E. N. LIGHTFOOT.

ELECTRIC HEATER.

APPLICATION FILED JAN. 31, 1920.

1,378,247. Patented May 17, 1921.

Fig. 1

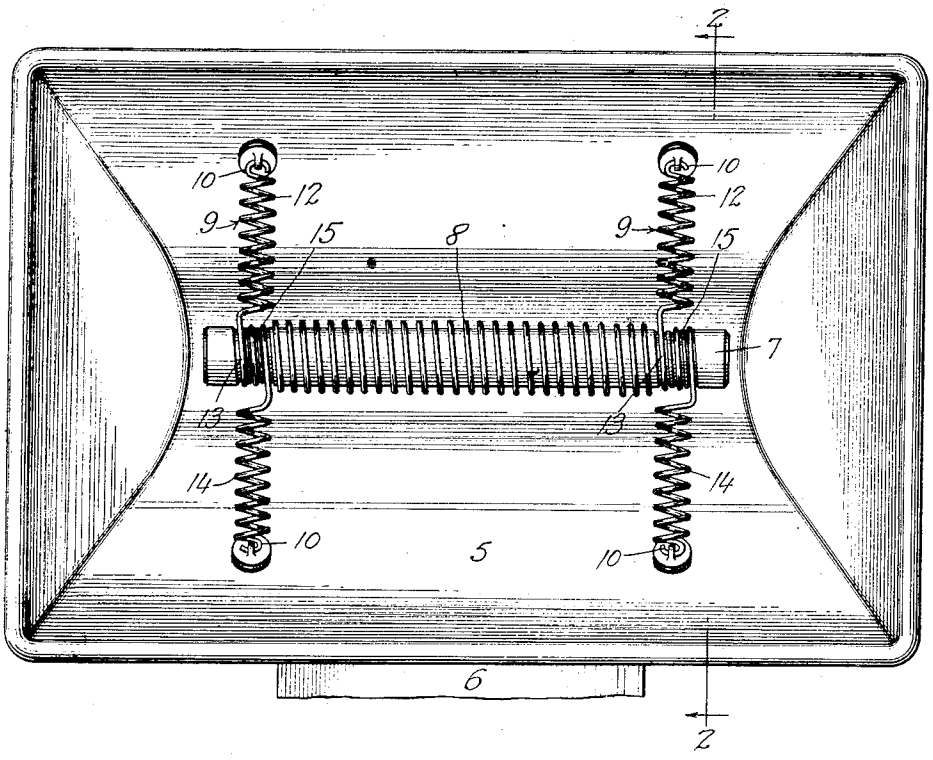


Fig. 3.

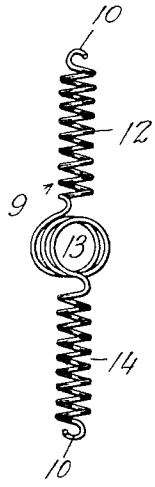


Fig. 2.

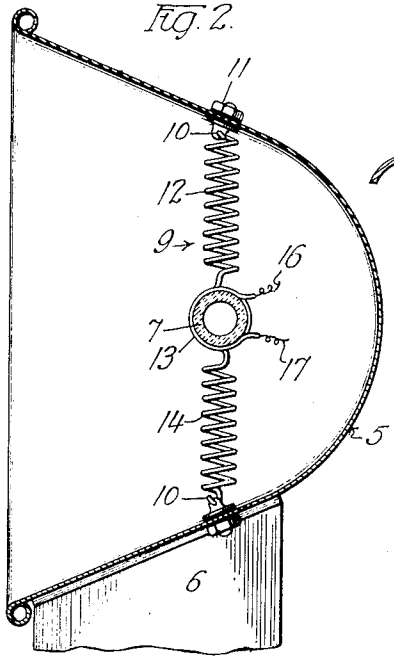
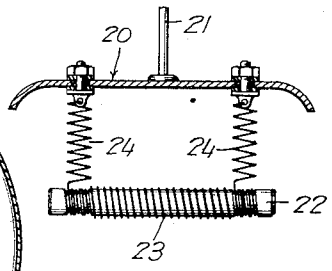


Fig. 4.



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ELECTRIC HEATER.

1,378,247. Specification of Letters Patent. **Patented May 17, 1921.**

Application filed January 31, 1920. Serial No. 355,340.

To all whom it may concern:

Be it known that I, EDWIN N. LIGHTFOOT, a citizen of the United States, residing at New York, in the county of Bronx and State of New York, have invented new and useful Improvements in Electric Heaters, of which the following is a specification.

This invention relates to electric heaters.

It relates more particularly to portable radiant electric heaters having reflectors in which the resistor is mounted.

The resistor or resistance wire of such heaters is usually carried by an insulating tube or core of porcelain or other high heat resisting material. These tubes or cores are very fragile. The portable radiant heaters in which such resistor carrying tubes are mounted are subjected to considerable rough handling, and it becomes important therefore to so mount the resistor carrying tubes that they may not be readily broken by this rough handling.

Usually the resistor carrying tubes are mounted rigidly in the reflectors. The mechanical jarring and vibrations due to the rough handling of the heaters is communicated to the rigidly mounted tubes and frequent cracking and breaking thereof results.

Unequal expansion and contraction of the rigid mounts by which the resistor carrying tubes are usually attached to the reflectors also causes cracking and breaking of the tubes.

It is therefore an object of the present invention to provide means for so mounting the resistor carrying tubes in the reflectors that the cracking and breaking of the tubes will be either entirely or to a great extent prevented.

In accordance with this invention the resistor carrying tubes are mounted in the reflectors by means of resilient attachers the ends of which may be attached to opposite faces of the reflectors thereby suspending the resistor carrying tube in spaced relation to the surface of the reflector.

These resilient attachers may take the form of helical springs with means for attaching the springs of the tubes to the reflectors. The mechanical jarring and vibrations of the reflector which would ordinarily be communicated to the resistor carrying tube is largely absorbed or dissipated in the spring attachers. Since neither end of the resistor carrying tube is rigidly supported the tube will not be affected by unequal expansion and contraction of the spring by which it is supported in the reflectors. Furthermore, the tubes will not be affected by such mechanical jarring and vibrations as may be communicated to them.

While such springs are particularly useful in mounting resistor carrying tubes in reflectors, it will be evident that they may be employed for mounting resistor supports elsewhere. The resistor support may also take a form other than a core or tube.

Other objects and advantages will appear from the following specification and claims.

An embodiment of this invention is illustrated in the accompanying drawings in which—

Figure 1 is a front elevation of a resistor carrying tube mounted in the reflector of a radiant heater;

Fig. 2 is a sectional view on line 2—2 of Fig. 1;

Fig. 3 is a view of the spring attacher for mounting the resistor carrying tube in the reflector; and

Fig. 4 is a vertical sectional view through the reflector of another form of radiant heater.

Figs. 1 and 2 will first be described.

The illustrated radiant heater comprises in general a reflector 5 supported on a base 6 and having suspended therein an insulating tube 7 of porcelain or other high heat resisting material upon which is wound a resistor or resistance wire 8.

The tube 7 is suspended in the reflector by means of helical springs 9, each having a hook 10 formed at each end thereof. These hooks engage eyelets formed in the ends of bolts 11 extending through apertures in the top and bottom of the reflector. These bolts 11 are preferably suitably insulated from the reflector.

Each spring 9 comprises three coil sections which may be formed from a single wire. The coils of the upper and lower coil sections 12 and 14 are formed about the same axis and comprise the resilient portions of the attacher. The coils of the intermediate coil section 13 are formed about an axis at

right angles to that of the other coils. The coils of this intermediate coil section 13 engage grooves provided in the periphery, and near the ends, of the tube 7.

The ends of the resistor 8 may be connected with conductors 16 and 17 leading to a source of current from which the resistor is heated.

Fig. 4 shows a portion of a radiant heater, the reflector 20 of which is suitably held in a horizontal position by an attaching rod or standard 21. An insulating core 22 upon which is wound a resistor 23 is suspended from the reflector 20 by means of helical springs 24. These springs 24 are similar to springs 9, but comprise only two instead of three coil sections. The lower coil sections engage the resistor carrying core 22, while the upper coil sections resiliently attach the resistor carrying core to the reflector.

Due to the resiliency of the helical springs by which the core is positioned in the reflector these springs absorb a part of any jarring to which the reflector and its supporting base may be subjected. If one end of the core shifts its position the other end will immediately adjust itself, thereby preventing cracking or breaking of the core.

The helical springs form resilient suspension members which conduct a minimum of heat from the resistor carrying cores to the reflectors.

Obviously other structures may be devised which will embody the invention herein set forth. The drawings and description are, therefore, to be considered in an illustrative sense and not a limiting sense.

What is claimed is:

1. An electric heater comprising an insulating tube, a resistor carried thereby, a support, and a helical spring connected with the support and having means to engage the insulating tube.

2. An electric heater comprising an insulating tube, a resistor carried thereby, a reflector and means including helical springs for positioning the insulating tube in the reflector.

3. An electric heater comprising a reflector, an insulating tube, a resistor carried thereby, a pair of helical springs each having its ends attached to opposite faces of the reflector, and means for connecting the ends of the insulating tube with the helical springs intermediate the ends thereof.

4. An electric heater comprising a reflector, an insulating tube, a resistor carried thereby, a pair of helical springs each having its ends attached to opposite faces of the reflector, and means formed integrally with the helical springs for connecting the ends of the insulating tube therewith at points intermediate the ends of the springs.

5. An electric heater comprising a reflector, an insulating tube, a resistor carried thereby, a pair of helical springs each having its ends attached to opposite faces of the reflector, and means formed integrally with and intermediate the ends of the springs for connecting the ends of the insulating tube therewith.

6. An electric heater comprising a reflector, an insulating tube, a resistor carried thereby, a pair of helical springs each having its ends connected with opposite faces of the reflector and each spring having two sets of resilient coils formed about one axis and other coils formed intermediate the two sets and about an axis at right angles to the axis of the two sets, said other coils engaging the ends of the insulating tube.

7. An electric heater comprising a reflector, a pair of helical springs, each having its ends attached to opposite faces of the reflector and each having two sets of resilient coils formed about one axis and other coils formed intermediate the two sets about an axis at right angles to the axis of the two sets, and a resistor carrying tube engaged by the intermediate coils whereby the tube is resiliently suspended in the reflector.

8. An electric heater comprising a reflector, a pair of helical springs, each having its ends attached to opposite faces of the reflector, each spring including a set of resilient coils, and other coils formed about an axis at an angle to the axis of the resilient coils, and a resistor carrying tube engaged by the other coils of each spring.

9. An electric heater comprising an insulating tube, a resistor carried thereby, a support, and resilient means for attaching the resistor carrying insulating tube to the support.

10. An electric heater comprising an insulating member, a resistor carried thereby, a support, and resilient means for attaching the resistor carrying insulating member to the support.

11. An electric heater comprising a reflector, a pair of helical springs, each having its ends attached to opposite faces of the reflector, each spring including a set of resilient coils, and other coils formed about an axis at an angle to the axis of the resilient coils, and a resistor carrying member engaged by the other coils of each spring.

12. An electric heater comprising an insulating member, a resistor carried thereby, a support, and a helical spring connected with the support and having means for engaging the insulating member, whereby said member and the resistor carried thereby are resiliently attached to said support.

13. An electric heater comprising a reflector, an insulating support, a resistor carried thereby and a pair of helical springs engaging said insulating support and being attached to said reflector.

14. An electric heater comprising a reflector, an insulating core, a resistor carried thereby, a pair of helical springs each having its ends attached to opposite faces of the reflector, and means formed integrally with and intermediate the ends of the springs for attaching the resistor carrying core therewith.

15. An electric heater comprising a resistor, an insulating core upon which the resistor is wound, a reflector, and a plurality of helical springs engaging the resistor carrying core and the reflector whereby the resistor carrying core is resiliently attached to the reflector.

16. An electric heater comprising a resistor, an insulating support upon which the resistor is mounted, a reflector, and a plurality of helical springs engaging the insulating support and the reflector whereby the resistor carrying support is resiliently suspended from the reflector.

In witness whereof, I have hereunto subscribed my name.

EDWIN N. LIGHTFOOT.