

Oct. 5, 1948.

W. R. SMITH
TOY CAR UNLOADER

2,450,867

Filed Dec. 15, 1942

2 Sheets-Sheet 1

Fig. 1

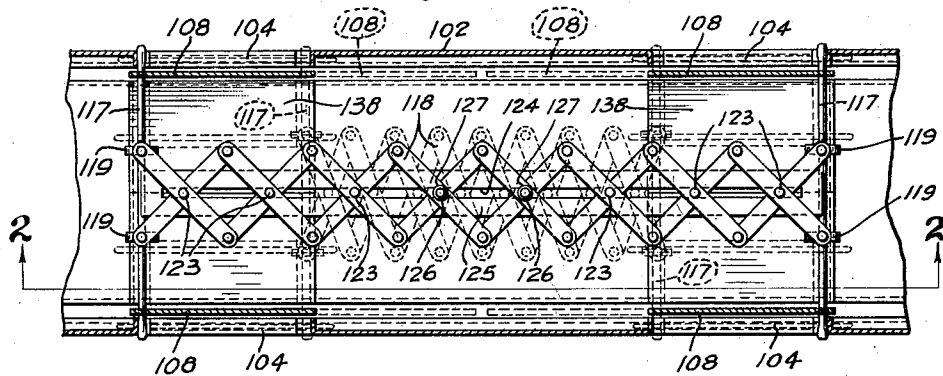


Fig. 2

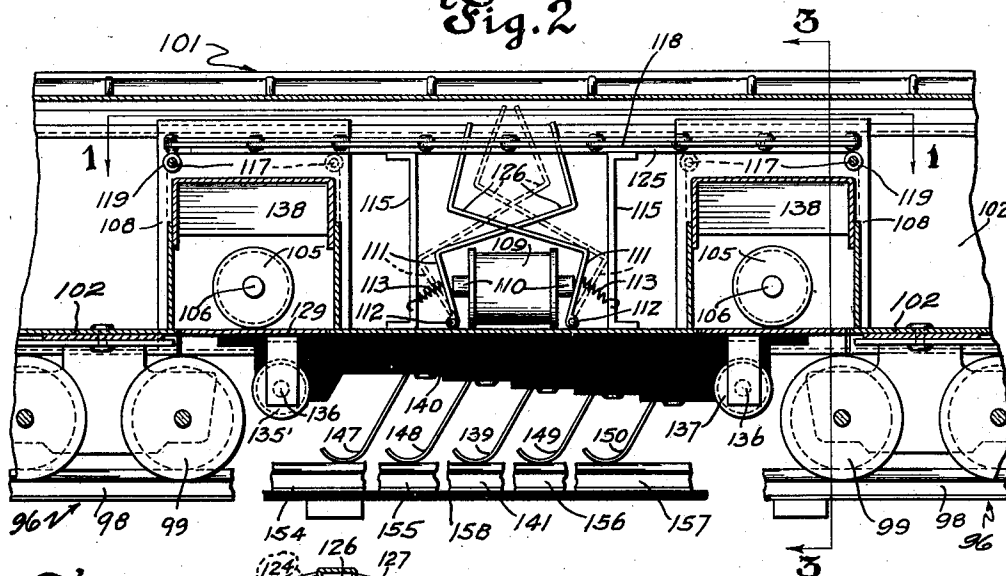
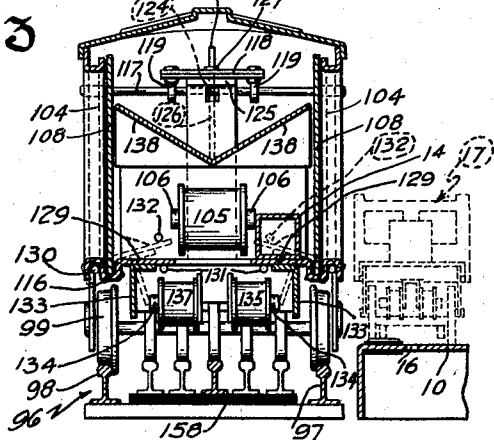


Fig. 3



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Fig. 4

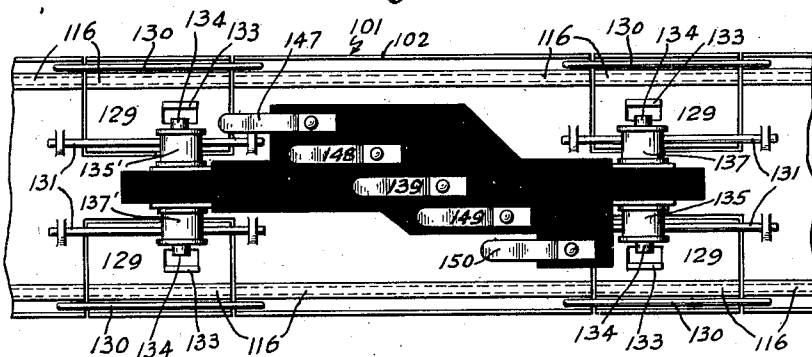


Fig. 5

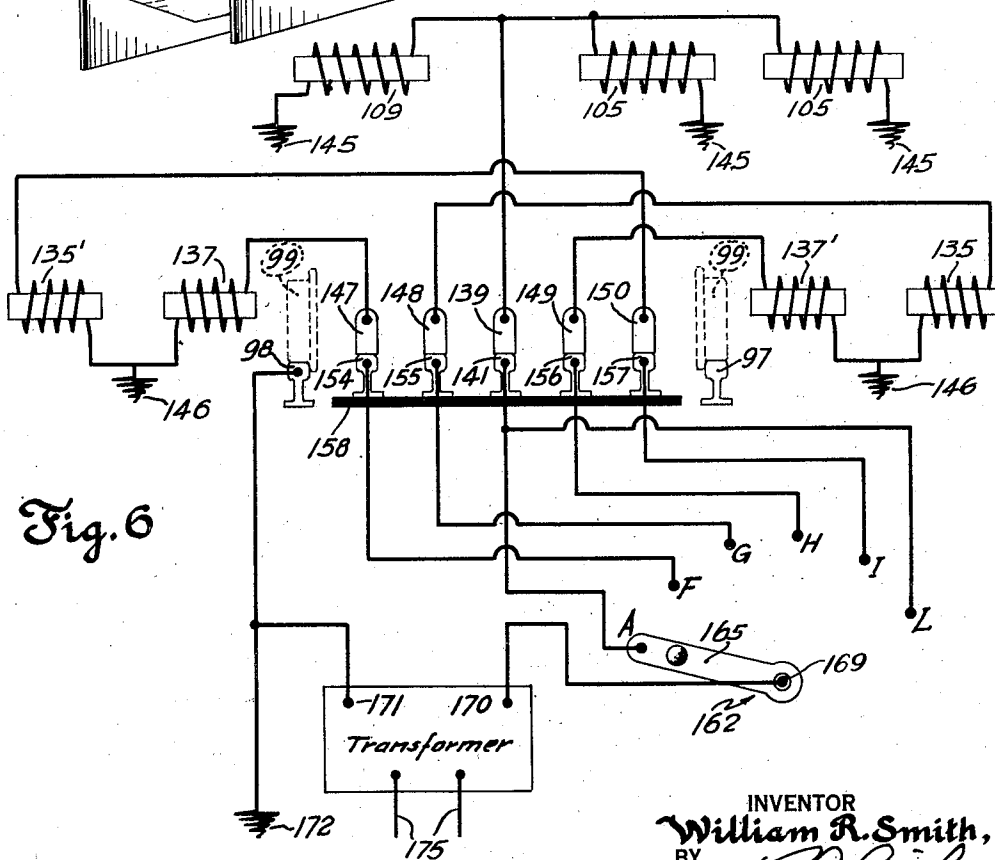
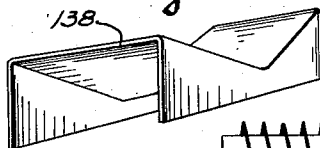


Fig. 6

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2,450,867

TOY CAR UNLOADER

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Application December 15, 1942, Serial No. 469,046

3 Claims. (Cl. 46—218)

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This invention relates in general to toys automatically motivated under electrical control for simulating activities of equipment associated with railway operation and particularly in connection with unloading baggage or other toy articles from the car of a toy train as when the latter is drawn up at the platform of a railway station or depot.

One object of the invention is to provide an electrically operated toy set including a stretch of toy track, a toy train including a baggage, express or freight car and a toy railway platform alongside the track including parts electrically operable under remote control so that the parts mentioned realistically imitate the familiar performance of unloading baggage from the toy train.

With the foregoing and related objects in view, an illustrative form of toy apparatus embodying the present improvements is set forth in the following description, in which reference is had to the accompanying drawings, wherein the arrows on all section planes denote the direction of observation in which each corresponding sectional view is drawn.

Fig. 1 is a fragmentary plan view showing the interior of a toy baggage car with its roof removed and certain parts sectioned on the plane 1—1 in Fig. 2.

Fig. 2 is a view taken in section through the baggage car on the plane 2—2 in Fig. 1.

Fig. 3 is a view drawn on an enlarged scale taken in section crosswise through the baggage car and track rails on the plane 3—3 in Fig. 2.

Fig. 4 is a fragmentary bottom plan view of a central portion of the car.

Fig. 5 is a perspective view of an auxiliary roof section removed from the baggage receiving compartment of the car.

Fig. 6 is a diagram of an electrical system by means of which the performance of different electromagnetically operated parts of the toy car may be initiated and synchronized under remote control.

The structure of the toy railway station includes a low hollow platform 10 which may be made of sheet metal.

In Figs. 2 and 3, a stretch of toy railway track 96 is shown at the front edge of the station platform 10 composed of outer rails 97 and 98 upon which the wheels 99 of the cars and electrical impelling locomotive of a toy train may roll in usual manner as indicated by car 101. This illustrative car of the train is specially equipped

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to participate in the automatic handling and transfer therefrom of the baggage piece 14.

The usual frame 102 of the box type of car 101 forms an enclosure which may have two pairs of baggage loading and unloading door openings or doorways 104 in the side walls thereof. The openings of each pair are opposite each other and between these opposite openings of each pair, the car is provided with a baggage receptive compartment. Each such compartment contains an electromagnet 105, as best shown in Figs. 2 and 3, whose core 106 projects from the magnet coil toward each side of the car and assists in determining the performance of the baggage piece 14 when it is being loaded into either side of the car as will later appear. Each of openings 104 is provided with a slidable door or two pairs of doors 108, making four doors all of which are so connected as to be opened and closed in unison by the action of a third electromagnet 109 located in the car between the compartments containing electromagnets 105. The core ends 110 of magnet 109 at a suitable time simultaneously attract the armatures 111 each of which is pivoted to the car frame at 112 but normally pulled away from its core 110 by a spring 113 which normally urges each armature to its broken line position in Fig. 2 where it rests against an upright partition 115 fixed to the car frame. Each door 108 is guided to slide lengthwise of the car at both its bottom and top edges to and from a position to close its doorway 104. The bottom edge slides in a guide trough or linear continuous depressed channels 116 formed in the floor wall of the car to extend lengthwise thereof. The top portions of opposite doors are connected by cross rods 117 which slide with the doors between full line and broken line positions in Figs. 1 and 2. These cross rods are acted upon simultaneously by a lazy tongs mechanism 118 whose free four ends respectively carry the four collars 119 which are slidably and pivotally engaged with the cross rods 117 of the car doors in a manner clearly shown in Figs. 1 and 3. In its contractile and expansive movements lengthwise of the car, the lazy tongs is maintained in straightway alignment by means of its central line of pivot pins 123 which slidably engage with an elongated slot 124 formed in a roof bracket 125 rigid with the car frame. Each of armatures 111 carries a stiff element or angle arm 126 which projects upwardly through and rides lengthwise in the slot 124 and pivotally engages with one of two centrally located hollow pivotal joints or eyelets 127 of the lazy tongs

mechanism thereby enabling the electromagnet 109 to actuate the lazy tongs mechanism and cause it to extend from its full line position to its broken line position in Fig. 1 for opening the car doors 108.

The floor of each car compartment occupied by one of the electromagnets 105 includes a main floor stationary with car frame 102 and a swingable auxiliary floor section 129 pivotally supported on the fulcrum pin 130 which is fixed to the car frame. Section 129 can swing upward from its normal or full line position to its tilted or broken line position in Fig. 3. In its full line position the inner edge of section 129 rests on stationary frame pins 131 in coplanar relation to a cutout in the main floor that extends through the lateral edge thereof and flanks doorway 104. Thus floor section 129 in its said full line position occupies and is confined to the limits of such cutout. The upward swing of each section 129 to its tilted or broken line position 129 is limited by a stop-pin 132 which also is fixed in the frame of the car in the path of upward swing of floor section 129. From each of the article ejectors or catapult floor sections 129 there depends an armature 133 rigid therewith and positioned to be attracted by the core 134 of a catapult electromagnet 135. Thus there are four such catapult electromagnets as 135, 135', 137 and 137', arranged in two pairs, the magnets of each pair being rigidly supported beneath the car body in coaxial alignment crosswise of the car by means of an insulative bracket 136 fixed on the car frame. For purposes that will hereinafter appear, the roof portion of each baggage receptive compartment in the car is equipped with a baggage piece deflector shield 138 most clearly appearing in Figs. 3 and 5.

Means for electrically energizing simultaneously the windings of door-operating magnet 109 and baggage-piece attracting magnet 105, include the grounding of one end of each of said magnets to the car frame as at 145 (Fig. 6), wherefore current from said end of each winding passes to one or both of the traction rails 97, 98, and said electrical energizing means further include connection of the other end of each of said magnets to the terminal spring finger 139 which is carried below and insulated from the frame of the car by means of the terminal block 140 of non-conductive material and thus serves as a collector shoe wiping constantly against the central or "third" or power rail 141 of the train track, from which said rail the locomotive of the toy train (not shown) also derives its power throughout the length of the track in the toy railroad system. Thus it will be plain that whenever the train is running, car doors 108 are closed and magnet 105 is energized, whereas the instant current is cut off from the track for stopping, the train doors 108 open and magnet 105 becomes deenergized.

Means for conducting current at different selected times through the windings of each of catapult magnets 135', 137', 135, 137, which are carried by the car reside in the grounding of each such magnet to the car frame as at 146 (Fig. 6). Such current conducting means further reside in electrical connections between each of the said four magnets and four spring fingers 147, 148, 149 and 150, respectively, each of which is carried below and insulated from the frame of the car by one or the other portion of terminal block 140. Spring fingers 147, 148, 149, and 150 thus serve as collector shoes which, when the train draws up in front of the station platform 10, ride

into contact with separate short sections of electrically conductive rails 154, 155, 156 and 157, respectively, located intermediate the traction rails 97 and 98 and insulated therefrom as well as from each other by bed plates 158 made of non-conductive material.

The stationary and individually insulated contacts of a remote control switch 162 are respectively denoted by letters from A to I, inclusive, in Fig. 6, and any one of such contacts may selectively be placed in circuit with the conductive distributor arm 165 of such switch which swings about and possesses the electrical polarity of its pivot 169. Arm 165 therefore is electrically connected always to one secondary terminal 170 of the toy power supply transformer, so marked in Fig. 6, the other secondary terminal 171 of which connects with the ground as at 172 in said figure. A supply of alternating current to the transformer is indicated at 175. All grounding points denoted in Fig. 6 as 145, 146, and 172, are understood to be in constant electrical communication through the various structural parts of the toy that are made of electrically conductive material.

The complete toy illustrated and described in the foregoing operates as follows. When the distributor arm 165 of the remote control switch 162 is positioned as indicated by solid lines in Fig. 6, supply current is carried through the switch contact A only to the power rail 141 of the toy railway track system and thence through the electric motor of the locomotive of the train (not shown) to the traction rail 98 and thence back to the toy transformer terminal 171 or to "ground" 172 of the same polarity. Hence a train can be traveling along the track toward the station embodying these improvements. In Fig. 6 it will be noted that the power rail 141 also supplies current through the car-carried collector "shoe" 139 to the car-door closing magnet 109 whose solenoid is further electrically connected with the ground 172 through the frame 102, wheels 99, and traction rail 98. Simultaneously the two drag-in magnets 105 in the baggage compartment of the car are energized through the power rail shoe 139, each of these magnets having its solenoid connected to ground 172 as is the solenoid of the car-door operating magnet 109.

As a first step in operating the toy by means of remote control switch 162, distributor arm 165 is shifted from contact A to contact F whereupon the power rail 141 of the track system is deprived of current. The train when deprived of power comes to rest with the baggage car positioned beside the station platform 10. Also when the power rail 141 is deprived of current, the car-door operating magnet 109 is deenergized permitting springs 113 to pull the armatures 111 to their broken line positions in Figure 2 thus contracting the lazy tongs 118 to its broken line position in Figure 1 and simultaneously opening all four of the car doors. It may be assumed that the baggage accommodating compartment in the left end of the car in Figure 2, which is opposite the track side platform, is empty, while the baggage compartment at the right end of the car contains, on the platform side of the car-carried magnet 105, a second piece of baggage 14' at the time the train arrives at the platform.

If a baggage piece should chance to be resting in a position wherein it fails to clear the doorway of the car, attracting magnet 105 acts at a proper time to pull the baggage piece inwardly of the car to such position as is shown in Fig. 3

for clearing the doorway of the car compartment as will later be described.

Through contact H the short rail section is provided with current so that through the collector shoe 149 the car unloading magnet 135 beneath the compartment which contains baggage piece 14 in Fig. 3 is energized, its solenoid being grounded at 146 to the frame of the car and thereby electrically connected through the wheels 99 of the car and track rail 98 to the ground side 172 of the toy transformer. This draws the armature 133 smartly toward the left in Fig. 3 and tilts the car floor section 129 upwardly about its fulcrum pin 130 until its movement is abruptly checked by stop-pin 132 in the broken line position shown in Fig. 3. This causes the baggage piece 14 to slide off from the car floor section onto truck 17 or to be flung or catapulted from the car floor section, clear of the side of the car and onto the station platform 10. If additional baggage pieces differing in appearance from baggage piece 14 as to color, shape, or size are used, it can be apparent to the observer when a different article of baggage has been unloaded from the car than that which was formerly loaded into the car. The construction of each baggage piece wherein its inner body of magnetically attractable material is covered by a thin shell 15 of non-magnetic material, such as brass, prevents any residual magnetism in the core 106 of electromagnet 105 from causing the baggage piece to adhere to said core after its solenoid has been deenergized. It will be understood that through additional short sections of the electrically conductive rails such as 154, 155 and 157, any one of the magnets 137', 135, and 137 may selectively be caused to eject from their respective car compartments any baggage piece occupying such compartment whenever the solenoids of these three electromagnets are energized through collector shoes 147, 148 or 150 respectively. This may be accomplished merely by placing the distributor arm 165 against contacts F, G, or I, respectively, of the remote control switch. It will also be understood that the construction of switch 162 is such that the distributor arm 165 need not sweep the various lettered contacts of this switch sequentially but may be lifted clear of certain contacts and pass them, without supplying current thereto, for reaching other selected contacts. The four compartments in the baggage car, each having the ability to receive and eject the same or a different piece of baggage, make the car universally usable for unloading purposes by means of the remote control switch and regardless of which side of the car may be adjacent to the platform of the station.

After the above described series of operations or some desired part thereof has been carried out in a sequence which is optional with the desire of the operator through the ability of distributor arm 165 to be placed selectively at any time on any one of the lettered contacts of the remote control switch, this distributor arm may finally be shifted to contact L, whereupon current supply will be restored to the power rail 141 of the track system, just as when the distributor arm was originally located at contact A, so that the train will start running under its own power and pull out from in front of the station. At the same time and through current collector shoe 139, the magnets 105 in the baggage compartments of the car become reenergized and attract to themselves any baggage piece which may have been loaded incompletely into the car and there-

fore be standing in the way of the closing of the door. At the same time the door closing magnet 109 becomes energized also through the same collector shoe 139, and overcomes the armature biasing springs 113 causing the armatures 111 to assume their full line position in Fig. 2 and thus elongate the lazy tongs 118, thereby closing all four of the car doors simultaneously. It will be understood that current collecting shoe 139 rides constantly in contact with the power rail 141 throughout the length of the track system of the toy railway, but if desired, the current collecting shoes 147, 148, 149, and 150 need have no rails to engage except when the car is standing at the station platform or in some other particular location along the track where its various door and baggage actuating magnets need to be energized for assisting in loading or unloading operations or the like.

The invention may be embodied in forms of toy apparatus differing from the exact parts herein disclosed and many modifications of the latter may be resorted to within the intended scope of the appended claims.

The remote control switch 162 may take the form of a drum type of step-by-step circuit controller operated by repeatedly depressing a single push-button or control handle operating a ratchet pawl drive in well understood manner. The circuits may be varied in many ways from those shown in Fig. 6 and the railroad track may consist of only two traction rails or may comprise a three-rail system involving the "third" or power rail as herein employed.

In Fig. 3 it is clear that when the ejector or catapulting section 129 occupies its lifted position as shown in broken lines in Fig. 3, the guide trough 116 of the same rises into the sliding pathway of the edge of door 108 thus blocking the door and preventing it from closing until the ejector has dropped again to full line position in Fig. 3. It is equally evident from the same figure that when door 108 is closed, it overlies the guide trough 116 of swingable section 129 and prevents the latter from lifting to said broken line position to perform its catapulting action. Thus there is mutual blocking of the section 129 by door 108 and of door 108 by section 129 insuring the proper sequence of action, namely to insure that the baggage or other load piece 14 shall not be catapulted while the door is closed, and insuring that the door will not be closed while the load piece is being catapulted.

The following claims will be understood to include in their intended scope all equivalents and substitutes for the particular parts of the apparatus herein illustrated which might be suggested to workers in this art by the disclosure hereof.

This application discloses structure which is also disclosed in my U. S. Patent No. 2,266,091, in which patent certain features of construction are claimed involving parts 105 and 133 hereof as well as combinations of the subject toy car with certain trackside equipment, apparatus, and electrical systems in part disclosed herein.

I claim:

1. An elongated toy railway box car constructed and operative to unload therefrom a toy article, including in combination, a side wall of the car containing a doorway for a slidable door, a horizontal main floor of the car having a cut-out extending through the lateral edge of said floor at said doorway, an auxiliary floor section constructed and pivotally mounted to turn about an

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axis positioned to enable said floor section to swing about said axis between a tilted position occupying said doorway and blocking said door and a normal position in coplanar relation to said car floor confined to the limits of said cut-out in the latter, means normally to support said floor section in said position, means to swing said floor section upward away from its said position toward said doorway into a tilted position, and a stop arranged in the path of the upward swinging movement of said section thereby suddenly to check said section in tilted position for catapulting out of said doorway a toy article resting on said floor section.

2. An elongated toy railway box car, including in combination, opposite side walls of the car each containing two doorways, two pairs of doors supported and guided to move edgewise to and from positions to close said doorways respectively, a lazy tongs mechanism having movable pivotal connections to all of said doors respectively, and means to actuate said lazy tongs mechanism for expanding and contracting the latter lengthwise of the car including elements movable simultaneously in opposite directions lengthwise of the

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car pivotally connected to said lazy tongs mechanism at spaced points intermediate two of said pairs of opposite doors.

3. An elongated toy railway box car constructed and operative to unload therefrom a toy article, including in combination, a side wall of the car containing a doorway, a horizontal main floor having a cut-out flanking said doorway, an auxiliary floor section pivotally mounted to occupy said cut-out, means normally to support said floor section in horizontal position flush with said main floor, said main floor and auxiliary floor section being formed to provide a linear continuous depressed channel extending lengthwise of the car, means to swing said floor section upward away from said flush position toward said doorway into a tilted position, a stop arranged in the path of the upward swinging movement of said section thereby suddenly to check said section in tilted position for catapulting out of said doorway a toy article resting on said floor section, and a door adapted to close said doorway having its lower edge slidably resting in said channel.

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No references cited.