(No Model.)

H. K. GOODRICH.

DEVICE FOR SEPARATING AIR IN PIPE LINES FROM ARTESIAN WELLS.

No. 465,019. Patented Dec. 15, 1891.

Fig. 1.

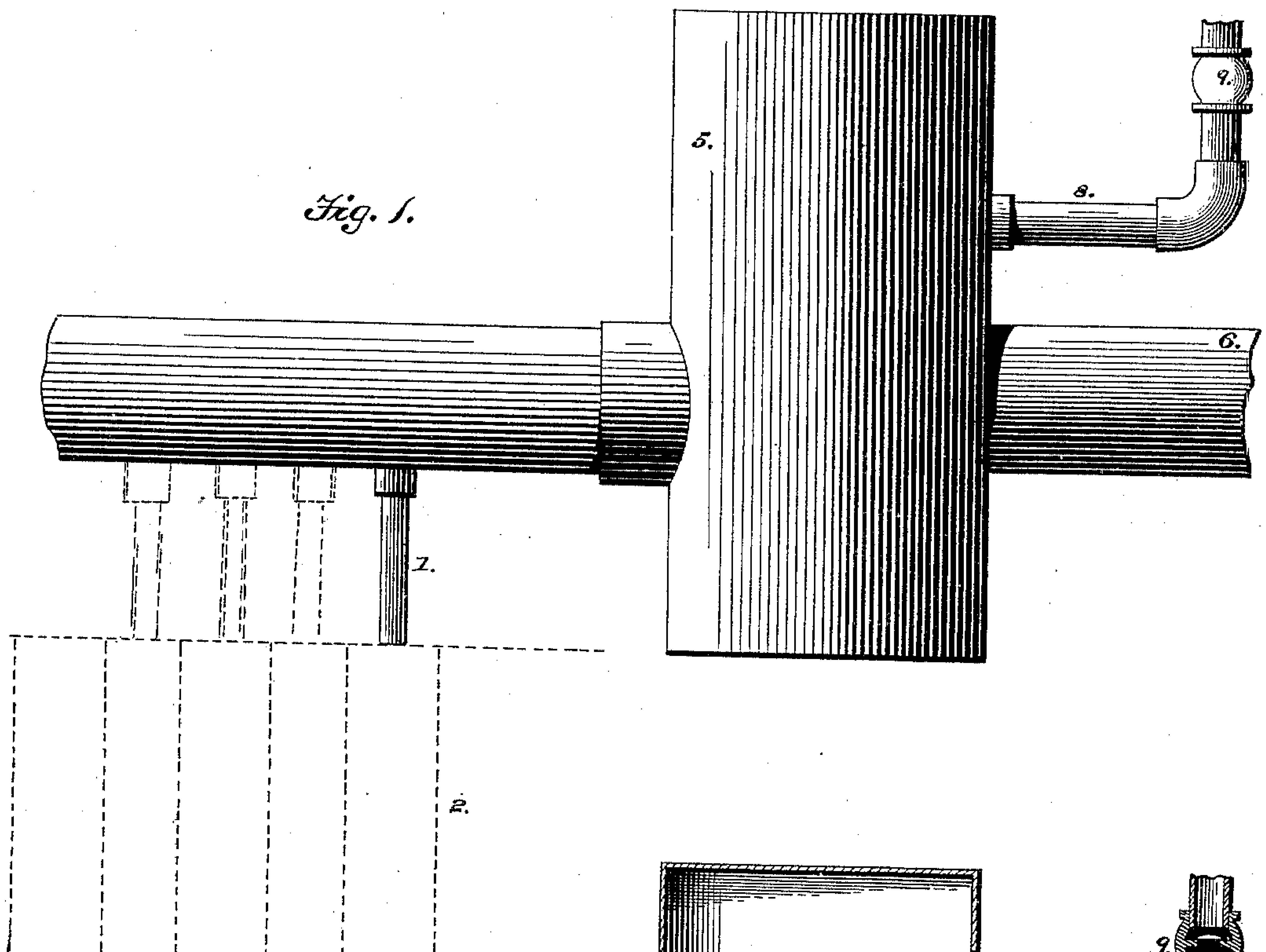
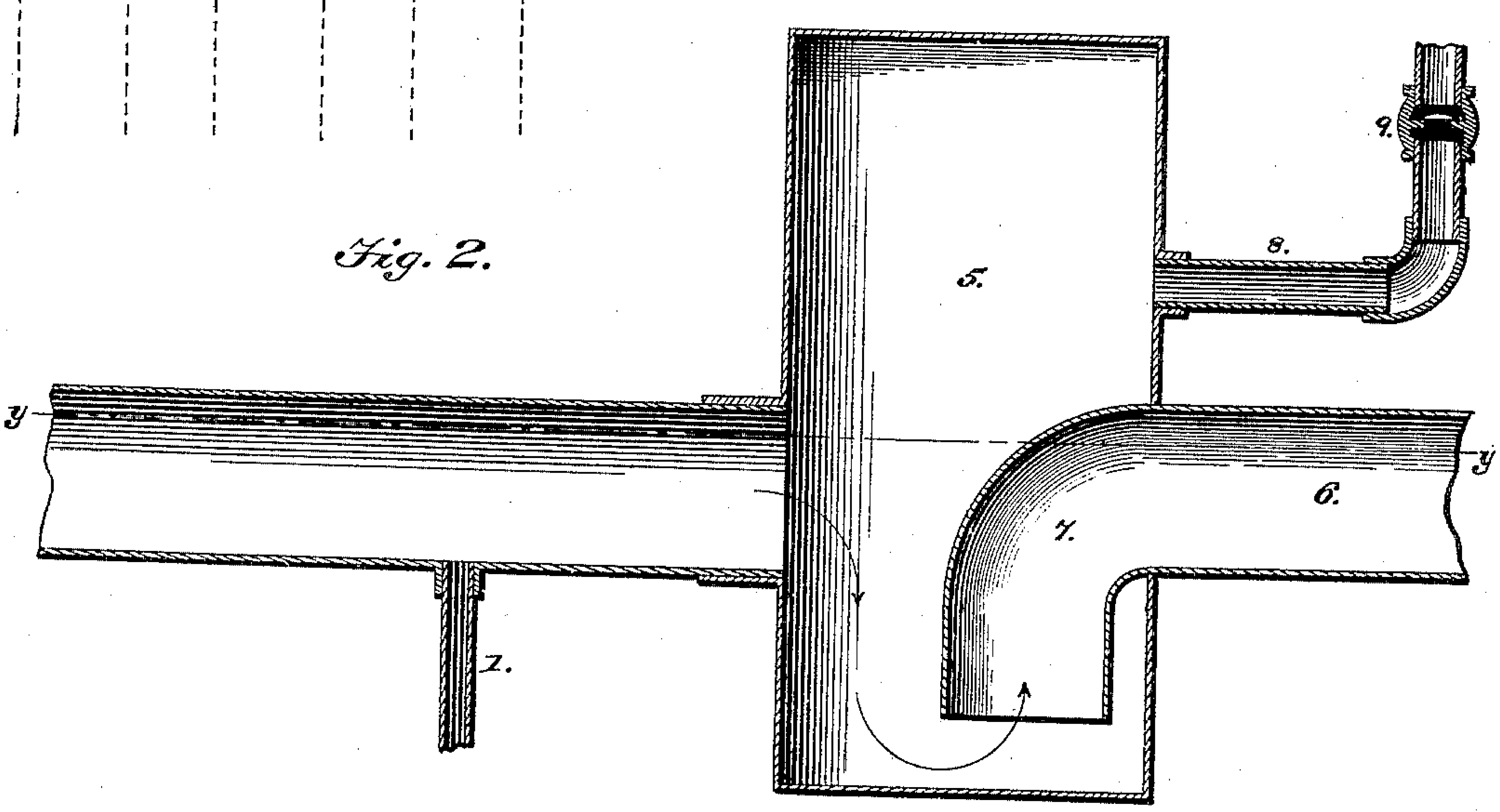


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

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DEVICE FOR SEPARATING AIR IN PIPE-LINES FROM ARTESIAN WELLS.

SPECIFICATION forming part of Letters Patent No. 465,019, dated December 15, 1891.

Application filed March 18, 1890. Serial No. 344,341. (No model.)

To all whom it may concern:

Be it known that I, HERVEY K. GOODRICH, a citizen of the United States of America, residing at Topeka, in the county of Shawnee and State of Kansas, have invented certain new and useful Improvements in Devices for Separating Air in Pipe-Lines from Artesian Wells, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to means for separating air from water in a suction-pipe for pumps, especially in a pipe common to a series or gang of wells. It is a well-known fact that a considerable volume of air accumulates in a long line of suction-pipe common to a series of wells, which enters the pump with the water and causes the pump to "pound" or become subject to a jarring motion, which impairs the efficiency of the pump and causes the same to run at a greatly-reduced speed.

It is the object of my invention to overcome this objection, and thus insure to the pump an easy smooth-running motion and enable the same to perform its full duty by working up to the required capacity.

With this and other objects in view my invention consists of a receiver which has the pipe-line communicating with the same, an air-pipe leading from the receiver, and a suction-pipe for water, which extends and opens into the receiver, the lower end of said suction-pipe terminating above the bottom of the receiver and the suction-pipe leading to the pump.

My invention further consists in the combination of devices and peculiar construction and arrangement of parts, as will be hereinafter more fully described and claimed.

To enable others to understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure 1 is an elevation showing the apparatus in connection with a suction-pipe line of a gang of wells. Fig. 2 is a vertical sectional view through the improvement.

Like numerals of reference denote corresponding parts in both the figures, referring to which—

1 designates the suction-pipe or pipe-line from a series of wells, (indicated at 2,) said pipe-line leading to a pump, as is usual, although I have not deemed it necessary to illustrate the pump, as it is of the ordinary form and will be readily understood by those skilled in the art to which the present invention relates.

My improvement consists in the use of a receiver 5 and in the arrangement and organization of adjunctive parts intermediate between the pump and the source of water-supply, (the gang of wells,) whereby I am enabled to effect the separation of the major portion of the column or body of air from the water before the latter enters the pipe to the pump to be forced by the latter to the point where it is to be used or stored. This receiver 5 consists of an upright tank or vessel of the required size and capacity, having the closed upper and lower ends, the lower part of the receiver forming a water-reservoir and the upper part of the receiver forming an air-chamber, the approximate water-line being indicated by the dotted line *y y* in Fig. 2. When the water and air flow from the gang of wells into the suction-pipe line 1, which is usually of considerable length, the air has a tendency to accumulate in the upper part of the pipe-line and form a separate column or body of air from the column or body of water, which, owing to its specific gravity, lies at the bottom of the pipe-line. This fact has been well established, and in my apparatus I utilize the same by arranging the suction-pipe line to enter the receiver, so that the water is discharged at or below the water-line and the body or column of air is permitted to escape into the receiver above the water-line and into the air-chamber above the water-line.

6 designates the suction-pipe for water to the pump, which pipe enters the receiver at the water-line and has its inner end bent or formed into an elbow 7, which terminates just above the bottom of the receiver, whereby the water is free to pass into the elbow 7 at a point below the water-line, and the intervening body of air between the open end of the suction-pipe 6 and the air-chamber serves as a water seal to prevent the air in said chamber from being drawn into the suction-pipe 6 with the water.

The air-outlet pipe 8 leads from the receiver at a point above the water-line, so that said pipe communicates with the air-chamber in

the upper part of the receiver. This air-outlet pipe is connected to an air-pump or to the condenser of an engine, so that the air is exhausted or drawn by suction from the receiver, and in this air-pipe is placed a check-valve 9, of any preferred pattern, which prevents ingress of air into the receiver through the outlet-pipe should the pump be stopped.

The operation and advantages of my invention will be readily understood and appreciated by those skilled in the art from the foregoing description.

Changes in the form and proportion of parts and in the details of construction and arrangement of devices can be made without departing from the spirit or sacrificing the advantages of my invention.

Having thus described my invention, what I claim as new is—

A device of the character described, consisting of the reservoir or receiver having the openings near the lower portion thereof, the supply-pipe leading to one of the openings of the reservoir, the suction pipe or pipes leading from the wells to the supply-pipe, the suction-pipe leading from the other opening of the reservoir and having a downturned elbow, and the air-outlet pipe leading from the reservoir above the other pipes and having a valve which is operated by the pressure of air to allow the escape of air, but prevents the entrance of air through said pipe, substantially as described.

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

HERVEY K. GOODRICH.

Witnesses:

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