No. 759,060. PATENTED MAY 3, 1904.

A. J. BACKER.

ELECTRIC RAILWAY SWITCH POINT AND OPERATING MEANS THEREFOR.

APPLICATION FILED JULY 8, 1903.

NO MODEL.

Fig. 1.

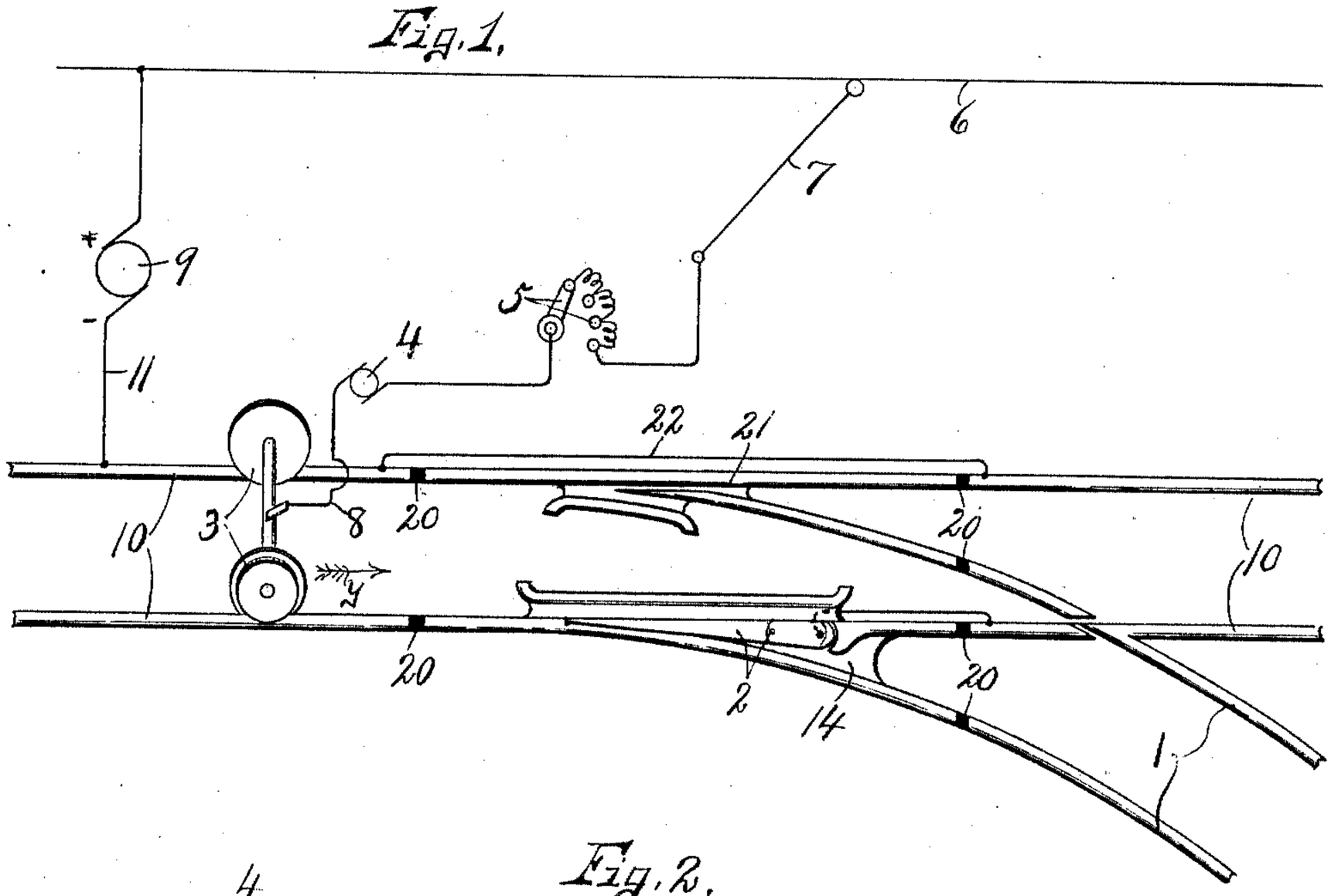


Fig. 2.

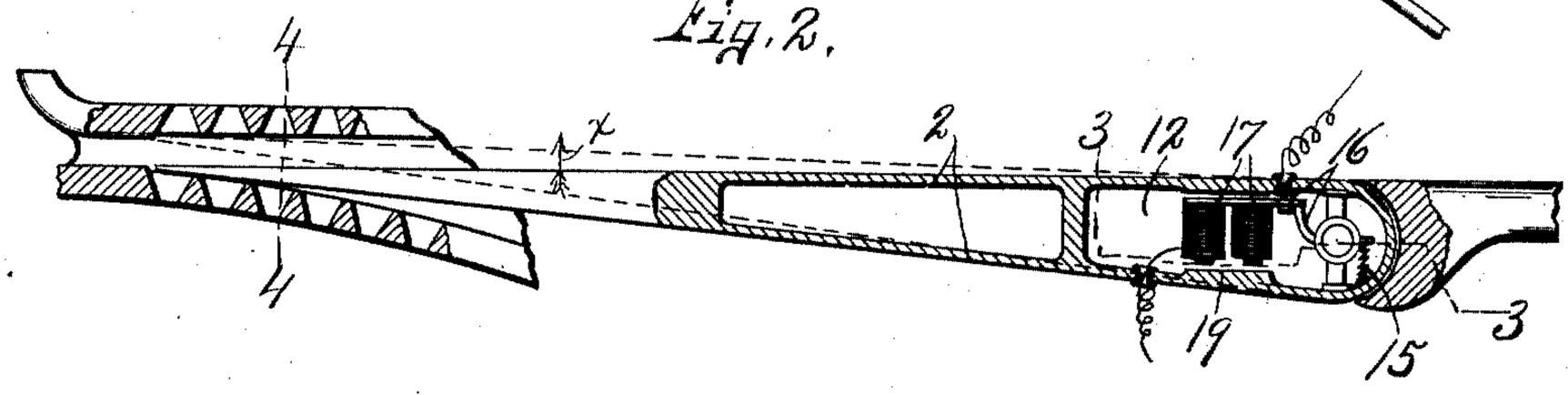


Fig. 3.

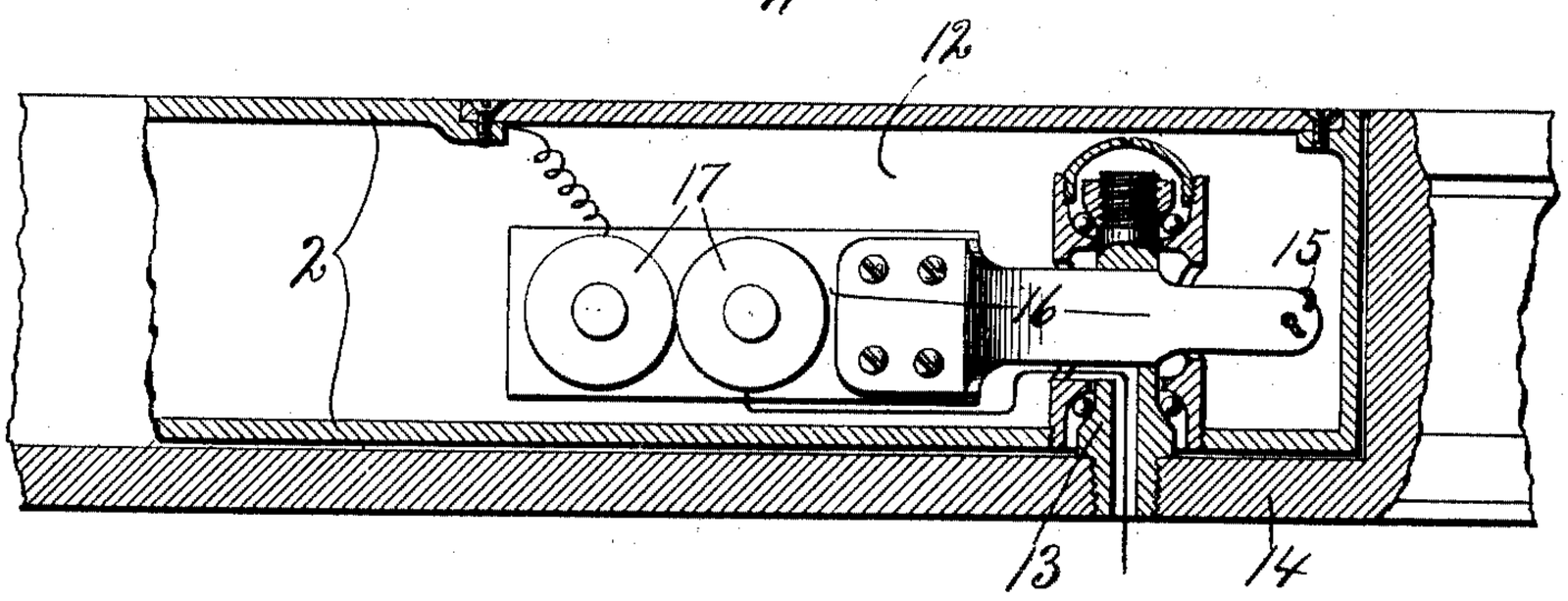
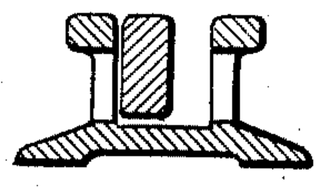


Fig. 4.



Witnesses:
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No. 759,060. Patented May 3, 1904.

UNITED STATES PATENT OFFICE.

ARTHUR J. BACKER, OF SYRACUSE, NEW YORK.

ELECTRIC-RAILWAY SWITCH-POINT AND OPERATING MEANS THEREFOR.

SPECIFICATION forming part of Letters Patent No. 759,060, dated May 3, 1904.

Application filed July 8, 1903. Serial No. 164,671. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR J. BACKER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Electric-Railway Switch-Points and Operating Means Therefor, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in railway switch-points and operating mechanism therefor and is somewhat similar to my allowed application, Serial No. 142,485, filed February 9, 1903, in which an electric operating device is located within a hollow switch-point for the purpose of throwing the switch-point automatically, the electric operating device being energized by a suitable contact mechanism under the control of the motorman.

The essential object of this improvement is to dispense with the third-rail feature and separate circuit-controller coöperating therewith and to utilize a portion of one of the rails of the track as well as the circuit-controller for the motor of the car for energizing the switch-point-operating device.

In the drawings, Figure 1 is a diagrammatic view of a portion of a railway system, showing a turnout and switch-point and means for automatically throwing the switch. Fig. 2 is a top plan, partly in section, of the detached switch-point and portions of the frog for receiving the same. Figs. 3 and 4 are sectional views taken, respectively, on lines 3 3 and 4 4, Fig. 2.

Similar reference characters indicate corresponding parts in all the views.

In Fig. 1 I have shown a portion of a railway system consisting of a turnout 1 and a switch-point 2 and have also shown diagrammatically a portion of a car including the wheels 3, motor 4, and a controller 5, the controller being connected in the circuit between the trolley-wire 6 and motor through the medium of the trolley-pole 7, said motor being connected in the usual manner to propel the car and is electrically connected by a wire 8 to the axle of the car-wheels 3.

The electric current is supplied to the trolley-wire from a dynamo 9, (shown diagrammatically in Fig. 1,) and the rails, as 10, of the track serve as return-conductors, which conductors may be grounded or connected by a metallic circuit to the negative pole of the dynamo, and I have shown in Fig. 1 a metallic connection 11 between one of the rails and dynamo.

The motor 4 and controller 5 are connected in the power-circuit in the usual manner, and this motor-circuit is utilized in a manner hereinafter described for energizing the switch-point-operating device.

The heel of the switch-point is provided with a chamber 12 and is pivotally mounted upon a stud 13, projecting upwardly from the base of the frog 14, said switch-point being held in its normal position by a spring 15, Fig. 2.

The stud 13 is fixed and is provided with a laterally-projecting bracket 16 within the chamber 12, and upon this bracket is mounted a switch-point-operating device consisting of electromagnets 17.

A portion of one of the upright side walls of the switch-point, as 19, forms an armature for the magnets and is normally separated from the poles of the magnets by means of the spring 15, so that when the magnets are energized the armature is attracted to the poles and throws the switch-point in the direction indicated by arrow *x*, Fig. 2, to the position indicated by dotted lines in said figure, whereby the moving car may take the turnout 1.

The portion of the switch-point and the electric device 17 for operating the same is substantially the same as set forth in my application above referred to; but in order that I may be enabled to control the current through these magnets by the ordinary controller, as 5, which controls the current through the motor, the switch-point and rails adjacent thereto are deadened or cut out of the return-circuit except when the car-wheels are in contact with said cut-out portions This is accomplished by insulating the frog 14 from the ends of the adjacent rails, such insulation being indicated at 20 at short distances from the ends of the switch-point, and in order to further prevent the return-current

from passing through the rails I preferably insulate both rails of the track at opposite ends of the switch-point, the object of this being to divert the live current through the magnet 17 when the wheels of the car are upon the deadened rails or switch-point.

The outer rail of the track 10, at opposite ends of the deadened portions 21, is connected by a conductor 22, so that the return-current may be continuous around the deadened rail 21.

Assuming now that the car is moving in the direction indicated by arrow *y* and is approaching the switch-point and that the controller is in position to divert the power-current through the motor in the usual manner for operating the car, then before the car-wheels reach the deadened rails upon which the switch-point is mounted the return-current is free to pass through the rails 10 and conductor 11 back to the dynamo and not pass through the deadened sections of the rails. As soon as the car-wheels come in contact with the deadened rails the live current is then diverted from the wheels to the deadened rails and through the magnets 17, one end of the coil of said magnets being electrically connected to the deadened rail, and the other end of the coil is connected to one of the rails 10 beyond the deadened portion of the rail or frog, so as to complete the circuit back to the dynamo. It is therefore apparent that when it is desired to throw the switch to take the turnout the controller is left in position with more or less resistance to complete the circuit through the motor, so that when the approaching car-wheels come in contact with the deadened sections of the rail said deadened sections become a part of the circuit to conduct the current through the switch-operating magnets, which throw the switch from its normal position (seen in Fig. 1) from a straight way to the position indicated by dotted lines in Fig. 2, this operation being automatic and permits the car to take the turnout. On the other hand, when it is desired to continue on the straight track the car is permitted to attain a sufficient momentum before reaching the deadened sections of the rail to carry it beyond the switch-point, and it therefore becomes necessary for the motorman to operate the controller to break the motor-circuit before the car reaches the deadened sections of the track, whereupon the momentum of the car carries it forwardly beyond said deadened sections, after which the controller may be operated to close the circuit in the usual manner.

It will be observed upon reference to the previous description and accompanying drawings that, in addition to the specific construction of the switch-point and its electric operating devices, as the magnets 17 and spring 15, the only change necessary is to insulate or deaden the portions of the track upon which the switch-point is mounted and a slight distance beyond its opposite ends, the same controller which controls the motor-circuit being utilized for controlling the action of the electromagnets 17. Therefore the essential feature of novelty of this invention lies in the deadening of the rail-sections, as hereinbefore described, in combination with the specific switch-point and operating mechanism.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. An electric-railway switch-point having an interior chamber and electric switch-point-operating device located in the chamber in combination with an electric-power circuit, a controller on the car connected in the circuit, a track for the car having a deadened rail-section electrically connected to the switch-point-operating device, and means on the car in circuit with the controller for contacting with said deadened rail-section whereby the power-current is diverted through the deadened rail-section and switch-operating device before the car reaches the switch-point to excite said device and throw the switch-point automatically.

2. The combination with the power-circuit of an electric railway including therein feed and return conductors and the car-motor and controller, of a switch-point having a chamber and an electromagnet in the chamber and electrically connected in the circuit between the controller and return-conductor to attract and move the switch-point.

In witness whereof I have hereunto set my hand this 20th day of June, 1903.

ARTHUR J. BACKER.

Witnesses:
H. E. CHASE,
HOWARD P. DENISON.