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H. H. FORD

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COMBINED ELECTRIC HEATER AND LIGHT FIXTURE

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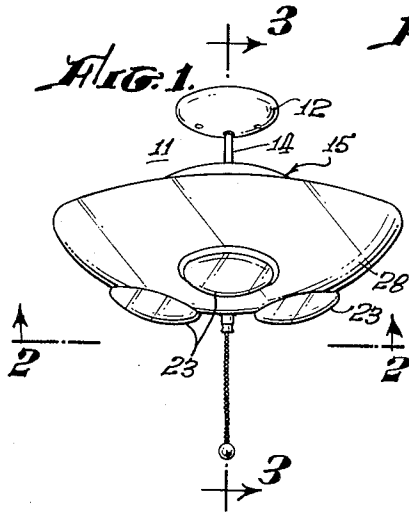


FIG. 2.

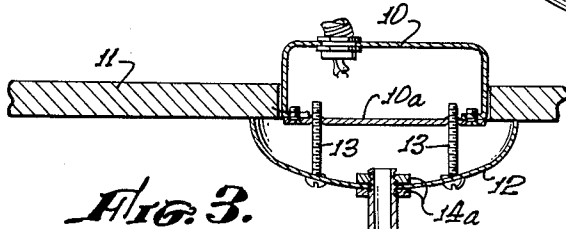
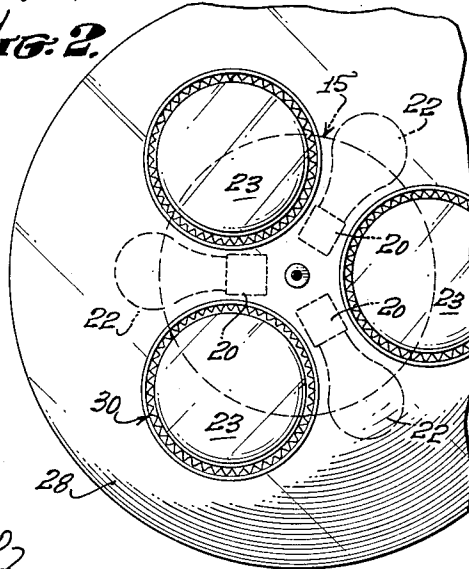


FIG. 3.

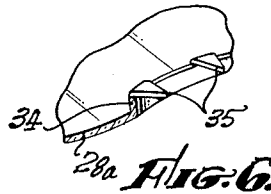


FIG. 6.

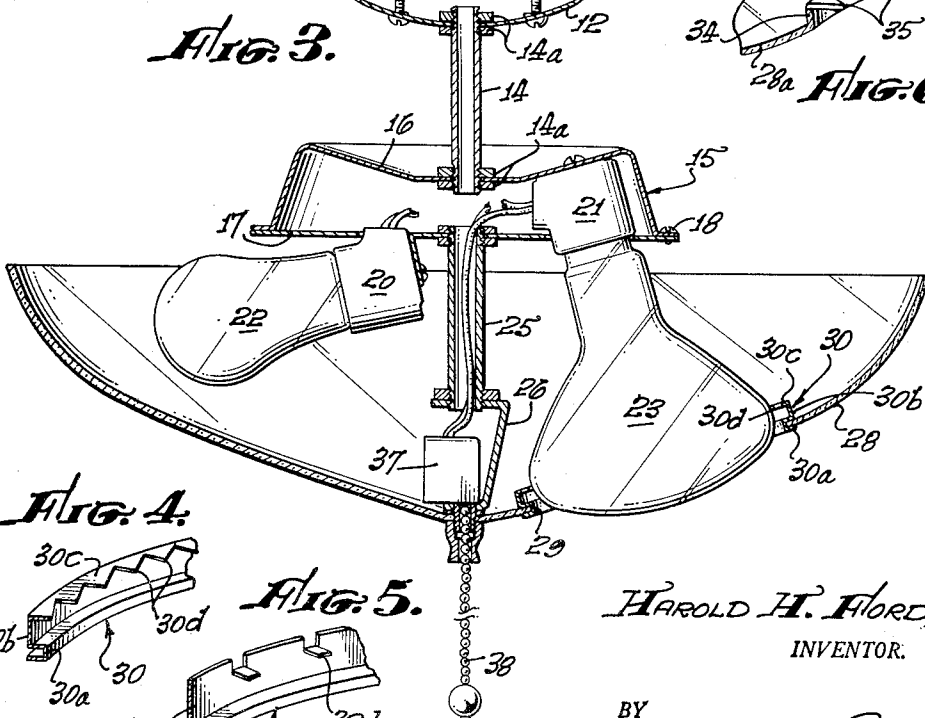
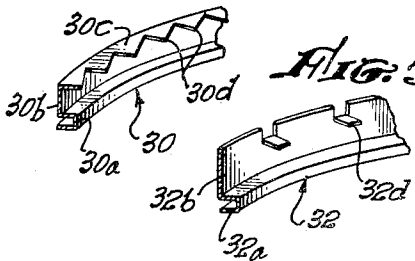


FIG. 4.

FIG. 5.



HAROLD H. FORD,  
INVENTOR.

BY  
*Knights & Rodgers*  
ATTORNEYS.

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**COMBINED ELECTRIC HEATER AND LIGHT FIXTURE**

Harold H. Ford, Claremont, Calif., assignor to Emerson-Fryne Company, Pomona, Calif., a corporation of Delaware

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The present invention relates generally to electrical fixtures, and more especially to a combined heater and light fixture which is particularly adapted to be mounted overhead, as by being suspended from the ceiling of a room.

The combination of an electrical heater with a source of illumination in a single fixture offers the advantage of economy and convenience for several reasons. Combining the two types of electrical fixtures into a single fixture simplifies the wiring required and reduces the amount of conduit that must be installed in a home or other building. A radiant type electric heater installed overhead has many advantages in small rooms, such as bathrooms, or other enclosed spaces. The advantages of electric heat are well known and need no discussion here. However, the location of the radiant heater when combined with a lighting fixture is advantageous because heat may be radiated more effectively to all portions of the room. The heater in this location does not interfere with the use of the walls or location of furniture and the like; and persons standing in the central portion of the room are relatively closer to the source of heat and therefore benefit from it to a greater extent than if the heater is located in one of the side walls of the room.

Because of the existence of these and other advantages, it is a general object of my invention to combine into a single electrical fixture a radiant heat source and a light source in a practical and convenient arrangement.

It is a further object of my invention to provide in combined heater and light fixture a light diffuser which diffuses light throughout the room but which does not interfere with the radiation of heat from the heat lamps and which is itself protected from deterioration by heat received from the heat lamps.

A further object of my invention is to provide a guard that may be combined with a light diffuser of relatively low heat conductivity to prevent localized concentration of heat in the diffuser from a closely adjacent radiant heat source.

These and other objects and advantages of my invention are attained according to my invention by providing in a combined electrical fixture a base member having a plurality of lamp sockets mounted on the base member, and a translucent light diffuser spaced below the base member and having a plurality of openings therein. In certain of said sockets a plurality of lights are mounted above the light diffuser while in others of said sockets there is a plurality of heat lamps, each lamp projecting into and through an opening in the light diffuser. At each opening there may be provided means around the opening to prevent localized concentration of heat in the diffuser.

Such means, according to a preferred form of my invention, consists of a metal guard ring mounted on the diffuser and extending completely around the opening therein. This metal ring has a relatively high rate of heat conductivity and is provided with a flange which extends away from the diffuser and from which heat is radiated into the atmosphere. The ring is preferably provided with inwardly extending projections which engage the heat lamp to prevent contact of the lamp with other portions of the diffuser. By this arrangement, only a very limited area on the guard ring can engage the lamp, thus reducing the amount of heat which can be

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transmitted to the diffuser by conduction. At the same time these projections are designed to permit circulation of air between the lamp and the ring to carry away heat from the ring and the diffuser.

It will be realized that the invention is not necessarily limited to a fixture including electric bulbs providing a source of light. In a fixture without ordinary lights the light diffuser may be used without change for ornamental reasons as a shield or screen for heat lamps.

How the above and other objects and advantages of my invention are attained will be more readily understood by reference to the following description and to the annexed drawing in which:

FIG. 1 is a perspective of a combined heater and light fixture constructed according to my invention.

FIG. 2 is a fragmentary enlarged bottom plan view of the fixture of FIG. 1, as indicated by the line 2-2 of FIG. 1.

FIG. 3 is a vertical median section through the entire fixture on a further enlarged scale.

FIGS. 4 and 5 are fragmentary perspective views of portions of the metal guard ring showing two different forms of inwardly extending projections engaging the heat lamps.

FIG. 6 is a fragmentary section through the diffuser at the edge of an opening to show an integrally formed guard.

Referring to the drawing, and more particularly to FIG. 3, it will be noticed that splice box or outlet box 10 of any suitable design, is recessed into ceiling 11 of a room. The underside of the outlet box is provided with a removable cover 10a which permits access to the interior of the box for splicing or connecting the electrical conductors. These details are well known in the art and constitute no part of my invention. Accordingly they need not be described in detail here.

Ornamental cap 12 is attached to splice box 10 in any suitable manner, as by a plurality of screws 13 which draw the cap against the ceiling. Centrally connected to cap 12 is a length of hollow rod or tubing 14. The lower end of tubing 14 is attached to the top wall of housing 15. The housing comprises two separable members providing top wall 16 and bottom wall 17. The two ends of tubing 14 are preferably threaded in order to receive lock nuts 14a, a pair of lock nuts at the upper end fastening the tubing to cap 12 while a similar pair of lock nuts at the lower end connects the tubing to housing wall 16.

The two walls 16 and 17 of housing 15 are spaced apart centrally and are fastened together by any suitable means, as for example sheet metal screws 18 at several points around the periphery of the housing. Housing 15 provides a base upon which there is mounted a plurality of lamp sockets which are divided into two groups. A first group of sockets 20 is mounted upon lower wall 17 of housing 15 while the other group of sockets 21 is mounted upon upper wall 16 of the housing. Sockets 20 and 21 may be all alike. Sockets 21 are opposite openings in lower wall 17 into which the sockets may partially extend if desired but which more importantly provide access to the sockets. Sockets 20 are also mounted at openings in lower wall 17 in order for conductors to reach the sockets from the interior of housing 15. Housing 15 provides a splice box or the like in which connections may be made between incoming conductors passing through tube 14 and leads to the individual sockets.

Sockets 20 are directed more or less horizontally and are adapted to receive light bulbs 22 which provide illumination. Sockets 21 are directed downwardly and are adapted to receive heat lamps 23. Although the number of lights 22 and heat lamps 23 may be altered

as desired, I find it convenient to provide three of each. As may be seen in FIG. 3, heat lamps 23 have a relatively large diameter at their outer ends and a much smaller neck adjacent the base which is screwed into a socket while the illuminating lights 22 are comparatively smaller in their overall dimensions, especially in diameter. By directing sockets 21 downwardly, the heat from lamps 23 is radiated chiefly in the desired downward direction; and this permits the lights 22 providing illumination to be located in the spaces between the necks of the heat lamps.

Extending downwardly from housing 15 is a second section of hollow rod or tubing 25 which is aligned with upper section 14 and thus is in effect an extension or continuation of the upper tubing. Tubing 25 is attached to the housing wall in any suitable manner, as by the lock nuts described above. From the lower end of tubing 25 there is mounted angle bracket 26 which serves as a means for mounting on the tubing light diffuser 28.

Light diffuser 28 is an upwardly concave, bowl-shaped member disposed below lights 22 for the purpose of diffusing and softening the light emanating from these sources. To accomplish this, diffuser 28 is made of any suitable type of translucent material, many of which are well known in the art. For example the diffuser may be made of glass having an etched, hammered or frosted surface; but it is preferred for reasons of cost, safety, and appearance, as well as to reduce the weight of the entire fixture, to make diffuser 28 of a synthetic resin or plastic of which there are a number that are suitable. One example is fiberglass impregnated with polyester resin.

In order that diffuser 28 does not interfere with the radiation of heat from lamps 23, the diffuser is provided with a plurality of openings 29 equal in number to the number of lamps 23 and so disposed that the lamps project into and slightly through these openings, as may be seen clearly in FIG. 3. By this arrangement, the light diffuser is interposed between the room space below and the light sources but offers no barrier to downward radiation of heat since the portion of lamps 23 from which heat is chiefly radiated is exposed directly to the room beneath the fixture.

For various reasons it is preferable that openings 29 in light diffuser 28 be as small as possible while still being somewhat larger than the maximum diameter of lamps 23 in order that they may be inserted in or removed from sockets 21 through the openings in the diffuser. The consequent proximity of a diffuser of a synthetic resin or plastic material to heat lamp 23 creates a problem since the amount of heat radiated to the diffuser is considerable, each lamp 23 typically having a rating of 250 watts. Contact of a lamp with the diffuser results in a localized accumulation of heat in the portion of the diffuser bordering the openings which is sufficient to cause the diffuser to discolor or otherwise deteriorate. Thermal stresses may crack a glass diffuser, so plastic is preferred.

In order to overcome this condition, I provide each of these openings in the light diffuser heat with guard means which prevents this concentration of heat in the diffuser.

In a preferred form, this heat guard means takes the form of a metal ring 30 mounted on diffuser 28 and extending entirely around each one of the lamp openings 29 therein. The ring 30 is made of metal in order to obtain relatively high heat conductivity; and for this purpose it is preferred to use a metal such as copper or aluminum or alloys thereof which conduct heat rapidly and also present an attractive appearance. As may be seen from FIGS. 3 and 4, ring 30 has a lower base section 30a which, viewed in cross-section, is channel shaped and opens toward the outside of the ring. This base section provides a means for mounting the ring on the dif-

fuser, the width of the channel being made such that it slips easily over the wall of the light diffuser.

Extending upwardly from base 30 is flange 30b. Flange 30b not only serves to some extent to intercept heat from the associated lamp 23, which would otherwise reach the light diffuser, but also serves as a radiating member which radiates to the surrounding atmosphere heat received from the remainder of the ring. The height of flange 30b may be any desired value, but it is preferable to make this flange about 1/4 inch or more.

Each ring 30 is provided with a plurality of radially inwardly extending projections. These may be conveniently provided by bending inwardly the upper portion of the ring at the top of flange 30b to form a radially extending flange 30c as shown in FIG. 4, and then serrating the inner edge to provide a plurality of teeth 30d which extend radially inwardly. These projections 30d serve several purposes. They are made longer than the depth of base section 30a so that if a lamp 23 is not exactly centered within an opening in diffuser 28, the tips of projections 30d are the only portion of the ring to contact the heat lamp. This prevents contact between the metal ring and the heat lamp over any substantial area; and because of the limited area of contact reduces to a minimum the heat that can be transferred through the ring by direct conduction to the diffuser. Also these projections 30d act as spacers which limit the closeness of the approach of the heat lamp to the main body of the ring. This prevents contact between the lamp and the ring over a large enough area to interfere substantially with the circulation of air around the lamp. It is in order to maintain such air circulation around the lamp that teeth 30d, or other projections, are spaced apart around the ring. Gaps between successive projections through which air can rise, allow circulation of air which carries away heat from the ring and limit the reception of heat from the lamp.

The projections on ring 30 which engage the adjacent heat lamp may have a variety of positions and shapes other than so far described. For example, there is shown in FIG. 5 a variational design of heat dissipating ring 32 in which the outer upwardly extending flange 32b is somewhat higher than is the case with the ring illustrated in FIG. 4. By cutting narrow tabs 32d in this upstanding flange and then bending them over 90 degrees so that they extend radially inward as shown, suitable projecting portions are provided on the ring. These are located relatively farther apart than are the teeth 30d and are also located at a point below the top of flange 32b. By making the cut deeper in the upstanding flange, projections 32d may be made longer if desired without diminishing the height of the wall 32b.

Some plastics are less subject to deterioration by heat than others. In the case of a highly heat resistant substance, the guard may be made an integral part of the diffuser as shown in FIG. 6. Then the body of diffuser 28a has an upstanding flange 34 around each of the openings for a heat lamp. At the top of this flange there may be a plurality of inwardly extending pointed projections 35, preferably shaped like teeth 30d in FIG. 4. These teeth permit contact of the diffuser with a heat lamp over such a limited area that the amount of heat transmitted to the main body of the diffuser is not damaging. If teeth 35 do discolor, they are partly concealed from view by being above the main wall portion of the bowl-shaped diffuser. In this case the relatively low heat conductivity assists in minimizing the quantity of heat that reaches the main body of the diffuser by conduction from the tips of projections 35.

The light and heating fixture of the present invention may be wired in any suitable manner. Suitable arrangements of the electrical conductors will occur to persons skilled in the art and consequently are not described or illustrated in detail in the present application. The lights 22 providing illumination may be controlled from a wall

switch in the well known manner, and a similar switch may be provided to control heat lamps 23. If it is preferred that a separate switch be provided at the fixture for heat lamps 23, switch 37 may conveniently be mounted upon bracket 25. The switch is provided with pull chain 38 which passes through diffuser 28 to extend below the fixture where it may be conveniently reached. Electrical conductors extending between the switch and heat lamps 23 may pass through hollow stem 25 and wires from both sets of sockets 20 and 21 can extend upwardly through the upper section 14 of the central stem to reach outlet box 10.

From the foregoing description it will be evident that various changes may be made in the location and arrangement of the various parts constituting my improved heater and light fixture without departing from the spirit and scope of my invention. Accordingly, it is to be understood that the foregoing description is considered to be illustrative of rather than limitative upon, the invention as defined by the appended claims.

I claim:

- 1. A combined electric heater and light fixture comprising, in combination:
  - a housing having top and bottom spaced walls detachably connected to each other, said bottom wall having openings therein;
  - a plurality of lamp-receiving sockets mounted on the top wall opposite openings in the bottom wall;
  - a second plurality of lamp-receiving sockets mounted on the bottom wall;
  - an electric lamp in each of said sockets;
  - a first support rod connected to and extending upwardly from the top wall of the housing;
  - a second support rod connected to and extending downwardly from the bottom wall of the housing;
  - and a light diffuser mounted on the second support rod below lamps in the second plurality of sockets and having openings through which project lamps in the first plurality of sockets.
- 2. In an electric heating fixture, the combination comprising:
  - a shallow bowl-shaped shield of synthetic plastic material or the like having a relatively low heat conductivity, said shield having an opening in one wall to receive a heat lamp;
  - and a heat guard mounted on the shield around the opening to minimize heat transfer to the shield from said lamp, said guard comprising a metal ring having a channel-shaped body providing an outwardly facing annular groove adapted to receive the diffuser around said opening and provide a substantially continuous wall of metal covering the edge of the diffuser exposed to the lamp at the opening;
  - the heat guard also including a flange projecting axially from the metal ring and having projections on the flange extending radially inwardly therefrom to provide limited areas of contact between the heat guard and said lamp.
- 3. In an electric heat fixture, the combination as claimed in claim 2 in which said projections are provided by an inwardly turned and serrated portion of said flange providing a series of points for contact with said lamp.
- 4. A combined electric heater and light fixture comprising in combination:

- a base member;
- a plurality of lamp sockets mounted on the base member;
- a translucent light diffuser made of a substance of relatively low heat conductivity and spaced below the base member and having a plurality of openings therein;
- a plurality of lights mounted in selected sockets above the light diffuser;
- a plurality of heat lamps mounted in others of said sockets, each lamp projecting into and through an opening in the light diffuser in sufficiently close proximity to overheat the diffuser locally;
- and guard means at each opening to prevent a harmful concentration of heat in the diffuser from the heat lamp in the opening, said guard means being a metal ring mounted on the diffuser and having a relatively high heat conductivity interposed between the lamp and the closest portion of the diffuser, said ring having projections engageable with the lamp to prevent direct contact between the body of the ring and the lamp.
- 5. A ceiling mounted electric heating and lighting fixture comprising:
  - a base member;
  - a downwardly facing lamp socket mounted on the base member;
  - a light diffuser having an opening therein adapted to receive a lamp mounted in and supported by one said socket above the diffuser;
  - means supporting the light diffuser from and below the base member;
  - and heat guard means at said opening in the light diffuser to prevent localized heat concentration in the diffuser from the lamp, said guard means comprising a metal ring having an outwardly facing annular groove receiving the rim of the diffuser around the opening and providing a substantially continuous wall of metal exposed to the lamp and covering the edge of the diffuser at the opening therein, and the metal ring also having an upwardly extending integral flange with a plurality of projections extending radially inwardly from the flange toward the lamp to provide limited areas of contact between the heat guard and the lamp.

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