

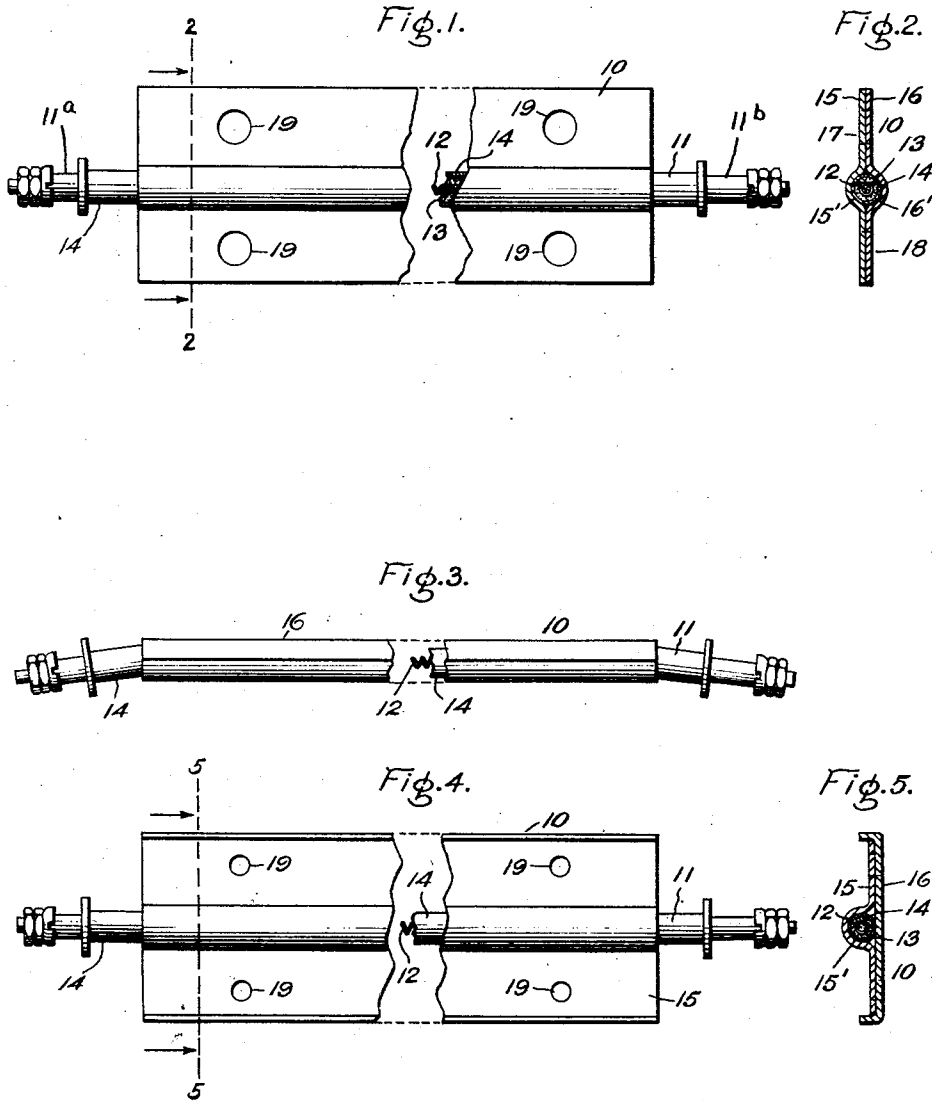
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C. C. ABBOTT

ELECTRIC HEATER

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Inventor:
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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATER.

Application filed September 23, 1922. Serial No. 590,020.

To all whom it may concern:

Be it known that I, CHARLES C. ABBOTT, a citizen of the United States, residing at Pittsfield, in the county of Berkshire, State of Massachusetts, have invented certain new and useful Improvements in Electric Heaters, of which the following is a specification.

My invention relates to electric heaters and has for its object the provision of a simple, rugged and compact electric heater.

My invention has utility in various heating applications, for example, it may be used as an air or space heater or it may be clamped on or otherwise secured to an object to be heated.

In carrying out my invention I employ a sheath wire heating unit, for example, of the type forming the subject matter of my copending application Serial No. 549,636, filed April 4, 1922. In heating units of this type the resistance conductor is embedded in a compacted mass of insulating material enclosed in a metallic containing sheath. In one form of my invention I provide longitudinal heat dissipating vanes associated with the containing sheath whereby the heat generated in the unit may be quickly transferred either to the air or to the object to be heated.

For a better understanding of my invention reference should be had to the accompanying drawing in which Fig. 1 is an elevation view of an electric heater embodying my invention; Fig. 2 is a section view along the line 2—2 of Fig. 1 looking in the direction of the arrows; Fig. 3 is a view of a modified form of my invention; Fig. 4 is an elevation view of Fig. 3; while Fig. 5 is a section view along the line 5—5 of Fig. 4 looking in the direction of the arrows.

Referring to Figs. 1 and 2 of the drawing, the electric heater 10 in one form of my invention comprises a helical coil sheath wire heating unit 11, such as that forming the subject matter of my aforesaid copending application. This heating unit in general comprises a helical resistance conductor 12 embedded in a compacted mass of insulating material 13, such as magnesium oxide, the whole being enclosed by a metallic containing sheath 14. This insulating material not only serves to insulate the resistance conductor but acts also as a good heat conductor between the resistance con-

ductor and the sheath. Connected to the ends of the resistance conductor are the terminals 11^a and 11^b which project from the ends of the sheath in insulated relation therewith. The heating unit 11 is clamped between two metallic plates 15 and 16 extending longitudinally thereof, the plates being formed with registering central longitudinal grooves or recesses 15' and 16' respectively in which the heating unit is secured. These plates are welded together as near the heating unit as possible so as to clamp the heating unit tightly. The welding of the plates may be accomplished in any suitable manner such as by the line welding or spot welding process.

The plates 15 and 16 extend throughout substantially the full length of the heating unit 11 and it will be observed form two longitudinal heat dissipating vanes 17 and 18 extending along opposite sides of the heating unit. Due to the fact that the plates 15 and 16 are clamped tightly on the metallic enclosing sheath 14, an intimate thermal relation is secured between the heating unit and the heat dissipating vanes so that heat generated in the unit will be quickly transmitted to the vanes. This heater is particularly adapted for use as an air or space heater in which application it may be mounted with the vanes 17 and 18 in a vertical position so as to facilitate the circulation of air around the vanes. Apertures 19 may be provided in the vanes 17 and 18 by means of which the heater can be secured to a suitable support, for example, by screws or bolts. The heater may also be similarly secured or clamped on to an object so as to heat the object, the object serving as the support for the heater.

In the modified form of my invention shown in Figs. 3, 4 and 5 one of the clamping plates, for example, 16, is in the shape of a channel member, it being flat, and having its longitudinal edges bent over to provide for greater strength in a lateral direction. In this form of my invention only one longitudinal recess for the heating unit is provided, this recess 15' being formed in the plate 15 and having a depth substantially equal to the diameter of the heating unit 11. The plates 15 and 16 are welded together so as to clamp the heating unit tightly, as described in connection with Figs. 1 and 2. This type of heater is particularly

adapted for heating various objects, the outer face of plate 16 being flat so that the heater may be mounted on an object to be heated and clamped or secured tightly to the object so as to be in good thermal relation therewith. The ends of the heating unit carrying the terminals are preferably bent away from the plane of the outer face or clamping surface of plate 16 so as to be out of the way when the heater is secured to the object to be heated, and also to facilitate the connection of the terminals to a suitable electrical supply source. The heater may be secured by suitable bolts or screws passing through the apertures 19. Obviously this form of my invention can be used also as a space or air heater as described in connection with Figs. 1 and 2.

I have thus provided an exceedingly compact, rugged and economical heater which has many applications and which is particularly adapted for use as a space or air heater or as a heater for various objects by clamping it onto the object. The construction and arrangement of the heater offers considerable economy in manufacture, so that it can be produced at relatively low cost. Also by providing longitudinal rather than circumferential heat dissipating vanes so that the heater is flat, the heater occupies and hence may be fitted in a very limited space.

Since one of the characteristics of heating units of the sheath wire type, such as used for the heating unit 11, is that they can be bent or shaped into any desired form, obviously the electric heaters embodying my present invention may be readily formed into any desired shape so as to fit the space or object to be heated.

While I have described my invention as embodied in concrete form and as operating in a specific manner in accordance with the provisions of the patent statutes, it should be understood that I do not limit my invention thereto, since various modifications

thereof will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

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

1. An electric heater comprising a metallic sheath, a pair of metallic plates between which said sheath is clamped in good heat conducting relation therewith, said plates forming heat dissipating vanes for said sheath, a resistance conductor in said sheath, and granular insulating material embedding said resistance conductor so that heat is readily conducted to said sheath and heat dissipating vanes.

2. An electric heater comprising a metallic sheath, a pair of metallic plates one of which is provided with a longitudinal recess in which said metallic sheath is clamped by the other in good heat conducting relation with said plates, said plates being joined together so as to form longitudinal heat dissipating vanes for said sheath, a helical resistance conductor in said sheath, and granular insulating material compacted to a hard dense mass in said sheath so that heat is readily conducted to said sheath and heat dissipating vanes.

3. An electric heater comprising a metallic sheath, a metallic plate provided with a longitudinal groove for said sheath, a second plate forming a clamping surface securing said sheath in said groove in good heat conducting relation with said plates, said plates being connected together so as to form longitudinal heat dissipating vanes for said sheath, a helical resistance conductor in said sheath, and granular insulating material compacted to a hard dense mass in said sheath so that heat is readily conducted to said sheath and heat dissipating vanes.

In witness whereof, I have hereunto set my hand this 16th day of September, 1922.

CHARLES C. ABBOTT.