H. H. D. HEIBERG.

SAFETY CUT-OUT FOR ELECTRIC RAILWAYS.

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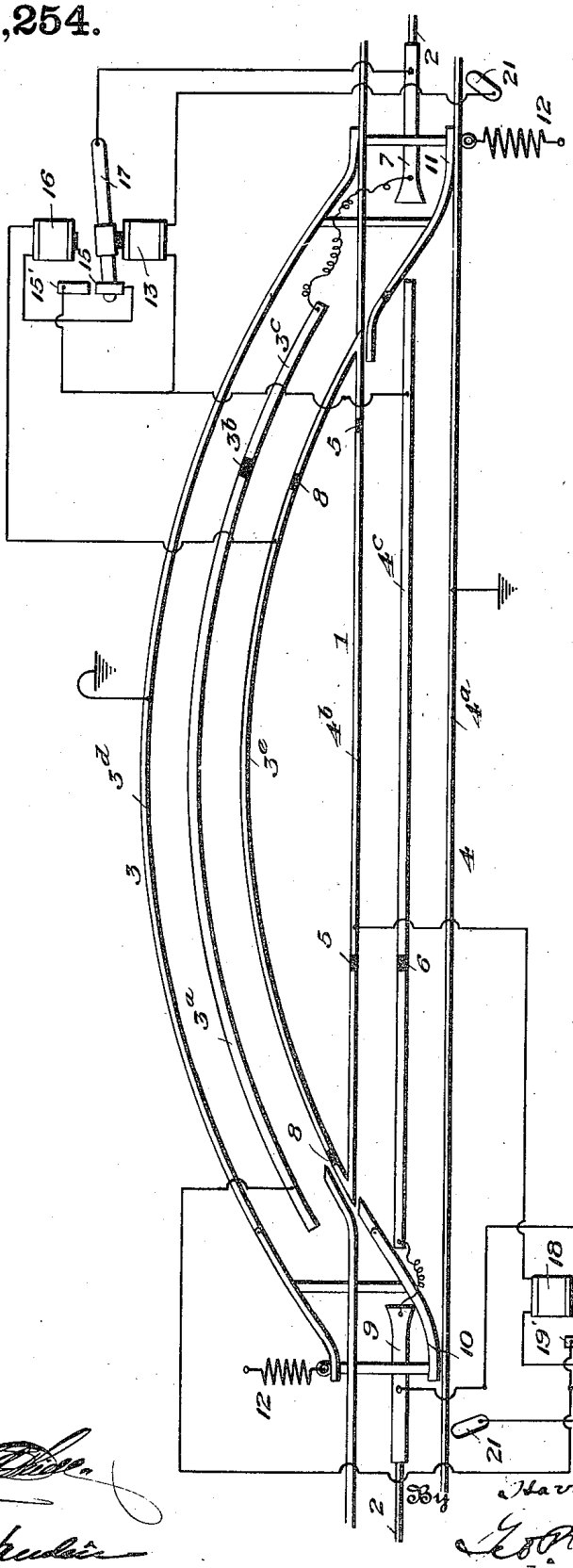

Witnesses

Inventor

By Harrison H. Dodge Heiberg

Attorney

UNITED STATES PATENT OFFICE.

HARRISON H. DODGE HEIBERG, OF SIMSBURY, CONNECTICUT.

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To all whom it may concern:

Be it known that I, HARRISON H. DODGE HEIBERG, a citizen of the United States, residing at Simsbury, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Safety Cut-Outs for Electric Railways, of which the following is a specification.

This invention relates to safety cut-outs for electric railways.

My object is to provide in a single track electric railway system, particularly one of the third rail type, a novel safety cut-out or turn-out, whereby electric cars traveling in opposite directions will automatically side-track or cut out each other so that they may pass when going in opposite directions, one being diverted into a side-track and the other occupying the main line, the first to arrive being automatically stopped, by deprival of its energizing current, until the arrival and turning out of the car coming from the opposite direction, whereupon the respective cars will pass each other.

My invention is particularly designed for use on toy or miniature electric railway systems employing a third rail from which the current that propels the cars is derived, but while it is peculiarly adapted to a miniature electric railway and is described and shown in that connection, nevertheless, I do not limit myself to the use of the invention on miniature electric railways and have shown such use as illustrative of a practical embodiment of the invention.

When embodied in a miniature electric railway, my invention renders the employment of a double track unnecessary to the travel of cars going in opposite directions and it has the instructive and entertaining features of an automatic electrically controlled railway system such as not possessed by a single track miniature railway where the cars all travel in one direction, or, a double track railway. When the invention is embodied in a miniature electric railway, it is well adapted for use as a window display device designed to attract attention of pedestrians by virtue of the peculiar action of each car as it reaches a siding or turn-out, the car coming to a full stop and awaiting the arrival of the car from the opposite direction, whereupon the car which has stopped automatically starts up and the two cars pass each other.

I am aware that modifications can be resorted to in the railway switches and the electric switches which control the energization of the third rail and I do not, therefore, limit myself to details except where specified in the claims.

The accompanying drawing is a plan view diagrammatically showing a portion of a main line, one turn-out, the tangent thereof, and the railway and electric switches.

As many turn-outs, tangents and automatic switches can be used as desired at different points of the system.

The main line is shown at 1 as having third rail 2; the turn-out or siding is shown at 3 and the tangent at 4. The rail 4^a is grounded and rail 4^b is insulated from its support and also insulated from the main line rail, such insulation appearing at 5. There is also a dead third rail 4^c for the tangent, this being insulated at 6 and its other end being open. The turn-out 3 has a normally dead third rail 3^a which is open at one end and at its other end insulated at 3^b, there being a section 3^c which is electrically connected to the third rail 2 as, for instance, at the frog 7. One rail 3^d of the turn-out is grounded. The other rail has an insulated normally dead section 3^e which is insulated at its ends 8. Another frog 9 is provided as a terminal of the left-hand third rail 2 of the main line.

The switch point 10 is normally closed and the other switch point 11 is normally open, both being retained yieldingly in these positions by springs 12.

At each end of the turnout is an electric switch, each a duplicate of the other. One of these switches can energize the dead third rail section 4^c in the tangent, while the other can energize the dead third rail section 3^a in the turnout. The first of these switches has two electromagnets 13, 16 (or solenoids, if preferred), set opposite to each other and operating to throw a pivoted switch arm 17 from a contact segment 15 to a contact segment 15′ or vice versa. The segment 15 is connected to the electromagnet 16, whose other terminal is connected to the insulated rail section 3^e of the turnout. The segment 15′ is connected with the dead third rail section 4^c of the tangent, and also with one terminal of the electromagnet 13. The other terminal of this electromagnet is connected to a contact 21 located adjacent to the grounded track rail 4^a in a position to be touched by a car wheel running

on said rail. The electric switch at the other end of the turnout has two electromagnets (or solenoids) 14, 18 set opposite to each other and operating to throw a pivoted switch arm 20 from a contact segment 19 to a contact segment 19′ or vice versa. The segment 19 is connected to the electromagnet 18, whose other terminal is connected to the insulated rail section 4^b of the tangent. The segment 19′ is connected with the dead third rail section 3^a of the turnout, and also with one terminal of the electromagnet 14, whose other terminal is connected with a second track contact 21. These two track contacts may be located anywhere along the line beyond the turnout, and are for the purpose of energizing the resetting magnets 13, 14 when a car passes them.

The armature lever 17 is pulled one way or the other according as the electro-magnet or solenoid 13 or 16 is energized and it remains where moved, keeping the switch 17 open or closed, as the case may be. A similar control is exerted on armature lever 20 by the electro-magnets or solenoids 14 and 18, and the switch 20 is maintained in closed or open position according to which of said electro-magnets last attracted the armature lever.

A car approaching from the right, runs in on the turn-out or siding 3, the third rail section 3^c affording the current for that purpose. When the car passes the insulation 3^b, it is deprived of current for propulsion as its trolley is then on normally dead third rail 3^a. Immediately the car runs on rail 3^e, magnet 16 is electrically energized by current derived from right-hand third rail 2, passing via lever 17, contact segment 15, magnet 16 and rail 3^e, through the car wheels and axles to ground rail 3^d. The switch 17 is thus closed on segment 15′, and normally dead third rail 4^c is energized. But the car having run onto normally dead third rail section 3^a (switch 20 being open), the car comes to a stop on the turn-out 3 and there remains until the other car coming from the left-hand side of main-line 1 passes onto the now electrified third rail 4^c of the tangent 4, and, receiving current from said rail, proceeds on its way along the tangent and out upon the main line to the right, without stopping. But the instant its wheels and axles connect the rails 4^a, 4^d of the tangent, that closes the circuit of the electromagnet 18 from the left hand third rail 2 through the lever arm 20 and segment 19, thereby causing switch 20 to close on segment 19′ and putting third rail 3^a in circuit with the third rail 2 at the left. The stalled car standing on the turn-out then receives power and moves toward the left, passing from the turn-out onto the main line. It thus appears that when the two cars arrive at the meeting point simultaneously, they can proceed on their respective ways without interruption. But if one of them arrives before the other, it must wait until that other comes along before it can itself proceed. In other words, the first car to arrive at the meeting point will be automatically stalled until the other car comes up. If the first car is the one running to the right, it will pass along the tangent a short distance and then stop; while if it is the car running to the left, it will run out upon the turnout and then stop. Whichever car is thus stalled will, however, immediately start forward again as soon as the other car passes it. If the track is arranged in a show window, and the electric switches are concealed, this automatic stopping and starting of the cars will attract attention and comment. Each car as it comes to the end of the main line, strikes a track trip 21 which causes closing of the circuits of magnets 13 and 14, and re-setting of the armature levers 17 and 20 to the normal position shown.

The cars have not been illustrated as they form no part of my invention. Each car will be provided with an electric motor for propelling it, taking current from the third rail, and controlled by a suitable controller, which may be provided with a simple reversing switch. This is so obvious a device and so customary in installations of this kind that I have not thought it necessary to show it in the drawings.

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

1. In an electric railway operating cars in opposite directions on a single track, a safety cutout for preventing head-on collisions, comprising a main line, a turn-out, a tangent, and automatic circuit switches respectively controlling the supply of current to the tangent and the turn-out, the current control switch for the tangent being operated by the entry of a car on the turn-out from one direction and the current control switch for the turn-out being operated by a car entering the tangent from the opposite direction.

2. In an electric railway operating cars in opposite directions on a single track, a safety cutout for preventing head-on collisions, comprising a main line, a turn-out, a tangent, normally dead trolley sections for the tangent and turn-out, and automatic means for electrifying the respective normally dead trolley sections, the automatic means for the turn-out being operated by the entry of a car on the tangent from one direction and that of the tangent being operated by a car entering the turn-out from the other direction.

3. In an electric railway operating cars

in opposite directions on a single track, a safety cutout for preventing head-on collisions, comprising a main line, a turn-out, a tangent, normally dead trolley sections for the tangent and turn-out, and automatic means for electrifying the normally dead trolley sections comprising two independent electro-magnetic switches, each having oppositely disposed magnets, an armature controlled thereby, switch contacts opened or closed by the armature according to whether it is attracted by one or the other of said magnets, the magnet which throws the switch in one direction being controlled by a car when on the main line, the magnet which throws the switch in the opposite direction being controlled by a car entering the tangent in one electro-magnetic switch and in the other electro-magnetic switch being controlled by a car entering the turn-out, the switch contacts of the respective electro-magnetic switches constituting means for electrically energizing or deënergizing the normally dead trolley sections of the tangent and turn-out.

4. In an electric railway operating cars in opposite directions on a single track, a safety cutout for preventing head-on collisions, comprising a main line, a turn-out having one grounded rail, one normally dead or insulated rail section and a normally dead trolley section, a tangent having one grounded rail, one normally dead or insulated rail section and a normally dead trolley section, and automatic switches respectively controlling the supply of current to the normally dead trolley sections of the tangent and turn-out, said switches having circuit connections with the trolley sections of the main line and with the normally dead rail sections of the tangent and turn-out, whereby a car entering the turn-out from one direction is automatically stalled by deprivation of its propelling circuit until a car enters the tangent from the opposite direction and operates one of the electric switches to cause electrification of the trolley of the turn-out, and vice versa.

HARRISON H. DODGE HEIBERG.