June 21, 1927. 1,633,509

R. L. ANDERSON

HEADLIGHT DEFLECTING ATTACHMENT

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Fig. 1.

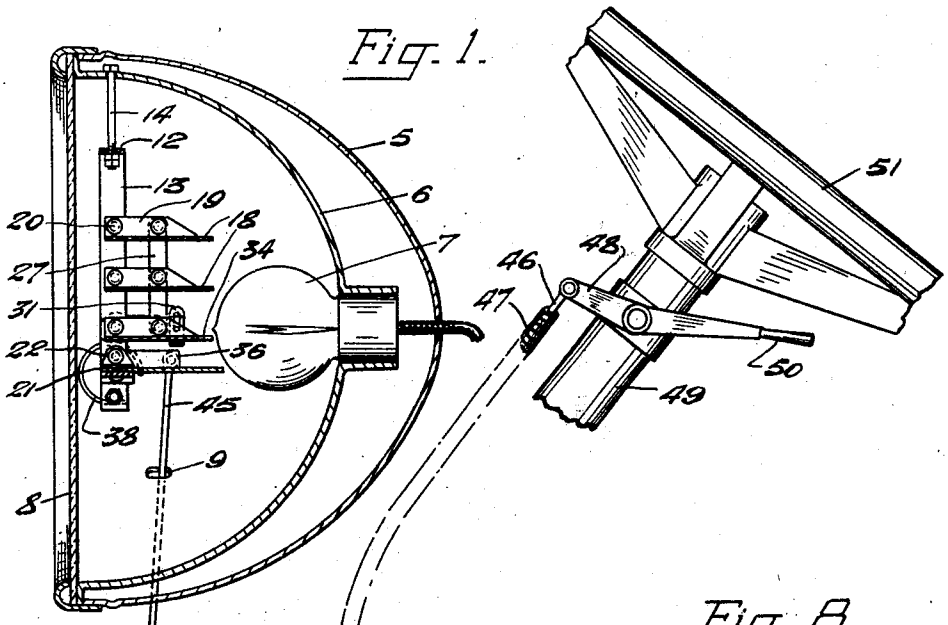


Fig. 8.

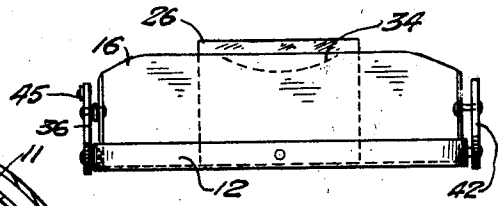


Fig. 2.

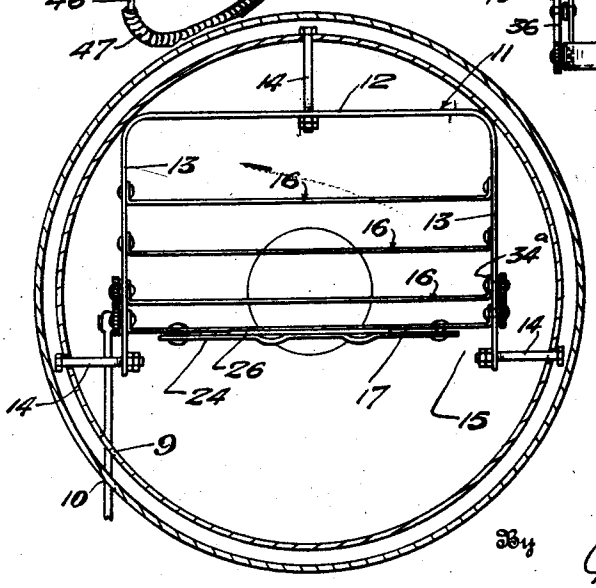
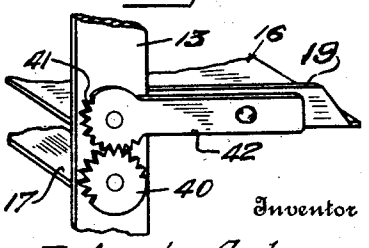


Fig. 5.



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Fig. 3.

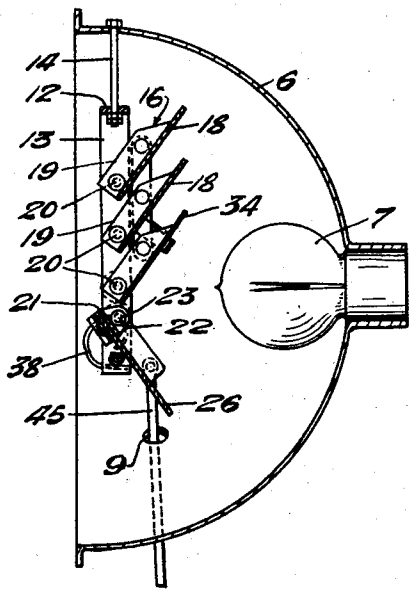


Fig. 4.

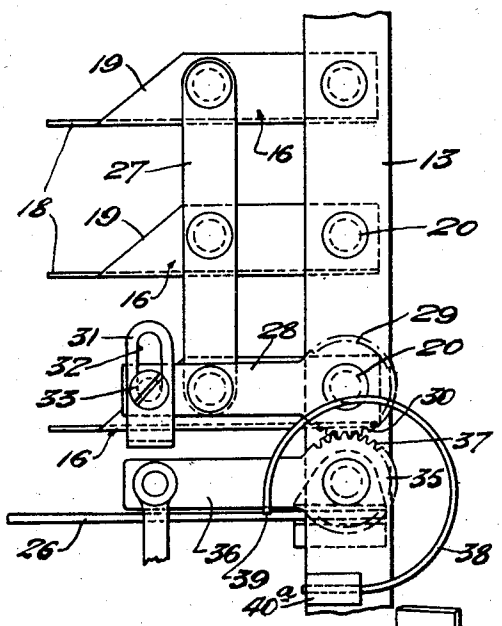


Fig. 6.

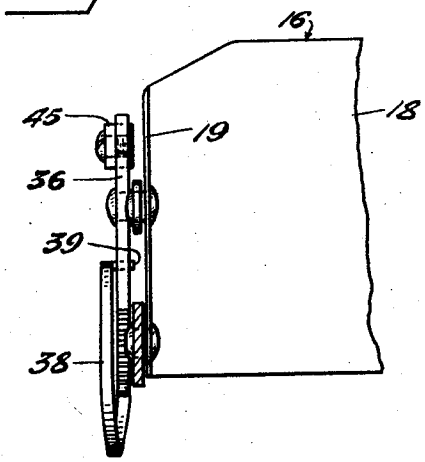
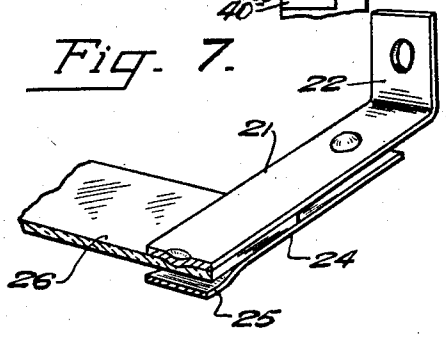


Fig. 7.



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UNITED STATES PATENT OFFICE.

RUFUS L. ANDERSON, OF ORLANDO, FLORIDA.

HEADLIGHT-DEFLECTING ATTACHMENT.

Application filed November 9, 1925. Serial No. 68,020.

This invention relates to headlights for automobiles and the like and particularly to means for deflecting the light, and the primary object of the same is to provide a deflecting attachment that may be readily applied to the interior of the reflector without materially modifying the structure of the ordinary form of headlight embodying a parabolic reflector, and whereby light rays projected from the headlight may be modified to such an extent as to eliminate objectionable glare and yet give sufficient light with relation to the roadway to enable a driver to be guided in the operation of the machine.

A further object of the invention is to provide a deflecting attachment for a headlight or the like which may be applied within the headlight at one operation and positioned to effect control of the projected light rays as may be desired, and particularly the usual upwardly flaring light rays which are so objectionable to pedestrians and those operating machines progressing in a direction opposite to that of the machine carrying the attachment.

With these and other objects and advantages in view, the invention consists in the preferred construction and arrangement of parts which will be more fully hereinafter described and claimed.

In the drawings:

Fig. 1 is a sectional view of a headlight and the deflecting attachment in normal position and embodying the features of the invention, together with means for operating the movable parts of the attachment and a portion of the steering post and wheel to which the primal operating means for the attachment is applied.

Fig. 2 is a transverse section of the front portion of a headlight, showing the improved attachment mounted therein in front elevation.

Fig. 3 is a sectional view through the reflector of a headlight, showing the attachment mounted therein in section similar to Fig. 1, the parts or shutters of the attachment being operated to modify the projected light rays from the light source, held as usual within the center of the reflector.

Fig. 4 is an enlarged side elevation of a portion of the frame and shutters, showing the operating connections and means at one side of the frame.

Fig. 5 is a detail perspective view of a portion of the side of the frame opposite that shown by Fig. 4 and particularly illustrating the cooperating means for actuating the shutters.

Fig. 6 is a front detail elevation, partially broken away, particularly showing the mutilated gear disks and levers and the spring together with a part of the connections for actuating the shutters.

Fig. 7 is a detail perspective view of parts of the attachment.

Fig. 8 is a top plan view of a portion of the shutters and operating mechanism.

The numeral 5 designates a headlight casing of the usual form having therein a parabolic reflector 6 with the usual light source or incandescent electric light 7 disposed in the center thereof, and a front lens 8 secured in the front of the casing by any preferred means. The headlight is substantially of well known construction, and the only modification necessary in applying the improved deflecting attachment is to form openings 9 and 10 in the lower portion of the reflector 6 and casing 5 for movement therethrough of operating means for the improved attachment.

The improved attachment consists of a U-shaped frame 11, which is secured at the center of the top member 12 and at the lower ends of the side members or legs 13 by bolts or analogous fastenings 14 to the reflector. The lower part of the frame is fully open, as at 15, to allow unrestricted movement of the lower part of the deflector mechanism in a downward direction. The improved attachment is disposed in advance of and in any suitable position within the reflector 6, in the present instance the attachment being elevated to its maximum extent within the reflector, but it is obvious that it could be lowered to obtain a desirable modification of the projected light rays. Between the legs 13 of the frame 11 a plurality of shutters 16 and 17 are pivotally mounted, the shutters 16 being similar in construction and the lower shutters 17 somewhat varied or provided with means which will shield or diffuse a part of the lower projected light rays. All of the shutters 16 are movable from a normal horizontal position upwardly at a rearward angle of inclination as shown by Fig. 3, and the lower shutter 17 is reversely movable in a downward and rear-

ward angular direction. The shutters consist of base plates 18 with side flanges 19 at right angles to the said plates, pivots 20 being inserted through the side flanges 19 and secured to the legs 13 of the frame 11. The lower shutter 17 comprises a flat base strip 21 with upstanding end ears or pivot flanges 22, which are connected by pivots or pivot fastenings 23 to the lower portions of the legs 13 of the frame 11, and to the lower side of the flat strip 21 a holding strip 24 is secured having transverse corrugations or downward bends 25 on opposite sides of the center thereof, to facilitate the insertion and retention between the flat strip 21 and holding strip 24 of a deflector plate 26, which may be of any material adapted for the purpose, such as frosted or colored glass, mica, or prismatic glass, to serve as a softening or diffusing means for the bright projected rays immediately in front of the light source or electric incandescent bulb 7. The shutters 16 are reinforced by the formation of the flanges at the ends thereof in addition to the function of the said flanges of serving as means for pivotally connecting them to the legs 13 of the frame 11. The shutters 16 are shifted as a unit through the medium of a link 27 pivotally connected thereto, the lower end of the said link being also attached to a lever 28 having a disk head 29 centrally secured to the one end pivot 20 of the lower shutter of the group of shutters 16. The disk head 29 has a mutilated gear structure, or the periphery thereof is partially toothed, as clearly shown by Fig. 4. The lower end of the link 27 is pivotally connected to the lever or lever arm 28 of the disk head 29 at a distance inwardly from the rear free end of said lever, and as a combined reinforcing and adjusting means, an upwardly projecting arm 31 is provided and has a vertical slot 32 therein which is engaged by a headed screw 33 also secured to the lever 28. The arm 31 is fixed to the bottom plate 18 of the lowermost shutter 16, and this lowermost shutter has the central portion of its bottom plate 18 arcuately recessed, as at 34, to clear the forwardly projecting portion of the bulb of the light source 7. The one pivot which connects the one end ear of the strip 17 comprised in the formation of the lower shutter also serves as a fulcrum means for a disk head 35 having a lever or lever arm 36 extending rearwardly therefrom and serving as the main operating instrumentality or actuating means for moving the entire group of shutters. The disk head 35 has its periphery partially toothed, as at 37, the teeth 30 and 37 of the two disk heads 29 and 35 being in continual mesh and in effect serving as gear teeth segments. To return the disk head 35 and its lever or lever arm 36 to normal position subsequent to operation and release thereof, a flat spring 38 of substantially circular form is provided and has at one extremity an angular projection or contact means 39 which engages the lower edge of the lever or lever arm 36, the opposite extremity of said spring being held fixed in a clip 40^a secured to the outer side of the adjacent leg 13 of the frame 11, as clearly shown by Fig. 4. The depressions 25 on the opposite sides of the center of the holding strip 24 for the deflector plate 26, which may be of opaque formation or frosted, colored or prismatic as hereinbefore indicated, serve particularly for convenience in applying the fastening means for said plate to the strip 21 of the lower shutter 17. The bottom plates 18 and the end flanges of the shutters 16 are formed of suitable metal and polished or otherwise brightened to render them effective as subsidiary reflecting devices when the shutters 16 are in normal horizontal positions, and likewise the members of the frame 11 may be brightened or polished or provided with reflecting surfaces so that they will coact with the shutters 16 as reflecting means.

The motion of the lower shutter is transmitted at its end opposite that to which the disk head 35 is connected by means of a mutilated gear disk 40, secured to the pivot device at the end of the strip 17 opposite that to which the disk head 35 is connected, and this mutilated disk or gear is held in continual mesh with a segmental gear 41 on the forward end of a lever 42, pivotally held between adjacent end pivots of the lower shutter 16, the lever or lever arm 42 extending rearwardly from the said toothed segment and connected to the outer side of the end flange 19 of the lowermost shutter 16, to assist in regularly operating the shutters 16.

The operating means for the attachment preferably consists of a pull wire or small rod 45, having its upper end attached to the rear extremity of the lever or lever arm 36 and passed downwardly through the openings 9 and 10, respectively formed in the reflector and casing, the lower end of this rod having a shock spring 46^a connected thereto and interposed therebetween and the lower extremity of an actuating wire 46 which is passed through a coiled tubular member 47 extending upwardly at a rearward angle of inclination and terminating adjacent to the steering post within the body of the automobile as shown, the upper end of the wire 46 being movably connected to one end of a lever 48, pivotally attached at an intermediate point to the steering post 49, the said lever having a handle 50 for actuating the same. The handle extremity of the lever 48 is normally elevated and within convenient reaching distance of the steering wheel 51.

The operation of the improved attachment is very simple, and consists in pressing the handle 50 of the lever 48 in a downward direction and thereby pulling upwardly on the wire 46 and drawing downwardly on the shock spring 46ª, which in turn exerts a downward pulling action on the wire 45 and a depression of the lever or lever arm 36. The downward movement of the lever or lever arm 36 rotates the disk head 35, and through the gear teeth or segmental gear 37, the gear 30 effects a reverse movement of the disk head 29 and an elevation of the lever or lever arm 28. which in turn transmits movement through the link 27 to the shutters 16 and the latter are all uniformly raised and close the area occupied thereby against the forward projection of light rays from the light source 7 and particularly the upwardly flaring light rays. At the same time the lower shutter 17 is reversed in its movement and projects downwardly and rearwardly and interposes the opaque, colored, frosted or prismatic plate between the light source and a portion of the lower light rays and acts as a deflecting or diffusing plate for the said lower light rays that are projected from the light source. By this means the glare at the center of the headlight is eliminated and softened or diffused but at the same time the open spaces above the top member 12 and outside of the legs 13 of the frame and also below the limit of projection of the plate 26 permit light rays to be projected by the reflector through the lens and particularly at the side and lower portion of the headlight sufficient to guide the driver in the operation of the automobile or machine. After the improved deflecting attachment as a whole has served its purpose by disposing the upper and lower shutters in reverse angular positions as just explained, the primary actuating lever on the steering post is released and the spring 38 instantly restores the shutters to normal position, permitting light rays from the light source to be projected therebetween and through the frame supporting said shutters. The spring 46ª absorbs any shocks that may be present during operation of the attachment.

The improved light controlling or deflecting attachment as a whole will be found very advantageous and effective in its operation, and it is to be understood that changes in the proportions and general dimensions of the several parts may be adopted at will to accommodate headlights of various sizes.

What is claimed as new is:

1. The combination with a headlight provided with the usual casing having a reflector and light source therein, of a plurality of sheet metal shutters pivotally mounted in advance of the light source within the reflector, the shutters being normally disposed in open horizontal, parallel planes and operatively arranged in upper and lower groups respectively embodying a plurality of shutters and a single shutter, the shutters of the upper group having edge-overlapping engagement when closed and the lower shutter fitting close to the lowermost of the upper group of shutters, and means connected to the shutters for simultaneously moving the shutters of the upper group upwardly and the remaining lowermost shutter downwardly.

2. The combination with a headlight having a casing with a reflector and light source therein, of a frame mounted in the reflector in advance of the light source, a plurality of sheet metal shutters pivotally connected at their forward extremities to the frame and projecting rearwardly from the latter towards the light source, the shutters being arranged in an upper group comprising a plurality of shutters and a lower single shutter, the shutters of the upper group having edge-overlapping engagement when closed and the lower shutter fitting close to the lowermost of the upper group of shutters, the upper group of shutters being connected for simultaneous upward movement, the lower shutter being moved downwardly when the upper group of shutters is moved upwardly and means for operating the shutters to simultaneously upwardly move the upper group of shutters and the lowermost shutter downwardly.

3. The combination with a headlight having a casing with the usual reflector and light source therein, of a frame mounted within the reflector in advance of the light source, a plurality of sheet metal shutters pivoted at their forward extremities to the frame and having side flanges, the shutters being arranged in an upper group comprising a plurality of the same and a lowermost shutter, the upper group of shutters being connected for simultaneous upward movement, the shutters of the upper group having edge-overlapping engagement when closed and the lower shutter fitting close to the lowermost of the upper group of shutters and means for simultaneously operating the upper group of shutters and the lower single shutter to respectively move the upper group in an upward direction and the remaining lowermost shutter in a downward direction from a normal, horizontally disposed, open position.

4. The combination with a headlight having a casing with the usual reflector and light source therein, of a frame mounted within the reflector in advance of the light source, a plurality of shutters pivotally mounted at their forward extremities within the frame and having a normal horizontal position with open spaces between them to give a full projected light ray operation, the shutters being divided into an upper group

comprising a plurality of the same and a lowermost single shutter, the upper group of shutters being connected for simultaneous movement in an upward direction at a rearward angle of inclination and the lower shutter at the same time movable downwardly at a rearward angle of inclination, gear means between the lower shutter and the upper shutters for simultaneously reversely moving the said shutters, and operating means in part extending through the reflector and connected to a portion of the said gear means for actuating all of the shutters.

5. The combination with a headlight having the usual reflector and light source, of deflecting means disposed in advance of the light source and comprising an upper group of shutters which uniformly move upwardly and downwardly and a lower single shutter having a reverse movement simultaneously with respect to the operation of the upper group of shutters, all of the shutters having opaque plates and the plate of the lowermost shutter being of greater extent than the shutters thereabove, and means for operating the lower shutter to simultaneously shift all of the shutters.

6. The combination with a headlight having a casing with the usual reflector and light source therein, of a frame mounted within the casing in advance of the light source, a plurality of shutters pivotally mounted at their forward extremities in the frame and having side flanges to strengthen the same and also serving as connecting means, the shutters being arranged in an upper group movable similarly from open to closed positions and a lower single shutter reversely movable with relation to the upper shutters, link means connecting the flanges of the upper shutters for effecting a simultaneous similar movement of the said latter shutters, the lowermost shutter comprising a strip with angular terminals and carrying a light-ray-modifying plate, and means connected to the lowermost shutter and embodying gear devices operating with the upper shutters for simultaneously actuating the shutters to move the upper shutters upwardly and the lower shutter downwardly.

7. The combination with a headlight having a casing with the usual reflector and light source therein, of a frame mounted within the casing in advance of the light source, a plurality of shutters pivotally mounted at their forward extremities in the frame and having side flanges to strengthen the same and also serving as connecting means, the shutters being arranged in an upper group movable similarly from open to closed positions and a lower single shutter reversely movable with relation to the upper shutters, link means connecting the flanges of the upper shutters for effecting a simultaneous similar movement of the said latter shutters, the lowermost shutter comprising a strip with angular terminals and carrying a light-ray-modifying plate, and means connected to the lowermost shutter and embodying gear devices operating with the upper shutters for simultaneously actuating the shutters to move the upper shutters upwardly and the lower shutter downwardly, said means including a spring shock-absorbing means.

In testimony whereof I have hereunto set my hand.

RUFUS L. ANDERSON.