

Feb. 18, 1941.

A. D. WARREN

2,232,418

WINDOW CONTROLLER

Filed May 8, 1939

4 Sheets-Sheet 1

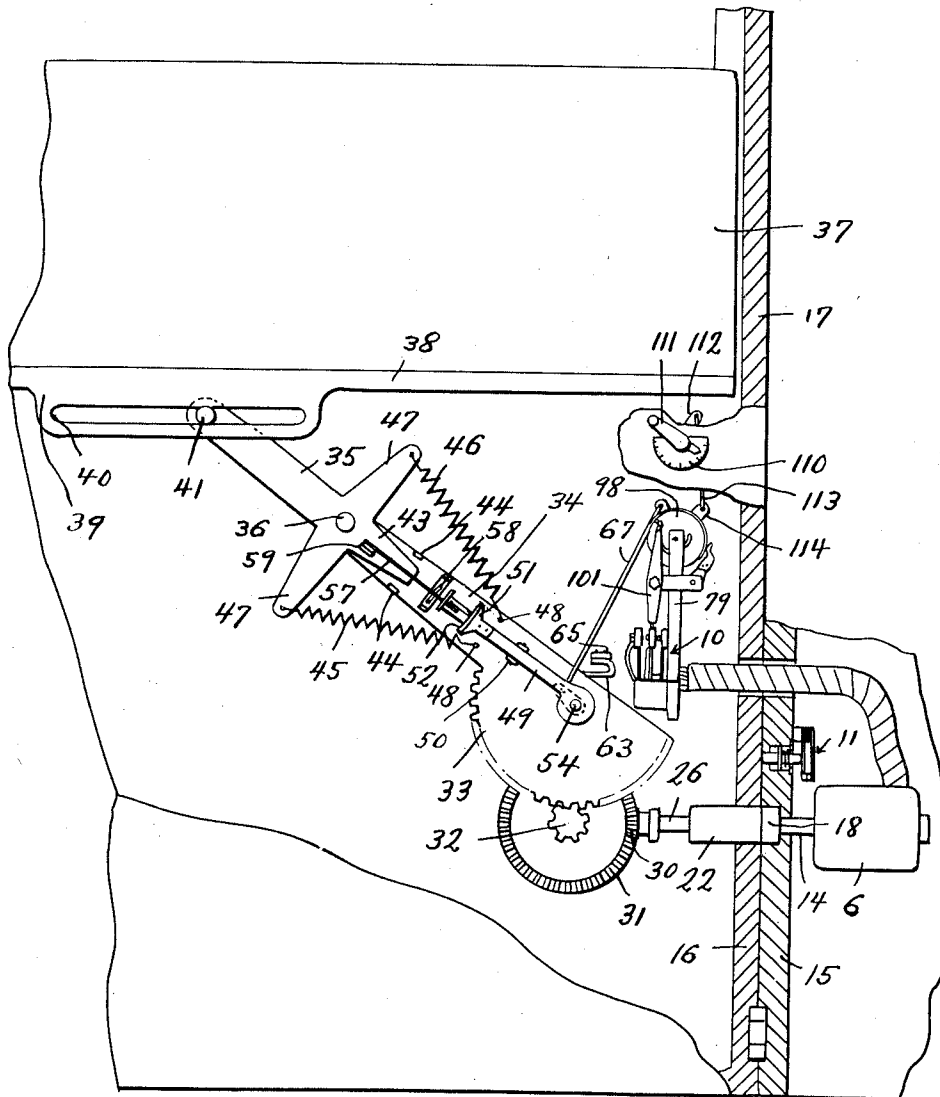


Fig. 1.

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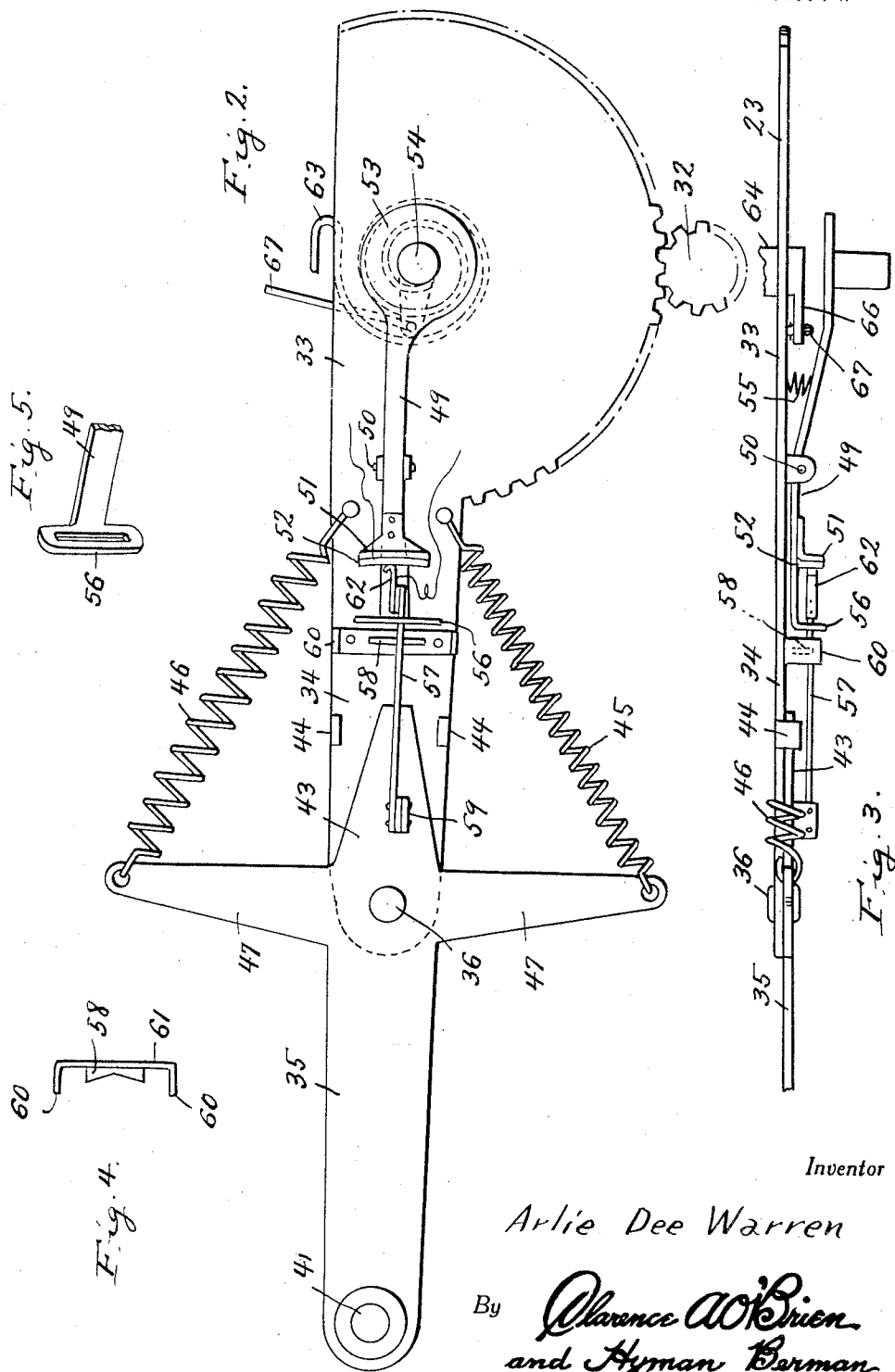
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4 Sheets-Sheet 2



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4 Sheets-Sheet 3

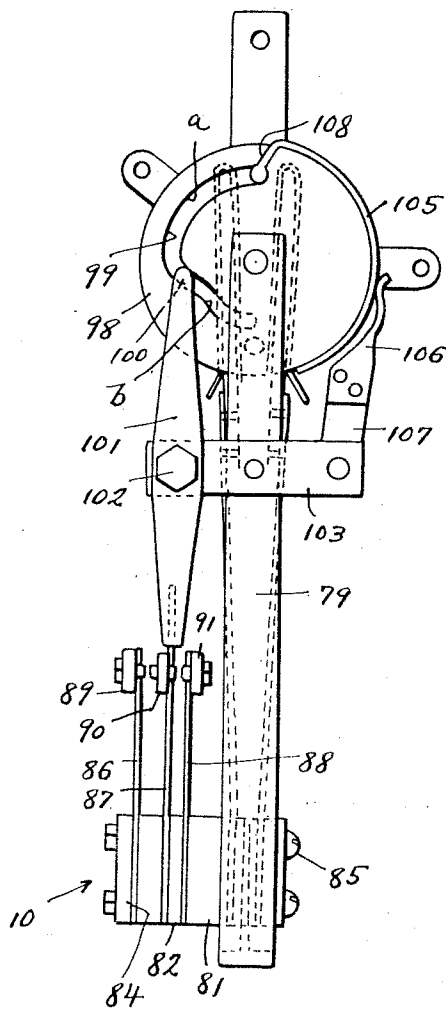


Fig. 6

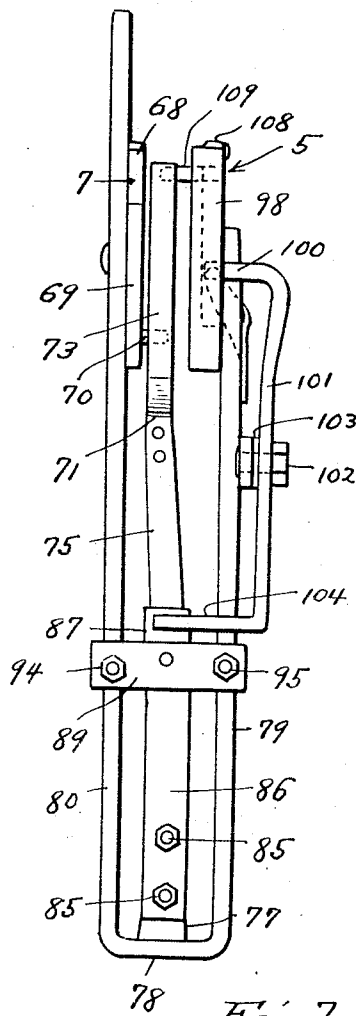


Fig. 7.

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4 Sheets-Sheet 4

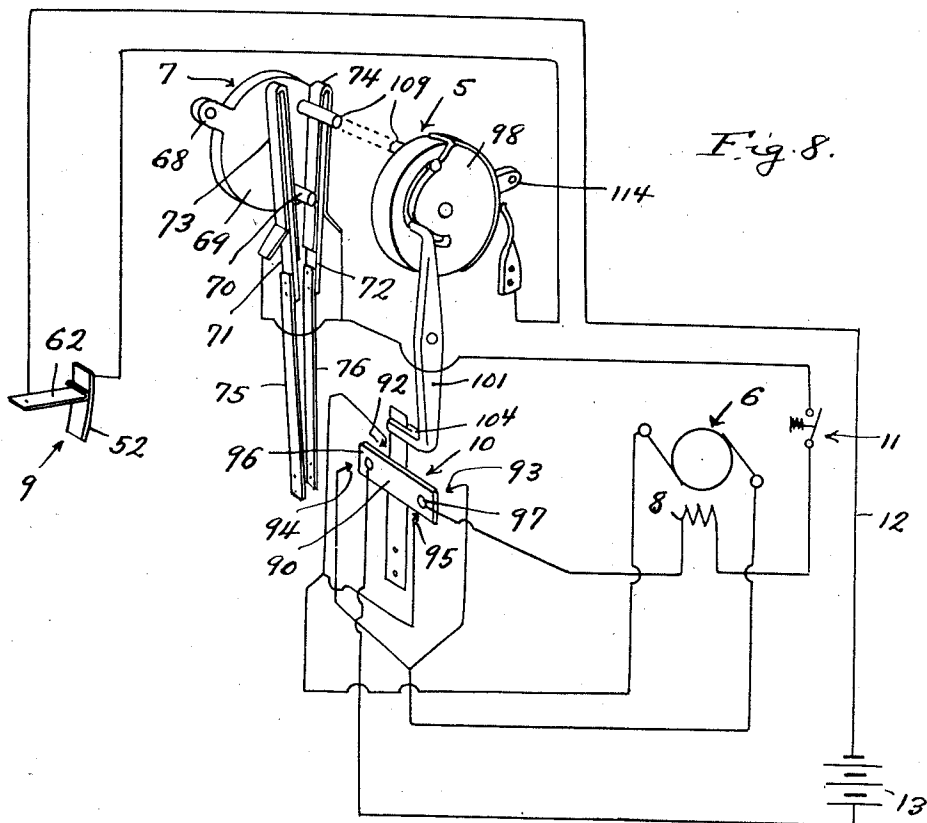
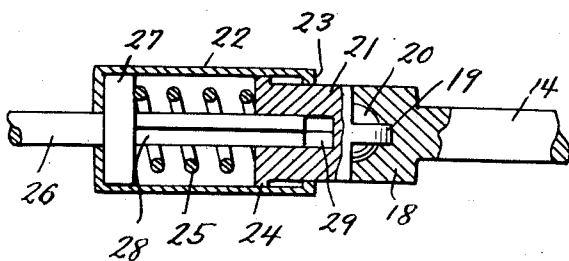


Fig. 9.

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UNITED STATES PATENT OFFICE

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WINDOW CONTROLLER

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Application May 8, 1939, Serial No. 272,475

4 Claims. (Cl. 268—124)

This invention appertains to new and useful improvements in means for controlling windows such as the automobile window adjacent the driver's seat, with the principal object in view of permitting convenient and effortless operation of the window when the driver is required to give traffic signals especially in inclement weather.

Another important object of the invention is to provide an automobile window control which is power operated and which requires only switch actuation on the part of the driver to effect the elevating or lowering movements of the window to the desired extent.

These and other objects and advantages of the invention will become apparent to the reader of the following specification.

In the drawings—

Figure 1 represents a fragmentary vertical sectional view through a door showing in side elevation the control mechanism.

Figure 2 is a side elevational view of the control beam.

Figure 3 is a fragmentary edge elevational view of the control beam.

Figure 4 is an edge elevational view of the detent.

Figure 5 is a fragmentary perspective view of the spring arm controlling guide.

Figure 6 is a front elevational view of the duration and reversing switch assembly.

Figure 7 is a side elevational view of the assembly shown in Figure 6.

Figure 8 is a diagrammatic view disclosing the electrical connections between the electrical devices involved.

Figure 9 is a fragmentary longitudinal sectional view through the door jamb shaft jaw.

Referring to the drawings wherein like numerals designate like parts, it can be seen in Figure 8 that numeral 5 generally refers to the controller for regulating the duration of operation of the motor generally referred to by numeral 6.

Numerals 7 represents the switch which is associated with the controller 5 and which is in circuit with the field 8 of the motor 6.

Numerals 9 represents the switch which is automatically operated by the window-operating beam, while numeral 10 generally refers to the reversing switch. A door jamb-controlled switch generally referred to by numeral 11 in the lead 12 from the battery or other source of current 13.

As shown in Figure 1 the motor 6 is suitably mounted, preferably in the cowl portion of the automobile and has its shaft 14 disposed into

the jamb wall 15 opposed to the vertical jamb portion 16 of the hinged edge of the door 17. The shaft 14 has the socket head 18, the surface of the socket being formed with a channel for receiving the rib 19 on the ball section 20 which is carried by the plunger 21 operative in the barrel 22. The outer end of the barrel is flanged as at 23 to serve as an abutment for the circumferential shoulder 24 on the plunger 21. When the door 17 is open the ball 20 simply rotates in the socket head 18 as the spring 25 forces the plunger 21 outwardly. A shaft 26 having the fixed collar 27 thereon in the barrel 22 has the squared portion 28 in the barrel slidably disposed in the squared opening 29 of the plunger 21. The shaft 26 at its rear end is equipped with the bevel gear 30 which meshes with the large bevel gear 31. This gear 31 is suitably mounted and carries with it the pinion 32 which meshes with the semi-circular gear 33 on the shaft 34.

Extending in alignment with the straight side of the gear 33 is the shank 34 which at its outer end has the T-shaped member 35 swingably mounted thereon on the fulcrum 36.

As shown in Figure 1, the window glass 37 has the base strip 38 from which depends the flange 39 having the longitudinal slot 40 therein and this slot receives the stud 41 which projects from the upper end of the T-arm 35.

The T-member 35 which is substantially inverted in use has the finger protrusion 43 which operates between the two lugs 44—44 on the shank 34, these lugs serving as stops. To afford a yieldable connection between the arm 35 and the shank 34, coiled, tension springs 45 and 46 extend between the outer ends of the swing members 47—47 and anchors 48 on the shank 34, the spring 46 being substantially stronger than the spring 45.

As substantially shown in Figures 1, 2 and 3, a lever 49 is rockably supported as at 50 on the gear 33 and has the head 51 of insulation to which the arcuate strip 52 of current-conductive material is secured. The lower end of the lever 49 terminates in the circular head 53 which has an outwardly extending knob 54, and a compressible spring 55 is interposed between the lever 49 and the gear 33 to normally maintain the head 53 urged outwardly and the free end of the lever 49 urged inwardly toward the shank 34 with its slotted guide 56 receiving and retaining the elongated strip spring 57 disposed in the V-cut of the boss 58. One end of this strip spring 57 is anchored and insulated as at 59 while its opposite end is operative between the lugs 60—60

on the ends of the plate 61 and normally operate within the confines of the V-cut of the boss 58. The free end of the spring 57 carries the contact 62 properly insulated from the spring 57 and in wiping engagement with the strip 52.

A spring is convoluted on the shaft 34 that has one end secured to the shaft and the other end secured to the bracket 65, this spring being denoted by numeral 64.

It can also be seen that the gear 33 is secured to the shaft 64 and that the adjacent outer end of the shaft has the lateral arm 66 from which extends the rod 67 to the lug 68 of the switch 7. (See Figures 1 and 8.)

The switch 7 consists of the disk 69 having the pin 70 extending laterally therefrom. This pin 70 operates between the two contact arms 71 and 72 which are covered with the conductor strips 73 and 74 respectively. These strips 71 and 72 of insulation are mounted on the strip springs 75 and 76 respectively, which as shown in Figures 6 and 7, are disposed at opposite sides of the stump 77 which rises from the bight portion 78 of the U-shaped frame which includes the front and back legs 79 and 80. The lower ends of these springs 75 and 76 are insulated from the stump 77 and additional blocks 81, 82, 83, and 84 are secured together with the springs 75 and 76 and the stump 77 through the use of bolts 85 to properly mount the switch elements of the reversing switch 10. The switch elements consist of the strip springs 86, 87 and 88 which carry at their upper ends the cross-members 89, 90 and 91 of insulation. The strip 91 carries the contacts 92 and 93, while the strip 89 carries the contacts 94 and 95. The intermediate contact strip 90 carries the contacts 96 and 97.

This reversing switch 10 is operated by the duration and reversing switch assembly generally referred to by numeral 5 which consists of the disk 98 having the tortious groove 99 on the front side thereof and in this groove operates the stud 100 of the rockable lever 101 which is fulcrumed as at 102 on the bracket 103 carried by the leg 79. As shown in Figure 8 the lower end of the arm 101 has the laterally disposed and bifurcated finger 104 which receives the upper end portion of the spring 87 of the reversing switch 10.

The upper portion *a* of the groove 99 serves to control the window-lifting and lowering mechanism in one direction while the portion *b* controls the apparatus in the opposite direction.

A portion of the periphery of the disk 98 has the conductor strip 105 secured thereto and against this rides the brush 106. The brush 106 is insulated from the bracket 103 by the block 107 of insulation. The upper end of the conductor strip 105 has the connection 108 to the contact pin 109 which projects rearwardly from the disk 98 and is interposed between the upper portions of the arms 71 and 72 as shown in Figure 1, on the inside wall of the door 17 there is a segmental dial 110 through which a shaft extends and this shaft carries at the driver's end the handle 111 and adjacent its inner end the short arm 112 from which extends the connecting rod 113 to the lug 114 on the disk 98. Thus by actuating the handle 111 to the desired degree, the dial 110 can be provided with suitable graduations, the disk 98 will be adjusted to a predetermined position with the studs 100 located at a particular position either in the groove *a* or the groove *b* which of course determines whether the contacts 96 and 97 are to be engaged with the contacts 92 and 93 or 94 and 95, for regulating the motor 6 in one direction or

the other. Obviously when the reversing switch 10 is in fact closed, the mechanism starts in operation and will continue until actuation of the rod 67 moves the disk 69 so that the pin 70 will disengage the corresponding arm 71 or 72 from the contact pin 109, thus breaking the circuit.

The mechanism shown in Figure 2 is to take care of any undue strain on the mechanism. In the event the window 37 becomes jammed, the spring 46, or the spring 45 will yield and the T-arm 35 will break or swing on the shank 34 so that the spring 57 moves out of the V-cut of the boss 58 and over the end thereof and it requires actuation of the lever 49 before this spring 57 can be restored. Obviously when the spring 57 rides over one end of the boss 58 the contact 62 is disengaged and held disengaged from the contact strip 52.

The switch 11 is of simple design, the same simply consisting of a spring-pressed pin operative against the switch blade so that the switch is only closed when the door is closed and will automatically open to break the circuit when the door is in open position.

While the foregoing specification sets forth the invention in specific terms, it is to be understood that numerous changes in the shape, size and materials may be resorted to without departing from the spirit and scope of the invention as claimed hereinafter.

Having described the invention what is claimed as new is:

1. A window actuating mechanism comprising a motor, a swingable beam driven by the motor for lifting and lowering a window, said beam being divided into a pair of yieldably connected sections, a switch on the beam for cutting out the motor when the sections of the beam are moved one with respect to the other, one of said sections carrying the contactor of the switch, the other section carrying a stationary contact of the switch and against which the contactor rides, said contactor being of spring material, a catch member having a V cut therein in which the contactor normally operates, said contactor being adapted to ride out of the V-cut and to pass over one end of the V-cut member when a variance occurs in a normal operating position between the sections of the beam.

2. A window actuating mechanism comprising a motor, a swingable beam driven by the motor for lifting and lowering a window, said beam being divided into a pair of yieldably connected sections, a switch on the beam for cutting out the motor when the sections of the beam are moved one with respect to the other, one of said sections carrying the contactor of the switch, the other section carrying a stationary contact of the switch and against which the contactor rides, said contactor being of spring material, a catch member having a V cut therein in which the contactor normally operates, said contactor being adapted to ride out of the V-cut and to pass over one end of the V-cut member when a variance occurs in a normal operating position between the sections of the beam, and an operator for restoring the contactor to a position within the V-cut.

3. A window actuating mechanism comprising a motor, a swingable beam driven by the motor for lifting and lowering a window, said beam being divided into a pair of yieldably connected sections, a switch on the beam for cutting out the motor when the sections of the beam are moved one with respect to the other, one of said sections carrying the contactor of the switch, the other section carrying a stationary contact of

the switch and against which the contactor rides, said contactor being of spring material, a catch member having a V cut therein in which the contactor normally operates, said contactor being adapted to ride out of the V-cut and to pass over one end of the V-cut member when a variance occurs in a normal operating position between the sections of the beam, and an operator for restoring the contactor to a position within the V-cut, said operator consisting of a rocker having one end engageable with the contactor and its other end provided with a push button.

4. A window actuating mechanism comprising a motor, a swingable beam driven by the motor for lifting and lowering a window, said beam being divided into a pair of yieldably connected sections, a switch on the beam for cutting out the motor when the sections of the beam are moved

one with respect to the other, one of said sections carrying the contactor of the switch, the other section carrying a stationary contact of the switch and against which the contactor rides, said contactor being of spring material, a catch member having a V cut therein in which the contactor normally operates, said contactor being adapted to ride out of the V-cut and to pass over one end of the V-cut member when a variance occurs in a normal operating position between the sections of the beam and an operator for restoring the contactor to a position within the V-cut, said operator consisting of a rocker having one end engageable with the contactor and its other end provided with a push button, and a guide for the contactor at the contactor engageable end of the rocker.

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