N. T. SHAW.

ELECTRIC SWITCH OR SIGNAL CONTROLLING APPARATUS.

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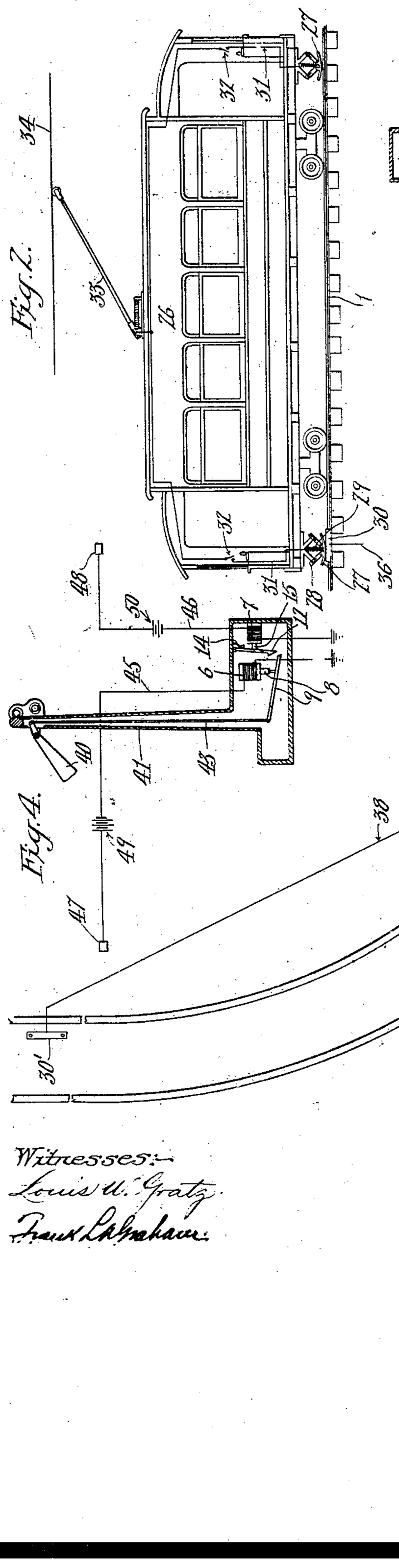

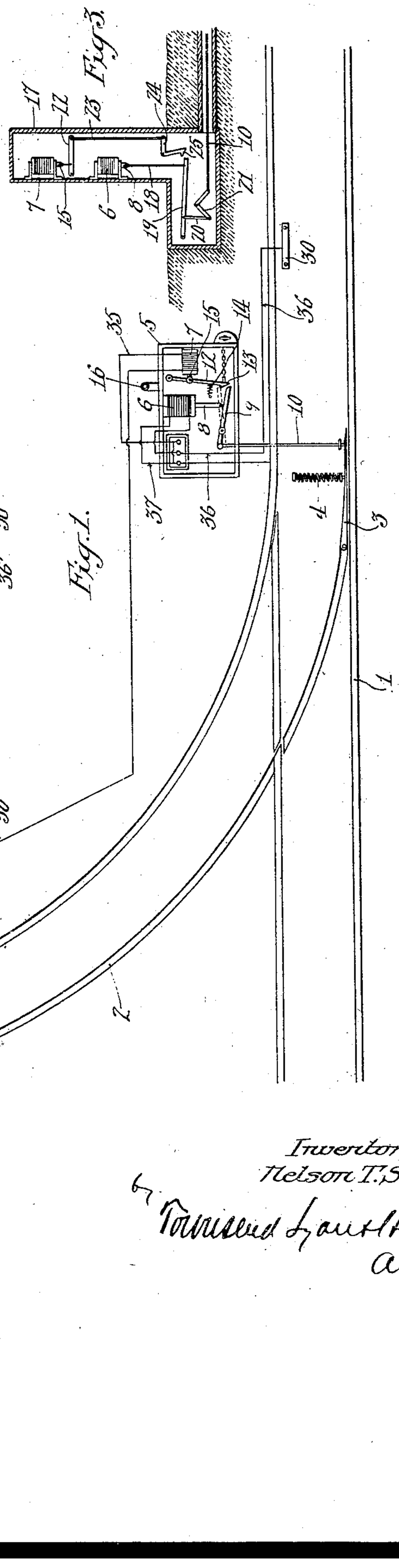

Witnesses:-
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UNITED STATES PATENT OFFICE.

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ELECTRIC SWITCH OR SIGNAL CONTROLLING APPARATUS.

No. 916,039. Specification of Letters Patent. Patented March 23, 1909.

Application filed March 14, 1908. Serial No. 421,261.

To all whom it may concern.

Be it known that I, NELSON TOWNE SHAW, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Electric Switch or Signal Controlling Apparatus, of which the following is a specification.

This invention is intended particularly for the operation of the switches of railways, for example, street railways, the object of the invention in that connection being to provide means for operation of a switch, in opening and closing the same, by the motorman, without necessity of his leaving the car.

The invention, in some of its features, is also applicable for the operation of electric railway signaling devices, for example, semaphores in block signaling apparatus.

In the accompanying drawings:—Figure 1 is a plan of a railway track at a switch or turnout, showing the switch operating means thereat, the cover of the containing case thereof being removed to show the interior parts. Fig. 2 is a diagrammatic section of the car, showing the contact means thereon for controlling the operation of the switch. Fig. 3 is a vertical section of a preferred construction and arrangement of the switch operating means. Fig. 4 is a sectional elevation of a semaphore for a block signal provided with my invention, the controlling circuits thereof being shown diagrammatically.

Referring to Fig. 1, 1 designates the main track or railway line and 2 a branch thereof, a movable switch or tongue 3 being provided to turn the car from the main to the branch line. A spring 4 operates on the switch to normally hold the same open, so that the car will continue on the main line. The switch operating means may be inclosed in a case 5 located adjacent to the track and containing a switch operating electromagnetic means or solenoid 6 and a retaining electromagnetic means or solenoid 7. The armature or core 8 of solenoid 6 is connected to a lever 9 and a link or rod 10 connects this lever with the switch tongue 3 so that energization of solenoid 6 will, through the core 8, lever 9 and rod 10, push the switch tongue to closed position to turn the car onto the branch 2. A locking or retaining lever 12 is pivoted in the case and has a hook 13 engaging with the lever 9 when the latter is operated by core 8, to hold said lever in such operated position, a spring 14 acting on the retaining lever 12 to cause its engagement with the lever 9, and the ends of levers 9 and 12 being beveled to enable the lever 9 to press the lever 12 back until lever 9 passes the hook. Lever 12 is connected to the core 15 of solenoid 7. The case 5 containing the above described apparatus may be buried in the ground alongside the track and provided with a suitable vent as indicated at 16, but it is preferred to mount the solenoids 6, 7 in such manner that they will be out of the reach of water, and for this purpose the case is preferably provided with an upward extension, as shown at 17 in Fig 3, the solenoids 6 and 7 being mounted in this upward extension and the core 8 of solenoid 6 being connected by link or rod 18, lever 19, link 20 and bell crank 21 to the operating rod 10 for the switch, the core 15 of solenoid 7 being connected by lever 22 and rod 23 to a bell crank lever 24, one arm of which is formed with a hook 25 to engage the lever 19 and lock the same in operated position.

The car, indicated at 26 in Fig. 2, is provided with means for closing circuit to the above described electric operating devices for operation thereof by any suitable electromotive supply, for example, from the main line or trolley connection, in case of an electric car. For this purpose a shoe 27 is supported by toggles 28 and depressed by a spring 29 to position for engaging a fixed contact block 30 or 30′ suitably located in the bed of the car track, this shoe being connected by a circuit 31, including a switch 32, to the trolley 33. A shoe 27 is preferably provided at each end of the car. An insulated contact block 30 is located in the bed of the track on the main line somewhat in advance of the switch to be operated and connected to one terminal of the solenoid 6 by wire 36, and another insulated contact block 30′ is located in the bed of the track along the branch on which the car is to be turned and at any desired distance from the switch, for example, around the curve or partly around the curve from the switch and is connected by wire 38 to one terminal of solenoid 7. The other terminals of solenoids 6 and 7 are grounded by wires 35 and 37.

The operation is as follows:—The switch or circuit controller 32 on the car is normally open and if the car passes over the main line with the circuit controller in this position, there is no action on the railway switch. If the motorman desires to

pass on the branch line he will close the circuit controller 32 before the car reaches the contact block 30 in the track, so that when the contact shoe 27 runs on said contact block 30 a circuit will be established from the trolley line 34 through trolley 33, circuit 31, through switch 32 to shoe 27 and contact block 30, thence by wire 36 to solenoid 6 and by wire 37 to ground. The solenoid 6 thus energized, operates through the connections 8, 9 and 10 as shown in Fig. 1, (or through the connections 18, 19, 20 and 21 as shown in Fig. 3), to move the switch tongue over to position for turning the car onto the branch line. As the car passes off the main track onto the branch track, and after it has fully left the main track, the contact shoe 27 will pass onto the contact block 30′ in the track bed establishing connection from trolley 33 through circuit 31, shoe 27, contact block 30′, wire 38 to releasing solenoid 7, thus operating lever 12 to disengage it from lever 9, or, in the form shown in Fig. 3, operating lever 24 to disengage it from lever 19, allowing the railway switch to be turned to open position by its spring 4.

The invention is applicable in connection with railway semaphore signals as shown in Fig. 4, where 40 designates the semaphore mounted on a column or pole 41, the lever 9 of solenoid 6 being connected to operate the operating rod 43 for the semaphore, and lever 12 being adapted to lock the lever 9 in operated position and to be released by solenoid 7, as above described. In this case the solenoids 6 and 7 are connected in two circuits 45, 46 respectively connected to two insulated contact blocks 47, 48 at the ends of a block of the track, these two circuits 45, 46, respectively, including batteries 49, 50. As a car or train passes onto a section, it establishes circuit by grounding the insulated contact block 47, current passing from battery 49, through circuit 45 to solenoid 6 to ground and through ground and contact block 47 to the other side of the battery. The solenoid 6 operates the semaphore and when the car reaches the end of the block it grounds the other contact block 48, operating the solenoid 7 in similar manner to release the semaphore which is returned automatically to "safety".

What I claim is:—

1. The combination with a main track, a branch track, and a movable switch connecting the same, a pivoted lever, a connection from said lever to the movable switch, a second pivoted lever at right angles to the first lever and having a hook adapted to engage the first lever at a point farther from the fulcrum of said lever than is said connection, a solenoid with its core connected to the first lever, another solenoid with its core in connection with the second lever, a contact in advance of the switch on the main track and a contact at the rear of the switch on the branch track, a car provided with means for establishing connection from an electro-motive source to said contacts on the track, a manually operated circuit controller at each end of the car for controlling said connection, a circuit connecting the first named contact with the first named solenoid, and a circuit connecting the second named contact with the second solenoid.

2. The combination with a main track, a branch track, and a movable switch connecting the same, a pivoted lever, a bell crank lever, a link connecting said two levers, a rod from the bell crank lever to the movable switch, a solenoid, an armature for the solenoid, and a rod connecting the armature with the first lever, a second bell crank lever one arm of which has a hook adapted to engage the end of the first named lever, a second pivoted lever, and a rod connecting the same with the latter bell crank lever, a second solenoid and an armature therefor and a link connecting the armature with the second pivoted lever, a contact in advance of the switch on the main track and a contact at the rear of the switch on the branch track, a car provided with means for establishing connection from an electromotive source to said contacts on the track, a manually operated circuit controller on the car for controlling said connection, a circuit connecting the first named contact with the first named solenoid, and a circuit connecting the second named contact with the second solenoid.

In testimony whereof, I have hereunto set my hand at Los Angeles, California this sixth day of March 1908.

NELSON TOWNE SHAW.

In presence of—

GEORGE T. HACKLEY,
FRANK L. A. GRAHAM.