No. 849,767. PATENTED APR. 9, 1907.

B. BARTON.

TEMPERATURE REGULATOR.

APPLICATION FILED MAY 18, 1906.

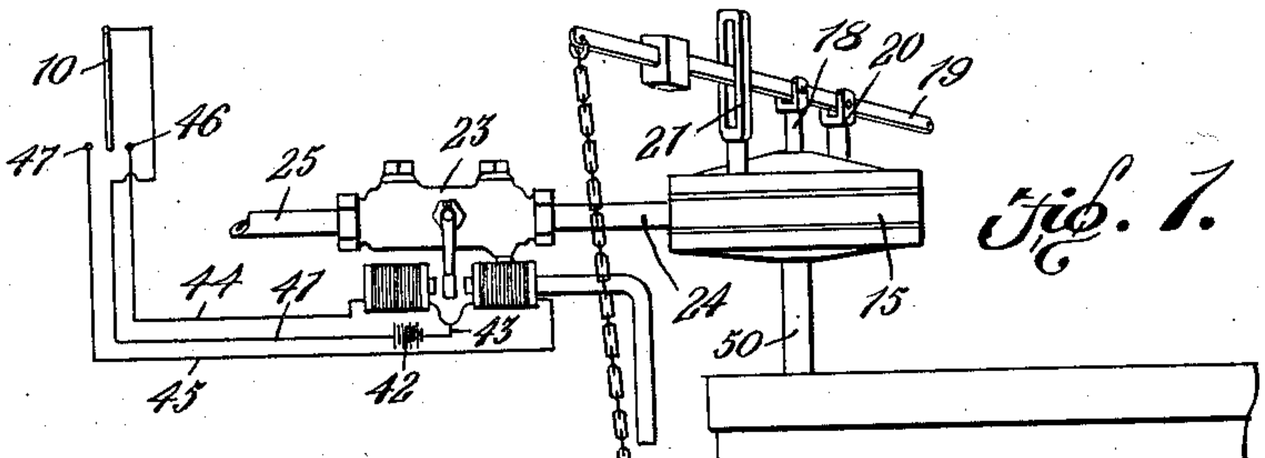


Fig. 1.

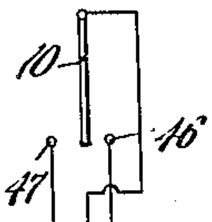
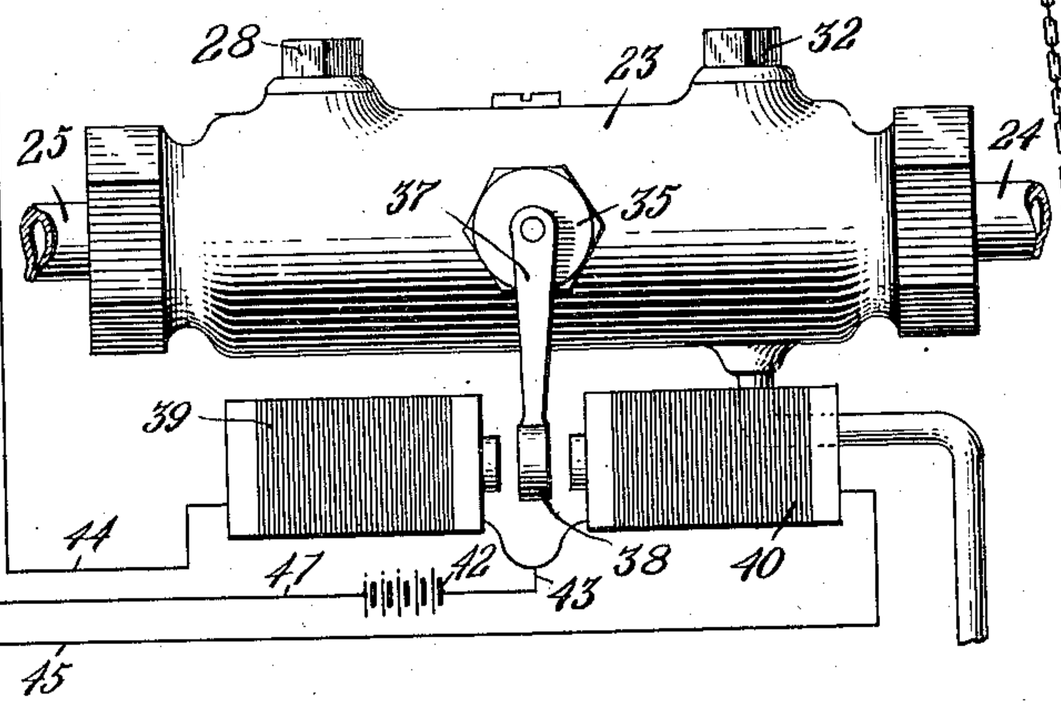


Fig. 2.



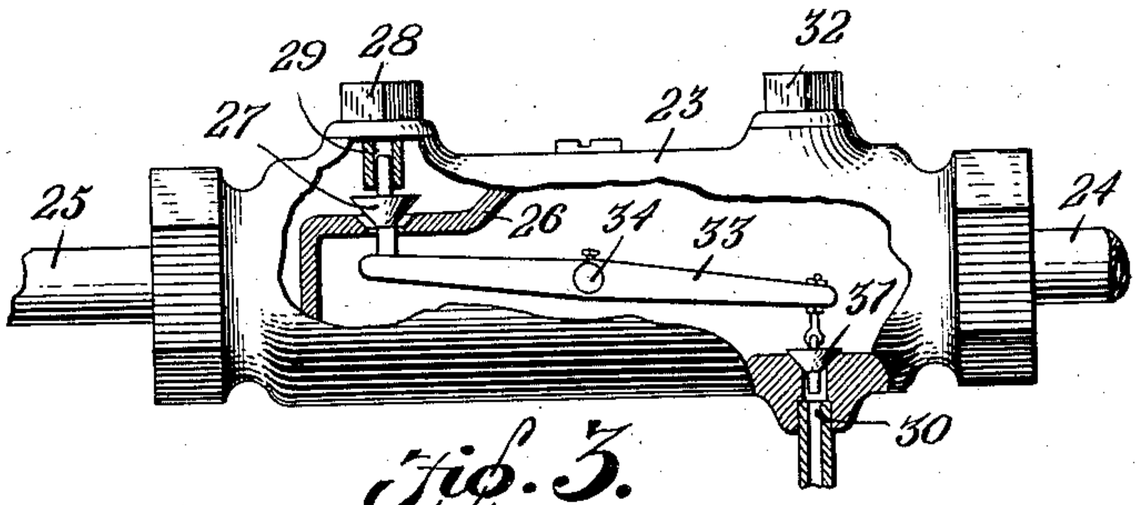


Fig. 3.

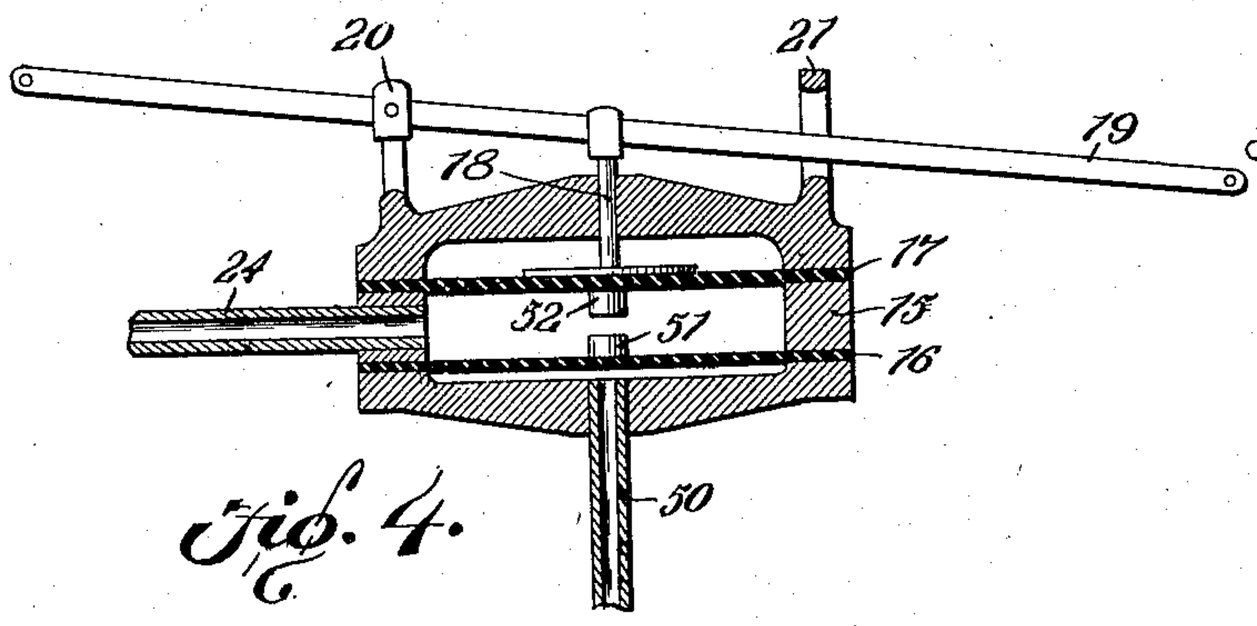


Fig. 4.

WITNESSES:

E. F. Stewart

Jno. E. Parker

Bert Barton, INVENTOR.

By Cushman & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

BERT BARTON, OF DRYDEN, MICHIGAN.

TEMPERATURE-REGULATOR.

No. 849,767. Specification of Letters Patent. Patented April 9, 1907.

Application filed May 18, 1906. Serial No. 317,446.

To all whom it may concern:

Be it known that I, BERT BARTON, a citizen of the United States, residing at Dryden, in the county of Lapeer and State of Michigan, have invented a new and useful Temperature-Regulator, of which the following is a specification.

This invention relates to temperature-regulators, and has for its principal object to provide a device of simple construction which is quickly responsive to varying conditions and will act to control the temperature by the opening or closing of a draft-door, flue, the operation of a steam-valve, or other well-known means whereby the temperature of a room or apartment is regulated.

A further object of the invention is to provide a device of this character which may be used both as a temperature-regulator and as a safety device for application to steam or hot-water heating systems.

A still further object of the invention is to provide a thermostatically-controlled temperature-regulator in which the work of operating the damper or other temperature-controlling means is accomplished by the weight or pressure of a fluid, the flow of the fluid being placed under the control of an electromagnetically-actuated valve.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is an elevation of a temperature-regulating device constructed in accordance with the invention, showing the same as applied to a boiler and the regulating device being attached to and controlling the opening and closing of a damper. Fig. 2 is a side elevation of the electromagnetically-actuated valve. Fig. 3 is a transverse sectional view of the valve-casing. Fig. 4 is a similar view of the damper-actuating device.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

In carrying out the invention a thermostat 10, formed of any suitable material, is placed at any desired point—as, for instance, in a room or apartment which is heated by steam, hot water, or air received from a heater 11, which may be located in the cellar or at any other convenient point.

Arranged above the heater or boiler 11 is a casing 15, containing two spaced diaphragms 16 and 17, which are preferably formed of some yieldable or elastic material, the upper of these diaphragms carrying a stem 18, which is connected to a lever 19, that is pivoted to a small post or bracket 20, carried by the casing, and is guided by a slotted post 21, also carried by the casing. This lever is connected to a temperature-controlling means, which in the present instance takes the form of a damper *d*. By opening the damper the temperature may be raised or lowered in accordance with the location of said damper; but in the present instance it is presumed that the opening of the damper will reduce the draft through the combustible material on the grate, and therefore lower the fire, while the closing of the damper will result in increased supply of air to the combustible material and the raising of the temperature.

At one side of the casing 15 or at any other convenient point is arranged a valve-casing 23, one end of which is connected to the casing 15 by a pipe 24, while the opposite end of said casing has an inlet-pipe 25, leading from any source of fluid-pressure supply—as, for instance, the water-pipe.

The casing is provided with a partition 26, having an opening that is tapered to form a seat for a valve 27, which may be removed from position by unscrewing a suitable plug 28 in the upper portion of the casing, said plug being provided in the present instance with a depending tubular guide 29 to receive the upper portion of the valve-stem. The lower portion of the casing is provided with a discharge-port 30, the mouth of which is tapered to form a seat for the valve 31, which is also accessible on the removal of a suitable plug 32. The two valves are operated by a lever 33, that is secured to a rock-shaft 34, that extends out through one side of the casing, preferably through a small stuffing-box or gland 35. To the end of the stem is secured a rocker-arm 37, carrying an armature 38, that is disposed between the opposite pole-pieces of a pair of electromagnets 39 and 40.

The thermostatic element 10 is connected to a wire 41, leading to a battery 42, and from the battery leads a wire 43 to both electromagnets. The return-circuit is accomplished through independent wires 44 and 45 to contacts 46 and 47, respectively. Should the temperature of the room in which the thermostat is located be increased beyond a predetermined point, the thermostat will move into engagement with the contact 46, closing a circuit through and energizing the electromagnet 39. This attracts the armature 38 and moves the valve-operating lever 33 to the position shown in Fig. 3, and the fluid under pressure entering through pipe 25 passes the valve and through the casing, running through pipe 24 to the casing 15, where it acts upon diaphragm 17, raising the latter, and this movement is transmitted to the lever 19, with the result of opening the damper, and thus decreasing the temperature. The damper will remain in this position until the temperature decreases, whereupon the thermostat may move into engagement with the contact 47, closing a circuit through the electromagnet 40 and moving the valve to the opposite position—that is to say, closing the inlet-valve 27 and opening the discharge-valve 31, so that the water or other fluid is allowed to escape through the casing 15, through the pipe 24 and casing 23, to discharge-port 30. This allows the diaphragm 17 to descend and permits the closing of the damper, with the result of increasing the temperature.

The lower portion of the casing 15 is connected to the steam-space of the boiler by a pipe 50, and in case the thermostat fails to respond to increase in temperature from any cause and there is likelihood of dangerous steam-pressure in the boiler the steam passing upward through a pipe 50 will act on the lower diaphragm 16, and a button 51, carried by this diaphragm, will engage a button 52, carried by the upper diaphragm, moving the latter up and transmitting movement to the lever 19 and to the damper, thus reducing the steam-pressure.

It will be understood that the apparatus forming the subject of the present invention may be applied to and used in connection with any temperature-regulating device—such, for instance, as a window or ventilator, a steam-valve, hot-air-register valve, damper, or other known means by which temperature may be regulated.

I claim—

In apparatus of the class described, the combination with a steam-boiler, of a temperature-regulating member, a casing having a pair of spaced flexible diaphragms, the adjacent faces of which are provided with buttons or blocks, a pipe connecting the lower portion of the casing to the steam-space of the boiler, a stem extending from the upper diaphragm, a lever connected to the stem and to the temperature-regulating member, a valve-chamber, a ported partition in said chamber, there being a discharge-port leading from said valve-chamber, a pair of valves controlling the ports, and a lever for operating both valves, a rock-shaft carrying the lever and extending out through the wall of the chamber, an armature hung on the rock-shaft, a pair of electromagnets between which the armature is arranged, electromagnetic connections between the thermostat and the electromagnets, a fluid-pressure-supply pipe connected to the valve-chamber, and a connecting-pipe leading from said chamber to the casing at a point between the two diaphragms.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

BERT BARTON.

Witnesses:
MURRAY E. HULL,
IRA E. PARKER.