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2,641,690

TRACK SWITCH

Filed March 29, 1948

3 Sheets-Sheet 1

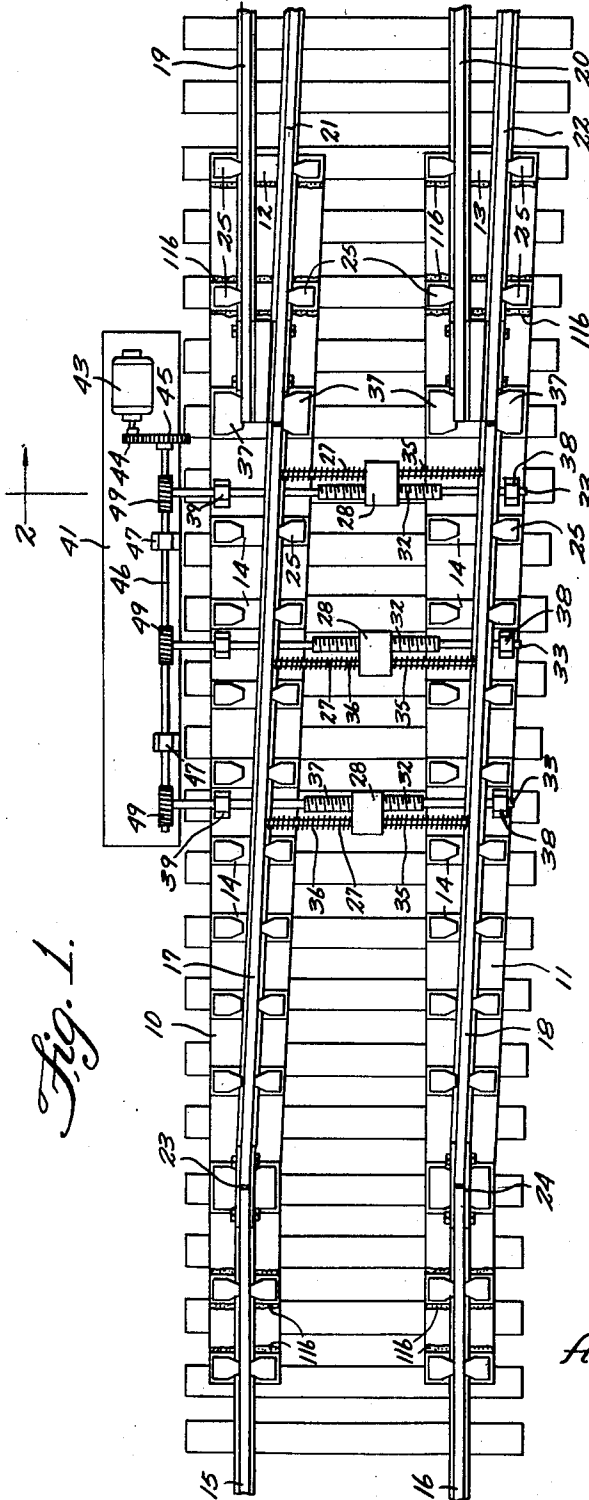
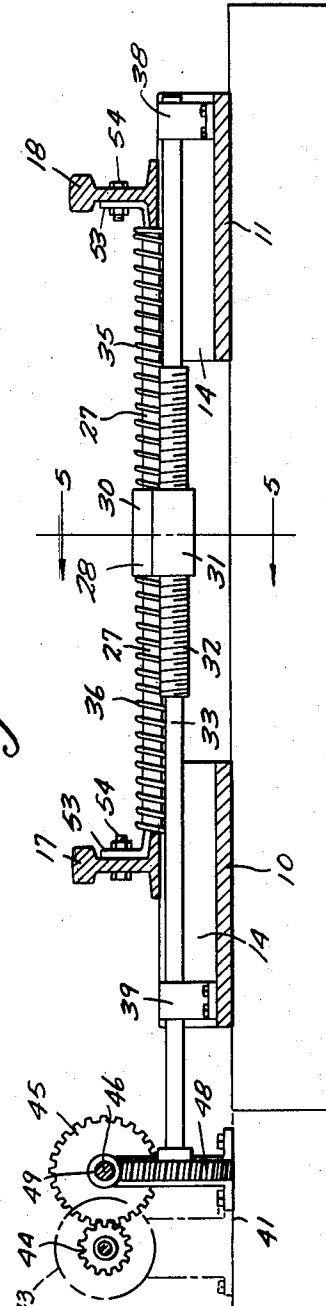


Fig. 2.



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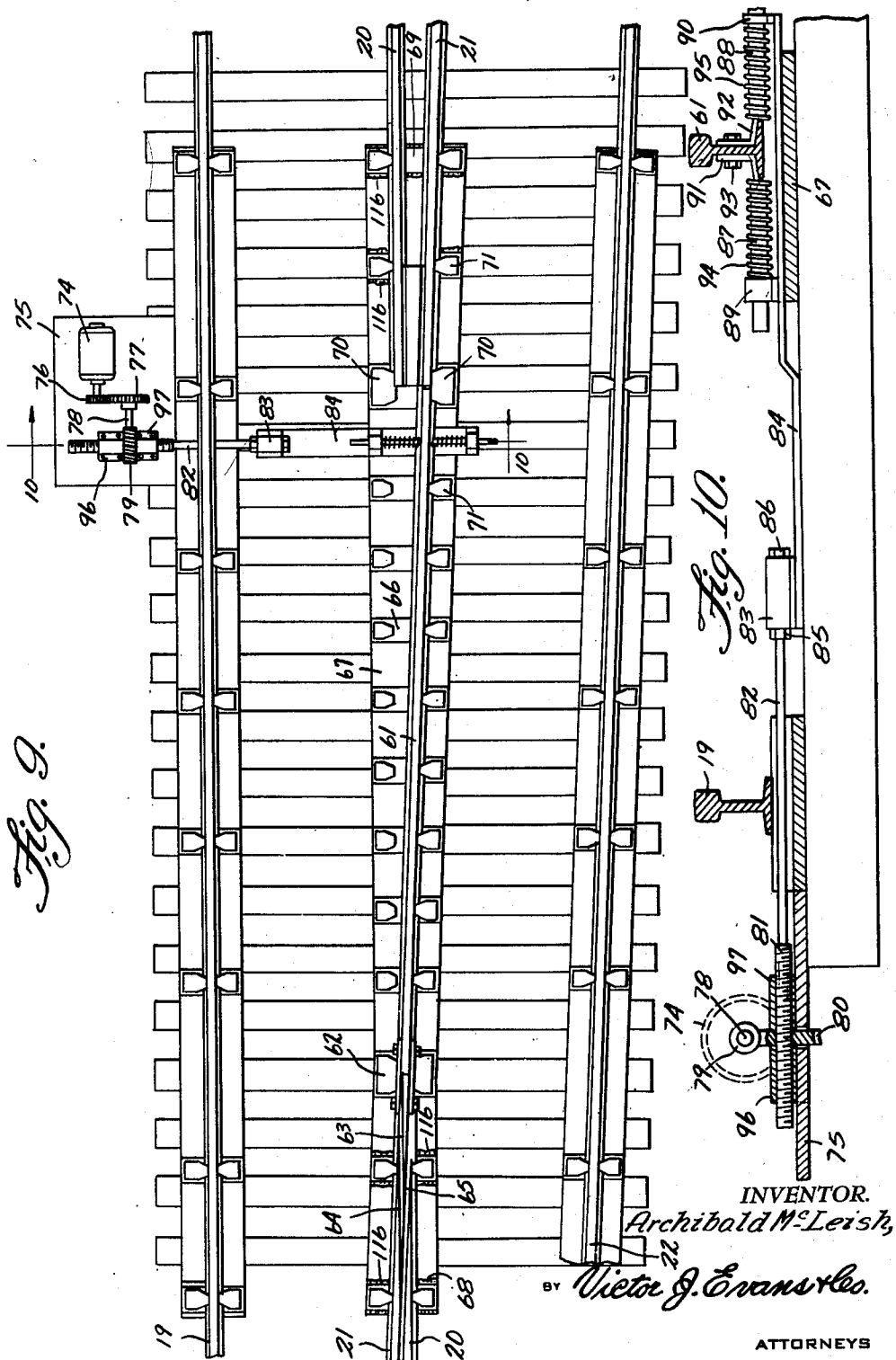
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UNITED STATES PATENT OFFICE

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TRACK SWITCH

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2 Claims. (Cl. 246-240)

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This invention relates to railroad track switches.

It is an object of the present invention to provide a railroad track switch which is operated by an electric motor located at the switch and controlled from a distant point wherein the operating parts are positive in operation, free of lost motion, and connected to the movable track parts through a heavy spring device to cushion any overrun of the operating parts.

It is another object of the present invention to provide a switch operating mechanism with which engagement is made with the track at different distances along its length and wherein the connections are such that the difference in movement from one point to the other is compensated for, whereby to provide an arrangement having multiple connections with the moving portions of the track and to render the control mechanism more safe.

Other objects of the present invention are to provide a track switch construction which can be operated from a distance, which is simple, inexpensive to manufacture, of minimum parts, rugged and sturdy and efficient in operation.

For other objects and for a better understanding of the invention, reference may be had to the following detailed description taken in connection with the accompanying drawing, in which

Fig. 1 is a top plan view of a track construction applying a switch with control mechanism embodying the features of the present invention.

Fig. 2 is a sectional view taken through the track construction and generally on line 2-2 of Fig. 1.

Fig. 3 is a fragmentary and detail sectional view taken through the connection of one of the tie members with the rail.

Fig. 4 is a fragmentary and sectional view taken generally on line 4-4 of Fig. 3.

Fig. 5 is a transverse sectional view taken on line 5-5 of Fig. 2.

Fig. 6 is a sectional view taken through the track and looking upon one of the guide elements, the view being taken on line 6-6 of Fig. 7.

Fig. 7 is a fragmentary plan view looking down upon the track and upon the guide elements.

Fig. 8 is a wiring diagram of the control circuit utilized with the construction shown in Figs. 9 and 10 employing a single reversible motor.

Fig. 9 is a fragmentary plan view of a section of a track with control mechanism for adjusting one rail, and showing the point where the inner rail of a spur crosses the inner main rail after leaving a switch.

Fig. 10 is a transverse sectional view taken on line 10-10 of Fig. 9.

Referring now to the drawings wherein like reference characters denote corresponding parts

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the railroad switch of this invention includes elongated tapering base or sole plates 10 and 11, which are provided with cross bars 12 and 13 at the wide ends that are welded to the permanent rails after the switch is installed, and intermediate cross bars 14 on which the movable rail sections slide. The narrow ends of the base plates are also welded to the ends of the main line rails 15 and 16 that are hinged to the switch rails 17 and 18, and the rails 17 and 18 are adapted to register with main line rails 19 and 20 at the opposite side or with the spur rails 21 and 22. The ends of the rails 15 and 16, and 17 and 18 are connected by the usual switch rail connectors 23 and 24, as shown in Figure 1. Bumpers 37 are provided at opposite sides of the rails 19 and 21, and 20 and 22 to assure registration of the rails.

The rail sections 17 and 18 are slidably mounted on the cross bars 14 and rail engaging lugs 25 extending upward from base flanges 26 are provided on the ends of the cross bars to properly position the rails in the main operating and switching positions.

The switch rails 17 and 18 are connected at a plurality of points by transverse bars 27 on which travelers 28 are mounted through openings 29 in hubs 30 and the travelers are provided with threaded sleeves 31 through which screws 32 on transverse shafts 33, that extend under the rails, are held. The travelers are maintained in the center of the track by springs 35 and 36 on the bars 27, as shown in Figure 2. The shafts 33 extend across under the rails and the ends are mounted in bearing blocks 38 and 39 that are carried by the base plates 10 and 11, respectively.

At one side of the track is a base 41 on which an electric motor 43 is mounted, and the motor is provided with a pinion 44 that meshes with a gear 45 on a longitudinally extending shaft 46 which is journaled in bearings 47 on the base 41. Worm gears 48 are provided on the ends of each of the shafts 33 on which the screws 32 are mounted, and these worm gears mesh with worms 49 on the shaft 46 so that as the shaft 46 is rotated by the motor the screws actuate the travelers 28 and with the pitch of the thread of the screws 32 gradually increasing on each screw toward the outer ends of the rails to compensate for the different distances from the pivots of the rails, the pressure will be equalized along the rails. Although one reversible motor is shown in the drawings, it is to be understood that two motors may be used so that one may be removed for repairs.

The ends of the transverse rods 27 are provided with threaded sockets 51 into which threaded studs 52 on brackets 53 are threaded as shown in Figure 3, and the brackets are secured to the rails by bolts 54.

The inside rail 21 of the spur crosses the rail 20 at a point remotely situated from the switch and, as illustrated in Figures 9 and 10, a hinged rail 61 is provided at the intersection of the rail 21 with the main rail 20, with the movable end of the rail 61 adapted to register with the converging ends of the rails 20 and 21. The rail 61 is hinged by a connector 62 to a point 63 which is provided with a groove 64 on the inner side of the rail 20 for the wheel flange, and also a groove 65 for the wheel flange on the inside of the rail 21. The rail 61 is carried on cross bars 66 similar to the bars 14, on a base plate 67, the ends of which are welded to the ends of the rails 20 and 21 through cross bars 68 and 69. The base plate 67 is also provided with bumpers 70, similar to the bumpers 37, which are positioned to be engaged by the movable end of the rail 61, and the cross bars are provided with shoulder brackets formed by lugs 71, similar to the lugs 25, shown in Figure 6, to stop and grip the rail 61 in either position. These shoulder brackets may be used throughout the length of the plate, and may also be used on side plates 72 and 73, as shown in Figure 9.

The rail 61 is actuated by a motor 74 on a base 75 at one side of the track, and the motor is provided with a pinion 76 that meshes with a gear 77 on a shaft 78. The shaft is provided with a worm 79 that meshes with a worm gear 80 that is threaded on a screw 81 on a rod 82 which passes under the rail and is secured in a socket 83 on a tie plate 84 by lock nuts 85 and 86, as shown in Figure 10. The tie plate 84 extends under the rail 61 and over the base plate 67, and the ends of rods 87 and 88 are slidably held in bearings 89 and 90 on the end of the plate. The inner ends of the rods 87 and 88 are connected to brackets 91 and 92, that are secured to the rail 61 by bolts 93, similar to the brackets 53 shown in Figure 3. The rods 87 and 88 are provided with springs 94 and 95 that provide cushions and resiliently hold the rail centrally positioned between the bearings. The screw 81 is journaled in bearings 96 and 97 at the sides of the worm gear 80, and it will be understood that a plurality of units may be used along the rail 61 as illustrated in the design shown in Figure 1.

In this design a single reversible motor 74 is used, and as illustrated in the wiring diagram shown in Figure 8, the motor may be actuated by push buttons 100 or 101 to run in either direction. The motor is provided with a field winding 102 and a reversing switch 103 which is actuated by solenoids 104 and 105 that are connected to switches 106 and 107 positioned at the extreme positions of the rail 61. The switches are provided with arms 108 and 109 that are positioned to be engaged by the rail 61 as it reaches the end of its movement toward each side wherein a circuit is closed to energize a solenoid associated with the switch to stop the motor and reverse the connections to the winding thereof so that when a circuit is closed again the motor will rotate in the opposite direction. Similar switches and controls are provided for the switch shown in Figure 1, which is connected in the same circuit so that the motor will automatically stop when the switch rail reaches the end of the movement, and the motor will be set to run in the opposite direction. The switches and solenoids are connected to a suitable source of power by wires 110 and 111,

and the motor is also connected to a source of current by wires 112 and 113. Switches 114 and 115 are provided in the motor circuit which are positioned to be actuated by the solenoids to open and close the circuit as the solenoids are energized, and particularly to open the circuit and stop the motor as the rail reaches the end of its movement.

The motor wires 112 and 113 are connected by wires 117 and 118 to the motors 42 and 43 of the main switch, illustrated in Fig. 1, whereby the operation of the switch and rail 61 are synchronized.

The switch is adapted to be installed in the main line or other track of a railroad, and in making the installation the ends of the rails of the track and spur are welded to the base plates through the cross bars as indicated at the points 116 in Figures 1 and 9, and the other parts are connected as shown and described.

It will be understood that changes may be made in the design and arrangement of the parts without departing from the spirit of the invention.

I claim:

1. In a railroad switch, the combination which comprises rail sections positioned in openings between spaced ends of rails, sole plates positioned under the said rail sections and rails and permanently connected to the said rails, connecting elements retaining the rail sections on the sole plates and positioned to provide lateral travel of said rail sections, a transversely disposed rod connecting said rail sections at one end, a traveller positioned on said transverse rod, springs on opposite sides of the traveller for urging the traveller to a point midway between the rails, a threaded bar extended through the said traveller, and means rotating the said threaded bar to actuate the said rail sections.

2. In a railroad switch, the combination which comprises rail sections positioned in an opening between spaced ends of rails, sole plates positioned under the rail sections and rails and permanently connected to the said rails, retaining elements holding the rail sections on the sole plates and positioned to provide lateral travel of the said rail sections, a plurality of transversely disposed rods connecting the said rail sections spaced from one of the ends thereof, springs on the said transversely disposed rods, travellers freely slidable on the transversely disposed rods and positioned between the springs, threaded bars extended through said travellers, a motor and suitable transmission means for rotating the said threaded bars by the motor.

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