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A. H. GILL

TOY RAILROAD TRACK SWITCH

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2 Sheets-Sheet 1

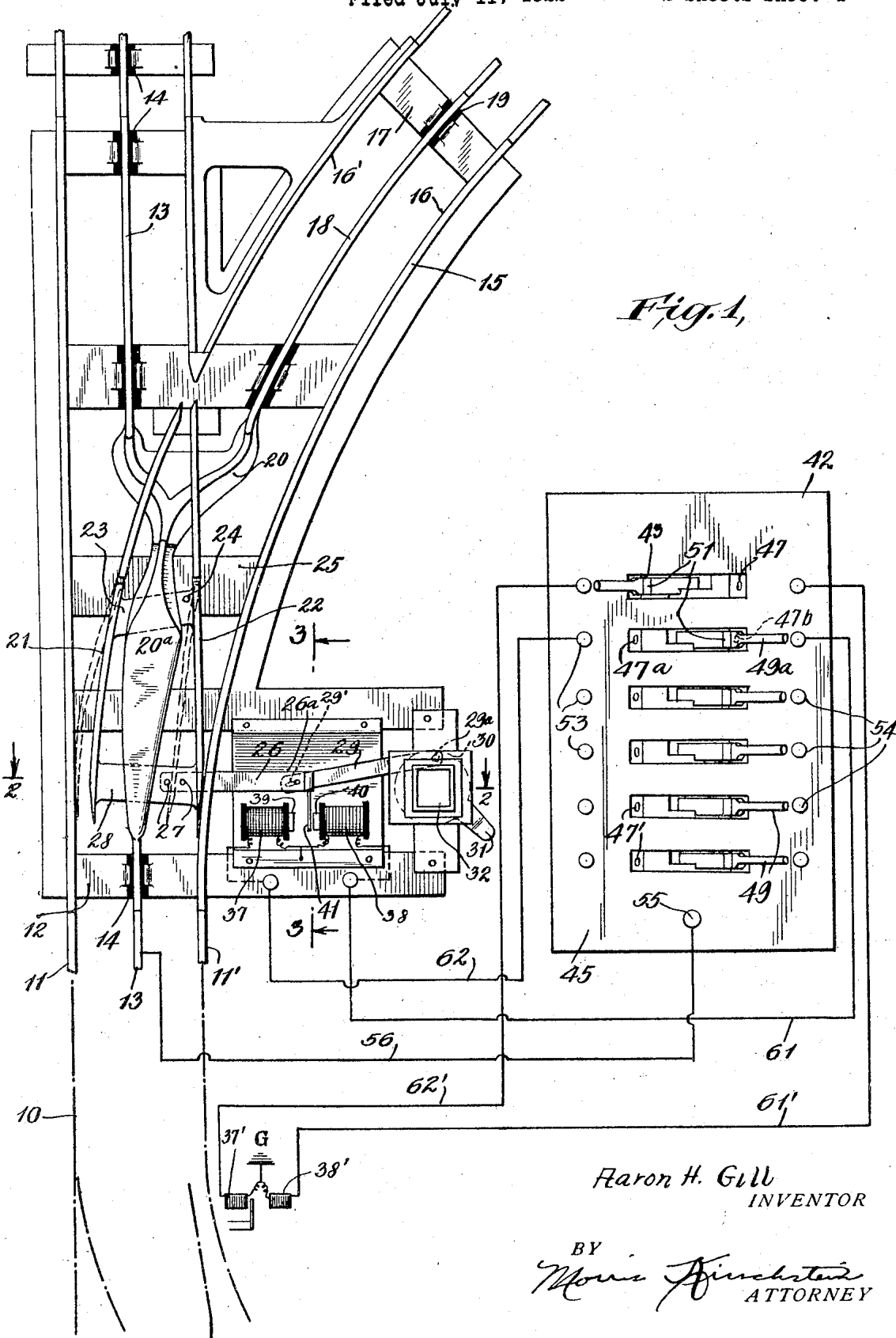


Fig. 1.

Aaron H. Gill
INVENTOR

BY
Morris Finckstein
ATTORNEY

Aug. 11, 1925.

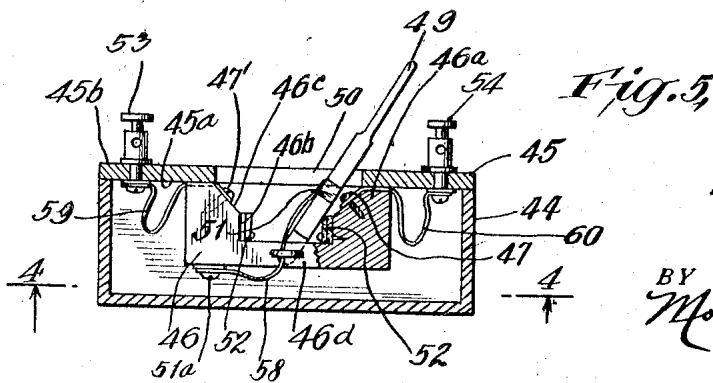
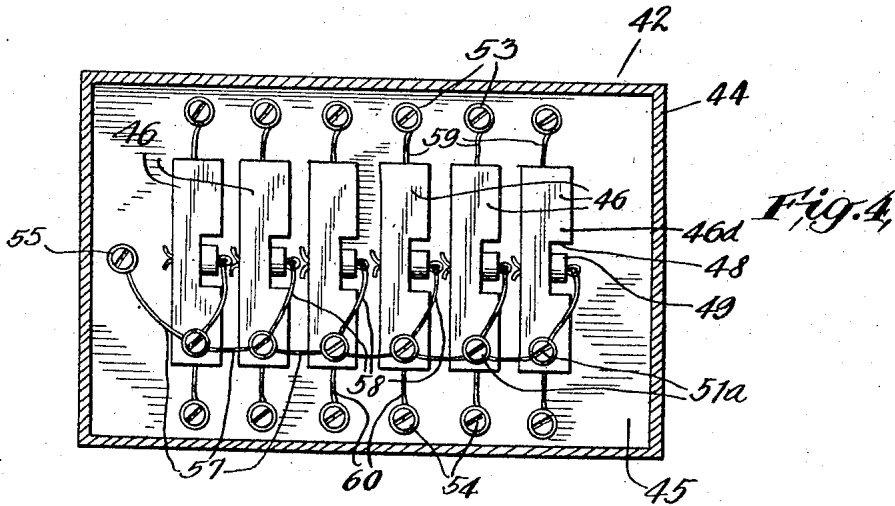
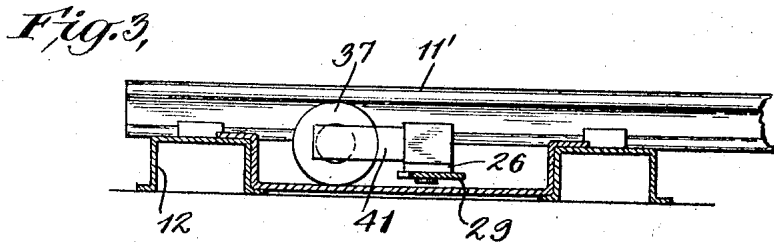
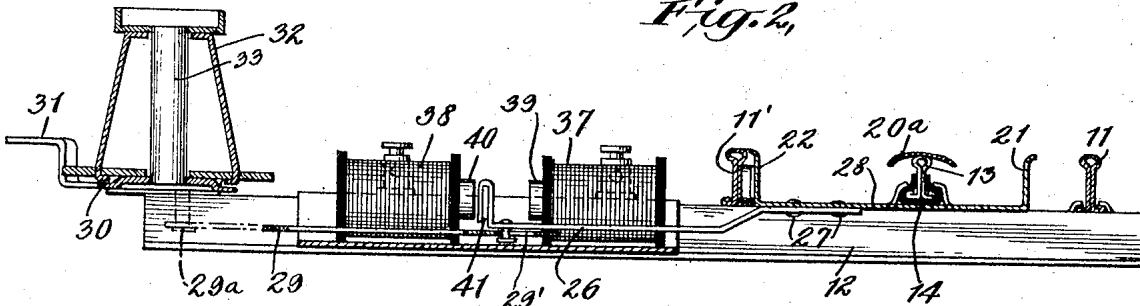
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2 Sheets-Sheet 2



Aaron H. Gill
INVENTOR

BY
Morris Firschtain
ATTORNEY

UNITED STATES PATENT OFFICE.

AARON H. GILL, OF WEST HAVEN, CONNECTICUT, ASSIGNOR TO THE LIONEL CORPORATION, A CORPORATION OF NEW YORK.

TOY RAILROAD TRACK SWITCH.

Application filed July 11, 1922. Serial No. 574,214.

To all whom it may concern:

Be it known that AARON H. GILL, citizen of the United States, residing at West Haven, in the county of New Haven and State of Connecticut, has invented certain new and useful Improvements in Toy Railroad Track Switches, of which the following is a specification.

This invention relates to toy railroad track switches. One object thereof is to provide in an electrical toy railroad outfit a track switch which may be mechanically or electro-magnetically operated for switching the toy train from one track to another, and which shall be simple in construction, cheap to manufacture and adapted to be easily manipulated.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combination of elements and arrangement of parts which will be exemplified in the construction hereinafter described and of which the scope of application will be indicated in the following claims.

In the accompanying drawings, in which is shown one of various possible illustrative embodiments of this invention,

Fig. 1 is a plan view showing a toy switch embodying this invention as applied to a toy electrical railroad having a main line and branch lines, the electrical connections for electro-magnetically operating the switch being shown diagrammatically;

Fig. 2 is a cross-sectional view taken through the switch mechanism along line 2-2 of Fig. 1;

Fig. 3 is a cross-sectional view cut along line 3-3 of Fig. 1;

Fig. 4 is a cross-sectional view in plan of the electrical switch box, taken along line 4-4 of Fig. 5; and

Fig. 5 is an end cross-sectional view of said switch box.

Referring in detail to the drawing, 10 indicates the main railroad track of a toy electrical railroad, and 15 the branch line thereof. The track 10 comprises the rails 11, 11' extending over cross-ties 12 and an intermediate third rail 13 insulated as at 14 from said ties. Preferably, the rails and cross-ties are made in one piece from sheet metal, the cross ties being in the form of bases or stand-

ards depending downwardly from the rails and serving as supports whereby the railroad rests on the floor of the room or any other suitable support. The branch line 15 comprises similar rails 16, 16' extending across similarly constructed cross-ties 17 and an intermediate third rail 18 insulated from the cross-ties as at 19.

Where the branch line 15 connects with the main track 10, the respective third rails 18, 13 thereof are connected by a fork member 20 from which extends a widened portion 20^a, so that the contact shoe (not shown) of the toy car may stay in contact with the "third" rail as the toy train switches from one track to the other. The usual switch tongues 21, 22 are provided which may be moved into proper position as desired for switching the train from the main track to the branch track and vice versa. The switch tongues 21, 22 are connected at their ends by cross-braces 23, 28. The cross-brace 23 is pivoted as at 24 to the rail tie 25 so that the tongues 21, 22 may be operated as a unit and switched into desired position as hereinafter described.

The track switch comprises a switch arm 26 secured at one end as at 27 by any suitable means, such as rivets, to the under side of the cross-brace 28. The free end 26^a of the switch arm is loosely pivotally connected to a link 29, the latter having a slot 29' formed therein to permit a little play at the pivoted end which is eccentrically connected as at 29^a to a rotatable disc 30. Extending from the latter is an operating handle 31 formed preferably integral therewith. The disc 30 is disposed at the base of the signal standard 32 and is connected to or formed integral with a vertical shaft 33 housed in said standard. In this way, a signal tower (not shown) mounted on said shaft may be operated simultaneously with the operation of the switch.

The automatic electro-magnetic means for operating the track switch at a distance from the tracks will now be described. Disposed opposite the members 26, 29, of the switch mechanism are two electro-magnets 37, 38, arranged to either side of the pivoted end of the lever 29 with their cores 39, 40 in opposed relation to each other. A common armature 41 is provided for the electro-magnets, said armature 41 being secured to the horizontal member 26 adjacent the end 26^a

thereof. A switch box 42 is adapted to control the supply of current to the electro-magnets 37, 38 so that the circuit may be closed through one or the other of the magnets 37, 38. When electro-magnet 37 is energized, the armature 41 is attracted to the core 39 carrying with it the member 26 and thus moving the tongues 21, 22 into position for the branch track as shown in dotted lines in Fig. 1 for the train. Similarly when the electro-magnet 38 is energized the armature 41 is drawn towards the core 40 and the switch is set for the main line as shown in full lines in said figure. It will be understood of course that where several branch lines or sidings are used, a similar track switch mechanism will be provided at each junction and pairs of electro-magnets 37', 38' similarly installed and connected to the switch box.

The current for the electro-magnets is controlled by the electric switches 43 disposed in the switch box 42. The latter comprises a casing 44 preferably rectangular in shape and a flat cover 45 detachably secured thereto. Secured to the interior face 45^a of the cover by any suitable means such as nails, is a plurality of narrow channel shaped members 46 substantially of the cross-section shown in Fig. 5 having the upper portion 46^a of the vertical channel face 46^b cut away as at 46^c. Each of these cut-away faces 46^c are provided with contacts 47, 47' for the purpose hereinafter pointed out. The material 46^c of the horizontal portions of the channel members 46 is recessed on one of the sides thereof as at 48 in which recess are pivotally held the switch levers or handle members 49, extending through slots 50 in the cover 45. Each of the handle members 49 is provided with a metallic contact piece 51 adapted to make contact with the contacts 47 or 47' depending on the position in which the lever is thrown. Each of the faces 46^b is provided with a resilient cushion 52 of rubber or other suitable resilient material so that when a given lever 49 is thrown in position to make contact 47 or 47', the cushion 52 acts to restore the lever and quickly break the contact. In this way the circuit through the electro-magnet 37 or 38 is completed only for a short interval long enough to operate the armature 41 and then the circuit again broken. On the outer faces 45^b of the cover are two series of binding posts 53, 54, respectively in the circuits of the electro-magnets 38, 38', etc. for setting the track switches in the main track positions and the electromagnets 37, 37' etc. for the branch track positions. The current is led into the switch box from the third rail, or an independent source through the binding post 55 by means of lead wire 56. The contacts 51 on the switch handles are connected in parallel across the supply line, the cur-

rent being led by means of a lead wire 57 to each of the binding posts 51^a and thence by branch wires 58 to the respective contacts 51. The binding posts 53 are each connected by means of branch wires 59 to their respective contacts 47, and the binding posts 54 are likewise each connected to the respective contacts 47' by means of branch wires 60. A lead wire 61, 61' further connects each binding post 54 to its corresponding electro-magnet 38, 38' and thence to ground as shown at G. Similarly a lead wire 62, 62' connects each binding post 53 to its corresponding electro-magnet 37, 37' and thence to ground.

The circuit through a particular set of magnets say 37, 38 can now be easily traced. On throwing the lever against the contact 47^a the current passes out through lead wire 62 to electro-magnet 38 and then to ground thus completing the circuit. When the switch lever 49^a is thrown in the opposite direction against contact 47^b, the current passes by lead wire 61 to electro-magnet 37 and thence to ground. It will be clear that each of the switch levers 49 controls in this way a separate set of electro-magnets such as 37, 38, 37', 38' etc. and that the switch box thus becomes the control device for the entire track layout. Each switch lever may be marked to indicate the portion of the main track and branch track controlled thereby and thus a child may at a distance from the tracks run the train as desired.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention I claim as new and desire to secure by Letters Patent:—

1. In a toy railroad in combination with a main track and a branch track and switch tongues for guiding the toy train on one or the other of said tracks, mechanical means for manually operating said switch tongues, and electrically controlled means for operating said switch tongues independently of said mechanical means comprising a pair of electro-magnets and a common armature extending from said mechanical means in operative relation to each of said electro-magnets, and means for automatically restoring the electrical switch to open the circuit position after closing the cir-

cuit through one or the other of said magnets.

2. In a toy railroad, in combination with a main track and a branch track and switch tongues for guiding the toy train on one or the other of said tracks, mechanical means for manually operating said switch tongues and electro-magnetic means adapted to operate said switch tongues independently of said mechanical means, said mechanical means comprising an arm secured to said switch tongues and a link loosely pivoted to said arm and said electro-magnetic means including an armature member secured to said link, the loose connection of said link to said arm permitting the latter to have a limited movement independently of said armature.

3. In a toy railroad in combination with a main track and a branch track and switch tongues for guiding the toy train on one or the other of said tracks, mechanical means for manually operating said switch tongues, and electrically controlled means for operating said switch tongues independently of said mechanical means comprising a pair of electro-magnets and a common armature extending from said mechanical means in operative relation to each of said electro-magnets, means for energizing one or the other of said electro-magnets, and means for automatically restoring the electrical switch to open the circuit position after closing the circuit through the one or the other of said magnets.

4. In a toy railroad, in combination with a main track and a branch track and switch tongues for guiding the toy train on one or the other of said tracks, mechanical means for manually operating said switch tongues, and electrically controlled means for operating said switch tongues independently of said mechanical means compris-

ing a pair of electro-magnets and a common armature extending from said mechanical means in operative relation to each of said electro-magnets, and means for energizing one or the other of said electro-magnets, said means comprising a double-throw switch lever adapted to close a circuit through one or the other of said magnets.

5. In a toy railroad, in combination with a main track and a branch track and switch tongues for guiding the toy train on one or the other of said tracks, mechanical means for manually operating said switch tongues, and electrically controlled means for operating said switch tongues independently of said mechanical means comprising a pair of electro-magnets and a common armature extending from said mechanical means in operative relation to each of said electro-magnets, means for energizing one or the other of said electro-magnets, said means comprising a double-throw switch lever adapted to close a circuit through one or the other of said magnets, and means for automatically restoring the switch to open the circuit position after closing the circuit through one or the other of said magnets.

6. In a railroad the combination with a main track and a branch track, a switch tongue for guiding the trains on one or the other of said tracks, mechanical means for operating said tongue including link members pivoted together, the free ends of said link members being connected to the switch tongue and mechanical operating means, an extension adjacent said pivot projecting laterally from one of said link members, and electrical means for manipulating said extension to move said switch.

In testimony whereof I affix my signature.

AARON H. GILL.