J. F. WEBB, JR.

TRAIN STOPPING SYSTEM.

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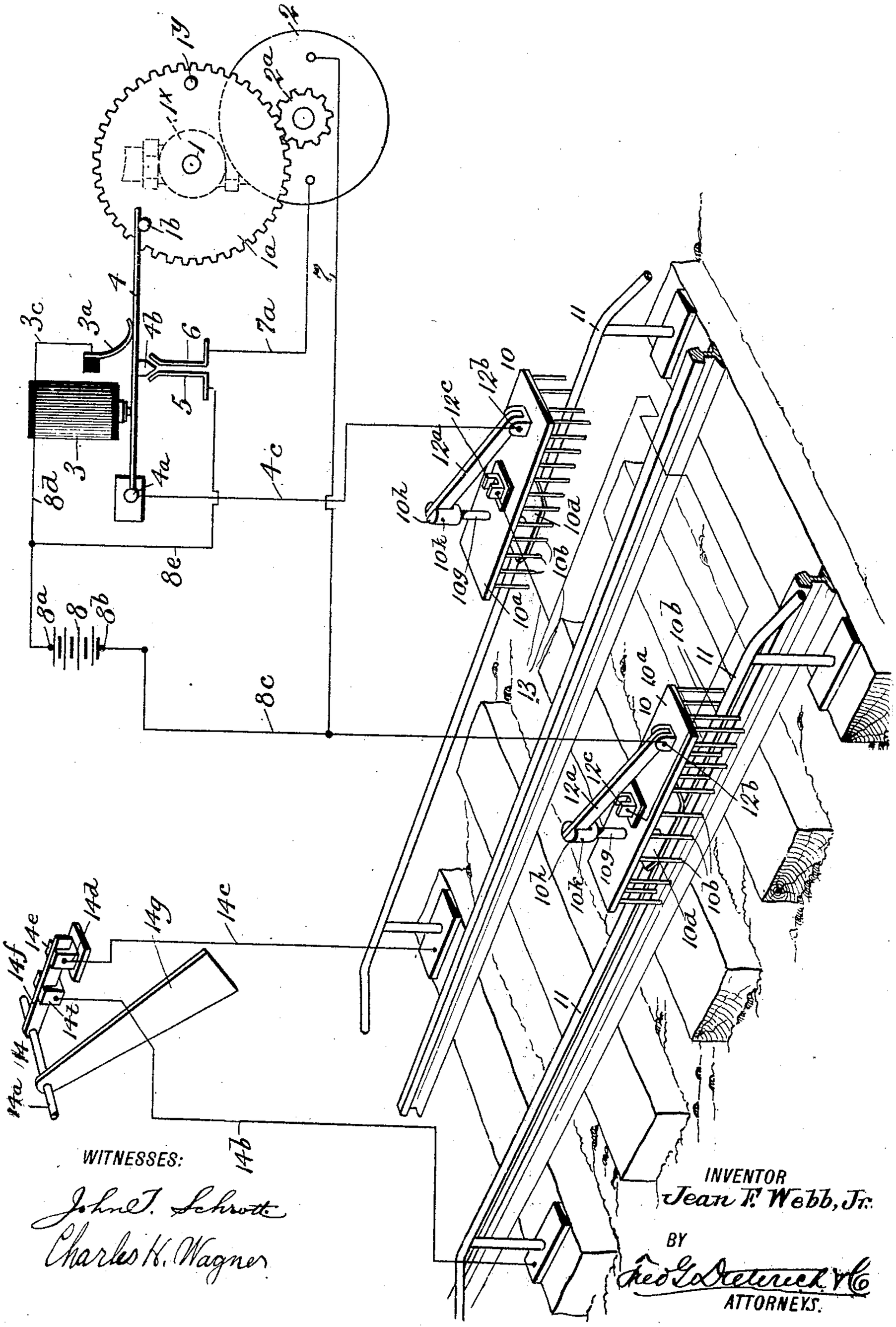

UNITED STATES PATENT OFFICE.

JEAN F. WEBB, JR., OF NEW YORK, N. Y., ASSIGNOR TO THE ELECTRIC SIGNAGRAPH AND SEMAPHORE COMPANY, INCORPORATED, OF NEW YORK, N. Y.

TRAIN-STOPPING SYSTEM.

932,923. Specification of Letters Patent. Patented Aug. 31, 1909.

Application filed August 15, 1908. Serial No. 448,649.

To all whom it may concern:

Be it known that I, JEAN F. WEBB, JR., residing at New York city, in the county of New York and State of New York, have invented a new and Improved Train-Stopping System, of which the following is a specification.

My invention relates to an improved train stopping system in which means are provided for stopping a train at predetermined places and in which advantage is taken of a closed electric circuit, thus making the system what is known in the art as a closed circuit system.

More especially the invention embodies a train stopping system of the general type disclosed in the co-pending application filed by myself and Jean F. Webb, on May 12, 1908, Serial No. 432,330.

In the present system, an air valve in addition to the engineer's is introduced into the air brake system of a train, which valve is motor operated to open the same, the motor being electrically connected through a motor circuit and relay mechanism and is brought into operation to open the air valve when the local closed circuit, containing the train carried contacts, is broken, in any manner.

In this application I have disclosed an improved contact maker which is particularly adapted for use in my present invention, but may be found advantageous in other relations, and I make no claim, *per se*, in this application to such contact maker as that forms the subject-matter of a co-pending divisional application filed May 26, 1908, Ser. No. 450,367.

In its subordinate nature, this invention embodies those novel details of construction and cooperative arangement of parts, all of which will be first fully described and then be specifically pointed out in the appended claims, reference being had to the accompanying drawing, which is a diagrammatic figure illustrating my invention and showing a semaphore switch connected with the track contacts for controlling the track circuit between a pair of track contacts.

Referring now to the accompanying drawing, in which like numerals and letters of reference indicate like parts in the figure, that part of my invention which is carried by the train consists of the air valve 1^x whose stem 1 carries a gear 1^a that meshes with a pinion 2^a of an electric motor 2, the gear 1^a being provided with a pin 1^b and a handle 1^x, for a purpose presently to appear.

8 designates a train carried source of electric energy, one terminal 8^b of which connects through a wire 8^c with a contact shoe 10 at one side of the train and also through a wire 7 to one terminal of the motor 2. The other terminal 8^a of the local source of energy 8 connects through a wire 8^d with one terminal of a relay magnet 3, the other terminal 3^c of which connects with a resilient fixed contact 3^a that engages the armature 4 of the relay when the parts are positioned, as shown in the figure. The terminal 8^a of the battery or source of energy 8 also connects through a wire 8^e with a fixed contact 5 of a pair of contacts 5—6, the other one 6, of which connects through a wire 7^a to the other terminal of the motor 2.

The circuit between fixed contacts 5—6 is adapted to be closed by the contact 4^b on the armature 4 when the magnet 3 becomes deënergized. The armature 4 is pivoted at 4^a and is connected through a wire 4^c with another contact maker 10 at the opposite side of the train.

Each contact maker 10 comprises a metallic plate 10^a having bristles 10^b to engage the track contacts 11, and beneath the plate 10^a a shoe 10^d is mounted, the shoe 10^d being connected to a rod 10^g, which projects through an aperture in the plate 10^a and has a split head 10^h through which a pin 10^k passes to connect the head 10^b to the knife 12^a of a knife switch, the knife 12^a being pivoted at 12^b and in electrical connection with the plate 10^a. Each switch 10 also includes a fixed contact 12^c insulated from the plate 10^a, and the contacts 12^c of each shoe 10 are connected together by a wire 13 so when the knives 12^a are in engagement with the contacts 12^c the circuit from the battery through the relay magnet 3 and the contact makers 10 will be closed.

A spring (not shown) on the rod 10^g beneath the plate 10^a may be provided to assist the force of gravity in closing the knives 12^a against the contacts 12^c, as shown in my contact maker application hereinbefore referred to.

In the practical application of my inven-

tion pairs of track contacts 11 may be placed at suitable intervals along the track so when they are engaged by the shoes 10 they will open the local normally closed train carried circuit and permit the motor circuit to be closed by the armature 4 to open the air valve.

In order to effect a positive control of the train carried part of the train stopping mechanism suitable means are provided for electrically connecting each of a pair of track contacts 11, under normal conditions, so that the train may pass such contacts without actuating the train stopping mechanism, when desired. These means may consist of a semaphore switch 14^e comprising a knife 14^f mounted on the shaft 14^a of a semaphore mechanism 14 and coöperating with fixed contacts 14^t and 14^d respectively, the fixed contacts 14^t and 14^d being respectively connected through wires 14^b—14^c to the track contacts 11, as shown in the drawing. The semaphore blade is indicated by 14^g in the drawing.

So far as described, the manner in which my invention operates when the train stopping mechanism is controlled by the action of a semaphore is as follows: Assume the train to be passing along the track carrying its brush shoe members 10—10 and a local source of electrical energy 8, together with the magnet 3, motor 2 and air valve 1^x, and the coöperating parts; as soon as the train arrives at the pair of track contacts 11, the brush shoe members will engage such contacts and electrically connect therewith. At the same time the shoe 10^d will ride up on such contacts and break the circuit between the knives 12^a and the fixed contacts 12^c.

Should the semaphore 14 be in its safety position with the circuit between the knife 14^f and the fixed contacts 14^d and 14^t of the switch 14^e closed, then the current will continue to flow through the magnet 3, irrespective of the opening of the circuit by the knife switches of the brush shoe since the current instead of flowing across the short circuit bridge 13 will flow through the wires 14^b and 14^c and the semaphore switch. Should, however, the circuit be broken at the semaphore by having the semaphore in its danger position then as soon as the brush shoes are in engagement with the track contacts 11 and the circuit broken between the knives 12^a and the fixed contacts 12^c of the knife switches on the brush shoe, no current will flow through the magnet 3 and hence the armature 4 will drop, breaking the circuit between the brush 3^a and the armature 4, and at the same time closing the local circuit through the contacts 5 and 6, and thus energize the motor 2 which causes it to rotate to open the air valve 1^x.

As soon as the valve 1^x has been opened, the lug 1^b will engage the armature 4, and raise the same to break contact between the fixed contacts 5 and 6 of the motor circuit and at the same time will again close the circuit at the contact 3^a and the armature 4, for as soon as the brush shoes have left the track contacts 11 and the knife switches carried thereby have again closed the short circuiting means, the current will, as soon as the armature 4 has been raised, again flow through the magnet 3 and hold the armature 4 in its raised position.

As soon as the train has come to a stop, the engineer may get out of his cab and return the valve 1^x to its closed position by grasping the handle 1^y and turning the gear 1^a backward a predetermined distance.

What I claim is:

1. In a train stopping mechanism, an air brake system of a train including an air valve, a motor connected with said valve for opening the same, a normally closed train carried circuit, a relay having its magnet in said circuit, a train carried source of electric energy in said circuit, a train carried contact member in said circuit, means mounted on said contact member for opening said circuit at times to deënergize said relay, means independent of the train for engaging said contact member to cause it to open the circuit, means controlled by the relay for operating the motor when the relay magnet becomes deënergized, and means forming a part of said relay for breaking the circuit through the relay magnet independent of the train carried contact member.

2. In a train stopping mechanism, an air brake system of a train, including an air valve, a motor connected with said valve for opening the same, a normally closed train carried circuit, a relay having its magnet in said circuit, a train carried source of electric energy in said circuit, a train carried contact member in said circuit, means mounted on said contact member for opening said circuit at times to deënergize said relay, means independent of the train for engaging said contact member to cause it to open the circuit, means controlled by the relay for operating the motor when the relay magnet becomes deënergized, means coöperating with said independent means for rendering said independent means inoperative at times to prevent it from opening the train carried circuit, and means forming a part of said relay for breaking the circuit through the relay magnet independent of the train carried contact member.

3. In a train stopping mechanism, an air brake system of a train including an air valve, a train carried normally closed electric circuit including a source of electric energy, a train carried contact member having a circuit opening switch connected in said circuit, means mounted independent of the train for engaging said train carried contact

maker to open the switch thereof to break said normally closed circuit at times, an auxiliary means coöperating with said breaking means to render the same inoperative at times, an electric motor geared with the stem of said air valve to open the same, a relay having its magnet connected in said closed circuit and controlling said motor to bring it into operation when the relay magnet becomes deënergized, and means forming a part of said relay for independently breaking the circuit through the relay magnet when the motor circuit is closed by the relay.

4. In a train stopping mechanism, an air brake system of a train including an air valve, a train carried normally closed electric circuit including a source of electric energy, a train carried contact member having a circuit opening switch connected in said circuit, means mounted independent of the train for engaging said train carried contact maker to open the switch thereof to break said normally closed circuit at times, an auxiliary means coöperating with said breaking means to render the same inoperative at times, an electric motor geared with the stem of said air valve to open the same, a relay having its magnet connected in said closed circuit and controlling said motor to bring it into operation when the relay magnet becomes deënergized, and means forming a part of said relay for independently breaking the circuit through the relay magnet when the motor circuit is closed by the relay, and means for restoring said last named breaking means to close the relay magnet circuit at such means and simultaneously breaking the motor circuit to stop the motor.

5. In a train stopping system, a closed train carried circuit, an air valve adapted to connect to the air brake system of the train, an electric motor for operating said air valve, a relay having a circuit closing armature, a pair of contacts adapted to be closed when said armature is released, connections between one of said contacts and the motor, a train carried source of electric energy connected to one of said relay contacts and to the other terminal of the motor, said relay including a magnet having one of its terminals connected with one terminal of said source of electric energy, said relay including another contact connected with the other terminal of said relay magnet and engaging said armature when the magnet is energized, a pair of train carried circuit controlling shoe switches, to one of which one terminal of said source of electric energy is connected, connections between the other shoe switch and the armature of the relay, said shoe switches each including a movable contact and a fixed contact, said fixed contacts being in electrical connection with one another, and means independent of the train and coöperating with said shoe switches to open the circuit at the shoe switches at times to deënergize the relay magnet and permit the armature to close the motor circuit.

6. In a train stopping system, a closed train carried circuit, an air valve adapted to connect to the air brake system of the train, an electric motor for operating said air valve, a relay having a circuit closing armature, a pair of contacts adapted to be closed when said armature is released, connections between one of said contacts and the motor, a train carried source of electric energy connected to one of said relay contacts and to the other terminal of the motor, said relay including a magnet having one of its terminals connected with one terminal of said source of electric energy, said relay including another contact connected with the other terminal of said relay magnet and engaging said armature when the magnet is energized, a pair of train carried circuit controlling shoe switches, to one of which one terminal of said source of electric energy is connected, connections between the other shoe switch and the armature of the relay, said shoe switches each including a movable contact and a fixed contact, said fixed contacts being in electrical connection with one another and means independent of the train and coöperating with said shoe switches to open the circuit at the shoe switches at times to deënergize the relay magnet and permit the armature to close the motor circuit and open the relay magnet circuit between the fixed contact that joins with the magnet and the armature.

7. In a train stopping system, a closed train carried circuit, an air valve adapted to connect to the air brake system of a train, an electric motor for operating said air valve, a relay having a circuit closing armature, a pair of contacts adapted to be closed when said armature is released, connections between one of said contacts and the motor, a train carried source of electric energy connected to one of said relay contacts and to the other terminal of the motor, said relay including a magnet having one of its terminals connected with one terminal of said source of electric energy, said relay including another contact connected with the other terminal of said relay magnet and engaging said armature when the magnet is energized, a pair of train carried circuit controlling shoe switches, to one of which one terminal of said source of electric energy is connected, connections between the other shoe switch and the armature of the relay, said shoe switches each including a movable contact and a fixed contact, said fixed contacts being in electrical connection with one another, means independent of the train and coöperating with said shoe switches to open the circuit at the shoe switches at times to deënergize the relay magnet and permit

the armature to close the motor circuit, and means controlled by the motor to engage said relay armature to break the motor circuit and close the magnet circuit at the armature at times.

8. In a train stopping system, a closed train carried circuit, an air valve adapted to connect to the air brake system of the train, an electric motor for operating said air valve, a relay having a circuit closing armature, a pair of contacts adapted to be closed when said armature is released, connections between one of said contacts and the motor, a train carried source of electric energy connected to one of said relay contacts and to the other terminal of the motor, said relay including a magnet having one of its terminals connected with one terminal of said source of electric energy, said relay including another contact connected with the other terminal of said relay magnet and engaging said armature when the magnet is energized, a pair of train carried circuit controlling shoe switches, to one of which one terminal of said source of electric energy is connected, connections between the other shoe switch and the armature of the relay, said shoe switches each including a movable contact and a fixed contact, said fixed contacts being in electrical connection with one another, and means independent of the train and cooperating with said shoe switches to open the circuit at the shoe switches at times to deënergize the relay magnet and permit the armature to close the motor circuit and open the relay magnet circuit between the fixed contact that joins with the magnet and the armature, and means controlled by the motor to engage said relay armature to break the motor circuit and close the magnet circuit at the armature at times.

9. In a train stopping mechanism, an air brake system of a train including an air valve, an electric motor for opening said air valve, a relay having armature controlled contacts, a motor circuit including a source of electric energy, said armature controlled contacts and the motor, said relay having a magnet, a normally closed train carried electrically operating circuit including said relay magnet and said source of electric energy, a pair of train carried contact makers connected in said operating circuit, circuit opening switches carried by each of said contact makers, said switches being electrically connected in series with one another and in said operating circuit, means mounted independent of the train for engaging said contact makers to open said switches to break said normally closed operating circuit at times.

10. In a train stopping mechanism, an air brake system of a train, including an air valve, an electric motor for opening said air valve, a relay having armature controlled contacts, a motor circuit including a source of electric energy, said armature controlled contacts and the motor, said relay having a magnet, a normally closed train carried electrically operating circuit including said relay magnet and said source of electric energy, a pair of train carried contact makers connected in said operating circuit, circuit opening switches carried by each of said contact makers, said switches being electrically connected in series with one another and in said operating circuit, means mounted independent of the train for engaging said contact makers to open said switches to break said normally closed operating circuit at times, and auxiliary means independent of the train for short-circuiting said contact makers at times to maintain the closed circuit when the switches are opened.

11. In a train stopping mechanism an air brake system of a train including an air valve, an electric motor for opening said air valve, a relay having armature controlled contacts, a motor circuit including a source of electric energy, said armature controlled contacts and the motor, said relay having a magnet, a normally closed train carried electrically operating circuit including said relay magnet and said source of electric energy, a pair of train carried contact makers connected in said operating circuit, circuit opening switches carried by each of said contact makers, said switches being electrically connected in series with one another and in said operating circuit, means mounted independent of the train for engaging said contact makers to open said switches to break said normally closed operating circuit at times, auxiliary means independent of the train for short-circuiting said contact makers at times to maintain the closed circuit when the switches are opened, and means independent of said contact makers for opening the circuit through said relay magnet while the motor is operating.

12. In a train stopping mechanism, an air brake system of a train including an air valve, an electric motor for opening said air valve, a relay having armature controlled contacts, a motor circuit including a source of electric energy, said armature controlled contacts and the motor, said relay having a magnet, a normally closed train carried electrically operating circuit engaging said relay magnet and said source of electric energy, a pair of train carried contact makers connected in said operating circuit, circuit opening switches carried by each of said contact makers, said switches being electrically connected in series with one another and in said operating circuit, means mounted independent of the train for engaging said contact makers to open said switches to break said normally closed operating circuit at times, auxiliary means independent of the

train for short-circuiting said contact makers at times to maintain the closed circuit when the switches are opened, means independent of said contact makers for opening the circuit through said relay magnet while the motor is operating, and mechanical means for restoring the circuit through the relay magnet at such independent breaking means and simultaneously breaking the motor circuit.

JEAN F. WEBB, Jr.

Witnesses:
A. E. Dieterich,
John T. Schrott.