

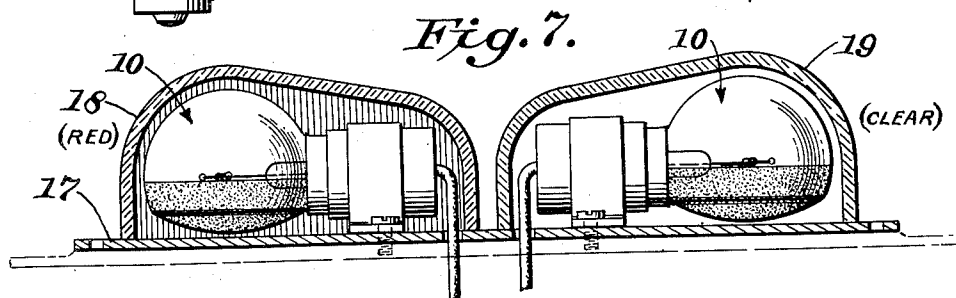
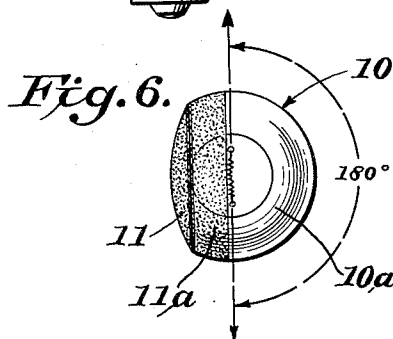
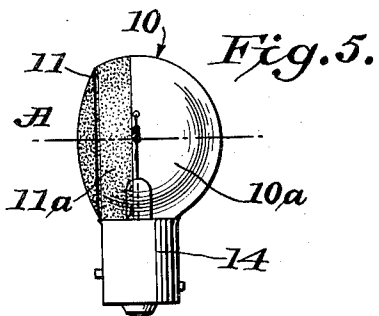
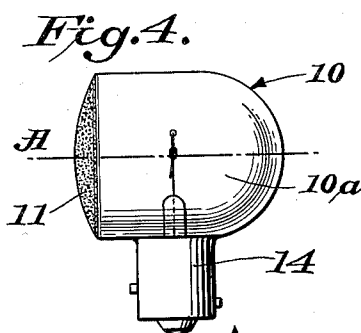
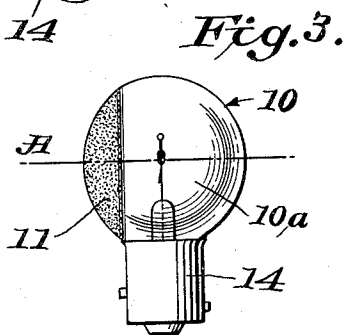
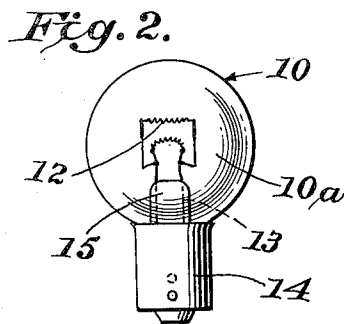
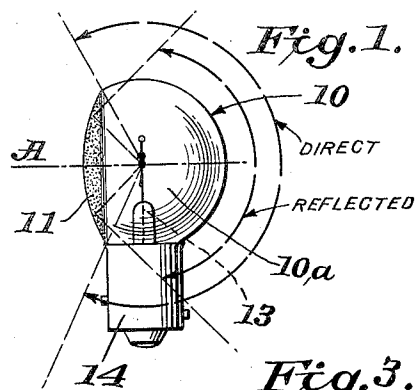
Dec. 19, 1944.

C. ADLER, JR

2,365,504

LAMP

Filed June 9, 1944



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UNITED STATES PATENT OFFICE

2,365,504

LAMP

Charles Adler, Jr., Baltimore, Md.

Application June 9, 1944, Serial No. 539,563

2 Claims. (Cl. 176—34)

This invention relates to lamps particularly useful as running and passing lights for aircraft or in association with aircraft landing indicators as illustrated in my application, Serial No. 518,754, filed January 18, 1944, and my Patent No. 2,316,751. The lamps also have general utility and are useful, for example, as signal lamps, as medical examination lamps and numerous other applications.

An object of the invention is to provide a lamp in which the light source produces a spherical angle of illumination substantially of the order of a hemisphere.

Another object is to provide a lamp including a reflector and a light transmitting area wherein the positioning of the light source, such as a filament in the lamp bulb, and the location of associated means for supporting the lamp in electrically connected relation do not substantially interfere with the use of the entire reflector surface particularly the central portion thereof or substantially the entire light transmitting area, whereby a spherical angle of illumination substantially of the order of a hemisphere is produced.

In the accompanying drawing, I have illustrated my improved lamp and shown various modifications all of which are regarded to be within the scope of the invention.

Referring to the drawing:

Figure 1 is a side elevation of one form of the invention and showing the spread of both reflected and direct beams.

Figure 2 is a front elevation of the lamp shown in Figure 1.

Figure 3 is a side elevation of a lamp having a reflector surface of deeper concavity than in Figure 1.

Figure 4 is a side elevation of a further form of the invention in which the light transmitting area is elongated.

Figure 5 is a side elevation of another form of the invention having the reflector surface extended to form a screen for limiting the spread of direct beams to about 180°.

Figure 6 is a top view of the form of the invention shown in Figure 5 and showing the light spread of direct beams as limited to 180° by the screen.

Figure 7 is a sectional view of a flashing aircraft tail light unit in which lamps of the present invention are employed.

It is an important feature of each of the lamps that both reflected and direct beams of light are produced by the light source and that the re-

flected beam may be controlled with respect to the angle of spread by the character of the reflector and focal location of the light source with respect thereto. That is to say, concentrated reflected beams may be produced for use in connection with an aircraft landing indicator while wide angle reflected beams may be produced for use as the forward flashing fuselage lights on aircraft. In all cases the light source produces a spherical angle of illumination substantially of the order of a hemisphere.

In order to obtain these highly desirable advantages and improved efficiency of the lamp, I have discovered that the light source may be disposed so as not to interfere substantially with the use of the reflector particularly the central portion thereof or interfere substantially with the light transmitting area. Thus, a small bulb may be used to give highly efficient results for numerous purposes.

Referring to Figure 1, the lamp has a sealed chamber or bulb 10 which is made of glass, plastic or other suitable light transmitting material. The wall of the chamber 10 is provided with a mirror or reflector surface preferably by coating the same as at 11. This mirror surface is generally circular and has a shallow concavity as illustrated.

Referring to Figure 2, the light source or filaments 12 are supported by leads 13 within the chamber 10 which in turn may be either directly connected with the base 14 or supported by a conventional stem-press 15 fused to the bulb wall and through which the leads extend and are connected to said base. The leads extend at substantially right angles to a line A projected normally from the center of the mirror surface.

It will be noted with the construction shown in Figure 1 that the reflector surface 11 constitutes a relatively small area of the bulb as compared to the light transmitting area and that this mirror surface has no dead spots and substantially the entire area thereof including the central portion is not obstructed.

The bayonet base 14 is connected to the chamber preferably by a suitable cement. The base is relatively small and is connected to the light transmitting area 10a at a central point, namely, at one side thereof as shown, in order that there will be no substantial interference with the use of the entire light transmitting area. In this manner, both direct beams and reflected beams are produced by the light source and a spherical angle of illumination is obtained which is of the order of a hemisphere.

Lamps may be made in which the light source or filaments may be disposed at or about the focal point or away from the focal point depending on whether concentrated reflected beams or reflected beams having a wide angle spread are desired.

The light transmitting area 10a is convexly disposed with respect to the mirror surface 11 and is on an area such as substantially to comprehend or cover the entire area of the mirror, and is generally circular.

Referring to Figure 3 the construction is similar to that shown in Figures 1 and 2, except that the mirror 11 has a more pronounced concavity which brings the filament closer to or at the focal point of the reflector.

The construction shown in Figure 4 is similar to the construction shown in Figures 1 and 2, except that the light transmitting area 10 is elongated. The mirror 11 is similar to that shown in Figure 1 and the filament is located at the focal point thereof which is made possible by the elongated light transmitting area.

The lamp shown in Figures 1 and 2 is preferably employed with the filament out of the focal point of the reflector, i. e., between the focal point and the mirror, to produce a wide angle spread of reflected beams as shown. The lamps shown in Figures 3 and 4 are preferably employed with the filaments at or close to the focal point of the reflector to produce concentrated reflected beams. In each of the constructions, the illumination produced is devoid of dead spots or central dark areas and whether parallel beams or non-parallel beams are reflected, substantially the entire areas of the reflector in each case is available and unobstructed particularly at the central portions. This is likewise true of the light transmitting area.

Referring to Figures 5 and 6, I have shown a lamp similar to Figure 1 except that the reflector surface 11 encompasses a larger area of the bulb, e. g., where it is desired that the direct beams from the light source be limited in spread to not greater than 180° or about one hemisphere. To this end, the reflector surface extends to a point on the bulb adjacent to the filament as shown at 11a, so as to act as an opaque screen and in order that the lamp may be efficient, a mirror surface is employed as such screen to provide the angular cutoff for the direct beams as shown in Figure 6.

Also, in the construction shown in Figures 5 and 6 wherein the filament is shown as located out of the focal point of the reflector, the entire area of the reflector is unobstructed except for a relatively small portion where the base 14 is connected to the bulb, so that there is no substantial interference with the use of substantially the entire reflector surface as is true likewise in the case of the lamps shown in Figures 1 to 4.

In this connection and referring to Figures 1 to 4 and also 5 and 6, it will be noted that the base 14 is connected to the bulb at the side thereof so that there is substantially no interference with the use of the light transmitting area.

The base 14 is relatively small and the manner in which I have connected it to the bulb and positioned the light source in the chamber contributes to the markedly improved results obtained wherein the reflector and light transmitting area operate at maximum efficiency.

It will be observed upon reference to Figures 1

and 6 that direct beams from the light source are visible throughout the entire area of the light transmitting portion of the lamp in all cases except for the small but negligible area taken up by the connection of the base 14 with the bulb 10 which, of course, is necessary.

In Figure 1 the light spread of direct and reflected beams in diagrammatically illustrated and it is to be understood that such beams pass through the entire light transmitting area of the bulb. In Figures 1 to 4 the direct beams have a spread which encompasses more than one hemisphere while as shown and described in connection with Figures 5 and 6, the light spread of the direct beams is limited substantially to 180 degrees.

Since the entire area of the mirror surface including the central portion thereof is substantially unobstructed and this is equally true of the light transmitting area, (1) the reflected illumination is devoid of dark spots or dead central areas, (2) direct beams from the light source pass through the entire area of the light transmitting area and (3) a spherical angle of illumination is produced by the light source substantially of the order of one hemisphere. These advantageous results are obtained as explained by the critical point of connecting the base 14 to the bulb 10 and locating the light source 12 in such a manner that maximum availability of the mirror and light transmitting area is made possible.

Referring to Figure 7, there is shown, by way of illustrating one embodiment of the invention, a unit containing a pair of lamps as illustrated in Figures 5 and 6, for attachment to the tail of an aircraft to provide a flashing red and white signal as shown in my United States Patent 2,273,747, assigned to the people of the United States. In my patent each of the lamps has a mirror or reflector surface but the base is attached centrally of the mirror which it is the object of the present invention to eliminate. The unit shown in Figure 7 comprises a base 17 upon which are detachably mounted a red cover glass 18 and a clear cover glass 19. The lamps are disposed within the cover glasses as shown and electrically connected to a suitable flashing means. The unit itself may be detachably connected to the tail cone of an aircraft in any suitable manner.

While in the accompanying drawing I have illustrated a light source consisting of two electrically energizable filaments it is to be understood that a single filament or a multiplicity thereof may be used and in fact any suitable light source of which many are well known may be employed.

I claim:

1. A lamp having a sealed chamber, the wall of the chamber having a concave mirrored portion and a light transmitting area convexly disposed with respect to the mirror and substantially overlying the entire opposed area of the same, a light source supported within the chamber so as not substantially to interfere with the use either of substantially the entire reflector surface, particularly the central portion thereof, or substantially the entire light transmitting area, whereby the reflected illumination is free of dead spots, the light source being connected to a lamp base extending externally of the chamber, said base being connected to the chamber at a point which does not substantially interfere with the use of either substantially the entire reflector surface particularly the central portion thereof or substantially the entire light transmitting area, whereby the reflected illumination is free of dead spots, said light source being so located with re-

spect to the margin of the reflector as to produce at least a spherical angle of illumination substantially of the order of a hemisphere.

2. A lamp having a sealed chamber comprising a continuous glass bulb, the wall of the chamber having coated thereon a concave mirrored portion and the uncoated wall portion defining a light transmitting area convexly disposed with respect to the mirror and substantially overlying the entire opposed area of the same, a light source comprising a filament supported within the chamber so as not substantially to interfere with the use either of substantially the entire reflector surface, particularly the central portion thereof, or substantially the entire light transmitting area, 15

whereby the reflected illumination is free of dead spots, the light source being connected to a lamp base extending externally of the chamber, said base being connected to the bottom of the chamber at a point which does not substantially interfere with the use of either substantially the entire reflector surface particularly the central portion thereof or substantially the entire light transmitting area, whereby the reflected illumination is free of dead spots, said light source being so located with respect to the margin of the reflector as to produce at least a spherical angle of illumination substantially of the order of a hemisphere.

CHARLES ADLER, JR.