

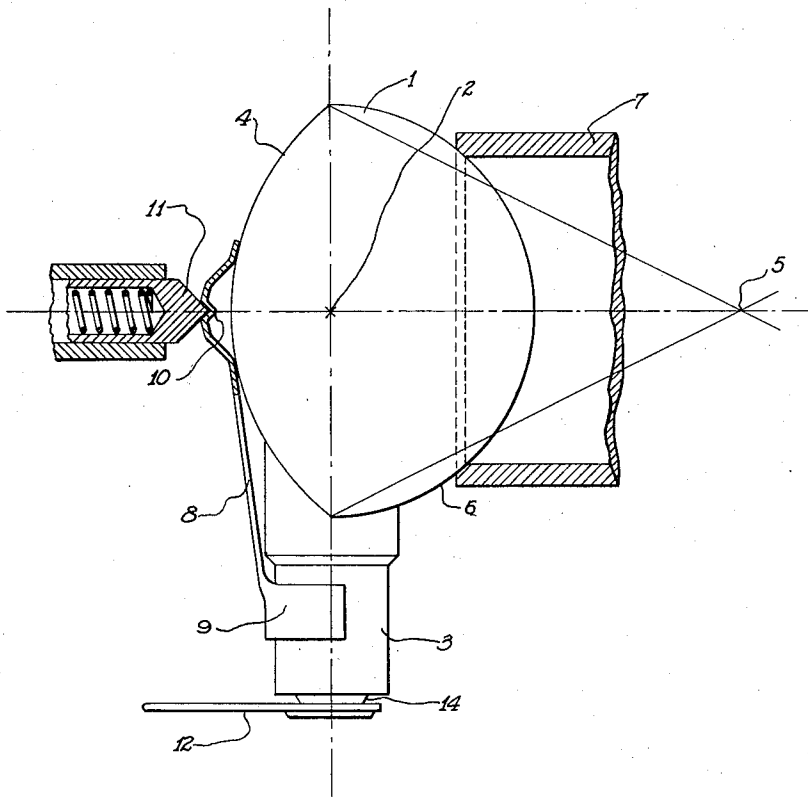
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OPTICAL LAMP WITH CENTERING MEANS

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OPTICAL LAMP WITH CENTERING MEANS

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The present invention relates to electric lamps comprising an integral optical member having an optical axis and its principal object is to provide such a lamp having means by which the position of the axis may be fixed in space. Other objects and advantages of the invention will appear from the following description of a species thereof.

A known form of optical apparatus comprises an optical system, for example a condenser, and an incandescent lamp which is fastened to the apparatus by its bulb. The bulb of the incandescent lamp has an incandescent body located in the center of a globe-shaped part thereof, which is pressed against a stop by a spring. The stop is, at least partially, in the shape of a ring. The power contacts have so much play that they cause no restriction as to the position of the incandescent lamp. With this construction it is possible to rotate the lamp around the center point of the globe-shaped part, that is, around the incandescent body, which is an advantage in many ways particularly in simplification of structure.

It has become apparent, however, that it is not desirable in mounting some incandescent lamps to allow rotation thereof in every direction although the advantages of the clamping of the bulb in place still remains. Thus, for example, it is desirable in incandescent lamps having an integral optical member or system with a pronounced axis that the position of this axis be fixed. Rotation of the lamp around the axis is, in general, not objectionable. The optical system may consist of a non-spherical mirror or a lens. In such lamps the light radiates in general from one side of the bulb.

This invention has to do with lamps of this kind and, in accordance with the invention, the lamp possesses a centering arrangement on the side opposite its light radiating side and by which the position of the axis can be fixed in space.

In lamps provided with a base, such a centering arrangement may be attached to one end of a bracket, the other end of which is fastened to the lamp base. The centering arrangement may have a centering point located in the continuation of the optical axis.

Such a lamp may be manufactured by first properly adjusting the centering arrangement and the optical axis with respect to each other and then fastening the centering arrangement to the lamp; for example, by soldering to the base the bracket which carries the centering arrangement.

In the single figure of the accompanying drawing a species of the invention is shown in an elevational, partly sectional view with the lamp bulb shown diagrammatically and with the optical apparatus shown only in part.

The lamp comprises an envelope or bulb 1, an incandescent body 2, such as a filament, and a base 3. A part 4 of the bulb 1 is in the form of an ellipsoid of revolution one focal point of which coincides with the incandescent body 2 while the other focal point is located at 5. The part 4 is silvered or aluminized inside so that an optical system is formed with the axis 2—5.

The lamp rests with a part 6 of the bulb against a support 7 in the form of a tube constituting part of the optical apparatus. The part 6 is hemispherical in shape. However, this shape is not essential for the invention as will be explained later.

A bracket 8 rests against part 4 of the bulb 1 and is fastened at its lower end to base 3 by two wings 9. The bracket has its upper end a centering recess having a center point 10 which is located in the continuation of the axis 2—5. This center point 10 is engaged by a spring pressed centering pin 11 mounted in the optical apparatus. It is essential that in such use of the incandescent lamp the image of the light source at point 5 be located accurately in the optical apparatus. The distance from this point 5 to the edge of the tube 7, which is used as the support, is determined during manufacture of the lamps, by centering the incandescent body 2 in the bulb 1.

Normally it is not necessary that this centering be done particularly accurately because there are no ill effects when point 5 is moved a little to the right or left. It is more important that the point 5 always be located at the same height and this height cannot be fixed accurately when the incandescent filament is mounted in the bulb.

When the centering arrangement is located on that side of the bulb 1 opposite the side from which the light is emitted this height can be fixed accurately. When only one center located in the extension of the optical axis is used, as shown in the drawing, the lamp may turn a little around the optical axis as far as the power connection parts permit, and this is seldom objectionable. When, however, such turning must be prevented, the centering arrangements may have a number of spaced notches or indentations.

The centering arrangement is mounted on that side of the bulb opposite the side through which the light is transmitted because it functions there

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most favorably. In general, rotation is possible when the lamp is fastened in this way and the axis of rotation coincides with the line connecting the center of the bulb and the center point of the centering arrangement. In the drawing it is the line connecting points 10 and 2. When this line coincides with the optical axis, point 5 will remain stationary when the lamp rotates about the line. If the point 10 of the centering arrangement was on the base 3, then the lamp could turn around a vertical axis and point 5 could then become displaced above or below the plane of the drawing.

When the part 6 of the bulb 1 is hemispherical and the light source 2 is located at its center then the light source will remain in its proper location if the bulb 1 rotates around line 10-2. Inasmuch as this rotation is prevented by the centering arrangement, it is normally not objectionable if part 6 has another shape. When the centering arrangement permits a rotation around the optical axis it of course is desirable that the globe part 6 be shaped as a body of revolution around the same axis.

The electric power may be applied to the lamp by means of contacts which hold the base 3 with some liberty to move; however, the centering arrangement may be used with advantage as one power contact by connecting pin 11 into the circuit, in which case only one spring contact 12 need engage the center contact 14 of the base 3.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. An electric lamp comprising in combination, an envelope having a light transmitting portion and including light-directing means defining a pronounced optical axis through the envelope, a light source located in the envelope on said optical axis and centering means mounted on the lamp and disposed on the side of the envelope away from its light transmitting portion and having a centering recess therein accurately located in said optical axis and engageable with a centering pin to predetermine the accurate positioning of the axis in an optical apparatus.

2. An electric lamp comprising, in combination, an envelope provided with a base and having a light transmitting portion and including light-directing means defining a pronounced optical axis through the envelope, a light source located in the envelope on said optical axis and a bracket mounted on said base and disposed on the side of the envelope away from its light transmitting portion and having a centering recess therein accurately located in said optical axis and engageable with a centering pin to predetermine the accurate positioning of said axis in an optical system.

3. An electric lamp comprising, in combination, an envelope provided with a base and having a light transmitting portion and including light-directing means defining a pronounced optical axis through the envelope and laterally of

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the base, a light source located in the envelope on said optical axis and a bracket mounted on said base and disposed on the side of the envelope away from its light transmitting portion and having a centering recess therein accurately located in said optical axis and engageable with a centering pin to predetermine the accurate positioning of said axis in an optical system.

4. An electric lamp comprising in combination, an envelope provided with a base and having a reflecting portion having a focus and an optical axis, a light transmitting portion opposite said reflecting portion, a light source mounted within said envelope and at said focus and a bracket mounted on said base and disposed in back of said reflecting portion and having a centering recess therein accurately located in said optical axis and engageable with a centering pin to predetermine the accurate positioning of said lamp and the said axis in an optical apparatus.

5. An electric lamp comprising, in combination, an envelope provided with a base and having an elliptical reflecting portion with a focus in the envelope and an optical axis, said envelope having also a hemispherical light transmitting portion opposite said reflecting portion with its center at said focus, a light source mounted within said envelope and at said focus and a bracket mounted on said base and disposed in back of said reflecting portion and having a centering recess therein accurately located in said optical axis and engageable with a centering pin to predetermine the accurate positioning of said lamp and the said axis in an optical apparatus.

6. An electric lamp comprising in combination, an envelope having an elliptical reflecting portion with a focus in the envelope and an optical axis, said envelope having also a neck extending outwardly laterally of said axis and a hemispherical light transmitting portion opposite said reflecting portion with its center at said focus, a light source mounted within said envelope and at said focus, a base mounted on said neck and a bracket mounted on said base and disposed in back of said reflecting portion and having a centering recess therein accurately located in said optical axis and engageable with a centering pin to predetermine the accurate positioning of said lamp and the said axis in an optical apparatus.

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