

No. 822,271.

PATENTED JUNE 5, 1906.

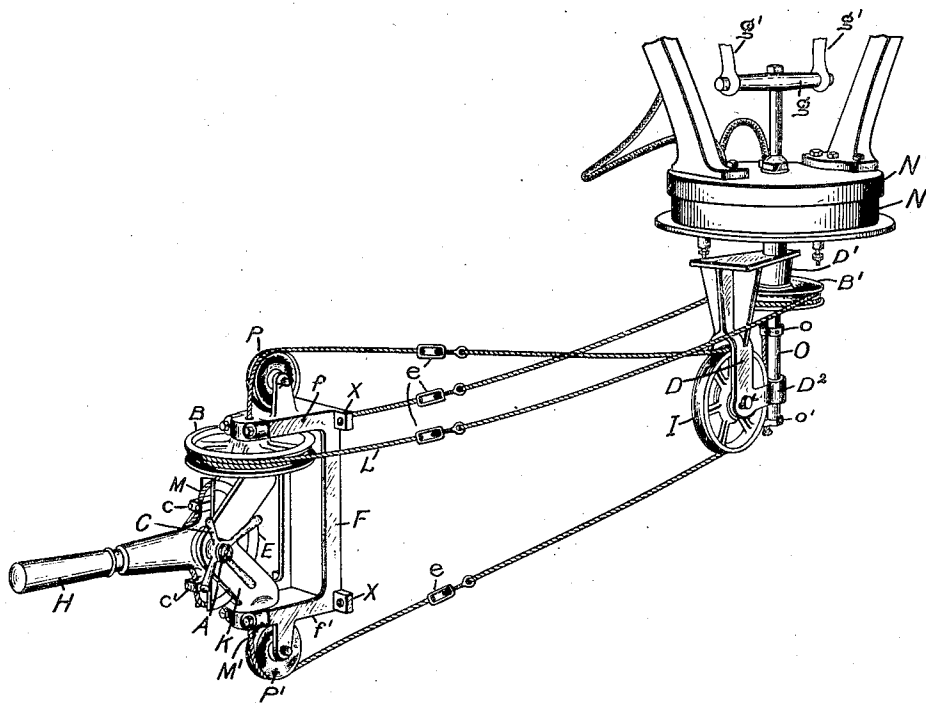
J. L. HALL.

CONTROL SYSTEM FOR SEARCH LIGHT PROJECTORS.

APPLICATION FILED NOV. 15, 1902.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

George W. Tilden.
Allen Orford

Inventor.

John L. Hall.

by *Albert B. Davis.*

Att'y.

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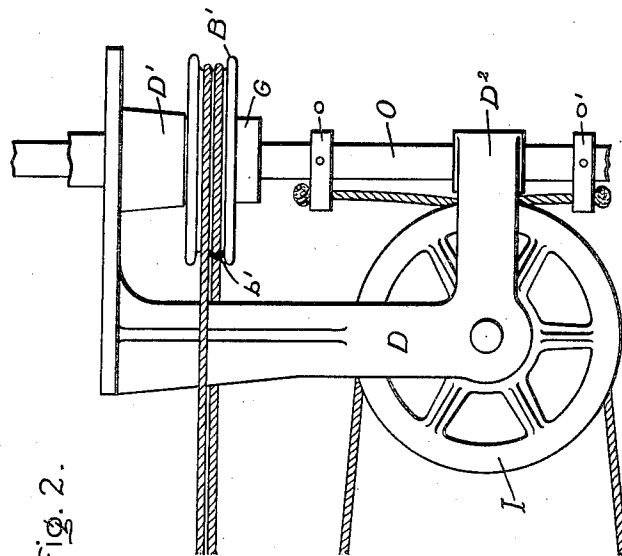
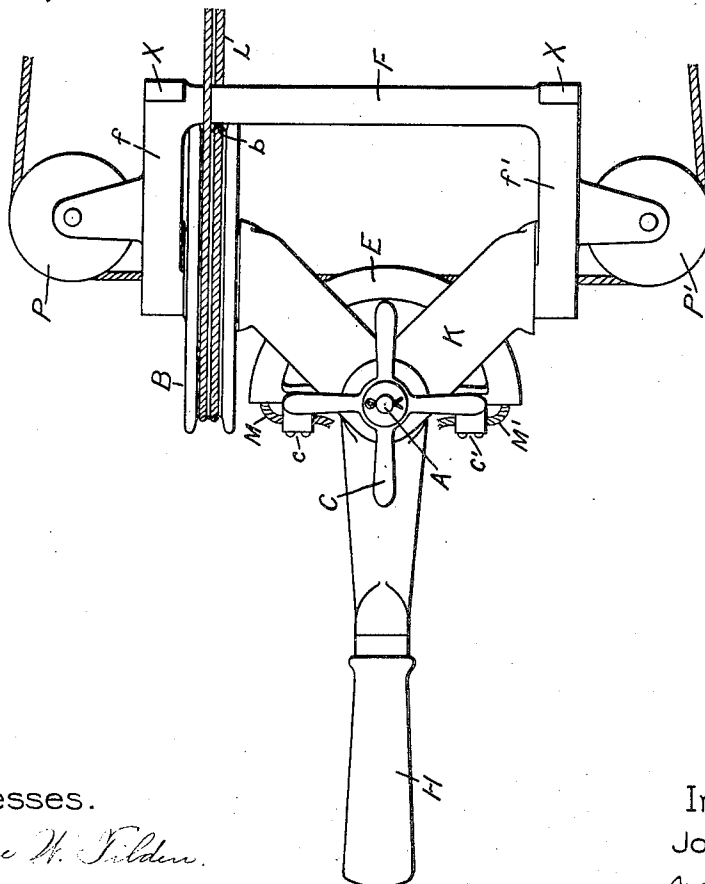


Fig. 2.



Witnesses.

George W. Tilden.
Helen Orford

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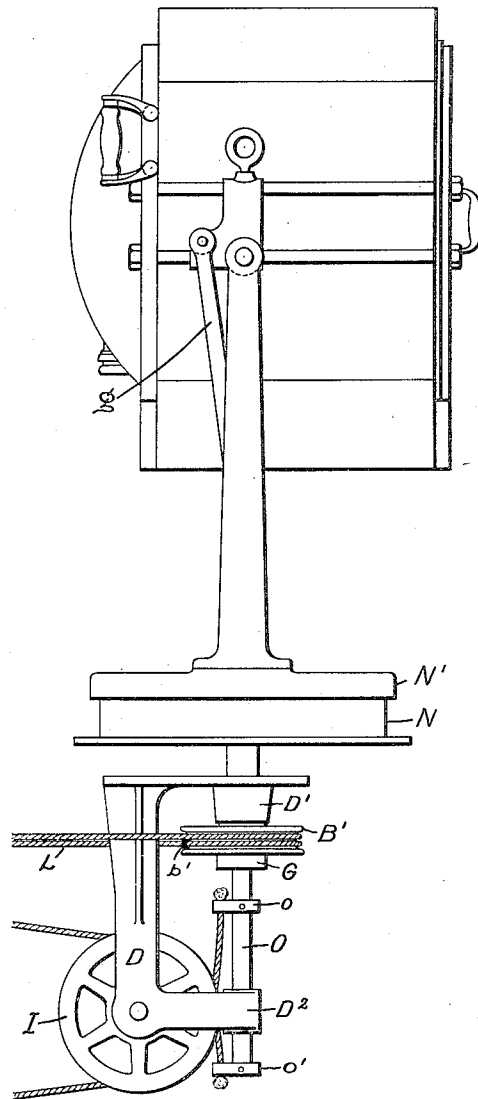
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3 SHEETS—SHEET 3.

Fig. 3.



Witnesses.

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Helen Orford

Inventor.

John L. Hall.

by *Albert H. Davis*
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UNITED STATES PATENT OFFICE.

JOHN L. HALL, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

CONTROL SYSTEM FOR SEARCH-LIGHT PROJECTORS.

No. 822,271.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed November 15, 1902. Serial No. 131,549.

To all whom it may concern:

Be it known that I, JOHN L. HALL, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Control Systems for Search-Light Projectors, of which the following is a specification.

This invention relates to a system of control for a search-light projector, and has for its object the regulation of the direction of the beam of light in altitude and azimuth either separately or simultaneously by a single handle placed at a distance from the projector.

As used on shipboard search-lights are often placed far forward in an elevated position where the beam of light would be unobstructed, and the direction of the beam is controlled from the bridge or some other point at a distance from the projector. For this purpose systems of rope-gearing have been employed by which ropes or cable transmit the movements of a handle mounted at the point of control to mechanism regulating the direction of the beam of light.

My invention relates to rope-control systems of the character above described. Its object is to simplify and cheapen the construction of the controlling device and to provide mechanism such that the movement of the projector is always under the direct and positive control of the operating-handle. To this end I provide a handle at the point from which the projector is to be trained mounted on a universal bearing and connected positively by ropes or cables with the projector, which when shifted to the right or left trains the beam in azimuth without possibility of lost motion and when raised or lowered effects a similar training in altitude. For simplicity of construction pulleys are employed to transmit the operating power to and from the rope. On account of its large moment of inertia the projector resists the pull of the rope or belt on the pulleys, and the former tends to slip without imparting completely the motion of the handle to the projector, and when moved it tends to continue its turning motion even after the operator ceases to move the handle, the belt slipping on the pulleys. If the belts had become stretched by the action of the weather on them or had be-

come slack from any other cause, this slipping would occur to even a greater extent, so that it would be difficult to maintain the apparatus in proper working order. I therefore clamp the belts to each of the pulleys, thereby preventing them from slipping and provide turnbuckles in each side of the belt for taking up slack. In this way slipping is avoided and the projector is trained in exact accordance with any movement of the operating-handle.

The two ropes clamped to the handle pass over guide-sheaves and out to the projector, where they pass over a common pulley and are fastened to a rod movable vertically within the hollow shaft and extending upward through the base of the projector. An upward or downward movement of the handle thus causes a corresponding vertical movement of the rod, which by means of a cross-head mounted at its upper end above the base and linked to the projector at points eccentric to its pivots trains the projector in altitude. The ropes being clamped to both the handle and the reciprocating rod, and turnbuckles being provided in each rope for taking up slack, the projector is caused to turn on its horizontal axis whenever the handle is raised or lowered and it cannot turn except when the handle is moved.

A diagonal movement of the handle in any direction operates both of the controlling-ropes simultaneously and causes a corresponding diagonal movement of the projector. In this way the projector can be trained to any desired angle both as to altitude and azimuth by a single movement of the handle, and, further, the handle always indicates the direction in which the projector is trained as the beam of light is always thrown in a direction parallel to the axis of the handle.

My invention therefore comprises a control system for a search-light projector containing a universally-mounted lever at the control-point and flexible connections with the projector for communicating a positive movement in any direction. It also comprises more specific features which will be hereinafter more fully described and definitely claimed.

The construction of my device will be more readily understood by reference to the

accompanying drawings, which show the preferred embodiment of my invention.

Figure 1 is a perspective view of the controlling mechanism. Fig. 2 is a side elevation of the operating parts, and Fig. 3 an elevation of a projector with the controlling mechanism attached.

The handle H is carried by the frame F, which is mounted at the point from which it is desired to control the projector by bolts passing through the lugs X X. Extending outward from the frame F are the arms ff' , to the ends of which the frame K is pivoted by means of hollow pivots. In the preferred construction the frame K has the form of two parallel V-shaped bars connected together at their ends. The pulley B is rigidly mounted horizontally on the frame K near one end thereof and concentric with the hollow pivots. The handle H has a head E in the form of a semicircular sheave or sector with two parallel grooves cut in the curved portion of its periphery and is pivoted on the bolt A between the parallel sides of the frame K in such a position that a line between the centers of the hollow pivots would be tangent to the curved head of the handle. The hand-nut C turns on the bolt A and is adapted to lock the handle H against vertical movement. The clamps $c c'$ are mounted on the sector E to clamp the ropes M M', which in the position shown pass around one-half of the sector E through the hollow pivots of the frame K and over the pulleys P P', mounted on the arms ff' , respectively, of the frame F. The pulley or sheave B has a helical groove cut in its periphery, and the rope L runs in this groove and out over a similar horizontal pulley or sheave B', keyed to the hollow shaft G, and on the pulleys B B' are the clamps $b b'$, respectively, which grip the rope L and prevent it from slipping. The shaft G turns in a bearing D', formed integral with the frame D, mounted on the under side of the stand supporting the projector and extends upward through the pedestal N where it is secured to the turn-table N', which carries the arms in which the projector is trunnioned. This frame supports the pulley or sheave I and has an extension which forms a guide D² for the rod O. The ropes M M' pass over the pulley I through openings in the collars $o o'$ on the rod O and are knotted to prevent being drawn through those openings. The rod O extends upward through the hollow shaft G and above the turn-table carries the cross-arm g , which is connected by the links $g' g'$ to the drum of the projector at a point to the rear of the trunnions by which the drum is supported. Turnbuckles $e e$ are inserted in each side of each rope for taking up slack.

It will thus be seen that any movement of the handle H to the right or left turns pulley B, and, by means of belt L, the pulley B' on

the shaft G, thereby training the projector in azimuth, and when the handle is raised or lowered the ropes M M' are drawn in and let out, thereby raising or lowering the rod O and training the projector in altitude. As the belts are clamped both at the projector and at the point of control, they cannot slip and the projector moves exactly in accordance with the movements of the operating-handle. When the handle is moved diagonally, both movements take place simultaneously, and the projector is trained to a position corresponding to the position of the handle. The ropes can be made of any length, guide-sheaves being provided to guide them around obstructions, so that the handle can be mounted at any point from which it is desired to control the projector.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination with a search-light projector, of means for controlling the same comprising a main frame, a bearing-frame pivoted therein, a sheave pivoted concentrically with said frame and movable therewith, a handle pivoted to said bearing-frame at right angles to the axis of said frame, a sector mounted concentric with said handle and movable therewith, and flexible connections between said sheave and sector and the projector.

2. The combination with a search-light projector, of means for controlling the same comprising a main frame, an operating-handle pivoted therein for movement in two planes at an angle with each other, a sheave mounted concentric with each axis of said handle and movable therewith, correspondingly-arranged sheaves on said projector, and flexible connections between the pairs of sheaves.

3. Controlling-gear for search-light projectors, comprising a handle having a curved end movably mounted on a frame pivoted on hollow pivots in a stationary frame, and a flexible connection clamped to said handle and passing through said hollow pivots, the ends of said flexible connection being secured to a reciprocating rod connected to the projector at a point eccentric to its horizontal axis.

4. A controlling device for search-light projectors, comprising a handle having a curved end movably mounted on a frame pivoted on hollow pivots in a stationary frame, said movable frame being so shaped that the axis on which it turns is tangent to the curved end.

5. In combination with a search-light projector, a handle having a curved end movably mounted on a movable frame pivoted on hollow pivots and so shaped that the axis on which the frame turns is tangent to the curved head of the handle, means operated by the handle for turning a hollow shaft se-

cured to the projector turn-table, and a belt
clamped to the handle passing over a portion
of the curved head and through the hollow
5 pivots and having its ends attached to a rod
vertically movable within the hollow shaft
and linked to the projector at a point eccen-
tric to its horizontal axis.

In witness whereof I have hereunto set my
hand this 14th day of November, 1902.

JOHN L. HALL.

Witnesses:

BENJAMIN B. HULL,
HELEN ORFORD.