

Dec. 17, 1957

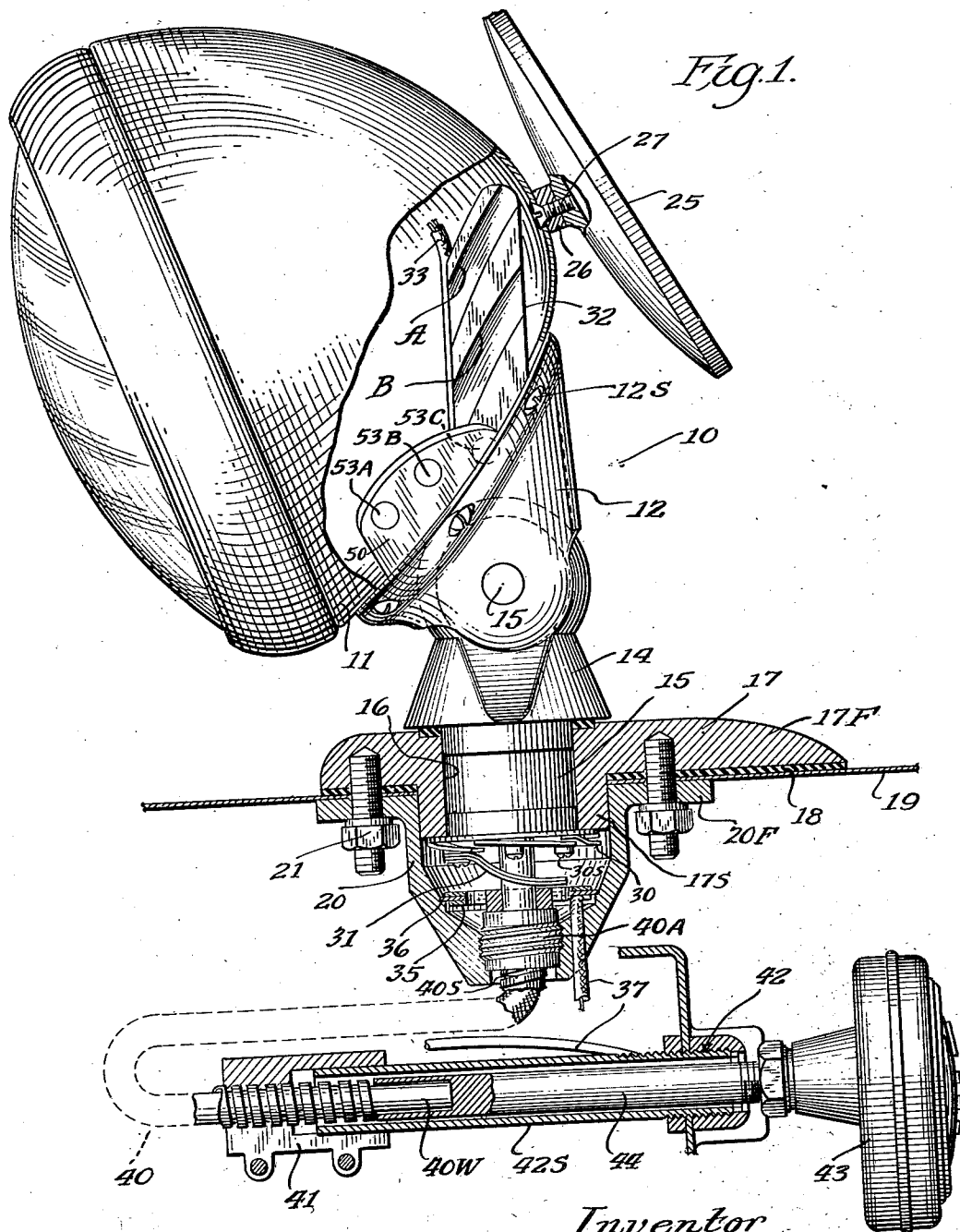
C. E. CAMERON

2,817,005

SPOTLIGHT

2 Sheets-Sheet 1

Filed April 9, 1956



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Fig. 2.

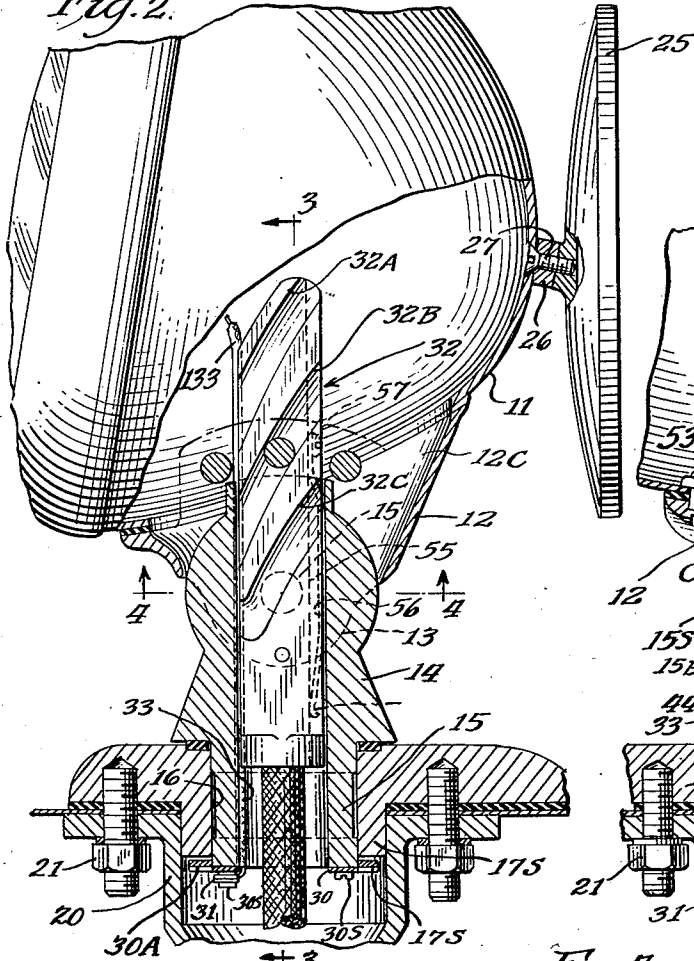


Fig. 3

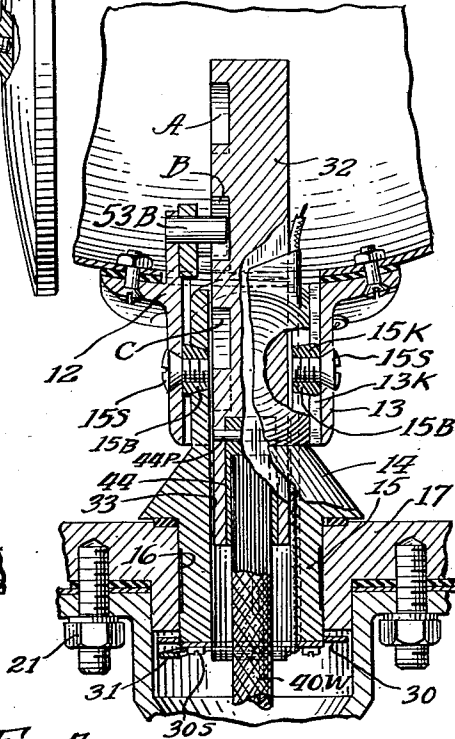


Fig. 4

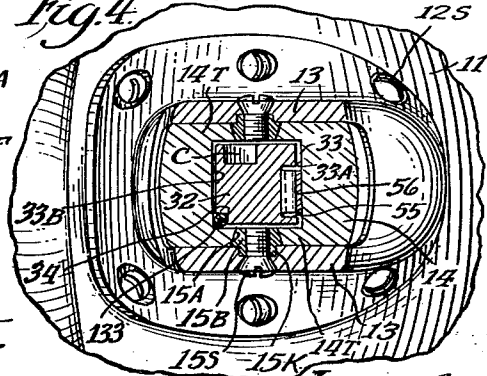
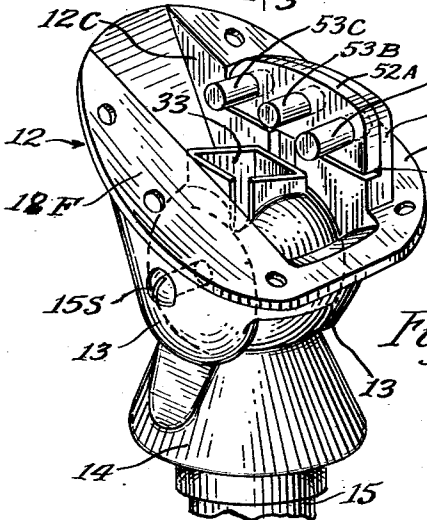


Fig. 5.



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SPOTLIGHT

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6 Claims. (Cl. 240—61.6)

This invention relates to spotlights of the kind used on vehicles such as automobiles, boats, airplanes and the like, and particularly the invention relates to remote control spotlights.

Remote control spotlights of the above character have been made with many different types of actuating or control apparatus, and one of the most effective and satisfactory operating devices for such spotlights has involved the use of an operating element that is capable of actuation through both longitudinal and rotative movements, and the rotative movement has been utilized in turning the spotlight, while the longitudinal movement of the operating member has been utilized to impart rocking movements to the light. Such an operating element or member has been operatively connected to the lamp housing of the spotlight by means of a cam connection somewhat in the nature of a spiral gear so that during longitudinal shifting movement of the operating member, a series of angularly disposed cam slots on one side of the operating member cooperate successively with a series of pins disposed in the lamp housing in an arcuate series centered upon the horizontal axis of the lamp housing. Through this arrangement and cooperation of the cam slots and the pins the longitudinal movements of the operating member are effective to impart the desired rocking movements to the lamp housing.

Where a remote control spotlight of the aforesaid character is used on a vehicle, such as an automobile, it often becomes desirable to utilize the lamp housing of the spotlight as the supporting means for a rear-vision mirror, and when such a rear-vision mirror is provided, additional utility is attained because the remote control means for the spotlight may also serve as a convenient adjustment means for the rear-vision mirror.

Such mounting for a rear-vision mirror has been utilized to some extent in industry, but it has been found that the lamp housing of a spotlight, such as that above described, is, in certain instances, subject to considerable vibration which, of course, interferes with the use of the rear-vision mirror. It is usually considered to be desirable that the normal adjustment of a rear-vision mirror be attained when the spotlight is in substantially its horizontal position or, in other words, when it is about midway between its upper and lower limits of rocking movement, and with the cam type of actuator above described, it is at this intermediate position of adjustment that any rocking or vibrating tendencies that are often found in the actuating structure are the most pronounced.

In view of the foregoing, it is the primary object of the present invention to enable cam-operated spotlights of the aforesaid character to be so constructed and arranged that the tendency toward vibration of the lamp housing is substantially eliminated, and another and related object of the invention is to enable vibration of the lamp housing of such a light to be substantially eliminated while at the same time making provision for adequate manufacturing tolerances in the parts thereof.

Other and further objects of the present invention will

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be apparent from the following description and claims, and are illustrated in the accompanying drawings, which by way of illustration show a preferred embodiment of the present invention and the principles thereof, and what I now consider to be the best mode in which I have contemplated applying these principles. Other embodiments of the invention embodying the same or equivalent principles may be used and structural changes may be made as desired by those skilled in the art without departing from the invention.

In the drawings:

Fig. 1 is a vertical sectional view taken through a spotlight embodying the features of the invention, and showing the remote control operating means in schematic association therewith;

Fig. 2 is a vertical sectional view showing the spotlight in a different adjusted position and showing further details of construction;

Fig. 3 is a vertical sectional view taken substantially along the line 3—3 of Fig. 2;

Fig. 4 is a horizontal sectional view looking in an upward direction and taken substantially along the line 4—4 of Fig. 2; and

Fig. 5 is a perspective view of the head and base of the light with the lamp housing removed.

In the form chosen for disclosure herein the invention is embodied in a remote control spotlight 10 having a lamp housing 11 that is secured on complementary upper flanges 12F of a bracket 12 by means such as bolts 12S, and this bracket provides a pair of spaced mounting ears 13 that extend downwardly and which are pivoted on a horizontal axis 15 on a supporting head 14. The head 14 has a downwardly extending stem 15 of a reduced size that projects into a vertical mounting bore 16 that is provided in a base 17, such base having horizontally extending flanges 17F that may through the intermediary of a gasket 18 be positioned on a horizontal surface or wall 19 of vehicle body as, for example, on the upper surface of the fender of an automobile. The base 17 also has a downwardly extending sleeve 17S which serves in part to form the vertical bearing or bore 16 and which projects through an opening in the mounting wall 19 and into a central opening or chamber in a cup-shaped lower retaining fitting 20. This fitting 20 has flanges 20F that engage the lower face of the mounting wall 19, and means such as stud and bolt connections 21 serve to clamp the fitting 20 and the base 17 in position on the vehicle. With the structure thus described the lamp housing 11 may be turned about the vertical axis of the bore 16 by rotation of the head 14, and the lamp housing may be rocked about the horizontal axis 15 by imparting rocking movements to the bracket 12. These adjusting movements of the lamp housing 11 may be utilized to position a rear-vision mirror 25 that is secured to a rear portion of the lamp housing 11 by means such as a spacer 26 and a securing screw 27 as will be evident in Figs. 1 and 2.

The turning and rocking movements are imparted to the lamp housing 11 by means including an operating member 32 that is mounted within the head 14 for longitudinal sliding movement in a vertical direction, and the member 32 is associated with the head 14 in such a way that rotative forces applied to the operating member 32 will impart corresponding rotating or turning movements to the head 14. While the specific structure of the operating member 32 will be described in detail hereinafter, it might be noted that, as herein shown, the operating member is generally square in its horizontal cross section and is slidable in a generally complementary square vertical passage 33 that extends entirely through the head 14 from top to bottom thereof.

The passage 33 makes it necessary to mount the pivot

means on the axis 15 in relatively thin wall sections of the base 14. Thus, as shown particularly in Figs. 3 and 4, these thin wall sections are indicated at 14T, and openings 15A are formed therein on the axis 15. In these openings, bearing members 15B are positioned so that these bearing members terminate at the adjacent side wall of the opening 33. The bearings 15B have what amount to key sections 15K formed therein with parallel side walls that are complementary to key slots 13K formed on the inner surfaces of the ears 13. Screws 15S extend through aligned openings in the ears 13 and are threaded into the bearing members 15B, thus to hold the bearing members 15B with the key portions 15K thereof in engagement with the slots 13K. The bearings 15B thus rotate or rock with the bracket 12 and act as bearings in the bearing openings 15A, Fig. 4.

The bearing sleeve 15 of the head 14 terminates at its lower end just below the lower face of the sleeve 17S, and means are provided on this lower end of the sleeve 15 for holding the sleeve in position. Such means, as herein shown, comprise a resilient metal member 30 held in place by screws 30S and having arcuate spring arms 30A about the edge thereof acting upwardly against the lower end of the sleeve 17S. Certain of the screws 30S also serve to support an electrical contact arm 31 in position on and in an insulated relationship with respect to the lower end of the sleeve 15. An electrical conductor 133 connected to this contact extends upwardly through clearance space 34 at one corner of the passage 33 so that the upper end of the conductor 133 may be connected to the lamp in the lamp housing 11. The contact arm 31 bears against an annular stationary contact ring 35 that is supported on an insulating ring 36 within the fitting 20, such contact ring 35 being centered on the axis of the bore 16. A wire 37 extends from the contact ring 35 to a suitable switch that is conveniently located within the vehicle upon which the spotlight is mounted.

The operating member 32 is actuated by a Bowden cable 40 that has a sheath 40S anchored at one end by an anchor sleeve 40A in the fitting 20 on the axis of the bore 16, and the other end of the sheath is anchored by a clamp sleeve 41 on a mounting sleeve 42S of a control fitting 42. This control fitting has an operating handle 43 connected by a shaft 44 within the sleeve 42S to the adjacent end of the Bowden wire 40W of the Bowden cable 40. The other end of the Bowden wire 40W is connected by means of a connecting fitting 44 and a pin 44P to the lower end of the operating member 32 so that by rotation of the handle 43, the base 14 and the lamp housing 11 may be turned about the vertical axis thereof, while by longitudinal movement of the handle 43, the operating member 32 may be moved longitudinally in its guide passage 33 so as to thereby impart rocking movements to the lamp housing as will now be described.

Thus, in affording the cam connection between the operating member 32 and the bracket 12, the bracket is formed, as shown particularly in Figs. 1, 3 and 5, with an upstanding wall 50 that is located on one side of the upper end of the passage 33 and which projects upwardly beyond the adjacent flange 12F. The wall 50 is cut away as at 51 to form a pocket in which a pin-carrying plate 52A is positioned. This plate 52A has three cylindrical pins 53A, 53B and 53C formed in evenly spaced relation thereon so as to project from both faces of the plate 52A, and on one side of the plate 52A the pins project through appropriately located openings in the wall 50 and are riveted at their ends so as to hold the plate 52 in position on the wall 50.

The plate 52A is so located that the three pins 53A, 53B and 53C are spaced from each other and are located on an arc that is centered on the axis 15. The pins 53A to 53C project from the plate 50 to a point beyond the adjacent surface of the operating member 32, and this adjacent face of the operating member 32 has three laterally spaced and

angularly located cam slots 32A, 32B and 32C formed therein. The respective slots 32 are arranged to cooperate respectively with the correspondingly lettered pins 53A, 53B and 54C so that in longitudinal movement of the operating member 32 the slots 32A, B and C will act in succession upon the pins 53A, 53B and 53C to rock the lamp housing 11. In such rocking movement the upper end portion of the member 32 projects substantially and in varying amounts into the lamp housing and through the upper portions of the bracket 12, and clearance is provided within the bracket by an internal cutting away of the material of the bracket as indicated at 12C in Figs. 2 and 5 of the drawings.

The fit of the several pins 53A, 53B and 53C within the cam slots is relatively snug while at the same time allowing the requisite sliding movement of the pins along the cam slots, so that in this part of the motion-transmitting train, very little lost motion is encountered. However, in respect to the slidable operating member 32, it is found that in providing the necessary working tolerances between such member and the sides of the passage 33 there is often sufficient lateral play of the member 32 to produce or allow slight rocking movement or vibration of the lamp housing 11 about the axis 15. This is, of course, objectionable, particularly where the lamp housing serves as a mounting for a rear-vision mirror 25, and under the present invention means are provided whereby the lateral positioning of the operating member 32 is accurately determined to prevent such vibration. Thus, as will be evident particularly in Figs. 2 and 4, one side surface of the operating member 32 that is parallel to the rocking axis 15 has a longitudinal clearance groove 55 formed therein. Within this clearance groove a bow-type spring 56 is mounted by means of a securing screw 57 that extends through one end of the spring 56 and into the body of the operating member 32. The opposite end of the spring 56 bears against the bottom of the groove 55, and the intermediate portion of the spring 56 projects from the groove 55 and engages and presses against the opposed side wall 33A of the passage 33. Thus, the spring 56 acts to maintain the opposite side surface of the operating member 32 in firm sliding contact with the opposed wall 33B of the passage. With this arrangement, the forming operations in respect to the passage 33 and the operating member 32 may be simplified in that the two parts need not be fitted with as great accuracy as was heretofore considered to be desirable. Moreover, since the operating member 32 is held at all times against the surface 33B, objectionable lateral movement of the operating member within the passage is prevented, and consequently objectionable vibration of the lamp housing 11 is prevented.

Through the use of the spring-biased mounting of the operating member 32, as hereinabove described, it has been found that the usefulness of the rear-vision mirror 25 is enhanced, and there is no vibration of such a character that it might be considered objectionable.

From the foregoing description it will be apparent that the present invention provides an improved cam-type operating structure for spotlights, and that through the use of the operating structure that has been provided, the mounting of a rear-vision mirror on the spotlight is rendered feasible.

Thus, while I have illustrated and described the invention in a particular embodiment, it will be recognized that changes and variations may be made within the spirit and scope of the invention.

I claim:

1. In a spotlight, a base, a head mounted on said base for rotation about a vertical axis, a lamp housing mounted on said head for rocking movement about a horizontal axis, a plurality of motion transmitting pins in fixed relation to said housing and extended parallel to and disposed in arcuate series about said horizontal axis, said base having a non-circular guide passage there-

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in along said vertical axis, an operating plunger vertically slidable in said passage and effective when rotated to turn said head about said vertical axis, said plunger having angularly disposed segmental slots therein effective to snugly and slidably engage said pins in succession as said plunger is moved axially to impart rocking movement to said housing about said horizontal axis, and spring means acting in a direction perpendicular to said pins and laterally on said plunger to hold the same laterally against a side surface of said passage and thereby prevent rocking vibration of said housing.

2. In a spotlight, a base, a head mounted on said base for rotation about a vertical axis, a lamp housing mounted on said head for rocking movement about a horizontal axis, a plurality of motion-transmitting pins in fixed relation to said housing and extended parallel to and disposed in arcuate series about said horizontal axis, said base having a substantially square guide passage therein along said vertical axis and having a first pair of its opposite faces perpendicular to said horizontal axis and the second pair of opposite faces parallel to said horizontal axis, an operating plunger substantially complementary to and vertically slidable in said passage and effective when rotated to turn said head about said vertical axis, said plunger having angularly disposed segmental slots therein in a face thereof opposite one of said first pair of faces of said passage and effective to snugly and slidably engage said pins in succession as said plunger is moved axially to impart rocking movement to said housing about said horizontal axis, and spring means acting between said plunger and one of said second pair of faces to hold said plunger laterally against the other one of said second pair of faces so as to prevent rocking vibration of said housing.

3. In a spotlight having a base, a head mounted on said base for rotation about a vertical axis, and a lamp housing mounted on said head for rocking movement about a horizontal axis, said base having a non-circular guide passage therein along said vertical axis, an operating plunger vertically slidable in said passage and effective when rotated to turn said head about said vertical axis, a plurality of motion transmitting pins in fixed relation to said housing and extended parallel to and disposed in arcuate series about said horizontal axis, said plunger having angularly disposed segmental slots therein effective to snugly and slidably engage said pins in succession as said plunger is moved axially to impart rocking movement to said housing about said horizontal axis, and a leaf spring mounted on said plunger and acting against one side of said passage in a direction perpendicular to said pins and to hold said plunger laterally against the opposite side surface of said passage and thereby prevent vibration of said housing.

4. In a spotlight, a base, a head mounted on said base for rotation about a vertical axis, a lamp housing mounted on said head for rocking movement about a horizontal axis, said base having a substantially square guide passage therein along said vertical axis and defined by first and second opposite faces that are perpendicular to said horizontal axis and third and fourth faces that are parallel to said horizontal axis, an operating plunger vertically slidable in said passage and effective when rotated to turn said head about said vertical axis, a plurality of spaced parallel motion-transmitting pins in fixed relation to said housing and extended parallel to and disposed in arcuate series about said horizontal axis, said pins projecting beyond the plane of said first face and toward the plane

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of said second face, said plunger having angularly disposed segmental slots therein effective to snugly and slidably engage said pins in succession as said plunger is moved axially to impart rocking movement to said housing about said horizontal axis, and spring means mounted on said plunger and acting against said fourth face to hold said plunger laterally against said third face of said passage and thereby prevent vibration of said housing.

5. In a spotlight, a base, a head mounted on said base for rotation about a vertical axis, a lamp housing mounted on said head for rocking movement about a horizontal axis, said base having a substantially square guide passage therein along said vertical axis and defined by first and second opposite faces that are perpendicular to said horizontal axis and third and fourth faces that are parallel to said horizontal axis, an operating plunger vertically slidable in said passage and effective when rotated to turn said head about said vertical axis, a plurality of spaced parallel motion-transmitting pins in fixed relation to said housing and extended parallel to and disposed in arcuate series about said horizontal axis, said pins projecting beyond the plane of said first face and toward the plane of said second face, said plunger having angularly disposed segmental slots therein effective to snugly and slidably engage said pins in succession as said plunger is moved axially to impart rocking movement to said housing about said horizontal axis, said plunger in the side thereof that faces said fourth face being formed with a longitudinally extending clearance groove therein, and a bow-type spring mounted on said plunger so as to be disposed longitudinally in said clearance groove and acting against said fourth face to hold said plunger laterally against said third face of said passage and thereby prevent vibration of said housing.

6. In a spotlight, a base, a head mounted on said base for rotation about a vertical axis, a lamp housing mounted on said head for rocking movement about a horizontal axis, said base having a substantially square guide passage therein along said vertical axis and defined by first and second opposite faces that are perpendicular to said horizontal axis and third and fourth faces that are parallel to said horizontal axis, an operating plunger vertically slidable in said passage and effective when rotated to turn said head about said vertical axis, said plunger having faces disposed in opposed relation to said faces of said passage including a fourth face on said plunger disposed in opposed relation to said fourth face of said passage, a plurality of spaced parallel motion-transmitting pins in fixed relation to said housing and extended parallel to and disposed in arcuate series about said horizontal axis, said pins projecting beyond the plane of said first face and toward the plane of said second face, said plunger having angularly disposed segmental slots therein effective to snugly and slidably engage said pins in succession as said plunger is moved axially to impart rocking movement to said housing about said horizontal axis, and spring means mounted on one of said fourth faces and acting against the other of said fourth faces to hold said plunger laterally against said third face of said passage and thereby prevent vibration of said housing.

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