Aug. 27, 1940. A. L. CHAUVET 2,212,876

NONGLARE HEADLIGHT

Filed Nov. 5, 1938

Fig. 1.

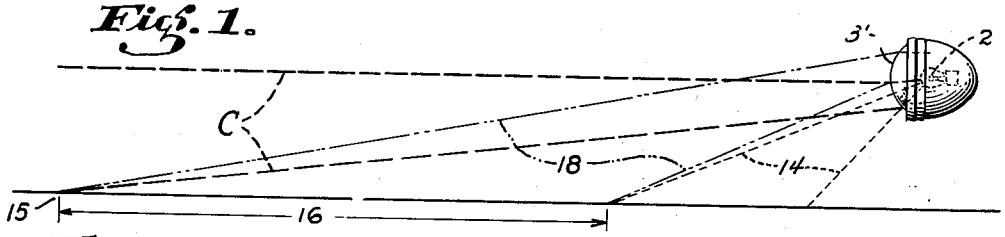


Fig. 2.

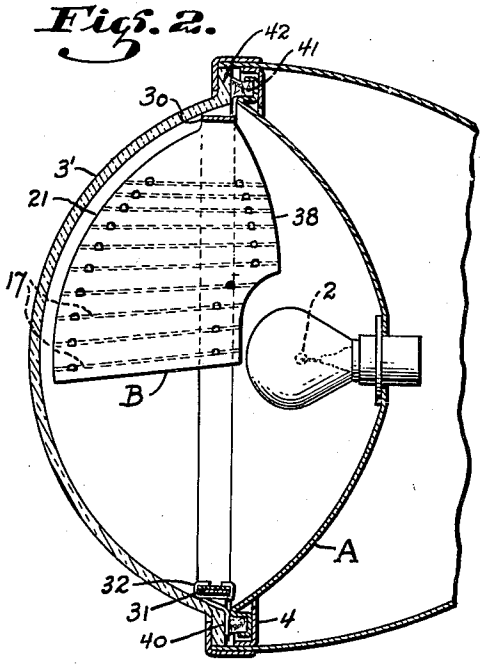


Fig. 4.

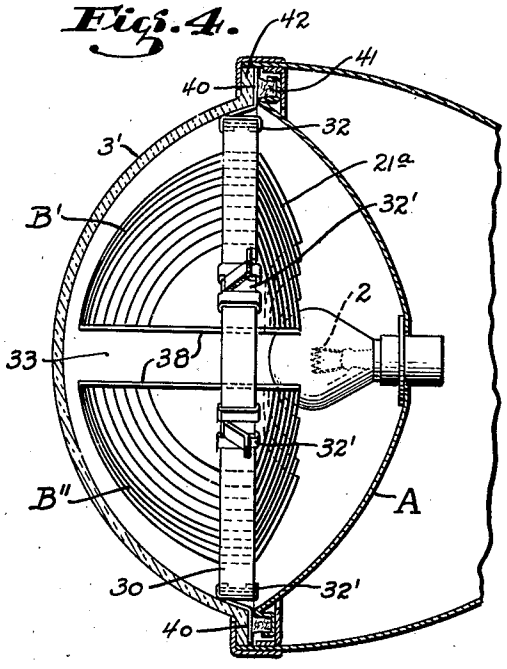


Fig. 3.

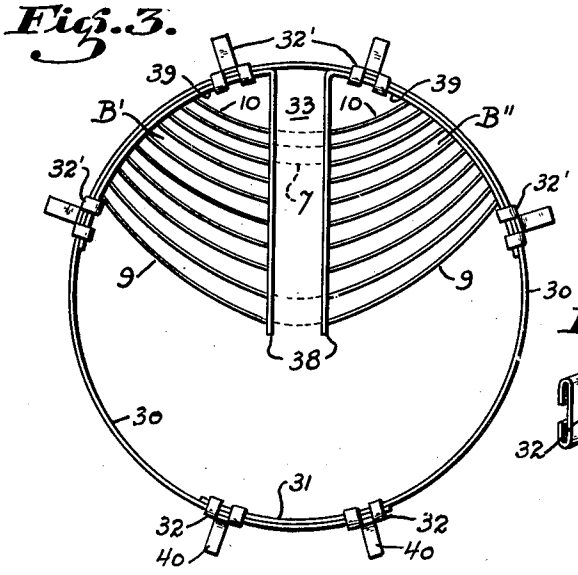


Fig. 5.

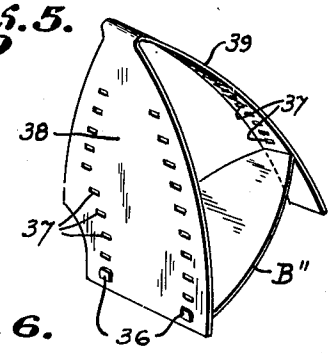
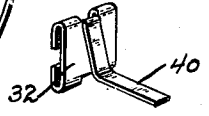


Fig. 6.



INVENTOR.
Albert L. Chauvet.

BY

Chas. E. Townsend.
ATTORNEY

Patented Aug. 27, 1940

2,212,876

UNITED STATES PATENT OFFICE

2,212,876

NONGLARE HEADLIGHT

Albert L. Chauvet, Piedmont, Calif.

Application November 5, 1938, Serial No. 239,007

5 Claims. (Cl. 240—48.4)

This invention relates to vehicle headlights and especially to a series of auxiliary reflectors interposed between the main parabolic reflector of a light and the lens, whereby a certain proportion of the parallel rays projected from the upper half of the parabolic reflector are deflected downwardly and laterally, the present application being an improvement on my application entitled "Nonglare headlight," filed September 8, 1937, Serial No. 162,900.

A headlight is essentially a modified searchlight consisting of a parabolic reflector with an incandescent filament at its focus forming a system capable of projecting a powerful cylindrical beam of parallel light rays an unlimited distance. Outside of the path of these rays but slight illuminating power exists. If the reflector be viewed along the path of these rays it is seen as a disk of blinding brilliancy known as "glare."

Various attempts to render such a searchlight suitable for motor vehicle requirements have resulted in the use of ribbed or fluted cover glasses or "lenses" of various designs which serve to deflect and diffuse the light rays emanating from the reflector, and to spread them along and across the highway in front of the car, which also reduces the glare by spreading its visibility over a much wider area. However satisfactory these headlights may be to the driver of a car, the approaching motorist suffers inconvenience if not danger from this glare of blinding rays of various degrees of intensity which he is unable to avoid.

Research has developed the fact that it is the upper half of the projected beam which produces the major portion of the blinding or glaring rays, particularly if the headlight is out of adjustment or, in other words, pointed too high. Hence, if this portion of the beam can be deflected in a downward direction, much if not all of the headlight glare is avoided.

The object of the present invention is generally to improve the operation of headlights of the character described and, more specifically stated, to interpose a series of auxiliary reflectors between the parabolic reflector of the headlight and the lens whereby a certain portion of the parallel projected rays from the upper half of the parabolic reflector are deflected downwardly and at the same time laterally, thereby assuring additional illumination of the immediate sides and foreground of a vehicle and, at the same time, clear illumination sufficiently far ahead to permit safe driving.

The non-glare device used in conjunction with the headlight is shown by way of illustration in the accompanying drawing in which—

Fig. 1 is a diagrammatic view showing the three types of rays deflected by a headlight employing the auxiliary reflectors;

Fig. 2 is a central vertical section of a standard form of headlight showing the reflectors placed therein;

Fig. 3 is a front view of Fig. 2 showing the adjustable band supporting the auxiliary reflectors;

Fig. 4 is a horizontal section of the headlight shown in Fig. 2, said section showing the band and the auxiliary reflectors supported thereby in plan view;

Fig. 5 is a perspective view of one of the frames supporting the auxiliary reflectors; and

Fig. 6 is a perspective view of one of the securing clips.

Referring to the drawing in detail, and particularly Figs. 2 and 3, A indicates a standard form of parabolic reflector, 2 a source of light mounted therein, and 3′ a modern type of convex lens which may be made of clear glass or provided with flutes or ribs to produce diffusion of light as will hereinafter be described.

Interposed between the flange 4 of the reflector and the lens 3′ is a ring 30, and suitably secured thereto is a series of closely spaced curved reflectors generally indicated at B. The reflectors serve two main functions, first, that of deflecting the parallel rays projected from the upper half of the parabolic reflector in a downward direction and, secondly, that of deflecting said rays laterally, or in other words, to opposite sides of the car or vehicle in which the headlight is employed.

The curvature of the vanes is an important feature. By referring to Fig. 3, it will be noted that the center or middle portion of each vane indicated at B has a curve indicated at 7, and that the radius of said curve is substantially the same from the top to the bottom. On the other hand, it should also be noted that the portions of the reflectors between the center curved portion 7 and the ends diverge at gradually increasing angles as shown by the reference characters 9—9 and 10—10, the angle being the greatest on the lowermost deflector and the least on the top deflector. The curve in general may be a parabolic curve, but it may also be a hyperbolic or similar curve. This gradual increase of angle of each vane from the center outwardly is important, as it causes gradual deflection of the projected rays from the parabolic reflector in a lateral direction to the opposite sides of the car, thus

giving ample illumination both in the immediate foreground and at the sides of the car.

In addition, it will be noted by referring to Fig. 2 that each individual auxiliary reflector B is disposed on a slight angle with relation to the longitudinal axis of the parabolic reflector. The uppermost deflector is disposed on an angle of about one degree; the next deflector is disposed at a slightly greater angle, and so on until the lowermost deflector is reached, which is disposed at an angle of about seven degrees. Hence, all parallel rays reflected by the parabolic reflector which strike the under side of the auxiliary reflectors will be re-reflected and deflected in a downward direction. Thus the auxiliary reflectors serve two important functions, first, that of deflecting the rays from the upper half of the parabolic reflector in a downward direction, and secondly, that of causing a gradual lateral deflection.

The lens indicated at 3' may be made of plain clear glass if desired, but a standard type of headlight lens with a fluted surface may be employed if diffusion of the light rays is desired.

By means of the auxiliary reflectors, it is possible to spread a light beam along and across the highway of sufficient intensity to meet all the requirements for safe driving and at the same time restrict the glare to a region below the headlight level and within the limits of the driver's traffic lane so that cars approaching in adjoining traffic lanes may suffer no inconvenience from headlight glare.

By referring to Figs. 3 and 1, it will be noted that the lower half of the parabolic reflector and a small portion of the upper half thereof is left uncovered; hence, all parallel rays reflected and projected by the parabolic reflector are projected forwardly in the form of a main beam indicated at C in Fig. 1. The direct rays from the filament 2 are projected downwardly immediately in front of the car as indicated by the lines 14, and illuminate the immediate foreground. Between the area illuminated by the direct rays and the area 15 iluminated by the projected parallel rays is an intermediate area 16 which, under ordinary conditions, has little if any illumination. This area is illuminated in the present instance by the auxiliary reflectors B. As these are provided with highly polished reflecting surfaces on their lower sides, and as they are downwardly inclined as indicated at 17 in Fig. 2 with relation to the longitudinal axis of the parabolic reflector, they will deflect the parallel rays reflected from the upper half of the parabolic reflector in a downward direction as indicated by the lines 18, thus illuminating the intermediate area 16 and at the same time the sides of the road, due to the angular position of the auxiliary reflectors between their centers and outer ends.

From the foregoing, it should be obvious that the present headlight employs without modification the powerful parallel rays emanating from the lower part of the parabolic reflector for long range illumination as indicated at C, that the direct rays indicated at 14 which radiate from the incandescent filament of the bulb illuminate the ground immediately in front and at the sides of the car, and that the rays deflected by the lower surfaces of the auxiliary reflectors illuminate the intermediate section indicated at 16 and also the sides of the road.

In order to obtain sufficient reflecting surface, the reflectors B are placed as closely together as possible, first, to obtain as much reflecting area as possible and, secondly, to eliminate the projection of bands of light. For instance, if the auxiliary reflectors B were spaced a little too far apart, each reflector would project a band of light on the road ahead of the car, and these bands would be spaced apart, but by placing the auxiliary reflectors sufficiently close together, the bands of light will overlap or blend one into the other, and a substantially uniform illuminated surface will be insured. Putting it another way, the surface of the highway should be uniformly illuminated. Therefore, it becomes necessary to determine the angle of inclination of each auxiliary reflector so that each strip of light may occupy its proper position. This may be approximately found from a table of natural cotangents. These angles will vary, in actual practice, from about one degree of arc for the uppermost vane to about seven degrees for the lowermost vane.

To increase further the reflecting surface produced by the auxiliary vanes, they are made to project into the parabolic reflector as shown at 38 in Figs. 2 and 4, and also outwardly as indicated at 21, almost to contact the convex lens.

The auxiliary reflectors are, as previously stated, secured to the flat ring 30. The manner of securing them may obviously be varied.

While the lower surfaces of the vanes are highly polished and chromium plated, the upper surfaces should be dull black to prevent dispersion of light therefrom. The auxiliary reflectors, consisting of the ring 30 and the reflector plates secured thereto, may be made entirely separate from the headlight and may be clamped between the flange of the parabolic reflector and the lens and as such may be installed both in new and old headlights.

The effect of a fluted lens is to diffuse the parallel rays projected by the parabolic reflector. By interposing the auxiliary vanes between the parabolic reflector and a diffusing lens of a fluted character, the rays will first be deflected both downwardly and laterally by means of the auxiliary reflectors, and when passing through the lens will be diffused and deflected, the effect being to deflect and diffuse the light through a much greater area and prevent the concentration of light where not required. As was previously stated, the clear lens may be employed if desired, as both downward and lateral reflection and deflection is insured by the auxiliary reflectors.

In actual practice, it is found that the headlights produced by different manufacturers vary considerably in diameter. Hence an adjustable mounting for the auxiliary deflector is desirable. Such a structure is shown in Figs. 2 to 6, inclusive. In this structure, a split ring-shaped band 30 is employed with overlapping ends 31 which are secured with relation to each other by flexible friction clips 32. By pulling the overlapping ends of the band apart, the ring will increase in diameter. Conversely, by pushing them together, the diameter of the ring will be decreased, thus permitting headlights of varying diameters to be fitted.

It will also be noted that the auxiliary deflector is in this instance made in two separate sections as indicated at B' and B'', and that these sections are secured to the ring or band by clips 32' similar to the clips 32. By this method of attachment the reflectors may be slid along the band and brought together, or they may be separated to form a vertical slit or space between them such as shown at 33. Also, this space may obviously be increased or decreased in width. The space thus provided is of great

importance, as it permits a narrow beam of light from the parabolic reflector to be projected, said projected beam materially aiding in illuminating the distant foreground or the road ahead, and without any danger of blinding an approaching driver, as the beam is so narrow that if an approaching driver is keeping within his own lane or, in other words, is staying on the proper side of the road, the beam will not be visible.

The curvature of the deflectors indicated at B' or B'' and their vertical inclination will be as shown in Figs. 2 to 4. Their method of attachment is immaterial. For instance, they may be spot-welded or riveted in place as shown in Fig. 3, or they may be provided with tongues 36 at each end which pass through slots 37 and then bend over to secure them as shown in Fig. 5. In this figure, only one deflector is shown at B'', the rest being removed to show the construction of the frame in which they are secured. The frame consists of a vertical plate or leg 38 and an integral segmentally-shaped leg 39 bent to fit the average contour or circle formed by the adjustable band 30. There are two frames as shown in Fig. 3, and as these are adjustably secured to the band 30 by the clip 32', each frame, with the deflectors B' or B'' secured therein, may be adjusted to or away from each other to form the slot or space 33.

It should also be noted that each of the clips 32 and 32' are provided with a finger 40. These fingers project over the gasket or packing ring 41 when the headlight is assembled and as such are clamped between the flange 42 and the lens 3' and the gasket, thereby securing the band 30 and the auxiliary deflectors B' and B'' in place when the headlight is fully assembled.

While these and other features of the present invention have been more or less specifically described and illustrated, I wish it understood that various changes may be resorted to within the scope of the appended claims, and that the materials and finish of the several parts employed may be such as the judgment and experience of the manufacturer may dictate or other conditions may demand.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A light deflector for a vehicle headlight having a parabolic reflector, comprising a ring adapted to be secured in front of the deflector, a pair of substantially parallel frame members adjustably secured to the ring and bodily movable to or away from each other to form a central light-emitting space between them, said space of elongated narrow shape and vertically disposed and extending from the upper edge of the reflector to a point substantially central of the reflector, and a plurality of deflector plates spaced apart one above the other in a vertical plane in each frame, said plates being curved in a direction crosswise in the ring to deflect light from the parabolic reflector laterally to opposite sides of the headlight.

2. A light deflector for a vehicle headlight having a parabolic reflector, comprising a ring adapted to be secured in front of the reflector, a pair of frame members carried by the ring, flexible clips securing the frame members to the ring, said clips permitting adjustment of the frame members to or away from each other to form a central light-emitting space between them, and a plurality of deflector plates spaced apart one above the other in the vertical plane in each frame, said plates being curved in a direction crosswise in the ring to deflect light from parabolic reflector laterally to opposite sides of the headlight.

3. A light deflector for a vehicle headlight having a parabolic reflector, comprising a ring adapted to be secured in front of the reflector, a pair of frame members carried by the ring, flexible clips securing the frame members to the ring, said clips permitting adjustment of the frame members to or away from each other to form a central light-emitting space between them, a plurality of deflector plates spaced apart one above the other in the vertical plane in each frame, said plates being curved in a direction crosswise in the ring to deflect light from the parabolic reflector laterally to opposite sides of the headlight, a light diffusing lens on the headlight, and fingers on the flexible clips projecting in under the peripheral edge of the lens to be engaged and clamped thereby so as to secure the ring and the frame members carried thereby between the lens and the headlight.

4. A light deflector for a vehicle headlight having a parabolic reflector comprising a pair of frame members disposed in front of the reflector, each frame having two legs, one leg in each frame being curved to conform to the rounded contour of the reflector, and the other leg of each frame being parallel to a vertical center line drawn in front of the reflector, said frames being spaced apart to provide an opening between the last named legs, which forms a vertically disposed, elongated, unobstructed light emitting space, and a plurality of vertically spaced deflector plates secured between the legs of each frame, said plates being curved in a direction crosswise of the vertically disposed light emitting opening to deflect light from the parabolic reflector laterally to opposite sides of the headlight.

5. A light deflector for a vehicle headlight having a parabolic reflector, comprising a ring adapted to be secured in front of the reflector, a pair of frame members carried by the ring, each frame having two legs, one leg in each frame being curved to conform to the rounded contour of the reflector, and the other leg of each frame being parallel to a vertical center line drawn in front of the reflector, said frames being spaced apart to provide an opening between the last named legs, which forms a vertically disposed, elongated, unobstructed light emitting space, and a plurality of vertically spaced deflector plates secured between the legs of each frame, said plates being curved in a direction crosswise of the vertically disposed light emitting opening to deflect light from the parabolic reflector laterally to opposite sides of the headlight.

ALBERT L. CHAUVET.