

A. GREGG.
Automatic Water-Lifter.

No. 206,435.

Patented July 30, 1878.

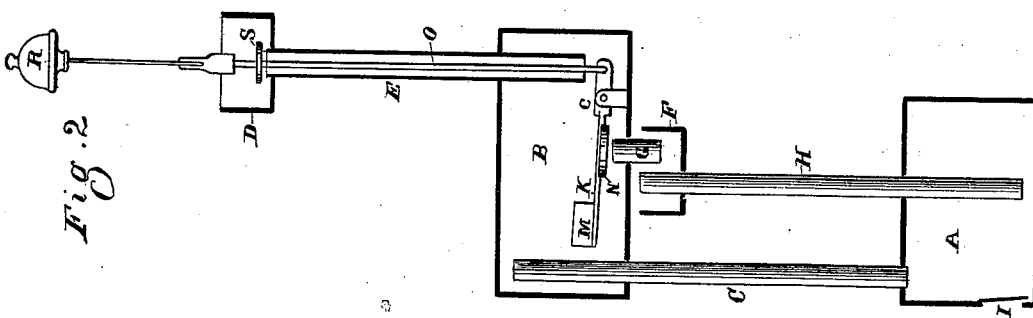


Fig. 2.

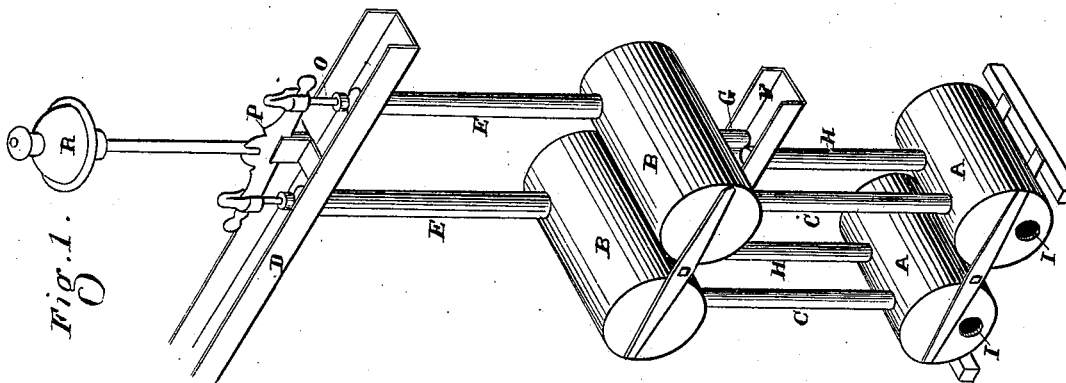


Fig. 1.

Witnesses
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ABRAHAM GREGG, OF FOREST CITY, CALIFORNIA.

IMPROVEMENT IN AUTOMATIC WATER-LIFTERS.

Specification forming part of Letters Patent No. 206,435, dated July 30, 1878; application filed February 16, 1878.

To all whom it may concern:

Be it known that I, ABRAHAM GREGG, of Forest City, county of Sierra, and State of California, have invented an Automatic Water-Lifter; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

My invention relates to an automatic water-lifter, which is intended for raising water out of a pit or excavation where an elevated supply or head of water can be obtained for providing the requisite pressure.

My machine is especially adapted for raising water out of a mine where an elevated flume or water supply is convenient. My machine is then self-acting—that is, it is operated by the pressure or head of water obtained from the elevated water-supply, and raises the water from the mine to the surface of the ground, where both the water which has been drawn from the elevated source and that which has been lifted from the mine are discharged into a flume and conducted away.

My machine consists of a duplicate arrangement of what is known as "Hero's Fountain," a device by means of which the water is raised by compressed air, and the air is condensed by a high column of water. I employ two of these machines side by side, and connect the operating-valve of one with the operating-valve of the other, so that the machines are operated alternately, automatically, and continuously, all as hereinafter more fully described.

Referring to the accompanying drawings, Figure 1 is a perspective view of my machine. Fig. 2 is a vertical view of the same.

Let A A represent two cylinders or, better, containing-vessels, each of which is supplied with an inlet-opening, which is closed by an inward-opening valve. These vessels are placed side by side in the pit or excavation, and are to be submerged in the water which it is desired to raise to the surface. Each of these cylinders is connected with one of the independent cylinders B B at the surface of the ground by a pipe, C, which extends through the top of each lower cylinder, and passes through

the bottom of the upper cylinders and terminates inside of them near the top.

D is the elevated flume or water-supply, from which the water column for condensing the air is drawn, and a pipe or tube, E, connects the bottom of this flume or water-supply with each of the cylinders B B. These tubes E pass down through the top of each cylinder, and terminate near the bottom, as represented.

F is the waste-flume, into which the water which is elevated from the excavation and the water which is drawn from the flume D are discharged. This flume passes along underneath the cylinders B B, and a discharge-spout, G, at the bottom of each cylinder B B discharges the water from each cylinder into it. A tube, H, extends from near the bottom of each lower cylinder or vessel A up through the top of the vessel, and thence up through the bottom of the flume F, where it terminates in the flume. Each lower cylinder A A has an inlet-opening, I, which is closed by an inwardly-opening valve. A lever, K, is mounted in each upper cylinder B B, with its fulcrum at C, and its long arm extends out into the vessel and has a float, M, on its extremity. A valve or stopper, N, is secured to this lever directly over the discharge-opening G. The short arm of the lever terminates directly below the tube E in each cylinder, and a rod, O, has its lower end attached to it, and extends directly up through each tube to a distance above the flume D, where the ends of the two rods, which extend above the two tubes, are connected by a beam, P. This beam is pivoted at its middle to a bearing or frame, and a rod extends upward from its middle a short distance, and has a weight, R, at its upper end. Each rod O has a valve, S, secured to it just above the end of the tube E.

This machine operates as follows: One of the valves S is always open. Water flows through this valve and down the tube E into the cistern or vessel B, driving the air in that cylinder down through the tube C. This drives the water in the cylinder A up through H into the waste-flume E. While this is transpiring the water in the opposite cylinder, B, is emptying through the spout G into the waste-flume E. When the latter vessel is empty the float M descends and closes the dis-

charge-opening G and opens the valve S, the same movement operating through the balanced beam P to close the valve S of the filled cylinder and open its discharge-spout G. The opposite cylinder then fills, and the compressed air forces the water from the lower cylinder A up into the waste-flume, while the first cylinder discharges its contents likewise into the waste-flume, as heretofore described. Thus the two machines automatically operate each other alternately, and water is raised from the excavation and discharged into the waste-flume.

It is necessary usually in raising water from mines to allow a loss of one-third of the power employed for overcoming friction, and the machinery is subjected to considerable wear and tear, especially if the water to be raised is muddy; but in this machine the only friction to be overcome is what is caused by the water and air passing through the pipes and by the moving of the valves.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

The combination of two air-compressing water-lifters, each of which consists of two cylinders or vessels, A B, which are connected by a tube, C, the vessel B being connected with an elevated water-supply by a tube, E, the lower vessel, *a*, having the vertical discharge-pipe H, and the vessel B, having the discharge-spout G, and having the lever N, with its float M and valve N, arranged to open and close the discharge-passage, in combination with the vertical rods O, which are connected by the balanced beam P, each of said rods being provided with a valve, S, all combined and arranged to operate substantially for the purpose described.

In witness whereof I have hereunto set my hand and seal.

ABRAHAM GREGG. [L. S.]

Witnesses:

FRANK LOWE,
WALTER LOWRY.