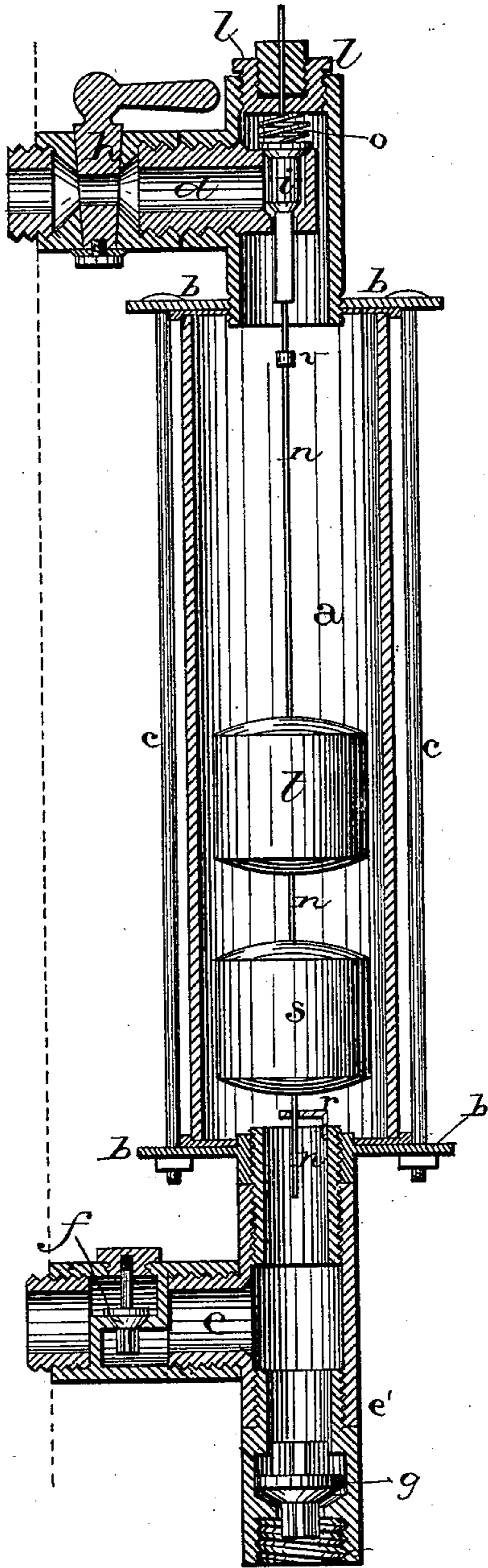


W. C. WOLFE.

Water-Inductor for Steam-Boilers.

No. 206,381.

Patented July 23, 1878.



Witnesses.

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UNITED STATES PATENT OFFICE.

WILLIAM C. WOLFE, OF JOHNSTOWN, PENNSYLVANIA.

IMPROVEMENT IN WATER-INDUCTORS FOR STEAM-BOILERS.

Specification forming part of Letters Patent No. **206,381**, dated July 23, 1878; application filed May 18, 1878.

To all whom it may concern:

Be it known that I, Wm. C. WOLFE, of Johnstown, in the county of Cambria and State of Pennsylvania, have invented certain new and useful Improvements in Water-Inductors for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawing, which forms part of this specification.

My invention relates to an improvement in water-inductors for steam-boilers; and it consists in a tube or chamber that is attached to the boiler opposite the water-line, and communicates with the water at its lower end, and with the steam-space at its upper end, and in which are placed two floats. The floats open and close a valve in the upper end of this tube, so as to admit and shut off the steam from the boiler, and by the condensation of the steam in this tube a vacuum is formed, which draws water from a well or other source, and thus supplies the boiler automatically without the use of a pump or other device, as will be more fully described hereinafter.

The accompanying drawing represents my invention.

a represents a tube or chamber, of glass or metal, of any desired size or shape, and which is connected to a boiler at any desired place opposite the water-line. This tube, when made of glass, serves both for an indicator, to show the height of water in the boiler, and for the purpose that will be more fully described hereinafter; but it is not necessary that glass should be used, as metal or any other opaque substance may be used. The tube *a* is here shown as being clamped air and steam tight between the disks *b* by means of the screw-rods *c*. Through each of these heads is made an opening for the insertion of the T-shaped pipes *d e*, one of which connects the tube with the steam-space of the boiler, and the other with the water, as shown.

In the water-pipe *e* is placed a check-valve, *f*, to prevent the water from the boiler from rising in the tube, but which allows the water in the tube to run into the boiler.

In the pipe *e'*, which communicates with the well or other water-supply, is a check-valve, *g*, which prevents the water from running back into the well after it has once been raised upward.

In the steam-pipe *d* is placed a common cock, *h*, for shutting off the steam when it is desired that the inductor shall not work, or to remove it for repairs. In this steam-pipe, immediately over the top of the tube *a*, is placed a balanced puppet-valve, *i*, which controls the entrance of the steam from the boiler to the tube when the cock *h* is open.

Upon the top of this valve is placed a coiled spring, *o*, and the tension of this spring upon its valve is regulated by a nut, *l*, so that the amount of tension to raise the valve can be regulated to a nicety.

To the under side of this valve is connected a wire, *n*, which passes down through the tube *a*, having its lower end held plumb by a guide, *r*, and which has a float, *s*, of any suitable material, secured firmly to it, and a second movable float, *t*, sliding up and down upon it.

The float *s* is secured to the wire *n* at the desired water-level. When the water falls below its proper level, the loose float, no longer being buoyed up, drops down upon the top of the lower one, *s*, and the combined weight of the two floats pulls down the puppet-valve upon its seat, so as to shut off the steam from the boiler. As soon as the steam is cut off, what steam is in the tube instantly condenses, thus forming a vacuum sufficient to raise water twenty-five or more feet. As soon as the water rises into the tube the float *t* rises on its top until it strikes against a stop, *v*, on the wire, which causes the valve to again open, and allows the steam from the boiler to enter the tube again. The equilibrium being established between the boiler and the tube *a*, the weight of the water in the tube raises up the valve *f* and sinks to a level with the water in the boiler, having been partially heated while in the tube *a*. If this volume of water does not raise the level of the water in the boiler to what it should be, the above-described operation is repeated again and again until it is raised, and then the operation ceases until the level again becomes too low. As this action is entirely automatic there is no time and

attention to be bestowed upon it, but it works silently and surely as long as the parts are in repair.

If desired, the feed-water may be raised by the inductor through a heater, so that the water will be fed to the boiler in a heated condition.

Having thus described my invention, I claim—

1. In combination with a steam-boiler, a tube or chamber attached thereto, communicating with the water at one end and the steam-space at the other, and provided with valves *f g i*, and double floats for operating the valve *i*, constructed and arranged to operate substantially as shown.

2. The combination of the tube *a*, having the pipes *d e*, for connecting it to the boiler, with the valve *i* and two floats connected thereto, substantially as described.

3. In a water-inductor for steam-boilers, the combination of the rod *n*, having a float,

s, valve *i*, and stop *v* secured permanently thereto, with the movable float *t*, spring *o*, and a regulating device, *l*, substantially as shown.

4. The tube or chamber *a*, connected to the boiler by the pipe *e*, which is provided with the automatic valves *f g*, whereby the water in the boiler is prevented from rising in the tube, but the water in the tube can pass into the boiler until equilibrium is restored, substantially as set forth.

5. The puppet-valve *i*, connected to the rod *n*, and having a regulating-spring placed upon its top, for controlling the entrance of the steam to the tube or chamber, substantially as shown.

In testimony that I claim the foregoing I have hereunto set my hand this 30th day of April, 1878.

WM. C. WOLFE.

Witnesses:

JOHN HENDERSON,
JOHN WIDMANN.