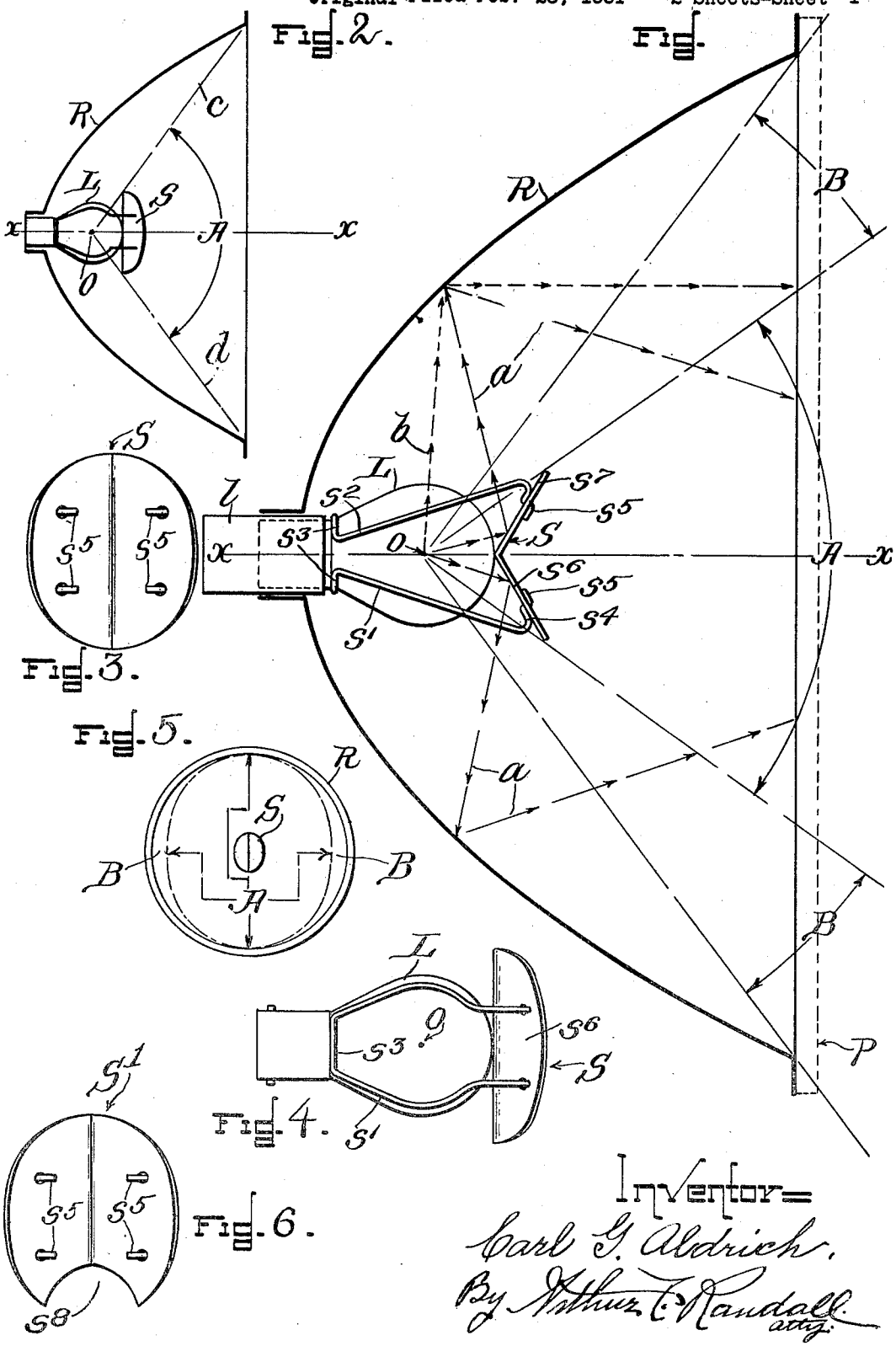
April 17, 1934. C. G. ALDRICH 1,954,978

HEADLIGHT

Original Filed Feb. 28, 1931 2 Sheets-Sheet 1



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Fig. 7.

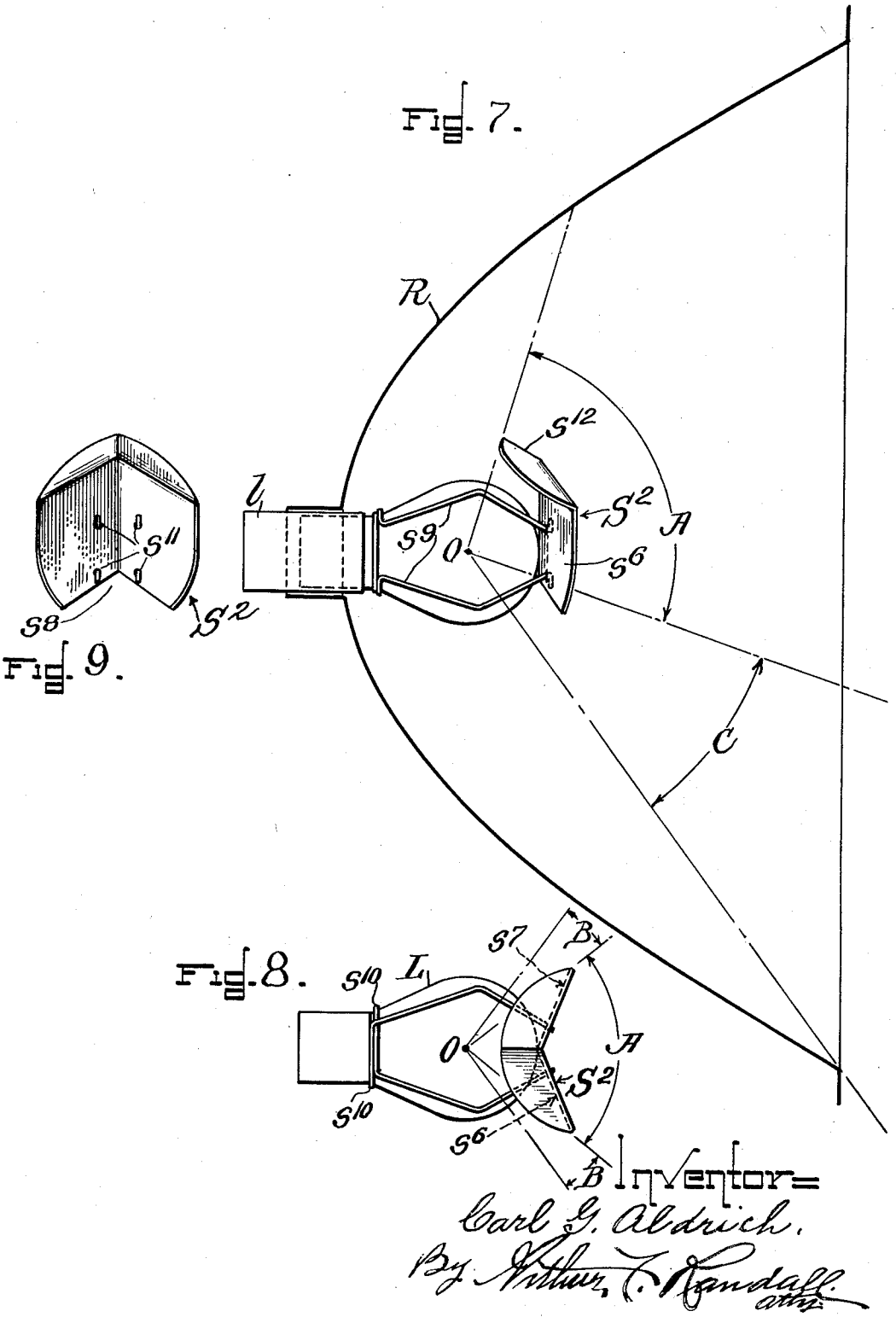


Fig. 9.

Fig. 8.

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HEADLIGHT

Carl G. Aldrich, Medford, Mass.

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4 Claims. (Cl. 240—48.6)

My invention relates to headlights for motor vehicles and to attachments therefor, the object of the invention being to eliminate or minimize the objectionable blinding glare characterizing many headlights as heretofore constructed, and to provide a construction which will function to illuminate the roadway in an improved manner.

To these ends I have provided a headlight structure comprising as parts thereof the usual parabolic reflector within, and at the focal point of which is arranged the usual electric lamp or light bulb.

In carrying out my invention I provide a small auxiliary reflecting shield directly in front of the electric lamp and close to the bulb thereof whose side nearest the latter is constituted by a pair of angularly disposed, preferably flat, reflecting surfaces which meet at a peak or crest that is preferably perpendicular to, and intersected by, the axis of the parabolic reflector, and from which peak or crest the said surfaces extend obliquely forward so that the angle between and in front of the two is less than 180°.

Thus the auxiliary reflecting shield occupies a central position in the path of direct light rays emanating and radiating forwardly from the lamp filament which, except for my new auxiliary reflecting shield, would issue radially from the front of the headlight without impinging upon the main parabolic reflector.

My new auxiliary device, however, reflects most of these rays laterally with respect to the axis of the parabolic reflector and against the latter at such an angle that said parabolic reflector again diverts them forwardly.

It is also a feature of my invention that the auxiliary reflecting shield is shaped, proportioned and positioned with respect to the parabolic reflector and lamp so as to permit the exit at the opposite sides thereof of two laterally directed beams of direct rays from the lamp filament by which the sides of the road, or curbs, adjacent the vehicle are illuminated.

Another feature of my invention consists in constructing the auxiliary reflecting shield as an attachment for the bulb of the lamp of a headlight.

Other features of my invention are hereinafter pointed out.

In the accompanying drawings:

Figure 1 is a top plan view of the parabolic reflector, lamp and reflecting shield, of a headlight constructed in accordance with my invention, said reflector being shown in longitudinal section.

Figure 2 is a side view of the parts shown in Fig. 1, the reflector being shown in longitudinal section.

Figure 3 is a front elevation of the reflecting shield.

Figure 4 is a side elevation of the lamp and reflecting shield shown in Figs. 1 and 3.

Figure 5 is a diagrammatic view hereinafter referred to.

Figure 6 illustrates an alternative form of reflecting shield.

Figure 7 is a view like Figure 1 but illustrating a headlight construction embodying other features of my invention.

Figure 8 is a top plan view of the lamp and reflecting shield of Figure 7.

Figure 9 is a front elevation of the reflecting shield shown in Figures 7 and 8.

The embodiment of my invention illustrated in Figs. 1 to 5, inclusive comprises a parabolic reflector R made at its back with an aperture within which is adjustably mounted a lamp socket 1 adapted to receive and hold the base of an electric lamp L. The socket 1 is adjusted toward and from the focal point O of reflector R manually by the usual means, not shown, and when in its proper position the filament of lamp L coincides with the focal O which is, therefore, the source of light.

Directly in front of the lamp L and close to the bulb thereof, I provide an auxiliary reflector-shield S of non-transparent sheet material such as sheet metal which is made upon its rear side with two forwardly divergent reflecting surfaces s^6 and s^7. These surfaces, which are preferably flat, are obliquely disposed relatively to each other and also relatively to the axis x—x of the parabolic reflector R. The angle of divergence of these two surfaces may be in the neighborhood of 120°.

Thus the reflector-shield is a peaked structure and it is separably attached to the bulb of lamp L, as herein shown, by a pair of oppositely disposed resilient arms s^1 and s^2 which may be made from spring wire. These arms s^1 and s^2 support the reflector-shield S with its peak or crest disposed vertically at right angles to, and intersecting, the axis of the parabolic reflector R.

It will thus be clear that light rays radiating forwardly from the source O which are within the region A, Figs. 1, 2 and 5 will strike upon the surfaces s^6 and s^7 and be reflected laterally at such angles that they will strike upon the para-

bolic reflector R by which they will again be reflected forwardly.

The large arrows *a* in Fig. 1 illustrate the paths of two of these rays which are on a horizontal plane coincident with the axis *x*—*x*. Other rays of this group which are above and below the axis *x*—*x*, Fig. 2, will also be diverted laterally by reflector S and then reflected forwardly by reflector R. The main parallel rays which are reflected straight forward in parallelism by reflector R are indicated by the smaller arrows *b* in Fig. 1.

Owing to the forwardly divergent disposition of the two reflecting surfaces s^6 and s^7 of the auxiliary reflector S approximately all of the direct rays emanating from the source of light and impinging thereon are deflected laterally directly to the parabolic reflector R, and from reflector R these rays are again deflected forwardly.

The above-described headlight may be provided, as is usual, with a prismatic lens as indicated by dotted lines at P, and this lens may be constructed, also as usual, to group the light rays which pass through it or most of them, in a horizontal band-like beam.

From the above description it will be seen that my new auxiliary reflector-shield S not only blankets the greater portion of the direct forwardly radiating rays which would otherwise pass out at the front of reflector R without striking the same thereby greatly reducing the glare, but these blanketed light rays are diverted laterally in all directions, by the reflecting surfaces s^6 and s^7 on to the parabolic reflector R so that they are utilized to illuminate the roadway, particularly at the opposite sides thereof.

The reflector shield of Figs. 1 to 5, inclusive, is made of a length, vertically, to extend from a straight line *c* connecting the source of light and focal point O with the chime of reflector R at the top of the latter to a straight line *d* connecting O with the chime of reflector R at the bottom of the latter. Therefore, there is no exit at the top and bottom of the parabolic reflector for direct light rays from the source O.

In order that direct light rays diverging from source O may have outlets B at opposite sides of the reflector R, the reflector-shield is shown as made less in width than its vertical dimension and therefore crescent shaped outlets B exist at the opposite sides of reflector through which light rays pass directly from the lamp filament toward the curbs or opposite sides of the roadway close to the front of the vehicle and to the adjacent parts of the roadway between the illuminated curbs and the headlight while the main light beam from reflector R illuminates a much larger field of the roadway well in advance of the vehicle a substantial distance ahead of the two curb illuminating beams.

An alternative form of reflector-shield is shown at S^1 in Figure 6 and this shield is in all respects the same as the form above described except that it is made at its bottom with a notch s^8, or otherwise formed, to provide an outlet at the bottom of reflector R through which light rays from source O pass directly obliquely downward and forward so as to illuminate the roadway close to and directly in front of the vehicle.

In driving in a fog, smoke or dust, without my new reflecting shield S or S^1 in position on the bulb the divergent light rays passing directly out of the front of reflector R brighly illuminate the vapor of the fog or particles of dust or smoke immediately in front of the vehicle and this illuminated matter appears as a curtain and practically prevents vision beyond the same which is highly undesirable and dangerous. Under the same foggy or other described conditions, and with my new shield in position on the bulb, this illumination of the atmosphere in the line of vision of the driver does not exist.

In the embodiment of my invention illustrated in Figs. 7, 8 and 9 the reflecting shield S^2 is molded to shape from stiff sheet material and, like the forms above described, is provided upon its rear side with forwardly divergent approximately vertical reflecting faces s^6 and s^7 meeting at a straight peak or crest.

Near its middle this reflecting shield is made with four small perforations s^{11} symmetrically grouped in two pairs, one at each side of the vertical median line of said shield. Into each pair of holes is hooked the extremities of the legs of a spring wire bail s^9 whose middle portion is bent sidewise sharply so as to provide a laterally and inwardly extending loop s^{10} to embrace the relatively small neck portion of the lamp L.

The intermediate portions of the legs of each spring wire bail s^9 are permanently bowed apart radially with respect to a line extending perpendicularly from a point on the apex or peak of shield S^2 at the middle of the group of holes s^{11} to provide each bail with a socket into which fits the adjacent convex side of the larger outer end of the lamp bulb and, since the loops s^{10} of the two wire bails extend inwardly around opposite sides of the neck of the lamp, the shield is securely held in position upon the bulb.

The top of the shield S^2 is made with a rearwardly extending upwardly tilted peaked visor s^{12} made upon its under side with two downwardly diverging reflecting surfaces at opposite sides of its middle.

This visor s^{12} not only serves as a barrier to prevent any direct rays from leaving reflector R at the top of the latter throughout about one-third of the circumference of its chime, but its divergent bottom surfaces deflect laterally on to reflector R all, or approximately all, of the said direct rays which strike thereon.

At its lower end the shield S^2 may be cut away, or formed with a notch s^8, to permit a beam of direct light rays C, Fig. 7, to illuminate the roadway close to and in front of the vehicle. At the same time the shield S^2 may, as shown, be made narrow enough to permit the escape at each side thereof of two curb illuminating beams of direct rays B, Fig. 9.

The above described reflecting shield is very inexpensive to build and in practice I have found it highly satisfactory and efficient in securing the above described results.

The form of shield illustrated in Figs. 7, 8 and 9 has the advantage that it will function to prevent the escape of direct light rays at the top of reflector R even though the diameter of its chime may vary either way within a wide range, whereas the use of the forms shown in Figs. 1 and 6 is more limited in this respect.

What I claim is:—

1. As a new article of manufacture an attachment for the electric lamp of a headlight, said attachment comprising a small auxiliary reflecting shield of molded sheet metal that is V-shaped in horizontal cross section and means adapted to engage the lamp thereby to separably fasten said reflecting shield in position directly in front of the bulb of said lamp with its apex disposed vertically and closely adjacent the end of the bulb of said lamp, the rear side of said reflecting

shield consisting of a pair of vertically disposed flat reflecting surfaces which diverge forwardly from and at opposite sides of a vertical line intersecting the axis of said lamp, closely adjacent the latter, and each of said vertically disposed surfaces being approximately parallel throughout its extent with said vertical line.

2. As a new article of manufacture an attachment for the electric lamp of a headlight, said attachment comprising a small auxiliary reflecting shield of molded sheet metal and means projecting rearwardly from the back of said reflecting shield adapted to engage the lamp thereby to separably fasten said reflecting shield in position opposite and closely adjacent to the end of the bulb of said lamp, the said reflecting shield being provided upon its rear side with a pair of reflecting surfaces which diverge forwardly from and at opposite sides of a vertical line throughout a substantial length of said line and the latter intersecting the axis of said lamp, and the said reflecting shield being provided at its top with a rearwardly extending ray-intercepting visor.

3. As a new article of manufacture an attachment for the electric lamp of a headlight, said attachment being constructed in accordance with claim 2, and wherein the under side of said rearwardly extending visor serves as a reflector by which direct rays from said lamp are deflected on to the main reflector of the headlight.

4. As a new article of manufacture an attachment for the electric lamp of a headlight, said attachment comprising a small auxiliary reflecting shield of molded sheet material and means for separably fastening said reflecting shield in position opposite and closely adjacent the end of the bulb of said lamp, said reflecting shield being provided upon its rear side with a pair of flat vertically disposed reflecting surfaces which diverge forwardly from and at opposite sides of a vertical line intersecting the axis of said lamp and wherein said reflecting shield is provided adjacent its top with a rearwardly extending ray-intercepting visor having upon its under side a reflecting surface by which forwardly and upwardly projected direct rays from said lamp are deflected laterally on to the main reflector of the headlight.

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