

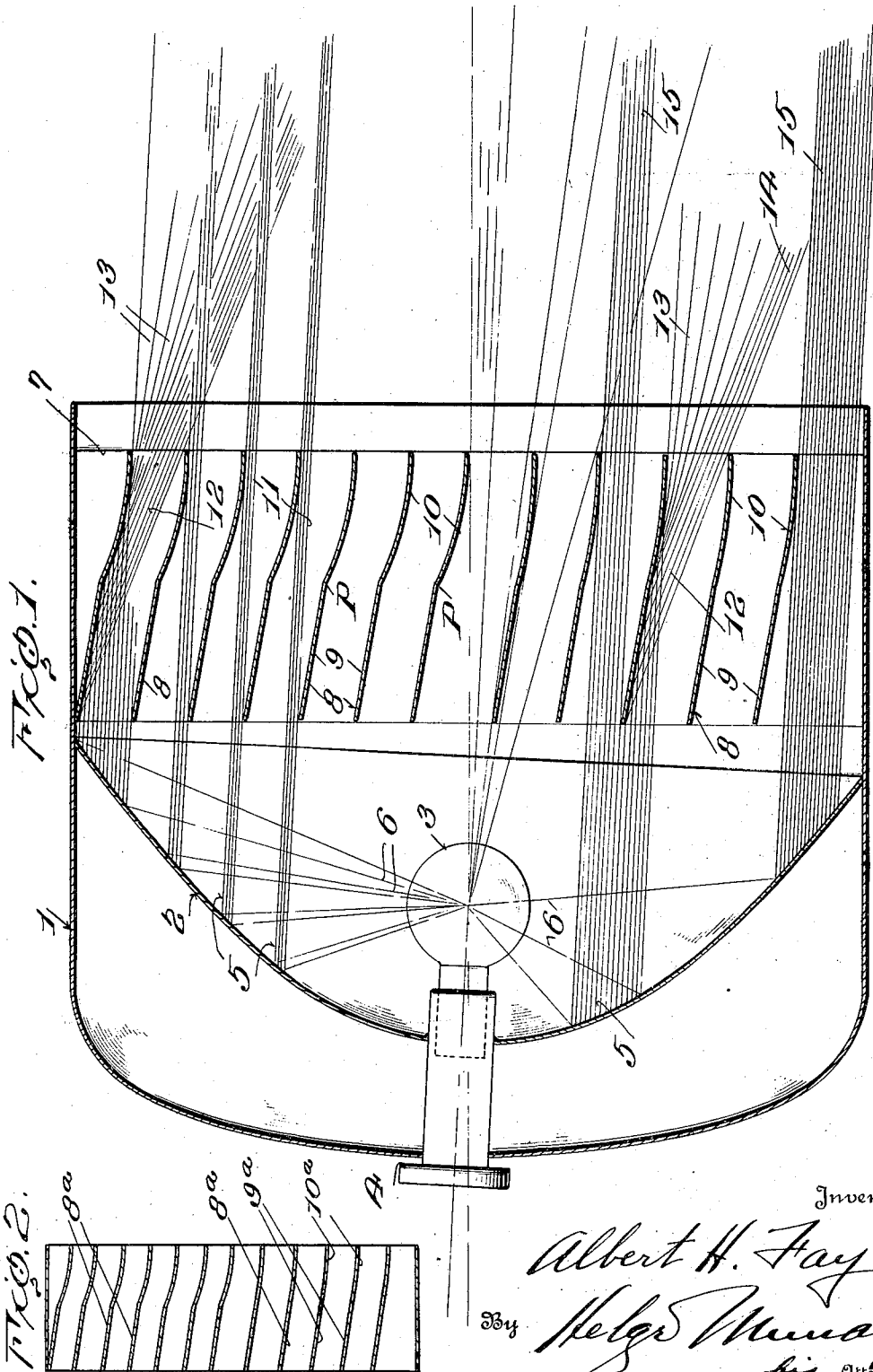
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A. H. FAY

HEADLIGHT

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UNITED STATES PATENT OFFICE.

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HEADLIGHT.

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To all whom it may concern:

Be it known that I, ALBERT H. FAY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Headlights, of which the following is a specification.

My invention relates to headlights such as are used on automobiles for example and, generally stated, resides in the provision of a light deflecting means which will disperse the light free from glare and without reducing or diminishing the useful intensity of the light.

The present invention has for a principal object the provision of a deflector associated with a reflector for intercepting or interrupting a portion of the forwardly projected light and deflect said intercepted light downwardly and forwardly below the horizontal plane of the headlight.

Another object of the invention is to provide a light deflecting means comprising a plurality of relatively deep and properly spaced deflecting members, each member being preferably formed with a light reflecting surface including straight and curved portions adapted to deflect and project a portion of the intercepted rays forwardly and downwardly in parallel relation, and other portions of said rays in fan-like relation from the ground to a plane below the horizontal.

Another object of my invention is to provide in combination a reflector adapted to project the light angularly and downwardly with relation to the horizontal, and means for reducing the glaring effect of the rays projected from said reflector, said means involving relatively broad and deep deflecting strips preferably spaced proportionately to their depth and capable of intercepting but a portion of the projected rays, and further arranged so that the uninterrupted rays flowing directly from the reflector are all located below and spaced from the horizontal plane, the uppermost ray leaving the forward end of the deflecting strip and the lowermost ray intercepted by the inner end of an adjacent deflecting strip being preferably adapted to intersect the horizontal plane of the headlight.

A further object of the invention is to provide a series of differentially spaced deflecting strips each preferably formed with a substantially straight inner portion adja-

cent the reflector, and each having a dropped or dipper-like curved portion adjacent the straight inner portion whereby substantially the entire power of the light is effectively controlled without producing a blinding glare and distributed at a utilizable distance in front of the automobile or other device to which the headlight may be applied.

With these and other objects in view, my invention further consists in the construction and arrangement of the several parts which can be easily and inexpensively manufactured.

In the accompanying drawing shown for purposes of illustrating somewhat diagrammatically the invention:

Figure 1 is a vertical longitudinal sectional view through a headlight embodying my invention.

Figure 2 is a detail vertical longitudinal sectional view through a slightly modified form of my invention.

The numeral 1 indicates the headlight case in which is positioned the reflector 2, a suitable source of light being shown at 3 with means diagrammatically shown at 4 to adjust or focus the same, as will be understood. The light 3 is adjusted in focus with the reflector which is preferably tilted from the horizontal, as shown, thereby providing for the proper projection of the reflected rays.

In the present embodiment of my invention I have provided a parabolic reflector and slightly tilted the same, as shown, so as to project the rays of light forwardly and downwardly below the horizontal. The downwardly inclined parallel rays leaving the reflector are indicated by the parallel lines 5. Some of the light rays proceeding from the source of light 2 and striking the tilted reflector are indicated by the radiating lines 6. While I have shown and in practice prefer to merely tilt the usual reflector, it will be understood that other arrangements of reflecting surfaces adapted to project the rays of light angularly and downwardly with relation to the horizontal may be employed. In some cases where it is desirable to locate the headlight relatively low or close to the ground, the reflector need not be tilted but may be arranged to project the light rays substantially horizontally.

The light deflecting means is arranged adjacent the reflector and may be secured

thereto by means of a band or strip member indicated by the numeral 7, or in any other suitable manner. It consists of a plurality or series of light deflecting strips 5 8 formed of metal or other appropriate material, the underside or face of said strips being preferably treated to form a reflecting surface, as will be understood. The upper surfaces of the strips are preferably 10 non-reflecting and may be painted or otherwise treated to give any color of a soft and non-glaring nature. The several strips or deflector are arranged relatively close to each other but are spaced apart and slanted 15 sufficiently to permit the projection of the proper proportion of light rays, some of which rays pass forwardly in an uninterrupted manner between the deflecting strips. Other portions of the projected rays are 20 intercepted by the deflecting portions of the strips and distributed forwardly and downwardly with relation to the uninterrupted rays into which latter the deflected rays are merged.

The arrangement and construction of the deflecting members or strips are important factors in effecting the objects of my present invention, the strips as shown being preferably relatively thin and deep with 30 respect to their longitudinal dimension, and relatively positioned adjacent one another in an angular or inclined manner to more effectively deflect the rays forwardly and downwardly with minimum glare. In order 35 to obtain a maximum projection of the light rays forwardly at a utilizable distance and at the same time reduce to a minimum the glare upon approach, I have found that the deflecting strips may be advantageously set 40 at an angle proportionately to the depth of the strips, and that the reflector be slightly tilted to project the uninterrupted rays forwardly at an angle to and preferably below the horizontal. The deflection of 45 the intercepted rays will now be described in conjunction with the present embodiment of deflecting strips.

The deflecting strips 8 consist of a relatively straight portion 9 and a curved portion 10, 50 said portions being arranged adjacent one another. The curved portions of the strips are preferably formed to extend beneath the adjacent straight portions, and as shown in the present embodiment of the invention, 55 have a curved deflecting surface arranged beneath a plane passing through and forming a continuation of the adjacent straight deflecting surface. In the upper portion of the headlight the deflecting strips are preferably 60 arranged relatively close and the curved portions of the strips are relatively pronounced or deep, as shown. The arrangement of strips in the lower portion of the headlight are preferably located further 65 apart than those positioned above a hori-

zontal plane passing through the source of light, and the curved portion of the strip is relatively shallow or less pronounced.

The upper deflecting strips are angularly disposed or inclined so as to prevent the 70 projection of the light rays above a horizontal plane passing through any portion of the projected light, the forward lower edge or surface of the curved portion of said strips being preferably arranged in substan- 75 tially horizontal alinement with the upper rear edge or surface of an adjacent strip. The tilting or angular arrangement of the reflector or reflecting surface, however, produces the projection of a series of paral- 80 lel rays indicated by the numeral 11 between adjacent strips. The rays indicated at 11 are projected slightly downwardly and the arrangement of adjacent deflecting strips permits their projection from an ex- 85 posed portion of the reflector in the upper portion of the headlight.

The straight or plane surface 9 is of a size to permit a maximum deflection of a portion of the intercepted rays clear of 90 the end of an adjacent strip. The rays deflected by the straight surface are indicated by the numeral 12 and, as shown, proceed in a downward and parallel direction in front of the headlight or in close proximity 95 to the automobile, as will be understood. The curved portion 10 of the deflecting surface of the upper strips receives the remaining portion of the intercepted rays and deflects them in a fan-like manner between 100 the parallel rays striking the ground and the forwardly projected uninterrupted horizontal rays. These rays are indicated by the numeral 13, and as will be seen, are sent forwardly a substantially long distance, the 105 uppermost of said rays merging into and passing along with the uninterrupted rays to infinity or the vanishing point of the reflected light. The dropped or dipper-like curved deflecting surface of the strip in addition 110 to effectively merging the intercepted rays with the forwardly projected rays also serves to cover the otherwise exposed portion of the reflector when viewed from below a horizontal plane, as is frequently the 115 case upon approach from a distance.

The lower deflecting strips are preferably arranged to similarly deflect the light rays, that is, the straight surface provides for a maximum deflection of parallel rays 120 clear of the end of an adjacent strip, said rays being indicated by the numeral 14. The adjacent curved portion of each strip deflects the remaining portion of the intercepted rays being deflected and merged into 125 the forwardly projected and uninterrupted rays indicated at 15. Forwardly projected uninterrupted rays indicated by the numeral 15 in the lower portion of the headlight are preferably increased in number by the grad- 130

ual increasing of the spacing between the strips, as shown in the drawing. In this event the reflector becomes exposed when viewed from below the horizontal, but as these exposed portions are below a horizontal plane passing through the source of light, the glare incident to such exposure is comparatively negligible. I do not wish to be understood as limiting my invention, however, to the particular arrangement of strips shown, as other arrangements can be effectively made according to the service conditions under which the headlight is to be used.

The straight and curved portions of the deflecting strip meet at a point P, a relatively large portion of the reflected light being deflected in slanting parallel rays from the straight surface 9 up to the point P and the remainder of said reflected rays being gradually spread out and merged with the uninterrupted rays. One of the intermediate deflecting strips is preferably arranged with the forward end of the curved portion adjacent the axis of the reflector, and the central ray from the source of light is sent forwardly in a slightly inclined path, as shown.

In Figure 2, I have shown a slightly modified form of my invention in which the lower deflecting strips 8^a are provided with the curved portions 10^a tangent to the straight portions 9^a. This construction permits a maximum forward projection of the intercepted rays of light and the merging thereof into the uninterrupted rays, as will be understood.

The relation of the straight and curved portions of each strip may be varied. Likewise, the form, size and arrangement of the strips may be changed in accordance with my invention. In practice the strips 8 may be suitably held within an encircling band or other supporting frame, said frame or band being in turn positioned adjacent the reflector and source of light in any suitable manner. The lens may be affixed in any appropriate manner, as will be understood.

I claim:

1. In a headlight, the combination with a reflector and source of light, and means for interrupting a portion of the forwardly projected rays, said means involving straight and curved surfaces arranged transversely and substantially horizontally of the reflector, said curved surface being positioned beneath a plane passing through and forming a continuation of the straight surface.

2. In a headlight, the combination with a reflector and source of light, means arranged to interrupt a portion of the forwardly projected rays above the axis of the reflector, said means involving a series of deflecting strips formed of straight and curved surfaces, each curved surface being arranged beneath a plane passing through and continuous with said straight surface, said strips having their opposite adjacent ends coincident with a plane substantially horizontal to the axis of the reflector, and another series of deflecting strips arranged below the axis of the reflector for interrupting and deflecting a portion of the lower forwardly projected rays.

3. A deflector for headlights including a series of transversely disposed and substantially horizontal strips each formed with substantially straight and curved surfaces arranged to intercept relatively large portions of reflected light, some of said curved surfaces being arranged beneath planes passing through and continuous with said straight surfaces respectively, and other of said curved surfaces being arranged tangent to said straight surfaces.

4. In a headlight, the combination with a reflector and source of light, means arranged to intercept a portion of the forwardly projected rays above the axis of the reflector, said means involving a series of deflecting strips formed of substantially straight and curved surfaces, each curved surface being arranged beneath a plane passing through and continuous with said straight surface, said strips having their opposite adjacent ends coincident with a plane substantially horizontal to the axis of the reflector, and another series of deflecting strips arranged below the axis of the reflector for interrupting and deflecting a portion of the forwardly projected rays, said last named series of deflecting strips having a curved portion tangent to the adjacent straight portion of said last named strips.

5. A deflector for headlights including a series of relatively deep strips arranged transversely and substantially horizontally for intercepting relatively large portions of reflected light, each of said strips having a curved portion which dips beneath an adjacent portion of the strip, said curved portion acting to abruptly interrupt some of the forwardly projected rays and diverge other of said rays above said abruptly interrupted rays.

In testimony whereof I affix my signature.
ALBERT H. FAY.