

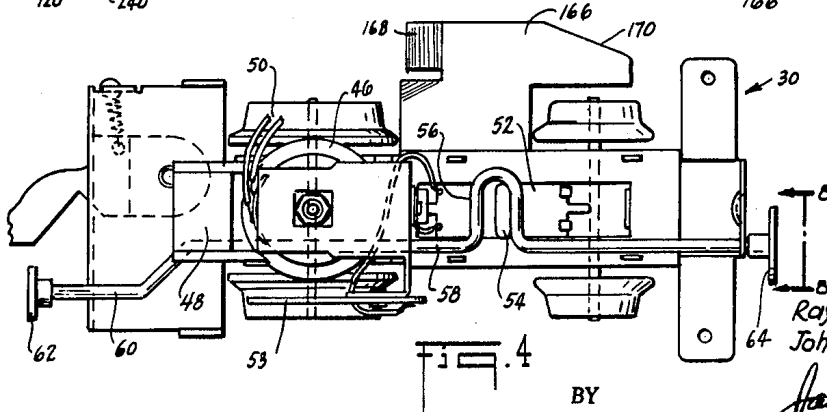
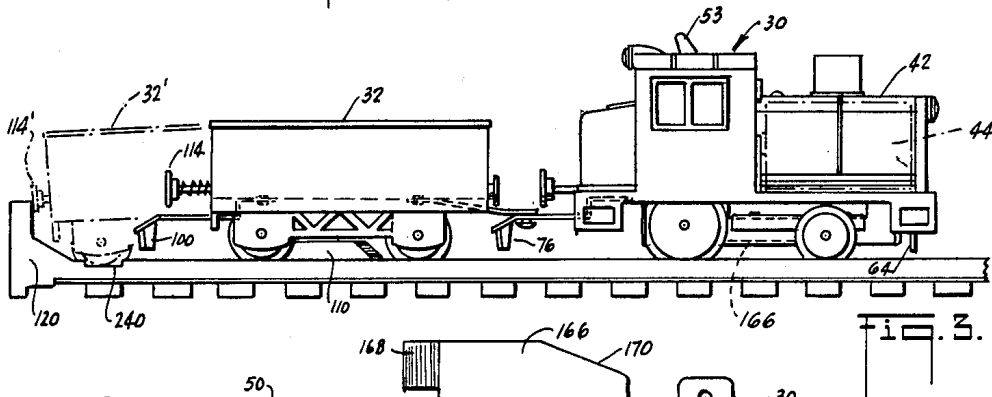
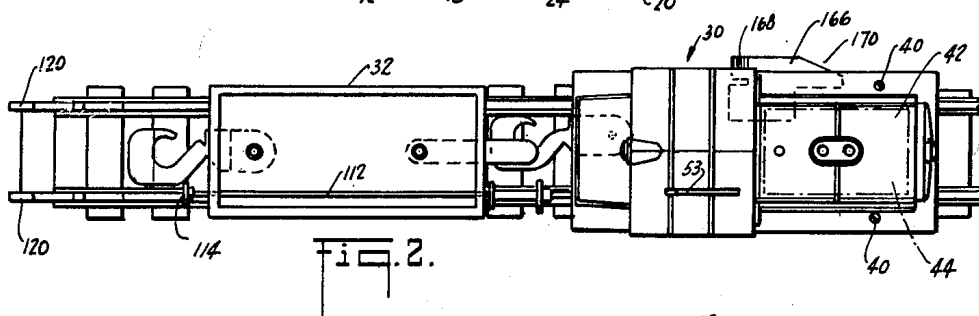
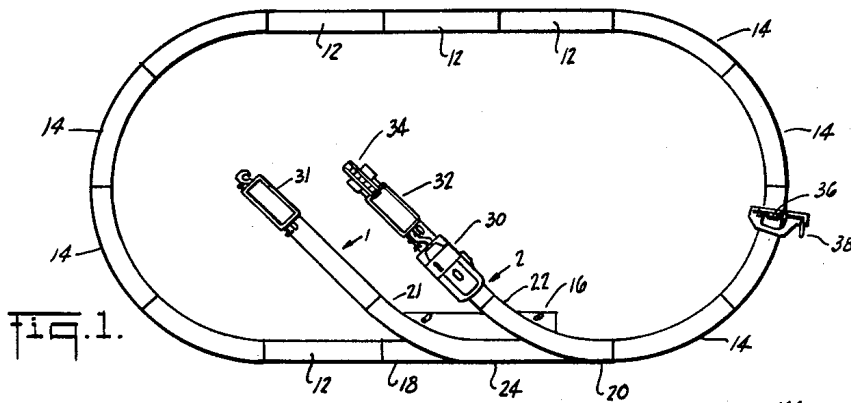
Oct. 27, 1964

R. J. LOHR ETAL
TOY RAILWAY SYSTEM

3,154,022

Original Filed May 31, 1960

6 Sheets-Sheet 1



INVENTORS

Raymond J. Loehr
John J. Dobkowski

BY

James and Franklin
ATTORNEYS

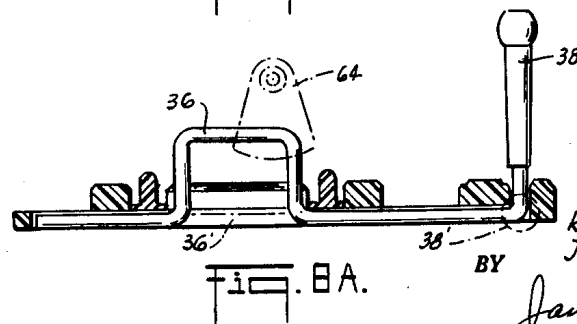
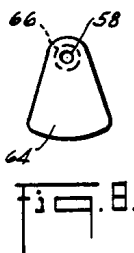
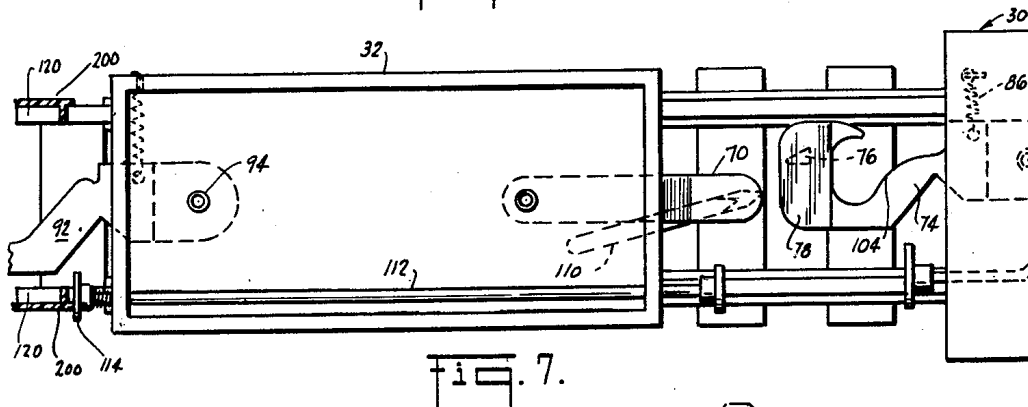
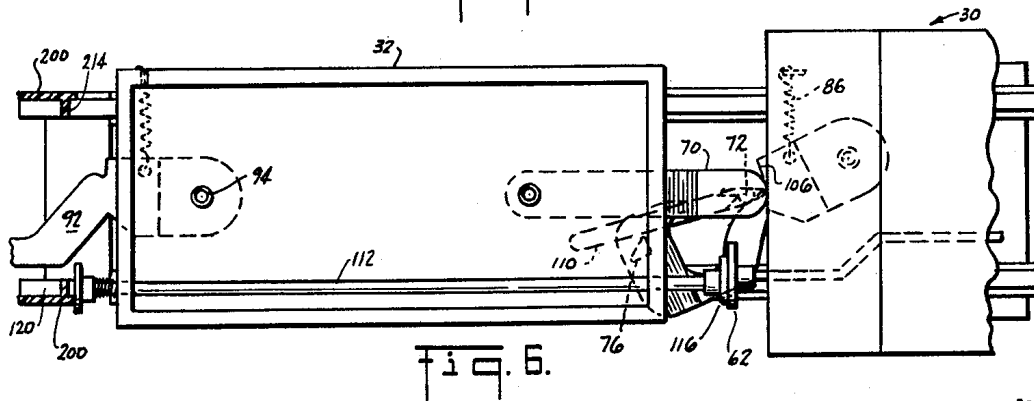
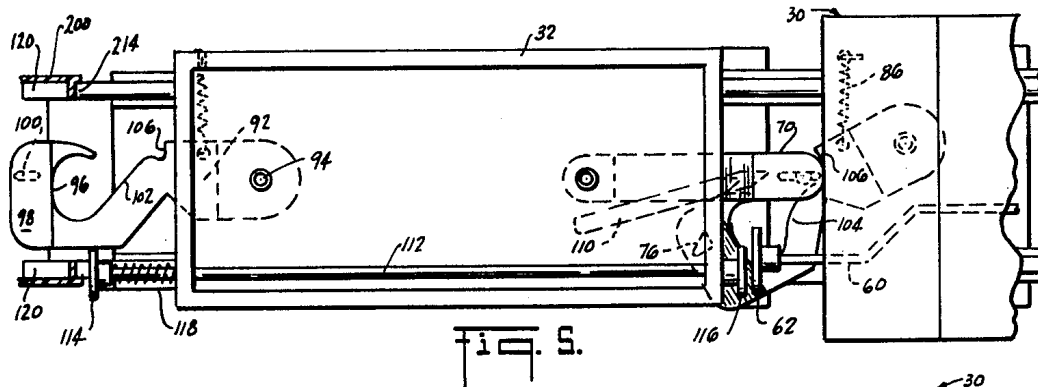
Oct. 27, 1964

R. J. LOHR ETAL
TOY RAILWAY SYSTEM

3,154,022

Original Filed May 31, 1960

6 Sheets-Sheet 2



INVENTORS
Raymond J. Lohr
John J. Dobkowski
BY
James and Franklin
ATTORNEYS

Oct. 27, 1964

R. J. LOHR ETAL
TOY RAILWAY SYSTEM

3,154,022

Original Filed May 31, 1960

6 Sheets-Sheet 3

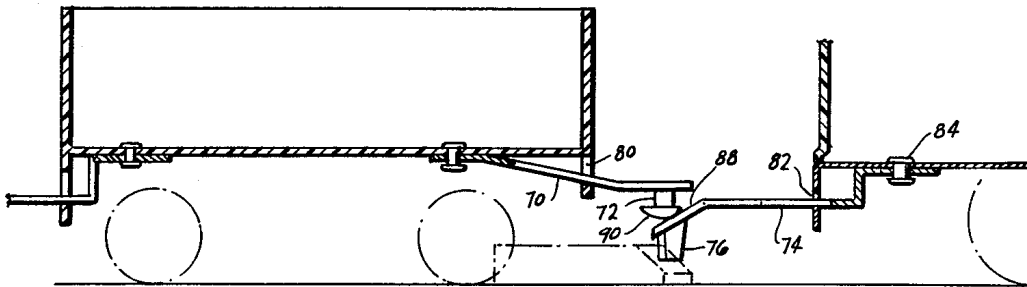


Fig. 9.

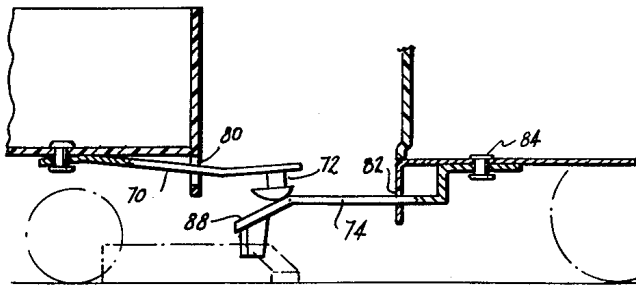


Fig. 10.

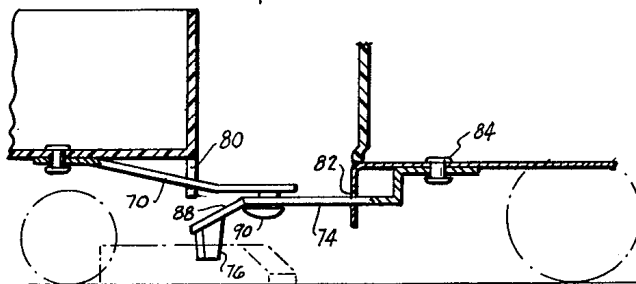


Fig. 11.

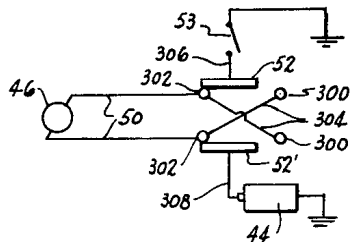


Fig. 11A.

INVENTORS
Raymond J. Lohr
John J. Dobkowski
BY James and Franklin
ATTORNEYS

Oct. 27, 1964

R. J. LOHR ET AL

3,154,022

Original Filed May 31, 1960

TOY RAILWAY SYSTEM

6 Sheets-Sheet 4

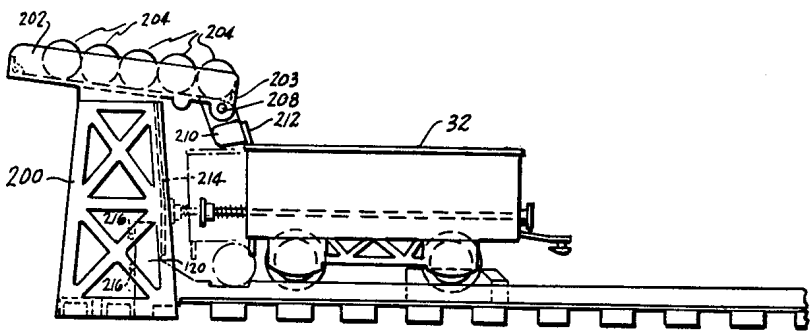


Fig. 13.

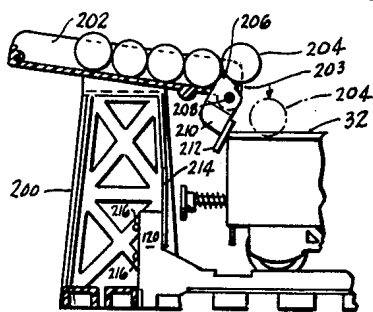


Fig. 13A.

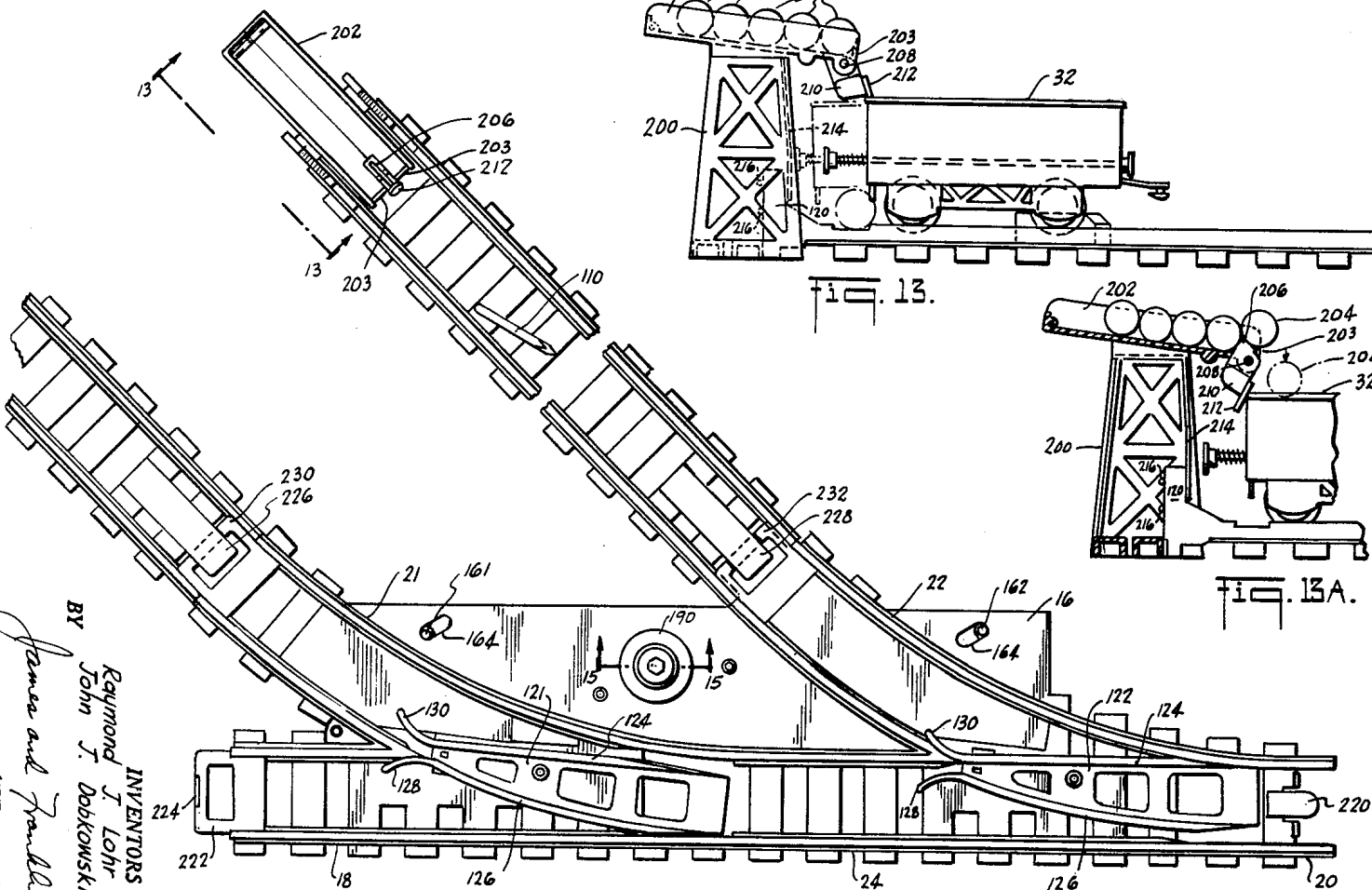


Fig. 12.

INVENTORS
Raymond J. Lohr
John J. Dobkowski
BY *James and Franklin*
ATTORNEYS

Oct. 27, 1964

R. J. LOHR ET AL

3,154,022

Original Filed May 31, 1960

TOY RAILWAY SYSTEM

6 Sheets-Sheet 5

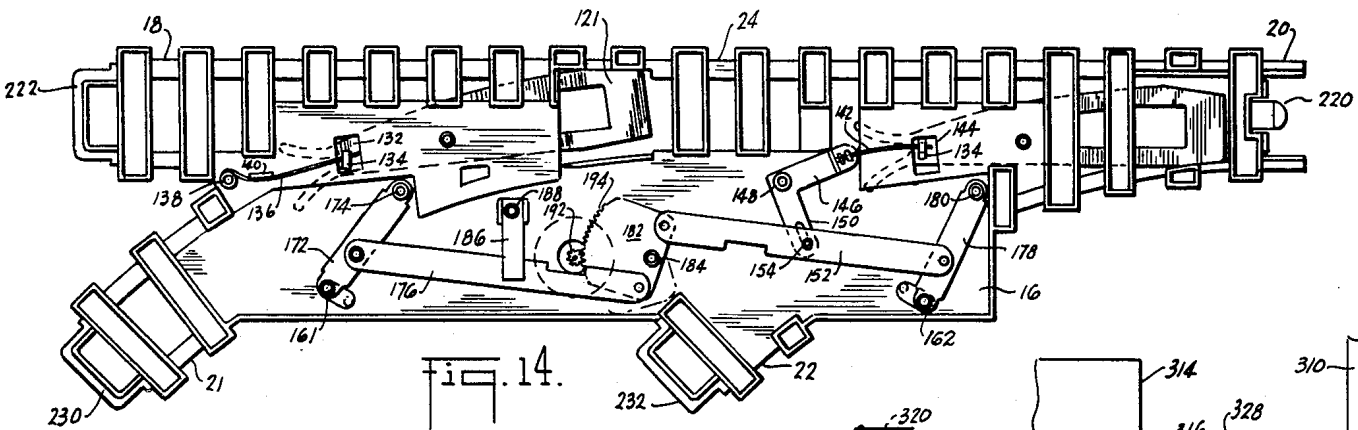


Fig. 14.

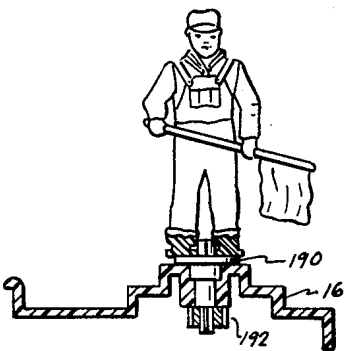


Fig. 15.

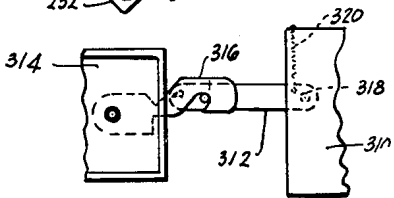


Fig. 22.

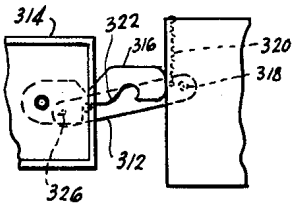


Fig. 23.

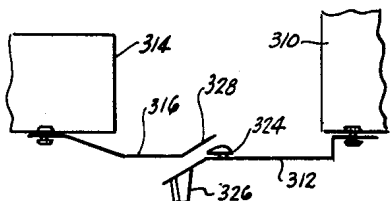


Fig. 24.

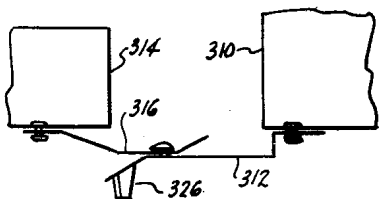


Fig. 25.

INVENTORS
Raymond J. Lohr
John T. Dobkowski
BY *James and Franklin*
ATTORNEYS

Oct. 27, 1964

R. J. LOHR ET AL
TOY RAILWAY SYSTEM

3,154,022

Original Filed May 31, 1960

6 Sheets-Sheet 6

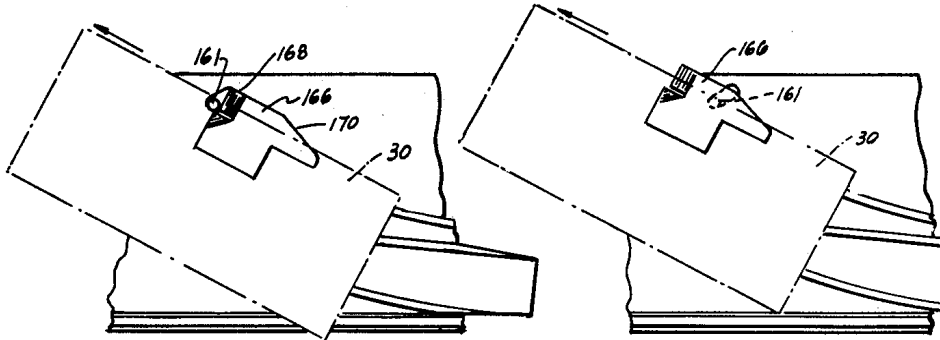


Fig. 16.

Fig. 17.

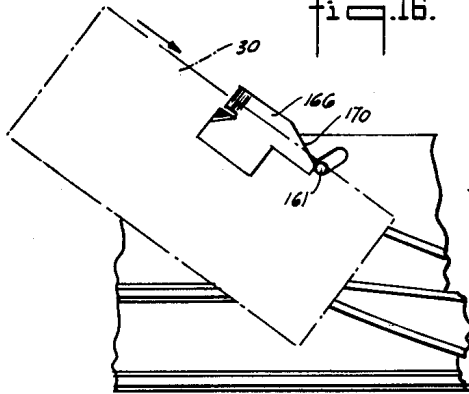


Fig. 18.

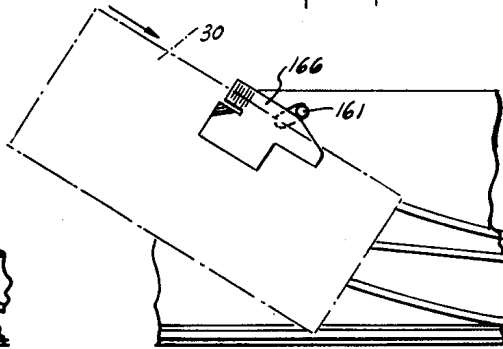


Fig. 19.

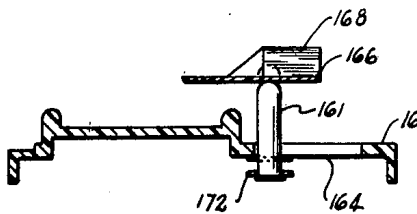


Fig. 20.

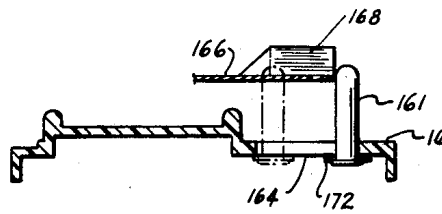


Fig. 21.

INVENTORS
Raymond J. Lohr
BY John J. Dobkowski
James and Franklin
ATTORNEYS

1

3,154,022

TOY RAILWAY SYSTEM

Raymond J. Lohr and John J. Dobkowski, Erie, Pa., assignors to Louis Marx & Company, Inc., New York, N.Y., a corporation of New York
Original application May 31, 1960, Ser. No. 32,790, now Patent No. 3,128,977, dated Apr. 14, 1964. Divided and this application Feb. 3, 1964, Ser. No. 342,167
10 Claims. (Cl. 104-1)

This invention relates to toy railway systems, and more particularly to such a system with automatic switching and coupling.

The primary object of the present invention is to generally improve toy railway systems. Another object is to provide for automatic uncoupling of cars. A further object is to provide improved track switch mechanism for automatic switching, as between a main line and one or more sidings.

Still another object is to combine the foregoing so that a train is backed into a siding and a car uncoupled, whereupon the train runs back on the main line and then may be backed into another siding to uncouple another car, and then runs back onto the main line, whereupon it may be backed and recoupled to the previously released cars in sequence, the operation all being automatic. This adds an element of mystery to the operation of the toy.

In accordance with a still further object of the invention, either or both sidings may be provided with means for automatically loading barrels or the like on a car backed into the siding. Also a switchman may operate at the track switches.

The present application is a division of our application Serial Number 32,790, filed May 31, 1960, and entitled "Toy Railway System," now Patent No. 3,128,977.

To accomplish the foregoing general objects, and other more specific objects which will hereinafter appear, our invention resides in the toy railway elements and their relation one to another, as are hereinafter more particularly described in the following specification. The specification is accompanied by drawings in which:

FIG. 1 is a schematic plan view showing a toy train system embodying features of the present invention;

FIG. 2 is a plan view drawn to larger scale showing the coupling relation between a switching locomotive and a car being pulled from a siding;

FIG. 3 is an elevation thereof;

FIG. 4 is a plan view of the chassis of the locomotive drawn to enlarged scale, and with the locomotive body and battery removed to expose the reversing switch mechanism;

FIG. 5 is a plan view drawn to enlarged scale and showing the coupling mechanism as a car is being backed to the end of a siding;

FIG. 6 shows the action of the car-carried buffer rod, as a bumper at the end of the siding is reached;

FIG. 7 is a similar view showing how the car is uncoupled and is left on the siding;

FIG. 8 shows the forward end of the locomotive buffer rod, and is a view looking in the direction of the arrows 8-8 in FIG. 4;

FIG. 8A shows its relation to an elevatable track strip;

FIG. 9 is a schematic vertical section taken longitudinally at the coupling mechanism as cars are recoupled;

FIGS. 10 and 11 show progressive steps in the coupling of the cars;

FIG. 11A is a wiring diagram for the locomotive;

FIG. 12 is a plan view showing a special double track switch here used for the two sidings (with a switchman omitted);

FIG. 13 shows the barrel loader in elevation;

2

FIG. 13A is a fragmentary view explanatory of the action of the barrel loader;

FIG. 14 is a bottom plan view of the double track switch shown in FIG. 12;

FIG. 15 is a fragmentary vertical section through a switchman mounted on the said double switch, and is taken substantially in the plane of the line 15-15 of FIG. 12;

FIGS. 16 and 17 show how the locomotive cam rides over a track switch post when the locomotive backs from the main line into a siding;

FIGS. 18 and 19 show how the locomotive cam engages and displaces the track switch post when the locomotive moves forwardly from the siding into the main line;

FIGS. 20 and 21 are fragmentary vertical sections through a part of the track switch, and are explanatory of the effect of the locomotive-carried cam on the track switch post;

FIGS. 22 and 23 are fragmentary plan views of equivalent car couplers in which the male coupler is pivoted for sideward movement; and

FIGS. 24 and 25 are fragmentary elevations of the same.

The general operation of the toy railway system may be described with reference to FIG. 1 of the drawing, which shows the invention in schematic or simplified form. The main line is here shown to be an ellipse made up of straight track sections 12 and curved track sections 14. There are also collateral sidings, generally designated 1 and 2, and these may be connected into the main line by appropriate track switches. In the present case, there is a special double track switch comprising a single base 16 with connections to the main line at 18 and 20. There are branches 21 and 22, and main line rails 24. Each switch has the usual movable frog, not shown in FIG. 1, but clearly shown in FIG. 12.

The particular train here illustrated comprises a locomotive and two cars. The locomotive 30 preferably simulates a switching locomotive, and the cars 31 and 32 are preferably open gondola cars. The sidings terminate in positive stop members or bumpers, and either or both may be provided with an additional accessory, in this case a barrel loader 34. At any desired point one of the main line track sections is provided with a trip element 36 which may be raised or lowered by a suitable manually operable lever 38.

The train runs in counterclockwise direction repeatedly around the loop or main line until the trip 36 is raised. The locomotive then is reversed and backs into siding 1 where the gondola 31 is reversed and left in the siding, while the locomotive and gondola 32 run forward out of the siding back on to the main line. If the trip 36 has been left raised (or when again raised) the locomotive again reverses and backs into siding 2 where the gondola 32 is uncoupled and left in the siding while the locomotive runs out of the siding on to the main line.

If the trip 36 is left raised (or when again raised) the locomotive reverses and backs into siding 1 where it picks up car 31, and then runs forward from the siding on to the main line. If the trip 36 is left raised (or when again raised) the locomotive again reverses and backs into siding 2 where it picks up car 32. It then runs out of the siding on to the main line and runs on the main line unless the trip 36 is left raised or until it is again raised. At such time the locomotive reverses and backs into siding 1 where it drops car 32 and then runs back to the main line, with the entire operation previously described now repeating itself, except for the interchange of cars 31 and 32. Meanwhile, whenever a car is backed into siding 2 and reaches the barrel loader 34, it receives a barrel.

All of the foregoing operations take place automati-

cally, except for the manual operation of the track trip 36. The seemingly self-intelligent operation of the toy for all of the necessary uncoupling, switching and coupling operations is surprising and puzzling, and has great amusement value. The manner in which this automatic operation is obtained is next explained in greater detail.

Locomotive Reversing Mechanism

The locomotive 30, here simulating a small switcher, is shown in FIGS. 2 and 3. The body is molded out of a plastics material, and may be lifted upward from the chassis by removing two small screws 40 (FIG. 2). The particular locomotive here shown is battery operated, and the forward portion 42 of the body houses a single flash-light cell 44. In FIG. 4 the body and the cell have been removed, thereby exposing the chassis.

The motor 46 is mounted with its shaft vertical. The motor has a permanent magnet field, as is well known in small model motors, and includes a block 48 of Alnico or equivalent permanently magnetic material. The armature is energized through two conductors 50, and the motor is reversed by simply reversing the direction of the current supply through the conductors. This is done by a sliding contact switch, including a slidable insulation element 52 having an upstanding projection 54 which is received in the reverse or "U-shaped" bend 56 of a rod 58 which extends lengthwise of the locomotive.

The rear end of this rod is displaced outwardly as indicated at 60, and preferably carries a circular enlargement 62 resembling a buffer used on railway rolling stock. At its forward end the rod 58 carries another enlargement 64, but this extends downwardly, instead of being circular, as is best shown in FIG. 8 of the drawing, in which rod 58 is received in the hub 66 of depending element 64. The latter is located between the rails and in appropriate position to engage the trip 36 (FIGS. 1 and 8A) previously referred to. This moves the buffer to the rearward position shown in FIG. 4 at which time the locomotive runs backward. When the buffer 62 is struck and moved forward, the reversing switch is operated by the bend 56 of the buffer rod, which moves the projection 54 and plate 52 of the reversing switch forward, whereupon the locomotive runs forward.

The locomotive may be started or stopped by means of a simple "on-off" switch controlled by a lever 53 (FIG. 3), the movable upper end of which projects through the top of the cab of the locomotive. This switch is in series with one of the conductors between the cell and the reversing switch.

A wiring diagram for the locomotive is shown in FIG. 11A. The movable element of the reversing switch is shown at 52, 52', and is slidable in fore-and-aft direction to engage either the forward contacts 300 or the reversing contacts 302. These four contacts are stationarily mounted beneath the slidable element, and are connected together by crossed conductors 304. The contacts are connected to the motor 46 by means of the conductors 50.

The slidable contact 52 is connected by means of a flexible conductor 306 to the "on-off" switch 53, and thence to ground, that is, the metal chassis of the locomotive. The other slidable contact 52' is connected by means of a flexible conductor 308 to one end of the battery cell 44. The other end of the cell is grounded to the chassis, thereby completing the circuit.

Not only the locomotive, but each of the cars is provided with a buffer rod for helping control the reversing action of the locomotive. Thus, referring to FIG. 5, the car 32 has a buffer rod 112 which extends slidably through the car near one edge, and which carries circular enlargements 114 and 116 at its ends. A light compression spring 118 may be disposed between the end 114 and the car so that the buffer is normally in rearward position. The car buffer 112 is substantially in alignment with the locomotive buffer 62. It should be understood that the

other car 31 is similar to the car 32, and similarly has a buffer rod in direct alignment with the rod 112.

The end of the siding preferably has a positive stop or bumper shown at 120 in FIGS. 2 and 3. For simplicity, the two uprights are aligned with the track rails, and the buffer 112 is disposed over one of the rails. When the locomotive backs the car 32 to the end of the siding, the buffer 114 reaches the bumper 120 as shown at 114', and is pushed forward.

Referring now to FIGS. 5, 6 and 7, when the buffer 114 engages the bumper 120 and is pushed forward, as shown by the change from FIG. 5 to FIG. 6, the buffer 116 pushes the buffer 62 forward, thereby shifting the reversing switch on the locomotive, which then runs forward, leaving the car behind as shown in FIG. 7.

It will be understood that when the locomotive backs into the siding with two cars, the buffer of the rearmost car hits the bumper, and in turn moves the buffer of the intermediate car forward which, in turn, moves the buffer of the locomotive forward, thereby reversing the locomotive. The buffers are all in alignment, and the motion may be carried from the bumper through car after car until the locomotive is reached. The buffers move substantially simultaneously.

The Uncoupling and Coupling Mechanism

The automatic uncoupling and coupling mechanism may be described with reference to FIGS. 5 through 11 of the drawing. The cars have a male coupler at one end and a female coupler at the other end. The locomotive differs in having a coupler on its rear end only, and in the particular system here shown, the locomotive has a female coupler, and consequently the cars have their male coupler at the forward end.

Referring to FIG. 9, the male coupler 70 has a coupling pin 72, and the female coupler 74 has a depending finger 76. In FIG. 7, where the coupler is shown in plan, it will be seen that the female coupler 74 has a relatively large open hook 78 which is adapted to receive the male pin, and which is pivoted for lateral movement. The male coupler 70 cannot move laterally, and passes through a slot 80 (FIG. 9) which permits some vertical movement of the male coupler 70, as will be seen by a comparison of FIGS. 9 and 10, but which prevents lateral movement. In contrast, the female coupler 74 passes through a horizontally elongated slot 82 (FIG. 9), and is pivoted at 84 so that it can move laterally. It is preferably provided with resilient means in the form of a very light pull spring 86 (FIGS. 5-7) which serves to normally center the hook in the position shown in FIG. 7.

Reverting to FIG. 9, the outer end of the female coupler slopes as shown at 88, and the lower end of pin 72 is preferably rounded as shown at 90, to facilitate coupling engagement between the pin and the hook. This takes place as shown by the successive positions in FIGS. 9, 10 and 11, with the male coupler riding upwardly over the incline 88 and then dropping into hooked position shown in FIG. 11.

Referring now to FIGS. 5-7, the female coupler 92 of the car is pivoted at 94 and has a similar large open hook 96. The outer end slopes in elevation at 98, and carries a depending finger 100. The inner end of the hook is oblique as shown at 102. The female coupler of the locomotive 80 has a slightly different shape, as here illustrated, but in all operative essentials it is the same, and the hook similarly has an inner portion which is disposed at an angle, as shown at 104 in FIG. 7. In all cases the oblique portion terminates in a shoulder indicated at 106.

The result of this arrangement is that when the cars are pushing instead of pulling the hook is displaced side-ward as shown in FIGS. 5 and 6, by the pressure of the coupler pin on the oblique inner portion 104.

Referring now to FIG. 3, the track section there shown in a special track section in that it is provided with a gen-

erally upright ramp 110 so positioned that it can cooperate with the depending finger 76 (or 100) of a female coupler. This ramp is disposed at an angle laterally, that is when viewed in plan, and is located as shown in broken lines in FIGS. 5, 6 and 7. From inspection of the drawing it will be seen that the finger of the hook rides outside the ramp as shown in FIG. 5 when the hook is pushing a car and the finger rides inside the ramp when the hook is free as shown in FIG. 7, or is pulling a car as shown in FIGS. 2 and 3.

On reflection it will be seen that a pushed car may be uncoupled by stopping the coupling at the ramp and then reversing the locomotive. This operation is shown in FIGS. 5, 6 and 7, the finger 76 being outside the ramp as the locomotive pushes the car 32 in FIG. 5, and being retained outside the ramp when the locomotive begins to move ahead as shown in FIG. 6. The ramp holds the hook at an angle and causes the hook to miss the pin 72 of the male coupler 70, and the locomotive runs ahead free of the car, as shown in FIG. 7. After leaving the ramp 110 the spring 86 serves to center the coupler hook, as shown at the right end of FIG. 7. The horizontal slot 82 (FIG. 9) limits the motion of the hook caused by its light pull spring. The ramp 110 need not be oblique, but it must be located between the pushing and pulling positions of the coupler finger, and it must cause the hook to miss the pin when the hook moves forward.

If now the locomotive returns to pick up a car, the finger 76 rides inside the ramp and is unaffected by it. The coupling operation then proceeds as illustrated in FIGS. 9, 10 and 11, with the male coupling pin 72 riding up the sloping surface 88 of the hook until the pin drops into the hook. When the direction of operation of the locomotive then is reversed, the locomotive pulls the car out of the siding.

Although the hook is shown pivoted for sideward movement while the pin of the coupler is stationary, it will be understood that an equivalent coupler arrangement may be made with the parts reversed, so that the pin is pivoted for sideward movement instead of the hook. In such case the locomotive coupler is a pin instead of a hook, and the succeeding cars then have a hook at the forward end and a pin at the rear end.

Such an equivalent coupler arrangement is schematically illustrated in FIGS. 22 through 25 of the drawings. In FIG. 22 a car 310 having a male coupler 312 is pulling a car 314 having a female coupler 316. The latter is fixed against sideward movement, but the male coupler is pivoted at 318, and is slightly urged to its centered position by a weak pull spring 320.

In FIG. 23 the car 310 is pushing the car 314, and at such time the male coupler 312 is moved to the sideward position shown by the oblique inner portion 322 of the hook 316.

Referring now to FIGS. 24 and 25, the male coupler 312 has a pin 324 which projects upwardly, instead of downwardly as in FIG. 9. Also, the male coupler 312 instead of the hook has a depending finger 326. The female coupler 316 has its end sloping upward as shown at 328, instead of downward as in FIG. 9.

In principle the coupling action is the same as before, that is, if car 310 is backed to car 314 the couplers ride over one another until the pin is caught in the hook, as shown by the change from FIG. 24 to FIG. 25. At this time the male coupler is centered, and its finger 326 comes inside of and is unaffected by the uncoupling ramp as previously described. However, if car 310 pushes car 314 into a siding, the male coupler is disposed at an angle as shown in FIG. 23, and its finger 326 comes outside the uncoupling ramp, which holds it at an angle when car 310 reverses, so that the coupling pin moves outside the open end of the hook, thus leaving car 314 behind.

Double Track Switch

The construction of the double track switch is best shown in FIGS. 12 and 14 of the drawing. In FIG. 12

the switches may be considered to be first and second switches, reading from left to right. The first switch has a frog 121 which is yieldably biased toward the siding. This frog has a straight rail 124 and a curved rail 126, with a wing 128 at the end of the curved rail to be engaged by approaching wheels to deflect the frog from the main line when a train is moving along the main line from left to right toward the switch. The straight rail 124 also has a wing 130, but this is provided merely so that the frog 121 of the first switch may be the same in manufacture as the frog 122 of the second switch.

Referring now to FIG. 14, showing the bottom of the switch, the base 16 has an opening or window 132 which receives a lug 134 depending from the frog 121. A thin wire spring 136 is anchored by an eyelet at 138 and bears against a stop 140. Its free end passes loosely through a hole in the lug 134. With this arrangement it will be evident that the frog is normally biased downward as shown in FIG. 14, or upward as shown in FIG. 12, that is, it is lightly biased toward the siding.

The second switch has a frog 122 (FIG. 12) which is the same as frog 121, and which similarly comprises a straight rail 124 and a curved rail 126 with divergent wings 128 and 130 at the adjacent ends of said curved and straight rails. There again is a resilient biasing means, but in this case the resilient means is shiftable to either of two positions. Referring now to FIG. 14, a light wire spring 142 has its free end passing through a hole in lug 134, which is movable in an opening 144 as before. However, the fixed end of spring 142 is anchored in the arm 146 of an angle lever which is pivoted at 148 and the other arm 150 of which is connected to a link 152 by means of a pin 154 which passes through a slot in arm 150. As here shown the spring is in its upper position as viewed in FIG. 14 and the frog is biased toward the main line. With the spring in its lower position the frog is biased toward the siding.

The parts so far described form a part of a linkage which extends under the base 16 to two cam followers, here shown as upright posts 161 and 162 which are adjacent the siding rails 21 and 22 of the two switches, as is best shown in FIG. 12. The linkage causes the posts to move in opposite directions toward or away from the rails, this movement being accommodated by slots 164 in base 16.

Referring now to FIGS. 2 and 4 the locomotive 30 has a fixed cam plate 166 mounted at one side. This is sloped in elevation near its rear end as shown at 168, and slopes horizontally at its forward end as shown at 170. The cam is so related to the posts 161 and 162 that it rides over the post when the locomotive backs into a siding, but it moves alongside and shifts the post when the locomotive moves out of a siding on to the main line.

Referring to FIG. 14 the post 161 is carried at the movable end of a lever 172, pivoted at 174, and moved by a link 176. Similarly, the post 162 is carried on a lever 178 which is pivoted at 180, and lever 178 is moved by link 152. The links 152 and 176 are connected by a direction-reversing lever 182 which is pivoted at 184. A restraining spring 186 mounted at 188 bears against the link 176 to help hold the linkage upward, and to hold it frictionally in its last position until again moved by the locomotive. When the post 161 is moved outward by a passing locomotive the other post 162 is moved inward, preparatory to later being moved outward by the locomotive at which time post 161 is again moved inward and so on.

The relation of the locomotive 30 and its cam 166 to either post may be described with reference to FIGS. 16-21 of the drawing. In FIG. 16 the locomotive is moving backward from the main line into a siding, and the post 161 (or 162) is in its inner position. The inclined surface 168 of cam 166 rides over the post 161 and the latter is readily depressible for the short distance needed. In FIGS. 17 and 20 the cam 166 is directly over the post 161, the latter being depressed from the dotted line to the solid line position. In FIG. 18, the locomotive has al-

ready moved into the siding; has been reversed; and is coming back out of the siding. At this time the oblique surface 170 of the cam 166 bears against the side of the post 161 and moves it from the inner position shown in FIG. 18 to the outer position shown in FIG. 19, where it remains until moved back by similar passage of the locomotive from the other siding on to the main line. The movement of the post caused by the cam is also shown by the change from the dotted line to the solid line position in FIG. 21.

It will be understood that other locomotive-carried deflecting means may be provided, to accomplish the same result, cooperating with different follower means other than a post as here shown. For example, the cam may be on the switch instead of on the locomotive.

The Switchman

To enhance the realism of the toy the double track switch is preferably provided with a simulated switchman carrying a flag, as shown in FIG. 15 of the drawing. This man is mounted on a disc 190, the shaft of which is received in the base 16 of the switch, preferably between the two sidings as shown in FIG. 12. The lower end carries a pinion 192.

Referring now to FIG. 14 the direction reversing lever 182 previously referred to, is preferably expanded to provide a gear sector 194. This meshes with the pinion 192. Thus, a change in the switch position is automatically accompanied by turning of the position of the switchman, so that he faces with his flag in one direction or another, preferably as may be appropriate to the next ensuing passage of the train. However, any turning of the switchman, even if random, adds to the action and interest of the toy.

The Barrel Loader

In the present case the end of siding 2 is provided with a barrel loader which automatically discharges a simulated barrel into a car reaching the end of the siding. Such a barrel loader may be provided at the end of either or both of the sidings.

Referring to FIG. 13 the barrel loader comprises a pedestal 200 supporting an inclined trough member 202 supporting a series of simulated barrels 204. These are prevented from rolling from the trough by two spaced fixed stops 203 at the lower end of the trough. A barrel lifter 205 (FIG. 13A) located between the stops 203, is pivoted at 208 and is formed at the upper end of a depending lever 210 (FIG. 13) having a transverse push surface 212 near its lower end. The push surface 212 is so located that a car, in this case car 32, engages and moves the arm 210 back with it, as shown in FIG. 13A. This causes the barrel lifter 205 to lift the endmost barrel up over the fixed stops 203 so that the barrel rolls into the car. The rearwardly facing edge of the barrel lifter meanwhile comes into the path of the next barrel and holds it back. The car goes slightly beyond the ledge 212, and when the car leaves the siding, it pulls the arm 210 back to the position shown in FIG. 13, at which time the barrels roll down until the then leading barrel is arrested by the fixed stops 203. Thus, one barrel is delivered each time a car is backed into the siding.

It will be recalled from FIGS. 2 and 3 that the end track section of the siding is formed integrally with up-standing bumpers 120. The pedestal of the barrel loader is preferably designed to fit over these bumpers and to be anchored in place thereby. This will be seen from inspection of FIGS. 5, 6 and 7, in which the tops of the bumpers are shown at 120, while the adjacent walls of the pedestal are shown at 200. These walls have flanges 214 which fit ahead of the bumpers and hold the loader against movement away from the end of the siding. Reverting to FIG. 13, each side of the pedestal 200 also has a pair of inwardly directed locating pins 216 which fit directly behind the bumper 120. Thus, the barrel loader

is applied to the end of the siding by sliding it downwardly from above, with the bumpers received between the pins 216 at the back, and the flanges 214 at the front.

The Track Sections

The present invention need not be limited to any particular form of trackage or track sections. In the case illustrated the locomotive is battery operated, and there is no need to supply power through the rails. The rails therefore may be made of an insulating material, and in practice the sections are molded out of a suitable plastics material, each section being an integral molding made up of rails and cross-ties and a somewhat hook-shaped detent at one end. Such a detent is shown at 220 at the right end of FIG. 12. Each section has a mating projecting portion 222 as shown at the left end of FIG. 12. The edge is inclined at 224 to facilitate sliding together of adjacent track sections, at which time the detent snaps over the part 222 to hold the sections against separation. Similar detent hooks for the sidings are shown at 226 and 228 in FIG. 12, and these engage over cross-bars 230 and 232 which form a part of the double switch structure. In all cases the cross-bar is dimensioned to just fit between the rails of the next section, thereby holding the rails in alignment.

There are straight sections and curved sections, as shown in FIG. 1. The double track switch is a special section, and the sidings are also special sections in that the bumpers 120 and ramps 110 are molded integrally with the said siding sections. Another special detail of these siding sections is shown in FIG. 3. The rails may be depressed or downwardly notched, as indicated at 240, in proper position to receive the wheels of a car when it has reached the bumper. This tends to lightly hold the car against forward movement on the siding, that is, toward the switch. However, it offers no appreciable resistance to movement of the car when it is pulled by the locomotive.

Operation

Referring to FIG. 1, the train consisting of locomotive 30 and cars 31 and 32, runs counterclockwise on the main line. At this time the switch frog 121 is biased toward siding 1, as always, and the switch frog 122 is biased toward the main line, all as shown in FIG. 12. The train when running counterclockwise on the main line deflects frog 121 each time its wheels reach the wing 129. Because the frog is longer than the spacing between the wheels it remains deflected until the entire train passes, but in any case it could be repeatedly deflected.

When desired the trip 36 is turned upward by its lever 38. When the locomotive reaches the trip the buffer rod of the locomotive is pushed back, and the train runs backward. The backing train passes siding 2 and backs into siding 1. At this time the post 161 is in the position shown in FIG. 12, and the locomotive cam plate rides over the top of the post.

When the train has backed all the way into the siding the rear-most buffer of car 31 hits the bumper 120 and moves forward. This moves the buffer of car 32 and also the locomotive buffer forward, thereby reversing the motor, so that the locomotive starts out of the siding. Meanwhile during the backing movement the coupling hooks have been deflected sideward as shown in FIG. 5, so that the finger of the hook of car 32 comes outside the uncoupling ramp 110. When the locomotive goes forward it pulls car 32, but leaves car 31 behind.

In its forward movement the locomotive cam engages track switch post 161 and moves it from inward to outward position. This moves the other post 162 from outward to inward position, and shifts the bias of frog 122 from the main line to the siding. The train proceeds past frog 122, deflecting it by wing 130 if necessary, and runs on the main line until again reversed by the track trip

36. It then backs into siding 2 and the locomotive cam rides over the top of post 162.

The coupling hook is deflected sideward and comes outside the uncoupling ramp, as shown in FIGS. 5 and 6. When car 32 reaches the barrel loader it receives a barrel, and at about this time it reaches the bumper, so that its buffer is pushed forward. This pushes the locomotive buffer forward, thereby reversing the motor and causing the locomotive to run ahead without car 32, the coupling hook being held sideward by the uncoupling ramp, and later being centered by its spring. The locomotive cam engages the post 162 and moves it outward, thereby changing the bias of switch frog 122 to the main line. However, if necessary the frog is deflected by the wheels and the locomotive comes on to the main line and runs on the main line until it again engages the track trip 36.

The locomotive then backs past siding 2 into siding 1. It rides over post 161. Its coupling hook is centered and comes inside the uncoupling ramp and is not affected thereby. The coupling hook rides under the coupling pin of car 31 and thus recouples car 31. The buffer of the locomotive strikes the buffer of car 31 and thereby reverses the motor so that the locomotive runs forward with car 31. As the locomotive passes post 161 it moves it outward, thus changing the bias of frog 122 of the other switch to the siding 2. However, the wheels deflect frog 122 as they pass along the main line.

When the locomotive is again reversed by the track trip 36, the locomotive and car 31 back into siding 2. The locomotive cam rides over the top of post 162. The coupling hook of car 31 is centered, and thus comes inside the uncoupling ramp and is not affected thereby. The hook rides under the coupling pin of car 32, thus recoupling the cars. The buffer of car 31 strikes the buffer of car 32 and is moved forward, thereby moving the locomotive buffer, and reversing the motor, so that the locomotive and both cars now run forward toward the main line. As the locomotive passes post 162 it moves the post outward, thereby changing the bias of frog 122 to the main line. However, if necessary the wheels deflect the frog as the train runs on to the main line, and it runs on the main line until the track trip 36 is again used, at which time the entire process may be repeated as above described, except that this time car 32 will be left in siding 1, and car 31 will be left in siding 2 and will there receive a barrel.

It is believed that the construction and operation of our improved toy train system, as well as the advantages thereof, will be apparent from the foregoing detailed description.

The rails may be made of metal if the locomotive is not battery operated. There may be three rails if the system uses a third rail power supply, or two rails of opposite polarity if there is no third rail. The main line need not be an ellipse as here shown. The sidings may extend outward instead of inward from the main line, and may be made longer by the addition of appropriate track sections between the double switch and the uncoupling sections. The uncoupling ramp need not be at an angle, theoretically.

These and other changes may be made without departing from the scope of the invention, as sought to be defined in the following claims. In the claims the reference to the movable coupler hook and the stationary depending coupler pin is not intended to exclude the reverse arrangement shown in FIGS. 22-25. The reference to posts on the track switch and a cam on the locomotive is not intended to exclude other equivalent locomotive-operated devices, such as a cam on the track switch instead of on the locomotive.

We claim:

1. A toy railway system comprising a main line, a siding, a track switch for connecting the siding into the main line, said track switch having a movable frog, the frog of said switch being yieldably biased toward the

siding, said frog having a straight rail, a curved rail, and a wing at the end of the curved rail to be engaged by approaching wheels to deflect the frog from the siding to the main line when a train is moved along the main line toward the wing, and automatic uncoupling and coupling mechanism, said mechanism comprising cars having at one end a male coupler with a coupling pin and at the other end a female coupler with a relatively large open hook pivoted for lateral movement, resilient means to normally center said hook, the outer end of the hook having a dependent finger, the inner end of said hook being oblique to cause lateral displacement of the hook when the cars are pushing instead of pulling, a special track section having a ramp so positioned that the finger rides outside the ramp when the coupler is pushing and rides inside the ramp when the coupler is free or is pulling, whereby a pushed car may be uncoupled by stopping and reversing at the ramp, and may be recoupled at the ramp, a reverse means in said locomotive, a trip means on the main line to operate the reverse means, and means on the siding to operate the reverse means when the coupler is at the ramp.

2. A toy railway system comprising a main line, a siding, a track switch for connecting the siding into the main line, said track switch having a movable frog, the frog of said switch being yieldably biased toward the siding, said frog having a straight rail, a curved rail, and a wing at the end of the curved rail to be engaged by approaching wheels to deflect the frog from the siding to the main line when a train is moved along the main line toward the wing, and automatic uncoupling and coupling mechanism, said mechanism comprising cars having at one end a male coupler with a coupling pin and at the other end a female coupler with a relatively large open hook pivoted for lateral movement, resilient means to normally center said hook, the outer end of the hook having a dependent finger, the inner end of said hook being oblique to cause lateral displacement of the hook when the cars are pushing instead of pulling, a special track section in said siding having a ramp so positioned that the finger rides outside the ramp when the coupler is pushing and rides inside the ramp when the coupler is free or is pulling, whereby a pushed car may be uncoupled by stopping and reversing at the ramp, and may be recoupled at the ramp, said track section terminating in a bumper, said cars having buffer rods extending longitudinally and carrying enlarged heads at the ends, a locomotive having a coupler mating with those of the cars and having a buffer aligned with the buffer rods of the cars, a reversing means in said locomotive operated by its buffer, said buffer rods also being aligned with a part of said bumper so that the locomotive is reversed when the end car hits the bumper.

3. A toy railway system comprising a main line, a siding, a track switch for connecting the siding into the main line, said track switch having a movable frog, the frog of said track switch having a straight rail and a curved rail with divergent wings at the adjacent ends of said straight and curved rails whereby the wheels of an approaching car may deflect the frog, and resilient means shiftable to either of two positions one of which biases the frog toward the siding and the other of which biases the frog toward the main line, a post projecting upward from said means adjacent the siding rails of the switch and laterally movable to one position or the other, a locomotive having a cam at one side for engaging said post, automatic uncoupling and coupling mechanism, said mechanism comprising cars having at one end a male coupler with a coupling pin, and at the other end a female coupler with a relatively large open hook pivoted for lateral movement, resilient means to normally center said hook, the outer end of the hook having a dependent finger, the inner end of said hook being oblique to cause lateral displacement of the hook when the cars are pushing instead of pulling, a special track section having a ramp so positioned that the finger of the hook rides outside the ramp when the coupler is pushing and rides inside the ramp when the

coupler is free or is pulling, whereby a pushed car may be uncoupled by stopping and reversing at the ramp, and may be recoupled at the ramp, a reverse means in said locomotive, a trip means on the main line to operate the reverse means, and means on the siding to operate the reverse means when the coupler is at the ramp.

4. A toy railway system comprising a main line, a siding, a track switch for connecting the siding into the main line, said track switch having a movable frog, the frog of said track switch having a straight rail and a curved rail with divergent wings at the adjacent ends of said straight and curved rails whereby the wheels of an approaching car may deflect the frog, and resilient means shiftable to either of two positions one of which biases the frog toward the siding and the other of which biases the frog toward the main line, a post projecting upward from said means adjacent the siding rails of the switch and laterally movable to one position or the other, a locomotive having a cam at one side for engaging said post, automatic uncoupling and coupling mechanism, said mechanism comprising cars having at one end a male coupler with a coupling pin, and at the other end, a female coupler with a relatively large open hook pivoted for lateral movement, resilient means to normally center said hook, the outer end of the hook having a dependent finger, the inner end of said hook being oblique to cause lateral displacement of the hook when the cars are pushing instead of pulling, a special track section in said siding having a ramp so positioned that the finger of the hook rides outside the ramp when the coupler is pushing and rides inside the ramp when the coupler is free or is pulling, whereby a pushed car may be uncoupled by stopping and reversing at the ramp, and may be recoupled at the ramp, said track section terminating in a bumper, said cars having buffer rods extending longitudinally and carrying enlarged heads at the ends, a locomotive having a coupler mating with those of the cars and having a buffer aligned with the buffer rods of the cars, a reversing means in said locomotive operated by its buffer, said buffer rods also being aligned with a part of said bumper so that the locomotive is reversed when the end car hits the bumper.

5. A toy railway system comprising a main line, two collateral sidings, a double track switch for connecting the sidings into the main line, said track switches each having a movable frog, the frogs of said switches having a straight rail and a curved rail with divergent wings at the adjacent ends of the straight and curved rails whereby the wheels of an approaching car may deflect the frog, the frog of a first siding being yieldably biased toward the siding, the second switch having resilient means shiftable to either of two positions one of which biases the frog toward the siding and the other of which biases the frog toward the main line, a post adjacent the siding rails of each switch, linkage to move said means extending to said two posts adjacent the siding rails of the two switches, said linkage causing said posts to move in opposite directions toward or away from said rails, a locomotive having a cam at one side for engaging said post, one or more cars having at one end a male coupler with a coupling pin and at the other end a female coupler with a relatively large open hook pivoted for lateral movement, resilient means to normally center said hook, the outer end of the hook having a dependent finger, the inner end of said hook being oblique to cause lateral displacement of the hook when the cars are pushing instead of pulling, a special track section in each of said sidings having a ramp so positioned that the finger rides outside the ramp when the coupler is pushing, and rides inside the ramp when the coupler is free or is pulling, whereby a pushed car is uncoupled by stopping and reversing at the ramp, and is recoupled at the ramp, a reverse means in said locomotive, a trip means on the main line to operate the reverse means, and means on the siding to operate the reverse means when the coupler is at the ramp.

6. A toy railway system comprising a main line, two collateral sidings, a double track switch for connecting the sidings into the main line, said track switches each having a movable frog, the frogs of said switches having a straight rail and a curved rail with divergent wings at the adjacent ends of the straight and curved rails whereby the wheels of an approaching car may deflect the frog, the frog of a first siding being yieldably biased toward the siding, the second switch having resilient means shiftable to either of two positions one of which biases the frog toward the siding and the other of which biases the frog toward the main line, a post adjacent the siding rails of each switch, linkage to move said means extending to said two posts adjacent the siding rails of the two switches, said linkage causing said posts to move in opposite directions toward or away from said rails, a locomotive having a cam at one side for engaging said post, said sidings each terminating in a bumper, said cars having buffer rods extending longitudinally and carrying enlarged heads at the ends, said locomotive having a coupler mating with those of the cars and having a buffer aligned with the buffer rods of the cars, a reversing means in said locomotive operated by its buffer, said buffer rods also being aligned with a part of said bumper so that the locomotive is reversed when the end car hits the bumper, and a trip on the main line for engaging the buffer of the locomotive to reverse the locomotive.

7. A toy railway system comprising a main line, two collateral sidings, a double track switch for connecting the sidings into the main line, said track switches each having a movable frog, the frogs of said switches having a straight rail and a curved rail with divergent wings at the adjacent ends of the straight and curved rails whereby the wheels of an approaching car may deflect the frog, the frog of a first siding being yieldably biased toward the siding, the second switch having resilient means shiftable to either of two positions one of which biases the frog toward the siding and the other of which biases the frog toward the main line, a post adjacent the siding rails of each switch, linkage to move said means extending to said two posts adjacent the siding rails of the two switches, said linkage causing said posts to move in opposite directions toward or away from said rails, a locomotive having a cam at one side for engaging said post, one or more cars having at one end a male coupler with a coupling pin and at the other end a female coupler with a relatively large open hook pivoted for lateral movement, resilient means to normally center said hook, the outer end of the hook having a dependent finger, the inner end of said hook being oblique to cause lateral displacement of the hook when the cars are pushing instead of pulling, a special track section in each of said sidings having a ramp so positioned that the finger rides outside the ramp when the coupler is pushing, and rides inside the ramp when the coupler is free or is pulling, whereby a pushed car is uncoupled by stopping and reversing at the ramp, and is recoupled at the ramp, said track section terminating in a bumper, said cars having buffer rods extending longitudinally and carrying enlarged heads at the ends, said locomotive having a coupler mating with those of the cars and having a buffer aligned with the buffer rods of the cars, a reversing means in said locomotive operated by its buffer, said buffer rods also being aligned with a part of said bumper so that the locomotive is reversed when the end car hits the bumper, and a trip on the main line for engaging the buffer of the locomotive to reverse the locomotive.

8. A toy railway system comprising a main line, two collateral sidings, a double track switch for connecting the sidings into the main line, said track switches each having a movable frog, the frogs of said switches having a straight rail and a curved rail with divergent wings at the adjacent ends of the straight and curved rails whereby the wheels of an approaching car may deflect the frog, the frog of a first siding being yieldably biased to-

13

ward the siding, the second switch having resilient means shiftable to either of two positions one of which biases the frog toward the siding and the other of which biases the frog toward the main line, a post adjacent the siding rails of each switch, linkage to move said means extending to said two posts adjacent the siding rails of the two switches, said linkage causing said posts to move in opposite directions toward or away from said rails, a locomotive having a cam at one side for engaging and shifting the position of said posts, said locomotive having a coupler mating with those of the cars, said sidings each having means to automatically operate the coupler of the rearmost car in the siding, a reverse means in said locomotive, means on the main line to operate the reverse means, and means on the siding to again operate the reverse means.

9. A toy railway system comprising a main line, a siding, a track switch for connecting the siding into the main line, the frog of said track switch having a straight rail and a curved rail with divergent wings at the adjacent ends of said straight and curved rails whereby the wheels of an approaching car may deflect the frog, resilient means shiftable to either of two positions one of which biases the frog toward the siding and the other of which biases the frog toward the main line, a post projecting upward from said means adjacent the siding rails of the switch and laterally movable to one position or the other, a locomotive having a reversing means, said locomotive also having a cam at one side for engaging said post, said cam being so shaped that it rides over the post when the locomotive backs into the siding,

14

and moves alongside and shifts the post when the locomotive moves forward out of the siding into the main line, a trip on the main line for operating said reversing means and reversing the locomotive, and means at the end of the siding for again reversing the locomotive so that it runs from the siding onto the main line.

10. A toy railway system comprising a main line, two collateral sidings, a double track switch for connecting the sidings into the main line, the frogs of said switches having a straight rail and a curved rail with divergent wings at the adjacent ends of the straight and curved rails whereby the wheels of an approaching car may deflect the frog, the frog of a first siding being yieldably biased toward the siding, the second switch having resilient means shiftable to either of two positions one of which biases the frog toward the siding and the other of which biases the frog toward the main line, a post adjacent the siding rails of each switch, linkage to move said means extending to said two posts adjacent the siding rails of the two switches, said linkage causing said posts to move in opposite directions toward or away from said rails, a locomotive having a reversing means, said locomotive also having a cam at one side for engaging said posts, said cam being so shaped that it rides over the post when the locomotive backs into a siding, and moves alongside and shifts the post when the locomotive moves forward out of a siding onto the main line, a trip on the main line for operating said reversing means and reversing the locomotive, and means at the end of each siding for again reversing the locomotive.

No references cited.