

April 8, 1952

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2,592,102

SEALED BEAM FILAMENT LAMP WITH HEAT-REDUCING MEANS

Filed Sept. 23, 1949

Fig. 1.

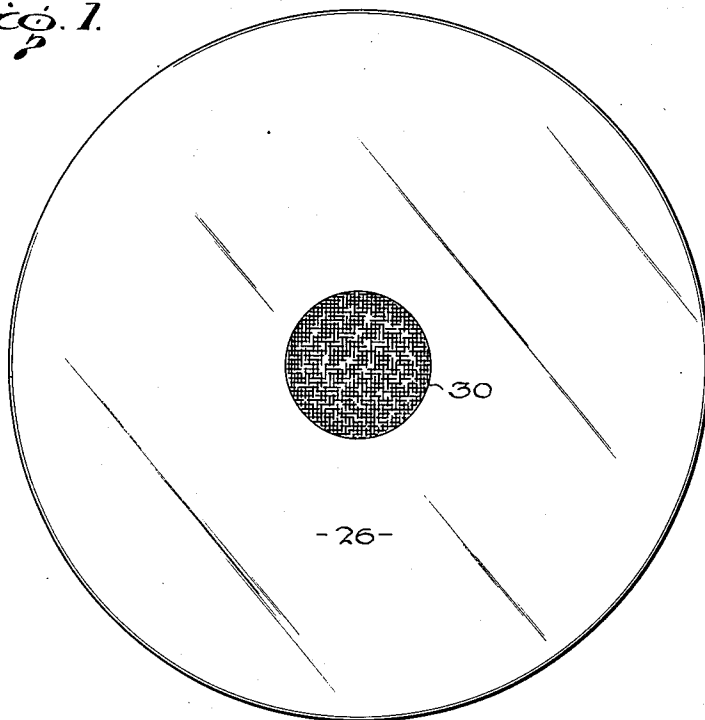
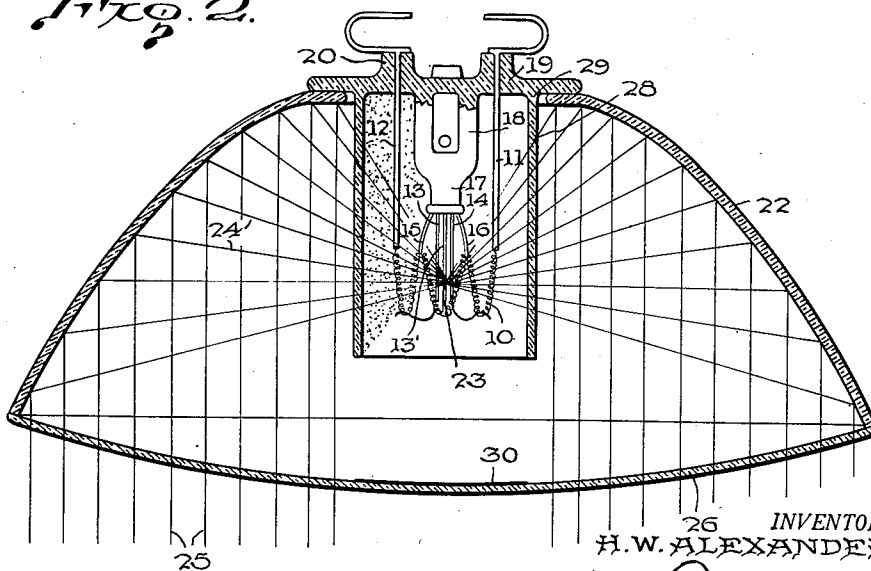


Fig. 2.



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2,592,102

SEALED BEAM FILAMENT LAMP WITH
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Application September 23, 1949, Serial No. 117,400

4 Claims. (Cl. 313-116)

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This invention relates to electric lamps of the incandescent type, and more particularly to lamps of the type generally designated as sealed beam and comprising a filament suitably supported in a sealed chamber of relatively large size and including a dished reflector wall and a light-transmitting wall.

It is a general object of the present invention to provide a novel and improved sealed beam type of lamp.

More particularly it is an object of the invention to provide in a sealed beam lamp of the type described means to separate a greater part of the heat generated in the lamp from the useful light beam and to disburse the heat from the lamp so that it will not be detrimental to the object being illuminated.

An important object of the invention resides in the arrangement in a sealed beam type of lamp of a screen arranged between the filament and the reflector wall to intercept heat rays to prevent them from striking the reflector while passing light rays thereto.

Another important object of the invention resides in the construction of a lamp of the type described in which the filament is supported from a base disc on which is mounted an annular screen of heat resistant, light conducting and heat absorbing glass so sized and positioned as to intercept all rays passing from the filament to the reflector.

A still further important object of the invention resides in the construction of a lamp of the type described in which the filament is supported from a base disc on which is mounted an annular screen of heat resistant, light conducting and heat absorbing glass so sized and positioned as to intercept all rays passing from the filament to the reflector and in which the light transmitting wall of the lamp enclosure is provided with means to intercept direct heat rays from the filament travelling in the general direction of those forming the useful light beam from the reflector.

Other and further objects and features of construction of the invention will be apparent to those skilled in the art upon a consideration of the accompanying drawings and following specification, wherein is disclosed a single exemplary embodiment of the invention, with the understanding that such changes and modifications may be made in the device disclosed as fall within the scope of the appended claims without departing from the spirit of the invention.

In said drawings:

Fig. 1 is a front or face view of the sealed beam lamp constructed in accordance with the present invention, incorporating a light trap in the front wall of the envelope; and

Fig. 2 is a transverse central section through the longitudinal axis of the lamp of Fig. 1, illustrating in more or less conventional manner the path of light and heat rays.

Reflector lamps are used for many purposes. Perhaps one of the first uses was for automobile lighting. In that construction the filament is of a concentrated character, arranged in a relatively large sealed casing, the back wall of which is suitably shaped and coated to form a reflector and the front or light transmitting wall of which may be suitably formed for light refraction and dispersion. With this type of device heat is no particular problem for the casing is large and well spaced from the filament, but where reflector lamps are used, for instance, in the lighting of stage personnel and television stages, for model lighting, photographic lighting and the lighting of perishable articles, such as ice cream, baked goods, flowers, fruits, vegetables and the like, it is highly desirable to eliminate the large quantity of heat which is generated concomitant with the light and reflected and directed along with the useful light beam. It is estimated that approximately 87% of the energy of electric current passing through a lamp filament is converted to heat, with the remainder given to light. Where the light beam is highly concentrated and directed as in the various forms of reflector lamps herein generally referred to as the sealed beam type, this heat can be particularly disagreeable and/or damaging to such an extent that many efforts have been made to control the heat. They have consisted mostly in extraneous devices such as fans, exterior shields or screens, water cells and the like, and all have been cumbersome, costly, difficult to clean and adjust, and not always satisfactory.

In accordance with the present invention it is proposed to incorporate directly in the lamp structure a screen or filter formed of heat resisting glass, because it is so close to the filament, and arranged to transmit substantially all of the light falling on it and to absorb the majority of the heat striking it. Such glass is conventional and available and may be so attached to one of the exterior walls of the lamp as to assist in conducting away a greater part of the heat. Such a screen is preferably so shaped and positioned as to intercept only the rays directed from the filament toward the reflector. If desired heat

and also light rays may be similarly reduced or completely eliminated from the direct rays of the filament travelling in the general direction of those directed by the reflector.

Referring now to the drawing for an illustrative form of the invention, there is shown at 10 a lamp filament of the relatively concentrated type which may comprise one of the common helical filaments or the more recently developed coiled-coil type, or the even later developed coiled-coiled-coil filaments. The filament choice, arrangement and mounting form no part of the present invention, but the filament is shown as suspended in a W form, which in front view may be more or less annular, by having its outer ends attached to the conductor wires 11, 12, its center and outer peaks supported by the wires 13, 13' and 14, and its bottom loops held down by wires 15 and 16. The five wires 13 to 16 inclusive, may be supported in a more or less conventional press 17 on the tubular standard 18 sealed to the base disc 19 forming the foundation of the lamp. Such a disc has the conductor wires 11 and 12 sealed therein, as shown, and reinforced by portions 20.

Suitably sealed to the outer flange of the disc 19 is the dished reflector wall 22 of the lamp, which takes any desired configuration in accordance with the required character of the light beam. In the present showing it is generally of a paraboloidal form, with the center of the filament near the focus as shown at 23 so that light beams radiating therefrom as illustrated by lines 24 will be reflected into a substantially parallel bundle of rays 25. The construction of the wall 22 and the application of the reflector surface thereto may be conventional. The front of the reflector wall is closed by a shallow dished wall 26, the clear light transmitting glass being processed to provide for diffusion or refraction of the light if desired.

Arranged to absorb the heat in the rays, from the filament to the reflector only, is the screen or filter 28, preferably tubular or annular in form and open at the front end. It is formed of glass and may be integral with or suitably welded or merged with the glass of the disc 19 at the annular fillet 29.

The screen 28 is preferably formed of a suitable glass, of which several are known and commercially available, which has the characteristic of transmitting nearly 100% of the visible light falling on it and absorbing a very large percentage of the heat from the rays which it intercepts. Thus at the left hand side of Fig. 2 of the drawing the stippled area represents heat rays within the screen which are stopped at its surface and do not reach the walls of the reflector. Naturally the glass of the screen being so close to the filament and receiving and absorbing the heat rays, must be fully resistant to high temperatures. The screen being directly attached to the base disc conducts thereto a quantity of heat for radiation outside of the lamp while other heat is radiated by the various lamp walls but is not focused with the concentrated light beam and hence does not travel with the desired light.

Sometimes even the quantity of heat coming directly from the filament is undesirable. Also the light coming directly from the filament is not directed by the reflector and may produce undesired results in the object lighted. If this is the case it can be relatively effectively eliminated by the device of forming a light trap 30 in the

center of the light transmitting wall 26. This could be a blackened area for stopping both light and heat, or it might be an area impervious to heat and relatively pervious to light, thus succeeding in radiating the heat close to the lamp and keeping it out of the beam. It could also be a reflector directing the light and/or heat back into the housing. The expression "light trap" or a similar one in the claims is intended to cover these various means. This light trap may be said to eliminate from the useful beam thus treated rays not acting in perfect harmony with the desired reflected rays.

The device of the present invention is susceptible to embodiments in many forms, the basic feature of the invention residing in the light transmitting and heat absorbing means arranged between the filament and the reflector wall in a lamp of the sealed beam type.

I claim:

1. In a reflector lamp of the sealed beam type, in combination, a lamp filament, a sealed inclosure for said filament including a dished reflector wall and a light transmitting wall, a screen directly secured to and supported from one of said walls and positioned and shaped to lie in the path of all direct rays from the filament to the reflector and out of the path of reflected rays directed toward said light transmitting wall, said screen being formed solely of light-transmitting and heat-absorbing glass.

2. The lamp as defined in claim 1 in which said light-transmitting wall is fitted with a screen to limit passage of direct rays from the filament through said light-transmitting wall.

3. In a lamp of the type described, in combination, a filament, a sealed inclosure for said filament including a base disc supporting said filament, a surrounding dished reflector wall and a light transmitting wall opposite said reflector wall, an annular screen surrounding said filament and extending axially of the reflector such a distance as to intercept rays directed toward the reflector only, said screen being formed solely of glass and being heat resistive, substantially 100% light conducting, non-reflecting and heat absorbing and mounted on said base disc in direct heat conductive relation thereto.

4. In a reflector lamp of the sealed beam type, in combination, a lamp filament, a sealed enclosure for said filament including a dished reflector wall, a light transmitting wall and a base disc all sealed together, an open ended tube coaxial with the reflector, surrounding the filament and formed integrally with the base disc solely of high heat absorbing and high light transmitting glass, said tube being of sufficient height to intercept all rays from the filament to the reflector and having walls of uniform thickness throughout.

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