

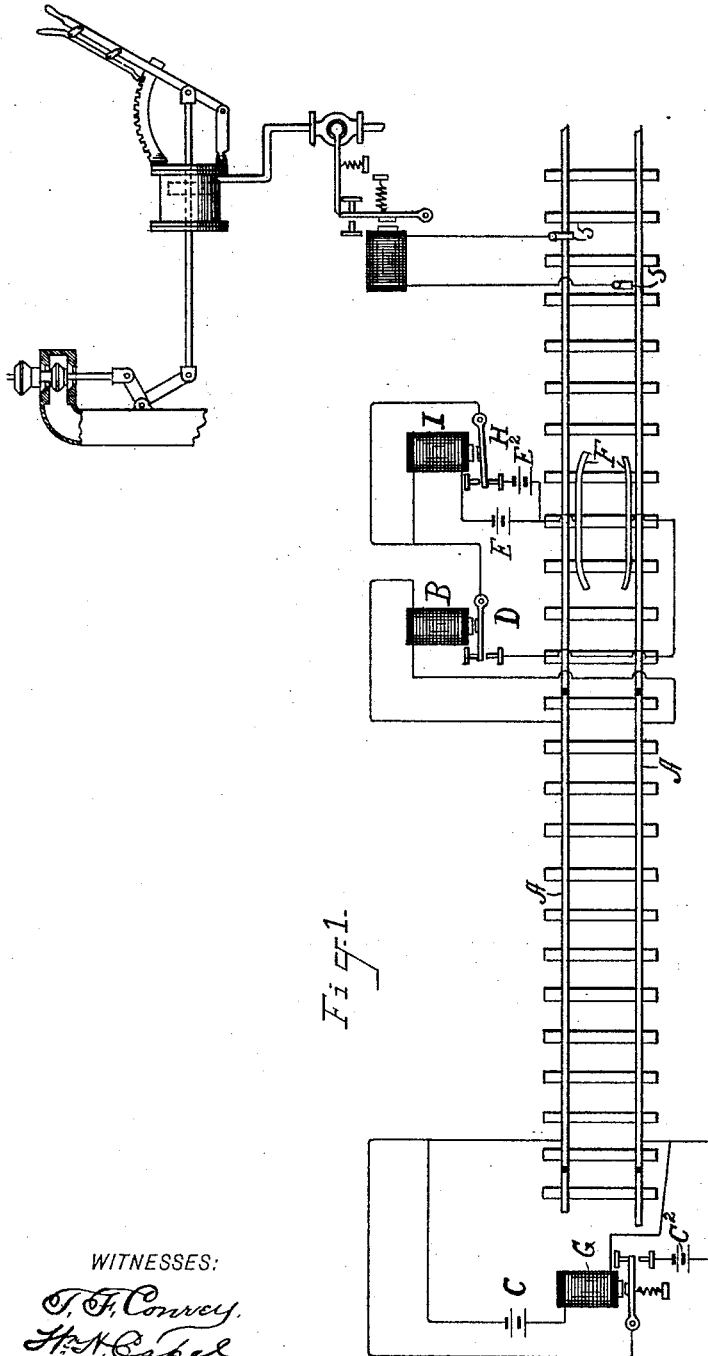
(No Model.)

2 Sheets—Sheet 1.

F. E. KINSMAN.  
RAILWAY SIGNAL.

No. 523,723.

Patented July 31, 1894.



WITNESSES:

*T. F. Convey.*  
*H. K. Capel.*

INVENTOR

*Frank E. Kinsman*

BY

*H. C. Townsend*

ATTORNEY.

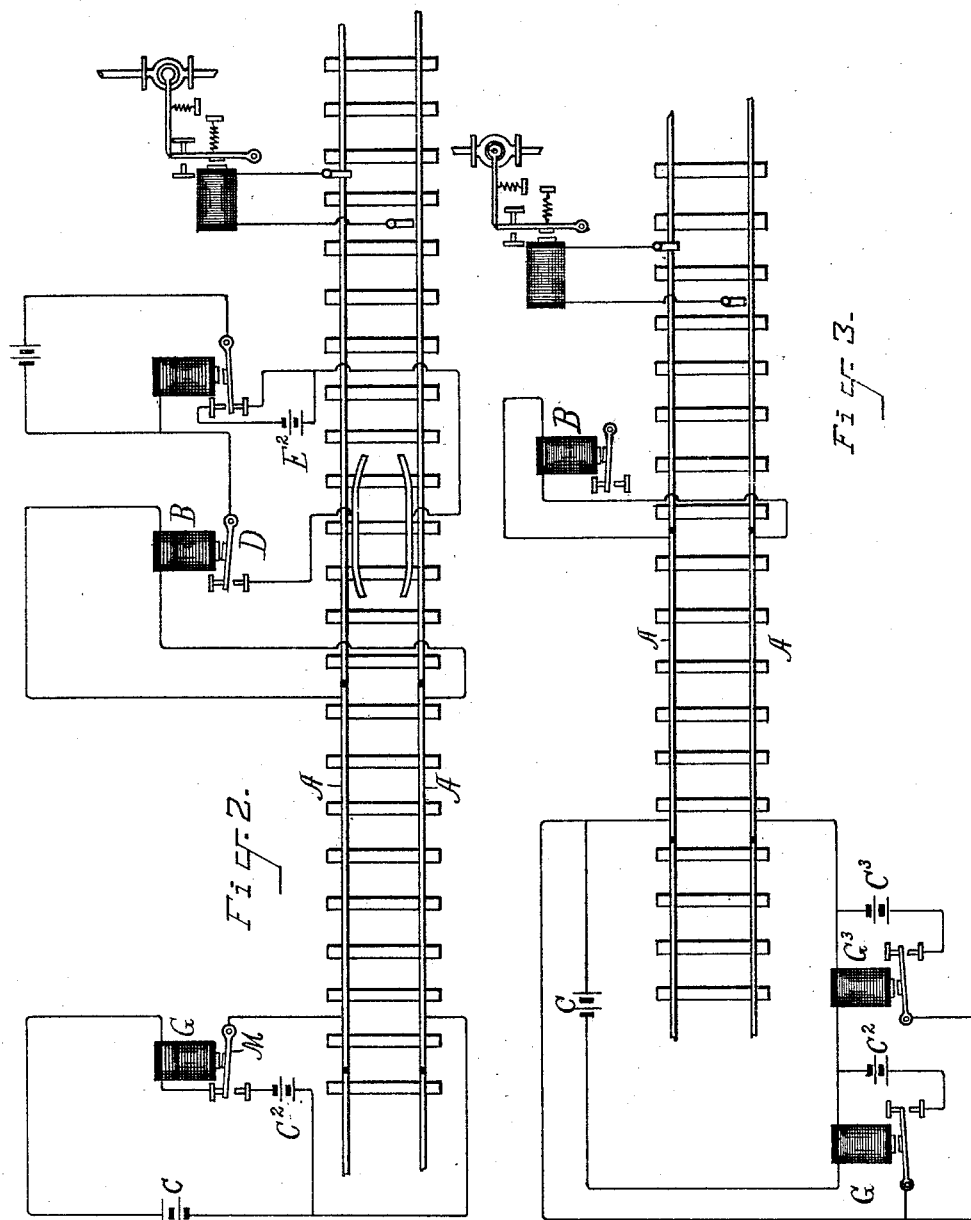
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# UNITED STATES PATENT OFFICE.

FRANK E. KINSMAN, OF PLAINFIELD, NEW JERSEY.

## RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 523,723, dated July 31, 1894.

Application filed February 1, 1893. Serial No. 460,561. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK E. KINSMAN, a citizen of the United States, and a resident of Plainfield, in the county of Union and State of New Jersey, have invented a certain new and useful Railway-Signal, of which the following is a specification.

My invention relates to apparatus for controlling the movement of railway trains, cars or vehicles, by any means visual, audible, or electro-mechanical, and is designed more particularly for use in connection with my improved system of automatically bringing a locomotive or other propelling motor to rest by automatically shutting off the motive power of the apparatus, reversing the motor or applying the brakes, in order to prevent accident.

The principal object of my invention is to provide for the case of a whole or partial failure of the electric battery or generator and consequent failure of the apparatus to work properly at the time that the conditions may require that a car or train should be stopped.

My invention consists in the construction and combinations of apparatus as hereinafter described and then specified in the claims.

In the accompanying drawings:—Figure 1, is a diagram illustrating my invention as applied to a main or detector circuit and to a relay or signal circuit. Fig. 2, is a diagram illustrating a modification of the apparatus whereby the failing generator is cut out when the reserve generator is thrown in. Fig. 3, illustrates the invention as carried out in connection with a number of reserve or relay generators that may come into action one after the other.

Referring to Fig. 1, A, A, indicate the rails of a section of track and B, an electro-magnet connected to the said section at one end thereof and normally charged by means of a battery or other generator of electricity C, connected to the rails of said section at the opposite end; the organization being such that, as well understood in the art, the presence of a locomotive or other vehicle on the section A, A, will shunt current from the electro-magnet B, and the latter losing its power will operate upon a visual or audible signal, or will cause the proper circuits to be closed whereby a locomotive or other vehicle on an

adjoining section of track may be brought to rest. In the present instance I have shown the rail magnet B, as controlling for this purpose, an armature lever D, which operates as a circuit closer for completing the circuit of a battery E, or other generator, to a contact or guard rail or rails F, F. The contact or guard rails F, F, serve to operate as a means for closing by arms or brushes 5, 5, the circuit of suitable devices on a car or vehicle passing over them, but as the details of these devices are well known in the art and may be varied, they will not be particularly described. It is sufficient to state that the circuit through switch D, will be completed when magnet B, loses its power and serves to energize a magnet whereby a visual or audible signal may be given to the engineer, or automatic devices may be set into operation for setting the brakes or cutting off steam or other motive power.

Referring now to the section of rails A, A, I have shown at G, an electro-magnet which is charged from the battery C, that charges the section A, so that if the battery C, fails or partially loses its power, the electro-magnet G, will weaken sufficiently to permit the retractor applied to the armature lever of said magnet to draw the armature back.

C<sup>2</sup>, is the auxiliary or reserve battery which is connected to the section of rails A, A, in a similar manner to the battery C, and has its circuit controlled by means of the armature lever of magnet G, operating as an ordinary switch or circuit closer.

As will be seen, so long as the battery C, maintains its power the armature lever will be held up and the battery C<sup>2</sup>, will remain in reserve, but if the battery C, should fail so that the proper action of the apparatus would be endangered or the signal falsely given, then the reserve battery C<sup>2</sup>, will have its circuit closed and will maintain the voltage or potential on the rail circuit. This battery C<sup>2</sup>, being connected in multiple, or in the same manner as battery C, it is obvious that there will not be any undue increase of potential on the rail circuit A, A, so that any pair of wheels and connecting axle upon the section A, may still operate in the manner required to shunt sufficient current from magnet B, so as to call the apparatus into operation whereby

the signal may be given or the train upon at neighboring section brought to rest.

The electro-magnet G, which is charged by the normal battery is preferably arranged, as shown, in the direct connection between the battery and the rails but might be charged by other connections as will be well understood in the art.

To provide for the case of a failure or loss of power in the relay battery E, which is controlled by electro-magnet B, I prefer to employ an auxiliary or reserve battery E<sup>2</sup>, the circuit of which is controlled by the armature lever H, for an electro-magnet I. The electro-magnet I, is placed in circuit with battery E, so that it will be normally charged and will, by operating on the armature lever H, which serves as a circuit closer, open the circuit of the battery E<sup>2</sup>. Should the battery E, fail, however, the battery E<sup>2</sup>, will be thrown onto the circuit controlled by lever D, and the contact for the arms 5, will then be ready to pass an electric current onto the locomotive or other vehicle for the desired purpose even although battery E, should be inoperative at the time magnet B, loses its power through the presence of a pair of wheels and connected axles on the section A.

In the diagram Fig. 2, I have illustrated a modification in the connections of the batteries C, and C<sup>2</sup>, and controlling switch whereby the defective battery C, may be thrown out of circuit when the reserve or relay battery C<sup>2</sup>, is thrown in. For this purpose the armature lever M, of the electro-magnet G, is made to operate as a double switch having two sets of contacts one of which is closed and keeps battery C, connected to the rails A, while said battery is of proper charging power while, when the battery fails in whole or in part, said switch by dropping back will open the circuit of battery C, and close that of battery C<sup>2</sup>, in the manner already explained. By this arrangement the battery C<sup>2</sup>, will be prevented from short circuiting through battery C, in case the latter should develop a short circuit in itself or its voltage should fail so much as not to oppose materially the counter-electro-motive force to the battery C<sup>2</sup>, to prevent the latter short circuiting.

It will be obvious that my invention is applicable to cases where the electro-magnet B, is used in other ways for controlling the movement of trains or vehicles, and also that the circuit of the contact rails F, F, or other device employed for closing the circuit upon the vehicle or locomotive, might be governed by other devices instead of by an electro-magnet B, without departing from my invention.

In Fig. 3, a series of reserve or relay batteries is shown. The battery C<sup>2</sup>, corresponds

to that already described while the battery C<sup>3</sup>, is controlled by magnet G<sup>3</sup>, in such manner that if battery C<sup>2</sup>, shall fail, then battery C<sup>3</sup>, will come into operation. It is obvious that if desired this plan might be extended to additional batteries.

I do not limit myself to the particular arrangement of circuits and batteries herein shown as the auxiliary reserve battery or batteries might be placed in other circuits and thrown into connection in other ways so as to supplement the action of the battery C, in case of a partial or complete failure of the latter.

By the term battery as used herein I mean to include not only a galvanic battery but a storage or secondary battery or any other generator of electricity no matter what its nature.

What I claim as my invention is—

1. In an apparatus for controlling the movement of railway trains, the combination substantially as described, of a section of rails A, A, an electro-magnet and a charging battery for the section connected respectively to the section at opposite ends thereof, an auxiliary or reserve battery, an electro-magnet controlling the connection of the same with the rails and having its circuit normally governed by a magnet normally charged by the main battery, a switch controlled by magnet B, one or more contact rails F, F, connected to said switch, a battery or other generator of electricity in the circuit of said rail or rails, and an auxiliary or reserve battery normally disconnected from the circuit, and a switch governed by the main battery connected to the contact rails for throwing the auxiliary battery into circuit, as and for the purpose described.

2. In an apparatus for controlling the movement of railway trains, the combination of a section of rails A, A, an electro-magnet included in a circuit between the rails at one end of said section, a train controlling circuit governed by said magnet, a circuit between the opposite ends of said rails, a battery and a series of electro-magnets included therein, a switch controlled by each of the magnets in said series, and a branched supplemental circuit of which each branch includes one of said switches together with a supplemental battery, substantially as and for the purpose set forth.

Signed at New York, in the county of New York and State of New York, this 10th day of January, A. D. 1893.

FRANK E. KINSMAN.

Witnesses:

WM. H. CAPEL,  
THOS. F. CONREY.