July 28, 1959 R. D. SCHIFF 2,897,337

RADIANT CEILING HEATER

Filed Aug. 12, 1957 2 Sheets-Sheet 1

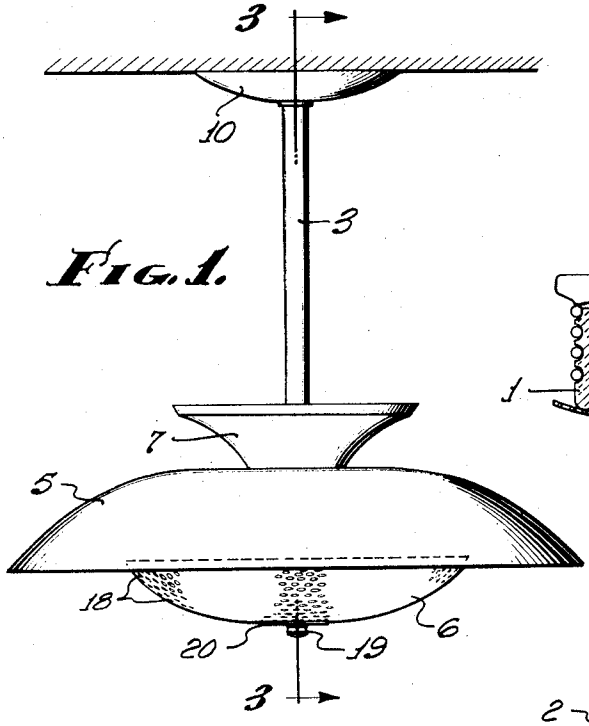


FIG. 1.

FIG. 7.

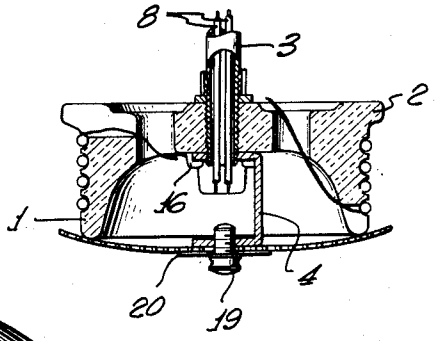


FIG. 8.

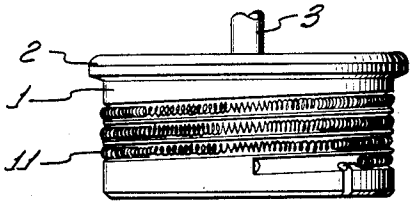
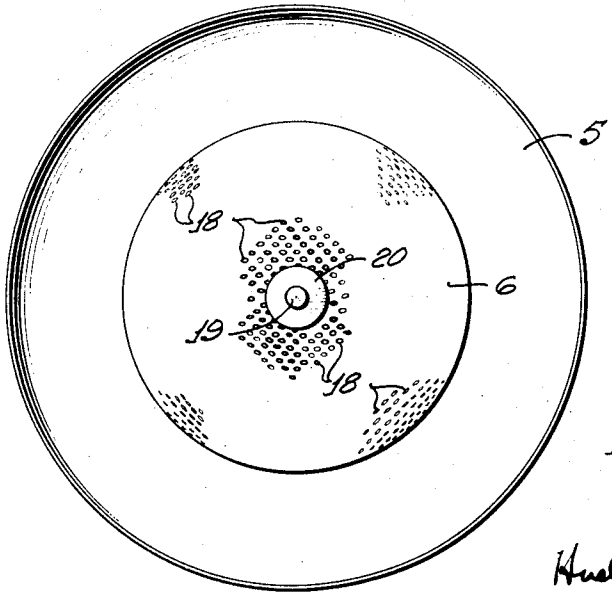


FIG. 2.



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RADIANT CEILING HEATER

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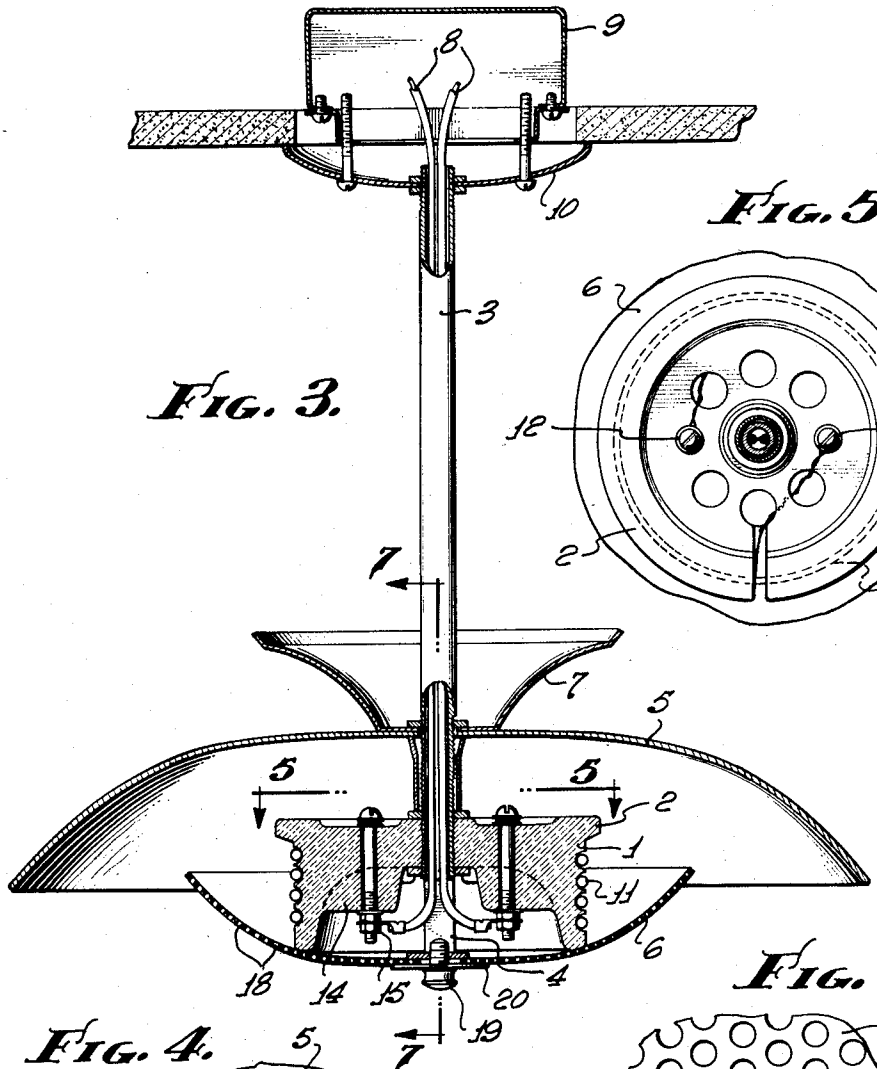


FIG. 3.

FIG. 5.

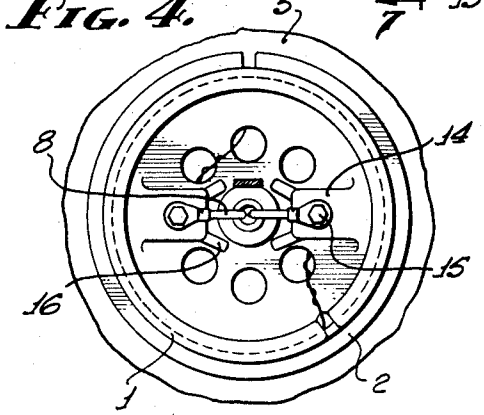


FIG. 4.

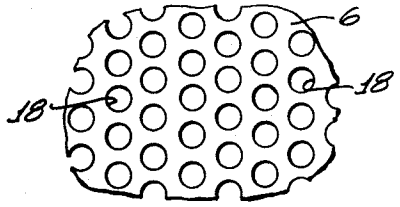


FIG. 6.

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RADIANT CEILING HEATER

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Application August 12, 1957, Serial No. 677,707

8 Claims. (Cl. 219—34)

This invention relates to the art of space heating, and more particularly to the structure of a ceiling electric heater embodying a heating coil wound about a core, mounted in a fixture of modified parabolic form, with heat dispersion means above and below the core, by which radiant heat is evenly dispersed downwardly from an overhead heating fixture without concentration of heat above or below the core or the heater itself.

Fixed electric space heaters used frequently in bathrooms and other relatively small room areas are generally mounted in side walls in an area close to the floor, in order to obtain maximum dispersion of heat upwards by means of normal thermal processes, without the necessity of using a fan or blower. In such units it is impossible to avoid concentration of excessive heat close to the heating elements. Furthermore, such space heaters are dangerous, particularly to small children, because the heating elements are exposed to a considerable extent and readily accessible, being mounted close to the floor.

Such overhead electric heaters as are in use are frequently of a type equipped with fans or blowers used to disperse the heat generated by the heater and to prevent concentration of the heat in spots at the upper parts of the heaters or above them at a spot or spots along the ceiling. In order to accommodate the fans or blowers, such heaters are of considerable size and weight, and sometimes prohibitively bulky, and in any event such fan or blower equipped heaters require special and often costly installation. Furthermore, the operation of the fans or blowers involves additional power consumption and additional cost of maintenance and repair.

Other overhead electric heaters in general use are equipped with heat generating lamps, known generally as "red ray" lamps, which have a short effective life and burn out relatively frequently, causing an inconvenient as well as costly replacement problem. Furthermore, such heaters do not give adequate heat dispersion, but cause heat concentration in the area to which the face of the lamp is directed.

A primary objective of my invention is to provide a relatively inexpensive overhead type electric heater without a fan or blower which will adequately disperse heat downwardly and evenly, with no concentration of heat at any given spot or spots in the area to be heated, and without a noticeable upward flow of heat or any concentration thereof in a spot or spots above the heating element or on the heater itself.

A further objective of my invention is to provide an overhead electric heater of the character described which will have the added safety factor of being removed from easy contact by small children, which may be easily and economically mounted as a normal ceiling electric light fixture is mounted, that is at a standard ceiling electric outlet box, and which is economical to operate and maintain.

These and other objectives and advantages of my invention will become more apparent from a consideration of the description of my invention which follows, taken in conjunction with the drawings thereof.

In the drawings:

Figure 1 is a side elevation of the heater in installed position on the ceiling of a room to be heated.

Figure 2 is a bottom plan view of the heater.

Figure 3 is a cross-sectional view of the heater taken on the line 3—3 of Figure 1.

Figure 4 is a bottom view of the heater core after removal of the lower heat dispersing member of the assembly.

Figure 5 is a top view of said core taken on the line 5—5 of Figure 3.

Figure 6 is an enlarged fragmentary view of the lower heat dispersing unit of the assembly.

Figure 7 is a cross-sectional view of the heater core with the lower heat dispersing element in position and taken on a line 7—7 of Figure 3.

Figure 8 is a side elevation of the heater core element of the assembly.

The primary elements of the heater are a heating core 1 of ceramic or other heat resistant material, having an extended upper edge or lip 2, said core being mounted on a tubular member 3 by means of a hickey 4 above which is mounted a heat dispersing element and reflector 5 of a sharply modified parabolic shape in open umbrella position, and below which is mounted another heat dispersing element 6 of modified parabolic shape, perforated, and of smaller circumference and overall size than the dispersing and reflecting unit 5 and in reverse position thereto.

Above the heat dispersing element or reflector 5 is mounted another heat deflecting and dispersing unit 7 having outwardly curving sides. The tubular member 3 contains electric current wires 8 which are attached at their upper ends to a standard ceiling electric outlet box 9 by recognized means. The tubular member 3 also has mounted on it a face plate 10 which covers the outlet box 9 when the heater is affixed to the ceiling.

By way of illustration and not of limitation, I have found it to be expedient to construct the heat dispersing and reflecting units 5 and 7 of aluminum, which has high reflective qualities, is light in weight and is easy to shape and form, and also to construct the lower perforated heat dispersing unit 6 of aluminum because of lightness and ease of shaping and forming, whereas I generally prefer steel for the tubular member 3 and the face plate 10 because steel is less heat conductive than aluminum, and I desire to limit the amount of heat in the vicinity of the ceiling electric outlet box 9.

Around the core 1 is wound a regular standard electric resistance coil 11, the ends of which are fastened at 12 and 13 by recognized means, as shown in Figure 5. The core 1 has protuberances 14 on its lower side on which are mounted the terminals 15 to receive the electric current wires 8, and which terminals are electrically connected by appropriate standard screws extending from 12 and 13 through openings in core 1. The protuberances 14 have jutting out from them small nipples 16 which, like the protuberances, are an integral part of the ceramic core 1, but which are positioned so as to prevent circular movement of the hickey 4 when the unit is fully mounted in position and thus insure a continuously tight mounting.

The lip 2 extends outwardly from the surface of the core 1 on which the heating coil 11 is mounted, and is directly above the heating coil 11, with its perimeter extending outwardly beyond it.

The lower heat dispersing unit 6 is perforated with a plurality of holes 18 of relatively small size. Again by way of illustration and not of limitation I have found that said lower heat dispersing unit 6 performs its heat dispersing function more efficiently if the total area of the

holes 18 is approximately 51% of the entire face area of the dispersing unit 6. This lower heat dispersing unit 6 is attached to the hickey 4 by a thumb screw 19 or other suitable means, and a washer or buffer 20 is recommended for use between the thumb screw 19 and the surface of the lower heat dispersing unit 6 for ease in mounting and protection of the unit 6 from bending or warping.

When the heater is mounted in position on the ceiling, directly below the normal electric ceiling outlet 9, an electric current is fed into the heater and the electric resistance coil 11 becomes heated rapidly. Such of the radiant heat thereby generated as flows in a generally lateral direction is deflected downwardly, outwardly, and in an evenly spreading distribution by the modified parabolic shape of the heat dispersing unit or reflector 5. Such of said radiant heat as flows in an upward direction from the coil 11 will be intercepted and deflected by the restrictive position of the lip 2 of the core 1, and will strike the dispersing or reflecting member 5 in the area where the parabolic shape takes its sharpest downward turn, thereby being similarly dispersed in a generally downwardly, outwardly and evenly spreading direction.

Again by way of illustration and not of limitation, I have found that if the heat dispersing and reflecting unit 5 is constructed in a truer parabolic shape, much of the radiant heat which has been deflected by the lip 2 may be deflected upwardly, following the parabolic form of the reflector unit in that direction, whereas, if the parabolic shape is flattened out from a point on an extended line with the under side of the lip 2, the radiant heat deflected by the lip 2, following that line, is more effectively directed downwardly and outwardly, with very little of the heat following the face of the flattened part of the surface of the unit 5 or penetrating through it.

The radiant heat which is following in a generally downward direction from the electric resistance coil 11 will be evenly dispersed downwardly and outwardly by the perforated lower heat dispersing unit 6 through its plurality of holes 18.

Much of the convected heat flowing from the electric resistance coil 11, similarly will be deflected outwardly and, to a limited extent, downwardly upon striking the lower face of the dispersing and reflecting unit. 5.

Some of the heat that may find its way through the said dispersing and reflecting unit 5, or may flow by convection around the lip of the dispersing unit 5 and then along the upper surface of said dispersing unit, will be intercepted and again deflected outwardly by the upper heat dispersing unit 7.

Any heat that may escape downward deflection and may find its way inwardly to the tubular member 3 will be of negligible amount, and will be of even lesser amount when by conduction it reaches the face plate 10, where its conduction is further dissipated through the plate.

If the heating coil 11 should burn out, it is simple to replace it by removing the thumb screw 19 and the washer 20 which will release the lower heat dispersing unit 6, and the hickey 4 can then be removed from the tubular member 3. After the electrical connections are broken at the terminal points 15 the entire core 1 can be readily removed for easy replacement of the heating coil 11 and reinsertion of the core and new coil into the heater.

Although I have shown my invention and described it herein in what is considered to be the most practical and preferred embodiment thereof, it will be recognized that departures may be made therefrom within the scope of my invention, which is therefore not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices, structures and methods.

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

1. An overhead electric space heater comprising the combination of: a coil supporting member having a body and a marginally outwardly extending lip at the upper end of the body; an electrical resistance heating coil supported on the external surface portion of said coil supporting member below said lip; suspension means adapted to suspend said member from a room ceiling; a first reflecting element of generally open umbrella shape mounted on said suspension means and superimposed over the coil supporting member; a second reflecting element of generally cup shape with outwardly curving sides also mounted on said suspension means and superimposed in turn over the first reflecting element; and a perforated bowl shaped member connected to said suspension means and disposed below said coil supporting member.

2. An overhead electric space heater comprising the combination of: a coil supporting member having a body and a marginally outwardly extending lip at the upper end of the body; an electrical resistance heating coil supported on the external surface portion of said coil supporting member below said lip; suspension means adapted to suspend said member from a room ceiling; a first reflecting element of generally open umbrella shape mounted on said suspension means and superimposed over the coil supporting member; a second reflecting element of generally cup shape with outwardly curving sides also mounted on said suspension means and superimposed in turn over the first reflecting element; and a perforated bowl shaped member connected to said suspension means and disposed below said coil supporting member, said bowl being of lesser cross-section than the first reflecting element.

3. An overhead electric space heater comprising the combination of: an annular coil supporting member having a body and an annular marginally outwardly extending flange at the upper end of the body; an electrical resistance heating coil supported on the external surface portion of said member below said flange; suspension means adapted to suspend said coil supporting member from a room ceiling; a first annular reflecting element of generally open umbrella shape mounted on said suspension means and superimposed over the coil supporting member, a second annular reflecting element of generally cup shape with outwardly curving sides also mounted on said suspension means and superimposed in turn over the first reflecting element; and a perforated annular bow shaped member connected to said suspension means and disposed below said coil supporting member.

4. An overhead electric space heater comprising the combination of: a coil supporting member having a dielectric body and a marginally outwardly extending lip at the upper end of the body; an open, exposed electrical resistance heating coil supported on the external surface portion of said coil supporting member below said lip; suspension means adapted to suspend said member from a room ceiling; a first reflecting element of generally open umbrella shape mounted on said suspension means and superimposed over the coil supporting member; a second reflecting element of generally cup shape with outwardly curving sides also mounted on said suspension means and superimposed in turn over the first reflecting element; and a perforated bowl shaped member connected to said suspension means and disposed below said coil supporting member.

5. An overhead electric space heater comprising the combination of: a coil supporting member having a body of electrical insulating material and a marginally outwardly extending lip at the upper end of the body; an open, exposed electrical resistance heating coil supported on the external surface portion of said coil supporting member below said lip; suspension means adapted to suspend said member from a room ceiling; a first reflecting element of generally open umbrella shape mounted on said suspension means and superimposed over the coil supporting member; a second reflecting element

of generally cup shape with outwardly curving sides also mounted on said suspension means and superimposed in turn over the first reflecting element; and a perforated bowl shaped member connected to said suspension means and disposed below said coil supporting member.

6. An overhead electric space heater comprising the combination of: a coil supporting member having a body and a marginally outwardly extending lip at the upper end of the body; an electrical resistance heating coil supported on the external surface portion of said member below said lip; suspension means adapted to suspend said member from a room ceiling and comprising a hollow metal tube carrying electric current wires from a ceiling outlet to the electrical resistance heating coil, and connected to the coil supporting member by a hickey; a first reflecting element of generally open umbrella shape mounted on said suspension means and superimposed over the member; a second reflecting element of generally cup shape having outwardly curving sides also mounted on said suspension means and superimposed in turn over the first reflecting element; and a perforated bowl shaped member connected to said suspension means and disposed below said coil supporting member.

7. An overhead electric space heater comprising the combination of: a coil supporting member having a body; molded studs on the undersurface of the body spaced radially and adapted to abut against a mounting hickey; a marginally outwardly extending lip at the upper end of the body; an electrical resistance heating coil supported on the external surface portion of said coil-supporting member below said lip; suspension means adapted to suspend said coil supporting member from a room ceiling, and comprising a hollow metal tube carrying electric current wires from a ceiling outlet to the electrical resistance heating coil and connected to the coil supporting member by the hickey; a first reflection element of generally open umbrella shape mounted on said suspension means and superimposed over the coil-supporting member; a second reflecting element of generally cup shape with

outwardly curving sides also mounted on said suspension means and superimposed in turn over the first reflecting element; and a perforated bowl shaped member connected to said suspension means and disposed below said coil supporting member.

8. An overhead electric space heater comprising the combination of: a coil supporting member having a body and a marginally outwardly extending lip at the upper end of the body; an electrical resistance heating coil supported on the external surface portion of said coil-supporting member below said lip, suspension means adapted to suspend said member from a room ceiling, and comprising a hollow metal tube carrying electric current wires from a ceiling outlet to the electrical resistance heating coil, and connected to the coil supporting member by a hickey; a first reflecting element of generally open umbrella shape superimposed over the coil supporting member, and rigidly mounted on the ceiling suspension element in fixed relation to the coil supporting member by suitable spacing and support means; a second reflecting element of generally cup shape with outwardly curving sides also mounted on said ceiling suspension element and superimposed in turn over the first reflecting element; and a perforated bowl shaped member connected to said ceiling suspension element and disposed below said coil supporting member.

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