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ELECTRIC HEATER

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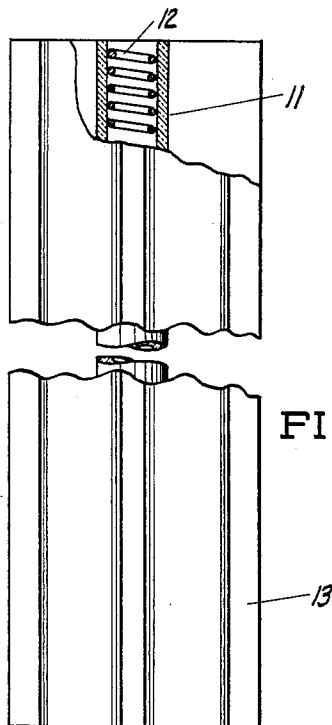


FIG. 1.

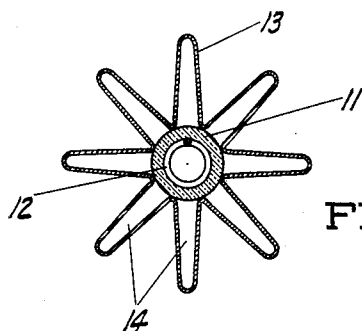


FIG. 2.

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## UNITED STATES PATENT OFFICE.

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## ELECTRIC HEATER.

Application filed November 27, 1926. Serial No. 151,205.

This invention relates to electric heaters, and more particularly to such heaters that are adapted to provide a large area of contact between it and the medium to be heated.

5 It has been proposed to utilize an elongated container made from good heat conducting material such as metal or clay, in which a heating unit is located, and to provide radiating fins externally of the contain-  
10 er for providing a path for the rapid exchange of heat. The mechanical construction of such units as these has been found to be expensive, necessitating as it does, such operations as welding or swaging fins upon  
15 the tubes.

It is accordingly one of the objects of our invention to provide a radiating heating unit of this general character that is inexpensive to manufacture and simple to as-  
20 semble.

It is another object of our invention to provide an improved form of radiating electrical heating unit.

Our invention possesses many other advantages, and has other objects which may be made more easily apparent from a consideration of one embodiment of our invention. For this purpose we have shown a form in the drawings accompanying and  
25 forming part of the present specification. We shall now proceed to describe this form in detail, which illustrates the general principles of our invention; but it is to be understood that this detailed description is not to  
30 be taken in a limiting sense, since the scope of our invention is best defined by the appended claims.

Referring to the drawings:

Figure 1 is an elevation of a heating unit  
40 partly broken away, embodying our invention; and

Fig. 2 is a horizontal sectional view of the unit.

In the present instance we show a tube  
45 11 of refractory material, such as clay or porcelain, which serves to house a heating element. This element 12 is shown as a helical coil of bare resistance wire, which is closely encompassed by the tube 11. Upon  
50 current being sent through element 12, it becomes heated and transfers its heat to the walls of tube 11, which in turn also becomes highly heated and serves as a source of heat. Since tube 11 is made from insu-  
55 lating material, it is entirely practicable to

cause the coil 12 to touch the tube, whereby an efficient heat transfer is provided. There is sufficient frictional engagement to retain the coil 12 snugly in the tube 11.

In order to increase the radiation surface  
60 of the unit, and also to provide convection flues, we provide a corrugated metal sheathing 13 that slips over the tube 12 and is retained firmly thereon by friction. The corrugations are very deep, and form in fact  
65 deep longitudinal ribs or vanes that are hollow. Thus convection flues 14 are formed between the sides of the corrugations and the exterior surface of tube 11. It is further evident that, due to the seamed or cor-  
70 rugated structure, there is sufficient resilience in the sheathing to permit spreading it for introducing the tube 11. Then by releasing the sheathing, the tube will be  
75 strongly gripped by frictional force.

The sheathing 13 can be made from sheet copper or steel, and welded or brazed into the circular form shown.

The element described can be used as an  
80 air heater effectively by positioning it vertically, thereby providing for the passage of convection currents in and around the corrugations. Any appropriate form of support can be provided, and it is considered unnecessary to detail these. Of course the  
85 heater can effectively be used in other positions, the deep corrugations acting in any position to provide an extensive radiating surface.

We claim:

1. In an electric heater, a tube, a heating  
90 wire in the tube and in direct thermal conducting relation therewith, and a sheathing disposed over the tube and forming with the external surface of the tube a series of lon-  
95 gitudinal spaces.

2. In an electric heater, a tube, a heating  
100 wire in the tube, and a sheathing of corrugated metal disposed over the tube and contacting therewith, the corrugations forming radiating fins as well as a series of spaces angularly spaced next the tube.

3. In an electric heater, an insulating tube  
105 capable of transmitting heat, a convoluted electrical heating wire inside the tube and in contact therewith, and a metallic sheathing having deep corrugations disposed on the tube, the inner portions of the corrugations resiliently engaging the tube, whereby a plu-  
110 rality of spaces are formed by the outer sur-

face of the tube and the inner surfaces of the corrugations.

4. In an electric heater, a tube of refractory material, a coil of bare heating wire  
5 within said tube and frictionally contacting therewith, and a sheet metal sheathing engaging the tube, said sheathing having deep

corrugations forming spaces between them and the exterior surface of the tube, as well as longitudinal fins. 10

In testimony whereof we have hereunto set our hands.

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