R. W. DAVENPORT.

ELECTRICAL HEATING UNIT.

APPLICATION FILED FEB. 13, 1914.

1,147,789. Patented July 27, 1915.

Fig. 2.

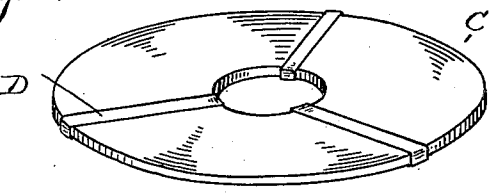


Fig. 1.

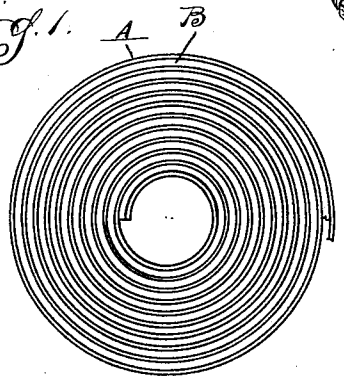


Fig. 3

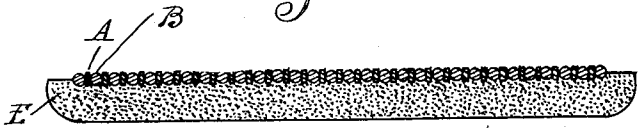


Fig. 4.

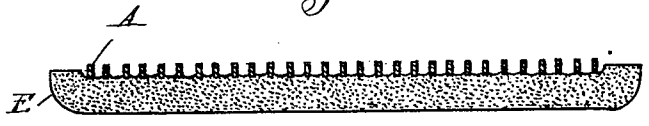
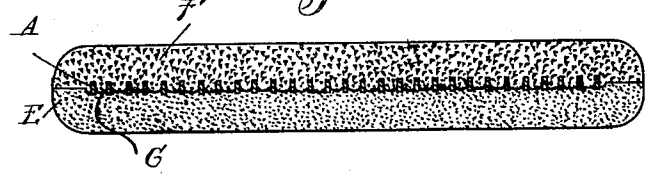


Fig. 5.



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ELECTRICAL HEATING UNIT.

1,147,789. Specification of Letters Patent. Patented July 27, 1915.

Application filed February 13, 1914. Serial No. 818,469

To all whom it may concern:

Be it known that I, RANSOM W. DAVENPORT, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electrical Heating Units, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to electrical heating units of that type in which the heat is developed in a resistor and is distributed therefrom through an insulator, heat-conducting body.

It is the particular object of the invention to obtain a construction in which the heat generation is concentrated in a relatively small area, and in which there is provision for the rapid conduction of heat into the distributing body.

Another object is to prevent the dissipation of heat from one side of the resistor, to avoid waste and to increase the concentration of heat at the work surface.

Still another object is to obtain a simple method of construction.

In the drawings: Figure 1 is a diagram showing the method of coiling the resistor in volute form; Fig. 2 is a perspective view of the completely coiled resistor; Fig. 3 is a section showing the manner of engaging the resistor with the heat-insulating body; Fig. 4 is a similar view showing the spacing member removed; and Fig. 5 is a similar view showing the heat-distributing body applied.

For many uses, such for instance as a substitute for the open gas burner in a cooking stove, it is desirable to obtain an electrical heating unit capable of developing a relatively high temperature. The difficulty encountered is to obtain this temperature without endangering the life of the unit, which necessitates the employment of a good heat-conducting body in contact with the resistor and as large an area of contact as is possible within the space limits. This result I have obtained by constructing a unit in the following manner: The resistor element, preferably in the form of a flat ribbon A is wound with a parallel strip B of destructible material, such as a combustible string, to form a volute or flat disk C. The coil is held in this position by suitable binding strips D and is preferably dipped in some adhesive, such as shellac, which will hold the coils temporarily in position. One side of the coil is then covered with a plastic substance E of an electrically-insulating material of low thermal conductivity, such for instance as fire-clay. This material is pressed against the disk so as to be forced slightly in between the convolutions of the resistor element, as indicated in Fig. 3. When the plastic material E is set, the spacer strip B is removed, preferably by burning. The products of combustion are then removed by any suitable means, such as blowing out the ashes, which leaves the spaced convolutions of the resistor, as indicated in Fig. 4. A plastic body F of an insulating character and having relatively high thermal conductivity is then placed upon the other side of the resistor, being forced in between the convolutions thereof and into good heat-conducting contact therewith.

The unit being constructed as described, will, in use, develop a relatively high temperature with perfect safety, as the large amount of surface in the resistor will form an easy path of conduction for the heat into the body F, from which it is distributed to the working surface. On the other hand, the body E being of low thermal conductivity will resist the passage of heat and will force the distribution in the opposite direction.

The terminals G may be carried out through the body E and if desired further heat-insulating means may be used to intercept the loss of heat from this side of the resistor.

What I claim as my invention is:—

1. An electrical heating unit, comprising a volute-coiled resistor, a body of low thermal conductivity on one side of said coil, and a body of relatively high thermal conductivity upon the opposite side of said coil and filling the spaces therebetween.

2. An electrical heating unit, comprising a volute coil of resistor ribbon, a body of relatively low thermal conductivity on one side of said coil, and a body of relatively high thermal conductivity on the opposite side of said coil, filling the spaces therebetween and forced into positive heat-conducting contact therewith.

3. An electrical heating unit, comprising

a volute coil of resistor ribbon, a section of said ribbon extending transverse to the plane of the coil, and a body of material having relatively high thermal conductivity arranged upon one side of said coil and extending between the convolutions thereof, in heat-conducting contact therewith.

4. An electrical heating unit, comprising a volute coil of resistor ribbon, a body of relatively low thermal conductivity on one side of the coil engaging a comparatively small portion of the ribbon and holding the same in spaced position, and a body of material of relatively high thermal conductivity on the opposite side of said coil engaging said coil and filling the spaces therebetween.

In testimony whereof I affix my signature in presence of two witnesses.

RANSOM W. DAVENPORT.

Witnesses:
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HENRIETTA E. BOWMAN.