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INCANDESCENT ELECTRIC LAMP COOLING MEANS

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Fig-1

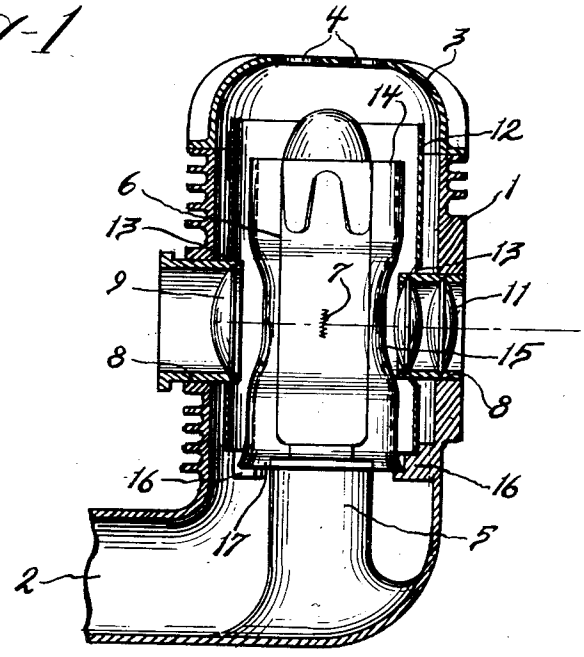
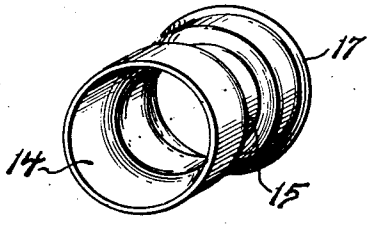


Fig-2



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INCANDESCENT ELECTRIC LAMP COOLING MEANS

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7 Claims. (Cl. 240—47)

Our invention relates particularly to cooling means for incandescent electric lamps of motion picture projecting machines, although not limited to this use alone.

The main object of the invention resides in providing for the cooling of incandescent electric lamps of the concentrated filament type, such as are used in picture projecting machines, with a view toward maintaining the lamps at a safe and practical temperature and preventing immature burning out thereof.

With this object in view our invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said object and certain other objects hereinafter appearing are effected, all as fully described with reference to the accompanying drawing and more particularly pointed out in the appended claims.

In the said drawing—

Figure 1 is a central vertical section of the lamp house of a motion picture projecting machine embodying our invention; and

Figure 2 is a perspective view of the air current tube of our invention, hereinafter described.

Referring to the drawing, 1 designates a vertically disposed generally circular lamp chamber having its lower end connected with an air conduit 2 and provided at its upper end with a removable top 3 provided with holes 4 for the passage of an air current upwardly therethrough, the air current being effected by a suitable fan, not shown, forcing air into the conduit 2 and upwardly through the lamp chamber as is usual on motion picture projecting machines.

Disposed centrally within the bottom portion of the lamp chamber is a lamp socket structure, generally designated at 5, and mounted in the socket 5 is a cylindrical incandescent electric lamp 6 of the concentrated filament type, the concentrated filament being indicated at 7, the lamp being thus located centrally in the lamp chamber and in vertical position, as is usual.

The cylindrical wall of the lamp chamber is provided with diametrically opposite openings 8 alined with the filament 7, and a focusing reflector 9 is mounted in one of these openings and a condensing lens 11 is mounted in the other of these openings, the reflector lamp filament and condensing lens being alined and cooperating to provide a projection light.

Disposed within the lamp chamber, is a tubular heat shield 12 surrounding the lamp 6 adapted for the passage of air on the exterior and interior thereof, this shield serving to prevent the chamber wall from becoming excessively hot and being provided with diametrically opposite openings 13 in the region of the lamp filament 7 for the accommodation of the reflector 9 and condensing lens 11.

Also disposed within the lamp chamber, is a transparent tubular member 14, constructed of heat resistant material such as glass capable of withstanding relatively high temperatures, and this member is arranged within the heat shield 12 and surrounds the lamp 6 and is adapted for the passage of air on the exterior and interior thereof, there being sufficient difference between the diameters of the shield 12, the member 14 and the lamp for this purpose.

The end portions of the tubular member 14 are of a relatively large diameter, see Figures 1 and 2, while the intermediate portion thereof in the region of the filament 7 of the lamp is reduced in diameter as designated at 15, the reduced portion being preferably cylindrical as shown and being disposed opposite the filament 7 of the lamp for the undistorted passage of the light therethrough.

The heat shield 12 and the member 14 are supported at their lower ends in concentric relation with each other and with the lamp chamber and lamp by means of shouldered lugs 16 formed on the lamp chamber wall, and the lower end of the member 14 is preferably flared outwardly, as designated at 17, to increase the air current between the member 14 and the lamp 6.

In operation a current of air is forced upwardly through the lamp chamber from the conduit 2 by a suitable fan as aforesaid, and the air passes between the lamp chamber wall and the shield 12, between the shield 12 and the member 14, and the lamp, serves to carry off the heat dissipated by the energized filament 7 of the lamp.

The reduced intermediate portion 15 of the member 14 has a Venturi tube effect and being disposed in the region of the filament increases the velocity of the air current on the lamp in this region and thus increases the carrying off of the heat of the filament.

It will be observed that by reason of member 14 being transparent, at least in the region of the filament, the passage of the light is not interfered with and that the member 14 has no transverse openings which would interfere with the Venturi tube effect at the filament or hottest part of the lamp.

While we have described and shown the preferred embodiment of our invention we do not wish to be limited to the precise details of con-

struction as changes may readily be made without departing from the spirit of our invention, but having thus described our invention, we claim as new and desire to secure by Letters Patent the following:

1. In a device of the character described the combination with a lamp chamber adapted to have an incandescent electric lamp of the concentrated filament type located therein and to have an air current pass therethrough, of a tubular member located in said lamp chamber for the passage of an air current therethrough and surrounding said lamp and provided with a portion of reduced diameter disposed in the region of the filament of said lamp, at least a portion of said tubular member being of transparent heat resistant material for the passage of light from said filament transversely of said tubular member.

2. In a device of the character described the combination with a lamp chamber adapted to have an incandescent electric lamp of the concentrated filament type located therein and to have an air current pass therethrough, of a heat resistant transparent tubular member located in said lamp chamber for the passage of an air current therethrough and surrounding said lamp and provided with a portion of reduced diameter disposed in the region of the filament of the lamp.

3. In a device of the character described the combination with a lamp chamber adapted to have an incandescent electric lamp of the concentrated filament type located therein and to have an air current pass therethrough, of a heat resistant transparent tubular member located in said lamp chamber for the passage of an air current therethrough and surrounding said lamp and having its intermediate portion reduced in diameter and disposed in the region of the filament of the lamp.

4. In a device of the character described the combination with a lamp chamber adapted to have a cylindrical incandescent lamp of the concentrated filament type located centrally therein in a vertical position and adapted to have an air current pass vertically therethrough, of a tubular member located in vertical position in said chamber and surrounding said lamp and provided with a portion of reduced diameter disposed in the region of the filament of the lamp, at least a portion of said tubular member being of transparent heat resistant material for the passage of light from said filament transversely of said tubular member.

5. In a device of the character described the combination with a lamp chamber adapted to have a cylindrical incandescent electric lamp of the concentrated filament type located centrally therein in a vertical position and adapted to have an air current pass vertically therethrough, of a transparent heat resistant tubular member located in vertical position in said chamber and surrounding said lamp and provided with an intermediate portion of reduced diameter disposed in the region of the filament of the lamp.

6. In a device of the character described the combination with a lamp chamber adapted to have a cylindrical incandescent electric lamp of the concentrated filament type located centrally therein in vertical position and adapted to have an air current pass vertically therethrough, of a transparent heat resistant tubular member located in vertical position in said chamber and surrounding said lamp and provided with an intermediate portion of reduced diameter disposed in the region of the filament of the lamp, said reduced portion including a cylindrical tubular formation opposite said filament.

7. In a device of the character described the combination with a lamp chamber adapted to have an incandescent electric lamp of the concentrated filament type located therein and to have an air current pass therethrough, of a tubular heat shield located in said lamp chamber and surrounding said lamp and provided with diametrically opposite openings in the region of the filament of the lamp and adapted for the passage of an air current on the exterior and interior thereof, and a transparent heat resistant tubular member located in said lamp chamber and arranged within said heat shield and surrounding said lamp and adapted for the passage of an air current on the exterior and interior thereof and having its intermediate portion reduced in diameter and disposed in the region of the filament of the lamp.

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