

(No Model.)

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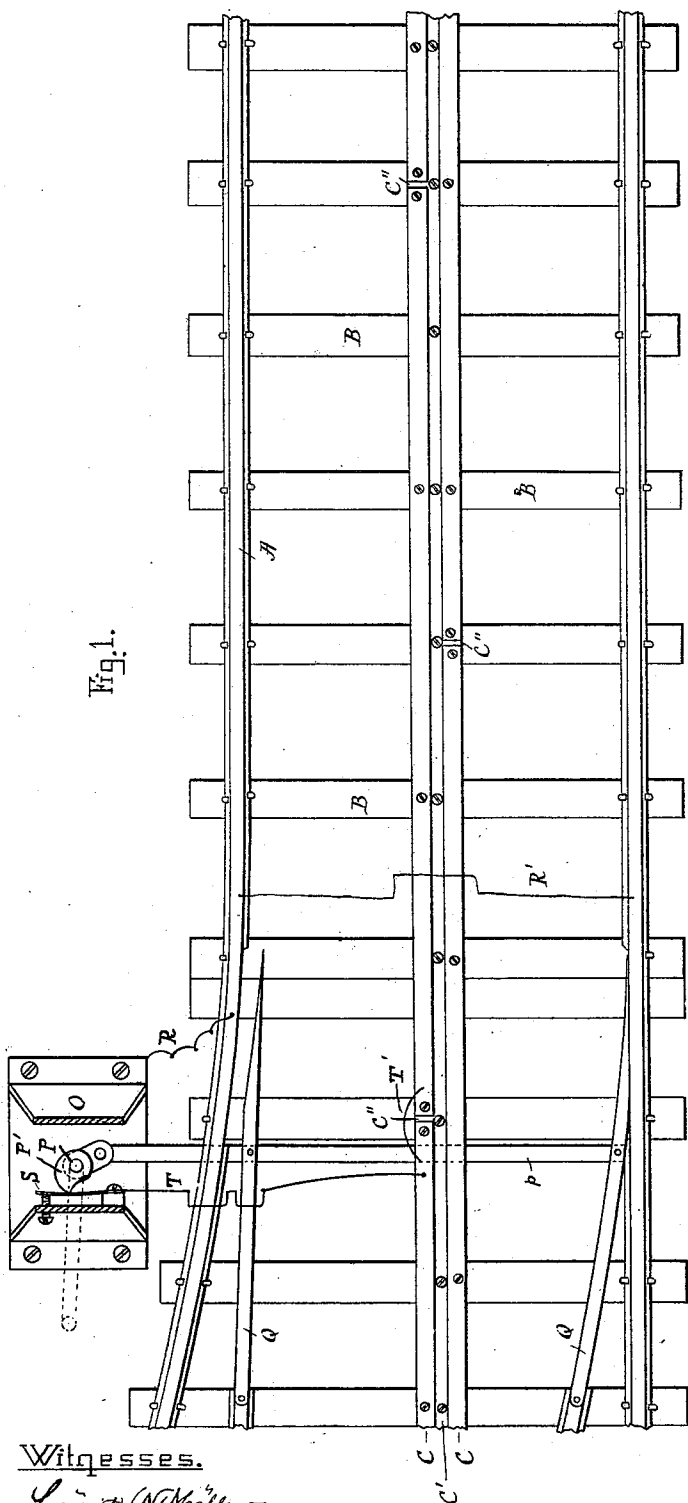
G. E. MILLER.

ELECTRIC TRAIN AND SWITCH SIGNAL DEVICE.

No. 507,918.

Patented Oct. 31, 1893.

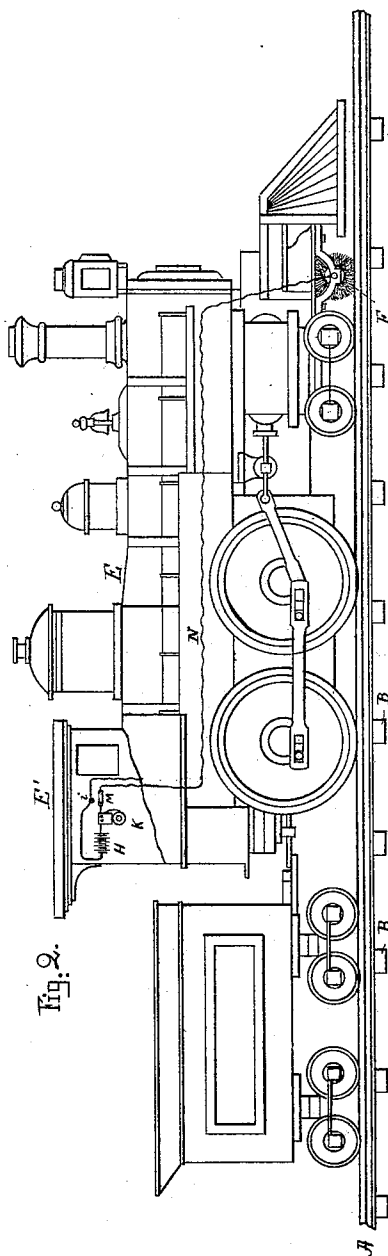
Fig. 1.



Witnesses.

Laurie N. Miller.
Alice A. Perkins.

Fig. 2.



Inventor.

George E. Miller
by *Alvan Audren*
his atty.

(No Model.)

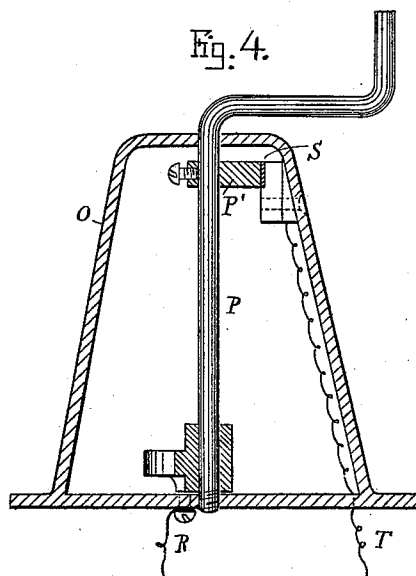
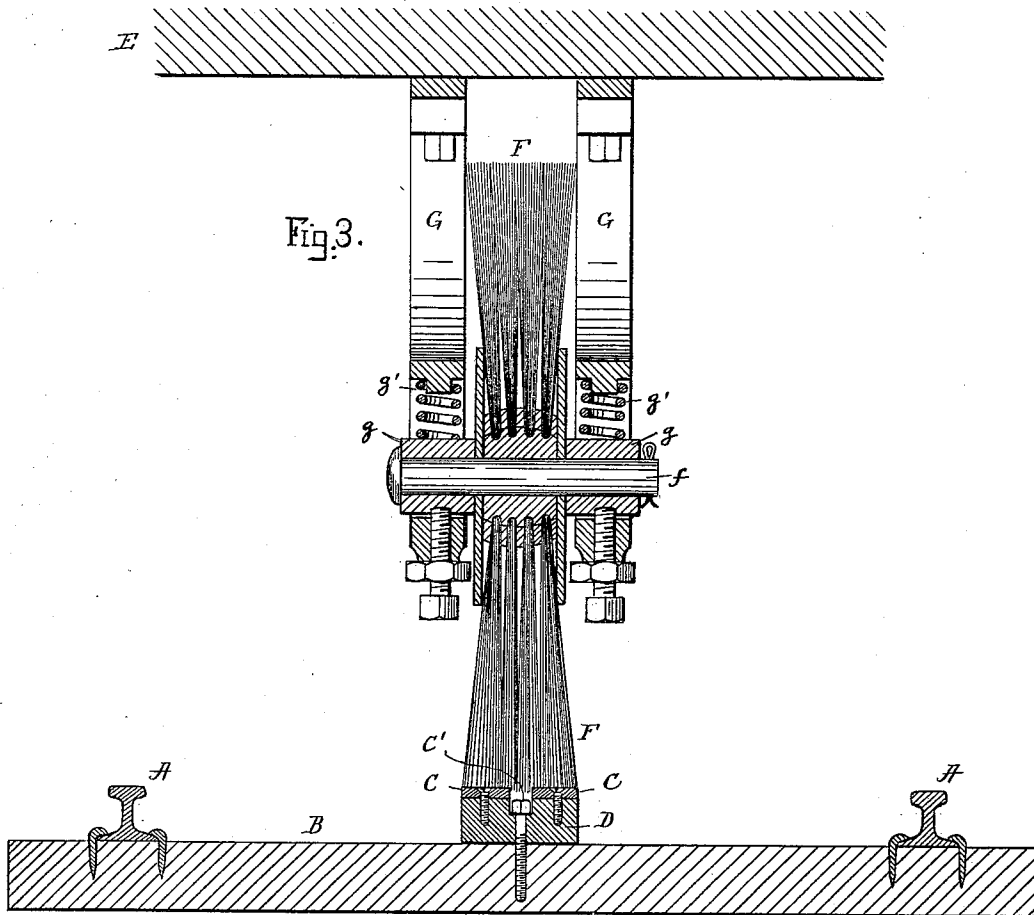
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ELECTRIC TRAIN AND SWITCH SIGNAL DEVICE.

No. 507,918.

Patented Oct. 31, 1893.



Witness

Laurie W. Miller.
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(No Model.)

3 Sheets—Sheet 3.

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Fig. 5.

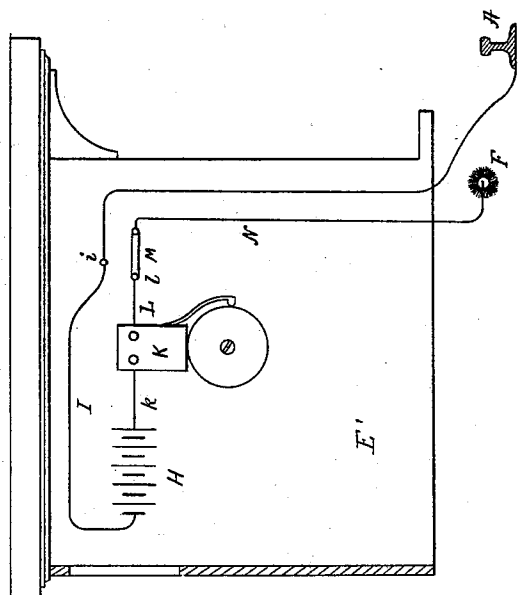
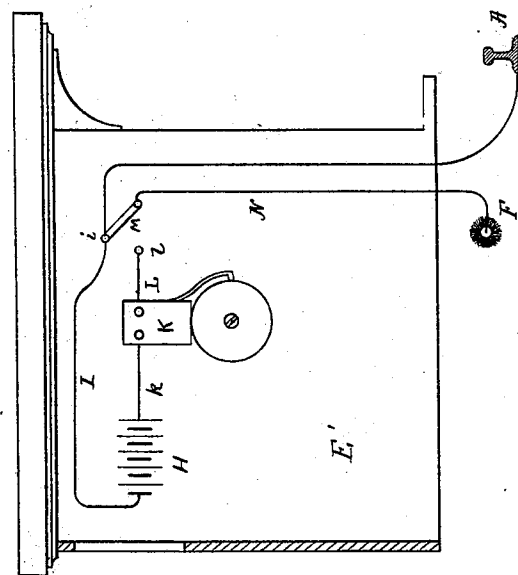


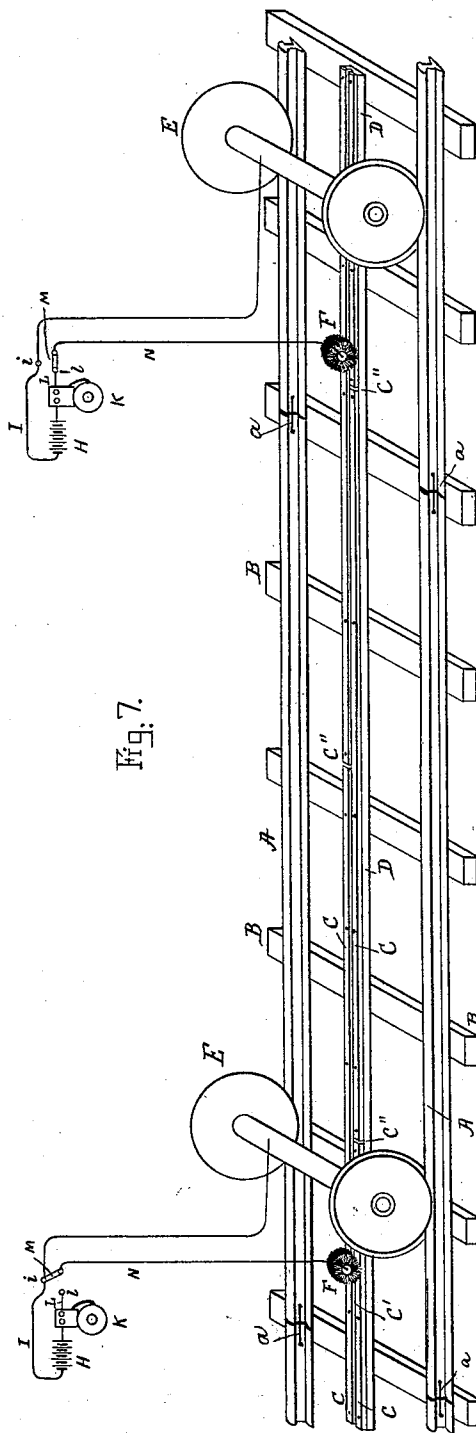
Fig. 6.



Witnesses.

Lauretta W. Miller.
Alice A. Perkins.

Fig. 7.



Inventor.

George E. Miller
by *Wm. Andrew Lisatt,*

UNITED STATES PATENT OFFICE.

GEORGE E. MILLER, OF SAUGUS, MASSACHUSETTS, ASSIGNOR TO THE
AMERICAN ELECTRIC TRAIN AND SWITCH SIGNAL COMPANY, OF
PORTLAND, MAINE.

ELECTRIC TRAIN AND SWITCH SIGNAL DEVICE.

SPECIFICATION forming part of Letters Patent No. 507,918, dated October 31, 1893.

Application filed May 24, 1893. Serial No. 475,320. (No model.)

To all whom it may concern:

Be it known that I, GEORGE E. MILLER, a citizen of the United States, and a resident of Saugus, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Electric Train and Switch Signal Devices, of which the following, taken in connection with the accompanying drawings, is a specification.

10 This invention relates to improvements in electric train and switch signaling devices and it has for its object to automatically give a signal to the engineer or other person in charge of a locomotive in case a switch should
15 be wrongly set or one train should approach another too close in either direction and it is carried out as follows, reference being had to the accompanying drawings, wherein—

Figure 1 represents a plan view of the track
20 and a switch device thereon partly shown in section. Fig. 2 represents a side elevation of said track showing a locomotive thereon equipped with my improved electric danger signaling apparatus. Fig. 3 represents a cross-
25 section of the track showing the brush or sweeper in contact with the metallic conductors arranged midway between the rails. Fig. 4 represents a cross-section of the switch stand on the line 4—4 shown in Fig. 1. Fig.
30 5 represents an interior view of the cab of the engine showing the circuit of the signaling device closed. Fig. 6 represents a similar view showing the circuit open; and Fig. 7 represents a diagram of the invention showing
35 two trains and electrical connections between the same.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

40 A, A, represent the rails and B, B, the sleepers or ties of a railroad track as usual. The rail ends are metallically connected, preferably by means of wires *a, a*, as is common in devices of this kind.

45 About midway between the rails A, A, are located the longitudinal metallic conductors C, C, preferably made in the form of flat bars arranged side by side with a space C' between them as shown in Figs. 1 and 3 and
50 preferably secured to a longitudinal wooden

rail D and fastened to the sleepers B, B, as shown in Fig. 3.

Each of the metallic conductors C, C, is alternately broken at C'', C'', that is the break on one conductor is arranged about
55 midway between the break on the other conductor as shown in Fig. 1, and such breaks on each of the said conductors may be arranged about a mile or so apart according to the distance at which the danger signal is to
60 be sounded as fully shown and described in the United States Letters Patent No. 464,979, dated December 15, 1891.

E in Fig. 2 represents a locomotive or driving engine and E' represents the cab thereof
65 as usual, said cab being also shown in Figs. 5 and 6.

In Fig. 7 the letters E, E, are also made to represent a pair of engines on the same track between which the electric signaling device
70 is to be established.

Each locomotive or train is provided with a sweeper held at all times preferably by a yielding pressure in metallic connection with both of the metallic conductors C, C. In
75 practice I prefer to make such sweeper in the form of a loosely journaled brush wheel F the metallic bristles of which are held in metallic contact with the conductors C, C, and for this purpose I prefer to secure the
80 hub of said brush to a spindle *f* journaled in spring pressed bearings *g, g*, which are vertically adjustable in brackets G, G, secured in an insulated manner preferably to the locomotive; the said brush is held in contact
85 with the conductors C, C, preferably by means of springs *g', g'*, in a manner similar to that shown and described in my above mentioned patent.

In each cab E' is located a battery or current generator H one pole of which is connected by means of a ground wire I to the rails A, A, through the wheels and metal frame work of the locomotive.

K is the bell alarm or other sound or visual
95 signal one binder post of which is connected by means of a wire *k* to the other pole of the battery or current generator; from the other binder post of said alarm or signal K leads a wire L to a metallic switch button *l* which is
100

adapted to be electrically connected by means of a switch lever M to the wire N and brush or sweeper F as fully shown in Figs. 5 and 6.

On the wire I is a switch button *i* to which the switch lever M may be connected as shown in Fig. 6 for the purpose of cutting the battery or current generator and alarm out of the circuit when the locomotive is stalled or not in use so as to prevent the ringing of the alarm at such time.

When the train is running the engineer closes the circuit by placing the lever M in the position shown in Figs. 2, 5 and right hand end of Fig. 7, by which an alarm will automatically be sounded or shown in his cab as soon as the brush or sweeper F of his engine is by means of one of the middle conductors C metallically connected to the brush or sweeper of another engine in front or rear, even if the current through the battery or generator on such other engine should be open as shown in the left hand end of Fig. 7. By making the alternate breaks in the middle conductors C, C, a mile or more or less apart it will be seen that an alarm will be given in the engine where the circuit is closed through the battery or generator whenever such engine comes within a distance of another engine equal to the length of a middle conductor C thus automatically giving notice to the engineer that he is too near another train.

If the circuit on two engines are both closed through the battery or generator an alarm will automatically be given to both engineers when their trains are on the same middle conductor.

In Figs. 1 and 4, O represents a switch stand of any well known construction secured to one side of the track as usual. In said stand is journaled the crank shaft P which is positively connected by means of a link *p* to the pivoted switch points Q, Q, as is common in railroad switch devices. The metal stand O is metallically connected to the rails A, A, by means of wires R, R', as shown in Fig. 1. To the stand O is secured in an insulated manner a yielding spring electrode S which is metallically connected to the middle conductors C by means of wires T, T', as shown in Fig. 1. On the switch shaft P is secured a metal cam arm or projection P' which is brought in metallic contact with the insulated spring electrode S when the switch Q, Q, is left open as shown in Fig. 1. When the switch Q, Q, is closed the projection P' on the crank axle P is disengaged from the yielding electrode S thus breaking the circuit between the rails A, A, and the insulated mid-

dle conductors C, C, and when said switch is thus kept closed and the main track open no signal is given to the engineer and he therefore knows the track is all right. If on the other hand the switch is open as shown in Fig. 1 and a train approaches within the distance of the length of one of the conductors C, the alarm or signal on the train will be in a closed circuit passing from the conductors C to and through said signal to the ground thus automatically indicating to the engineer or man in charge either that the switch is open or that a train is near, in either case of which the engineer has time to stop the train and avoid accidents.

Having thus fully described the nature, construction, and operation of my invention, I wish to secure by Letters Patent and claim—

1. The herein described electric train-signaling mechanism, consisting of the insulated alternately broken conductor rails C, C, the battery H carried on the train, a ground wire I connected to one pole of the battery and provided with a switch-button *i*, the alarm or signal K connected with the other pole of the battery by a wire *k*, the wire L connected to the signal and provided with contact button *l*, the brush or sweeper F held in contact with the conductor rails C, C, the wire N connected with the brush, and the switch M intermediate the wires L, N, and adapted to make and break contact with the switch-button *i* and *l*, substantially as described.

2. The herein described electric train, and switch signaling mechanism, consisting of the insulated alternately broken conductor rails C C, the switch stand O having a crank-shaft P connected with the switch rails, wires R R' connecting the switch stand with the main track rails, an insulated spring electrode S mounted in the switch stand and connected by wires T T' to the conductors C C, an arm P' carried on the crank shaft P and adapted to be brought in contact with the electrode S when the switch rails Q Q are open, a grounded battery or current generator H carried on the train, the brush or sweeper F in contact with the conductor rails C C and adapted to be electrically connected with the battery, the alarm or signal K, and the switch M, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 22d day of May, A. D. 1893.

GEORGE E. MILLER.

Witnesses:

ALBAN ANDRÉN,
LAÜRITZ N. MÖLLER.