

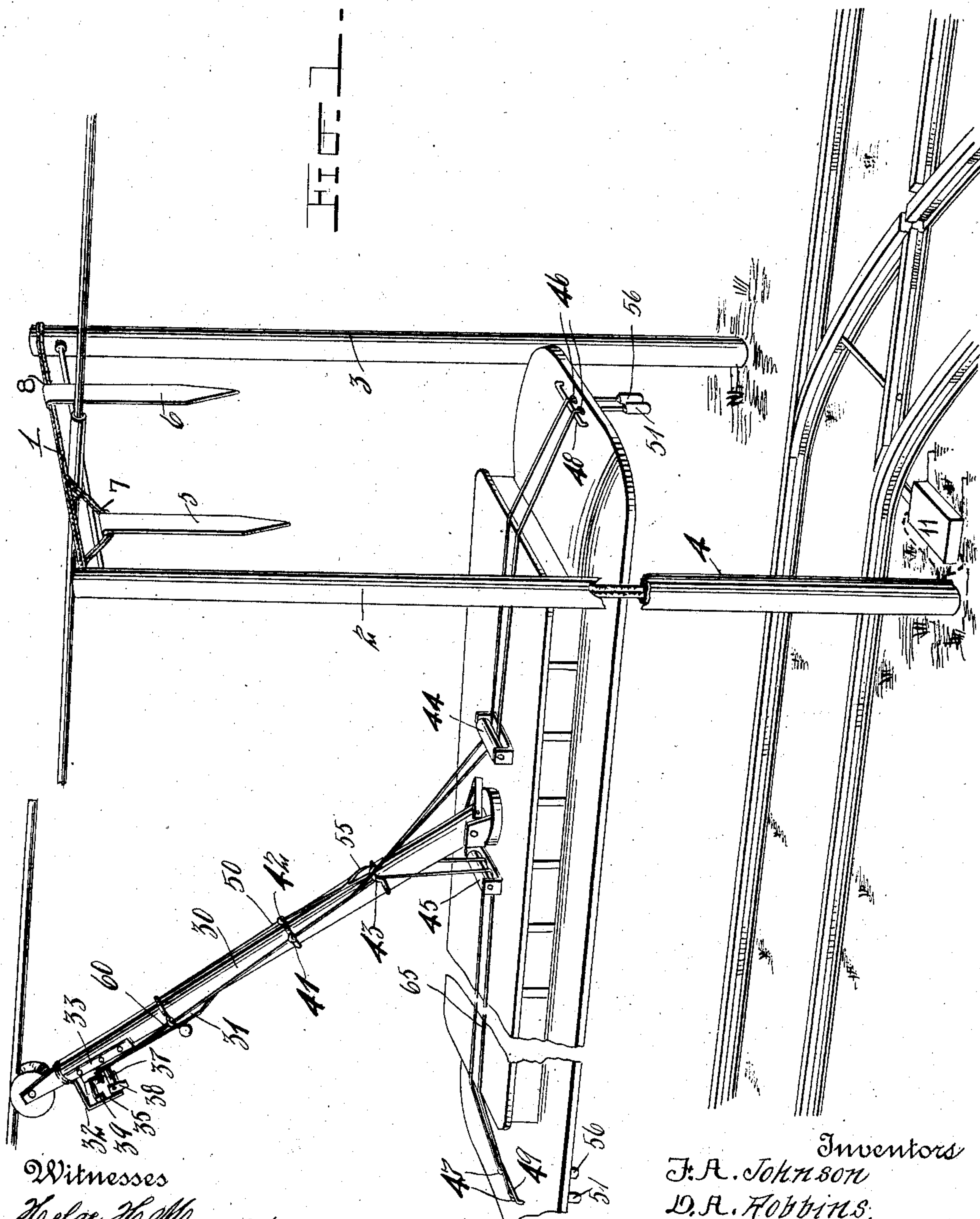
No. 864,306.

PATENTED AUG. 27, 1907.

F. A. JOHNSON & D. A. ROBBINS.
ELECTRIC SWITCH OPERATING DEVICE.

APPLICATION FILED OCT. 22, 1906.

2 SHEETS—SHEET 1.



Witnesses

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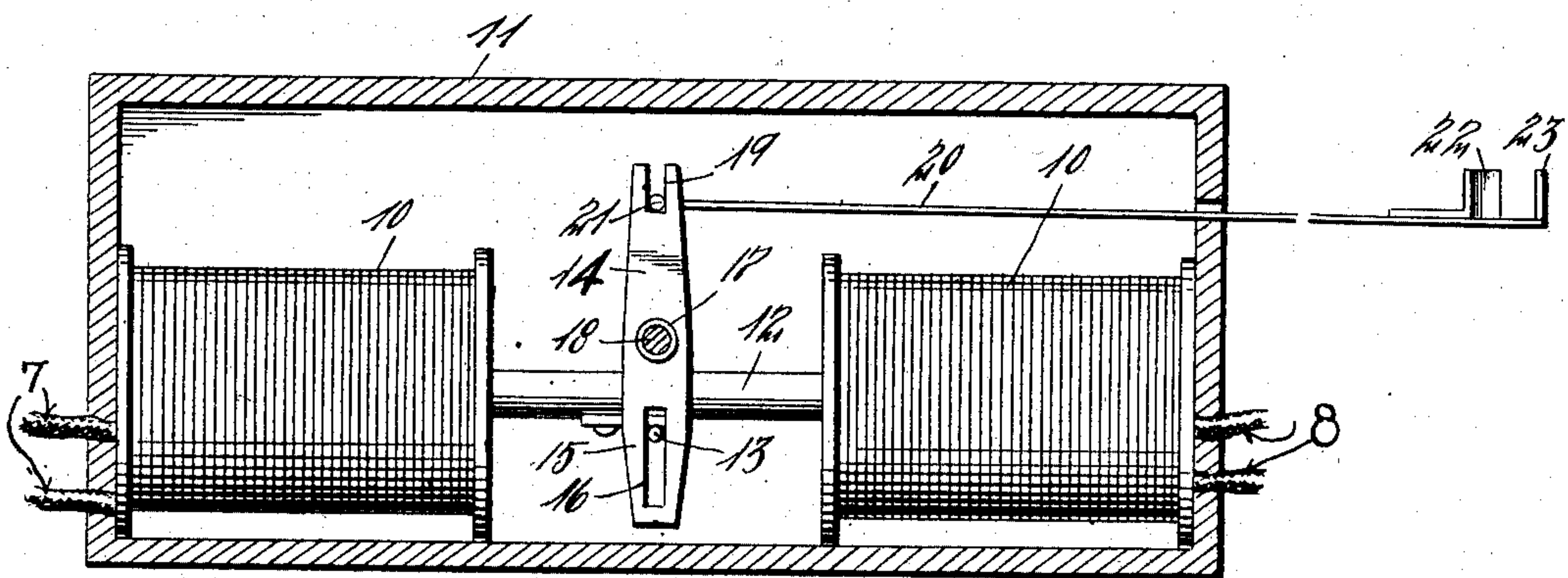
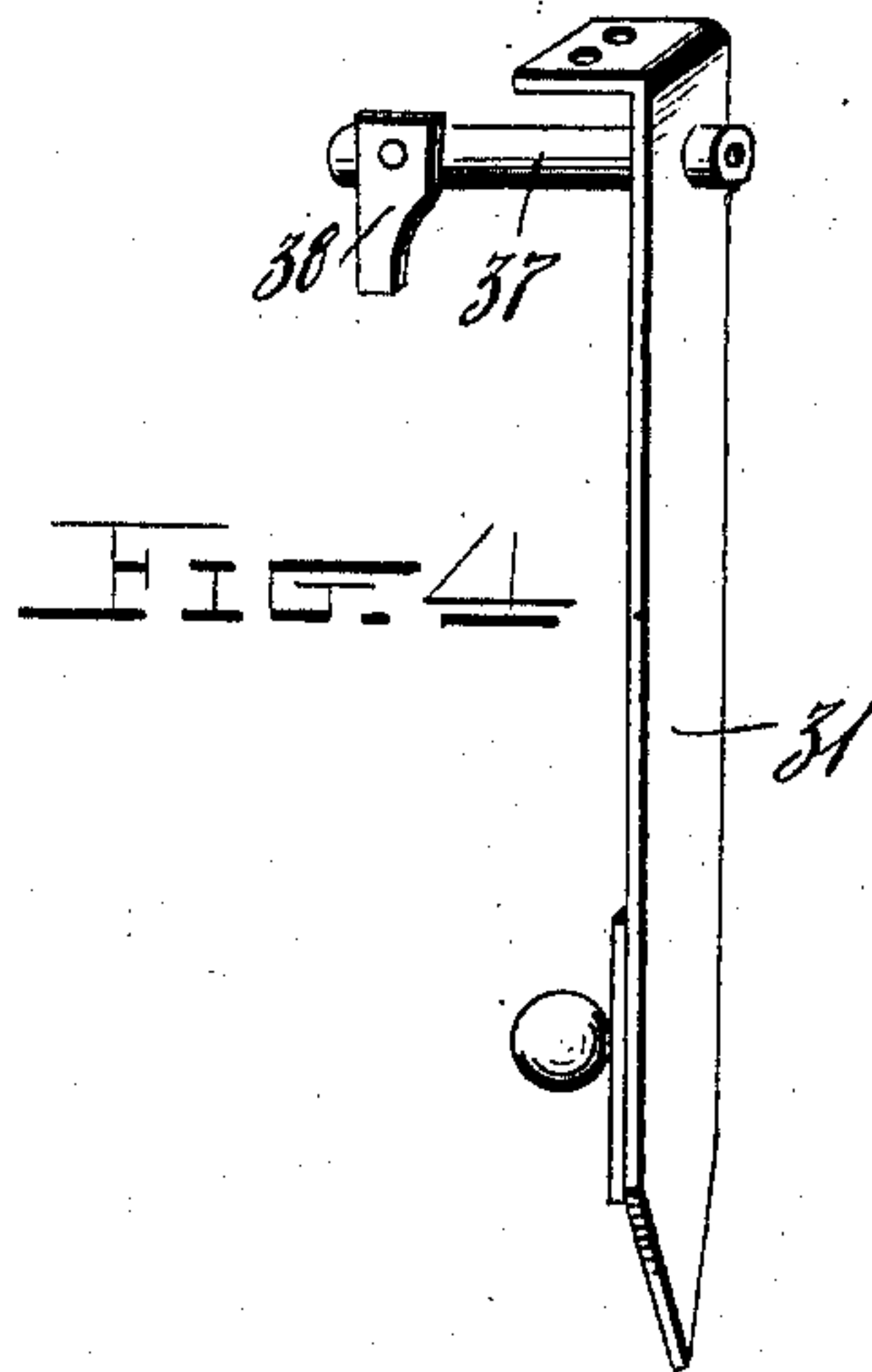
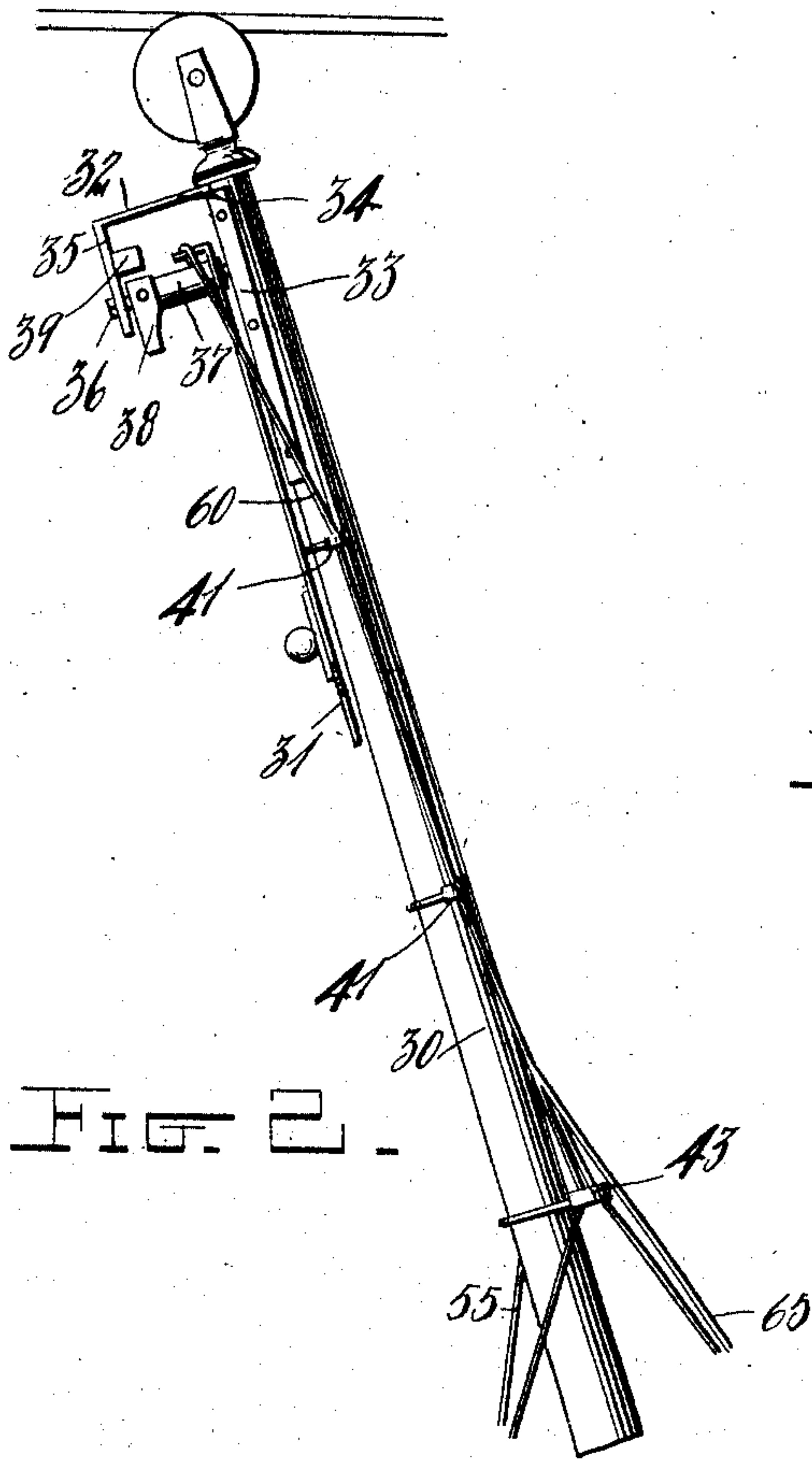
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

FRANK A. JOHNSON AND DAVID A. ROBBINS, OF DANVILLE, ILLINOIS.

ELECTRIC SWITCH-OPERATING DEVICE.

No. 864,306.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed October 22, 1906. Serial No. 340,080.

To all whom it may concern:

Be it known that we, FRANK A. JOHNSON and DAVID A. ROBBINS, citizens of the United States, residing at Danville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Electric Switch-Operating Devices; and we do 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 appertains to make and use the same.

This invention relates to an electrically-operated switch throwing device designed to be actuated from a car while moving.

The object of the invention is to provide a simple electrical device for opening and closing a switch and for setting signals which may be operated from a car while in motion.

In the accompanying drawings, in which like reference characters indicate corresponding parts, Figure 1 represents a perspective view of a portion of a track and switch of a trolley road with a car equipped with this invention designed to operate in conjunction with an electro-magnet disposed adjacent to the tracks; Fig. 2 represents a side elevation of a trolley pole equipped with a circuit closer for moving the switch point, and showing the actuating cords or cables connected therewith; Fig. 3 represents a longitudinal section of a casing, the electro-magnet disposed therein, being shown in side elevation and a casing arranged adjacent to the track the magnet being energized by the closing of the circuit to throw the switch point in the desired direction; Fig. 4 represents a detail, showing the pivoted circuit closer on an enlarged scale.

In the embodiment shown in the accompanying drawings the invention is applied to a trolley road, but it may be used on any railroad, either steam or electric, the current for operating it being supplied from a battery or other suitable source.

Referring to the drawings, conducting wires 7 and 8 extend between two of the trolley wire posts 2 and 3, which are disposed nearest to the switch to be operated and are insulated and twined together forming a twisted wire 1 which runs down the pole 2, preferably through a tube 4 attached to said pole, then beneath the ground as shown in dotted lines in Fig. 1 to the electro-magnet 10 disposed adjacent to the switch point. Extended from said wire 1 are two swinging copper contacts 5 and 6 arranged on opposite sides of the trolley wire and spaced therefrom and connected respectively with the wires 7 and 8.

The electro-magnet 10 is disposed adjacent to the track in a closed casing 11, and is composed of spaced coils with a core 12 operating therein. A transverse pin 13 is attached to the lower side of said core at a point between the coils and its ends project on opposite

sides thereof. A yoke 14 surrounds the core 12 and has its arm 15 slotted at 16 to receive the ends of the pin 13. These yoke arms 15 are connected near their center by a sleeve 17 fixed thereto and extending on opposite sides thereof. A rod or shaft 18 extends through this sleeve with its opposite ends mounted in the sides of the casing 11 and on which the sleeve is adapted to turn. In the upper free ends of the yoke arms are open slots 19.

A thrust rod or bar 20 extends through an opening in one end of the casing 11, and is provided at its inner end with a transverse pin 21, which is mounted in the open slots, as 19, of the yoke arms 15 and this bar is provided at its outer free end with upwardly-extending spaced lugs or flanges 22 and 23 to receive the switch point. When the coil at one end of the casing 11 is energized, the core 12 is drawn thereinto and causes the upper ends of the yoke arms to which the thrust arm 20 is connected to move forward and open the switch. When the other coil at the opposite end of the casing 11 is energized, the core 12 is drawn thereinto and moves the yoke and its connected thrust rod backward and closes the switch.

On the trolley pole 30 near its upper end is mounted a transversely movable circuit closer, preferably made in the form of a blade or arm 31 pivoted to swing in a bracket 32 attached to the pole 30. This bracket preferably consists of a semi-cylindrical plate 33 attached to the pole 30 and having an L-shaped arm 34 with its free end 35 turned down and apertured to receive a bolt 36. On this bolt 36 is rotatably mounted a sleeve 37, which projects laterally from the blade 31 near its upper end. Extending laterally from this sleeve 37 is a finger 38 adapted to engage stops as 39 at opposite sides of the arm 35 to limit the upward movement of said blade in either direction. This blade 31 is preferably weighted at its lower free end to cause it to drop down adjacent to the trolley pole when not in use and its upper end is preferably bent at right angles and perforated to provide for the attachment of the operating cords 50 and 60 now to be described. The trolley pole 30 is provided at its opposite sides with spaced guide-eyes 41 and 42, and near its lower end with a larger single eye 43 arranged on its upper face. On top of the car at opposite sides of the pole 30 are arranged pulleys 44 and 45 around which the operating cords pass. The car top is also provided at its opposite ends with spaced apertures, as 46 and 47, through which the cords are threaded. Adjacent to said apertures at the rear thereof are disposed rods or rollers 48 and 49, over which the operating cords are guided. The two cords 50 and 60 are secured to the upper end of the blade 31 by passing them through the apertures in the upper bent end of the blade and tying them. These cords 50 and 60 are threaded through the guide eyes 41 and 42 at opposite sides of the pole 30. The cord 50 is passed through the large eye 43 then un-

der the pulley 44 and over said rod, as 48, at the front of the car, through one of the apertures, as 46, and its free end is provided with a handle or grip 51. To the cord 50 at a point above the eye 43 is attached a branch cord 55, which passes outside the eye 43 under the pulley 45, over the rod, as 49, at the rear of the car, then through one of the apertures, as 47, and its free end provided with a grip 56. When either of the grips 51 at the front or 56 at the rear of the car is grasped and drawn down, the blade 31 is swung upward in the same direction into the path of one of the swinging contacts 5 or 6. The cord 60, after being threaded through the guide eyes 41 and 42 is passed through the large eye 43 then under the pulley 45, over the rod 49 at the rear of the car and through the unoccupied aperture, as 47, and its free end provided with a handle grip 51. To the cord 60 at a point above the large eye 43 is attached the branch cord 65 which passes outside the eye 43 under the pulley 44, over the rod 48 and through the unoccupied aperture 46 and is provided at its free end with a hand grip 56.

In the use of this invention as illustrated, the electricity is supplied by the trolley line wire to the bracket 32 and a copper blade 31 thereon through the trolley wheel and its supporting bracket.

When the switch is in open position and signal, connected with the electro magnet indicating such position and with a car approaching, the motorman on the car grasps the handle of the proper cord and throws the circuit closing blade 31 upward into position to engage one of the swinging contacts 5 or 6 according to the direction in which the car is traveling and closes a circuit whereby the coil of the magnet at one end of the casing is energized and the core 12 drawn thereinto carrying with it the thrust rod 20 connected to the switch point thereby closing the switch and permitting the car to pass safely thereover. After passing the switch, the motor-

man releases the operating cord and the weighted blade 31 drops down into normal position.

Having thus described our invention, what we claim as new and desire to secure by Letters-Patent, is:—

1. An automatic switch operating device comprising a switch bar connected to a switch point, an electro-magnet having its core attached to said bar, conducting wires extending from said electro-magnet, swinging contacts carried by said wires, a depending freely swinging contact carried by the car, means within the reach of the car operator for swinging said contact into the path of one of the swinging track contacts for closing the circuit and energizing the magnet to operate the switch and means for limiting the movement of said car-carried contact in either direction.

2. A switch operating device comprising a switch bar, an electro-magnet connected thereto, swinging contacts arranged over the track and connected with said electro-magnet, a swinging contact carried by the car and means for moving said contact into the path of one of the track contacts for closing the circuit and operating the switch said means comprising two flexible elements connected at one end to the opposite sides of said swinging car-carried contact and movably mounted on the pole, and with their opposite ends bifurcated and one member of each extended to the rear of the car and the other member to the front thereof.

3. A switch operating device comprising a switch bar, an electro-magnet connected therewith, swinging contacts arranged over the track and connected with said electro-magnet, a weighted contact arm mounted to swing on the trolley pole of the car, and means for moving said weighted arm in to the path of one of said swinging contacts for closing the circuit and operating the switch said means comprising two flexible elements connected at one end to opposite sides of said swinging car-carried contact and having their opposite ends bifurcated and extended to the rear of the car and to the front thereof, respectively.

In testimony whereof we have hereunto set our hand in presence of two subscribing witnesses.

FRANK A. JOHNSON.
DAVID A. ROBBINS.

Witnesses:

FRED M. JAHNKE,
JAMES M. MILLS.