C. C. ABBOTT.

ELECTRIC HEATING UNIT.

APPLICATION FILED JUNE 20, 1918.

1,350,910.

Patented Aug. 24, 1920.

Fig. 1.

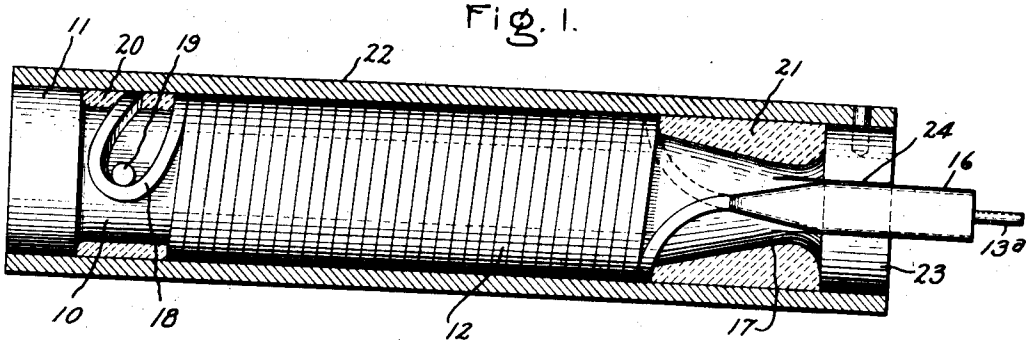


Fig. 2.

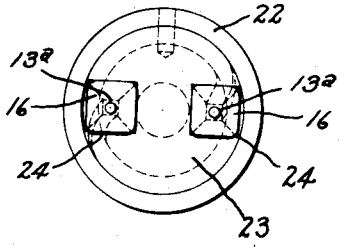
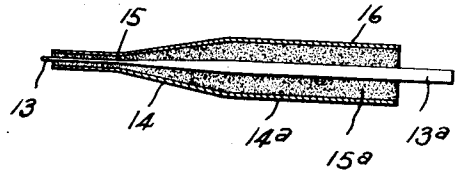


Fig. 3.



Inventor:
Charles C. Abbott,
by Albert G. Davis
His Attorney.

UNITED STATES PATENT OFFICE.

CHARLES C. ABBOTT, OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC HEATING UNIT.

1,350,910. Specification of Letters Patent. Patented Aug. 24, 1920.

Application filed June 20, 1918. Serial No. 241,061.

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 Heating Units, of which the following is a specification.

My invention relates to an electrical heating unit and more particularly to such a unit in which sheathed wire is used and it has for its object the improvement in a device of this character.

My invention will best be understood by reference to the accompanying drawing in which Figure 1 is a longitudinal section, partially in elevation, of one form of heating unit embodying my invention; Fig. 2 is a side view thereof and Fig. 3 is a detail sectional view showing a section of the sheathed wire with an enlarged terminal.

Referring now to the drawings, 10 is a metal core member, preferably provided with enlarged cylindrical ends as shown at 11 and 23. The resistance element is formed of sheathed wire 12 comprising a resistance core 13 inclosed in a metal sheath 14 with an intervening layer of refractory insulating powder, such as magnesia 15, insulating the core from the sheath. The sheathed wire is preferably square in cross section and is tightly wound on the contracted portion of the core 10. Sheathed wire of this character is commonly provided with an enlarged terminal which I have indicated at 16, the core 13^a and sheath 14^a of the terminal being continuous with the core and sheath of the sheathed wire proper. The insulating material of the terminal is indicated at 15^a. Adjacent the enlarged end 23 the core is reduced and tapered as at 17. The sheathed wire is tightly wound on the contracted portion of the core 10, the enlarged terminals being disposed adjacent the beveled portion 17 of the member so as to form a close fit between the core and the sheath 12. When both terminals of the resistance wire are brought out at the same end of the unit, as disclosed in the form of my invention illustrated in the drawings, the free looped end 18 of the sheathed wire may conveniently be secured in position by a pin 19 which is inserted in an opening formed for this purpose in the core member. The space between the enlarged section 11 of the core and the solid winding of the sheathed wire is preferably filled with a heat conducting material 20, such as iron cement. The opposite end of the unit is also built up into a cylindrical form which is flush with the outside diameter of the sheathed wire by means of a similar cement 21 which closely surrounds the terminals and holds the same against the core. The unit thus formed is preferably surrounded with a metal sheath 22, the end of the sheath adjacent the terminals being sealed by means of collar 23 provided with openings 24 through which the enlarged terminals pass. The opposite end of the sheath is sealed and made water tight by the enlarged section 11 of the core. The sheath is then compressed, preferably by swaging, sufficiently to bring the same into intimate thermal relation with the sheathed wire so as to promote the transfer of heat from the core to the sheath, which sheath acts as the heat distributing member. It will be apparent that a heating unit made in accordance with my invention is small and compact and will readily transfer the heat from the resistance element to the sheath of the wire and may be used in a variety of ways, among others as an ordinary unit as illustrated. The unit may be placed in an opening formed in a heat distributing member for the reception of the same or it may be used as an immersion heater or otherwise.

While I have herein shown and described one modification of my invention, I do not desire to be limited to the exact arrangement shown and described but seek to cover in the appended claims all those modifications which come within the true spirit and scope of my invention.

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

1. An electric heating device comprising a metal core and a sheathed wire heating element surrounding the core, the core and heating element being worked into intimate contact.

2. An electric heating device comprising a metal core, a sheathed wire heating element surrounding the core and a metal sleeve inclosing the heating element; the core, heating element and sleeve being worked into intimate contact.

3. An electric heating device comprising a core member, a sheathed wire resistance

element tightly wound on said core member and a metal sleeve inclosing the resistance element and compressed into good thermal relation therewith.

4. An electric heating device comprising a core member, a sheathed wire resistance element square in cross section closely wound on said core member, and a metal sleeve surrounding the resistance element and in close thermal relation therewith.

5. An electric heating unit comprising a core member, a sheathed wire resistance element wound on said member, a metal sleeve inclosing the resistance element and worked into good thermal relation therewith, and a member closing one end of the sleeve and provided with openings through which the terminals of the resistance element are brought out.

6. An electric heating unit comprising a core member provided with a beveled end, a sheathed wire heating unit provided with enlarged terminals wound on said core, the enlarged terminals being disposed adjacent the beveled portion of the core, a metal sheath surrounding the sheathed wire and in good thermal relation therewith, a filling material surrounding the beveled portion of the core and occupying the space between the core and the metal sheath.

In witness whereof I have hereunto set my hand this 17th day of June, 1918.

CHARLES C. ABBOTT.