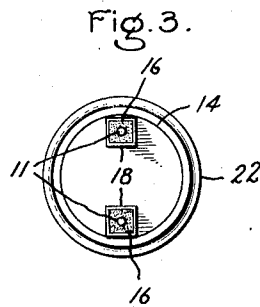
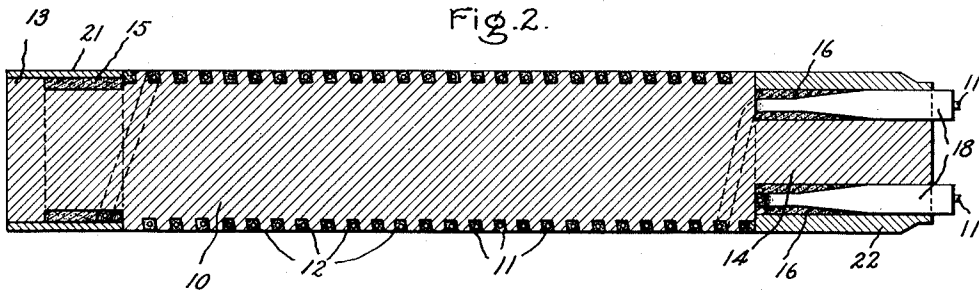
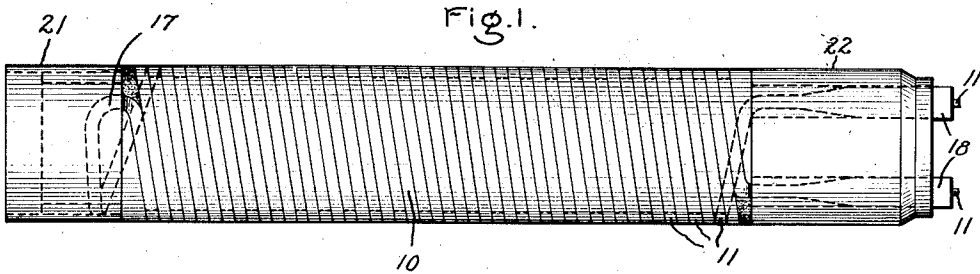


C. C. ABBOTT.
ELECTRIC HEATING UNIT AND METHOD OF MAKING THE SAME.
APPLICATION FILED MAR. 29, 1918.

1,281,744.

Patented Oct. 15, 1918.



Inventor:
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UNITED STATES PATENT OFFICE.

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ELECTRIC HEATING UNIT AND METHOD OF MAKING THE SAME.

1,281,744.

Specification of Letters Patent.

Patented Oct. 15, 1918.

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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 and Methods of Making the Same, of which the following is a specification.

My invention relates to the manufacture of an electric heating unit, and more particularly a heating unit of the cartridge type, and has for its object the improvement in the method of making the same and in the article produced in accordance with the method.

It has hitherto been proposed to cast sheathed wire, comprising a core resistance surrounded by a metal sheath, with an intervening layer of insulating material, in a cylindrical mass of metal to form a cartridge type of heating unit. Difficulty has been experienced, however, in producing a satisfactory casting of this character due, in part at least, to the insufficient amount of metal surrounding the heating unit. In accordance with my present invention, sheathed wire is embedded in the surface of a metallic member preferably, by forcing the two into intimate thermal relation. The heat generated in the heating element during its normal operation is thus readily transmitted to the metallic member from which the heat may be transmitted to various kinds of heating devices, as circumstances may require.

My invention will best be understood by reference to the accompanying drawing, in which I have shown one embodiment of my invention and in which Figure 1 is a side elevation of a heating unit embodying my invention; Fig. 2 is a longitudinal section therethrough; and Fig. 3 is an end elevation.

Referring now to the drawing, 10 is a metallic member in the surface of which the sheathed wire is to be embedded. This metallic member is here shown as solid, but obviously it is not necessarily so. When the heating unit is to take the form of a cartridge unit, the general character of which is shown in Vogel Patent #839,343, which was issued December 25, 1906, then the metallic mass is preferably cylindrical in form as shown. One convenient way of embedding the sheathed wire 11 in the sur-

face of the metallic member is first to form a spiral groove 12 on the surface thereof, or if the two ends of the sheathed wire are to be at the same end of the unit as shown, then two such grooves are provided corresponding in cross section to that of the sheathed wire and the sheathed wire is laid in the groove or grooves. The sheathed wire used in the art is commonly made square in cross section, as shown, in which case the groove is square in cross section. The ends of the metallic member are preferably contracted as at 13 and 14 (see Fig. 2) and when both ends of the resistance element are brought out at the same end of the heating unit as here illustrated, the contracted portion 13 is provided with a peripheral groove 15 for a purpose which will presently appear, while the contracted end 14 is provided with diametrically opposite longitudinal grooves 16. The sheathed wire is folded on itself before being laid in the grooves. The terminals are then placed in position within the longitudinal grooves 16 and the two limbs of the sheathed wire are laid in the respective grooves of the cylinder, the folded end 17 of the sheathed wire being disposed in the peripheral groove 15, the groove thus forming a convenient space within which the folded end of the wire may be disposed, the lengths of which will vary slightly for different units. Enlarged terminals of this character which include an enlarged core wire are fully described in patent to Whitney #1,093,512, and need here be no further described. The groove 15 and the grooves 16 are preferably filled with cement after the sheathed wire and the enlarged terminals respectively, are laid therein, in order to facilitate the transmission of heat that may be generated in these parts to the surrounding metal. Preferably the contracted portion 13 is then surrounded by a metal thimble or sleeve 21, while the contracted portion 14 is surrounded with a sleeve 22.

The entire unit is now preferably swaged or otherwise reduced to a slight extent, just sufficient to firmly compress the sheathed wire against the walls of the spiral groove in which it is disposed, in order to bring the same into intimate thermal relation therewith, and at the same time impart a smooth finish to the exterior of the unit.

Units of this character are usually inserted

in an opening formed in a metallic heat distributing mass in the same manner as is the cartridge unit shown in the Vogel patent referred to. It will be understood, however, 5 that a heating unit of this character can be advantageously used in a variety of places.

While I have shown the heat distributing member provided with a groove in which the sheathed wire is laid prior to its being swaged, it will be understood that the 10 sheathed wire may be forced directly into the metallic member, provided the metal base in which the sheathed wire is embedded is, relatively to the materials of which the 15 sheathed wire is made, sufficiently soft to permit of the sheathed wire being forced into the metal without mechanical injury to the wire. It will also be understood that the unit shown in Fig. 2 may, if desired, be in- 20 closed in a metallic sheath which then becomes a part of the completed unit.

While I have described my invention as embodying a concrete structure and as operating in a specific manner in accordance 25 with the provisions of the patent statutes, it should be understood that I do not limit my invention thereto, since various modification thereof will suggest themselves to those skilled in the art without departure from the 30 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:—

35 1. The method of making an electric heating unit comprising sheathed wire as the heating element, which consists in forming a

groove at the surface of a heat distributing member, embedding the sheathed wire in said groove, and reducing the unit to bring the 40 sheathed wire into intimate thermal engagement with said metallic member.

2. A heating unit comprising a heat distributing member and a sheathed wire heating unit embedded in the material at the 45 surface of said member.

3. A heating unit comprising a metallic member formed with a groove at its surface and a sheathed wire heating unit embedded in said groove and in intimate thermal en- 50 gagement with the walls thereof.

4. An electric heating unit comprising a metallic member formed with a groove at the surface and a sheathed wire heating element disposed in said groove and brought 55 into intimate thermal engagement with the walls thereof by reducing the unit.

5. An electric heating unit comprising a cylindrical metallic member formed with a groove on the periphery thereof, and a 60 sheathed wire heating unit disposed in said groove and in intimate thermal relation with the walls thereof.

6. An electric heating unit comprising a metallic member formed with a peripheral 65 groove, and a sheathed wire heating unit disposed in said groove and in intimate thermal engagement with the walls thereof, the terminals of the heating element being brought out through longitudinal grooves at 70 the end of the unit.

In witness whereof, I have hereunto set my hand this 26th day of March, 1918.

CHARLES C. ABBOTT.