March 17, 1959 C. L. STEBER ET AL 2,878,374

LENS COLLAR AND RETAINING SPRING

Filed April 1, 1957

FIG. 1

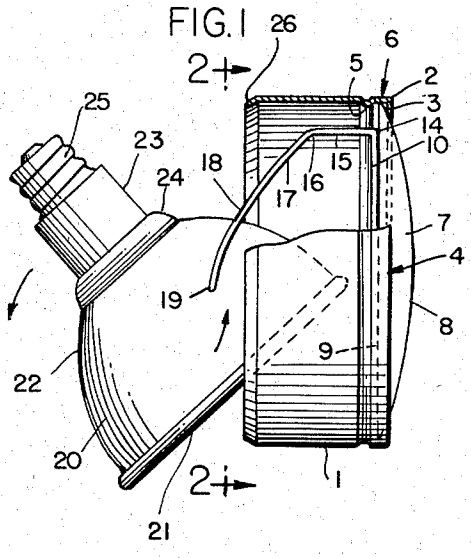


FIG. 2

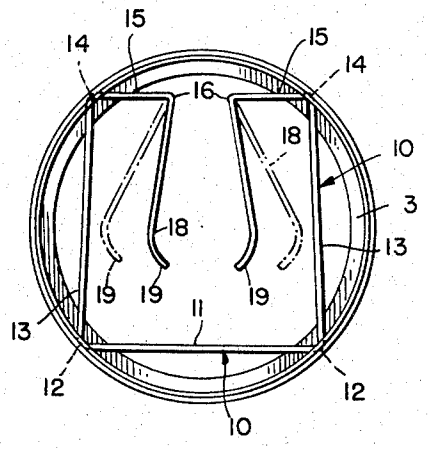
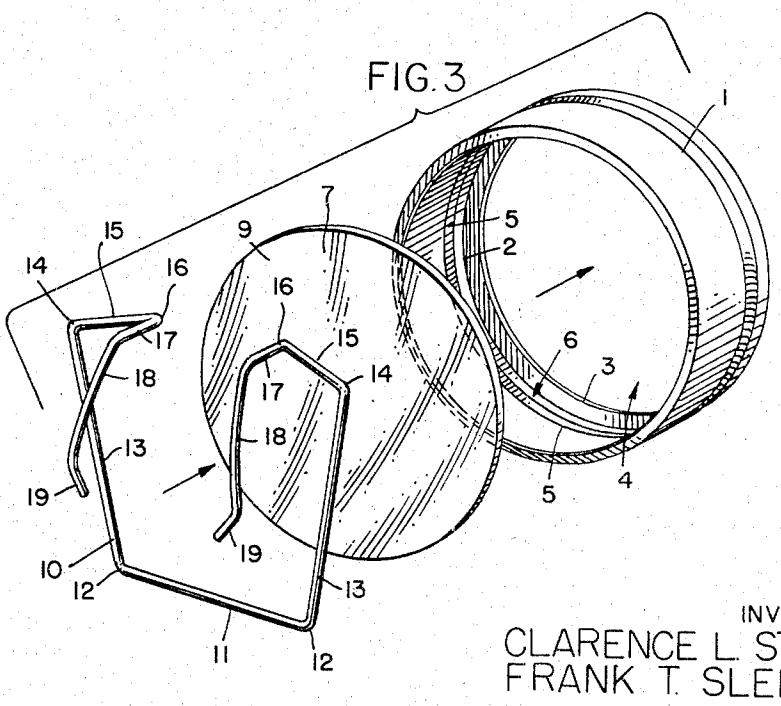


FIG. 3



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United States Patent Office 2,878,374 Patented Mar. 17, 1959

2,878,374

LENS COLLAR AND RETAINING SPRING

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Application April 1, 1957, Serial No. 650,011

3 Claims. (Cl. 240—151)

This invention relates to a lens holder for holding a lens in position with respect to a lamp. More specifically, the invention relates to a lens holder to be used in connection with indoor and outdoor projector and reflector lamps.

The present invention consists of a lens holder and a retaining ring for use in connection with lamps of the indoor and outdoor projector and reflector types. The holder is preferably in the form of a circular, tubular collar which is provided with an internal rib or bead spaced at its front end from an inturned annular flange. The forward end of the collar is closed by a lens which contacts the annular flange. The collar supports a retaining spring which is arranged between the annular flange and the rib, the spring being arranged rearwardly of the lens and forwardly of the light emitting surface of the lamp. The spring is provided with bifurcated spring fingers which engage the neck of a lamp. The spring also causes the lens to be forced against the annular flange as well as to space the lens from the lamp, thus permitting for cooler operation of the lamp. The rear end of the collar is provided with an inturned, annular bevel so as to considerably reduce the back halo of the light.

Lighting fixtures, particularly for indoor and outdoor lighting, use, quite extensively, lamps which are known on the market as "PAR–38" or "R–40." Some manufacturers of this type lamp have the light emitting end of considerable thickness; and in cases where colored light is to be employed, each lamp is of a specific coloring, and, therefore, there is no interchangeability of the same lamp for different colorings. Therefore, if a different color is required, a different lamp must be used. An arrangement of that nature is relatively expensive and requires the handling of a great number of different colored lamps.

The primary object of the present invention, therefore, is to overcome the inherent disadvantages of certain conventional lamps, and to provide a single lamp for universal application by supplying lenses of different colors applied over the front or light emitting surface of the lamp, there being new and improved means for securing a lens in spaced relation with the front of the lamp and to maintain the lamp in proper position.

Another object of the invention consists in the provision of a new and improved lens holding device for supporting a lens in a predetermined position and to allow for ventilation between the lamp and the lens.

Another object of the invention consists in providing a new spring retaining element for holding a lens in proper position with respect to the lamp, and for supporting the lens in proper position with respect to its cooperating lens holding collar.

A further object of the invention consists in a new and improved lens holder or collar, and a retaining spring for maintaining the lens in a predetermined position and in spaced relation from the light emitting surface of a lamp, the lens holder or collar being provided with an inwardly annular bevelled surface at its rear end to reduce back halo of the light.

A still further object of the invention resides in the provision of a new and improved lens collar or holder and a retaining spring to support properly the lens, and to provide a space between the lens and the lamp, thus preventing direct contact between the lens and the face of the lamp, and insuring for much cooler operation of the unit.

Numerous other objects and advantages will be apparent throughout the progress of the specification which is to follow.

The accompanying drawing illustrates a certain selected embodiment of the invention, and the views therein are as follows:

Fig. 1 is a detail elevational view of the improved lens collar and retaining spring and indicating the manner in which the same is adapted for application on a lamp of the indoor and outdoor projector and reflector types.

Fig. 2 is a rear elevational view looking in the direction of the arrows 2—2 of Fig. 1, the lamp being omitted; and

Fig. 3 is an exploded view showing the various parts or elements which constitute the lens holder and retaining spring of the invention.

The particular construction herein shown for the purpose of illustrating the invention comprises a cylindrical or tubular collar **1** which is preferably made of sheet metal, such as aluminum. The collar **1** has its forward end turned inwardly, as indicated at **2**, to form an inwardly extending annular flange **3**, leaving a circular lens receiving opening **4** at the front of the collar **1**. An internal annular bead or rib **5** is pressed inwardly rearwardly of the flange **3**, whereby an annular groove or channel **6** is provided. A lens **7** is adapted to be arranged in the annular groove or channel **6**, the periphery of the lens being received in the annular channel **6** with the front face of the lens engaging the inner surface of the inturned annular flange **3**.

The lens **7** may be clear for light intensifying purposes, or it may be colored. In cases where colored lenses are to be provided, a different color effect may be had by substituting one colored lens for another. It is, therefore, unnecessary to substitute different lamps, but instead a different colored lens may be applied, thereby reducing cost considerably. Different colored lenses, therefore, may be substituted, particularly for display purposes to effect a different colored light as required.

The lens **7** has its outer surface bulged as indicated at **8**, while its inner surface may be relatively straight and flat as indicated at **9**, Fig. 3. The lens **7** is adapted to be maintained in position within the cylinder **1** by a retaining spring **10** which is also arranged in the annular groove or channel **6**.

The retaining spring **10** may be formed from a single piece of wire and comprises a base (bottom) section **11** which is bent at **12, 12** to provide legs **13, 13** which are integral with the section **11**. The upper part of each leg **13** is bent as indicated at **14** to form inwardly projecting sections **15**. Each section **15** is bent at **16** to form a relatively straight rearwardly and outwardly projecting part **17** from which downwardly curved fingers **18** extend. The ends of the fingers **18** terminate in inwardly and downwardly extending parts **19**. The retaining spring **10** is preferably made from a single piece of springy wire which is bent to the desired configuration, there being a gap of substantial size between the two bends **16** and the inwardly extending straight portions **17**, Fig. 3.

The two vertical legs **13**, Fig. 3, on the bottom or base part **11** are relatively the same size, and the parts **15** are relatively short so as to provide the necessary gap to receive a lamp **20** therebetween. The retaining spring **10** is arranged in position in the manner shown in Fig. 2, whereby the corners or bent edges **12, 12** and **14, 14** engage the cylindrical part of the body **1** and are in

physical contact therewith, but within the annular groove or channel **6**. The resiliency of the spring member **10** causes the corners to be forced or pressed outwardly and in engagement with the inside of the collar within the groove or channel **6**.

A lamp **20** is preferably of the so-called "PAR–38" or "R–40" type and has its outward front glass light-emitting surface **21** adapted to bear against the rear of the parts **11** and **13**, **13** of the spring, and thus retain the surface **21** of the lamp in spaced relation with respect to the inside flat surface of the lens **7**. This arrangement prevents direct contact between the lens **7** and the face **21** of the lamp and leaves an air space between the lamp face **21** and the lens **7**, thereby providing for cooler operation of the unit than could be had were the face **21** of the lamp in direct contact with the flat face **9** of the lens **7**.

The lamp **20** includes the usual skirt-like or shade part **22**, Fig. 1, which merges with the relatively circular end part **23** of the lamp, there being an annular bead **24** between the shade or skirt portion **22** and the straight part **23**. The outer rear end of the lamp, as usual, terminates in a screw thread **25** which is adapted to be screwed into the threaded socket of a socket member (not shown). The fingers **18**, **18** of the remaining spring member **10** are spread apart and are adapted to engage the lamp **20** intermediate its ends, particularly at a point either inwardly or outwardly (preferably rearwardly) of the bead **24**. The retaining spring member **10** is maintained in proper position with respect to the lamp, and not only holds the collar **1** to the lamp, but also maintains the lens in tight fitting engagement with the annular flange **3**. The fingers **18**, therefore, comprise bifurcated or fork-like members which straddle a part of the body of the lamp, holding the parts together, and holding the surface **21** of the lamp away from the lens, thus permitting an air circulation within the collar for cooler operation.

The extreme outer edge of the collar **1** is bent inwardly and downwardly rearwardly to provide a bevel **26**. This bevel and the relatively deep collar **1** prevents, or at least reduces halo light considerably.

The invention provides a new and novel means for permitting interchangeability of lenses so that any colored lens, or a clear lens, may be substituted one for the other, and, therefore, a single clear lamp may be converted to a colored light by merely interchanging one lens **7** for another. The retaining spring **10** maintains the lens in tight contact with the internal flange **3** as well as holding the collar in place with respect to its cooperating lamp **20**. Also, the use of the spring **10** provides a space or gap between the lens and the surface **21** of the lamp to permit air circulation to effect a cooling operation with respect to the lamp **20**.

The parts may be easily and very economically manufactured, and they may be assembled readily and quickly, thus permitting quick interchangeability of lens. The spring **10** is locked in its groove or channel **6**, but it can be instantly removed by pressing inwardly on the spaced legs **14**, thus permitting the spring to be quickly and easily applied or removed. Also, the bifurcated fingers **18** allow the assembled device, which constitutes the spring, collar and lens, to be quickly and easily applied to, and removed from, the lamp **20**.

Changes may be made in the form, construction and arrangement of the parts without departing from the spirit of the invention or sacrificing any of its advantages, and the right is hereby reserved to make all such changes as fall fairly within the scope of the following claims.

The invention is hereby claimed as follows:

1. In combination with a lamp, a lens holder removably attached thereto, said lens holder comprising a tubular collar surrounding the outer end of the lamp, said collar having an inwardly extending flange at its outer end defining a lens opening, a bead spaced inwardly from said flange defining therewith an annular groove, a removable lens covering said opening and bearing against the inner side of said flange, a one-piece spring retaining member having means received in said groove holding said lens against said flange, means on said member extending chordally of said collar for spacing said lens from said lamp, and means on said member yieldably attaching said lens holder to said lamp and holding said lamp within said collar in contact with said last named means.

2. The combination of claim 1, including an inwardly extending bevelled lip on the other end of the collar spaced rearwardly of the light emitting end of said lamp for reducing back halo of the lamp.

3. In combination with a lamp, a lens holder removably attached thereto, said lens holder comprising a tabular collar surrounding the outer end of the lamp, said collar having an inwardly extending flange at its outer end defining a lens opening, a bead spaced inwardly from said flange definining therewith an annular groove, a removable lens covering said opening and bearing against the inner side of said flange, and a one-piece wire spring retaining member including a pair of side legs, a lower connecting member, spaced parts inwardly extending from the upper ends of said legs, said legs, lower member and spaced parts lying in a common plane and defining corners biased into said groove for holding said lens against said flange and spacing said lens from the light emitting end of the lamp, arms projecting rearwardly from the inner ends of said spaced parts away from the common plane, and fingers extending rearwardly and downwardly from the rear ends of said arms for yieldably retaining the lamp in contact with the legs, connecting member and spaced parts.

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