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E. G. MARTIN & J. H. HAKE.

WATER ELEVATOR.

APPLICATION FILED APR. 23, 1906.

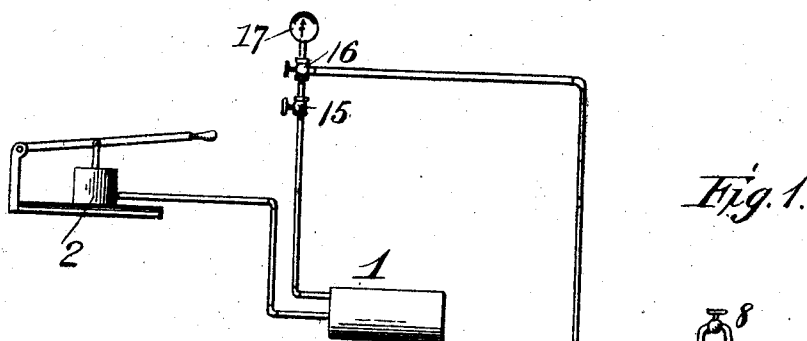


Fig. 1.

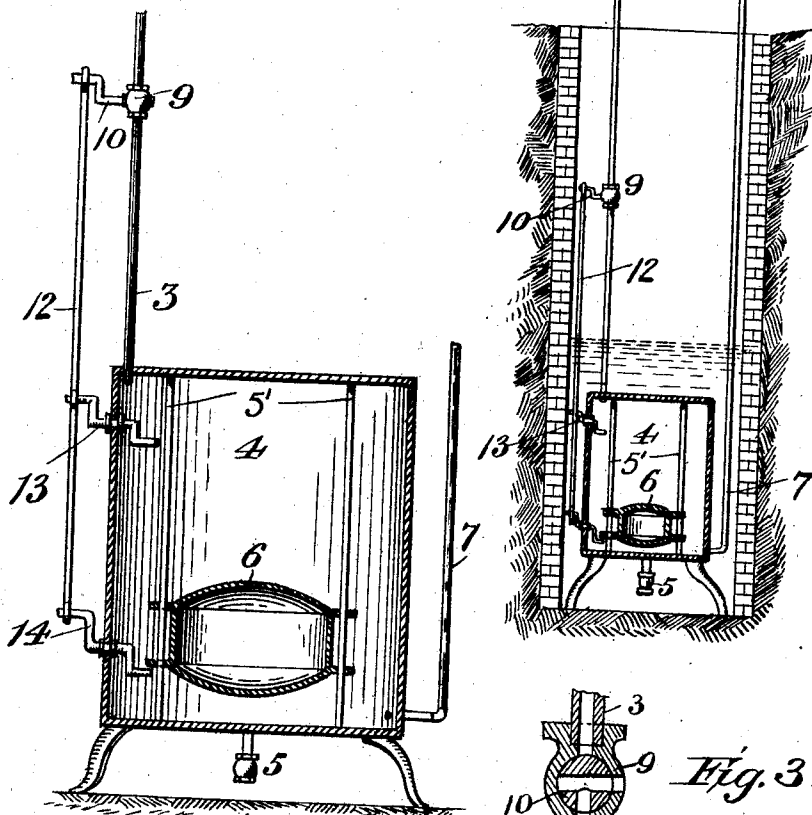


Fig. 2.

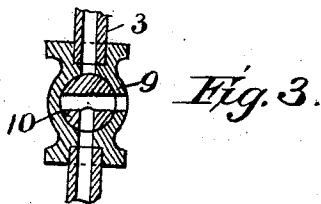


Fig. 3.

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WATER-ELEVATOR.

No. 859,400.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, EDWARD G. MARTIN and JOHN HENRY HAKE, citizens of the United States, residing at Tyler, in the county of Smith and State of Texas, have invented certain new and useful Improvements in Water-Elevators; and we do 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 improvements in compressed air water elevators.

The object of the invention is to provide a water elevator of this character having improved means whereby the same will be automatically operated to raise the water from a well and discharge the same at any desired point.

A further object is to provide novel means whereby the compressed air may be manually controlled to raise the water.

With the above and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts, as will be hereinafter described and claimed.

In the accompanying drawings:—Figure 1 is a diagrammatic view, partly in section, showing the application of the invention to a well; Fig. 2 is a vertical sectional view through the water tank in the well, showing the tank empty and the float therein in position to operate the three-way air valve to cause the latter to cut off the air supply pipe and to open the air exhaust pipe from the tank; and Fig. 3 is a detail sectional view of the three-way air valve.

Referring more particularly to the drawings, 1 denotes a compressed air tank, to which is connected a suitable air pump 2, whereby air may be forced into said tank. Communicating with the tank 1 and extending into a well is an air pipe 3, which is connected at its lower end to the upper end of a water tank 4 which is submerged in the well and is suitably supported therein. In the bottom of the water tank 4 is arranged a check valve 5. Slidably mounted on suitable guide rods 5' in the tank 4 is a float 6, which is adapted to rise and fall with the water in the tank as the same enters and is discharged therefrom. Connected to the lower end of the tank is a discharge pipe 7, the upper end of which is here shown as being provided with a spigot 8. Arranged in the air supply pipe 3 above the water in the well is a three-way valve 9, by means of which the supply pipe 3 from the air tank is closed and at the same time a portion of the pipe between the valve and the water tank 4 is opened, thereby providing a vent for said tank by means of which the air may be discharged therefrom.

The stem of the valve 9 is provided with a crank handle 10, which is connected by a rod 12 to upper and lower double operating cranks 13 and 14 arranged in the tank 4 adjacent to the upper and lower ends of the same, as shown. The ends of the operating cranks 13 and 14 within the tank 4 project within the path of movement of the float 6, whereby when said float raises and lowers, the same will engage said cranks and turn the same, thereby opening or closing the valve 10 through the connecting rod 12, as will be understood.

In the operation of the elevator, assuming the pipe 3 from the air tank to be closed by the valve 9 and the air vent from the water tank open, the water from the well will run into the tank from the check valve 5, thereby filling the same and raising the float 6 until the same comes into contact with the crank 13 at the upper end of the tank, which will operate the three-way valve 9 to open the air supply pipe and at the same time close the air vent, thus letting the compressed air from the tank 1 into the water tank 4, which will force the water in said tank out through the discharge pipe 7 until the tank 4 is empty and the float 6 has again lowered and comes into contact with the lower crank 14, which when engaged by said float will operate the valve 9 to cause the same to cut off the air supply from the tank 1 and open the air vent from the water tank, thus allowing said tank to again fill.

Should it be desired to use the elevator without the float 6 or other automatic operating devices, the air supply pipe may be provided near its upper end with a manually operated cutoff valve 15, above which or between the same and the water tank is arranged a discharge cock or valve 16, so that by opening the valve 15 and closing the cock 16, the compressed air in the tank is let into the water tank 4, thereby forcing the water from the same. After the water has been thus discharged from the tank 4, the valve 15 is closed and the discharge cock 16 open, thereby providing a vent for the escape of air from the tank 4 while the same is filling with water. If desired the air supply pipe 3 may be provided with a pressure gage 17, whereby the pressure in the tank 1 is indicated.

A water elevator constructed and arranged as herein shown and described will be simple and comparatively inexpensive in construction, efficient and reliable in operation and by providing an air supply pipe with manually operated valves as herein shown, the elevator may be operated either automatically or manually.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Having thus described our invention, what we claim as new and desire to secure by Letters-Patent, is:—

1. In a water elevator, the combination with a compressed air tank, of a submerged water tank, a valve-controlled inlet for the water tank, a discharge pipe connected to the latter, an air supply pipe connecting said air tank with the water tank and provided with a vent opening, a three-way valve arranged in the air supply pipe and operable for establishing communication between the air and water tanks or between the latter and vent opening, said valve being provided with a stem, operating members extended into the water tank, operative connections between the valve stem and members for turning the former when the latter are operated, and a float arranged in the water tank and operated by the rise and fall of water therein to actuate said members for operating the three-way valve to automatically control the admission of air to and its discharge from the water tank.
2. In a water elevator, the combination with a compressed air tank, of a submerged water tank, an air supply pipe connecting said tanks and provided with a vent opening, a pump for forcing air into the air tank, a valve-controlled inlet leading to the bottom of the water tank, a discharge pipe connected to the latter, a three-way valve arranged in the air supply pipe and operable for establishing communication between the air and water tanks, or between the latter and vent opening, said valve having a stem provided with a crank handle, operating cranks extended into the water tank, a rod con-

necting the operating cranks with the valve stem crank, and a float arranged in the water tank to rise and fall with the water therein and to engage said operating cranks for actuating the three-way valve to automatically control the admission of air to and its discharge from the water tank.

3. In a water elevator, the combination with a compressed air tank, a submerged water tank, a pair of guide rods extended through the latter, a float slidably mounted on said rods within the tank and adapted to rise and fall with the water therein, a valve controlled inlet leading to the water tank, a discharge pipe leading therefrom, an air supply pipe connecting the air tank with the water tank and provided at an intermediate point with a vent opening, a three-way valve arranged in the air pipe and operable for establishing communication between the air and water tanks or between the latter and vent opening, said valve having a stem, operating members extended through the wall of and into the water tank within the path of movement of the float, and operative connections between the members and valve stem for turning the latter when the members are operated, thus to automatically control the admission of air to and its escape from the water tank.

In testimony whereof we have hereunto set our hand in presence of two subscribing witnesses.

EDWARD G. MARTIN.
JNO. HENRY HAKE.

Witnesses:

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