Aug. 14, 1934. J. L. LEHMAN 1,969,982

LIGHT BEAM REFLECTING AND CONTROLLING MEANS

Original Filed March 12, 1931

Fig. 1.

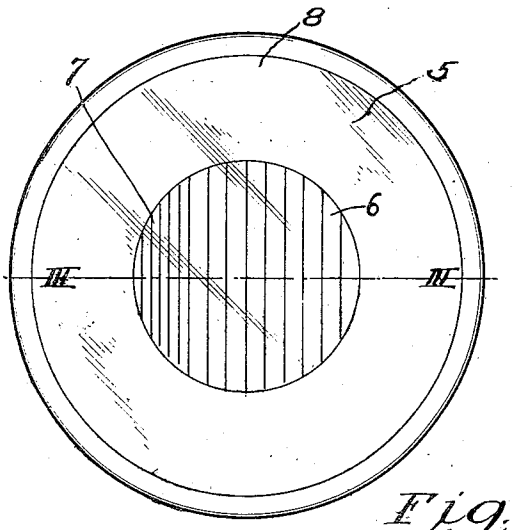


Fig. 2.

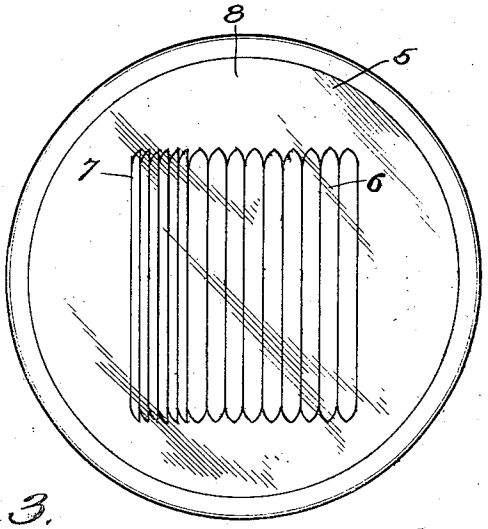


Fig. 3.

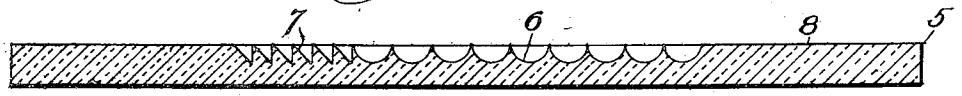


Fig. 4.

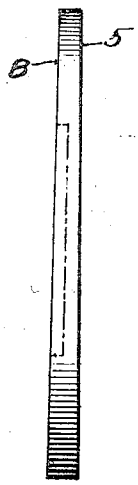


Fig. 5.

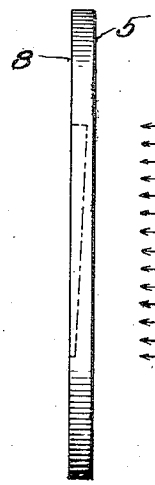


Fig. 6.

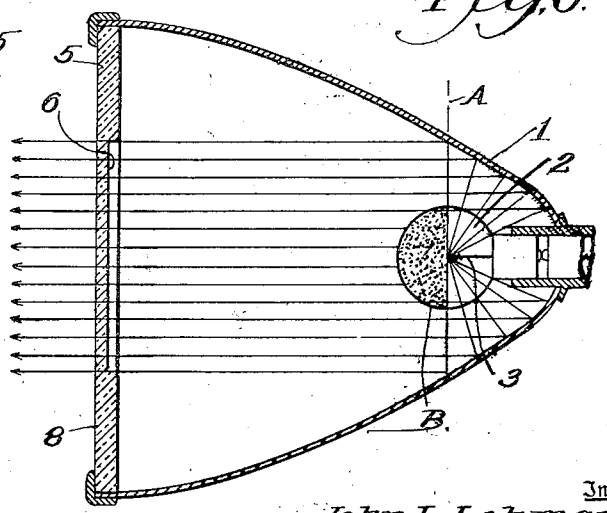
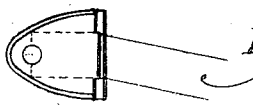


Fig. 7.



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Patented Aug. 14, 1934 1,969,982

UNITED STATES PATENT OFFICE

1,969,982

LIGHT BEAM REFLECTING AND CONTROLLING MEANS

John L. Lehman, St. Louis, Mo.

Original application March 12, 1931, Serial No. 521,895. Divided and this application January 9, 1933, Serial No. 650,852

2 Claims. (Cl. 240—41.4)

This invention relates to head or search lights and constitutes a division of my application which eventuated in United States Letters Patent No. 1,397,202, February 14, 1933. The invention as described in the application mentioned shows two methods of controlling what I have called the hot or central light beam reflected by the usual type of parabolic reflector, first, by a special lens having a central transparent refracting area surrounded by a diffusing area (suitable for use with a clear or ordinary type of electric light bulb), and, second, a construction in which the lens, although having the same type of central transparent refracting area, is surrounded by a clear or transparent area, in combination with a special bulb having its front half satined or rendered translucent by any suitable treatment, to diffuse all the direct rays and all rays reflected by the area of that part of the reflector lying in front of a plane passing through the focus of and at right angles to the principal axis of the reflector.

This invention is directed to the second method above-mentioned and as set forth in said previous application, namely, to a transparent lens having a predetermined central refracting area, in combination with a regular light bulb so treated as to diffuse all direct rays and those rays reflected from that area of the reflector forward of a plane passing through the focus of and at right angles to the principal axis of said parabolic reflector, to avoid glare in the eyes of approaching motorists or pedestrians as more fully set out in my said patent.

The objects of the invention are accomplished by the structure and arrangement hereinafter described; and in order that the invention may be fully understood, reference is to be had to the accompanying drawing, in which:—

Figure 1 is a front view of a lens embodying the invention in which the central transparent refracting area is molded or pressed.

Figure 2 is a view, similar to Figure 1, in which the refracting area has been ground.

Figure 3 is an enlarged section on the line III—III of Figure 1.

Figures 4 and 5 are side elevations of modified or prismatic lenses to direct the rays downwardly toward the roadway.

Figure 6 is a central vertical section through a lens, reflector and bulb combination of the inventiton for projecting a horizontal beam.

Figure 7 is a view similar to Figure 6, but on a smaller scale, to illustrate the downward refraction of the light beam as produced by the lens of Figure 4, the same result being also produced by the lens of Figure 5.

Referring to the drawing in detail, 1 indicates the conventional parabolic reflector in which an electric light bulb 2 is mounted.

The light bulb, when properly focused, is arranged so that the center of its filament 3 is substantially in a plane designated by A, passing at right angles to the principal axis of the reflector, and through the focus thereof, as I have determined that the greatest concentrated volume of the total light reflected is found in the light reflected from that area of the reflector rearward of said plane. The rays reflected by the balance of the reflector forward of said plane, are of small value as far as correct desired illumination is concerned, as they are of such nature that they cannot be readily controlled, and, therefore, lead to the objectionable glare so commonly encountered.

Therefore, in the present embodiment of the invention, to diffuse the direct rays and those rays which are reflected by that portion of the reflector forward of the said plane A, the forward portion of the light bulb, designated by B, is satined or rendered translucent in any other suitable way.

The front end of the reflector is closed by a lens 5 provided with a central transparent refracting area, preferably in two sections, one, a series of vertical similar contiguous cylindrical portions 6 for spreading the light horizontally, and, second, one or more side sections of vertical prismatic or ratchet-tooth form 7, to concentrate or direct a beam or beams of light laterally toward the side of the roadway. The refracting central portion is of sufficient area to direct the beam reflected from that portion of the reflector rearward of the said plane A, and that area of the lens, designated by 8, surrounding said central refracting area may be clear or plain.

In practice the refracting grooves may either be pressed or ground in the lens to produce either a relatively total rectangular area or a round area as illustrated in Figures 2 and 1 respectively. In assembling the lens in the reflector, it is also desirable that the refracting or grooved area shall be placed towards the inner side of the reflector for better protection against dust and dirt. If desired, the entire lens may be of wedge-shape or prismatic in vertical cross section as shown in Figure 4 to direct the beam of light downwardly toward the

road. The same result may be accomplished, as shown in Figure 5, by using a lens with parallel sides, but imparting prismatic characteristics to the refracting area by making the opposite ends of the refracting grooves of different depth according to the degree it is desired to depress the light beam.

From the above description it will be evident that I have produced a construction embodying the features of advantage set forth as desirable, and while I have described what now appears to be the preferred embodiment of the invention, I reserve the right to all changes within the spirit of the invention and without the ambit of the prior art.

I claim:—

1. The combination in a headlight, of a lens having a transparent central field of parallel symmetrical grooves segmental in cross-section, the side lines of adjacent grooves being coincidental, and a side field of grooves parallel with the first-named grooves, the grooves of the side field being of ratchet-tooth or prismatic form in cross-section and the inner edge of said side field substantially coinciding with the proximate side margin of the main central field, a parabolic reflector in cooperative arrangement with the lens and a light bulb arranged so that its filament lies substantially in a plane at right angles to the principal axis of the reflector and passing through the focus thereof, said bulb having that portion of its surface forward of said plane, rendered translucent to diffuse the light emitted therethrough.

2. The combination in a headlight, of a lens having a transparent central field of parallel symmetrical grooves segmental in cross-section, the side lines of adjacent grooves being coincidental, and a side field of grooves parallel with the first-named grooves, the grooves of the side field being of ratchet-tooth or prismatic form in cross-section and the inner edge of said side field substantially coinciding with the proximate side margin of the main central field, said central and side fields being prismatic to throw the rays downwardly, a parabolic reflector in cooperative arrangement with the lens, and a light bulb arranged so that its filament lies substantially in a plane at right angles to the principal axis of the reflector and passing through the focus thereof, said bulb having that portion of its surface forward of said plane, rendered translucent to diffuse the light emitted therethrough.

JOHN L. LEHMAN.