May 23, 1933. L. LEBAU 1,910,113

ELECTRIC RADIANT HEATER

Filed March 13, 1930 2 Sheets-Sheet 1

Fig. 2.

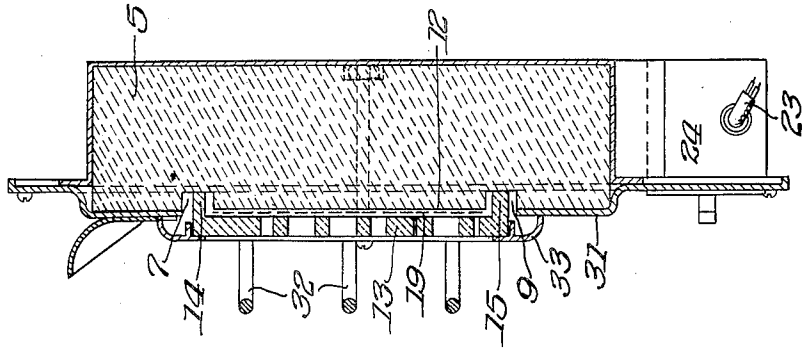
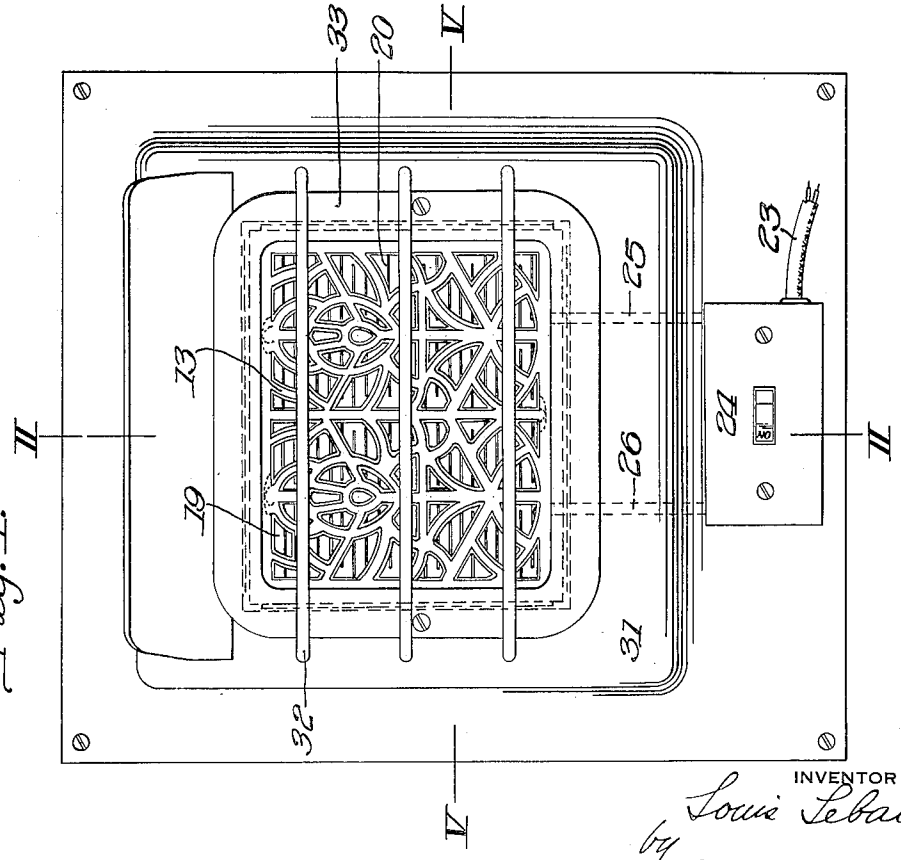


Fig. 1.



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Filed March 13, 1930 2 Sheets-Sheet 2

Fig. 4.

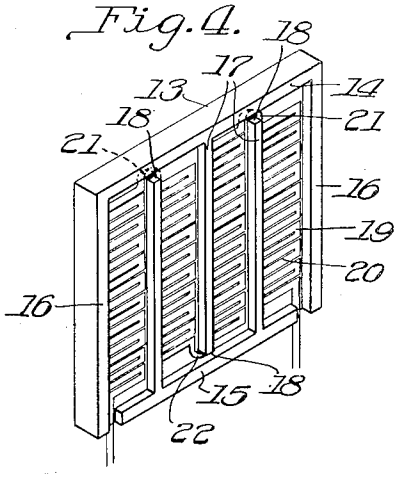


Fig. 3.

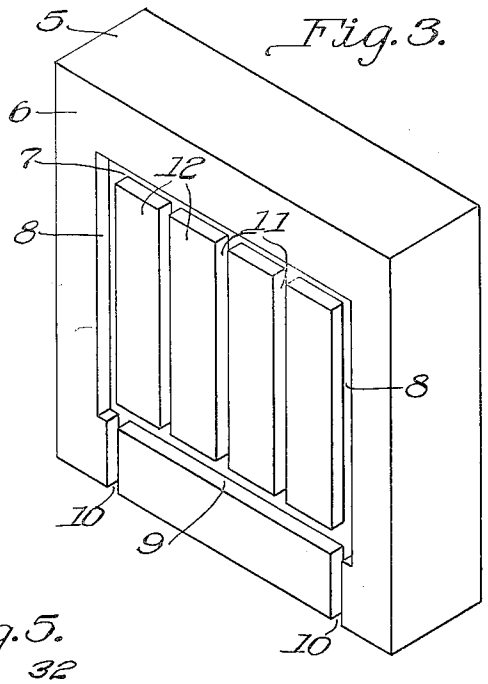


Fig. 5.

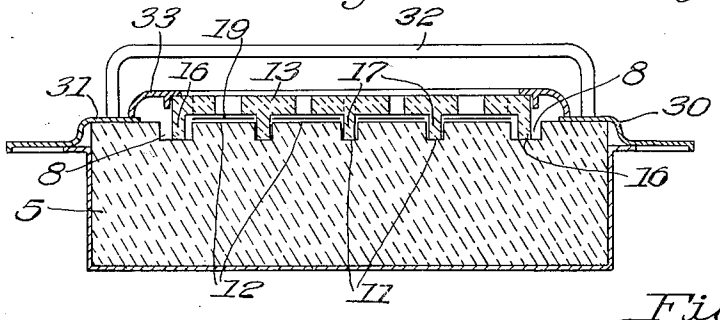


Fig. 7.

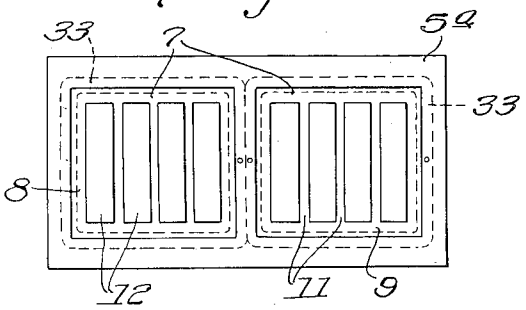
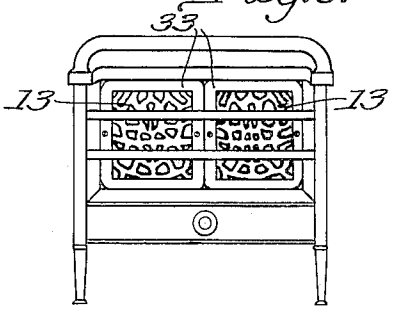


Fig. 6.



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Patented May 23, 1933 1,910,113

UNITED STATES PATENT OFFICE

LOUIS LEBAU, OF PITTSBURGH, PENNSYLVANIA

ELECTRIC RADIANT HEATER

Application filed March 13, 1930. Serial No. 435,463.

This invention relates to an electric heater, and more particularly to a new and improved electric radiant heater particularly designed for heating rooms and halls of buildings in an economical and efficient manner.

In designing heaters of the type of the present invention, it is of the utmost importance to construct a heater that will embody means for preventing the structure setting fire to a building in which it is used, while at the same time producing the desired heat. Heaters of the character stated must be such as to pass the rigid requirements of fire underwriters and insurance companies, and the present invention, it is believed, includes these desirable qualities.

In the embodiments thereof as shown, I have illustrated a wall type of heater and a fireplace or floor heater, but the present invention may be employed with various designs of casings.

Among the objects of the present invention are, to provide a new and improved electric heater having a relatively thick back or heat-reflector block or plate, adapted to receive and support an electric resistor; to provide in conjunction with the back block or reflector a resistor element or elements of relatively thin flat current-conducting strips of suitable electric resistant material; to provide a new and improved refractory radiant member designed to be associated with the reflector block and the resistor element or elements; and to provide a simple and efficient heater in which the operative parts may be readily and effectively assembled, and when so assembled may be utilized in various styles of casings or housings.

In the accompanying drawings, which illustrate applications of my invention;

Fig. 1 is a front elevational view of a wall type of heater embodying my invention;

Fig. 2, a vertical sectional view taken on line II—II of Fig. 1;

Fig. 3, a perspective view of the reflector block or plate;

Fig. 4, a similar view of a refractory radiant member and the resistor element or elements associated therewith;

Fig. 5, a cross sectional view taken on line V—V of Fig. 1;

Fig. 6, a front elevational view showing a floor or fireplace heater; and

Fig. 7, a front elevational view showing a double back block and a plurality of frame members disposed thereon.

Referring to the drawings, 5 designates a block or plate made of suitable insulating material, of relatively light weight. In practice, I employ a block made up of pulverized diatomaceous earth mixed with finely ground cork and clay molded and kiln fired. This block constitutes the back heat-reflecting plate of the heater and, at the same time, functions to prevent too much heat being passed to the rear of the resistor elements employed in the heater. As illustrated, the block is relatively thick and of rectangular shape.

Plate or block 5 is formed on its front face 6 with a plurality of grooves or depressions including an upper groove 7, side grooves or depressions 8, a bottom groove 9, and leading-out grooves 10, the latter extending from the bottom groove 9 to an edge of the reflector. In addition to the grooves or depressions mentioned, the face is formed with a series of spaced-apart vertically extending grooves 11. These grooves, in conjunction with the upper, lower and side grooves, provide a series of spaced-apart members 12, having their outer faces flush with the front face 6 of the block.

Adapted to be superimposed upon the block 5 is a refractory open-work radiant member 13. Member 13 includes a depending upper flange 14, a depending lower flange 15, depending side flanges 16, and a series of spaced-apart vertically extending ribs 17 extending between the upper and lower flanges of the radiant member. Each alternate rib 17 is cut away at opposite ends, as indicated at 18. The purpose of these cut-away portions will be more fully hereinafter described.

From the foregoing, it will be apparent

that when the radiant member 13 is positioned upon the block 5, the upper and lower depending flanges 14 and 15 will respectively enter the upper and lower grooves 7 and 9 of the block 5, and that the side flanges 16 of member 13 will be entered in the side grooves or depressions 8 of the block 5; and that the vertically extending ribs of the member 13 will be entered in the vertically extending grooves 11 of the block.

The preferred type of resistor element or elements employed by me comprises a plurality of electrically connected units consisting of relatively thin flat sheet metal strips 19 having slots 20 cut therein, the slots being spaced apart and extending inwardly from opposite longitudinal edges of the strip, the slots extending from one edge being arranged alternately to those along the opposite edge. This arrangement of slots in connection with the strips forms as a whole a sinuous path for the passage of electric current, and provides a highly efficient heating element or elements including a plurality of resistor units electrically connected. The respective units are connected to adjacent units at the top by connecting pieces 21 and at the bottom by a single connecting piece 22.

The resistor elements may be connected to the electric current wire 23 through a suitable switch mechanism located in switch box 24 and the wires 25 and 26 extended therefrom.

The electric resistor elements are placed upon the block 5, resting directly upon the faces or members 12 thereof. After being thus positioned, the radiant member 13 is superimposed upon the block, with the flanges thereof fitting into the grooves or recesses thereof, as above described. It will be noted that the cut-away portions 18 of the vertically extending ribs provide spaces for the cross connecting pieces 21 and 22 of the resistor elements.

The assembled parts above described may be positioned in a casing or housing of any preferred construction, as for example, a casing shown by Fig. 1, in which 30 designates a sheet metal construction having an open front and closed back and side portions, a frame plate 31 having cross protector bars 32 mounted over a portion of the reflector block 5 and secured thereto by suitable means, and a rim frame member 33 also secured to said block and frame plate.

In some forms of heaters, I may employ a number of back blocks or plates 5, and the associated parts, or the blocks may be in the form of double blocks 5*a*, as shown in the form of Figs. 6 and 7.

The constructions shown are of such a character that the resistor elements may be readily removed from and applied to the heater by a removal of the rim member or members 33 and the radiant member or members 13.

After current is applied, the forward face of the reflector block or plate, as well as the radiant members, are heated sufficiently to produce a red glow, thus providing a very attractive appearance.

I claim:

1. An electric radiant heater including a back reflector plate of refractory material, an electric resistor element on the reflector plate, and a refractory radiant member superimposed upon the reflector plate and cooperating with the plate for maintaining the resistor element therebetween, said plate having grooves and said radiant member having extensions entered in the grooves.

2. An electric radiant heater including a back reflector plate of insulating material, a series of electrically connected resistor elements positioned on the plate, a refractory open-work radiant member superimposed upon the plate and over the resistor elements, said plate and radiant member having cooperating interengaging elements for maintaining the resistor elements therebetween.

3. An electric radiant heater including a back reflector plate of insulating material, a series of electrically connected resistor elements positioned on the plate, and a refractory radiant member superimposed upon the plate and over the resistor elements, said resistor elements each including a relatively thin flexible current conducting strip having transverse slots to provide a sinuous path for the current, said plate having grooves and said radiant member having extensions entered in the grooves.

4. An electric radiant heater including a back reflector plate of insulating material, a series of electrically connected resistor elements positioned on the plate each including a relatively thin flexible current conducting strip having transverse slots to provide a sinuous path for the current, a refractory open-work radiant member superimposed upon the plate and over the resistor elements, said plate and radiant member having cooperating inter-engaging elements for maintaining the resistor elements therebetween, and means for securing the radiant member to the front face of the reflector plate.

In testimony whereof I affix my signature.

LOUIS LEBAU.