No. 675,892. Patented June 11, 1901.

# S. JONES.

## APPARATUS FOR SUPPLYING WATER.

(Application filed Sept. 15, 1898.)

(No Model.)

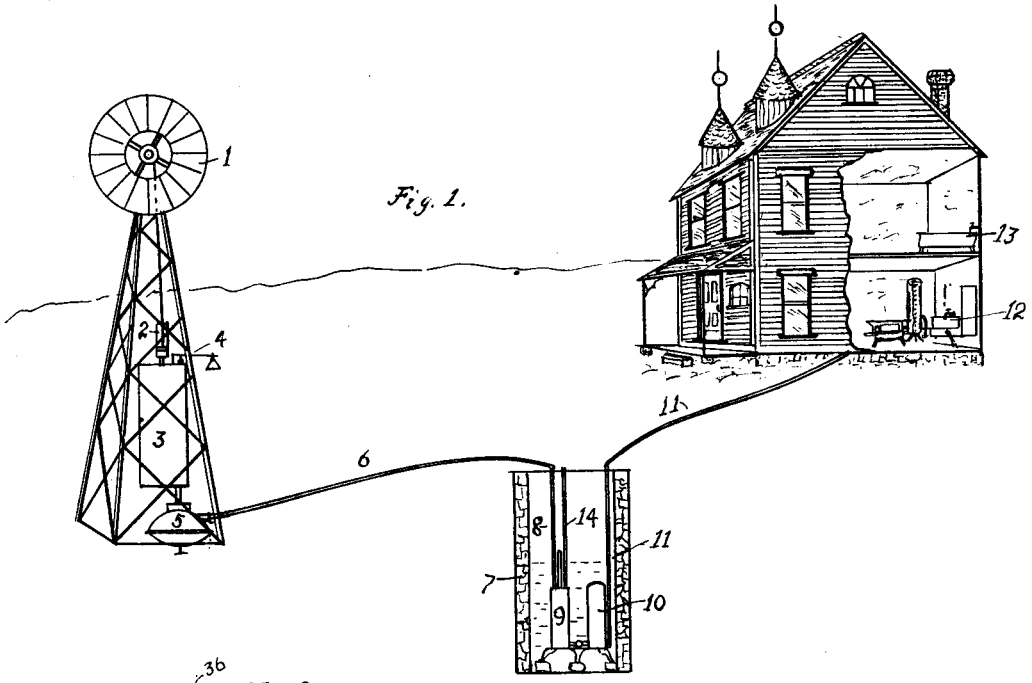


Fig. 1.

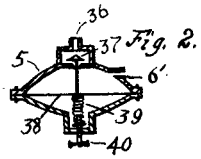


Fig. 2.

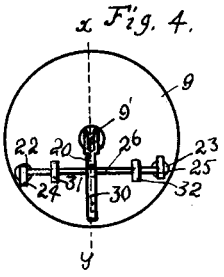


Fig. 4.

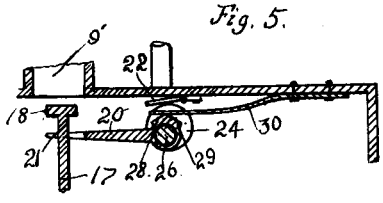


Fig. 5.

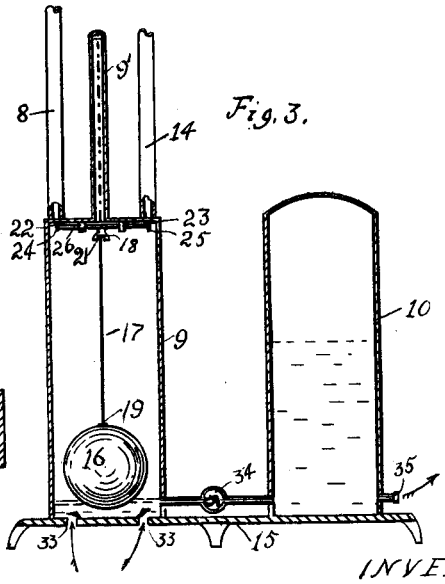


Fig. 3.

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# UNITED STATES PATENT OFFICE.

STEPHEN JONES, OF SCRANTON, PENNSYLVANIA.

## APPARATUS FOR SUPPLYING WATER.

SPECIFICATION forming part of Letters Patent No. 675,892, dated June 11, 1901.

Application filed September 15, 1898. Serial No. 691,017. (No model.)

*To all whom it may concern:*

Be it known that I, STEPHEN JONES, a citizen of the United States, residing at Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Methods of and Apparatus for Supplying Water; and I declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to supplying water for domestic or other purposes by means of a continuous or intermittent motive force.

In the supplying of water from wells and springs located at a distance from the point of use it has been customary to use a reservoir in the shape of a tank, stand-pipe, or basin located at a higher level than that to which the water is to be delivered and the motive force applied to lifting or raising the water to the said reservoir, whence it is drawn off as may be required. Other methods, such as steam-siphon and steam-pumps, have been used, most of which either pollute the water or deliver it in a warm state.

My invention contemplates as part of its purpose to deliver the water at the temperature and freshness of the spring, well, or other source from which it is drawn or in an improved condition consequent upon the aeration which it receives by my method.

My improved method and apparatus for supplying the water are illustrated in the accompanying drawings, in which—

Figure 1 is a view of a motor, source of supply, and points of delivery with the necessary apparatus used in my method. Fig. 2 is a cross-section showing the construction of the regulator by which I regulate the pressure in the automatic pump used in the device. Fig. 3 is a view, mostly in cross-section, of the automatic pump used in the device. Fig. 4 is an under side view of the top of one of the cylinders of my automatic pump. Fig. 5 is a detail view of part of the valve-operating mechanism, taken in cross-section on the line *x y* of Fig. 4.

Similar figures of reference refer to similar parts throughout the views.

1 designates a wind-wheel or other motor which operates an air-pump 2, by which air is pumped into the air-chamber 3 and compressed to the required pressure. The air-chamber 3 is provided with a safety-valve or blow-off 4. The air-compressor should generally, of course, be near the motor. The air is passed from the regulator 5 through the pipe 6 to the well or other source of supply, where it is connected with the pipe 8 of the automatic pump, which consists of two cylindrical portions 9 and 10, standing in an upright position on the base or platform 15, and from which the water is delivered through the pipe 11 to the points of supply 12 and 13. In the automatic pump 9 is a cylindrical extension on the top of the cylinder 9 to permit the rod 17, connected to the hollow globe 16, to slide upward when the globe is lifted by the buoyant force of the water which is permitted to enter at the valves 33 and 33. The rod 17 is provided at its upper end with the knob 18, and at the attachment to the globe with a similar knob or collar 19. The rod is designed to slide between the bifurcations of the arm 20, attached to the shaft 26, and by means of the knob 18 and collar 19 aforesaid to turn the said shaft so as to open and close the valves 22 and 23, respectively, by means of the cams 24 and 25, which are secured to the aforesaid shaft 26. The cams 4 and 5 are so adjusted to the shaft that when the arm 20 is pulled downward the valve 22 is tightly closed and the valve 23 is opened; but when the arm is pressed upward the valve 22 is opened and the valve 23 tightly closed. At the base of the arm 20 are two polls or faces 28 and 29, with which the flat spring 30 engages alternately, so as to hold the shaft into the positions in which it is placed by turning the arm aforesaid. The shaft revolves in lugs 31 and 32, secured to the top of the cylinder 9. The bases of the cylinders 9 and 10 are connected by a short pipe, having the valve 34, and the cylinder 10 is provided with an exit 35, to which the delivery-pipe is attached. The regulator 5 consists of an upper and lower half clamped together, having the diaphragm 38 between them, which

does not permit any air to pass to the lower side. To the diaphragm is attached the valve 37, which is operated by it. The diaphragm 38 is adapted to be stiffened by means of the coiled spring 39, and the tension of the spring 39 is adjusted by means of the screw 40. The port 36 is adapted to receive the air from the chamber 3, and the opening 6′ forms the exit into the pipe 6.

The operation of the apparatus is as follows: The motor keeps a pressure in the chamber 3 considerably greater than that required to operate the pump and raise the water, which when it is transmitted to the diaphragm 38 draws down on the valve 37 and closes it; but it is evident that the pressure will not become great enough on the diaphragm 38 so long as it can be reduced by escaping through opening 6′, and thus relieving the pressure. The diaphragm is adjusted by turning the screw 40 either upward or downward, as it is required, so that it will shut off the valve 37 at a pressure considerably less than that maintained in the chamber 3, but sufficient to operate the automatic pump and create a pressure in the air-chamber of the cylinder 10 sufficient to raise the water to the points of delivery. When the globe has dropped to the bottom of its course, the valve 22 is suddenly shut off, which stops the flow of air from the regulator and immediately the valves 33 and 33 are pressed open by the upward pressure of the water in which the pump is immersed, filling the cylinder 9 and driving the air out through the pipe 14, which extends above the level of the water. The buoyant force of the water as it fills up the cylinder lifts the globe until the collar 19 on the slanting rod 17 lifts the arm 20, shutting off the valve 23 and opening the valve 22, whereupon the pressure, if not shut off by the regulator, will drive the water accumulated in the cylinder 9 through the valve 34 into the cylinder 10, compressing the air in the upper part of said cylinder so as to create sufficient pressure there to drive a considerable amount of water to the points of delivery. It is evident that when much water is drawn the pressure will be continually lessened on the diaphragm 38 and the automatic action just described continued; but whenever there is a cessation of use the valve 34 will not respond to the action of the water from the cylinder 9 after the normal pressure at which the pump is working is acquired in the cylinder 10 until it is relieved. The diaphragm 38 is adjusted so as to be held closed by the said normal pressure.

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

In an apparatus for supplying water the combination with an intermittent power-supply and air-compressor operated thereby, of an air-tank adapted to have air compressed therein by said compressor, a submerged pneumatic pump connected by a pipe or passage-way with said air-tank, a pressure-regulator adapted to control the action of said pump interposed in the passage-way between said compressed-air tank and pneumatic pump, and adapted to suspend and set into action the said pump according as the pressure is increased and decreased therein, the pump aforesaid consisting of two main chambers, one of which is an air-pressure chamber for the purpose of producing a constant flow at the point of supply, and the other chamber being connected with the regulator-controlled passage-way aforesaid, and being provided with an ascending and descending float 16, having a sliding rod with stops thereon adapted to operate a semirevolving shaft by means of sliding in a bifurcated projection extending from said shaft, a shaft having a bifurcated projection adapted to engage with the said sliding rod, and the said shaft adapted to control, supply and discharge valves by means of cams impinging on the lids of the said valves respectively, cams secured to said shaft and adapted to be operated thereby, whereby the valves are alternatively opened and closed by semirevolution of the shaft aforesaid effected by the ascending and descending of the float 16 aforesaid, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

STEPHEN JONES.

Witnesses:
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A. J. BRANDA.