March 31, 1931. S. LYMAN 1,798,745

INCANDESCENT ELECTRIC LIGHT BULB

Filed Aug. 5, 1927 2 Sheets-Sheet 1

Fig. 1.

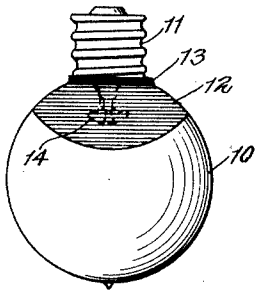


Fig. 2.

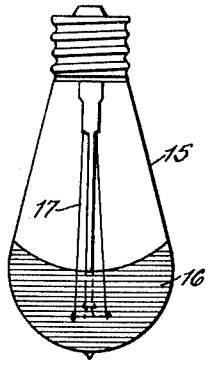


Fig. 2a.

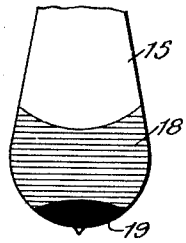


Fig. 3.

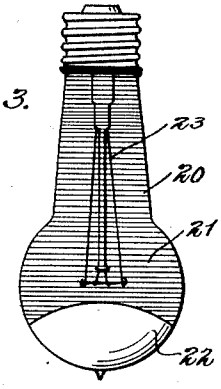


Fig. 4.

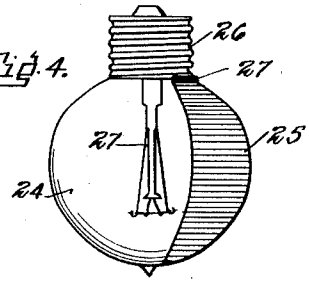


Fig. 5.

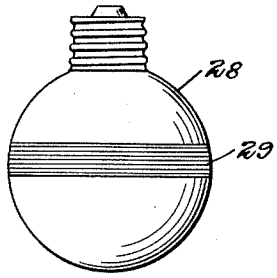


Fig. 6.



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INCANDESCENT ELECTRIC LIGHT BULB

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Fig. 7.

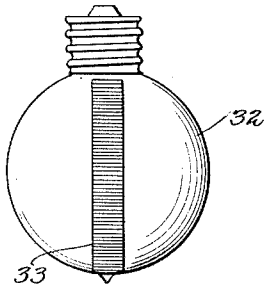


Fig. 8.

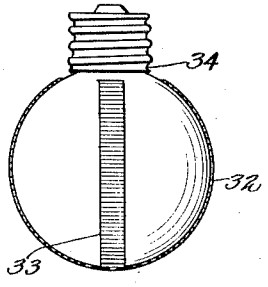
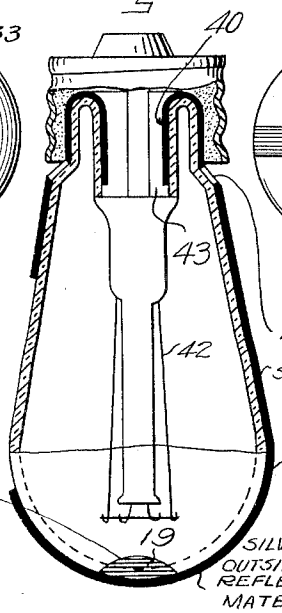


Fig. 12



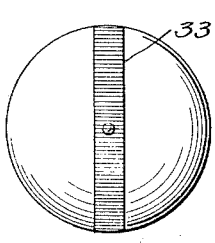


Fig. 9.

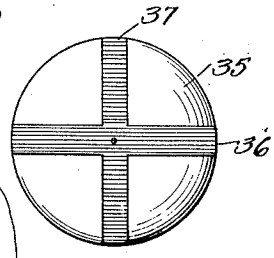
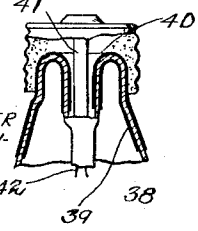


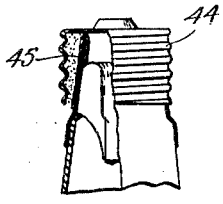
Fig. 10.

Fig. 11.



NON-REFLECTING MATERIAL

Fig. 13.



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UNITED STATES PATENT OFFICE

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INCANDESCENT-ELECTRIC-LIGHT BULB

Application filed August 5, 1927. Serial No. 210,868.

My invention relates to improvements in electric light bulbs; preferably of the incandescent type, to be used for electric signs, automobile lights, decorative lamps and in many other ways for commercial as well as private use, and it is the principal object of my invention to provide such bulbs in which the power of the electric light rays is most economically used to fullest extent with the least loss of effective rays.

Another object of my invention is the provision of electric light bulbs of any shape, make and color in which the reflecting surface is made of any suitable reflecting material and is either arranged on the outside or inside of the bulb; and if provided on the outside, an insulating space of a dimension and material is provided suitable to prevent injury to persons by shocks when they accidentally touch the mirrored surface while being in contact with another conductor of electricity.

A further object of my invention is the provision of an electric incandenscent lamp bulb in which the mirrored or silvered reflecting surface is arranged in many different ways as for instance to cover the upper or the lower part of the bulb, one side thereof, the greater part of the bulb, or constituting a laterally disposed band, or two longitudinally extending intersecting bands, or one vertically guided band, or in any other desired and suitable way.

A still further object of my invention is the provision of a silvered or mirrored incandescent electric light bulb, equipped at its bottom with a rim or part of a non-reflecting material in order to avoid waste of valuable light rays which are in the usual lamp bulbs reflected forth and back between the bottom and the tip of the bulb without being thrown to the outside.

It is furthermore, also one of the objects of my invention to make the reflection of the light rays by the silvered parts most effective by carrying the silvering into the bulb to avoid dark spots in the inside of the same near the socket covering the filament holder tube either on the outside or inside of the bulb with a reflecting material, and in the latter case, providing a suitable insulation preventing any part of the filament from touching the silvered surface to avoid short circuits.

It is also one of the objects of my invention to provide incandescent electric light bulbs having the unmirrored or unsilvered parts thereof made of clear glass or colored glass, so that one, two, three, four or more fields are created through which the light rays are reflected in order to give highly ornamental and pleasant light effects for decorative purposes as for instance on Christmas tree or other ornaments.

It is furthermore also one of the objects of my invention to provide incandescent electric light bulbs in which the silvered or mirrored portions are constituted by flowers, birds, etc., in order to create highly decorative light effects.

These and other objects and advantages of my invention will be more fully described as the description thereof proceeds, and will then be specifically defined in the appended claims.

This invention also relates to improvements in incandescent light bulbs the base of which is equipped with a spring to ensure at all times a proper electric connection if for instance it is desired to rotate the bulb in order to focus the light rays upon a desired object at a certain locality, as for instance in electric signs etc.

In the accompanying drawings, forming a material part of this disclosure:

Figure 1 illustrates a modified form of the bulb shown in Figure 12.

Figure 2 is a side elevation of such a lamp with a bulb of different shape with the silvering at the lower part thereof.

Figure 2*a* illustrates a modified form of the bulb shown in Figure 2.

Figure 3 is a side elevation of a lamp with the silvering covering the larger part of the lamp and the bulb having a still different shape.

Figure 4 is a side elevation of another modification of my invention with the silvering covering one side of the bulb from the tip to the base.

Figure 4*a* illustrates a modified form of the bulb shown in Figure 4.

Figure 5 illustrates a lamp bulb in which the silvering appears as a median band encircling the bulb.

Figure 6 shows another modification of my invention with a plurality of decorations.

Figure 7 illustrates a lamp bulb with the mirror band extending from the tip around the bottom to the tip again on the opposite side thereof.

Figure 8 is a modification of the form illustrated in Figure 7 leaving an insulating space near the tip.

Figure 9 is a bottom plan view thereof.

Figure 10 shows a still further modification of my lamp bulb with the mirrored part in two intersecting strips constituting at the bottom part of the bulb the form of a cross.

Figure 11 shows in side elevation, partly in section, a modified form in which the silvering or mirror extends into the bulb to cover part of the filament holder tube.

Figure 12 shows an incandescent lamp according to my invention.

Figure 13 shows in sectional view, the extension of the mirrored part into the lamp socket.

As illustrated in Figure 1, the customary lamp bulb 10 having the usual base 11, has its upper part mirrored or covered by a light reflecting substance 12, which may be applied at the outside or inside of the bulb. If the silvered part is at the outside of the bulb, an insulating space 13 of about ⅛″, more or less, according to voltage should be left to avoid accidental shocking of persons.

The location of the filament 14, which is preferably of horse-shoe-shape, which however may just as well have any other preferred and customary shape, is either as shown as close as possible to the base of the bulb within the shaded part thereof or may extend to the middle of the same or to near the bottom end thereof. The glass of the bulb may either be clear or in any preferred color or colors. The silvering may also cover, instead of the upper part of the bulb only, the major part of the same without departure from my invention, in which case the bottom opening leaves just a passage for the light rays to pass. This bulb may be used for many purposes, as for instance automobile head lights, electric signs, flash lights, in short all standard lights, and the silvered portion near the upper end of the bulb will throw the light rays in the manner of a reflector through the clear part of the bulb straight ahead, so as not to waste any of the light rays to make the lamp as efficient as possible.

As illustrated in Figure 2, a modified form of bulb 15 preferably of the commonly used lamp type, has its lower part silvered or mirrored, as at 16, with the filament 17 extending to nearly the bottom end of the bulb within the mirrored part.

It will be clear that my bulb may have just as well any other form, the main object being to throw the light rays upwards, or backwards, or sidewise.

Also this lamp may be used with clear or colored glass and for any suitable purposes.

As shown in Figure 2*a*, the bulb has a mirrored part 18 while the bottom of the bulb is covered by a non-reflecting material indicated at 19. This is done by proper filament adjustment as shown in Figures 1, 2, and 6 for the purpose of preventing any loss of reflecting light rays by throwing the light vertically forth and back between tip or socket and bottom and thus allowing the reflection of all useful rays through the clear glass, so as not to lose any of the light effects.

As shown in Figure 3, the bulb 20 has a shape different from the bulbs in Figures 1, 2, and 2*a*, and has the greater part of its surface mirrored, as at 21, to leave at the bottom of the bulb a space of clear glass designated 22 through which the light rays are focused. The filament 23 of this bulb may extend within the silvered part close to the clear space or may have any other suitable length, in order to reflect the concentrated light rays efficiently through the bottom of the bulb.

In the form of my invention illustrated in Figure 4, the bulb 24 is silvered, as at 25, on a portion to one side of its longitudinal median line extending from the socket 26 to the bottom of the bulb, and if the silvered portion is provided on the outside of the bulb, also in this form, a suitable insulating space 27 must be left in order to protect injury to persons, accidentally touching the silvered surface and any conducting part, from shocks, etc.

The filament 27 in this form of my invention is brought down as close as possible to the end of the bulb in order to let the reflector reflect its rays to the side or up and down in the most efficient way, or it may be either arranged in the center or up and down or as close as possible to the reflecting surface.

In Figure 4*a* the form of bulb illustrated in Figure 4, has its base equipped with a spring 28 in order not to interrupt the current when the bulb is to be adjusted so as to turn its clear face upon any object in any direction desired or required, particularly when used with electric signs etc.

In the form of my invention illustrated in Figure 5, the bulb 28 has the mirrored part in the form of a band encircling the bulb laterally in approximately the center thereof to throw the light rays from any filament, preferably one extending to opposite the mirrored part in all directions through the clear glass or the colored glass, if color effects are desired, as for instance in lamp bulbs to be used on Christmas trees or the like.

In my bulb 30, illustrated in Figure 6, the mirrored effect is produced by silvered birds 31, flowers or any other decorative or allegoric figures for ornamental purposes, any suitable filament may be used in this lamp.

In the form of my invention illustrated in Figures 7, 8, and 9, the bulb 32 has a mirrored band 33 encircling the bulb in vertical direction as a band of any desired width and either ending close to the base, if the mirrored band is provided inside of the bulb, or spaced from the base by an insulating space indicated at 34, if it is arranged on the outside of the bulb in order to avoid accidental shocks and eventual injury to persons touching the mirrored surface and a conductor. The mirrored surface may also be covered entirely by any suitable insulating material. The glass of this bulb may also be clear or colored in any suitable manner to suit the occasion and requirement.

In Figure 10, I have shown a light bulb 35 of any desired shape and color having mirrored bands 36 and 37 encircling the bulb on the outside or inside thereof to leave four fields through which the light rays may be reflected which may be vari-colored or clear according to selection in order to produce pleasing color effects so desirable for instance with lights for decorative purposes as for instance on Christmas trees etc.

In Figure 11 I have shown the bulb 38 having a mirrored or silvered part 39 extending over the upper outer face of the bulb and into the same to cover the outer face of the glass tube 40 surrounding the filament holder 41 for the filament 42. It will be clear that the mirrored part may also extend, as shown in Figure 12, to the inside of the filament stem tube either partly or to the end of the stem, in which case a proper insulation for the filaments, indicated at 43, must be provided in order to avoid short-circuits.

In Figure 13 the extension of the mirrored surface into a lamp base 44 is illustrated as at 45, and in this case the same is entirely covered by an insulating substance.

It will be clear from the above description, that I have created in this manner an incandescent electric light bulb, the silvered or mirrored part of which may either be arranged on the outside or the inside of the bulb and when arranged on the outside of the bulb is insulated by a properly acting insulating material of more or less width and form as for instance a ring, or any other suitable shape preventing injury to persons by shocks and an insulation which, when extending into the base etc., is insulated therefrom to prevent short-circuiting of the lamp.

The bulbs according to my invention will reflect all useful light rays strongly to the outside without any loss of useful rays while color effects can be obtained thereby of any desired constellation thus making my lamp especially well adapted for ornamental and decorative purposes. A positive conducting of the current is at all times ensured by the spring mounted base, and while I have shown this arrangement with one form only it will be clear, that the same may be used with all the forms illustrated, so that the lamps may be turned in order to direct their rays at any desired point. It will be likewise evident that any kind of filament may be used, and that the dimensions of the same, may be selected according to occasion to suit the special purpose.

It is to be understood that while I have shown and described some of the preferred forms of my invention, as examples of the many ways in which my invention may be practically constructed, I do not wish to limit myself to the exact constructions disclosed but wish to reserve my right to make such changes in my lamps as come within the scope of the appended claims without departure from the spirit of the invention and the principles involved.

It will be evident that the reflecting surfaces to be used on the top, bottom or side of the bulbs can be made in spider form or circular by an arrangement of a plurality of concentric circles or by arranging a rectangular or other angular figure within the spider, to many times increase the reflecting effect.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent is:—

1. In an incandescent electric light bulb, a base, a reentrant portion in said base, a silvered reflecting surface on the reentrant upper portion of the base section of the bulb and carried thereon to the filament holder.

2. In an incandescent electric light bulb comprising an exhaust stem, a reentrant tube surrounding the latter and a silvered reflecting surface on the reentrant upper portion of the base section of the bulb and carried thereon to the stem and insulation to separate said surface from the filament on said stem and said base of said bulb.

3. An electric incandescent lamp comprising a bulb, a filament stem, a reentrant upper portion formed within said bulb, a silvered layer on said bulb, and a silvered layer carried on said reentrant upper portion, both silvered layers separated by a non-silvered portion of the bulb constituting an insulation.

4. An electric incandescent lamp comprising a bulb, a filament holder, a tube surrounding said holder, a silvered surface extending over part of the outer face of said bulb, a reentrant upper portion formed within said bulb, a silvered layer surface carried by said reentrant portion on the outer and inner face thereof, both silvered sur-

faces separated by a non-silvered portion of the bulb constituting an insulation.

5. An electric incandescent lamp comprising a bulb, a filament holder therein, a reentrant upper portion formed with said bulb, a silvered layer on part of the outside of said bulb, a silvered layer on the outside of said reentrant portion, both silvered layers separated by insulation, and a covering of non-reflecting material for the outer face of the lower part of said bulb for stopping reflection in said bulb.

6. In an incandescent electric light bulb, a base, a reentrant portion in said base, a reflecting surface on the outer side of the bulb, and a reflecting surface on the reentrant upper portion of the base section of said bulb, the surface on said reentrant upper portion separated by an insulation from the surface on the outer side of said bulb.

Signed at New York in the county of New York and State of New York.

SAMUEL LYMAN.