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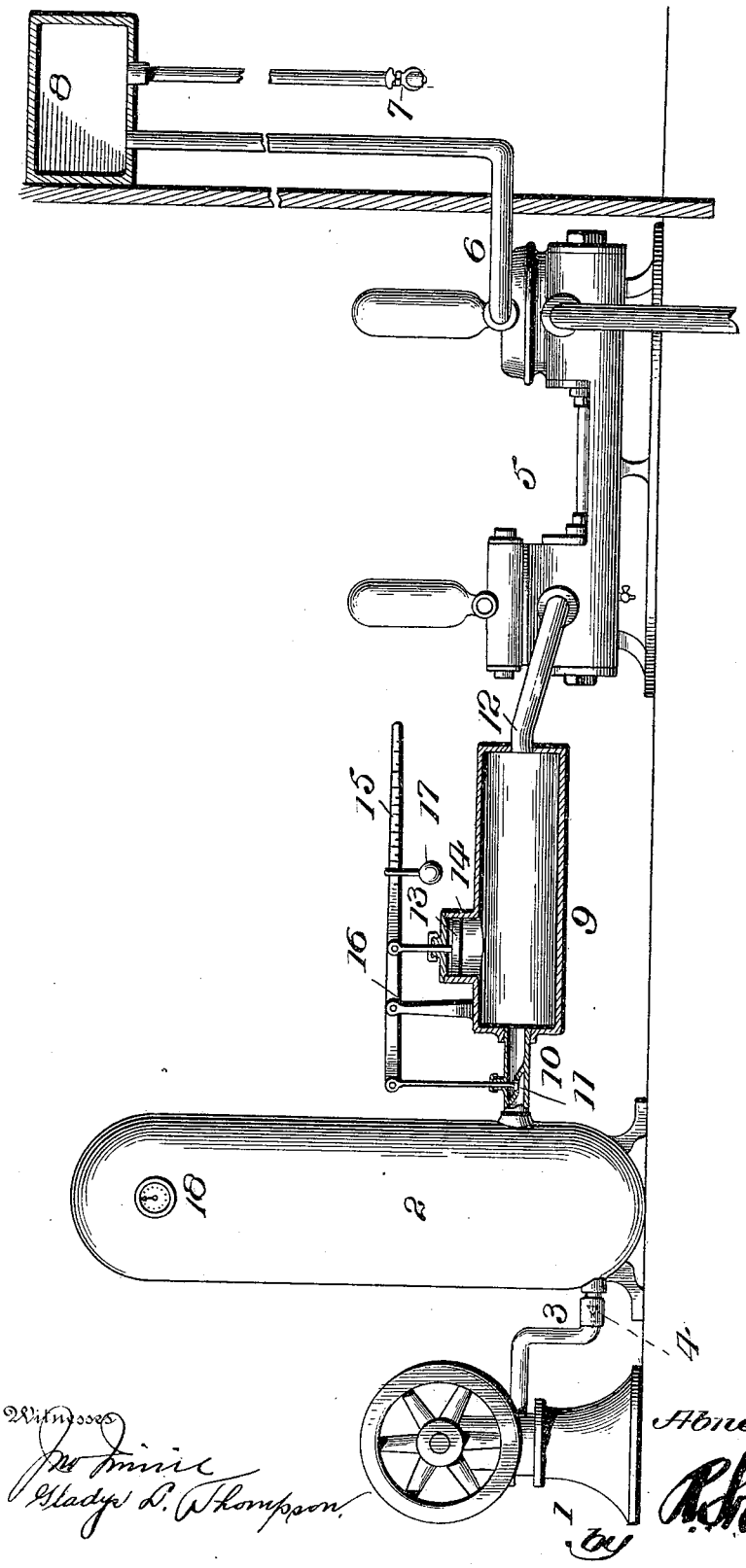
A. D. STRONG.

WATER DISTRIBUTING SYSTEM.

(Application filed May 16, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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WATER-DISTRIBUTING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 645,876, dated March 20, 1900.

Application filed May 16, 1899. Serial No. 717,062. (No model.)

To all whom it may concern:

Be it known that I, ABNER D. STRONG, a citizen of the United States, residing at Ashtabula, in the county of Ashtabula and State of Ohio, have invented certain new and useful Improvements in Water-Distribution Systems; and I do hereby 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.

This invention relates to a system for raising water from a well, spring, cistern, or other reservoir and supplying it to a service-pipe under pressure for distribution, said system being automatic in action and maintaining a practically-uniform pressure within the service-pipe under all conditions.

For a full understanding of the merits, advantages, and details of construction of the invention reference is to be had to the accompanying drawing, which shows a water-distribution system embodying the vital features of the invention. It is not necessary that the parts be arranged in the manner disclosed or that any particular make of air-compressing device or water raising and forcing means be employed. Hence within the purview of the invention various changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages thereof.

The air-compressor 1 may be an air-pump of ordinary construction to be operated either by hand or power, and its purpose is to charge the reservoir 2 with air under pressure, the pipe 3, connecting the air-compressor with the reservoir, being provided with a check-valve 4, opening toward the reservoir and closing toward the air-compressor, so as to prevent escape of air from the reservoir when the pump or compressor 1 is not in action.

The pump 5, for raising the water from the spring, well, cistern, or other reservoir and supplying it to the service-pipe 6, may be of any type commonly used in connection with windmills or water-raising apparatus. This pump is constructed to be operated by means of the compressed air stored in the reservoir 2. The service-pipe 6 is provided at required points in its length with faucets 7 or like means for drawing off the water when required and at desired places. An air-chamber 8 is located at the highest point of the service-pipe, and the air contained therein is normally compressed by the pressure of the water in the service-pipe, thereby providing a sufficient head to enable a continuous and uninterrupted flow through any one of the faucets when open.

A chamber 9 is in communication with the reservoir 2 by means of a pipe 10, in which is located an upwardly-opening valve 11, and another pipe 12 connects the chamber 9 with the pump 5. A plunger 13 operates in a cylinder 14, applied to a side of the chamber 9, and is of larger area than the valve 11. The stems of the valve 11 and plunger 13 are connected to a lever 15 upon opposite sides of its fulcrum, whereby the parts 11 and 13 move in inverse directions. The lever 15 is fulcrumed upon a standard 16, rising from the chamber 9, and its long arm is graduated and receives a weight 17, which is adjustable thereon.

The operation of the apparatus is as follows: The reservoir 2 is charged with air under pressure by means of the air pump or compressor 1, the degree of pressure being determined by means of a gage 18, of any make, applied thereto. As the reservoir 2 is charging the check-valve 4 opens, so as to permit the air passing freely therein, and after the air-compressor ceases operation the check-valve closes, thereby preventing the escape of the stored air which is the motive agent for operating the pump 5 for lifting and supplying the water to the service-pipe. The air under pressure passes from the reservoir 2 into the chamber 9, automatically unseating the valve 11. When the pressure in the chamber 9 reaches the predetermined degree, the plunger 13 will operate and through the lever 15 close the valve 11 and shut off further ingress of air from the reservoir into the chamber 9. The difference in pressure between the reservoir 2 and the chamber 9 will depend, primarily, upon the difference in superficial area of the parts 11 and 13, also upon the position of the weight 17 and the points of contact of the stems of the parts 11 and 13 with the said weighted lever. It is presumed that the stems of the parts 11 and 13 will be connected with

the lever 15 at points equidistant from the fulcrum of the said lever. Hence no advantage results from difference of leverage, and by dispensing with the weight 17 the difference of pressure between the reservoir and chamber will depend solely upon the difference in area of the valve 11 and plunger 13. By weighting the long arm of the lever 15 the effective pressure of air in the chamber 9 can be increased as required for any particular purpose. The air under pressure passes from the chamber 9 to the pump 5 and is the agent for actuating said pump to lift the water and supply it to the service-pipe 6. When the pressure in the service-pipe about equalizes the pressure of air in the chamber 9, the pump ceases operation, and when the pressure in the service-pipe is diminished, as when opening any one of the faucets 7 to draw off water, the pump immediately begins to operate, thereby recharging the service-pipe and maintaining the requisite pressure therein necessary to provide for a continuous flow of water through the open faucet. When the pressure within the chamber 9 falls below a given point, the valve 11 will open by the superior pressure of air from the reservoir 2, thereby enabling the chamber 9 to be replenished. It will thus be seen that the system or apparatus is entirely automatic in its action, it being necessary only to keep the reservoir 2 charged with air, which can be effected by operating the air compressor or pump 1 at desired intervals.

Having thus described the invention, what is claimed as new is—

1. An apparatus or system for elevating and distributing water, the same consisting of a service-pipe provided with faucets at desired points, a pump for lifting the water and charging the service-pipe, a compressed-air reservoir, means for charging said reservoir with air under pressure, and a pressure-reducing means between the compressed-air reservoir and the said pump, substantially as set forth.

2. In a system or apparatus for elevating and distributing water by means of a service-pipe, a pump for effecting and charging the service-pipe, a compressed-air reservoir, means for charging said reservoir with air under pressure, a chamber in communication at opposite ends with, respectively, said reservoir and pump, a valve located in the connection between the chamber and reservoir and opening with the pressure from said reservoir and means operatively connected with the valve and controlled by the pressure of air within the said chamber to automatically reduce the effective pressure for actuating the pump, substantially as described.

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

ABNER D. STRONG. [L. S.]

Witnesses:
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