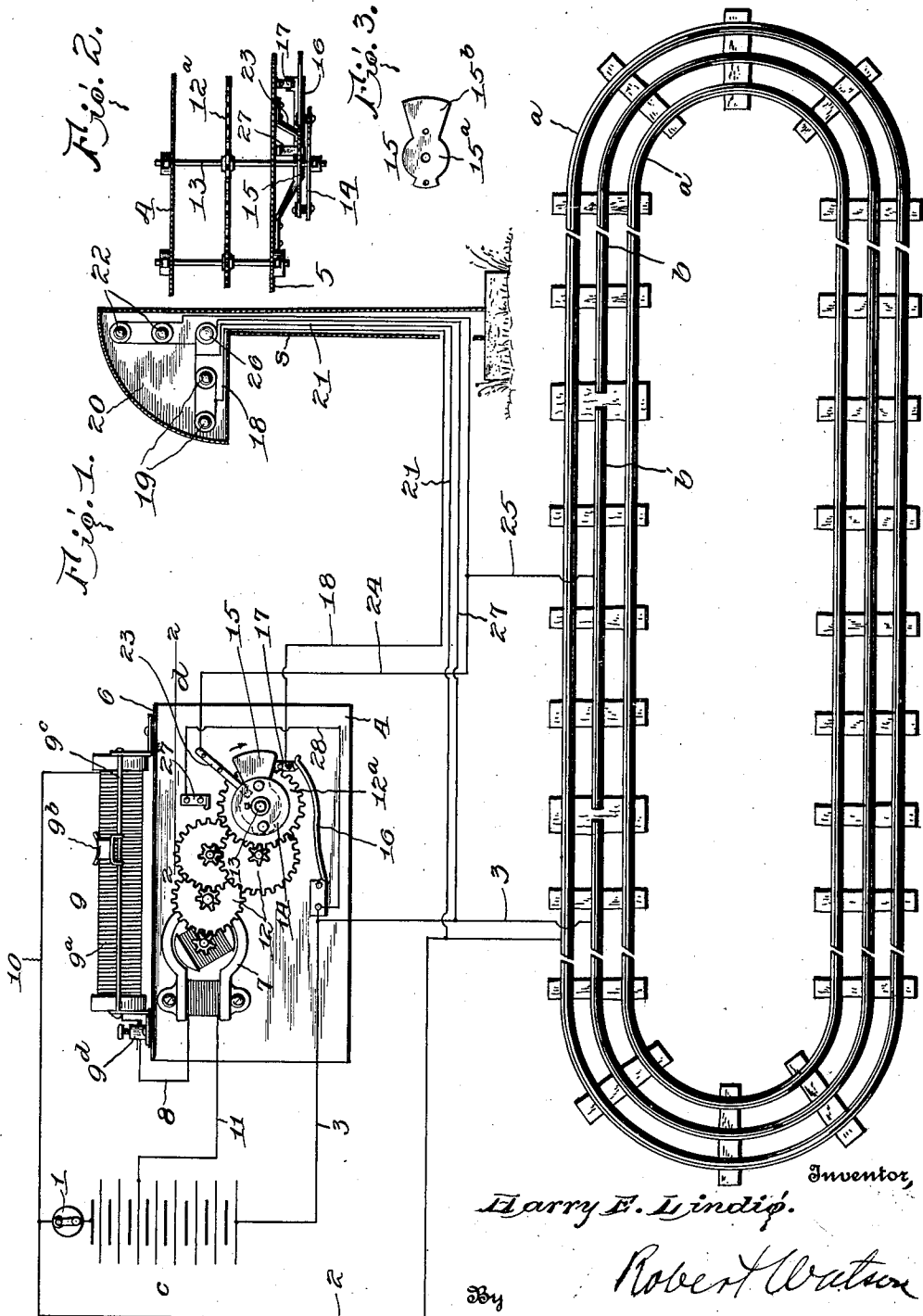


H. E. LINDIG.
TOY ELECTRIC RAILWAY.
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Inventor,
Harry E. Lindig.

Robert Watson

Attorney

UNITED STATES PATENT OFFICE.

HARRY E. LINDIG, OF SUNBURY, PENNSYLVANIA.

TOY ELECTRIC RAILWAY.

1,418,151.

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To all whom it may concern:

Be it known that I, HARRY E. LINDIG, a citizen of the United States, residing at Sunbury, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Toy Electric Railways, of which the following is a specification.

This invention relates to toy electric railways, and it comprises means for periodically connecting and disconnecting a section of the trolley rail, or third rail, from the source of electric power, to render said section alive and dead alternately, and for simultaneously changing the signals in a signal tower to indicate safety when said section is alive, and danger when said section is dead. These changes are effected by a motor driven switch which moves constantly and effects the changes at timed-intervals, the duration of which may be varied by changing the speed of the motor, which latter is provided with suitable speed regulating mechanism. The track is endless and by adjusting the speed of the switch to suit the length of the track and the speed of the train, the section of the third rail referred to may be rendered dead at the end of each circuit of the train, which will stop when it engages this dead section and start when the section is again made alive; or, by varying the speed of the switch with respect to the speed of the train, the latter may make several circuits on the track before it passes on to the third rail section at the time when the latter is dead. When this occurs, the train stops for a few moments and then starts when the third rail section is again connected to the power source. As an additional feature, I provide means for showing all the lights in the signal tower for a short time while the train is making its circuit, to make the toy more attractive to children.

In the accompanying drawing,

Fig. 1 is a plan view of a toy railway, a side elevation of the automatic controller for the train, a section through the signaling tower, and a diagrammatic view of the circuit connections;

Fig. 2 is a section on the line 2—2 of Fig. 1; and,

Fig. 3 is a detail view of the rotatable switch member.

Referring to the drawing, *a* and *a'* represent the track rails of an endless car track, and *b* represents the third rail or trolley con-

ductor having an insulated section *b'*, which latter is alternately rendered dead and alive by the automatic switching mechanism hereinafter described. One terminal of a battery *c* is connected through a manually operable switch 1 and conductor 2 to the track rail *a*, and the other terminal is connected by conductor 3 to the third rail *b*, and these rails are constantly alive when the hand switch 1 is closed.

A toy electrically driven car having a contact member for engaging the third rail *b* will run the full length of said third rail on the track rails but will stop when the contact member rides on to the section *b'* if the latter is not at the time connected to battery. This section is alternately connected to and disconnected from the battery by the automatic controller *d*. This controller is mounted upon a suitable boxlike structure having parallel side frames 4 and 5, the latter being omitted in Fig. 1, and these sides are connected by a top 6. The mechanism comprises a small electric motor 7, having one terminal connected by conductor 8, through an adjustable resistance device 9 and conductor 10 to the hand operated switch 1, and thence to one terminal of the battery, and the other terminal of the motor is connected by conductor 11 to an intermediate point of the battery, only a few cells of the battery being required to operate this motor. The resistance device comprises a resistance coil 9^a connected to the wire 10 and an adjustable contact member 9^b, engaging the wires of the coil and slidable on a metal rod 9^c, which is connected to a binding post 9^d to which the wire 8 is attached. By moving the contact device 9^b along the resistance coil the speed of the motor may be varied.

The motor 7 operates a train of gearing 12. Upon the arbor 13 of the last gear 12^a in the train is mounted a disk 14 to which is secured an insulated switch member 15, having a disklike central portion 15^a and a segmental arm 15^b, which latter projects radially outward beyond the disk 14. The switch member 15 revolves slowly when the motor is in operation and causes the desired changes in the electrical connections to the signals in the signal tower *s* and also makes and breaks the connection between the short section *b'* of the third rail and the battery. A spring contact arm 16, connected to the lead wire 3 from the battery, normally engages a fixed contact 17 mounted adjacent

the rotatable switch member 15, and this contact 17 is connected by conductor 18 to two electric lamps 19, arranged in a horizontal row upon a suitable support 20 on the signal post. The return wire 21 from said lamps is connected to the wire 2 leading from the battery. Thus, since the spring switch arm 16 normally engages the contact 17, the lamps 19 will be normally connected across the battery and will be lighted. As the rotating switch arm 15 moves in the direction of the arrow, it engages the spring arm 16 and moves the latter out of engagement with the arm 17 and thereby interrupts the circuit through the lamps 19 which become extinguished. Simultaneously with the engagement of the rotating arm 15 with the spring arm 16, a circuit is established through two lights 22, arranged in a vertical row on the signal tower. The circuit through these two lights extends from conductor 3, through switch arms 16 and 15 to a fixed spring contact 23, which bears against the hub of the switch member 15, thence through conductor 24 to lamps 22, thence through conductor 21 to the conductor 2 which is connected to the battery. The wire 21 is a return wire for both sets of lamps, 19 and 22. While the switch members 15 and 16 are engaged, the lights 22 will burn and the section *b'* of the third rail will be rendered alive through the wire 25 which connects said section with the conductor 24, leading to the lights 22. When the contact member 15 leaves the spring arm 16, the circuit through the conductor 24 is broken, thus extinguishing the lights 22 and interrupting the circuit to the section *b'* of the third rail, and the spring arm 16 then engages the contact 17, re-establishing the circuit through the conductor 18 to the lamps 19. The lamps 19, which may be red lamps to indicate danger, are now lighted and the section *b'* of the third rail is dead. A train passing around on the track and approaching the section *b'* of the third rail, will have the danger signal set against it and it will stop when it passes on to the dead section of the third rail. When the rotating switch arm 15 again engages the spring arm 16, the connection to the signal lamps 19 will be broken at the contacts 16 and 17, and the signal lamps 22, indicating safety, will be lighted by the closure of the circuit through the wire 24, and at the same time the section *b'* of the third rail will be rendered alive and the train will start and continue running until the contact member 15 leaves the contact member 16 and the train engages the section *b'* of the third rail when the train will again stop. The timing of the gear train which operates the switch arm 15 may be regulated to suit the length of the track and the speed of the motor so that after the motor has started and left the section *b'*

of the third rail, the latter will be dead before the train makes a complete circuit of the track, if it is desired to have the train stop after making one circuit. But the speed of the gear train may be adjusted with relation to the length of the track and the speed of the train, so that at times when the train approaches the section *b'* of the third rail, the latter will be alive and the train will pass on, while at other times this section of the third rail will be dead and the train will stop. Each time, however, that the train stops, the lamps 19, indicating danger, will be burning, and the lamps 22, indicating safety, will be out.

The lamp 26, which is in line with the lamps 22 and also with the lamps 19, burns constantly and is not affected by the rotation of the switch. As shown, this lamp is connected to one side of the battery through conductors 3 and 27, and to the other side of the battery through conductors 2 and 21.

In addition to the arrangement described, whereby the danger signal is set when the third rail track section *b'* is dead, and the safety signal is set when said section is alive, I have provided means whereby all of the lamps in the signal tower will be lighted for a short time during the movement of the rotary switch, this feature being added merely to make the device more interesting or attractive to children. The lamp 26, as has been stated, is constantly connected in circuit, and the lamps 19 are normally connected in circuit and in order that all the lamps may be lighted at one time, I have provided connections whereby the lamps 22 will be lighted for a short time while the other lamps are lit. For this purpose, I provide a fixed contact 27 which is connected by a wire 28 to the wire 3 leading from one side of the battery, and this contact is arranged in the path of movement of the rotating contact 15 so as to be engaged thereby at the time when the contacts 16 and 17 are closed and the lamps 19 are burning. As shown, this contact 27 is arranged so that it will be engaged by the contact arm 15 after the latter has left the arm 16 and made a one-quarter to a one-third revolution. When the arm 15 is in engagement with the contact 27, a circuit is completed from one side of the battery through conductors 3 and 28, contact 27, arm 15, contact 23 and conductor 24 to lamps 22 and thence through conductors 21 and 2 to the opposite side of the battery. The lamps 22 will be lighted while the fan-shaped end of the member 15 is rubbing across the contact 27 and these lights will be extinguished as soon as the member 15 passes the contact 27.

The contact 27 may be omitted, if desired, in which event, the lamps 22 will be lighted only when the lamps 19 are extinguished.

When it is desired to stop the motor 7 130

and clocktrain, the switch 1 will be opened by hand. This will also disconnect the track rails from the battery.

It is believed the operation of the apparatus will be clear from the foregoing without further description.

What I claim is:

1. In a toy electric railway, an endless track, a third rail parallel with the track and having an insulated section, a current source connected to the track and third rail, and a motor driven switch adapted to alternately connect said insulated section with and disconnect said section from the power source.

2. In a toy electric railway, an endless track, a third rail parallel with the track and having an insulating section, a signal having lamps to indicate danger and safety, a current source connected to the track and third rail, a motor driven switch adapted to alternately connect said insulated section with and disconnect said section from the power source, and means operated by said switch for connecting the lamps indicating safety to the power source while said section is alive and for connecting the lamps indicating danger to said source when said section is dead.

3. In a toy electric railway, an endless track, a third rail having an insulated section, a current source connected to the track and third rail, a lamp for indicating safety, a lamp for indicating danger, circuits for said lamps, and a constantly operated switch mechanism adapted to simultaneously open the circuit through the latter lamp, close the circuit through the former lamp and connect said section to the current source.

4. In a toy electric railway, an endless

track, a third rail having an insulated section, a current source connected to the track and third rail, a lamp for indicating safety, a lamp for indicating danger, circuits for said lamps, and a constantly operated switch mechanism adapted to simultaneously open the circuit through the latter lamp, close the circuit through the former lamp and connect said section to the current source and to then connect the lamp indicating danger to the current source and disconnect the lamp indicating safety and said insulated rail section from said source.

5. In a toy electric railway, an endless track, a third rail having an insulated section, a current source, a motor connected to said source, a gear train operated by the motor, a rotatable switch member constantly operated by said gear train and adapted to alternately connect said section to the current source and disconnect said section from said source.

6. In a toy electric railway, an endless track, a third rail having an insulated section, two signal lamps, a current source, a switch mechanism comprising a fixed contact, a spring pressed arm connected to the power source and normally closing the circuit of one of said lamps through said contact, a rotatable contact member, connected to the other lamp and to said insulated section, and adapted to electrically engage said arm and mechanically move it away from said contact once during each revolution of said member, and means for constantly rotating said member.

In testimony whereof I affix my signature in presence of a witness.

HARRY E. LINDIG.

Witness:

JOHN W. BASSLER.