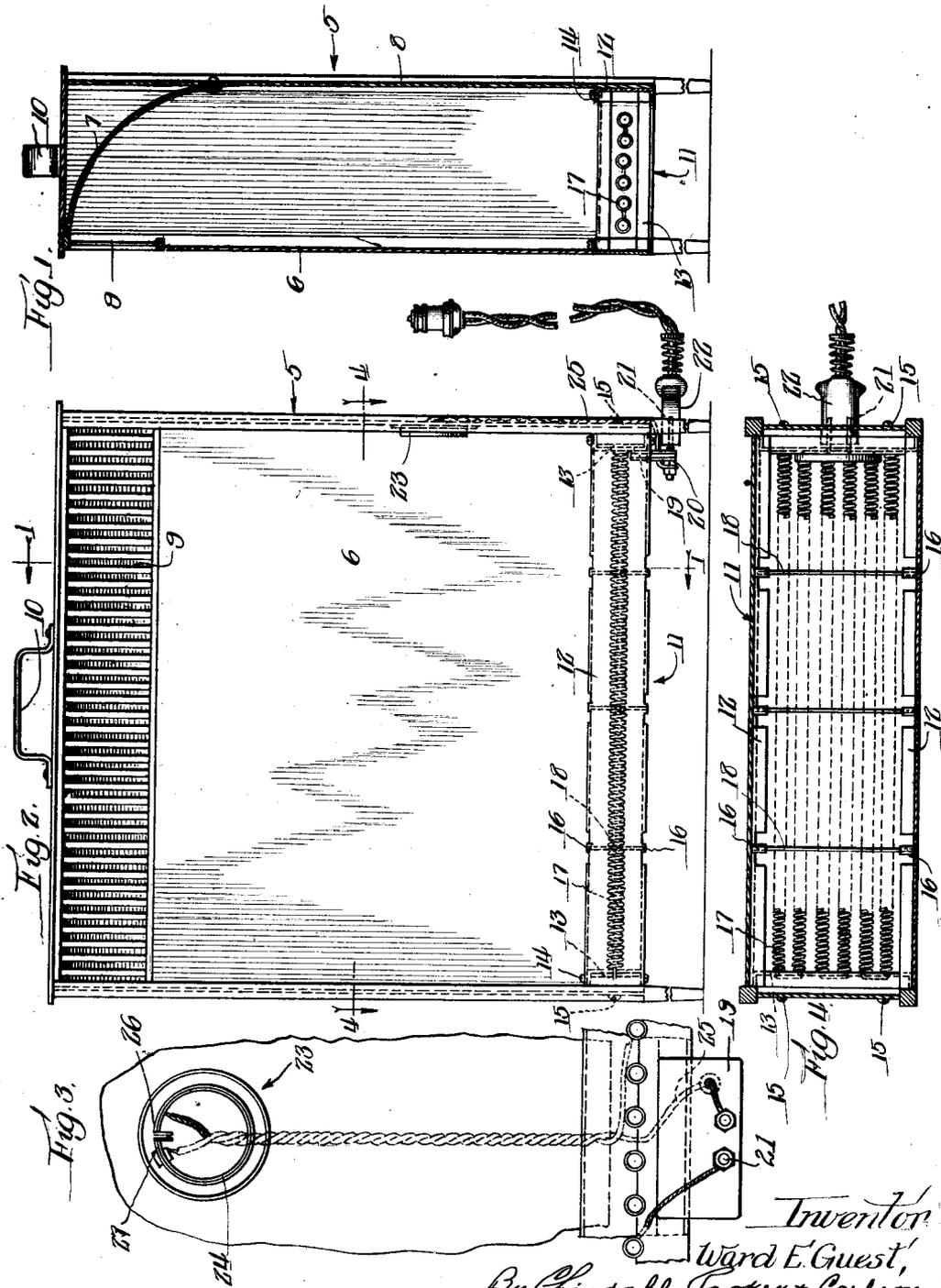


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W. E. GUEST
ELECTRIC HEATER

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ELECTRIC HEATER

Application filed September 10, 1926. Serial No. 134,604.

This invention relates in general to electric heaters and refers more particularly to a portable electric heater from which the heat is caused to emanate by means of convection currents generated as distinguished from heat radiated.

An object of this invention is to devise a portable electric heater in which the desired heating is effected through the agency of convection currents created by the heater with a minimum amount of heating by radiation.

It is a further object of this invention to provide an improved means for controlling the temperature within a room to be heated by means of a control unit located within the heater.

Another object is to provide an improved heater of this type comprising a hollow case or flue having therein a heating unit located to provide the most efficient generation of convection currents, the heating unit being removably secured in the heater case; and in which the arrangement of the parts is such as to insure a high degree of safety.

Other objects and advantages will become apparent in the following description and from the accompanying drawings, in which:

Figure 1 is a vertical section of the heater taken on the line 1—1 of Fig. 2.

Fig. 2 is a front elevation of the heater.

Fig. 3 is an enlarged fragmentary view of one form of control means.

Fig. 4 is a sectional view taken on a line 4—4 of Fig. 2.

In attaining the objects of this invention I provide an upright box-like heater case or flue 5 which has an air outlet at the upper end which may be provided by having one face 6 partially open. The flue 5 also has an air inlet provided by leaving the lower end open. A curved wall or diverter 7 is secured to the entirely closed face 8 of the flue intermediate the upper and lower ends thereof, and slopes forwardly to join the front face near the upper edge of the opening therein. A grille 9 serves as a screen for the opening in the face 6. A handle 10 of any suitable construction may be provided to facilitate movement of the case from one position to another.

In the open lower end of the case is mounted a removable electric heating unit designated generally as 11, properly arranged to direct the heat therefrom in an upward direction. The heating unit may be of any suitable construction, but I have devised a unit which is very simple in construction and is exceedingly efficient in operation. The supporting frame for this unit comprises a pair of side members 12 and a pair of end members 13 rigidly secured together as by bolts 14, to provide a substantially rectangular open-faced frame adapted to fit snugly into the open end of the case 5 and to be removably secured therein in a suitable manner as in the present instance by means of set screws 15 mounted in the case to engage the frame of the heating unit. The side members 12 have their edges turned to provide an inwardly opening channel and each turned edge is, at appropriate intervals, struck inwardly of the channel at two adjoining places, thereby providing a series of clips 16 integral with the side members 12.

A heating element 17 formed in the usual manner of coiled high resistance wire is wound alternately between the two ends 18 of the frame, which are insulated in a suitable manner as by mica sheets to prevent contact of the heating element with the end members. A plurality of insulating supporting plates 18 of sheet mica or other substantially heavy insulating material, extend transversely of the frames and are held in place by means of the clips 16 on the side members 12. The heating element is threaded through appropriate openings in these plates which thus serve to support and to space the heating element. A downwardly extending insulated plate 19, on one end member, has thereon a pair of terminal binding posts 20 which extend outwardly through the plate to provide contact members 21 arranged to fit into a commercial type of connection plug 22.

This construction provides a simple, sturdy heating unit, in which all of the parts are self-contained and which may be bodily removed from the heater for repairs or replacement.

An essential feature of this invention re-

sides in the operating principle. The prior types of electric heaters utilize generally the principle of radiant heat. That is, the heat emanates in all directions from a source of heat and by means of reflection is directed
 5 along a certain path. Oftentimes such a concentration of heat rays in one direction is objectionable because these concentrated rays have been found to scorch or burn objects located a considerable distance away. Fur-
 10 thermore, direction of the heat rays in this manner does not properly diffuse the heat throughout a room.

In my heater the heat rays are used as
 15 much as possible to create convection currents by drawing cool air in at the base of the heater and heating that air, such air then passing upwardly in the heater until de-
 20 flected outwardly through the grille 9 by the curved portion 7 on the wall 8. The creation of convection currents in the room causes a much more rapid heating thereof than is obtained by a purely radiant type heater.

The utilization of the principle of con-
 25 vection currents in my heater has enabled me to provide the heater with a relatively accurate automatically operating thermostatic control which is incorporated in the
 30 heater. The thermostatic control may comprise any well known type of thermostat. In the present instance I have shown installed a simple circular bi-metallic thermostat strip
 35 24 which is set to expand and break a circuit at a certain predetermined temperature. The thermostat 23 is securely mounted within the case 5 at a point above the heating unit 11
 40 and a lead 25 from one of the binding posts 21 to one end of the heating unit 17 is connected in series with the thermostat strip 24 (see Fig. 3). Thus the bi-metallic strip upon
 45 being subjected to a certain degree of heat will expand, moving one contact 26 away from the other insulated contact 27 to break the circuit. Experimental tests determine to
 50 what degree of heat the thermostat must be exposed in order to correspond to a desired degree of heat in a room and the thermostat is then set to open at that temperature. Thus
 55 the thermostat can be set at a certain temperature, and when, during operation, the temperature of the air within the heater case has "built up" to a certain limit, the thermostat will automatically "shut off" the
 60 heater. This control system in itself provides a safety device in case a coat, wrap or other inflammable obstacle be thrown over the heater outlet accidentally. In this event the entrapped air within the heater case is
 65 heated very rapidly and in a very short time will cause the disconnecting operation of the thermostat.

Although the invention is susceptible of various modifications and alternative construc-
 65 tions, I have shown and herein described in

detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within
 70 the spirit and scope of the invention as expressed in the appended claims.

I claim as my invention:

1. A portable electric heater having, in combination, a heater case, a removable heat-
 75 ing unit including a heating element arranged to extend across the lower end of said case, contact means on said unit connected with said heating element for connection of said element with a source of current,
 80 and thermostatic control means secured within said heater case and interposed in a circuit between said contact means and said heating element whereby when the tempera-
 85 ture within the heater case reaches a predetermined point, said thermostatic control means will operate to break the circuit to said heating element.

2. A portable electric heater comprising, in combination, a heater case having a par-
 90 tially open front face, an open lower end, and a back, a diverter secured to said back and arranged to slope forwardly to meet the upper end of said open face, a heating unit
 95 removably secured in said case, and a heating element carried by said unit and extending in a substantially horizontal plane across and adjacent the open lower end of said case when said unit is secured therein.

3. A portable electric air heater comprising, in combination, a top wall and side walls
 100 defining a heating space, legs on said side walls to space the heater from the surface upon which it is supported whereby to give access of air into said heating space, the lower
 105 edges of the side walls defining an inlet opening, an aperture in one of the side walls providing an outlet opening, a plurality of heating coils extending substantially horizontally
 110 across said inlet opening and vertically positioned insulating plates spanning said opening and supporting said coils.

In testimony whereof, I have hereunto af-
 115 fixed my signature.

WARD EARL GUEST. 115

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