

A. F. BERRY.
HEATING SYSTEM.
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1,289,617.

Patented Dec. 31, 1918.

Fig. 1.

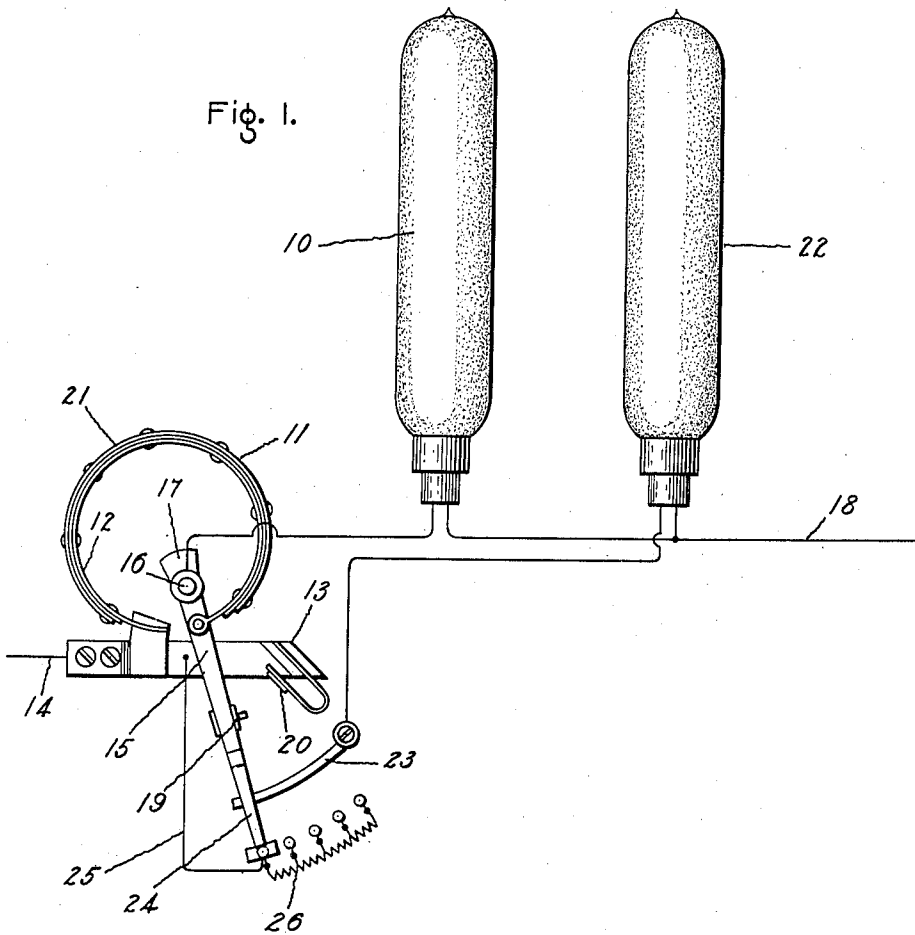
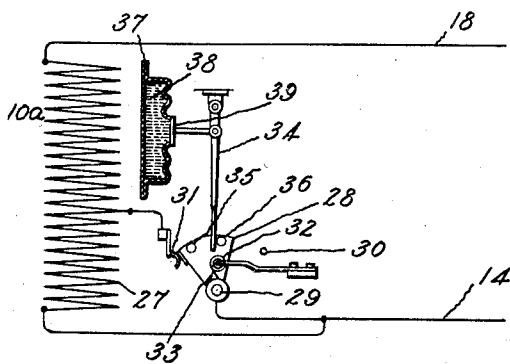


Fig. 2.



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UNITED STATES PATENT OFFICE.

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HEATING SYSTEM.

1,289,617.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ARTHUR FRANCIS BERRY, a subject of the King of Great Britain, residing at Ealing, England, have invented certain new and useful Improvements in Heating Systems, of which the following is a specification.

My invention relates to a luminous radiator combined with means associated with the same for automatically and continually varying the amount of energy that is supplied to the radiator, and correspondingly varying the luminosity of the radiator itself.

In an application which I filed in the U. S. Patent Office, on Dec. 13, 1915, Serial No. 66,453, I have described an electric heat radiator comprising a resistance element forming an openwork, grid-like structure, over and around which air can freely flow in an upward direction so as to come in contact therewith, the wire being made of such length and cross-section that it will be rendered red hot when in use. The air thus flowing upward over it will cool it at different parts to varying degrees, so that an effect is produced resembling upwardly moving smoke and flame, which thus simulates the combustion of fuel.

Now, the present invention has for its object the provision in combination with a luminous radiator, whether of bare resistance wire or other form of luminous radiator, means for varying the luminous effects thereof in other ways, so as to produce an effect of movement or liveliness therein.

For this purpose, according to the present invention it is arranged that the energy supplied to the radiator shall be varied in a regular or irregular manner, so as to produce varying degrees of luminosity in the heat radiator or parts thereof, while the radiator is in use. I have illustrated my invention in the accompanying drawings, in which: Figure 1 is a somewhat diagrammatic view showing one embodiment thereof; and Fig. 2 shows a modification.

Referring first to Fig. 1, there may be included in the circuit of the heating element or radiator 10 which is here shown as a lamp radiator, a resistance device 11 which is preferably composed of a plurality of metallic strips having different coefficients of expansion. This may consist, for example, of a strip of iron 12 fixed at one end

to a support 13 to which is connected one of the supply leads 14. The other end of the resistance device is connected to a contact lever 15 pivoted at 16 to a metal plate 17, to which is connected one terminal of the heating unit 10, the other terminal being connected to the other supply conductor 18 so that the resistance device 11 is in series with the heating unit 10. The lever 15 carries a contact 19 adapted to make connection with a contact 20 carried by and electrically connected to the support 13, so that when the contacts 19 and 20 are in engagement, the resistance device 11 is short circuited. Preferably a strip 21 of a metal dissimilar to the strip 12 such as brass is secured thereto, and insulated therefrom. The heat occasioned by the passage of current through the resistance device will cause the resistance device to open in a well known manner, and it is this action which brings the contact 19 into engagement with the contact 20. As soon as the contacts are brought into engagement, the resistance device 11 is short circuited and at once begins to cool, and thereby moves the free end of the resistance device in the opposite direction and the contact 19 out of engagement with the contact 20.

When the heater or heaters are without current, the parts occupy the position shown in Fig. 1. When the circuit of the heating unit 10 is closed, the current thereto passes from the conductor 14 to the support 13, resistance strip 11, lever 15, to the conductor leading to the lamp 10. The current passing through the resistance member 11 heats the same, thereby bending the resistance outwardly and swinging the lever 15 about its pivot until the contact 19 is brought into engagement with the contact 20. A circuit is thus closed to the lamp 10 from the conductor 14, contacts 20 and 19, arm 15, and the conductor leading to the lamp, thereby shunting the resistance 11. The amount of energy supplied to the lamp 10 is thereby increased and its luminosity correspondingly increased. The temperature of the compound resistance device will then fall and the contacts 19 and 20 be opened as previously described with the result that the current passing through the heating unit will be reduced with a corresponding reduction in its luminosity, and in this manner

the amount of energy supplied to the lamp and the luminosity thereof will be caused to automatically and continually vary.

The energy thus varied obviously may be supplied to a number of heating elements connected in parallel so that the luminosity of all of them will simultaneously vary in the same manner, or the arrangement may be such that the laws of variation of the various devices may be different. An arrangement for this latter purpose is shown in Fig. 1, where a second heating element 22 which is also shown as a lamp, has one terminal connected to the supply lead 14 through a fixed contact 23, a movable contact 24 carried by, but insulated from, the contact lever 15, conductor 25 and the support 13, the contact 24 being arranged to move over an adjustable resistance 26 connected at one end to the conductor 25. As will be apparent, the arrangement is such that when the lever 15 moves in a direction to short circuit the resistance device 11 and to thereby increase the luminosity of the lamp 10, the contact 24 will move over and insert the successive parts of the adjustable resistance 26 in the circuit of the lamp 22 to reduce the luminosity thereof, the luminosity being changed in the reverse order when the lever 15 moves in the opposite direction. It is thus apparent that the luminosity of the device 22 varies in a different manner from the device 10.

Fig. 2 shows an arrangement wherein a resistance 27 in circuit with the heating element 10^a is arranged to be short circuited and open circuited by a circuit breaker comprising a metal plate 28 pivoted at 29 and connected to the supply lead 14 and arranged to work between a stop 30 and a contact 31 connected to adjacent ends of the resistance 27 and heating element 10^a, and adapted to bear against one or the other of these parts under the action of a spring actuated roller or other device 32 which engages a V-shaped projection 33 on the plate. The plate is moved alternately in opposite directions by a lever 34 under the action of a thermostatic device responsive to the temperature of the heating element 10^a, the lever acting between two pins 35 and 36 on the plate 28. The thermostatic device in the embodiment here shown comprises a closed receptacle 37 filled with an expansible liquid 38 and having a movable diaphragm 39 connected to said lever. When the parts are in the position shown, the resistance 27 is short circuited by the plate 28 so that when the heating device is connected into

the circuit, it will be supplied with the maximum amount of energy and will attain its maximum luminosity. The thermostatic device will thereupon move the lever in a direction to bear against the pin 36 and turn the plate 28 to the right against the action of the roller 32 which will in turn complete the turning movement and thereby bring the plate 28 into a position to open the short circuit around the resistance 27. The resistance is thereby included in circuit with the heating element and thereby reduces the amount of energy supplied thereto and the luminosity thereof. The thermostatic device will then act in the reverse direction to move the lever 34 and plate 28 in the opposite direction to short circuit the resistance 27 and again increase the energy supplied to the heating element 10^a and correspondingly increase the luminosity thereof.

It will be apparent that the invention can be applied to luminous electric heat radiators of various kinds, including those of bare resistance wire or strip, and those in the form of lamps which are exposed to view, as well as those in which the wires are shielded from direct view and the light therefrom reflected from a reflecting surface.

The heat radiating device can be designed to be temporarily overloaded for the short times when the resistance associated therewith is out of effective action so that the radiation of energy emitted therefrom at these times will be greater than would otherwise be permissible.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. In combination, a luminous electric heat radiator and means associated therewith comprising a thermally operated member for automatically and continually varying the amount of energy supplied to said heater and thereby varying its luminosity.

2. In combination, a luminous electric heat radiator, a resistance member connected thereto, and a heat responsive device for automatically and continually varying the effective amount of said resistance included in circuit with said heat radiator.

3. In combination, a luminous electric heat radiator, and means responsive to the temperature of the radiator for automatically and continually varying the luminosity thereof.

In witness whereof, I have hereunto set my hand this seventh day of March, 1917.

ARTHUR FRANCIS BERRY.