June 10, 1930. L. E. NORDHOLM 1,762,789

CIRCUIT CONTROLLER

Filed Aug. 1, 1929 2 Sheets-Sheet 1

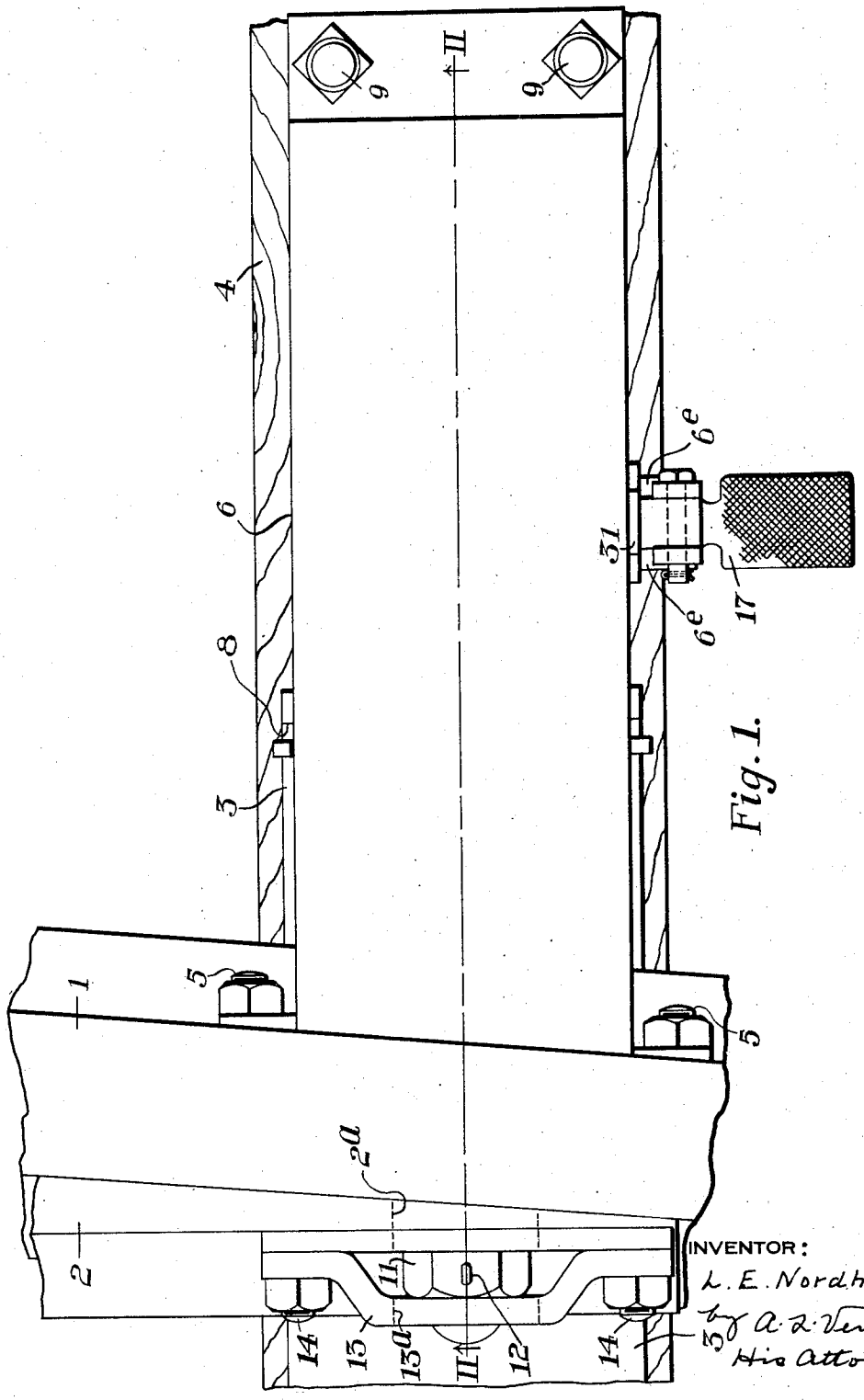


Fig. 1.

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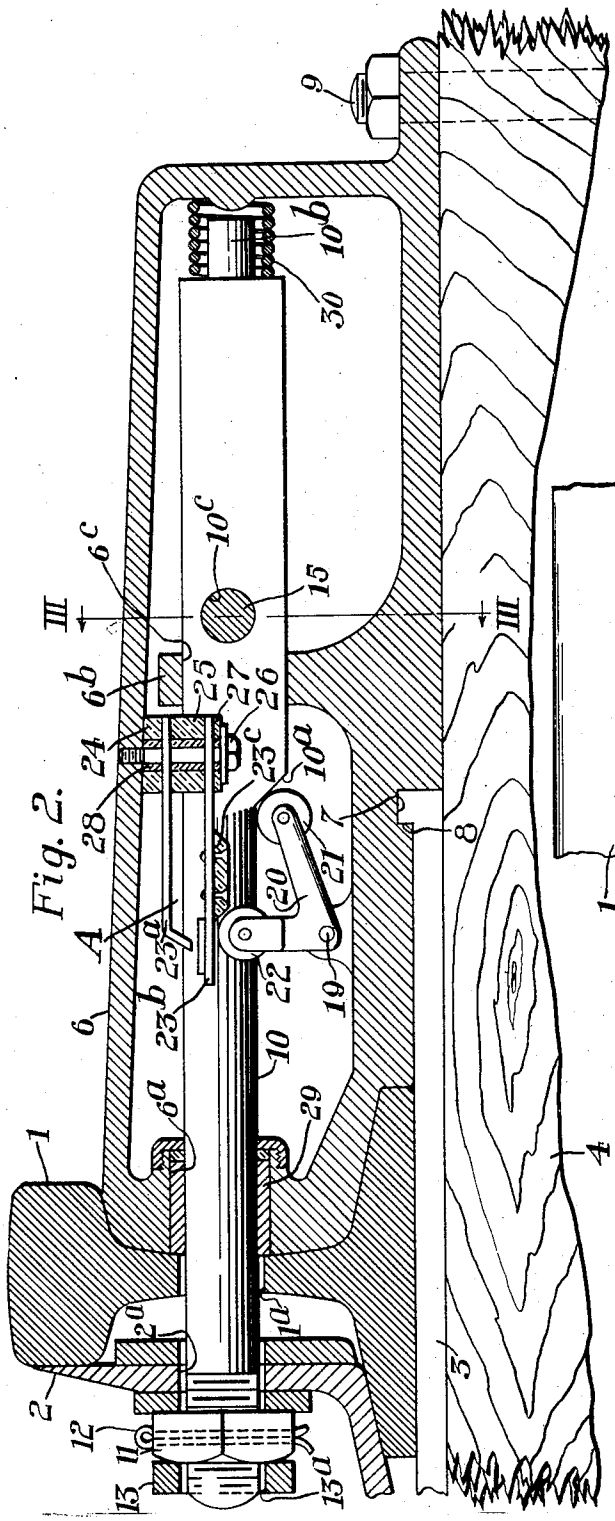


Fig. 2.

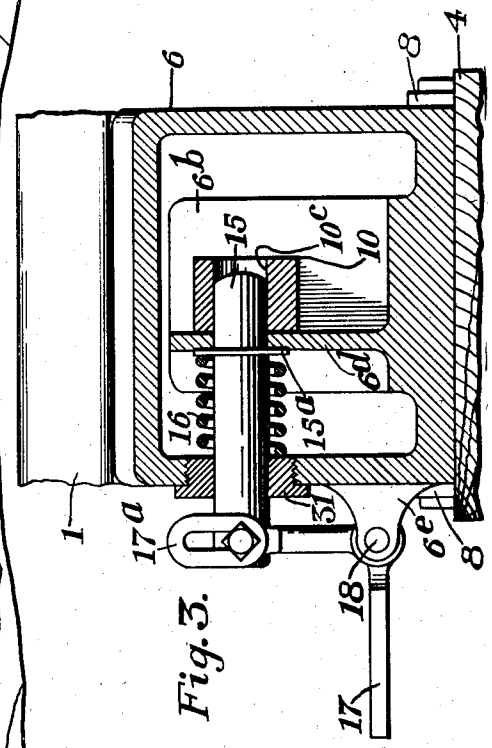


Fig. 3.

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UNITED STATES PATENT OFFICE

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CIRCUIT CONTROLLER

Application filed August 1, 1929. Serial No. 382,808.

My invention relates to circuit controllers, and particularly to circuit controllers adapted for use in connection with railway switches. Circuit controllers of this type usually include a contact which is responsive to the position of a movable point of the switch with respect to a fixed rail of the switch. One feature of my invention is the provision of a circuit controller of improved design which serves also as a switch lock and a rail brace in addition to performing the usual contact operating functions.

I will describe one form of circuit controller embodying my invention, and will then point out the novel features thereof in claims.

In the accompanying drawings, Fig. 1 is a top plan view showing a portion of a railway switch provided with one form of circuit controller embodying my invention. Fig. 2 is a sectional view on the line II—II of Fig. 1. Fig. 3 is a sectional view on the line III—III of Fig. 2.

Similar reference characters refer to similar parts in all three views.

Referring first to Figs. 1 and 2, the reference character 1 designates a fixed rail, and the reference character 2 designates a movable switch point of a railway switch, the rail 1 and switch point 2 being mounted on a tie plate 3 secured to a crosstie 4 in the usual manner. When the switch occupies one extreme position, the switch point 2 engages the fixed rail 1 as illustrated in the drawing, but when the switch is reversed, the switch point 2 is moved out of engagement with the rail 1. The means for reversing the switch forms no part of my invention and therefore is not shown in the drawing.

Associated with the rail 1 and switch point 2 is a housing 6, the left-hand end of which is shaped to snugly engage the rail 1 as best seen in Fig. 2, and which is securely fastened to the rail 1 by any suitable means, as by bolts 5 extending through the rail 1 and through suitable lugs formed on the housing 6 (see Fig. 1). The right-hand end of the housing 6 is secured to the crosstie 4 by means of bolts 9, while the underside of the housing is engaged by the upset end 8 of the tie plate 3, which end enters a transverse groove 7 in the housing. It will be seen that due to the shape and heavy construction of the housing 6, and to the method of fastening the housing 6 to the tie and to the rail 1, the housing acts as a brace for the rail 1, and prevents tipping or lateral displacement of the rail.

The housing 6 contains a lock rod 10 which is slidably mounted in a rectangular hole 6^c formed in an upright member 6^b of the housing 6, and in a bushing 29 located in an aperture 6^a in the end of the housing 6 adjacent the rail. The lock rod 10 extends through a hole 1^a in the rail 1 and through an elongated opening 2^a in the switch point 2, and is threaded at its end to receive a nut 11 which is held in place by a cotter pin 12. Both the hole 1^a and the opening 2^a are coaxial with the aperture 6^a in the housing 6. A strap 13 provided with an elongated slot 13^a similar to the opening 2^a in the switch point 2, is bent over the nut 11 with the slot 13^a receiving the tip of the lock rod 10, as best seen in Fig. 1. This strap is secured to the switch point 2 by means of bolts 14. It will be noted that since the hole 2^a in the switch point 2 and the hole 13^a in the strap 13 are both elongated, the switch point 2 may shift parallel to the fixed rail 1 for a considerable distance without causing binding between the lock rod 10 and the housing 6, but that any movement of the switch point with respect to the fixed rail is communicated directly to the rod 10.

Means are provided for automatically locking the lock rod 10 to prevent accidental movement of the switch point 2 when the switch point 2 engages the fixed rail 1. Referring now also to Fig. 3, these means comprise a locking plunger 15 which is adapted to enter a hole 10^e in the lock rod 10. The locking plunger 15 is supported by a bushing 31 screwed through the side wall of the housing 6 and by an upright integral member 6^d on the inside of the housing, and is constantly urged into engagement with the lock rod 10 by means of a spring 16 which surrounds the locking plunger be-

tween the side wall of the housing and a shoulder 15[a] formed on the locking plunger 15. The outer end of the locking plunger is pivotally attached to the upwardly extending arm 17[a] of a pedal 17 which in turn is pivotally supported on a pin 18 carried by a pair of lugs 6[e] formed on the side of the housing 6. It will be apparent that when the pedal 17 is depressed, the plunger 15 is withdrawn from the hole 10[c] in the lock rod 10 so that the lock rod 10 is then free to move.

The lock rod 10 operates a contact mechanism A of any suitable type. As here shown a bell crank 20 is pivotally attached at 19 to the housing 6, and is provided with two rollers 21 and 22. The contact mechanism A, as here shown, comprises a movable contact finger 23[b], and a fixed contact finger 23[a]. The contact fingers 23[a] and 23[b] are spaced from each other by an insulating block 25 and are fastened to the housing 6 by means of a stud 26. An insulating block 24 is interposed between the housing 6 and the contact finger 23[a] and an insulating washer 27 is interposed between the head of the stud 26 and the contact finger 23[b]. Furthermore, an insulating sleeve 28 surrounds the shank of the stud 26 so that the contact fingers are completely insulated from each other and from the housing 6. The roller 21 on crank 20 coacts with a sloping surface 10[a] formed on the lower side of the lock rod 10, while the roller 22 co-acts with an insulating member 23[c] fastened to the contact finger 23[b]. The parts are so proportioned that when the switch point 2 is moved away from the fixed rail 1, so that the lock rod 10 is moved toward the left, as viewed in Fig. 2, the surface 10[a] of the lock rod 10 will engage the roller 21 and rotate the crank 20 in a clockwise direction, thereby moving the roller 22 into engagement with the member 23[c], and thus closing the contact 23[a]—23[b] of contact mechanism A.

A coil spring 30 is interposed between the right-hand end of the lock rod 10 and the housing 6 and is held in place by an extension 10[b] of the lock rod 10. The spring 30 is so proportioned that if the left-hand end of the lock rod should become broken or disconnected from the switch point 2 for any reason while the point 2 engages rail 1, the spring would force the lock rod toward the left a sufficient distance to operate the contact mechanism A.

The operation of the circuit controller is as follows: When the switch point 2 is in engagement with the rail 1, the parts occupy the positions in which they are illustrated in the drawing, that is, the contact 23[a]—23[b] of contact mechanism A is open and locking plunger 15 engages the lock rod 10 at the hole 10[c] so that switch point 2 is securely held against the fixed rail 1. If, now, it is desired to reverse the switch, pedal 17 must first be operated to withdraw locking plunger 15 from the hole 10[c] in the lock rod 10, after which the switch may be operated, as by the usual manually controlled switch stand. When the switch point is moved away from the fixed rail, the lock rod 10 is moved to the left as viewed in Fig. 3, and contact 23[a]—23[b] of contact mechanism A becomes closed. When the switch is next returned to its normal position, the contact 23[a]—23[b] is opened, and lock plunger 15 is forced into the hole 10[c] in the lock rod 10 by means of the spring 16.

The contact mechanism A may be utilized to control any suitable apparatus, such for example, as the signals which control traffic over the switch of which the rail 1 and switch point 2 form a part.

One advantage of a circuit controller embodying my invention is that, since the housing 6 is securely fastened to the rail 1, any change in the relative position of the switch point 2 with respect to the fixed rail 1 will operate the contacts of the circuit controller.

Although I have herein shown and described only one form of circuit controller embodying my invention, it is understood that various changes and modifications may be made therein within the scope of the appended claims without departing from the spirit and scope of my invention.

Having thus described my invention, what I claim is:

1. In combination with a railway switch comprising a fixed rail and a movable switch point, a housing fastened to the fixed rail, a movable lock rod in said housing operated by said movable switch point, and manually operable means for at times preventing relative movement of said lock rod and said housing.

2. In combination with a railway switch comprising a fixed rail and a movable switch point, a housing fastened to the fixed rail, a movable lock rod in said housing operated by said movable switch point, manually operable means in said housing for at times engaging said lock rod to prevent movement of said lock rod, and a contact mechanism controlled by said lock rod.

3. In combination with a railway switch comprising a fixed rail and a movable switch point, a housing fastened to said fixed rail, a movable lock rod in said housing connected with said movable switch point and provided with a hole, and a manually operable locking plunger in said housing for at times entering said hole to prevent movement of said lock rod with respect to said housing.

4. In combination with a railway switch comprising a fixed rail and a movable switch point, a housing fastened to said fixed rail opposite said switch point and provided with an aperture in the end adjacent said

rail, said rail being provided with a hole and said switch point being provided with an opening both of which are co-axial with the aperture in said housing; a lock rod mounted to slide in said housing and extending through said aperture, said hole, and said opening, and fastened to said switch point; manually operable means in said housing for at times engaging said lock rod to prevent movement of said lock rod, and a contact responsive to the position of said lock rod with respect to said housing.

5. In combination with a railway switch comprising a fixed rail and a movable switch point, a rigid housing fastened to said fixed rail opposite said switch point and provided with an aperture in the end adjacent said rail, said rail being provided with a hole and said switch point being provided with an opening both of which are co-axial with the aperture in said housing; a lock rod mounted to slide in said housing and having a threaded end extending through said aperture, said hole, and said opening; a nut screwed on the threaded end of said rod, a strap bent over said nut and provided with an elongated slot to receive the end of said rod and attached at both ends to said switch point for fastening said rod to said switch point, and means for at times engaging said lock rod to prevent movement of said switch point.

6. In combination with a railway switch comprising a fixed rail and a movable switch point mounted on a tie plate secured to a crosstie, a housing fastened at one end to said rail opposite said movable switch point and at the other end to said tie and provided on its underside with a groove, said tie plate being provided with a bent up end which enters said groove, a movable lock rod in said housing operatively connected with said switch point, manually controlled means in said housing for at times engaging said lock rod to prevent movement of said switch point, and a contact responsive to the position of said lock rod.

7. In combination with a railway switch comprising a fixed rail and a switch point movable toward and away from said fixed rail on a tie plate secured to a crosstie and extending underneath said fixed rail, a rigid housing secured at one end to the side of said rail opposite said switch point and at the other end to said crosstie and provided with a groove on its underside and with an aperture in its end adjacent said rail, said rail being provided with a hole and said switch point being provided with an elongated opening both of which are co-axial with the aperture in said housing, an upset end on said tie plate fitting in said groove for preventing lateral motion of said rail with respect to said tie, an upright member in said housing provided with a hole aligned with said aperture, a bushing in said aperture, a lock rod mounted to slide in said bushing and in the hole in said upright member and extending through the hole in said rail and the elongated opening in said switch point and provided with a hole, a nut screwed on said rod and abutting against said switch point, a strap bent over said nut and provided with an elongated slot to receive the end of said rod and attached at both ends to said switch point for fastening said rod to said switch point, a bell crank provided with two rollers, means for pivotally attaching said crank to said housing in such manner that said crank is rotated by engagement of one of said rollers with said lock rod when said switch point is moved away from said fixed rail, a contact operated by the other roller of said crank when said crank is rotated, a locking plunger mounted to slide in said housing and adapted to at times enter the hole in said lock rod to prevent movement of said switch point, a spring for constantly urging said locking plunger into engagement with said lock rod, and a pedal pivotally attached to said housing and operatively connected with said locking plunger for at times withdrawing said plunger from the hole in said lock rod.

8. In combination with a railway switch comprising a fixed rail and a movable switch point, means including a crosstie for supporting said switch, a housing rigidly attached to said rail opposite said movable point and also fixed to said crosstie, a lock rod attached to said movable point and extending into said housing, and means for at times locking said rod against relative movement with respect to said housing.

9. In combination with a railway switch comprising a fixed rail and a movable switch point, means including a crosstie for supporting said switch, a housing rigidly attached to said rail opposite said movable point and also fixed to said crosstie, a lock rod attached to said movable point and extending into said housing, and contact mechanism responsive to the relative position of said lock rod and said housing.

In testimony whereof I affix my signature.

LEON E. NORDHOLM.