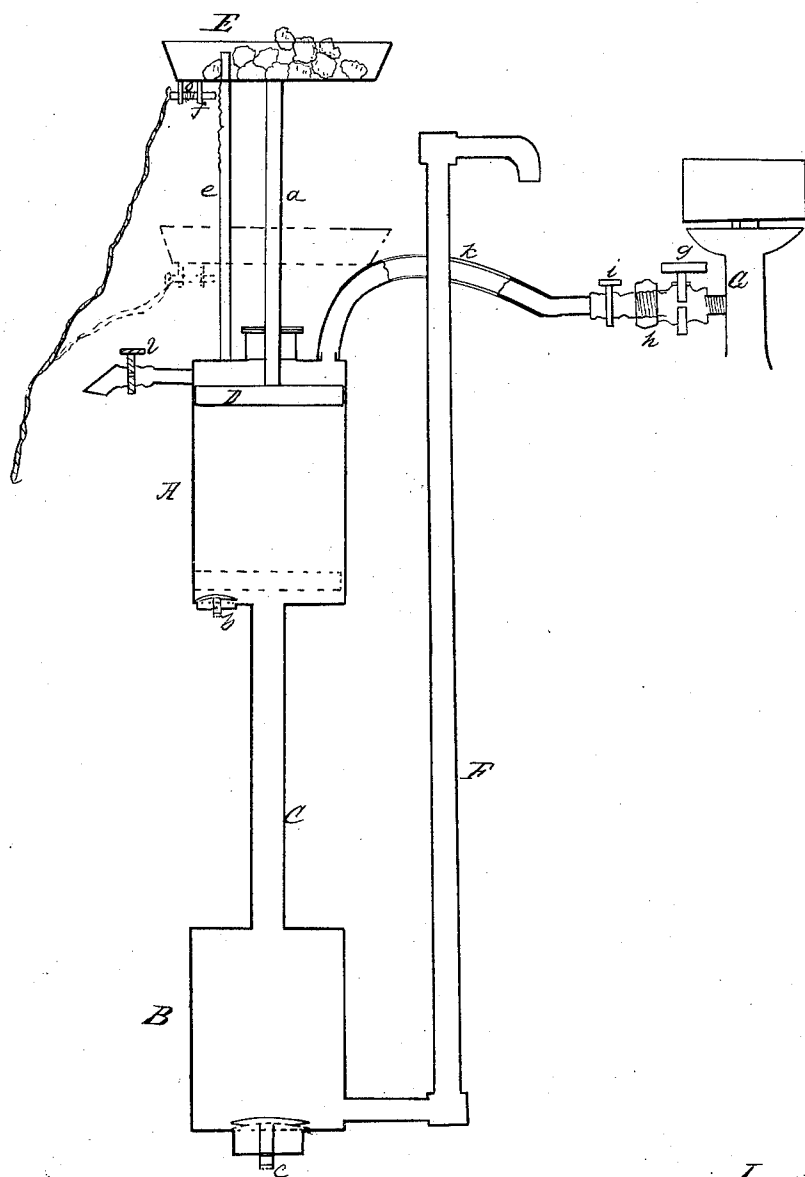


J. B. Atwater,

Pump Brake,

N^o 44,501.

Patented Oct. 4, 1864.



Witnesses:
W. C. Dodge
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UNITED STATES PATENT OFFICE.

JOHN B. ATWATER, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN RAILROAD-PUMPS.

Specification forming part of Letters Patent No. 44,501, dated October 4, 1864.

To all whom it may concern:

Be it known that I, JOHN B. ATWATER, of the city of Chicago, Cook county, and State of Illinois, have invented certain new and useful Improvements in a Pumping Apparatus for Supplying Water to Tanks or Tenders for the use of Locomotive-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, and to the letters of reference marked thereon.

The nature of my invention consists, first, in a novel pumping device; and, second, in a novel manner of applying a weight to the piston thereof, for the purpose of assisting to operate the same.

To enable others skilled in the art to construct and use my invention, I will proceed to describe it.

In the drawings my apparatus is shown in vertical section. A and B represent two cylinders, connected by the pipe C. The lower cylinder is provided with a valve, *c*, opening inward, and has attached to it, at or near its bottom, the discharge-pipe F.

The upper cylinder, A, is provided with a piston-head, D, the stem *a* of which works through the upper end of A, and is provided at its upper end with a box, E, for the reception of a weight.

A rod, *e*, is secured firmly to A or some part of the frame, and has its upper end passing up by the side of E or through an opening in the same, as shown in the drawings.

Secured to E in any suitable manner is a sliding bolt, *f*, which, being held up to its work by the spiral spring *o* or its equivalent, engages in the notches shown on the rod *e*, and thereby retains the box E in its elevated position.

k represents a flexible tube, firmly connected to the upper end of cylinder A at one end, its opposite end being connected to the tube G of the steam-whistle of a locomotive by means of the coupling *h*. The short tube with the stop-cock *g* remains permanently attached to the steam tube or pipe G, while the short metallic tube with the stop-cock *i* remains attached to the flexible tube *k*. A valve, *b*, is also provided at the lower end of cylinder A, similar to that in cylinder B. A stop-cock, *l*, is also attached to A near its upper end, as shown in the drawings.

These constitute all the working parts of my apparatus.

Its operation is as follows: The lower end of the pumping device is immersed in the water of the well or pond to such a depth as to entirely cover B and to as much greater depth as the size of the apparatus and depth of the well or pond may render necessary, care being taken that the water shall not reach the valve *b* in the lower end of cylinder A. The stop-cock *l* being closed, the tube *k* is united to the steam-pipe G by screwing on the union or coupling *h*. The cocks *i* and *g* are both opened, when the steam from pipe G will flow into cylinder A above the piston D, which will be thereby forced down to the position shown in red. The box E having been previously loaded with weights until it nearly balances the pressure of the atmosphere against the under side of piston D, (which is known to be about fifteen pounds to the square inch,) it follows that but little additional force is required to operate the piston D, or, in other words, just in proportion as weight is added to box E just in that proportion is the pressure of steam required to operate the piston D lessened, and thus by the employment of the weight a less quantity of steam is required than would be if the weight was not used—nearly to amount of one atmosphere. It is obvious that when the piston D is depressed the valves *b* and *c* will both be closed, and the air in cylinder A will be compressed and forced down the tube C into cylinder B, where it will displace the water contained in said cylinder; and as the water is prevented from flowing out at the bottom by the closing of valve *c* it will of necessity flow up and out of tube F, from which it can be conducted into the tender or tank as desired. The stop-cock *i* is then closed and the tube K detached from the steam-pipe G and the apparatus left in that condition, while the locomotive passes on its journey. In a short time the steam which has been admitted above the piston D will become condensed, thereby creating a vacuum in the cylinder A above the piston D, when the pressure of the atmosphere against the under side of D, and which is permitted to operate upon it both by the inflowing of the water into B through *c* and of the air at *b*, will return D, and with it E, to its original position, in which position it is secured by

the bolt *f* until another operation is to be performed in a similar manner. As soon as the pressure upon the water is removed by the ascent of piston D, all the water that remains in pipe F will flow back into cylinder B, whereby the freezing of the same in pipe F is effectually prevented. If it be desired to effect the emptying of pipe F in a less time than would be required for the condensation of the steam in cylinder A, it may be done by letting the steam escape from said cylinder by opening cock *l* or *i*.

It is obvious that the elevation of the water in pipe F may be accomplished without the aid of the air by applying the piston D direct to the surface of the water in the cylinder without the intervention of the compressed air.

The water formed by the condensation of the steam above piston D may be expelled by opening cock *l* when the steam is first admitted, and while D is elevated to its highest position. In forcing the piston D down suddenly the air will be more or less compressed,

and the piston will need to be held down until the air shall have expanded all it will.

Having thus fully described the construction and operation of my invention, what I claim as new therein, and which I desire to secure by Letters Patent, is—

1. The cylinders A and B, connected with the pipe C, in combination with the piston D and box E, or its equivalent, when constructed and operating substantially as and for the purpose set forth.

2. In combination with the foregoing, the application of a weight attached to the upper end of the stem *a* of the piston D, substantially as and for the purpose herein set forth.

3. In combination with a piston weighted as above described, the application of a body of air between the piston and the water to be elevated, substantially in the manner herein described.

JOHN B. ATWATER.

Witnesses:

E. TRIPP,
E. HIND.