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C. J. BRIEFER

2,115,839

ELECTRIC LAMP

Filed April 27, 1936

Fig.1.

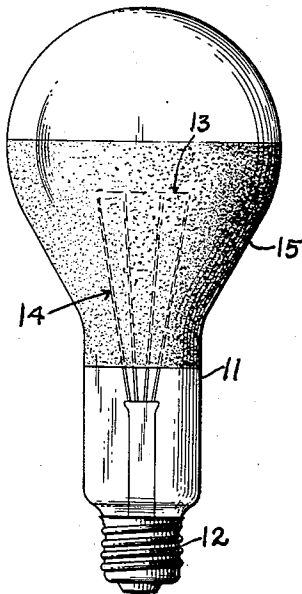


Fig.2.

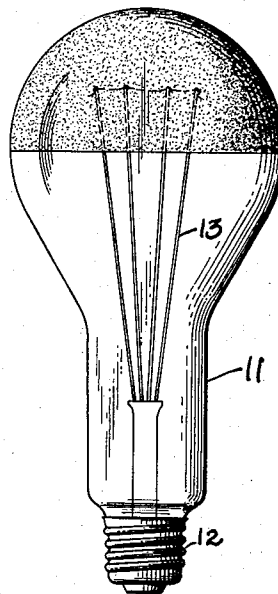
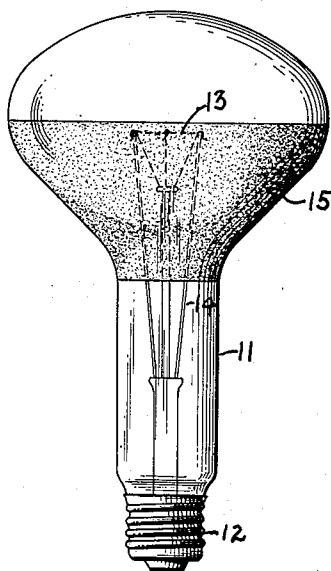


Fig.3.



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ELECTRIC LAMP

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Application April 27, 1936, Serial No. 76,610

4 Claims. (Cl. 176—34)

This invention relates to an electric lamp.

It is an object of this invention to provide a lamp giving a greater amount of useful light in the direction of desired illumination for a given desired consumption and useful life.

It is a further object to provide a light which will produce a more continuous illumination during the normal life of the lamp without obstruction by blackening of the bulb.

It is a further object to produce a new and improved gas filled lamp of the character described which will have a greater efficiency in proportion to the intended life.

It is a further object to provide a lamp which, while having the greater portion of the light distributed in the direction of desired illumination, will permit an ornamental illumination in other directions.

This invention is in part a continuation of my co-pending application Serial #25,592, filed June 8th, 1935.

The invention accordingly comprises the several steps and relation and order of one or more of such steps with respect to each of the others, and the article possessing the features, properties, and the relation of elements, which are exemplified in the following detailed disclosure, and the scope of the application of which will be indicated in the claims.

For a fuller understanding of the nature and objects of the invention, reference should be had to the following detailed description, taken in connection with the accompanying drawing, in which:

Figure 1 is a side elevation of a lamp embodying this invention intended to distribute illumination in the direction of the end of the bulb.

Figure 2 is a similar view of a lamp designed to distribute the illumination toward the base of the bulb.

Figure 3 is a similar view showing the application of the invention to a bulb of the so-called mushroom type.

In the drawing the numeral 11 indicates a bulb of pear shape having at one end a base 12 and a filament 13 supported upon standards 14.

In a lamp in accordance with this embodiment of the invention, the bulb is over-size compared to the filament, that is, for example if a 100 watt lamp is to be made, the bulb chosen will be that normally used for a 150 watt lamp; or if a 200 watt lamp is to be manufactured, a 300 watt bulb may be employed.

Bulbs for lamp manufacture are made in certain standardized sizes rated for the wattage of

the filament with which they are intended to be used and in general this is the rating which in normal lamps without a reflector produces the greatest efficiency of illumination.

I am unable to state with definiteness just how much oversize would produce the best effect since I am limited by the standard sizes of bulbs available. Thus, in making a 100 watt lamp for an oversize bulb, I have had the choice of either using the 150 watt bulb or the 200 watt bulb and in general in the smaller size I have found, in this reflector lamp, that the results attained by this invention are best attained when the next size larger bulb is used. Accordingly, when the word "oversize" bulb is used in this specification, I employ in practice a size bulb of the next higher rating above that customarily used for the filament employed, but it will be understood that any variation therefrom which attains the same result will be within the scope of the invention.

In accordance with this invention, a portion of the bulb is coated with a reflecting surface 15, preferably by depositing a coating of silver upon the interior surface of the glass. Within the scope of this invention, any method may be employed to produce this result, as for example the method disclosed in the co-pending application above referred to. In accordance with that process, the coating is first applied to the interior surface all over or almost all over the interior of the lamp, and thereafter the coating is removed from those portions which are to remain clear. The lamp is then constructed from the bulb, evacuated and filled with gas in the usual manner.

As shown in Figure 1, the outer end of the bulb is clear, the reflecting surface being confined to the portion adjacent to the base. In Figure 2, on the contrary, the reflecting surface is carried only on the outer end of the bulb, leaving the portion toward the base clear.

In either modification, the filament is placed substantially in the effective focus of the portion of the bulb which remains coated. It will be understood that with the ordinary shape of bulb the glass does not conform accurately to a true parabola so that no exact focus exists, nevertheless this is a matter of small importance because an effective focus can be found sufficiently definite to concentrate the maximum part of the light in the direction desired.

When a pear shaped bulb is used, the filament will be found to be situated well within the coated portion of the bulb, being thus held much closer

to the base of the bulb than usually when the base of the bulb is coated and extending much further outwardly toward the tip end of the bulb when the outer portion is coated. Roughly

speaking, when the end of the bulb is coated, the filament will be situated approximately one half the distance between the center of the bulb of the spherical portion of the bulb and the outer end of the bulb, and when the base portion of the bulb is coated, the filament will be situated approximately an equivalent distance inwardly toward the base from the center.

The reason for the increased effective illumination with the oversize bulb is not thoroughly understood by reason of the fact that when a bulb is used without a reflector, the use of the oversize bulb may somewhat increase the life but it actually reduces the efficiency of the illumination.

Applicant has found that with this new reflecting lamp the oversize bulb actually increases the effective illumination.

In Figure 3 the bulb employed is of the so-called mushroom type in which the lower portion of the bulb is in the form of a flattened spheroid. Such bulbs have been heretofore employed in the manufacture of lamps with the filament placed substantially in the center of the spheroid. In making a lamp of this invention with the mushroom bulb, however, the filament is placed in substantially the effective focus of the reflecting surface, which as illustrated in Figure 3, will bring it within the coated portion of the bulb where one-half of the bulb is coated. With such a bulb I can obtain the effective benefits of the oversize bulb by changing the position of the filament to near the effective focus while in fact using the standard size bulb for the filament, since mushroom bulbs have substantially the same curvature of bulb at the critical points that the oversize bulb would have for the same filament.

A possible explanation of the greater effectiveness of this lamp when employed with an oversize bulb may be due to the greater circulation of the gas content of the bulb around the filament which may play some part in assisting in the cooling of the filament, counteracting the reflected rays from the mirrored surface.

In either character of lamp, I have found a new and remarkable effect is produced, namely that such a lamp is substantially free from the liability of a black deposit upon the bulb during the life of the lamp. The exact reason for this remarkable effect is not positively understood, but the explanation is believed to be somewhat as follows.

One of the most objectionable residual gases in the tungsten lamp is water-vapor, because of its tendency to react with the tungsten to form a volatile lower oxide of tungsten. This oxide is deposited upon the cooler parts of the bulb and is subsequently reduced to metal by the hydrogen resulting from the interaction between the water-vapor and the tungsten filament. In the ordinary tungsten lamp this reaction regenerates the water-vapor leaving it free again to react with the tungsten to form more oxide. Silver, however, has a high affinity for gas, especially at high temperature. For example, it is common practice when melting silver to immerse into the silver a lump of sponge iron to prevent the silver

from spitting on cooling. It is therefore proper to conclude that the finely divided silver layer on the glass absorbs the water-vapor, thereby preventing its reaction with the tungsten filament. In any event, regardless of cause, it has been clearly demonstrated that these lamps having the interior deposit of metallic silver, are remarkably free from blackening by tungsten deposit.

In any of these lamps of this character, I have found that a new ornamental effect can be obtained when desired by confining the silver to a thickness which, while reflecting substantially all of the useful light, will, nevertheless, permit a sufficient light to penetrate the film to give a pleasing illumination. This effect prevents the sharp line of demarcation between the illuminated and the un-illuminated area, and instead blends the one area into the other with good effect.

Since certain changes in carrying out the above process and certain modifications in the article which embody the invention may be made without departing from its scope, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the invention herein described, and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

What I claim and desire to secure by Letters Patent is:

1. A gas filled incandescent lamp having a coiled tungsten filament and a pear-shaped bulb substantially one size greater than the standard sized bulb for the filament employed and having a material portion of the bulb coated upon its interior with a reflecting surface and the remainder of the bulb free from such reflecting surface, the filament being disposed substantially in the focus of the coated portion of the bulb.

2. A gas filled incandescent lamp with a coiled tungsten filament and a bulb having a portion of its surface coated upon its interior with a reflecting surface, said portion having a radius of curvature substantially the same as the radius of curvature of the next size larger pear-shaped bulb for the same filament, the filament being disposed substantially in the focus of the coated portion of the bulb.

3. A gas filled incandescent lamp having a coiled tungsten filament and a bulb having a portion of its surface coated upon its interior with a deposit of metallic silver, said portion of said surface having a radius of curvature substantially equal to the radius of curvature of the next size larger pear-shaped bulb, whereby the presence of the metallic silver substantially prevents blackening of the bulb throughout the life of the filament.

4. A gas filled incandescent lamp having a coiled tungsten filament and having a material portion of its inner surface coated with a deposit of metallic silver, the metallic silver serving as a means to substantially prevent blackening of the bulb throughout the life of the filament.

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