July 27, 1943. J. L. BONANNO 2,325,471

TOY RAILROAD TRACK SWITCH

Original Filed Dec. 6, 1940

Fig. 1.

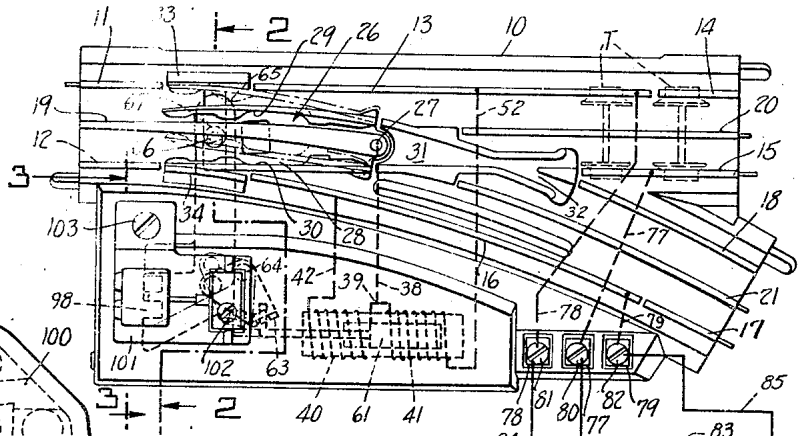


Fig. 2.

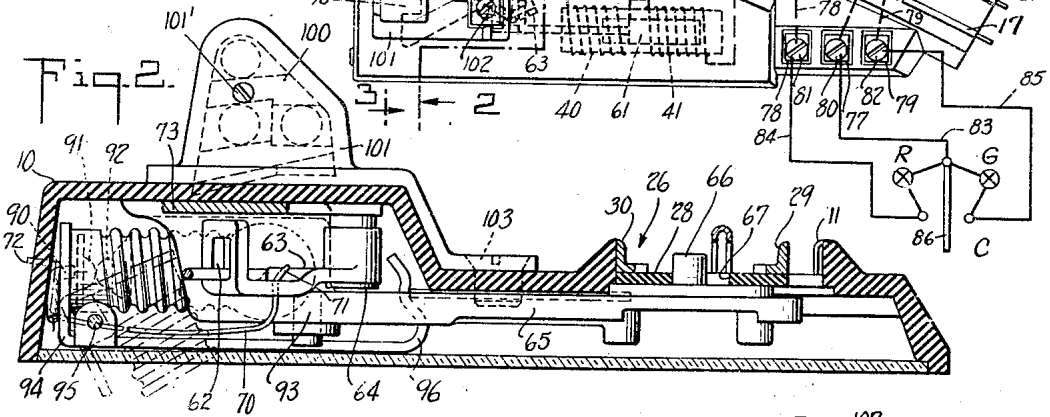


Fig. 4.

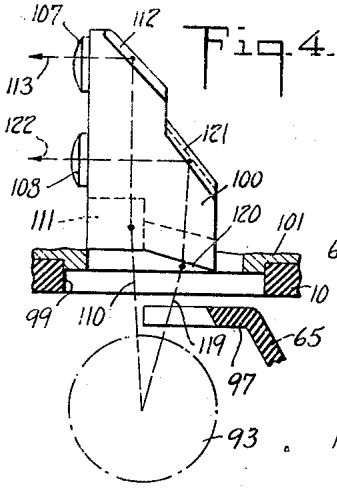


Fig. 3.

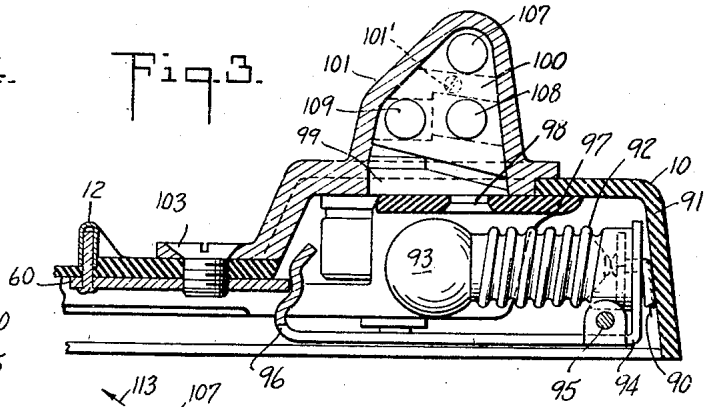
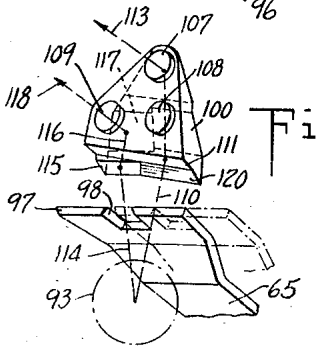


Fig. 5.



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TOY RAILROAD TRACK SWITCH

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3 Claims. (Cl. 246—220)

The present invention relates to toy railroad track switches, and is more particularly directed toward an improved signalling arrangement to indicate the position of the switch tongue.

According to the present invention the signalling arrangement employs a single lamp energized from the power rail and an optical system which provides ray paths depending upon the position of the switch tongue shifting mechanism.

Other and further objects will appear as the description proceeds.

The present application is a division of my application Serial No. 368,806 filed December 6, 1940 now Patent No. 2,297,131 dated September 29, 1942.

The accompanying drawing shows, for purposes of illustrating the present invention, an embodiment in which the invention may take form, it being understood that the drawing is illustrative of the invention rather than limiting the same.

In the drawing:

Figure 1 is a top plan view of a right-hand switch showing the switch tongue in the position to direct trains through the straight line track;

Figure 2 is a vertical sectional view taken on the broken line 2—2 of Figure 1 in the direction of the arrows;

Figure 3 is a sectional view taken on the line 3—3 of Figure 1 looking in the direction of the arrows; and

Figures 4 and 5 are diagrammatic views illustrating the signal association with the track switch.

The molded piece of insulation, to which all the other parts of the track switch section are secured, is indicated at 10. It carries short lengths of U-shaped sheet metal wheel bearing rails 11 and 12 forming what may be termed the main line wheel bearing rails of the track switch section. It also carries two pieces of straight rail 13 and 14 in line with the rail 11, a piece of straight rail 15 in line with the rail 12, and three pieces of curved rail 16, 22 and 18 forming wheel bearing elements in a branch track which diverges from the branch formed by the rails 13, 14 and 15.

The rail elements 11, 12, 14, 15, 22 and 18 are interconnected with the other wheel bearing rails of the toy track layout when the toy track switch section is inserted into the track layout and are all at what is generally termed ground potential. The third rail elements are connected to the power source and form a power rail.

The insulating base 10 supports a shiftable switch tongue 26 pivotted at 27. The tongue has an insulating bottom plate 28, shown more clearly in Figure 2, and two metal wheel bearing rails 29 and 30. The rails of the shiftable switch tongue need not be electrically connected with any of the other rails. Adjacent the pivot 27 the insulating base is provided with raised frog forming portions 31, 32 which provide wheel bearing rail elements between the switch tongue rail elements 29 and 30 and the fixed wheel bearing elements 15 and 18. The insulating base 10 is also provided with upwardly extending elements 33 and 34 intermediate the rail elements 11 and 13 and the rail elements 12 and 16, respectively.

Current is supplied from the third rail through a connection 38 to the midpoint 39 of two solenoid coils 40 and 41. The coil 40 is connected through a wire 42 (and self-disconnecting switches shown in detail in the application above referred to) with the insulated wheel bearing rail 16 and the coil 41 is similarly connected by wire 52 with the rail 13, so that one or the other of the coils may be grounded through the wheels and axles of a car truck approaching the switch tongue on the corresponding branch track. When the truck T passes through the branch of the track switch for which the switch tongue is set the corresponding solenoid coil is not energized, but should the truck approach from the branch against which the switch tongue is set, the proper coil is energized to shift the tongue. The energizing of the coil 40 will attract the armature 61 to the left. It has a lost motion connection 62 with a bell crank 63 pivoted at 64 to a sheet metal member 73. The bell crank is connected with a slider 65 which has a lug 66 passing through an enlarged opening 67 in the insulating plate 28 so that the switch tongue can be shifted from the position indicated in Figure 1 to place the rails of the switch tongue in position to receive the wheels of the approaching vehicle and guide the train through the track switch section. The armature, the switch tongue and intermediate movable parts are held in the extreme position to which they have been shifted by an over-the-center spring 70. One end 71 of the spring is secured to the bell crank 63, while the other end 72 is passed through a hole in the insulating base 10.

A wire 90 suitably connected to the third rail is also connected with the center contact 91 of a lamp socket 92. This socket carries a lamp bulb 93. The socket is secured to an L-shaped lever 94 pivoted on a screw 95 which extends in through

the end of the insulating base 10. The long end 96 of the lever 94 has a snap connection with the plate 60 so that the lamp may be grounded when in the position indicated in full lines in the drawing and so that the socket may be swung down, as indicated in dot-and-dash lines in Figure 2, for relamping. Reciprocatory tongue shifter 65 has an extension 97 which overlies the lamp bulb 93 and terminates adjacent the vertical plane through the socket axis. This extension 97 has a slot 98 adapted to be moved back and forth relative to the center of the lamp, as will be apparent from Figures 3 and 5.

The insulating base 10 is provided with an opening 99 above the lamp 93 so that light rays from the lamp might pass upwardly. Above this opening is a light transmitter 100 (made of plastic such as "Lucite") which receives the light rays passing up through the opening 99 in the insulating body and through this opening and the shutter opening 98 in the shifter 65. The light transmitter 100 is clamped in a metal housing 101 by a screw 101'. The housing 101 is secured in place by screw 102 entering the plate 73 and by screw 103 entering plate 60. The housing 101 is a metal casting shaped to simulate the signal head of a railroad track switch and has three openings 104, 105 and 106 opposite the lens elements 107, 108 and 109 of the light transmitter 100. The light ray 110 from the lamp 93, passing to the left of the extension 97 of the shifter 65, is intercepted by a surface 111 on the bottom of the light transmitter 100 and passes to an upper totally reflecting rear surface 112, where it is reflected and passes out through the lens-like surface 107, as indicated at 113. Rays such as 113 will be projected all the time that the toy track switch is connected in circuit.

A light ray, such as 114 in Figure 5, passing through the shutter opening 98 will fall on a surface 115 deflected upwardly, as indicated at 116, reflected by a rear surface 117 and projected out through the lens area 109, as indicated at 118. When the shifter 65 is moved to the dot-and-dash line position of Figure 5, the light ray 114 is intercepted and light ray, such as 119 Figure 4, falls on the lower surface 120 of the light transmitter, passes up to the reflecting surface 121 and is projected out through the lens area 118 as indicated at 122.

The grounded rail 15 is connected through a strap 77, binding post 80 and wire 83 with two lamps R and G and switch arm 86 of a remote controller C. The lamp R is connected through wire 84, binding post 81, and strap 78 with rail 13, while lamp G is connected through wire 85, binding post 82 and strap 79 with rail 16. Only one lamp will burn at a time and the short circuiting of this lamp by the switch 86 will energize the corresponding solenoid coil 40 or 41 and shift the switch tongue.

It will thus be seen that the shifting of the switch tongue, whether by the approach of a train on a branch track against which the switch has been set, or by the remote controller C, or manually by merely shifting the switch tongue itself, will bring about a change in the light signal sent out by the light transmitter, and the operator can see by looking at the lights which setting is made for the track switch and can thus readily control the switch from a remote point to direct trains as desired from the main track into one or the other of the branch tracks.

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

What is claimed is:

1. A toy unitary railroad track switch having a base, main and branch tracks carried by the base, a shiftable switch tongue carried by the base for guiding trains through either branch track, and means for indicating the position of the switch tongue comprising a lamp socket supported from the base, a lamp bulb therein having a light source, a transparent element opposite the source and having three light incident faces, three surfaces adapted to produce total reflection of rays received through the corresponding incident faces and three light emergent areas opposite the respective reflecting surfaces thereby forming three light paths, and a movable shutter having two positions in one of which it cuts off passage of light from the source through one of the light paths, and in the other of which it cuts off passage of light in another of the light paths.

2. A toy railroad track switch such as claimed in claim 1, having an opaque housing about the transparent element provided with three holes opposite the light emergent areas.

3. A unitary toy railroad track switch having a base, main and branch tracks carried by the base, a shiftable switch tongue carried by the base for guiding trains through either branch track, and means for indicating the position of the switch tongue comprising a light source below an opening in the base, a unitary light transmitter above the opening and including two lower light incident surfaces and two totally reflecting prisms arranged side by side to provide independent light transmitting paths from said source to two light emitting surfaces, a housing about the light transmitter and having openings opposite the light emitting surfaces, and a shutter movable with the switch tongue for selecting one or the other of lower light incident surfaces.

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