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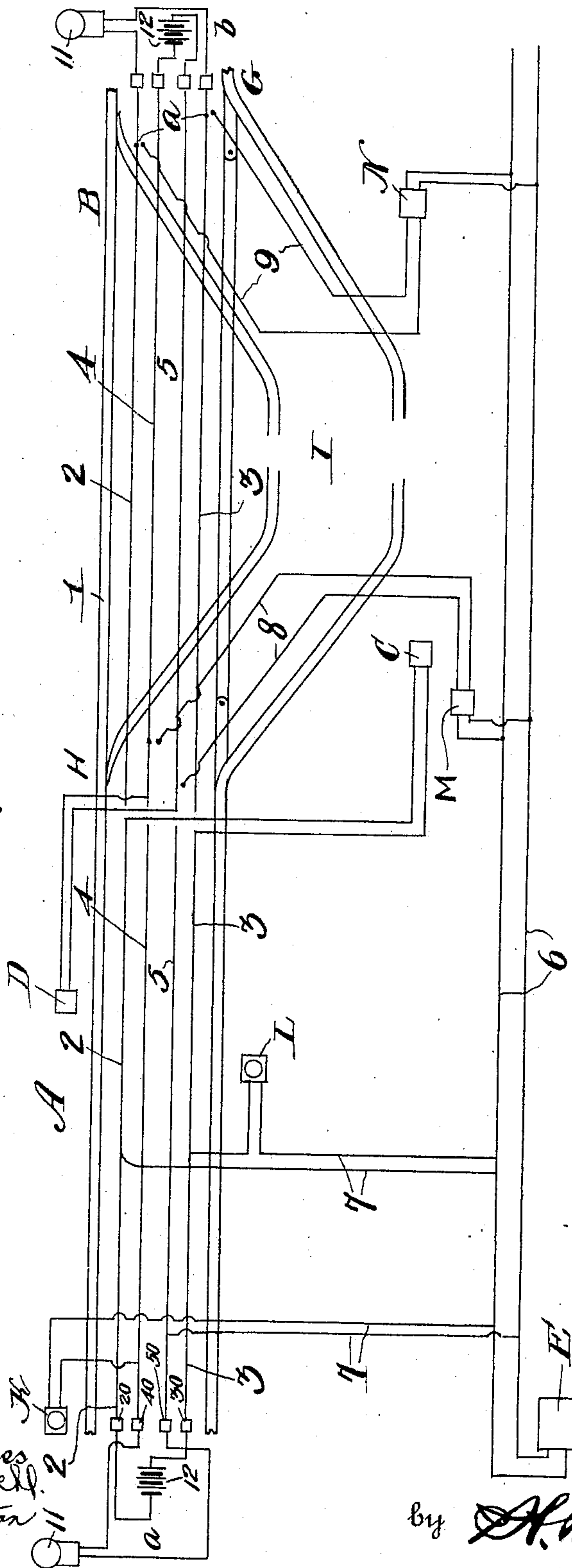
PATENTED MAR. 28, 1905.

J. D. GORDON.  
ELECTRIC RAILWAY SIGNALING SYSTEM.

APPLICATION FILED MAY 5, 1904.

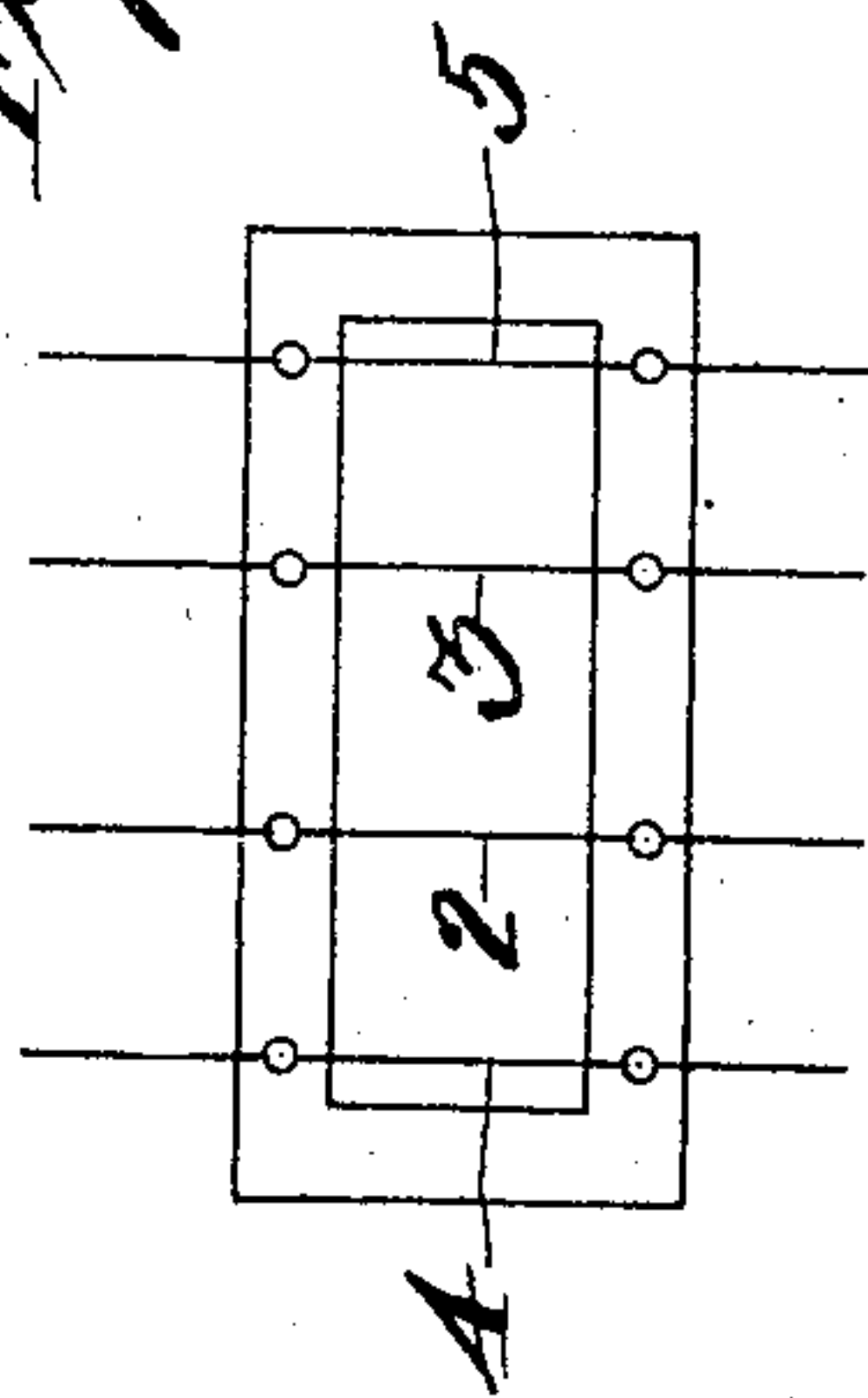
3 SHEETS—SHEET 1.

Fig. 1.



Witnesses  
for A. D. Bell.  
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Fig. 5.



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3 SHEETS—SHEET 2.

Fig. 2.

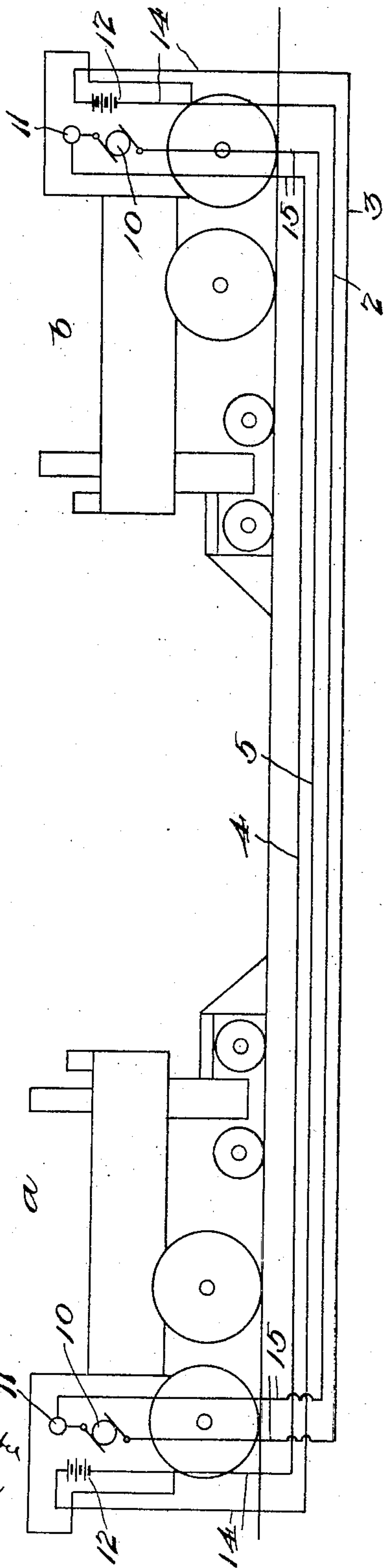
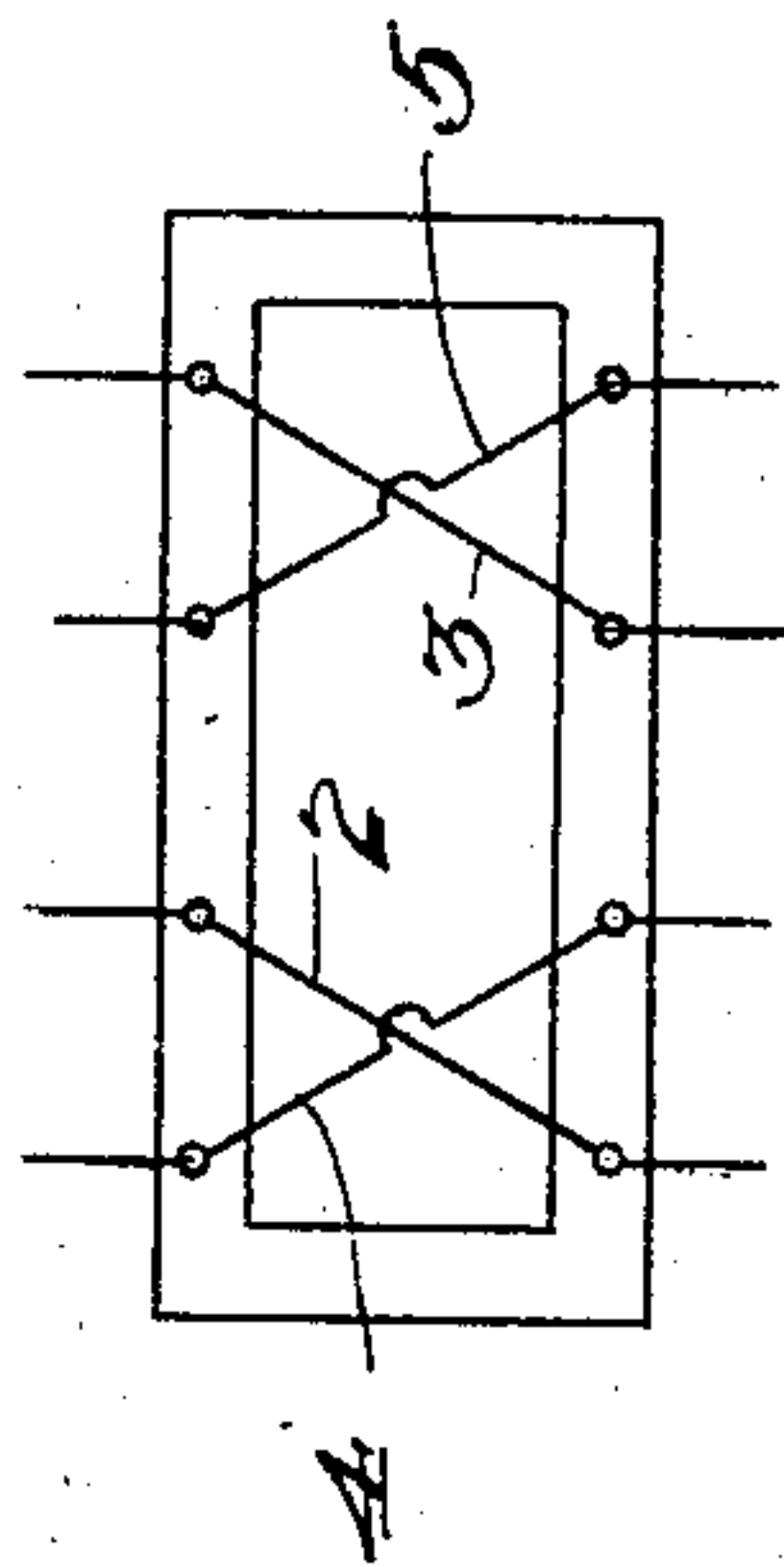


Fig. 6.



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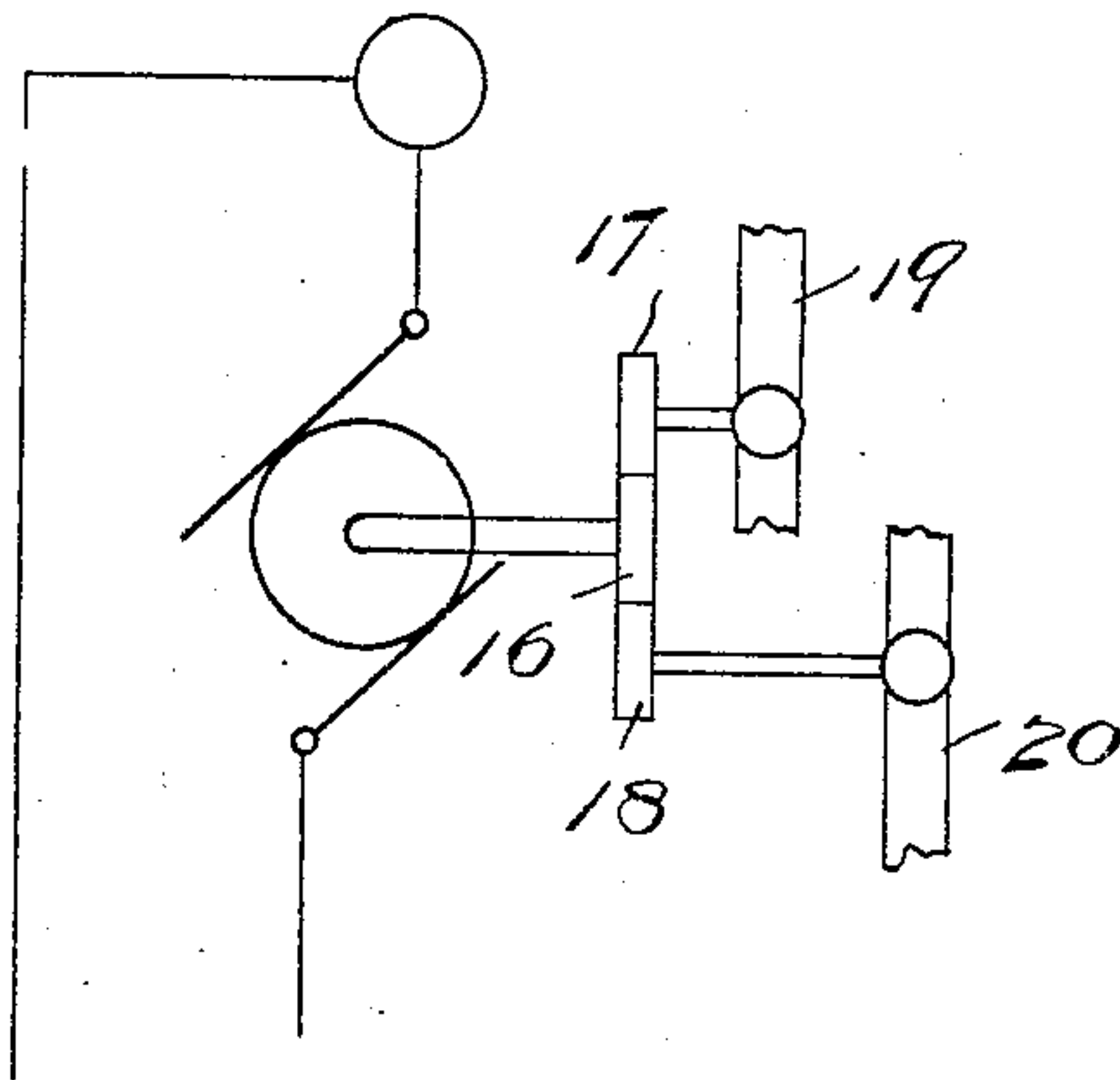
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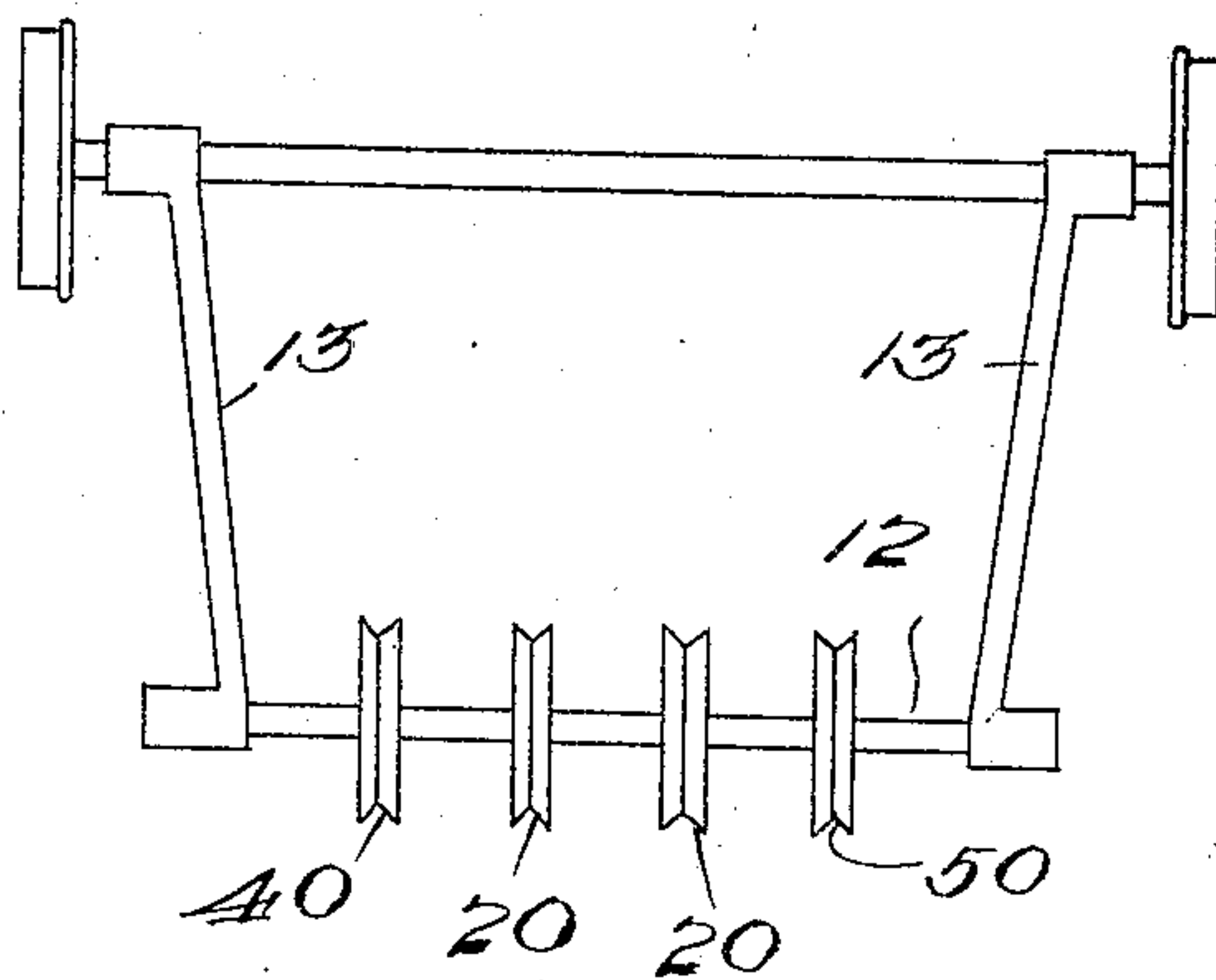
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3 SHEETS—SHEET 3.

*Fig. A.*



*Fig. 3.*



Witnesses

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# UNITED STATES PATENT OFFICE.

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## ELECTRIC RAILWAY SIGNALING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 786,209, dated March 28, 1905.

Application filed May 5, 1904. Serial No. 206,568.

*To all whom it may concern:*

Be it known that I, JOHN DAWSON GORDON, a citizen of the United States, residing at Riverside, in the county of Riverside and State of California, have invented certain new and useful Improvements in Electric Railway Signaling Systems; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is an improved electrically-operated railway signaling system; and it consists in the construction, combination, and arrangement of devices hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a diagrammatic top plan view illustrating a section of a railway provided with my improved signaling system. Fig. 2 is a diagrammatic elevation of the same. Fig. 3 is a detail diagrammatic plan showing the conductor or contact wheels. Fig. 4 is a detail diagrammatic elevation indicating a motor and its connections. Figs. 5 and 6 are diagrammatic plans of train switch devices.

In accordance with my invention the railway (indicated at 1) is provided with two sets of conductor-wires 2 3 and 4 5. They are here shown as disposed between the track-rails, the conductor-wires 2 3 being outermost and the conductor-wires 4 5 being between the conductor-wires 2 3. Said conductor-wires are insulated. I do not desire to limit myself to the arrangement of these conductor-wires between the track-rails, as they may be otherwise arranged within the scope of my invention as the same is pointed out in the appended claims. The said conductor-wires are arranged in blocks of suitable length, two of such blocks being here shown and designated, respectively, as A B. The conductor-wires of each block are totally disconnected and insulated from those of the other blocks.

One pair of the conductors of each block extend to some suitable distance along the next adjacent block and are connected to a suitable signal for supplying currents thereto. As here shown, the wires 2 3 of block A extend along block B to a signal C at one side

of the track, and the wires 4 5 of block B extend along block A to a similar signal D.

Along the track, from end to end thereof, are a pair of feed-wires 6, which are constantly charged with current by a suitable generator at any suitable point on the road, the generator being indicated at E. This constant current is for operating signals at crossings and switches, as hereinafter described. A road-crossing is indicated at F in block A, and switches and a side track in block B are indicated, respectively, at G, H, and I. The wires 6 are shown as connected by bridge-conductors 7 to the wires 2 3 of block A in open circuits on opposite sides of the crossing, said open circuits including, respectively, crossing-signaling devices K L of suitable construction, here indicated as electric bells.

Each of the switches is provided with conductors to make and break connection with one pair of the open-circuit conductors in the main track. Thus, as shown, the switch H is provided with conducting-wires 8, connected to the wires 6 and including in open circuit therewith an electric signaling device M. When the switch is open, there is electrical connection between the conductors 8 and the conductors 4 5; but when the switch is closed, so that the main track is clear, said conductors 8, which are movable with the movable switch-rails, are disconnected from the said conductors 4 5. The switch G is shown as provided with conducting-wires 9, connected also to the wires 6 and including in open circuit therewith an electric signaling device N. When the said switch is open, said conductors 9, which are movable with the movable switch-rails, are in contact with the conductors  $\alpha$ , so that there is electrical connection between the conductors 9 and the conductors 2 3; but when the said switch is closed, so that the main track is clear, said conductors 9 are disconnected from the said conductors 2 3.

Each locomotive operating in connection with my signaling system and moving in one direction is provided with an electric motor of suitable construction, a bell or other suitable signaling device 11, and a battery 12. The latter has the poles connected to one pair of the open-circuit block conducting-



wires, being here shown as connected to the wires 2 3, and the motor and bell or other electric signaling device 11 of each locomotive is in circuit with the open-circuit block  
 5 conducting-wires 4 5. Each locomotive operating in connection with my signaling system and moving in the opposite direction on the same track has its battery and motor and signaling-bell reversely connected with refer-  
 10 ence to the open-circuit block-conductors—that is to say, its battery is normally connected to the conductors 4 5, and its motor and bell are connected to the conductors 2 3.

Within the scope of my invention any suitable means may be employed to establish  
 15 electrical connection between the open-circuit block conducting-wires and the batteries, motors, and signaling devices of the locomotives. For the purposes of this specification I  
 20 show each locomotive provided with trolley or conductor wheels 20, 30, 40, and 50 on an axle 121, which is connected to one of the locomotive wheel-axles by link-bars 13, having bearings for said axles. Said trolley or conduc-  
 25 tor wheels respectively operate on the block-conductors 2, 3, 4, and 5. The poles of the battery 12 on each locomotive are connected to the conductor or trolley wheels 20 30 by suitable conductors, (indicated at 14,) and the  
 30 motor and signaling device 11 of each locomotive are connected by suitable conductors (indicated at 15) to the conductor or trolley wheels 40 50.

When a train is running in either direction,  
 35 the current from its battery 12 will operate the signaling device of the next block ahead—that is to say, if a train is on block A and running toward block B the current from its battery 12 will by the connections, hereinbe-  
 40 fore described, pass through the conductors 2 3 to the signal C, set at a suitable point in said block B, and will set said signal at "danger" to warn a train that may be in said block B of its approach. In the event that  
 45 two trains should be in the same block running toward each other the battery 12, carried by each train or locomotive thereof, will send its current through the motor 10 and signaling device 11 of the other and actuate said  
 50 motor and signaling device—that is to say, the current from the battery 12 of a train *a* running in one direction and connected to the wires 2 3 will operate the motor 10 and signaling device 11 of a train *b* in the same  
 55 block running in the reverse direction, which motor and signaling device are also connected to the said wires 2 3, while the current from the battery 12 of train *b*, which has its poles connected to the wires 4 5, will operate the motor 10  
 60 and signaling device 11 of the train *a*, said last-mentioned motor and signaling device being also connected to the said wires 4 5. Hence each train will signal the other of its approach.

The motors 10 are employed to automati-  
 65 cally apply the air-brakes on the trains and

to also cut off the supply of steam to the locomotive-engines, so as to stop both trains when they enter the same block, and hence prevent the possibility of a collision between them. Within the scope of my invention the motors  
 70 may be connected by any suitable means to the steam-feed and compressed-air pipes' valves to automatically operate said valves. For the purposes of this specification the shaft of each motor is shown as provided with a  
 75 spur-gear 16, which engages similar gears 17 18, with which cut-off valves in the air-brake and steam-feed pipes 19 20, respectively, are provided.

By means of a suitable switch adapted to  
 80 connect its battery and motor and signaling device to either the wires 2 3 or 4 5 at will a train running in one direction in a block may ascertain the presence of another train running in the same direction in the same block,  
 85 as will be understood, and hence prevent the possibility of a rear-end collision. Such a switch is shown in detail in Figs. 5 and 6.

When a train is approaching a crossing in a block, its signaling device 11, by its con-  
 90 nections with either the wires 2 3 or 4 5, according to the direction in which the train is moving, gets in circuit with one of the signals K L and utilizes the current from the constantly-charged feed-wires 6 to operate  
 95 said signal and also its signaling device 11, thus notifying those at the crossing of the approach of the train and also notifying the engineer of the train that he is approaching a  
 100 crossing. It will be understood that suitable devices will be provided to put the motors 10 of the trains in or out of circuit, as may be desired or necessary.

When a train approaches a switch, such as shown at G and H, if the switch be open the  
 105 feed-wires 6 will be in circuit with the block-wires connected to the signaling device 11 of the train, as hereinbefore described, and hence said signaling device will be operated by the current from the feed-wires 6 to notify the  
 110 engineer that he is approaching an open switch. The same devices may be employed for a railroad junction or crossing, as will be understood.

From the foregoing description, taken in  
 115 connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion,  
 120 and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention. For instance, the wires 6 may be disposed on opposite sides of the tracks,  
 125 near the rails thereof, and the axle 121 provided with trolley-wheels to engage them to receive currents from a block ahead and establish communication between the same and the moving train.



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

1. An electric railway signaling system having open-circuit block-conductors for the several blocks, and fixed signaling devices connected to said conductors, said conductors for each block being disconnected from those of the other blocks, and extending past the junctions with the next adjacent blocks, a generator, carried by a train, and connections between said generator and the said conductors, whereby the latter are charged by such generator when the train enters a block and operates the fixed signal or signals for such block, substantially as described.

2. An electric railway signaling system having open-circuit block-conductors for the sev-

eral blocks and fixed signaling devices connected to said open-circuit conductors, relatively constantly charged conductors connected, in open circuit with the open-circuit conductors of the several blocks, and a circuit-closer device carried by a train, coacting with the open-circuit block-conductors and the relatively constantly charged conductors, to successively cut in the said fixed signaling devices as the train proceeds, substantially as described.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN DAWSON GORDON.

Witnesses:

RAYMOND RIS,  
K. D. HARGER.