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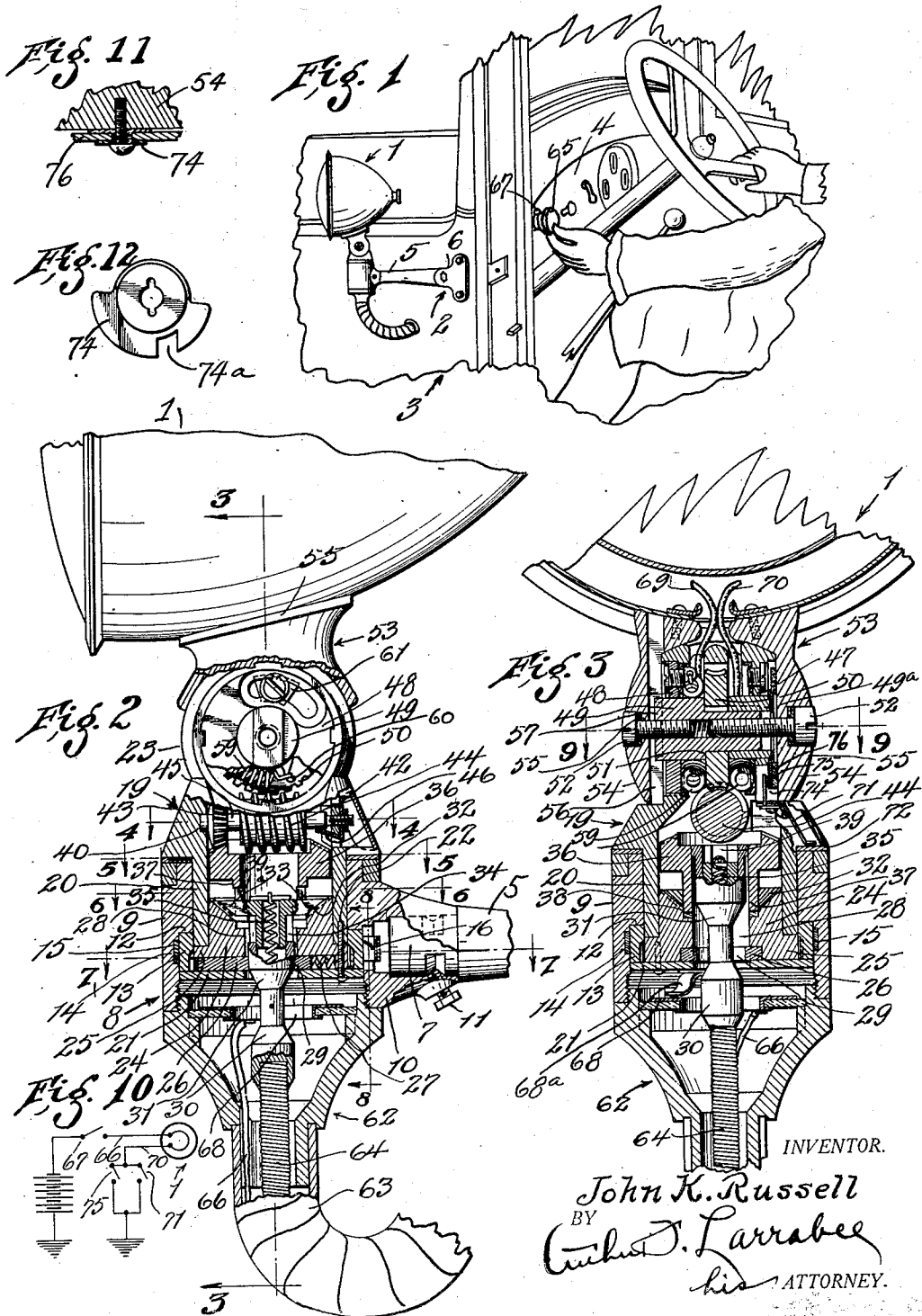
J. K. RUSSELL

1,833,308

SPOTLIGHT

Filed April 18, 1928

2 Sheets-Sheet 1



Nov. 24, 1931.

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Fig. 4

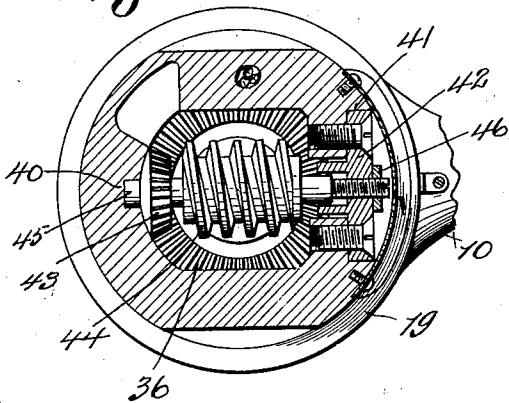


Fig. 5

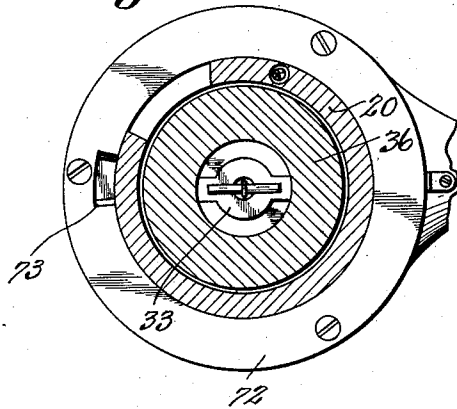


Fig. 6

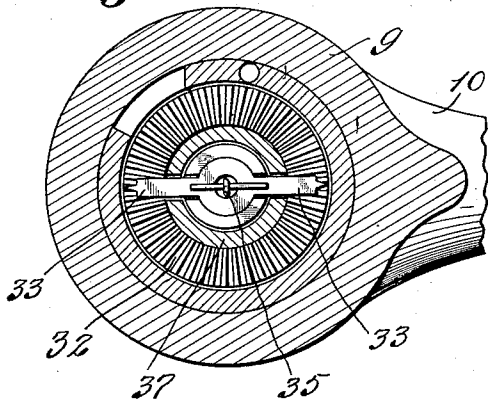


Fig. 7

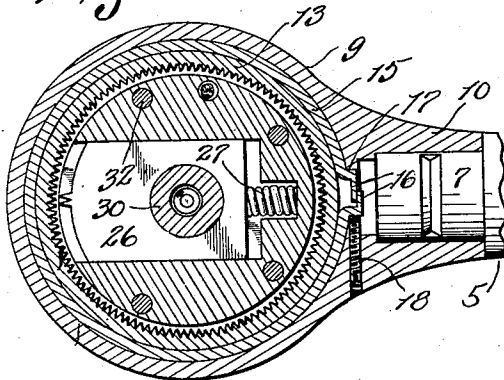


Fig. 8

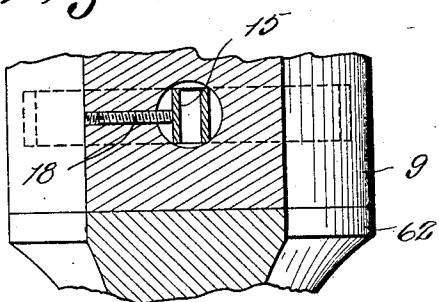
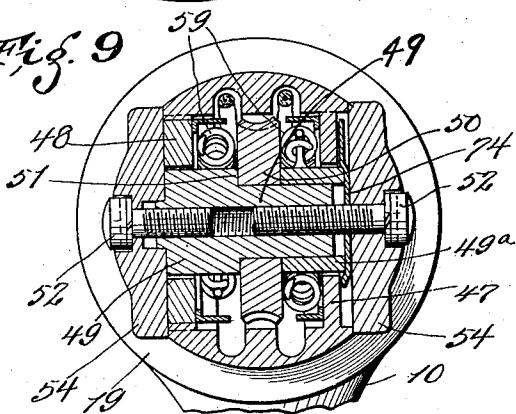


Fig. 9



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SPOTLIGHT

Application filed April 18, 1928. Serial No. 270,884.

This invention relates to the type of lights which may be bodily moved for substantially universal direction of its rays and has among its objects to provide a gear drive comprising a distant manipulative element whereby the lamp body may be selectively caused to revolve about a vertical axis or a horizontal axis either by said distant element or by force directly applied to the lamp body.

Another object is to provide simple, durable and inexpensive means, for mounting and moving a lamp body either by a distant manipulative control element and distant gear drives for selective directional movements of the lamp body, which means includes elements providing for movements of the lamp body by forces directly applied without effect upon the gear drives.

An important advantage incident to the structure of this invention is that breakage of parts, and particularly gear stripping, due to movements of the lamp body, by forces either intentionally or accidentally applied directly thereto, is eliminated.

Another object is to provide a novel combination of parts whereby the circuit to the lamp of a spot light will be automatically extinguished during movement of said light through predetermined arcs.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined description and the appended claims.

The accompanying drawings illustrate the invention in a form I at present deem preferable.

Figure 1 is a perspective view of a fragment of an automobile showing a lamp of my invention as mounted thereon and as operated by the driver.

Fig. 2 is an elevation, on an enlarged scale and partly in section, of a lamp mounting and gear drive constructed in accordance with my invention.

Fig. 3 is a vertical sectional elevation taken on line 3—3 of Fig. 2.

Fig. 4 is a sectional plan view taken on line 4—4 of Fig. 2, showing on enlarged

scale the master gear and the worm for vertical adjustment of the lamp.

Fig. 5 is a sectional plan view on the same scale as Fig. 4 and as taken on line 5—5 of Fig. 2 showing the master gear and a part of the automatic lamp control.

Fig. 6 is an enlarged sectional plan view taken on line 6—6 of Fig. 2 showing the gear selecting clutch.

Fig. 7 is an enlarged sectional plan view taken on line 7—7 of Fig. 2 showing the gear lock and tension means for normally maintaining horizontal adjustment of the lamp body.

Fig. 8 is an enlarged fragmental transverse sectional elevation taken on line 8—8 of Fig. 2 showing means for varying the tension drive shown in Fig. 7.

Fig. 9 is an enlarged sectional plan view taken on line 9—9 of Fig. 3 showing the gear and variable tension drive for vertical swinging of the lamp body.

Fig. 10 is a symbolic illustration of the lamp and the several switches and a diagram of the wirings.

Fig. 11 is a fragmentary enlarged sectional view showing the mounting of the ground brush to the turret fixture.

Fig. 12 is a detail view of the ground contact plate.

In the drawings the numeral 1 designates the spot light; 2 the spot light support; 3 the automobile body, and 4 the instrument board, all of which are, or may be, of conventional design and construction and except as combined with the device embodying my improvements, form no part of my invention.

As best shown in Fig. 1, the support comprises an arm 5 which is pivotally secured to a base fixture 6 so that the arm and light carried thereby may be vertically adjusted relative to the automobile body and as shown in Fig. 2, the arm at its forward end is provided with a cylindrical stub-shaft 7 about which the light may be rotated for its vertical truing.

The device 8 of my invention comprises a body portion, or arm supported fixture 9, which is of substantially cylindrical shape and provided with a tubular extension 10

for fitment over and rotary support upon the stub-shaft 7 of the supporting arm. By this expedient in connection with the set screw 11, the fixture 9 may be verticalized regardless of the position of the supporting arm which may vary as mounted at different locations on the automobile bodies. Adjacent the lower end, the fixture is diametrically reduced to form a shoulder 12 into and against which there is loosely fitted a floating ring gear 13. On the inner face of the fixture in the plane of the ring gear is an annular recess 14 for occupancy by an elastic band 15 that encircles the ring gear and whose free ends are each provided with overlapping tails 16 one of which engages a shoulder 17 in the fixture to prevent bodily rotation of the band and the other of which is engaged by a set screw 18 seated in the fixture for varying the tension of the band on the ring gear.

A turret fixture 19 having a collar 20 is fitted over and into the fixture 9 for normally free rotation therein and is secured against withdrawal upwardly therethrough by an assembly disc 21 which is secured to the collar of the turret fixture as by screws 22 and which rests against the ring gear. Surmounting the body proper of the turret and formed integral therewith is a head 23 of substantially cylindrical shape and whose axis is horizontal and at a right angle to the axis of the collar 20.

Fitted within the collar is a horizontal drive gear element 24 of cylinder form for fitment in the collar and which is provided with an outstanding flange 25 for extension beneath the collar and through which flange the recited screws 22 extend so that a rotation of the gear element, as by applied energy will effect rotation of the whole turret. Formed in the underneath face of the gear element is a recess in which a trigger 26 is mounted and which is acted upon by an extensible coil spring 27 to normally hold it to a position to engage and clutch into the ring gear 13.

Formed vertically through the gear element 24 is a bore 28, and formed through the plate like body of the trigger is a hole 29 through which bore and hole there is a vertically slidable drive shaft 30, having within its length a reduction forming a cam 31 for the actuation of the trigger against the tension of its spring 27.

In the upper vertical face of the horizontal drive gear 24 there is formed an annular rack 32 and in the upper end of the drive shaft is a cross-bar having teeth 33 at its ends for engagement, at times, with the rack of the horizontal drive gear, and said drive shaft is provided with lateral slots 34 whereby the cross-bar is keyed to revolve with the drive shaft.

A coil spring 35, as shown in Fig. 2, serves to provide a yielding connection between the

drive shaft and the cross-bar to allow slight movement of the drive shaft, as by a manual pull thereon, beyond the functional limit of the cross bar so that breakage of the bar is prevented.

The object of such mounting is to prevent breakage of any parts due to the movement and manipulation of the reflector casing by persons tampering with the light from motives of curiosity or other reasons.

If the reflector casing is moved forwardly in such a movement, the push is transmitted through a saddle or lamp supporting fixture 53 and pins 52 to a shaft 49 upon which is fitted loosely a worm-wheel 50. Upon both the shaft 49 and a collar 49a there is found a pin, the one on 49 being shown as 60 in Fig. 2. The pins face in opposite directions. To each of the pins one of the coil springs 59 is attached by its ends, so that motion of the shaft 49 extends these springs by the ends thereof through the pins. Upon cessation of the push or pull, as the case may be, the spring affected exerts its recuperative power to pull the light back into its original position without damage to any of its working parts.

A master gear 36 as shown in Figs. 2 and 3 is fitted into the collar 20 of the turret fixture and provided with a tubular nut 37, which rests in bearings 38 formed in the horizontal drive gear element and which is provided with slots 39 which provide keying the master gear to the drive shaft.

As best shown in Figs. 2 and 4, there is formed in the one side of the turret fixture a fixed bearing 40 and formed diametrically opposite thereto is a recess 41 for the reception of a removable bearing block 42 in which a pinion 43 and worm 44 carried on a shaft 45, may be assembled and carried in operating position and retained in such position as by a removable and adjustable spring clip 46.

The turret head 23 comprises a fixed cheek 47 and a removable cheek 48 in which the shaft 49 is revolvably supported. The worm wheel 50 which is fitted for normal idling thereon, and which is caused to be rotated therewith by tension means comprising a shoulder 51 on the shaft, the slip collar 49a on the shaft for engagement with the worm wheel in opposition to the shoulder and a pair of threaded journal pins 52 seated in the ends of the shaft.

The saddle, or lamp supporting fixture 53 which has cheeks 54 provided with bearings 55, is slipped over the turret head with its cheeks coinciding with the cheeks of the turret head and is journaled or hinged thereto as by journal pins 52. In the one cheek of the saddle, there is formed a vertical keyway 56 for coaction with a key 57 formed in the end of the shaft 49 to bodily rock the saddle over the turret head. At the upper end of the saddle, means, such as a perforated cap 55

provide for the attachment of the lamp body or barrel.

For carrying the lamp body in equipoised, or balanced relation with the turret fixture, I provide an equalizer comprising the opposed springs 59 having their ends respectively connected with the turret head and with the pins 60 which, as before described, radiate from both the shaft 49 and the slip collar, 49a. By preference and as shown, the springs are connected with the saddle, as by the adjustable blocks 61, whereby their tensions may be adjusted.

Secured as by threading, to the body portion 9 is a base fixture 62 which is tubular and tapers downwardly for connection with a housing tube 63 which is for extension to a point conveniently accessible to the driver such as the instrument board shown. This housing encloses a flexible shaft 64 operatively connected with the drive shaft 30 and with a knob 65 at the instrument board. A wire 66 is also extended through the housing tube for connection with a switch 67 adjacent the knob 65 and with a contact ring 68 fixed in the base fixture 62.

As shown in Figs. 2, 3, and 10, there is a brush 68a secured to the assembly disc 21 and a wire 69 extends therefrom through suitable openings in the several fixture parts to the lamp. A return wire 70 leads from the lamp to a ground brush 71 carried in the turret fixture, as shown in Fig. 3 for engagement with the top of a flat ground ring 72 carried on the body of the device.

As shown in Fig. 5, the ground ring has a dwell 73 which occupies a plane out of the path of the brush so that when the brush is moved thereover, the circuit is interrupted or broken and the lamp extinguished when a brush 75 is interrupted by passing into the cut away portion 74a of a contact plate 74.

When the switch at the instrument board is closed, the lamp is continuously lighted except when the light is moved to cast its beam directly forward at which time the brush and dwell as described, break the circuit.

The contact plate 74 is secured so as to rotate with the saddle, and the brush 75 is electrically connected with the described ground brush so as to extinguish the lamp when the lamp body is swung to a certain angle in its vertical movement in a manner similar to the described extinguishing means in connection with the horizontal movements of the lamp body.

A plan view of the ground contact plate 74 is given in Fig. 12. It will be seen that the contact edge of this plate is interrupted at 74a, as before mentioned. The mounting of the contact plate when in use is shown in Fig. 11. As long as the ground brush 71 is in contact with the metallic brush plate 74, the electric circuit for the spotlight lamp will

be complete by reason of the ground through the frame of the vehicle. Should the brush coincide with opening 74a, however, the brush will come in contact only with an insulating surface 76, through which no grounding can occur, and the lights will be extinguished while the brush remains in that position and the brush 71 is out of engagement with the ground ring 72 by being moved into register with the dwell 73.

When the knob, at the instrument board is pulled rearwardly and the drive shaft is depressed as shown in Fig. 2, the cross bar engages the teeth of the horizontal drive gear 13 and is in position to effect bodily turning of the turret and of all the gear elements therein and thus to rotate the lamp body on its vertical axis without effect on the vertical drive gear. When the knob is pushed forward the cross bar is disengaged from the horizontal drive gear and a turning of the knob effects only a turning of the master gear, and the worm gear of the vertical drive gear.

From the foregoing it will be seen that the circuit to the lamp will be broken only when the arms 71—75 of the ground brush are moved out of engagement with the ground ring 72 and the contact plate 74, and that as long as either of said arms 71 or 75 is in engagement with the ground ring 72 or the contact plate 74, the circuit to the lamp will be closed.

The ground ring 72 may be adjusted relative to the housing, and the contact plate 74 may be adjusted about the axis of the shaft 49 so that the arc through which the lamp may be extinguished may be varied to suitably adapt the lamp for satisfactory operation when mounted upon a vehicle.

I claim:

1. A spot light holder and moving means, comprising a fixture for securement to a fixed support; a second fixture rotatably mounted on the first recited fixture for rotation in a horizontal direction; a third fixture rotatably mounted on the second fixture for rotation in a vertical direction; a shaft having a knob distantly related to the said third fixture; a gear selector operable by said knob and shaft; a driving gear for effecting a vertical direction of the spot light; a second gear operable in conjunction with the first gear for effecting a horizontal direction of the spot light; and a resilient band having a tension device to provide relative slippage of one of the gear moved fixtures relative to its driving gear.

2. Spot light supporting and adjusting means comprising a supporting fixture; a rotatable collar mounted on said fixture; a drive gear within said collar and fastened thereto; a ring gear extending around a portion of said collar; a trigger mounted to rotate with said drive gear; said trigger being adjusted

to connect and disconnect said drive gear and ring gear; a spring tending to move said trigger into position to connect said gears; and a slidable drive shaft adapted to slide into and out of position for rotating each of said gears independently of the other, said drive shaft being provided with means to move said trigger against the opposition of its spring out of the gear connecting position, one of said gears being operatively connected with the spot light to rotate it in one plane, and the other of said gears being operatively connected therewith to rotate it in another plane.

3. Spot light supporting and adjusting means comprising a turret fixture, a collar supported by said fixture and rotatable about a vertical axis; a horizontal drive gear fitted into the lower end of said collar and fixed thereto; a floating ring gear having a working fit around said drive gear and collar; a trigger extending diametrically of said collar and mounted to rotate with said drive gear to slide transversely thereof, said trigger being adapted to connect and to disconnect said drive gear and ring gear; a spring tending to move said trigger into position to connect said gears, and a slidable drive shaft adapted to slide into and out of a position for rotating each of said gears independently of the other, said drive shaft being provided with a cam portion whereby during its movement into position for rotating said drive gear, it moves said trigger against the opposition of its spring out of the gear connecting position, one of said gears being operatively connected with the spot light to rotate it about a substantially vertical axis, and the other of said gears being operatively connected with the spot light to rock it about a substantially horizontal axis.

4. In a device of the character described, a body portion; a flat ground ring secured in the body portion, the ring being vertically co-axial with the body portion and having a cut-out portion therein; a spot light connected with an electric circuit and rotatably mounted in the body portion; a ground brush connected with the spot light and contacting the surface of the ground ring so as to be adapted to snap into the cut-out portion and thereby to open the circuit when the spot light is in a certain predetermined position relative to the body portion.

5. In a device of the character described, a body portion, a flat ground ring adjustably secured to the body portion, the ring being virtually co-axial with the body portion and having a cut-out portion therein; a spot light connected with an electric circuit and rotatably mounted in the body portion; a ground brush connected with the spot light and contacting the surface of the ground ring so as to be adapted to snap into the cut-out portion and thereby to open the circuit when the spot

light is in a certain predetermined position relative to the body portion.

6. In a device of the character described, a body portion; a flat ground ring secured in the body portion, the ring being virtually co-axial with the body portion and having a cut-out portion therein; a spot light connected with an electric circuit; a lamp-supporting fixture secured to the spot light and mounted in the body portion so as to be rotatable on an axis co-axial with the body portion and on an axis virtually at right angles to the axis of the body portion; a contact plate secured in the fixture so as to be rotatable therewith on the right-angular axis, the plate having a cut-out portion therein; a ground brush connected with the spot light and respectively contacting the ground ring and the contact plate so as to be adapted to snap into the respective cut-out portions of the ring and the plate and thereby to open the circuit when the spot light is in a certain predetermined position relative to the body portion.

7. In a device of the character described, a body portion; a flat ground ring secured in the body portion, the ring being virtually co-axial with the body portion and having a cut-out portion therein; a spot light connected with an electric circuit; a lamp-supporting fixture secured to the spot light and mounted in the body portion so as to be rotatable on an axis co-axial with the body portion and on an axis virtually at right angles to the axis of the body portion; a contact plate adjustably secured in the fixture so as to be rotatable therewith on the right-angular axis, the plate having a cut-out portion therein; a ground brush connected with the spot light and respectively contacting the ground ring and the contact plate so as to be adapted to snap into the respective cut-out portions of the ring and the plate and thereby to open the circuit when the spot light is in a certain predetermined position relative to the body portion.

8. In a device of the character described, a body portion; a spot light mounted in the body portion so as to be rotatable on an axis virtually at right angles to the axis of the body portion; and means for holding the spot light in a balanced position on the body portion.

9. In a device of the character described, a body portion; a spot light mounted in the body portion so as to be rotatable on an axis virtually at right angles to the axis of the body portion; and opposing springs connected with the spot light and arranged so as to hold the spot light in a balanced position on the body.

10. In a device of the character described, a body portion; a spot light mounted in the body portion so as to be rotatable on an axis virtually at right angles to the axis of the body portion; opposing springs connected

with the spot light and arranged so as to hold the spot light in a balanced position on the body portion; and adjustable means for regulating the tension of the springs.

5 In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 28th day of November, 1927.

JOHN K. RUSSELL.

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