No. 762,798. PATENTED JUNE 14, 1904.

M. A. BORN.

RAILWAY SIGNALING SYSTEM.

APPLICATION FILED NOV. 7, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

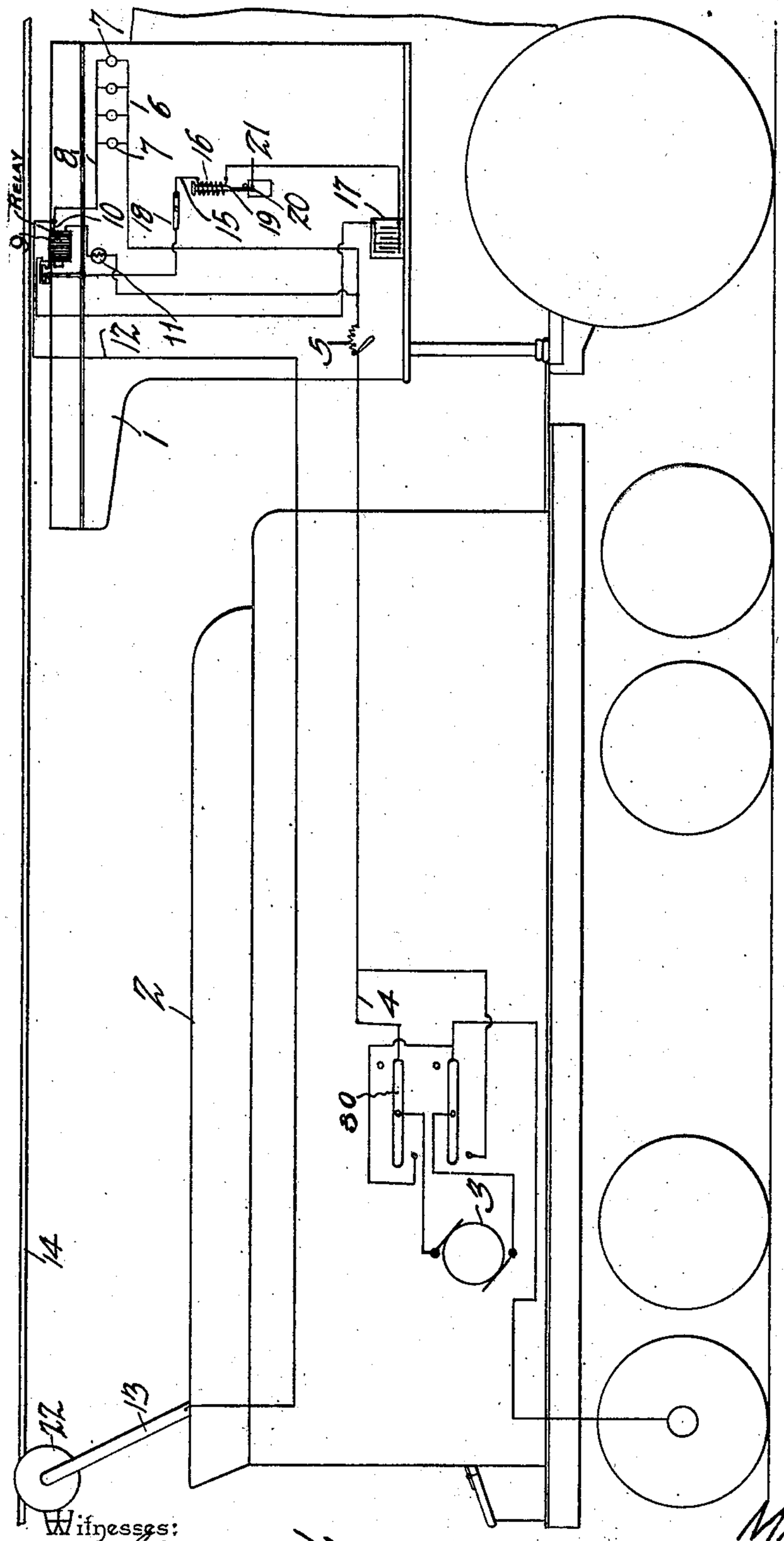

Fig. 1.

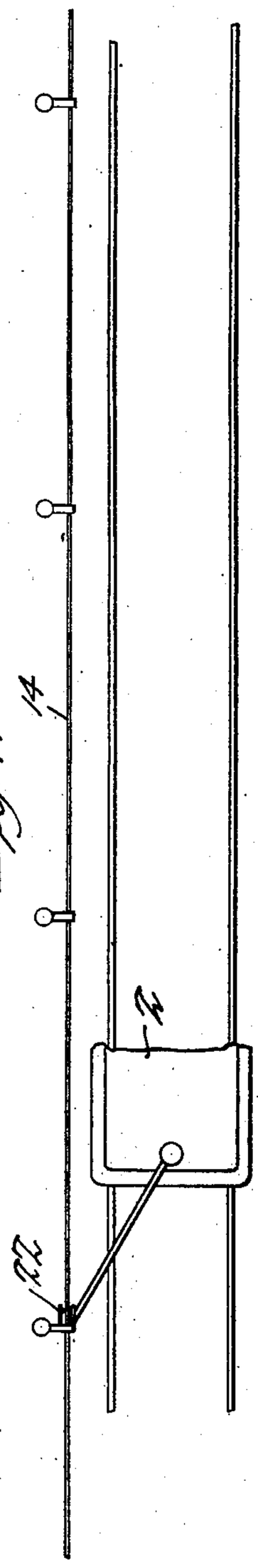

Fig. 4.

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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 4.

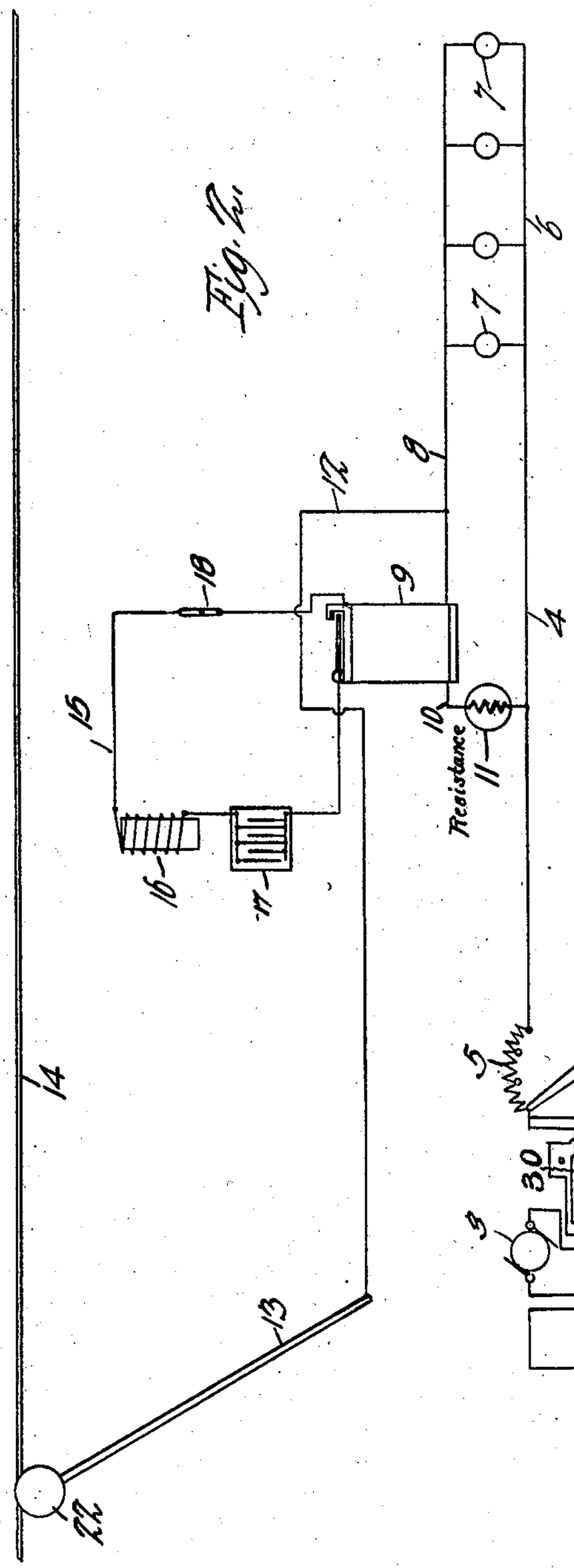


Fig. 5.

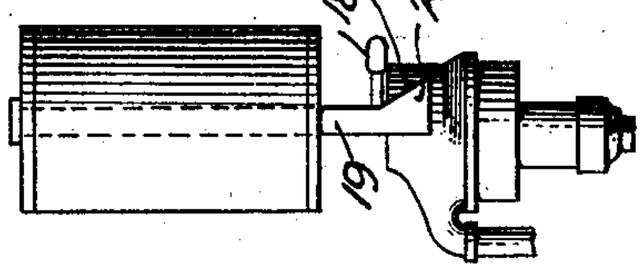
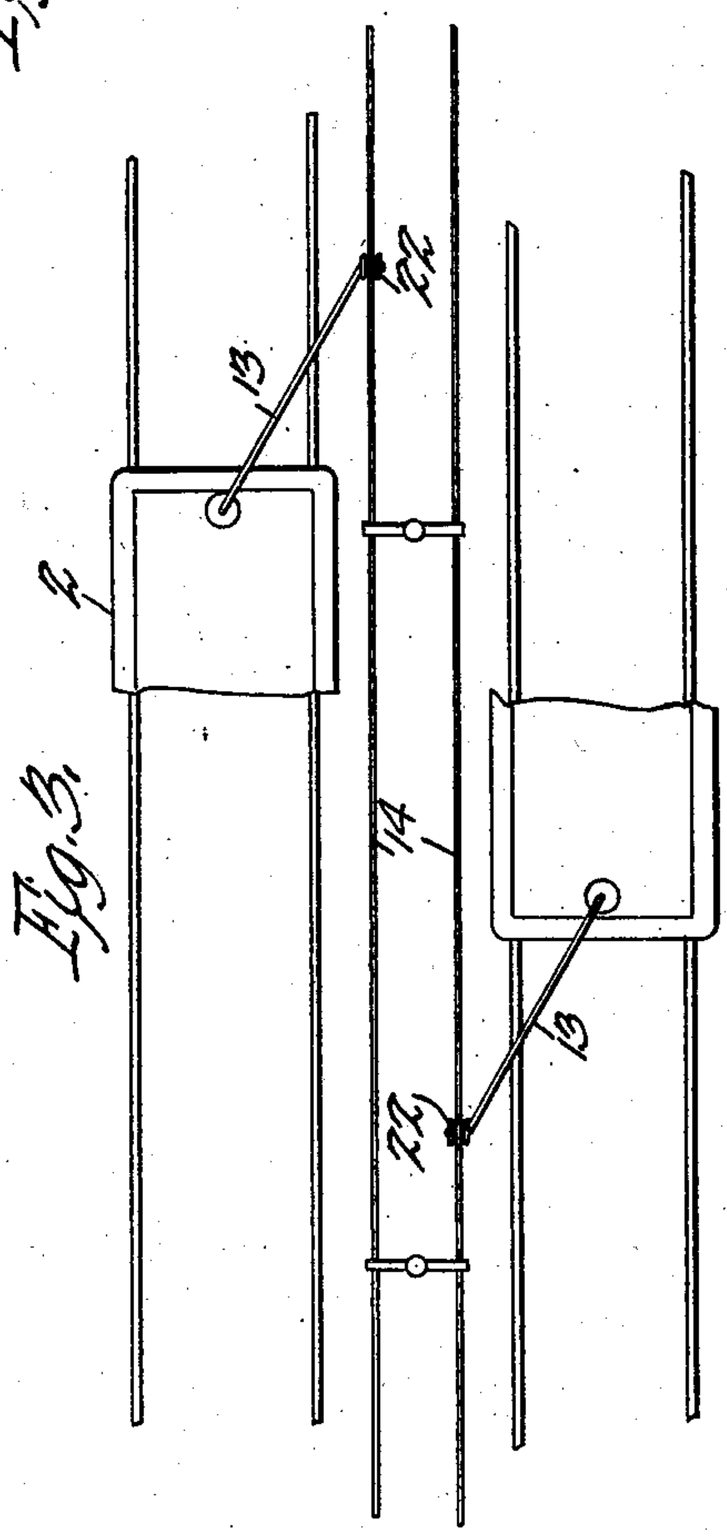


Fig. 6.

Fig. 3.



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No. 762,798. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

MARION A. BORN, OF LAWRENCEVILLE, GEORGIA, ASSIGNOR OF PART TO MILTON H. LOUDON, OF KANSAS CITY, MISSOURI, AND NARCISSA HAYES AND EMMA BYLES, OF WASHINGTON, DISTRICT OF COLUMBIA.

RAILWAY SIGNALING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 762,798, dated June 14, 1904.

Application filed November 7, 1902. Serial No. 130,443. (No model.)

To all whom it may concern:

Be it known that I, MARION A. BORN, a citizen of the United States, residing at Lawrenceville, in the county of Gwinnett and State of Georgia, have invented a new and useful Railway Signaling System, of which the following is a specification.

This invention relates to railway signaling systems.

The object of the invention is in a ready, simple, thoroughly-feasible, certain, and practical manner automatically to effect stoppage of two trains on the same track, whether running in the same or opposite directions, when they shall have reached a predetermined range of approach.

The system of this invention embodies a source of electrical energy carried by the engine or tender, preferably a dynamo, a main circuit including a plurality of lamps, and a local circuit including a relay, a secondary source of electrical energy, and an air-brake-lever-operating device.

It also embodies an overhead conductor to be engaged by a trolley or other contact carried by the tender, said conductor constituting the return, one of the rails of the track constituting the lead.

It also embodies a novel device for automatically operating the engineer's brake-valve when the trains are at a predetermined distance apart.

The underlying principle of this invention resides in a signaling and brake-lever-operating apparatus which will remain passive until a portion of the conductor is reached, where the current will be sufficient to overcome the resistance of the lamps and relay, thus to cause the lamps to burn brightly and the engineer's brake-lever-actuating device to operate to apply the brake. The manner in which the system is operated is the reverse of what is generally observed. In most systems of this character the overhead conductor constitutes the lead and the rail the return; but in this instance the rail constitutes the lead and the overhead conductor the return.

With the above and other objects in view, as will appear as the nature of the invention is better understood, the same consists in the novel construction and combination of parts of a railway signaling system, as will be hereinafter fully described and claimed.

In the accompanying drawings, forming a part of this specification, and in which like characters of reference indicate corresponding parts, there is illustrated one manner of carrying the invention into effect, it being understood that the elements therein exhibited may be varied or changed as to shape, proportion, and exact manner of assemblage without departing from the spirit thereof, and in these drawings—

Figure 1 is a view in side elevation, showing diagrammatically the application of a system to a tender and engine. Fig. 2 is a diagrammatic view exhibiting the manner of applying the system. Fig. 3 is a view in plan, exhibiting the manner of carrying out the invention in connection with a double-track system. Fig. 4 is a similar view showing the manner of carrying the invention into effect with a single-track system. Fig. 5 is a detail view in elevation, showing the manner of operating the engineer's brake-valve lever.

Referring to the drawings, 1 designates the cab of an engine, and 2 the tender thereof. The tender, or the locomotive, if preferred, carries a dynamo 3, which may be driven in any suitable manner, preferably by a small engine. (Not necessary to be shown.) Connected with the dynamo is the lead 4, one terminal of which is in circuit with the rail by being secured to the journal-boxing of one of the tender-wheels—in this instance the rear one. The lead connects with a rheostat 5, which may be disposed on a locomotive, as shown, or on the tender, the object of which is to adjust the resistance of the circuit to cause it to operate when two trains are any desired or predetermined distance apart—that is to say, it may be adjusted to cause the signaling apparatus to become responsive when the trains are three hundred yards apart or at a greater distance. The lamp-circuit 6 includes a plurality of incandescent lamps 7—

in this instance in multiple arc, although, if preferred, they may be in series multiple—the return branch 8 of the circuit being connected with a relay 9, wound to high resistance, and connecting the relay and the lead 4 is a branch 10, including a suitable resistance 11, such as a lamp of high candle-power. Tapped into the branch 8 adjacent to the relay is a branch 12, which connects in any suitable manner with the trolley-pole 13, the trolley-wheel of which engages with the return 14. The relay controls a local circuit 15, including a solenoid 16 and a storage battery 17, of which there may be any desired number of cells. A switch 18 is included in the circuit, operating to cut it out when desired.

If two trains be approaching each other on the same track, when a portion of the track is reached where the current is of sufficient potential to overcome the resistance of the rheostat the current will pass through the lead 4, through the lamps 7, causing them to glow, thence through the branch 12 to the trolley, and thence to the lead. As the trains approach each other nearer and reach a predetermined distance apart the current divides, and part of it passes through the lamps 7 and causes them to shine brightly, and the other part overcomes the resistance of the relay and energizes its armature, thereby closing the local circuit. The solenoid is now energized, and its core moves the engineer's brake-lever 22, causing the brakes to be applied and the train to stop. In the event that the current through the local circuit is not sufficient to energize the solenoid the storage battery will then perform its function; but in the event of the current from the dynamo being of higher potential than that of the storage battery the latter will perform no function whatever. In other words, the storage battery is designed as a reserve in case of emergency.

The solenoid operates the engineer's brake-valve lever by providing the core 19 with a head 20, having a beveled face 21, which when the core lifts engages with the lever and shifts it. The core is disposed in front of the lever, and thus does not interfere with its normal operation by the engineer.

As shown in Figs. 3 and 4, the return 14 is disposed at one side of the track instead of overhead, and the trolley-poles are disposed at an angle to the tracks in order to cause their wheels properly to engage the return. The trolley-wheels 22 will be of the ordinary spool type, but will be of sufficient length to insure a positive contact with the return, irrespective of the rate of speed with which the train may be running. As shown in Fig. 3 this system is applied to a double-track system and in Fig. 4 to a single track.

The glow of the lamps 7 will be a warning to the engineer that another train is on the block and will give him ample time to apply the brakes by hand; but in the event that he does not observe the lamps the device will operate automatically in the manner set forth and will positively stop the train before a collision can take place.

In the drawings there is shown a pole-changer 30 for convenience in sending the energizing-current in either direction, so that the system may be made to operate between trains traveling in the same or in opposite directions.

Having thus described the invention, what I claim is—

1. In a system of the class described, a pair of continuous bare conductors parallel with the road-bed, a source of electrical energy carried by each train, a main circuit on each train having its terminals connected respectively to the conductors, an adjustable resistance and a plurality of lamps connected in the main circuit, a relay and resistance connected in shunt with the main circuit, and an electromagnetically-actuated controlling means disposed in a circuit controlled by said relay.

2. In a system of the class described, a pair of conductors arranged parallel with the road-bed, a main circuit on each train, the terminals of the circuit being in electrical connection with the respective conductors, a source of electrical energy, a rheostat and signal-lamps connected in said main circuit, a shunt including a resistance higher than that of the signal-lamps, a relay connected in the shunt, an auxiliary circuit having an independent source of electrical energy controlled by the relay, and an air-brake-actuating means connected in said auxiliary circuit.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

MARION A. BORN.

Witnesses:
M. H. LOUDON,
R. M. ELLIOTT.