June 16, 1931. E. J. WHALEN 1,810,235

HEAD LAMP CONSTRUCTION

Filed June 26, 1928 3 Sheets-Sheet 1

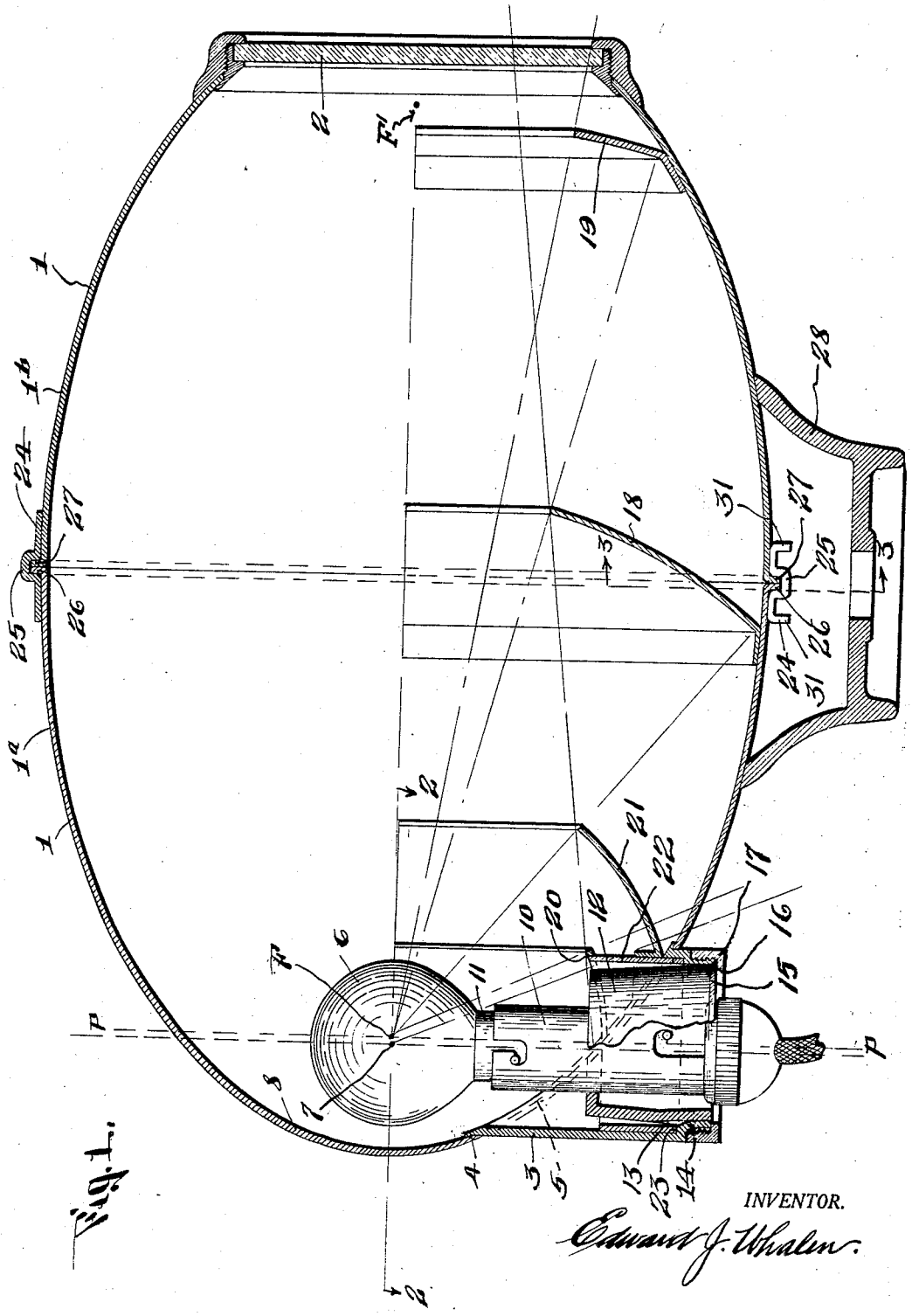


Fig. 1.

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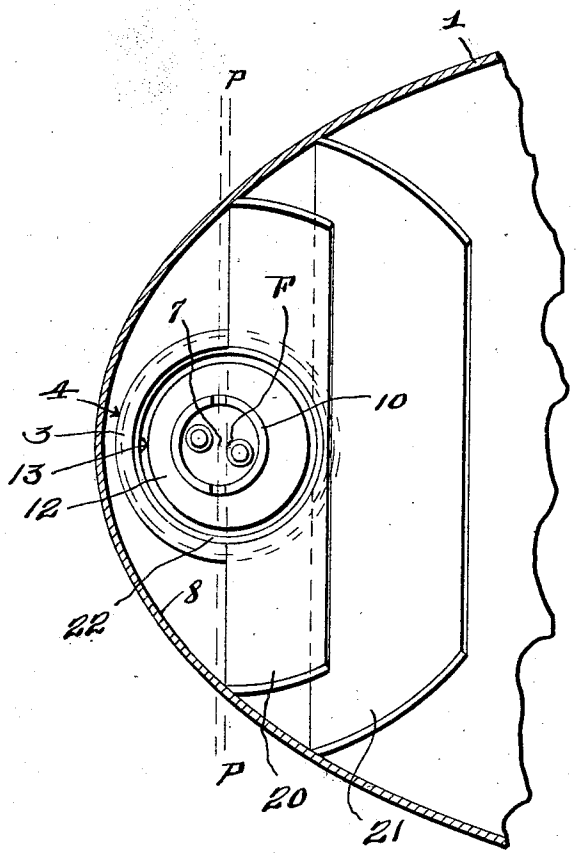


Fig. 2.

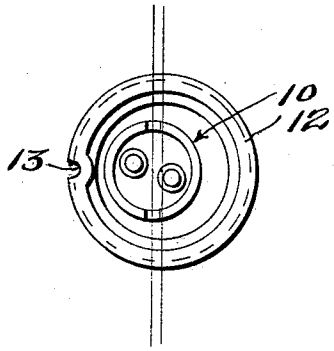


Fig. 4.

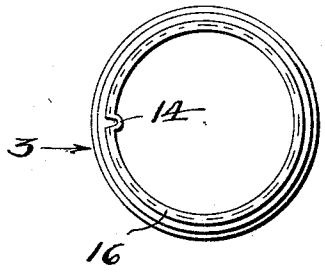


Fig. 5.

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HEAD LAMP CONSTRUCTION

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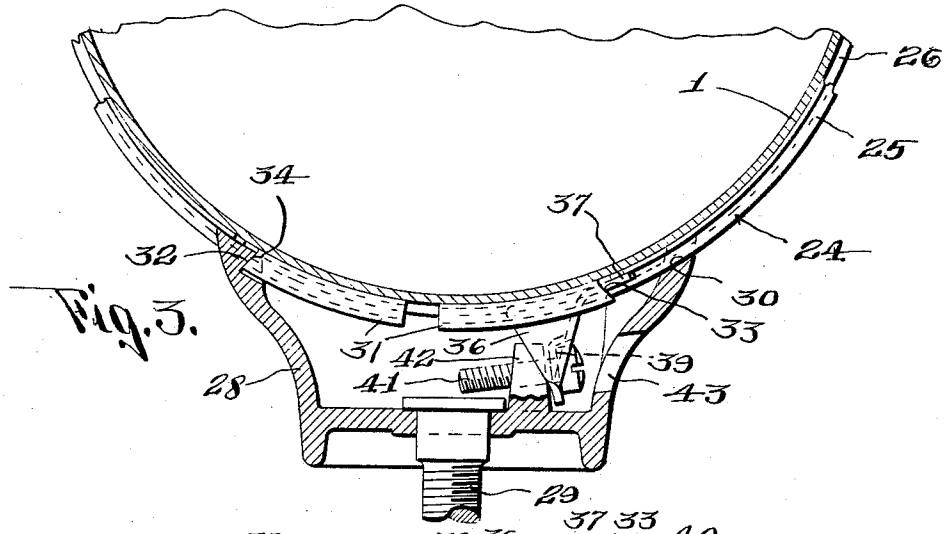


Fig. 5.

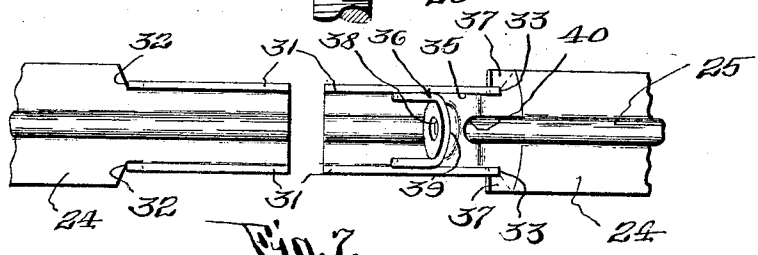


Fig. 7.

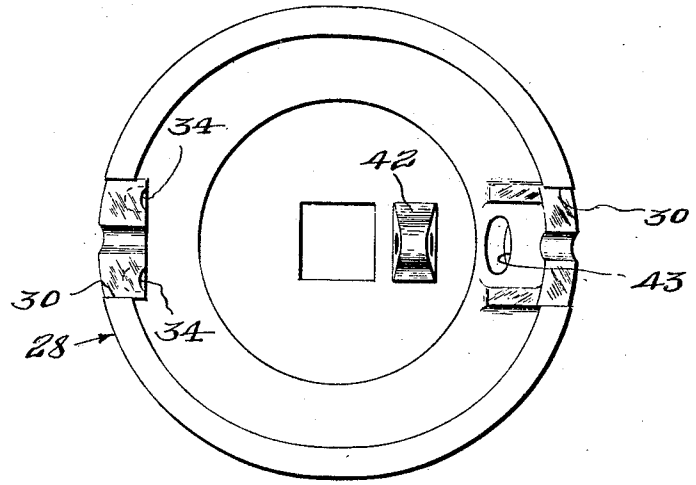


Fig. 6.

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Patented June 16, 1931 1,810,235

UNITED STATES PATENT OFFICE

EDWARD J. WHALEN, OF SYRACUSE, NEW YORK, ASSIGNOR TO REDIRECTED LIGHT CORPORATION OF AMERICA, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK

HEAD LAMP CONSTRUCTION

Application filed June 26, 1928. Serial No. 288,340.

This invention relates to light projectors, particularly headlights for vehicles of the type shown in my Patent No. 1,641,714 and has for its object, a particularly economical and simple construction for supporting and accurately locating the lamp in the reflector and also, for assembling in a simple and economical manner conducive to greatly lessening the cost of production, the secondary reflecting means in the main reflector. Other objects appear throughout the specification.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

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

Figure 2 is a fragmentary horizontal sectional view through the rear end thereof on line 2—2, Figure 1.

Figure 3 is a fragmentary sectional view on line 3—3, Figure 1.

Figure 4 is a plan view of a lamp socket holder.

Figure 5 is an end view looking upwardly in Figure 1 of the lower end of the passage in which the lamp socket holder is mounted.

Figure 6 is a plan view of the saddle or base on which the head lamp or the body thereof is mounted.

Figure 7 is a fragmentary view of the end portions of the clamping band.

This headlight comprises, generally, a main reflector which is also the body, the reflector being concave and having a light opening at its front end, the focus of the reflector located near the rear end, the body of the reflector also having a passage at its rear end arranged at an angle to the axis of revolution of the reflector preferably, at a right angle thereto, a lamp socket support mounted in the passage and also a secondary reflector having a base detachably mounted in said passage, the passage and the lamp socket support having means for locating the source of light relatively to the focus of the reflector, this means being a so-called fixed focus.

1 designates the reflector or body which is ellipsoidal in general form and having a light projecting opening at its front end in which a glass 2 is suitably mounted. The curve of the reflector is generated by revolving an ellipse about an axis so that the reflector is circular in cross section and the rear focus is located near the rear end at F of the reflector. The other focus may be located insofar as this invention is concerned, at any suitable point F′ at or beyond the front end of the body 1.

The passage in which the lamp socket support is mounted is here shown as enclosed by a tubular wall 3 suitably secured at 4 to the body 1 at the rear end thereof and below the axis of the reflector and usually at a right angle to such axis. The upper edge of this tubular wall 3 is shaped to conform to the curve of the body 1 as indicated at 5. The source of light 7 is the filament of an incandescent electric lamp 6.

Theoretically, the source of light to act most efficiently, should be located in the focus F, but as the source of light is a finite thing, it can not be located in a theoretical point and in order to obtain as near as possible the result that would follow if it could be located in the theoretical point F, the source of light is located slightly back of the focal plane or the focus F so that more rays of light are concentrated on the rear intensive part of the reflector 8 back of the focal plane P than would otherwise be if the finite source of light were located in the focus F. In other words, by locating the source of light 7 in the rear of the focus F, the rays of light actually do strike the rear intensive part of the reflector 8 back of the focal plane that would theoretically strike such portion 8 back of the focal plane if the source of light were a point located at F. Or again, the source of light being a finite thing, it is in practical effect, more accurately located in the focus point F by placing it slightly in the rear of the point F.

10 designates the lamp socket for receiv-

ing the lamp base 11, the parts 10 and 11 being connected by the usual bayonet joint.

12 designates the lamp socket support in which the lamp socket 10 is fixed in any suitable manner.

This lamp socket support is in the form of a plug extending into the tubular wall 3 from the lower end thereof, the wall 3 and the support having means by which the lamp socket support must be always placed in the passage enclosed by the wall 3 in one position; and as here shown, the lamp socket support is formed with a groove or key slot 13 for receiving a corresponding key or projection 14 on the inner side of the wall. Also, in order to get the lamp as near as possible to the rear wall 8 of the reflector, and the passage enclosed by the wall 3 large enough to permit the lamp bulb to pass therethrough, the lamp socket 10 is eccentrically mounted in the lamp socket support 12.

The lamp socket support 12 and the wall 8 are provided with means for centering or accurately positioning the lamp with the filament 7 located accurately relatively to the point F. It will be understood that these lamps come in approximately the same size, although there are small variations. In practical effect they are the same although the filaments or the position thereof vary slightly.

The means for centering or accurately positioning the lamp comprises coacting conical surfaces 15, 16 provided respectively at the lower end of the lamp socket support 12 and the lower end of the passage 3, the portions of the lamp socket support 12 above the conical surface 13 being spaced apart from the wall 3 and any other parts as the base of the secondary reflector to be presently referred to, mounted in said passage 3. The lamp support 12 is held in the passage 3 by a retaining means at the lower end of the passage 3, here shown as a cap 17 threading on the lower end of the wall 3 and thrusting against the lower end of the lamp socket support 12 to press the surfaces 15 and 16 together.

By reason of the mounting for the lamp socket support, no adjustment of the lamp is necessary and the lamp has a fixed focus. In replacing the lamp, it is merely necessary to remove the cap 17, withdraw the lamp socket support 12 and the lamp socket out through the wall 3, remove the bulb or lamp, place a new bulb in the socket, reinsert the lamp socket support 12 with the lamp therein through the wall 3 and screw the cap 17 in position.

In order to redirect the rays of light that pass downwardly from the lamp 6 rearwardly to the rear intense portion 8 of the reflector, back of the focal plane so that they will be redirected forwardly in lines inclined but slightly out of the horizontal through the front focus of the ellipsoid, the body is provided with one or more rearwardly facing secondary reflectors in the lower half thereof.

18 and 19 designate two of these reflectors and 20 and 21 two more of such secondary reflectors. The reflectors 18 and 19 are fixed directly to the body 1, while the reflectors 20 and 21 are carried by a tubular base or stem 22 which fits into the wall 3 from the inner side of the reflector body 1 and which rests on an annular internal shoulder 23 on the wall 3.

The body 1 is formed in rear and front sections 1^a and 1^b which abut against each other substantially midway between the front and rear ends of the body and the reflector 18 is located in the front end of the rear section 1^a while the reflector 19 is located in the front section 1^b. Owing to this sectional formation of the body 1, the reflectors 18 and 19 can be readily assembled in the body sections 1^a, 1^b and owing to the mounting of the reflectors 20, 21 on the sleeve or collar 22, these reflectors are readily and economically mounted in the reflector body 1 through the front end of the section 1^a. The surfaces of these reflectors are spherical with the centers thereof at the focus F.

In operation, any light striking the secondary reflector is reflected back to the rear end 8 of the reflector and from there projected forwardly through the front focus F' of the ellipsoid. These reflectors are so located that the greater portion of the light passing from the lamp downwardly below the horizontal plane of the axis of the main reflector is redirected by the rear portion 8 of the reflector back of the focal plane.

The sections 1^a, 1^b are held together by a band 24 encircling the middle of the body 1 and lapping the joint between the sections 1^a, 1^b, the band having a corrugation 25 along its median line for receiving out-turned flanges 26, 27 at the abutting ends of the sections 1^a, 1^b. This band is split as shown in Figure 7 and means are provided for clamping the ends of the bands around the body 1 and at the same time, securing the body 1 to a base or saddle 28. The base or saddle is here shown as cup shaped with its upper edge shaped to conform to the contour of the body 1. It is held in position on a bracket or other support on the vehicle, by means of the screw 29 extending through the bottom of the cup shaped formation. The saddle 28 is formed in its upper edge with diametrically opposite notches 30 through which the ends of the band extend and the ends of the band on the inner sides of the notches are formed with outwardly extending flanges 31 struck therefrom, these flanges providing shoulders 32, 33. The shoulders 32 of the flanges 31 at one end of the band thrust against the shoulders 34 on the saddle at the inner side of the corresponding notch 30. The flanges 31 at the other end of the band

provide shoulders 33 and a channel 35 for connecting a coupling on the band.

36 designates the coupling which is struck up from sheet metal in order to form an outwardly extending lug on the end of the band, this coupling having laterally extending lugs 37 for coacting with the shoulders 33 and with the body portion for fitting the channel 35. The coupling 36 is also formed with an opening 38 therethrough and with a seat 39 around the opening for receiving a screw head. The coupling is provided with a suitable slot 40 through which the corrugation 25 of the band extends.

In assembling the lamp body to the saddle 28, the band is arranged with the shoulders 32 against the shoulders 34 of the saddle and the screw 41 is passed through the opening 38 in the coupling and threaded into a lug 42 within the saddle. When the screw is tightened, the band is tightened about the body and the body at the same time clamped to the saddle. The cup-shaped saddle 28 is also formed with a work hole 43 through which the screw 41 is accessible.

By reason of the mounting of the lamp socket support, the support with the lamp can be readily removed and replaced and the filament accurately located relatively to the focus F without adjustment and owing to the sections 1^a, 1^b, the secondary reflectors and particularly those reflectors located in the rear end of the lamp body can be assembled in position in a relatively inexpensive manner and also accurately formed in an inexpensive manner before being assembled in the body.

Owing to the band 24 and its coaction and connection to the saddle 28, the assembly of all the parts in an economical manner is obtained so that a headlight of this type and the type of my Patent No. 1,641,714 can be produced commercially.

What I claim is:

1. A headlight comprising a concave reflector having a light opening at its front end and a passage at its rear end arranged at an angle to the axis of the reflector, a source of light, a lamp socket support mounted in said passage and removable with the source of light through the outer end of the passage, said passage having an internal inwardly presented shoulder and a rearwardly presented reflector located in front of the source of light and having a sleeve fitting said passage and abutting against said shoulder and surrounding the lamp socket support.

2. A headlight comprising a concave reflector having a light opening at its front end, and a passage at its rear end, a lamp bulb, a lamp socket support detachably mounted in said passage and together with the lamp bulb being removable through said passage, and a rearwardly facing reflector arranged in front of the lamp bulb and having a support detachably mounted in said passage independently of the lamp socket support whereby the lamp socket and bulb are removable independently of the reflector support, the reflector support fitting the passage and surrounding the lamp socket support.

In testimony whereof, I have hereunto signed my name, at Syracuse, in the county of Onondaga, and in the State of New York, this 23rd day of June, 1928.

EDWARD J. WHALEN.