W. A. SCHROEDER.

DIMMING DEVICE FOR HEADLIGHTS.

APPLICATION FILED SEPT. 27, 1919.

1,375,418.

Patented Apr. 19, 1921.

2 SHEETS—SHEET 1.

Fig 2.

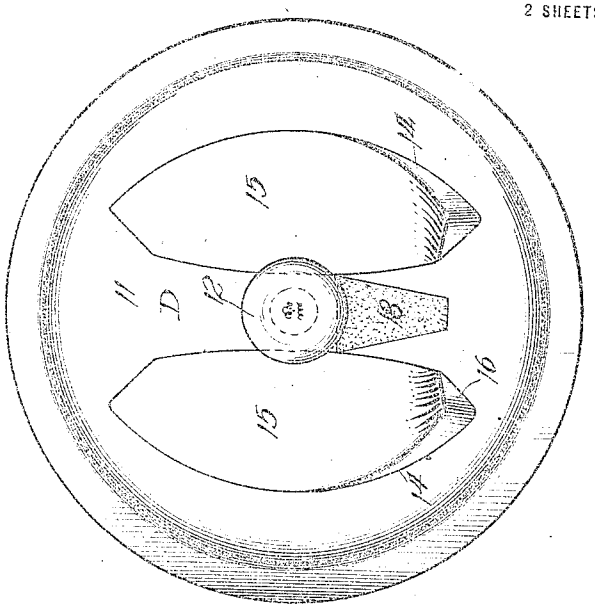
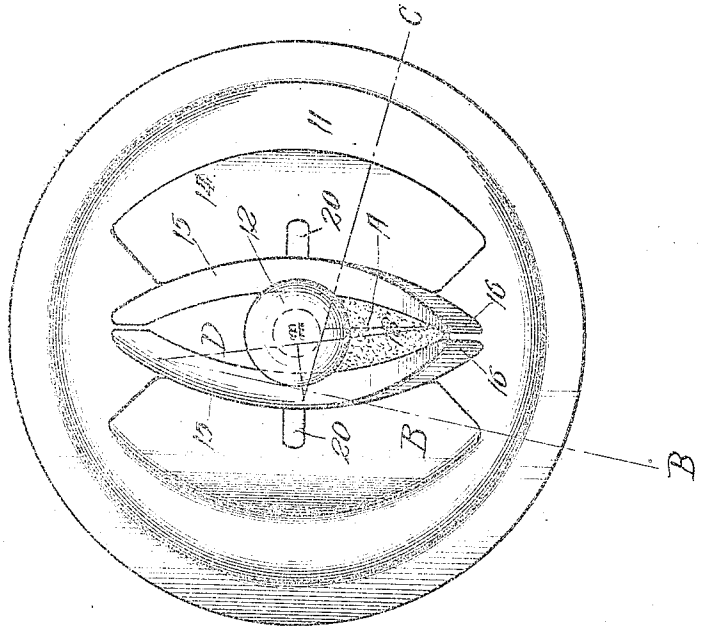


Fig 1.



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2 SHEETS—SHEET 2.

Fig. 1.

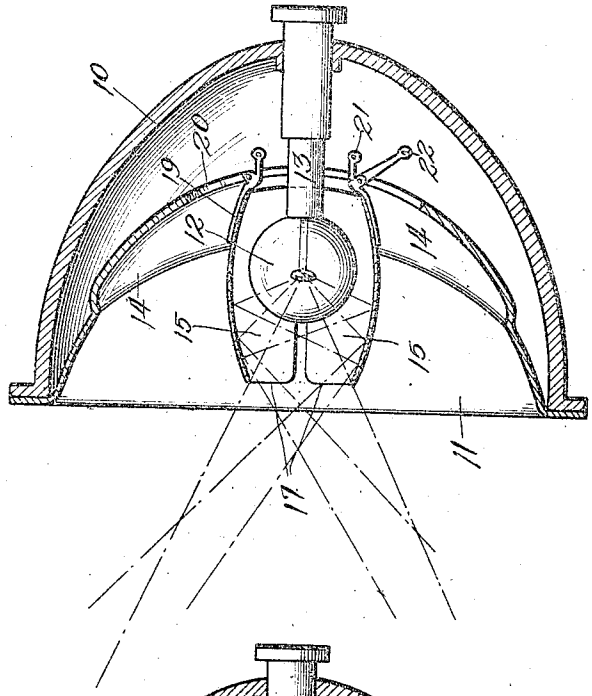
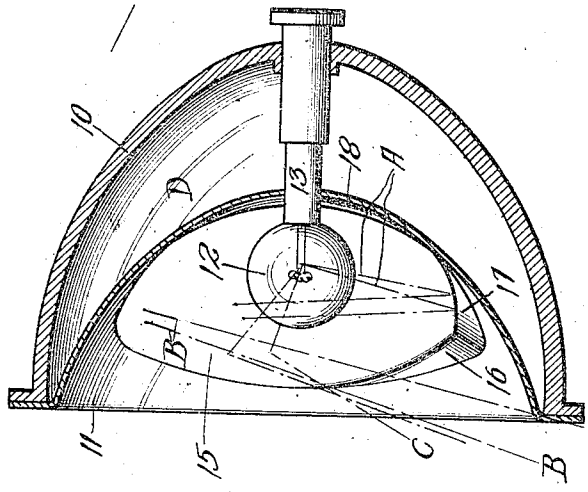


Fig 3.



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UNITED STATES PATENT OFFICE.

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DIMMING DEVICE FOR HEADLIGHTS.

1,375,418. Specification of Letters Patent. Patented Apr. 19, 1921.

Application filed September 27, 1919. Serial No. 326,744.

To all whom it may concern:

Be it known that I, WILLIAM A. SCHROEDER, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Dimming Devices for Headlights, of which the following is a specification.

This invention is intended primarily for use on automobile headlights. The object of this invention is to provide a pair of screens disposed within the space embraced by the reflector and configured, when open, to lie within the plane of the reflector and form a part of the reflecting surface thereof, and when brought into screening position to cut off from the main reflector the rays of light emanating from the lamp, and at the same time subserve the function of reflecting the rays laterally, with the result that the forwardly projecting glare of the headlight will be eliminated and rays of light laterally diffused in such a manner as to illuminate the road immediately in front of the automobile and on each side thereof. This manipulation of the device subserves a two-fold function, in that it destroys the glaring effect which tends to dazzle the eyes of the driver of an on-coming machine, while at the same time diffusing ample radiance immediately in front of the headlight and at each side thereof, so that the road will be amply illuminated while the lights are dimmed to permit safe driving while passing the on-coming machine.

While it was old in the art to provide screens or the like for obstructing the passage of light from the source of illumination to the surrounding reflector, some of such devices have in themselves subserved no reflecting function, so that a dimming or screening of the headlight has resulted in darkening the road immediately in advance of the machine, so that safe riding is rendered difficult or impossible. Such danger will be appreciated when it is realized that the powerful headlights commonly used will cast a glaring radiance to a very considerable distance, and that safe driving demands a dimming of these lights while approaching machines are quite distant from one another, so that obstructions in advance of a machine cannot be readily detected during the relatively long period of time during which the lights are dimmed.

Further objects and characteristics of the present invention will be apparent from a detailed description of the invention which consists in the features of constructions hereinafter described and claimed.

In the drawings:

Figure 1 is a front elevation of an automobile headlight with the screens in closed or screening position;

Fig. 2 is a similar view showing the screens laid back in normal or open position;

Fig. 3 is a vertical sectional view of the headlight with the screens closed; and

Fig. 4 is a similar horizontal section.

The headlight, as a whole, comprises an outer shell 10 of the usual dished formation, which shell provides a housing for the main reflector 11 which is preferably a parabolic reflector or one approaching that formation. The characteristic feature of such a reflector, as is well known, is found in the fact that rays of light emanating from the focal point to any portion of the reflector will be thrown forward in substantially parallel lines, with the result that the radiance will be projected to a great distance in the form of a narrow intense but slightly diffused column of light.

The reflector 11 has entered therethrough a lighting device preferably in the form of an incandescent electric bulb 12 carried by a socket 13 which is preferably adjustable, so that the source of illumination can be brought to the exact focal point or to varying distances therefrom the customary adjustment being one which diffuses the light to some extent and gives to the beam an elongated, narrow, conical formation. The main reflector 11 on opposite sides of its vertical center plane is provided with depressions 14 adapted to receive a pair of screens 15 which, when open or laid back, will occupy the recessed portions of the main reflector, and these screens are so configured that when laid back they will constitute portions of the parabolic reflecting surface comprising, in effect, a portion of the main reflector. Each of the screens is of dished or concave formation being parabolically curved with the exception, however, that uniform configuration of the screen is interrupted at its lower edge 16 which is more abruptly inturned to afford a lip 17 which, when the screen is in closed position, extends fore and aft in a line sub-

stantially parallel with the major axis of the main reflector. The metal contiguous to the lip 17, instead of being truly concave, as is the case with other portions of each of the screens, affords a more nearly cylindrical configuration for a purpose to be presently explained.

The forward edges of the screens, when in closed position, occupy a position considerably in advance of the illuminated filament, so as to completely obstruct the passing of any light from the filament to the outer brightened surface at the sides of the reflector, and similarly the upper and lower edges of the two screens occupy positions in such close proximity to one another as to substantially screen the main reflector at points above and below the source of illumination. It is desirable that the lower lips 17 shall almost, if not completely, close the gap below the source of illumination in order to prevent the forward or upward projection of any light from the lower portion of the main reflector, but like considerations do not apply to the upper portions of the screens, which may be separated slightly since light striking through this opening will, in the main, be projected downwardly on the road and hence not in the eyes of the driver of an on-coming machine.

In order to prevent any glare from the surface of the main reflector below and immediately behind the source of illumination, the reflector at this point 18 is preferably dulled within the space subtended between the lower rear edges of the screens, but this slight diminution in the reflecting surface area of the main reflector is negligible.

In order to provide means for adjusting the screens to open or closed positions, each of the screens has secured to its rear surface a bracket 19 which extends through a slot 20 in the adjacent portion of the recess 14, and the rear end of the bracket is pivoted at the point 21. An arm or lever 22 is also pivoted to the bracket for operating the screen, and suitable means, not shown, either manually or electrically-operated, are provided for imparting the necessary movement to the parts. Since, however, the present invention is in no sense concerned with the specific means employed for effecting this result, it is not deemed necessary to refer to the same, although mechanism of the character set forth in my Patent No. 1,305,498 issued June 3, 1919, may be employed for this purpose.

In use, with the screens laid back into open or normal position, the main reflector will preferably present a substantially parabolic reflecting surface broken only by the slight protuberances caused by the lips 17, so that with the light positioned at or near the focal point an intense substantially parallel beam of light will be projected forwardly to a considerable distance. Of course, it is quite customary in the use of such headlights to throw the source of illumination slightly out of focus in order to secure a wider diffusion of the light than would otherwise be obtained. Even with the light thus slightly diffused, the illumination would strike the road at a considerable distance in advance of the machine.

When it is desired to dim the lights in the presence of an on-coming machine, the screens will be closed, and this closing will obstruct the passage of light to the outer reflector and center the reflecting function in the screens themselves which are, of course, silvered on their inner surfaces. These inner surfaces, being brought into close proximity to the source of illumination, and standing in but slightly divergent relation to one another, will reflect the light laterally, thus serving to illuminate the road in the immediate vicinity of the machine without projecting any of the light forwardly in a manner to cause a glare in the eyes of the on-coming driver. The road will thus be brightly illuminated immediately in advance, so that no difficulty will be experienced in driving the machine forward during the interval of time prior to the passage of the on-coming machine.

The manner in which this lateral diffusion of light is effected is well illustrated in Fig. 4, in which the rays of light are indicated by dotted lines, and it will be noted that all of the reflected light is thrown at a widely divergent angle, and that no reflection is thrown forwardly. The only light which will be visible to the on-coming driver will be that afforded by the electric bulb itself which is ample for the purpose of indicating the position of the machine but wholly inadequate to occasion any glare in the eyes of the on-coming driver.

In Fig. 3 the functioning of the lip 17 is indicated by the dotted lines, from which it will be noted that the rays of light A are caught on the abruptly turned upper surface of the lip of one of the screens, and thrown back against the upper reflecting surface of the other screen whence they are projected downwardly upon the road immediately in advance of the machine. The lines B indicate rays primarily reflected from the lip of the companion screen, and caught and reflected from the screen indicated in the drawing. C is intended to indicate approximately the manner in which rays of light are reflected from the upper inner surfaces of the screen which, being of constantly varying curvature, will throw the rays in varying directions, but always in a lateral rather than a forward direction. Of course, the upper inner surfaces of the screens will reflect a certain amount of light forwardly, but this light is reflected in a downward

direction so that it will not create a glare at a point substantially in advance of the machine.

The main reflector at the point D will be exposed to receive the rays from the source of illumination, but with the bulb adjusted slightly in front of the focal point as is customary this light will be projected in a slightly downward direction, so that no glare will be occasioned. The inner portions of the screens will reflect the light back and forth from one screen to another, thereby intensifying the light ultimately reflected from one of the screens past the edge of the other and toward the side of the road.

The configuration of the screens is made to conform to the curvature of a parabolic reflector, but it will be understood that strict compliance with such a formation is not essential, since the use of such screens with the reflectors involving a departure from true parabolic form is contemplated, and it is understood that the description given is by way of preference rather than limitation.

I claim:

1. In a headlight, the combination of a source of illumination, an outer reflector, and a plurality of adjustable screens brightened on their inner surfaces to constitute reflectors, adapted when in open position to constitute a portion of the outer reflecting surface and adapted when in closed position to screen the light of the outer reflector and reflect the rays of light laterally, each of the screens at its lower portion being configured to reflect rays of light upwardly toward the companion screen, substantially as described.

2. In a headlight, the combination of a source of illumination, an outer reflector, and a pair of adjustable screens brightened on their inner surfaces, adapted when in open position to lie substantially flush with and constitute a portion of the outer reflecting surface and adapted when moved to closed position to present their forward edges in position to intercept rays of light and screen the major portion of the outer reflecting surface, said screens being concavely formed to reflect rays of light back and forth from one to the other, and to project rays of light laterally and downwardly to afford illumination at a point closely in advance of the headlight, the lower edge of each screen being more abruptly rounded to reflect rays of light upwardly to the companion screen and prevent the forward projection of rays from the lower surface of the screen, substantially as described.

3. In a headlight, the combination of a source of illumination, an outer reflector of substantially parabolic formation, and a pair of adjustable screens of generally parabolic curvature, adapted when in open position to lie substantially flush with the outer reflector and brightened to constitute a portion of the outer reflecting surface on opposite sides of the source of illumination, and adapted when in closed position to screen off rays of light from the outer reflecting surface and constitute reflectors adapted to diffuse the light laterally, the lower edges of each screen being more abruptly curved to reflect the light upwardly to the companion screen and prevent the forward projection of light from the lower screen surfaces, substantially as described.

4. In a headlight, the combination of a source of illumination, an outer reflector of substantially parabolic formation, and a pair of adjustable screens of generally parabolic curvature, adapted when in open position to lie substantially flush with the outer reflector and brightened to constitute a portion of the outer reflecting surface on opposite sides of the source of illumination, and adapted when in closed position to screen off rays of light from the outer reflecting surface and constitute reflectors adapted to diffuse the light laterally, the lower edges of each screen being more abruptly curved to reflect the light upwardly to the companion screen and prevent the forward projection of light from the lower screen surfaces, the surface of the outer reflector being exposed between the screens when closed at a point immediately above the source of illumination, substantially as described.

5. In a headlight, the combination of a source of illumination, an outer reflector provided with recessed portions, and a pair of adjustable screens adapted when in open position to lie within the recessed portions of the outer reflector and brightened on their surfaces to constitute a portion of the outer reflecting surface, and curved to conform to the curvature of the outer reflector, said screens when closed being adapted to screen off the rays of light from the major portion of the outer reflector and to project rays of light laterally, the lower portion of each being more abruptly curved to provide a lip adapted to project rays of light upwardly to the companion screen and prevent the forward projection of rays of light, substantially as described.

6. In a headlight, the combination of a source of illumination, an outer reflector provided with recessed portions, and a pair of adjustable screens adapted when in open position to lie within the recessed portions of the outer reflector and brightened on their surfaces to constitute a portion of the outer reflecting surface, and curved to conform to the curvature of the outer reflector, said screens when closed being adapted to screen off the rays of light from the major portion of the outer reflector and to project rays of light laterally, the lower portion of

each being more abruptly curved to provide a lip adapted to project rays of light upwardly to the companion screen and prevent the forward projection of rays of light, the surface of the outer reflector intermediate the screens when closed and above the source of illumination being exposed to project rays of light forwardly and downwardly, substantially as described.

7. In a headlight, the combination of a source of illumination, and a pair of screens adjustably mounted with respect to the source of illumination, said screens being of dished or concave configuration, adapted when in open position to project rays of light forwardly, and adapted when closed to occupy positions closely contiguous to the source of illumination, and to reflect rays of light laterally, the lower edge of each of the screens being more abruptly curved to reflect the light upwardly to the companion screen and prevent the forward projection of the rays of light, substantially as described.

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