Sept. 13, 1932. C. H. BISSELL 1,876,840

LAMP CHANGING MECHANISM FOR BEACONS

Filed July 24, 1929 4 Sheets-Sheet 1

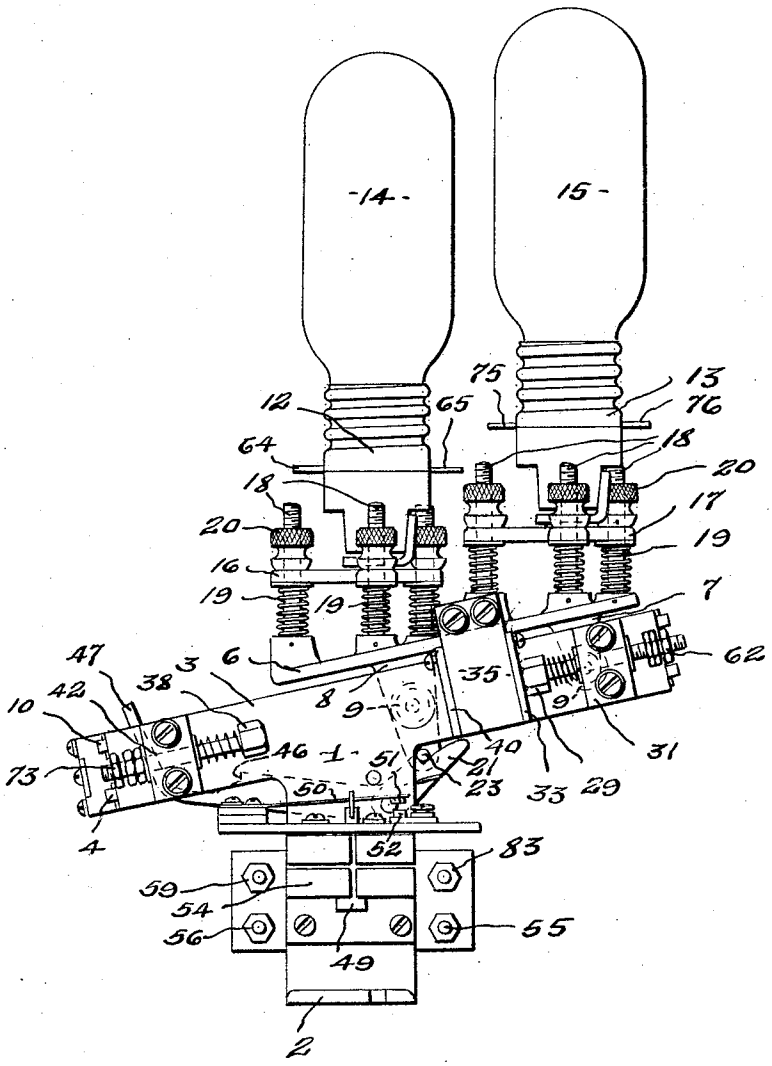


Fig. 1.

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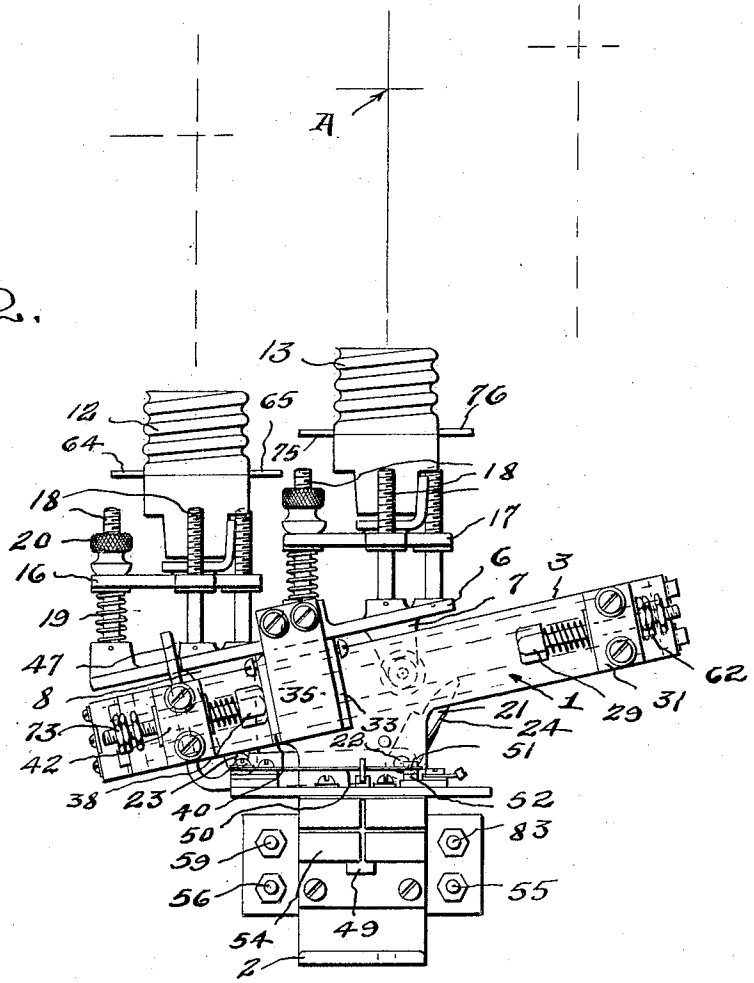
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LAMP CHANGING MECHANISM FOR BEACONS

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Fig. 2.



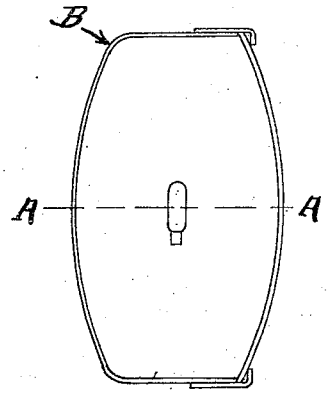


Fig. 8.

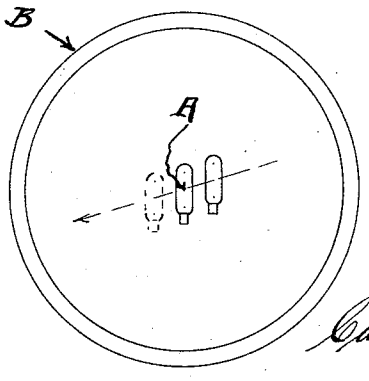


Fig. 7.

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LAMP CHANGING MECHANISM FOR BEACONS

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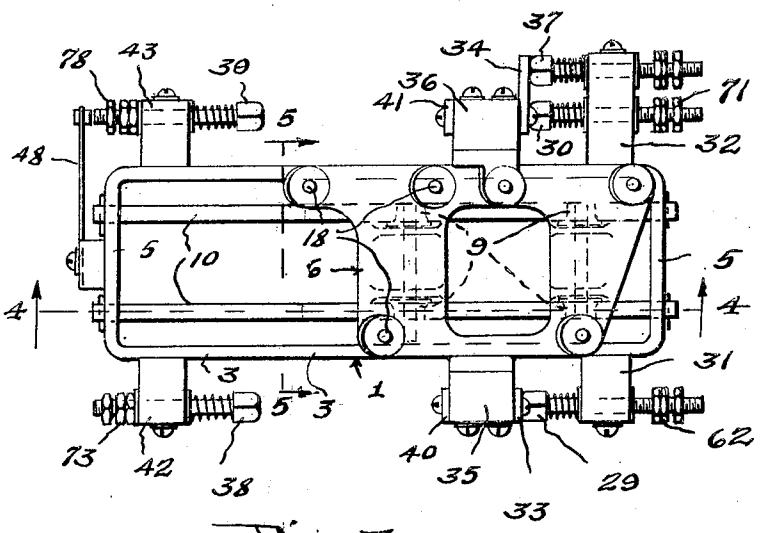


Fig. 3.

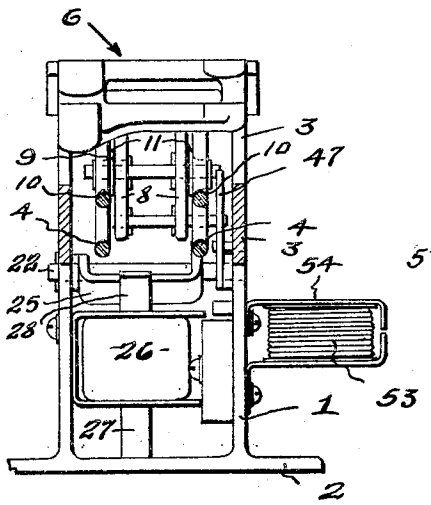


Fig. 5.

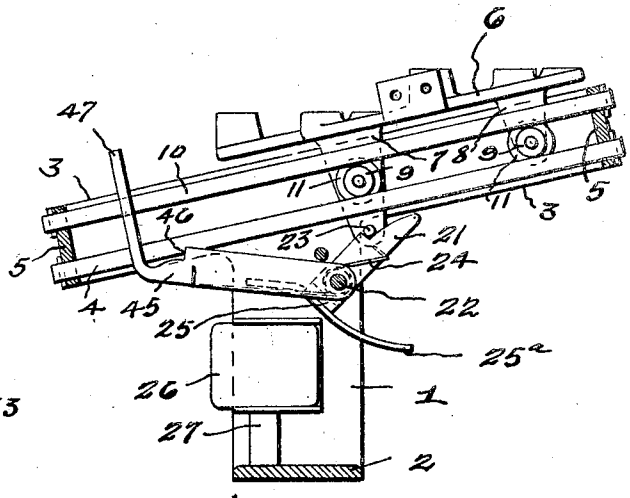


Fig. 4.

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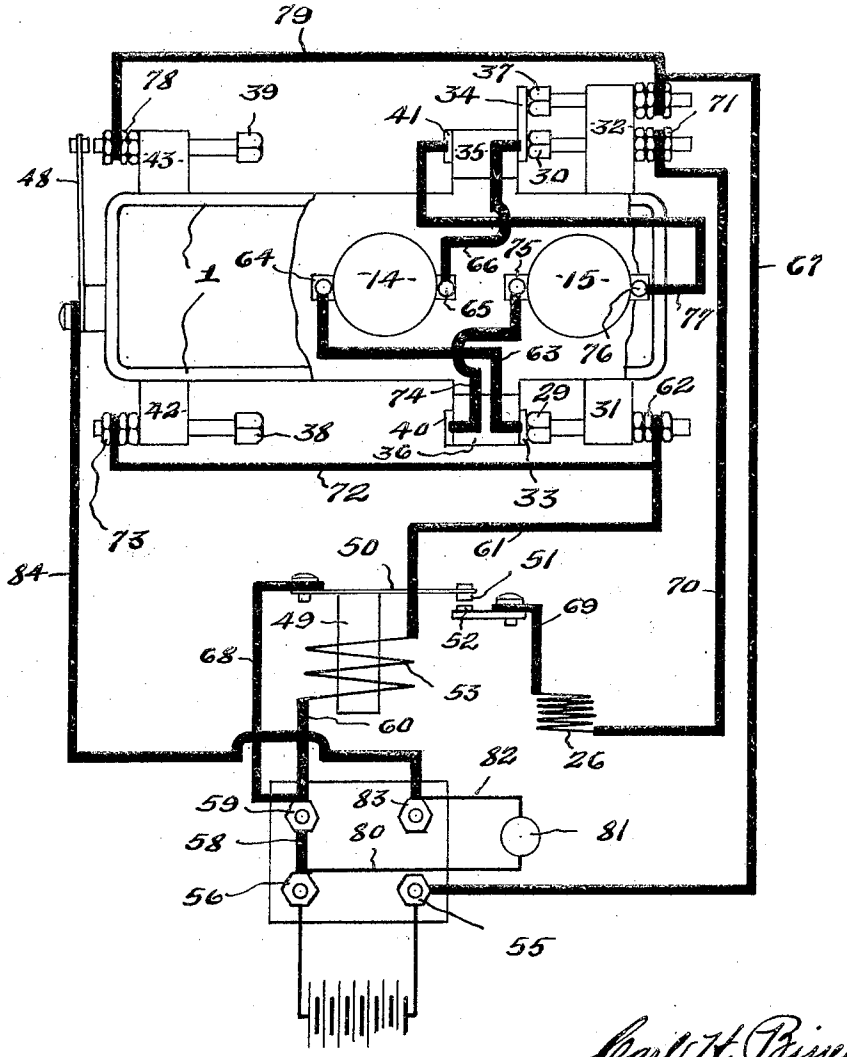
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Sept. 13, 1932. C. H. BISSELL 1,876,840

LAMP CHANGING MECHANISM FOR BEACONS

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Fig. 6.



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Patented Sept. 13, 1932 1,876,840

UNITED STATES PATENT OFFICE

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LAMP CHANGING MECHANISM FOR BEACONS

Application filed July 24, 1929. Serial No. 380,646.

This invention relates to lamp changers for beacons and the like, that is, a mechanism controlled by the failure of the current through one electric lamp in a predetermined position in the beacon for shifting the lamp out of such predetermined position and another lamp into the predetermined position, and has for its object, a particularly simple and efficient and compact lamp changing mechanism.

The invention consists in the novel features and in the combinations and constructions hereinafter set forth and claimed.

In describing this invention, reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a front elevation of this lamp changing mechanism, the lamp carriage and lamps carried thereby being shown in their initial position.

Figure 2 is a view similar to Figure 1, showing the lamp carriage shifted out of its initial position into another position to bring another lamp into the predetermined position in the beacon.

Figure 3 is a plan view of the lamp support and carriage, the lamp sockets and lamps being removed.

Figure 4 is a sectional view taken approximately on line 4—4, Figure 3.

Figure 5 is a sectional view taken approximately on line 5—5, Figure 3.

Figure 6 is a diagrammatic view of the wiring of the lamp changing mechanism.

Figure 7 is a diagrammatic face view of a beacon showing the relative positions of the lamps therein.

Figure 8 is a diagrammatic, central, vertical, sectional view taken on Figure 7.

The predetermined position of the lamps is with the filament located approximately in the axis of the beacon, that is, the axis of the reflector thereof, or the center of the drum shaped body thereof and the lamp carriage shifts in a direction transversely of such axis to carry the defective lamp out of its operative position and the second lamp into operative position, that is, the predetermined position with its filament in the axis of the beacon.

This lamp changing mechanism comprises, generally, a support having a track extending transversely of the axis of the beacon, a lamp carriage mounted on the track and normally arranged in one position with one lamp in the axis of the beacon, or any other predetermined initial position, a suitable electric circuit having branches connected to the lamps respectively, one branch being closed when the carriage is in its initial position and the other branch open, and means controlled by the failure of the current through the lamp in the predetermined position for controlling the movement of the carriage along the track to carry the other lamp into predetermined position and close the circuit through the other lamp, or the branch circuit in which it is connected.

1 designates the support which is here shown as in the form of a double bracket having a base plate 2 mountable in the beacon body in any suitable manner, the support being T shaped and the head 3 of the T shaped formation carrying the track 4. The head 3 is inclined out of the horizontal, so that the track 4 is inclined and extends transversely of the axis A of the body of the beacon B as shown by the arrow, see Figure 7.

The track 4 as here shown consists of parallel rods located between the front and rear members of the double head of the T formation and as mounted at their ends in end bars 5 of the head 3.

6 designates the lamp carriage which is movable along the upper side of the head 3 of the T formation and which is provided with depending lugs 7 and 8 extending between the rods of the track 4 and carrying wheels 9 which move along the track. Preferably, there are two additional rods 10 supported within the head 3 of the T formation above and parallel to the track 4 and over the rollers 9, but spaced therefrom. These bars 10 are for the purpose of preventing the wheels from jumping the track. The wheels are provided with flanges 11 which lap the sides of the tracks 4 and bars 10, which flanges prevent displacement of the carriage off the track.

12 and 13 are respectively lamp sockets for

the lamps 14 and 15. These sockets are preferably spring mounted on the carriage and are here illustrated as mounted upon base plates 16, 17, each being slidable on three upright rods or studs 18 projecting from the carriage 6. Compression springs 19 are interposed between the carriage 6 and the plates 16 or 17 and surrounding the studs 18, each stud 18 carrying an adjusting nut 20 which threads upon the studs 18 against the upper side of the plate 16 or 17 whereby the sockets 12, 13 may be adjusted vertically and also horizontally so as to bring the filament of the lamps 14, 15 to the focal axis of the reflector.

Normally, the lamp carriage 6 is located at the higher portion of the track 4 and with the left hand lamp 14 in juxtaposition to the axis A of the beacon and with the left hand lamp in the electric circuit, and the carriage is movable by the failure of the current through the lamp 14 down the track to bring the other lamp 15 in juxtaposition to the axis of the beacon and also to connect it in the electric circuit.

The carriage is normally held in its initial position by a latch 21 pivotally mounted on a rod 22 extending transversely, or forwardly and rearwardly of the support 1 and coacting with a pin 23 on the lamp carriage 6, this pin being here illustrated as carried by an extension of the lug 7 on which one pair of wheels 9 is mounted. It is normally held in its operative position in engagement with the pin 23 by a spring 24 and moved out of its operative position by electro-responsive means, as an electro magnet which is energized when the current through the lamp 14 fails, that is, when the lamp burns out, or becomes defective.

The latch 21 is here shown as an extension of a yoke 25 mounted on the rod 22. The latch 21 is tripped by an electro magnet 26 carried by the support between the uprights of the legs of the T formation, this electro magnet being a solenoid 26 and the core 27 thereof being movable upwardly to engage an arm 28 on the yoke 25 when the magnet is energized, thus moving the latch 21 in a clockwise direction, thus disengaging it with the pin 23. The solenoid 26 is energized, as will be presently described, upon the burning out of the lamp 14 and when energized, the core 27 thereof moves upwardly, trips the latch 21, so that the lamp carriage 6 moves down the incline of the track 4 to move the defective lamp 14 out of its predetermined position and bring the lamp 15 into juxtaposition to the axis of the beacon. The carriage moves down the incline of the track partly by gravity and partly by means which gives it a starting impulse when the latch 21 is tripped.

This means is here shown as, spring pressed plungers 29 and 30 slidable in suitable brackets 31, 32 mounted on the support and located in the path of shoulders 33, 34 on the lamp carriage. These plungers are electric contacts through which the current is carried to the lamp 14, that is, the lamp in juxtaposition to the axis of the beacon when the carriage 6 is in its initial position. The shoulders 33 and 34 are also contacts connected to the lamp terminals. The brackets 31 and 32 are blocks of insulation and also, the shoulders 33, 34 are carried by blocks 35 and 36 of insulation. As these plungers and shoulders are contacts, the are preferably located on the front and rear sides of the head 3 of the T formation in order to be accessible. Also, there is an additional spring pressed contact 37 carried by the block 32 adjacent the contact 30 and coacting with the shoulder contact 34 on the carriage 6.

When the latch 21 is tripped, the springs of the contacts 29, 30 and 37 react and give a starting impulse to the carriage 6 down the incline of the track 4.

Similar plunger contacts 38 and 39 are located to engage similar shoulder contacts 40 and 41 on the blocks of insulation 35 and 36 when the carriage 6 reaches the lower end of the track 4. These plunger contacts 38 and 39 are carried by blocks of insulation 42 and 43 on the front and rear sides of the head 3 of the T formation. The contacts 38, 39 are in a branch circuit connected to the lamp 15.

The movement of the carriage 6 down the incline track 4 under the influence of gravity and the spring pressed plungers 29, 30 and 37, is sufficient to compress the springs behind the plunger contacts 38, 39 and a latch is provided for holding the carriage in its shifted position when the springs behind the plungers 38, 39 are compressed.

45 designates the latch which is mounted on the pivot pin 22 on which the latch 21 is mounted and extends lengthwise of the track under the same and has a latch tooth 46 near its outer end for coacting with the pin 23 on the carriage 6. The latch 45 also has an upwardly extending finger engaging part 47. The spring 24 which serves to press the latch 21 into its operative position also acts to press the latch 45 into its operative position.

When the carriage 6 moves down the inclined track 4 under the influence of gravity and the spring pressed plunger contacts 29, 30 and encounters the spring pressed plunger contacts 38 and 39 and compresses the same, the latch tooth 46 moves behind the pin 23 and holds the carriage 6 in its shifted position.

When the lamp carriage is to be reset to its original position, the operator trips the latch 45 by depressing the handle or finger 47 thereof and the springs behind the plunger contacts 38 and 39 react and press the carriage 6 up the track far enough to clear the latch and then, the operator pushes the car-

riage by hand up the track, until the latch 21 again engages the pin 23.

A tell tale switch 48 is closed by one of the plunger contacts 39 to cut in a tell tale lamp indicating that one of the lamps is burned out.

The current through the windings of the electromagnet 26 is controlled by an electromagnetic switch in the feed circuit comprising, an armature 49 carrying a switch member 50 having a contact 51 movable into and out of engagement with the contact 52 in circuit wth the windings of the electromagnet 26.

The windings 53 of the electromagnet which actuates the armature 49 is connected in the feed circuit and is normally energized to hold the switch contacts 51, 52 separated. This electromagnet consisting of the windings 53 and armature 49 is mounted on a bracket 54 on the front side of the support. The latch 21 may be tripped by hand and for this purpose, a finger piece 25ª is provided on the yoke 25.

Referring to Figure 6, the feed wires are connected to terminals 55 and 56 mounted on a block of insulation supported by the frame.

The various branch circuits are as follows, assuming the lamp carriage is in the position shown in Figure 1. From the terminal 56, through wire 58, post 59 through wire 60 to the windings 53, through wire 61 to a binding device 62 or plunger contact 29, through shoulder contact 33, wire 63 to binding post 64 of one of the terminals of the lamp 14, through the lamp to the other binding post 65, wire 66 to shoulder contact 34, plunger contact 37, wire 67 to the feed wire terminal 55, to the other side of the source of supply. When the lamp 14 burns out, this circuit is broken and hence, the circuit is broken through the coil 53 which holds the switch 50 open so that now, the current passes from binding post 59, through wire 68, switch member 50, contacts 51, 52, wires 69 through the windings of the trip magnet 26, wire 70 to binding device 71 on the rear end of the plunger contact 30, through shoulder contact 34, plunger contact 37 and wire 67 to the other feed wire terminal 55, to the other side of the source of supply. Thus, the trip magnet 26 is energized, moving its core 27 upwardly and tripping the latch 21 as before described and hence, permitting the lamp carriage to be moved down the incline track 4 carrying the lamp 14 out of juxtaposition to the axis of the beacon and carrying the lamp 15 into juxtaposition.

Also, bringing the shoulder contacts 40, 41 into engagement with the plunger contacts 38, 39 so that now, the current flows from the feed wire terminal 56 to wire 60, coil 53, wire 61, wire 72 to binding device 73 on the outer end of plunger contact 38, through shoulder contact 40, wire 74, lamp terminal 75 and lamp 15, through the lamp to the lamp terminal 76, wire 77 to shoulder contact 41, plunger contact 39 and binding device 78 thereon, through return wire 79 to the wire 67 back to the feed wire terminal 55.

The current also flows from feed wire terminal 56, through wire 80, tell tale lamp 81, wire 82, binding post 83, wire 84 to the switch 48 which has been closed by the movement of the plunger contact 39, thence through return wires 79, 67. These tell tale lamps 81 are usually located on the top of the beacon, or any other place to call attention of the attendant to the fact that one of the lights has been burned out.

This lamp mechanism is particularly advantageous in that the lamps are firmly supported and can be more accurately located in juxtaposition to the beacon and more firmly supported than with oscillating lamp changers.

What I claim is:

1. In a lamp changing mechanism for beacons and the like, the combination of a support provided with an inclined track extending transversely of the axis of the beacon, a carriage mounted on the track, a pair of electric lamps mounted on the carriage, the carriage being normally arranged at the upper portion of the track with one of the lamps in a predetermined position and an electric circuit in which the lamp in such position is connected, means for normally holding the carriage from movement down the track and means controlled by the breaking of the circuit through the lamp in said predetermined position for releasing the holding means, and means for giving a starting impulse to the carriage when the holding means is released.

2. In a lamp changing mechanism for beacons and the like, the combination of a support provided with a track designed to extend transversely of the axis of the beacon, a carriage movable along the track, electric lamps mounted on the carriage, an electric circuit having branches, two sets of spring pressed contacts located respectively at opposite ends of the track, and connected respectively in the branches of said circuit, the carriage having two sets of contacts for coacting with the former contacts and connected to the terminals of the lamps respectively, the carriage being normally arranged in one position on the track with one set of contacts on the carriage engaged with one set of spring pressed contacts and with one lamp connected in the circuit, and means controlled by the failure of the current through the lamp in the circuit for shifting the carriage along the track and bringing the other set of contacts on the carriage into engagement with the other set of spring pressed contacts.

3. In a lamp changing mechanism for beacons and the like, the combination of a

support provided with a track designed to extend transversely of the axis of the beacon, a carriage movable along the track, electric lamps mounted on the carriage, an electric circuit having branches, two sets of spring pressed contacts located respectively at opposite ends of the track, and connected respectively in the branches of said circuit, the carriage having two sets of contacts for coacting with the former contacts and connected to the terminals of the lamps respectively, the carriage being normally arranged in one position on the track with one set of contacts on the carriage engaged with one set of spring pressed contacts and with one lamp connected in the circuit, and means controlled by the failure of the current through the lamp in the circuit for shifting the carriage along the track and bringing the other set of contacts on the carriage into engagement with the other set of spring pressed contacts, said spring pressed contacts being in the form of plungers movable in a direction parallel to the track.

4. In a lamp changing mechanism for beacons and the like, the combination of a support provided with a track designed to extend transversely of the axis of the beacon, a carriage movable along the track, electric lamps mounted on the carriage, an electric circuit having branches, two sets of spring pressed contacts located respectively at opposite ends of the track, and connected respectively in the branches of said circuit, the carriage having two sets of contacts for coacting with the former contacts and connected to the terminals of the lamps respectively, the carriage being normally arranged in one position on the track with one set of contacts on the carriage engaged with one set of spring pressed contacts and with one lamp connected in the circuit, and means controlled by the failure of the current through the lamp in the circuit for shifting the carriage along the track and bringing the other set of contacts on the carriage into engagement with the other set of spring pressed contacts, and a latch for locking the carriage when said other set of contacts are engaged with said other set of spring pressed contacts and the springs thereof are compressed.

In testimony whereof, I have hereunto signed my name at Syracuse in the county of Onondaga, and State of New York, this 2nd day of July, 1929.

CARL H. BISSELL.