

08 E. PITKJAAN 3,
SEALED-BEAM TYPE ELECTRIC LAMP WITH NON-CIRCULAR
LENS COMPONENT

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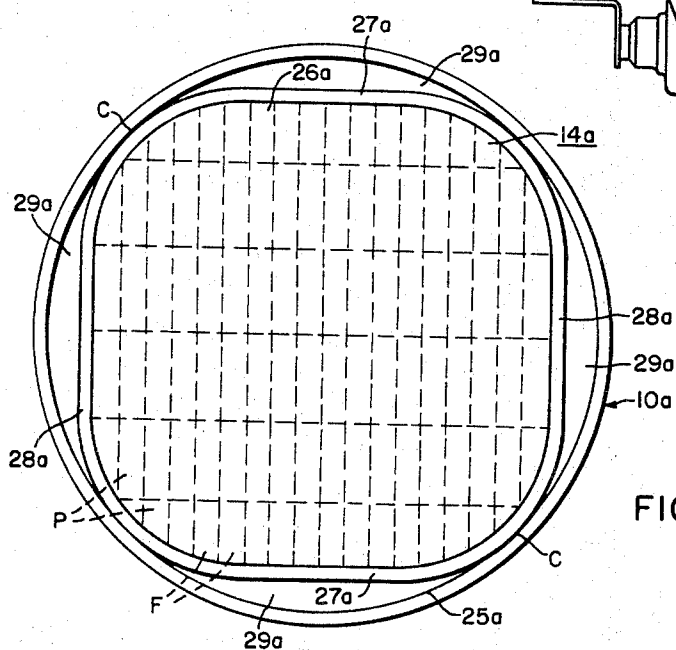
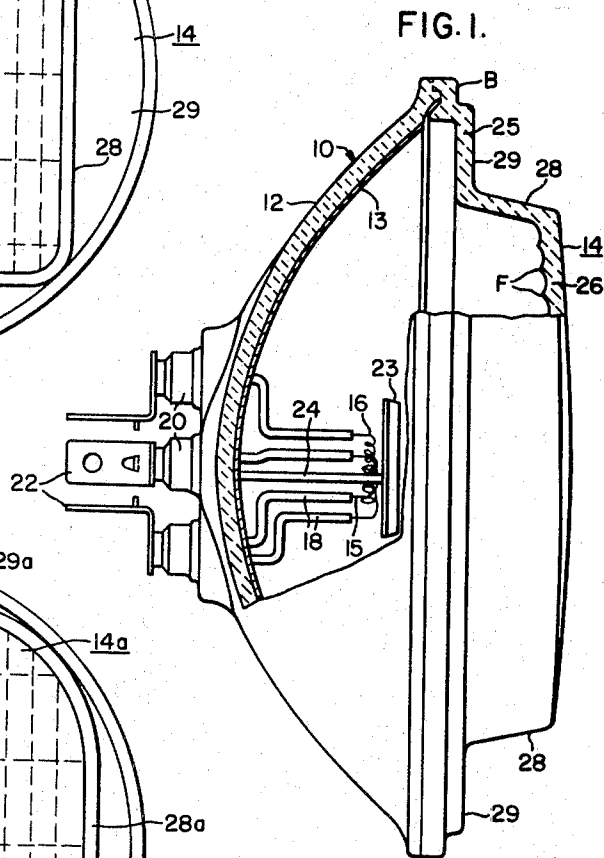
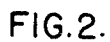


FIG.3.

WITNESSES

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SEALED-BEAM TYPE ELECTRIC LAMP WITH NON-CIRCULAR
LENS COMPONENT

3,413,508

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2 Sheets-Sheet 2

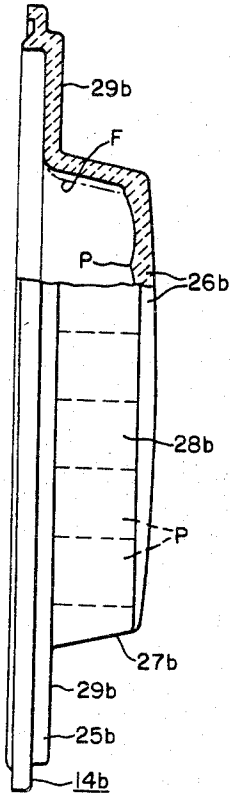


FIG. 5.

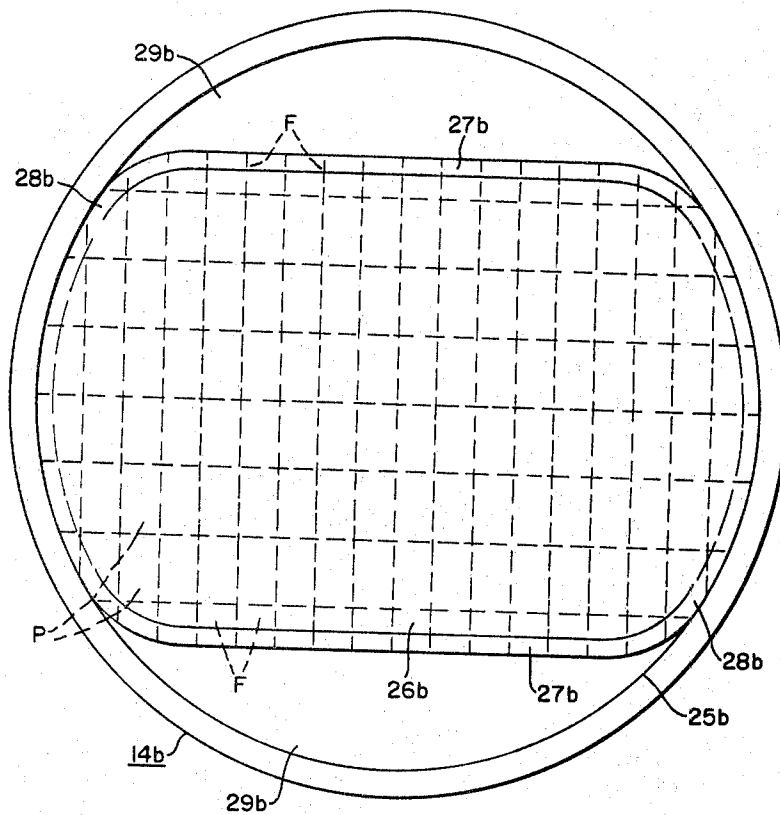


FIG. 4.

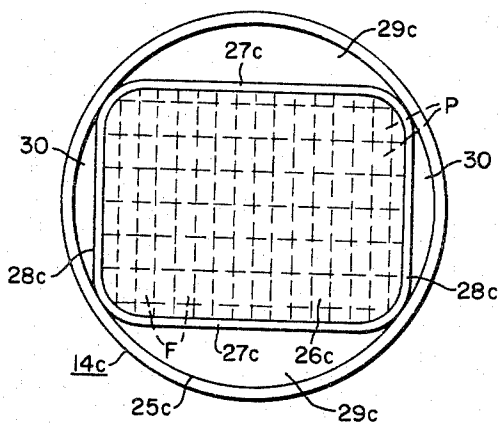


FIG. 6.

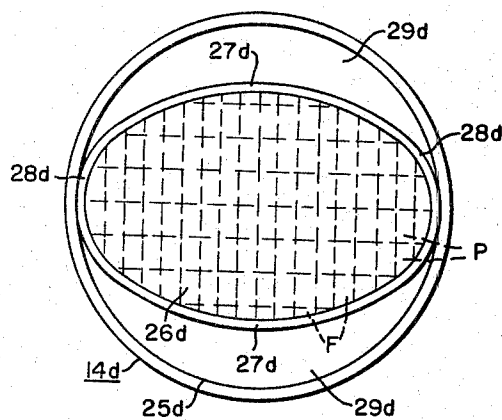


FIG. 7.

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3,413,508

SEALED-BEAM TYPE ELECTRIC LAMP WITH NON-CIRCULAR LENS COMPONENT

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ABSTRACT OF THE DISCLOSURE

The reflector component of a conventional circular sealed-beam lamp is closed by a vitreous cover plate that has a circular flange and a non-circular outwardly protruding hollow refractor that includes a lens portion. The circular flange of the plate is fused to the matching rim of the reflector to form a hermetically sealed envelope. The construction gives the lamp a non-circular appearance when it is mounted on the vehicle but permits it to be manufactured on standard equipment designed for circular-shaped lamps.

Background of the invention

This invention relates to electric lamps and has particular reference to sealed-beam type reflector lamps for automobiles and other vehicles. Serious consideration has recently been given to a proposal that square-shaped or rectangular-shaped automobile headlamps be used in place of the conventional circular type to enhance their aesthetic appearance and provide automobile designers with greater latitude as regards the styling of the lighting system and associated trim components. While such a change is quite feasible from a functional standpoint, it presents a serious manufacturing problem in that it is very difficult to seal a non-circular glass lens to a matching non-circular glass reflector.

As is well known, circular sealed-beam headlamps are manufactured on so-called "sealex" machines which hold the parabolic glass reflector and circular glass lens components in abutting relationship and rotate them as a unit through sealing fires which fuse and seal the glass members together at their peripheries. This sealing operation is critical because a carefully controlled amount of heat must be applied to the glass sealing flanges in order to form a uniform stress-free hermetic seal. As will be apparent, if non-circular lens and reflector components are placed in abutting relation and rotated about the reflector axis, the distance between the periphery of such an assembly and an adjacent fixed point in the same plane will vary. Hence, a special sealing machine having movable sealing-fires or other means for uniformly heating the abutting peripheral edges of the glass components is required to manufacture non-circular headlamps. Such a machine would not only be complicated and expensive but would have to be periodically adjusted and constantly monitored by a skilled machine attendant to insure high quality seals.

Summary of the invention

It is accordingly the general object of the present invention to provide an electric lamp of the reflector type that has an integral non-circular lens component and avoids the foregoing manufacturing and other problems associated with making non-circular reflector lamps.

Another and more specific object is the provision of a sealed-beam type vehicle lamp which will have the appearance of a non-circular lamp when mounted on the vehicle but which can be manufactured on conventional lamp-sealing machines.

Another object is the provision of a glass closure mem-

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ber for the glass reflector component of a sealed-beam type lamp which simulates the appearance of a non-circular lamp but retains the manufacturing advantages of a circular-shaped lamp.

The aforesaid objectives and other advantages are achieved in accordance with the present invention by utilizing a conventional glass reflector component and a novel closure member that has a circular flange portion and a lens portion that is of non-circular configuration and constitutes part of an outwardly protruding hollow refractor which is located entirely within the periphery of the closure member. The circular rim of the closure member matches that of the conventional glass reflector and the components are sealed together at their peripheries in the same manner and on the same lamp-making machines as standard circular sealed-beam lamps. However, when the lamps are mounted on the car or other vehicle, suitably designed trim and lamp housings mask the recessed circular flange portions of the closure members so that only the non-circular refractor and lens portions are visible. Thus, the lamps per se, as mounted, appear to be of non-circular configuration.

Brief description of the drawing

A better understanding of the invention will be obtained by referring to the accompanying drawing, wherein:

FIGURE 1 is a top view of a sealed-beam type lamp embodying the invention, portions of the envelope being removed to show construction details;

FIG. 2 is a front view, on a slightly reduced scale, of the lamp shown in FIG. 1;

FIG. 3 is a similar view of a sealed-beam lamp having a lens of different configuration;

FIGS. 4 and 5 are front and side elevational views, respectively, of a circular closure member having a generally rectangularly-shaped lens portion; and

FIGS. 6 and 7 are front elevational views of alternative closure member embodiments.

While the present invention can be used with advantage in various types of reflector lamps that require a lens or other light-modifying component to redirect the light rays and provide a controlled beam of light, it is particularly adapted for use in sealed-beam vehicle headlamps and has accordingly been shown and will be described in this form.

Embodiment 1

With specific reference now to the embodiment illustrated in FIG. 1, the sealed-beam lamp 10 there shown includes a conventional concave reflector member 12 that is molded from vitreous material such as soft glass and has its inner surface coated with a reflective layer 13 of suitable metal such as aluminum or silver. The reflector member 12 is preferably of paraboloidal configuration and has a circular rim that is sealed to a similarly shaped and matching rim of the vitreous cover plate or closure member 14 of the present invention. The two members thus form an integral hermetically sealed envelope having a bead B of fused glass extending around its periphery.

A suitable concentrated light source such as a pair of refractory wire filaments 15 and 16 of tungsten or the like are sealed within the envelope formed by the reflector and closure components 12 and 14, respectively. These filaments are located at or near the focal point of the reflector and are held in such position by a plurality of lead wires 18 that are connected to ferrules 20 sealed into the back of the reflector component 12 in the conventional manner. Metal lugs 22 are fastened to each of the ferrules 20 to facilitate the connection of the lamp 10 with the lighting circuit of the car. A glare-reducing shield 23 is preferably mounted in front of the filaments

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15 and 16 and is held at this location by a support wire 24 that is fastened to one of the ferrules 20. The lamp is evacuated and filled with an inert gas, such as argon, through an exhaust tube (not shown) located at the back of the reflector member 12.

In accordance with the present invention, the appearance of a non-circular lamp is achieved by utilizing a closure member 14 which (as will be noted in FIGS. 1 and 2) consists of a circular glass plate having a substantially planar flange portion 25 and an elevated lens portion 26 which is of non-circular configuration and spaced outwardly from the flange portion of the plate. In this particular embodiment, the lens portion 26 is square shaped and, as shown more particularly in FIG. 2, it is located entirely within the circular rim of the closure plate 14. The edges of the square lens portion 26 merge with a pair of spaced horizontal ledges 27 and a pair of spaced vertical ledges 28 that are conjoined and form a continuous transversely-extending sloped collar or bezel of uniform width. The lens portion 26 is thus disposed in a plane that is spaced a predetermined distance from the planar flange portion 25 of the cover plate 14.

The lens portion 26 intersects the optical axis of the reflector 12 and, as shown in FIG. 2, is provided with a plurality of vertically extending flutes F and horizontally extending prisms P which are optically designed and arranged in the well known manner to bend the light rays generated by the filaments 15 and 16 into an intense beam of light having the desired beam pattern. These flutes and prisms are preferably molded directly onto the inner surface of the lens portion 26, as is illustrated in FIG. 1, so that the outer surface of the lens is smooth and easy to keep clean. The construction and manner in which the flutes F and prisms P cooperate to redirect the light rays in the manner required to obtain the desired beam pattern are described in U.S. Patent No. 2,177,217 issued Oct. 24, 1939 to E. A. Howard et al.

An important feature of the present invention resides in the fact that the elevated square-shaped lens portion 26 and the bezel formed by the conjoined ledges 27 and 28 constitute integral parts of the glass cover plate 14 and together form a hollow outwardly-protruding refractor or light-modifying structure. The closure member 14 can thus be fabricated in one piece on a mass production basis by utilizing conventional press-molding techniques and suitably designed molds or dies.

As will be noted in FIG. 2, the refractor formed by the square-shaped lens portion 26 and conjoined ledges 27, 28 is centrally located with respect to the circular periphery of the closure plate 14 thus providing four arcuate-shaped flats or lands 29 that are symmetrically arranged around the circumference of the plate. If desired, these lands may be utilized as reference surfaces for adjusting the position of the mounted headlamps and insuring that they are properly aimed.

Embodiment II

In FIG. 3 there is shown an alternative sealed-beam headlamp embodiment 10a that is closed by a glass cover plate 14a having an outwardly protruding generally bezel and square-shaped lens portion 26a similar to the one above described. However, in accordance with this form of the invention the corners C of the lens portion are rounded off and have approximately the same degree of curvature as the circular flange 25a of the plate. The ledges 27a and 28a are also located closer to the rim of the plate 14a so that area of the elevated lens portion 26a is larger than in Embodiment I. The arcuate lands 29a are proportionately much smaller in area.

Embodiment III

In FIGS. 4 and 5 there is shown another form of closure plate 14b which has a circular flange portion 25b and a raised generally rectangular-shaped lens portion 26b which extends horizontally across practically the

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entire diameter of the plate. The laterally disposed ledges 28b are curved and follow the contour of the plate periphery. Since only the upper and lower ledges 27b are straight and spaced a considerable distance inwardly from the plate periphery, only two arcuate lands 29b are provided in this embodiment.

As indicated in FIGS. 4 and 5, the flutes F and prisms P can be extended, if desired, to the inner surfaces of the horizontally disposed ledges 27b and vertically disposed arcuate ledges 28b, respectively, to control the light rays passing through these portions of the hollow refractor. The bezel formed by the transversely extending ledges would, in this case, also serve as a light modifier and constitute a functional part of the lens portion 26b that could be used to minimize glare from stray light rays or to provide "cornering" light.

Embodiment IV

In FIG. 6 there is shown another type of cover plate 14c having a rectangular-shaped raised lens portion 26b, the slightly rounded corners of which are spaced only a short distance inwardly from the rim of the plate. The side ledges 28c which define the short sides of the bezel and rectangular lens 26b are located much closer to the plate periphery than the upper and lower ledges 27c. This arrangement provides arcuate lands 30 on each side of the lens that are much smaller than the upper and lower lands 29c.

Embodiment V

The cover plate 14d illustrated in FIG. 7 shows still another form of the invention wherein the protruding bezel and lens portion 26d are in the shape of an ellipse that is so disposed that its major axis is aligned with the horizontal axis of the plate. The sharply curved side ledges 28d are located near the periphery of the plate so that only two moon-shaped lands 29d located above and below the lens are provided.

As will be obvious, the elevated or raised bezel and lens portions can be of any shape as long as they can be conveniently formed and will not produce any strains in the glass which will weaken or cause the cover plate to crack during or after the sealing operation.

It will be appreciated from the foregoing that the objects of the invention have been achieved in that a novel sealed-beam type lamp and lens component have been provided which afford the appearance of styling advantages of a non-circular lamp but avoid the manufacturing and other difficulties that would be encountered in fabricating such lamps.

While several embodiments have been illustrated and described, it will be appreciated that various modifications can be made without departing from the spirit and scope of the invention. For example, the inner surface of the glass plate corresponding to the lands can be roughened or stippled to give the finished lamp a more attractive appearance, or can be coated with reflective material to reduce the amount of light lost inside the lamp. Protruding glass lugs can also be molded onto the outer surfaces of the lands or edges of the raised lens portion to provide aiming pads which can be ground down in the well known manner, after the lamp has been sealed, to form accurately oriented reference surfaces.

I claim as my invention:

1. A sealed-beam-type electric lamp comprising:
 - a concave reflector member of vitreous material having an optical axis, a circular rim and a layer of reflective material on its inner surface,
 - a concentrated light source located within said reflector member and disposed in predetermined spatial relationship with respect to the optical axis thereof, means supporting said light source at the aforesaid location within said reflector member, and
 - a vitreous light-transmitting closure member having (1) a planar flange portion with a circular periphery that

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matches the rim of said reflector member, (2) a non-circular lens portion, and (3) a plurality of conjoined ledges that define a transversely extending bezel which is joined to said lens portion and together therewith constitutes a hollow outwardly-protruding refractor of non-circular configuration that is disposed within the periphery of said flange portion, said closure member being joined to the rim of said reflector member and constituting therewith an integral hermetically-sealed vitreous envelope having a circular periphery and a non-circular lens portion that intersects the optical axis of the reflector member and is spaced a predetermined distance in front of the envelope periphery.

2. The electric lamp set forth in claim 1 wherein the lens portion of said closure member has a smooth outer surface and a plurality of integral light-bending elements disposed on its inner surface.

3. The electric lamp set forth in claim 2 wherein integral light-bending elements are also disposed on the inner surfaces of the bezel portion of said hollow refractor.

4. The electric lamp set forth in claim 2 wherein said vitreous reflector member is of substantially paraboloidal configuration, said light source comprises a refractory wire filament, and the lens portion of said closure member is of substantially rectangular configuration and said light-bending elements comprise a plurality of flutes and prisms that protrude from the inner surface of the lens portion that are spatially arranged to direct the light rays from said filament and reflector into a beam of light having a predetermined beam pattern,

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5. As a new article of manufacture, a closure member for the reflector component of a sealed-beam lamp or similar device comprising a glass plate having a planar flange portion of circular configuration and a plurality of transversely-extending conjoined ledges which define a bezel that merges with a non-circular lens portion and together therewith forms a hollow refractor of non-circular configuration that lies within the periphery of said plate but protrudes outwardly from the planar flange portion thereof.

6. The article set forth in claim 5 wherein the protruding hollow refractor is generally square shaped and is centrally disposed with respect to the periphery of said plate.

7. The article set forth in claim 5 wherein the protruding hollow refractor is of generally rectangular configuration.

8. The article set forth in claim 5 wherein said protruding hollow refractor is of generally elliptical configuration.

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