May 31, 1927. 1,630,649

H. A. ZIOLA

ELECTRIC HEATER

Filed July 21, 1924 2 Sheets-Sheet 1

Fig. 1.

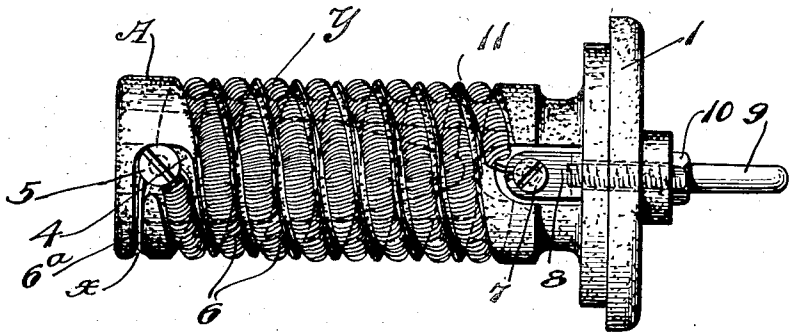
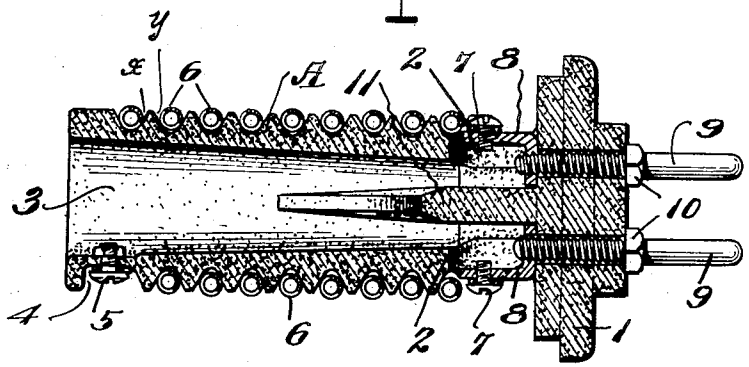


Fig. 2.



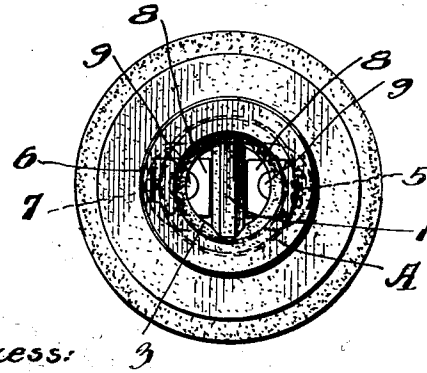


Fig. 4.

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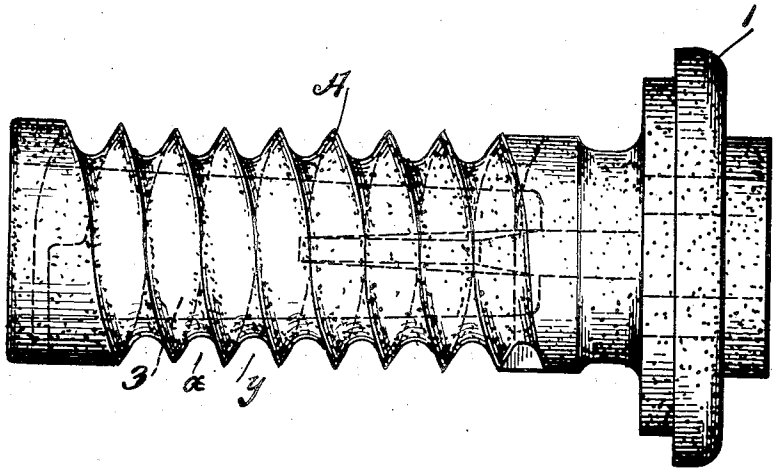
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2 Sheets-Sheet 2

Fig. 3.



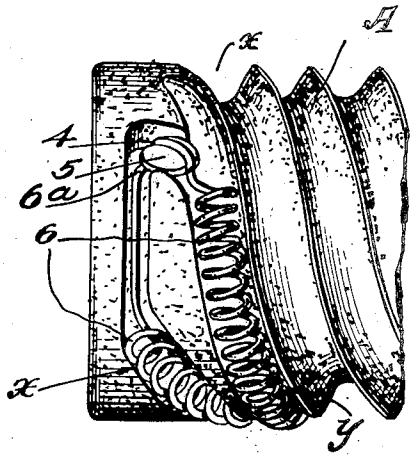


Fig. 5.

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UNITED STATES PATENT OFFICE.

HENRY A. ZIOLA, OF TOLEDO, OHIO, ASSIGNOR TO THE SWARTZBAUGH MFG. CO., OF TOLEDO, OHIO, A CORPORATION.

ELECTRIC HEATER.

Application filed July 21, 1924. Serial No. 727,361.

Electric heaters of the type involving a concaved reflector member, and centrally disposed heating coil ordinarily involve the employment of a core of suitable insulation material or substance about which is wound the resistance wire forming the heater member per se. Heretofore there have been used in practically all heaters an insulation core of a hollow construction, through which a portion of the resistance wire forming the heating member is passed or looped in the operation of assembling the wire and core. Owing to the above method of combining the core and wire elements the assembly operation is a rather expensive one because comparatively few of these heating units, composed of said two parts, can be assembled by a worker in an hour's working time.

A primary object of my invention has been the production of a heating unit of the class referred to wherein the resistance wire is arranged wholly upon the outside of the unit, no portion thereof running through the center of the core.

A further object of the invention has been to provide a core member and the heating unit enabling the resistance wire coils to be wound thereabout in parallel relation, from a point about centrally between the ends of the wire, the terminals being applied in a simplified and advantageous manner to special terminal plates secured to the core. The arrangement of said terminal plates is such that they may not only be readily secured in place upon the core but they are additionally so disposed that a worker may very quickly secure the terminal ends of the resistance wire thereto. These operations are some of the most expensive ones employed in the ordinary building up of a heating unit of the class referred to. Still another feature of my invention has been the formation on the core of the heating unit of grooves in which the coiled resistance wire is so seated that there is no liability of the wire accidentally becoming displaced from the grooves, as by jumping from one groove to another, so as to result in a short circuit or arcing.

My invention involves other detailed features of construction of the unit and arrangement and formation of the resistance wire element which will be more fully apparent upon study of the full description in conjunction with the appended drawings in which,

Figure 1 is a side elevation of a reflector electric heater heating unit embodying the invention.

Figure 2 is a vertical sectional view of the same.

Figure 3 is another side elevational view showing the core member alone.

Figure 4 is a top plan view of the core or insulation member.

Figure 5 is a fragmentary view and elevation bringing out more clearly the way the resistance wire is looped at its central portion beneath the head of a fastening screw, the opposite sides of the wire then being bent in parallelism in the special grooves provided on the outer side of the insulation core.

In the carrying out of my invention I utilize the customarily employed core A which however I have made of a special construction for the purposes hereinbefore stated. The said core is composed of a relatively large cylindrically shaped hollow body projecting from an integral base member 1. At opposite sides of the core, adjacent to the point where the same joins the base 1, I provide openings 2 leading through the wall of the core and establishing communication between points exterior to the core, and the inner hollow portion 3 thereof. At the outer end of the core, which end is opposite to the base 1, I form a recess 4 in which is disposed a small screw bolt 5 the screw head of which is adapted to engage and clamp there beneath the central portion 6^a of the heating element 6 which is preferably nickel chromium resistance wire. From the recess 4 of the core A there extend parallel grooves x and y which grooves are formed spirally about the core and extend in substantially parallel relation to one another, the said grooves terminating, however, at opposite sides of the core at the openings 2 which have been before referred to.

The heating element is coiled substantially the entire distance from the portion 6^a which is looped beneath the fastening 5, until it reaches the terminals thereof near the base 1 which terminals are secured by screws 7 to the terminal plates 8. The terminal plates 8 are small brass plates each of L-form and said plates are attached to the base 1 in positions in which they practically close the openings 2 in the side of the core. To simplify the construction as much as possible the plates 8 are held in place by means of terminal screws 9 which are adapted to be received by the plug openings of a regular standard connector plug to which is attached the heater cord for connecting the heater with a source of electric current. The terminal members 9 are screw threaded so as to screw directly into screw threaded openings in the terminal plates 8, and nuts 10 are adapted to be applied to the screw threaded portions of the terminal members 9 so as to clamp the base 1 on one side while the plates 8 are clamped by the parts 9 to the opposite side of the base. It will be apparent from the foregoing that very few parts are used in securing the plates 8 to the core and in holding the terminal members 9 in position on the core so that the operations required for the application of these parts to the core in assembling the heating unit, are very few, very simple, and is easily made at the expense of a minimum amount of time and labor.

The grooves x and y in the surface of the core A are quite deep, in fact almost as deep as the diameter of the coils of the resistance wire heating element 6. Under these conditions, therefore, liability of the jumping of the coils of the heating element from one groove to another is wholly obviated, and correspondingly there is no likelihood of short circuiting or arcing with disadvantageous or even disastrous results.

From the foregoing it will be evident that the application of the heating element 6 to the core A involves simply a wrapping of the ends of the coiled resistance wire in parallel paths around the external surface of the core. It is not necessary as in previous heating units to bring either end of the wire back to the plug terminals through the center of the core.

Another feature of the invention is the provision between the openings 2 in the wall of the core A of a relatively heavy partition or separating wall 11 that projects from the base 1 a considerable distance into the hollow portion of the core and forms an effective separating means between the two terminal connections 7 thereby eliminating possibility of short circuiting at these terminals.

By reason of the simplicity of the construction of my heating unit and the ease by which its parts may be assembled a very considerably larger number of these units may be made in a predetermined time, than is possible with the more complicated heating unit constructions now commonly found upon the market. Furthermore it is notable that all of the resistance wire which constitutes the heating element is exposed upon the surface of the core and its heat is thus effectively neutralized to a maximum degree.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:

1. As a new article of manufacture, a heating unit for electric stoves comprising a hollow core of refractory substance having an integral base at one end, and formed with openings through its wall at approximately the point where the body of the core joins the base, and also formed with a partition integral with the core and with the base and extending from the base some distance into the core, terminal plates disposed at the openings aforesaid, resistance wire wound about the outer surface of the core and connected with said terminal plates and means for securing the terminal plates to the base.

2. As an article of manufacture, a heating coil for electric reflector stoves comprising a core having a base separated from the core by a recessed portion, terminal members passing through the base of the core, terminal plates held in place by said terminal members at the recessed portion, a heating coil of resistance wire wound about said core from its outer end toward the base and terminating at opposite sides of the core adjacent the base, and fastenings on the terminal plates securing the resistance wire to said plates at the recessed portion of the core, whereby the resistance wire is wholly external to the core and removed from the base.

3. An electric heating unit for reflecting electric heaters, comprising a hollow insulation core, having a base, spaced terminals passing through the base, the said core being hollow and having opposite openings in its wall adjacent to the base and leading to its hollow portion, a heating element wrapped wholly around the outer surface of the core and means connecting terminals of the heating element with said terminal members passing through the base, adjacent to said openings in the core, and comprising terminal plates seated in said openings and having fastenings for attachment of the terminals of the heating element and into which plates the said terminal members are screwed, the terminal plates being external to the core for ready attachment of the heating element terminals.

4. A heating unit for reflecting electric

heaters, comprising a hollow core having a solid base, and having openings at opposite sides of the core through the wall thereof and said base and the core body, L-shaped terminal plates in said openings, terminal members passing through the base and screwed into said plates, a heating element comprising coiled resistance wire wrapped about the core from its outer end to the base, and fastenings securing the terminals of said heating element to the L-shaped plates.

In testimony whereof I affix my signature.

HENRY A. ZIOLA.