

No. 776,214.

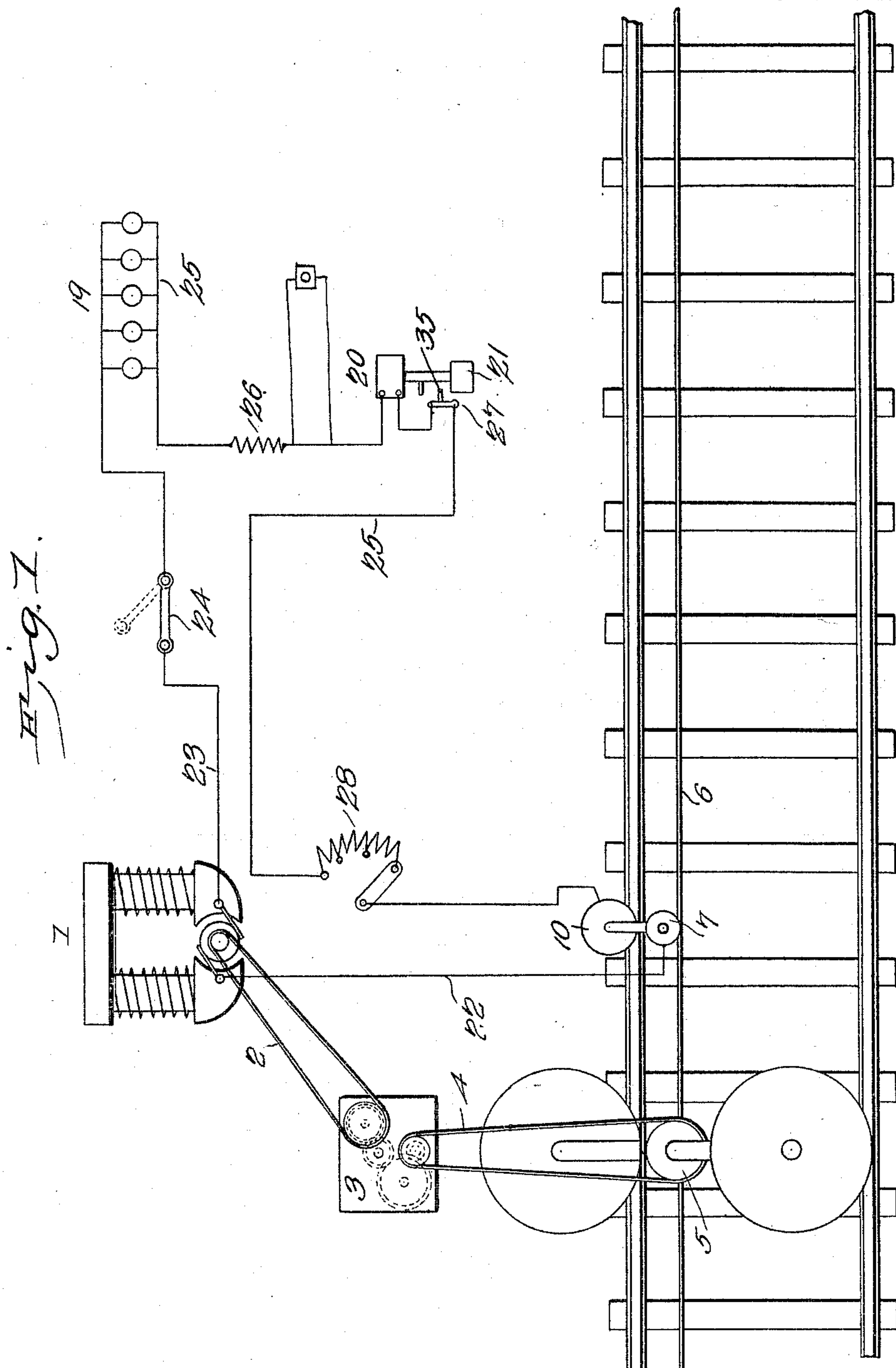
PATENTED NOV. 29, 1904.

M. A. BORN.
ELECTRIC RAILWAY SIGNALING SYSTEM.

APPLICATION FILED MAR. 11, 1902.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses
E. J. Howard
R. M. Elliott

M. A. BORN, Inventor.
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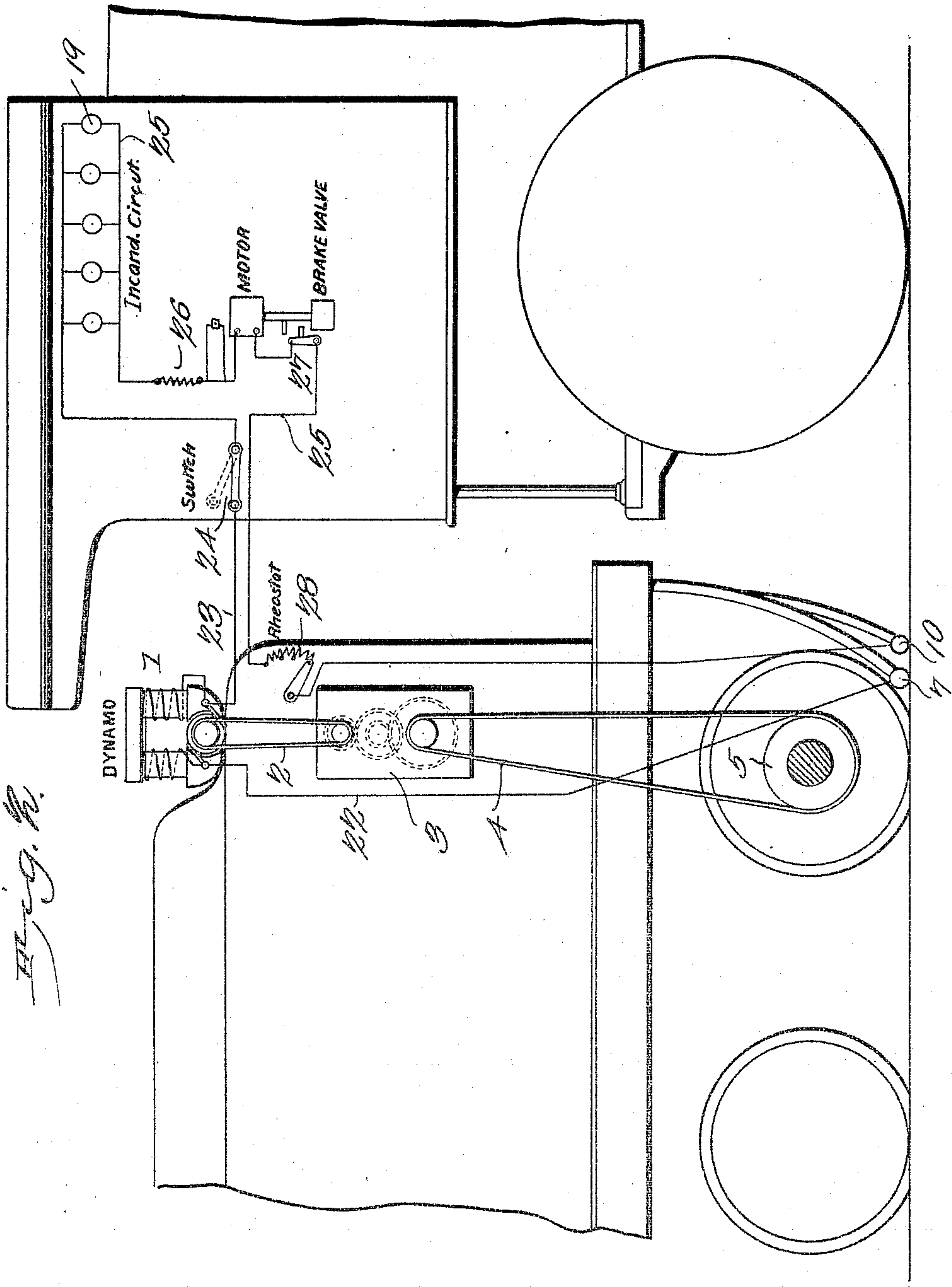
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3 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

MARION A. BORN, OF LAWRENCEVILLE, GEORGIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF PART TO EARLY W. BORN, OF NORCROSS, GEORGIA, EDWARD W. VANCE, OF BUFORD, GEORGIA, MILTON HOPKINS LOUDON, OF KANSAS CITY, MISSOURI, AND EMMA BYLES, OF WASHINGTON, DISTRICT OF COLUMBIA.

ELECTRIC RAILWAY SIGNALING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 776,214, dated November 29, 1904.

Application filed March 11, 1902. Serial No. 97,779. (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 Gwinnette and State of Georgia, have invented a new and useful Electric Railway Signaling System, of which the following is a specification.

This invention relates to electric railway signaling systems.

The object of the invention is in a simple, feasible, and thoroughly practical manner to transmit electric signals over a length of track on which two trains are moving, the signal to be visual, audible, or both combined, as may be desired, and at the same time in the event of the signal not being seen or heard to effect automatic application of the air-brakes.

The underlying principle of the invention resides in the provision of means by which in a positive manner two trains on the same track and running in like or opposite directions shall be notified in ample time to avoid a catastrophe.

Generally stated, the invention consists in the employment of a continuous exposed conductor disposed adjacent to one of the rails or tracks and adapted by a traveling contact suitably connected with a source of electric energy carried by the cab or engine to receive a current of electricity of a predetermined resistance, the signaling apparatus to be responsive only to a current of a determined tension. Thus, for example, if it be desired to render the signaling apparatus operable by a current of, say, ten ohms resistance the apparatus will remain inactive until a part of the conductor is reached where the current has such resistance, whereupon the apparatus will respond and perform the function for which it is designed.

With these 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 an electric 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 numerals of reference indicate corresponding parts, there is illustrated one form of embodiment of the invention capable of carrying the same into practical operation, 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 the drawings—

Figure 1 is a view exhibiting diagrammatically the circuits and electrical generator associated therewith employed in carrying out the invention. Fig. 2 is a view in elevation, showing in outline a portion of a locomotive cab and tender, exhibiting diagrammatically the manner in which the apparatus is associated therewith. Fig. 3 is a view in elevation of the tender, showing one manner of associating the trolley therewith. Fig. 4 is a view in plan of a part of the mechanism shown in Fig. 3. Fig. 5 is a perspective detail view of a trolley with the parts thereof separated.

In carrying the invention into effect there is provided a suitable source of electric energy, preferably a dynamo 1, which is driven by a belt 2 from a train of multiplying-gears 3, actuated from a belt 4, engaging a pulley 5, located in this instance on the front axle of the tender. As is well known, the armature of a dynamo has to make about twenty-four hundred revolutions a minute before it will generate electricity, and under ordinary conditions, as when a train is running at a speed of from five to ten miles an hour or somewhat greater, the dynamo would be inoperative for the purposes designed, and to obviate this defect the multiplying-gear is employed, so that under relatively low rates of speed of travel the dynamo will be rendered efficient. Of course if the desired

speed can be imparted to the dynamo-armature when an engine is running at the rate of four or five miles an hour it will be obvious that when running at the rate of forty or fifty miles an hour the speed of the armature would be excessive, and to obviate this the train of gear can be arranged in the usual manner to control the speed of the armature under all conditions, and as this will be readily understood detailed illustration thereof is deemed unnecessary, especially as the precise arrangement employed forms no part of the present invention. The current from the dynamo is transmitted to a bare conductor 6, disposed adjacent to one of the tracks through the medium of a trolley-wheel 7, carried by one member, 8, of a two-part trolley, the other member, 9, of which carries a trolley-wheel 10, that travels on the rail constituting the return. The members 8 and 9 of the trolley are suitably connected with but insulated from a hanger 11, mounted in a bearing 12 in the floor of the tender, the upper end of the hanger being provided with a handle 13, by which the position of the trolleys may be shifted according to the direction in which the train may be running. The upper portion of the hanger projects through a housing 14, in which is arranged a spiral spring 15, one end of which bears against the upper wall of the housing and the other end against a disk 16, rigidly secured upon the hanger against movement, as by a collar 16^a, and operating resiliently to hold the trolley-wheels in engagement with the conductor and the rail.

As a means for causing operative contact between the conductor and the rail, or, in other words, to prevent the hanger from having any rotary movement, the hanger is provided with a key 17, adapted for alternate engagement with oppositely-disposed slots or keyways 18, formed in the walls of the hanger-openings of the housing, by which arrangement it will be seen that under the action of the spring 15 the key will be kept in positive engagement with whichever keyway it enters, thereby insuring positive coaction between the trolleys and their contacts. Should it be desired to lift the trolleys free from the contacts, this may be effected by raising the key out of engagement with its keyway and then giving the hanger a quarter-turn to bring the key upon an imperforate portion of the housing. The form of trolley herein shown will be found thoroughly efficient for the purposes designed; but it is to be understood that the invention is not to be limited to the precise arrangement shown, as other devices may be employed equally effective in operation and still be within the scope of the invention.

Connected up in parallel with the dynamo is a series of lamps 19, preferably varicolored, a motor 20, and a cut-out 21 for open-

ing the circuit when the air-brake lever shall have been shifted to apply the air-brakes. The conductor 22, which connects with the arm of the trolley-wheel 7, is connected with one field of the dynamo, and the other field has connected with it a conductor 23 in circuit with one terminal of each of the lamps 19, the latter conductor including a switch 24, by which the lamps may be cut out of circuit when desired. The return-conductor 25, which is in circuit with the other terminal of each of the lamps, connects with the motor 20 and includes a rheostat 26, thence with a switch 27, thence to the rheostat 28, and the latter with the arm of the trolley-wheel 10, thereby completing the circuit.

The operation of the device is as follows: Suppose it be desired to render the apparatus responsive to a current of ten-ohms resistance in a stretch of conductor, say, one mile long. The arm of the rheostat 28 will be adjusted to this resistance, and the apparatus will then be in position to perform its function. As soon as the engine starts to run the dynamo will begin to generate electricity, and the current will then pass to the conductor 6. Should an engine or train be on the same track and coming from the opposite direction, (it being of course supplied with a similar apparatus,) as soon as it reaches a part of the conductor where the resistance is ten ohms the circuit will be completed and the lights in both cabs will be simultaneously flashed. It will be understood that the same result will take place if both engines are running in the same direction, thereby preventing tail-end collisions.

As before stated, in addition to the visual signal employed an audible signal, as a bell 36, may be included in the system and may be arranged in the conductor leading from the lamp to the motor.

It will be seen from the foregoing description that although the device of this invention is exceedingly simple of construction it will in practical operation be found perfectly efficient for the purpose designed and may be relied upon for doing thorough and effective work.

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

1. In a railway signaling system, the combination with the traffic-rails, a continuous bare conductor disposed adjacent to one of the traffic-rails, a revolubly-adjustable hanger arranged on the car or train, and a pair of independent trolley-supporting arms carried by the hanger and having trolleys for engaging the conductor and one of the traffic-rails.

2. In a railway signaling system, the combination with the traffic-rails, of a continuous bare conductor arranged adjacent to and parallel with one of the traffic-rails, a spring-pressed hanger on the train, a pair of insu-

lated trolleys carried by the hanger, a hanger-housing provided with a pair of diametrically-disposed slots or recesses, and a locking-lug carried by the hanger and adapted to engage
5 one or other of said slots or recesses.

3. In a railway signaling system, the combination with the traffic-rails, of a continuous bare conductor disposed adjacent to and parallel with one of the traffic-rails, a vertical-
10 guided spring-pressed hanger, a slotted housing for the hanger, a locking device for holding the hanger in either position of adjust-

ment, a pair of trolley-arms secured to the lower end of the hanger and insulated therefrom, and independent trolleys carried by said
15 arms.

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:

E. WINN BORN,
POWELL F. GRAY