Aug. 18, 1942. E. E. McKEIGE ET AL 2,293,397

TOY RAILROAD SIDING SYSTEM

Filed May 31, 1939 2 Sheets-Sheet 1

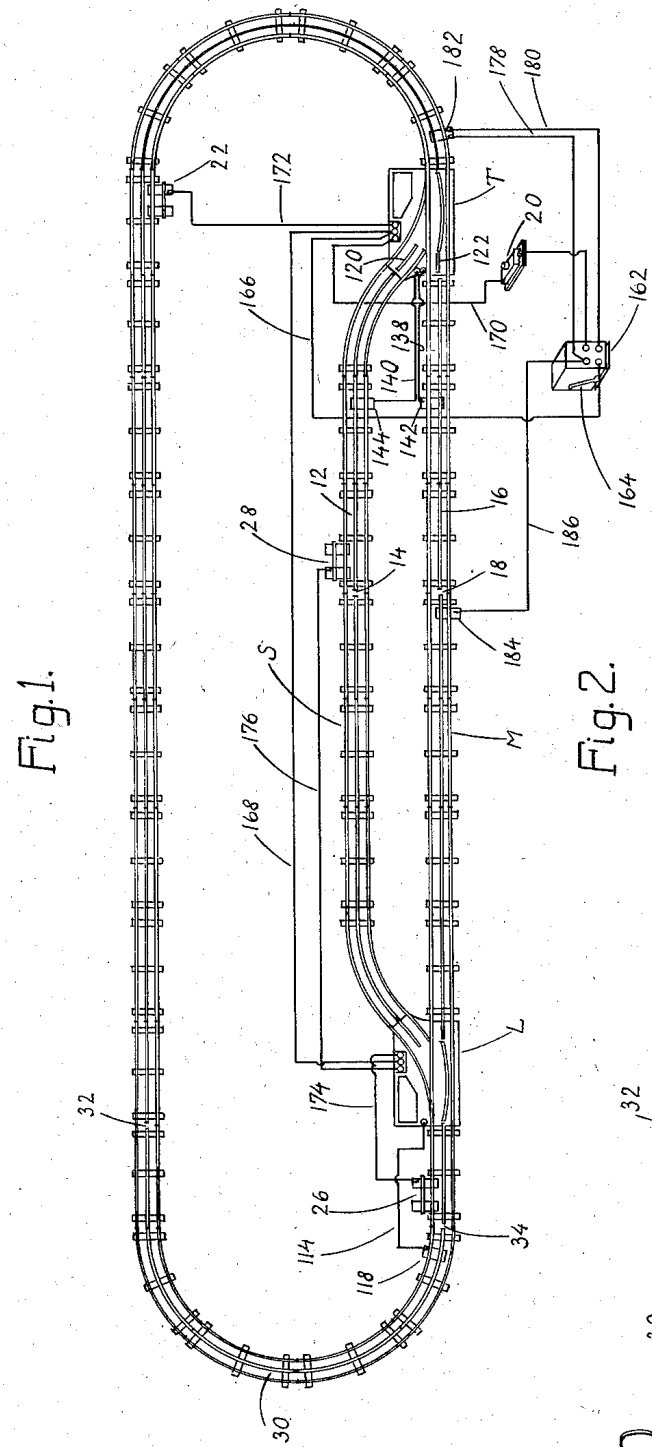

Fig. 1.

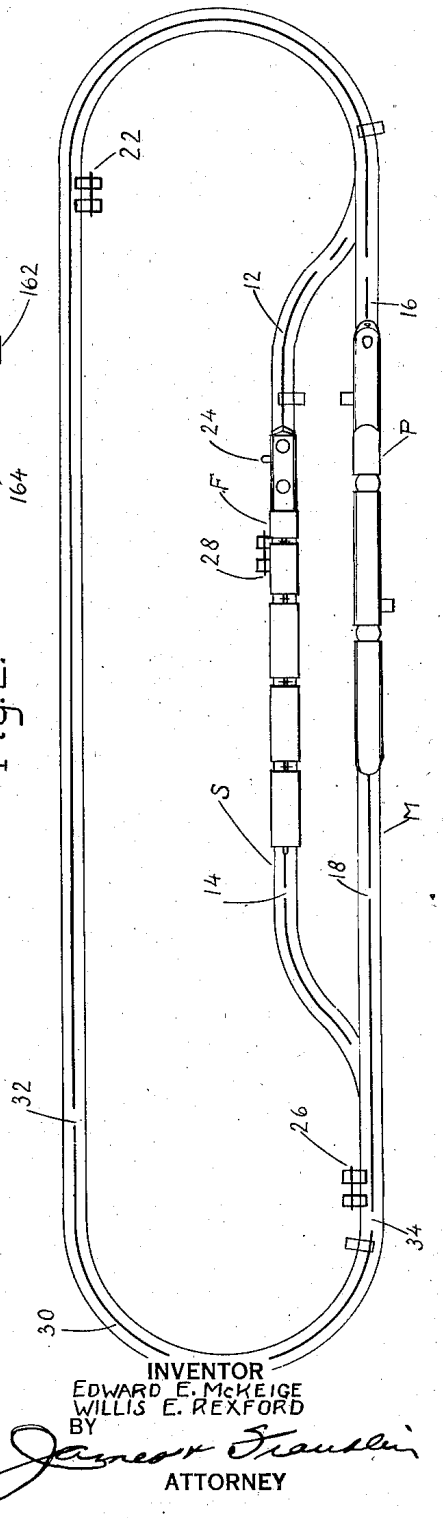

Fig. 2.

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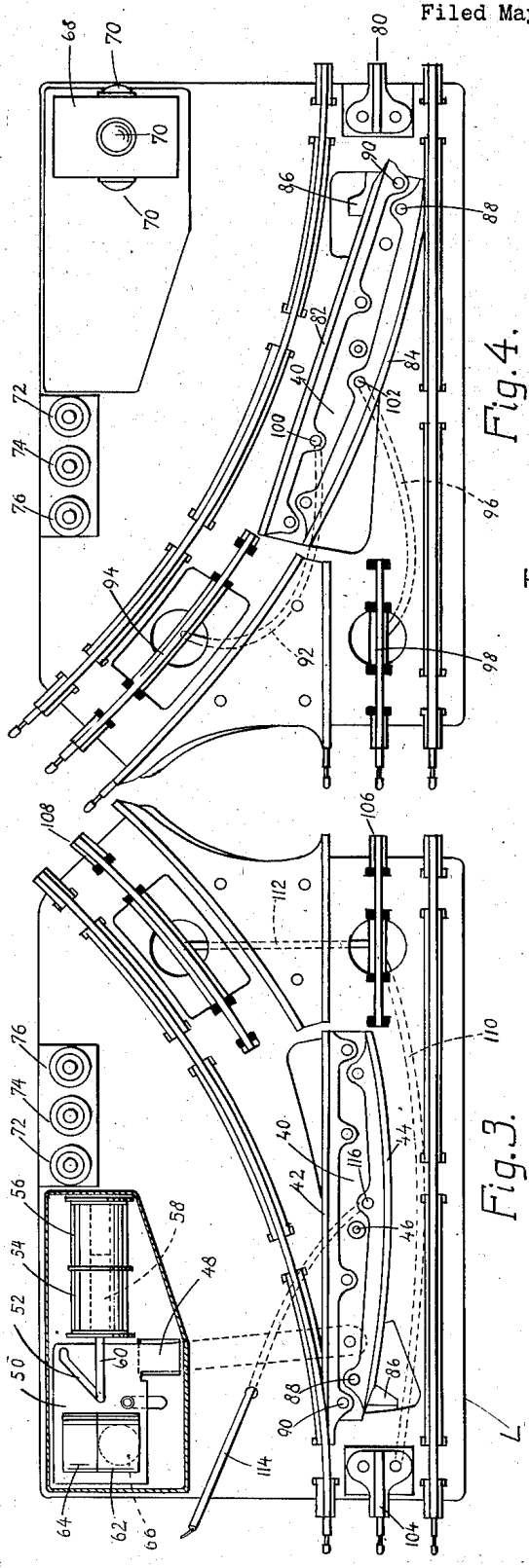

Fig. 4.

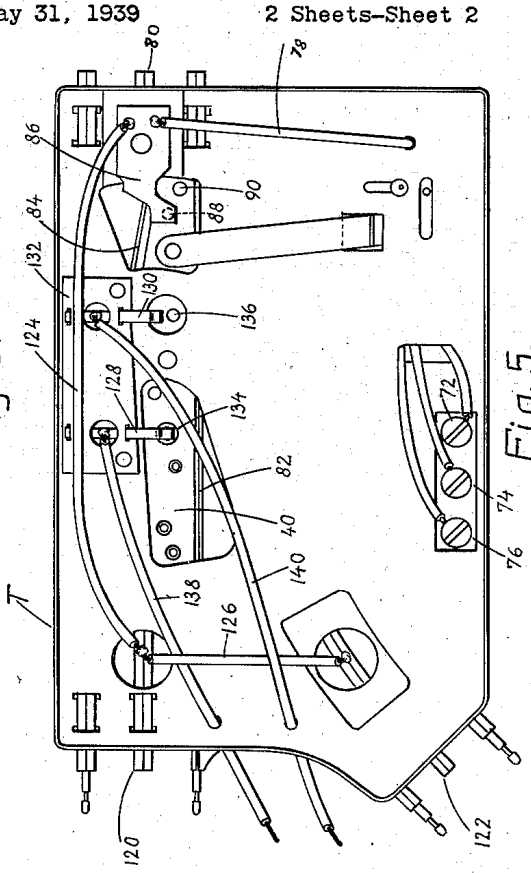

Fig. 5.

Fig. 3.

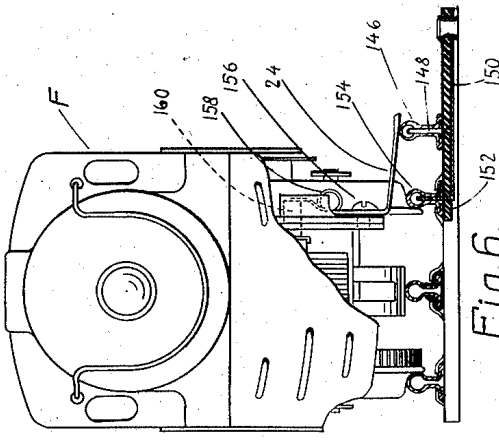

Fig. 6.

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TOY RAILROAD SIDING SYSTEM

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Application May 31, 1939, Serial No. 276,568

3 Claims. (Cl. 246—219)

This invention relates to toy railroads, and more particularly to a siding system therefor.

The primary object of the invention is to generally improve toy railroads. A more particular object is to provide a toy railroad with a siding and with two trains, the system being so arranged as to help illustrate the true function of a siding in a real railroad. With this object in view, one train is preferably made to simulate a through train or fast train, or typically, a passenger train, while the other is made to simulate a local train or slow train, or typically, a freight train. For convenience, the trains are referred to hereinafter as a passenger train and a freight train, but it will be understood that any simulation of fast and slow trains or of through and local trains may equally well be used.

In accordance with further features and objects of the invention, the freight train is normally disposed on the siding while the passenger train is free to run continuously around the main track; the operation of the freight train may be initiated whenever desired under remote control; danger of collision is averted by appropriate automatic control of insulated power rail sections in the track system; and the system is preferably so arranged that the freight train is automatically returned to the siding after completing a circuit of the track, thus again clearing the way for through operation of the passenger train on the main line.

Further objects of the invention are to provide a system of the foregoing character which is simple in construction and simple to operate, so that it may be run safely by a child, yet is not fully automatic, the control of the freight train being, as aforesaid, optional under remote control. Still further objects are to make such a system which uses equipment which is either standard or substantially so, the necessary modification from standard being a minimum which is convenient for manufacture or for attachment to train sets already in use.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, our invention consists in the toy railroad elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings, in which:

Fig. 1 is a plan view showing the track and control for a toy railroad embodying features of our invention;

Fig. 2 is a similar view showing the trackage schematically with freight and passenger trains thereon;

Fig. 3 is a partially sectioned plan view of the left-hand switch for the system;

Fig. 4 is a plan view of a right-hand switch which may be used in the system;

Fig. 5 is a bottom view of the right-hand switch shown in Fig. 4, with the bottom plate of the switch removed; and

Fig. 6 is a front elevation of the freight locomotive with a portion of the locomotive body cut away to show the ramp contact.

Referring to the drawings, and more particularly to Figs. 1 and 2, the system as here illustrated comprises a loop of track made up of straight and curved track sections in conventional manner. A siding S is provided alongside the main line M. The system is provided with a freight train F and a passenger train P, as is best shown in Fig. 2. The trains run in counterclockwise direction, and the switches which connect the siding to the main line may therefore be referred to as a leading switch L and a trailing switch T (Fig. 1).

The power rail of the siding is provided with an insulated section 12, as by the removal of the center track pin at 14. The main line at the siding is also provided with an insulated section of power rail 16, as by the removal of a track pin at 18. The points 14 and 18 may be selected by trial and error, for the necessary length of insulated section depends on the speed of operation and stopping distance needed for the trains. In a typical case, the location shown in Fig. 1 has been found satisfactory. In Fig. 2 the open-circuit points 14 and 18 have been moved toward the left a substantial distance in order to prevent the trains F and P from concealing the same in the drawings.

The trailing switch T is provided with means for energizing the insulated section toward which the switch is turned. With the switch set for the main line as shown in Fig. 1, the section 16 is powered, while the section 12 is dead. If, however, the switch is turned from the main line to the siding, then section 12 is energized, and section 16 is de-energized. The position of switch T is controlled by appropriate means such as the remote control push button 20. More specifically, the switch is normally set for the main line, but momentary depression of the push button 20 shifts the switch to the siding.

It will be evident that with this arrangement the freight train F normally remains stationary on siding S, while the passenger train P is per-

mitted to run continuously about the loop of track. However, upon depression of the button 20, the switch T is shifted; the dead section 12 is energized; and the freight train F is started. At the same time, the insulated power rail section 16 is de-energized, thus preventing the passenger train from colliding with the freight train.

At a suitable distance beyond the trailing switch T the track is provided with a ramp 22. The freight train but not the passenger train is provided with means cooperating with the ramp 22. In Fig. 2 this means is shown as a contact 24 projecting from the freight locomotive and adapted to engage ramp 22. This engagement actuates trailing switch T to restore it to through position, thus again energizing the power rail section 16 and permitting the passenger train to proceed behind the freight train.

Just ahead of the leading switch L the main line is provided with another ramp 26. This is so wired to switch L that engagement of the ramp by the freight locomotive throws the switch L to siding position, thus guiding the freight train back into siding S. Inasmuch as the power rail section 12 is dead, the freight train comes to a stop in the siding. Before coming to a stop, however, it engages a third ramp 28, and this is suitably connected to the leading switch L to restore the same to through position. The way is thus cleared for the passenger train to run on the main line past the freight train.

Inasmuch as the passenger train may be operated at a higher speed than the freight train, and inasmuch as the freight train may be slowed up when running over switch L into siding S, it is desirable to prevent any possibility of a rear-end collision. For this purpose, a third insulated power rail section is provided, this being the outer rail section 30 ahead of the ramp 26. The insulated section 30 is provided by removing track pins at the points 32 and 34. The energization of insulated section 30 is controlled by the leading switch L, and the latter is so arranged that section 30 is powered when the switch is in through position, but is dead when the switch is thrown to the siding. Thus, when the freight train is running over switch L into siding S, the section 30 is dead and the passenger train is prevented from running into the freight train. However, as soon as the freight train has safely entered the siding, it engages the ramp 28 and throws the switch L to through position, whereupon the insulated section 30 is again energized for continued travel of the passenger train.

The track switches L and T may be remote control switches of conventional character, and require only slight modification. The conventional remote control switch comprises solenoids selectively energized by a three-wire system, energization of one solenoid pulling the switch in one direction, and energization of the other shifting the switch to opposite position. The specific switches here employed may be described in greater detail with reference to Figs. 3 through 5 of the drawings. These switches are substantially of the character disclosed in United States Patent No. 2,161,424, granted June 6, 1939, to Edward E. McKeige and Anthony N. Smith. Referring to Fig. 3, the frog or moving part of the switch comprises a plate 40 with a straight rail 42 and a curved rail 44 insulatedly mounted thereon. For this purpose, plate 40 is preferably made of insulation. It is pivoted at the point 46, and may be swung about point 46 by a link 48 extending transveresly from a plate 50 carrying a diagonal camming slot 52. Solenoid coils 54 and 56 act on a solenoid core 58 connected to a rod 60 the end of which is bent downwardly and moves in slot 52. In Fig. 3 the switch is shown in through position. It will be evident, however, that upon energization of coil 56, core 58 will be drawn to the right, thus shifting plate 50 downwardly and so oscillating the switch frog to the branch or siding position. This siding position is shown in Fig. 4, although Fig. 4 shows the right-hand switch, whereas Fig. 3 shows the left-hand switch.

The cam plate 50 (Fig. 3) carries inverted U-shaped pieces of Celluloid, there being a green piece 62 and a red piece 64, one or the other of which is disposed around a lamp 66. Referring now to Fig. 4, a housing 68 is provided with colorless lenses 70 which are illuminated with green light in one position of the switch and with red light in the other position of the switch, due to the shift in position of the Celluloid strips. It will be understood that the housing for the switch mechanism has been cut away or sectioned in Fig. 3 in order to expose the interior mechanism. The binding posts 72, 74 and 76 on each switch lead to the solenoid coils 54 and 56, the center post 74 being a common return. Thus the post 72 may be considered a green post, it energizing the solenoid 54 and putting the switch in through position with accompanying green signal, and post 76 may be considered a red post, it energizing the solenoid 56 and putting the switch in siding position with accompanying red signal. The solenoids need be energized only momentarily, but the lamp 66 is lighted continuously, and is therefore preferably energized from the common power rail of the track. This is shown in the bottom view of Fig. 5 in which the conductor 78 leads from the common power rail 80 to the lamp.

Comparing Figs. 3 and 4, it will be observed that when the switch is in through position, the straight rail 42 acts as a wheel-bearing rail, while the curved rail 44 acts as a power rail, and conversely, when the switch is in siding position, as shown in Fig. 4, the straight rail 82 acts as a power rail, while the curved rail 84 acts as a wheel-bearing rail. It is for this reason that the straight and curved rails of the switch frog are insulated from one another, as by being mounted on insulation plate 40. The straight and curved rails are selectively energized by contacts forming a part of the switch mechanism. Referring to Fig. 5, a blade 86 made of phosphor bronze or like spring metal is mounted in the base of the switch and is electrically connected to the power rail part 80. It is so shaped as to engage one or another of two rivets or eyelets 88 and 90. In Fig. 5 it is shown engaging the rivet head 88. This corresponds to the through position of the switch, and rivet 88 is one of those leading to and holding the curved rail 84 in position. The curved rail is therefore energized and acts as a power rail. When, however, the switch is shifted to siding position, the rivet 88 leaves contact 86 and rivet 90 comes into engagement with contact 86. Rivet 90 is one of those leading to and holding the straight rail 82 in position, and the straight rail is therefore energized to act as a third rail. The location of the rivets 88 and 90 will also be clear from inspection of Fig. 4.

Referring now to Fig. 4, attention is directed to the flexible conductor 92 leading from the straight rail 82 to the power rail part 94 of the

switch, and to the flexible conductor 96 leading from the curved rail 84 to the power rail part 98 of the switch. These conductors extend beneath the base of the switch and their right-hand ends may be conveniently soldered to the lower ends of rivets 100 and 102 respectively holding the straight and curved rails on the insulation frog plate 40. It will be evident that with this construction, the power rail part 94 is energized when the straight rail 82 is energized, which in turn takes place when the switch is in the siding position shown in the drawings. Furthermore, at this time the curved rail 84 is dead, and consequently, the power rail part 98 is dead. The opposite holds true when the switch is shifted to through position. This arrangement may accordingly be used to control the energization of the power rail sections 12 and 16 (Fig. 1) in the siding and main line respectively.

The left-hand or leading switch of Fig. 3 is more nearly conventional in that the common and branch third rail parts 104, 106 and 108 are all connected together for continuous energization, as by means of the conductors 110 and 112 underlying the base. The straight and curved rails 42 and 44 of the frog are selectively energized as before, by means of the contact blade 86 which is connected to power rail part 104 and continuously energized. It engages either the rivet 88 or the rivet 90, as was previously explained in connection with Figs. 4 and 5.

In Fig. 3 the sole addition needed for the particular siding system here disclosed, is the conductor 114, the inner end of which is connected at 116 to the curved rail 44. This conductor leads to the insulated power rail section ahead of the leading switch, and the latter section is therefore energized only when the switch is in through position. Thus, reverting to Fig. 1, conductor 114 leads to a connector 118, which in turn is connected to the insulated power rail section 30.

A modified form of trailing switch is shown in Fig. 5. This differs from the arrangement shown in Fig. 4 in that the power rail parts 86, 120 and 122 are all connected in common and are continuously energized, as by means of the conductors 124 and 126. In this respect the switch is conventional, much like the leading switch of Fig. 3. The base of the switch is provided with extra switch means or contact fingers 128 and 130, these being insulatedly mounted on a strip of insulation 132 disposed in the base of the switch. The fingers 126 and 130 are so disposed as to engage one or another of two rivets or eyelets 134 and 136. These rivets form a part of the switch frog, and rivet 134 is one of the rivets holding the curved rail 84 on the insulation frog plate 40, while rivet 136 is one of those holding the straight rail 82 on the plate. Thus, with the switch in through position, as shown, the curved rail 84 is energized, and consequently, power is supplied through contact finger 128 to a conductor 138, while when the switch is in siding position, power is supplied to contact finger 130 and conductor 140. These may be connected respectively to the main line and siding of the track system.

Thus, referring back to Fig. 1, the conductor 138 leads to a connector 142 connected to the power rail section 16, while the conductor 140 leads to connector 144 which is connected to the power rail section 12.

The construction of the ramps and the ramp contact on the freight locomotive will be clear from inspection of Fig. 6. The ramp consists of a short length of rail 146 having a split web. The rail is forced down on an upright blade 148 projecting through an insulation plate 150. Another upright blade 152 is spaced and insulated from the blade 148 and is adapted to be inserted in the split web of wheel-bearing rail 154. It will be clear from Fig. 1 that two such connectors are used for each ramp, the ramp rail extending therebetween. The blade 148 of either connector may be used for electrical connection to the ramp 146. The ramp rail is preferably made higher than the regular track rails, in order that the contact 24 of the freight locomotive may clear the regular rails when going over switches. The contact 24 is made of phosphor bronze or other springy metal, and in the present case, is secured in position by a screw 156, said screw also functioning to hold a spring 158 acting on one of the brushes 160 of the driving motor of the locomotive. In this way power is supplied to contact 24, and when the contact engages the ramp 146, the ramp is energized. It is immaterial whether the ramp be considered as energized or grounded, this depending on the wiring within the locomotive, but, of course, the external wiring to the switches must be made consistent. In the present case, we shall for convenience refer to the ramp as being grounded when engaged by the contact 24.

Reverting now to Fig. 1, power is supplied to the entire system by means of a transformer 162. This is preferably provided with four terminals or binding posts, two being provided with variable voltage depending on the position of speed regulating handle 164, and the other two being provided with a constant voltage output for controlling accessories, or in this case, the track switch solenoids. The common or center terminal of switch T is connected by means of conductor 166 to the transformer 162. The common or center terminal of switch L is connected to the center terminal of switch T by conductor 168. The switches may then be shifted to either side depending on which of the outer terminals is grounded. The left-hand or red terminal of switch T may be grounded by means of conductor 170 leading to the normally open push button switch 20, and thence back to transformer 162. When button 20 is depressed, the left-hand solenoid of switch T is energized, thus shifting the switch to the siding position. For reasons previously explained, this energizes the siding power rail section 12 and de-energizes the main line power rail 16, thus starting the freight train and stopping the passenger train. When the freight train engages ramp 22, it grounds the ramp and consequently, grounds the right-hand terminal of switch T through conductor 172, thereby restoring the switch to the through position.

When the freight train reaches the ramp 26, a circuit is made through conductor 174 to the right-hand terminal of switch L, thereby throwing the switch to the siding position. When the freight train reaches ramp 28, a circuit is made through conductor 176 to the left-hand terminal of switch L, thereby restoring the switch to the through position.

Most of the loop of track is continuously energized in the normal way through conductors 178 and 180 leading from the double-blade track connector 182 to the transformer 162. The left-hand portion of the siding and main line between the open-circuit point 34 at the left and the points 14 and 18 at the right, are energized through a

separate connector 184 and conductor 186 leading to transformer 162, where it is connected in common with the conductor 178. Thus all parts of the track system are continuously energized except for the purposefully insulated control sections 12, 16 and 30. Movement of the speed control handle 164 of the transformer changes the potential applied to the track system through conductors 178 and 186.

It will be understood that when the trailing switch of Fig. 4 is used instead of the switch of Fig. 5, the conductors 138, 140, Figs. 1 and 5, and connectors 142, 144 (Fig. 1), are eliminated, for the insulated sections 12 and 16 are then connected to and energized from the branched power rail parts 120 and 122 (Figs. 1 and 5). In other words, in the specific form shown in Fig. 1, using the trailing switch of Fig. 5, the connection pins have been removed at the branched ends of the switch, that is, at the outer ends of the power rail parts 120 and 122. This will be clear from inspection of Fig. 5 in which the center pins at the left-hand end of the switch are shown removed. When using the switch of Fig. 4, these pins are retained, as will be seen in Fig. 4.

It is believed that the construction, method of assembly, and operation, as well as the many advantages of the present improved toy train system, will be apparent from the foregoing detailed description thereof. It will also be apparent that while we have shown and described the invention in preferred forms, many changes and modifications may be made in the structures disclosed, without departing from the spirit of the invention defined in the following claims. In the claims, the terms "freight train" and "passenger train" are used merely to distinguish between a first train and a second train, one of which normally has the right of way. The terminology is for convenience of reference, and is not intended to be in limitation of the invention to trains actually simulating a freight train or a passenger train.

We claim:

1. A toy railroad comprising a main line on which trains are operated in only one direction, a siding, leading and trailing switches at the near and far ends of the siding relative to the direction of operation of the trains, a first insulated power rail section in said siding, a second insulated power rail section in said main line at the siding, means associated with said trailing switch for energizing either the first or second insulated section according to whether the switch is turned to the siding or the main line, optionally usable means for shifting said switch, a freight train, a passenger train, a ramp contact on one of said trains but not on the other, means including a ramp on said main line beyond said siding for changing the position of the trailing switch, means including a ramp on said main line ahead of said leading switch for shifting said leading switch from one position to the other, and means including a ramp between said switches for changing the leading switch back to initial position.

2. A toy railroad comprising a main line on which trains are operated in only one direction, a siding, leading and trailing switches at the near and far ends of the siding relative to the direction of operation of the trains, a first insulated power rail section in said siding, a second insulated power rail section in said main line at the siding, means associated with said trailing switch for energizing either the first or second insulated section according to whether the switch is turned to the siding or the main line, a remote control push button for changing said switch from through position to siding position, a freight train normally on the siding, a passenger train normally running on the main line, a ramp contact on said freight train but not on said passenger train, means including a ramp on said main line beyond said siding for returning the trailing switch from siding position to through position, means including a ramp on said main line ahead of said leading switch for turning said leading switch from through position to siding position, and means including a ramp on said siding for changing the leading switch from siding position to through position.

3. A toy railroad comprising a main line on which trains are operated in only one direction, a siding, leading and trailing switches at the near and far ends of the siding relative to the direction of operation of the trains, a first insulated power rail section in said siding, a second insulated power rail section in said main line at the siding, means associated with said trailing switch for energizing either the first or second insulated section according to whether the switch is turned to the siding or the main line, means for changing said switch from through position to siding position, a freight train normally on the siding, a passenger train normally running on the main line, a ramp contact on said freight train but not on said passenger train, means including a ramp on said main line beyond said siding for returning the trailing switch from siding position to through position, means including a second ramp on said main line ahead of said leading switch for turning said leading switch from through position to siding position, means including a third ramp on said siding for changing the leading switch from siding position to through position, a third insulated power rail section in the main line ahead of the second ramp, and means associated with said leading switch for de-energizing said third insulated section when the leading switch is turned to the siding and for energizing said third insulated section when said leading switch is turned to through position.

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