(No Model.) 2 Sheets—Sheet 1.

W. S. BROWNE.

ELECTRICALLY ACTUATED SWITCH MECHANISM.

No. 570,373. Patented Oct. 27, 1896.

Fig. 1

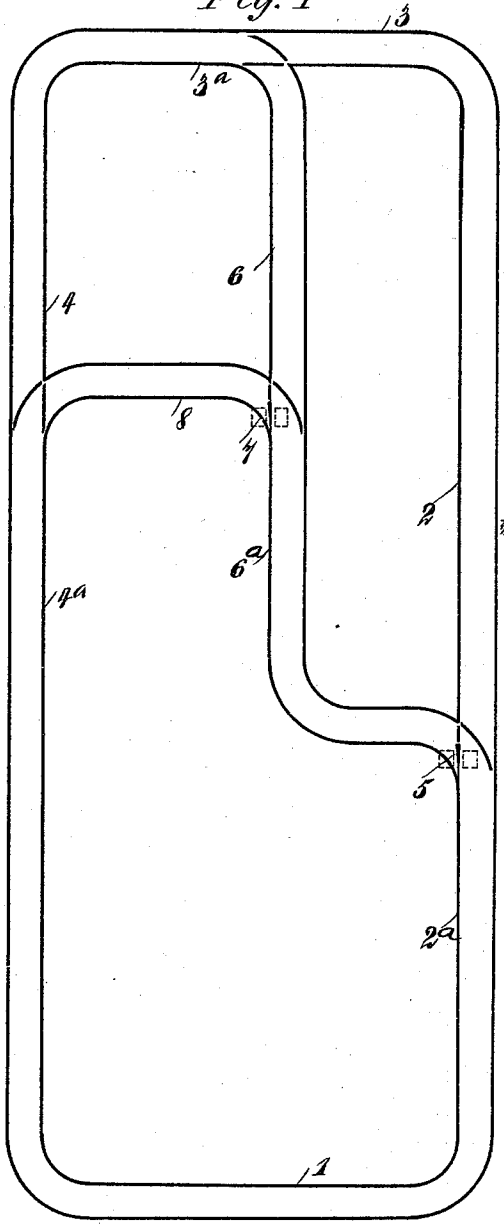


Fig. 2

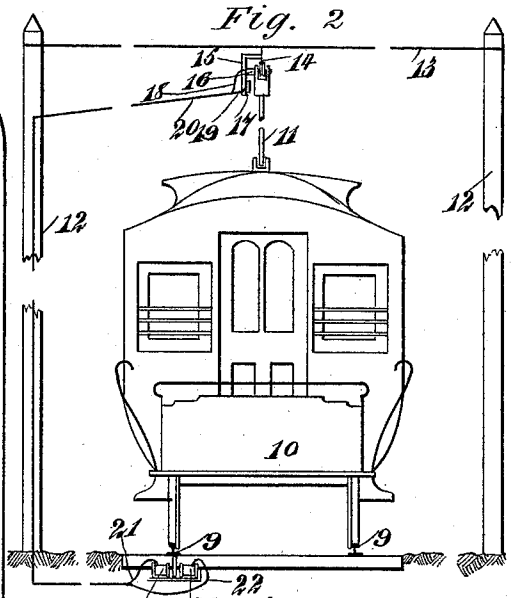


Fig. 3

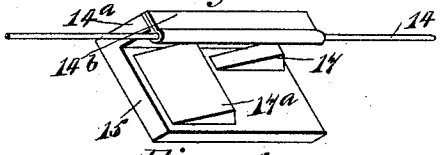
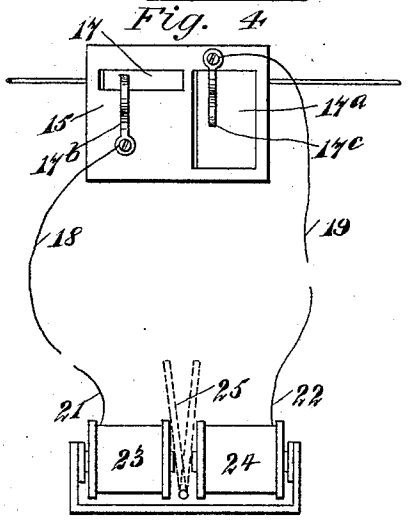


Fig. 4



WITNESSES:

J. B. Walker

J. L. Laplinger

INVENTOR

W. S. Browne

BY Munn & Co

ATTORNEYS

(No Model.) 2 Sheets—Sheet 2.

W. S. BROWNE.

ELECTRICALLY ACTUATED SWITCH MECHANISM.

No. 570,373. Patented Oct. 27, 1896.

Fig. 5.

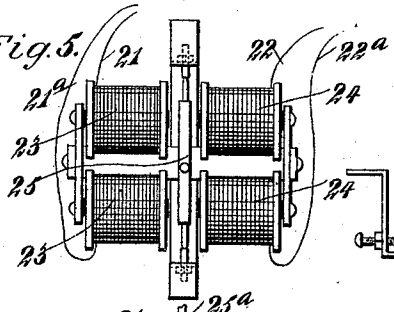


Fig. 6.

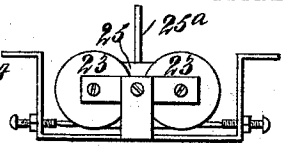


Fig. 7.

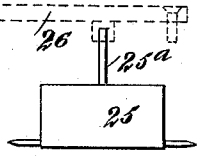


Fig. 8.

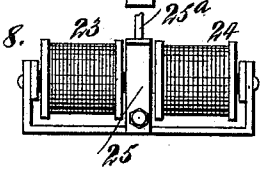


Fig. 9.

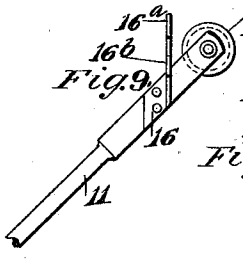


Fig. 10.

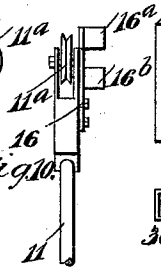


Fig. 11.

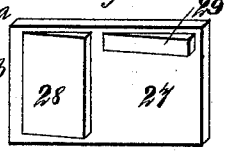


Fig. 12.

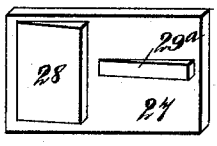


Fig. 13.

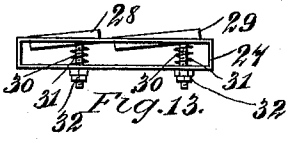
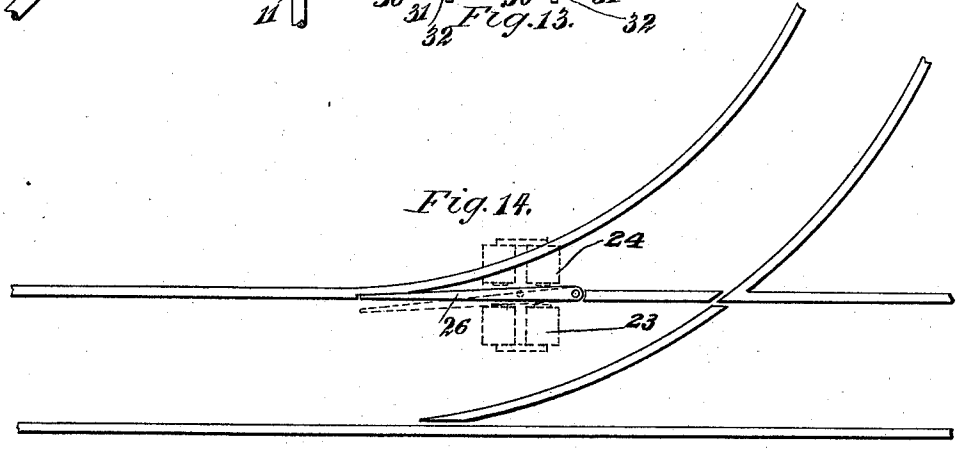


Fig. 14.



WITNESSES:

J. B. Walker

J. R. Baylinger

INVENTOR

W. S. Browne

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

WALRAM S. BROWNE, OF BROOKLYN, NEW YORK.

ELECTRICALLY-ACTUATED SWITCH MECHANISM.

SPECIFICATION forming part of Letters Patent No. 570,373, dated October 27, 1896.

Application filed December 5, 1895. Serial No. 571,131. (No model.)

To all whom it may concern:

Be it known that I, WALRAM S. BROWNE, of Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Electrically-Actuated Switch Mechanism, of which the following is a full, clear, and exact description.

This invention relates to certain improvements in electrically-actuated switch mechanisms such as are adapted for use on electric railways, and has for its object to provide a device of this character of a simple and inexpensive nature, which shall be adapted, when applied to the various cars running over a line of railway, to automatically switch the cars from one loop to another without necessitating any action on the part of the motorman.

The invention consists in a switch mechanism having means to actuate it from a current of electricity, two series of contacts arranged along the line of railway, one contact of each series being adjacent to each switch, a contact carried on a car in position to engage each contact of one of said series and but one contact of the other series, and circuit connections between the contacts and switch mechanism.

The invention also contemplates certain novel features of the construction, combination, and arrangement of the improved switch mechanism, whereby certain important advantages are attained and the device is made simpler, cheaper, and otherwise better adapted and more convenient for use than other similar devices heretofore employed, all as will be hereinafter fully set forth.

The novel features of the invention will be carefully defined in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a diagraphic view showing a line of railway having various loops adapted to be controlled by electrically-actuated switch mechanism constructed in accordance with my invention. Fig. 2 is a transverse sectional view taken through the line of railway, showing the position of the various parts of the improved mechanism. Fig. 3 is a perspective view drawn to an enlarged scale and showing the contact devices arranged along the track. Fig. 4 is a somewhat diagraphic view showing a modified form of said contact devices in connection with switch-operating magnets and conductors such as are employed in my improvements. Fig. 5 is a plan view showing the preferred form and arrangement of the switch-magnets. Fig. 6 is an end view of the same. Fig. 7 is a detached view showing the armature of the switch-magnets, the switch-point being shown in connection with said armature in dotted lines. Fig. 8 is a side view of the switch-magnets as shown in Fig. 5. Fig. 9 is a side view showing the preferred form and arrangement of the contact carried on the car. Fig. 10 is an end view of the same. Figs. 11 and 12 are similar perspective views showing modified forms of the contact devices located on the track and adapted for operating different switch-points. Fig. 13 is a section taken through the casing of the contact devices shown in Figs. 11 and 12, and Fig. 14 is a fragmentary view drawn to an enlarged scale and showing a section of the track at one of the switches.

Referring, primarily, to Fig. 1, the line of railway therein shown is in the form of an elongated loop having tracks or ends 1, 2, 3, and 4. A switch 5 is located in the side-track 2 of the loop and communicates with a branch line 6, wherein is also located a switch 7, communicating with a branch line 8, which extends across the main loop and communicates with the side 4 thereof, while the branch line 6 communicates with the side 3 of the main loop. By this arrangement of the switches it will be understood that there are three different routes comprised in the system, one route comprising the sides 1, 2, 3, and 4 of the main loop, a second route comprising the side 1 of the main loop, the lower portion 2^a of the side 2, the branch line 6, and the portions 3^a and 4 of the main loop, and a third route comprising the side 1 of the main loop and the lower portion 2^a of the said track, the portion 6^a of the branch line 6, the branch line 8, and the lower portion 4^a of the side 4 of the main loop.

Referring to Fig. 2, 9 9 indicate the track-rails, and 10 indicates a car having a trolley-pole 11. 12 12 indicate the posts for supporting the trolley-wire 14 in place, said posts being connected by brace-wires 13 at their

upper ends and said wires being provided with hangers of ordinary construction for supporting the said trolley-wire 14 in position to be engaged by the trolley-wheel 11ª, (seen in Figs. 9 and 10,) carried on the trolley-pole 11 of the car.

The stationary contact device comprises a frame or casing 15, as seen in Fig. 3, having an angular upper portion 14ª, extending from one of its sides and provided at its edge with a clamp 14ᵇ, adapted to engage the trolley-wire 14, and on said casing are carried contact-plates 17 and 17ª, preferably constructed to move in recesses or openings formed in the said frame when engaged by the contacts carried by the car.

The contacts carried on the car comprise lugs 16ª and 16ᵇ, bent outwardly from one side of a plate 16, formed of metal and secured to the end of the trolley-pole 11 in electrical communication with the trolley-wheel, whereby the current from the trolley-wire is utilized to operate the switch mechanism, as will be hereinafter described.

As shown in Fig. 4, the respective contact-plates 17 and 17ª are provided with springs 17ᵇ and 17ᶜ for holding them normally pressed outward in position to be engaged by the contacts on the car, and said springs are connected with circuit-wires 18 and 19, which are carried transversely, as indicated at 20 in Fig. 2, from the lower portion of the angular frame or casing to one of the poles 12 in such a manner as to form a brace or guy to prevent lateral movement of the lower end of the casing 15, whence said conductors extend down to the ground and are connected, as indicated at 21 and 22 in the drawings, to the switch-operating magnets 23 and 24. These magnets 23 and 24 are arranged in a suitable frame with their poles adjacent, and between them is pivotally mounted at its lower part an armature 25, adapted to be attracted to the respective magnets, and having an upwardly-extending arm or stem 25ª, as seen in Fig. 7, the upper end of which is in engagement with the switch-point 26, whereby when either of said magnets 23 and 24 is excited the switch-point will be correspondingly moved.

As shown in Figs. 11, 12, and 13, the casing 27 of the stationary contacts is hollow, and the contacts 28 and 29 are hinged at the edges of openings in said casing in such a way that their outer faces are held inclined to the face of the casing, said contacts being provided with stems 30, projecting from their rear faces and working in slots in the opposite wall of the casing 27, between which wall and the rear face of the contacts springs 31 are coiled on the stem. The stems 30 are screw-threaded to receive lock-nuts 32, whereby the contacts are held against projecting too far outside the face of the casing.

In operation as the car moves along the track and approaches one of the switches one of the contacts 16ª and 16ᵇ comes into electrical communication with the stationary contacts carried on the trolley-wires and closes the circuit through the switch-magnets so as to actuate the switch-point and set the switch. The contact 17ª is arranged in electrical communication with the magnet 24 of the switch-actuating device, and said magnet serves to hold the switch-point 26 in its closed position, as indicated in Fig. 14. The contact-point 17 is connected to the magnet 23, and said magnet serves to hold the switch-point in its open position, as indicated in dotted lines in Fig. 14.

As shown in the drawings, the contacts of the series 17ª are made wider than the contacts of the series 17 17, and in setting up the switch mechanism the different switches of the system indicated at 5 and 7 in Fig. 1 will have their contacts 17 arranged at different elevations, as indicated in Figs. 11 and 12, the contact 29 in Fig. 11 being higher than the contact 29ª in Fig. 12. The contacts 16ª and 16ᵇ on the car are arranged to engage each contact 17ª and are so arranged as to pass the contact 17 of the switch or switches which are not designed to be actuated by them, but to engage the contact 17 of the particular switch or switches controlling the route along which the car passes, to accomplish which the said contacts 16ª and 16ᵇ will be arranged at different elevations on the different cars, as will be readily understood.

In the operation of the device as the car approaches the switch the contact 16ª first engages the contact 17ª and closes the circuit through the magnet 24, so as to set the switch-point 26 at its closed position, this operation occurring some little time before the car reaches the switch. After having passed out of engagement with the contact 17ª the contact 16ª on the car engages the contact 17 so as to close the circuit through the magnet 23 and open the switch, so that the car may pass upon the branch line. As the car approaches the next switch it will act in a similar way to first close the switch, and then if it is not desired that the car shall be switched onto the branch line at this point the contact on the car will not engage the contact 17, but will pass the same without actuating the corresponding switch-magnet.

From the above description it will be understood that the device is of an extremely simple and inexpensive construction and is of such a nature as not to be liable to become deranged or broken while in use, whereby traffic would be interfered with along the line of road, and it will also be obvious that the invention is susceptible of considerable modification without material departure from its principles and spirit, and for this reason I do not wish to be understood as limiting myself to the exact form of the device herein set forth.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

An electrical-railway system, comprising a main line and a branch line, a switch-point

at the junction of the branch line with the main line, electrically-operated devices for moving the switch-point in opposite directions, two series of contacts supported by the trolley-wire, one contact of each series being adjacent to the switch-point, the contacts of one series being of less width than and being arranged at different elevations with respect to the contacts of the other series, circuit connections between the contacts and the devices for operating the switch-point, and contacts carried by a car for engaging successively with the first-named contacts, and operating first to place or hold the switch-point in engagement with the main-track line and then operating to move the switch-point into engagement with the branch line, substantially as specified.

WALRAM S. BROWNE.

Witnesses:
A. PAGENSTECHER, Jr.,
C. E. CORTIS.