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ELECTRICAL HEATING ELEMENT

Filed April 4, 1927

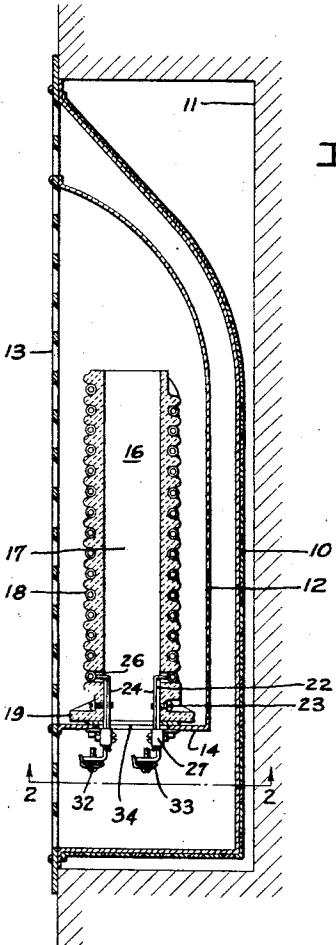


FIG. 1.

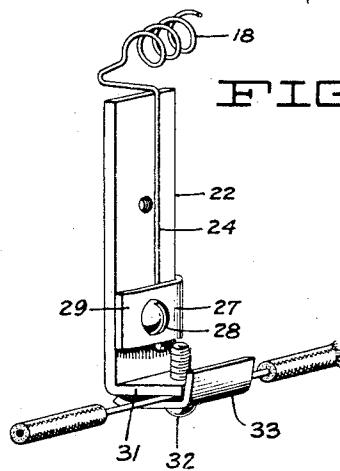
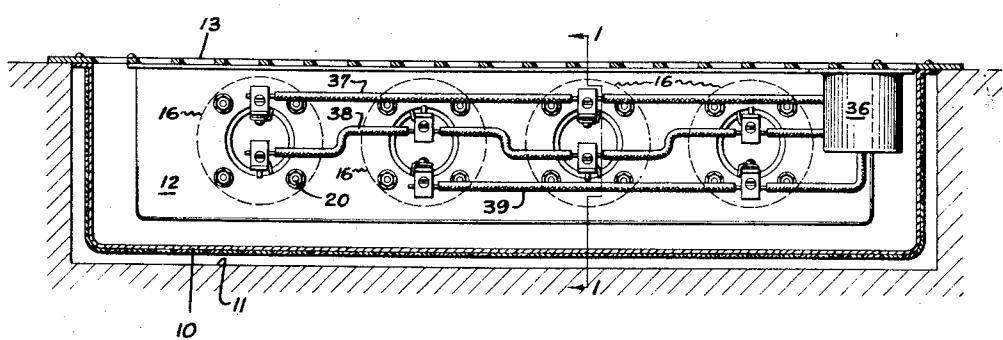


FIG. 3.

FIG. 2.



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## UNITED STATES PATENT OFFICE

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## ELECTRICAL HEATING ELEMENT

Application filed April 4, 1927. Serial No. 180,681.

This invention relates generally to electrical heating apparatus and has particular application to the construction of electrical heating elements for such apparatus.

5 It is an object of this invention to devise means which will facilitate making external electrical connections to the heating elements of electrical heating apparatus.

10 It is a further object of this invention to devise novel means to facilitate making electrical connections to an electrical heating element of the ceramic support type.

15 It is a further object of this invention to devise a novel type of ceramic core to be used for an electric heating element, which will be provided with means to facilitate making external electrical connections to the same.

20 Further objects of this invention will appear from the following description in which we have set forth the preferred embodiment of our invention. It is to be understood that the appended claims are to be accorded a range of equivalents consistent with the state of the prior art.

Referring to the drawing:

25 Figure 1 is a transverse cross sectional view showing this invention applied to a wall type of electrical air heater.

30 Fig. 2 is a cross sectional view taken along the line 2-2 of Fig. 1.

35 Fig. 3 is a detail in perspective showing one of the metallic members which are secured to the ceramic support of a heating device.

40 In providing electrical heating elements for electrical air or other types of heaters, it has become common to use a ceramic support upon which is disposed one or more resistance wires. In the past difficulty has been experienced in making a good electrical connection between the ends of the resistance wire and the external current supply wires, as such connections must not only make good electrical contact, but should facilitate quick assembly of the heater and ready replacement of a burnt out element. In the invention herein described, the end of the resistance wires are not only provided with a positive low temperature connection, but in-

dividual terminal connectors are provided for each element so that an individual element may be readily connected or disconnected for removal or replacement.

45 Referring to the drawing there is shown an electrical heating appliance of the wall type. It is to be understood however that the invention is applicable to a variety of electrical appliances and electrical air heaters. The wall type of electrical heater shown comprises an outer housing 10 which is adapted to be positioned within a wall recess 11. Within the housing 10 there is disposed the relatively smaller shell 12, and extending across the open front of both housing 10 and shell 12, there is a suitable grill 13. The shell 12 is provided with a shelf or bottom wall 14 which serves as a support for one or more electrical heating elements 16.

50 The particular form of electrical heating elements shown are in the form of hollow cores made of refractory ceramic material and having vertical flues 17 formed therein for passage of convective currents of air. The outer surface of each core is grooved and disposed within these grooves is a coiled resistance wire 18. The lower portion of the core is provided with an integral flange 19 to facilitate in securing each core to the shelf 14, bolts or other suitable means 20 being provided for this purpose.

55 For making external electrical connections to the ends of wire 18, a plurality of members 22 are provided, these members each being preferably in the form of a relatively flat metal strip. Members 22 are secured to the lower edge of each core by means of screws 23, so as to be clamped against the inner faces of the lower core portions. The ends 24 of wire 18 are extended through apertures 26 and are electrically connected to members 22 as by means of connecting devices 27. These connecting devices may consist merely of a screw 28 threaded in member 22, and a plate or washer 29 adapted to clamp the wire 24 between the plate and the member 22. The connecting device 27 of each member 22 is located 60 a substantial distance from the upper end 95 of the core. The ends 24 of the wires 18 are 100

thereof so that a considerable portion of the wire end 24 is in thermal contact with member 22, thus reducing the temperature of the connection between wire 24 and the 5 connection device 27.

Formed upon the lower end of each member 22 and extending laterally from the same there is a terminal connector for making electrical connections with external wires. 10 For example this connector may be formed merely by bending the lower end of member 22 to form a lateral extending portion 31 into which is threaded a screw 32 which cooperates with a suitable clamping plate or 15 washer 33. In practice the members 22 extend down below the shelf 14, through suitable apertures 34, so that the several electrical elements may be connected together in any desirable manner so that they may 20 be controlled by a suitable switch. Generally these elements are connected into two groups, so that these groups may both be connected in parallel with the current supply lines, in series with each other, or so 25 that they may be connected individually. In making electrical connections of this kind three different conductors must be employed for connecting the several elements with the control switch 36.

30 In order to facilitate assembly and electrical installation of these conductors, the terminal connectors of each heating core 16 are extended in the same direction and the connectors of adjacent cores are extended in the opposite direction as shown in Fig. 2. Therefore a side conductor 37 may 35 be employed for connecting the terminal connectors of the first and third cores, the central conductor 38 may be employed for connecting with one terminal of all the cores, while the third conductor 39 may be employed for connecting the outer terminal connector of the second and fourth core. By 40 means of this method of offsetting the terminal connectors alternately, proper connections to the control switch are clearly indicated so that danger of faulty wiring during assembly is entirely obviated. Furthermore 45 the fact that each core has its individual terminal connectors makes it possible to replace an individual core which has become injured.

I claim:

50 1. A heating device comprising a hollow ceramic core, a resistance wire disposed on said core, L-shaped double binding terminals secured to the lower edge of said core against the inner face of the same and extending below the core, said terminals having bent portions extending laterally in the same direction with respect to the core, said binding terminal having means for binding the resistance wire thereto, and a separate 55 binding clamp on the lateral extension there-

of to facilitate connection of feed wires for the heating device.

2. A heating device comprising a hollow cylindrical ceramic core, a resistance wire disposed on the outer surface of the core, a plurality of L-shaped connecting members fastened on the inside of the core and extending beyond one end thereof, a binding clamp on one leg of each of the L-shaped connecting members for connection with one end of the resistance wire, and a separate binding clamp on each of the other legs of the L-shaped connecting members for establishing circuit connections, said L-shaped connecting members and associated circuit connection binding clamps extending laterally in the same direction.

70 In testimony whereof, we have hereunto set our hands.

75 ARTHUR J. KERCHER.  
WILLIAM WESLEY HICKS.

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