No. 867,918. PATENTED OCT. 8, 1907.

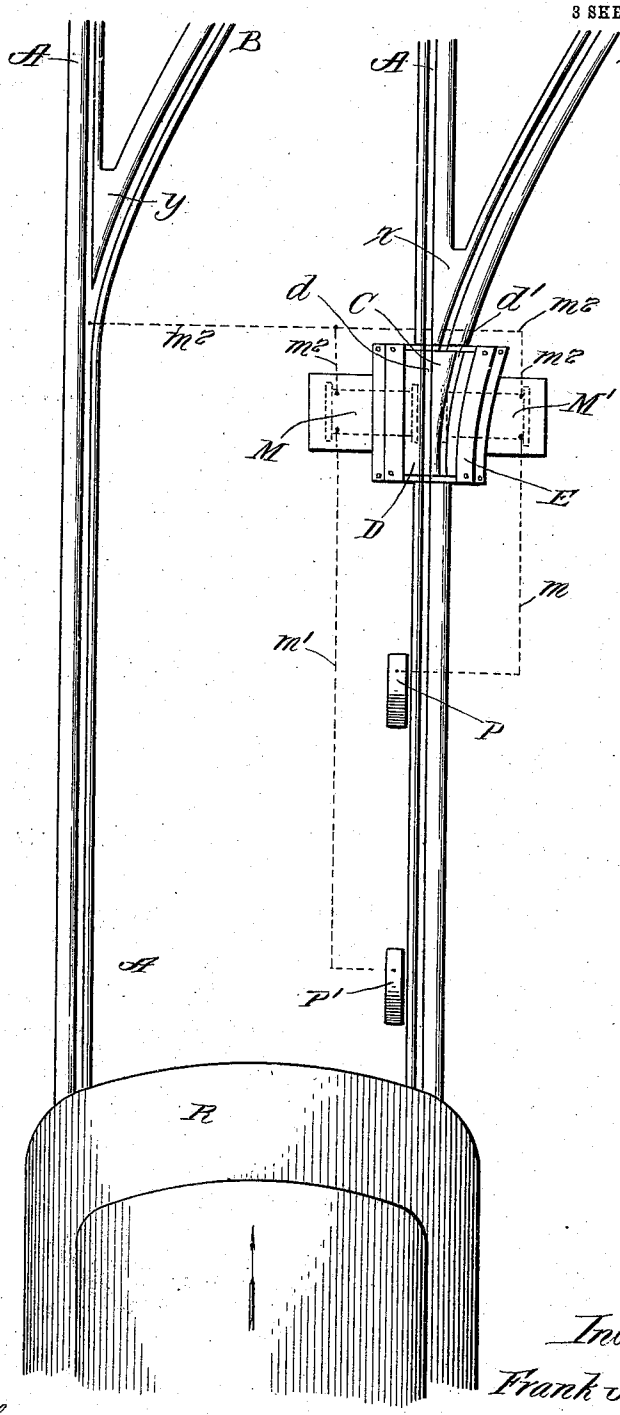
F. J. JOHNS.

ELECTRICALLY OPERATED RAILWAY SWITCH.

APPLICATION FILED MAR. 20, 1907.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:

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C. B. Franconi

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3 SHEETS—SHEET 2.

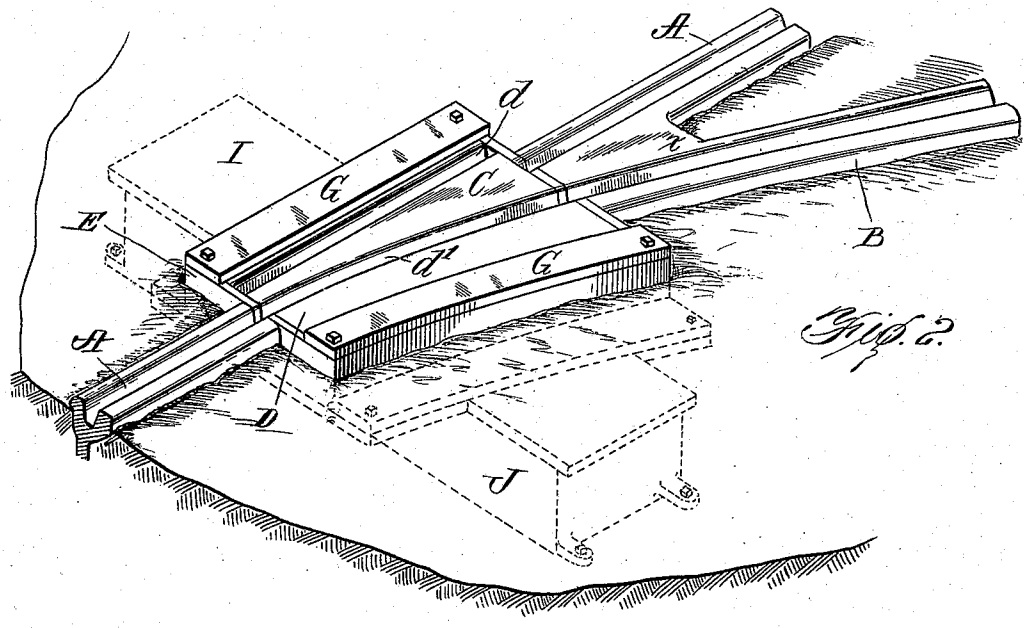

Fig. 2.

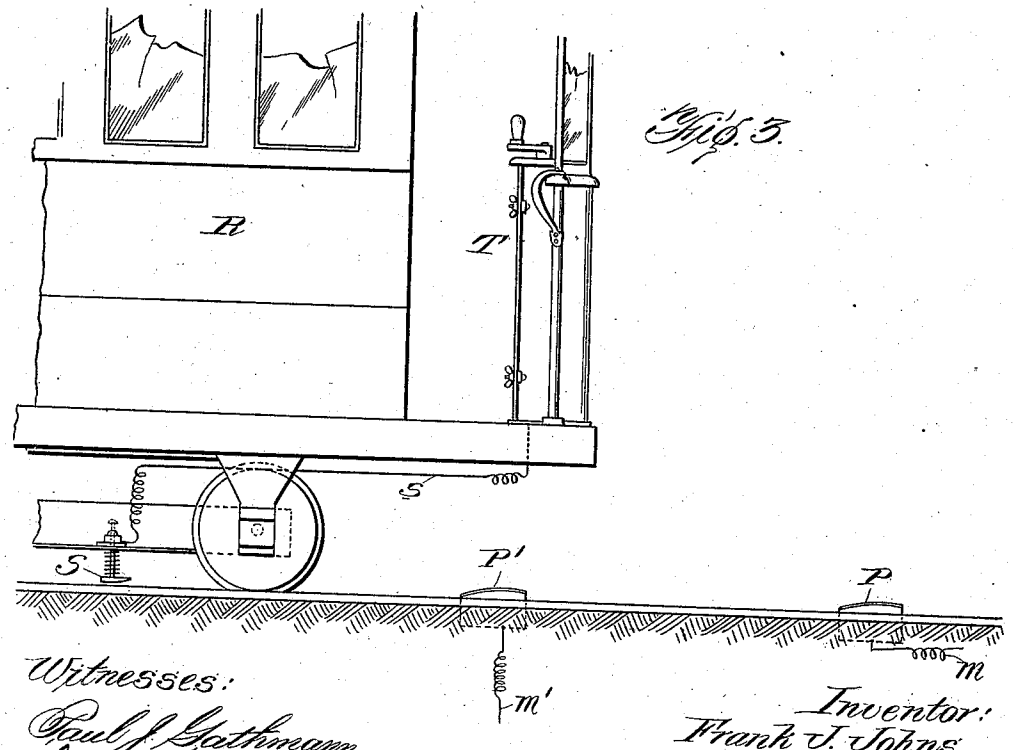

Fig. 3.

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3 SHEETS—SHEET 3.

Fig. 4.

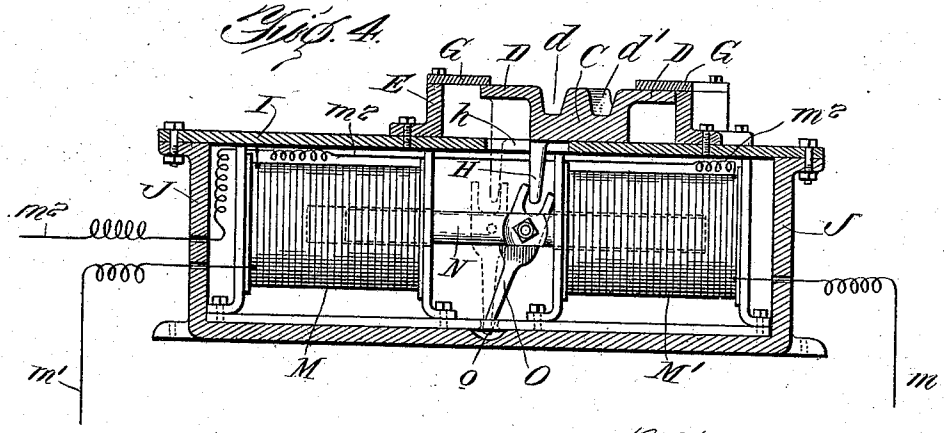


Fig. 5.

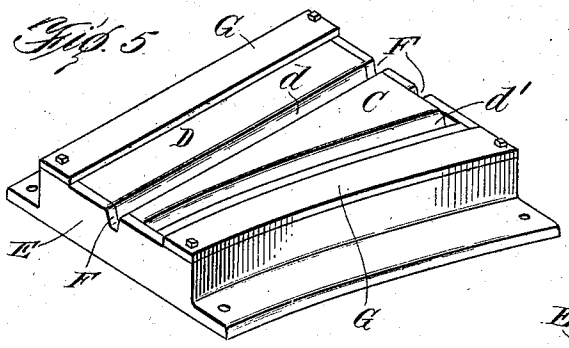


Fig. 6.

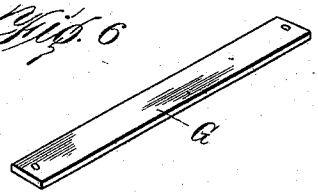


Fig. 8.

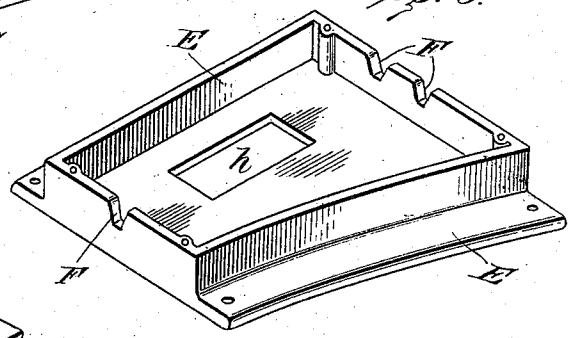
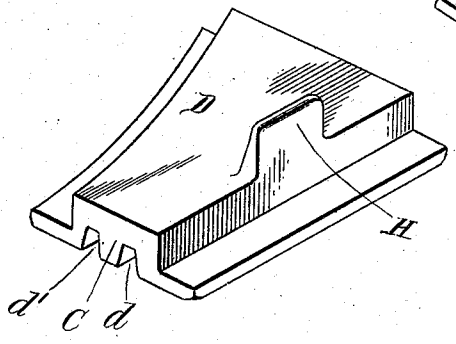


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRANK J. JOHNS, OF SCRANTON, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO JOHN NELSON GARRETT, OF SCRANTON, PENNSYLVANIA, AND ONE-THIRD TO JAMES P. PULSIFER, OF PHILADELPHIA, PENNSYLVANIA.

ELECTRICALLY-OPERATED RAILWAY-SWITCH.

No. 867,918. Specification of Letters Patent. Patented Oct. 8, 1907.

Application filed March 20, 1907. Serial No. 363,421.

To all whom it may concern:

Be it known that I, FRANK J. JOHNS, a citizen of the United States of America, residing in Scranton, in the county of Lackawanna and State of Pennsylvania, have invented certain new and useful Improvements in Electrically-Operated Railway-Switches, of which the following is a specification.

My invention relates to railway switches of the class in which a car may be automatically shifted from the main track to a siding or a branch track by means of devices carried by the car and under the control of the motorman. A switch of this class is shown in Letters Patent of the United States No. 746,644 of December 8, 1903, invented by James P. Pulsifer of Philadelphia, Pennsylvania. In that patent, however, the switch was operated mechanically, while in my invention I have provided means whereby a switch of this general character may be operated by electro magnetic devices.

According to my invention I form a switch point in a plate which is mounted to slide in a closely fitting box or casing in such manner as to cause the switch point to register with a rail of either the main track or a branch track, and the plate is formed with grooves on oppostie sides of the switch point which are arranged to register with the grooves of the tracks. The plate is provided with a downwardly projecting arm engaged by the upper bifurcated end of a lever which is connected with an iron bar constituting the core or armature of two solenoid electro magnets arranged opposite each other in a box or housing below the switch plate. The arrangement is such that when one magnet is energized it operates the lever in one direction to set the switch for the main track, and when the other magnet is energized the switch is set for the siding or branch track. Two contact plates are arranged on the track, one of which is connected with one magnet, and the other with the other magnet and both magnets are connected to ground. Each car carries a yielding contact maker which is electrically connected with the controller of the car and this contact maker is adapted to make electrical contact with either of the contact plates to close the circuit through the appropriate magnet to set the switch for either the main track or the siding.

In the accompanying drawings illustrating my invention,—Figure 1 is a plan view of a railway track with my improvements applied and it also shows part of a car on the main track. Fig. 2 is a perspective view of a part of the main track and branch track with my improved switch applied, some of the parts being shown by dotted lines. Fig. 3 is a side elevation of a portion of a car equipped with my improvements showing the relation of the contact maker of the car with the contact plates connected with the electro magnets which operate the switch. Fig. 4 shows a longitudinal section through the switch and its operating mechanism. Fig. 5 is a perspective view of the plate carrying the switch point and the housing or casing for the plate. Fig. 6 is a perspective view of one of the plates of this casing. Fig. 7 is a perspective view of the under side of the switch plate. Fig. 8 is a perspective view of the upper side of the casing of the plate.

The main track, A, is joined to a branch track, B, in the usual way except as hereinafter indicated. The rails shown are of the ordinary grooved type and the joints at x and y may be of any approved form. The switch point, C, is formed on a plate or block, D, which is mounted to slide transversely of the main track in a housing or casing, E. The block or plate, D, is grooved at d, d', to correspond with the grooves in the main track and the branch track and the plate is adapted to slide in its housing transversely of the main track so as to cause the grooves to register alternately with the grooves in the main and branch tracks. The housing, E, incloses the plate or block, D, in such manner as to prevent the entrance of dirt, snow, &c., and its opposite ends are recessed at F to register with the grooves in the rails of the main and side tracks.

As will be seen by reference to Figs. 5 to 8 inclusive, the plate D may be dropped into position within the housing when the top plates, G, are detached, and then the plates, G, may be applied to confine the plate, D, in its housing while permitting it to slide therein.

The plate, D, is provided with a downwardly projecting arm, H, which extends through an opening, h, in the top plate, I, of the housing which incloses the electro magnetic devices for actuating the switch plate.

It will be observed that the casing, E, is provided with laterally projecting flanges receiving screws which securely hold the housing, E, to the top plate, I, to permit of the housing, E, being removed for repairs when desired.

It will be obvious from an inspection of Figs. 1 and 2 that when the plate, D, is shifted to one position the switch is set for the main track, and when shifted to the opposite position it is set for the branch track.

The housing, J, for the electro-magnetic devices, as before stated, is covered by a plate, I. It contains two solenoid electro magnets, M, M', arranged horizontally on opposite sides of the downwardly projecting arm, H, and its armature is in the form of a bar or core, N, which is adapted to slide back and forth through the solenoids in the manner indicated in Fig. 4. The bar, N, is pivotally connected with a lever, O, which has a loose joint at the bottom of the casing as indicated at

o, and its upper end is bifurcated and engages the downwardly projecting arm, H. When the magnet or solenoid, M, is energized, the core or armature, N, is drawn into it and the switch is shifted in such manner as to set it for the side track. When the magnet, M′, is energized, the switch is shifted in the opposite direction and sets the switch for the main track. As indicated in Fig. 1, the magnet, M′, is connected by a wire, *m*, with a contact plate, P, while the magnet, M, is connected by a wire, *m*′, with a contact plate, P′. Both magnets are connected by wires, m^2, to ground, or, as shown, to one of the tracks at A′. It will be observed that normally there are no live wires in the system and no danger of accident on this account.

The car, R, is provided with a yielding contact-maker, S, or any suitable construction, which is connected by a wire, *s*, with the controller or rheostat, T, of the car. The contact-maker, S, is arranged in line with the contact plates, P, P′, and the motorman may cause the contact maker to either clear both contacts or to make electrical connection at the proper time with either of them. For instance, if the motorman desires to continue on the main line and he observes that the switch is set for the side track, he will energize the contact-maker, S, to cause it to engage the contact plate, P. This will energize the magnet, M and set the switch for the main track, in the manner before described. In like manner the switch may be set for the side track by causing the contact-maker, S, to engage the contact plate, P′. As shown, the contact-maker is adapted to engage both contact plates, P, P′, but the circuit need not be closed when it reaches the first contact plate, and therefore the corresponding magnet will not be energized, but the circuit may be closed as soon as the contact maker engages the proper contact plate.

The mechanism shown is simple and efficient and is very reliable in operation. The plate carrying the switch point may be well protected, as may also the electro-magnetic devices and they may be all simple in construction and operated without expenditure of unnecessary energy.

I claim as my invention:

1. An automatic railway switch comprising a sliding plate carrying a switch point, a box or casing for said plate in which it is guided, a housing below the plate, electro-magnets within said housing, an armature common to said magnets, an arm projecting downwardly from the sliding plate between the magnets, a bifurcated lever engaging said arm, and a pivotal connection between the lever and the armature.

2. An automatic railway switch comprising a sliding plate carrying a switch point and having a downwardly projecting arm, electro-magnets on opposite sides of said arm, an armature common to both magnets, mechanical connections between the armature and the arm, contact plates connected with the magnets, a ground connection for the magnets, and means carried by a passing car for closing the circuit through either magnet.

In testimony whereof, I have hereunto subscribed my name.

FRANK J. JOHNS.

Witnesses:
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R. U. CAPWELL.