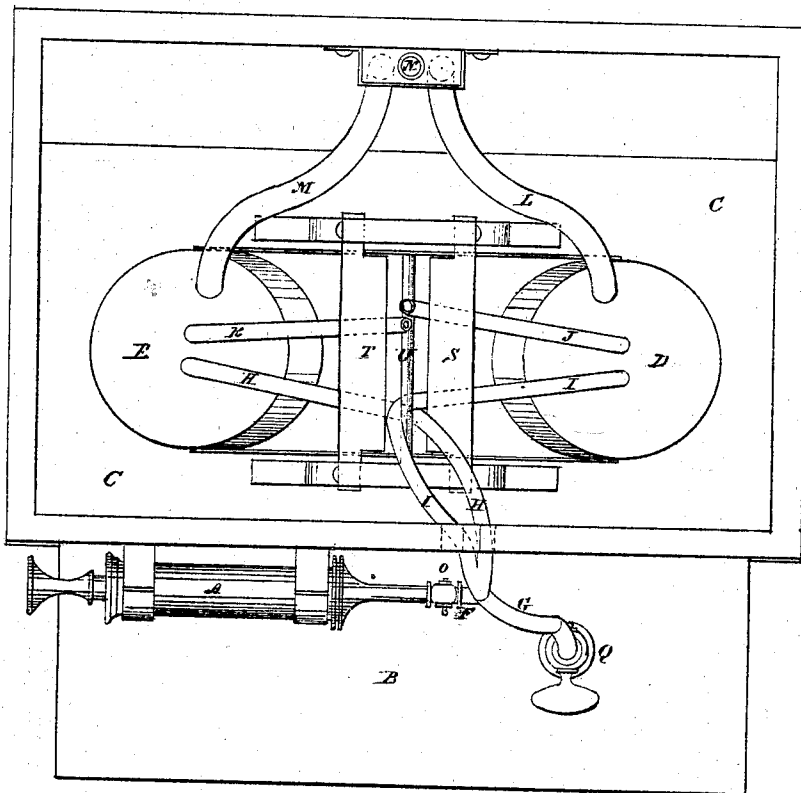


J. A. AYRES.
Water Elevators.

No. 137,754.

Patented April 15, 1373.

Fig. 1.



Witnesses.

Ben. A. Cooke

Charles L. Burdett

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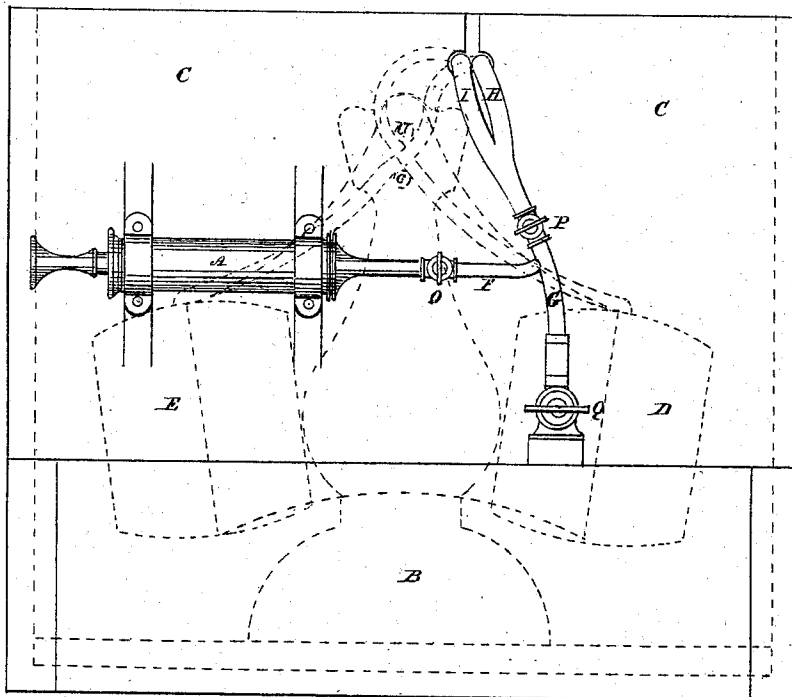
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Patented April 15, 1873.

Fig. 2.



Witnesses.

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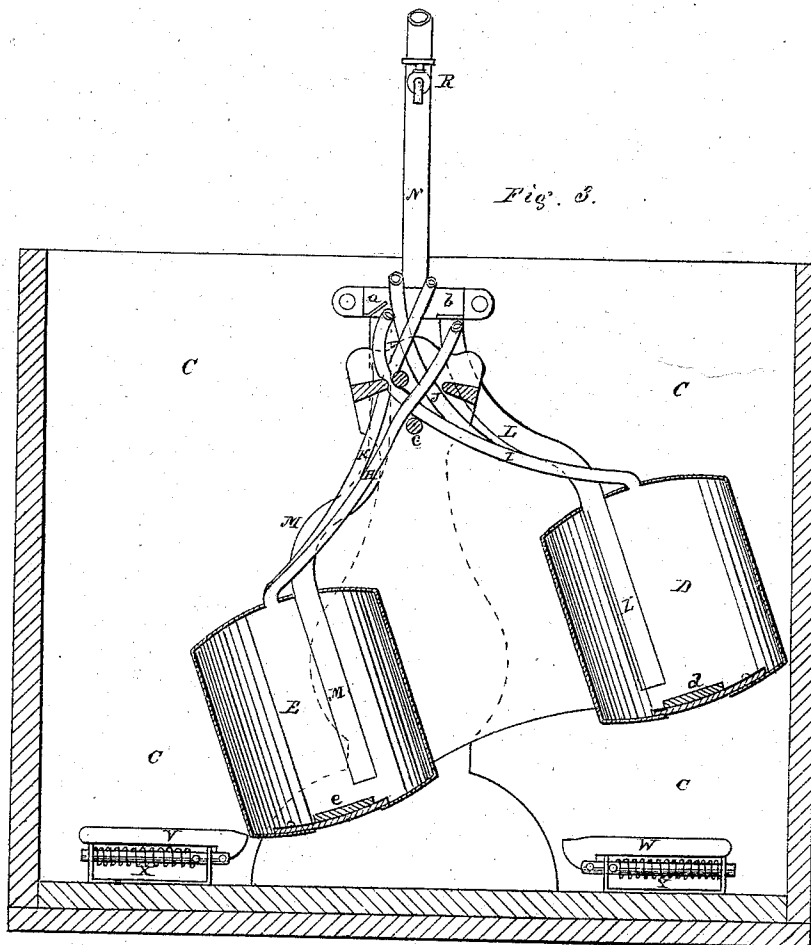
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UNITED STATES PATENT OFFICE.

JARED A. AYRES, OF MYSTIC RIVER, CONNECTICUT.

IMPROVEMENT IN WATER-ELEVATORS.

Specification forming part of Letters Patent No. 137,754, dated April 15, 1873; application filed September 7, 1872.

To all whom it may concern:

Be it known that I, JARED A. AYRES, of Mystic River, in the county of New London and State of Connecticut, have invented certain new and useful Improvements in Methods of Raising Water; and I do hereby declare that the following is a full, clear, and exact description thereof, whereby a person skilled in the art can make and use the same, reference being had to the accompanying drawing and to the letters of reference marked thereon.

Like letters in the figures indicate the same parts.

My invention consists in raising water by means of compressed air applied either directly from an air-pump or from an air-reservoir, into which the air has been previously forced. It also consists in the peculiar mechanical devices, hereinafter described, by which this is effected. The object of my invention is to carry water, under pressure, to any part of a building or to any desired height from a well, river, or other source of supply without previous pumping to a reservoir at a higher level to give the required head or pressure.

The essential parts of my apparatus are an air-pump, an air-reservoir, an oscillating pair of chambers from which the water is expelled by the pressure of the condensed air, and the necessary connecting and distributing pipes.

In the accompanying drawing on three sheets, Figure 1 is a top view of my improved apparatus, with the water-chambers as they would be when changing position after one is emptied. Fig. 2 is a front view of the apparatus, showing the air-reservoir and pump in full lines, and the water-chambers behind in dotted lines. Fig. 3 is a section through the water-chambers in the position they assume while the water is being discharged or ready to be discharged on turning a delivery-cock.

A is an air-pump of ordinary construction, operated by hand or any suitable power. B is an air-reservoir, into which the air is compressed by the pump A. C is a well or cistern containing water, in which the chambers forming the water-pump are submerged. D and E are the oscillating water-chambers suspended in a frame turning about the center c. These chambers have in their bottoms the valves *d* and *e* opening upward. F is a pipe

leading from the air-pump to the reservoir for compressed air. G is a pipe from the air-reservoir to the pumping apparatus for raising the water. It divides into two pipes, H and I, leading to the tops of the chambers E and D. J and K are pipes, by which the air passes out of the chambers after it has done its work. L and M are ascending water-pipes, which carry the water forced out of the chambers to any desired point. After leaving the chambers they unite in one main pipe, N. O, P, and Q are stop-cocks in their respective pipes, the use of which will be hereinafter explained. R is a delivery-cock in the pipe N. *a* and *b* are check-valves in the pipe N. S and T are bars on the frame that supports the oscillating chambers. They are so placed that the rod U upon the oscillating frame is brought against them as it swings to one side or the other. The pipes H I J K pass between these bars and the rod U, in the manner shown in the drawing, so that when the chamber D is uppermost, as shown in Fig. 3, the pipes I and K are squeezed and closed, and when the chamber E is uppermost the pipes H and J would be closed, leaving I and K open. This form of valve is shown to illustrate the invention, but any form of valves operated by the swinging of the chambers would accomplish the same result. V and W are tilting levers held in place by the spiral springs X and Y. They serve to catch and hold the descending water-chamber until a certain force overcomes the pressure of the spring and allows the chamber to escape and rise.

The operation of my invention is as follows: Air is pumped into the reservoir B until it acquires the requisite pressure. This is done by closing the cock P and leaving O and Q open while the pump A is working. When the reservoir is charged the cocks O and Q should be closed, unless it is desired to immediately use the compressed air, when P and Q are left open. When the water-chambers are in the position shown in Fig. 3, and submerged before any water is drawn, they are both full of water. If the delivery-cock R is now opened, the pressure of the air from the reservoir B acts through the pipe H upon the water in E and forces it out through the pipe M to the delivery-cock. Water can thus be drawn from this

chamber until nearly exhausted, when, it being nearly filled with air, the weight of the full chamber D preponderates, and, by compressing the spring X, allows E to escape and rise; D descends, and is caught by the latch W. The pipe K is opened, which allows the air to escape from the chamber E, which immediately fills with water through the valve e. The pipe I is opened, which admits the pressure to the surface of the water in D. The pipe J is closed, which prevents the escape of air from D, and the pipe H is closed, which cuts off the pressure from E. The apparatus is now in position to use the water from the chamber D in the same manner as that from E was forced through the delivery-pipe. The two chambers thus alternately discharge their contents through the delivery-pipe N so long as the cock is kept open. When it is closed the operation of the pump stops.

It is sometimes desirable not to use the supply of compressed air in the reservoir B, but to obtain the requisite power directly from the air-pump. In this case the cock Q is allowed to remain closed and O and P open, when the pressure from the pump A acts directly upon the water in the chambers E and D so long as the pump is worked. The connecting-pipes between the several parts of the apparatus need not be exactly as arranged in the drawing so long as they admit of the same communications between the parts that are herein described. It is generally more convenient to place the air-reservoir at a point distant from the water. It may be placed in any convenient position and be connected with the other parts of the apparatus by suitable pipes. It may also be large or small, according to the

amount of water to be raised and the time it is required to act without refilling.

Claims.

What I claim as my invention is—

1. The self-acting oscillating pumping apparatus D E operated by compressed air, substantially in the manner described.
2. The combination of an air-pump, a reservoir for compressed air, and an automatic continuously-acting water-pump, constructed substantially in the manner herein described.
3. The combination of a reservoir of compressed air with an automatic continuously-acting pump and delivery-cocks, by the arrangement of which the action of the pump is controlled, as herein described.
4. A self-acting pumping mechanism, constructed substantially in the manner described, in combination with a delivery-cock, so that its action can be started by opening the delivery-cock and stopped by closing it through the intervention of the inclosed water, substantially as herein specified.
5. The arrangement of the water-chambers with their supply and waste-air pipes in such a manner that the motion of the water-chambers opens and closes the communication through the pipes, substantially in the manner specified.
6. The latch V with its yielding spring X, or its equivalent, to allow a certain force to detach the chamber E, substantially as described.

J. A. AYRES.

Witnesses:

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