

No. 751,048.

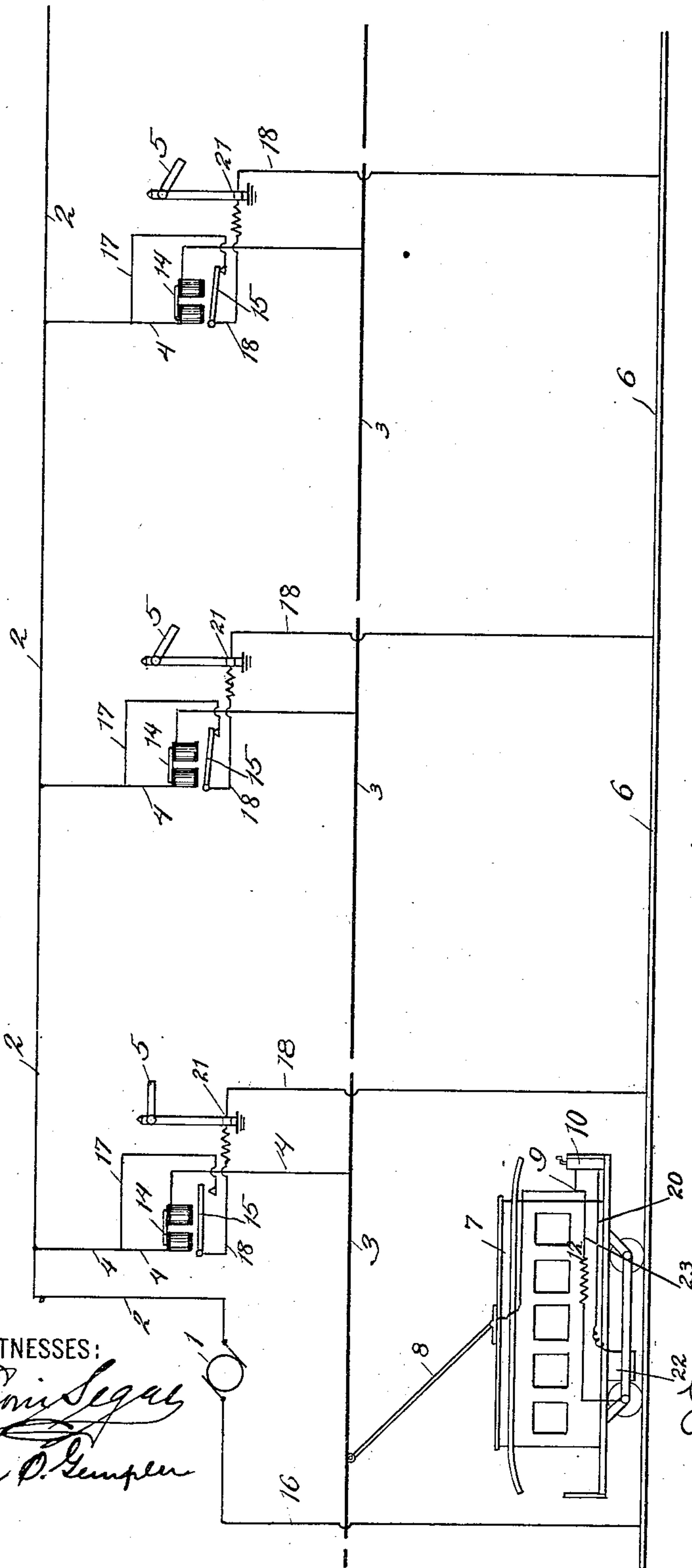
PATENTED FEB. 2, 1904.

C. P. BREESE & A. J. WILSON.
SIGNAL SYSTEM FOR ELECTRIC RAILWAYS.

APPLICATION FILED MAY 5, 1902.

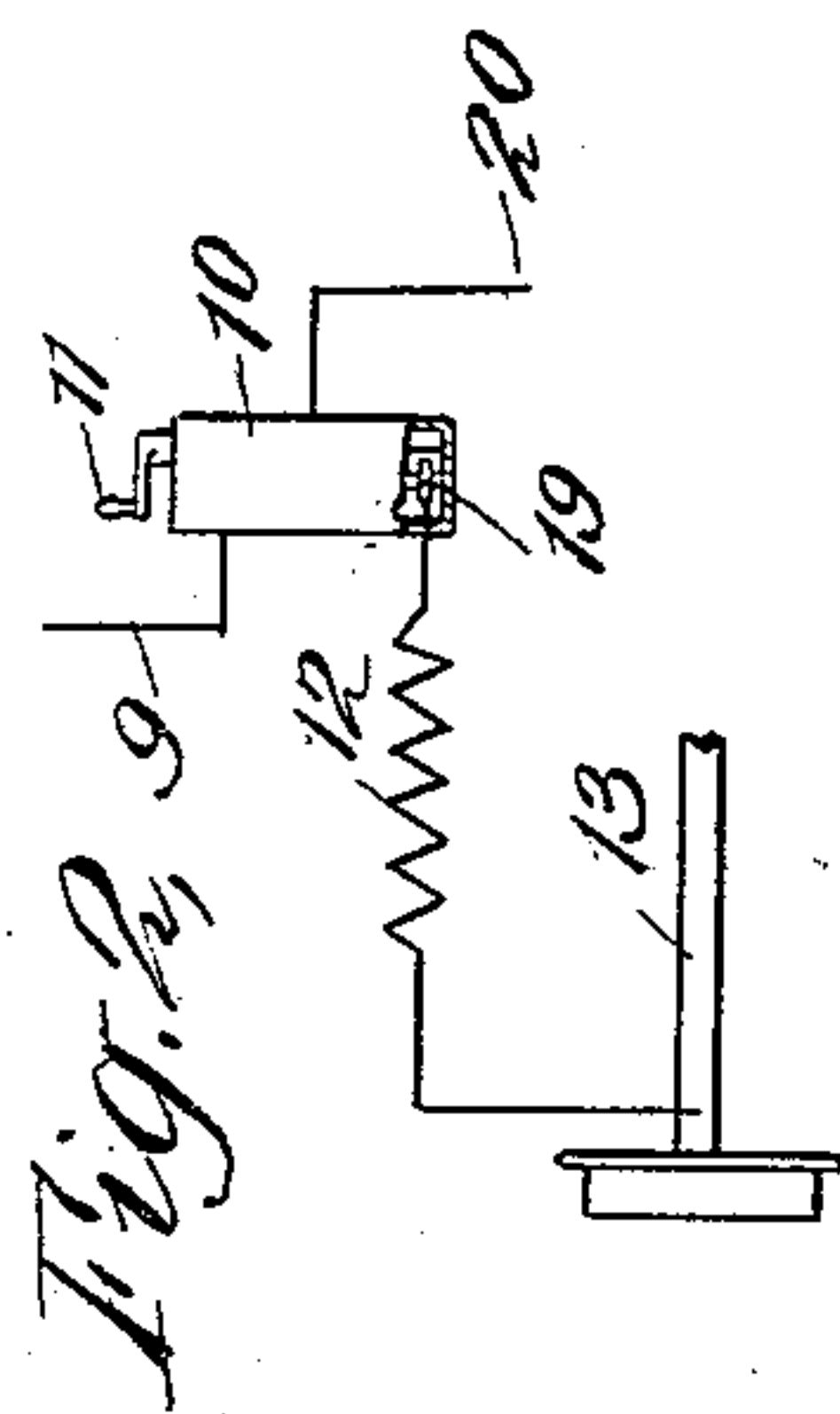
NO MODEL.

Fig. 1,



WITNESSES:

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SIGNAL SYSTEM FOR ELECTRIC RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 751,048, dated February 2, 1904.

Application filed May 5, 1902. Serial No. 105,871. (No model.)

To all whom it may concern:

Be it known that we, CHARLES P. BREESE, a resident of Norfolk, in the county of Norfolk and State of Virginia, and ADONIRAM J. WILSON, a resident of Westfield, Union county, New Jersey, citizens of the United States, have invented certain new and useful Improvements in Signal Systems for Electric Railways, of which the following is a specification.

Our improvement relates to signaling systems for electric railways. It has for its object to provide means for enabling the signals of such a railway to be automatically actuated by cars upon the track.

It consists of the novel devices and combinations herein shown and described.

In the drawings accompanying this specification and forming a part hereof we have shown the preferred form or embodiment of our invention.

Referring to such preferred form, Figure 1 is a diagrammatic view representing three complete blocks of an electrical railway provided with our improved devices in its preferred form. Fig. 2 is a detail showing a modification of the electrical connections upon the car.

1 represents the source of electrical energy—as, for example, the dynamo at the powerhouse.

2 is the continuous-feed conductor, running the length of the road or some portion thereof.

3 3 represent a series of intermediate supply-conductors, one for each block, for conveying the current from the continuous-feed conductor to the cars. These intermediate supply-conductors are electrically disconnected from adjoining supply-conductors of other blocks, and they may be made wholly independent of one another or be made of a continuous wire divided into blocks insulated from one another. Each block is connected by a wire 4 with the continuous-feed conductor.

5 5 are a series of signals arranged along blocks of the railway at any desired points. As shown, one is provided for each block.

6 is a return-conductor, which may either be the rails of the track, as here shown, or the earth or any suitable conductor.

7 represents a trolley-car upon one of the blocks; 8, its trolley-arm, and 9 the wire connecting it with the switch-box 10; 11, the switch-operating arm; 20, the wire connecting with the motor of the car. (Not shown.)

14 14 are signal-controlling magnets, one for each block. As shown, they are connected with the continuous-feed conductor through part of wire 4 and also by means of the other part of wire 4 with intermediate supply-conductor 3 of its block. As shown, these magnets are normally deenergized. Each magnet controls its signal through a circuit-controller 15 in circuit with the signal 5. As shown, each circuit-controller 15 is normally on its back-stop in its closed position, but is broken whenever magnet 14 is energized.

The signal and its circuit-controller are normally in circuit with the continuous-feed conductor and are also connected with the return-conductor. The circuit through the signal runs from continuous-feed conductor 2 through part of wire 4, wire 17, circuit-controller 15, and wire 18 to return-conductor 6. The signal itself is provided with a high resistance, through which the signal-circuit passes, and this resistance is so adjusted that only enough current will pass through the signal when the signal-circuit is closed to operate the signal in one direction, preferably to move it positively to "safety." This resistance may be of any form or kind and is not shown in detail in the drawings, but its presence is merely indicated, as at point 21 in the signal-post, where signal-operating mechanism of any usual kind is placed for operating the signal.

The operation of our improved devices is as follows: With no car upon the track magnet 14 is deenergized and circuit-controller 15 is on its back-stop and closed, closing the circuit through the signal-operating device, including the resistance (indicated diagrammatically at 21,) and positively moving the signal to "safety." The circuit connection formed by the closing of the circuit-controller 15 is from the dynamo 1, the main feed-wire 2, wire 17, armature 15, connecting-wire 18, resistance 21 to the return-conductor 6. This condition of

affairs is shown in the two blocks at the right in Fig. 1. When the car enters a block, as seen at the left in Fig. 1, the circuit through magnet 14 is closed and circuit-controller 15 is moved from its back-stop, breaking the signal-circuit and permitting the signal to go to "danger," which it does by means of a weight or spring or any other suitable means. The signal remains at "danger" as long as the car is on the block. In order to prevent the signal from returning to "safety" while the car is on the block by the motorman shutting off current through the motor, we preferably provide a by-path through wire 23, connecting wire 9 with return 6 and containing a resistance 12, and, if desired, by means of a brush 19, connected with the switch, resistance 12, and the axle of the car, and so arrange the switch that when it shuts off power through the motor it will connect with the by-path, so as to preserve the circuit closed through magnet 14. This form is shown in Fig. 2. The resistance 12 may be made of any suitable degree of strength consistent with magnet 14 holding circuit-controller 15 in its broken condition.

By means of our improved devices a normally closed circuit is maintained through the signal-operating-device; but only enough current flows normally through it to hold the signal at "safety" or in the position to which it is positively moved, and the magnet 14 is normally deenergized.

Modifications and changes may be made in the devices shown in the drawings without departing from our invention, the essentials of which are set forth in the claims appended hereto.

What we claim as new, and desire to secure by Letters Patent, is—

1. In a signaling system for electric railways, the combination of a continuous-feed conductor connected with a source of electrical energy, an intermediate supply-conductor for each block for conveying the current from the feed-conductor to any car that may be upon the block, each supply-conductor being electrically disconnected from the supply-conductors of adjoining blocks, a return-conductor, a signal for each block normally in circuit with the continuous-feed conductor and provided with a high resistance, through which the signal-circuit passes, so adjusted that only enough current will pass through the signal-circuit when it is closed to operate the signal in one direction, and an electromagnetic means for controlling said signal and connected with the continuous-feed conductor, all so arranged that the presence or absence of a car upon a block will change the electrical condition of the said electromagnetic means of said block and thereby change the condition of the signal.

2. In a signaling system for electric railways, the combination of a continuous-feed conductor connected with a source of electrical energy, an intermediate supply-conductor for

each block for conveying the current from the feed-conductor to any car that may be upon the block, each supply-conductor being electrically disconnected from the supply-conductors of adjoining blocks, a return-conductor, a signal for each block, normally in circuit with the continuous-feed conductor and provided with a high resistance, through which the signal-circuit passes, so adjusted that only enough current will pass through the signal-circuit when it is closed to move or hold the signal at safety, and an electromagnetic means for controlling said signal and connected with the continuous-feed conductor, all so arranged that the presence or absence of a car upon a block will change the electrical condition of the said electromagnetic means of said block and thereby change the condition of the signal.

3. In a signaling system for electric railways, the combination of a continuous-feed conductor connected with a source of electrical energy, an intermediate supply-conductor for each block for conveying the current from the feed-conductor to any car that may be upon the block, each supply-conductor being electrically disconnected from the supply-conductors of adjoining blocks, a return-conductor, a signal for each block normally in circuit with the continuous-feed conductor and provided with a high resistance, through which the signal-circuit passes, so adjusted that only enough current will pass through the signal-circuit when it is closed to move or hold the signal at safety, and a magnet controlling said signal connected with the continuous-feed conductor and normally deenergized, whereby the presence of a car upon the block will energize said magnet and cause it to break the circuit through the signal to send it to danger.

4. In a signaling system for electric railways, the combination of a continuous-feed conductor connected with a source of electrical energy, an intermediate supply-conductor for each block for conveying the current from the feed-conductor to any car that may be upon the block, each supply-conductor being electrically disconnected from the supply-conductors of adjoining blocks, a return-conductor, a signal for each block normally in circuit with the continuous-feed conductor and provided with a high resistance, through which the signal-circuit passes, so adjusted that only enough current will pass through the signal-circuit when it is closed to operate the signal in one direction, and a magnet controlling said signal connected with the continuous-feed conductor, a circuit-controller in circuit with each signal and controlled by said magnet, all so arranged that the presence of a car upon the block will affect the magnet to move its circuit-controller to cause it to move the signal to danger.

5. In a signaling system for electric railways, the combination of a continuous-feed conductor connected with a source of electrical

energy, an intermediate supply-conductor for each block for conveying the current from the feed-conductor to any car that may be upon the block, each supply-conductor being electrically disconnected from the supply-conductors of adjoining blocks, a return-conductor, a signal for each block, normally in circuit with the continuous-feed conductor and provided with a high resistance, through which the signal-circuit passes, so adjusted that only enough current will pass through the signal-circuit when it is closed to move or hold the signal at safety, a circuit-controller in circuit with each signal and controlled by said magnet and operated by it to normally close the circuit through the signal and hold it at safety, all so arranged that the presence of a car upon the block will affect the magnet to open its circuit-controller and break the circuit through the signal to cause it to move the signal to danger.

6. In a signaling system for electric railways, the combination of a continuous-feed conductor connected with a source of electrical energy, an intermediate supply-conductor for each block for conveying the current from the feed-conductor to any car that may be upon the block, each supply-conductor being electric-

ally disconnected from the supply-conductors of adjoining blocks, a return-conductor, a signal for each block normally in circuit with the continuous-feed conductor and provided with a high resistance, through which the signal-circuit passes, so adjusted that only enough current will pass through the signal-circuit when it is closed to move or hold the signal at safety, and a magnet controlling said signal connected with the continuous-feed conductor and normally deenergized, a circuit-controller in circuit with each signal and controlled by said magnet and operated by it to normally close the circuit through the signal and hold it at safety, all so arranged that the presence of a car upon the block will affect the magnet to open its circuit-controller and break the circuit through the signal to cause it to move to danger.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHARLES P. BREESE.
ADONIRAM J. WILSON.

Witnesses:

CLARENCE W. COLEMAN,
EDWIN SEGER.