W. S. PERRY.

REFLECTING LAMP.

APPLICATION FILED FEB. 21, 1908.

950,600. Patented Mar. 1, 1910.

Fig. 1

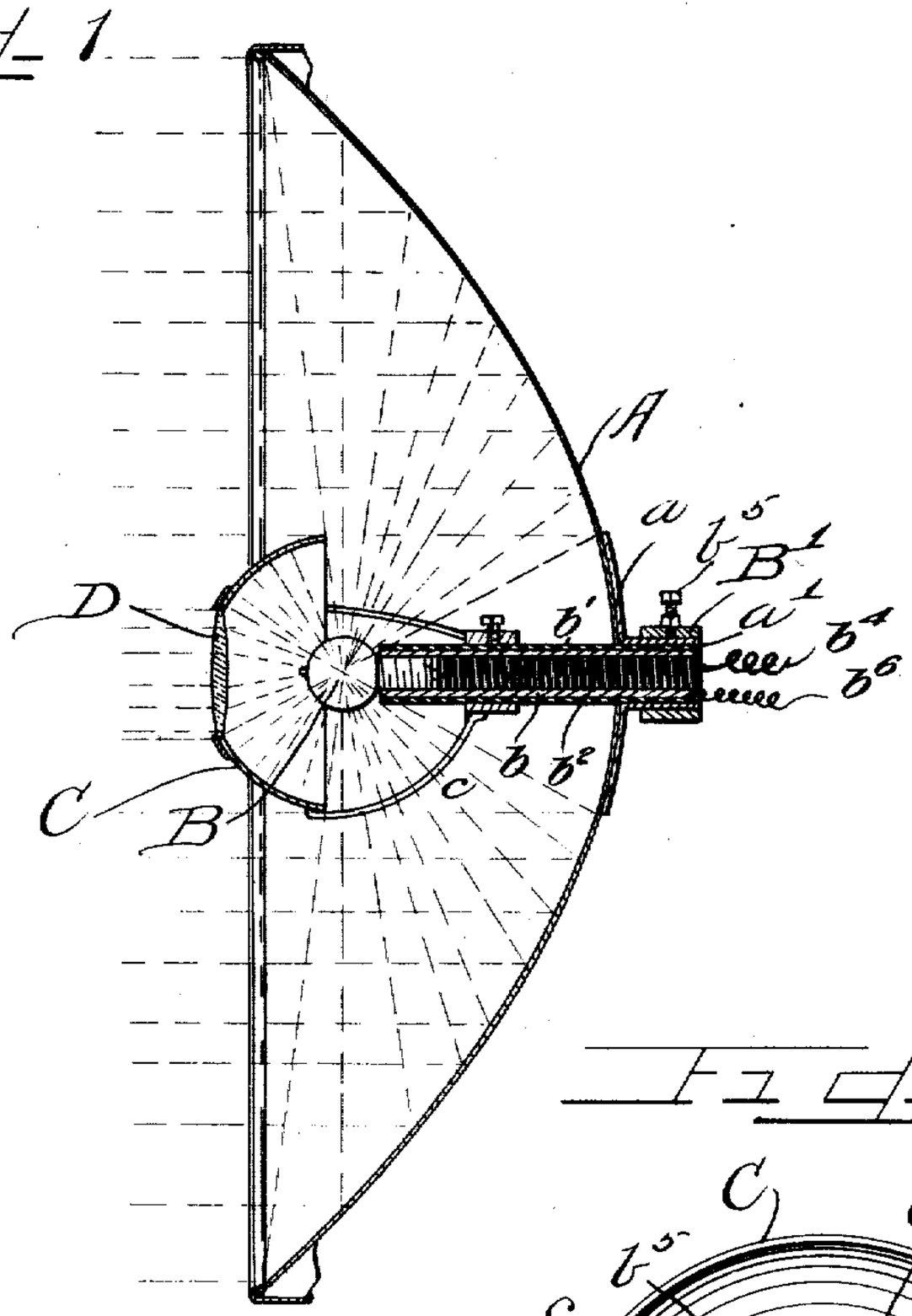


Fig. 3

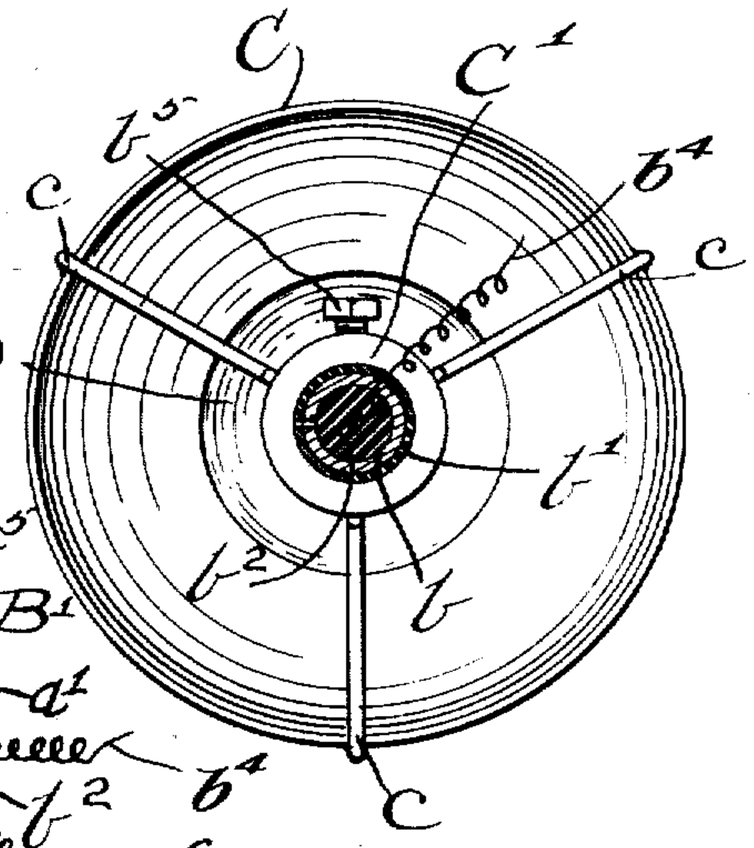
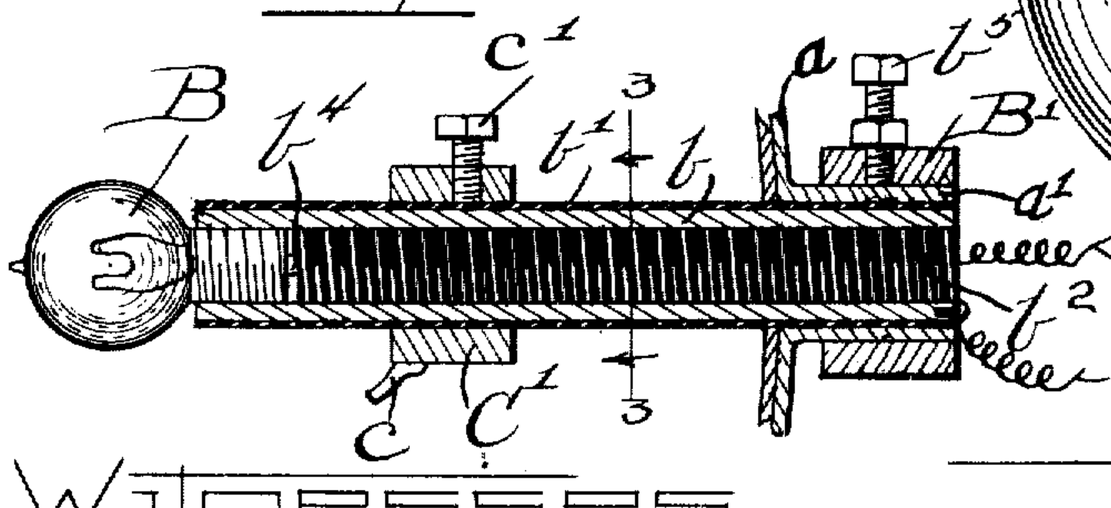


Fig. 2



Witnesses

J. N. Angell.

R. E. Farnum

by

Inventor

Ward S. Perry

Charles W. Hills

Atty.

UNITED STATES PATENT OFFICE.

WARD S. PERRY, OF CHICAGO, ILLINOIS.

REFLECTING-LAMP.

950,600. Specification of Letters Patent. Patented Mar. 1, 1910.

Application filed February 21, 1908. Serial No. 417,050.

To all whom it may concern:

Be it known that I, WARD S. PERRY, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Reflecting-Lamps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in that class of reflecting lamps in which an electric or other light of relatively low candle power may be employed.

In practically all the reflecting lamps such as are used for automobile headlights and similar purposes a considerable portion of the light radiated from the burner or lamp is lost so far as its utilization for any effective purposes is concerned through failure of the reflectors or refractors to concentrate all the light in parallel rays forming a forwardly directed beam of light. Furthermore there has always been with lights of this kind a considerable loss owing to the fact that there is invariably a dark spot on the reflector at the rear of the burner owing to the supporting means for the burner cutting off certain rays of light that would otherwise fall upon the reflector. For these reasons electric searchlights on most automobiles, including practically all automobiles driven by explosive engines, have not been used and acetylene gas or gas of some other kind has usually been employed and in the few instances in which it has been attempted to employ electric search lights on such cars, it has been deemed necessary to use lamps of relatively high candle power necessitating the use of a large and expensive storage battery.

The object of this invention is to obviate the conditions hereinbefore recited and to enable an electric lamp of relatively low candle power to be employed for search-light purposes either for automobile lamps or for any of a related kind.

It is also an object of the invention to afford a construction in which nearly all the light from the lamp is directed straight ahead in parallel rays, thus utilizing those rays which have heretofore been lost by diffusion or have been radiated from the lamp in lines falling outside the reflector.

It is also an object of the invention to afford a construction in which the source of light may be adjusted accurately at the focus of the reflector or reflectors and in which nearly all of the rays of light emanating from the source are reflected or refracted to afford a beam of parallel rays.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a central vertical section of a lamp and reflector and refractor embodying my invention. Fig. 2 is an enlarged longitudinal section of the adjusting means for the lamp. Fig. 3 is an enlarged section taken on line 3—3 of Fig. 2.

In said drawings: A, indicates a parabolic reflector of metal or other suitable material and which is ordinarily held in position in the lamp frame by the engagement of its periphery with the frame in a familiar manner. Secured on the back of said reflector is a plate of sheet metal a, provided with a rearwardly directed sleeve a', which registers with a corresponding aperture through the center of the reflector and through which extends a longitudinally split or slitted sleeve b, which contains the conductors for the electric light B. Said sleeve, as shown, is provided on the outer side with a longitudinally slitted or split insulating shell b', as shown in Fig. 3, which fits closely in the sleeve a', and threaded within the sleeve is an insulating stem or core b^2, containing one of the conducting wires b^4, which extends through said core in position to be engaged by one of the contacts for the lamp B, and the other conductor b^6, is electrically connected with the sleeve b, in any suitable manner. Said conductors, of course, are connected with any suitable source of current. Said sleeve and its non-conducting shell b', are adjustable through the sleeve a', at the rear of the reflector to adjust the lamp B, exactly at the focus of the lens, and for the purpose of retaining the same in adjusted position a collar B', provided with a set screw b^5, is provided on said sleeve a', and said sleeve a', being relatively thin, it may be readily pressed or sprung inwardly by the action of the set screw to firmly hold the sleeve b, in place.

Of course, with the lamp supported as shown, and described there would of necessity occur a dark spot at the center of the

reflector and in addition, those rays of light falling normally outside the reflector would be of comparatively slight value in illuminating. For the purpose of utilizing all such rays and reducing as much as possible the dark spot in the center of the beam I have provided a spherically concave reflector C, which, as shown, is supported on the sleeve b', by means of arms or rods c, which extend from the periphery of said reflector inwardly. Said arms are engaged on a collar C', provided with a set screw c', whereby said reflector is adjustably supported upon the sleeve b, which carries the lamp B. The set screw c', also serves to spring or force the sleeve together and firmly clamp the core in any adjustment and acts to prevent relative movement of the core and sleeves. The middle portion of the reflector C, is cut away to afford an aperture in which is set the refracting lens of any suitable kind, as shown in Fig. 1, to direct the rays passing therethrough from the lamp into parallel rays.

The operation is as follows: The rays from the lamp B, falling upon the parabolic reflector A, are reflected in parallel lines as is usual when the source of light is at the focus of the parabola. The dark spot at the center of the beam is occasioned of course, by the plug and sleeve with which the lamp is connected cutting off part of the rays. The spherically concaved reflector C, is also adjusted so that the source of light is at the center thereof and said reflector is positioned to intercept all the rays of light that would otherwise fall outside the parabolic reflector. Such rays of light are, of course, directed back to the parabolic reflector and thence are again thrown out in parallel lines so that all the light from the source is thus utilized.

Of course, the diameter of the spherically concave reflector will not exceed the diameter of the dark spot in the parabolic reflector and should no refracting lens whatever be used, said reflector enables all the light to be utilized without increasing the dark spot that would, in any event, occur in the parabolic reflector. For the purpose of reducing to the smallest possible size the dark or noneffective portion of the reflector the refracting lens D, is secured in said spherical reflector in a position to receive the light therethrough directly opposite said dark spot and is so shaped that the focus thereof is also at the center of the lamp, so that the light rays passing therethrough are refracted into parallel rays, as shown in Fig. 1. The principal axis of said lens coincides with the principal axis of the reflectors and said axis of the lens also passes through the light source.

Of course, owing to the construction described, in which all the light from the rays is utilized, a source of much smaller candle power may be used than has heretofore been deemed practicable. In consequence an electric lamp of very small size may be employed, requiring the use of a comparatively small and low power battery, affording the same or better results than has been heretofore possible when using electric lights of very much higher candle power, all of which have necessitated large and very expensive storage batteries.

Of course, I am aware that details of this construction may be varied but for obvious reasons, however, I prefer the construction shown owing to the facility with which the source of light can be adjusted relatively to the focus of its reflectors and owing also to the protection and economy of current consumption insured by this construction.

I do not purpose limiting this application for patent as to details as many changes may be made without departing from the principles of this invention.

I claim as my invention:

1. A lamp embracing a parabolic reflector, a longitudinally slit metallic sleeve extending thereinto, a source of light at the inner end of the sleeve in the reflector, means extending through the sleeve for supplying electrical current to the source of light, a relatively small concave reflector positioned on the sleeve on the opposite side of the source of light from the parabolic reflector and acting to concentrate rays from said source that would otherwise fall outside said reflector thereupon, means for adjusting the small concave reflector relatively to the parabolic reflector and means for adjusting the sleeve to vary the position of the source of light.

2. A lamp embracing a parabolic reflector and a relatively small concave reflector oppositely disposed thereto, a metallic sleeve adjustably secured to the parabolic reflector, a source of light secured to the end of the sleeve at the principal focus of both reflectors, means for rigidly securing the sleeve in any adjustment to the parabolic reflector, said concave reflector being positioned to reflect part of the rays normally falling outside of the parabolic reflector thereon and means for adjusting said concave reflector and said source relatively to the parabolic reflector.

3. A lamp embracing a parabolic reflector and a spherically concave reflector positioned oppositely each other and with a common focus, concentric insulating and conducting sleeves adjustable with respect to one of the reflectors, a source of light at one end of the sleeves and adjustable means supporting the other reflector, thereby adapting the same to be adjusted toward and from the first named reflector.

4. In a device of the class described a

parabolic reflector provided with a central aperture, a short sleeve secured thereto in alinement with said aperture, sleeves adjustably secured to said short sleeve, a source of light secured to the adjustable sleeves in the parabolic reflector and a concave reflector adjustably supported on the end of the sleeves in the parabolic reflector.

5. In a device of the class described a parabolic reflector having a central aperture therein, a sleeve secured on the rear side of said reflector in register with said aperture, an adjustable sleeve extending through said sleeve and aperture, a source of light at the inner end thereof, means for adjusting said adjustable sleeve to bring said source to the principal focus of the reflector, a small concave reflector supported on said adjustable sleeve oppositely from the parabolic reflector in position to concentrate part of the rays of light from said source normally falling outside said parabolic reflector thereupon.

6. In a device of the class described a parabolic reflector having an aperture at its center, a relatively thin sleeve secured on the rear side of the reflector and registering with the aperture, an adjustable sleeve extending through said sleeve and aperture, a source of light at the inner end thereof, means for adjusting said adjustable sleeve to bring the light at the principal focus of the reflector, a small spherically concave reflector supported on said adjustable sleeve oppositely from the parabolic reflector, means for adjusting the same relatively to said source, said reflector having an aperture therethrough opposite said adjustable sleeve.

7. A lamp embracing a parabolic reflector having a central aperture therethrough, a relatively thin sleeve secured on the rear side of the reflector in register with said aperture, an insulated sleeve extending through said sleeve and aperture, an electric light at the inner end of said insulated sleeve, means for securing said insulated sleeve to hold said source of light at the principal focus of the reflector, a small. concave reflector adjustably secured on said insulated sleeve oppositely from the parabolic reflector and positioned to reflect to the parabolic reflector rays of light from said source normally falling outside said parabolic reflector.

8. A lamp embracing a parabolic reflector having a central aperture therein, a relatively thin metallic sleeve secured on the rear side of the reflector, in register with said aperture, an adjustable insulated sleeve extending through said sleeve and aperture, a collar on said first named sleeve, a set screw therein to press said sleeve into binding engagement, with the insulated sleeve, a source of light at the inner end of said insulated sleeve, and thereby adapted for adjustment to the principal focus of the reflector, a small spherically concave reflector adjustably supported on said insulated sleeve, opposite the parabolic reflector to intercept part of the rays from said source normally falling outside said parabolic reflector, said spherically concave reflector having a central aperture and a lens secured in said aperture.

9. In a device of the class described a parabolic reflector having an aperture through its center, a thin rearwardly directed sleeve secured on the back of the reflector and registering with said aperture, an insulated adjustable sleeve extending through said reflector and sleeve, an electric light in the inner end thereof, means for rigidly engaging said adjustable sleeve in any adjustment thereof, conductors for said light connected with a source of current, one extending through said insulated sleeve and the other electrically connected with the insulated sleeve, a small, centrally apertured concave reflector supported on the insulated sleeve to receive therein and reflect to the parabolic reflector light rays from the source normally falling outside the first named reflector and means for adjustably securing said reflector on said insulated sleeve.

10. In a lamp a parabolic and a small spherically concave reflector arranged oppositely, means for adjusting one of the same relatively to the other to a common focus, electrically conducting means extending into the parabolic reflector, means for adjustably securing the same between the reflectors, a source of light supplied by the electric conductors, means for adjustably supporting one of the reflectors on the conducting means, and a condensing lens secured in an aperture in the smaller reflector whereby practically all the light from said source is directed in a beam of parallel rays.

11. In a device of the class described a parabolic reflector, a source of light supported in front of the reflector, means supporting the source of light adapted for adjustment to vary the distance of the light from the parabolic reflector, means for rigidly securing the supporting means in any adjustment and a small reflector oppositely disposed from the parabolic reflector and adjustably supported on the means which supports the source of light.

12. In a device of the class described a parabolic reflector, a source of light, means for supporting said source of light in front of the reflector and adjustable to move the light toward or from the reflector, a reflector adjustably supported by said means provided with a central aperture and a lens secured in said aperture in the reflector.

13. In a device of the class described a parabolic reflector, a source of light, means for supporting said source of light in front of the reflector and adjustable to move the light toward or from the reflector, a concave

reflector adjustably supported by said supporting means and a lens secured to the concave reflector in axial alinement with the source of light providing an unobstructed passage for all the rays of light at the center of the reflectors.

14. In a device of the class described a reflector, a sleeve rigidly secured thereto slit longitudinally, an insulated sleeve adjustably engaged in said rigid sleeve and slit longitudinally, a source of light secured to the insulated sleeve, said insulated sleeve adjustable to vary the distance of said light from the face of the reflector.

15. In a device of the class described a reflector, a sleeve rigidly secured thereto, an insulated sleeve adjustably engaged in said rigid sleeve, a source of light secured to the insulated sleeve, said insulated sleeve adjustable to vary the distance of said light from the face of the reflector, a small reflector having a central aperture, a lens secured in the central aperture in the reflector, arms secured to the reflector and a collar secured to the arms slidable on the insulated sleeve to vary the distance of the small reflector from the light and the first named reflector.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

WARD S. PERRY.

Witnesses:
C. W. HILLS,
K. E. HANNAH.