April 14, 1925. 1,533,226

O. A. COLBY

STREET CAR HEATER

Filed Oct. 4, 1922

Fig. 1.

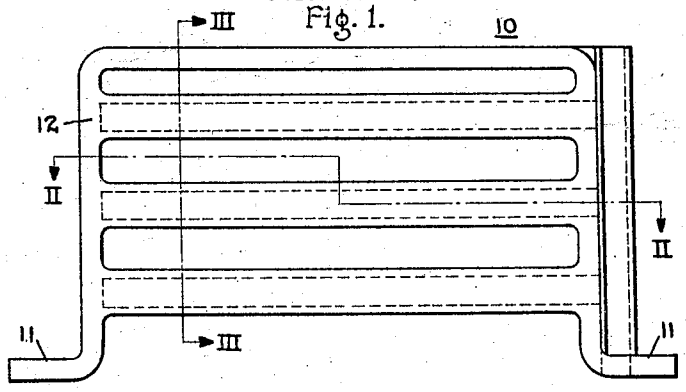


Fig. 3.

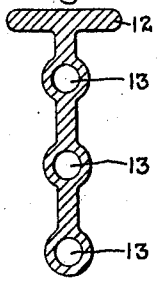


Fig. 2.

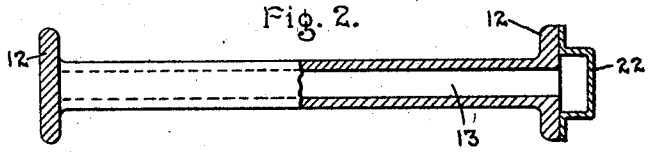


Fig. 4.

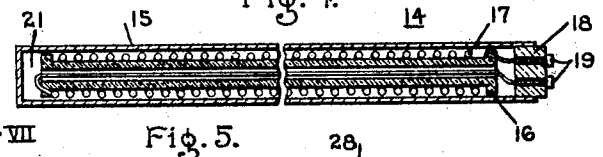


Fig. 5.

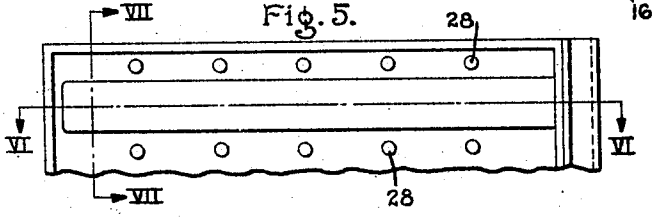


Fig. 6.

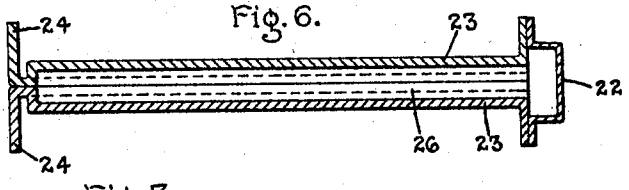


Fig. 7.

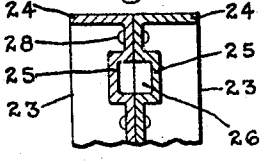
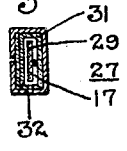


Fig. 8.



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UNITED STATES PATENT OFFICE.

ORA A. COLBY, OF IRWIN, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

STREET-CAR HEATER.

Application filed October 4, 1922. Serial No. 592,293.

To all whom it may concern:

Be it known that I, ORA A. COLBY, a citizen of the United States, and a resident of Irwin, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Improvement in Street-Car Heaters, of which the following is a specification.

My invention relates to electric heating devices and, particularly, to electric air heaters.

The object of my invention is to provide a relatively simple, compact, easily manufactured and easily installed electric heater for use in street cars.

In practicing my invention, I provide a relatively thin metal frame casting having a relatively large surface area, the casting having a plurality of openings therein within which removable heating elements may be located. A terminal box is located adjacent one end of the frame through which terminal leads from the heating element may extend to positions below the car floor.

In a modified form of construction, I provide relatively thin pressed-sheet-steel plates which are so shaped as to provide pockets or openings within which suitable heating elements may be removably located.

In the single sheet of drawings,

Figure 1 is a view, in front elevation, of an electric heater embodying my invention;

Fig. 2 is a view, in horizontal longitudinal section, taken on the line II—II of Fig. 1;

Fig. 3 is a view, in vertical lateral section, of a device embodying my invention, taken on the line III—III of Fig. 1;

Fig. 4 is a view, in longitudinal section, of an encased heating element which may be employed with the device embodying my invention;

Fig. 5 is a view, in front elevation, of a portion of a pressed-sheet-steel frame comprising a modified form of my invention;

Fig. 6 is a view, in horizontal longitudinal section, taken on the line VI—VI of Fig. 5;

Fig. 7 is a view, in vertical lateral section, taken on the line VII—VII of Fig. 5; and

Fig. 8 is a view, in lateral section, of an encased heating element employed with the frame illustrated in Fig. 5.

A frame 10 for my improved heating element comprises an elongated and relatively thin metal casting of iron or brass and provided with supporting extensions or feet 11 at the lower opposite corners thereof. The upper and the side edges of the casting 10 may be provided with a web portion 12, for the purpose of providing greater strength in the casting as well as a greater radiating surface. A plurality of chambers or openings 13 may be provided within the frame 10 to extend longitudinally thereof in spaced relation relatively to each other. The openings 13 extend from one side edge to within a short distance of the other edge of the frame 10 and to substantially the web 12. Any number of openings 13 may be provided, depending upon the desired distribution of heat over the lateral surfaces of the frame and the overall dimensions thereof. The openings 13 may be of any desired configuration in order to co-operate with and receive encased heating elements 14 which are to be placed therein.

As illustrated more particularly in Fig. 4, the heating elements 14 may comprise an outer tubular metal casing 15, within which is located a hollow refractory spool 16 upon which a suitable resistor member 17 is wound. The ends of the resistor member 17 project through suitable openings in a refractory plug 18 located at one end of the tubular member 15. Terminal members 19 are mounted on the outside of the plug 18 to which the ends of the resistor and of the supply-circuit conductors (not shown) may be secured. The tubular casing 15 may be filled with a quantity 21 of a suitable granular electric-insulating and heat-conducting material to insure that the heat generated in the resistor member 17 shall be conducted to the casing 15 and from there to the walls of the opening 13 to be radiated from the outer surfaces of the frame 10.

A terminal box 22, of substantially channel form in lateral section, is secured to one end of the frame 10 and provides a covered conduit through which terminal leads connected to the terminal members 19 may extend to a junction box located below the car floor or through which the ends of supply-circuit conductors may extend to the terminal members 19.

In the modified form of frame illustrated in Figs. 5 to 7, inclusive, I employ a plurality of pressed-sheet-steel plates 23 which are located in abutting and opposed relation and are provided, at their top and at their ends, with laterally-extending integral

flanges 24. Each of the plates 23 is provided with a plurality of longitudinally-extending depressions 25, two opposing depressions co-operating to provide an opening 26 within which a suitable encased heating element 27 may be removably located. A plurality of rivets 28 may be provided at suitable places on the frame, comprising the pressed-sheet-steel plates 23, to securely rivet the two plates together.

The heating element 27, as illustrated, comprises an insulating support 29, upon which may be wound the resistor member 17, and an insulating sheet 31 may be wrapped around the resistor and its supporting strip. An outer casing or cover 32 for the heating unit 27 may comprise a relatively thin sheet-metal strip so bent as to substantially enclose the resistor member and its surrounding insulation. It is understood, of course, that the shape of the openings 13 in the frame casting 10 and of the openings 26 in the pressed-sheet-metal frame are such as to co-operate with and receive the respective heating elements 14 and 27, which are to be located therein. The respective heating elements should fit closely within the respective openings in order that the heat may be easily and quickly conducted from the heating element to the frame and from there conducted to, and radiated from, the outer surfaces of the frame.

A terminal box 22, substantially as hereinbefore described in connection with the cast frame illustrated in Fig. 1, may be secured against one end of the built-up pressed-metal radiator.

The device embodying my invention provides a relatively simple, electrically-heated radiator which may be installed in street cars or in rooms which are to be electrically heated which will permit of employing quickly removably heating elements of substantially standard construction, and any desired method of control of the resistor members may be employed.

Various modifications in the arrangement and location of parts may be made within the spirit and scope of my invention, and such modifications are intended to be covered by the appended claims.

I claim as my invention:—

1. In an electric heater, in combination, a metal frame having a relatively large surface area and a plurality of chambers therein, each chamber having one open end, a plurality of removable heating elements in said chambers, and a terminal box adjacent the open ends of said chambers.

2. In an electric heater, in combination, a metal frame having a relatively large surface area and a plurality of longitudinally-extending spaced-apart chambers therein, removable heating elements in said chambers, of such lateral contour as to fit closely therein, and a terminal box for said heating elements extending laterally of said frame at one edge thereof.

3. In an electric heater, in combination, a metal frame having a relatively large surface area and a plurality of longitudinally-extending spaced-apart chambers therein, said chambers extending to one edge of the frame, a removable electric heating element in each of said chambers and fitting closely therein, and a terminal box for said heating elements secured to said frame at one edge thereof.

In testimony whereof, I have hereunto subscribed my name this 16th day of September 1922.

ORA A. COLBY.