

July 14, 1959

D. V. HOWARTH

2,894,693

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Filed Sept. 24, 1957

3 Sheets-Sheet 1

Fig. 1

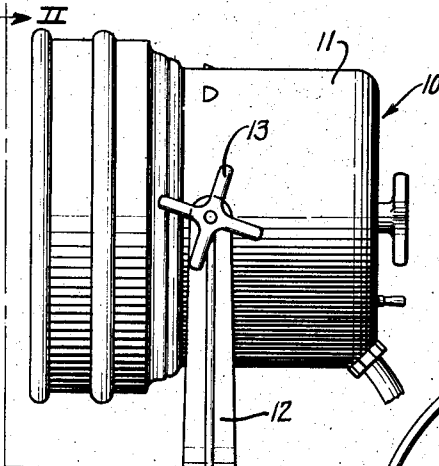


Fig. 2

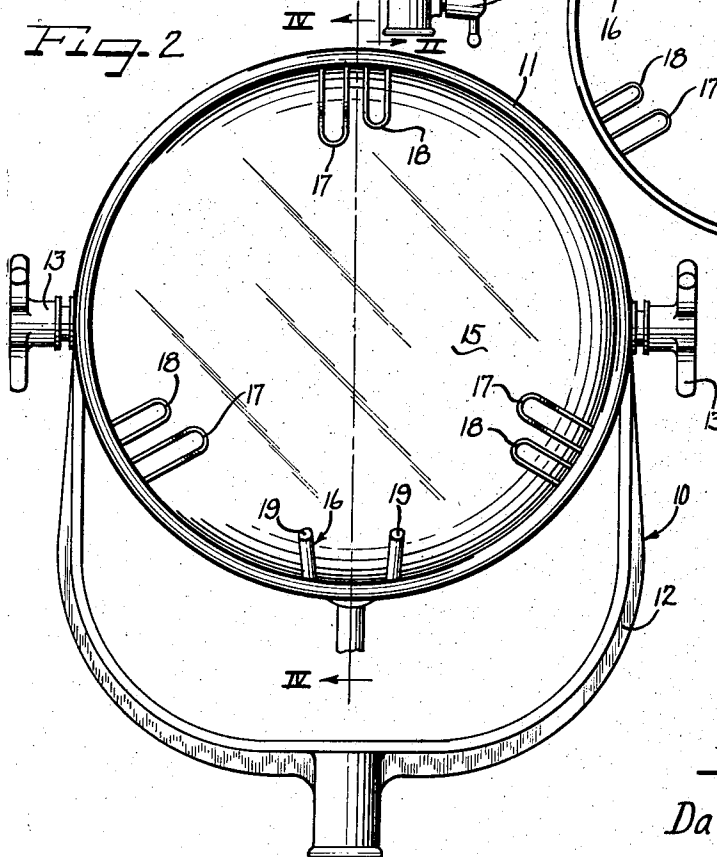
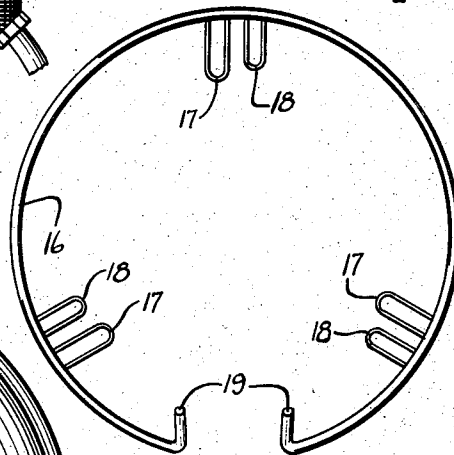


Fig. 3



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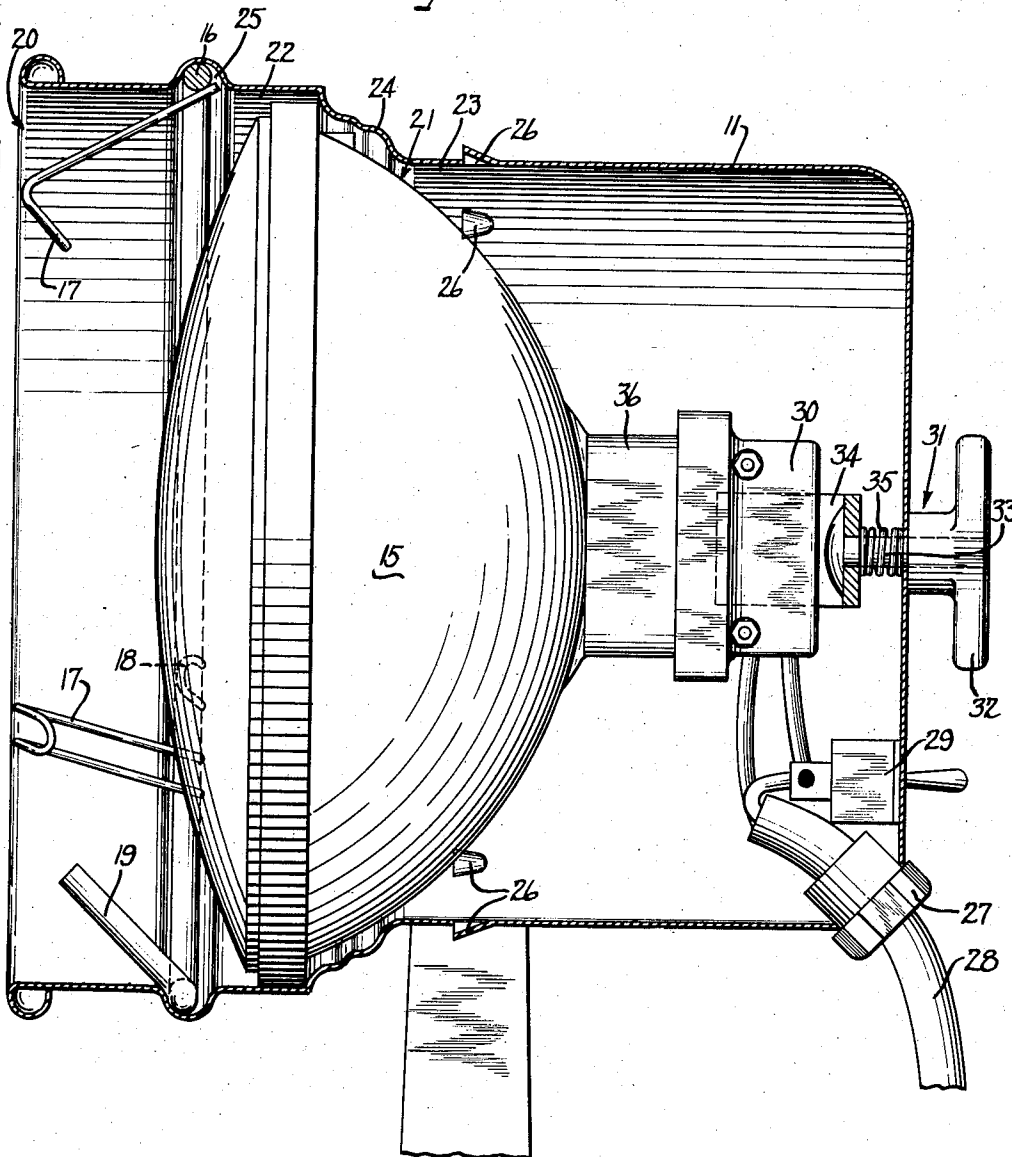
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Fig. 4



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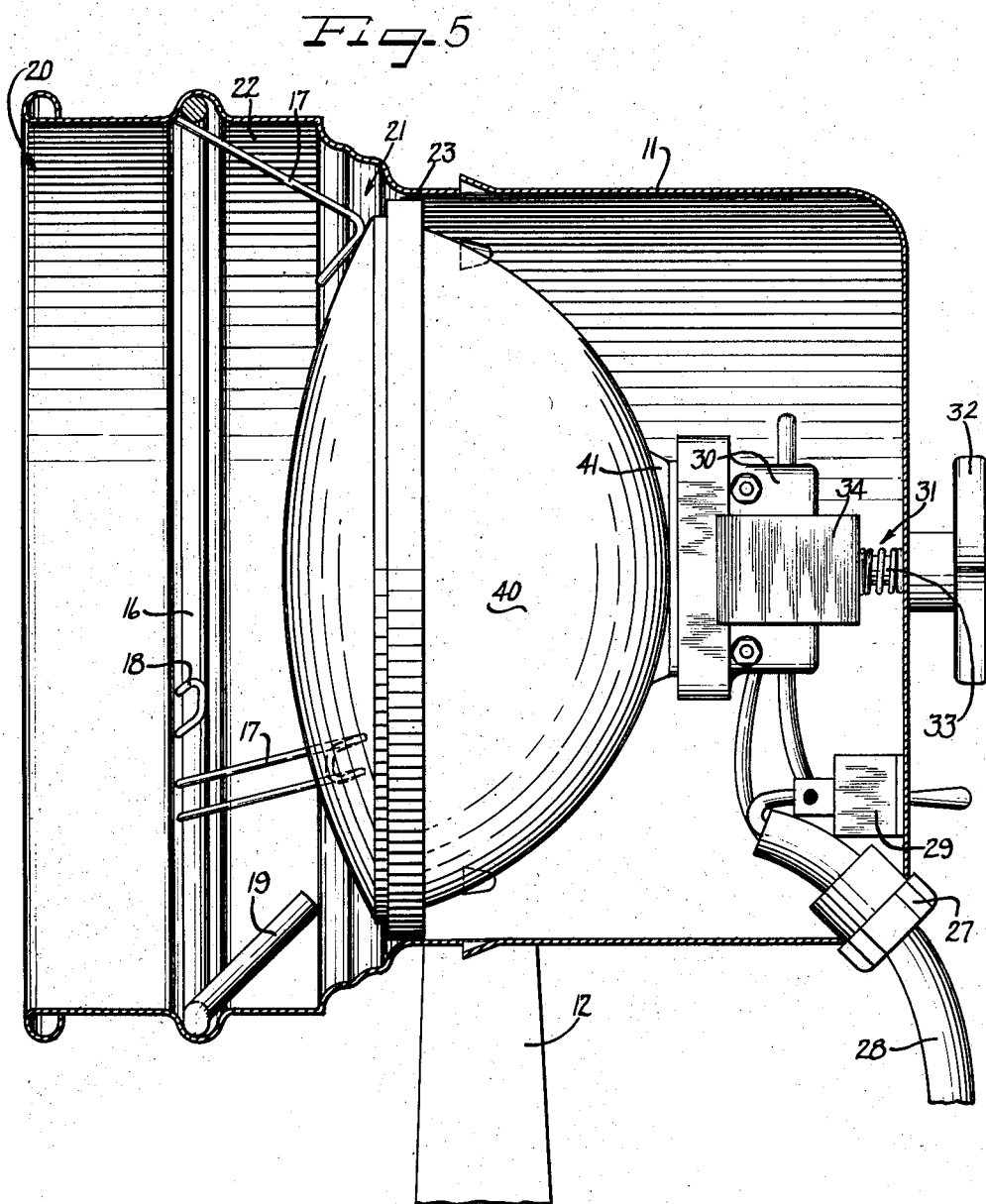
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Application September 24, 1957, Serial No. 685,982

11 Claims. (Cl. 240-41)

This invention relates generally to lamp housings, and more specifically to a housing having an improved lamp retainer clip or split-ring incorporated therein.

Although the principles of the present invention may be included in various lamps, a particularly useful application is made in housings that employ sealed-beam lamps. In particular, provision must be made for easy installation and removal of such lamps from the housing. Furthermore, heretofore it has been necessary to employ several different housings where lamps having different physical sizes were to be used.

The present invention contemplates the utilization of a housing which receives a lamp therein, the lamp being held in position by a removable clip which engages both the housing and the lamp. Further, the lamp-engaging portion of the retainer ring is so constructed that lamps of various overall lengths may be retained in a given housing using the same fastening means. Still further, when lamps of different sizes are substituted, not only does the length vary, but also the width of the diameter thereof varies.

Accordingly, it is an object of the present invention to provide a lamp housing for the reception of lamps, such as sealed beam lamps.

Another object of the present invention is to provide a lamp housing wherein the lamp may be readily installed or removed without the use of tools.

A still further object of the instant invention is the provision in a lamp housing of means for rotating the illumination pattern.

Yet another object of the present invention is to provide a lamp housing wherein lamps having different envelope dimensions may be selectively installed, in the alternative.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying sheets of drawings in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

On the drawings:

Figure 1 is a side elevational view of a lamp housing constructed in accordance with the principles of the present invention;

Figure 2 is an enlarged view taken along lines II—II of Figure 1;

Figure 3 is a slightly reduced view of a lamp retainer ring or clip, also shown partly in Figure 2.

Figure 4 is an enlarged cross-sectional view, partly in elevation and taken along line IV—IV of Figure 2; and

Figure 5 is similar to Figure 4 except that the lamp housing is shown to include a smaller lamp unit.

As shown in the drawings:

The principles of this invention are particularly useful when embodied in a lamp housing assembly such as

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illustrated in Figure 1, generally indicated by the numeral 10. The housing includes a case 11 which typically is supported on a trunnion 12, having a pair of locking knobs 13 for securing the relative angular position between the case 11 and the trunnion 12. The trunnion 12 may be supported on any convenient pin or stand (not shown) and locked thereto by a third locking knob 14.

Referring now to Figure 2, there is shown a view of the housing assembly 10, looking into the interior of the case 11 where an electric lamp 15 is disposed. The case 11 carries a lamp retaining ring generally indicated at 16 which has a plurality of fingers 17 and 18 for engaging the lamp 15 and holding it in position in a manner more fully set out later herein.

Figure 3 shows the lamp retaining split-ring 16 removed from the housing. The lamp retaining clip 16 preferably comprises resilient material having a free size slightly larger than that provided by the case 11 for engaging with the clip 16. As shown in Figure 3, the clip 16 is in its free or non-constrained condition. The clip includes a pair of parallel spaced ends 19, 19 whereby the clip 16 may be constrained to a smaller overall dimension, such as by the manual movement of the ends 19 toward each other, whereby the clip 16 may be installed or removed from engagement with the case 11.

The fingers 17 comprise one set of fingers while the fingers 18 comprise a second set of fingers. Both of these sets of fingers are secured rigidly to the clip 16 and extend from the main portion thereof in an inward or radial direction. The bight or inner end of each of the fingers of each of the sets terminates in a substantially uniform axial distance from the plane of the clip 16, whereby the inner or distal ends of each of the fingers defines a plane which is substantially parallel to the main portion of the clip 16, at least one of such planes being spaced axially from the body of the clip 16. Where both of the sets of fingers are axially displaced from the plane of the clip 16, it is preferable that the plane defined by the ends of the fingers 17 be spaced axially from the plane of the clip 16 by a distance which is different from that of the plane defined by the ends of the fingers 18.

Also, preferably, the individual fingers 17 and 18 comprise resilient material whereby they may returnably yield with respect to the clip 16 in a generally axial direction.

Referring now to Figure 4, there is shown a further-enlarged cross-sectional view of the lamp housing 10. In this embodiment, the case 11 is generally cylindrical and has an open end 20 through which the various lamps 15 and the clip 16 are inserted and removed. Of course, it is through the open end 20 that the light from the lamp 15 passes. Within the case 11, there is a lamp receiving zone 21, generally occupied by the lamp 15. It can be seen that the lamp receiving zone 21 is spaced inwardly from the open end 20, and that it communicates with the open end 20. The lamp receiving zone 21 includes two concentric or generally concentric axially spaced portions 22 and 23 defined by the case 11 and joined together by an intermediate portion 24. Since the inner portion 23 is smaller than the outer portion 22, the case being cylindrical, the lamp receiving zone thus defined is generally frusto-conical, the lamp 15 having its principal radial dimension received by the wider portion 22 of the lamp receiving zone 21.

The case 11 is adapted intermediate the open end 20 and the lamp receiving zone 21 to receive the clip 16. In the instant structure, the case 11 has an inwardly opening groove 25 extending annularly about the periphery of the case 11 in spaced relation to the open end

20. It is preferable that the groove 25 be spaced or set back from the open end 20 by an amount which permits the reception, as shown in Figure 4, of the resilient fingers 17 of the clip 16 within the confines of the case 11, whereby the fingers 17 do not protrude therefrom and cause interference with other accessories (not shown) which may be conventionally used with the lamp housing.

The case 11 is provided with a plurality of louvers 26 disposed circumferentially about the case. Also, the case 11 has an opening through which a grommet 27 and an electrical cable 28 extend to communicate with a switch 29 and a connector 30.

The connector 30 is slidably engageable in an axial direction with a means for rotating the connector, generally indicated at 31, which means extends outwardly through the case 11 to a manual rotating knob 32. Thus the knob 32 may be threaded on a stub shaft 33 which extends through the case 11. To the inner headed end of the shaft 33, there is rigidly secured a generally U-shaped bracket or yoke 34 which has a pair of arms removably surrounding opposite sides of the connector 30, the arms in the instant embodiment being divergently tapered from the shaft 33. Further, a spring 35 may be included if desired to act between the means 31 and the case 11 to insure rotational driving engagement of the bracket 34 with the connector 30, and to thereby urge the means 31 toward the connector 30 and the open end 20 of the case 11. The connector 30 is normally axially spaced as shown from the head of the bolt 33, which is yieldably biased by the spring 35. Thus it can be seen that the lamp 15 may be mounted between the resilient fingers 18 and the inherently resilient spring 35. In the instant embodiment, the knob 32 has been advanced on the shaft 33 to take up a substantial amount of the back play or slack in the means 31. Thus the means 31 are secured to the case 11 and are journaled therein and have rotational driving engagement with the connector 30. The means 31 also provide an axial support for the connector 30, which in turn communicates with the cable 28 and the switch 29.

The detailed construction of the lamp is not a part of the instant invention and need not be disclosed herein. For purposes of identity, however, the lamps illustrated herein are commercially available as "Par" 56 and 64 aircraft approach lights, and have sealed beam construction substantially similar to that used in present day automobiles. The lamp includes a base 36 which has means, for example two prongs, for establishing electrical connection between the lamp 15 and the connector 30, and which means precludes relative rotation therebetween.

It can be seen that the lamp 15 is normally supported in an axial direction by and between the fingers 18 and a shoulder in the intermediate portion 24 of the case 11, and in a radial direction, by the portion 22 of the case 11 with the connector 30 removably slidably received in the bracket 34. The lamp element can be expected to produce an asymmetrical pattern, the rotation of which under certain circumstances is desirable. Accordingly, since the knob 32 is locked to the shaft 33 in any convenient manner (not shown), the lamp 15 may be directly manually rotated by the knob 32.

Referring now to Figure 5, the lamp housing of Figure 4 is again shown, but wherein the lamp 15 has been replaced by a second lamp 40 having a smaller diameter which engages with the narrower portion 23 of the case 11. The lamp 40 has a shorter overall length, particularly apparent by comparing the integral base 36 with the base 41. The lamp 40 is held in position by the rotating and supporting means 31 as described in connection with Figure 4. However, the clip 16 has been inserted in a selectively reversible position, wherein the longer and axially extending fingers 17 now act on the face of the lamp 40 to resiliently support it.

Thus the instant embodiment of this invention can support at least two different size lamps, alternatively and selectively. The lamps specifically identified above, for purpose of example, have diameters of 7 and 8 inches and differ in length from the face of the lamp to the innermost part of the base by a distance reflected substantially in the relative axial spacing of the set of fingers 17 with respect to the set 18. A snug fit between each of the lamps 15 and 40 and the case 11 is neither desirable nor necessary, and variations in length between nominally identical lamps are compensated for by the yieldable urging of the various fingers 17 and 18, together with the spring 35.

The resulting structure is exceedingly adaptable to various uses, both indoor and outdoor, and has particular usefulness in photographic work, where the change of lamp sizes, and hence lamp intensity needs to be effected relatively often. It will be noted that the change can be made without the use of any hand tool whatever, either to replace a burned out bulb or lamp, or to exchange the lamp for one of a different size. It is to be understood that in a preferred embodiment, both sets of fingers 17 and 18 are employed. However, when one of the sets of fingers 17 or 18 is omitted, a highly advantageous structure results, which meets certain objects of the instant invention.

Therefore, although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A lighting structure comprising in combination: a case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; a lamp directly supported by said housing in said zone and positioned therein to direct light through said open end; and a generally circular split retaining clip, said clip being resiliently biased against and supported by an integral portion of said case, said portion being intermediate said open end and said lamp-receiving zone, said clip having a plurality of fingers extending radially of said open end and engaging the face of said lamp in an axial direction, said clip comprising the sole means precluding axial displacement of said lamp from said zone toward said open end of said case.

2. A lighting structure comprising in combination: a case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; a lamp directly supported by said housing in said zone and positioned therein to direct light through said open end; a generally circular split retaining clip, said clip being resiliently biased against and supported by an integral portion of said case, said portion being intermediate said open end and said lamp-receiving zone, said clip having a plurality of fingers extending radially of said open end and engaging the face of said lamp in an axial direction, said clip comprising the sole means precluding axial displacement of said lamp from said zone toward said open end of said case; an electrical connector attached to and supported by said lamp; and means rotatably journaled in and extending through said case, the inner end of said means having axially slidable rotational driving engagement with said connector for selective manual rotation of said lamp.

3. A lighting structure comprising in combination: a case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; a lamp directly supported by said housing in said zone and positioned therein to direct light through said open end; a generally circular split retaining clip, said clip being resiliently biased against and supported by an integral portion of said case, said portion being intermediate said open end and said lamp-receiving zone, said

clip having a plurality of fingers extending radially of said open end and engaging the face of said lamp in an axial direction, said clip comprising the sole means precluding axial displacement of said lamp from said zone toward said open end of said case; an electrical connector attached to and supported by said lamp; means rotatably journaled in and extending through said case, the inner end of said means having axially slidable rotational driving engagement with said connector for selective manual rotation of said lamp; and a spring continuously acting between said inner end of said means and said case, and urging said inner end of said means toward said connector; whereby the light pattern of the lamp may be rotated with respect to the case.

4. A housing for an electric lamp, comprising in combination: a unitary case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; peripheral groove means in said case disposed intermediate said open end and said lamp-receiving zone, said groove means opening inwardly of said case; and a split lamp-retaining spring-clip having a free size, said clip being selectively receivable in said groove means, and being constrained thereby and therein to a size less than its free size, said clip having a plurality of fingers extending in a direction generally across said open end for engaging only the face of the lamp, said fingers being so constructed and arranged as to preclude axial displacement of the lamp from said case zone toward said open end of said case.

5. A housing for an electric lamp having prong terminals, comprising in combination: a case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; an electrical connector for attachment to the lamp terminals; a spring operative to urge said connector toward said open end; and a lamp-retaining clip engaging said case intermediate said open end and said lamp-receiving zone, said clip having a plurality of resilient fingers extending transversely to said open end and constructed and arranged for yieldably engaging the lamp face to urge the lamp terminals into said connector and to load said spring, whereby the lamp may be resiliently supported in said case in the direction of the axis of said open end.

6. A housing for an electric lamp, comprising in combination: a case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; and a reversible lamp-retaining clip engaging said case intermediate said open end and said lamp-receiving zone, said clip having two sets of fingers extending transversely to said open end for alternatively engaging only the face of the lamp, said sets extending substantially different distances in the direction of said open end, said fingers of each of said sets being so constructed and arranged that one of said sets precludes movement of the lamp from said zone, whereby either of two lamps of different length may be alternatively, axially held in said zone by one of said sets of fingers.

7. A housing for an electric lamp, comprising in combination: a generally cylindrical case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; and a generally circular lamp retaining clip reversibly engaging said case intermediate said open end and said lamp-receiving zone, said clip having two sets of radially inwardly extending fingers for alternatively engaging the face of the lamp, said fingers respectively terminating in two axially spaced planes generally parallel to said clip, said planes being disposed unequal distances from said clip, said fingers of each of said sets being so constructed and arranged that one of said sets precludes movement of the lamp from said zone, whereby either of two lamps of different length may be alternatively held in said zone by one of said sets of fingers.

8. A housing for an electric lamp, comprising in combination: a generally cylindrical case having an open end, 75

said case having a lamp-receiving zone spaced from and communicating with said open end; a circumferential groove in said case intermediate said open end and said lamp-receiving zone, said groove opening in an inward radial direction; and a generally circular lamp-retaining clip reversibly engageable with said groove; said clip having two sets of radially inwardly extending fingers for alternatively engaging the face of the lamp, said fingers terminating in two axially spaced planes generally parallel to said clip, said planes being disposed unequal distances from said clip, said groove being spaced from said open end by a distance such that both of said axially spaced planes are disposed within said case, said fingers of each of said sets being so constructed and arranged that one of said sets precludes movement of the lamp from said zone, whereby either of two lamps of different length may be alternatively held in said zone by one of said sets of fingers.

9. A housing for an electric lamp, comprising in combination: a generally cylindrical case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; said zone having two concentric axially spaced cylindrical portions of different diameters for receiving alternatively lamps of two diameters; and a lamp retaining clip reversibly engaging said case intermediate said open end and said lamp-receiving zone, said clip having two sets of radially inwardly extending fingers for alternatively engaging the face of the lamp, said fingers terminating in two axially spaced planes generally parallel to said clip, said planes being disposed unequal distances from said clip, said fingers of each of said sets being so constructed and arranged that one of said sets precludes movement of the lamp from said zone, whereby either of two lamps of different length and diameter may be alternatively held in said zone by one of said sets of fingers.

10. A housing for an electric lamp, comprising in combination: a generally cylindrical case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; said zone being of generally frusto-conical configuration, diverging toward said open end; and a lamp retaining clip reversibly engaging said case intermediate said open and said lamp-receiving zone, said clip having two sets of radially inwardly extending fingers for alternatively engaging the face of the lamp, said fingers terminating in two axially spaced planes generally parallel to said clip, said planes being disposed unequal distances from said clip, said fingers of each of said sets being so constructed and arranged that one of said sets precludes movement of the lamp from said zone, whereby either of two lamps of different length and diameter may be alternatively held in said zone by one of said sets of fingers.

11. A housing for an electric lamp, comprising in combination: a generally cylindrical case having an open end, said case having a lamp-receiving zone spaced from and communicating with said open end; circumferential groove means in said case intermediate said open end and said lamp-receiving zone, said groove means opening in an inward radial direction; a generally circular lamp-retaining clip reversibly engageable with said groove means; and two sets of fingers carried by said clip and extending in a radially inwardly direction for alternatively engaging the face of the lamp, said fingers terminating in two axially spaced planes generally parallel to said clip, said planes being disposed unequal distances from said clip; said groove means being spaced from said open end such a distance that both of said axially spaced planes are simultaneously positionable within said case; said fingers of each of said sets being so constructed and arranged that one of said sets precludes movement of the lamp from said zone, whereby either of two lamps of different length may be alternatively held in said zone by one of said sets of fingers.

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