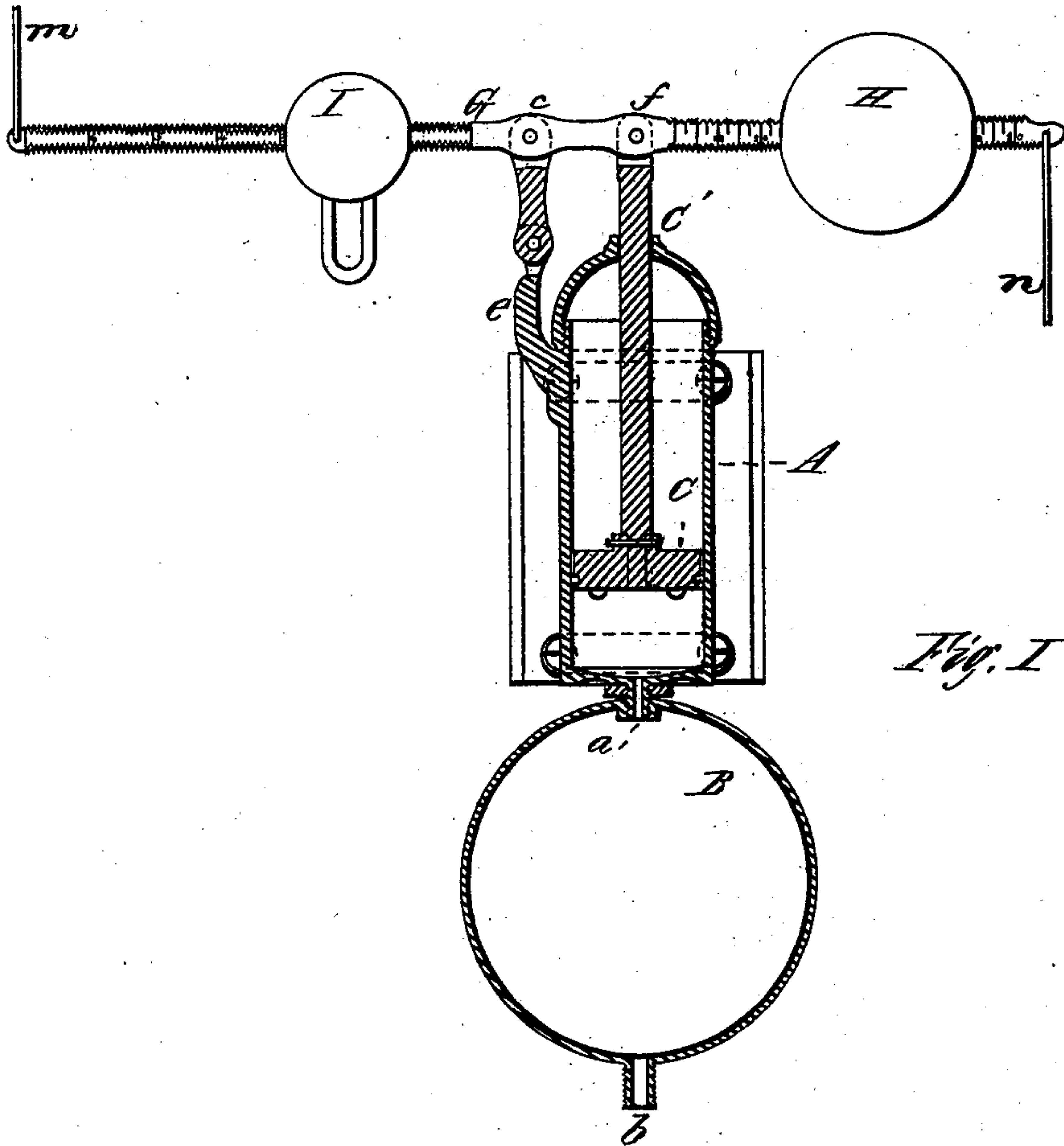


J. A. LAKIN.  
Regulator for Boilers and Furnaces.

No. 209,972.

Patented Nov. 19, 1878.



*Fig. I*

Witnesses

L. E. Buckland  
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By T. A. Curtis,  
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# UNITED STATES PATENT OFFICE.

JAMES A. LAKIN, OF WESTFIELD, MASSACHUSETTS.

## IMPROVEMENT IN REGULATORS FOR BOILERS AND FURNACES.

Specification forming part of Letters Patent No. **209,972**, dated November 19, 1878; application filed July 12, 1878.

*To all whom it may concern:*

Be it known that I, JAMES A. LAKIN, of Westfield, in the State of Massachusetts, have invented a new and useful Improvement in Regulators for Boilers and Furnaces; and that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon.

My invention relates to a regulator-piston; and it consists of a chamber communicating with the boiler, and also with a cylinder above it containing a piston whose rod is connected with a lever pivoted to a fulcrum, with a weight on each arm of the lever, so that the flow of water from the boiler into the chamber below the cylinder will force the air in the chamber up into the cylinder and against the piston, forcing the latter upward, and elevating one end of the lever and depressing the other end, or vice versa, when the water is allowed to flow out of the chamber, all which will be more fully described.

The figure is a vertical section through the axis of the cylinder and piston-rod and through the water and air chamber.

In the drawings, B represents the water and air chamber, having an orifice, *b*, communicating, through a pipe connected therewith, with the boiler at a point below the water-line, and another orifice, *a*, at the upper part serves as a means of communication with the interior of the cylinder A, containing the piston C and rod C', which latter is attached at its upper end to the lever G at *f*, said lever being pivoted to a fulcrum, *e*, at *c*. One arm of this lever G is either provided with a screw-thread or with a series of notches, so that a ball, I, may be adjusted to any desired point on that side the fulcrum; and the opposite arm is also similarly provided with notches or a screw-thread, to facilitate the adjustment of the ball or weight H along the arm. A rod, *m*, attached to the end of one arm of the lever, is connected with the damper of the furnace

or smoke-pipe, and a rod, *n*, attached to the other arm, is connected with the draft-register of the furnace.

The operation of the device is as follows: The balls H and I, being adjusted at the desired points on the respective arms of the lever, if the water is heated to the desired degree in the boiler, it is forced, by the pressure of the steam, through the orifice *b* into the chamber B, and the air therein is forced up through the orifice *a* into the cylinder below the piston, and the latter is forced up, raising the ball H and that end of the lever G, and the flue-damper is closed or cold air admitted to the smoke-pipe to check the draft, and at the same time the opposite end of the lever, with the ball I, is depressed and the draft-register is closed. This tends to decrease the heat until the water slowly begins to flow back out of the chamber B and the piston to fall, when a reversed movement of the lever takes place until the heat is increased to the desired point, when the lever is again reversed as before.

A uniform and regular degree of heat is thus constantly maintained automatically by the operation of the water heated according to the adjustment of the weights H and I.

I am aware that various regulating devices have heretofore been made in which both air and water have been used as an operating medium to regulate the heat; and I do not claim the same irrespective of my construction and arrangement of the same, as hereinbefore described.

Having thus described my invention, what I claim as new is—

The combination, in a draft-regulator, of the chamber B, provided with the orifices *a* and *b*, the cylinder A, piston C, piston-rod C', and weighted lever G, all constructed and arranged substantially as described.

JAMES A. LAKIN.

Witnesses:

T. A. CURTIS,  
C. E. BUCKLAND.