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C. ANDREINO

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ADJUSTABLE PROJECTOR

Filed Nov. 28, 1928

2 Sheets-Sheet 1

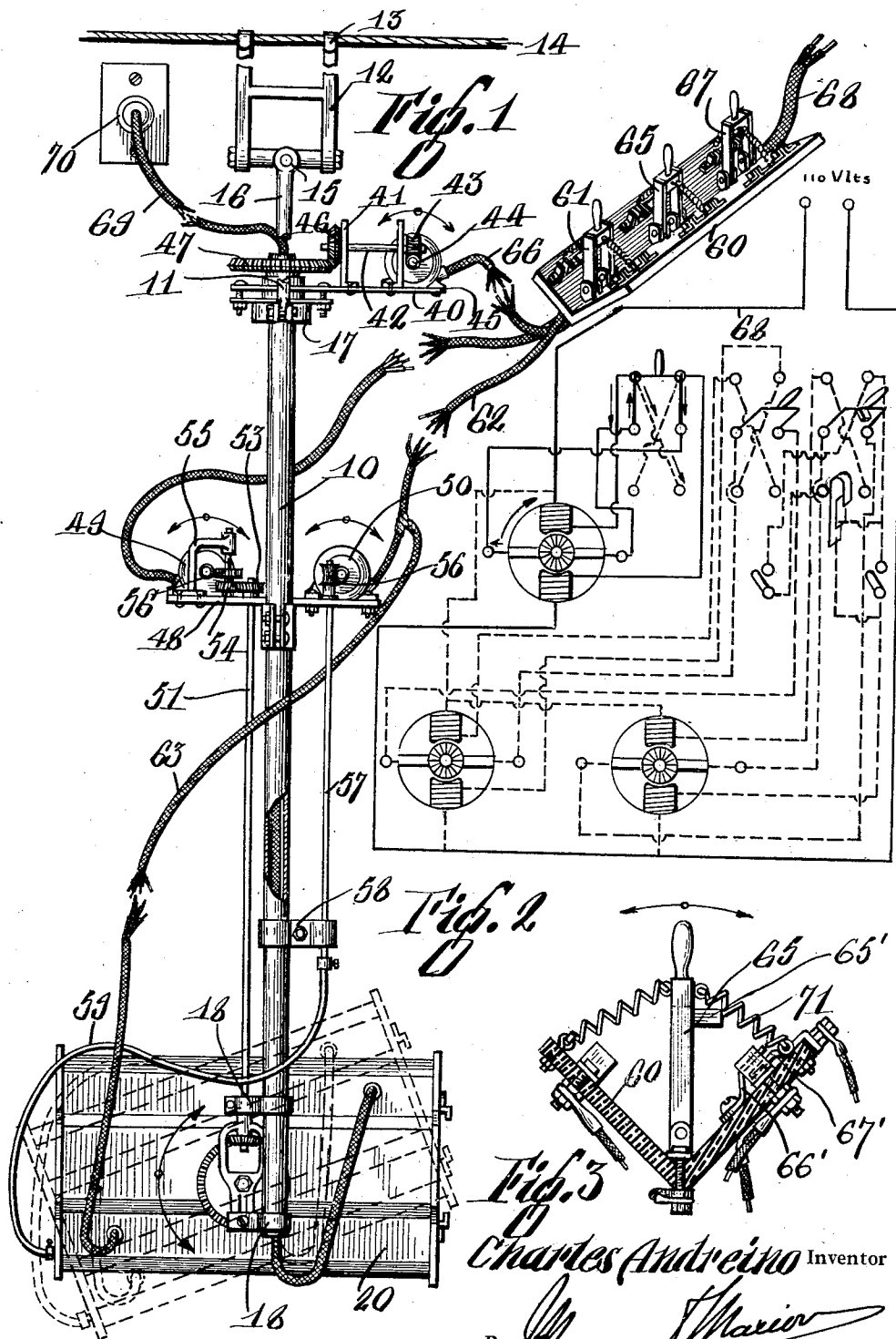


Fig. 3

Charles Andreino Inventor

By

Marion J. Marion Attorneys

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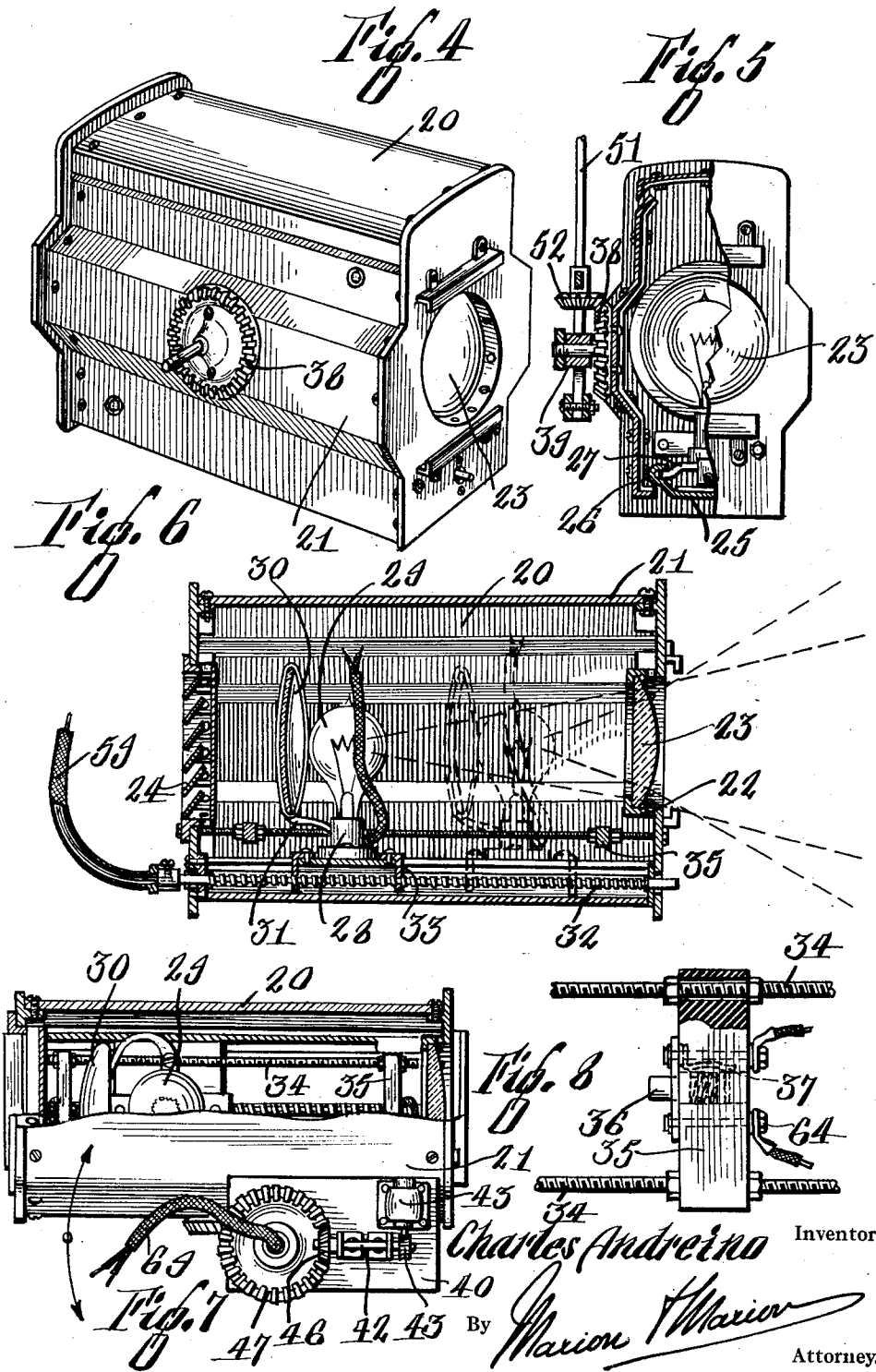
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UNITED STATES PATENT OFFICE

CHARLES ANDREINO, OF MONTREAL, QUEBEC, CANADA

ADJUSTABLE PROJECTOR

Application filed November 23, 1928, Serial No. 322,462, and in Canada November 30, 1927.

The present invention relates to improvements in light projecting apparatus and has for its primary object to provide a projecting apparatus which can be conveniently adjusted to project the light beam at various angular positions.

A further object of the invention is the provision of an adjustable projecting apparatus which can be accurately controlled from a distant control position.

A further object of the invention is the provision of an adjustable projecting apparatus which may be quickly and accurately adjusted to swing the projector lantern and focus the lamp.

Another object of the invention is the provision of a projecting apparatus having a distant control mechanism for electrically swinging the lantern in a vertical and horizontal plane.

Still another object of the invention is the provision of means for electrically focusing the projector lamp.

A further object of the invention is the provision of a projecting apparatus of the above character which is compact and durable of construction and which can be conveniently installed for operation.

Other objects and advantages of the invention will become apparent as the description progresses.

In the accompanying drawings forming a part of this specification and in which like reference characters are employed to designate corresponding parts throughout the same:—

Figure 1 is a side elevational view of the assembled apparatus,

Figure 2 is a diagrammatic illustration of the wiring connection,

Figure 3 is an enlarged transverse section through the switch panel,

Figure 4 is a perspective view of the lantern,

Figure 5 is a front view of the same partly in section,

Figure 6 is a vertical longitudinal sectional view through the lantern,

Figure 7 is a top plan view partly in section, and

Figure 8 is an enlarged plan view of an automatic switch.

Referring to the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 10 generally designates a tubular support standard which is normally arranged in a vertical position.

The upper end of the standard is journaled in a bearing collar 11 adapted to rotatably support the standard 10 in vertical suspended position. This bearing is supported by a hanger 12 the upper end of which is formed with a pair of spaced hooks 13 engageable with a cable 14 or other supporting element. The lower portion of the hanger is provided with a universal connection 15 from which is suspended an arm 16 having its lower end rigidly secured to the bearing 11 by means of a bracket 17.

Secured to the lower portion of the standard 10 in spaced superposed positions are a pair of brackets 18 adapted to support a vertical gear frame 19 provided with a rectangular recess in its upper portion.

Rotatably connected with the gear frame 19 for vertical adjustable movement is a lantern 20. This lantern embodies a longitudinal rectangular shaped casing 21 vertically elongated and provided with an inwardly offset angular flange 22 designed to snugly receive therein a lens 23. The rear end of the casing is provided with a shutter 24 adjustable to permit suitable ventilation within the casing.

In the bottom of the casing is formed a longitudinal guide member 25 having channel shaped side edges 26. Slidably associated with the guide member 25 for longitudinal adjustment in the casing is a lamp plate 27 the side edges being downwardly offset and formed to engage the channel shaped side edges of the guide member so that the plate 27 can be slidably actuated in the casing. The plate 27 forms a support for a lamp socket 28 formed to receive a projecting lamp 29. As shown to advantage in Figure 6, a mirror 30 is supported in a vertical position immediately in the rear of the lamp by means

of an angular bracket 31 attached to the socket 28.

The lamp is longitudinally shifted in the casing through the instrumentality of a threaded shaft 32 rotatably journaled in the bottom of the casing and engageable with a pair of flanges 33 secured to the forward and rear edges of the lamp plate 27 and formed with threaded openings adapted to engage the shaft.

As it is intended to electrically operate the shaft 32, means are provided for automatically disconnecting the shaft operating circuit at the forward and rear terminal positions of the lamp, this being effected by providing a pair of horizontally projecting threaded rods 34 fixed in parallel positions in the casing adapted to form adjustable guides for a pair of terminal blocks 35. From this construction, it is obvious that the exact positions of the blocks may be longitudinally varied in the casing and that the blocks may be locked in selected positions to limit the longitudinal movement of the lamp.

Each block carries a slidable switch contact 36 urged outwardly by a coiled spring 36', and having an outwardly projecting portion directed toward the lamp engageable with an inner resilient stationary contact 37. This switch is arranged so that when the lamp reaches one of its end positions it will engage the movable contact 36 and slide the same with respect to the stationary contact 37 so as to open the switch and automatically stop the operative movement of the shaft 32.

Of course, when it is desired to reverse the motor, the circuit that has been opened by the switch just described must be closed before the lamp can be shifted backward. To this effect, the knife switch 65 controlling the focussing motor 50 is equipped with a projecting fibre block 65' adapted to close a pair of contacts 66' and 67'. As shown in the circuit diagram, the said contacts are connected in shunt with the lamp switch contacts 36 and 37 so that when the knife switch 65 is thrown to the right the contacts 66' and 67' will complete the broken circuit and allow of the focussing motor 50 to be reversed when the knife switch 65 is pushed on full.

Rigidly attached to the inner side of the lantern casing 21 in a vertical position is a bevel gear 38 to the centre of which is secured a horizontally projecting stub shaft 39. The shaft 39 is journaled in a bearing formed in the lower portion of the gear frame 19 and secured against displacement by a nut. Thus the lantern is supported for vertical oscillating movement.

Rigidly secured about the bearing collar 11 and projecting laterally in horizontal position therefrom is a platform 40 on the upper surface of which are mounted a pair of spaced vertical bearing plates 41. The complemen-

tary plates 41 are provided with opposed openings forming bearings for a horizontal shaft 42 rotatably mounted therein. Fixed on one end of the shaft 42 is a worm wheel 43 arranged to mesh with a drive worm 44 mounted in and adapted to be rotatably driven by means of an electric motor 45. On the opposite end of the shaft 42 is secured a bevel pinion 46 in mesh with a relatively large horizontal bevel gear 47 rigidly attached to the upper end of the standard 10. This construction is designed to permit selective rotation of the standard by means of the electric motor 45.

A second platform 48 is secured in horizontal position to the intermediate portion of the standard and is adapted to operatively support a pair of motors 49 and 50. A drive shaft 51 is mounted parallel with and adjacent to the standard 10, the lower end being rotatably supported in the upper bracket 18 and projecting through a sleeve formed in the upper portion of the gear frame 19 while the upper end of the drive shaft projects through an opening in the platform 48 and is held in position by a bearing collar secured thereon. A bevel pinion 52 is fixed on the lower end of the drive shaft 51 and meshes with the bevel gear 38. The upper end of the drive shaft 51 carries a horizontal gear 53 rigidly attached to the shaft and in mesh with a complementary gear 54 fixed on a vertical counter shaft supported in position by an angular bracket 55. A worm wheel 56 is secured on the counter shaft immediately above the gear 54 and is arranged to mesh with a drive worm fixed on the outer end of the motor shaft of the drive motor 49. Upon operation of the motor 49, the shaft 51 and lantern gear 38 will be rotated by means of the transmission gearing so as to tilt the lantern forwardly or rearwardly. The motor 50 is also formed with a drive worm arranged to drive a worm wheel 56 fixed on the upper end of a vertical shaft 57. The shaft 57 is mounted for rotatable movement adjacent the standard and arranged so that its upper end projects through an opening in the platform 48 while its lower end is journaled in a bracket 58. Detachably connected with the lower end of the shaft 57 and with the rear end of the threaded lantern shaft 32 is a flexible drive shaft 59. Thus, upon operation of the motor 50, in forward or reverse movement, the focus of the light rays of the lantern can be altered to spread said rays or concentrate the same into a light pencil.

An important feature of the present invention resides in the provision of a compact control unit which may be arranged in a remote position from the apparatus and permit accurate control thereof. This control unit embodies, in the present instance, an angular panel 60 to which are connected three independent switch members pivotally mounted

on the panel. Each of the contact members are of double bladed form arranged to provide a double throw for forward and reverse operation of the respective motors. In the present arrangement, the initial switch member indicated at 61, is connected with the motor 50 by means of a conductor 62. An auxiliary conductor 63 is associated with the conductor 62 and with the automatic switch blocks 35 in the lantern casing, the lower ends of the auxiliary conductors 63 being connected to terminals 64 mounted in the switch blocks. An intermediate switch member indicated at 65, controls the operation of the motor 45 through the medium of a conductor 66. In a similar manner, the switch member at the opposite end of the panel designated at 67 controls the operation of the lantern tilting motor 49. The switch contacts are also connected with a main conductor 68 which is adapted to be associated with an ordinary house socket. The lamp 29 is connected with a conductor 69 which is connected with an independent socket indicated at 70.

As clearly illustrated in the wiring diagram shown in Figure 2, the main conductor 68 is connected with one of the pivot contacts of each switch. When an individual switch is swung in one direction into contact with the stationary terminals, the motor connected with the switch will be operated in one direction. When the switch is thrown into contact with the terminal on the opposed side of the panel the operation of the motor is reversed. In the operation of the light focussing mechanism, when the switch is thrown in one position to close the circuit the motor 50 is operated in one direction to move the lamp 29 forwardly in the casing so that the projecting beam will diverge. In the event that the light is moved forwardly to the end of its transversing movement, the socket 28 will engage the movable contact 36 and force the same inwardly thus automatically disconnecting the motor operating circuit. When the motor is reversed the circuit will be similarly automatically disconnected when the socket engages the rear block 35 so as to avoid injury to the mechanism. As clearly shown in Figure 3, the switch members are normally maintained in an intermediate disconnected position by a pair of counteracting tension springs 71 secured to the outer edges of the panel and the switch.

In operation, the lamp 29 may be desirably focused by suitable operation of the switch 61 as described. When it is desired to elevate or lower the light beam, the switch 67 is swung into the corresponding fixed contacts to rotate the motor 49 in its forward or reversed movement. When it is desired to swing the beam horizontally, the intermediate switch 65 is thrown into engagement with the fixed contacts to operate the motor 45 in forward or reversed movement so as to rotate the tubu-

lar standard 10 in clockwise or counter-clockwise direction. This will enable the operator to accurately control and focus the projecting beam quickly and accurately from an adjacent or remote position.

It is also within the contemplation of the present invention to provide auxiliary control circuits so that the pivoted switch members can be operated by electromagnets to provide a dual distant control. This construction will permit the use of relatively small conductors for the operation of the switches.

It is to be understood that the form of my invention herein shown and described is to be taken as a preferred example of the same, and that various changes as to the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. A projecting apparatus comprising a rotatably supported standard, an electric motor adapted to rotate the standard, gearing interposed between the motor and the standard for rotatable operation of the standard, a lantern pivotally connected with the lower portion of the standard, an electric motor adapted for adjustment of the lantern, gearing interposed between the lantern and the motor adapted to permit oscillatory movement of the lantern upon operation of the motor, a third motor for selectively adjusting the lamp inside the lantern, and a remote control unit for selectively operating the motors in forward or reversed operation.

2. A projecting apparatus comprising a rotatably supported standard, an electric motor adapted to rotate the standard, gearing interposed between the motor and the standard for rotatable operation of the standard, a lantern pivotally connected with the lower portion of the standard, an electric motor adapted for adjustment of the lantern, gearing interposed between the lantern and the motor adapted to permit oscillatory movement of the lantern upon operation of the motor, a lamp support mounted for longitudinal sliding movement in the lantern, a motor for operatively actuating the said lamp support, a connecting shaft associated with the motor and threaded lamp actuating shaft adapted to rotate the threaded shaft upon operation of the motor to focus the lamp support, and a control unit adapted to permit selective operation of the respective motors.

3. A light projecting apparatus comprising a rotatable support standard, a hanger adapted to support the standard in vertical position, a lantern pivotally mounted at the lower end of the standard for vertical oscillating adjustment, a lamp support mounted for longitudinal sliding movement in the lantern, a threaded shaft mounted in the

lantern in operative engagement with the lamp support, a standard rotating motor, gearing interposed between the said motor and standard for reversibly rotating the said standard, a lantern oscillating motor, a gearing interposed between the said lantern oscillating motor and lantern adapted to oscillate the lantern upon operation of the motor, a motor for driving the threaded lamp support adjusting shaft, a flexible shaft disposed between the said motor and the threaded shaft for rotatable operation of the shaft, and a switch control unit adapted for selective operation of the respective motors.

In witness whereof I have hereunto set my hand.

CHARLES ANDREINO.