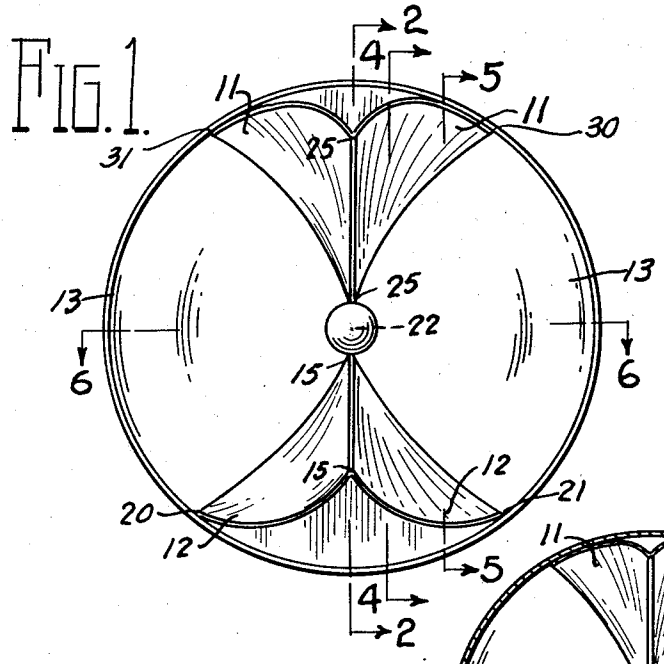
Nov. 2, 1954 R. L. HARRIS 2,693,524

HEADLIGHT REFLECTOR

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FIG. 1.



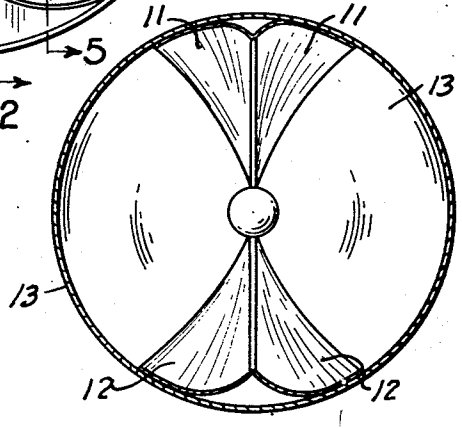


FIG. 3.

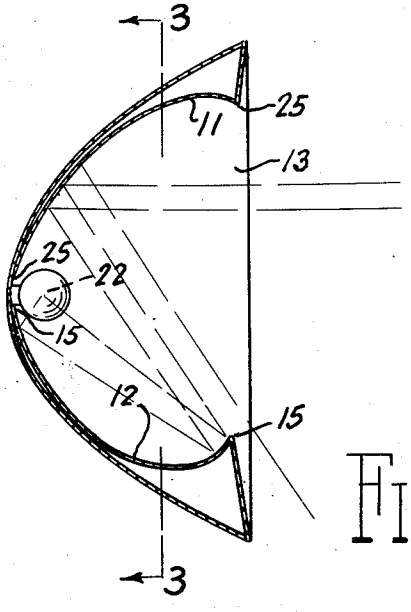


FIG. 2.

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FIG. 4.

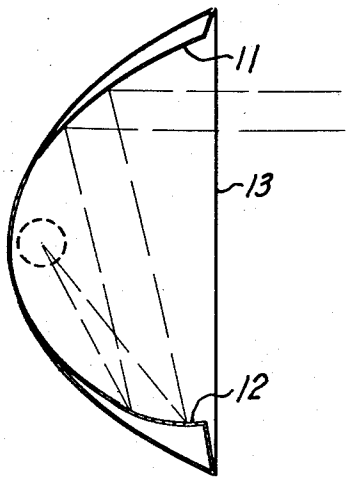


FIG. 5.

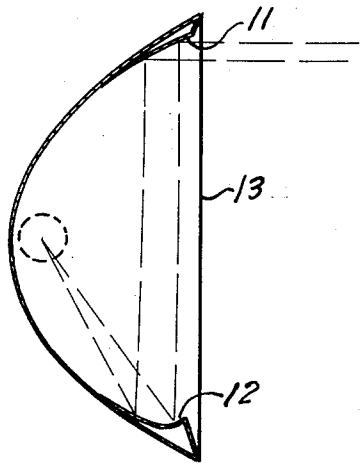
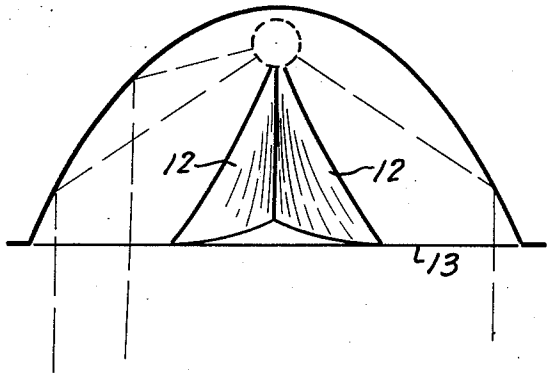


FIG. 6.



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HEADLIGHT REFLECTOR

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Application March 4, 1952, Serial No. 274,680

2 Claims. (Cl. 240—103)

This invention relates to a headlight reflector, and, more particularly, to such a reflector having a novel shape that avoids ascending rays of light.

Many attempts have heretofore been made to produce a headlight reflector to minimize stray ascending rays of light that are particularly blinding to approaching motorists. However, such attempts have taken the direction of complicated reflector shapes that would be expensive to produce; so far as is known no such reflector is commercially available, only the simple parabolic reflectors being in general use. At the present time the principal reliance is placed on the lens to prevent blinding rays, but the problem has been by no means solved.

The present invention is based upon the discovery of a novel reflector, of relatively simple shape, that substantially eliminates the glare from headlights, but concentrates illumination on the highway to assure safe night driving. The reflector may be used alone or in conjunction with any conventional ray-directing lens.

The principal object of the invention is, therefore, to provide a novel improved headlight reflector.

Other objects of the invention are apparent from the description which follows, and from the accompanying drawings, in which:

Fig. 1 is a front view showing a novel reflector of the invention;

Fig. 2 is a sectional view along the line **2—2** of Fig. 1;

Fig. 3 is a view in section along the line **3—3** of Fig. 2;

Fig. 4 is a sectional view along the line **4—4** of Fig. 1 showing the shape of deflecting surfaces in the reflector;

Fig. 5 is a view in section along the line **5—5** of Fig. 1 further showing the shape of deflecting surfaces; and

Fig. 6 is a central, horizontal sectional view of the reflector along the line **6—6** of Fig. 1 showing the horizontal pattern of a beam of light.

Referring now in more detail to the drawings, and, specifically, to Fig. 1, the reflector shown is composed of two pairs of concave deflecting surfaces **11—11** and **12—12**, and two reflecting surfaces **13—13** which are essentially sections of a parabolic surface, and which space the pairs of deflecting surfaces **11—11** and **12—12**. The deflecting surfaces **12—12** are so disposed as to intercept and redirect in a horizontal plane downwardly directed light rays that would otherwise cause glare. The deflecting surfaces **11—11** are so disposed as to intercept and redirect in a horizontal plane upwardly directed rays that would otherwise be beamed to an undesirable height above the highway.

The deflecting surfaces **12—12** are disposed at the bottom of the reflector, and approach tangency with each other along a line **15—15** which lies in the vertical center plane of the parabolic reflecting surfaces **13—13**. Each of the surfaces **12—12**, is also approximately tangent to one of the reflecting parabolic surfaces **13—13** along its line of contact therewith. Two points, **20** and **21**, represent the outer extremities of the deflecting surfaces **12—12**, and a point **22** represents the intersection of all six surfaces of the reflector. As is apparent in the projection of Fig. 1, lines drawn thereon from **20** to **22** and from **21** to **22** form an angle of about 85°. As can be seen in Fig. 2, the line of tangency between the two surfaces **12—12** is generally of sine wave shape, and constitutes about ⅜ of a complete cycle. The two surfaces **12—12** are generally symmetrical with respect to each other. Most desirably, the hair

line **15—15** along which the surfaces **12—12** approach tangency is painted black to avoid any possibility of reflection therefrom.

The deflecting surfaces **11—11** are disposed at the top of the reflector, and approach tangency with each other along a line **25—25** which lies in the vertical center plane of the parabolic reflecting surfaces **13—13**. Each of the surfaces **11—11** is also approximately tangent to one of the reflecting surfaces **13—13** along its line of contact therewith. Two points, **30** and **31**, represent the outer extremities of the deflecting surfaces **11—11**. As is apparent in Fig. 1 lines drawn thereon from **30** to **22** and from **31** to **22** form an angle of about 80°. As can be seen in Fig. 2, the line of tangency between the two surfaces **11—11** is generally parabolic and has a lesser spread than do the parabolic reflecting surfaces **13—13**. The two surfaces **11—11** are generally symmetrical with respect to each other.

As can be seen by reference to Figs. 4 and 5 the two surfaces **11—11** and the two surfaces **12—12** change gradually in shape from the lines **15—15** and **25—25** where they approach tangency, respectively, with each other to their respective points of tangency with the surfaces **13—13**. The upturned outer extremities of the lower surfaces **12—12** serve to reflect backwardly and laterally rays of light emanating in a downward direction from a light source **35**. The reflected rays are then reflected a second time by one of the surfaces **13—13** or by one of the surfaces **11—11**; the direction of any of the rays after this second reflection, as is shown in Figs. 2, 4 and 5, is in a generally horizontal plane. As is shown in Fig. 6, this direction is also generally axial of the parabolic surfaces **13—13**.

Accordingly, it is clear that a reflector of the invention provides a beam of light virtually without upwardly directed rays, and is of such shape that it can readily be produced by simple stamping techniques.

It is to be understood that the invention is not limited to the precise relationships and proportions shown, as various modifications can be made without departing from the spirit of the claims. It will be apparent that the invention provides a reflector comprising, in combination, means including a pair of adjacent, concave, generally symmetrical surfaces disposed at the bottom of the reflector for deflecting back into the reflector downwardly directed rays of light from a light source within the reflector, and means for reflecting the deflected rays trom the reflector in a generally horizontal plane comprising a pair of adjacent, concave, generally symmetrical surfaces disposed at the top of the reflector, and a pair of spaced, generally parabolic surfaces spacing the two pairs of concave surfaces.

Having described the invention, I claim:

1. An integral reflector comprising, in combination, means for deflecting downwardly directed light rays from a light source within said reflector into said reflector, said means consisting of a pair of adjacent, concave, generally symmetrical surfaces disposed at the bottom of said reflector, and approximately tangent to each other generally along a line in the vertical center plane of said reflector, means for reflecting said deflected rays from said reflector in a generally horizontal plane, said latter means comprising a pair of adjacent, concave, generally symmetrical surfaces disposed at the top of said reflector, and approximately tangent to each other generally along a line in the vertical center plane of said reflector, and a pair of symmetrical surfaces each constituting a portion of a paraboloid spacing said two pairs of concave surfaces from one another, said paraboloid surfaces being spaced from one another by said pairs of concave surfaces, and each of said paraboloid surfaces being approximately tangent to one of said deflecting surfaces disposed at the bottom of said reflector and to one of said deflecting surfaces disposed at the top of said reflector.

2. An integral reflector comprising, in combination, two pairs of concave deflecting surfaces, and two spaced, opposed, substantially identical reflecting surfaces spacing said pairs of deflecting surfaces from one another, wherein said reflecting surfaces are portions of a paraboloid, two of said deflecting surfaces constituting one

of said pairs are generally symmetrical, and are disposed at the bottom of the reflector, are tangent to each other along a line approximately in the vertical center plane of the paraboloid surfaces of the reflector, and, respectively, to each of said reflecting surfaces, the lines of tangency of said two deflecting surfaces with said reflecting surfaces meet at an angle of from 70° to 90°, and the line of tangency of said two deflecting surfaces with each other is generally of sine wave shape, and constitutes about ⅜ of a cycle, sarting at zero at the interior extremity of said line; and wherein the two deflecting surfaces constituting the other of said pairs are generally symmetrical, are disposed at the top of the reflector, are tangent to each other along a line approximately in the vertical center plane of the reflecting surfaces of the reflector and, respectively, to each of said reflecting surfaces, the lines of tangency of said two deflecting surfaces with said reflecting surfaces meet at an angle of from 70° to 90°, and the line of tangency of said two deflecting surfaces with each other is generally parabolic and has a lesser spread than do the said reflecting surfaces of the reflector.

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