

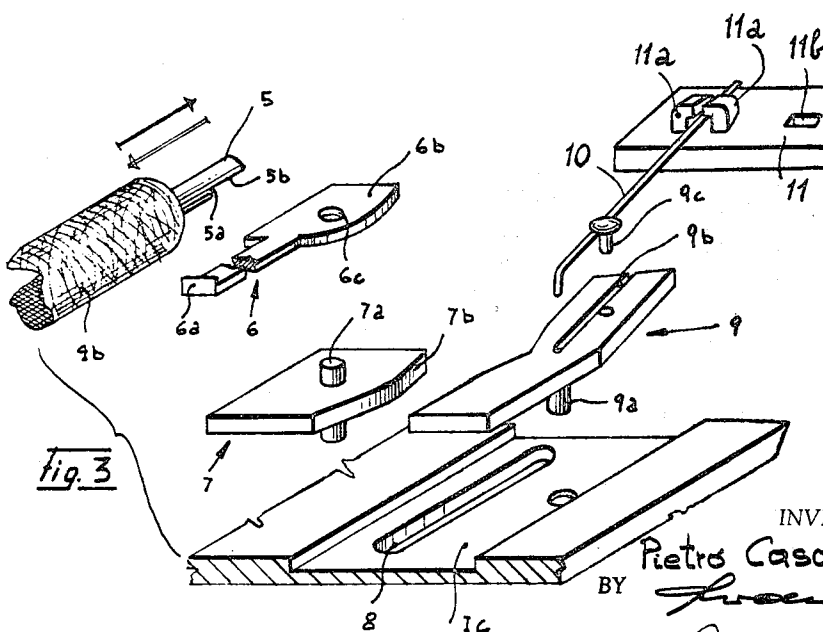
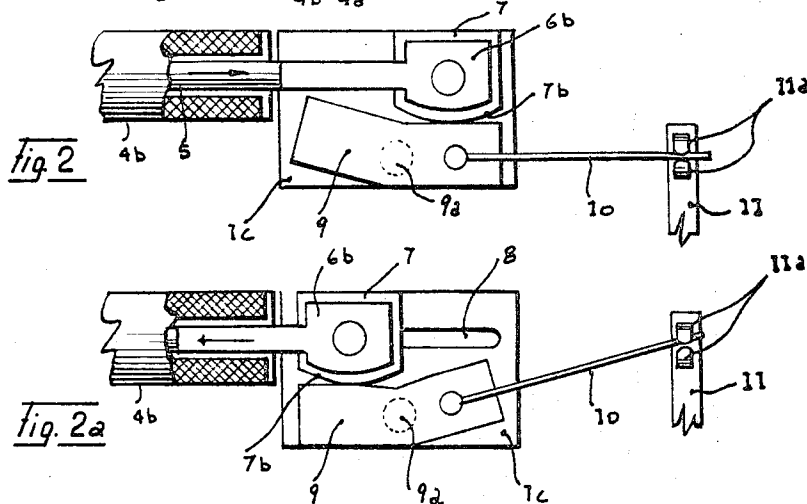
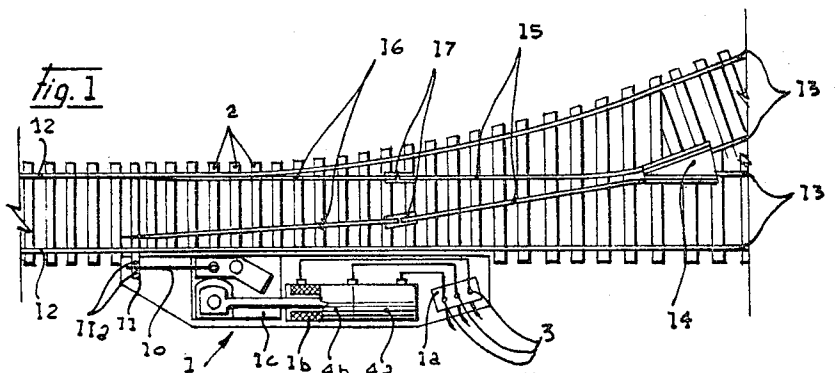
April 23, 1968

P. CASADIO
ELECTRO-MAGNETICALLY ACTUATED SWITCH FOR
TOYS FORMING ELECTRICAL TRAINS

3,379,873

Filed Oct. 21, 1965

2 Sheets-Sheet 1



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Agent

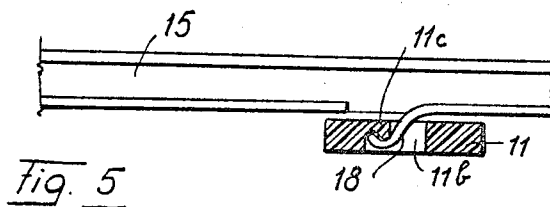
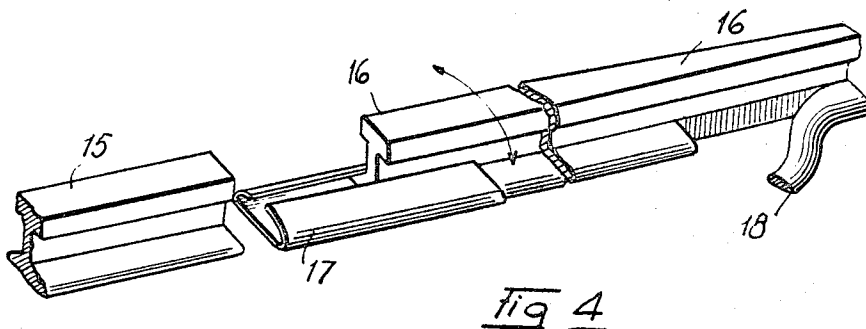
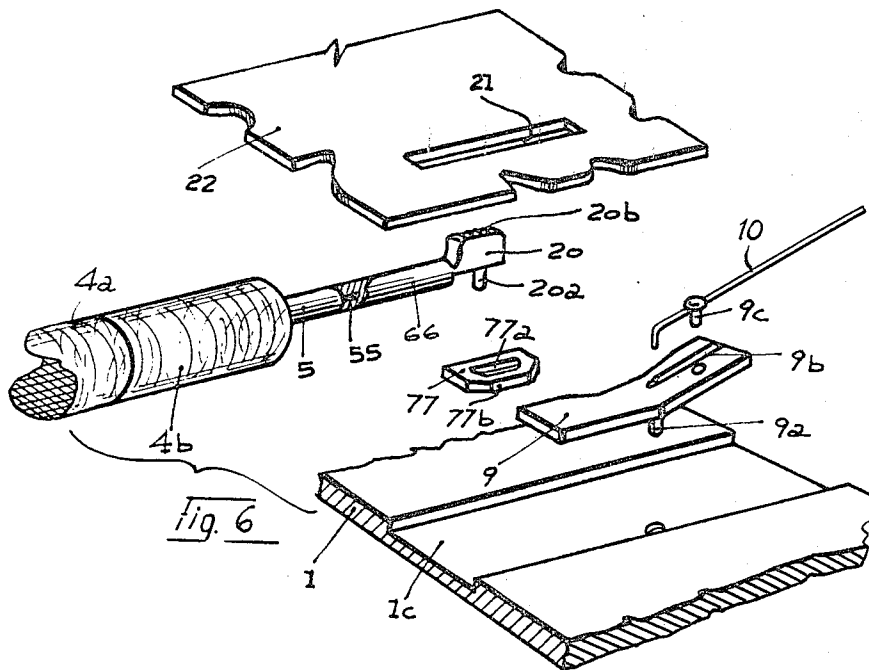
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ELECTRO-MAGNETICALLY ACTUATED SWITCH FOR TOYS FORMING ELECTRICAL TRAINS

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19,107/65

5 Claims. (Cl. 246—415)

ABSTRACT OF THE DISCLOSURE

This invention relates to a toy railroad track switch comprising a cross bar connected with the movable switch tracks, a two position solenoid relay, an armature actuated by said solenoid and transmission means connected with said armature and the said cross bar for transmitting motion from said armature to said switch tracks.

The present invention refers to the actuating device for controlling switches suitable for use with toys formed of electrical trains.

It is well-known in the art to use devices comprising electro-magnetical means for switching the points from one rail to the other. These known devices comprise a rather complicated series of elements aimed at transmitting electro-magnetical pulses to the switch members.

It is an object of this invention to provide simple and reliable means for transmitting an electro-magnetic pulse to the switch in order to get one or the other operative condition of the railway connection points.

It is a further object to provide a switch which may be easily adapted for allowing the switching to occur not only by remote electrical control but also by hand actuation.

These and other objects which will be more apparent from the detailed description which follows are attained by a device according to the invention which comprises a two-position solenoid relay, an armature for said relay, a head projection connected with said armature, said head projection having on one side thereof a shaped portion; a pivotable member arranged to pivot in the proximity of said shaped portion, said pivotable member having in turn a shaped surface arranged near said head projection so as to be in contact with at least part of the shaped portion of said pivotable member, and a tongue member having one end connected with said pivotable member and the other end suitable for engagement with the switch to be operated.

Further advantages and features of the invention will appear from the description of a preferred embodiment thereof, which description is made with the aid of the accompanying drawings, which are for an illustrative purpose and not limitative, and wherein:

FIG. 1 is a view from the top of a device according to the invention, in its operative position adjacent to a railway switching point;

FIG. 2 is an enlarged scale view from the top of the device, shown in a reversed arrangement with respect to FIG. 1 and in the "out-of-solenoid" position of the armature;

FIG. 2a is a top view similar to that of FIG. 2 of a device in the "in-the-solenoid" position of the armature, wherein the pivotable member has a slightly different shape;

FIG. 3 is an exploded view of the component parts bringing about the connection between the armature and the head projection with its tongue member;

FIG. 4 is a further exploded view showing the rather

loose connection between a blade of the switch and a deviated branch of the rail;

FIG. 5 is a cross-section of the tongue member at its connection zone with a switch blade;

FIG. 6 is an exploded view of an alternative embodiment of the connection between armature and pivotable member.

Referring now more particularly to the drawings, the device comprises a base or supporting plate 1, divided into three portions 1a, 1b and 1c which are recessed into said base 1. The base 1 is arranged adjacent to the ties 2 of the railways. Recess 1a has three clamping screws 3 for the connection with electrical lines for remote control, as is conventional in the art.

A solenoid is positioned in recess 1b, which solenoid is divided into elements 4a and 4b, element 4a being for a pulling action and element 4b for a pushing action on armature 5. The armature (FIG. 3) has a slot 5a and a flattened portion 5b. Slot 5a is for engagement with a bent end 6a of a plate 6, arranged for contact with said flattened portion 5b. Plate 6 acts consequently as a removable connecting member. An enlarged portion 6b of said plate 6 has a hole 6c for engagement with the pin 7a of a head projection or head member 7, which has a shaped portion 7b having, in the embodiment shown in FIGS. 1 and 2, a curved shape, and in the embodiment shown in FIGS. 2a and 3 a shape resembling to a V, with a rounded vertex and with opened, spaced apart arms. In general, the portion 7b is, consequently, defined by a convex surface. Pin 7a projects also from the bottom side of the head member 7 and is guided in the guideway slot 8 machined through the rail of the recess 1c. As clearly shown in FIG. 2a and FIG. 3 of the drawing, the recess 1c acts also as a stop for the angular rotation of a rocker member 9. This recess has also a hole for receiving and cooperating with the pivot 9a of the pivotable or rocker member 9. As clearly shown in the drawing, the rocker member 9 is defined by two converging arm portions defining a V-shape in the vertex zone of which the pin 9a is arranged. Preferably the rocker member is provided with a slot 9b and a hole for receiving the pin 9c secured to a tongue member 10 made of spring material, one bent end of which enters said slot 9b. The other end of the tongue member 10 is arranged for engagement with two projections 11a of a switch cross-bar 11 arranged across the rails 12. The switch cross-bar 11 has a hole 11b wherein a bent end 18 is engaged, as will be seen.

The rails 12 are merged into the two rails 13. In the merging zone the frog 14 is provided which is made of a moulded insulated material, said rails 13 being continued by the branching extensions 15. The end of the extensions 15 and of the blades 16 are connected by a joint piece 17, in the form of a partly opened sheath, which provides for a loose engagement with the blades 16 and a more rigid connection with the extensions 15. In this manner the blades 16 may be caused slightly to rotate along an axis which is perpendicular to the blades 16 themselves, these blades 16 being of the conventional shape which provides for a tapered end: this allows the blades to receive the wheels of the train on the progressively inclined sides, thus assisting the switching over of the train itself. Each blade 16 has a flange integral therewith, which has a broken portion, wherefrom a bent end 18 projects downward, in engagement with the hole 11b of the switch 11.

In the alternative embodiment of FIG. 6 armature 5 of the solenoid has an axial pin projection 55, suitable for fitting connection with the hole of a rod 66 made of plastic material, having a head member 20 with a knurled portion 20b for hand operation and having furthermore a pin 20a suitable for cooperation with the hole 77a of a shaped head 77, the shaped side 77b of which is similar

in its conformation to the shape of the head 6b, so that a cooperation is possible with the pivotable member 9, which is the same as that shown in FIG. 3, and is arranged for pivoting within the recess 1c of the plate 1.

A cover 22 with a slot 21 may be arranged above plate 1 so that the head 20 with its knurled portion 20b projects through said slot 21, being accessible to the operator's finger.

The operation of the switch according to the invention is now readily understandable: excitation of the section 4a of the solenoid brings about a pulling of the head 6b or 7 in the direction of the arrow as shown in FIG. 2a. If the starting position is assumed to be that of FIG. 2, the pivotable member 9 is brought from the position in FIG. 2 to the position of FIG. 2a so that the tongue member 10 shifts the switch from the position in FIG. 2 to that in FIG. 2a. This shifting brings about a switching of the blades 16 according to a conventional procedure which is not further described herein. Obviously, if it is the section 4b of the solenoid to be excited, then the head 6b or 77, is pushed from the position of FIG. 2a to the position of FIG. 2, giving rise to a reverse shifting of the switch cross-bar 11.

Actuation of the knurled surface 20b of the head 20 through slot 21 permits the switching to be caused by hand operation.

It is obviously not required that the tongue 10 has an extension to be engaged with slot 9b, since its connection with pin 9c may be sufficient to secure the transmission of the movements of pivotable member 9 to the tongue member 10.

It may be readily seen that the arrangement relies upon a limited number of pieces operating in a very simple and therefore very reliable manner.

Although some preferred embodiments of the invention have been heretofore described and illustrated, it is not intended to limit the scope of the invention to the details heretofore taken into consideration, and reserve is hereby made to all such modifications and changes as properly come within the scope of the appended claims.

I claim:

1. A toy railroad track switch with a cross-bar connected with the movable switch tracks, a two position solenoid relay, an armature actuated by said solenoid, and transmission means connected with said armature and the said cross-bar for transmitting motion from said armature to said switch tracks and wherein the improvement in the transmission means comprises a movable head member (7) connected with said armature (5) and receiving mo-

tion from said armature, a supporting plate (1) below said head member (7) and having guideways (1c, 8) for said head member (7), said head member (7) having a convex lateral surface (7b), a rocker member (9) arranged in side by side relationship with said head member (7) at the side of said convex surface, said rocker member (9) having two converging arm portions extending in the direction of said guideways and defining a V-shape and having pivot means (9a) in the vertex zone of the V-shape, said supporting plate having means for cooperating with said pivot means (9a), a resilient tongue member (10) fixed with one end portion thereof on one of the arm portions of said rocker member (9) and fixed with the other end portion thereof on the cross-bar (11) of the track switch.

2. A track switch according to claim 1, wherein said resilient tongue member, said rocker member and said guideways extend in the direction of said switch tracks.

3. A track switch according to claim 1, wherein said supporting plate (1) has a recess (1c), said recess with its side edges defining stop means for limiting the angular motion of said rocker member.

4. A track switch according to claim 1, further comprising a connecting member (6, 66) pivotally connected with one end portion thereof to said head member (7, 77) and removably connected with the other end thereof to said armature.

5. A track switch according to claim 4, wherein said connecting member (66) has a projection (20b) for hand-actuation of the switch.

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