange or rib 15 on a cylinder cap or head 16, bolted to and closing the lower end of the outside cylinder. Ports 17 are formed in the disk 13 similar to those in the disk at the opposite end of the cylinder, and these ports are closed by a valve-annulus 18, lying against the inner face of the head or disk 13. The closing of this annulus cuts off all access through the lower disk 13 to the chamber 3. The lower end of the inner cylinder 2 is closed by a head 19, having a central boss 20, which rests against the inner face of the disk 13, thereby forming upon the inner face of the boss 20 an air-chamber 20^a, into which a short section of tube 21 is tapped centrally. The water-inlet pipe 22 is tapped through the cylinder-head 16, the length of said pipe being varied, as required, in order to reach the water and at the same time locate the cylinder below the line of frost. Within the inlet-pipe is arranged a smaller air-pipe 23, the end of which is tapped through a diametrical bar 24 on the cylinder-head 16 and lying closely against a central boss 25 on the disk 13, through which the air-pipe section 21 passes, thus giving communication between the pipe-section referred to and the pipe 23.

Within the inner cylinder 2 is the piston 26, the rod thereof being tubular, as shown at 28, Fig. 1. The end of this rod is tapped into the center of the piston and communicates with an air-chamber, in which lies a puppet-valve 29, seating upon a circular valve-seat 30 in an air-chamber 31, which has free communication with the air-chamber 20^a. The air-pipe or tubular piston-rod 28 passes up through the disk 5 at the upper end of the inner cylinder and into the discharge-pipe 12, its end being tapped into the thimble by which it is connected to the brake or lever, an air-discharge 32 being provided at this point. The lower end of the inner cylinder 2 being wholly closed by the head 19, save as to the central air-passage, and the puppet-valve in the piston being closed, when the piston descends the whole body of air lying beneath the piston will be forced through the

air-pipe in the head and thence down through the air-pipe lying in the inlet-pipe below. The latter pipe is used when the pump is standing above the water-level. By the arrangement thus described it will readily be seen that as the piston rises the air will pass down through the tube and into the space beneath the piston. As the latter makes its downward stroke this air will be driven down through the air-pipe in the water-inlet and will be discharged into the well or cistern, its oxygen and the agitation produced serving to keep the water pure and preserve its transparency and absence of all color.

I have shown in Fig. 1 the ordinary and preferred form of pump; but I may substitute therefor the form seen in Fig. 2, in which an auxiliary or third cylinder 33 is employed, lying parallel to the axes of the cylinders 1 and 2 and connected rigidly with the outer cylinder 1 by integral portions of metal 34, which form part of the cylinder-heads. In this construction the inlet is arranged laterally with reference to the third cylinder, as seen in Fig. 3, and is placed centrally. The cylinder 33 communicates with the annular space between the cylinders 1 and 2 by means of a port 35, opening from a valve-chamber 36, in which is arranged a check-valve 36ª, closing on the upstroke of the pump-piston. The lower end of the third cylinder is closed by a screw-plug 37. In this form of pump I also slightly change the construction seen in Fig. 1, as the cylinder 2 is closed at its lower end by the cap of the outer cylinder 1, in which is turned a central screw-plug 38, into which is tapped or screwed the air-pump 23, which communicates with the air-chamber 40, containing a valve 41 for closing the port 42 as the piston rises.

What I claim is—

1. The combination of an outer cylinder, an inner cylinder arranged therein to provide an intervening water-chamber and having communication at its upper end with the latter, an outlet water-pipe extending from the upper head of the outer cylinder, a valve for controlling the passage of water from the upper portion of the inner cylinder to the outlet water-pipe, a piston arranged in the inner cylinder and having an air-chamber, a tubular piston-rod rising from the piston through the outlet-pipe, a valve located in the air-chamber of the piston for controlling the flow of air from the lower end of the tubular piston-rod to said air-chamber, a water-inlet to the outer cylinder, an air-pipe leading from the lower head of the outer cylinder and adapted to extend downward into the water in the well or cistern, and a valve-chamber containing a valve and interposed between the said air-pipe and the piston, substantially as and for the purposes described.

2. The combination of an outer cylinder having upper and lower heads, an inner cylinder arranged within the outer cylinder to provide an intervening water-chamber and having ports at its upper end, communicating with the said water-chamber, a water-inlet, a water-outlet, a piston working within the inner cylinder and having a tubular piston-rod, a valve for controlling the flow of air from the end of the tubular rod connected to said piston, an air-pipe leading from the center of the lower head of the outer cylinder and designed to extend downward in the water of a well or cistern, and suitable valves arranged at opposite ends of the outer cylinder, substantially as described.

3. The combination, with a pump-cylinder, of an interior concentric shell of such diameter as to leave an annular water-charging chamber outside said shell, an air-pipe tapped into and communicating with a valved passage in the piston, a valve-annulus in a valve-chamber at the lower end of the cylinder and closing inlet-ports in the outer cylinder-head, an inlet-pipe tapped through the head, an air-pipe arranged within the inlet-pipe and having its open end communicating with the closed lower end of the inner cylinder, and a valve-annulus upon the tubular piston, seating over ports in the upper end of the inner cylinder, substantially as described.

4. The combination, with a pump-cylinder composed of an inner and outer inclosing shell or cylinder having an annular space between to form a water-charging chamber, of a valve closing the discharge-ports at the upper end of the inner cylinder, a valve opening to the inlet at the lower end of the outer cylinder, a piston having a tubular rod passing up in the discharge-pipe, an air-pipe in the inlet-pipe, and a valve-passage in the piston between the tubular rod, and an air-chamber communicating with the air-pipe in the inlet, substantially as described.

In testimony whereof I have hereunto set my hand and affixed my seal in presence of two subscribing witnesses.

JOHN NORTH. [L. S.]

Witnesses:
EPHRAIM H. ANDREWS,
MARCUS H. HOLCOMB.