Dec. 21, 1926. 1,611,267

A. E. CASE

LAMP

Filed March 22, 1924 2 Sheets-Sheet 1

Fig. 1

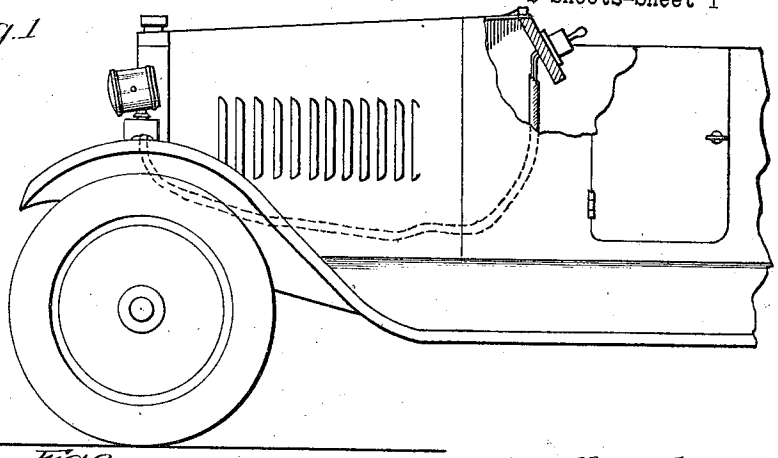


Fig. 2

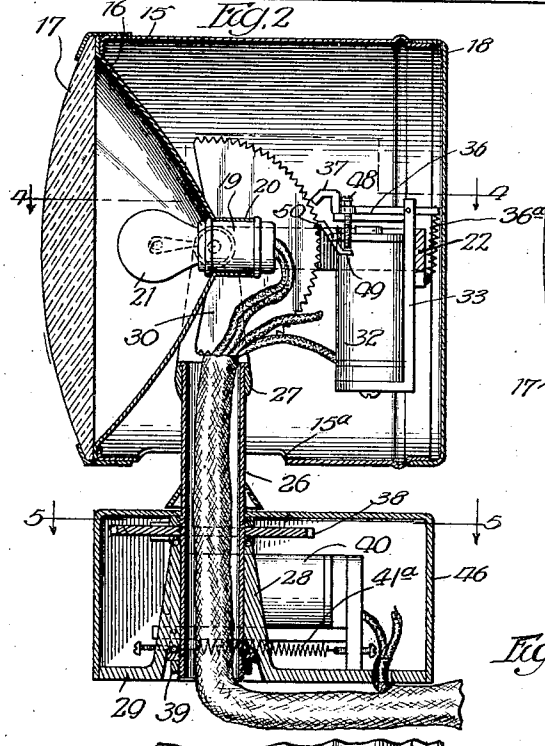


Fig. 4

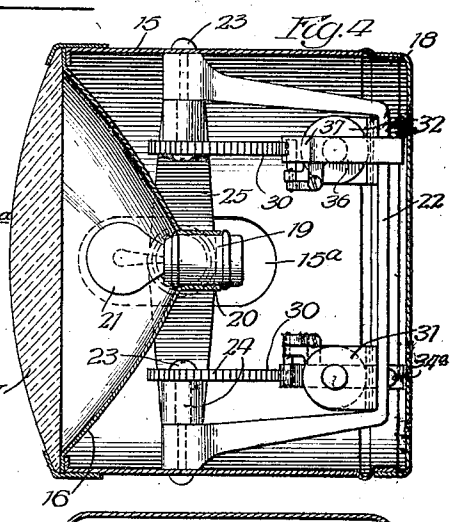


Fig. 3

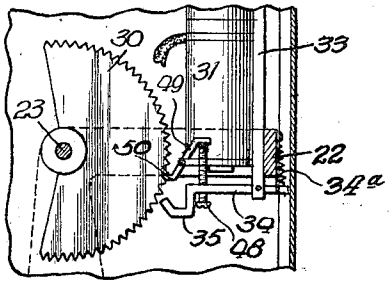
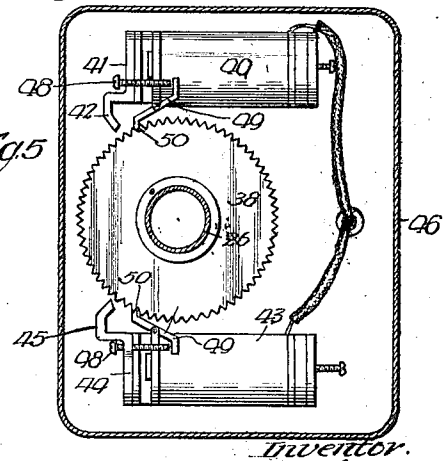


Fig. 5



Inventor.
Arthur E. Case
By Fred Zulauf
Atty.

Dec. 21, 1926. 1,611,267

A. E. CASE

LAMP

Filed March 22, 1924 2 Sheets-Sheet 2

Fig. 6

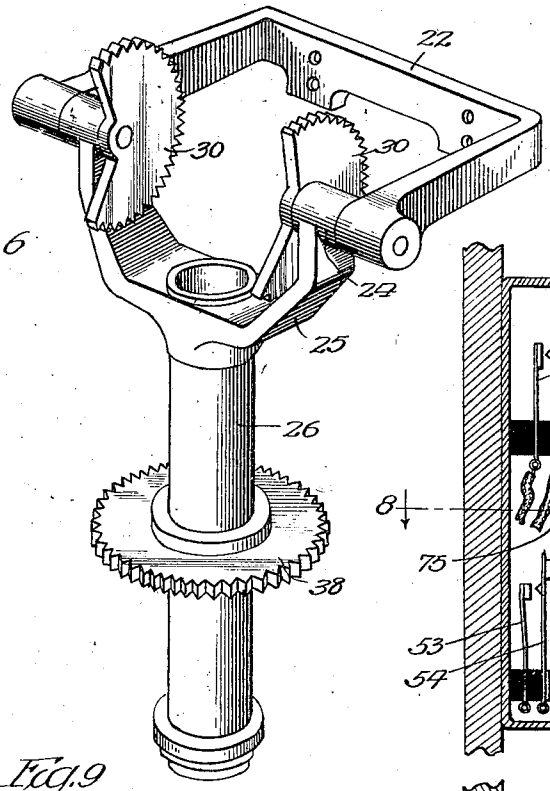


Fig. 7

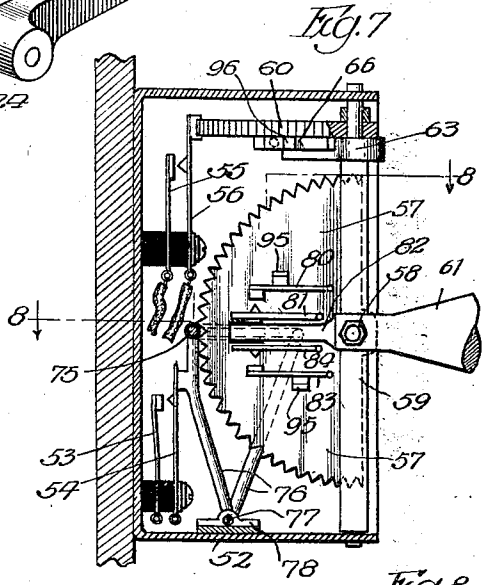


Fig. 9

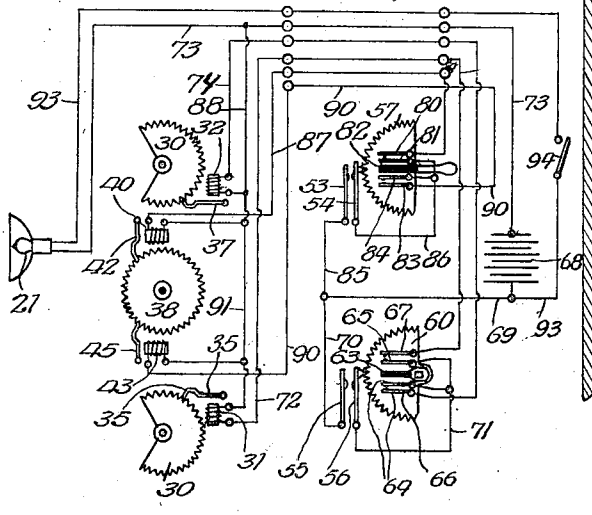
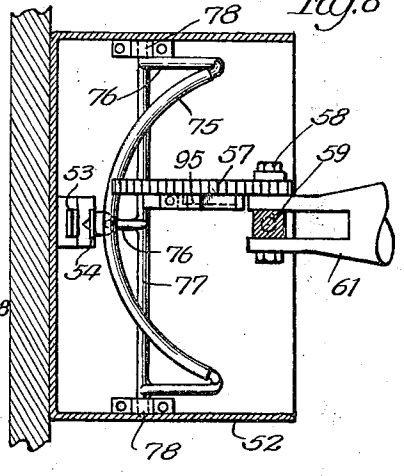


Fig. 8



Inventor

Arthur E. Case

By Fred Gulach

Atty.

Patented Dec. 21, 1926. 1,611,267

UNITED STATES PATENT OFFICE.

ARTHUR E. CASE, OF MARION, INDIANA, ASSIGNOR TO INDIANA MANUFACTURING & ELECTRIC CO., OF MARION, INDIANA, A CORPORATION OF INDIANA.

LAMP.

Application filed March 22, 1924. Serial No. 701,034.

The invention relates to lamps adapted to be carried by vehicles and more particularly to that type which is adjustable to permit a column of light to be projected in any desired direction from the vehicle.

One object of the invention is to provide improved means for adjusting a lamp from a remote point, for example, by the driver occupying a seat in the vehicle when the lamp is located beyond his reach. Another object of the invention is to provide electrically operated means for adjusting the lamp which is mounted so it may be adjusted in any direction. Other objects of the invention will appear from the detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings: Fig. 1 is a side elevation of an automobile equipped with the invention. Fig. 2 is a central vertical section through the lamp and its support and operating mechanism. Fig. 3 is a detail of the electro-magnetically operated device for vertically tilting the lamp in one direction. Fig. 4 is a section on line 4—4 of Fig. 2. Fig. 5 is a section on line 5—5 of Fig. 2. Fig. 6 is a perspective of the tiltable frame to which the lamp-casing is secured and the support for carrying it. Fig. 7 is a plan of the controlling device, the case being shown in section. Fig. 8 is a section taken on line 8—8 of Fig. 7. Fig. 9 is a diagram of the electrical connections.

The invention is exemplified in connection with a lamp to be used as a spot-light and which is mounted on one of the front fenders of the vehicle, although it will be understood that it may be supported at any other desired point. The lamp comprises a cylindrical casing 15, a reflector 16 suitably held therein, a lens 17 removably secured in the case and a removable cap 18 for the rear end of the casing, a lamp-socket 19 of any suitable or usual construction mounted in a sleeve 20 carried by the reflector and an incandescent lamp 21 held in the socket. In practice, it is necessary, in the use of the lamp as a spot-light, to provide for tilting the lamp vertically and laterally so that the column of light may be directed to any desired point within practical limits. A U-shaped frame 22 is fixedly secured to the lamp-casing by aligned screws 23. These screws are pivotally supported in the branches 24 of a fork 25 which is fixedly secured to a hollow standard 26, the tilting of the lamp on the axis of screws 23 permitting the desired vertical adjustment thereof and the horizontal rotation of the standard 26 permitting the lateral swinging of the lamp to any desired point within the limits provided for. Fork 25 has a hub 27 which is fixedly secured to the upper end of hollow standard 26. The latter is rotatably mounted in a bracket comprising a socket 28 which has a base 29 which is provided with suitable means by which it may be secured to the fender or any other desired part of the vehicle. Arcuate racks 30 are fixedly secured to the inner sides of the members of fork 25 respectively, which are used in vertically tilting and controlling the lamp. One of the racks 30 is used to tilt the lamp downwardly and the other to retract it or tilt it vertically in the opposite direction.

An electro-magnet, comprising a coil 31, is provided to cooperate with one of the racks 30 to tilt the lamp and an electro-magnet, comprising a coil 32, is provided to cooperate with the other rack 30 and tilt the lamp downwardly. These magnets 31 and 32 are each carried by a bracket 33, and these brackets are fixedly secured to the cross-bar of frame 22 which with the lamp-case is rotated vertically when the magnets are energized. Coil 31 is adapted to operate pivoted armature 34 which carries a pawl 35 which is adapted to engage one of the racks 30 for the purpose of swinging the frame 22 and the lamp to project the latter's rays upwardly, and coil 32 is adapted to operate an armature 36 which carries a pawl 37 which is adapted to engage the other rack 30 to tilt the lamp step-by-step downwardly. Springs 34^a and 36^a are provided for armatures 34 and 36 respectively to retract the latter after their respective coils have become de-energized. This mechanism exemplifies electro-magnetic means for vertically controlling the lamp to swing it upwardly and downwardly step-by-step.

The mechanism for shifting and controlling the lateral adjustment of the lamp through the rotation of hollow standard 26 comprises a toothed wheel 38 which is fixed to rotate with standard 26, its hub bearing against the upper end of socket 28 to ver-

tically position the standard. The latter is held against displacement from socket 28 by a washer and nut 39 on the lower end of said standard. An electro-magnet, comprising a coil 40 and an armature 41 carrying a pawl 42 to engage the ratchet, is adapted to operate the hollow standard 26 step-by-step in one direction, and an electro-magnet, comprising a coil 43 and an armature 44, carrying a pawl 45 adapted to act on the wheel 38, is adapted to operate this wheel step-by-step in the opposite direction. A spring 41ª is provided for each of the armatures 41 and 44 so as to retract the latter after their respective coils have become de-energized. These electro-magnets and toothed wheel exemplify electro-magnetic means for swinging the vertically tiltable lamp laterally to different positions, as desired in practice. A case 46 encloses the mechanism for swinging the hollow standard 26. The lower portion of the lamp-case 15 is cut away, as at 15ª, to permit the vertical swinging of the lamp relatively to the standard 26.

In order to keep each of the racks 30 and the toothed wheel 38 locked against rotation, except when the electro-magnets are energized respectively, each of the pawls 35, 37, 42 and 45 is provided with an adjustable screw 48 to operate the tail of a dog 49 which is provided with a tooth 50 and is pressed by any suitable means in one direction to cause said tooth to prevent retraction of one of the racks or the wheel 38 respectively. Each dog 49 is pivoted to the coil with which it is associated and automatically permits one-way movement of the toothed wheel or rack in the opposite direction to which its associated pawl operates the rack or toothed wheel and prevents movement in the opposite direction except when it is released. As a result, the racks 30 and wheel 38 will normally be locked against movement in either direction and will be locked against movement in one direction, when an electro-magnet is operated its associated dog will be automatically released to permit its associated pawl to act.

Mechanism to control the adjustment of the lamp by means of impulses through the coils of the electro-magnets 31, 32, 40 and 43 is located within convenient reach of the operator and connected by means of electric conductors to said magnet. This controlling mechanism is arranged in a box 52, which is secured to the dashboard or any other suitable point and comprises a switch comprising resilient normally separated members 53 and 54 for controlling a circuit to send impulses through the helices of magnets 40 and 43, a switch comprising resilient normally separated members 55 and 56 for producing impulses to operate the helices 31 and 32 of the magnets for vertically controlling the lamp, a laterally swinging rack 57 which is pivoted at 58 to a rotatable shaft 59 which is journalled in the sides of the box 52, a toothed rack 60 which is mounted on and operable vertically from the shaft 59; and a handle 61, which is pivoted on pin 58 to rock shaft 59 vertically and to swing rack 57 laterally. The teeth of racks 57 and 60 are adapted to operate the switches 53, 54 and 55, 56 respectively to make and break circuits to produce impulses for the operation of the electro-magnets which will cause them to attract and release their armatures to step up the elements to be shifted thereby.

Rack 60 is adapted to close and open switch 55, 56 when moved in either direction and switches are associated with and mounted on the rack to automatically control the circuit through the helices 31 and 32 according to the direction in which rack 60 is shifted. The means for this purpose comprises an arm 63, which is fixed to shaft 59 and is adapted to engage either a switch-contact 64 or 65 according to the direction in which the shaft is turned. A normally open contact 66 is associated with contact 64 and a contact 67 with contact 65. When the handle 61 is operated downwardly to rock shaft 59, arm 63 will engage contact 65 and initially force it into engagement with contact 67 to automatically establish a circuit to produce impulses for the operation of the helix 31 is as follows: battery 68, conductor 69, 70, contacts 55 and 56, conductor 71, contacts 65 and 67, conductor 72, helix 31 and the return conductor 73. The teeth on rack 60 will make and break the circuit to cause the pawl 35 to be operated the number of steps desired and according to the range of movement of the handle 61 in said direction. This will cause the lamp to be tilted upwardly in accordance with the corresponding range of movement of the handle 61. When the handle 61 is swung upwardly, shaft 59 will force rock-arm 63 to force contacts 64, 66 together and thereupon a circuit for the impulses to actuate helix 32 to step the lamp downwardly will be established as follows: battery 68, conductor 69, 70, contacts 55, 56, conductors 71, contacts 64, 66, conductor 74, helix 32 and return conductor 73. The movement of rack 60 with arm 63, after contacts 64, 66 have been closed, will open and close contacts 55, 56 to produce impulses according to the range of movement of the handle 61 in forward direction to correspondingly tilt the lamp downwardly.

Rack 57 is held by pivot 58, so that it will swing vertically with shaft 59, and in order to provide for the operation of contact 54 in all of its different positions, an arcuate member 75 engages the teeth of rack 57 and is carried by arms 76 which are rigid with a shaft 77 which is pivoted to bear-

ings 78 in box 52. Arcuate member 75 is adapted to engage contact 54 to force it against contact 53 to make and break a circuit for controlling the operation of wheel 38 and to remain in operative engagement with the rack or tappet 60 in all of its positions.

To alternately control the impulse circuits through the helices 40, 43, a pair of normally separated switch spring-contacts 80, 81 are mounted on the rack or tappet 57 at one side of an arm 82 which is rigid with the handle 61 and a pair of normally separated spring contacts 83 and 84 are mounted on said tappet adjacent the other side of said arm. When the handle 61 is swung laterally in one direction, its initial movement around pivot 58 will cause its arm 82 to force contacts 80, 81 into engagement and the further movement of the handle will swing tappet 57 to make and break the circuit at contacts 53, 54, said circuit being as follows: battery 68, conductor 69, 85, contacts 53, 54, conductor 86, contacts 81, 80, conductor 87, helix 40 of the electro-magnet for shifting wheel 38 in one direction, conductor 88 and return conductor 73. Such operations of the handle 61 will cause impulses to be sent through helix 40 to operate pawl 42 to step toothed wheel 38 in one direction and correspondingly swing the lamp laterally. Shift of the handle 61 in the opposite direction will cause its arm 82 to initially close contacts 84, 83 and the further movement of the handle in the same direction will cause a circuit for impulses as follows: battery 68, conductor 69, 85, contacts 53, 54, conductor 86, contacts 84, 83, conductor 90, helix 43, conductors 91, 88 and return conductor 73. The teeth on tappet 57 will operate contacts 53, 54 to produce impulses through helix 43 to operate pawl 45 so that it will rotate the wheel 38 in the opposite direction to that in which it is operated by pawl 42 and thus swing the lamp laterally in corresponding direction. The incandescent lamp 21 is included in a conductor 93 between conductor 69 and the return conductor 73. A switch 94 of any suitable construction is provided to control the lamp circuit. A stop 95 is provided adjacent contact 80 and another adjacent contact 83 on the rack or tappet-wheel 57 to cause the latter to move with the handle 61 after the initial closing of one of the switches. Similar stops 96 are provided on rack or tappet 60 for contacts 66 and 67. The electrical conductors for the lamp 21 and the electro-magnets in casing 15 are extended through the hollow standard 26, as shown in Fig. 2.

From the foregoing description, it will be apparent that the projection of light may be controlled by swinging a lamp vertically or horizontally according to the movement of the controller handle 61 and that the lamp may be tilted vertically while it is turned laterally in any of its positions and turned laterally while it is in any of its vertical positions.

The invention exemplifies mechanism for manipulating a universally adjustable lamp by electromagnetic means in response to a controlling device located at a point remote from the lamp and in which a single lever or handle is adapted to control all of the movements of the lamp.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims, without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a vehicle lamp, the combination of a lamp, means for supporting the lamp so it may be selectively swung in opposite directions, devices comprising electro-magnets each operable by impulses to variably shift the supporting means to shift the lamp in opposite directions and control its positions, means for producing impulses to operate said devices and a manually and variably shiftable controlling device for operating the impulse-producing means, whereby the extent of the shift of the lamp in either direction will be controlled.

2. In a vehicle lamp, the combination of a lamp, means for supporting the lamp so it may be selectively swung in opposite directions, devices comprising electro-magnets, each operable by impulses to variably shift the supporting means to shift the lamp in opposite directions to control its positions, means for producing impulses to operate said devices, and a manually and variably shiftable unitary controlling device for operating the impulse-producing means, whereby the extent of the shift of the lamp in either direction will be controlled by the extent of the shift of the controlling device.

3. In a vehicle lamp, the combination of a lamp, means for supporting the lamp so it may be selectively swung in opposite directions, devices comprising electro-magnets, each operable by impulses to variably shift the supporting means to shift the lamp in opposite directions and control its positions, means for producing impulses to operate said devices, and a manually and variably shiftable handle connected to operate the impulse-producing means to vary the extent of the shift of the lamp in either direction.

4. In a vehicle lamp, the combination of a lamp, means for supporting the lamp so it may be selectively swung in four directions, devices comprising electro-magnets

each operable by impulses to variably shift the supporting means to shift the lamp in any of said directions and control its positions, means for producing impulses to operate said magnets, and manually and variably shiftable means for operating the impulse-producing means and connected to vary the extent of the shift of the lamp by the magnets respectively, in any of said directions.

5. In a vehicle lamp, the combination of a lamp, means for supporting the lamp so it may be selectively swung in four directions, devices comprising electro-magnets, each operable by impulses to variably shift the supporting means to shift the lamp in any of said directions and control its positions, means for producing impulses to operate said magnets, and a manually and variably shiftable unitary controlling device for operating the impulse-producing means connected to vary the extent of the shift of the lamp by the magnets respectively, in any of said directions.

6. In a vehicle lamp, the combination of a lamp, means for supporting the lamp so it may be selectively swung in four directions, devices comprising electro-magnets, each operable by impulses to variably shift the supporting means to shift the lamp in any of said directions and control its positions, means for producing impulses to operate said magnets, and a manually and variably shiftable handle connected to operate the impulse-producing means and connected to vary the extent of the shift of the lamp by the magnets respectively, in any of said directions.

7. In a vehicle lamp, the combination of a pivotally supported lamp, electro-magnets for shifting said lamp in opposite directions, and mechanism for controlling the operation of said magnets comprising a handle, means operable by the handle for automatically making and breaking a circuit to produce impulses for the magnets, and switches selectively operable by the handle for controlling the impulses to the magnets.

8. In a vehicle lamp, the combination of a lamp supported to project light in four directions, electro-magnets for shifting said lamp in said directions respectively, and mechanism for controlling the operation of said magnets comprising a handle, means operable by the handle for automatically making and breaking a circuit to produce impulses for the magnets, and switches selectively operable by the handle for controlling the impulses to the magnets.

Signed at Marion, Indiana, this 23 day of February, 1924.

ARTHUR E. CASE.