

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

Improvements in or Connected with Remote-Control Coupling and Uncoupling Devices for Toy Electric Railways

We, **TRIX LIMITED**, of 11, Old Burlington Street, London, W.1, a British Company, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to remote-control coupling and uncoupling devices for toy electric railways and has for its object to construct same in an improved manner.

A toy electric locomotive is known in which a switch drum is rotated by a switch magnet which is energised from a controller outside the track, the switch drum being provided with contacts for bringing into circuit for a forward running of the vehicle, a reverse running of the vehicle and for operating an electro-magnet which rocks a movable coupling member.

According to this invention, a remote-control coupling and uncoupling device for a toy electric railway, incorporate two solenoids end to end carried by a vehicle, a plunger slidable in the solenoids, a rockable coupling member with which the plunger coacts and switching means cooperating with the plunger so arranged that the plunger at one end of its stroke cuts out the first solenoid and brings the second solenoid into circuit ready for energising from a source of electric power and when at the other end of its stroke cuts out the second solenoid and brings the first solenoid into circuit and whereby when the plunger is at one end of its stroke allows the coupling member under action of a spring to position itself in coupling position and when the plunger is at the other end of its stroke rocks the coupling member to uncoupling position.

The invention will be clearly understood from the following description aided by the accompanying drawings, in which:—

Figure 1 is a side elevation, partly in section, of a locomotive and tender. Figure 2 is a plan view of the tender. Figure 3 a similar view with the top plate removed. Figure 4 is a section on the line IV—IV of Figure 2. Figure 5 is a perspective view of the plunger. Figure 6 is a sectional detail view of part of the tender. Figures 7 and 8 are dia-

grams of the circuit of the tender.

In the example shown in the accompanying drawings, the locomotive is more or less of known construction and comprises a chassis frame 1 mounted on wheels 2 for running on a track. Mounted on the chassis frame 1 is a motor 3 and also a switch magnet 4. Current is taken up from the track 5 through pairs of shoes 6 from the middle rail and supplied to the motor and from one outer rail by a pair of shoes 7 on the tender through one core of the connecting cable to the locomotive and from there supplied to the motor, the rotational movement of which is transmitted to the driving wheels.

A switch drum 8 is rotatably mounted in the locomotive and is rotated by the switch magnet 4. When a circuit is completed by the controller the magnet pole 9 attracts the armature 10 which is rockably mounted at 11, its movement being restricted by a stop 12. The movement of the armature 10 is transmitted through a rod 13 to a bell-crank lever 14, 15. The bell-crank lever through suitable mechanism turns the switch drum 8 so that when the armature 10 is attracted the switch drum is turned one step.

When the train is standing the contact springs 15a and 15b touch insulated parts of the switch drum 8. With the drum 8 in this position the armature of the engine is dead. If a current impulse be now set in action by actuating the controller, the switch drum 8 turns bringing by means of suitably shaped contacts on the drum 8 the spring 15b into contact with the contact spring 16 and the spring 15a into contact with the chassis frame 1 switching the engine motor into circuit. The train then moves forwards. Next time the controller is actuated and a further turning movement is imparted to the switch drum 8 the contact spring 17b is additionally connected with the chassis frame 1 and operates the uncoupling device by energising the solenoid 25.

On the next step the springs 15a, 15b touch again insulated parts of the drum 8 and the locomotive stops, but the contact spring 17a is now connected to the chassis frame 1 and restores the uncoupling device by energising the solenoid 26.

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The tender 18 mounted on running wheels 19 carries the uncoupling means which comprise two plates 20, 21 of insulating material positioned at a distance apart and secured to the tender 18 by screws 22 and tubular bushes 23, 24. Between the two plates 20, 21 are two electric solenoids 25, 26 end to end and with a through flat bore. The solenoids 25, 26 are conveniently supported on a central partition 27 and end walls 28, 29 secured between the plates 20, 21.

The plunger 30 is constructed of an iron portion 30a and a portion 30b of insulating material, the end of which is enlarged to form a square plate portion with the end curved at 30c. On the underside of the plate 30b is secured a contact plate 31, such as by a tongue 31a passing up through a slot and the end bent over. The contact plate 31 is formed with two upstanding contact posts 32, 33 positioned at a distance apart behind the shoulders formed by the square end.

On the bottom plate 21 is secured a spring contact 34 which is in contact with the contact plate 31 and the pick-up shoes 7 on the tender 18.

The top plate 20 is formed on each side of a longitudinal centre line with a slot or aperture 35 and a spring contact plate 36 is secured at one end by a rivet 37. The contact plate 36 is of such a length that it leaves a gap between its free end and the end of the slot 35. The contact plate 36 may be cranked as at 38. On the other side of the top plate 20 is formed a slot 39 and a contact plate 40 having a crank 41 is secured by a rivet 42 at one end to the top plate 20. This contact plate 40 is of a length to pass over the slot 39 with the crank 41 over or partially over the slot 39. The free ends of the contact plates 36, 40 may be lipped upwards.

The coupling member 43 consists of a strip of metal having a flat straight portion 43a positioned under the end of the tender 18. One end is bent upwards at an angle through a slot in the bottom of the tender 18 and formed with a curl 43b which rest against the end of the plunger 30. The other end 43c is bent downwards and formed with a hook 44 to one side and a projecting portion 45 to the other side. The coupling member is secured to the tender 18 by a headed screw 46 or pin passing up through a hole in the straight portion 43a into a bush 47 in the floor of the tender 18. The screw 46 is comparatively long and a coiled spring 48 is located on the screw 46 between the head and coupling member.

Preferably the electrical mechanism in the tender 18 is connected to the electrical mechanism in the locomotive by a three wire cable having three pronged plugs at each end, the prongs being at unequal distances apart to

ensure being correctly inserted in the sockets. In which case the end wall of the tender 18 is provided with a member 49 of insulating material having three sockets 50, 51, 52 at unequal distances apart.

The socket 50 is connected at 50a by a wire 53 to one end of the coil of the solenoid 25, the other end of the coil being connected by a wire 54 to the contact plate 36 at 55. The socket 52 is connected at 52a by a wire 56 to one end of the coil of the solenoid 26, the other end being connected by a wire 57 to the contact plate 40 at 58. The socket 51 is connected by a wire 59 to the spring contact 34 which forms the return lead and to the pick-up shoes 7 on the tender 18.

In place of plugs and sockets, the electrical mechanism of the engine can be connected to the electrical mechanism in the tender directly by wires.

In coupled condition as shown in Figure 4 with the plunger fully retracted into the solenoid 26, the contact post 33 is in contact with the contact plate 36 and the contact post 32 is in the crank portion 41 and out of contact with the contact plate 40, so that the circuit is from the socket 50 through the solenoid 25, contact post 33, contact plate 31 to the terminal 51 (Figure 7). The terminal 51 is connected to the motor M. The coupling member 43 is held up by the spring 48 and its hook 44 engaged with the coupling hook 60 of the first carriage 61 and with the curl 43b resting against the end of the plunger 30.

On giving an impulse of current to the sockets to uncouple, the solenoid 25 is energised and the plunger 30 attracted to move in the solenoid 25 towards the coupling member and rock the coupling member 43 in the slot against the spring 48 so that the hook 44 is rocked downwards out of the hook 60 as will be seen in Figure 6. The coupling member is locked in this position by the curl 43b slipping onto the top of the insulated portion of the plunger 30 as will be seen in Figure 6. When the plunger 30 has moved its full stroke, the contact post 33 will be out of contact with the contact plate 36 and the contact post 32 will be in contact with the contact plate 40 thus cutting out the solenoid 25 and bringing into circuit the solenoid 26 ready for action on a further current impulse (Figure 8).

What we claim is:—

1. A remote-control coupling and uncoupling device for toy electric railways, incorporating two solenoids end to end and carried by a vehicle, a plunger slidable in the solenoids, a rockable coupling member with which the plunger coacts, and switching means co-operating with the plunger so arranged that the plunger at one end of its stroke cuts out the first solenoid and brings

the second solenoid into circuit ready for energising from a source of electric power and when at the other end of its stroke cuts out the second solenoid and brings the first
5 solenoid into circuit, and whereby when the plunger is at one end of its stroke allows the coupling member under action of a spring to position itself in coupling position and when the plunger is at the other end of its stroke
10 rocks the coupling member to uncoupling position.

2. A remote-control coupling and uncoupling device for toy electric railways, incorporating two solenoids supported end to end
15 in a frame carried by a vehicle, a spring contact plate carried by the frame and electrically connected to one end of one of the solenoids, a second spring contact plate carried by the frame and electrically connected to
20 one end of the other solenoid, a plunger slidably located in the solenoids, an extension of insulating material on one end of the plunger, contact members on the insulated end of the plunger adapted to contact with the contact
25 plates and with a return lead, the other ends of the solenoids being connected to switching means in a source of electric power, so arranged that when the plunger is at one end of its stroke one contact on the plunger is in
30 contact with its plate to bring one solenoid into circuit and when at the other end of its stroke the other contact member on the plunger is in contact with its plate to bring the other solenoid into circuit and a spring urged
35 coupling member cooperating with the plunger whereby when the plunger is at the end of its stroke away from the coupling member the coupling member under action of its

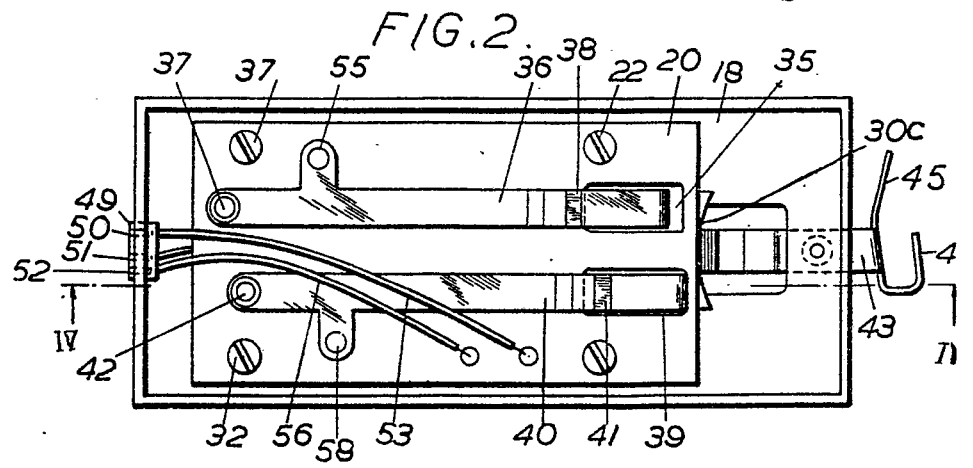
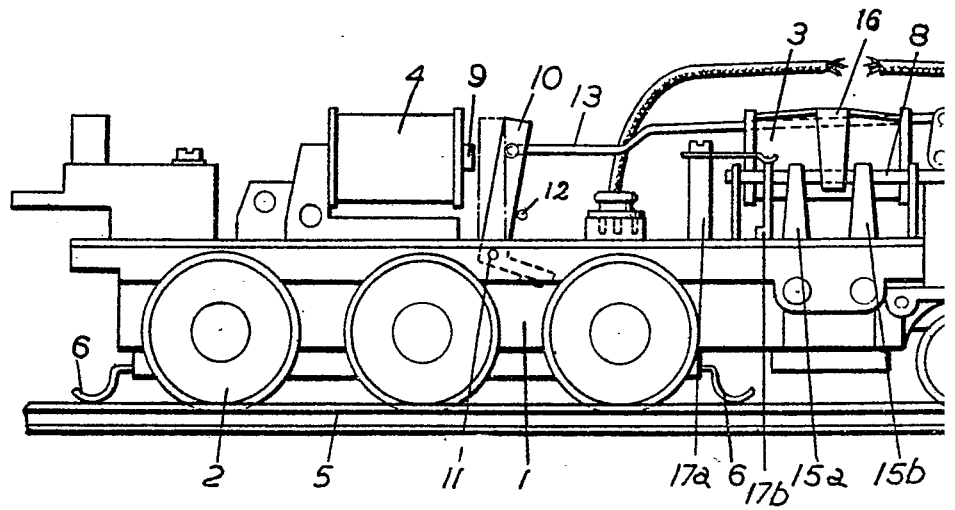
spring is positioned into coupling position and when the plunger is at the end of its
40 stroke towards the coupling member the coupling member is rocked to uncoupling position, substantially as set forth.

3. A remote-control coupling and uncoupling device for toy electric railways as
45 claimed in Claims 1 or 2, wherein the coupling member consists of a strip of metal having a flat central portion formed with a hole so that the strip can be connected to the underside of the floor of the vehicle by a
50 headed screw or pin passing through the hole into the floor, a spring being interposed between the head of the screw or pin and the strip, one end of the strip being bent upwards at an angle through a slot in the floor and
55 formed with a curl resting against the end of the plunger and the other end of the strip with a hook to one side and a projecting portion to the other side, substantially as set forth.
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4. A remote-control coupling and uncoupling device as claimed in Claim 3, wherein the curled end of the coupling member is so
65 shaped that when the coupling device is in the uncoupling position the curl engages on the top of the insulating portion of the plunger to lock the coupling device in the uncoupled position, substantially as set forth.

5. A remote-control coupling and uncoupling device for toy electric railways, constructed substantially as described with reference to the accompanying drawings.
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2 SHEETS

COMPLETE SPECIFICATION

This drawing is a reproduction of
the Original on a reduced scale.

SHEET 1

