May 26, 1931. P. GIESE 1,806,850

DIMMING DEVICE FOR SEARCHLIGHTS

Filed May 24, 1929 2 Sheets-Sheet 1

Fig. 1.

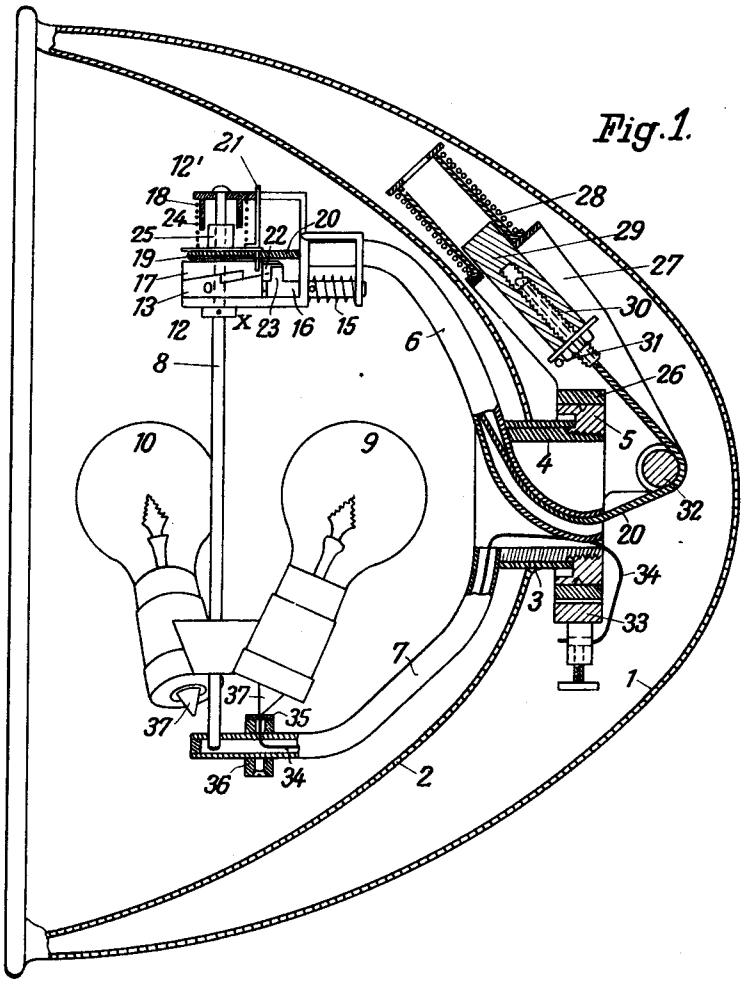
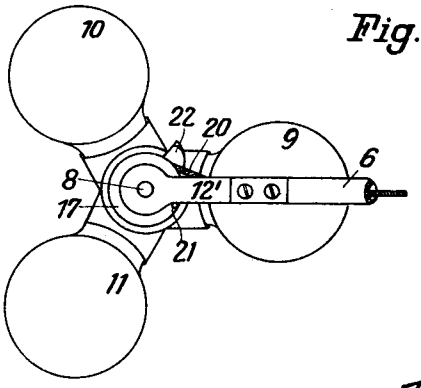


Fig. 2.



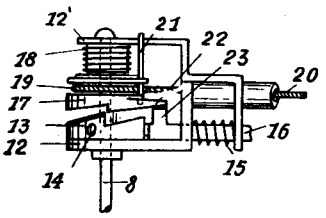
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Fig.3.



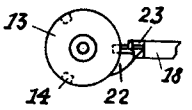


Fig.4.

Fig.5.

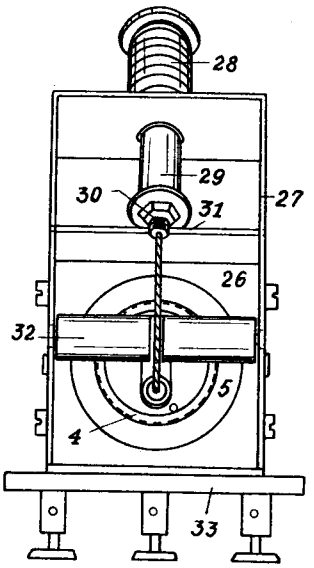
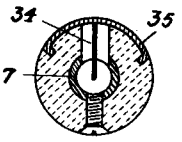


Fig.6.



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UNITED STATES PATENT OFFICE

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DIMMING DEVICE FOR SEARCHLIGHTS

Application filed May 24, 1929, Serial No. 365,693, and in Germany October 31, 1928.

This invention relates to a dimming device for search lights, especially such of motor cars. The first of the characteristic features of this improved dimming device is that an optical dimming member is combined with a lamp carrier designed either for only one lamp or for a plurality thereof; the second characteristic feature consists in said lamp carrier being detachably attached to the reflector of the search light by means of a hollow insertion; and the third feature resides therein that the actuating member for adjusting or re-adjusting said optical dimming member, as well as the electric conductors, pass through said hollow insertion.

This arrangement and combination of parts affords the possibility of providing the lamp carrier with two or more lamps emitting light of different colors and being attached to a rotary axle in such a manner that by turning this axle any one of the lamps can be moved into the focus of the reflector. In this manner it is rendered possible to bring that lamp or these lamps into the focus of the reflector which emit diffused light or colored light whereby also these rays can penetrate the dark to longer distances than heretofore. The range of action of the search light is thereby considerably extended or enlarged also for dimmed light.

Another part of this invention relates to an electro-magnetically operable switching device for moving the lamps successively into the focus of the reflector and to lock them in this position.

The invention is illustrated diagrammatically and by way of example on the accompanying drawings on which Figure 1 is a vertical section through a search-light designed according to this invention; Figure 2 is a plan of the turning device for the set of lamps; Figure 3 is a side-view of this device; Figure 4 is a plan of certain parts of this device; Figure 5 is a rear view of the control device for the turning device (Figs. 2 and 3); and Figure 6 shows also some details which are also duly dealt with hereinafter.

On the drawings, 1 (Fig. 1) denotes the search light casing, and 2 the reflector therein. Through the rear, or innermost portion, of the reflector extends a ring 3 which is firmly connected therewith, and in this ring is arranged a sleeve 4, the rearwardly projecting end of which is threaded and bears on this end a correspondingly threaded ring 5. From the sleeve 4 extend two bent tubes, or tubular arms 6 and 7, the one (6) upwardly, the other (7) downwardly, and both forwardly, as shown. The turning device (Fig. 3) is attached to the free end of the tubular arm 6, and the set of lamps (Fig. 2) is located just over the free end of the tubular arm 7. From this arm extends upwardly a vertical axle 8, to which are attached, in the example shown, three electric incandescent lamps 9, 10 and 11, spaced from each other by angles of 120° (Fig. 2). In the position of these lamps as shown in Figs. 1 and 2 the lamp 9 is in the focus of the reflector 2, and by turning the axle 8 by 120° (for instance in clockwise direction when viewed from above) first the lamp 10 and then the lamp 11, and then again the lamp 9, and so on, will arrive in the focus of the reflector. The lamps emit rays of different kinds, that is to say, one lamp emits undimmed clear light, the other diffused light, and the third colored (for instance yellow) light, this latter being particularly suited for the penetration of fog.

For moving the lamps successively into the focus of the reflector, and to lock each lamp in that position, the device shown in connection with the search light on the lefthand side of the upper half of Fig. 1, and detached from the lamp in Fig. 3, is provided. Affixed to the end of the tubular arm 6 are two superposed brackets 12 and 12′ in which is located the upper end of the axle 8. Just above the bracket 12 a disk 13 is secured to the axle 8, and the top face of this disk is divided into three sections, each of which is designed similar to a ratchet tooth. The disk 13 has also three lateral bores uniformly distributed around its circumference. These bores co-operate with a horizontal locking pin 16 subjected to the action of a helical spring 15 surrounding it and tending continually to move its front end into one of said bores so as thereby to lock

the disk 13, whereby at the same time also the axle 8 and the lamp 9, 10, 11 are locked in their adjusted position. The position of the bores of the locking disk relatively to the lamps is such that whenever the locking pin has engaged the bore having arrived just in front of it, that lamp located just in front of the sleeve 4 is located also in the focus of the reflector.

Another disk with ratchet teeth (17) is arranged immediately above the disk 13 on the axle 8 and is freely turnable thereon. The ratchet teeth of the disk 17 are on the bottom side thereof and engage those of the disk 13. The disk 17 is continually pressed against the disk 13 by a helical spring 18, and this same spring tends continually to turn the disk 17 in counter-clockwise direction. There is, however on the disk 17 an upwardly extending abutment pin 21 which is retained by the bracket 12', that is to say, this bracket prevents any further turning of said pin after it has been operated, i. e. turned in clockwise direction together with and by the disk 17. Normally, the position of the two disks relatively to one another is such that there is some dead play or lost motion between their ratchet teeth, as appears from Fig. 1 in which the parts concerned are shown in their position of rest. In Fig. 3 a certain intermediate position or operative position is shown.

The disk 17 has a lateral nose-like projection or cane 22 which co-operates with an upper projection 23 of the locking pin 15. When the disk 17 is turned (the means therefore will be presently described), the nose 22 presses the projection 23, that is to say, the pin 15, rearwardly so as to disengage it from the respective bore of the disk 17, so that also the disk 13 is disengaged and can be turned. This takes place, however, only after the teeth of the disk 17 have covered the lost-motion way mentioned in the preceding paragraph. This lost-motion way is necessary in order to first withdraw the locking pin from the disk 13 as only now this disk can be turned. It is turned by the ratchet-teeth of the disk 17, the teeth of both disks engaging then one another, and simultaneously therewith the spring 18 is put under tension and turns the disk 17 back into its former position instantly after it is released. When, during this rotation, the upper ratchet teeth leave the lower ones these latter are retained for such a length of time as is necessary to establish the lost motion way by the nose 22 bearing on the projection 23, the parts being then in the position shown in Fig. 3.

The disk 17 has an upwardly directed hub 25 (Fig. 1) engaging a short tubular member 24 extending downwardly from the bracket 12'. The helical spring 18 encompasses said member 24 and is held in proper operative position thereby. The arrangement is such that the spring is in no way detrimentally affected by the vertical movements of the disk 17.

The upper half of the disk 17 is designed as a rope pulley, into the groove of which is placed a thin rope 20 by means of which the disk 17 can be turned in clockwise direction whereby also the axle 8 and the lamps are turned in that direction, as has already been described. The cord is operated by an electromagnetic device (see righthand side of the upper half of Fig. 1 and Fig. 5) comprising an oblong frame 27 which is firmly connected with the ring 5 by the intermediary of a sleeve 26 and extends upwardly in oblique position between the casing 1 and the reflector 2. To the uppermost transverse member of the frame 27 is attached a solenoid coil 28 which co-operates with a solenoid core 29. This core has a threaded bore in which a threaded pin 30 can be longitudinally adjusted by being turned. This pin is firmly connected with the free end of the rope 20 that extends over, and is guided by, a grooved roller 32 supported in the sides of the frame 27 (Fig. 5). The downward stroke of the core 29 is limited by a transverse pin 31 (Fig. 1). It is obvious that the turning device (Fig. 3) will be operated by the core when a current flows through the solenoid coil. When the current is broken, the core 29 is moved automatically into its position of rest by its dead weight, and the disk 17 is turned also automatically into its former position by the spring 18, as already described.

At the lower end of the frame 27 is a transverse piece of an insulating material to which are secured the terminals. One thereof is connected by a wire 34 (Figs. 1 and 6) with a contact plate 35 affixed to the top portion of an annular member 36 secured to the lower end of the arm 7, as shown especially in Fig. 6. The contact plate contacts always with that lamp which is just opposite the center of the reflector and, therefore, only this lamp is inserted into the circuit, the other lamps remaining dark.

Inserting the solenoid coil into the circuit (not shown) can be effected by means of a push-button provided near the driver's seat in convenient reach of the driver.

The lamps may be of any desired type, and also the means by which they are affixed to the axle 8 may be chosen as desired.

A particular advantage presented by the improved search-light is this that the different lamps are arranged in a reflector common to them, and that also turning them is effected by a device common to them.

If the succession of the lamps is such that after the undimmed light first the colored light and finally the diffused light appears, the advantage is obtained that the forward range of the light cone becomes shorter only by and by, and the eyes of the driver can more easily follow the procedure.

Finally, it is possible to attach the device

also to existing search lights, as the whole is held in proper position by means projecting forth from the centre of the search light, or of the reflector thereof respectively.

I claim:—

1. A dimming device for use in connection with search lights, comprising in combination with the reflector of the search light, a lamp carrier arranged in the reflector and including a hollow member arranged in the central portion of the reflector; a plurality of different ray projecting lamps mounted on the carrier; means for actuating the carrier to bring any of the lamps in the focus of the reflector, a contact for supplying current to the lamp disposed in the focus of the reflector, and a conductor for supplying current to said contact, said actuating means and conductor extending through said hollow member.

2. A dimming device for use in connection with search lights, comprising in combination with the reflector of the search light, a lamp carrier including a hollow member and a vertical axle arranged in the reflector; a set of electric incandescent lamps supported by said axle; means for turning said axle together with said lamps in intervals by such angles that always one of the lamps is located in the focus of the reflector; means extending through said hollow members for turning the axle; and means also extending through the hollow member for supplying current to that lamp which is located in said focus at the time being.

3. A dimming device for use in connection with search lights, comprising, in combination with the reflector of the search light, a lamp carrier including a hollow member and a vertical axle arranged in the reflector; a set of electric incandescent lamps supported by said carrier; a driving gear combined with said axle and so designed as to permit turning it in intervals by equal angles; means for thus actuating said gear, and means for locking it after every actuation; said means actuating the gears extending through said hollow member; and means also extending through the hollow member for supply current to that lamp which is located in said focus at the time being.

4. A dimming device for use in connection with search lights, comprising in combination with the reflector of the search light, a lamp carrier arranged in the reflector, and a set of electric incandescent lamps supported by said carrier, this latter comprising a vertical axle and means including a hollow member arranged in the central portion of the reflector for holding it in proper position; a driving gear combined with said axle and comprising a toothed disk affixed to the axle, another toothed disk arranged loosely on the axle just above the first-mentioned disk and engaging the teeth thereof in one direction of rotation, means for turning said other disk in intervals, a shiftable member adapted to lock the first disk after every part turning, a lug at the other disk adapted to release said locking member prior to every part turning; and means for turning the second disk back into its former position after having been actuated: the said means for turning the said second disk and the means for supplying current to the lamp located in the focus of the reflector extending through said hollow member.

5. A dimming device for use in connection with search lights, comprising in combination with the reflector of the search light, a lamp carrier arranged in the reflector, and a set of electric incandescent lamps supported by said carrier, this latter comprising a vertical axle and means including a hollow member arranged in the central portion of the reflector for holding it in proper position; a driving gear combined with said axle and comprising a toothed disk affixed to the axle, another toothed disk arranged loosely on the axle just above the first-mentioned disk and engaging the teeth thereof in one direction of rotation, means for turning said other disk in intervals, a shiftable member adapted to lock the first disk after every part turning, and having a projection extending into the plane of the other disk; a lug at this other disk so arranged as to be adapted to cooperate with said projection in the one direction, but to move past over it in the other direction owing to the obliquity of the teeth of the two disks; and means for turning the second disk back into its former position after having been actuated; the means for turning the said second disk and the means for supplying current to the lamp located in the focus of the reflector extending through said hollow member.

6. A dimming device for use in connection with search lights, comprising, in combination with the reflector of the search light, a lamp carrier arranged in the reflector and a set of electric incandescent lamps supported by said carrier, this latter comprising a vertical axle and means and including a hollow member arranged in the central portion of the reflector for holding it in proper position; a driving gear combined with said axle and comprising a toothed disk affixed to the axle, another toothed disk arranged loosely on the axle just above the first-mentioned disk and engaging the teeth thereof in one direction of rotation, means for turning said other disk in intervals, a shiftable member adapted to lock the first disk after every part turning, and having a projection extending into the plane of the other disk; a lug at this other disk so arranged as to be adapted to co-operate with said projection in the one direction, but to move past it in the other direction owing to the obliquity of the teeth of the two

disks, the upper disk being supported by said projection remote from the lower disk until said lug has left the said projection during its backward movement; and means for turning the second disk back into its former position after having been actuated; the means for turning the said second disk and the means for supplying current to the lamp located in the focus of the reflector extending through said hollow member.

7. A dimming device for use in connection with search lights, comprising, in combination with the reflector of the search light, a lamp carrier arranged in the reflector and a set of electric incandescent lamps supported by said carrier, this latter comprising a vertical axle and means and including a hollow member arranged in the central portion of the reflector for holding it in proper position; a driving gear combined with said axle and comprising a toothed disk affixed to the axle, another toothed disk arranged loosely on the axle just above the first-mentioned disk and engaging the teeth thereof in one direction of rotation, a helical spring arranged over the second, i. e. upper disk and tending to press it into the first, i. e. lower disk and to move it back into its position of rest; a shiftable member adapted to lock the first disk after every part turning, a lug at the other disk adapted to release said locking member prior to every part turning; means for turning the second disk back into its former position after having been actuated; the means for turning the said second disk and the means for supplying current to the lamp located in the focus of the reflector extending through said hollow member.

8. A dimming device for use in connection with search lights, comprising, in combination with the reflector of the search light, a lamp carrier arranged in the reflector and a set of electric incandescent lamps supported by said carrier, this latter comprising a vertical axle and means including a hollow member arranged in the central portion of the reflector for holding it in proper position; a driving gear combined with said axle and comprising a toothed disk affixed to the axle, another toothed disk arranged loosely on the axle just above the first-mentioned disk and engaging the teeth thereof in one direction of rotation, a helical spring arranged over the upper disk and tending to press it into the lower disk and to move it back into its position of rest; a hollow cylindrical member located within said spring and keeping it in proper position; another cylindrical member extending upwardly from the upper disk and engaging said first-mentioned cylindrical member; a shiftable member adapted to lock the first disk after every part turning, a lug on the upper disk adapted to release said locking member prior to each rotary movement thereof; and means for turning the second disk back into its former position after having been actuated; the means for turning the said second disk and the means for supplying current to the lamp located in the focus of the reflector extending through said hollow member.

9. A dimming device for use in connection with search lights, comprising, in combination with the reflector of the search light, a lamp carrier arranged in the reflector and a set of electric incandescent lamps supported by said carrier, this latter comprising a vertical axle and means including a hollow member arranged in the central portion of the reflector for holding it in proper position; a driving gear combined with said axle and comprising a toothed disk affixed to the axle, another toothed disk arranged loosely on the axle just above the first-mentioned disk and engaging the teeth thereof in one direction of rotation; a cord pulley connected with the upper disk, a cord connected with said pulley; means for subjecting the cord to pulls from the rear of the reflector, these means comprising an electromagnetic device to which the rear end of the said cord is attached; a shiftable member adapted to lock the first disk after every part turning, a lug on the other disk adapted to release said locking member prior to each turning movement thereof; and means for turning the upper disk back into its former position after having been actuated; the means for turning the said upper disk and the means for supplying current to the lamp located in the focus of the reflector extending through said hollow member.

In testimony whereof I affix my signature.

PAUL GIESE.