

J. A. AYRES.

Apparatus for Elevating Water.

No. 114,092.

Patented April 25, 1871.

Fig. 1.

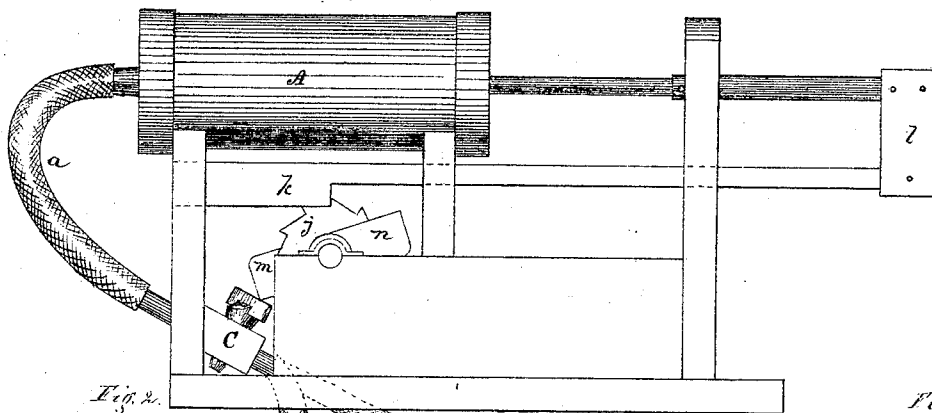


Fig. 2.

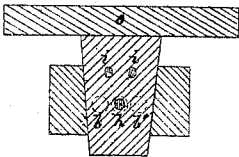


Fig. 3.

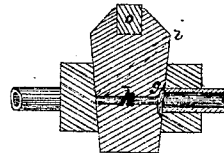
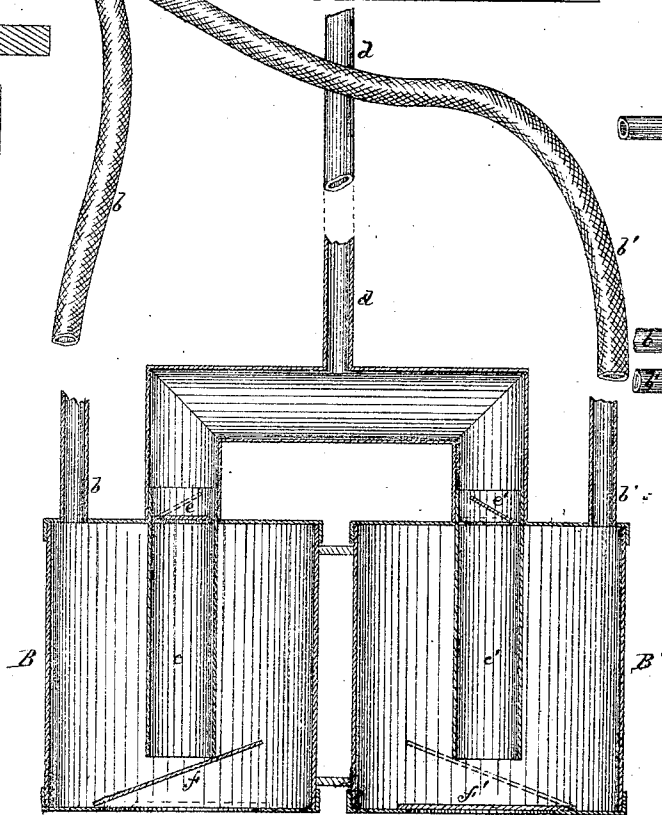
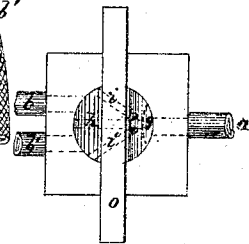


Fig. 4.



Witnesses.

Theo. G. Ellis

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# United States Patent Office.

JARED A. AYRES, OF HARTFORD, CONNECTICUT.

Letters Patent No. 114,092, dated April 25, 1871.

## IMPROVEMENT IN APPARATUS FOR ELEVATING WATER.

The Schedule referred to in these Letters Patent and making part of the same.

### *To all whom it may concern :*

Be it known that I, JARED A. AYRES, of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Method 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 from a pump or chamber, above the surface of the water, acting upon the water in submerged chambers in such a manner as to force it upward through a pipe or conduit to where it is to be used.

This is accomplished by means of the mechanism that I will proceed to describe.

### *Description of the Drawing.*

Figure 1 represents at the top an air-pump, A, connected by proper pipes to the water-chambers B B', shown in section below.

Figure 2 is a section through the three-way cock C in the direction of the handle.

Figure 3 is a section at right angles to that shown in fig. 2.

Figure 4 is a top view of the same, showing the connections of the cock in the positions they assume when the arm or handle is at right angles to the pipes.

### *General Description.*

A is an air-pump, in any convenient position above the surface of the water.

B B' are water-chambers, situated at any distance below the surface of the water, and connected with the air-pump by means of the pipes *b* and *b'*, which may be of any desired length, leading from the air-pump to the water.

*c c'* are pipes inside the water-chambers, reaching nearly to the bottom, and uniting at the top outside the chambers to form the ascending-pipe *d* for carrying the water to the desired point.

*e e'* are valves within the pipes *c c'*, opening upward.

*f f'* are valves in the bottoms of the chambers B B', also opening upward.

C is an automatic three-way valve or cock connecting the two pipes *b* and *b'* with the single air-pipe *a* leading from the air-pump A.

This cock has one straight hole through it, enlarged at the end *g* so as always to be in communication with the pipe *a*, while at the other end it can be turned so as to communicate with either of the pipes *b* or *b'*.

There are also two other holes, *i i'*, through the cock, one of which is in communication with one of the pipes *b* or *b'* when the aperture *h* is in communication with the other.

One end of *i* and *i'* opens into the atmosphere, which allows the air to pass out of one of the pipes *b b'* while the compressed air from *a* is passing into the other.

The handle or arm O of the cock is operated by the two cams *m* and *n* on the wheel *j*, which alternately push back the ends of the arm O and throw the communication with *a* from *b* to *b'* or from *b'* to *b*. This change is made every certain number of strokes of the pump A.

The pawl *k*, which is attached to the cross-head *l* of the air-pump, advances the wheel *j* one cog each stroke, and at each half-revolution of *j* one of the cams *m* or *n* operates against the arm of the cock and changes the communications.

As shown in the drawing, the cock is turned every fourth stroke of the pump.

The operation of my invention is as follows:

The air is pumped by any suitable power from the air-pump A, either directly into the pipe *a* or into some suitable reservoir from which *a* leads.

With the valve or cock C in the position shown in the drawing, fig. 1, the compressed air passes down through the pipe *b'* into the top of the chamber B'.

The water contained in the chamber is forced out of it through the pipe *c'*, and ascends through the valve *e'* into the pipe *d*, leading to any desired point.

The valve *e*, being closed by the weight of the column of water, prevents it from returning into the opposite chamber B.

The air from this chamber B is, in the meanwhile, escaping through the pipe *b*, which is in communication with the atmosphere, and the chamber B fills with water through the valve *f* in the bottom.

At the end of a certain number of strokes of the air-pump the cock is reversed and the water in the chamber B is forced out through the pipe *d*, while the air escapes from B' and that chamber becomes filled with water.

My invention can also be used with but one chamber, B, into which the air is alternately forced and released, instead of the double-acting arrangement of B and B', heretofore described.

*Claims.*

What I claim as my invention is—

1. The automatic valve or cock C, constructed so that in one position it opens communication between the compressed air and one of the chambers B B', and allows the air in the other chamber to escape through one of the holes *i i'*, and in the other position of the cock the operation is reversed, substantially as described.

2. The devices *j k* and *m n* for operating the valve C at the end of any number of strokes desired, substantially as described.

3. The chambers B B' connected with the automatic valve C, substantially as described.

J. A. AYRES.

Witnesses:

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WILLIAM D. GELETT.