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L. CARUSO

TOY ELECTRIC RAILWAY

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2 Sheets-Sheet 2

Fig. 4,

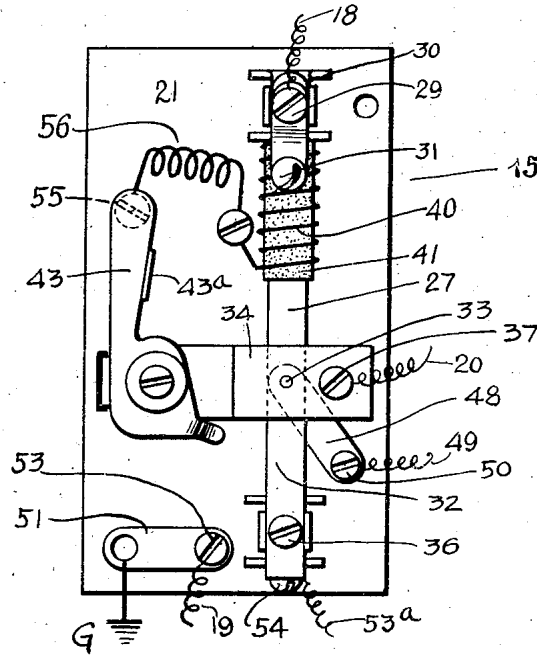


Fig. 5,

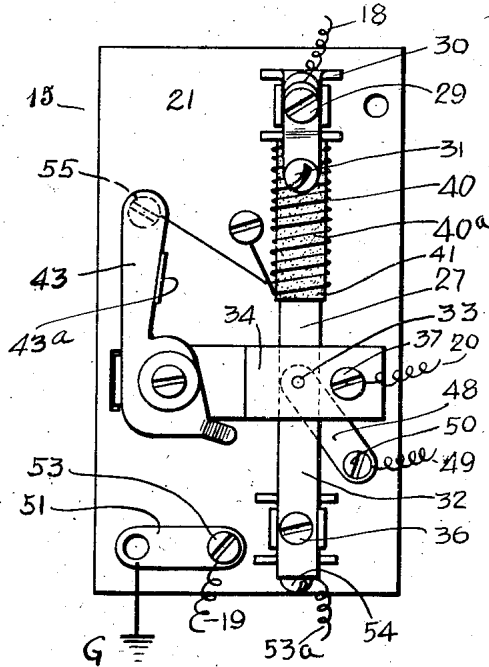
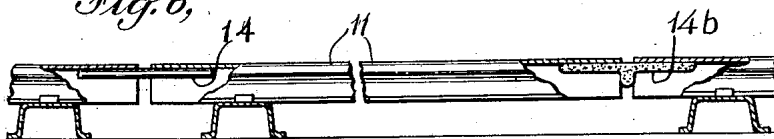


Fig. 6,



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UNITED STATES PATENT OFFICE.

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TOY ELECTRIC RAILWAY.

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This invention relates to toy electric railways.

One object of the invention is the provision of an electric toy railway having improved means for automatically stopping and restarting a train at any desired point along the line, which means may be readily installed and employed with the standard track sections now commonly in use for electrical toy railways.

Another object of the invention is the provision of a toy railway of the character described, which is simple in construction, easy to set up and disassemble, inexpensive to manufacture, and practical to a high degree.

A further object of the invention is the provision of means for automatically stopping and restarting the train of an electric toy railway not requiring any movable elements in the tracks for the operation or control thereof.

The invention also contemplates the provision in connection with the automatic stopping and restarting means of improved signaling devices operating committently with said means for indicating the changes in the train operation.

A still further object of the invention is the provision of an improved means of the character described in the form of a compact unitary device to serve as a detachable accessory adapted to be applied to a toy track so as to convert the system into one in which the train may be stopped and restarted automatically and such changes in train operation simultaneously signaled.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the following claims.

In the accompanying drawing, in which is shown one of the various possible illustrative embodiments of this invention,

Fig. 1 is a perspective view of a toy railway installation embodying the invention with portions thereof shown diagrammatically;

Fig. 2 is a diagrammatic view of the wiring system and a sectional view of the automatic control device;

Fig. 3 is an elevational view showing the rear side of the control device panel; and

Figs. 4 and 5 are plan views of the rear side of control device panels showing modified arrangements whereby thermostatic heaters adapted to operate on various ranges of voltages may be selectively switched into the control circuit; and

Fig. 6 is a fragmentary view of a portion of the third rail showing the pin connectors.

Referring in detail to the drawing, 10 denotes a toy railway track and 11 a contact or third rail, both being constructed in any well known manner and supplied with power from any suitable supply source (not shown) through conductor wires 12. The track comprises preferably a plurality of standard track sections adapted to be joined by means of a pin and socket connection in the well known manner as shown in Fig. 6 at 14. At any desired point along the track, as for example, in a portion passing by a station indicated at S in Fig. 1, a section 11^a is insulated from the remainder of the third rail as at 13 and 13^a, by replacing the usual metallic pin connectors 14 by fibre pins 14^b.

An automatic train stopping and restarting and signaling control device 15 embodying the invention is preferably connected to the track system by detachable plates 16 and 17. The plate 16 may have suitable means for connecting the track 10 and the third rail 11 to the device 15 through conductor wires 18 and 19 respectively, and the plate 17 connects the insulated section 11^a to the said device by a wire 20.

The device 15 is seen to comprise a thermostatic control switching mechanism mounted on a panel 21 and two semaphores 22, 23, said device being preferably constructed to form a unit by installing the mechanism and panel in the base of a tower 24 and the semaphores at the top thereof as shown in Fig. 1. The tower 24 and semaphores 22 and 23 are preferably constructed and arranged to simulate in appearance like apparatus used in actual railway signal work. The semaphores comprise a green and red transparent window 22^a and 23^a in the top housing of the tower 24 through which

lights 25 and 26 respectively are arranged to show for flashing signals controlled by the device 15.

The thermostatic switching control mechanism of the device 15 is seen to comprise a current carrying flexure member 27 which is anchored by a terminal screw 29 on a raised support 30 so that the member 27 is spaced from the rear side of the panel 21. Carried on the free end and on opposite sides of the member 27 are contacts 27^a and 27^b the former normally being adjusted to connect with a contact terminal 28 fixed to the rear side of the panel 21. A screw 31 positioned over the anchored end of said member 27 is provided for adjusting the latter to its normal position as shown in Fig. 2. The contact 27^b is adapted to engage a contact 32^a on one side of an overhanging spring terminal member 32 when the member 27 is flexed out of normal position, the opposite side of said member 32 being provided with a similar contact 32^b which is adapted to engage a fixed terminal 33 on a bridging yoke 34 as will hereinafter appear. This yoke 34 is arranged to extend over the free end of member 27 and is secured to the panel 21 by a terminal screw 37.

To hold the spring terminal member 32 in position, a raised support 35 secured to the panel 21 by a screw 36 is provided for anchoring the fixed end of said member 32.

The terminal screws 29 and 36 and a ground terminal screw 53 provided adjacent the lower edge of the panel 21 are arranged to pass to the front side of the latter and each of said screws has a knurled nut to form binding posts indicated at A, X and B respectively. Any suitable heating means may be provided for effecting the flexure of member 27, as for example, a plurality of turns of heater wire 40 wound over an asbestos or the like insulating covering 41 on said member 27 as shown in Figs. 2 to 5 inclusive. One end of the wire 40 is held to the fixed end of member 27 by the terminal screw 29, and the other end to a contact screw 42 mounted on the rear side of the panel adjacent said member 27. The heater wire 40 is cut in and out of circuit by means of a switch blade 43 operated through a control knob 44, said blade 43 being pivotally mounted so as to connect the yoke 34 to the contact screw 42. Said blade 43 is also provided with an extension 43^a which is adapted to swing under the flexure member 27 for making the train stopping and starting control ineffective as will hereinafter be explained.

The operation of the device will now be clear. The locomotive is represented in the drawing by wheels 45 which are driven by motor 46, the latter receiving power in the well known manner through a contact shoe

47 riding on the third rail and through the wheels 45 from the track rails 10. Assume the train to be traveling in the direction indicated by the arrow shown in Figs. 1 and 2 with the control knob 44 of the device 15 positioned so that the switch blade 43 connects with contact screw 42.

Before the locomotive reaches the third rail section 11^a, the parts of the automatic train stopping, restarting and signaling device are in their normal effective position shown in the full lines in Fig. 2. The current therein passes from the main line portion of the third rail 11, through the wire 18 to the binding post A, hence through the member 27 to the contacts 27^a and 28, to a jumper 48 having one end connected to the contact 28 and the other end having secured thereto by means of a binding screw 50 a wire 49 which connects with one terminal 26^a of the lamp 26, positioned behind the red colored window 23^a in the tower 24. The other terminal of the lamp 26^b is permanently grounded as at G to the structure of the tower 24 as is also one end of another jumper 51 by a screw 52 which holds the panel 21 in place on the tower base as shown in Figs. 1 and 3. The other end of the jumper 51 is connected with the wire 19 by means of a binding screw 53, thus completing the circuit to the track rails 10 and causing the red light to show in the tower.

On reaching the portion of the track which includes the insulated section 11^a, the power circuit to the shoe 47 and the motor 46 is interrupted. The current then flowing to the motor 46 is supplied through wire 19 to binding post A and hence successively through the heater coil 40, contact screw 42, switch blade 43, the yoke 34, the binding post X and wire 20 to the insulated rail section 11^a which connects through the shoe 47 with the motor 46.

It is apparent that due to the resistance of the heater coil 40 in series with the motor 46, the power to the latter is materially reduced and the train stops because of insufficient power supply. After a short interval of time the heater coil 40 due to the flow of current heats the current carrying member 27 sufficiently to cause it to flex from its normal position.

The movement of member 27 obviously breaks the circuit at contacts 27^a and 28 extinguishing the light 26 behind the red colored window while the contact 27^b on the other side of the member 27 engages contact 32^a causing the current to flow successively through spring member 32, support 35 to a wire 53^a secured thereto by means of binding screw 54, and connecting with one terminal 26^a of the lamp 26, the latter being positioned behind the green colored window 22^a in the tower. The other terminal of the lamp 26 is permanently grounded as at G to

the structure of the tower 24, from which the circuit is completed through wire 19 to track rails 10 as has been explained above, thus causing the green light to show in the tower.

5 As the heating of member 27 continues, it is flexed so as to move spring member 32 toward the yoke 34 causing the contacts 32^b and 33 to engage and thereby permit the direct flow of current from the third rail 11 through member 27 to the rail section 11^a. Full voltage is now impressed on the locomotive motor 46 which automatically restarts the train. After the locomotive passes over the rail section 11^a, the member 27 cools and returns to its initial position, automatically extinguishing the green and relighting the red signal.

To make the device 15 inoperative, the control knob 44 is turned to swing the blade 43 under member 27, the blade extension 43^a being adapted to retain the member 27 out of its normal position so that the third rail section 11^a is directly connected to the third rail 11 and so that the green light shows continuously.

The device 15 may be adapted for use on toy tracks of various standardized voltage ranges as for example from 7 to 12 volts and from 12 to 25 volts. To make each device 15 suitable for either voltage range, another contact screw 55 may be positioned on the panel 21 in the path of movement of the blade 42, and either a suitable resistance 56 may be inserted between said screw 55 and the contact screw 42 connected to the heater coil 40 as shown in Fig. 4, or a second heater coil 40^a may be provided, as shown in Fig. 5. The heater coil 40^a may be wound alongside coil 40 and has the end thereof connected to the anchor portions of member 27 and the other end secured to contact screw 55. By manipulating control knob 44 to swing the blade to contact with the screws 42, 55 or engages with member 27, a heater for either range may be selectively connected in circuit or the device 15 may be made ineffective to stop the train.

To indicate the setting of the control knob 44, a pointer 56 movable with the latter and suitable markings 57 on the panel 21 may be provided.

From the foregoing description, the advantages of the device and apparatus above described will be at once apparent.

55 It will be noted that the signal lamp and the electrical control mechanism for the lamps and the stopping and restarting of the train are all assembled and embodied in a neat and compact signal and switch tower unit which may be sold separately and readily connected to a standard toy railway track system, it being simply necessary in some manner to insulate a section of the third rail. To this end small fibre pins may be furnished together with the tower unit for re-

placing the metallic pin connectors, thus making the matter of connecting the standard electric toy outfit into one having the interesting train and signaling control features above described so simple as to permit installation and operation by the average child.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

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

1. A toy railroad including tracks, a "third" rail having an insulated section free from moving parts, an electric train adapted to operate on and to receive power from said tracks and rail, and means mechanically independent of said tracks and rail for automatically restarting the train after having stopped on said insulated section.

2. A toy railroad including tracks, a "third" rail having an insulated section free from moving parts, an electric train adapted to operate on and to receive power from said tracks and rail, and means mechanically independent of said tracks and rail for automatically restarting the train after having stopped on said insulated section, and means for signaling the changes in the train operation.

3. A toy railroad including tracks, a "third" rail having an insulated section free from moving parts, an electric train adapted to operate on and to receive power from said tracks and rail, means mechanically independent of said tracks and rail for automatically restarting the train after having stopped on said insulated section, and control means for making said restarting means ineffective.

4. A toy railroad including tracks, a "third" rail having an insulated section free from moving parts, an electric train adapted to operate on and to receive power from said tracks and rail, means mechanically independent of said tracks and rail for automatically restarting the train after having stopped on said insulated section, the means for signaling the changes in the train operation, and a single control means for making the automatic restarting and signaling means ineffective.

5. A toy railroad including tracks, a "third" rail having an insulated section, an electric train adapted to operate on and to

receive power from said tracks and rail, and means mechanically independent of said tracks and rail for automatically restarting the train after having stopped on said insulated section, said means being electrically controlled and constructed to be operated on power circuits of various ranges of voltage.

5 6. A toy railroad including tracks, a "third" rail having an insulated section, 70
 10 electric train adapted to operate on and to receive power from said tracks and rail, and means mechanically independent of said tracks and rail for automatically restarting the train after having stopped on said insulated section, said means being electrically controlled and constructed to be operated on power circuits of various ranges of voltage, and control means selectively adjustable for operating the device on a given desired 80
 15 range of voltages and for making said first mentioned means ineffective.

7. A toy railroad including tracks, an insulated rail section, an electric train adapted to run over the tracks and rail section, and an automatically operating control switch including a resistance coil in series with the insulated rail section for reducing the power supplied on passing of the train over said section and for increasing the power to said 30
 25 section thereafter.

8. A toy railroad including tracks, an insulated rail section, an electric train adapted to run over the tracks and rail section, semaphores for signaling the approach and departure of the train to and from said rail section, and an automatically operating control switch for reducing the power supplied to the insulated rail on passing of the train thereover, for increasing the power to said rail thereafter, and for simultaneously operating the semaphores, said semaphores operated by said switch independently of said rail section. 40
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9. In a toy railroad, a track and "third" rail system formed of standard sections including an insulated "third" rail section free from moving parts and an electrically operated thermostatic switch for automatically reducing and increasing the power supplied to the insulated railed section on passage of a train over said train track and rail. 50

10. In a toy railroad, a track and "third" rail system formed of standard sections including an insulated "third" rail section free from moving parts and an electrically operated thermostatic switch for automatically reducing and increasing the power supplied to the insulated railed section, and semaphores controlled by said switch for indicating the position of the latter, said semaphores controlled by said switch independently of said rail section. 60

11. In a toy railroad, a track and "third" rail system formed of sections of identical construction including an insulated "third" 65

rail section and an electrically operated thermostatic switch having means for automatically controlling the power supplied to the insulated rail section by diminishing and increasing said supply without entirely cutting off same, means cooperating with said first mentioned means for making the switch ineffective. 70

12. In a toy railroad, a track and "third" rail system formed of standard sections including an insulated "third" rail section and an electrically operated thermostatic switch for automatically reducing and increasing the power supplied to the insulated railed section, and control means for making the switch ineffective, and means for selectively controlling the effectiveness of the switch or for varying the circuit to correspond to different ranges of impressed voltage. 80

13. In combination an electric toy railway track and third rail system formed of detachable sections of identical construction, and an automatic train stopping and restarting device detachably interconnected with the system, said device including means for varying the power supply without entirely cutting off same. 85

14. In combination an electric toy railway track and third rail system formed of detachable sections of identical construction, and an automatic train stopping and restarting device detachably interconnected with the system, said device including means for varying the power supply without entirely cutting off same, and semaphores interconnected with said device for indicating the changes in operation. 90
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15. In combination a toy electric railway track and third rail system formed of sections of identical construction, a device having means for automatically stopping, restarting a train and for signaling the train operation detachably secured to the system, and control means cooperating with said first mentioned means for making the device ineffective. 100
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16. A toy railway formed of rail sections free from moving parts, and a control device constructed mechanically independent of said sections for repeatedly stopping and restarting a train. 110
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17. A toy railway formed of rail sections free from moving parts, and a control device constructed mechanically independent of said sections for repeatedly stopping and restarting a train, said device including semaphores for signaling the stopping and starting operation of the train. 120

18. A toy railway formed of rail sections free from moving parts, a control device having means constructed mechanically independent of said sections for repeatedly stopping and restarting a train, and manual means cooperating with said first mentioned means for making the device ineffective. 125
 130

19. A toy railway formed of rail sections free from moving parts, a control device having means constructed mechanically independent of said sections for repeatedly stopping and restarting a train, and a signal actuated by said device for indicating changes in the train operation, and manual means cooperating with said first mentioned means for making the automatic operation of the device and signal ineffective.

20. In a toy railway, a control device for automatically stopping and restarting a train, said device being arranged for selective operation on power supply sources of various ranges of voltage.

21. In a toy railway, a control device for automatically stopping and restarting a train, said device including means selectively adjustable to permit operating the device on power circuits of various ranges of voltage and to make the device ineffective.

22. In a toy railway, an automatic electric control device having means to diminish the power supply without cutting off same for stopping a train and thereafter to increase the power supply for restarting the train.

23. In a toy railway, an automatic electric control device having means to diminish the power supply without cutting off same for stopping a train and thereafter to increase the power supply for restarting the train, and means for simultaneously signaling the changes in the train operation.

24. In a toy railway, a control device for automatically stopping and restarting a train, said device including a flexing switch member cooperating with an electrically heated coil, said coil being intermittently cut in and out of the power circuit on the operation of the switch.

25. In a toy electrically operated railway, signal lights therefor, a control device comprising a flexing switch member cooperating with an electrically heated coil, said coil being intermittently cut in and out of the power circuit on operation of the switch for automatically stopping and restarting a train, said switch simultaneously controlling the signal lights.

26. A control device adapted to be installed in an electric toy railway system formed of rail sections of identical construction comprising a tower unit having a ther-

mostatic switch mounted in the tower base adapted to connect with one of said rail sections for varying the power supply thereto whereby the train is caused to automatically stop and restart, and semaphores positioned on the tower top for signaling the changes in the said train operation.

27. In a toy railroad, a track and "third" rail system formed of sections of identical construction including an insulated "third" rail section and an electrically operated thermostatic switch for reducing and increasing the power supplied to the insulated railed section without entirely cutting off said supply.

28. In a toy electric railroad, a track, a power supply means free from moving parts extending along and parallel to said track including a section insulated therefrom, and an electrically operated thermostatic switch detachably secured to said means for automatically reducing the power supplied to portions of the track.

29. An automatic train stopping and restarting device for a toy electric railroad comprising an electrically operated thermostatic switch adapted to be connected in circuit with the power supply, said switch including a single flexing member normally adapted to reduce the power supply to a non-movable portion of the track system and to stop the train along said portion, and a heating means arranged to flex said member for connecting said portion directly to the power supply on passage of the train along said portion to automatically restart the train.

30. An automatic train stopping, restarting and signaling device for a toy electric railroad comprising an electrically operated thermostatic switch adapted to be connected in circuit with the power supply, said switch including a single flexing member normally adapted to reduce the power supply to a non-movable portion of the track system and to stop the train along said portion, a heating means arranged to flex said member for connecting said portion directly to the power supply on passage of the train along said portion to automatically restart the train, and a semaphore operated by said flexing member to indicate the normal and flexed position thereof.

In testimony whereof I affix my signature.
LOUIS CARUSO.