

Nov. 20, 1928.

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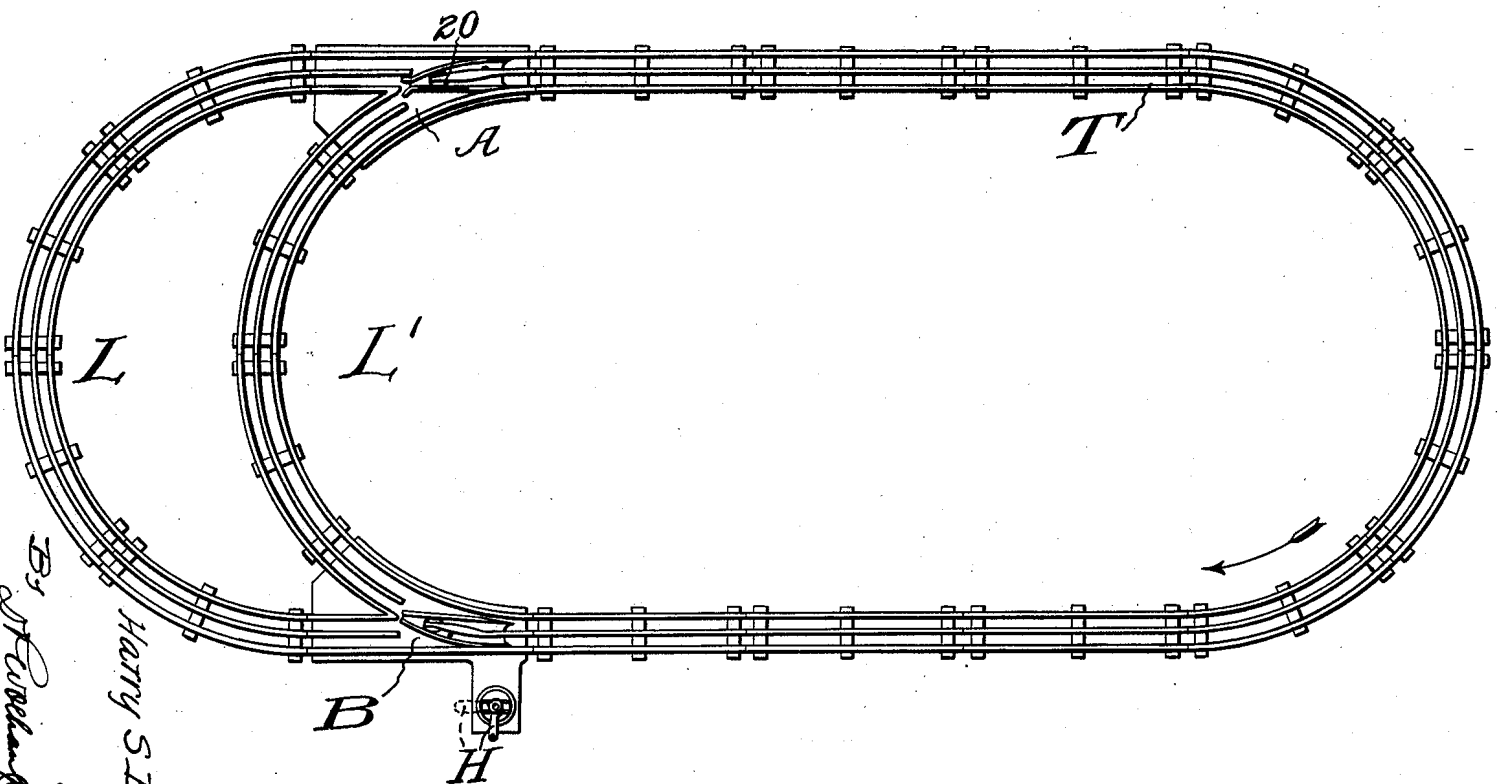
H. S. BECKER

AUTOMATIC SWITCH

Filed Sept. 3, 1926

3 Sheets-Sheet 1

Fig. 1.



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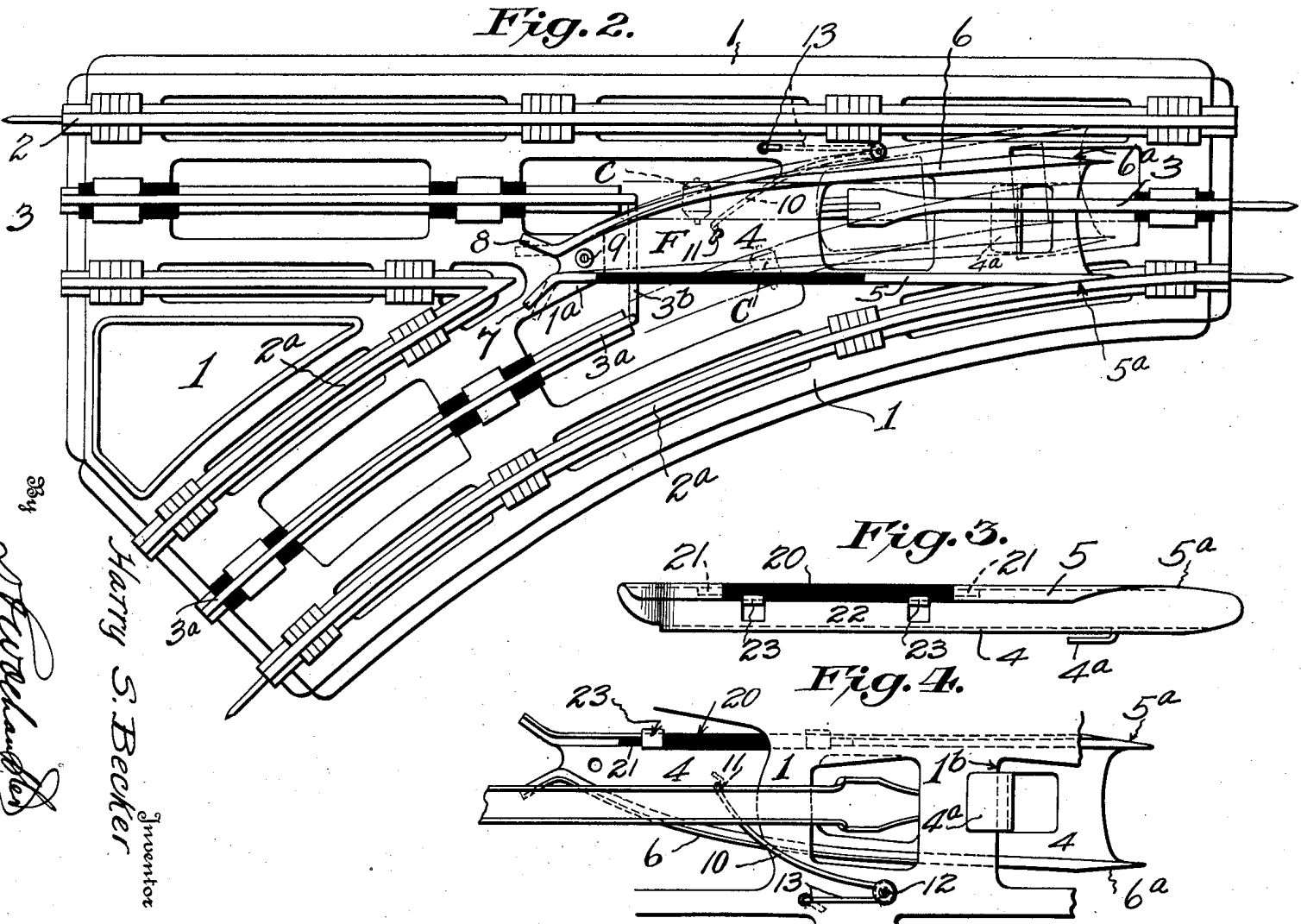
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AUTOMATIC SWITCH

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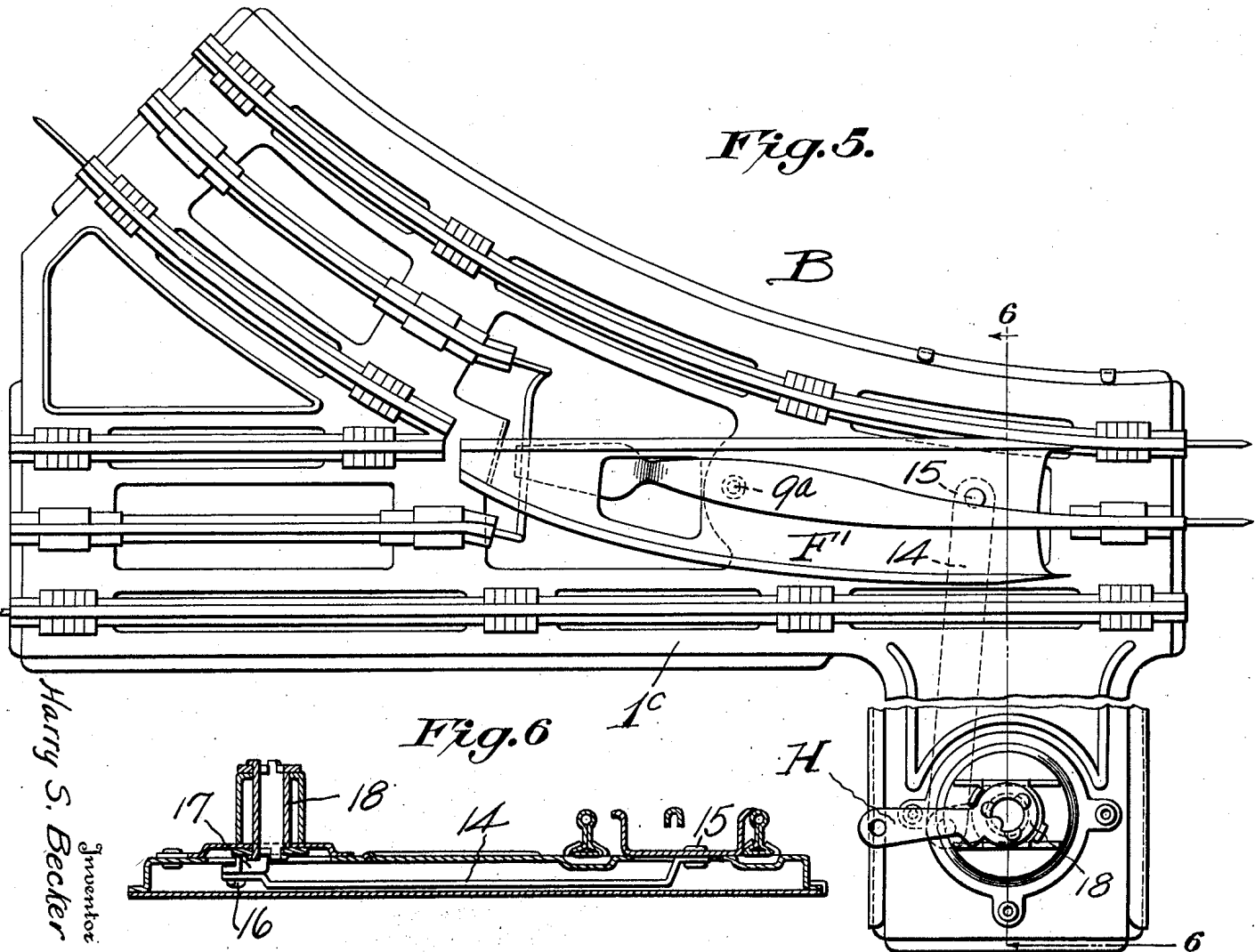
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AUTOMATIC SWITCH

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3 Sheets-Sheet 3



334

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UNITED STATES PATENT OFFICE.

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AUTOMATIC SWITCH.

Application filed September 3, 1926. Serial No. 133,462.

This invention relates to toy railways and more particularly to an improvement in automatic switches.

To that end the invention contemplates a novel switch device adapted to be used in connection with a multiple track loop in such a way as to permit of the train running continuously around the loop without likelihood of being derailed as might happen if the frog was not held true against the rail. That is to say, the invention contemplates a switch including a frog which is yieldingly held against the curved stock rail of the turn-out track section so as to normally provide a straight uninterrupted track-way along the main line.

The invention also contemplates the use of a switch of the type set forth in combination with a manually operated switch having a turn-out section communicating with a curved track leading to the turn-out track of the automatic switch so that when the hand operated switch is set to the curve the train will continuously travel around the smaller or inner loop of the track-way, yet on the other hand when the manually operated switch is set to the straight-away position the train will continuously travel over the larger loop. And, if the locomotive is automatically reversed it may pass back over the automatic switch without danger of derailment. In the latter case, of course, it will be necessary to set the manually operated switch to the straight-away position.

A further object of the invention is to provide a frog having special features of insulation which particularly adapt the same for use in connection with a track system of the third rail type.

With the above and other objects in view which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawings, in which:—

Figure 1 is a diagrammatic view illustrating the application of the invention to a toy track system.

Figure 2 is a top plan view of the improved automatic switch unit.

Figure 3 is a side elevation of the frog

showing the insulated section in the straight track portion of the frog.

Figure 4 is a fragmentary bottom plan view of the automatic switch illustrating the manner in which the spring is connected to the frog.

Figure 5 is a top plan view of the manually operated switch.

Figure 6 is a vertical sectional view taken on the line 6—6 of Fig. 5.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

In carrying the present invention into effect it may be pointed out that the novel automatic switch device designated generally as A is adapted to be used in connection with a track lay-out T including the loops L and L', the loop L' being connected with the main track-way by the automatic switch A and the manually operated switch B, the latter acting as a trailing switch and the former as a facing switch when the train is traveling in the direction of the arrow in Fig. 1. It will therefore be apparent that the present invention contemplates the combination of the automatic switch device A operating in conjunction with a manually operated switch B in such a way that a train may be selectively directed to either the loop L or L' as desired by the operator without giving any attention to the switch A. In the diagram of Fig. 1 the manually operated switch B is set so that the train will continuously travel over the main track-way and inner loop L', but when the handle of the manual switch is turned to the dotted line position shown in Fig. 1 that is, the full line position of Fig. 5 the train will travel over the larger or outside loop L.

The automatic switch A possesses novel features of construction which includes a base 1 for carrying the main track rails 2 and the third rail 3 as well as the curved or lead-in track-way which includes the curved rails 2^a and the third rail 3^a, the latter being connected with the third rail 3 by means of the bridge 3^b shown in Fig. 2.

The frog F is preferably formed from stamped metal and has the flat intermediate web portion 4 and the straight and curved lead rails 5 and 6 respectively formed therefrom by turning up the sides to form webs and rolling the edges to form hollow heads. The said lead rails are mitered at one end as

indicated at 5^a and 6^a to fit flushly against the outside rail 2 of the straight track section and also against the curved stock rail of the lead in section while the opposite ends are provided with the diverging wings 7 and 8 cooperating with the point formed by the junction of the straight and curved rails 2 and 2^a. The web of the frog is pivotally connected to an extension 1^a of the base 1 as indicated at 9; the said pivot being located relatively close to the point of convergence of the lead rails 5 and 6; and the wide end of the web being provided with a turned under part 4^a which slidably fits over the edge 1^b of an opening in the base to hold the frog true and prevent it lifting up.

For the purpose of normally maintaining the frog F in the position shown in Fig. 2, that is, with the straight lead rail 5 in contact with the stock rail 2^a a suitable spring 10 is provided. This spring is preferably bent to form two arms and is positioned beneath the base 1. One arm is connected as indicated at 11 with the web 4 of the frog while its intermediate bent portion fits around a rivet or like abutment 12 on the underside of the base 1 in such a way that the arm 13 thereof may be anchored to the base as indicated at 14. It will thus be apparent that the frog F may be moved from the full to the dotted line position shown in Fig. 2 against the tension of the spring 10. Each time that the frog is moved however, it will be thrust back to the full line position shown in Fig. 2 by the action of the spring 10. The said spring has just enough tension to keep the rail 5 in contact with the stock rail 2^a so that when the train reverses or the direction of travel is opposite to that indicated by the arrow in Fig. 1, the train will not be derailed.

With the arrangement described it will be apparent that the operator of the toy outfit will be able to control the movement of the train through the several loops simply by manipulating the handle H of the manually operated switch B. In this switch (Fig. 5) the frog F' having the straight and curved lead rails is pivoted to the base 1^a of the web of the frog as indicated at 9^a, substantially at the medial portion. The movement of the frog is effected by means of the link 14 which is connected to the web of the frog as indicated at 15 and also connected as indicated at 16 to the crank arm 17 of the rotatable post 18 which carries the handle H. Fig. 1 of the drawings shows the switch B set for the loop L' but Fig. 5 shows the switch set for the loop L, and corresponds to the dotted line position of the handle H in Fig. 1.

The arrangement shown permits of uninterrupted use of the selected loop without the aid of guard rails and not only simplifies the general construction but also simplifies

the selective routing of the train by the operator.

Another feature of the invention particularly useful in connection with track of the electrical third-rail type resides in the provision of the insulating section 20 in the straight lead rail 5 of the frog (see Figs. 2, 3 and 4). This insulation is preferably in the form of a bar or strip having reduced end portions 21 for permitting the insulation to be held in the tubular hollow head portion of the lead rail 5, and also to assist in supporting the strip of insulation the web 22 of the lead rail 5 may be punched out as indicated at 23 to provide supporting clips for the underside of the piece of insulation.

The arrangement and location of the insulation 20 is of particular importance because it provides insulation for the trolley of the locomotive where it is most needed and most effective. That is to say, in order to insure an even travel or speed of the train, it is proposed to insulate one only of the lead rails of the frog, namely, the straight lead rail. When the train is traveling over the track at the switch the trolley thereof, in crossing the lead rails, will necessarily strike the same and temporarily ground the third rail circuit, thus causing a flickering of lights and a reduction in speed of the locomotive. In accordance with the usual custom the trolley consists of two rollers mounted on a leaf spring and adapted to both travel on the third rail. When the locomotive passes through the lead in section it will be apparent that the spaced contact rollers will have a greater period of contact with the straight rail 5 than with the curved rail 6, and if the straight lead rail 5 is not properly insulated the trolley will ground the third rail circuit and slacken up the speed of the train considerably. This is undesirable at the curve, especially, because that is where the locomotive needs the most power due to the greater friction of pulling the train on the curve. Therefore, it is important to insulate the straight lead rail 5 as shown in the drawings so as to avoid a prolonged grounding due to the trolley bridging the insulated current-carrying third rail and the non-insulated track rails which are grounded to the base 1.

Figure 2 of the drawings illustrates in dotted lines the path of travel of the trolley designated as C over the curved and straight lead rails. As will be clear from that figure the trolley C has only a relatively short period of contact with the curved lead rail 6 because when the train is traveling over the straight section of track the trolley strikes the curved lead 6 at a more acute angle. On the other hand however, when the train is traveling into or out of the lead in (or turnout) section of the switch the trolley C has a longer sweep over the straight rail 5, and

hence the necessity of insulating the same to prevent a prolonged grounding which would extinguish the lights and reduce the speed of the locomotive at the curve.

When adding switches to track lay-out it has always been necessary to add more voltage to the train so that when the trolley rollers of the locomotive or cars came in contact with the frog, which is grounded, the train would have sufficient momentum to carry over the ground dead section. Therefore, it is very essential to insulate the one rail of the frog that comes in contact with the trolley rollers for the greatest period of time when the train is switched onto a curve.

From the foregoing it will be apparent that the present invention contemplates a novel switch for toy train outfits having novel features of construction which maintain it in proper relation to the main and curved track sections, and also provide for a more practical and continuous operation of the train when coming out or going into a curve.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:—

1. A switch for toy electric railways including a base, a straight and curved track section including turn-out and stock rails mounted on the base, a frog including straight and curved lead rails pivoted to the

base adjacent its narrow end, a spring mounted at the underside of the base and consisting of spring arms, means for anchoring the spring to the base at the junction of the arms, one of said arms engaging with the frog and the other of said arms engaging with the base.

2. In a switch for toy electric railways, a frog member comprising a metallic body including a web portion formed at one edge with a continuous curved metallic bead constituting a rail head and formed at the other edge with an upstanding straight bead forming a hollow rail head and a portion of said latter rail head being cut away, an insulation insert adapted to be placed in said cut out portion, and means struck out from the web of the rail for securing said insulation insert in place.

3. A switch for toy electric railways including a metallic base, straight and curved track sections including turn out and stock rails mounted on the base, a frog including straight and curved lead rail sections formed at opposite edges of a web portion, means for pivoting the web portion of the frog to the base, a spring for controlling the frog, and the lead rails of said frog having hollow head portions, and one of said lead rails being cut away at its medial portion and provided with clips struck outwardly and upwardly from the web thereof, and a cylinder insulation member reduced at its ends and fitting into the hollow head portions of said rails and having the body portion thereof engaged by said clips.

In testimony whereof I hereunto affix my signature.

HARRY S. BECKER.