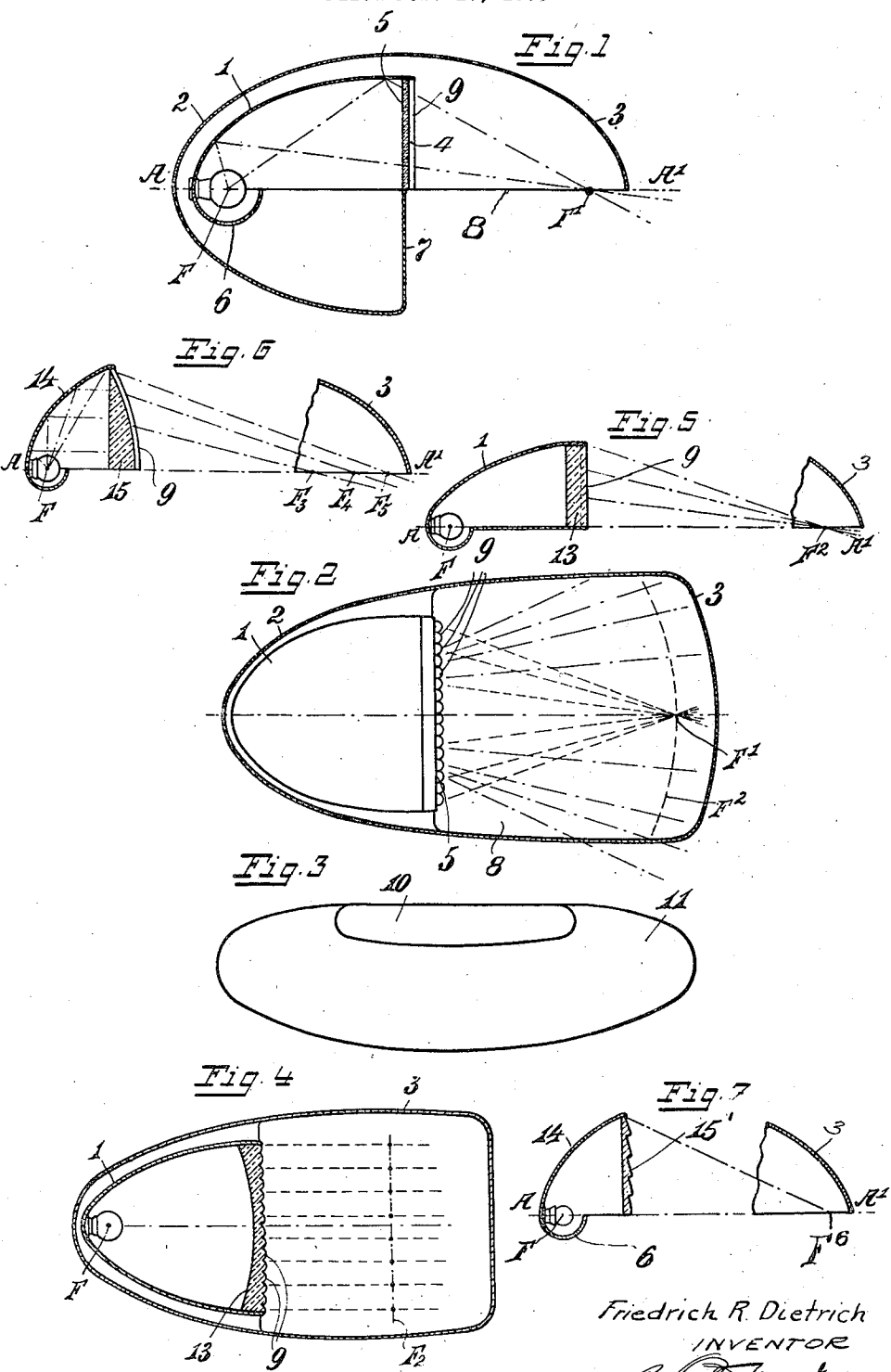


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F. R. DIETRICH
ANTIDAZZLE HEAD LAMP

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Friedrich R. Dietrich
INVENTOR
By *[Signature]*
his ATT'Y.

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ANTIDAZZLE HEAD LAMP

Friedrich Richard Dietrich, Munich, Germany,
assignor to Max Hermann Wende, Zurich,
Switzerland

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1 Claim. (Cl. 240—41.3)

The invention relates to antidazzle head lamps particularly for use in motor vehicles.

One of the objects of the present invention is to provide a head lamp which produces a completely dazzle-free light.

Another object of the invention is to produce a lamp the light of which is laterally diffused while the source of light as well as the reflector and the diffusing element are completely hidden from view under a normal angle of observation behind a screen.

A further object is to produce a head lamp yielding brightness values on the road which are greatest centrally in front of the lamp at a certain distance therefrom and which diminish gradually towards the sides and towards the vehicle.

Still another object is to produce a head lamp in which the light emitted from the source, the reflector and the diffusing elements is invisible under a normal angle of observation, while the road is illuminated to a substantially uniform brightness.

The above mentioned and other objects, which will appear as the description proceeds, are accomplished by the arrangement and combination of elements specified in the following description, set forth in the appended claim and illustratively exemplified in the accompanying drawing, in which:

Fig. 1 is a head lamp according to the invention shown in vertical section.

Fig. 2 is a horizontal section of the head lamp shown in Fig. 1.

Fig. 3 is a section through the beam produced by the lamp shown in Figs. 1 and 2.

Fig. 4 shows a second embodiment of the invention in horizontal section.

Fig. 5 is a vertical section of the head lamp shown in Fig. 4.

Figs. 6 and 7 are vertical sections of further forms of a head lamp.

According to Figs. 1 and 2, a reflector 1 consisting of a quarter of an ellipsoid is mounted in a housing 2. At the focal point F of the quarter ellipsoid a lamp is arranged. The point of convergence of the ellipsoid is designated F¹. The housing 2 has a projecting portion 3 serving as a screen or hood which covers at the front the opening 4 of the quarter ellipsoid through which the light emerges, and which is approximately bounded below by a horizontal plane through the optical axis A, A¹. The light outlet opening 4 is covered by a glass disc 5 which is therefore disposed behind the hood 3, and between the focal

point F and the point of convergence F¹. Beneath the reflector 1 there is, inside the housing 2 a semi-spherical mirror 6, the center point of which coincides with the focal point F of the quarter ellipsoid 1. The housing 2 extends below the plane intersecting the optical axis A, A¹ and that part of the housing below the axis A, A¹ may be provided with a cover 7. The rays indicated pass through the glass disc 5 and emerge through the horizontal opening 8 disposed between the lower end of the disc 5 and the foremost end of the screen 3.

Owing to the rays from the source of light disposed in the focal point F crossing each other in the horizontal plane through the optical axis A, A¹ they can emerge through the horizontal opening 8 in forward and downward direction, without it being possible for an oncoming person to see the glass disc 5 or the reflector 1 or the source of light.

A head lamp of this type is, therefore, in itself free from dazzle, but, if the disc 5 were formed as a plane-parallel element, the intersection of all the rays at the point of convergence F¹ would produce a shadow in the form of a cone centrally in front of the head lamp.

In order to eliminate this conical shadow, the glass disc 5 is provided with a plurality of adjacent cylindrical flutes 9 which are vertical to the intersecting plane A, A¹ bounding the reflector on its under side. The vertical cylindrical flutes 9 extend the point of convergence F¹ into a line of convergence F², so that the rays viewed in plan extend along the chain lines while if the cylindrical lenses 9 were not used they would extend as shown by the dash lines (see Fig. 2). In a side view all the rays intersect on the line of convergence F².

Owing to this distribution of the light, if the beam is viewed in section, a light image as shown in Fig. 3 results. The maximum brightness values are disposed below the limit of darkness in part 10 and the diffused light in part 11. The cone of shadow is eliminated. It is impossible for an oncoming person to see the lens. The distribution of the light takes place rearwardly of the point of convergence F¹ or the line of convergence F², so that a view into the flutes 9, and consequently a dazzle effect, is made impossible in every way.

Although it is possible by means of the vertical cylindrical flutes 9 to eliminate the conical shadow in front of the lamp, there is, nevertheless a lateral diffusion, as shown by the rays in Fig. 2. As, however, the light diminishes in in-

tensity inversely as the square of the distance from the source of light, it is essential, in order to throw the light forward as far as possible and also to ensure uniform illumination of the road surface so that the greatest brightness values are concentrated forwards and the light is caused to diminish gradually laterally and towards the vehicle.

This is specially provided for by the construction shown in Figs. 4 and 5. The glass disc 5 shown in Figs. 1 and 2 is in this case replaced by a cylindrical lens 13, the cylindrical axis of which is vertical to the intersecting plane A, A¹. By means of this cylindrical lens 13 the rays, considered horizontally, are parallel, though there is intersection of the rays in the line of convergence F² (see Fig. 5). It will be seen that lateral diffusion no longer exists as compared with the construction shown in Fig. 2. The cylindrical lens 13 may, however, in order to still produce a certain slight lateral diffusion, be provided on one side with a plurality of cylindrical flutes 9 of small radii, the axes of which are, of course, also vertical to the intersecting plane A, A¹.

Although normally an ellipsoidal reflector will be used, because the latter has by nature a focal point and a point of convergence, which are essential conditions for the invention, it is, nevertheless, possible to make use of an optical system without employing an ellipsoidal reflector.

A possibility of producing points of convergence, without the use of an ellipsoidal mirror is shown in Fig. 6 in connection with a head lamp shown in vertical section.

In this case, there is arranged in front of the aperture of a paraboloid mirror 14 a collector lens 15, which is provided on one side with cylin-

drical flutes 9 in accordance with Fig. 2. In this case, there exists a plurality of lines of convergence F³, F⁴, F⁵, and in front of the foremost line of convergence F⁵ lies the screen 3. The lens 15 is of course, disposed between the focal point F and the rearmost line of convergence F³.

If the cylindrical lens 15 shown in Fig. 6 is provided with steps of different refractive power (different radius) it is possible, as shown in Fig. 7, to obtain, instead of a plurality of lines of convergence, one single line of convergence F⁶. Of course, in this case also, only those parts of the parabolic mirror 14 and the cylindrical lens 15' are used which lie above the intersecting plane A, A¹.

What I claim is:

A headlight comprising a reflector having substantially the shape of a quarter section of an ellipsoid, a lamp disposed in the inner focus of said reflector, a curved dispersing prism disposed in the front opening of said reflector approximately halfway between the inner focus and the point of convergence thereof, the axis of said prism traversing the reflector axis at right angles to the plane defined by the axis and the side edges of the reflector and its curvature being sufficient to stretch the converging point of the reflector to a converging line extending in said plane transversely of the reflector axis and having a length approximately equal to the width of said reflector opening in said plane, and a light impervious screen for said reflector and prism, one edge of said screen being disposed adjacent said plane in front of and substantially parallel to said line of convergence and having a width substantially equal to the length of the latter.

FRIEDRICH RICHARD DIETRICH.