M. H. SHOENBERG.

ELECTRIC RADIATOR.

APPLICATION FILED FEB. 3, 1914.

1,109,551.

Patented Sept. 1, 1914.

3 SHEETS—SHEET 1.

FIG. 1.

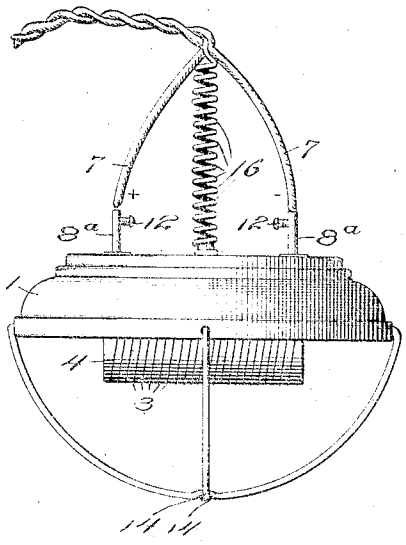


FIG. 2.

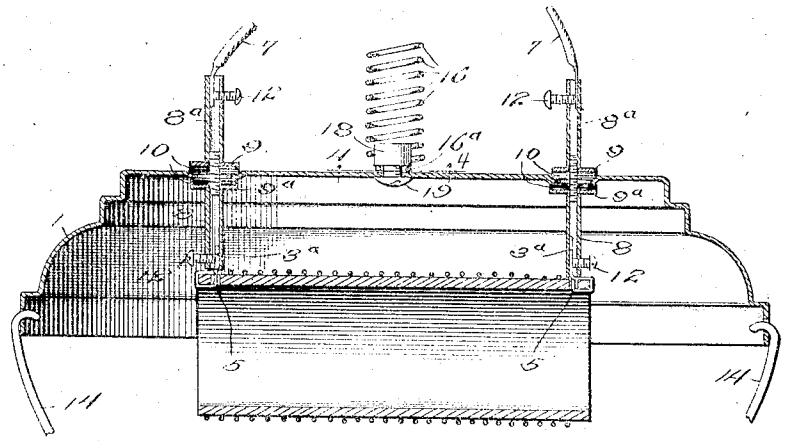


FIG. 4.

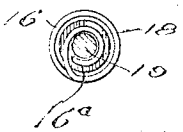
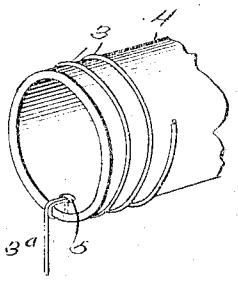


FIG. 3.



Witnesses

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3 SHEETS-SHEET 2.

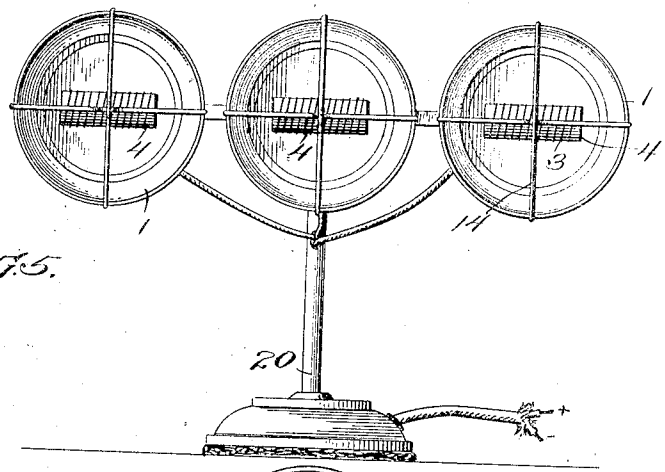


FIG. 5.

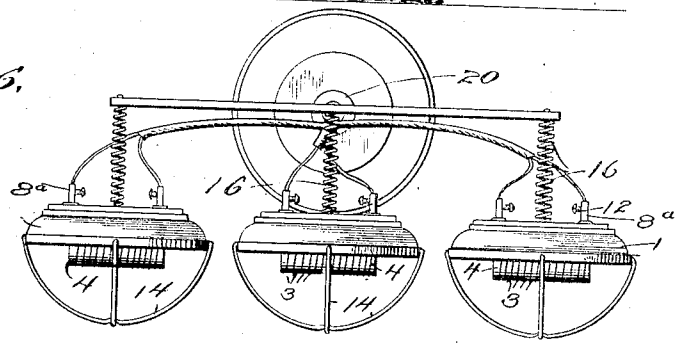


FIG. 6.

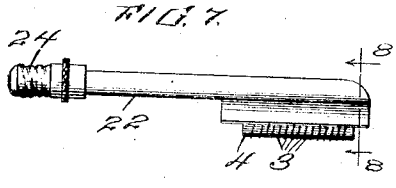


FIG. 7.

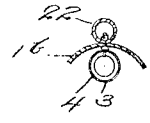


FIG. 8.

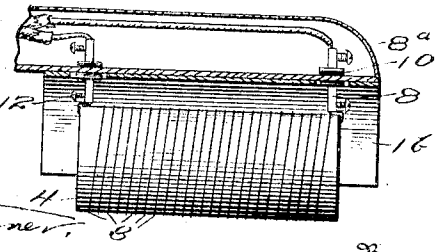


FIG. 9.

Witnesses

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ELECTRIC RADIATOR.

APPLICATION FILED FEB. 3, 1914.

1,109,551.

Patented Sept. 1, 1914.

3 SHEETS—SHEET 3.

FIG. 10.

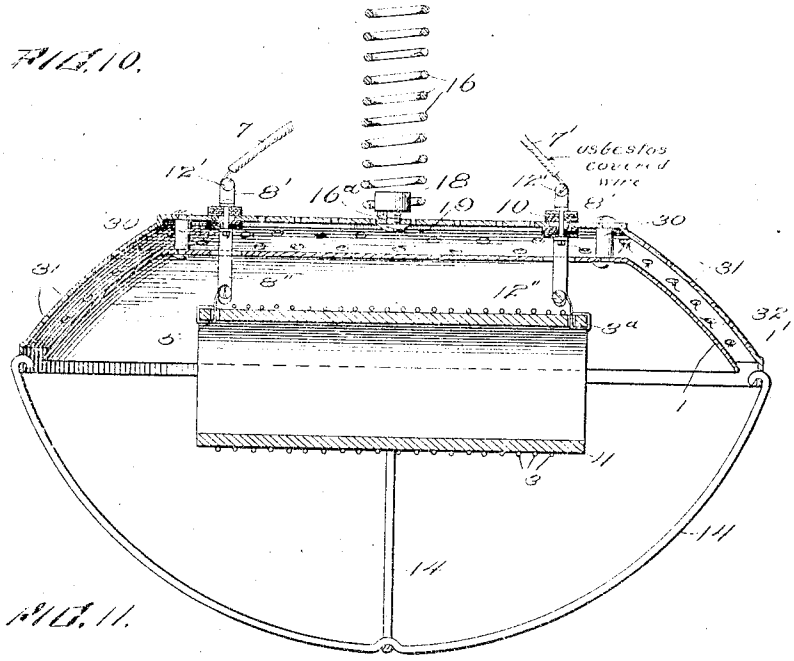


FIG. 11.

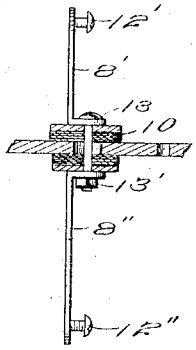


FIG. 13.

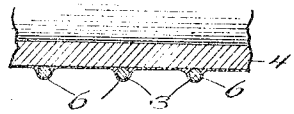


FIG. 12.



Witnesses

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UNITED STATES PATENT OFFICE.

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ELECTRIC RADIATOR.

1,109,551. Specification of Letters Patent. Patented Sept. 1, 1914.

Application filed February 3, 1914. Serial No. 816,197.

To all whom it may concern:

Be it known that I, MILTON H. SHOENBERG, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Electric Radiators, of which the following is a specification.

This invention relates to electric heaters or radiators in which the heat waves generated by a resistance coil are directed by a polished metal reflector.

One of the objects of my invention is to provide an efficient portable electric radiator, inexpensive to manufacture, and which may be connected by means of the usual connecting plug to any ordinary electric light socket; and to this end I provide means for suspending the radiator from the connector cord without endangering the insulation.

Another object is to provide means for readily attaching the heater unit independently of the connector cord terminals. Other objects will appear from the following detailed description in connection with the accompanying drawings, in which—

Figure 1 is a side elevation, and Fig. 2, is a vertical section of one embodiment of my invention; Fig. 3, is an enlarged fragmentary perspective view of the heater unit; Fig. 4, is a detail sectional view on the line 4—4 of Fig. 2; Fig. 5, is a front elevation of my invention applied to a multiple unit radiator and Fig. 6, is a top plan view of the same; Fig. 7, is a side elevation of a modification of the heater showing a different form of support; Fig. 8, is a sectional view on the line 8—8 of Fig. 7; Fig. 9 is an enlarged detail longitudinal section of the same; Fig. 10, is a sectional view of another form of this invention having a double dome or reflector, the outer one being preferably perforated; Figs. 11 and 12 are detail views showing one form of terminal connector; and Fig. 13, is an enlarged fragmentary detail of the heating element.

The reflector consists preferably of a highly polished metal shell 1, which is somewhat hemispherical or dome-shaped and serves to reflect the heat waves received from the heater and direct them outwardly from its inner concave surface.

The heater unit comprises a suitable heating element such as a bare high resistance wire 3, coiled helically upon a refractory cylinder 4, of fire-clay, asbestos or other suitable material. For the purpose of maintaining the coil in position upon the cylinder I prefer to coat or paint over the wire a refractory cement, indicated at 6, in Fig. 13. To provide a simple and efficient means for suspending or attaching the heater unit, the ends 3^a, of the coil are looped over the ends of the cylinder and outwardly through holes 5 near the edges. In case these ends become broken one turn of the coil may be unwound and the looped end may then be reformed.

The heater unit is firmly secured to the reflector 1, and maintained in spaced relation thereto by a pair of standards, which also serve to electrically connect the coil with the cord terminals 7, 7'. In the form illustrated in Fig. 2, each of the standards is composed of separable parts 8, 8^a, which are threaded together through an aperture in the wall of the reflector and serve to clamp washers 9, 9', upon opposite sides thereof separated by insulating disks 10. The ends of the standards are hollow and receive respectively the ends 3^a of the coil and the cord terminals 7, 7', each of which are fastened by set screws 12. This construction permits the heater unit to be detached independently of the cord terminals and vice versa, the importance of which will be appreciated by those familiar with these devices.

Instead of the standards shown in Fig. 2, I may use the form illustrated in Figs. 10, 11 and 12, in which the terminals or standards are composed of angle strips or bars 8', 8'', united by a bolt 13 and nut 13', passing through an aperture in one of the dome parts but insulated therefrom by the insulating washers 10. The ends of the conductors of the cord terminals are looped around and held by the screws 12', while the terminals of the heating element are fastened in a similar manner by the screws 12''. While the coiled support 16 will radiate the heat sufficiently to be safely used with the ordinary insulated conductors, I have indicated that asbestos-covered wire may be used.

I prefer to make the heater unit of cylindrical form and to mount it so that it projects somewhat beyond the rim of the reflector so that currents of air may circulate through the heated interior of the cylinder, but it is evident that the refractory support

upon which the wire of the heating-element is wound may be of any suitable shape or form. I prefer to employ a high temperature in order to increase the efficiency of the heater and therefore use a high resistance wire in the heating element. I am thereby enabled to use a small compact element to deliver the requisite amount of heat.

The coil of the heating element is made of bare wire of high resistance which becomes very hot and I therefore provide guard wires 14, which cross and have their ends secured in apertures in the rim of the reflector. These guard wires serve not only to prevent any inconvenience by accidental contact with the hot wires, but also to protect the heater unit from injury.

One form of my electric radiator is shown in Figs. 1 and 2, in which it may be suspended from the conductor cord and attached by means of the ordinary plug to any lamp socket. It is necessary, however, to relieve the cord terminals 7, 7', of any weight or strain and furthermore to prevent injury to the insulation of the cord by heat transmitted from the hot metal dome 1. For the purpose of providing a firm substantial support which may be directly connected to the back of the metal dome and also permit of attachment to the cord without injury thereto, I employ a helical metal coil 16, preferably of spring metal. The many turns of the helical wire constitute a radiator having a large radiating surface sufficient to dissipate the majority of the heat conducted from the reflector dome before it reaches the attachment to the cord. The inner turn of the spiral 16^a, is secured under a nut 18, which is fastened to the back of the dome by a screw 19, thus forming a rigid connection between the helical spring and the dome.

In Figs. 5 and 6, I have shown a multiple unit radiator having a plurality of heaters, such as above described, mounted upon the cross-arm of a standard 20.

In Figs. 7, 8 and 9, I have illustrated a modification of my invention in which the heater unit is mounted upon a tubular stem or support 22, having a plug attachment 24, upon one end, the reflector 1^b being preferably semi-cylindrical. With this form it is very convenient to insert a heater in any lamp socket and they may also be substituted for the bulbs or glowers in electric heaters of the luminous radiator type.

While the form of my radiator shown in Figs. 1 and 2, serves admirably for most purposes, I have found that it is often desirable to provide a radiator having an outer surface which is less highly heated and which will not afford discomfort if the hand or face should come in contact with it. I have therefore devised the duplex dome type shown in Fig. 10, in which the main heat reflector dome 1 is supported within an outer dome 1' and spaced therefrom by distance pieces 30, into the ends of the fastening bolts which may be threaded. The outer dome may be of polished metal and is preferably perforated, although this is not absolutely essential. There is thus formed a channel or chamber between the inner and outer domes through which air may circulate and which will prevent the outer dome from becoming highly heated.

For the purpose of keeping the outer dome comparatively cool, I prefer to perforate it with holes, as indicated at 31, which will cause a rapid circulation of air currents and through which the heated air in the channel 32 may escape. The terminal standards are preferably secured to the outer dome, the inner ends passing through apertures in the inner dome but not in contact therewith.

I have described in detail the constructions illustrated in the accompanying drawings for the purpose of disclosing embodiments of my invention, but it will be understood that various changes and modifications may be made without departing from the spirit thereof.

My invention provides a very efficient and exceedingly compact radiator in which the parts are easily assembled and the heater unit and reflector are securely held in position.

I claim:—

1. An electric radiator, comprising a reflector, a heating element, current conducting standards secured thereto and insulated therefrom, means for detachably suspending the heating element from the inner ends of said standards, and means for securing electric conductors or leads to the opposite ends of said standards.

2. An electric radiator, comprising a reflector, a heating element, connecting standards secured thereto and insulated therefrom, means for detachably securing the heating element to the inner ends of said standards, means for securing the terminals of an electric cord conductor to the opposite ends of said standards, and a resilient metal support fastened to said reflector and adapted to be supported by said cord conductor having an extended heat radiating surface.

3. An electric radiator, comprising a reflector, a heating element, standards extending through apertures in said reflector and having separable members provided with connecting means adapted to hold an insulating medium adjacent said apertures, and fastening devices carried upon opposite ends of said standards.

4. An electric radiator, comprising a polished metallic reflector, a heating element supported in spaced relation thereto, an electric cord conductor, means for connecting the electric terminals of said cord to said

element, and a supporting member carried at one end by said reflector having an extended heat radiating surface and provided with means at the opposite end for engaging said cord.

5. An electric radiator, comprising a dome-like reflector having inner and outer members held in spaced relation thereby providing a chamber or channel therebetween, said inner member having a polished reflecting surface and said outer member being perforated, terminal standards projecting inwardly through said inner member, a heating element connected to and supported by said standards within the inner member, and means for connecting electric conductors to said element.

6. An electric radiator, comprising a dome-like reflector having inner and outer members held in spaced relation thereby providing a chamber or channel therebetween, terminal standards projecting inwardly through said inner member, a heating element connected to and supported by said standards, means for connecting electric conductors to said standards, and guard wires secured to said outer member and protecting said heating element.

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

MILTON H. SHOENBERG.

Witnesses:

JOHN L. MURPHY,

GUS. W. BANTEL.