July 16, 1957 J. L. BONANNO 2,799,119

COALING STATIONS FOR TOY RAILROADS

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Fig. 1.

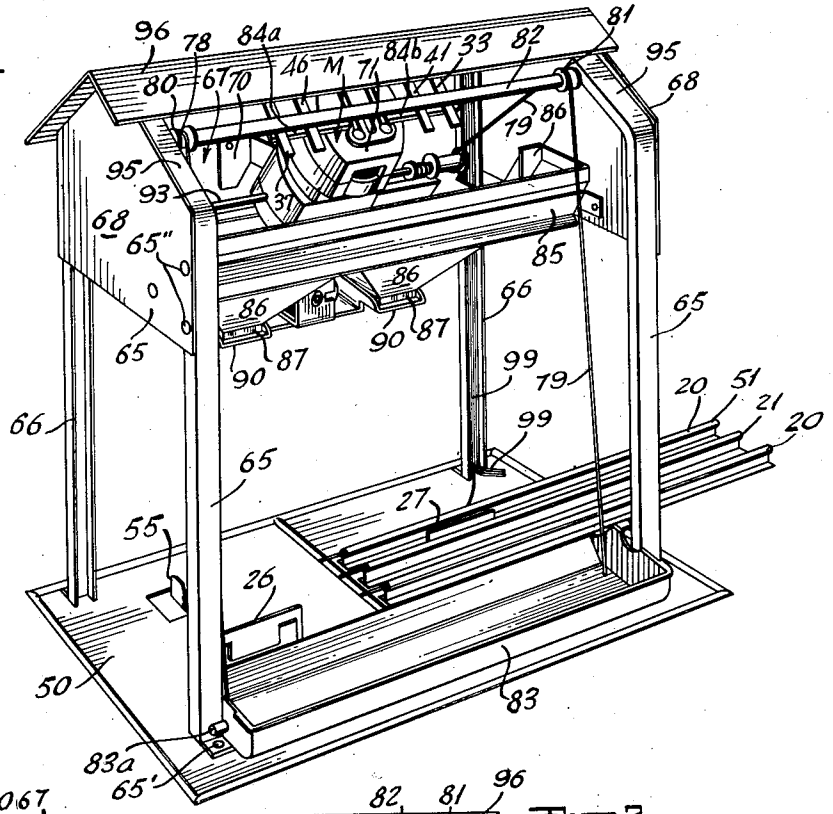
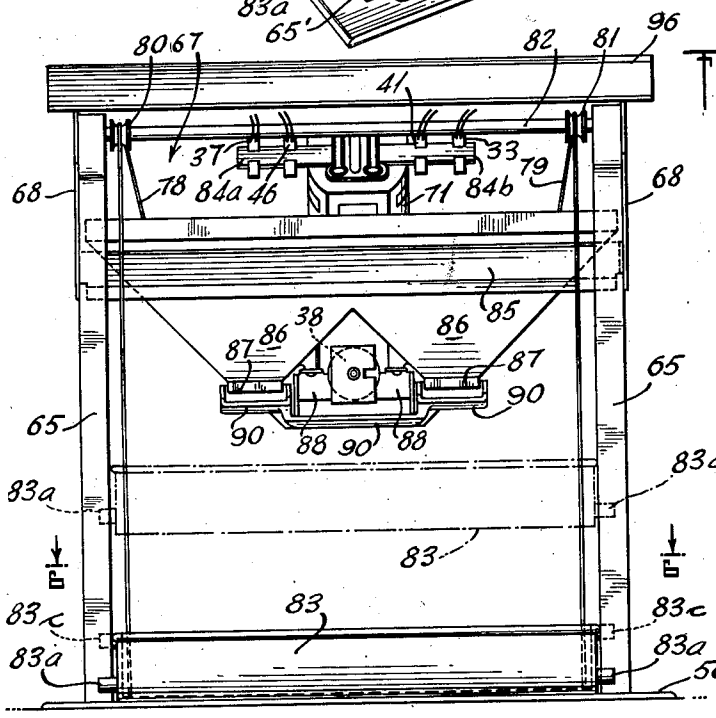



Fig. 2.




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Fig. 3.

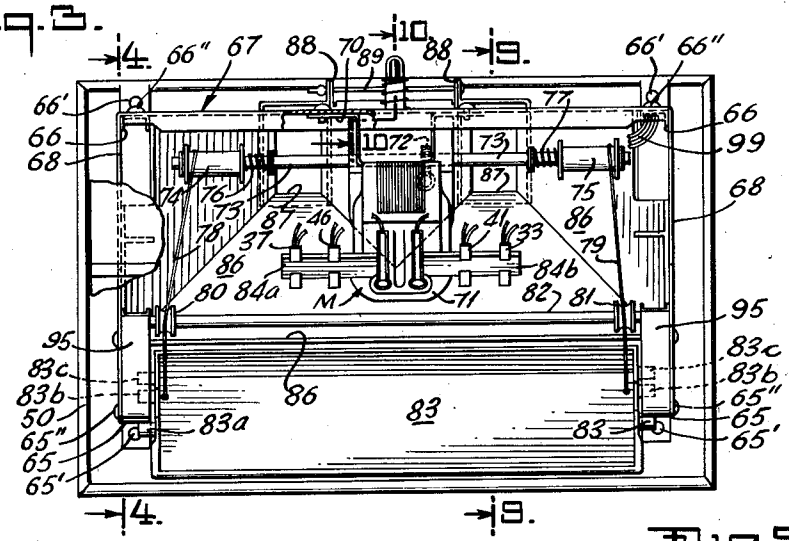



Fig. 4.

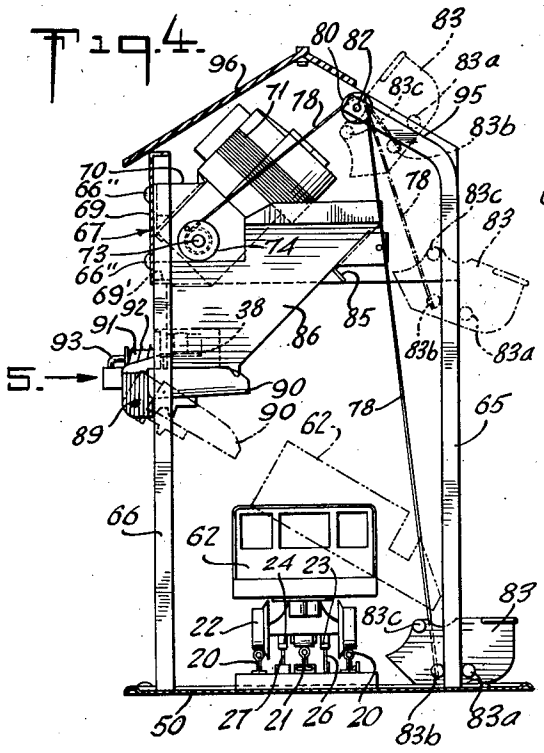
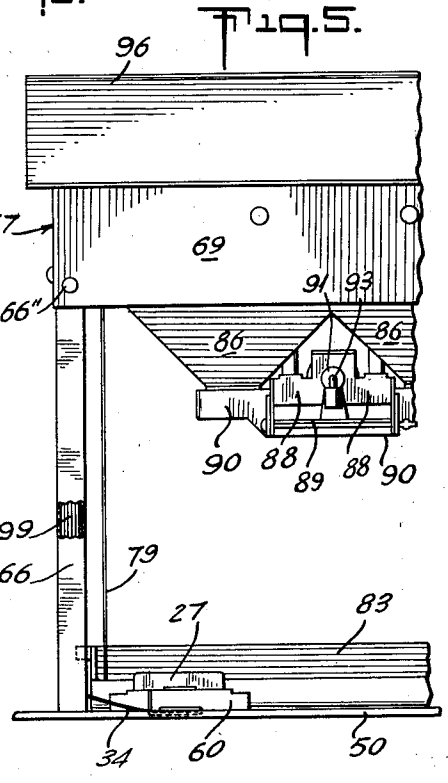



Fig. 5.




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Fig. 6.

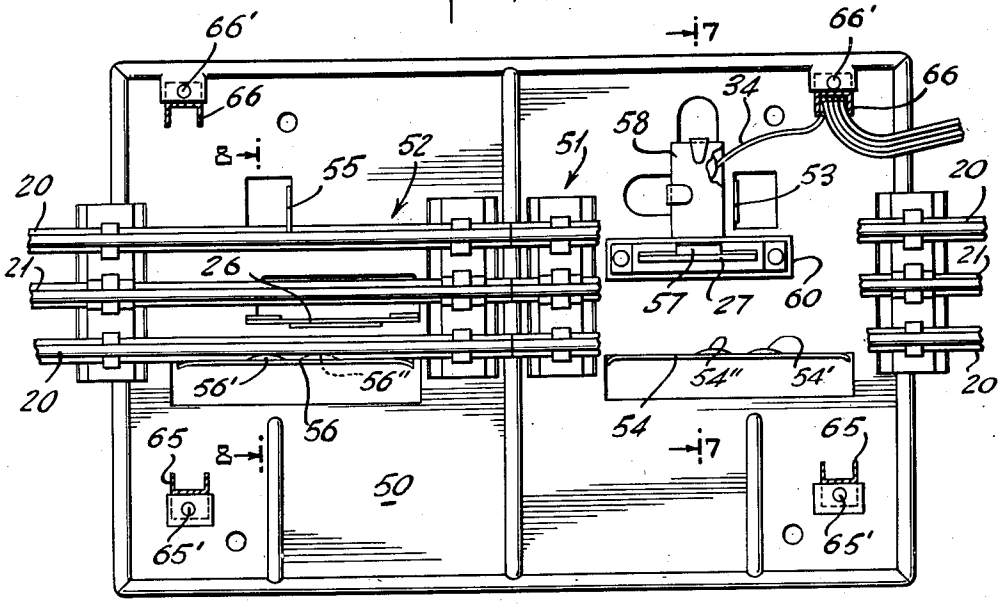



Fig. 7.

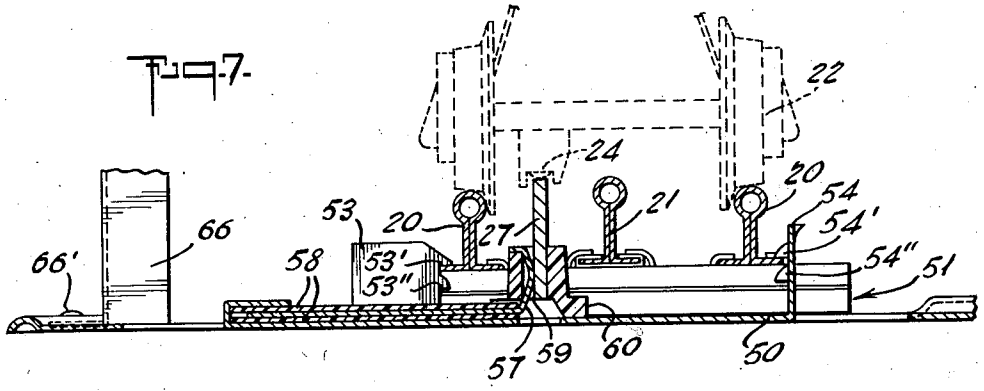
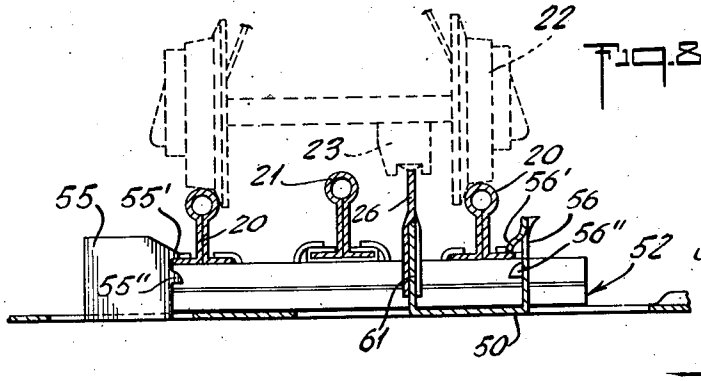



Fig. 8.




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Fig. 9.

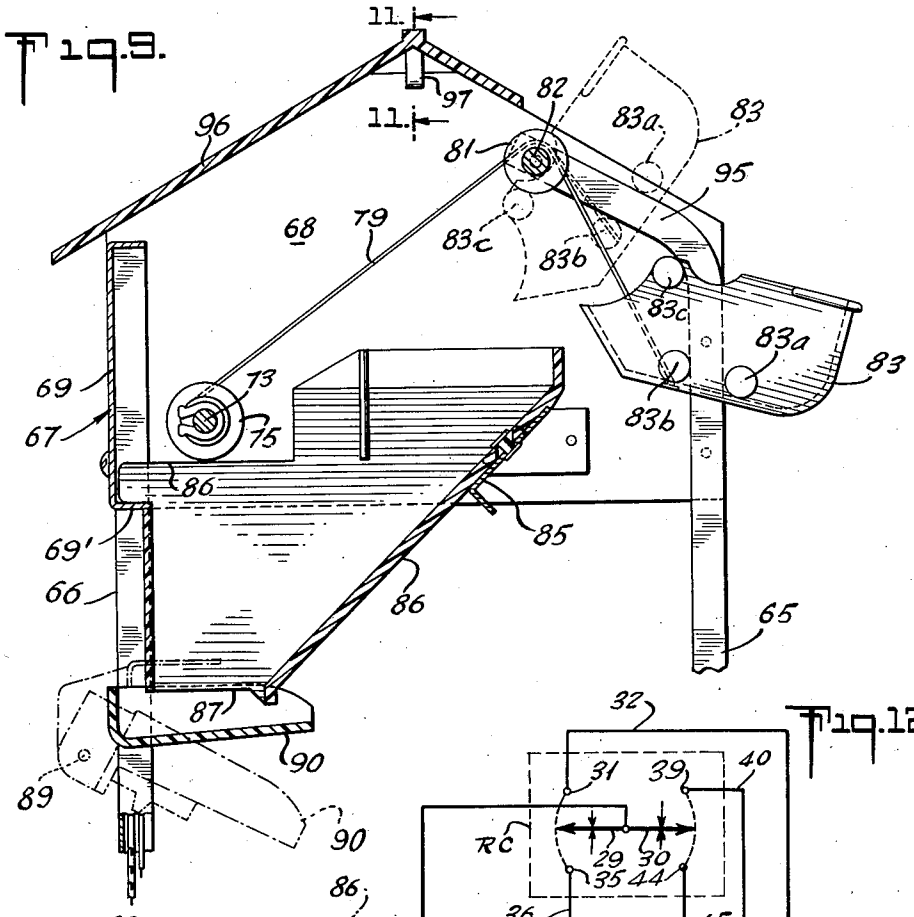



Fig. 10.

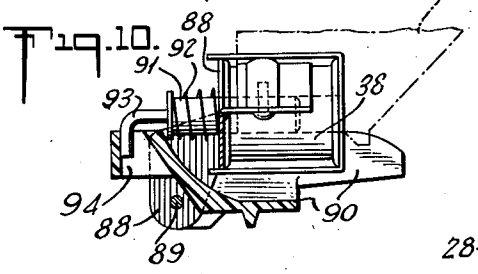



Fig. 11.

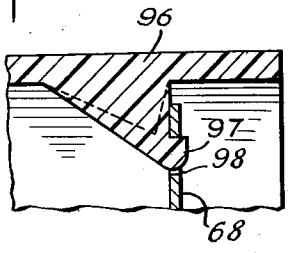
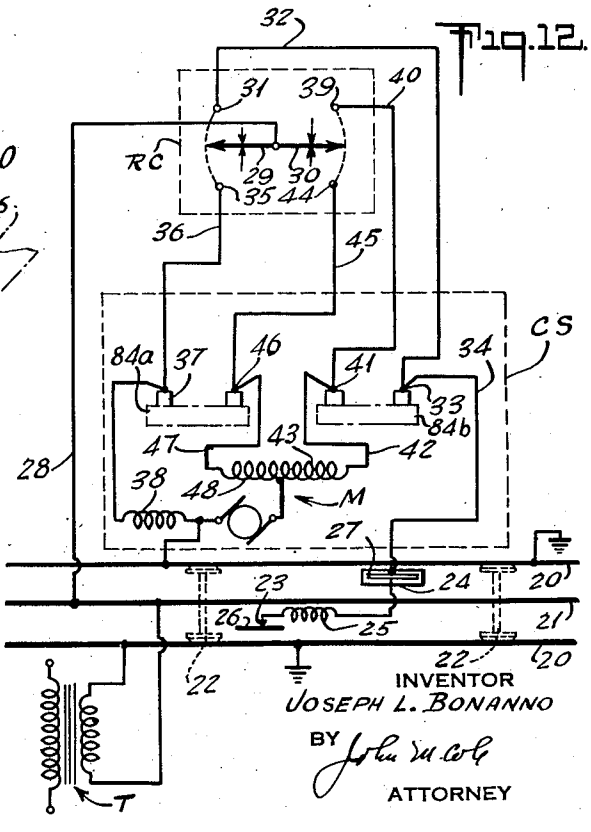



Fig. 12.




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United States Patent Office 2,799,119 Patented July 16, 1957



2,799,119

# COALING STATIONS FOR TOY RAILROADS

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Application November 22, 1954, Serial No. 470,246

8 Claims. (Cl. 46—40)

The present invention relates to coaling stations for toy railroads.

The present invention contemplates a trackside accessory for use with toy electric railroads by means of which the operation of the toy railroad layout may be able to simulate the loading and unloading operation of railroad cars with merchandise in the form of discrete particles such as coal, gravel and the like.

According to the present invention the accessory is one which may be readily assembled with conventional toy railroad track in such a manner as not to interfere with usual train operations. The accessory is provided with means for actuating the dump mechanism of a side dumping toy car to deposit the load (toy coal or the like) from the car into a receiving bin. It also has means to lift this dumped material to a higher elevation and dump it into a hopper where it can be retained. The hopper is associated with a remote controlled chute by which the contents of the hopper may be dumped into the same or another car, and means are also provided for lowering the bin to the first position for again receiving material dumped from a car on the track. All these operations are preferably carried out by a remote controller permanently wired to the trackside structure.

Other and further objects will appear as the description proceeds.

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

In the drawings:

Figure 1 is a perspective view of the coaling station showing one section of track in place;

Figure 2 is a front elevational view of the coaling station with the hopper down in the full line position and partly raised in dot and dash lines, the tracks being omitted;

Figure 3 is a top plan view of the coaling station, the roof being removed, except for a small fragment, the trackage being omitted;

Figure 4 is a vertical section on the line 4—4 of Figure 3, showing the trackage and car in place;

Figure 5 is a rear elevational view of the coaling station taken in the direction of the arrow 5 of Figure 4;

Figure 6 is a horizontal sectional view taken on the line 6—6 of Figure 2, showing the trackage in place with parts broken away;

Figures 7 and 8 are fragmentary vertical sectional views on an enlarged scale on the lines 7—7, 8—8 of Figure 6;

Figure 9 is a vertical sectional view at an enlarged scale on the line 9—9 of Figure 3;

Figure 10 is an enlarged sectional view on the broken line 10—10 of Figure 3;

Figure 11 is a fragmentary sectional view on the line 11—11 of Figure 9; and

Figure 12 is a wiring diagram.



The coaling station shown herein is designed more particularly for use with the usual 3-rail toy railroad track made up in sections and to be so mounted in the track layout that it spans the trackage and allows the toy train to pass through the coaling station.

Referring first to the wiring diagram of Figure 12 it will be seen that the trackage has two track rails 20, 20, and power rail 21 supplied by current from the low voltage transformer T. In this figure of the drawing a toy railroad car is indicated with trucks 22, 22, two contact shoes 23, 24 and operating coil 25 connecting the two contact shoes. When the car is in position on the coaling station the shoe 23 contacts a grounded rail 26 and the shoe 24 contacts an insulated rail 27. The details of construction for these will be described later.

The circuit elements are in a remote controller RC (Fig. 12) and those on the coaling station proper are indicated in the box CS. First tracing the controller circuit it will be seen that it has a power connection indicated at 28 to a pair of switches 29, 30. These switches are biased to an open circuit position. The switch 29 is cooperable with contact 31 for unloading the car and placing the load in the receiving bin, this circuit being traced through wire 32 to a terminal 33 on the coaling station proper, wire 34 to the insulated contact and the car circuit 24, 25, 23 to ground 26. The other contact 35 with which the switch contact 29 may be engaged to dump the upper hopper of the coaling station is connected by wire 36 to a terminal 37 on the coaling station and to a chute release coil 38, which is grounded as indicated. The other controller contact 30 is engageable with the "up" contact 39 on the controller and through wire 40, terminal 41 in the controller and wire 42 energizes one field coil 43 of the motor M. The other control contact 44, through wire 45, terminal 46 and wire 47, is adapted to energize the other field coil 48 of the motor M. It will thus be apparent that by manipulating the controller switch 29, one can either energize the coil 25 on the car to unload the car or the coil 38 on the coaling station to dump the contents of the coal pocket. Also that by shifting the controller switch 30 one way or the other, the motor M can be operated in the direction to lift the receiving bin or lower it.

The coaling station has a sheet metal base 50 which receives two sections of toy railroad track, indicated at 51 and 52, each section having the track rails 20, 20 and the power rail 21. These track sections are secured in place between upstruck flanges 53, 54, for the right track section and 55, 56 for the left track section. Each of these flanges has two notches 53', 53'', etc., which serve to engage the flanges of the rails 20, 20. The two sets of notches are provided to engage the flanges of two different types of toy railroad track with which the coaling station is adapted to be used. In the drawings the tracks are shown as being received under the upper set of notches. The other type track, not shown, is adapted to have its rail flanges received under the lower set of notches.

As shown more clearly in Figures 6 and 7, the base 50 carries a spring conductor 57 enclosed in insulation 58 and connected with the wire 34. This spring contact extends up through an opening 59 in an insulating member 60 and bears against the conducting blade 27 which extends up between the power rail 21 and the left track rail, as shown in Figure 7. Near the left end of the base 50 is an upstruck flange 61 between the power rail 21 and the right track rail 20, and this flange carries a removable blade 26. When the car is on the coaling station with its collectors 23 and 24 contacting the blades 26 and 27, the coil 25 in the car 62 may be energized as above described. This car is of the side dumping type,

as illustrated in Figure 4 and is adapted to dump the contents to the right, as shown.

The base 50 also carries two upwardly extending front columns 65, 65 and rear columns 66, 66. These are secured in place by rivets indicated at 65', 66'. The upper ends of the columns 65 and 66 are secured by screws 65'' and 66'' to a wall plate 67 having end portions 68, 68 and rear portion 69. The back portion 69 of the wall plate, by means of a bracket 70 supports a combined motor and reduction gear unit indicated at 71. This unit carries the field and armature of the motor and suitable reduction gears 72 for driving a low speed shaft 73. This shaft carries two spools 74, 75 actuated through a friction drive including springs 76, 77. These spools receive cords 78, 79 which pass about pulleys 80, 81 carried on a shaft 82 mounted in the upper ends of the columns 65, 65. The cords 78, 79 extend downwardly and are connected to a receiving bin 83. This bin is a plastic molding extending between the front columns 65, 65 and having lugs 83*a* in front of the columns and lugs 83*b*, 83*c* behind the columns. The upper front end of the motor unit 71 carries two terminal mounting strips 84*a*, 84*b* to which are secured terminals 37, 46, 41 and 33, above referred to.

The end members 68, 68 of the wall plate are connected by a cross bar 85 near the lower front portions thereof. This cross bar, together with the lower, forwardly extending flange 69' of the back wall plate, supports a hopper 86 in the form of a plastic molding. This hopper, as shown, has two pockets and two bottom openings 87, 87. The hopper 86 carries between the two pockets a bracket 88, the lower rear end of which carries a shaft 89 on which is pivoted a chute 90. The bracket 88 also carries the chute actuating coil 38 above referred to. The armature 91 in this coil is biased to the left by a spring 92 (see Fig. 10) and has a downwardly extending hook 93 entering into a slot 94 in the chute molding 90. A spring 92 acting on the armature also holds the chute 90 in the upper or full line position shown in Figures 1, 2, 4, 9 and 10.

When the controller is shifted to the dumping position where contact 29 engages contact 35, the coil 38 is energized and the armature pulled forward so that the chute is lowered by gravity to the dot and dash position and the contents of the hopper 86 delivered to the car. To transfer the contents of a loaded car from the car to the storage receiving bin, the controller contact 29 is shifted to contact 31 which, through the circuit including the car coil 25, operates to dump the contents of the car into the bin, which is assumed to be in the lowermost position. As soon as the operator releases the movable contact 29, the circuit for the car carried coil 25 is deenergized and the car body returns to normal position. To deliver the contents of the loaded bin to the hopper, the controller is shifted to the "up" position connecting contact 39 through field coil 43 of the motor to operate the motor in the proper direction to wind the cords onto the spools. As the cords are wound onto the spools 74 and 75, the bin 83 is carried up along the front columns 65, as indicated in a succession of dot and dash and dotted line positions of Figure 9. As the lugs 83*a*, 83*b* and 83*c* are carried along the upper rearwardly bent ends 95 of the columns 65, the receiving bin 83 is caused to tilt as indicated, so that its contents are delivered to the hopper 86. Overrun of the motor does no damage, as the slippage of the friction drive for the pulleys 74, 75 permits the motor to continue running after the bin has been stopped. Proper alignment of the bin at the time of dumping is assured by the engagement of the bin with the transverse shaft 82.

After the receiving bin has been dumped it is lowered by shifting the controller switch contact 30 to the "down" position, so the motor M operates in the reverse direction. As tension is taken off the cords 78, 79, the receiving bin passes down along the columns 65, 65.

To provide a finished appearance to the device and cover and protect the wiring, the device is provided with a roof member 96 in the form of a plastic molding held in place by lugs 97 which snap into openings 98 in the peaked portions of the wall plate ends 68.

The connecting wires 40, 32, 36 and 45 of the wiring diagram are collected in the form of a cable designated generally at 99, which leads to the controller structure at a suitable remote point.

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

What is claimed is:

1. In combination, a toy railroad track having a grounded rail and a power rail; a toy car on the track the car having a body adapted to carry discrete material, such as toy coal, an electrically operable side dumping mechanism for forwardly delivering the contents of the car body to one side of the track, and current collectors for supplying current to the dumping mechanism; and a trackside structure having fixed insulated and grounded contactors engageable with the current collectors on the car, a coal hopper at a higher elevation than the car, a chute pivoted to the rear of the hopper, the chute, when raised, closing the bottom of the hopper and when lowered delivering the contents of the hopper to the car, means for raising the chute to the raised position, electromagnetic means for effecting a lowering of the chute, a receiving bin to the front of the car movable between a lower position alongside the track where it may receive the contents of the car when it is dumped to a higher position where it delivers its burden to the hopper, a reversible motor and reduction gear unit, a slow speed shaft driven by the reduction gear unit, cord winding spools having slip drive connections with the shaft, cords wound about the spools and connected to the receiving bin to raise and lower it; a two position switch and wiring for connecting either the side dumping mechanism in the car or the chute lowering electromagnetic means whereby the car may be unloaded or loaded; and a second two position switch for controlling the direction of rotation of the motor to raise or to lower the receiving bin.

2. The combination of claim 1, having stops to arrest movement of the bin as it is brought to its raised position, the slip drive connections for the spools permitting slippage thereof.

3. The combination of claim 1, wherein the trackside structure has four supporting columns, two on each side of the track, the two front columns and the bin having interengaging parts which guide the bin up and down and tilt it in its upper position to dump the contents thereof.

4. The combination of claim 1, wherein the trackside structure has four supporting columns, two on each side of the track, a wall plate having a back portion extending between the two rear columns and end portions extending between the end columns, means carried by the back portion of the wall plate for supporting the motor-reduction gear unit and shaft and for supporting the rear of the hopper, and a strap interconnecting the end portions and supporting the front edge of the hopper.

5. A toy railroad track accessory having a base adapted to support toy railroad trackage, front and rear columns spaced to accommodate the trackage and a toy train thereon, a column supported hopper having bottom openings disposed toward the rear of the hopper, a column-supported forwardly opening chute spring biased to close the hopper openings and movable downwardly to permit flow of material from the hopper and forward discharge thereof into a car on the track, a column-supported, reversible motor-reduction gear unit above the hopper, a slow speed shaft drivingly connected to the reduction

gear unit, cord winding spools carried by the shaft and having friction drive connections therewith, a bin guided for vertical movement by the front columns from a position near the trackage to a position above and in front of the hopper and cord connected to the pulleys to be raised or lowered in accordance with the direction of motor operation, and means for tipping the bin during the upper portion of its movement to cause it to pour its contents into the hopper.

6. A unitary toy railroad trackside accessory having a base, columns extending upwardly from the base, a column-supported hopper having discharge openings, a chute movable from an upper position where it closes the hopper openings to a lower position to divert the contents of the hopper in a forward direction, a bin guided for vertical movement by the front columns, supplemental guides for effecting tilting movement of the bin at the upper part of its travel for dumping its contents into the hopper, cords connected to the bin to raise and lower said bin, spools on said accessory about which the cords are wound, a remote controlled electric motor carried by said columns and spool driving means coupled to said motor and to said spools, said driving means further including a friction clutch for permitting overrun of said motor and limit the pull on the cords.

7. A toy railroad accessory having a base, front and rear columns extending upwardly from the base, a house-like structure carried at the top of the columns and including a back wall, two end walls and a roof member extending from the back wall part way to the front to form a cut back roof portion, a hopper extending between the end walls and disposed below the roof, a motor-



reduction gear unit secured to the back wall and carried between the hopper and the roof, a bin guided by the front columns for vertical movement, a slow speed, reduction gear driven shaft beneath said roof, shaft carried spools, cords connecting the spools and bin, guide pulleys carried by said structure about which the cords pass, and means to guide the bin during the upper part of its movement to a position inwardly near the front edge of the roof member and cause it to tilt to dump its contents into the hopper.

8. In a toy loader for coal cars, an overhead coal hopper having two spaced open bottom pockets, a bracket member secured to the hopper and having a portion extending below and to the rear of the pockets, a chute assembly pivotally mounted on the lower portion of the bracket, a solenoid coil carried by the bracket between the pockets, a magnetizable plunger in the coil and connected to the chute to shift the chute assembly from an up position where it closes the pockets to a lower position where it opens them to discharge the contents, and a spring biasing said plunger to counterbalance the chute assembly and hold it in the upper position when the coil is deenergized.

**References Cited** in the file of this patent

UNITED STATES PATENTS

| | | |
|---|---|---|
| 1,873,764 | Hormel | Aug. 23, 1932 |
| 2,017,616 | Cuff | Oct. 15, 1935 |
| 2,438,603 | Ehrhardt | Mar. 30, 1948 |
| 2,693,891 | English | Nov. 9, 1954 |
| 2,725,668 | Bonanno | Dec. 6, 1955 |
| 2,732,958 | Bonanno | Jan. 31, 1956 |