

Aug. 30, 1927.

C. A. B. HALVORSON, JR

1,640,448

LIGHTING UNIT

Filed Feb. 28, 1925

Fig. 1.

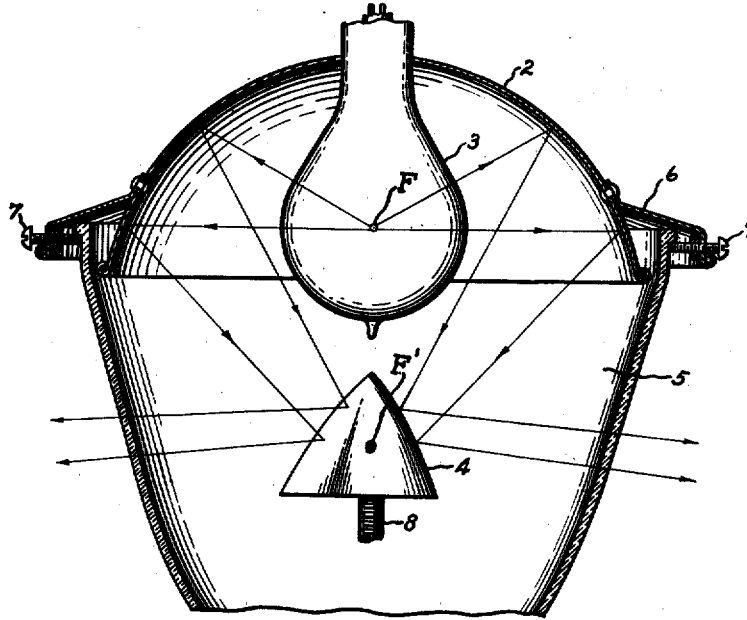


Fig. 2.

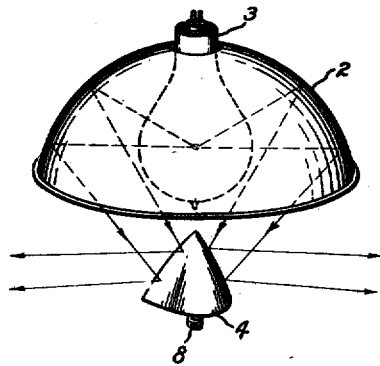
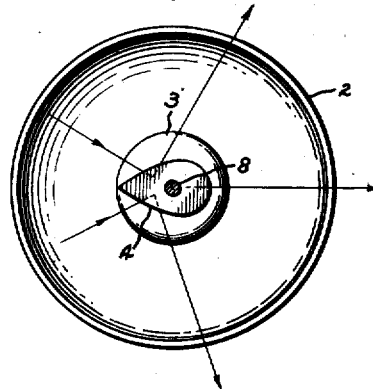


Fig. 3.



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# UNITED STATES PATENT OFFICE.

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## LIGHTING UNIT.

Application filed February 28, 1925. Serial No. 12,424.

My invention relates to lighting units of a type which is especially adapted for highway lighting, although it may be used for interior lighting as well.

5 It is quite common to find in the lighting art units which are adapted to illuminate uniformly a circular area or zone about the axis of the unit. In some instances a paraboloidal reflector is used for this purpose  
10 and a secondary conic reflector is interposed at any suitable distance in the path of the beam which intercepts and uniformly distributes the light in the zone. But as far  
15 as I am aware, in no instance has there been used in a lighting unit a main reflector of the ellipsoidal type with an auxiliary reflector located at or about the conjugate focal point and having a light source located  
20 at the principal focal point, the axes of both reflectors being coincident for uniformly or asymmetrically lighting the zone.

It is an object of my invention to provide a unit with such elements for the purposes indicated.

25 Furthermore, it is an object to construct the auxiliary reflector in the form of a curved surface of revolution for producing the uniform type of illumination in the zone about the axis of the unit and, to construct  
30 the auxiliary reflector as a warped or curved surface unsymmetrical with respect to the axis of the unit to produce the asymmetric type of illumination of the zone. The means for accomplishing the results indicated in  
35 the foregoing are hereinafter more fully set forth and claimed, reference being had to the accompanying drawing in which Fig. 1 shows the unit of my invention in section and in elevation; Fig. 2 is a perspective reduced drawing showing the main and auxiliary reflectors and the source of light in their relative positions; and Fig. 3 is a bottom view of the elements shown in Fig. 2.

Referring more in detail to the drawing,  
45 it will be seen that the unit has a main reflector 2, which reflector is ellipsoidal in form. At or about the main focal point F the unit has a light source 3, and at the conjugate focal point F' it has an auxiliary reflector  
50 4. Enclosing the unit appears the globe 5, on the upper end of which rests the ellipsoidal reflector 2, the lower end being provided with a circular flange 6. This flange may be suitably secured to the upper rim of  
55 the globe 5 by means of screws 7.

It will be understood that the socket for the light source 3 may be supported by any suitable frame work which may, if desired, be made to rest on the upper side of the reflector 2, also the auxiliary reflector or the target 4, as it is sometimes called, is provided with a threaded stem 8, thereby adapting the target to be screwed to any suitable supporting element at the base of the unit. It will be understood further that the auxiliary reflector surface may be of any suitable form. It may be curved, convex or concave; the curve may be parabolic, hyperbolic, elliptical or spherical; or it may be partly concave or convex, depending upon the character of light distributed desired.

With a lighting unit having the elements illustrated and described, the rays of light originating at the focal point F, for example, will follow a path indicated by the arrows and the nature of the distribution will be determined by the configuration of the surface of the target, as very clearly indicated in Fig. 3. With a device of this type, in order to change the nature of the distribution of light it is necessary only to take out the target 4 and replace it with another target having the proper form of reflecting surface.

It will be seen that with a unit such as applicant has devised he is able to produce a much wider zone of light about the axis of the unit than by using, for example, some other conicoidal form of main reflector. It will also be seen that a much broader zone of light is obtained with a much smaller auxiliary reflector at the conjugate focal region; and that the intensity of the light in the zone may be varied as desired by making the auxiliary reflector asymmetric in form.

Another advantage in applicant's construction is that by using an ellipsoidal reflector the auxiliary reflector may be made much smaller and, therefore, the shadow cast by the unit will be less prominent.

While I have shown and described my invention in a specific and concrete form, it will be understood I do not wish to be so limited, inasmuch as variation and modification of my invention will readily suggest themselves in view of the disclosure and may be produced without departing from the spirit of the invention or from the scope of the claims herein.

What I claim as new and desire to secure

by Letters Patent of the United States, is,—

1. In a lighting unit, in combination, an ellipsoidal reflector, a source of light located at the main focal point of the reflector, and an auxiliary asymmetrical reflector located between the main and conjugate points of the ellipsoidal reflector, the axes of the two reflectors being parallel and whereby a converging beam of light is projected toward the conjugate focal point of the ellipsoidal reflector, and intercepted by the auxiliary reflector and distributed asymmetrically in a zone about the axis of the unit.

2. In a lighting unit, in combination, an ellipsoidal reflector, a source of light located at the principal focal point, an auxiliary reflector located about the conjugate focal region of the ellipsoidal reflector and having a surface generated about its longitudinal axis, the apex of the auxiliary reflector being

located at a point between the two focal points of the ellipsoidal reflectors, whereby the beam of light projected toward the auxiliary reflector by the ellipsoidal reflector is distributed asymmetrically in a zone about the axis of the unit.

3. In a lighting unit, in combination, a main ellipsoidal reflector, a source of light located at one focal region of the reflector and a convex reflector covering the conjugate focal region of the main reflector, the convex surface of the convex reflector being toward the main reflector and also being asymmetrical in configuration whereby a zone of light is produced about the axis of the unit having asymmetric distribution.

In witness whereof, I have hereunto set my hand this 26th day of February, 1925.

CROMWELL A. B. HALVORSON, JR.

by Letters Patent of the United States, is,—

1. In a lighting unit, in combination, an ellipsoidal reflector, a source of light located at the main focal point of the reflector, and an auxiliary asymmetrical reflector located between the main and conjugate points of the ellipsoidal reflector, the axes of the two reflectors being parallel and whereby a converging beam of light is projected toward the conjugate focal point of the ellipsoidal reflector, and intercepted by the auxiliary reflector and distributed asymmetrically in a zone about the axis of the unit.

2. In a lighting unit, in combination, an ellipsoidal reflector, a source of light located at the principal focal point, an auxiliary reflector located about the conjugate focal region of the ellipsoidal reflector and having a surface generated about its longitudinal axis, the apex of the auxiliary reflector being

located at a point between the two focal points of the ellipsoidal reflectors, whereby the beam of light projected toward the auxiliary reflector by the ellipsoidal reflector is distributed asymmetrically in a zone about the axis of the unit.

3. In a lighting unit, in combination, a main ellipsoidal reflector, a source of light located at one focal region of the reflector and a convex reflector covering the conjugate focal region of the main reflector, the convex surface of the convex reflector being toward the main reflector and also being asymmetrical in configuration whereby a zone of light is produced about the axis of the unit having asymmetric distribution.

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#### Certificate of Correction.

Patent No. 1,640,448.

Granted August 30, 1927, to

CROMWELL A. B. HALVORSON, JR.

It is hereby certified that error appears in the printed specification of the above-numbered patent requiring correction as follows: Page 2, line 10, claim 1, for the word "of" read *by*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 11th day of October, A. D. 1927.

[SEAL.]

M. J. MOORE,  
*Acting Commissioner of Patents.*

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