

July 19, 1960

D. W. MOFFATT

2,945,946

LAMP

Filed July 22, 1957

2 Sheets-Sheet 1

FIG. 1

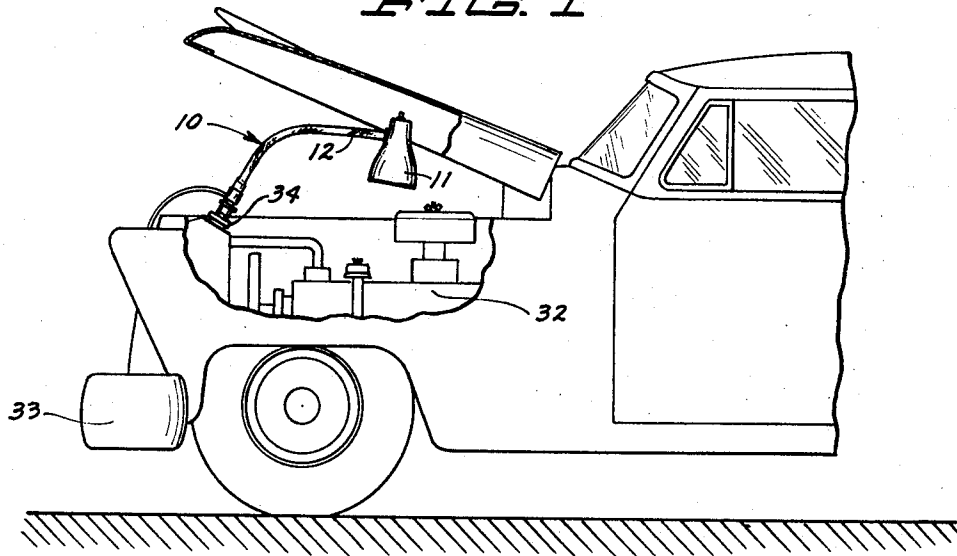


FIG. 2

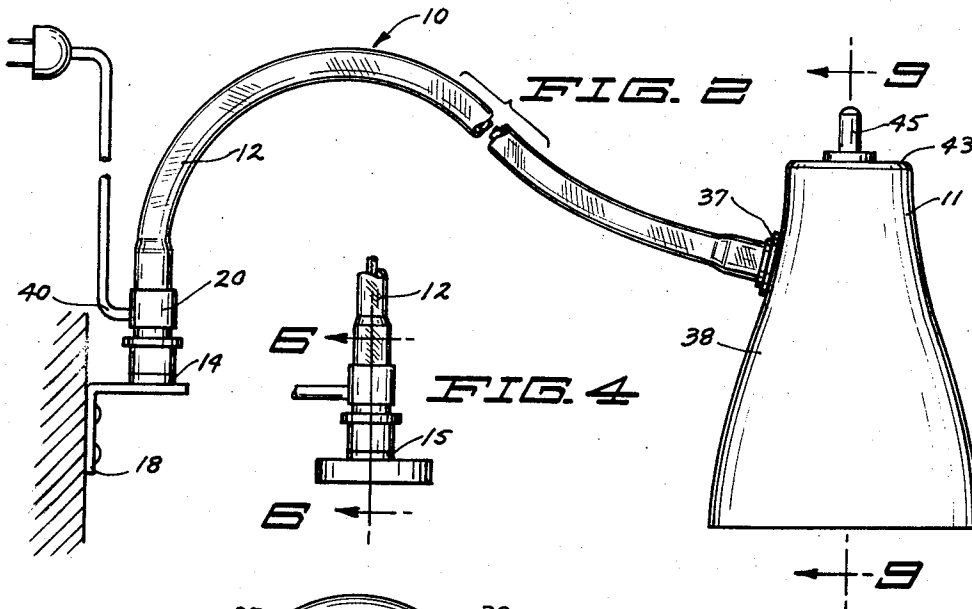
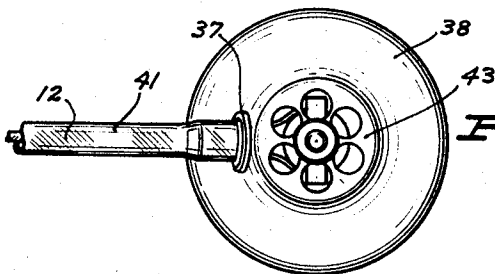


FIG. 3



INVENTOR.
DILLON W. MOFFATT

BY
Braddock and Braddock
ATTORNEYS

July 19, 1960

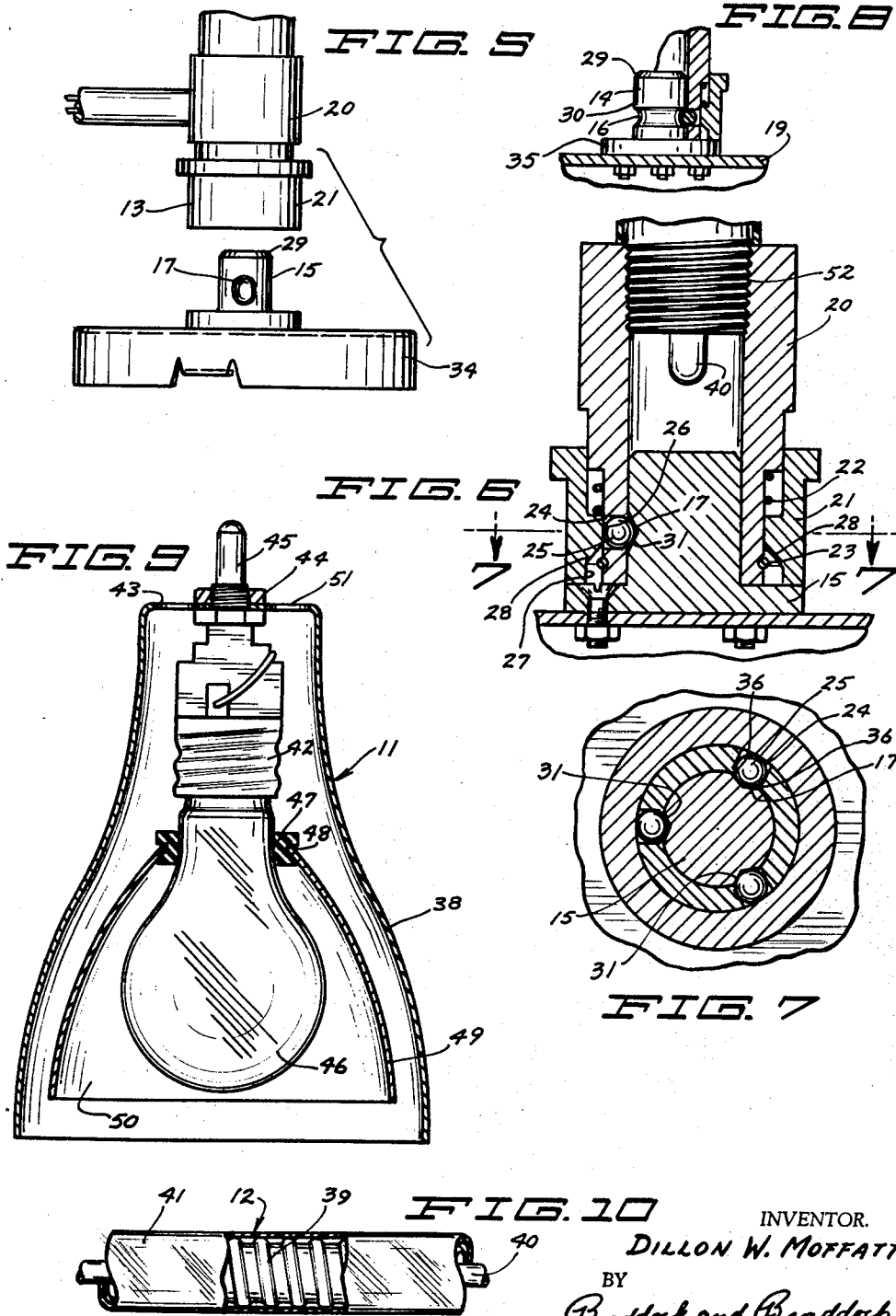
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INVENTOR.
DILLON W. MOFFATT
BY
Braddock and Braddock
ATTORNEYS

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Dillon W. Moffatt, 4824 Triton Drive,
Minneapolis 22, Minn.

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3 Claims. (Cl. 240—47)

This invention has relation to electrical lamps and more particularly to an adjustable electrical lamp which can be substantially instantaneous removably positioned on any one of a plurality of fixed lamp supports to allow for the utilization of one lamp in several locations as the need for illumination demands.

A lamp made according to the present invention utilizes an incandescent bulb mounted in an inner shade in sealed relation thereto to prevent any passage of air between this incandescent bulb and the inner shade. This eliminates the collection of dust on the surface of the bulb and on the reflecting surface of the inner shade. The lamp is also provided with an outer shade spaced from said inner shade so that cooling of the lamp is obtained by passage of air by convection between said inner and outer shades.

A relatively high friction flexible connecting arm connects a coupler assembly with the shade assembly, and a plastic tubing seals the outer surface of this flexible arm from the coupler assembly to the shade assembly to prevent loss of friction in the arm and so prevent sagging of the shade assembly.

The coupler assembly includes a slidable coupler sleeve which can be manually displaced to allow for instantaneous coupling and decoupling from a more or less permanently mounted boss. This boss may be provided with a mounting groove, in which case the coupler assembly will be freely rotatable thereon through 360°; or may be provided with a plurality of dimples, in which case the coupler assembly will not rotate with respect to the boss. The coupler assembly can alternatively be positioned on either the grooved or dimpled boss as desired.

In the drawings,

Fig. 1 is a side elevational view of a lamp made according to the present invention when mounted on a boss which is fixedly mounted to a special radiator cap of an automotive vehicle, and when the lamp is in position to furnish illumination for the performance of repair work on that vehicle;

Fig. 2 is a side elevational view of the lamp with parts broken away showing the lamp mounted on a boss permanently affixed to a wall mounted bracket;

Fig. 3 is a fragmentary top plan view of the lamp shade assembly and a portion of the flexible connecting arm;

Fig. 4 is a fragmentary side elevational view of the coupler assembly mounted on a boss permanently affixed to a special radiator cap;

Fig. 5 is an enlarged fragmentary sectional view of the coupler assembly and the dimpled boss of Fig. 4 when disconnected from each other;

Fig. 6 is an enlarged vertical sectional view taken on the line 6—6 in Fig. 4;

Fig. 7 is a horizontal sectional view taken on the line 7—7 in Fig. 6;

Fig. 8 is a side elevational view of a grooved boss and a fragmentary sectional view of a coupler assembly thereon;

Fig. 9 is a vertical sectional view taken on the line 9—9 in Fig. 2; and

Fig. 10 is a fragmentary view of a portion of the flexible connecting arm, with parts in section and parts broken away.

Referring now to the drawings and the numerals of reference thereon, a lamp 10 includes a lamp shade assembly 11, a flexible connecting arm 12, and a coupler assembly 13. This coupler assembly 13 is so constructed that it can be locked onto a more or less permanently mounted boss. When it is desired that the entire lamp including the coupler assembly be rotatable 360° with respect to the boss, the grooved boss 14 of Figs. 2 and 8 will be used. When it is desired that the lamp and the coupler assembly will not be rotatable with respect to the boss, the dimpled boss 15 of Figs. 4, 5, 6 and 7 will be used. The bosses are identical except that the boss 14 has an annular groove 16 therearound and the boss 15 has a plurality (three as shown) of dimples 17 therein.

In most installations, it will be possible to mount the boss in a horizontal position. This position of mounting is shown in Fig. 2 where the grooved boss 14 is fixedly positioned on the mounting bracket 18 and in Fig. 8 where the grooved boss 14 is fixedly positioned on a horizontal mounting bracket or plate 19. In this situation, it will usually be desirable that the lamp be rotatable throughout 360° with respect to the boss, and boss 14 will be employed. In some situations where the boss is horizontally mounted, however, and in the situation illustrated in Fig. 1, where the boss is mounted to a radiator cap which is canted, it will be desirable that the lamp and coupler assembly do not rotate with respect to the boss. In this situation, the dimpled boss 15 will be used. Although the grooved boss is probably the one which will find most use, the dimpled boss and the operation of the coupler assembly with respect thereto will be explained first for purposes of clarity.

The coupler assembly 13 is identical regardless of whether the dimpled boss 15 or the grooved boss 14 is associated with it. In fact, the same coupler assembly 13 may be used on each of the bosses alternatively and interchangeably. The coupler assembly 13 includes a coupler conduit 20 and a coupler sleeve 21 slidably mounted thereon. A spring 22 resiliently urges coupler sleeve 21 outwardly from conduit 20, and snap ring 23 rests in a groove in the coupler conduit 20 at position to prevent the springs 22 from pushing the coupler sleeve 21 off of the conduit 20.

The coupler conduit 20 is provided with a plurality of radially extending holes 24 therethrough. Each of these holes has a steel ball 25 positioned therein, and a lip 26 around each of the holes at the inner surface of the conduit 20 prevents the steel balls from passing through the holes. The coupler sleeve is so constructed that when the spring 22 has carried the sleeve to or near the limit of its travel in direction away from the remainder of the lamp, a cylindrical surface 26 will be in covering relationship to at least a major portion of each of the holes 24 in the coupler conduit. This coupler sleeve 21 can be moved manually against the action of the spring 22 in upward direction as seen in Fig. 6. This movement, when carried to its limit, positions a cylindrical surface 27 in alignment with and spaced from each of the holes 24 in the coupler conduit. Connecting the surface 26 and the surface 27 is a conical cam surface or ramp 28.

Referring now to the boss 15 as disclosed in Figs. 5, 6 and 7, the top outer edge thereof is comprised as a tapered surface 29. A similar tapered surface 29 constitutes the outer upper portion of the boss 14. A cylindrical outer surface 30 of each of the bosses 14 and 15

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is broken or interrupted by the groove 16 in the boss 14 and by the dimples 17 in the boss 15. The dimples 17 are constituted as cone-shaped depressions each defined by a conical wall 31.

The normal position of the coupler assembly 13 when the lamp is demounted from any boss is indicated in Fig. 5. When in this position, each of the balls 25 will be located in one of the holes 24 in the coupler conduit 20 between the lip 36 and the cylindrical surface 26 of the coupler sleeve 21. In order to utilize the lamp to best advantage doing repair work on the engine 32 of the automobile 33, a radiator cap 34 as seen in Fig. 1 and Fig. 5 is constructed with a dimpled boss 15 mounted thereon and integral therewith. To mount the lamp 10 on this radiator cap 34 and its boss 15, the coupler sleeve 21 will be moved in upward direction as seen in Fig. 5 with respect to the coupler conduit 20 against the action of the spring 22. This will position the cylindrical surface 27 of the coupler sleeve in alignment with the hole 24, and will allow freedom for the ball 25 to move clear of the inner cylindrical surface of the coupler conduit 20. This coupler assembly will now be moved down over the boss 15, and the tapered surface 29 of the outer end of the boss will come in contact with any of the balls 25 which have not rolled clear of the inner cylindrical surface of the conduit 20 and will force them back into their holes 24 adjacent the cylindrical surface 27 to allow passage of the boss 15 into the coupler conduit 20. The coupler sleeve 21 will then be released to allow the spring 22 to move it in downward direction as seen in Figs. 5 and 6, to cause the conical ramp 28 to come in contact with each of the balls 25 to move them radially inwardly toward the boss 15. If the dimples 17 are not in alignment with the holes 24 the balls will strike on the outer cylindrical surface 30 of said boss and the coupler conduit will come to rest with the ramp 28 still in contact with the balls 25. The coupler assembly 13 can then be rotated with respect to the boss 15, to cause the holes 24 and the steel balls 25 to become aligned with the dimples 17. When this happens, the balls 25 will move into the dimples and will contact the conical surface 31. This will allow clearance for the ramp 28 to slide down past the balls. Each ball is then firmly positioned between the sides of the hole 24, the conical surface 31 of the dimples 17, and the cylindrical surface 26 of the coupler conduit 20. Since the cylindrical surface 26 is immediately adjacent to or in contact with the steel balls 25, it is obvious that the balls are incapable of moving out of the dimples 17 as long as the coupler sleeve 21 is positioned as seen in Fig. 6. This means that there can be no movement whatsoever of the coupler sleeve 21 with respect to the boss 15. Any adjustment of the flexible connecting arm 12 and the lamp assembly 11, therefore, will not be disturbed by movement of the coupler assembly 13 with respect to the mount which is constituted as the radiator cap 34 and the dimpled boss 15. As previously stated, this arrangement is particularly advantageous when the radiator cap 34 is canted as shown in Fig. 1.

When it is desired that the light be mounted so that it will rotate freely about its base, the boss 14 will be employed. This boss can be mounted on a radiator cap also, and this is usually the preferable arrangement when the radiator cap is maintained in a level position as is the case in most automobiles. This boss 14 can also be mounted on a horizontal mounting plate 19 as shown in Fig. 8, or on a mounting bracket 18 as is seen in Fig. 2, or on a flat table top. A screw or bolt or any other conventional means can be used to secure the boss in the desired position, and this means forms no part of the present invention.

In order to secure the coupler assembly to the boss 14, the coupler sleeve 21 is moved against the action of

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the spring in upward direction as seen in Fig. 8 to cause the cylindrical surface 27 of the coupler sleeve to be positioned in alignment with the holes 24 and the steel balls 25. The coupler conduit is then slid down over the boss 14 until the bottom end of the conduit comes in contact with a flange 35 extending outwardly from the cylindrical surface 30 of the boss. With these parts so positioned, the holes 24 and the steel balls 25 will be in alignment with the groove 16 in the boss 14. When the coupler sleeve 21 is released, and the spring 22 carries it in downward direction as seen in Fig. 8, the ramp 28 will force the balls 25 into groove 16, and the balls will each be fixedly positioned between the curved surface of the groove 16, the sides of the holes 24, and the cylindrical surface 26 on the interior of the coupler sleeve 21. The balls will then be free to rotate and roll on the cylindrical surface 26 and the groove 16.

Referring now to Fig. 2, the flexible connecting arm 12 and the lamp shade assembly 11 can be moved until the lamp and the inner reflecting surface of the lamp shade assembly are directing light exactly on the point where it is needed. Should the lamp need to be displaced from that location momentarily to allow for the moving of awkward equipment to be worked on into the field of light of the lamp, the lamp shade assembly and connecting arm will simply be rotated about the axis of the boss 14. This will not disturb the relationship of the flexible arm 10 and the lamp shade assembly 11 with the spot to be illuminated when the lamp is again pivoted back around this axis of the boss 14 to be utilized as before. This is a very considerable advantage in the present lamp in as much as it eliminates the necessity for an adjustment of the lamp each time it is moved into place.

In order to be effective in the present invention, the flexible connecting arm 12 must be capable of being manually deformed to the desired configuration, and then capable of maintaining its deformed position until next it is desired to change the position of the lamp shade assembly 11 with respect to the work.

A difficulty presently encountered in flexible connecting arms of this general type is that they pick up dirt, oil and grease from their close association with the work being performed in the area being illuminated; and this oil, dirt and grease works into the flexible layers of the connecting arm to reduce the friction therebetween. This means that the arm is no longer capable of maintaining its position after it has been given a proper configuration to position a lamp shade assembly over the area to be illuminated. Also, by its very nature, this type of metallic flexible connecting arm is very difficult to properly plate to protect from corrosion. It, therefore, is one of the important features of the present invention that the outer surface of the metallic flexible conduit of the flexible connecting arm is covered with a continuous film impervious to dirt, oil, water and grease. The construction of this flexible connecting arm 12 is best illustrated in Fig. 10, where the flexible metal conduit is indicated at 39. A two or three wire electrical cable 40 extends through this conduit 39.

This outer impervious film may be constituted as a length of polyvinyl tubing 41, or tubing of any other flexible stretchable material. To be most effective, this tubing 41 will be slid over the flexible metal conduit 39, and then stretched slightly to cause it to hug the outer surface of the conduit. This installation may best be accomplished by directing a flow of air into one end of the flexible conduit 39, and by pinching off or blocking one end of a tubing longer than the length of the flexible conduit 39. The open end of the tubing will then be slid down over the open end of the flexible conduit, and the air escaping from the conduit will cause the tubing to be positioned outwardly and substantially free of outside wall of the flexible conduit. With the air flowing as de-

scribed, it will be relatively simple to get the tubing to slide over the flexible conduit. As soon as it is properly positioned, the air is abruptly cut-off and the tubing will instantaneously be snugly in place on the conduit. The tubing is then held in place on the conduit at position adjacent the air intake end thereof and air is again applied for a brief period. While it is applied, the closed end of the tubing is pulled in direction away from the conduit to cause the tubing to become stretched and to insure an even better snug fit of the tubing on the conduit. The air is then cut-off, and the tubing is cut off to the proper length to form tubing 41.

If the coupler conduit 20 has not already been threadably mounted on the flexible conduit 39, as at 52, this is done after the tubing 41 is in place. An outer shade inlet fitting 37 is then suitably secured to the opposite end of flexible conduit 39. When this is done the tubing 41 will be in sealing relationship with the inlet fitting 37 and with the coupler conduit 20. The electrical cable 40 extends through the side wall of the coupler conduit 20, through the flexible conduit 39, and the inlet fitting 37 to the interior of an outer shade 38 of the lamp assembly 11.

The lamp shade assembly consists of the aforementioned outer shade 38, a standard switch and lamp socket indicated at 42 fixedly mounted in an outer end surface 43 of the outer shade 38 as at 44. As disclosed, the switch is controlled by a toggle arm 45. A standard incandescent lamp 46 has a silicone-rubber grommet 47 mounted thereon in gripping, sealing relationship to the glass of the bulb as seen in Fig. 9. The outer periphery of the grommet 47 has an annular notch 48 therein. In this notch is supported an inner end of an inner reflecting shade 49. The inner surface 50 of this shade and the outer surface of the bulb 46 are protected from the collection of dust by reason of the fact that the grommet 47 is in sealing relationship both with this outer surface of the bulb and inner surface 50 of the shade so that there is no flow of air by convection due to the heating of the lamp. Cooling of the lamp and shade sufficient to protect the lamp from rapid deterioration due to overheating and to protect a person working near the shade from burns is obtained by the provision in the outer surface 43 of the outer shade 38 of a plurality of ventilation holes 51. This allows for the flow of air due to convection between the two shades, and through the open end and the otherwise closed end 38 of the outer shade.

Additional cooling of the shade assembly is obtained by treating inner shade 49 to obtain an inner reflecting surface 50 which will give maximum reflection of infrared rays. Use of a spun aluminum inner shade 49 which has been acid etched to remove oxide and some surface

metals has been found to be satisfactory. This inner shade can also be anodized to preserve this finish.

What is claimed is:

1. A lamp having a flexible connecting arm, a lamp shade assembly including an outer shade mounted with respect to said arm, an electric socket fixedly positioned with respect to and depending from said outer shade, a glass electric bulb mounted in said socket, a resilient grommet in air tight sealing relationship to and mounted on the glass of said electric bulb, an inner shade mounted on, carried by and in air tight sealing relationship to said grommet, in reflecting relationship to said bulb and in spaced relationship to said outer shade, said outer shade being provided with an opening adjacent said electrical socket to permit the passage of air therethrough.

2. A lamp having an outer shade, a socket mounted on said outer shade, an electric bulb mounted in said socket, a resilient grommet in air tight sealing relationship to and depending from said bulb at position adjacent and spaced from said socket, and an inner shade in air tight sealing relationship to and depending from said grommet and in reflecting relationship to said bulb, said outer shade being provided with an opening therein adjacent said socket, and said inner shade being in spaced relationship to said outer shade.

3. In a lamp having an outer shade; an electrical socket fixedly positioned with respect to said outer shade, a glass electric bulb mounted in said socket, a resilient grommet in air tight sealing relationship to, mounted on and depending from the glass of said electric bulb in adjacent, spaced relationship to said socket, an inner shade mounted on, supported by and in air tight sealing relationship to said grommet, in reflecting relationship to said bulb and completely encompassing the outer end of said bulb, said outer shade having an opening therethrough at position adjacent said electric socket, and said inner shade being in spaced relationship to said outer shade.

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