

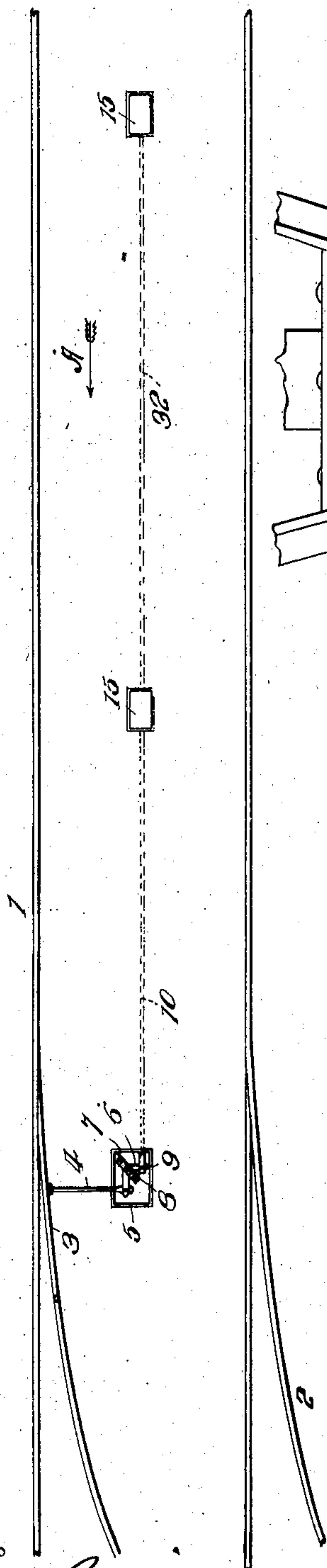
No. 834,168.

PATENTED OCT. 23, 1906.

N. SILVERSON.  
APPARATUS FOR OPERATING SWITCHES.

APPLICATION FILED APR. 13, 1906.

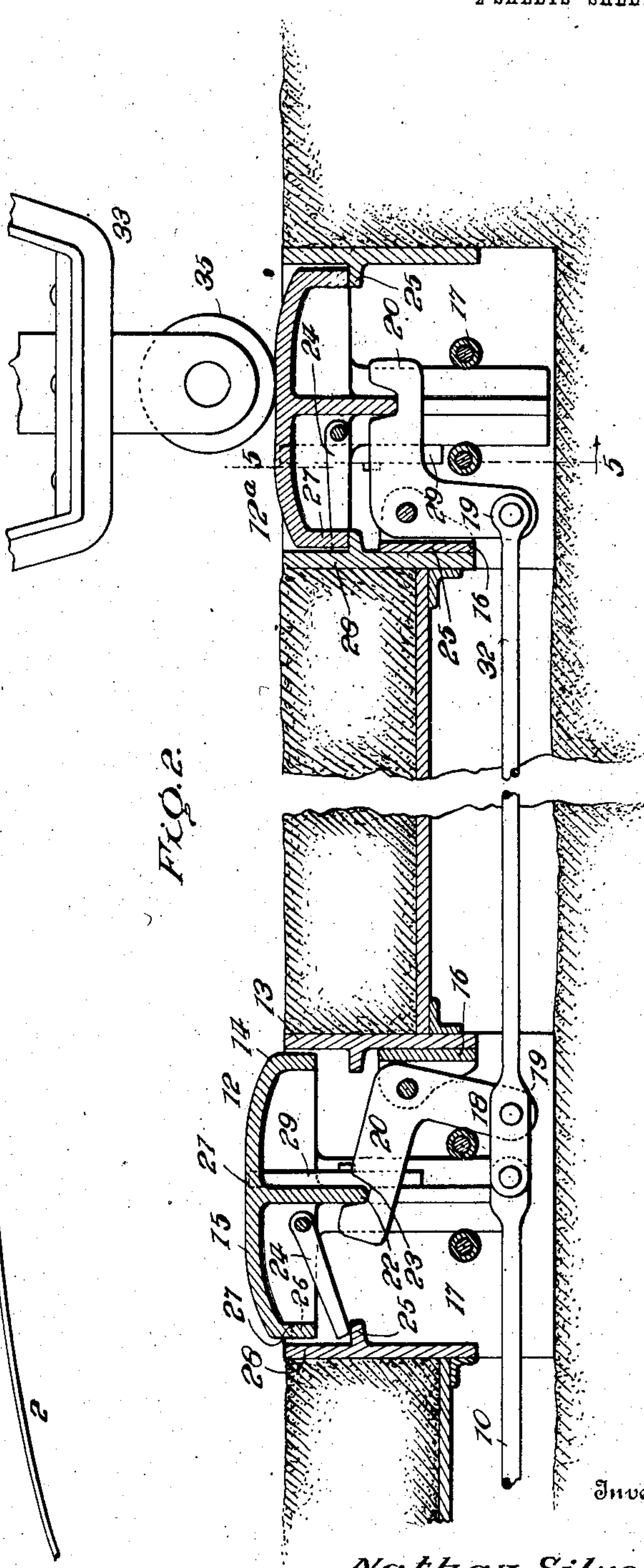
2 SHEETS—SHEET 1.



Witnesses

McMurre  
Francis S. Hagman

Fig. 2.



Inventor

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# UNITED STATES PATENT OFFICE.

NATHAN SILVERSON, OF NEW YORK, N. Y.

## APPARATUS FOR OPERATING SWITCHES.

No. 834,168.

Specification of Letters Patent.

Patented Oct. 23, 1906.

Application filed April 13, 1906. Serial No. 311,565.

*To all whom it may concern:*

Be it known that I, NATHAN SILVERSON, of New York, in the county of New York and State of New York, have invented certain  
5 new and useful Improvements in Apparatus for Operating Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it ap-  
10 pertains to make and use the same.

The object of this invention is to provide an improvement in that class of switch-setting devices for street-railway cars in which the switch is automatically shifted by mech-  
15 anism actuated by the approaching car, thus avoiding the necessity for switch attendants or for the motorman delaying his car while operating the switch.

Broadly stated, the invention contem-  
20 plates a system of levers connecting the movable switch-rails to a contact device arranged in advance of the switch and intermediate the rails. A roller carried by the car and under the control of the motorman is designed  
25 to engage the contact device and shift the movable rails.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

30 In the accompanying drawings, Figure 1 is a plan view of a railway-track equipped with a switch-controlling mechanism in accordance with my invention. Fig. 2 is a vertical longitudinal sectional view showing a pair of  
35 contact devices and their connection to the switch-rails. Fig. 3 illustrates means carried by a car and under the control of the operator for actuating the contact devices. Fig. 4 is a section on line X X, Fig. 3. Fig. 5 is a  
40 cross-section on line 5 5, Fig. 2. Figs. 6 and 7 are details.

Referring to the drawings, 1 designates the stationary rails, of the usual style or pattern adapted to street-railway cars. 2 designates  
45 the branch tracks, and 3 the movable switch-rails, constructed and operating in the usual or any preferred form and manner. The switch-bar 4 is shown extending into a housing 5 intermediate the tracks and beneath  
50 the surface of the ground, the extremity of the switch-bar being pivotally secured to a bell-crank lever 6, suitably supported within the housing, as by a pin 7, holding it in pivotal engagement with a bracket 8. The other

arm 9 of the bell-crank lever is pivoted to a  
toggle 10. This toggle extends beneath the  
ground through a suitable conduit to a point  
sufficiently in advance of the switch, where it  
is connected to the forward contact device 12.  
As shown, these contact devices 12 and 12<sup>a</sup>  
60 comprise housings or casings 13 and contact portions 14, movable vertically therein; the contact portions being formed with curved  
upper surfaces 15 and having depending  
arms 16 intermediate guides 17 of the hous-  
65 ing. These guides are shown as transverse rollers and the arms as movable freely between them.

Secured to one of the inner walls of the housing 13 is a vertically-disposed bell-crank  
70 lever 18, whose lower arm 19 is pivoted to toggle 10. The upper arm 20 is designed to engage the vertically-movable contact portion 14, and as an appropriate construction I have  
75 shown the contact member provided with a web or bridge 21 intermediate of and secured to the arms 16. The bridge is disposed transversely of the plane of the bell-crank 18, and at its central portion it is shown formed with  
80 a notch or recess 22, designed to be engaged by the notched or recessed portion 23 in the upper arm 20 of the bell-crank. The recess 23 is sufficiently wide to permit the movement  
85 of its arm upon the contact member being depressed without causing friction or binding. As a further means of preventing binding of the parts I have shown a pair of arms 24, piv-  
90 oted to the movable contact member, preferably on the inner faces of the arms 16, and having their free edges resting on a ledge 25 at the side of the housing when the contact  
95 member is depressed, grooves or notches 26 in the end 27 of the latter accommodating the arms when the contact member is in this position. These arms project beyond the  
100 end 27 and contact at their extremities with the wall 28 of the housing. When the movable contact member is depressed by a car moving in the direction of arrow A, Fig. 1, the tendency is to push the contact member  
105 toward wall 28, which might cause friction by binding. This is prevented by the arms 24, which in moving over their centers hold the movable contact member away from the housing-wall 28.

I have shown the contact device equipped with a latch 29, pivoted to a face of the web or bridge 21 and having a hook-shaped ex-



tremity 30, designed to engage upper arm 20 of the bell-crank 18, and thus lock the bell-crank and movable member together. The shank of this latch extends into an opening 5 31 in the top 15 of the contact member and terminates about flush with the top surface thereof. By means of a wedge or block this latch may be held so as to lock the parts together, as under ordinary circumstances. 10 When, however, it is desired to gain access to the interior of the contact device, the wedge is removed, permitting the latch to be opened and rendering the web or bridge 21 removable from arm 20 of the bell-crank, where- 15 upon the movable member 14 may be lifted out of the housing 13.

All of the features of construction which I have described with reference to the forward contact device 12 are or may be employed in 20 the rearward device 12<sup>a</sup>. It is essential, however, that the operation or depression of one of these contact devices shall cause the other one to rise. This is accomplished by reversing the dispositions of bell-cranks 18 25 in their respective housings and connecting their lower arms 19 by a link 32.

In Fig. 3 I have shown appropriate means, designed to be carried by a car, by which the contact devices may be operated. A frame 30 33, depending from the bottom 34 of a car, supports a vertically-movable element carrying a roller 35 at its lower end. This element is shown as comprising a pair of parallel plates 36, movable in a bearing 37 of the 35 frame and having the roller journaled between them. A spring 38, secured to one of the plates and to a cross-arm of the frame, tends to hold the plates elevated and the roller out of contact with the ground. By 40 means of a lever 39, pivoted to the frame and to the plates, the latter may be lowered. A hand or foot device 40 on the car, under the control of the driver or motorman and connected to lever 39 by a chain 41, serves as an 45 appropriate means of operating the roller device.

It is desirable when used on cars which may be operated at either end that the described roller device be located at about the 50 center of the car-body, in which event lever 39 will be duplicated, as at 42, lever 42 being connected and operated at the other end of the car similar to lever 39. When, however, the roller device is used at only one 55 end of the car, it is obvious that a single lever will suffice and that the operating means may be suitably changed, if necessary.

The operation of a switch-controlling mechanism embodying my invention will be 60 readily understood from the foregoing description. Assuming the construction of the switch-rails 3 to be such that they will be closed so as to direct a car over the branch tracks 2 when the parts are in the positions 65 indicated in Fig. 2, the operator of a car

moving in the direction of arrow A and intended for travel over the branch line first notes the position of the switch, and if it be open he operates the roller device to depress contact member 12<sup>a</sup>, as shown. This closes 70 the switch and causes contact member 12 to rise. After passing contact device 12<sup>a</sup> the operator raises the roller 35, so that it will not contact with contact device 12. The operator of the following car or cars intended 75 for the same direction—that is, over the branch line—finding the switch in the proper position need not operate the switch at all; but an operator of a following car not intended for the branch line, but for continuous 80 travel along the main line 1, lowers roller 35 of his car to depress contact device 12, which causes toggle 10 and link 32 to shift, reversing the relative positions of the contact members and opening the switch. Consequently 85 it will be a very simple matter for motormen to understand that in order for their cars to be directed over the branch line contact device 12<sup>a</sup> must be depressed and to continue along the main line contact device 12 must 90 be depressed. It will be noted that when the roller 35 begins to move up over the curved top of a movable contact member the latter is pushed or shifted toward wall 28 of its housing, which would cause its end 27 to 95 bind against the housing-wall but for arms 24. These, as described, are of such length that they extend beyond end 27 into contact with wall 28. Consequently when the contact is depressed the arms 24 in assuming a 100 horizontal disposition pass over their centers and prevent the end 27 from contacting with wall 28.

The space between the two contact devices may be sufficient to give ample oppor- 105 tunity for the operator depressing only one of the contact devices. In practice the weight of the parts and the fit of the bell-cranks 6 and 18 in their bearings are such that the contact devices will not readily op- 110 erate by light pressure upon them. My invention is primarily designed for overhead-trolley cars, and to that end I have shown the mechanism intermediate the tracks. It is obvious, however, that the invention will 115 be well adapted to underground-trolley systems where it may readily be installed without interfering with the wiring in the conduits.

I claim as my invention—

1. In a switch-operating means for cars, a 120 contact device in advance of the switch comprising a stationary housing equipped with guides, a contact member movable in said housing intermediate said guides, means for supporting said contact member, means for 125 locking said supporting means to said contact member, connections between said supporting means and the movable switch-rails, and means carried by a car and designed to engage said contact member. 130



2. In a switch-operating means for cars, a contact device in advance of the switch comprising a stationary housing having rollers forming guides, a contact member vertically movable in said housing intermediate and in engagement with said rollers, means for supporting said contact member, connections between said supporting means and the movable switch-rails, and means carried by a car and designed to engage said contact member.

3. In a switch-operating means for cars, a contact device in advance of the switch comprising a stationary housing having rollers forming guides, a contact member vertically movable in said housing intermediate said rollers and in engagement therewith, means for supporting said contact member, means carried by said contact member for locking the latter to said supporting means and designed upon being released to permit the withdrawal of said contact member from said housing, connections between said supporting means and the movable switch-rails, and means carried by a car and designed to engage said contact member.

4. In a switch-operating means for cars, a contact device in advance of the switch comprising a stationary housing equipped with guides, a contact member movable in said housing and having depending arms intermediate said guides, a web connecting said arms, a bell-crank lever vertically disposed and pivotally mounted in said housing transversely of said web and designed to engage the latter, means connecting said bell-crank lever with the movable switch-rails, and means carried by a car and designed to engage said contact member.

5. In a switch-operating means for cars, a contact device in advance of the switch comprising a stationary housing equipped with guides, a contact member movable in said housing and having depending arms intermediate said guides, a web connecting said arms, a bell-crank lever vertically disposed and pivotally mounted in said housing transversely of said web and designed to engage the latter, a latch pivoted to said web and having a hooked extremity designed to engage said bell-crank lever and hold it in engagement with said web, toggles connecting said bell-crank lever with the movable switch-rails, and means carried by a car for engaging said contact member.

6. In a switch-operating means for cars, a contact device in advance of the switch comprising a housing, a contact member vertically movable therein, means connecting said contact member with the movable switch-rails, means carried by a car for depressing said contact member, and means for maintaining said contact member out of engagement with the walls of said housing in its vertical movement.

7. In a switch-operating means for cars, a contact device in advance of the switch comprising a housing, a contact member vertically movable therein, means connecting said contact member with the movable switch-rails, means carried by a car for depressing said contact member, and antifriction means on said contact member comprising arms pivoted thereto and extending beyond the end thereof into engagement with said housing, as set forth.

8. In a switch-operating means for cars, a contact device in advance of the switch comprising a housing having guides and a ledge, a contact member vertically movable in said housing, means connecting said contact member with the movable switch-rails, means carried by a car for depressing said contact member, said contact member having depending portions movable in engagement with said guides, and antifriction means carried by said contact member comprising arms pivoted to said depending portions and extending beyond the end of said contact member into engagement with said housing and designed to have their free ends supported by said ledge.

9. In a switch-operating means for cars, two contact devices in advance of the switch each comprising a housing, movable contact members therein, and vertically-disposed bell-crank levers, a link connecting the lower arms of said bell-cranks, said bell-cranks being disposed oppositely to each other, and having their upper arms removably secured to their respective contact members, means for locking said arms to said contact members, connections between the bell-crank of the forward contact device and the movable switch-rails, and means carried by a car for operating one or the other of said contact members.

10. In a switch-operating means for cars, two contact devices in advance of the switch each comprising a housing, movable contact members therein, and vertically-disposed bell-crank levers, a link connecting the lower arms of said bell-cranks, said bell-cranks being disposed oppositely to each other, and having their upper arms removably secured to their respective contact members, means for locking said arms to said contact members, a switch-bar secured to the movable switch-rails, a casing adjacent said rails into which said switch-bar extends, a bell-crank pivotally mounted in said casing, to one arm of which said bar is pivotally secured, a toggle pivoted to the other arm of said bell-crank and to the lower arm of the bell-crank of the forward contact device, and means carried by a car for operating one or the other of said contact members.

11. In a switch-operating means for cars, two contact devices in advance of the switch each comprising a housing, movable contact



members therein, and vertically-disposed bell-crank levers, a link connecting the lower arms of said bell-cranks, said bell-cranks being disposed oppositely to each other, and  
5 having their upper arms in engagement with their respective contact members, a switch-bar secured to the movable switch-rails, a casing adjacent said rails into which said switch-bar extends, a bell-crank pivotally  
10 mounted in said casing, to one arm of which said switch-bar is pivotally secured, a toggle pivoted to the other arm of said bell-crank and to the lower arm of the bell-crank of the forward contact device, and means carried  
15 by a car for operating one or the other of said contact members.

12. The combination with the contact devices arranged in advance of a switch and means connecting them with the movable  
20 switch-rails, of operating means carried by a car comprising a frame having guides or bearings, a pair of plates secured together and movable in said guides or bearings, a roller journaled between the outer extremities of

said plates, a lever pivoted to said frame and  
25 secured to said plates, and means for operating said lever.

13. The combination with the contact devices arranged in advance of a switch and means connecting them with the movable  
30 switch-rails, of operating means carried by a car comprising a frame having guides or bearings, two plates secured together and vertically movable in said guides or bearings, a roller journaled between the outer extremities  
35 of said plates, a spring having one end secured to said plates and the other to said frame, a lever pivoted to said frame and secured to said plates, mechanism under the control of the car-operator, and connections  
40 between said lever and said mechanism.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

NATHAN SILVERSON.

Witnesses:

GRAFTON L. MCGILL,  
ALICE D. LIND.