March 2, 1926.

1,575,403

L. R. YEAGER

TILTABLE HEADLIGHT REFLECTOR

Filed Nov. 19, 1923

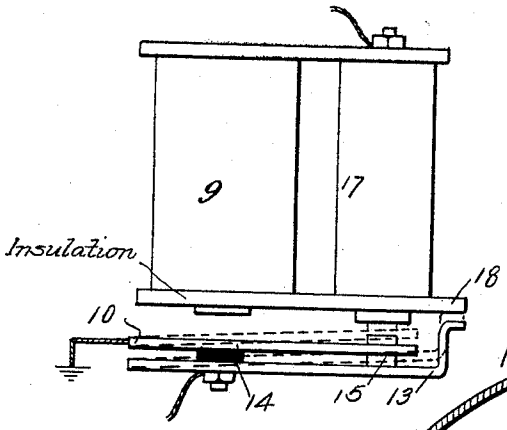


Fig. 2

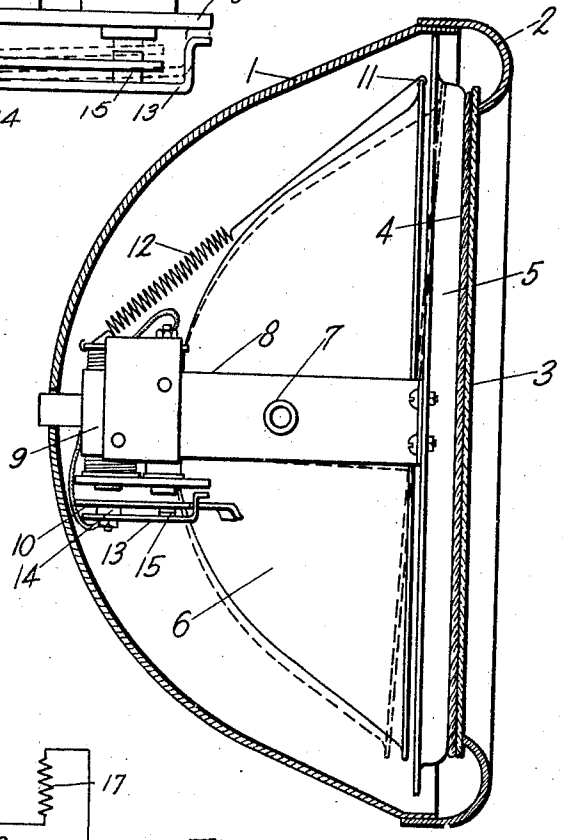


Fig. 1

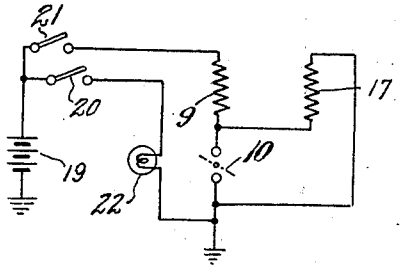


Fig. 3

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UNITED STATES PATENT OFFICE.

LEO R. YEAGER, OF COLUMBUS, OHIO.

TILTABLE HEADLIGHT REFLECTOR.

Application filed November 19, 1923. Serial No. 675,536.

To all whom it may concern:

Be it known that I, LEO R. YEAGER, a citizen of the United States of America, residing at Columbus, in the county of Franklin and State of Ohio, have invented certain new and useful Improvements in Tiltable Headlight Reflectors, of which the following is a specification.

My invention relates to tiltable headlight reflectors having movable or adjustable reflectors operable, under control, from without the lamp structure proper. It further has to do with such lamp structure where the reflector is moved or adjusted electrically by a relatively high current and held in the adjusted position by a relatively low current.

My invention primarily contemplates the provision of means for incorporating a current changing switch member with an electromagnetic unit used for effecting adjustment in such a way that the operation of the one becomes identified with the operation of the other without the introduction of any extra interconnecting parts or means. Furthermore, by my device, an armature of the electromagnetic unit may be made to act as one member of the current changing switch, while a means carried by a coil member of the electromagnetic unit acts to cause electrical contacts to be made or broken with the armature member by a contactor member when the armature moves away from or to the coil member.

More specifically, my invention comprises the use of a relatively high current for tilting a reflector and a low current for maintaining the reflector tilted, wherein, this relatively high current establishes a magnetic field of such intensity that the armature member preferably carried by the reflector is attracted to the coil member through a relatively long air gap and moves to it. Immediately before this movement is completed, a means carried by the coil member of the electromagnetic unit, which in the initial position permits electrical contact between the armature member and the contactor member, acts by the change in space relation of contactor member relative to the armature member. Therefore, the contactor member and the armature member no longer make electrical contact, but a new electrical circuit results, wherein a relatively lower current traverses the coil windings, producing a magnetic field of relatively low intensity. However, this relatively lower current suffices to maintain the armature in the adjusted position, once this position is established.

Many other novel features of my invention will be apparent as this description progresses and be brought out in the claims appended hereto. The various objects of my invention are preferably obtained by the structure illustrated in the drawings, wherein similar characters of reference designate corresponding parts and wherein:—

Figure 1 is a side elevation, partly in section, of a lamp structure showing an adjustable reflector electromagnetically controlled as applied to automobile headlights, and a reflector control means applied thereto comprising a form of my invention.

Figure 2 is an enlarged fragmentary detail view of my novel reflector control means showing a contactor member applied to an armature of an electromagnetic unit to form a member of a current changing switch.

Figure 3 is a diagrammatic sketch showing my invention applied to an electric circuit for controlling an adjustable headlight reflector.

In the drawings and particularly with reference to Figure 1 my invention is shown in connection with a lamp structure having an outer body or casing 1 and a cover or door 2. The usual glass 3 and a dust ring 4 are carried against a support ring 5.

A reflector 6 is pivotally supported by means of suitable pivots 7 and supporting arms 8 attached to the support ring 5. One of the supporting arms 8 is shown extended beyond the pivoting point and this extended portion carries with it a coil element 9 of the electromagnetic unit.

The reflector 6 also carries upon its outer surface the armature member 10 and a hook or other suitable means 11 for receiving one end of a coil spring 12. The coil spring 12 is attached at its other end preferably to the stationary support of the electromagnetic unit in such a manner as to hold the reflector 6 in the normal upward tilted position when the electromagnetic unit is not energized.

The contactor spring 13 is carried by the armature member 10, and is electrically insulated from the armature member 10 by an insulating washer 14 but makes contact with a contact point 15 of the armature member 10.

By reference to Figure 2 it will be seen that I have shown the coil element 9 and the armature member 10 as in Figure 1 but somewhat enlarged to more clearly show the relation of parts when no current traverses the windings. The dotted lines show the relation of parts when the electromagnetic unit is energized.

The electromagnetic unit which is relatively stationary consists of the major coil 9 and a minor coil 17 as indicated in Figure 1 by the numeral 9. The major coil 9 is designed to attract the armature member 10, which aramature is secured to a tiltable reflector. When the reflector is tilted by the energizing of the major coil 9, the armature moves toward such coil and the bent end of the contactor spring 13 on the armature will strike the fiber washer 18 on the coil element 9 and thus separate the contact point 15 and the contact spring 13. The separating of the contact point 15 and the contact spring 13 will thus throw the major coil 9 in series with the minor coil 17. The purpose of throwing such minor coil in series with the major coil is to reduce the current during the time that the reflector is tilted.

The electrical diagram, as shown in Figure 3 provides a circuit or connection of parts comprising a source of electrical energy 19 having one terminal grounded and the other terminal connected to a light switch 20. Traversing the switch 20 the current passes on through a lighting means 22, completing the circuit by any suitable ground.

Another branch circuit carries current from the battery 19 through the switch 21, the windings of the major coil 9, the switch 10 inside the lamp to any suitable ground. This switch 10 when open, throws the minor coil 17 in series with the major coil so that the current must traverse the windings of said minor coil and on to a suitable ground. It will be obvious that the major coil may be thrown in series with the minor coil without in any way affecting the circuit through the lighting means.

In operation, it will be seen my invention so provides that when the tilting switch 21 is closed current first traverses the major coil 9 of low resistance, allowing a relatively high current to flow which tilts the reflector. As the reflector tilts the armature member 10, carried by the reflector and carrying the contactor member 13, moves toward the coil member 9 of the electromagnetic unit. The bent end of said contactor member strikes the fiber washer 18 carried by the coil element 9 causing the contact point 15 and the contactor member 13 to separate. This causes the minor coil 17 to be thrown in series with the major coil 9 thereby cutting the current down to a relatively low value by the resistance effect of said minor coil. This relatively lower current however suffices to hold the reflector in a tilted position.

It will be seen that I have provided a tiltable reflector unit such as may be easily inserted in any standard lamp structure having a removable reflector without in any way altering said lamp structure. Moreover, my tiltable reflector unit may be incorporated in the initial building of a lamp structure. In either case the reflector unit may be inserted in or removed from the lamp casing quickly, easily, and without the use of tools.

It will be further seen that I have provided a current changing switch within the lamp structure, operable, to cause the armature member 10 to move toward the coil member 9 under the influence of a relatively high current and to remain in such adjusted position under the influence of a relatively low current.

It will be understood that the contactor member 13 may be incorporated with either the armature member 10 or the coil member 9 of the electromagnetic unit so long as the operation of the armature member 10 is identified with the operation of the coil member 9 for effecting adjustment of the reflector.

It will be also understood that the armature member 10 may be carried on the upper half of the reflector and the coil member 9 positioned accordingly to operate therewith. In this case, the coil spring 12 would be so utilized as to hold the reflector in a downward tilted position and the action of the electromagnetic unit, when energized, would be to tilt said reflector upward and hold it in the upward tilted position.

Having thus described my invention, what I claim is:—

1. In a lamp structure, a light projecting device adjustable to vary the direction of the beam of light, electromagnetic actuating means for adjusting said projecting device by a current of one value and for maintaining adjusted position by a current of a lower value, and means connected to the light projecting device and brought into contact with a part of the electromagnetic actuating means for breaking the high current circuit and completing the low current circuit.

2. A headlight comprising a casing, a shiftable reflector mounted within said casing, light creating means having a current circuit, electromagnetic means for shifting said reflector, a separate current circuit for said electromagnetic actuating means, and means cooperating with the electromagnetic means and operative automatically to throw a resistance in series with said actuating current upon the shifting of the reflector.

3. In a lamp, the combination with a casing, of a reflector pivotally mounted therein, an electromagnet having two coils and means for causing current to pass thru one coil to

adjust the reflector and means for causing the current to pass thru both coils for maintaining the reflector in adjusted position.

4. In a lamp structure having a movable reflector, an electromagnetic unit for operating said reflector having a major and minor coil, and a switch member actuated by the action of said electromagnetic unit, said switch being adjusted to direct the electrical circuit through the major coil of the electromagnetic unit in one position and through the major coil and the minor coil in series in another position.

5. In combination with a light structure having a movable reflector, an electromagnetic means for moving said reflector, a source of electrical energy for operating said electromagnetic means, and an armature carried by the reflector and acting as one member of a current changing switch, said armature being brought into contact with a part of the electromagnetic means for throwing a resistance in series with the actuating current upon the movement of the reflector.

6. In combination with a light structure having a movable reflector, a light source and a current circuit for said source, an electrical means for moving the reflector, a second current circuit for operating said electrical means, an armature member connected to said reflector, and means operable by the movement of the armature within the lamp structure whereby a resistance is placed in series in the second circuit.

In testimony whereof I hereby affix my signature.

LEO R YEAGER.