May 17, 1938. H. A. DOUGLAS 2,117,760

ELECTRIC LIGHTING DEVICE

Filed April 4, 1936

Fig. 1

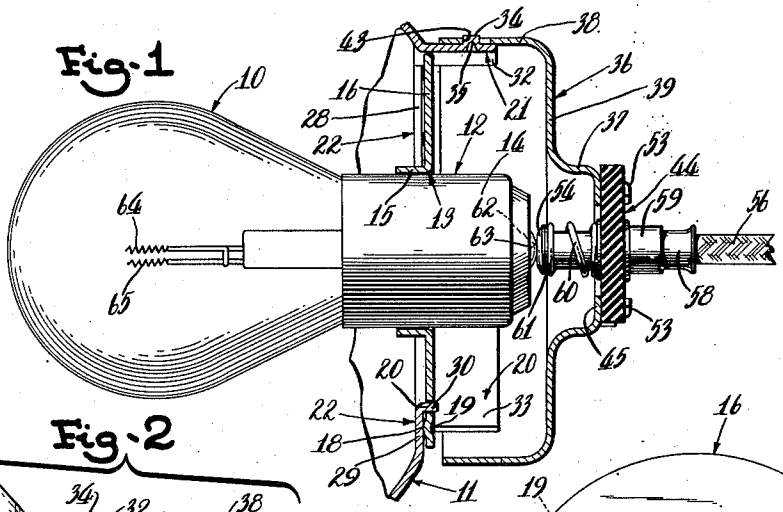


Fig. 2

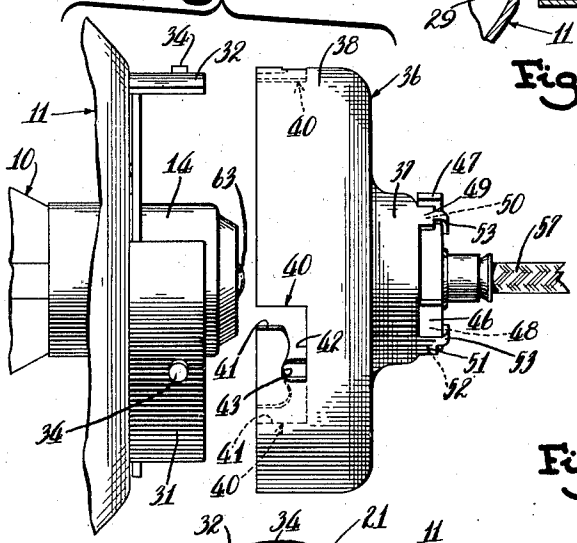


Fig. 3

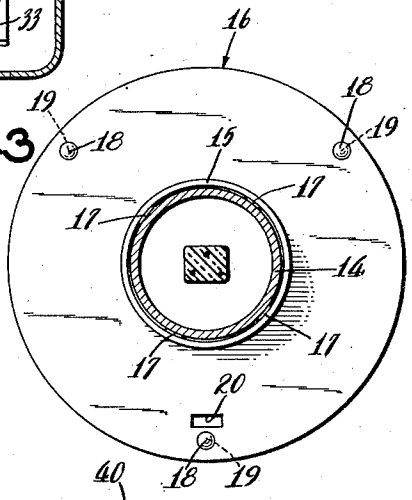


Fig. 4

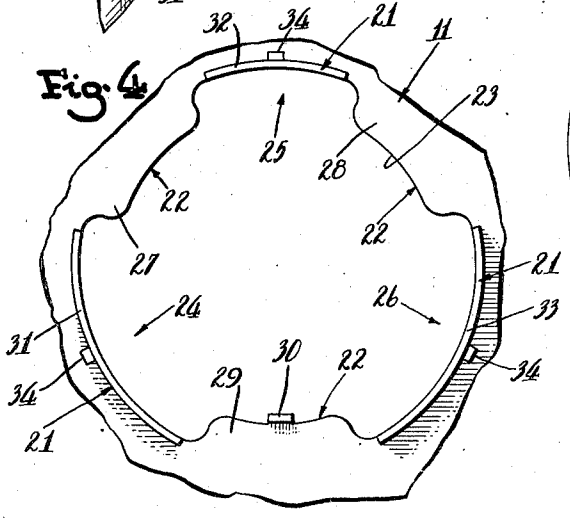
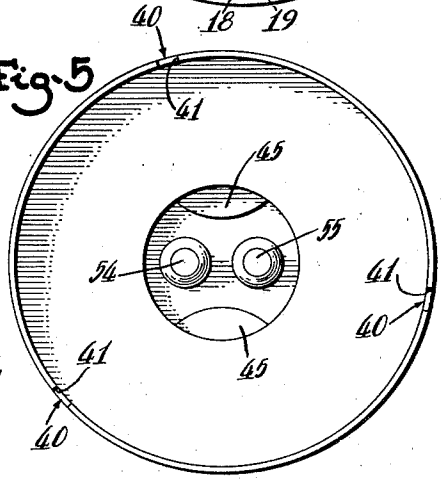


Fig. 5



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ELECTRIC LIGHTING DEVICE

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8 Claims. (Cl. 240—41)

My invention relates to electric lighting devices, and more particularly to electric lamp units comprising an incandescent electric lamp mounted in a reflector, as for example, in an automobile headlight, and the principal object of my invention is to provide a new and improved lighting device and a unit of this type.

In the drawing accompanying this specification, and forming a part of this application, I have shown for purposes of illustration, one form which my invention may assume. In this drawing:

Figure 1 is a vertical sectional view, certain parts being fragmentarily shown, of one embodiment of my invention,

Figure 2 is a side elevation, partly fragmentary, of the parts of Figure 1, partly disassembled,

Figure 3 is a transverse sectional front view of a lamp such as used in the embodiment of Figure 1,

Figure 4 is a rear elevation of a mounting or reflector such as used in the embodiment of Figure 1, and

Figure 5 is a front elevation of a detail of Figure 1.

Referring to Figure 1, the embodiment of my invention here illustrated is shown as including an incandescent electric lamp 10, adapted to be suitably connected to a mounting 11, the mounting being in this instance a reflector fragmentarily shown. The lamp is provided with a base 12, which in this instance includes laterally extending positioning means 13. The base includes a shell 14, and the laterally extending portion of the base comprises a collar 15 surrounding the shell 14, and a radially extending flange 16 on the collar 15. The collar 15 may be fastened to the shell in any suitable manner, as by solder 17 (see Figure 3). As may be seen best in Figure 3, the flange 16 is desirably circular in outline, and is provided with, desirably three, axially frontwardly extending projections 18 formed by making depressions 19 in the rear face of the flange 16. By the term front is meant that side of a part presented toward the light producing source of the lamp 10, and by rear the opposite side of the part. The projections 18 are here shown as concentrically disposed and as circumferentially unequally spaced. The lamp flange 16 may be further provided with a recess or aperture 20, here shown as in radial alinement with one of the axial projections 18.

The reflector 11 is here shown as provided with a cylindrical pocket 21 open at the rear and extending frontwardly, which, in this instance, is fragmentary in character. The pocket 21 has a plane bottom or end flange 22 having a central aperture 23 smaller than the outside diameter of the lamp flange 16. The end flange 22 is here shown as a flat portion of the crown of the reflector 11, and fragmentarily cut away to form the radially extending recesses 24, 25, 26. These recesses leave the end flange 22 in the form of three flat segmental end flanges 27, 28, 29, rear surfaces of which, at least, define a single plane. The end flange 29 is here shown as having a lug 30, extending axially rearwardly from its inner peripheral margin, adapted to fit freely but desirably snugly in the aperture 20 of the lamp flange.

The pocket 21 has a cylindrical portion, which is also fragmentary in character, formed by three arcuate ears 31, 32, 33, extending rearwardly from the reflector 11, between the end flanges 27, 28, 29.

The end flanges 27, 28, 29 of the reflector pocket, as may be seen particularly in Figure 4, are here shown as of equal circumferential extent, but the radial axes of symmetry of the upper flanges, 27, 28, as viewed in Figure 4, are less than 120° apart. The radial axis of symmetry of the lower end flange, 29, is on a line bisecting the angle between the radial axes of symmetry of the upper flanges 27, 28. In the illustrated embodiment the ears 31, 33 are consequently wider than the ear 32; and the ears are also circumferentially unequally spaced, as are also pins 34, here shown as extending radially outwardly from the circumferential centers of the ears. The pins 34 may be conveniently formed by locally pressing out the inner periphery of each ear to form an indentation such as 35.

The inner cylindrical periphery of the pocket 21 (that is, the cylindrical surface defined by the inner peripheral surfaces of the ears 31, 32, 33) is of such diameter that the circular peripheral margin of the lamp flange 16 will, desirably, be gaged thereby, that is, snugly fit in the pocket, when the axial projections 18 on the lamp flange 16 are in engagement with the rear surfaces of the end flanges 27, 28, 29, of the pocket 21.

When the lamp 10 is in the position shown in Figure 1, the lug 30 on the mounting flange 22 is positioned in the aperture 20 in the lamp flange 16. The circumferential extent of the aperture 20 is desirably very little greater than the width of the lug 30, so that the interengagement of the lug and aperture will accurately position the lamp 10 rotatively with respect to the reflector 11.

The lamp 10 may be held with the axial projections 18 on the lamp flange in abutment with the end flanges 27, 28, 29, by means here shown as a contact carrier 36.

The contact carrier 36 comprises a cylindrical shell 37 provided at its front end with a hollow generally cylindrical enlargement 38, joined to the shell 37 by an integral radial flange 39. The cylindrical enlargement 38 may be left completely cylindrical, that is, completely annular in cross-section, as shown, but this is not essential. As here shown, the diameter of the cylinder defined by the outer peripheral surfaces of the ears 31, 32, 33 is such as to fit within the cylinder defined by the inner peripheral surface of the enlargement 38.

The enlargement 38 of the contact carrier is provided with three bayonet slots 40 having axially extending entrances 41, communicating with circumferentially extending portions 42, having recesses providing seats 43. The bayonet slots 40, and the seats 43 thereof are so disposed circumferentially as to be complementary to the pins 34, so that when the contact carrier 36 is assembled with the reflector 11, as shown in Figure 1, the pins 34 will be in engagement with the seats 43.

The contact carrier 36 also includes an insulating member 44, having an outside diameter approximately the same as the inside diameter of the shell 37, adapted to abut diametrically opposite segmental flanges 45 extending radially inwardly from the rear end of the shell 37. The insulating member 44 is further provided with a plurality of circumferentially spaced radial projections, in this instance three, two of which, 46, 47, may be seen in Figure 2, and the third of which, 48, is located at the other side of the member 44, analogously to the projection 46. On opposite circumferential sides of the projection 47 are disposed two rearwardly extending projections 49, 50 on the shell 37. Immediately below the projections 46, 48, as viewed in Figure 2, the shell 37 is provided with the respective rearward projections 51, 52. The space between the projections 51, 52 is less than between the projections 49, 50. The projections 46, 47, 48, and the projections 49, 50, 51, 52 may be arranged in any other suitable manner, or any other suitable means may be adopted, so that the insulating member 44 and the shell 37 may be assembled in but one relative rotative relation. In order to hold the insulating member 44 assembled with the shell 37 a desirable number of axially extending fingers 53 may be provided at the rear ends of the projections 49, 50, 51, 52, the fingers 53 being clinched radially inwardly over the rear face of the insulating member 44.

The insulating member 44 is adapted to carry contacts 54, 55, these contacts being desirably formed as enlarged heads on shanks fitted over and swedged to the ends of conductors 56, 57. The conductors 56, 57 are disposed in sleeves 58, each sleeve being slidable within a bushing 59, which is fixedly mounted in any suitable manner, as by beading, through the insulating member 44. Each sleeve 58 is surrounded by a spring 60, between the bushing 59 of the sleeve 58, and a flange 61, on each sleeve, abutting the respective contacts, 54, 55.

In the position shown in Figure 1, the contacts 54, 55 of the contact carrier make contact respectively with contacts 62, 63 provided on the lamp base 12. One of these lamp contacts, 62, is not visible, being directly behind the contact 63 visible in Figure 1. The provision of a plurality of contacts 62, 63 on the lamp base enables the use of a multiple filament lamp, the lamp being shown here as provided with two filaments, one of which, 64, may desirably have its lighting center at some predetermined point with respect to the reflector, as for example at the focus, and the other of which, 65, may be displaced from the filament 64, and may be used for providing dim light or so-called tilted light. The filaments 64, 65 have their terminals connected in a well known manner to the lamp base 12 and to the contacts 62, 63 on the lamp base. The passage of current to either one or both of the filaments 64, 65, may be controlled in any suitable manner, by switching means (not shown) interposed in the conductors 56, 57.

In assembling the lamp 10, reflector 11, and contact carrier 36, the lamp 10 is first brought to a position, at the rear of the reflector, such that the lamp is coaxial with the reflector aperture 23. The lamp is then moved frontwardly, the bulb of the lamp passing through the aperture 23 and the flange 16 slipping into the pocket 21. The lamp 10 is rotationally so positioned that the lug 30 will enter the aperture 20 in the lamp flange, further frontward movement bringing the axial projections 18 into engagement with, in this instance, the circumferential centers of the rear faces of the end flanges 27, 28, 29. The lamp 10 then has the position shown in Figures 1 and 2. The contact carrier 36 is then brought to a position at the rear of the reflector, coaxial with the aperture 23, as for example in Figure 2, and is either first moved frontwardly to slip over the ears 31, 32, 33 and against the pins 34 and then rotated until the pins will enter the bayonet slot entrances 41, or first rotationally so positioned and then moved frontwardly. The contact carrier 36 is moved frontwardly, as hereinbefore noted, against the bias of the spring pressed contacts 54, 55, and, when the pins 34 reach the ends of the entrances 41, is rotated clockwise, as viewed from the rear of the reflector, until the pins reach the seats 43, whereupon the contact carrier may be released, the contacts 54, 55 acting to firmly press the pins 34 and seats 43 into engagement and hence pressing the axial projections 18 firmly into engagement with the end flanges 27, 28, 29.

It will be evident, since the pins 34 and the bayonet slots 40 are correspondingly unequally circumferentially spaced, that the contact carrier 36 may be assembled with the reflector 11 in but one relative rotative relation, and consequently the pair of contacts 54, 55, carried by the contact carrier 44 assumes a predetermined rotative relation with respect to the reflector 11, and therefore also with respect to the lamp 10, since the lamp is rotationally positioned by the lug 30 and aperture 20.

It will be evident that since the lamp flange 16 is accurately pre-positioned with respect to its distance from the filaments 64, 65, and the direction of the plane of the flange 16 is pre-positioned with respect to the axis of the lamp 10, the filaments 64, 65 will assume the desired predetermined position with respect to the reflector when the parts are assembled, as in Figure 1.

The mode of removal of the lamp 10 from the reflector 11 will be obvious from the hereinbefore described mode of assembly.

The lamp 10 may be assembled with the positioning means 13 by placing the positioning

means on a standard with the shell 14 within the collar 15 and then adjusting the lamp until the lighting center of the desired filament thereof is in a predetermined position, whereupon the collar 15 is soldered to the shell 14. The position of the other filaments of the lamp may be simultaneously predetermined.

It will be evident to those skilled in the art that in some aspects of the invention it is not essential that the pins 34 be unequally circumferentially spaced, nor is it essential that the ears 31, 32, 33 be unequal and circumferentially unequally spaced, nor that the end flanges 27, 28, 29 be unequally circumferentially spaced, but that all of these parts may be circumferentially equally spaced. Other variations will readily suggest themselves.

From the foregoing it will be apparent to those skilled in the art that the illustrated embodiment of my invention provides a new and improved electric lighting device and unit, readily and conveniently constructed and assembled, and accordingly, accomplishes the principal object of my invention. On the other hand, it also will be obvious to those skilled in the art that the illustrated embodiment of my invention may be variously changed and modified, or features thereof, singly or collectively embodied in other combinations than those illustrated, without departing from the spirit of my invention, or sacrificing all of the advantages thereof, and that accordingly, the disclosure herein is illustrative only, and my invention is not limited thereto.

I claim:

1. In combination: a reflector; an incandescent electric lamp having a base including a laterally extending positioning flange circular in outline, said flange being constructed and arranged to abut said reflector; said reflector having a front side presented toward the light producing source of said lamp, said flange being seated on the rear side of said reflector; said reflector having flange means extending rearwardly from said rear side of said reflector and disposed about said lamp flange; said flange means being so constructed and arranged that the inner periphery of said flange means defines a circle gaging the outer periphery of said lamp flange thereby to restrain lateral movement of said lamp flange when said lamp flange is so seated; means pressing said lamp flange into abutment with said rear side of said reflector; said pressing means including a portion complementary to said flange means; and said flange means and said portion comprising bayonet connection means for detachably connecting said portion and said flange means.

2. In combination: a mounting; an incandescent electric lamp having a base and provided with contact means, said base including a laterally extending flange circular in outline; said mounting having a front side presented toward the light producing source of said lamp, and having a pocket of generally circular outline at the rear side of said mounting, said pocket having a generally plane bottom provided with a central aperture larger than said bulb, said flange being seated on said bottom; pressing means, carrying contact means electrically operatively cooperable with said lamp contact means when said pressing means is in a predetermined rotative position with respect to said lamp, so constructed and arranged as to press said flange against said bottom; and said pressing means and said mounting comprising bayonet connection means so constructed and arranged that said pressing means may be connected to said mounting in but one relative rotative relation.

3. In combination: a mounting; an incandescent electric lamp having a base and provided with contact means, said base including a laterally extending flange circular in outline; said mounting having a front side presented toward the light producing source of said lamp, and having a pocket of generally circular outline at the rear side of said mounting, said pocket having a generally plane bottom provided with a central aperture larger than said bulb, said flange being seated on said bottom; said lamp and said mounting comprising means constructed and arranged to restrain relative rotation of said lamp about its axis with respect to said mounting when said flange is seated on said bottom; pressing means, carrying contact means electrically operatively cooperable with said lamp contact means when said pressing means is in a predetermined rotative position with respect to said lamp, so constructed and arranged as to press said flange against said bottom; and said pressing means and said mounting comprising bayonet connection means so constructed and arranged that said pressing means may be connected to said mounting in but one relative rotative relation.

4. In combination: a reflector; an incandescent electric lamp including laterally extending positioning means constructed and arranged to abut said reflector; said reflector having a front side presented toward the light producing source of said lamp, said positioning means being seated on the rear side of said reflector; said reflector having an aperture coaxial with said lamp, and a plurality of circumferentially spaced recesses extending radially outward from the margin of said aperture; said reflector having a plurality of circumferentially spaced projections, extending rearwardly from the general plane defined by the portions of the reflector between said recesses, and disposed at the outer margins of said recesses respectively; said projections being so constructed and arranged that they gage the outer periphery of said positioning means when said positioning means is so seated thereby to restrain lateral movement of said positioning means; and pressing means constructed and arranged to press said positioning means into abutment with said rear side of said reflector.

5. In combination: a reflector; an incandescent electric lamp including a laterally extending positioning flange, circular in outline, constructed and arranged to abut said reflector; said reflector having a front side presented toward the light producing source of said lamp, said flange being seated on the rear side of said reflector; said reflector having an aperture coaxial with said lamp, and a plurality of circumferentially spaced recesses extending radially outward from the margin of said aperture; said reflector having a plurality of circumferentially spaced projections, extending rearwardly from the general plane defined by the portions of the reflector between said recesses, and disposed at the outer margins of said recesses respectively; said projections being so constructed and arranged that their inner peripheries define a circle gaging the outer periphery of said flange when said flange is so seated thereby to restrain lateral movement of said flange; and pressing means constructed and arranged to press said flange into abutment with said rear side of said reflector.

6. In combination: a reflector; an incandescent electric lamp including a laterally extending position flange, circular in outline, constructed and arranged to abut said reflector; said reflector having a front side presented toward the light producing source of said lamp, said flange being seated on the rear side of said reflector; said reflector having an aperture coaxial with said lamp, larger than said bulb and smaller than said flange, and having a plurality of circumferentially spaced recesses extending radially outward from the margin of said aperture; said reflector having a plurality of circumferentially spaced projections, extending rearwardly from the general plane defined by the portions of the reflector between said recesses, and disposed at the outer margins of said recesses respectively; said projections being so constructed and arranged that their inner peripheries define a circle gaging the outer periphery of said flange when said flange is so seated thereby to restrain lateral movement of said flange; and pressing means constructed and arranged to press said flange into abutment with said rear side of said reflector.

7. In combination: a reflector; an incandescent electric lamp including laterally extending positioning means constructed and arranged to abut said reflector; said reflector having a front side presented toward the light producing source of said lamp, said positioning means being seated on the rear side of said reflector; said reflector having an aperture coaxial with said lamp, and a plurality of circumferentially spaced recesses extending radially outward from the margin of said aperture; said reflector having a plurality of circumferentially spaced projections, extending rearwardly from the general plane defined by the portions of the reflector between said recesses, and disposed at the outer margins of said recesses respectively; said projections being so constructed and arranged that they gage the outer periphery of said positioning means when said positioning means is so seated thereby to restrain lateral movement of said positioning means; pressing means constructed and arranged to press said positioning means into abutment with said rear side of said reflector; and said projections and said pressing means comprising means for detachably connecting said pressing means to said projections.

8. In combination: a reflector; an incandescent electric lamp including a laterally extending positioning flange circular in outline, constructed and arranged to abut said reflector; said reflector having a front side presented toward the light producing source of said lamp, said flange being seated on the rear side of said reflector; said reflector having an aperture coaxial with said lamp, and a plurality of circumferentially spaced recesses extending radially outward from the margin of said aperture; said reflector having a plurality of circumferentially spaced projections, extending rearwardly from the general plane defined by the portions of the reflector between said recesses, and disposed at the outer margins of said recesses respectively; said projections being so constructed and arranged that their inner peripheries define a circle gaging the outer periphery of said flange when said flange is so seated thereby to restrain lateral movement of said flange; pressing means constructed and arranged to press said positioning means into abutment with said rear side of said reflector; and said projections and said pressing means comprising means for detachably connecting said pressing means and said projections.

HARRY A. DOUGLAS.