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L. R. YEAGER

TILTABLE HEADLIGHT REFLECTOR

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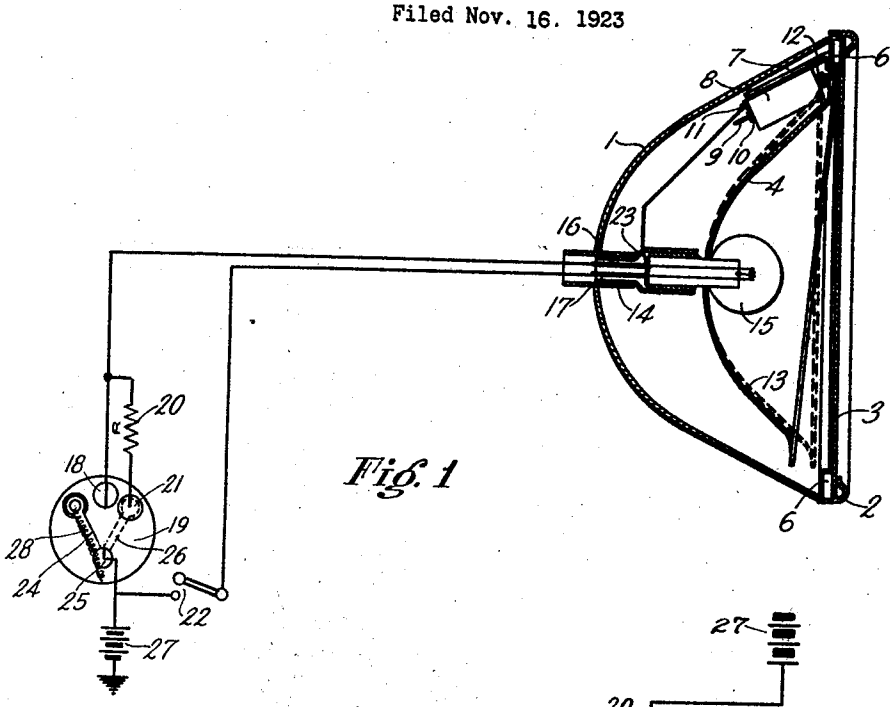


Fig. 1

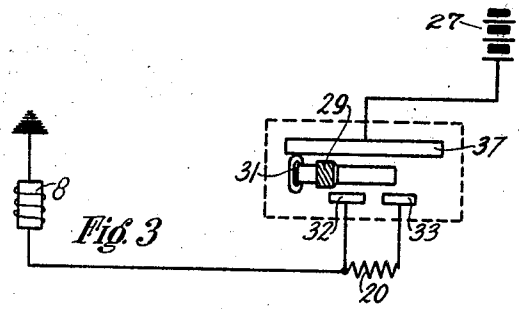


Fig. 3

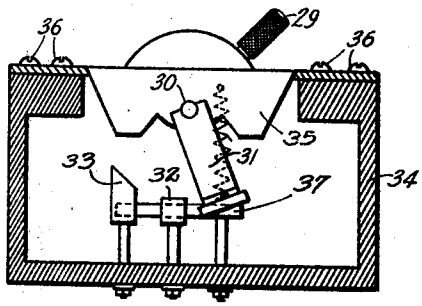


Fig. 2

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UNITED STATES PATENT OFFICE.

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TILTABLE HEADLIGHT REFLECTOR.

Application filed November 16, 1923. Serial No. 675,202.

My invention relates to tiltable headlight reflectors and pertains more particularly to electric switches used to control electromagnetic devices where the armature is attracted to the electromagnet under the influence of a relatively high current and maintained in this position under the influence of a relatively low current.

This invention is of particular value in connection with light projecting structures, such as automobile head lamps, wherein are carried tilting or other adjustable reflectors, said reflectors being tilted or otherwise adjusted electromagnetically by a current of a relatively high value and maintained in such tilted or adjusted position by a current of relatively low value.

One of the objects of my invention is to provide control switches of such form that the current change may be made entirely outside the lamp structure proper, thus simplifying the interior of the lamp structure, and permitting the placing of the control switch at any convenient place.

A further object of my invention is to provide means within the control switch whereby the flow of current of high value is of short duration, the action of the switch being such that it can only maintain permanently two well defined positions, either "off" or that position where the current flow is relatively low, passing thru an intermediate position, in its movement from "off" to "on", where the current flow is relatively high, but being unable to stand permanently in this intermediate position.

The preferred embodiment of my invention, used in connection with an automobile headlight having a tilting reflector electromagnetically controlled by a current of relatively high value for tilting the reflector and by a relatively low current for holding the reflector in the tilted position, is shown in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a diagrammatic view illustrating the use of my novel controllable switch in connection with a headlight having a tilting reflector electromagnetically controlled.

Figure 2 is a detailed view, partially in section, of a toggle switch constructed in accordance with my invention and showing the intermediate contact point.

Figure 3 is a diagrammatical plan view of the toggle switch shown in Figure 2 in connection with a wiring diagram connecting one contact point direct to the electromagnet and the other through a resistance.

In the drawings my switch structure is operatively connected to an automobile headlight which is shown as comprising an outer shell or casing 1, having a cover or door 2. This door or cover is adapted to be opened or removed and carries with it the usual glass or lens 3.

A reflector 4 is pivotally supported by means of suitable trunnion pins or pivots, not shown, in arms, not shown, forming a part of a flanged supporting ring 6, the pivoting points being preferably in line with the focal axis of the light. The flanged supporting ring 6 also carries with it a supporting arm 7 to which is fastened an electromagnet 8 whose armature 9 is positionally adjustable by a nut 10 and whose coils are electrically connected between a terminal 11 and any metallic part of the lamp structure providing a ground.

A coil spring 12 is suitably imposed about the protruding core or armature of the electromagnet 8 and between the rim of the reflector 4 and one end of the electromagnet 8 in such a manner as to normally hold the reflector 4 in its downwardly tilted position, as shown in Figure 1, one end of said armature 9 being connected to the rim of the reflector. The position which the reflector 4 assumes when the electromagnet 8 is energized is suggested by the dotted outline 13 in Figure 1.

The reflector as shown in the drawings is provided at its rear center with a suitable lamp socket 14 for the reception of an illuminating lamp 15. The reflector also carries upon its rear surface means, not shown, for engaging trunnion pins or pivots for its support. It will be understood that the lamp 15 may be mounted stationarily relative to the tiltable reflector or mounted to move with the reflector.

The lamp socket 14 is the usual "double contact" type carrying the usual terminals or electrodes 16 and 17, but with a special side outlet lead 23 provided for connecting one terminal or electrode 16 of said socket 14 to a device other than the lamp 15, namely the terminal 11 of the electromagnet 8 but at the same time maintaining the usual connection between said terminal or electrode 16 and the lamp 15.

The terminal or electrode 16 as shown, is further electrically connected either to an intermediate point 18 of a toggle switch 19 or through a suitable resistance 20 to the point 21 of said toggle switch 19. The terminal or electrode 17 is preferably electrically connected to the usual light switch 22 through which further electrical connection is made with one terminal of the battery 27, whose opposite terminal is grounded, or to any portion of the electrical connection provided between said terminal of the battery 27 and the control arm 24 of the toggle switch 19 at a point 25 to which said control arm 24 is rotatably connected.

The toggle switch 19 is diagrammatically shown inserted in the circuit and in the normal "off" position in which the control arm 24 carries no current. The only other position which control arm 24 maintains is shown by the dotted outline 26 in which case current is free to flow, between points 25 and 21 and on through the resistance 20.

By reference to the drawings it may be seen that the control arm 24 has only two well defined positions to which it is moved and maintained by a coil spring 28, but in changing from one position to the other instantaneous and temporary contact must be made with an intervening point 18 in which case current is free to flow between points 25 and 18 and on to the electromagnet 8 thus initially tilting the reflector without encountering the resistance 20.

The points 18 and 21 are sufficiently close to each other that the control arm 24, in moving from the "off" to "on" position, breaks contact with point 18 and immediately makes contact with point 21 allowing no opportunity for the spring 12 to return reflector 4 to its normal position.

By reference to Figure 2 it will be seen how one form of my novel toggle switch 19 may be constructed. This switch comprises a handle 29 of suitable form shown in the normal "off" position, but is so axially supported by the pin 30 as to be movable to a position opposite the position shown. Thus if the handle 29 is so moved to its opposite position the control arm 31 will in one continuous movement change its position so as to engage momentarily the contact point 32 and come to rest in contact with point 33. The casing 34 of this toggle switch is composed of such material as to insulate and insure the proper working of said switch and further, a supporting frame 35 is adapted to be held in place, as shown, by screws 36.

By reference to Figure 3 it may be seen how this form of toggle switch may be connected. The battery is electrically connected to a contact point 37 with which the control arm 31 is ever in contact. The intermediate contact point 32 is connected directly to the electromagnet 8 and the contact point 33 is connected through the restisance 20 to the electromagnet 8.

In the normal operation of my invention the control arm 24 being initially actuated is caused to automatically move from the "off" to "on" position, by virtue of the spring 28. When for an instant control arm 24 engages the intermediate contact point 18 and the full current of the battery 27 is flowing, the electromagnet 8 will be energized to a greater extent than when arm 24 rests on contact point 21 in which case the resistance 20 is included in the circuit and said resistance 20 limits or impedes the flow of current and the electromagnet 8 is energized to a lesser degree.

It is a well known fact that the strength of a given electromagnet is dependent upon the current flowing through the turns of said electromagnet, and it is so provided in my invention that the greater current is of sufficient strength to pull inwardly the armature of said electromagnet and said armature being attached at one end to the reflector thereby tilting the reflector toward said electromagnet. Further, after the reflector has been tilted the lesser current suffices to hold the armature stationary.

It will be obvious that the switch structure as shown in Figures 2 and 3 operates in the same manner as the switch diagrammatically shown in Figure 1. When the lever 29 is initially actuated the spring will be effective to automatically move the arm 31 from one extreme position to the other. During the movement of the arm 31 it will be in continuous contact with the contact 37 but will only temporarily contact with the contact point 32. During this temporary contact with the point 32 the full current from the battery 27 will be effective to actuate the electromagnet 8 and tilt the reflector. Moving past the contact 32 and contacting with the point 33 the arm 31 will cause the current from the battery to pass through the resistance 20 to thus maintain the reflector tilted by a current of a relatively lower value.

It will be understood that the time element relative to the temporary contact beween the switch arm and the intermediate contact may be widely varied. For example, the resistance between the switch control arm and the contact points may be varied so that the toggle spring may be effective to cause the control arm to pass the intermediate point substantially instantaneously or may be effective to cause the control arm to momentarily dwell at the intermediate point.

Having thus described my invention what I claim is:

1. In combination with an electrically operated device, of a switch structure,

means in said switch structure for effecting the supply of current of one value to said electrical device, means for effecting a supply of current of a relatively low value to said electrical device and means for allowing only temporary actuation of said first named means.

2. In combination with an electrically operated device of a switch structure for supplying current of a plurality of values and means for automatically moving the control arm of the switch structure past the contact for effecting the supply of one current value and into contact with another contact for effecting the supply of a different current value.

3. In combination with a lamp structure, a light projecting device adjustable to vary the direction of the beam of light, electrical means for adjusting said projecting device by a current of one value and for maintaining adjusted position by a current of lower value, and remote means for controlling said electrical means, said remote means comprising means for allowing said relatively high current to be only temporarily effective.

4. In combination with a lamp structure, a movable reflector for varying the direction of the light beam, an electromagnet for moving the reflector with a current of one value and maintaining adjusted position with a current of another value, and a remote control switch having an off position, an intermediate contact for supplying a current of one value to the electromagnet and a second contact for supplying a current of another value to the electromagnet and means for allowing only temporary contact between the switch arm and said intermediate contact.

In testimony whereof I hereby affix my signature.

LEO R. YEAGER.