March 9, 1926. 1,576,168

C. A. WHITSETT

SPOTLAMP

Filed August 15, 1921 4 Sheets-Sheet 1

Fig. 1

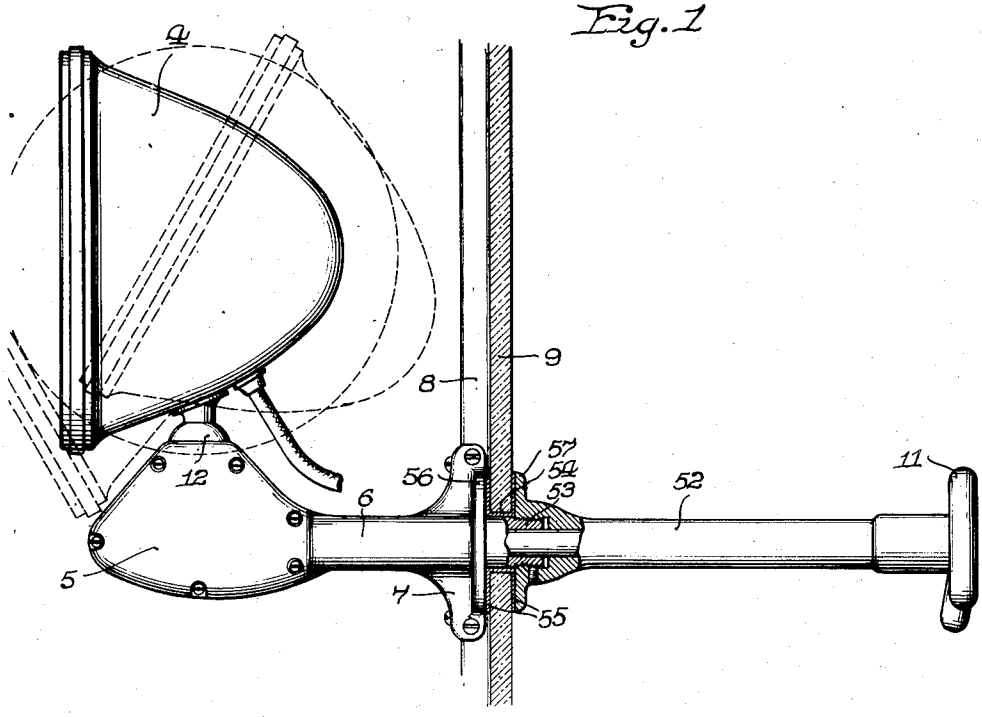
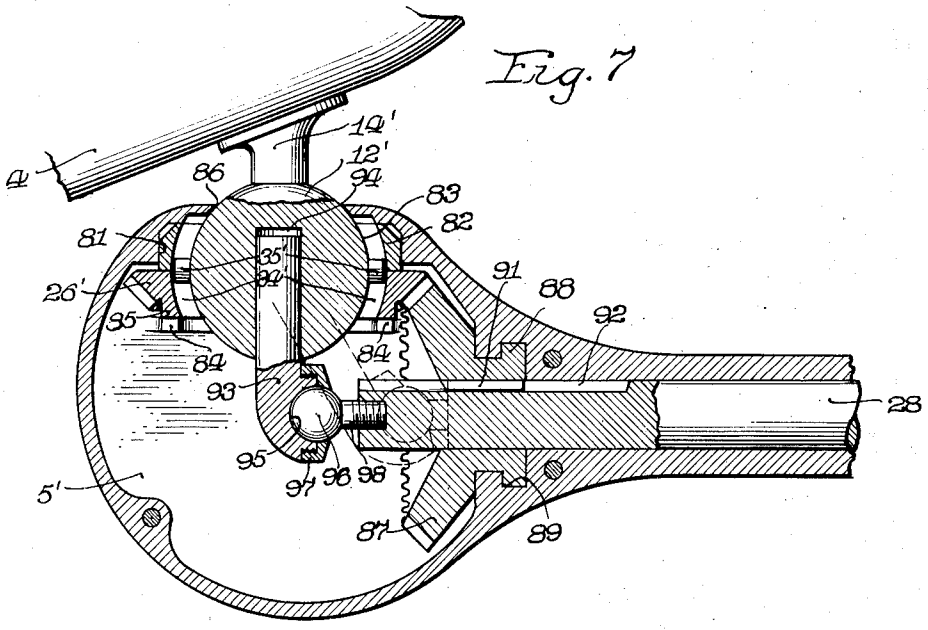


Fig. 7



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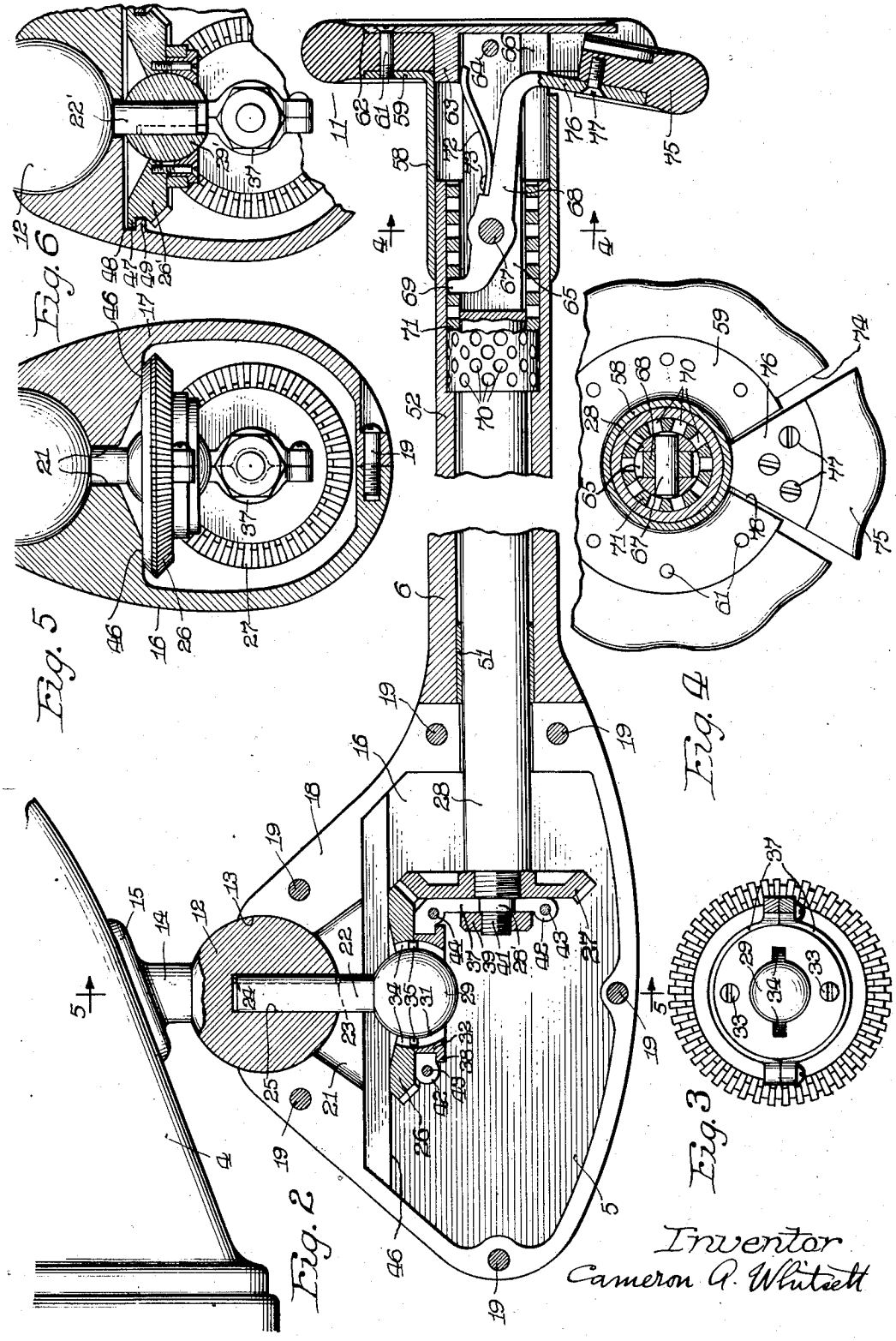


Fig. 6

Fig. 5

Fig. 4

Fig. 3

Fig. 2

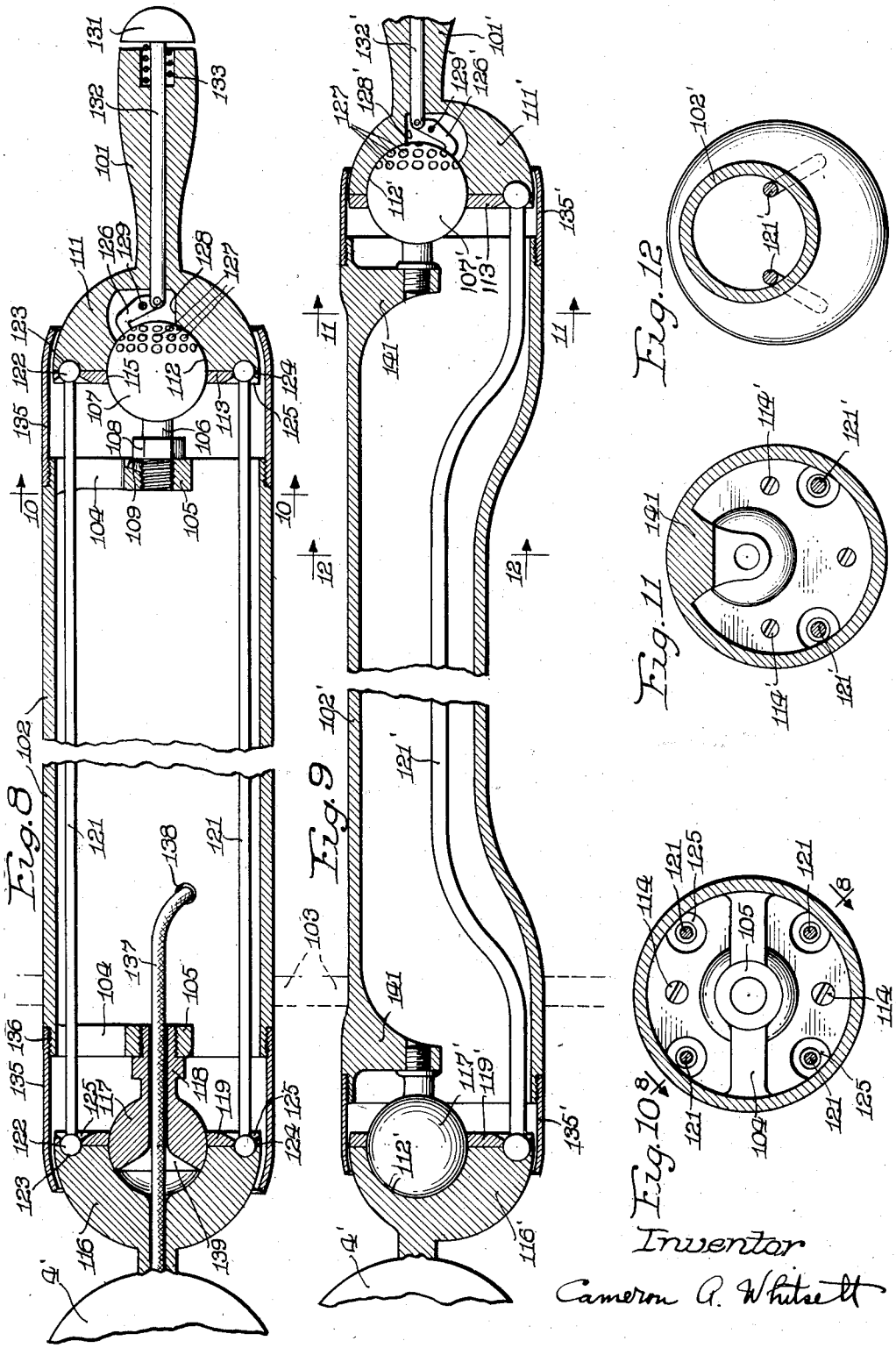
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Fig. 13

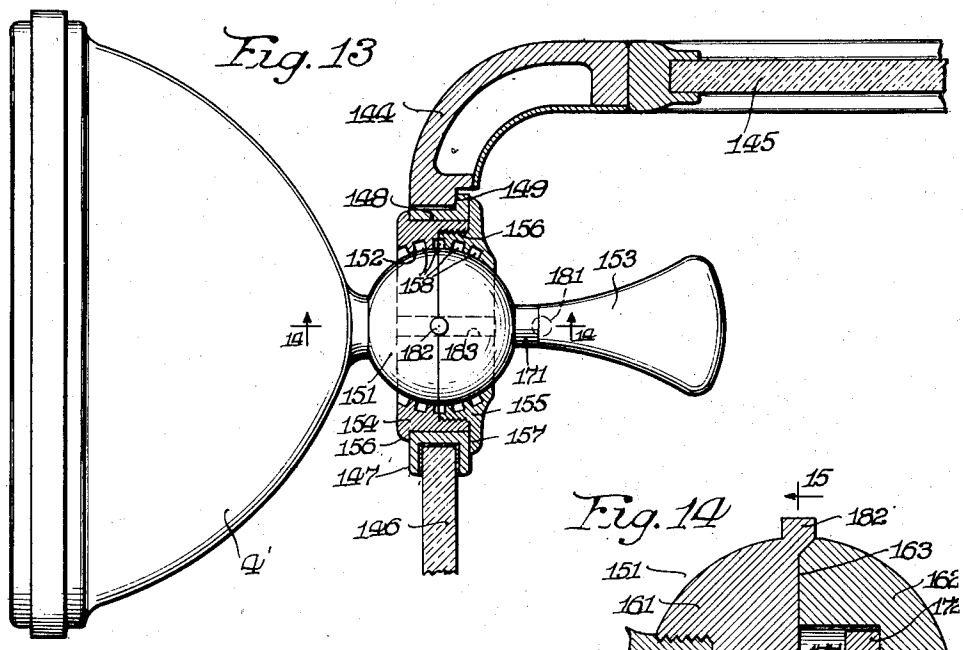


Fig. 14

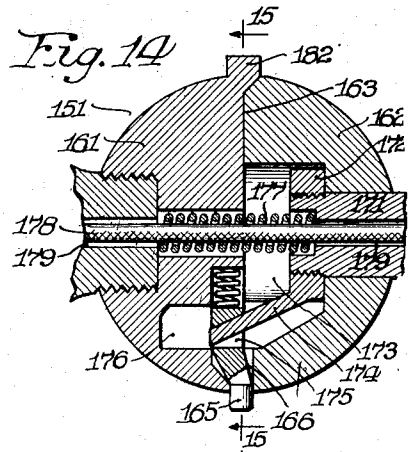


Fig. 16

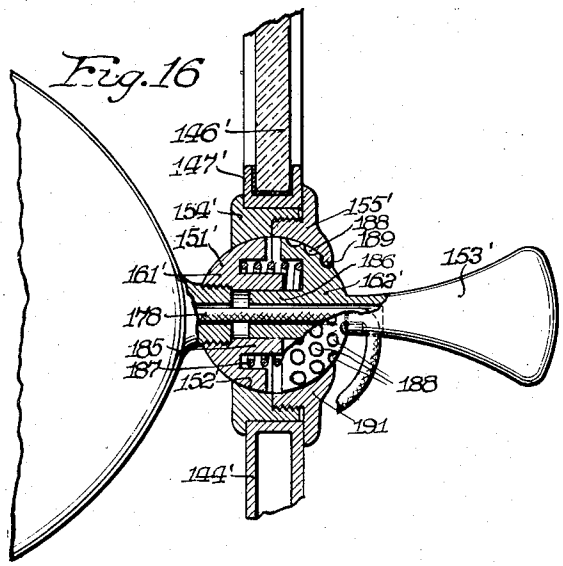
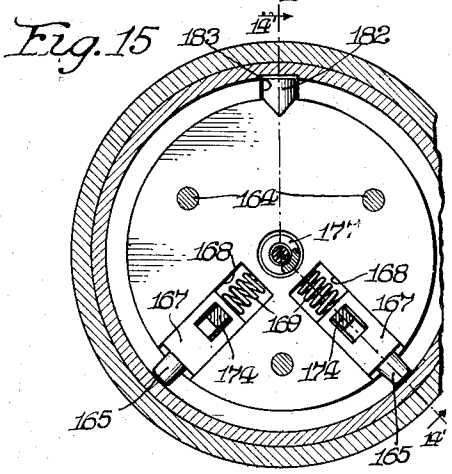


Fig. 15



Inventor

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Patented Mar. 9, 1926. 1,576,168

UNITED STATES PATENT OFFICE.

CAMERON A. WHITSETT, OF CHICAGO, ILLINOIS, ASSIGNOR TO FYRAC MANUFACTURING COMPANY, OF ROCKFORD, ILLINOIS, A CORPORATION OF ILLINOIS.

SPOTLAMP.

Application filed August 15, 1921. Serial No. 492,275.

To all whom it may concern:

Be it known that I, CAMERON A. WHITSETT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Spotlamps, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The present invention relates to spot lamps for automobiles, motor boats and the like. More specifically the invention is concerned with that type of spot lamp which, in the automobile adaptation, is operable from a control mechanism located within the driver's compartment. The pre-eminent advantage of this construction resides in the ability to operate the spot lamp from within the car in any type of car and under any condition. Spot lamps having this interior control feature are particularly adaptable to use on limousines and other closed cars, and, in fact, are the only types of spot lamps which can be practically mounted on a closed type of car. Similarly, in the case of the open body car, this control feature permits convenient operation of the spot lamp when the side curtains of the car are down, without the objectionable necessity of unfastening the side curtains, and exposing the hand or arm to the weather.

The fundamental object of the present invention is to simplify and facilitate the operation of such types of spot lamps, by providing an improved and simplified form of control mechanism which can be operated with the utmost facility.

A secondary object of the invention is to provide an improved form of lock or detent for locking the lamp in any adjusted position. This improved form of lock is so devised that its operation does not hinder or incumber the adjustment of the lamp.

Further objects will appear in the following description taken in connection with the accompanying drawings, in which:

Figure 1 is an elevational view of one form of improved spot lamp as mounted on a closed type of car;

Figure 2 is an enlarged fragmentary longitudinal sectional view through the same;

Figure 3 is an inverted plan view of one of the operating gears, illustrating its universal mounting;

Figure 4 is a transverse sectional view taken on the plane of line 4—4 of Figure 2;

Figure 5 is a similar view taken on the plane of 5—5 of Figure 2;

Figure 6 is a similar fragmentary view illustrating a modified construction;

Figure 7 is a fragmentary sectional view of another embodiment having the same principle of operation;

Figure 8 is a longitudinal sectional view through another form of my invention, being taken approximately on the plane of the line 8—8 of Fig. 10.

Figure 9 is a similar view of a modified construction;

Figure 10 is a sectional view taken on the plane of the line 10—10 of Figure 8;

Figures 11 and 12 are transverse sectional views of the construction illustrated in Figure 9, these figures being taken on the section planes 11—11 and 12—12, respectively, of Figure 9.

Figure 13 is a horizontal sectional view through the windshield and corner rail of a closed type of car, illustrating the mounting of another form of my invention;

Figure 14 is an enlarged sectional view taken on the plane of line 14—14 of Figure 13 and on the plane of the line 14′—14′ of Figure 15;

Figure 15 is a transverse sectional view taken on the plane of line 15—15 of Figure 14; and

Figure 16 is a fragmentary sectional view through the ball and socket joint of another modified construction.

Referring first to the embodiment illustrated in Figures 1 to 6 inclusive, it will be noticed that the spot lamp proper, which is designated 4, has a universal mounting in a housing 5. This housing is supported on the body of the automobile in any suitable manner; in the embodiment shown this being accomplished by a supporting sleeve 6, which is mounted on or adjacent the windshield of the car. In Figure 1, the device is illustrated as being mounted on a limousine or closed body type of car, and in this adaptation the sleeve 6 is formed with an integral lateral angle bracket 7, which is screwed or otherwise rigidly fastened to the corner rail 8 of the car. The operating shaft

is extended through the windshield 9 into the interior of the car as I shall hereinafter describe. For mounting on an open body type of car, the sleeve 6 would be provided with any suitable form of clamp or bracket for mounting on the side rail of the wind shield, as I have fully shown and described in my co-pending application, Serial No. 381,370, filed May 14, 1920. The control means for adjusting the lamp 4 consists of a single control knob 11, which is situated in convenient reach of the driver.

The universal adjusting motion of the lamp is provided for by a forward and back-tilting motion of the lamp, about a horizontal axis, together with a rotational motion of the lamp about its vertical or inclined axis, as indicated by the various dotted line positions shown in Figure 1. This universal mounting is afforded by a ball and socket mounting of the lamp comprising a ball 12 confined in a spherical socket 13 in the top of the housing 5. The ball 12 is suitably secured to the bottom of the lamp 4 by a stem 14 and mounting plate 15. For convenience and cheapness of manufacture and assembly I preferably construct the housing 5 of two parts 16 and 17, which can join on a vertical axial plane extending through the center of the ball 12. Thus, one-half of the spherical socket 13 is formed in each casing side, whereby the casing may be readily assembled over the ball 12 for interlocking the same in the socket 13 without the necessity of additional screw-threaded socket glands, etc. The left-hand half 16 is illustrated as being formed integral with the mounting sleeve 6, the other removable half 17 being fastened to the meeting face 18 of the other portion by a plurality of screws 19. Both casing sections are provided with co-operating recesses 21 extending downwardly from the socket 13, which recesses embrace and guide a pin 22 which is slidably or reciprocably mounted in the ball 12. The pin 22 is provided with a longitudinal slot 23 into which projects a spline or key 24 extending inwardly from the bore 25 in the ball 12. The lower end of the pin 22 carries a driven bevel gear 26 which is in constant mesh with a driving bevel gear 27 mounted on the end of operating shaft 28 which extends back to the control knob or handle 11. Through the medium of the driven bevel gear 26 the pin 22 is adapted to be rocked back and forth to incline the lamp up or down, or is adapted to be rotated when in its vertical position or any of its inclined positions, for rotating the lamp from right to left. To this end I have provided a novel construction of ball and socket mounting between the bevel gear 26 and the pin 22 which enables the gear to rotate the pin, irrespective of the angle between the two. The ball 29 on the lower end of pin 22 is mounted in a spherical socket 31 formed in the gear 26 by the addition of a removable collar 32. The web of the gear 26 and the collar 32 are formed with the co-operating halves of the spherical socket 31, these two members being assembled over the ball 29 by fastening the collar 32 to the face of the gear 26 by screws 33. Both the bevel gear and the collar are provided with diametrically opposite grooves 34, which are adapted to register to form vertical grooves for the reception of the diametrically opposite pins 35, projecting from the ball 29. By virtue of this construction it will be seen that the bevel gear 26 and pin 22 are capable of wide angular deviation without interrupting or interfering with the driving connection from the gear to the pin, whereby the gear is enabled to rotate the pin 22 when the pin is in any of its inclined positions. The two gears 26 and 27 are firmly held in their right-angled relation for proper mesh of the teeth by a construction of yoke consisting of separable yoke sections 37—37. The collar 32 is formed with a flange 38, and embracing the groove defined by the above mentioned flange are the horizontal semi-circular extensions of the yoke sections 37. The vertical extensions of the yoke sections 37 are formed with semi-circular portions to embrace the reduced portion 28′ on the end of the shaft 28. A nut 39 screws over the reduced end 41 of the shaft and rotatably confines the yoke section 37 against the face of the driving bevel gear 27. This gear is threaded or pinned on the shaft 28. The ends of the yoke sections are formed with lugs 42 for the reception of clamping screws 43 and the angles of the yoke sections are similarly joined by a screw 44. As an alternative construction, the yoke may be constructed in a single piece having ring portions at its ends for assembly under the collar 32 and nut 39. In addition to retaining gears 26 and 27 in right angle relation, it will be apparent that this yoke transmits the to and fro rectilinear or reciprocating motion of the operating handle and shaft 28 to the gear 26, for the purpose of rocking the pin 22 and thereby the lamp 4 about the ball and socket joint 12—13.

The yoke is assisted in retaining the driven bevel gear 26 in horizontal position by inwardly extending shoulders 46 (Figure 5) against which the top of the bevel gear 26 bears in its rectilinear motion. The opposing recesses 21 in the two casing halves, snugly engage the sides of the pin 22 so as to avoid any lateral wabbling of the pin and lamp.

In Figure 6, I have illustrated a modified construction wherein the weight of the driven bevel pinion and ball and socket joint, is carried by the casing instead of by

the yoke 37—37. In this form the gear 26′ is formed with an upper annular flange 47 which is adapted to engage and be supported in longitudinal grooves 48 defined by longitudinal ribs 49 projecting inwardly from each of the casing sections. In this form, the yoke 37 only functions to transmit the rectilinear motion of the shaft 28 to the gear 26′. As illustrative of an alternative construction, the pin 22′ can be formed integral with or fixed to the ball 12 and the lower sphere 29′ can be carried entirely by the gear 26′, the longitudinal keyed motion occurring between the pin 22′ and the lower sphere 29′. The operating shaft 28 is extended rearwardly through a bushing sleeve 51 in the supporting sleeve 6 and thence extends into a rear tubular stem or sleeve 52, forming a continuation of sleeve 6 projecting into the interior of the car. In some of the claims I may refer to the parts 5, 6 and 52 jointly as a sleeve since together they form a housing or sleeve, but the term "sleeve" as generally used in the claims will refer to part 6 or to parts 6 and 52.

As shown in Figure 1, the stem or sleeve 52 is preferably supported by threading over the reduced end 53 which projects from the supporting sleeve 6 through an aperture 54 in the windshield pane 9. The sides of the pane 9 and the aperture therein are provided with cushioning surfaces 55 of felt, rubber or the like which are compressed against the glass by the co-operating flanges 56 and 57, to avoid vibration between the lamp mounting and the windshield pane and to avoid fracturing of the glass around the aperture 54.

Referring again to Figure 2, it will be observed that the control knob 11, which is preferably constructed of rubber, fibre, vulcanite, or the like, is provided with a sleeve 58 which extends inwardly over the end of the stem 52. The sleeve 58 is formed with flange 59 which is secured to the body of the knob or wheel 11 by screws 61 which also extend through a disc 62 mounted in front of the wheel or knob 11. The disc 62 is formed with a central hub 63 which is rigidly fastened to the end of the operating shaft 28 by a pin or screw 64. This end of the operating shaft 28 is provided with a relatively long diametrical slot or recess 65 cut entirely through the shaft, there being a co-extensive slot 66 in the hub 63 to register with one side of the slot 65. Mounted in the slot 65 on a transverse pin 67 is a detent lever 68 which is designed to lock the lamp 4 in any of its adjusted positions by locking the shaft 28 against either longitudinal or rotary motion. The nose 69 of this lever is adapted to engage in any one of a plurality of locking holes 70 in the end of the stem 52. These locking holes are preferably formed in a separate sleeve 71, which is rigidly secured in a counter bore in the end of the stem 52 to snugly engage over the end of the shaft 28. The nose 69 of the detent lever is adapted to be projected out through one side of the slot 65 to engage in one of the locking holes by a leaf spring 72 which is pinned to the lever at 73 and has its resilient end bearing against the inner part of the hub 63. As shown in Figure 4, one part of the operating knob 11 is notched out over a considerable portion of its periphery as indicated at 74, for the reception of a matching segment 75, which is adapted to release the detent lever 68. The end of the lever 68 is flared outwardly in the form of a segmental plate 76 fastened to the back of the operating segment 75 by screws 77. The segmental plate 76 extends through the slot 66 in hub 63 and through the opening 78 cut out in the flange 59.

When the detent or locking lever 68 is engaging in the locking holes 70, it will be noted that the control knob 11 is rigidly locked against longitudinal motion as well as against rotational motion, so that the lamp 4 is firmly held in fixed position. To release the lock, the lock releasing segment 75 is merely "squeezed" into the body of the knob 11, this motion being the natural result following subconsciously from the simple act of grasping the operating knob 11. In making an adjustment of the lamp the knob 11 is then shifted either backwards or forwards or is rotated, depending upon the direction in which the light beam is to be swung. The longitudinal shifting motion of the control knob tilts the axis of the lamp forwardly or backwardly in a plane parallel to or coincident with the plane of the operating shaft 28. The rotary motion of the control knob revolves the lamp about any of the selected axes in this plane. By the proper combining of the shifting and rotary motions of the control knob, it will be apparent that the lamp may be made to assume various intermediate angles between the azimuth and vertical. The adjusting motion readily becomes instinctive, it being noted that simultaneous adjustment in both planes can be performed by a twisting or cork-screw motion of the control knob. The multiplicity of locking holes 70 enable the lamp to be locked in practically any adjusted position.

In Figure 7, I have illustrated a more simplified construction wherein the upper bevel gear 26′ is carried directly on the ball 12′ about which the lamp 4 is arranged to swing. In this form, the housing 5′ can be made considerably smaller, owing to the fact that it is not necessary to provide room for horizontal motion of the gear 26′. The housing is preferably of generally spherical

form, and may be split on a vertical median plane, or assembled in any other suitable manner. The upper part of the housing (or the two halves thereof if the housing is split) is formed with a guiding recess 81, preferably of cylindrical form, in which the upper section 82 of the upper bevel gear has rotatable mounting. The upper and lower halves 82 and 26′ of the upper bevel gear are formed with cooperating semi-spherical sockets, which unite in a spherical socket 83 assembling over the ball 12′. The two sections 82 and 26′ are preferably secured together by screws, similarly to the screws 33 of the previous embodiment (Fig. 3), and both upper and lower sections are provided with diametrically opposite grooves 34′ which are adapted to register to form vertical grooves for the reception of the diametrically opposite pins 35′ projecting from the ball 12′. As before mentioned, this bevel gear is guided for rotary motion in the cylindrical recess 81, in which the gear is held by extending lugs or bridge projections 84 extending inwardly from the housing walls of each housing section, and bearing under a depending hub portion 85 on the bottom of the gear. The stem 14′ which supports the lamp extends out of the casing through an opening 86 in the top thereof.

The bevel gear 26′ is rotated for horizontal swinging of the light beam through a cooperating bevel gear 87 which is splined on the operating shaft 28. The gear 87 is held against reciprocatory motion by having formed on the hub thereof a collar 88 which engages in an annular groove 89 formed in the two housing sections. When the housing sections are assembled, the engagement of the collar 88 in the groove 89 prevents reciprocation of the gear 87 with the motion of the shaft 28, but permits unhindered rotation of the gear 87 simultaneously with the shaft. A key or feather 91 extends inwardly from the bore of the gear and engages in a keyway 92 extending longitudinally of the shaft.

For depressing or raising the light beam, the ball 12′ is adapted to be rocked in its spherical socket 83 in the upper bevel gear 26′ through a stem 93 which extends upwardly into a cylindrical axial bore 94 in the ball. This stem is rotatable and reciprocal in the ball, and at its lower end is formed with a spherical socket 95 for receiving the ball 96. A nut or bonnet 97 having a spherical depression therein threads over a lateral hub projecting from the end of the stem 93 and completes the spherical socket 95. The ball 96 is carried on the end of the shaft 28, such as through the medium of the threaded stem 98 screwing into the end of the shaft 28.

In the operation of this embodiment, the rotation of the shaft 28 revolves the upper bevel gear 26′ and this, through the medium of the arcuate grooves 34′ and pins 35′, rotates the ball 12′ and lamp 4. The elevation or depression of the light beam can be performed independently or simultaneously with this rotary motion by thrusting or pulling on the control knob, the resulting reciprocating motion of the shaft 28 operating through the ball and socket joint 96 and 95 to incline the stem 93 and thereby rock or tilt the ball 12′ and lamp 4.

In Figure 8, the operating handle in the driver's compartment has the same universal motion as the lamp supported outside of the car. The lamp is fragmentarily illustrated at 4′ and the control handle is designated 101. Extending between the lamp and the control handle is a tubular housing or sleeve 102, which may be mounted by a bracket or clamp on the windshield of the car or which may be extended through the corner rail or windshield as previously described. The windshield or corner rail may be considered as diagrammatically represented by the dotted lines 103. At either end the sleeve 102 is formed with a bridge 104 extending diametrically across the same, each of these bridge members having central hubs 105 which are internally threaded. Screwing into the rear hub 105 is a stud 106 which carries a ball 107 at its end. A nut 108 on the stem enables the stem to be rigidly screwed into the hub 105 and a set screw 109 may be employed for locking the stud in place. The handle 101 is arranged for universal movement about the ball 107 and to this end is formed with a semi-spherical head 111 which is provided with a semi-spherical socket 112 engaging over the ball 107. To hold the head member 111 on the ball 107, a disc 113 is screwed to the diametrical face of the head 111 by screws 114, this disc having a central opening 115 of spherical curvature which embraces the other half of the ball and prevents the head 111 from being withdrawn or displaced from the ball.

The lamp 4′ is similarly provided with a semi-spherical head 116, the flat face of which is cut on a diametrical plane to enable the head to be readily assembled over a ball 117 on the end of the stem 118 which screws into the front hub 105. A disc 119, similar to the disc 113, is screwed to the face of the head 115 to hold the latter in place on the ball 117. The universal motion of the handle 101 is transmitted to the lamp 4′ through a series of rods 121, preferably four in number, which connect the head 111 with the head 116. As shown best in Fig. 10, these rods are equidistantly arranged around the axis of the heads 11 and 116 and to accommodate these various angular motions of the heads 111—116 the ends of these rods have ball and socket mountings

in the heads. This is accomplished by forming spherical ends 122 on the rods and seating these ends or ball tips in the semi-spherical depressions 123 in the faces of the two heads 111 and 116. The discs 113 and 119 have openings 124 of spherical curvature which embrace the backs of the ball tips 122 and retain the latter in the spherical depressions 123. The openings 124 in these discs are flared outwardly at the rear as indicated at 125 to permit extensive angular motion of the heads 111 and 116 without binding on the rods 121.

The lamp is adapted to be locked in any adjustable position by a pawl 126 which is recessed into the inner head 111 and which is adapted to lock in any one of a series of locking holes 127 in the inner face of the ball 107. The pawl 126 is pivoted in a slotted recess 128 on a pin 129 extending transversely through the head 111. The pawl is adapted to be retracted from the locking holes 127 by the inward depression of a button 131 at the outer end of the control handle 101. This button 131 connects through a reciprocal rod 132 which has pivotal connection with the inner end of the pawl, the pawl being normally thrust into one of the locking holes 127 by a compression spring 133 which is counterbored in the outer end of the handle 101.

The ends of the tubular housing 102 are closed by cylindrical shells 135 which screw over the threaded ends 136 of the tubular housing, the outer ends of these shells being contracted spherically to partially embrace the semi-spherical heads 111 and 116. The conducting cord 137 enters the tubular housing 102 through the opening 138 and extends through longitudinal bores drilled in the ball and stem 117—118 and in the head 116. The front part of the ball 117 is cut out as indicated at 139 to avoid pinching of the conductor 137 when the head 116 is inclined.

It will be apparent that any inclination imparted to the head 111 through the handle 101 will be transmitted to the head 116 at the same angle and in like degree through the rods 121—121. For example, a downward inclination of the operating handle 101, such as one would instinctively give the rear handle on the ordinary spotlight for directing the beam upwardly, draws the two upper rods 121 backwardly under tension and pushes the two lower rods 121 forwardly under compression, thereby rocking the head 115 to elevate the lamp 4′ and direct the light beam upwardly. This operation of thrusting some of the rods forwardly and drawing others backwardly of course always follows irrespective of whether the handle 101 is inclined horizontally, vertically or at any intermediate angle.

It is not essential that four rods 121 be employed, as three would suffice and in Figure 9, I have illustrated an embodiment employing only two. In this form the intermediate portion of the tubular housing 102′ may be contracted to a smaller dimension by having the reduced number of rods. The balls 107′ and 117′ are mounted in lugs 141 projecting downwardly and inwardly from the ends of the tubular housing 102′. The two semi-spherical heads 111′ and 116′ have their socket depressions 112′′ arranged eccentrically so as to give a greater radius of head below the balls 107′—117′ for connection with the rods 121′. The two rods have pivotal connection with the heads at lower diagonal points thereof, as shown in Figures 11 and 12. The rods 121′ have the previous form of ball and socket connection with the heads, and in the contracted portion of the tubular housing 102′ are humped upwardly and inwardly as clearly shown in Figure 12.

It will be apparent that upon raising or depressing the handle 101′ in a substantially vertical plane the rods 121′ act conjointly under tension or compression to raise or lower lamp 4′. Upon a horizontal motion of the operating handle 101′ or any motion thereof involving a horizontal component one rod 121′ will be thrust forwardly and the other drawn backwardly to turn the lamp to right or left as the case may be. Obviously this lateral swing of the lamp can be combined with any vertical depression or elevation so that the range of adjustment from the handle 101′ is substantially univarsal within its field of movement.

In Figure 13, I have shown an embodiment adapted for mounting directly in the windshield or corner rail in a closed body type of car. Figure 13 represents a horizontal sectional view through the body of an automobile adjacent one end of the windshield, one of the corner posts or standards for supporting the top being indicated at 144 and a side panel or door being indicated at 145. The glass 146 has its margin set in a channel rail 147, the edge of the windshield being defined by the channel 147 or by a rail 148 of angular section which abuts the shoulder 149 on the corner standard 144. The lamp 4 is supported directly in a ball and socket joint 151—152 which is embodied in the enclosing part of the automobile in order to enable the operating handle 153 to project inwardly into the driver's compartment. The socket 152 may be built into the corner standard 144 or may be embodied in or along the margin of the windshield as shown. In the arrangement illustrated, the socket 152 is constructed of front and rear sections 154 and 155 which abut on the diametrical plane of the socket and form cooperating semi-spherical depressions which combine to produce the socket 152. The two

socket sections are preferably formed with overlapping flanges which thread together as indicated at 156. The channel strip 147 may be so shaped as to embrace the socket sections between this channel strip and the angular rail 148. The front socket section 154 is provided with a flange 156 which overlaps the front of the channel strip and marginal rail, and the rear socket section 155 is provided with a similar flange 157. The inner spherical faces of these socket sections are provided with annular grooves 158 extending parallel with the diametrical line of separation between the sections. These grooves are preferably cut so that their lateral walls extend inwardly towards the center of the spherical socket on substantially radial planes, the central groove being formed by uniting half grooves cut in the opposing faces of both socket sections.

For locking the lamp 4 in any given position the ball 151 is provided with a plurality of small plungers which are adapted to be projected out of the ball into the grooves 158. As shown in Figures 14 and 15, the ball 151 is constructed of front and rear semi-spheres 161 and 162 which are united on the diametrical plane 163 by screws 164. The locking plungers, designated 165, are adapted to be projected outwardly of the sphere through openings 166 formed in the opposing faces of the sections 161—162 on the diametrical plane 163. Each plunger 165 constitutes part of a spring pressed block 167 which is adapted for reciprocation in the radial guideway 168 formed in the face of the front spherical section 161. Each block 167 is normally thrust outwardly under the action of a compression spring 169 in the inner end of the guideway. These locking plungers are adapted to be retracted into the confines of the sphere 151 by merely thrusting the control handle 153 forwardly into the sphere 151. The cylindrical neck portion 171 of the handle is guided for reciprocating motion in the rear ball section 162, and the inner end of this neck portion is threaded for the reception of a collar 172, which operates in a cylindrical recess 173 in the rear section. Corresponding to the angular position of each sliding block 167, there projects from the collar 172 an inclined arm 174, which engages in a slot in the block 167, bearing on an inclined face in this slot. Directly in the front of each block 167 is provided a narrow recess 176 for receiving the arm 174 when the same is thrust inwardly. A compression spring 177 extends from a bore in the front ball section 161 and bears against the end of the handle 153 to normally thrust the handle and cam arms 174 backwardly. It will be noted from the foregoing that by merely thrusting the handle 153 forwardly, the cam arms 174 retract all of the locking plungers 165 from the annular grooves 158 in the socket and permit the lamp to turn to any position. Upon releasing the handle 153, the same is thrust backwardly by the compression spring 177 which acts to thrust the locking plungers 165 outwardly into one or more of the locking grooves 158. The conducting cord is extended backwardly through the ball and socket joint through alined bores 179 in the lamp stem and in the handle, this cord being led downwardly out of the handle through a hole 181 intersecting the bore 179.

I have shown only two locking plungers 165 spaced at 90°. By this arrangement if one of the locking plungers should coincide with the axis of adjustment or inclination of the lamp, the other plunger would nevertheless be in position to lock the lamp by engaging in one of the grooves 158. It will be apparent, of course, that three or even more of these locking plungers 165 could be provided in the sphere 151, and with any desired spacing between the plungers. Where it is desirable that the sphere 151 be incapable of rotation in the socket 152, as for preventing the cord 178 from being twisted off, the sphere 151 may be provided with a pin projection 182 for engaging in a groove 183 extending axially of the socket 152 and lamp 4. For cooperating with the locking plungers 155—155, this pin is preferably placed in the position shown in Figure 15, this pin and groove connection between the pawl and socket preventing rotation of one relative to the other, but permitting free angular adjustments of the ball into any position.

In Figure 16, I have illustrated a modified construction wherein the lamp is locked in position by the separation of the two halves of the ball 151′. These are arranged for relative sliding motion to and from each other. The socket 152′ is constructed similarly to the above socket by the joining of the front and rear socket sections 154′—155′. The front ball section 161′ is formed with a boss 185 which has a slidable mounting upon an extension 186 projecting from the rear ball section 162′. The two ball sections are normally spread apart into firm contact with the walls of the spherical sockets by a compression spring 187 which is recessed into each ball section. The rear of ball section 162′ has a series of locking recesses 188 formed in its rear surface, which are adapted for cooperation with a locking detent or hump 189. This detent or hump is of spherical form to fit the depressions 188 and is positioned at the inner end of the flange 191 in proximity to the longitudinal axis of the ball and handle 153′, so that the hump will be able to clear itself of the locking recesses 188 when the handle 153′ is thrust inwardly. When the handle 153′ is released

after the setting of the lamp, the compression spring 187 thrusts the rear ball section backwardly and engages the locking hump 199 in the nearest locking recess 188, thereby rigidly locking the lamp in adjusted position. The conducting cord 178 is extended through the ball and socket joint and through the handle 153′ in substantially the same manner as above described. This form of ball and socket joint may be also provided with a pin 182 and longitudinal groove 183 to prevent rotation between the ball and socket if desired. Instead of being cylindrical as above described, the extension 186 may be of any polygonal formation for reception in a similarly formed bore in the boss 185 so as to prevent relative rotation between the front and rear ball sections 161′—162′.

It will be apparent, of course, that numerous changes may be made in the particular embodiment herein shown without departing from the spirit and scope of the invention.

I claim:

1. In combination, a rotatable and rockable stem, a lamp mounted on said stem, an operating shaft extending substantially at right angles to said stem, and motion transmitting means connecting said stem with said shaft and comprising a pair of cooperating gears whereby said shaft is operative to axially rotate said stem through said gears, said motion transmitting means also comprising mechanism whereby axial reciprocation of said shaft is operative to rock said stem in a substantially vertical plane extending approximately parallel with said shaft.

2. In combination, a stem, a lamp mounted on said stem and supported thereby, a substantially horizontal operating shaft, having rotational and reciprocatory motion for adjusting said stem, means supporting said stem permitting its rotation or inclination, and motion transmitting means connecting said stem with said shaft and comprising a pair of angle gears whereby rotation of said shaft is operative to axially rotate said stem, said motion transmitting means being also operative to rock or incline said stem in a substantially vertical plane extending substantially parallel with the axis of said shaft upon reciprocatory motion of said shaft.

3. In an automobile, the combination of a closed body having a hole extending therethrough, a lamp supporting housing comprising a tubular portion, a mounting member for mounting said housing on said automobile body with said tubular portion aligned with said hole, an operating shaft extending through said hole and through said tubular portion, a handle at the inner end of said shaft, a rotatable member journaled in said housing for rotation about an axis at an angle to the axis of said shaft, a spot lamp movably supported on said rotatable member, gears for rotating said rotatable member with the rotation of said shaft, and mechanism for moving said spot lamp relative to said rotatable member with the reciprocation of said shaft.

4. In an automobile, the combination of a closed body having a hole extending therethrough, a lamp supporting housing comprising mounting means for rigidly mounting said housing on said automobile body in alignment with said hole, an operating shaft extending through said hole and into said housing, a handle at the inner end of said shaft operative to rotate and reciprocate said shaft, a rotatable member journaled in said housing, a spot lamp pivotally supported by said rotatable member for motion relative thereto, gear mechanism for rotating said rotatable member with the rotation of said shaft, and means for pivotally tilting said spot lamp relative to said rotatable member with the reciprocation of said shaft.

5. In combination, a supporting member, a universal joint carried by said supporting member and comprising a ball member and a socket member, a lamp supported by said universal joint, and adjusting means for said lamp operative to rotate both of said members of the universal joint and to incline said lamp through said universal joint.

6. In combination, a stationary housing adapted to be fixedly mounted through a portion of an automobile and in connection with the windshield thereof, an operating shaft adapted to extend from the inside to the outside of the automobile body, the outer end of said shaft having reciprocable and rotational motion in said housing, an operating handle at the inner end of said shaft, a spot lamp pivotally supported by said housing for motion in two planes, gearing in said housing for translating the rotary motion of said shaft into rotary motion of said spot lamp in a horizontal plane, and means for translating the reciprocatory motion of said shaft into adjustment of said spot lamp in a vertical plane.

7. In combination, a housing adapted for mounting on or adjacent the automobile wind shield, an operating shaft adapted to extend from the inside to the outside of the automobile body, the outer end of said shaft having reciprocable and rotational motion in said housing, an operating handle for actuating said shaft, a spot lamp supported by said housing, a first gear journaled in said housing and operative to rotate said spot lamp in one plane, a second gear in said housing rotated by the rotational motion of said shaft and operative to revolve said first gear, and means passing axially through said first gear and movable relative thereto for connecting said spot lamp with said

shaft whereby reciprocatory motion of said shaft is operative to adjust said spot lamp in another plane.

8. In combination, a spot lamp, means for supporting said lamp to permit its motion in two paths, an operating shaft mounted for reciprocation, and means connecting said operating shaft with said lamp supporting means and operative to incline said lamp upon reciprocation of said shaft, said connecting means comprising a first gear element actuated by said shaft, and a second co-operating gear element connected to said lamp supporting means for rotating the latter about a substantially vertical axis.

9. In combination, a spot lamp, a lamp supporting member mounted for rotation and inclination, an operating shaft mounted whereby it is capable of axial rotation and reciprocation on the same horizontal axis, an operating handle mounted on the inner end of said shaft, and means comprising a pair of gears connecting said shaft with said lamp supporting member whereby rotation of said handle axially rotates said lamp supporting member about a substantially vertical axis and reciprocation of said handle inclines said lamp supporting member.

10. In combination, a lamp supporting housing adapted to be fixedly mounted to, and through an opening in an automobile windshield, a spot lamp mounted on one end of said housing, a stem projecting from said housing for supporting said spot lamp, said stem being mounted on the housing for axial rotation and axial inclination, an operating handle having motion in a plurality of paths connected to the opposite end of said housing, and means including gears within said housing operatively connecting said handle with said stem.

11. In combination, an automobile having a windshield, a tubular housing mounted on said automobile adjacent said windshield, said housing projecting outwardly from the automobile body, a ball and socket joint at the outer end of said housing removed from the automobile body, a lamp carried by said ball and socket joint, and an operating member extending back into the automobile body through said tubular housing.

12. In combination, a tubular housing adapted for mounting on an automobile adjacent the windshield, said housing being adapted for projecting outwardly from the automobile body, a ball and socket joint at the outer end of said housing removed from the automobile body, a lamp carried by said ball and socket joint, an operating member extending back through said tubular housing, said operating member having an endwise thrusting motion and a separate secondary motion, and means connecting said operating member with said ball and socket joint whereby said motions are operative to adjust said lamp.

13. In combination, a supporting member, a ball and socket joint carried by said supporting member, a lamp actuated by said ball and socket joint, a first bevel gear for rotating the socket member of said joint, a second bevel gear for rotating said first bevel gear, and operating means for actuating said second bevel gear.

14. In combination, an automobile having a windshield, a tubular housing supported on said automobile, said housing projecting forwardly from said windshield, a ball and socket joint at the outer end of said housing removed from the automobile body, a lamp carried by said ball and socket joint, operating means extending back into the automobile body through said tubular housing, and a control handle operatively connected to said operating means.

15. In combination, a lamp supporting member for mounting a spot lamp outside of the automobile body, an operating handle for operation inside of the driver's compartment having a substantially horizontal reciprocatory motion and a rotational motion, and means comprising a pair of bevel gears connecting said handle with said lamp whereby said reciprocatory motion is operative to incline said lamp in a substantially vertical plane, and said rotational motion is operative to rotate said lamp in a substantially horizontal plane through substantially a complete circle.

16. In combination, a lamp supporting member for mounting a spot lamp outside of the automobile body, an operating handle for operation inside of the driver's compartment, a tubular member extending from said lamp supporting member to said handle, said handle having a reciprocatory motion relative to said tubular member, said handle also having an axial rotational motion through substantially a complete revolution, and operating means connected to said handle and extending through said tubular member to said lamp, said operating means being arranged whereby the reciprocatory motion of said handle is operative to incline said lamp in a substantially vertical plane, said operating means comprising a bevel gear connected to said lamp supporting member and a bevel gear connected to said handle for transmitting the rotational motion of said handle to said lamp to revolve said lamp to direct the light beam to front, sides and rear of the car through substantially a complete revolution.

17. In combination, a lamp, an operating shaft having translational and rotational movement for actuating said lamp, a control handle on said shaft, said control handle having a slot therein, a detent in said slot adapted to be projected therefrom, a locking

member surrounding said shaft and having internal locking surfaces adapted to be engaged by said detent, and a detent releasing member normally projecting from said handle and connecting to said detent.

18. The combination with a spot lamp adapted for mounting in an automobile windshield having a rail at one edge thereof, of an operating member adapted to extend through an aperture in the windshield for actuating the lamp outside of the windshield, a mounting member surrounding a portion of said operating member and adapted to be extended into the aperture in the windshield, and means for securing said mounting member to the rail at the edge of the windshield.

19. In combination with an automobile, a windshield, a rail at one edge of said windshield, said windshield having an aperture therein, an operating member extending through said aperture, a lamp supported outside of said windshield adapted to be adjusted by said operating member, a handle on said operating member inside of said windshield, a mounting member supporting said operating member, and means for securing said mounting member to said rail whereby the weight of the device is carried by said rail.

20. The combination with an automobile body comprising a supporting member and a pane of glass constituting part of the body enclosure, said pane of glass having an aperture therethrough in proximity to said supporting member, of an inside control spot lamp comprising an operating member having operative connection with said spot lamp and adapted to be extended through said aperture, and a mounting member adapted for attachment to said supporting member for supporting said spot lamp.

21. The combination with a spot lamp adapted for mounting on the windshield of an automobile or the like, of an operating shaft adapted to extend through an aperture in the windshield for actuating the lamp outside of the windshield, inner and outer cooperating members surrounding said operating member and adapted for disposal on the inner and outer sides of the windshield, a housing supported by the outer cooperating member and extending forwardly from the windshield, said housing supporting said spot lamp and receiving the forward end of said shaft, one of said cooperating members having a sleeve portion for extending through the aperture in said windshield, said sleeve portion being screw threaded, the other of said cooperating members having threaded engagement therewith, and cushioning gaskets for interposition between said cooperating members and the inner and outer sides of the windshield.

22. The combination with a spot lamp adapted for mounting in the windshield of an automobile or the like, of an axially reciprocable and rotatable operating member adapted to extend through an aperture in the windshield for actuating the lamp outside of the windshield, means for mounting said operating member in the windshield, and compressible means adapted for interposition between said mounting means and the windshield for absorbing vibration and protecting the windshield.

23. A bracket for spotlights adapted to project through a piece of glass forming a part of an automobile enclosure, including means to clamp on a primary support, a tubular element attached to said clamping means and adapted to receive and extend through said piece of glass, a rod journaled in said element, and a spotlight pivotally connected to the front end of said rod.

24. In a spot light for vehicles, the combination of a sleeve extending through the windshield frame, means for holding said sleeve against longitudinal and rotary movement in said frame, a shaft slidable and rotatable in said sleeve, means for adjustably securing the inner end of said sleeve to the shaft to hold said shaft against longitudinal and rotary movement in said sleeve, a lamp mounted on the outer end of the sleeve, a connection between the shaft and the lamp for swinging and bodily rotating the lamp, and a handle on said shaft whereby the shaft may be rotated to rotate the lamp or shifted longitudinally in the sleeve to swing the lamp.

25. A dirigible headlight for motor vehicles comprising, a lamp, a housing, a stem connected to said lamp, means in said housing journalling said stem whereby said stem may be rotated and inclined, a gear on said stem, an operating shaft mounted for rotation and reciprocation at an angle to said stem, a second gear mounted on said shaft and arranged to mesh with the first said gear, whereby upon rotation of said shaft said stem will be rotated, and means connecting said shaft and stem whereby reciprocation of said shaft will incline said stem.

In witness whereof I hereunto subscribe my name this 10th day of August, 1921.

CAMERON A. WHITSETT.