

May 17, 1938.

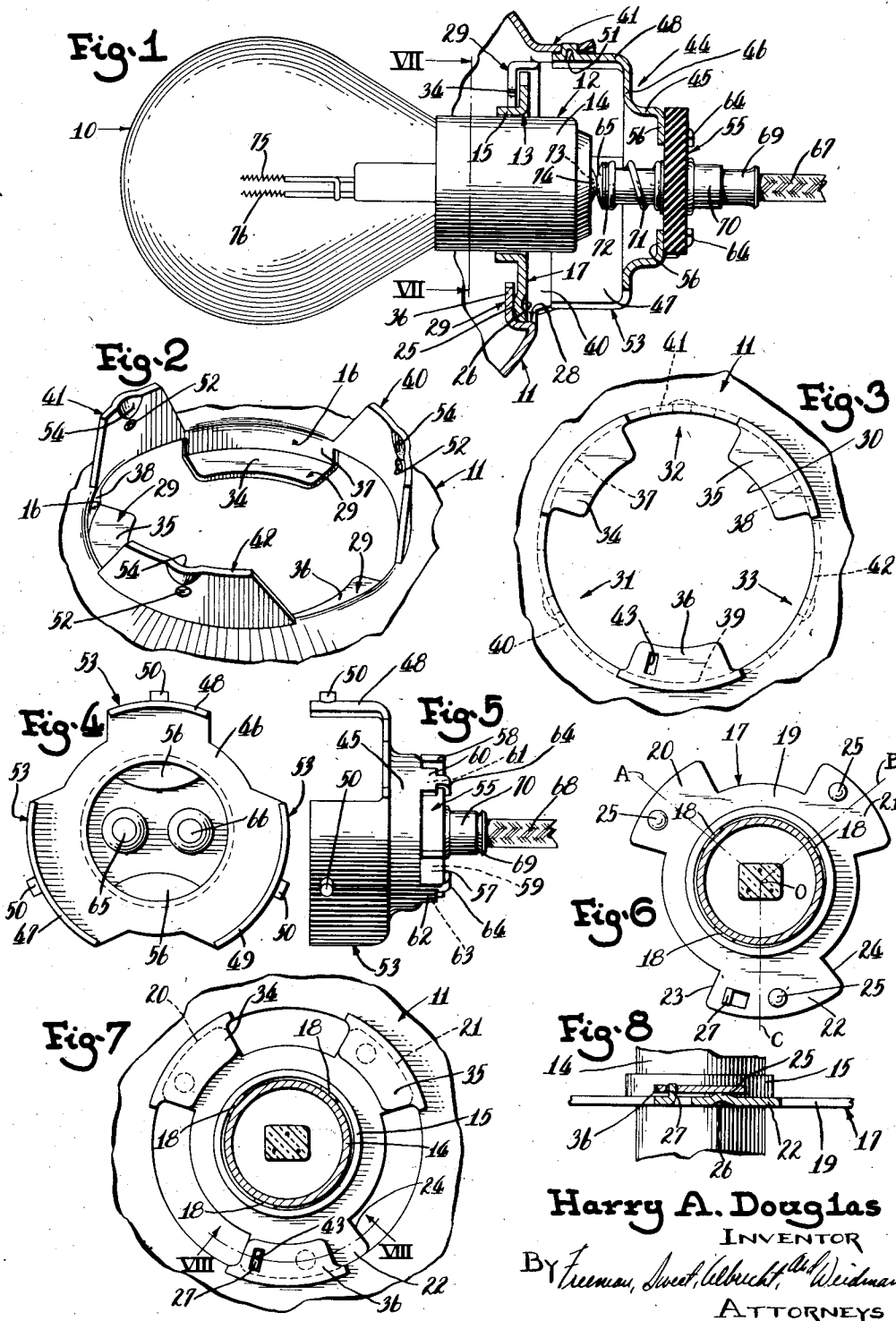
H. A. DOUGLAS

2,117,757

ELECTRIC LIGHTING DEVICE

Filed March 28, 1936

2 Sheets-Sheet 1



Harry A. Douglas
INVENTOR

By *Freeman, Sweet, Albrecht, & Weidman*
ATTORNEYS

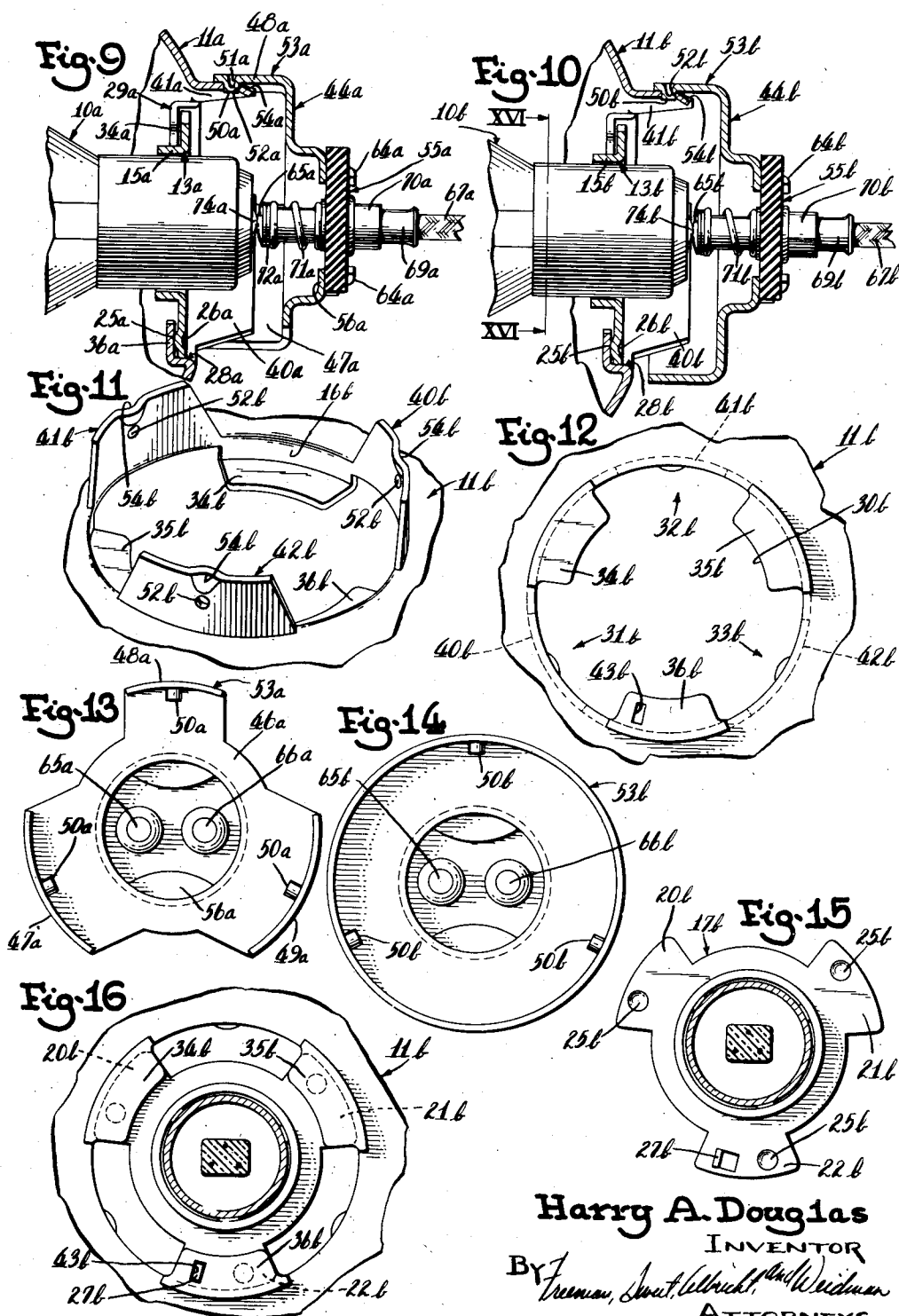
May 17, 1938.

H. A. DOUGLAS
ELECTRIC LIGHTING DEVICE

2,117,757

Filed March 28, 1936

2 Sheets-Sheet 2



Harry A. Douglas

INVENTOR

By *Freeman, Sweet, Ulbricht, and Weidman*
ATTORNEYS

UNITED STATES PATENT OFFICE

2,117,757

ELECTRIC LIGHTING DEVICE

Harry A. Douglas, Bronson, Mich., assignor to
Kingston Products Corporation, a corporation
of Indiana

Application March 28, 1936, Serial No. 71,439

2 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 unit of this type.

In the drawings accompanying this specification, and forming a part of this application, I have shown for purposes of illustration, several forms which my invention may assume. In these drawings:

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

Figure 2 is a perspective rear view of a mounting or reflector, fragmentarily shown, which is used in the embodiment of Figure 1,

Figure 3 is a fragmentary front view of the mounting or reflector used in the embodiment of Figure 1,

Figures 4 and 5 are respectively front and side elevations of a contact carrier, forming part of the embodiment of Figure 1,

Figure 6 is a transverse sectional front view of a lamp such as used in the embodiment of Figure 1,

Figure 7 is a section taken on the line VII—VII of Figure 1, looking in the direction of the arrows,

Figure 8 is a fragmentary sectional view taken on the line VIII—VIII of Figure 7, looking in the direction of the arrows,

Figures 9 and 10 are vertical sectional views of other embodiments of my invention,

Figure 11 is a perspective rear view of another embodiment of a mounting or reflector, such as may be used, for example, in the embodiment of Figure 10,

Figure 12 is a front elevation of the reflector shown in Figure 11,

Figures 13 and 14 are front elevations of contact carriers embodied in Figures 9 and 10 respectively,

Figure 15 is a transverse sectional front view of a lamp, of a different embodiment, such as may be used in the embodiment of Figure 10, which may be used instead of a lamp such as in the embodiment of Figure 1, and

Figure 16 is a section taken on the line XVI—XVI of Figure 10, looking in the direction of the arrows,

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 17 on the collar 15. The collar 15 may be fastened to the shell in any suitable manner, as by solder 18 (see Figures 6 and 7). As may be seen best in Figure 6, the flange 17 comprises a portion 19 having a generally circular outline, and extending radially outwardly from that portion there are a plurality, desirably three, sectoral projections 20, 21, 22, the peripheries of which define a circle. The upper projections, 20, 21, as viewed in Figure 6, have their radial axes of symmetry AO, BO spaced less than 120° apart. The peripheral arcs of the sectoral projections 20, 21 are here shown as equal to each other. The lower sectoral projection 22, as viewed in Figure 6, is here shown as so disposed, and so proportioned, with respect to the upper sectoral projections 20, 21, that the line CO, bisecting the angle AOB, does not coincide with the radial axis of symmetry of the lower sectoral projection, 22. As here shown the lower sectoral projection has a left hand radial margin 23 which is spaced clockwise from the line CO an amount such that the intercepted peripheral arc is equal to one half of the peripheral arc of one of the sectoral projections 20, 21; and a right hand margin 24 which is spaced counter clockwise from the line CO an amount such that the intercepted peripheral arc is substantially greater than one half of the peripheral arc of one of the sectoral projections 20, 21.

The lamp flange 17 is provided with, desirably three, axially frontwardly extending projections 25 conveniently formed by making depressions 26 in the rear face of the flange. 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 25 are concentrically disposed on the sectoral projections 20, 21, 22. Each projection 25 is here shown as displaced from the lines AO, BO, and CO, the same amount in a counter clockwise direction.

The lamp flange 17 may be further provided, on one of the sectoral projections, with a frontwardly extending lug 27, which is here shown as being formed by striking up metal out of the sectoral projection 22.

The reflector 11 is here shown as provided

with a frontwardly extending cylindrical pocket 28 which, in this instance, is fragmentary in character. The pocket 28 has a plane bottom or end flange 29 and a cylindrical portion 16, both of which are fragmentary in character. The end flange 29 has a central aperture 30 slightly larger than the diameter of the portion 16 of the lamp flange 17. The end flange 29 is fragmentarily cut away to form radially extending recesses 31, 32, 33. These recesses leave the end flange 29 in the form of three flat segmental end flanges 34, 35, 36, the rear surfaces of which, at least, define a single plane.

The recesses 31, 32, 33 extend into the cylindrical portion 16 of the pocket 28, leaving three fragmentary cylindrical portions 37, 38, 39. The recess 32 is complementary to one of the sectoral projections 20, 21, and so proportioned that one of these projections may pass axially there-through. The recesses 31, 33 are of a shape analogous to the recess 32 but are considerably wider circumferentially.

Extending rearwardly from the reflector 11, between the fragmentary cylindrical portions 37, 38, 39 are three arcuate ears 40, 41, 42, the inner peripheries of which are defined by the same cylinder that defines the inner periphery of the cylindrical portion 16 of the reflector pocket. The ears 40, 41, 42 may have rearwardly tapering margins.

The end flanges 34, 35, 36 of the reflector pocket, as may be seen particularly in Figure 3, are here shown as of equal circumferential extent, but the radial axes of symmetry of the upper flanges, 34, 35, as viewed in Figure 3, are less than 120° apart. The radial axis of symmetry of the lower end flange, 36, is on a line bisecting the angle between the radial axes of symmetry of the upper flanges 34, 35. The circumferential extent of each of the end flanges 34, 35, 36 is the same as that of one of the sectoral flanges 20, 21 on the lamp flange 17, and consequently, when the lamp is in the position of Figures 1 and 7, the upper sectoral flanges, 20, 21 will be in registry with the end flanges 34, 35, whereas the lower sectoral flange 22 of the lamp will have its margin 23 in registry with the left hand margin of the end flange 36, but the right hand margin 24 of the sectoral projection 22 will be spaced counter clockwise from the right hand margin of the end flange 36. The inner cylindrical periphery of the pocket 28 (that is, the cylindrical surface defined by the inner peripheral surfaces of the portions 37, 38, 39) is of such diameter that the peripheral margins of the sectoral projections 20, 21, 22 on the lamp flange will be gaged thereby, that is, snugly fit in the pocket, when the axial projections 25 on the lamp flange 17 are in engagement with the rear surfaces of the end flanges 34, 35, 36 of the pocket 28.

When the lamp 10 is in the position shown in Figures 1 and 7, the lug 27 on the lamp flange 22 is freely, but desirably snugly, positioned in a recess or aperture 43 in the end flange 36 of the pocket 28. The circumferential extent of the aperture 43 is desirably very little greater than the thickness of the lug 27, so that the inter-engagement 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 extensions 25 on the lamp flange in abutment with the end flanges 34, 35, 36, by means here shown as a contact carrier 44.

The contact carrier 44 comprises a cylindrical

shell 45 provided at its front end with a hollow generally cylindrical enlargement 53, joined to the shell 45 by an integral radial flange 46. The cylindrical enlargement 53 is here shown as fragmentarily cut away to form three segmental prongs 47, 48, 49. The diameter of the cylinder defined by the outer peripheral surfaces of the prongs 47, 48, 49 is such as to fit within the cylinder defined by the inner peripheral surfaces of the ears 40, 41, 42. The prongs 47, 48, 49 have their radial planes of symmetry unequally spaced, as may be seen in Figure 4, to correspond with the radial planes of symmetry of the ears 40, 41, 42 of the reflector; and the circumferential widths of the prongs 47, 48, 49 correspond generally to the circumferential widths of the respective ears 40, 41, 42. Here shown as extending radially outwardly from the circumferential centers of the prongs 47, 48, 49 are three projections 50, conveniently formed by locally indenting the inner peripheries of the prongs, to form depressions, such as the depression 51 shown in Figure 1.

The ears 40, 41, 42 are provided with recesses or apertures 52, suitably spaced from the free ends of the ears, and disposed complementarily with respect to the projections 50, so that the projections and apertures are adapted to interengage, as indicated in Figure 1, to hold the contact carrier 44 detachably assembled with the reflector 11. The ears 40, 41, 42 are further provided with recesses 54, extending axially rearwardly from near the apertures 52 and flaring radially outwardly in an axial direction toward the free ends of the ears.

The contact carrier 44 also includes an insulating member 55, having an outside diameter approximately the same as the inside diameter of the shell 45, adapted to abut diametrically opposite segmental flanges 56 extending radially inwardly from the rear end of the shell 45. The insulating member 55 is further provided with a plurality of circumferentially spaced radial projections, in this instance three, two of which, 57, 58, may be seen in Figure 5, and the third of which, 59, is located at the other side of the member 55, analogously to the projection 57. On opposite circumferential sides of the projection 58 are disposed two rearwardly extending projections 60, 61 on the shell 45. Immediately below the projections 57, 59, as viewed in Figure 5, the shell 45 is provided with the respective rearward projections 62, 63. The space between the projections 62, 63 is less than between the projections 60, 61. The projections 57, 58, 59, and the projections 60, 61, 62, 63 may be arranged in any other suitable manner, or any other suitable means may be adopted so that the insulating member 55 and the shell 45 may be assembled in but one relative rotative relation. In order to hold the insulating member 55 assembled with the shell 45 a desirable number of axially extending fingers 64 may be provided at the rear ends of the projections 60, 61, 62, 63, the fingers 64 being clinched radially inwardly over the rear face of the insulating member 55.

The insulating member 55 is adapted to carry contacts 65, 66, these contacts being desirably formed as enlarged heads on shanks fitted over and swedged to the ends of conductors 67, 68. The conductors 67, 68 are disposed in sleeves 69, each sleeve being slidable within a bushing 70, which is fixedly mounted in any suitable manner, as by beading, through the insulating member 55. Each sleeve 69 is surrounded by a spring 71, between the bushing 70 of the sleeve 69 and a

flange 72, on each sleeve, abutting the respective contacts.

In the position shown in Figure 1, the contacts 65, 66 of the contact carrier make contact respectively with contacts 73, 74 provided on the lamp base 12. One of these lamp contacts 73, is not visible, being directly behind the contact 74 visible in Figure 1. The provision of a plurality of contacts 73, 74 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, 75, 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, 76, may be displaced from the filament 75, and may be used for providing dim light or so-called tilted light. The filaments 75, 76 have their terminals connected in a well known manner to the lamp base 12 and to the contacts 73, 74 on the lamp base. The passage of current to either one or both of the filaments 75, 76, may be controlled in any suitable manner, by switching means (not shown) interposed in the conductors 67, 68.

It will be evident that in assembling the contact carrier 44 with the reflector 11, the enlargement 53 will be first brought into axial alignment with the axis of the cylinder defined by the ears 40, 41, 42 on the reflector, and the rotative relation of the contact carrier 44 with respect to the ears 40, 41, 42 must be such that the pins 50 are in axial alignment with the recesses 54 in the ears 40, 41, 42. The contact carrier 44 is then pushed in a frontward direction, the pins 50 engaging the surfaces of the recesses 54, further frontward movement of the contact carrier causing the ears 40, 41, 42 to be resiliently bent slightly outwardly until the pins 50 snap into the apertures 52.

It will be evident, since the pins 50 and the apertures 52 are unequally circumferentially spaced, that the contact carrier 44 may be assembled with the reflector 11 in but one relative rotative relation, and consequently the pair of contacts 65, 66, carried by the contact carrier 44 assumes a predetermined rotative relation with respect to the reflector.

When it is desired to assemble the lamp 10 with the reflector 11, the lamp is first brought to a position, at the front of the reflector, so that the portion 19 of the lamp flanges is concentric with the aperture 30 and the narrower sectoral projections 20, 21 of the lamp flange straddle the end flange 34. When the lamp 10 is in this position with respect to the reflector 11, the sectoral projection 22 has its left hand margin, 23, disposed slightly to the right of the right hand margin of the end flange 36. The sectoral projections 20, 21, 22 are then in a position to pass freely through the recesses 31, 32, 33 respectively. The lamp 10 may be then moved axially, rearwardly, against the bias of the springs 71, and it is so moved far enough so that the lug 27 will clear the end flange 36, whereupon the lamp is rotated in a clockwise direction, and at the same time may be permitted to move bodily frontwardly under the bias of the springs 71. This causes the narrower sectoral projections, 20, 21, to abut the rear faces of the end flanges 34, 35, and the end of the lug 27 to abut the rear face of the end flange 36. Further rotation of the lamp 10, in a clockwise direction will bring the lamp to the position shown in Figure 7 wherein the lug 27 has snapped into the aperture 43 in the end flange 36. Meanwhile, the axial pro-

jections 25 have been brought into contact with the rear faces of the end flanges 34, 35, 36, thereby definitely positioning the plane of the lamp flange 17 with respect to the end flanges 34, 35, 36 of the pocket.

It will be evident that since the lamp flange 17 is accurately pre-positioned with respect to its distance from the filaments 75, 76, and the direction of the plane of the flange 17 is pre-positioned with respect to the axis of the lamp 10, and the lug 27 positions the lamp rotationally, the filaments 75, 76 will assume the desired predetermined position with respect to the reflector when the parts are assembled, as in Figure 1. Also, it will be noted that due to the construction and relationship as between the end flanges 34, 35, 36 of the reflector pocket and the sectoral projections 20, 21, 22, of the lamp flange, it is possible to insert the lamp flange 17, as hereinbefore described, from but one relative rotative relation with respect to the reflector 11. In this connection it will be apparent that if it is attempted to insert the lamp flange 17 with the narrower sectoral projections 20, 21, straddling either the end flange 35 or the end flange 36, the shape and position of the wider sectoral projection, 22, will prevent insertion.

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.

When it is desired to remove the lamp 10 from the reflector 11, it will be obvious that it is necessary to first move the lamp rearwardly, so that the lug 27 will become disengaged from the aperture 43, whereupon the lamp may be rotated in a counter clockwise direction, until the narrower sectoral projections 20, 21, again straddle the end flange 34, whereupon the lamp may be removed.

Referring now to the embodiment shown in Figure 9, a lamp 10a, is held in a pocket 28a of the reflector 11a by a contact carrier 44a. The contact carrier 44a has an enlargement 53a which, as may be seen best in Figure 13, includes three prongs 47a, 48a, 49a. These prongs fit outside of three rearwardly extending ears on the reflector, two of which 40a, 41a are visible in Figure 9, and all of which are respectively similar to the ears 40, 41, 42, of the embodiment of Figures 1 through 8. The prongs 47a, 48a, 49a are provided with radially inwardly extending projections or pins 50a adapted to be seated in recesses or apertures 52a in the reflector ears 40a, 41a, and in the third ear, not visible, but corresponding to the ear 42. These ears are further provided with recesses 54a, extending axially rearwardly from near the apertures 52a, and flaring radially inwardly in an axial direction toward the free ends of the ears. The embodiment of Figure 9 is here shown as otherwise the same as the embodiment of Figure 1.

In the embodiment of Figure 10, a lamp 10b is held in a pocket 28b of a reflector 11b by a contact carrier 44b. The contact carrier has an enlargement 53b which, as may be seen best in Figure 14, is completely cylindrical and is adapted to fit outside of the reflector ears 40b, 41b, 42b. The enlargement is provided with radially inwardly extending pins 50b, adapted to be seated

in apertures 52b in the reflector ears. These ears are further provided with recesses 54b similar to the recesses 54a.

The reflector may have end flanges of its pocket 5 equally spaced, as for example the end flanges 34b, 35b, 36b of the reflector 11b, instead of unequally spaced as in the case of the reflector shown in Figure 3. Also, the lamp flange may have its sectoral projections equally spaced, and 10 of equal width, as for example the sectoral projections 20b, 21b, 22b, of the lamp flange 17b. In that case all of the sectoral projections 20b, 21b, 22b will register completely with the end flanges 34, 35, 36, as shown in Figure 16. The 15 sectoral projections 20b, 21b, 22b may then of course be passed through the recesses 31b, 32b, 33b in any one of three relative rotative relations, but the lug 27b will serve to properly locate the relative rotative position of the lamp 10b and the reflector 11b. The embodiment of Figure 10 20 is here shown as otherwise the same as the embodiment of Figure 1.

While the contact carrier 44b is shown as having the pins 50b circumferentially equally 25 spaced, it will be evident that these pins may be unequally spaced to correspond to and for cooperation with the unequally spaced recesses 54a and apertures 52a, of the reflector 11a. Moreover, while the ears 40b, 41b, 42b, of the reflector 30 11b are circumferentially equally spaced as are also the apertures 52b, this is not necessary since a contact carrier, such as 44a, or one such as 44b, but with unequally spaced pins 50b may be made cooperable with the reflector 11b having 35 correspondingly unequally spaced apertures 52b. Other variations will readily suggest themselves.

From the foregoing it will be apparent to those skilled in the art that the illustrated embodiments of my invention provide new and im- 40 proved electric lighting devices and units, readily and conveniently constructed and assembled, and accordingly, each accomplishes the principal object of my invention. On the other hand, it also will be obvious to those skilled in the art that 45 the illustrated embodiments 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 inven- 50 tion, 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 mounting having an 5 aperture and having a plurality of circumferentially spaced recesses extending outwardly from said aperture; an incandescent electric lamp provided with a base; said base being disposed in said aperture and having a lateral extension 10 constructed and arranged to abut said mounting at one side thereof; said mounting having integral circumferentially spaced projections extending laterally from said mounting at said side thereof and disposed around said aperture at the 15 ends of said recesses; pressing means constructed and arranged to be detachably supported by said mounting projections and so as to press said lateral extension into abutment with said mounting; said mounting and said lateral extension 20 including means separate from said pressing means, comprising cooperating parts on said mounting and said lateral extension respectively, so constructed and arranged that when said lamp 25 and said mounting are in a predetermined relative rotative position said lamp is restrained against rotation with respect to said mounting.

2. In combination: a mounting having an aperture and having a plurality of circumferentially spaced recesses extending outwardly from 30 said aperture; an incandescent electric lamp provided with a base having contact means; said base being disposed in said aperture and having a lateral extension provided with a plurality of circumferentially spaced radially extending pro- 35 jections constructed and arranged to abut said mounting; said recesses and said projections being so constructed and arranged that said projections are insertable through said recesses; said mounting having integral circumferentially 40 spaced projections disposed around said aperture at the ends of said recesses; said mounting projections extending laterally from one side of said mounting; and means, carrying contact means cooperable with said contact means on said base, 45 constructed and arranged to be detachably supported by said mounting projections and so as to press said lateral extension into abutment with said mounting.

HARRY A. DOUGLAS. 50