

April 6, 1926.

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E. W. KAPRAUN

HEADLIGHT SHIFTING MEANS

Filed April 16, 1925

3 Sheets-Sheet 1

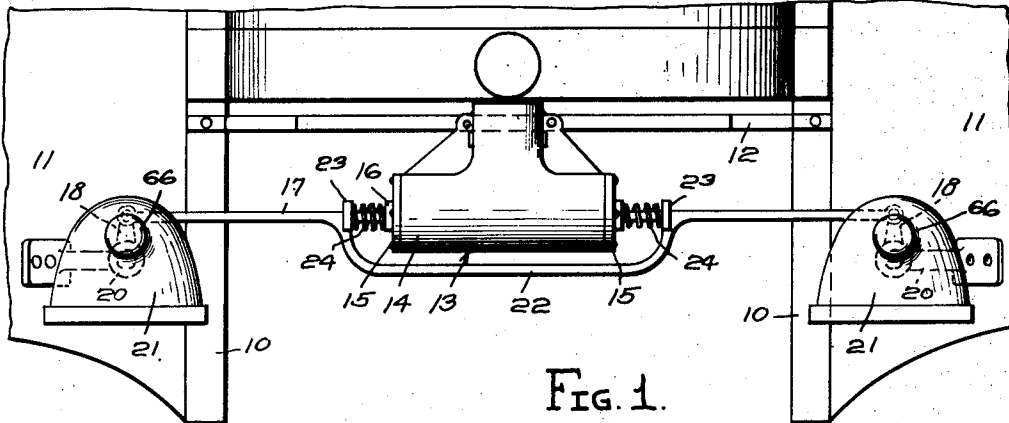


FIG. 1.

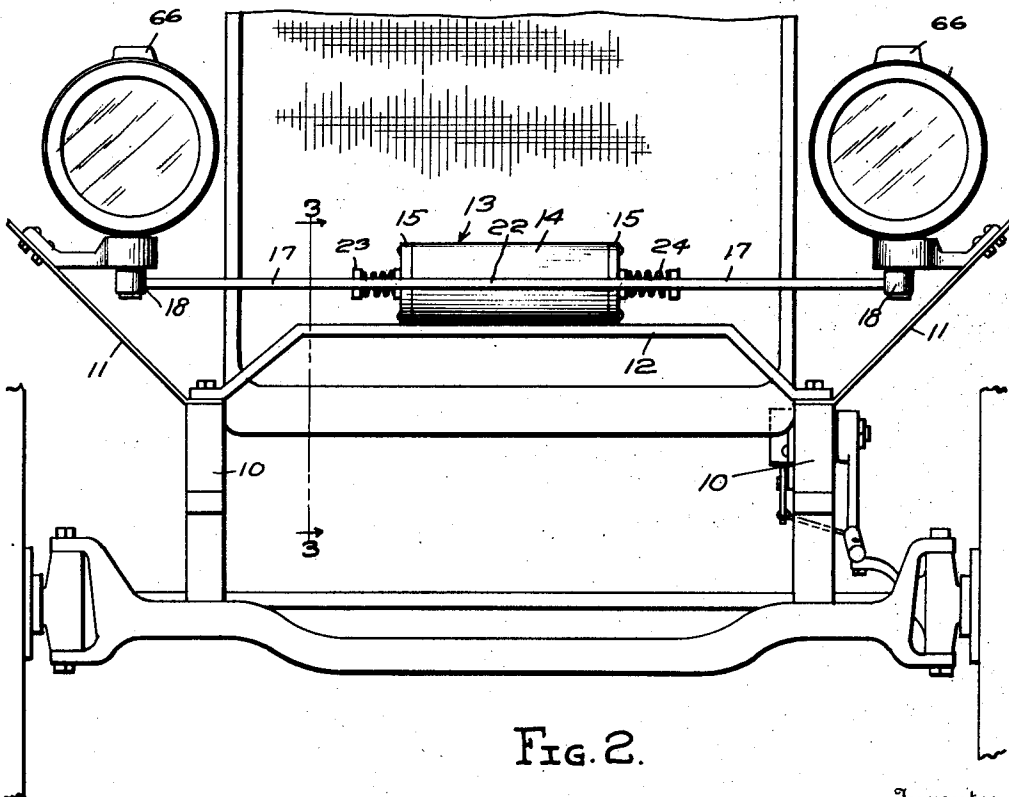


FIG. 2.

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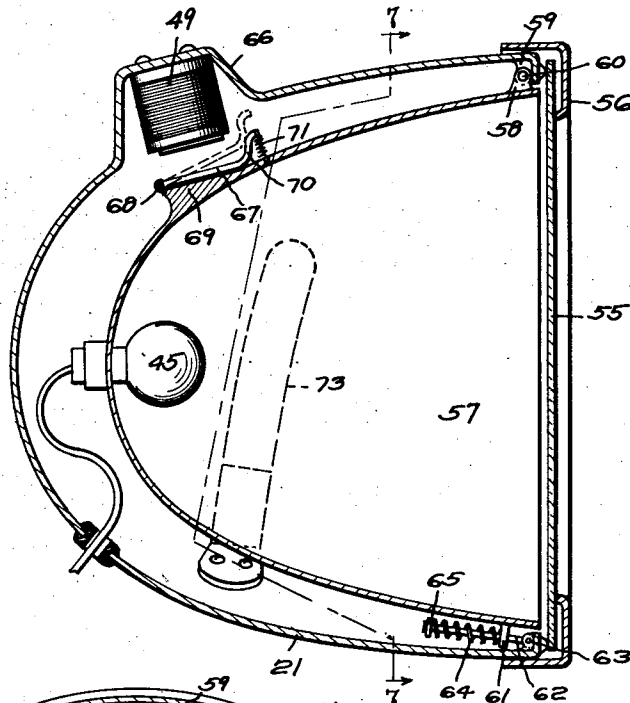


FIG. 6.

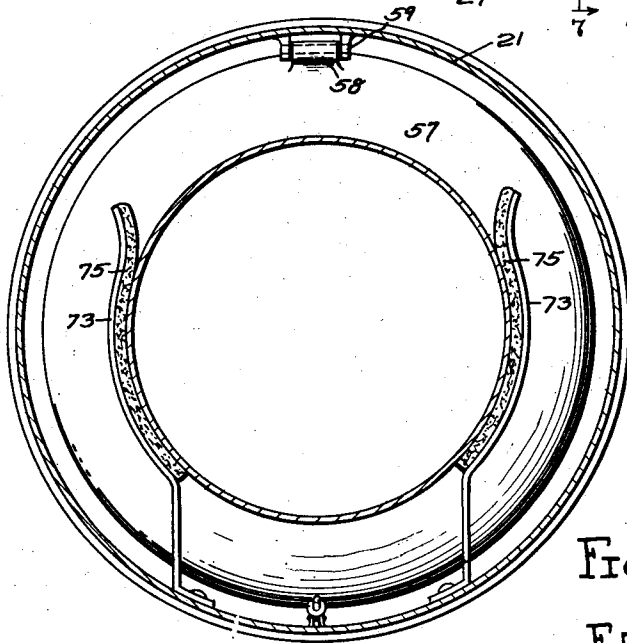


FIG. 7.

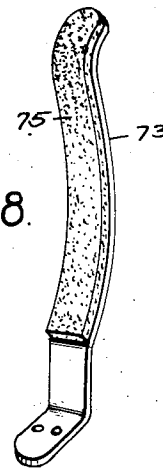


FIG. 8.

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UNITED STATES PATENT OFFICE.

EDWARD W. KAPRAUN, OF HENRY, ILLINOIS.

HEADLIGHT-SHIFTING MEANS.

Application filed April 16, 1925. Serial No. 23,563.

To all whom it may concern:

Be it known that I, EDWARD W. KAPRAUN, a citizen of the United States, residing at Henry, in the county of Marshall and State of Illinois, have invented certain new and useful Improvements in Headlight-Shifting Means, of which the following is a specification.

My invention relates to improvements in headlight turning means for automobiles.

An important object of the invention is to provide electrical means, which are adapted to automatically shift the headlights, in the direction in which the front wheels are steered, when the headlights are turned on, but will not shift the headlights when they are turned off.

A further object of the invention is to provide means operating in conjunction with the steering means, for projecting the light from the headlights downwardly upon the road, thus removing the blinding effect from the headlights.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this specification and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a plan view of apparatus embodying my invention,

Figure 2 is a side elevation of the same,

Figure 3 is a transverse section taken on line 3—3 of Figure 2,

Figure 4 is a horizontal section taken on line 4—4 of Figure 3,

Figure 5 is a diagrammatic view of the apparatus,

Figure 6 is a central vertical longitudinal section through one of the headlamps, parts in elevation,

Figure 7 is a transverse section taken on line 7—7 of Figure 6, and,

Figure 8 is a perspective view of one of the resilient reflector guides.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates the longitudinal beams of the chassis of the automobile, carrying fenders 11. The beams 10 are connected by a transverse bar 12, as shown.

Bolted or otherwise rigidly attached to the transverse bar or support 12 is a casing or housing 13, formed of any suitable ma-

terial. The housing preferably embodies a cylindrical body portion 14, the ends of which are closed by caps 15. These caps are equipped with tubular guides 16, slidably receiving transverse rods 17. These transverse rods, Figures 1 and 2, extend outwardly beyond the tubular guides 16 and are pivotally connected with cranks 18, which are rigidly attached to vertical spindles 19. These spindles turn in bearing brackets 20, attached to the fenders 11. The vertical spindles are rigidly attached to the headlamp casings 21. In order that the rods 17 will move together, they are preferably rigidly connected by means of a rod or bracket 22, disposed to one side of the cylindrical body portion 14. The rods 17 carry stop elements 23, rigidly mounted thereon, engaging compressible coil springs 24, arranged between these stops and the tubular guides 16. The function of these springs is to return the rods 17 to the normal central position, and retain the same in this position, until shifted therefrom, whereby the headlamps are normally retained in the central neutral position.

Rigidly mounted within the cylindrical body portion 14 are electro-magnets 25 and 26, of any well known or preferred construction. The outer ends of these magnets are suitably grounded to the chassis of the automobile, as indicated in Figure 5, at 26. These magnets are provided with armatures 27, which are rigidly attached to the inner ends of the rods 17, as shown.

Attention is now called more particularly to the diagrammatic view shown in Figure 5. In this figure, the numeral 28 designates the source of current, one pole of which is grounded to the chassis, as shown at 29. A wire 30 is connected with the opposite pole of this source of current and leads to a switch 31, which may be arranged upon the dash of the automobile. This switch embodies a stationary contact 32, to which the wire 30 is permanently electrically connected. The switch further embodies a stationary contact 33, having connection with a wire 34, which is electrically connected with a contact blade 35, carried by a lever 36, and insulated therefrom. The lever 36 is pivoted between its ends, at 37, and is disposed to operate within a housing 38, attached to one longitudinal beam 10, Figure 3. The contact blade 35 is disposed between the stationary contacts 39 and 40,

carried within the housing 38 and insulated therefrom. The contact blade 35 is adapted to be moved alternately into engagement with the stationary contacts 39 and 40. The lever 36 is pivotally connected with a link 39', pivoted to a crank 40' embodied in the steering gear of the automobile. The contact 39 has connection with a wire 41, and this wire passes into the housing 13 and is electrically connected with the inner end of the electro-magnet 25. The contact 40 has electrical connection with a wire 42, which passes into the housing 13 and is electrically connected with the inner end of the electro-magnet 26. The switch further embodies a stationary contact 43, having connection with a wire 44, which is electrically connected with corresponding terminals of bulbs 45 of the headlamps. The opposite terminals of these bulbs are grounded in the chassis through a wire 46. The electro-magnets 49 are disposed within the headlamp casings 21, and will be described later. The switch embodies a central pivot element 51, to which is attached a lever 52, by means of which the pivot element may be turned. The pivot element 51 carries a broad segmental contact 53, and a narrow segmental contact 54 in electrical connection with each other. The contacts 43 and 47 are relatively close together, as shown. As illustrated in Figure 5, when the lever 52 is in the neutral position, the contact 53 disengages contact 33 and contact 54 disengages contact 43. When the lever 52 is swung to the right to cause the headlamps to glow, contact segment 53 will engage contact 33 and contact segment 54 will engage contact 43, and hence the headlights will glow and the electrical shifting device will be rendered operative. When the lever 52 is shifted to the second position to the right, a contact segment 53 still engages contacts 32 and 33 and contact segment 54 engages both contacts 43 and 47. It is thus seen that the headlights will continue to glow while the magnets 49 will be energized to project the light upon the roadway, as will be described. While this occurs, the contact segment 53 engaging contacts 32 and 33 will retain the electrical shifting device operative.

Each headlamp embodies the outer lamp casing 21, having the usual lens 55, held in place by the rim 56. Mounted within the casing 21 is a reflector 57, in the rear end of which is carried the bulb 45. The reflector is mounted to swing in a vertical plane, and for this purpose it is provided at its forward end, and at the top thereof, with a knuckle 58, disposed between knuckles 59, carried by the casing 21. These knuckles are pivotally connected by a pin 60. At its bottom, and adjacent to the forward end thereof, the reflector, is provided

with an apertured guide lug 61, slidably receiving a rod 62, which is pivotally connected with the casing 21, at 63, to swing in a vertical plane. This rod receives a compressible coil spring 64, surrounding the same, and confined between apertured guide lug 61 and a nut 65, carried by the rod 62. This spring 64 and associated elements serves to retain the reflector in the forward horizontal position, and to return the same to such position, when shifted therefrom.

The lamp casing 21 is provided in its top with an outwardly bulging portion 66, within which is rigidly mounted one of the electro-magnets 49. This electro-magnet is arranged above and near an armature 67, carried by the upper portion of the reflector 57. The armature 67 is pivoted at 68 to a base 69, and is adapted to swing in a vertical plane, longitudinally of the reflector. The armature is provided at its forward end with a laterally extending arm 70, connected with a retractile coil spring 71, the opposite end of which is attached to the reflector 57. The spring 71 may be stiffer than the spring 64, and its function is to absorb the shocks and vibrations, when the electro-magnet 49 is energized, and the armature 60 drawn upwardly, carrying with it the reflector 57.

Arranged within the lamp casing 21 upon opposite sides of the reflector 57 are resilient guide arms or springs 73. These resilient guide arms are disposed upon opposite sides of the reflector and have their lower ends attached to the bottom of the casing 21. The upper portions of these resilient guide arms are preferably longitudinally curved and carry upon their inner faces linings 75 of felt, or other soft fibrous material. The reflector 57 operates in contact with this fibrous lining, which serves to steady the movement of the reflector and to eliminate vibrations and shocks.

The operation of the apparatus is as follows:

When the switch lever 52 is in the neutral position, Figure 5, the electro-magnets 25 and 26 cannot be energized, when the contact blade 35 engages either contact 39 or 40. During this condition, the bulbs 45 also do not glow. When the headlights are turned on, which is accomplished by swinging the lever 52 from the neutral position to the first position to the right, the contact segment 53 will engage contacts 32 and 33 and contact segment 54 will engage contact 43. When this occurs, current will flow from one pole of the source of current 29, through wire 30, contact 32, contact segment 53, contact 33 and wire 34 to the contact blade 35. Assuming that the automobile is turned or steered to the left, then the contact blade 35 will engage contact 40, and the current will pass through contact 35, contact 40, wire 42, electro-magnet 25, through the ground 26

and back to the opposite pole of the source of current 28, through the ground 29. If the automobile is steered in the opposite direction, the electro-magnet 26 will be energized, as is obvious. With the switch thus adjusted, a part of the current will also pass through segment 53 and segment 54, which is electrically connected to the segment 53, through contact 43, wire 44, to corresponding terminals of the bulbs 45, and through the wire 46 to the ground and hence to the opposite pole of the source of current. The headlights will then glow. Should it be desired to project the light from the headlights downwardly, this is accomplished by shifting the lever 52 to the second position to the right whereby segmental contact 54 engages contacts 43 and 47. The circuits above described remaining closed, while current also passes through wire 30, contact segment 54, contact 47, wire 48, magnets 49, and through wire 50 to the ground and to the opposite pole of the source of current. When the magnets 49 are energized, the armatures 67 are raised, carrying with them the reflectors 57, which are thus tilted downwardly, whereby the light is projected upon the roadway, and the blinding effect removed.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. The combination with pivotally supported headlight means of an automobile, of electrical means connected therewith to turn the headlight means in opposite directions, a switch automatically operated by the steering gear of the automobile for controlling the operation of the shifting means, and a second switch to control the glowing of the headlight means and rendering the shifting means inoperative with the respect to fulfilling its function when the headlight means is extinguished.

2. The combination with pivotally supported headlights of an automobile, of electrical means connected therewith to turn the same in opposite directions, a circuit connected with the shifting means and embodying a switch element adapted to be shifted in opposite directions by the steering gear of the automobile, and switch means to control the glowing of the headlights and also serving to close said circuit at one point when the headlights glow and to open the circuit when the headlights are extinguished.

3. The combination with pivotally supported headlights of an automobile, of electrical means connected therewith to turn the same in opposite directions, a circuit connected with the shifting means and embodying a switch element adapted to be shifted in opposite directions by the steering gear of the automobile, switch means to control the glowing of the headlights, said switch means being connected in said circuit and adapted to open the circuit when the headlights are extinguished, and means for projecting the rays of light from the headlights downwardly.

4. The combination with pivotally supported headlights of an automobile, of electrical devices to shift the headlights in opposite directions, a pair of stationary contacts electrically connected with the electrical devices, a movable contact to alternately engage the stationary contacts, said movable contact being automatically shifted by the steering gear of the automobile, a source of current, a wire leading to the movable contact, a wire leading to the headlights, and a switch device to simultaneously connect and disconnect the last named wires with the source of current.

5. The combination with pivotally supported headlights of an automobile, of electrical devices to shift the headlights in opposite directions, a pair of stationary contacts electrically connected with the electrical devices, a movable contact to alternately engage the stationary contacts, said movable contact being automatically shifted by the steering gear of the automobile, a source of current, a wire leading to the movable contact, a wire leading to the headlights, electrically operated means to throw the light from said headlights downwardly, a wire leading to the electrically operated means, and a switch device, said switch device being adapted to connect and disconnect the movable contact wire and the headlight wire with and from the source of current and to connect the electrically operated means wire with the source of current while maintaining the connection between the other wires and the source of current.

6. A headlight comprising a casing, a pivoted reflector arranged therein and carrying a bulb, an electro-magnet attached to the casing, an armature arranged near the electro-magnet and pivotally connected at one end with the reflector, a spring connecting the free end of the armature with the reflector to oppose the movement of the armature upon its pivot, and yielding means to oppose the movement of the reflector upon its pivot.

7. A headlight comprising a casing, a pivoted reflector arranged therein and carrying a bulb, an electro-magnet attached to the casing, an armature arranged near the electro-magnet and pivotally connected with the reflector, a spring to oppose the movement of the reflector upon its pivot.

ment of the armature upon its pivot, yielding means to oppose the movement of the reflector upon its pivot, and resilient guide arms secured to the casing and arranged to
5 engage the sides of the reflector.

8. A headlight comprising a casing, a pivoted reflector arranged within the casing and carrying a bulb, an electro-magnet attached to the casing to shift the reflector upon its

pivot, means to return the reflector to the 10 starting position, resilient guide arms attached to the casing and disposed to receive the reflector therebetween, and fibrous strips carried by the resilient guide arms to contact with the casing.

In testimony whereof I affix my signature.

EDWARD W. KAPRAUN.