Feb. 18, 1941. J. L. BONANNO 2,232,508

ACCESSORY CONTROL CIRCUITS FOR TOY ELECTRIC RAILROADS AND APPARATUS THEREFOR

Filed Oct. 21, 1938 2 Sheets-Sheet 1

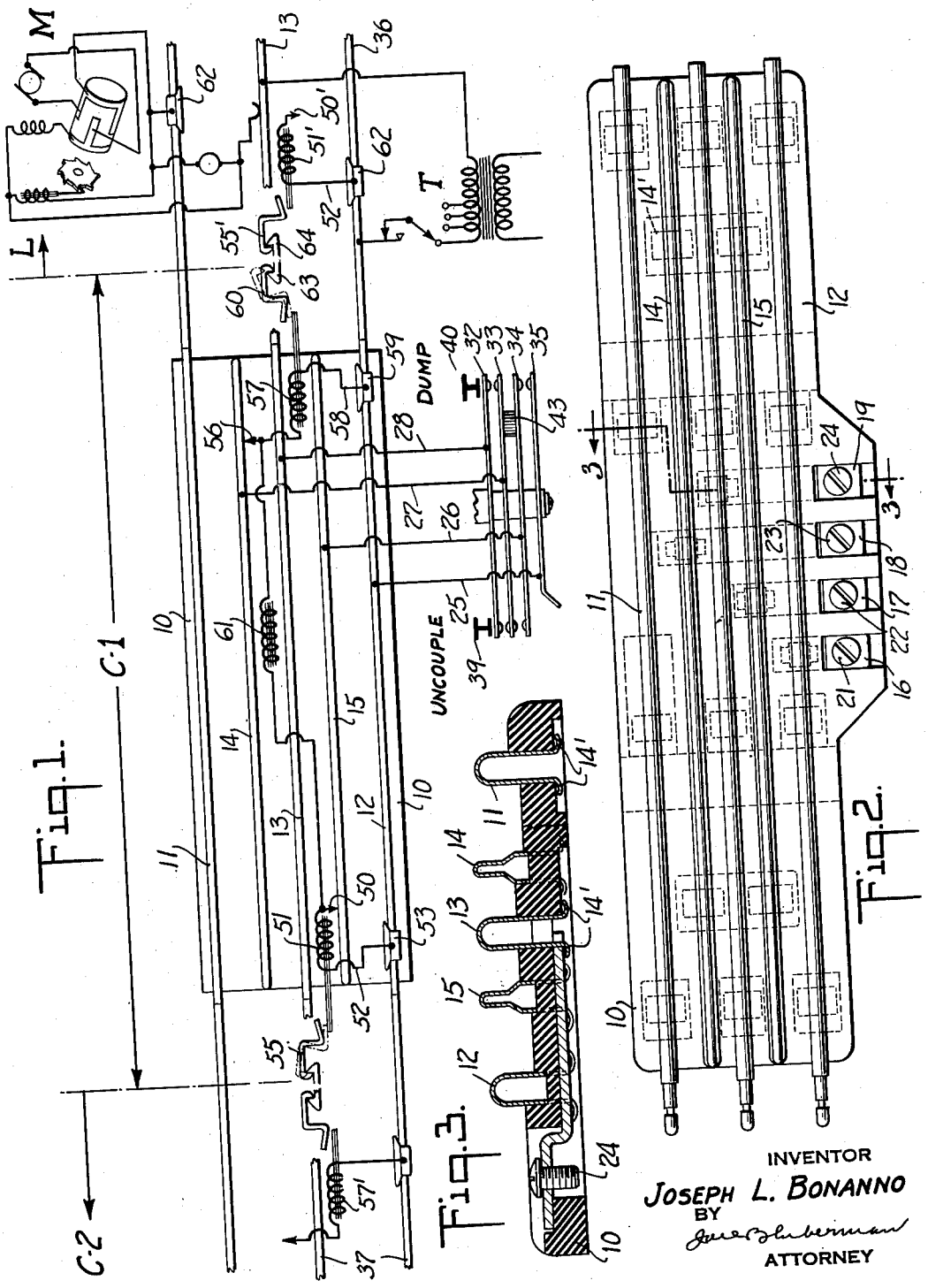



Fig. 1.



Fig. 2.



Fig. 3.

INVENTOR
JOSEPH L. BONANNO
BY
ATTORNEY

Feb. 18, 1941. J. L. BONANNO 2,232,508

ACCESSORY CONTROL CIRCUITS FOR TOY ELECTRIC RAILROADS AND APPARATUS THEREFOR

Filed Oct. 21, 1938 2 Sheets-Sheet 2

Fig. 4.

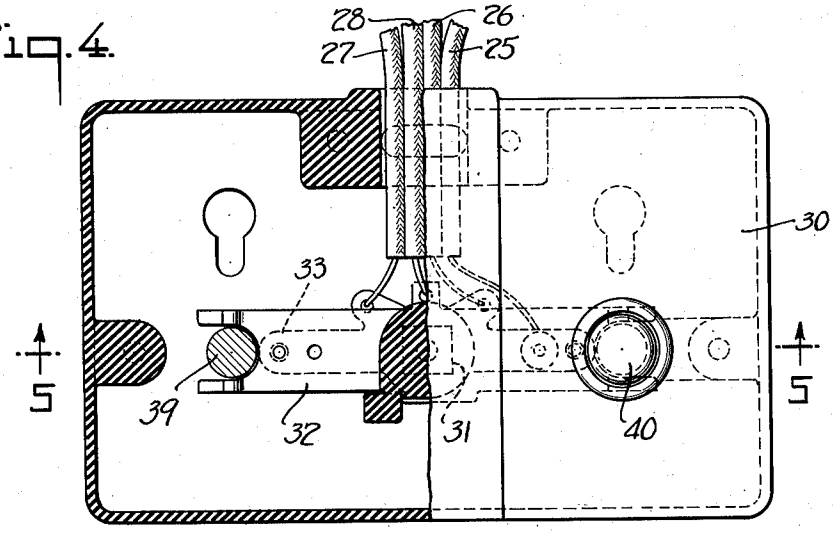



Fig. 5.

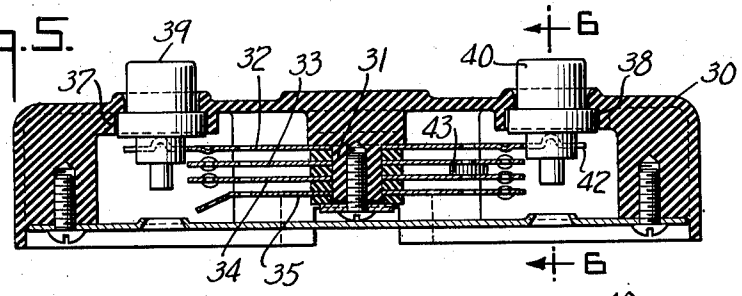



Fig. 6.

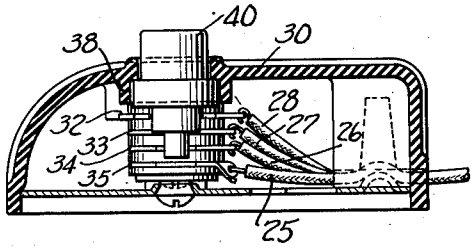
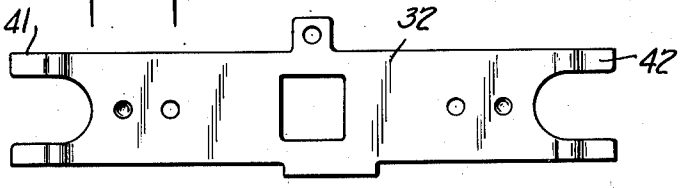



Fig. 7.




INVENTOR
JOSEPH L. BONANNO
BY
Jacob Liberman
ATTORNEY

Patented Feb. 18, 1941 2,232,508

# UNITED STATES PATENT OFFICE

2,232,508

## ACCESSORY CONTROL CIRCUITS FOR TOY ELECTRIC RAILROADS AND APPARATUS THEREFOR

Joseph L. Bonanno, Maplewood, N. J., assignor to The Lionel Corporation, New York, N. Y., a corporation of New York

Application October 21, 1938, Serial No. 236,241

3 Claims. (Cl. 213—212)

The present invention relates to accessory control circuits for toy electric railroads and apparatus therefor, and is more particularly directed toward arrangements for effecting the simultaneous operation of two electromagnetically operated couplers on the adjacent ends of two cars, so that the cars may be uncoupled, and to additional circuit arrangements and controls wherein a car-carried accessory, such as a hopper dumping mechanism, may be actuated without uncoupling the cars. All of these controls and operations are carried out in a toy train outfit having a locomotive which can be operated in either direction, or stopped without disconnecting the power source from the track layout, so that power is available for operating the couplers or accessory when the train is standing still.

The present invention contemplates the provision of the track layout with a special section of track having in addition to the usual wheel bearing and power rails, two supplemental rails on opposite sides of the third rail, and the use with such track of a controller arranged either to bring both supplemental rails to third rail potential to simultaneously operate two couplers, each connected to a current collector bearing on the corresponding supplemental rail, or to bring one of these supplemental rails to third rail potential, and the other one to ground potential so that a circuit can be established through the car-carried accessory for operating the latter.

Other and further objects will appear as the description proceeds.

The accompanying drawings show, for purposes of illustrating the present invention, one of the many embodiments in which the invention may take form, it being understood that the drawings are illustrative of the invention rather than limiting the same.

In these drawings:

Figure 1 shows a wiring diagram for a toy track layout having a train provided with automatically coupled cars, a carried accessory, a piece of special track and controller;

Figure 2 is a top plan view of the track section;

Figure 3 is a transverse sectional view on the line 3—3 of Figure 2;

Figure 4 is a top plan view of the controller;

Figure 5 is a vertical sectional view on a line 5—5 of Figure 4;

Figure 6 is a transverse sectional view taken on the line 6—6 of Figure 5; and

Figure 7 is a plan view of the control spring for the circuit controller of Figures 4 to 6, inclusive.

The special section of track shown in Figures 1 to 3, inclusive, is adapted to be substituted for an ordinary track section. It has an insulating base 10, two track rails, indicated at 11 and 12, the third rail, indicated at 13, also two supplemental rails 14 and 15. These rails are made of sheet metal bent to shape and each of the rails has fingers such as 14' extending down through holes in the insulating body, and these fingers anchor the rails in place as well as electrically connect the corresponding rail with a contact strap. Four such straps are shown at 16, 17, 18 and 19. The straps have binding screws 21, 22, 23 and 24, so that it is possible to connect the wheel bearing rail 12, the supplemental rails 15 and 14, and the third rail 13 to an external controller by means of wires, such as indicated at 25, 26, 27 and 28. A circuit controller is shown in detail in Figures 4 to 7, inclusive.

The circuit controller is a small portable device adapted to be conveniently placed near the track layout and connected up by the wires such as indicated. It has an insulating body member 30 provided with a central downwardly extending square post 31 adapted to receive four contact strips or straps 32, 33, 34 and 35 spaced above one another, as will be apparent from the drawings. The body member is apertured, as indicated at 37 and 38, to receive push buttons 39 and 40. These push buttons bear on the opposite ends 41 and 42 of the upper contact strip 32 which acts as a control spring for the circuit controller, and holds the push buttons in the upper or normal position at which time none of the contact strips are in electrical contact. When the left button 39 is pushed down it brings the left ends of strips 32, 33 and 34 into electrical contact and therefore brings both of the supplemental rails 14 and 15 to third rail potential. This establishes the uncoupling circuit to be described.

When the right-hand button 40 is pressed down it brings the contacts 32 and 33 together and owing to the interposition of an insulating spacer 43, the contact strip 33 is kept out of electrical contact with the contact strip 34, and this latter strip 34 is pressed down into contact with strip 35. The operation of this push button has therefore brought the upper supplemental rail 14 to third rail potential, and has brought the lower supplemental rail 15 to track rail potential. This establishes what is conveniently designated the "dump" circuit.

In Figure 1 the power supply circuit is diagrammatically indicated at T, and the propulsion

motor and associated automatic reverse mechanism at M. The power supply is usually in the form of a transformer with convenient switch and push button, and the control circuit M is of the type which permits starting, stopping and reversing the motor while keeping the power on the tracks when the motor is not operating, so that lights and accessories can be energized.

The short heavy lines above and below the rails of Figure 1 indicate the length of a car C1 and the apparatus carried on this car is placed on the drawing between these two lines. This car stands on a section of track indicated in the figure. The apparatus on the locomotive L, which is on a regular track section 36 is illustrated at the right. Part of the apparatus of the second car C2 of the train which is on another section 37 regular track, is shown at the left. The car C1 has a current collector 50 bearing on the supplemental rail 15. It is connected through a coil 51 and wire 52 with the grounded truck indicated at 53. This coil is adapted to actuate a coupler head diagrammatically illustrated at 55 whenever the rail 15 is energized. The front end of the car C1 carries a current collector 56 bearing on the supplemental rail 14, and this current collector is connected through a coil 57 and wire 58 with the running gear of the other truck indicated at 59. The coil 57 is adapted to operate a coupler head 60 whenever the supplemental rail 14 is energized. The current collectors 50 and 56 of the car C1 are connected to a circuit including a coil 61 of lower impedance than coil 57 and adapted to actuate an accessory carried on the car, such, for example, as the hopper for a dump car, a hoist, a small motor, a whistle, a lamp, or some other accessory.

When the car is standing on the special section of track, as shown, operating the dump button 40 will complete a circuit through the coil 61, and will also energize the coil 57 of the coupler at the right end of the car, without, however, effecting an uncoupling operation, which as explained below requires concurrent operation of two uncouplers.

If it is desired to uncouple the locomotive L from the car C1, the train is backed up a sufficient amount to bring the wheel 62 of the locomotive on to the special section of track. This will place the contact 50' on to the rail 15, and, when the button 39 is pressed down, current will flow through the coil 51' of the coupler carried by the locomotive and will actuate the coupler head 55'. At the same time current will flow from the supplemental rail 14 to the coil 57 and actuate coupler head 60. This will release the coupler head 60 from the hook 63 of the coupler carried by the locomotive and will release the coupler head 55' of the locomotive from the hook 64 carried by the car C1, so that the cars can be separated manually, or so that when the locomotive is again energized to start forward it will leave the train behind.

Similarly if it is desired to uncouple cars C1 and C2, the train is moved forward enough to bring the running gear of car C2 on to the special section of track. This will make it possible to energize the coupler coil 51 and the coupler coil 57' carried by car C2.

Owing to the low impedance of coil 61 it is possible to avoid operation of the associated accessory should the coil and a coupler coil, such as 57, be in series, as, for example, when collector 56 of car C1 is just off to the right of control rail 14 and rails 14 and 15 are energized for the purpose of uncoupling cars C1 and C2. It is unnecessary to stop the train to uncouple cars.

It is obvious that the invention may be embodied in many forms and constructions within the scope of the claims and I wish it to be understood that the particular form shown is but one of the many forms. Various modifications and changes being possible, I do not otherwise limit myself in any way with respect thereto.

What is claimed is:

1. A toy electric railroad comprising a track having track rails connected to one side of a power source, a central third rail connected to the other side of the power source, a supplemental insulated rail disposed between the third rail and each track rail, a toy car having wheels bearing on the track rails, two current collectors each bearing on a different supplemental rail, a current consuming device connected between each of the supplemental collectors and the wheels, a third current consuming device connected between the two collectors, and switching means for simultaneously energizing both supplemental rails so that both current consuming devices may be energized, or for simultaneously connecting one supplemental rail to the third rail and the other to a track rail to energize said third current consuming device and one of the first mentioned devices.

2. A toy electric railroad comprising a track having track rails connected to one side of a power source, a central third rail connected to the other side of the power source, a short length of supplemental insulated rail disposed between the third rail and each track rail, two toy cars each having trucks provided with wheels bearing on the track rails and two current collectors each bearing on a different supplemental rail, an electromagnetically operated uncoupler carried at each end of each car, and connected between the wheels of the corresponding car and current collector, a third current consuming device carried by a car and connected between the two current collectors of that car, switching means for simultaneously energizing both supplemental rails so that two adjacent uncouplers may be energized, whereby two cars may be uncoupled when adjacent trucks are over the supplemental rails, and switching means for connecting one supplemental rail to the third rail and the other to a wheel bearing rail to energize the said third current consuming device when the car is positioned so that both collectors thereof are on the supplemental rails.

3. A car for toy electric railroads having trucks each provided with wheels adapted to bear on track rails and an off center collector shoe adapted to bear on a supplemental rail, an electromagnetically operated uncoupler at each end of the car and connected between the respective collector shoe and the truck, and an electromagnetically operated accessory connected between the two collector shoes and operable by the same potential which is effective to operate the uncouplers but of lower reluctance than either of the uncouplers so that when said potential is supplied to an uncoupler and said accessory in series therewith the accessory is not actuated.

JOSEPH L. BONANNO.