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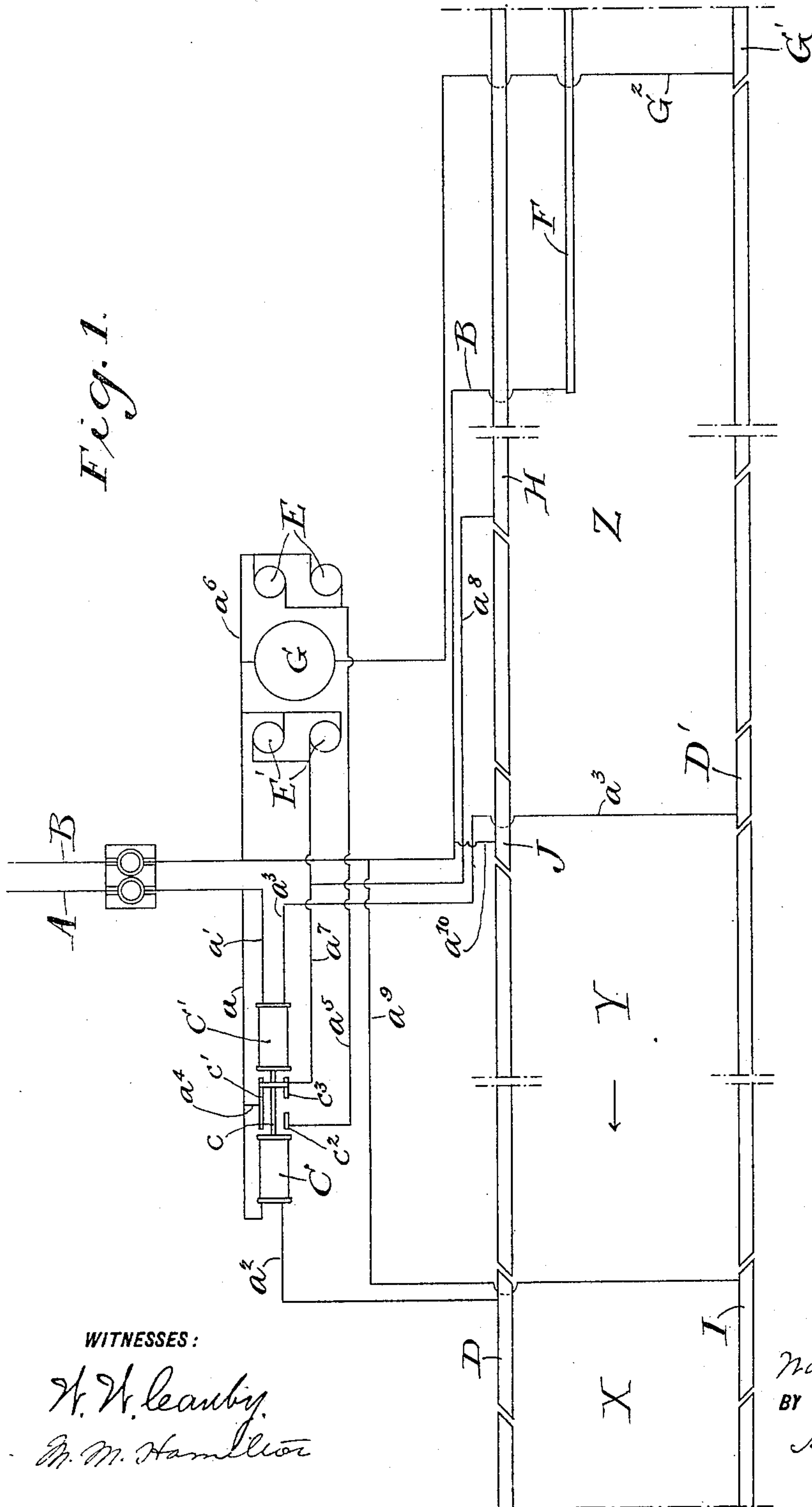
PATENTED MAY 8, 1906.

W. E. SANDS.

ELECTRIC BLOCK SIGNAL FOR RAILWAYS.

APPLICATION FILED MAR. 18, 1905.

2 SHEETS—SHEET 1.



WITNESSES:

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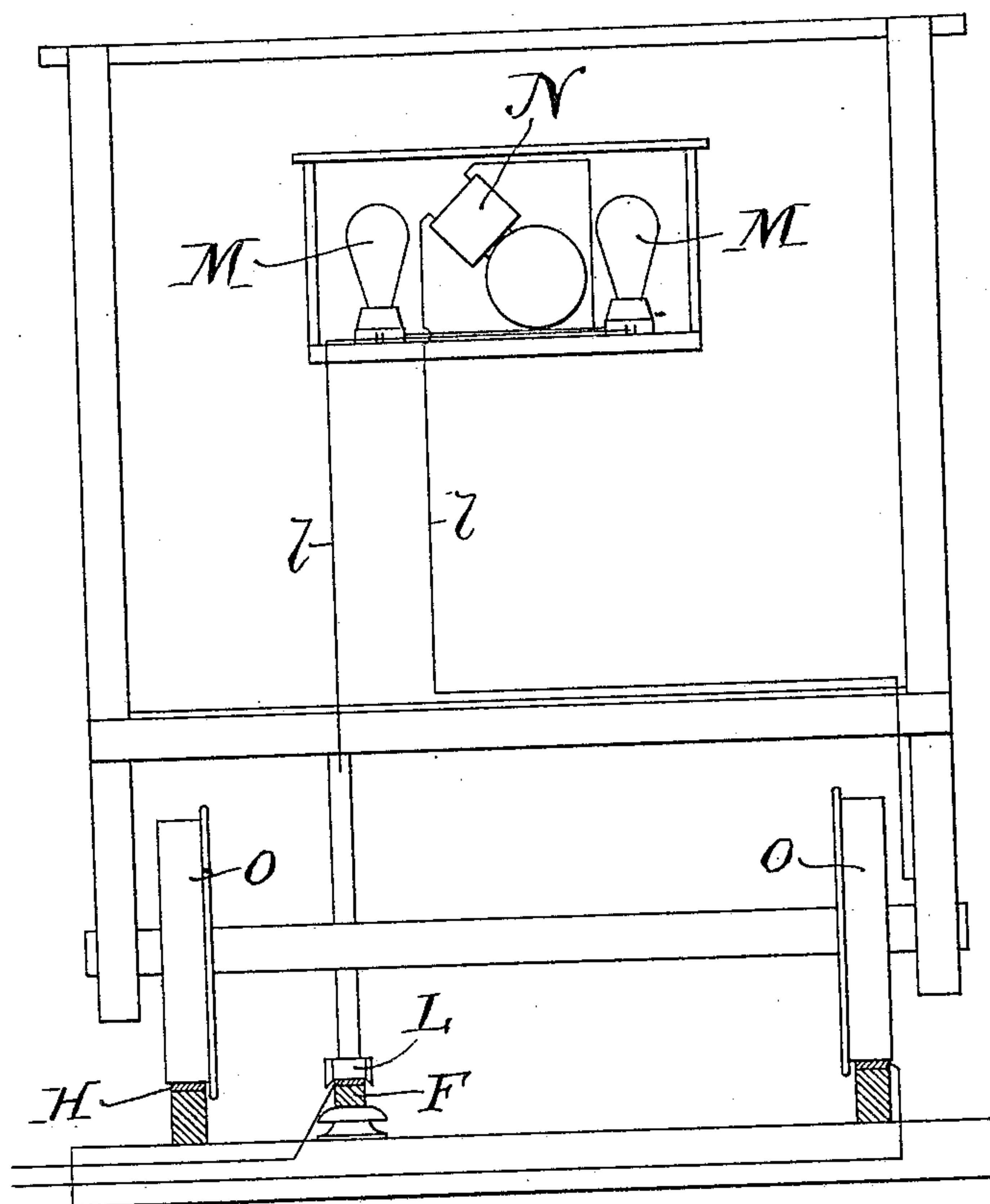
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

WALTER E. SANDS, OF BROOKLYN, NEW YORK, ASSIGNOR TO THE L. A. THOMPSON SCENIC RAILWAY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

ELECTRIC BLOCK-SIGNAL FOR RAILWAYS.

No. 819,808.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed March 18, 1905. Serial No. 250,702.

To all whom it may concern:

Be it known that I, WALTER E. SANDS, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented a new and useful Improvement in Electric Block-Signals for Railways, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its object certain improvements in electric block-signals, in which the road is divided up into sections and a train in a given section arranges an electric circuit in such a manner that a signal is set against a following train and said train approaching said section will be given a signal on the car or engine and at the same time start a signal at the side of the track. When the first-mentioned train or car has passed beyond the first-mentioned section, the electric arrangements are reversed, the following section receives a clear signal and the electrical arrangement is such that a car approaching that section will no longer act to signal on the car or at the side of the track.

I will first describe my invention as illustrated in the accompanying drawings and then point out the invention in the claims.

In the drawings, Figure 1 is a diagrammatic view of my invention, showing tracks, circuits, signals, &c. Fig. 2 is a section through the car and rails.

A is a wire leading from one pole of the source of current-supply. B is a wire leading from the other pole of the source of current-supply. From the wire A extends a wire a to solenoid-magnet C and a wire a' to the solenoid-magnet C'. The armatures of these magnets are connected by the bar c . From the magnet C extends a wire a^2 to rail-section D of the track-rails. From the solenoid-magnet C' extends a wire a^3 to rail-section D'. Between the two solenoid-magnets C C' is the long contact c' and the short contacts c^2 and c^3 . A wire a^4 connects the contact C' with the wire a . A wire a^5 connects the contact c^2 with the lights E, which are white or safety lights. A wire a^6 connects these lights with the wire B. A wire a^7 connects the contact c^3 with the lights E', which are red or danger lights, which lights E' are also connected to the wire a^6 . The wire

B extends to the third rail F. An alarm G is connected by wire with track-section G' by wire G^2 , and said alarm G is also connected to wire a^6 . Wire a^7 , by wire a^8 , is connected to rail-section H. Wire B is also connected by wire a^9 with rail-section I. Wire B is also connected by wire a^{10} with rail-section J. X, Y, and Z, respectively, represent sections of the railway.

The arrangement of currents just described is such, as will hereinafter be specifically described, that when the advance car is on section X the following car on section Z receives a white lights and no signal is rung on the road or car. If, however, the advance car is on section Y, the following car on Z as it approaches Y sees a red signal and will also ring an alarm by the road and on the car. I will now specifically describe how this is done with the described circuits. Supposing the advance car to be in section X, the wheels on rail-sections D and I, under these conditions the car through wires a , a^2 , and a^9 completes a circuit to solenoid-magnet C, which energizes the magnet and causes its armature to connect contacts c' and c^2 . At the same time the connection between contacts c' and c^3 is broken. The white lamps are lighted through the wire A, wire a , contact c' , contact c^2 , wire a^5 , wire a^6 , and wire B. At the same time the circuit, including the alarm G and the third rail F, are open by reason of the connection of wire a^8 with wire a , and wire A is broken by reason of the armature of magnet C' no longer bridging said contacts. If, however, the advance car is in section Y and over rail-section D' and J, then the circuit to solenoid C' is completed through wire A, wire a' , wire a^3 , rail-section D', car, rail-section J, wire a^{10} , wire B, and the magnet C is energized, causing its armature to bridge the contacts c' and c^3 , completing a circuit to danger-lights E' through wire a , contact c' , contact c^3 , wire a^7 , wire a^6 , and wire B. At this time the connection between contact c' and c^2 is broken. Thus a danger-signal is set against a following car approaching this section. Further, when the car-wheels are on sections G' and H a circuit is completed to the alarm G through the sectional rail G', the wire G^2 and a^6 to wire B, and from wire A through wire a , contacts c' c^3 , wire a^7 , wire a^8 to rail-section H through car to rail-section

G'. The rail-section G' is made quite short, so as not to continue to ring the alarm for any substantial period. During these conditions also when a brush L, carried by the car, touches and travels over the third-rail section F that third-rail section is connected by the wires l with lamps M M and bell-magnet N and also connects said devices with the wheel O of the car, which travels on the rail-section H. Thus so long as the wheel is on rail-section H and the brush L on third rail F a circuit is completed, through wires A a, contacts c' e³, wire a⁷, wire a⁸, rail-section H, car-wheel, lamps, and bell-magnet in car, to brush L, third rail F, wire B. The extent of third rail F and rail-section H determine the duration of the alarm and lighting on the car. The conditions just described remain until the advance car has passed through section Y and has reached the rail-sections D and I of section X.

Having now fully described my invention, what I claim, and desire to protect by Letters Patent, is—

1. In combination, a source of current-supply, a railway-track having, at two points thereof, opposite rail-sections, one rail-section at each point being electrically connected to one pole of the current-supply and the other to the other pole, a solenoid for each track-point, two signals, an electric circuit for each signal, one including the armature when one solenoid is energized and the other the armature when the other solenoid is energized, the energizing of each solenoid closing the circuit to its corresponding signal.

2. In combination, a source of current-supply, a railway-track having, at two points thereof, opposite rail-sections, one rail-section at each point being electrically connected to one pole of the current-supply and the other to the other pole, a solenoid for each track-point, two signals, an electric circuit for each signal, one including the armature when one solenoid is energized and the other the armature when the other solenoid is energized, said solenoids being oppositely placed, the energizing of one solenoid closing the circuit to its corresponding signal, and opening the circuit to the other signal.

3. In combination, a source of current-supply, a railway-track having, at two points thereof, opposite rail-sections, one rail-section at each point being electrically connected to one pole of the current-supply and the other to the other pole, a solenoid for each track-point, a contact in electrical connection with one pole of source of current-supply, a second contact, a signal in electrical connection with said contact and the other pole of current-supply, a third contact, a second signal in electrical connection with the third contact and the last-mentioned pole of current-supply, the armature when one solenoid is energized being adapted to connect the

first and second contacts, and the armature when the other solenoid is energized being adapted to connect the first and third contacts.

4. In combination, a source of current-supply, a railway-track having, at two points thereof, opposite rail-sections, one rail-section at each point being electrically connected to one pole of the current-supply and the other to the other pole, a solenoid for each track-point, a contact in electrical connection with one pole of source of current-supply, a second contact, a signal in electrical connection with said contact and the other pole of current-supply, a third contact, a second signal in electrical connection with the third contact and the last-mentioned pole of current-supply, the armature when one solenoid is energized being adapted to connect the first and second contacts, and the armature when the other solenoid is energized being adapted to connect the first and third contacts, said solenoids being oppositely placed and connected, whereby, when one solenoid is energized, the circuit to its corresponding signal is closed and the circuit to the other signal opened.

5. In combination, a source of current-supply and a railway-track, a contact in electrical connection with one pole of current-supply, a second contact in electrical connection with a rail-section, a signal in electrical connection with an opposite rail-section at that point and with the other pole of the current-supply, a solenoid adapted when energized to connect said contacts, an electrical circuit including said solenoid and opposite track-sections at a point in advance of the first-mentioned track-sections.

6. In combination, a source of current-supply and a railway-track, a contact in electrical connection with one pole of current-supply, a second contact in electrical connection with a rail-section, a signal in electrical connection with an opposite rail-section at that point and with the other pole of the current-supply, a solenoid adapted when energized to connect said contacts, an electric circuit including said solenoid and opposite track-sections at a point in advance of the first-mentioned track-sections, and means to release the last-mentioned solenoid-armature at the desired point on the track.

7. In combination, a railway, an electric circuit, a signal in said circuit, a switch in said circuit, an electric device controlling said switch, an electric circuit for said electric device including opposite rail-sections, a second circuit, a signal in said second circuit, a switch for said second circuit, an electric circuit for said second circuit-switch including opposite track-sections in advance of the first-mentioned track-sections, said switches being connected together so that the energizing of one electric switch-controlling device acts oppositely upon the two switches.

8. In combination, a source of current-sup-
ply, a railway-track, a car or cars thereon, a
signal in electrical connection with a track-
section and one pole of the source of current-
5 supply, a second rail-section in electrical con-
nection with the other pole of current-supply,
a switch on said connection, an electrical de-
vice controlling said switch, an electric cir-
cuit including said electric switch-controlling
10 device and opposite track-sections at a point
in advance of the first-mentioned track-sec-
tion, a device carried by the car adapted to
make connection with the rail-section and
electrical connections in the car, including a
15 signal or signals between said device and the
wheel adapted to travel on the first-men-
tioned track-section.

9. In combination, a source of current-sup-
ply, a railway-track, a car or cars thereon, a
20 signal in electrical connection with a track-
section and one pole of the source of current-
supply, a second rail-section in electrical con-
nection with the other pole of current-sup-

ply, a switch on said connection, an electrical
device controlling said switch, an electric 25
circuit including said electric switch-con-
trolling device and opposite track-sections at
a point in advance of the first-mentioned
track-sections, a device carried by the car
adapted to make connection with the rail- 30
section and electrical connections in the car,
including a signal or signals, between said
device and the wheel adapted to travel on
the first-mentioned track-section, and means
at a point in the railway in advance of the 35
second-mentioned track-sections to release
said switch.

In testimony of which invention I have
hereunto set my hand, at the city of New
York, State of New York, this 16th day of 40
March, 1905.

WALTER E. SANDS. [L. s.]

Witnesses:

EDWARD W. DITMARS,
A. F. TURPIN.