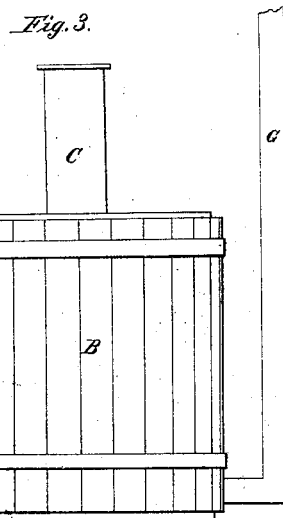
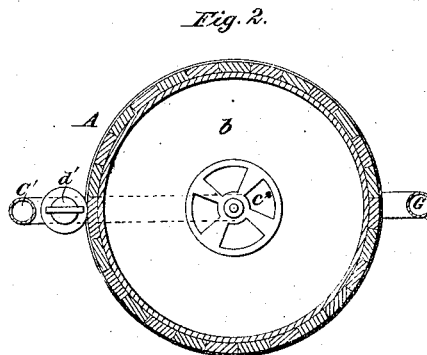
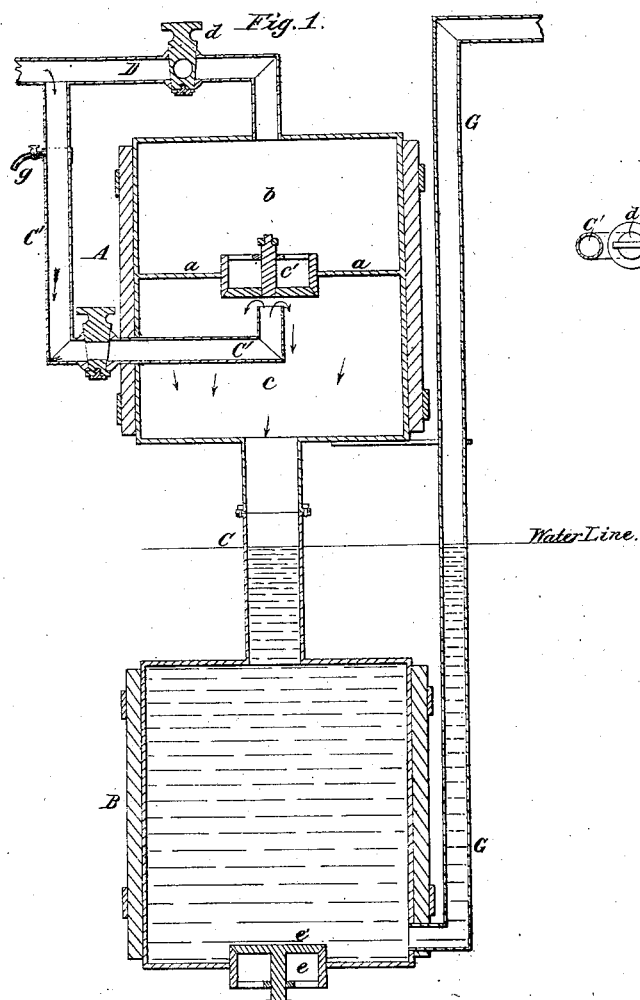


J. B. ATWATER.
STEAM WATER ELEVATOR.

No. 51,908.

Patented Jan. 9, 1866.



Witnesses:
R. T. Campbell
Edw. Chapin

UNITED STATES PATENT OFFICE.

JOHN B. ATWATER, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN STEAM WATER-ELEVATORS.

Specification forming part of Letters Patent No. 51,908, dated January 9, 1866.

To all whom it may concern:

Be it known that I, JOHN B. ATWATER, of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Caloric Water-Elevator; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a central section taken through the elevator in a vertical plane. Fig. 2 is a horizontal section through the upper cylinder of the elevator. Fig. 3 is a side elevation of the lower cylinder.

Similar letters of reference indicate corresponding parts in the three figures.

This invention is intended for supplying water to the tanks of locomotive-boilers from wells that may be located at suitable points along the line of a railroad.

My present invention is an improvement on the water-elevator for which Letters Patent were granted to me August 1, 1865; and its nature consists in a novel construction of the apparatus for elevating water, whereby steam and compressed air are employed together in a more effective manner than heretofore practiced by me, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A and B represent two vessels, which may be made of any required capacity, and which are connected together by means of pipe C, which should be made much smaller in diameter than either one of the vessels between which it forms a communication. This pipe C may be made of any desired length, according to the depth of the well in which the apparatus is arranged. Its length should be such as to admit of the vessel B being submerged in the water of the well, while the vessel A projects above the top of the well.

The vessels A B may be made of boiler-iron, and surrounded by staves and hoops for strengthening them, and the pipe C may be made of sections, bolted together, as shown in Fig. 1.

The upper vessel, A, is divided by a horizontal partition, *a*, so as to have two apart-

ments, *b* and *c*, which communicate with each other at certain times by means of a valve-opening, *e'*, through said partition, which opening is provided with a valve, *e²*, that opens downward.

D represents a pipe, which communicates with the chamber *b*, and which is provided with a stop-cock, *d*.

C' represents another pipe, which communicates with the chamber *c*, and also with the pipe D. This pipe C' is provided with a stop-cock, *d'*, and its lower end enters the chamber *c*, and is turned upward, so that steam passing through it will impinge upon the bottom of the valve *e²* and force this valve up to its seat. This pipe C' is also provided with a cock at *g*, which may be opened, when desired.

The pipe D is provided on its outer end with a flexible pipe, of any suitable description, by means of which the apparatus can be conveniently connected to the steam-boiler of a locomotive. Suitable couplings should be provided for enabling the engineer to connect and disconnect the flexible pipe at pleasure.

The lower vessel, B, is provided in its bottom with an opening, *e*, which is furnished with a valve, *e'*, that opens upward, for allowing water to enter said vessel and attain its equilibrium when there is no pressure in this vessel. The discharge-pipe G leads from the bottom of the vessel A upward and out of the well, and its upper end may be provided with a hose for conducting the water into the cistern of the locomotive-tender.

The operation of raising water is as follows: The chambers *b* and *c* being filled with air, and the vessel B and pipe C being supplied with water, steam is let into the chamber *b* from the locomotive-boiler, the cock *d'* being closed, which will force the air from this chamber through the opening *e'* into the chamber *c*. The cock *d* is then closed and the cock *d'* opened to admit steam into the chamber *c*, which will expand the air previously compressed in this chamber, and at the same time, by its impact, displace the water in the vessel B, elevating this water through the top of the well through the discharge-pipe G.

The air which is at first compressed into the chamber *c*, by the action of the steam upon it, is confined in this chamber by the sudden clos-

ing of the valve c^2 , and when steam is let into this chamber c the compressed air therein is forced into the pipe C, and, as practice demonstrates, a superior effect, from some cause, upon the water is produced over what is experienced practically when the steam alone or steam and free or uncompressed air act thereon. The superior effect experienced is the elevation of the water to a given altitude with a less expenditure of power.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The construction and arrangement of the within-described apparatus for elevating water from wells by the direct application of steam upon a body of air which is compressed within a chamber above a column of water, said apparatus being so constructed that it will automatically refill itself with water when the press-

ure of steam is removed, substantially as described.

2. In an apparatus constructed and arranged as herein described, forming a communication, C, between the chambers a b and B, which is of less diameter than the said chambers, for the purpose of presenting as small a cooling-surface as possible to the steam, substantially as described.

3. In an apparatus constructed and operating substantially as herein described, arranging the discharge end of the pipe C' in such relation to the valve c^2 that steam will impinge thereupon as it enters the chamber c , substantially as described.

JOHN B. ATWATER.

Witnesses:

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A. J. CLOSE.