April 28, 1942. W. A. PENNOW 2,281,047

CONTROL MECHANISM FOR SEARCHLIGHTS

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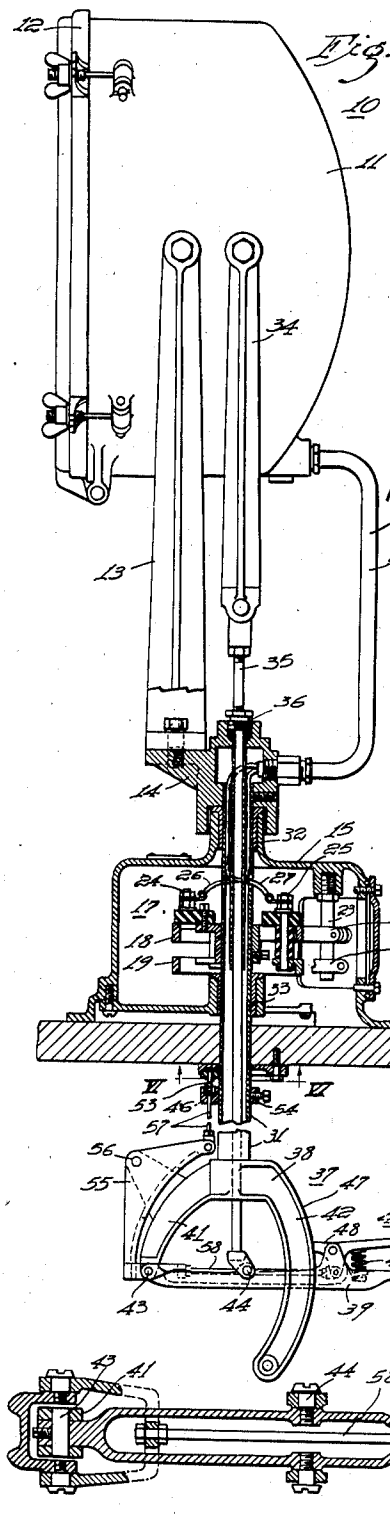


Fig. 1.

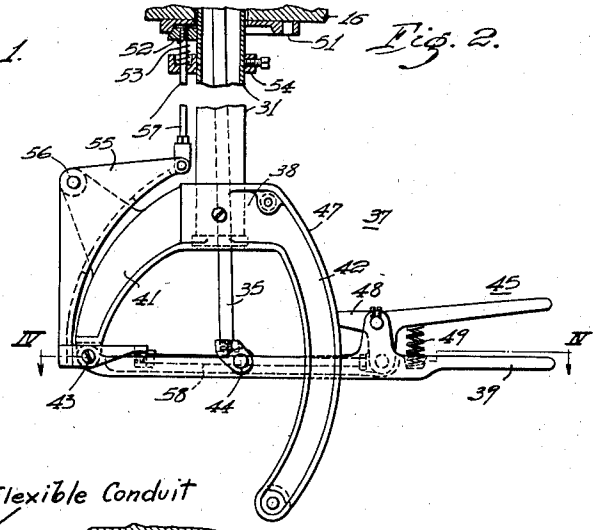


Fig. 2.

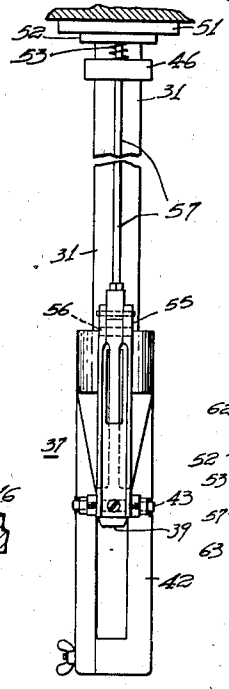


Fig. 3.

Fig. 4.

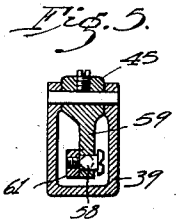


Fig. 5.

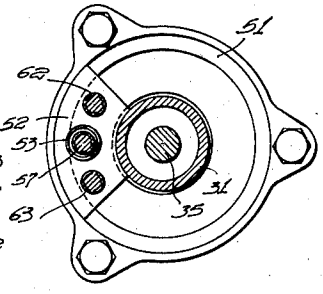


Fig. 6.

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CONTROL MECHANISM FOR SEARCHLIGHT

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4 Claims. (Cl. 240—61.1)

My invention relates, generally, to operating or control mechanisms for movable objects and, more particularly, to operating or control mechanisms for actuating the drum of a searchlight, or other movable device, to any desired position in azimuth and elevation and holding it in any desired position within the range of operation of the mechanism.

While the control mechanism of my invention is particularly adapted for use in conjunction with searchlights mounted on top of pilot houses of boats and ships, it is to be understood that it also may be of particular utility for operating and positioning searchlight drums and other movable objects mounted in other locations where a remote control thereof is desired or necessary.

Heretofore, searchlights mounted on pilot houses have been controlled from within the pilot house, or from some other remote point, by mechanical arrangements of a more or less cumbersome nature which are not only expensive and complicated, but which do not provide for readily and easily effecting the desired positioning of the drum with a minimum number of manual operations and do not provide for holding the drum in any desired position within the operating range of the mechanism.

Therefore it is the object of my invention, generally stated, to provide an operating or control mechanism for searchlight drums and the like which is of simple, rugged and durable construction and which may be economically manufactured, installed and maintained.

A more specific object of my invention is to provide a mechanism of the character described which may be operated to actuate the drum of a searchlight or other movable device to any desired position in azimuth and elevation and retain the drum or device in that position.

A further object of my invention is to provide a mechanism of the character described which may be actuated to release or lock the drum of a searchlight by means of a single manual operation.

Another object of my invention is to provide a mechanism which functions to automatically lock the drum of a searchlight in the position to which it has been moved by the mechanism by simply releasing a lever handle on the operating lever.

A still further object of my invention is to provide an operating and control mechanism for searchlights and the like wherein the functions of locking and unlocking the drum and positioning it in azimuth and elevation are accomplished by means of a single operating lever.

These and other objects of my invention will become more apparent from the following detailed description of an exemplification thereof when read in conjunction with the accompanying drawing, in which:

Figure 1 is a side elevation view, partly in section, of a searchlight and operating mechanism therefor constructed in accordance with the principles of my invention,

Fig. 2 is an enlarged side elevation view of the support member and operating lever of the mechanism of Fig. 1,

Fig. 3 is an enlarged front view in elevation of a portion of the mechanism of Fig. 1,

Fig. 4 is an enlarged top view partly in section of the operating lever and other associated parts taken along lines IV—IV of Fig. 2,

Fig. 5 is a cross-section view taken along lines V—V of Fig. 4 showing details of the connection of the lever handle to the brake operating rod, and

Fig. 6 is an enlarged sectional view taken along line VI—VI of Fig. 1 showing the braking device of the operating mechanism.

In practicing my invention, the searchlight drum is mounted for movement or adjustment both in azimuth and elevation, the drum being supported by a main bow mounted on a bow support which, in turn, is rotatably mounted on a housing which contains the current collector assembly. A tubular member is attached at one end to the bow support and extends downwardly through the housing and through the roof of the pilot house, the housing being mounted on the top thereof and the arrangement being such that the drum may be actuated in azimuth by rotating the tubular member. The elevational movements of the drum are effected by means of an elevator bow and elevator rod attached thereto which extend downwardly through the tubular member. The tubular member is rotated and the elevator rod actuated in an up and down direction by an operating mechanism mounted on the lower end of the tubular member. This mechanism comprises a lever support having oppositely-disposed downwardly-extending portions, one of which functions to pivotally support one end of an operating lever for the elevator rod and bow, the other being of split construction through which the operating lever extends in a transverse direction. The free end of the operating lever is provided with a spring-biased lever handle pivotally mounted thereon in such position that

one end thereof normally engages the outer face or surface of the split portion of the lever support which is curved to function as a clamping plate. This arrangement releasably retains the operating lever in any desired position to maintain the elevation adjustment of the drum.

The drum is rotated by simply moving the operating lever in a transverse direction which carries the lever support and tubular member around with it. The drum is releasably locked against movement in azimuth by a brake device actuated by the lever handle so that it is released for movement in both azimuth and elevation by simply squeezing or depressing the lever handle. This brake device comprises a circular brake band stationarily mounted on the bottom of the pilot house roof and engaged by a spring-biased brake shoe. The shoe is released by a lever mechanism carried by the lever support and attached to the lever handle, the arrangement being such that when the lever handle is actuated, the drum and actuating mechanism is released for adjustment in either azimuth or elevation, or both, and release of the lever handle automatically locks the drum in the desired position to which it has been actuated.

Referring now to the drawing, there is disclosed an exemplary embodiment of the invention as it may be applied for actuating and controlling the movements in azimuth and elevation of the drum of a searchlight of the type which is mounted in an exposed position on the top of pilot houses of ships or boats and operated or controlled from within the pilot house.

In Fig. 1 there is shown a searchlight 10 to which the invention has been applied. The searchlight comprises a drum 11 having a hinged cover 12 and containing a reflector and light source (not shown) which is mounted on a main bow 13 for adjustment in elevation about a horizontal axis. The main bow is attached to a bow support 14 rotatably mounted on a housing member 15. The housing member is mounted on the top of the pilot house or other support 16 and functions both as a support for the searchlight drum and as a container for the collector assembly 17.

Since the details of the collector assembly are not a part of the present invention, it need not be described other than to state that it comprises a pair of collector rings 18 and 19 and a pair of brushes (not shown) carried by the brush supports 21 and 22 mounted on the stud 23. The brush supports are connected to a source of current (not shown) and the terminals 24 and 25 of the collector rings are connected to the light source within the drum by means of the conductors 26 and 27 extending through a flexible conduit 28, as shown.

In order to provide for rotating the drum about a vertical axis, a tubular member 31 is utilized. As shown, the upper end of this member is attached to the bow support 14 and extends downwardly through bearings 32 and 33 in the housing member 15 and through the roof of the pilot house 16 into the interior thereof.

The drum 11 may be actuated about its horizontal axis by means of an elevator bow 34 and elevator shaft 35 extending downwardly through the tubular member 31 as shown. The elevator rod 35 extends through a packing gland 36 in the top of the bow support 14 in order to provide a water-tight joint.

In order to provide for rotating the tubular member 31 and actuating the elevator rod 35 to control the movements of the searchlight drum in azimuth and elevation, the mechanism shown generally at 37 is provided. This mechanism comprises, generally, a support member 38 and an operating lever 39. The support member 38 is attached to the lower end of the tubular member 31 and is provided with oppositely disposed downwardly extending arms 41 and 42, the arm 42 being of split construction as shown in Fig. 3. One end of the operating lever 39 is pivotally attached to the arm 41 at 43 and the lever extends transversely between the two sides of the arm 42. The lower end of the elevator rod 35 is pivotally secured to the lever at 44 so that by actuating the lever in an up and down direction the drum 11 is tilted about its horizontal axis.

In view of the construction of the mechanism 37, it will be apparent that the drum 11 may be rotated about its vertical axis by moving the lever 39 in a sidewise direction, thereby rotating the support member 38 and tubular member 31.

In order to provide for releasably retaining the drum in any desired position in azimuth and elevation, the lever is provided with a locking device in the form of a lever handle 45 and the tubular member is provided with a locking device in the form of a brake device 46.

As shown more clearly in Fig. 2, the arm 42 of the support is provided with an outer curved face 47 which cooperates with the end portion 48 of the lever handle 45 to provide a releasable locking arrangement. The handle 45 is biased into engagement with the curved face of the arm by means of a spring 49 which effectively holds the operating lever 39 in any desired position. It may be released by simply grasping the end of the operating lever and depressing the handle against the force of the biasing spring.

The brake device 46 comprises a brake band 51 which is attached to the support 16 and a releasable brake shoe 52 which is normally urged into engagement with the bottom surface of the brake band by means of a spring 53. The spring is supported by means of a collar 54 attached to the tubular member 31 as shown.

In order to provide for entirely releasing the mechanism for effecting adjustment of the drum in either azimuth or elevation, or both, provision is made for actuating the brake device 46 by means of the lever handle 45 so that when the lever handle is depressed to release the operating lever 39 the brake shoe 52 is also disengaged from the brake band. This may be accomplished by means of the lever assembly comprising a bell crank 55 pivotally mounted at 56 on the arm 41 and having one end attached to the brake shoe by means of a rod 57 and the other end attached to the lever handle by means of a rod 58. The manner in which the rod 58 is attached to the bell crank 55 and lever handle 45 is shown in Fig. 4. As shown in Fig. 5, the lever handle 45 is provided with a downwardly extending arm portion 59 which is attached to the rod 58 by means of a fitting 61.

Fig. 6 shows a bottom view of the brake mechanism 46 showing the relative positions of the brake band 51 and brake shoe 52. The brake shoe is guided in its movement by means of guide pins 62 and 63 carried by the collar 54.

In view of the foregoing description, it will be apparent that my invention provides an operating and control mechanism suitable for the remote control of searchlight drums and other similar devices which provides for readily effecting movements of the drum both in azimuth and ele-

vation, and which functions to effectively retain the drum in any desired position to which it has been operated. The general arrangement of the mechanism is such that it may be released for movement by simply depressing a lever handle mounted on the single operating lever which releases the operating lever for actuating the elevator rod and at the same time actuates the brake device to render the tubular member and drum rotatable in azimuth.

Since certain changes may be made in the above described construction and different embodiments of the invention may be made without departing from the spirit thereof, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interrupted as illustrative and not in a limiting sense.

I claim as my invention:

1. The combination with a searchlight having a drum mounted for movement in azimuth and elevation, of a mechanism for actuating and holding the drum in any desired position comprising a vertically disposed hollow shaft for rotating the drum in azimuth, a vertically disposed rod for actuating the drum in elevation, a support member attached to the lower end of the hollow shaft and movable therewith, said support member having a pair of downwardly extending arms, one of said arms having an outer arcuate surface, a lever pivotally secured to one of said arms and engaging the other of said arms for rotating the hollow shaft and actuating the elevation rod, braking means comprising a stationary band element and a co-operating shoe element carried by the hollow shaft for holding the hollow shaft in any desired position in azimuth, and a lever handle pivotally mounted on the lever adjacent its free end for releasing the shoe element of the braking means, said lever handle having one end thereof disposed in frictional engagement with the outer arcuate surface of the said other arm on the support member to releasably retain the lever in a desired position.

2. The combination with a searchlight having a drum mounted for movement in azimuth and elevation, of a tubular member operable to actuate the drum in azimuth, an elevation rod extending through the tubular member for actuating the drum in elevation, a support member attached to the lower end of the tubular member, said support member having downwardly extending arms one of which has a curved face portion, and a single operating lever pivotally attached to one of the arms and extending transversely of the other, said elevation rod being pivotally secured to the operating lever, whereby the lever may be utilized to rotate the tubular member and actuate the elevation rod within the tubular member to effect individual or coordinated movement of the drum in azimuth and elevation, a spring-biased lever handle pivotally mounted on the operating lever adjacent its free end and having one end in frictional engagement with the curved face portion of one of said arms to releasably retain the elevation rod and drum in a desired position in elevation, a braking device for holding the tubular member and drum in a desired position in azimuth, and a lever mechanism interposed between the lever handle and braking device to provide for actuating the braking device by the lever handle, whereby operation of the lever handle to release the elevation rod also operates the braking device to release the brake and permit rotation of the tubular member to move the drum in azimuth.

3. The combination with a light producing device mounted upon a support for movement in azimuth and elevation, of an elongated rigid member attached to the device for moving it in azimuth, an elongated rod member for actuating the device in elevation, a support member rigidly attached to the lower end of the elongated rigid member, said support member having downwardly extending oppositely disposed arms one of which is longer than the other, said longer arm being of bifurcated construction and having an arcuate face portion, an operating lever having one end thereof pivotally secured to the shorter of said arms of the support member and extending transversely of the longer of said arms between the bifurcated portions thereof, whereby the said operating lever may be moved in a sidewise manner to rotate the elongated rigid member and light producing device, means for pivotally securing the elongated rod member to the operating lever intermediate its ends, whereby movements of the operating lever in a vertical plane will effect movements of the light producing device in elevation, braking means including a stationary band element and a cooperating movable shoe element associated with said elongated rigid member, said braking means normally functioning to hold said elongated rigid member against rotation, means carried by the free end of the operating lever in cooperative relation with the arcuate face portion of the said longer arm of the support member for normally retaining said operating lever in a desired position with respect to said longer arm and operable to release said operating lever, and a lever system interposed between the braking means and the means carried by the free end of the operating lever, whereby operation of said means to release the operating lever disengages the movable shoe element of the braking means from the stationary band element to release the elongated rigid member and permit rotation thereof by the operating lever.

4. The combination with a searchlight having a drum element mounted for movement in azimuth and elevation, of a mechanism for actuating and holding the drum in any desired position comprising a first substantially rigid member for actuating the drum in azimuth, a second member for actuating the drum in elevation, braking means comprising a stationarily mounted band element and a cooperating shoe element carried by the first member for retaining the drum in any desired position in azimuth, a support member rigidly attached to the lower end of the first member, a single lever pivotally mounted upon the support member and pivotally attached to the second member for actuating said first and second members, a spring-biased lever handle pivotally mounted on the free end of the lever and cooperating with the support member for retaining the lever in any desired position to hold the drum in a corresponding position in elevation, and lever means controlled by the lever handle on the lever for releasing the shoe element of the braking means, whereby the drum may be fully released for movement in azimuth and elevation and locked against such movement by single operations of the lever handle.

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