The invention relates to improvements in the construction of the heat generating and deflecting portions of electric heating radiators, and the primary object is to provide improvements in the construction whereby the device may be made more economically than devices of this character heretofore constructed.

It is another object of the invention to simplify the construction and method of manufacture of electric heating radiator of the character described.

It is a further object of the invention to provide improvements in electric heating radiator whereby the heating elements may be connected to and disconnected from the device with facility, thereby cheapening the cost of assembly and of manufacture, and also rendering the device more satisfactory in the hands of users because of the ease with which the heating element of the radiator may be removed for replacement in case of a defective heating element.

A further object of the invention is to provide, in a detachable form, certain improvements in the electric heating element, thereby securing greater economy in manufacture, assembly and replacements.

Other objects of the invention will appear from the following description of the preferred embodiment of the invention as set forth in the accompanying specification directed to the preferred embodiment of the invention as depicted in the drawing which forms a part of the specification, the novel features being more particularly pointed out in the appended claims.

In the said drawing, Fig. 1, is a view of the device in side elevation, with the radiator portion of the heater in vertical section on a line extending diametrically through the axis of the radiator or reflector portion thereof and showing the heating element in position therein.

Fig. 2 is a longitudinal section view through the heating element taken on line 2—2 of Fig. 1, looking in the direction indicated by the arrows.

Fig. 3 is an end view of the binding post end of the heating element, with broken adjacent portions of the reflector to which it is attached, and Fig. 4 is a sectional view on line 4—4 of Fig. 3, looking in the direction indicated by the arrows and, together with Figs. 2 and 3, illustrates the details of the quickly detachable connection of the heating element with the reflector.

In the embodiment of the invention illustrated in the drawings the same is shown applied to a conventional parabolic type of reflector for the heat rays as designated generally by reference character 10, the same being preferably formed of sheet metal, with the inner reflector surface polished and provided with a coating of heat reflecting material, as a coating of copper or other analogous metal. The reflector 10, for economy in manufacture, is preferably made of a stamping circular in form, with an outer peripheral beaded portion as designated at 11, in which the beaded portion 11 is not entirely closed, but rather of a semi-circular form, as illustrated in Fig. 1, thus affording ready means for attachment to the outer periphery of the reflector body of the radially extending guard wires 12, of which there are a plurality according to the conventional form of construction, all secured to and radiating from the center plate 13, these radial guard wires being curved at their extremities, as indicated at 14, to engage over and be retained upon the aforesaid curved peripheral edge 11 of the reflector. The reflector is preferably pivotally connected by means of bracket 14 and pivot pin 15, with the usual supporting base 16 formed of cast iron or other suitable metal, and the heater may be rendered readily portable by means of middle 17 secured by metal bracket 18 and rivets 19 in a convenient location on the upper portion of the convex side of the member 10. Both the brackets 14 and 18 preferably made from metal stampings, and the bracket 14, like the bracket 9, is preferably secured to the reflector 10 by rivets as indicated at 19.

The detachable heating element is of a special improved construction, and the body of the same, comprising the usual heat generating or radiating element, is preferably molded in the form illustrated more clearly in the sectional view of Fig. 2 and may be made of any suitable refractory substance adapted for use in the construction of similar electric heating elements. The form of this element or core, which is designated generally by reference character 25, is that of a cylinder, with one end open and the other end closed by an integral closure member, as designated by reference character 26. The closure member 26 is, for strengthening pur-
poses, provided with a thickened portion, as indicated at 27, which extends diametrically across the end of the closure member 26 or the exterior thereof, the same being preferably perforated to receive the terminal or binding posts 28, 29, formed in the usual manner to receive the ordinary socket connec-
tions of the electric circuit wires not here-
in shown, as the same form no part of the
present invention. The binding posts 28 are
preferably provided with enlargements 30, which may be angularly formed to take a
suitable tool, as a wrench, and spaced-apart
openings are provided in the thickened por-
tion 27 of the closure member 26 for the re-
ception of these binding posts which pro-
trude on the interior of the hollow cylin-
drical member 25 and are screw-threaded to take the usual retaining nuts, of which there are
preferably two to each post, designed to se-
cure the terminals of the wire coiled on the
heating element thereto. Such screw-thread-
ed nuts are designated by reference charac-
ters 32 as shown on the post 29 in Fig. 2.
On the opposite sides of the thickened por-
tion 27 of the closure member 26 perforations
are provided for the reception of screws 33,
34, which are threaded on their interiorly
extending portions to receive the usual nuts,
as designated at 35, for binding the heating
element socket and retaining plate 36 on the
closed end of the heating element. This heat-
ing element socket and retaining plate 36 is
of a special cup-like construction, with the
bottom thereof slotted diametrically to fit
over the raised or thickened portion 27 at
the closed end of the heating element, and
slots are preferably provided in the same
manner to receive the retaining screws 32, 34.
The member 36 may be made as a metal
stamping and around the periphery thereof
there is a relatively wide band, designated
generally by reference character 36, which
is adapted to overlie the closed end of the
heating element, and around the free periph-
eral edge of the band 36 there is provided a
radial flange 37 adapted to engage the con-
cave side of the reflector member in the man-
er illustrated in the drawings. The heating
element, aside from the features already de-
scribed, may be of the usual or any desired
construction, but I prefer to place the resis-
tance windings or coils, as designated gener-
ally by reference character 40, in spiral
grooves cast or formed on the outer periph-
ery of the body 25 of the heating element.
The coils will be made of the usual or suit-
able resistance material for generating heat
and may be concentrically wound in the
grooves as indicated in Figs. 1 and 2, with
the terminal ends of the coils engaged to
binding posts 28, 29, the wire from the post
29 to the coil 40 being designated by re-
ference character 41. Fig. 2, and extending
through an anchoring perforation 42 at the
inner or free end of the member 25, and
extending thence in any desired number of
convolutions, as designated at 40, around
the member 25 with the other end passing
through suitable opening not shown in the
wall of the cylindrical portion 25 adjacent
the inner end of the coil and to an engaging
position with the other binding or terminal
post 28.

The heating element socket and retaining
75 plate 36, in addition to the peripheral flange
37, has formed on the surface of the periph-
eral side portion 36 two projections which
are designated by reference characters 50, 51.
These may be formed by upsetting the ma-
terial and forcing it in a direction outwards
at a distance spaced apart from the flange
57 a little greater than the thickness of the
material of which the reflector 10 is formed.
The reflector 10 is provided with an approxi-
mate circular opening at its center to receive
the heating element, and in order to furnish
securing means therefor and at the same time
to make the securing means of a quickly and
easily detachable character, on diametrically
opposite sides of the central circular opening
in the reflector 10, there are provided slots,
as designated by reference character 60.
These slots are preferably on the upper and
lower portions of the opening and of the ap-
proximate form shown most clearly in the
enlarged detail views, Figs. 3 and 4, the wall
at one side of each slot being approximately
radial to the center of the opening and the
wall at the other side extending angularly
thereby to afford a wedging surface for the
engagement of the radial projections 50, 51
on the heating element cap 35. In order to
further assist in securing the heating element
cap 35 in this opening in the reflector 10, the
material around the opening adjacent the angle side of the slot is bent out of its normal
plane, preferably toward the convex side
thereof, as designated at 55, Figs. 3 and 4.
This special construction of the reflector 10
around the central opening for the heating
element enables me to secure a screw-like ef-
flect when the heating element is inserted in
the manner shown, for example, in Fig. 1,
with the socket member 36 projecting on the
convex side of the reflector and the heating
core end of the element projecting on the
concave side thereof, with the flange 37 in
engagement with the inner surface of the
reflector plate around the opening therein.
The insertion of the cap plate 36 of the heat-
ing element is made possible by reason of the
correspondence of the projections 50, 51 with
the diametrically opposite slots 60 in the re-
lector 10, and the rotation given to the heat-
ing element when inserted in this manner
will result in bringing both of the projections
50, 51 into engagement with the laterally pro-
jecting portions 65 adjacent the slots and re-
sulting in a wedging action between the re-
lector 10 and the supporting socket cap 35 of the heating element whereby the heating element will be retained in a secure position in relation to the radiator for performing its work as long as may be desired. However, in the event of failure of the heating element, it may be removed from the reflector plate 10, as a simple rotational movement releases the locking effect of the projections 50, 51 and 60, which will permit the heating element to be withdrawn and disconnected when the circuit wires are disconnected from the terminal posts 28, 29.

13. It will be seen that the improved construction, particularly of the reflector 10, and the heating element socket or cap 35, may be economically formed from sheet metal by comparatively simple stamping operations, and that the same is true of the other various parts of the device with the exception of the base, so that little machinery work is required, and the resulting cost of production of the completed article is reduced to the minimum.

25. But one of the outstanding features of the invention resides in the ease with which persons having comparatively little knowledge of electrical devices may remove a defective heating element and replace it with a perfect unit without the necessity of resorting to the repair departments of electrical companies. Furthermore, the improvements with respect to economy of manufacture do not detract from the efficient operation of the heating element and reflector to the slightest extent as compared with more complicated devices that will not admit of repair without the services of an expert electrician. In order that the invention might be understood, I have shown and described the details of the embodiment which I prefer, but it will be apparent that persons skilled in the art may resort to various modifications without departing from the purpose and spirit of my invention.

45. I claim:

1. A heating unit comprising, in combination, a hollow cylindrical core of refractory material having a spirally formed groove on its periphery and an anchoring perforation adjacent one end thereof, an integrally formed closure member at the opposite end of said core, binding posts or terminals mounted in said closure member and extending into the interior of said core, a resistance winding secured to said binding posts inside said core and extending outwardly thereof through said anchoring perforation in a manner to be positioned in said groove, and a retaining plate secured to the closure member.

2. A heating unit comprising, in combination, a hollow cylindrical core, a closure member at one end of said core and formed integrally therewith, a thickened portion formed on the outer face of said closure member, terminals mounted on said thickened portion and extending into the interior of said core, a resistance winding secured to said terminals inside the core and extending outwardly thereof in a manner to be positioned on the periphery of the core, a retaining plate having an opening formed therein adapted to receive said thickened portion, means for securing said retaining plate to said closure member, and means on said retaining plate for securing said unit to a support.

3. A heating unit comprising, in combination, a hollow cylindrical core having a spirally formed groove on its periphery and an anchoring perforation adjacent one end thereof, a closure member at the opposite end of said core and formed integrally therewith, a thickened portion formed on said closure member and extending diametrically across the outer face thereof, terminals adapted for connection with an ordinary cord socket of an electric circuit mounted in said thickened portion and extending into the interior of said core, a resistance winding secured to said terminals inside the core and extending outwardly thereof through said anchoring perforation in a manner to be positioned in said groove, a cup-like retaining plate adapted to receive the closed end of said core and having a diametrically disposed elongated slot formed in its bottom portion and adapted to receive the thickened portion of the closure member, means for securing said retaining plate to said closure member, and means formed on said retaining plate for securing said unit to a support.

In testimony whereof I have signed my name to this specification, on this first day of October A. D. 1925.

ALLEN ANDERSON.