T. L. HILES.

HEADLIGHT.

APPLICATION FILED JULY 23, 1908.

905,312. Patented Dec. 1, 1908.

2 SHEETS—SHEET 1.

FIG. 1.

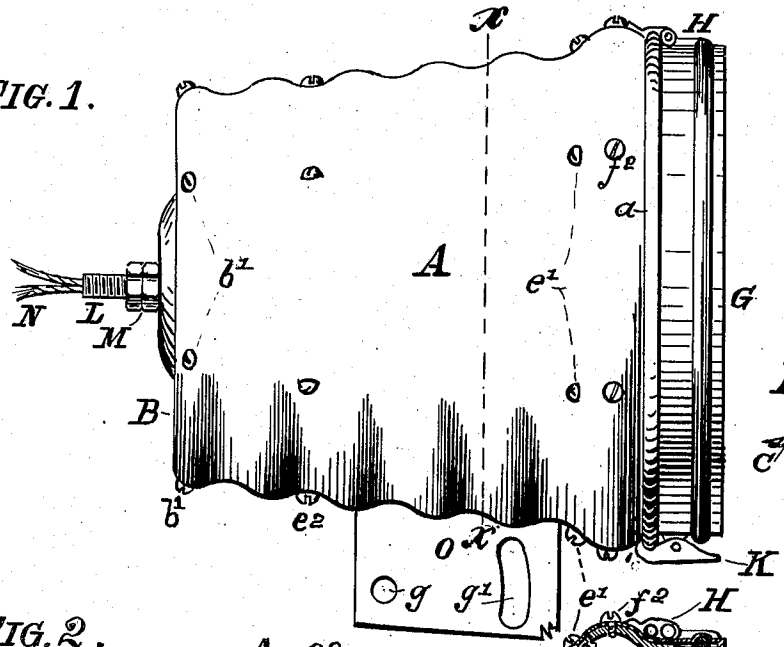


FIG. 3.

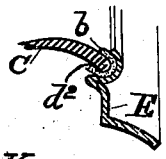
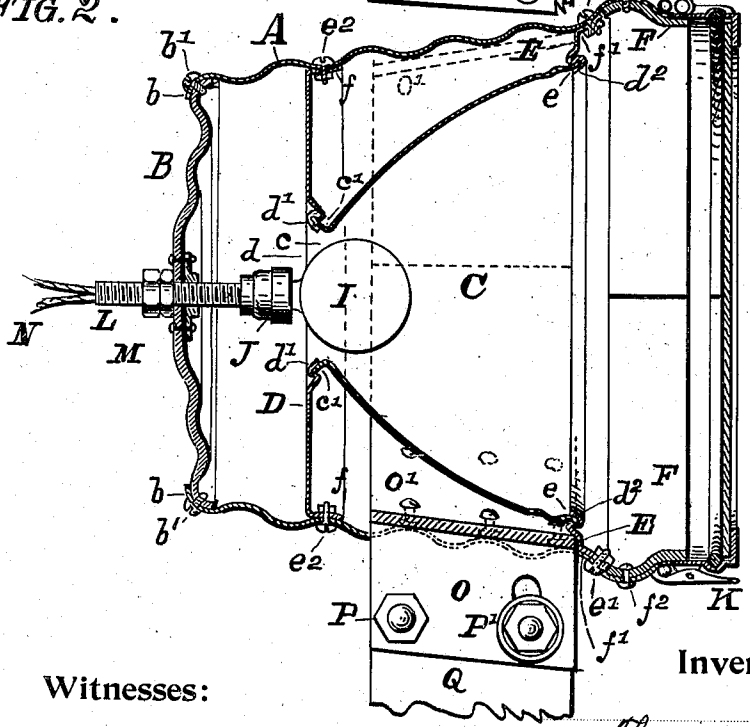


FIG. 2.



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2 SHEETS—SHEET 2.

FIG. 4.

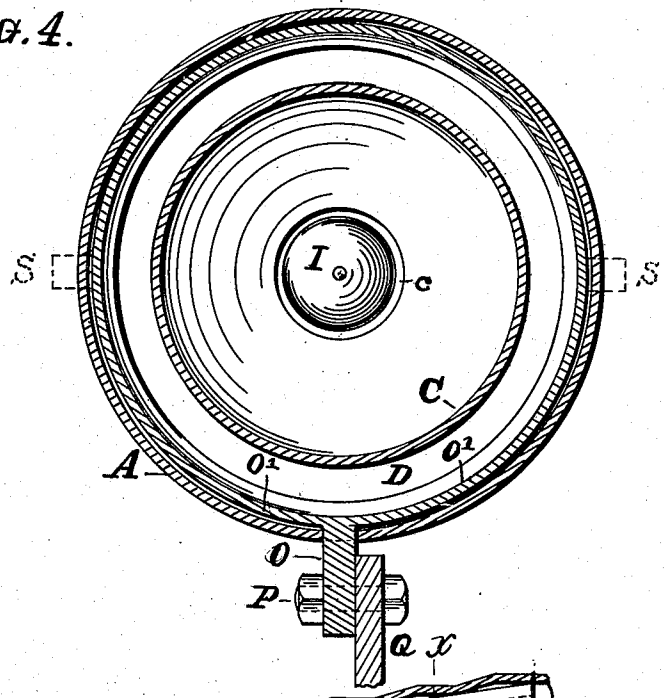
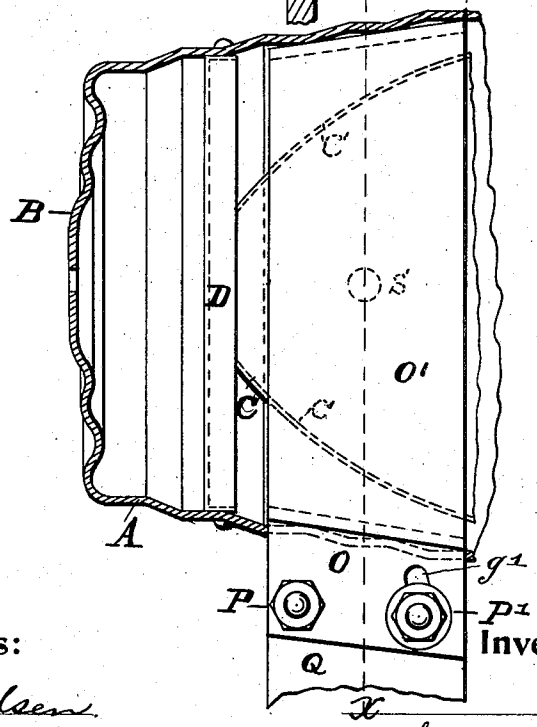


FIG. 5.



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UNITED STATES PATENT OFFICE.

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HEADLIGHT.

No. 905,312. Specification of Letters Patent. Patented Dec. 1, 1908.

Application filed July 23, 1908. Serial No. 444,991.

To all whom it may concern:

Be it known that I, THERON L. HILES, a citizen of the United States, and a resident of Chicago, in the county of Cook, in the State of Illinois, have invented certain new and useful Improvements in Headlights; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheets of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to headlights; and especially that class of headlights generally used on automobiles, launches, ships, cars, locomotives and other vehicles or vessels; and it consists, essentially, in the novel and peculiar combination of parts and details of construction, as hereinafter first fully set forth and described, and then pointed out in the claims.

In the drawings already referred to, which serve to illustrate this invention more fully, Figure 1 is an elevation of this improved headlight and Fig. 2 a longitudinal sectional elevation of the same. Fig. 3 is a sectional view of a fragment of the reflector and the diaphragm which holds the reflector in position. Fig 4 is a transverse sectional elevation in line *x x* of Fig. 1. Fig. 5 is a longitudinal sectional elevation of a headlight slightly modified.

Like parts are designated by corresponding symbols of reference in all the figures.

The object of this invention is the production of an effective, efficient and serviceable electric headlight that can be manufactured and sold at a reasonable figure. To attain this end, I construct this headlight of a sheet-metal shell A, which I prefer to make somewhat tapering or conical and smaller at the rear end, and circumferentially corrugated, as clearly shown in the figures. This shell is beaded at *a* at its forward end, or a strong wire-ring is fastened to this end of the shell to stiffen the same and at the same time constitute means for locking the lamp-front to said shell as will hereinafter more fully appear.

B is the bottom of this headlight. It is also made from metal either in the process of casting or stamping and is corrugated, as shown, and the shell A is spun or otherwise turned over the edge of the bottom B, at *b*, in order to secure a firm and substantial structure, screws b^1 being used to unite the two parts. This shell A with its bottom B, instead of being made in two separable pieces secured together as described, may, however, be drawn or spun in one integral piece. When spun, the corrugations may be of the curvatures substantially as shown in Figs. 1 and 2, but when drawn they are preferably made as shown in Fig. 5, that is to say, the various circular indentations may have straight lines, or in other words, be parallel with the longitudinal center line of the shell so as to be capable of being lifted out of the draw-die in which said shells are produced; or the shell may be drawn as a truncated cone having smooth sides and the corrugations produced by rolling, spinning, or other approved method.

C is a reflector. It is preferably of parabolic contour but may be of other suitable curvature delineated with reference to a focal point for parallel rays and made from thin glass in suitable molds; if desired, the surface and curvature may be further refined by suitable grinding and polishing. It is silvered on its back, or outer, surface, thereby producing a very brilliant reflector which, owing to the fact that it is silvered on its outside, where it is not subjected to the influence of heated gases, &c., will retain its brilliance for almost an indefinite space of time. This reflector C has at its apex an opening *c*, the edge of which is outwardly turned to form a flange c^1 by means of which the reflector is held centrally within the shell A in conjunction with a diaphragm D, which also is provided with a central aperture *d*, the edge of which is formed into a groove, d^1, which embraces the annular flange c^1 of said reflector. The forward or large end of this reflector is outwardly flared at d^2, to form a rim which engages a groove *e*, in a disk E, which is located within the shell A near its forward end and secured thereto by screws e^1, strips of elastic or soft material, shown in Fig. 3 at *b* being placed into the groove *e* as well as into the groove d^1 in the diaphragm D in order to prevent metallic contact with the reflector and the possibility of its breaking.

The diaphragms D and E have flanges *f* f^1 respectively by which and the screws e^1 already mentioned, and further screws e^2 in the flange *f* of the diaphragm D, the diaphragms are removably secured to the shell A so that they may be withdrawn should it

become necessary to remove the reflector for any purpose whatsoever. In the forward, larger, end of the shell A there is located an annular ring F, formed to correspond with the contour of the shell A and held therein by screws f^2. It serves as a reinforce to the shell A and also as a rim upon which is seated the door G, which door is of the usual construction and hinged to the shell A by suitable hinges H and held thereto by a catch K of any desired and approved construction.

The source of light in this headlight is an electric bulb or lamp I, which is screwed into a lamp-socket, J, secured to a screw-threaded shank L, which shank passes through a central, screw-threaded, aperture in the bottom B and is further secured thereto by lock-nuts M. The wires or cords N conveying electric current to the lamp pass through this shank L and the lamp I is brought into the focus of the reflector C by adjusting the shank and its lock-nuts in an obvious manner. It will now be observed that by constructing this headlight as described, I have produced a headlight that is eminently suited for use in automobiles, launches, ships and other vehicles and vessels, and in order that the parallel rays of light therefrom may be thrown in advance of such car, vessel, &c., to any particular point I provide this headlight with a downwardly-projecting lug O, securely fastened to the shell A by curved flanges O^1, said lug O having an aperture g, for the reception of a pivot-bolt P, and a slotted aperture g^1 for the reception of a fastening bolt P^1 whereby the headlight may be fastened to any suitable object Q which may be a plate, lug, strap or any other part of said car, &c. This construction provides an easy means of adjusting the line of projection of the beam of light in a vertical plane. At a speed of ten miles an hour a car travels about 15 feet in 1 second; at 20 miles an hour about 30 feet per second or 300 feet in 10 seconds. This is a speed often attained in ordinary travel and many times is exceeded as speed capacity of average cars is from 30 to 50 miles an hour. This feature of speed-capacity makes it a matter of importance to the driver and occupants of a car to be able to adjust the line of beam-projection in a vertical plane as it is obvious that the point of maximum road-illumination should be varied to suit the surface conditions of the road and the personal eyesight equation of the driver of the car with reference to the average speed at which car is driven.

The tang or lug O below the lamp-body is fitted with a round and a slotted opening. Into the round hole is fitted the round pin or bolt P on which the headlight pivots; by swinging it upon this pivot the center line of beam-projection can be made to strike the road at any desired distance in advance of the car, while the clamping-bolt P^1 fitted through the slot will hold it securely in position when it is screwed up tightly in place. In the usual form of forked bracket now in general use no provision is made for this adjustment and in order to make it the ends of the forks must be bent by application of considerable force and no nice adjustment is practicable.

Another desirable feature of this improved construction lies in the fact that the flat side surface of the tang or lug O is always in a vertical plane parallel to that in which the center line of light-projection lies, hence, when the lug is bolted to the side frame of a car or to a stud in line with it, the center line of light-beam is in line with the longitudinal axis of the car and the road is lighted in the direct line of travel. This alinement is not secured by the fork-bracket in common use. In Fig. 2 I have shown this lug with its side-wise-projecting, curved, members or flanges O^1, in solid lines. Instead of this construction I may continue the flanges or members O^1 to form a ring as shown in dotted lines in Fig. 2 and in solid lines in Figs. 4 and 5, such a construction adding to the strength of the headlight without materially adding to its weight. Thus in the smaller sizes of headlights the flanges or members O^1 may extend to, or slightly above or below, the center line of the shell, while in the larger sizes of headlights, or where special strength is required, these side-flanges or members O^1 may be continued to cover the entire internal circumference of the central portion of the shell A.

I have heretofore mentioned the present prevalent construction of automobile, launch, &c. headlights as having pivots by means of which the headlight is suspended in a forked bracket. While I prefer the construction shown in the drawings as being the more desirable one, it is evident, that instead of providing my headlight with the lug and its side-wise projecting, curved members or ring as described, I may provide the members O^1 with pivots S, as shown in dotted lines in Fig. 4 and may or may not dispense with the lug O in order to enable this lamp being used in connection with existing brackets, although by doing so, the perfect results of directing the rays of light heretofore described may not be as fully realized as by my preferred construction. By thus constructing the headlight with its inner, central stiffening plates or ring, I attain the important results of strength and durability of the entire structure; the outer surface is free from projecting parts and is, therefore, more readily cleaned and polished. It also adds to the pleasing-appearance of the headlight by securing harmony of outline

and graceful proportions. It is, furthermore, a new and novel element in lamp-body construction and is a distinct improvement over the prevailing types or models used on automobiles, all of which are arranged with projecting ears which are locally secured to shells of lamps either by solder or rivets and which engage the ends of a forked frame or bracket; these brackets are unsightly in appearance and represent considerable cost and expense in attaching lamps to automobiles; the method described herein is better from a mechanical point of view and effects a saving in cost. The ears in common use being of limited size and area of contact with the shell of lamps concentrates all stresses and strains due to support by brackets at these points where they must be sustained by the shell of the lamp alone whereas, in the construction shown and described in these specifications and drawings, all strains due to vibrations or shocks are sustained by the central side plates or ring O^1 and carried by them directly to the frame of the car through the projecting lug O, which may be bolted to car frame. Owing to the exposed position in which auto head-lights are usually placed, projecting in front of cars, they often receive damage by collision with other vehicles or with obstructions with which cars collide, these considerations make the improved construction herein provided of special and practical importance.

The headlight may be made in steel, brass, copper or any other suitable material and finished in any desired manner.

Having thus fully described this invention I claim as new and desire to secure to me by Letters Patent of the United States—

1. As an improved article of manufacture, a headlight, consisting of a conical, circumferentially-corrugated, shell having its forward, larger end reinforced as described; a bottom in said shell; a hinged door on said shell; a diaphragm located near the bottom of the headlight and having a central aperture, the edge of which is formed into a groove; a further diaphragm located near the larger end of said shell and also provided with an opening, the edge of which is formed into a groove; a parabolic reflector having ledges or flanges engaging the grooves in said diaphragms, and an electric lamp located in the reflector and provided with means for adjustment so as to bring said lamp into the focal point of said reflector.

2. As an improved article of manufacture, a headlight, consisting of a conical, circumferentially-corrugated, shell having its forward end reinforced as described; a bottom in said shell, and removably secured thereto; a hinged door on said shell; a diaphragm located near the bottom of the headlight and having a central aperture, the edge of which is formed into a groove; a further diaphragm located near the larger end of said shell and also provided with an opening, the edge of which is formed into a groove, a parabolic reflector made from glass and silvered on its outer surface, and having ledges or flanges engaging the grooves in said diaphragms, and an electric lamp located in the reflector and provided with means for adjustment so as to bring said lamp into the focal point of said reflector, said means consisting of a screw-threaded shank the axis of which is in line with the longitudinal center-line of the headlight, and locking means for said shank.

3. In a headlight, a parabolic reflector composed of glass and silvered on its outer surface, in combination with a shell or casing; diaphragms in said casing and means for removably attaching the reflector to said diaphragms, said diaphragms being circular disks removably attached to the shell of the headlight and having central apertures the inner edges of which are formed into retaining members to embrace the reflector at its open ends.

4. In a headlight, a parabolic reflector composed of glass and silvered on its outer surface, said reflector having an aperture in its apex, the edge of which is outwardly flared and having at its larger end an outwardly projecting ledge or flange, in combination with a suitable shell and means for securing the glass reflector within said shell, said means consisting of two circular, flanged, disks removably attached to said shell, said disks having central apertures the edges of which are formed into retaining means to embrace the open ends of said reflector, and a soft-material lining in said retaining-means, as described.

In testimony that I claim the foregoing as my invention I have hereunto set my hand in the presence of two subscribing witnesses.

THERON L. HILES.

Attest:

MICHAEL J. STARK,
WILLIAM O. STARK.