

No. 776,534.

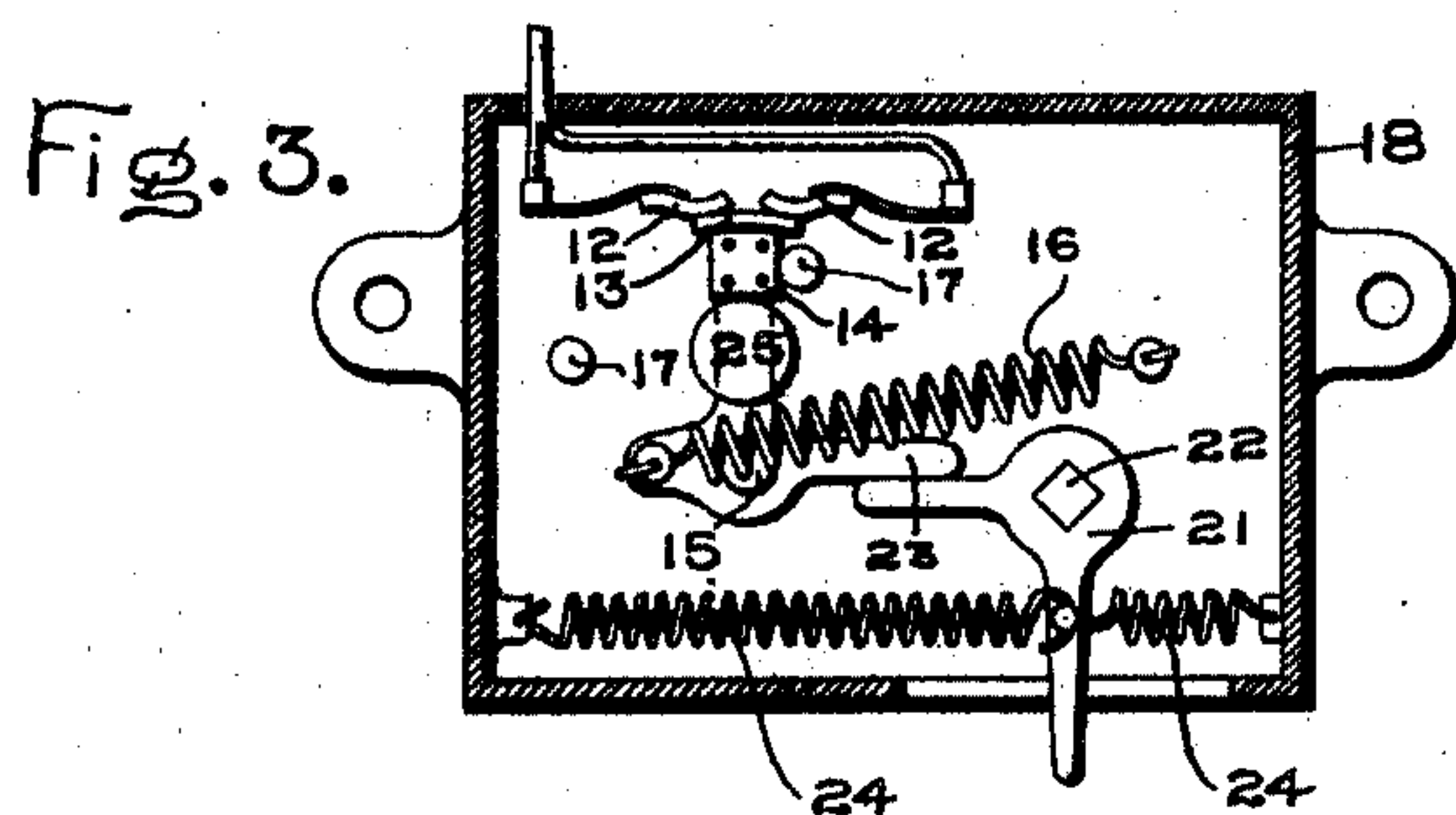
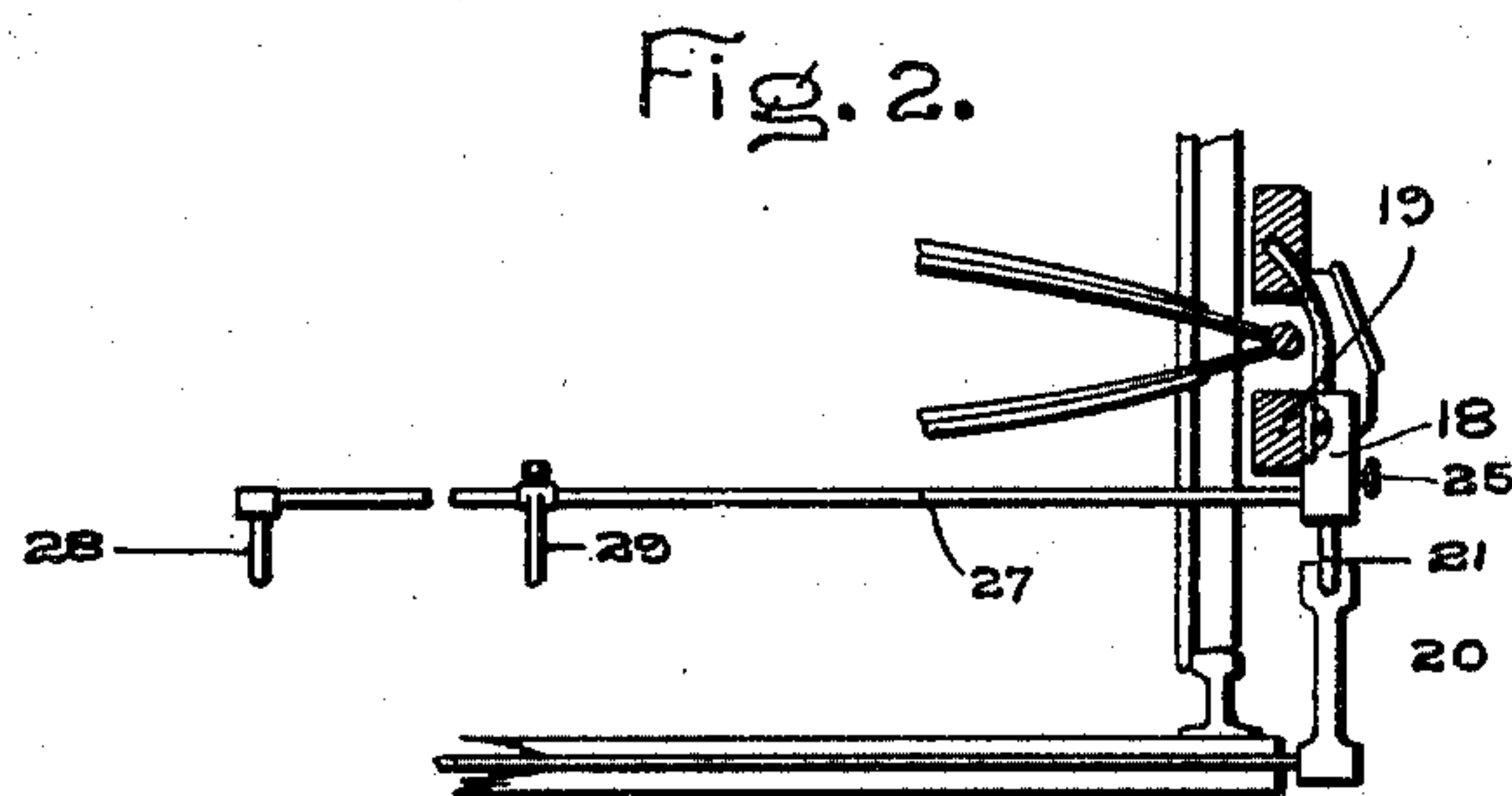
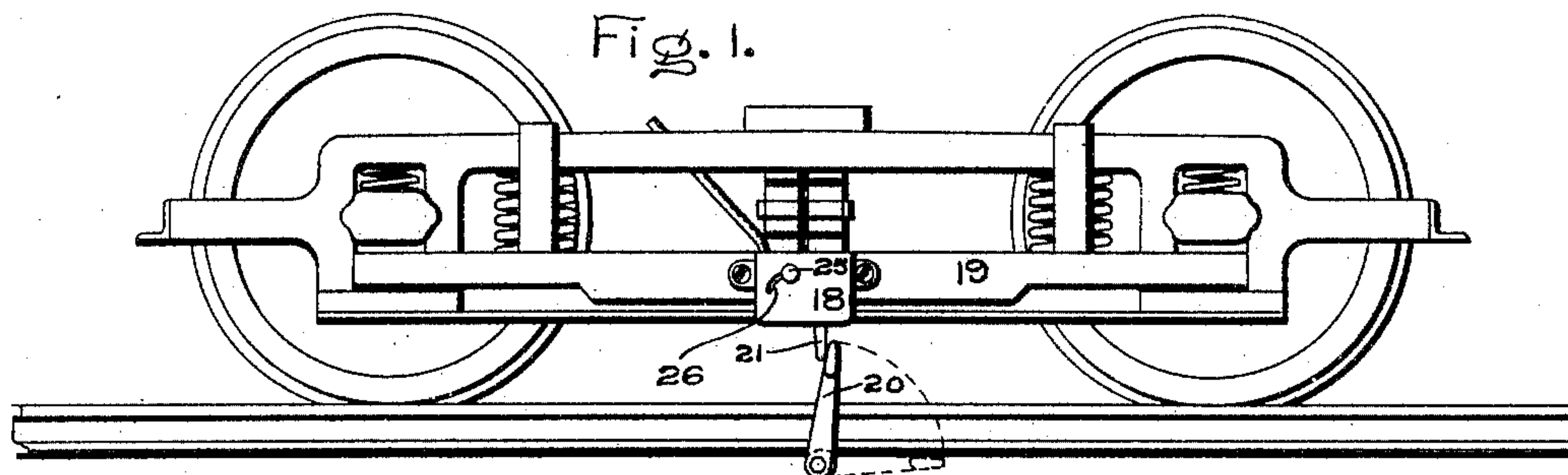
PATENTED DEC. 6, 1904.

W. O. MUNDY.
MEANS FOR AUTOMATICALLY STOPPING ELECTRIC RAILWAY
CARS OR TRAINS.

APPLICATION FILED SEPT. 30, 1902.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
George A. Thomson
Allen Orford

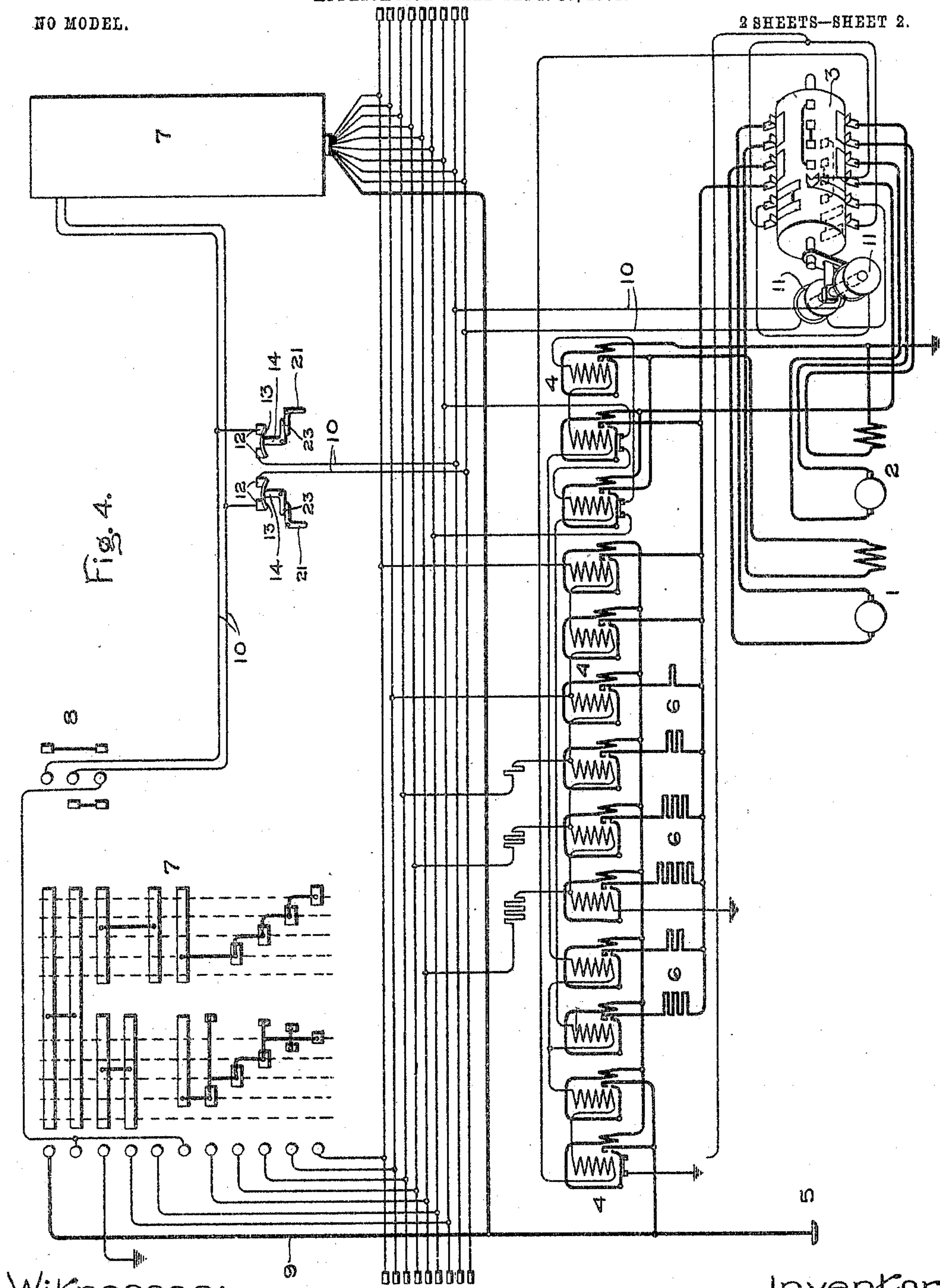
Inventor:
William O. Mundy,
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2 SHEETS—SHEET 2.



Witnesses:
George A. Thumton.
Helen Orford

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UNITED STATES PATENT OFFICE.

WILLIAM O. MUNDY, OF LOUISVILLE, KENTUCKY, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

MEANS FOR AUTOMATICALLY STOPPING ELECTRIC-RAILWAY CARS OR TRAINS.

SPECIFICATION forming part of Letters Patent No. 776,534, dated December 6, 1904.

Application filed September 30, 1902. Serial No. 125,377. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. MUNDY, a citizen of the United States, residing at Louisville, county of Jefferson, State of Kentucky, have invented certain new and useful Improvements in Means for Automatically Stopping Electric-Railway Cars or Trains, of which the following is a specification.

This invention relates to electric railways; and its object is to automatically stop an electric-railway car or train in case the motorman runs through a danger-signal. It may be used in connection with devices for automatically setting the power-brake in such an emergency, but is capable of independent employment, if desired, and will so be described in this specification.

This invention is designed especially for use in connection with a system of electric-train control—such as that described in the patent to Thomson, No. 617,546—in which the leads carrying power to the motors on each car are controlled by a plurality of electromagnetic switches or “contactors,” which are in turn controlled by a master-controller, all the master-controllers on the train being connected in parallel, so that any one of them may be used to control all the motor-controllers. In this system the current which operates the contactors controlling the power-lead is taken through a master reversing-switch, with which all the “trolley-contactors” on the train are connected in multiple. By opening the lead between the master reversing-switch and its train-wire all the power-controlling contactors will be deenergized and will open the leads between the trolleys and the motors.

My invention therefore consists in a safety-switch in the lead between the master reversing-switch and its train-wire and a tripping device located at the side of the track for opening said switch when said tripping device strikes the handle thereof. The tripping device is preferably a pivoted arm mechanically connected with the signal-operating mechanism, so that when the signal is set at “danger” the arm will be moved into the path of the switch-handle. Said handle is so con-

structed that it operates in one direction only, so that when the car is running backward the switch will not be opened. In order to permit the car to run either end foremost, a switch is placed at each end of the car, one controlling one lead and the other the other lead from each master reversing-switch. It follows that whichever lead is the forward lead that one only will be opened by the tripping device, leaving the backward lead uninterrupted, so that the motorman is still able to reverse his motors and supply current thereto to assist in checking the train even after they have been open-circuited by the breaking of the forward lead.

In the accompanying drawings, Figure 1 is a side elevation of a car-truck equipped with my safety-switch. Fig. 2 is a sectional end elevation of a portion of the same. Fig. 3 is a front elevation of the switch on a larger scale. Fig. 4 is a diagram of the power-circuits and control-circuits on a single car, showing the location of my safety-switches in the system.

Referring first to Fig. 4, it is not necessary to describe in detail the operation of the entire system, since that forms no part of my invention. It will be sufficient to say that the two motors 1 2 are connected with the reverser 3 and with the plurality of contactors 4, by means of which the circuit from the trolley 5 is opened and closed, the motors connected in series or in parallel, and the resistances 6 cut out of circuit in speeding up the motors.

The contactors are electrically controlled by a master-controller 7, one at each end of the car. Adjacent to each controller is a master reversing-switch 8, through which current passes from the trolley-lead 9 by way of the leads 10 to the solenoids 11 of the reverser 3 and thence to the electromagnets of the contactors. In each lead 10 I interpose my safety-switch, preferably constructed as shown in Fig. 3. The stationary spring-supported contacts 12 are bridged by a contact 13, carried on a switch-arm 14, pivoted at 15. A spring 16 is attached at one end to the hub of said switch-arm to give it a snap action in opening

and closing, its range of movement being limited by stops 17. The switch is inclosed in a box 18, secured to the car-truck 19 in such a position that it travels near the track. At 5 points where it is desired to open the switch, and thereby automatically stop the train, an arm 2 is pivotally mounted near the track and is so connected with suitable actuating means—as, for instance, the signal-operating 10 mechanism—that it can be raised and lowered at will. The switch is provided with a lever for opening it. When the arm 20 is raised, it stands in the path of said lever, which will be tripped by the arm and open the switch 15 when the car-truck passes said arm. The lever may be of any desired construction provided it operates when moved in one direction only, its movement in the other direction having no effect upon the switch for reasons 20 mentioned hereinbefore. A simple arrangement is shown in Fig. 3, where the elbow-lever 21 is pivoted at 22 and has one leg depending through a slot in the box 18, while its other leg abuts against an arm 23 on the 25 switch-arm. A spring 24 or the like keeps the elbow-lever normally in the position shown, but free to move in either direction. The depending leg is adapted to strike the tripping device 20 and be moved thereby. 30 When moved to the right in Fig. 3, it has no effect on the switch; but when moved to the left the arm 23 is lifted and the switch is opened. The spring 16 holds it open until a 35 trainman closes it again by means of a handle 25, projecting from the switch-arm through a slot 26 in the box.

In order that the switch may be operated from either side of the car, so that the car may be run either end foremost, the elbow-lever 21 is secured to a rock-shaft 27, extending 40 across the truck and provided with a similar elbow-lever 28 at its other end, occupying the same position with relation to the track. If it is desired to set the air-brakes 45 at the same time that the motors are open-circuited, the rock-shaft 27 may carry a rock-arm 29 for operating a suitable escape-valve in the train-pipe of the air-brake system.

It will be noted that when the switch is 50 opened and the power is shut off the backward lead from the master reversing-switch still remains available, so that if the motorman wishes to reverse the motors and use them to assist the brakes in checking the train he is 55 able to do so, but he cannot run forward until the safety-switch has been closed by hand.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In an electric-train-control system, a 60 safety-switch controlling the supply of current to the control-circuits, a tripping device for opening said switch, located adjacent to the track at a predetermined point, and means connected with said switch and extending from 65 both sides of the car so as to engage said trip-

ping device when the car is run either end foremost.

2. In an electric-train-control system, an electrically-operated controller, a safety-switch controlling the supply of current to 70 the control-circuits leading to the operating mechanism of said controller, a tripping device for opening said switch at a predetermined point in the track, and means whereby said device can operate only when the car is run- 75 ning in a given direction.

3. In an electric-train-control system, an electrically-operated controller, a safety-switch controlling the supply of current to 80 the control-circuits leading to the controller-operating means, a tripping device for opening said switch at a predetermined point in the track, and means whereby said device can operate only when the car is running forward.

4. In an electric-train-control system, the 85 combination with a master reversing-switch, of a safety-switch in a lead between said master reversing-switch and the controlling devices, and means for automatically opening said safety-switch at a given point in the track. 90

5. In an electric-train-control system, the combination with a master reversing-switch, 95 of two safety-switches, one in each lead controlled by said master reversing-switch, and means for automatically opening one of said safety-switches when the car runs past a given point in the track.

6. In an electric-train-control system, the combination of a master reversing-switch, a 100 safety-switch located in one of the leads of said reversing-switch so as to cut off the supply of current to the controlling devices when the master reversing-switch is in one of its operative positions but not when the master 105 reversing-switch is in its reversed position, and means for automatically opening said safety-switch when the car runs past a given point in the track.

7. In an electric-train-control system, the combination of a master reversing-switch, a 110 safety-switch located in one of the leads of said reversing-switch so as to cut off the supply of current to the controlling devices when the master reversing-switch is in one of its operative positions, a second safety-switch 115 located in another of the leads of said reversing-switch so as to cut off the supply of current to the controlling devices when the reversing-switch is in its reversed position, and means for automatically opening one of said 120 safety-switches when the car is moving in one direction past a given point in the track and the other of said switches when the car is moving in the opposite direction past said point. 125

8. In a train-control system, the combination of a reversing-switch, a master reversing device, connections between the reversing-switch and the master reversing device, a 130 safety device controlling the connection cor-

responding to the forward direction of movement of the car, and means for automatically operating said safety device to break said connection when the car moves in a forward direction past a predetermined point in the track.

9. In a train-control system, the combination of a reversing-switch, a master reversing device, connections between the reversing-switch and the master reversing device, a forward safety device controlling the connection corresponding to the forward direction of movement of the car, a backward safety device controlling the connection corresponding to the backward direction of movement of the car, and means for automatically operating the forward safety device to break the connection controlled thereby when the car

moves in a forward direction past a predetermined point in the track and for operating the backward safety device to break its connection when the car moves in a backward direction past said predetermined point, the whole being so constructed and arranged that when one of the safety devices is operated the reversing-switch may be thrown into its reversed position by a movement of the master reversing device into its reversed position.

In witness whereof I have hereunto set my hand this 26th day of September, 1902.

WILLIAM O. MUNDY.

Witnesses:

W. S. SPEED,

J. M. WINTERSMITH.