

## Steam Heater Regulator.

Patented Sept. 13, 1864.



Inventor;  
John Briggs  
per his Attorney



# UNITED STATES PATENT OFFICE.

JOHN BRIGGS, OF ROXBURY, MASSACHUSETTS.

## IMPROVED REGULATING APPARATUS FOR STEAM-HEATERS.

Specification forming part of Letters Patent No. 44,158, dated September 13, 1834.

*To all whom it may concern:*

Be it known that I, JOHN BRIGGS, a resident of Roxbury, in the county of Norfolk and State of Massachusetts, have invented an Improved Apparatus for Regulating the Heat of Steam Coils or Heaters; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view, Fig. 2 a front elevation, and Fig. 3 a transverse section, of it and its coil or heater.

The nature of my invention consists in the combination of one or more expansion-drums and their steam-heating coil or heater by means not only of a leading or induction pipe provided with a steam-cock, but a wheel, a chain, a counter-weight, and lever, arranged and applied together and to the steam-cock substantially as herein specified; also, in the combination of the expansion-drum—viz., with tubes extending through it and opening through its sides and insulated from its heads.

In the drawings, A denotes a steam heater or coil, it being constructed as represented—viz., not only of a series of serpentine tubes, *a a*, arranged in vertical planes, but of two transverse or horizontal tubes, *b b'*, closed at their extremities, and so connected with the ends of the serpentine tubes as to open into them, the whole being arranged as shown in the drawings. These tubes are supported within and by two standards, *c c*. There is an induction-pipe, B, to the upper tube, *b*, and there is also an induction pipe, C, to the lower tube, *b'*. The pipe B opens at its upper end into the coil or heater, serves to convey steam from a boiler into the same, and is provided with a stop-cock, D, by which the passage of steam through the pipe may be arrested. There is fixed to and concentrically with the stem of the said stop-cock a wheel, E, which has a chain, F, wound one or more times about its grooved periphery. To the lower end of this chain a weight, G, is appended, the upper end of the chain being fastened to a rod, *d*, which extends upward through the longer arm of a lever, H, and hangs therefrom. The rod *d* at its upper part has a screw, *e*, cut on it, on which a nut, *f*, is screwed, such nut resting on the lever. The said lever has its fulcrum *g* at the outer extremity of its shorter arm, or, in other words, bears upward

against a nut, *h*, screwed on a rod, *i*, which projects upward from a stationary shelf, *k*. An expansion-vessel, or a series of air-tight hollow drums or vessels, *l m n o*, placed one on the other, as shown in the drawings, rests on the said shelf and upholds the lever H, which rests on a bridge, *p*, extending upward from the top of the upper vessel, *l*. The three drums *m n o* are cylindrical in form, and the drum *n*, or the largest of the series, is constructed with a series of pipes, *r r r*, carried through it horizontally and from one side of its periphery to the other and between its two heads and independently of them. These tubes are open at their ends, in order that heated air may circulate freely through the tubes and impart heat to them, and thus aid in heating the air which may be within the drum. The tubes not only serve to strengthen the drum, but cause it to expand quicker under variations of temperature than it otherwise would. By the expansion of the air within the drum or series of drums, the head of such drum or drums will be pressed outward convexly, so as to cause the lever H to be elevated. This upward movement of the lever will cause the chain F to revolve the wheel, so as to turn the stop-cock in a manner to diminish the flowage of steam through it and into the coil or heater. On contraction of the air in the drum or drums the weight G, by drawing the lever downward, will produce a reverse motion of the stop-cock, so as to increase the flow of steam into the coil. As the temperature of the coil may be increased by the steam let into such coil, the atmosphere surrounding the coil will become warmer, and consequently the drums will become expanded and the stop-cock will be moved so as to diminish the flowage of steam into the coil. As the flowage of steam into the coil may be interrupted, the heat of the coil will diminish, and consequently the temperature of the air about it will be reduced. So, should the temperature of the atmosphere about the coil decrease below the desired degree, the stop-cock will be opened more, so as to admit more steam into the coil, and thereby increase its heating-powers.

By means of the wheel attached to the stop-cock and provided with the chain going around it the stop-cock may be adjusted for the passage of steam through its pipe to much better

advantage than were a lever used in the place of the wheel, the nicer adjustments of the stop-cock being effected by the nut and screw of the rod depending from the longer arm of the lever H.

I am aware that rods and various other contrivances have been used to regulate, by their expansion of heat, a valve or damper of a flue or pipe of a stove or furnace, and therefore I make no claim to such in the abstract; nor do I herein claim any of the apparatus as represented and described in a patent numbered 41,598, and granted to me on the 16th day of February, A. D. 1864.

I claim as my invention—

1. The combination of one or more expan-

sive drums, *l m n o*, and a steam coil or heater, A, by means not only of a leading-pipe, B, furnished with a stop-cock, D, but of a wheel, E, a chain, F, counter-weight G, and lever H, the whole being arranged and applied together substantially as hereinbefore specified.

2. The construction of either of the expansion-drums with tubes running into it or transversely through it from one part of its periphery to another or opposite part thereof, and being open so as to allow air to flow freely through them, as described.

JOHN BRIGGS.

Witnesses:

R. H. EDDY,

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