

S. C. HENDRICKSON.

Electric Signaling Apparatus for Railroad Switches.

No. 199,977.

Patented Feb. 5, 1878.

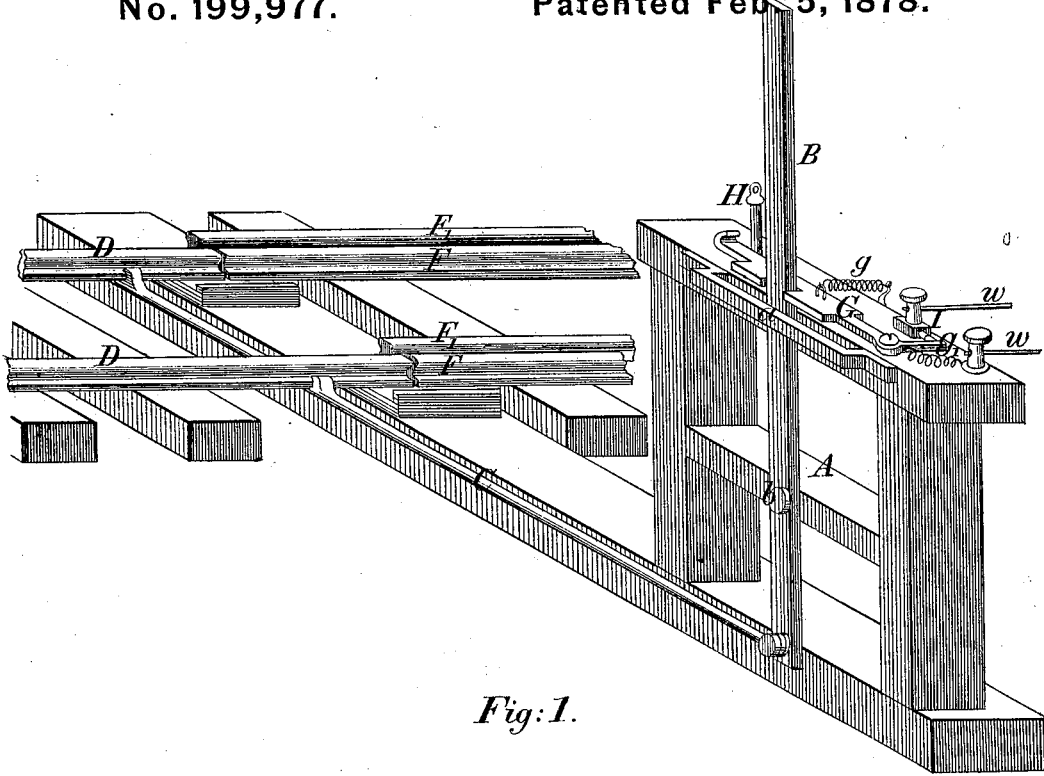


Fig: 1.

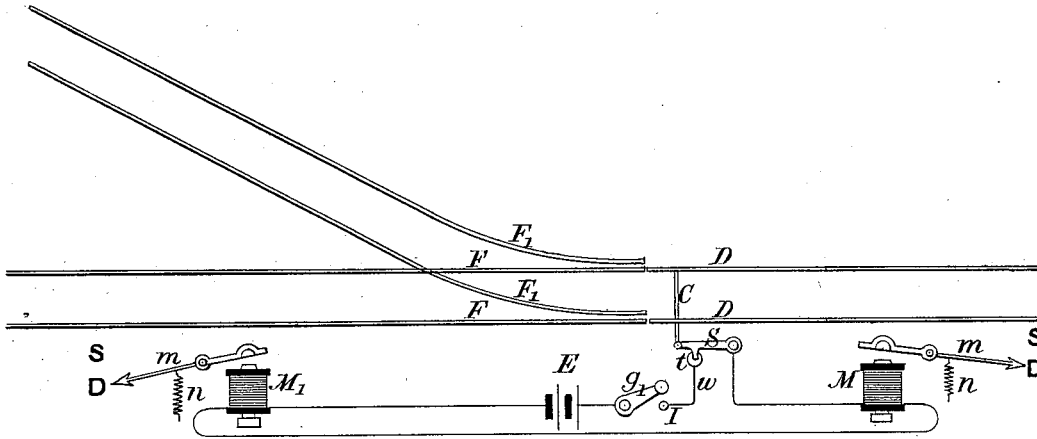


Fig: 2.

Witnesses:

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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN ELECTRIC SIGNALING APPARATUS FOR RAILROAD-SWITCHES.

Specification forming part of Letters Patent No. **199,977**, dated February 5, 1878; application filed April 16, 1877.

*To all whom it may concern:*

Be it known that I, STEPHEN C. HENDRICKSON, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Electric Signaling Apparatus for Railroad-Switches; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Visual and audible signals operated or controlled by electro-magnetism have heretofore been applied to railroad-switches in such a manner that when the switch is placed in line with a branch track or siding, and the main track consequently interrupted, the movement of the switch-rails will cause an electric circuit normally open to be closed, or a normally-closed circuit to be opened, by which means one or more danger-signals are exhibited or sounded at any required distance from the switch.

An objection to this arrangement arises from the fact that the circuit-closer or circuit-breaker which controls the movements of the distant signal or signals has been attached to the switch itself, so that the danger-signal could only be exhibited by actually moving the switch-rails more or less out of line with the main track.

In my arrangement the circuit-breaker which controls the signal or signals is attached to the locking apparatus of the switch, and in such a manner that the switch cannot be unlocked, much less moved from its normal position, without first breaking the circuit and causing the danger-signal to be exhibited.

In the accompanying drawing, Figure 1 is a perspective view, showing the application of my invention to a railroad-switch; and Fig. 2 is a diagram, showing the arrangement of the electric circuit connecting the switch with the signal or signals.

In Fig. 1, D D are the movable rails of a switch. F F are the stationary rails of the main track, and F<sub>1</sub> F<sub>1</sub> the stationary rails of a siding or branch track. The upright lever B turns upon a fulcrum, *b*, attached to the frame

or stand A, and its lower and shorter arm is connected by the rigid rod C with the movable switch-rails D D.

The switchman, by means of the lever B, can place the movable rails in line with either the main or the branch tracks at pleasure, in the manner ordinarily practiced.

I have shown in Fig. 1 a locking device consisting of a movable horizontal plate, G, having a square notch cut in its front edge for the reception of the upright switch-lever B. When this plate is in the normal position, (shown in Fig. 1) it serves to lock the lever B, and consequently the switch-rails D D, in their respective positions.

A projecting arm, *g*<sub>1</sub>, upon the lever C is provided with a contact-point, which, when the parts are in their normal position, is kept pressed against the fixed contact-stop I, and the circuit passing through the wires *uu* is thus kept closed.

In order to change the position of the switch-rails, it is first necessary to take out the pin H, which permits the locking-plate G to be swung back out of the way of the switch-lever B by the action of the spring *g*, and at the same instant the contact between *g*<sub>1</sub> and I is broken, and the distant signal or signals are thereby caused to indicate danger. The lever B may then be thrown over and the switch-rails placed in line with the siding in the usual manner. While the switch is in this position it is impossible to move the locking-plate into a position to close the circuit, and thus indicate safety upon the distant signal or signals without first restoring the switch to its proper position in line with the main track.

As an additional means of security, I sometimes attach an additional circuit-breaker directly to the movable rails D D or their connecting-rod C, through which the circuit is carried, as shown in Fig. 2. This precaution renders it impossible for evil-disposed persons to disconnect the switch-lever from the rails and move the latter out of position, while yet the former will continue to give a false safety-signal, for the reason that in this case either the unlocking of the switch or the movement of the rails will cause the danger-signal to be exhibited or sounded.

The arrangement of connections which I

have found preferable for ordinary use is shown in Fig. 2, in which E is the battery;  $g_1$ , the contact device attached to the locking-plate of the switch-stand; S, the circuit-breaker connected with the movable rails; M and  $M_1$ , the signal-operating magnets placed at a suitable distance, one in each direction.

The simple device shown in the drawing will serve to indicate the action of the signals.

In Fig. 2 the switch is supposed to be unlocked and the circuit broken between  $g_1$  and I. The armatures of the signal-magnets M  $M_1$  are released, and the action of the spring  $n$  causes the index  $m$  to point to D, indicating danger to the engine-driver of an approaching train. When the circuit is restored the index points to S, indicating safety. An audible or sounding signal may be used either in addition to or in lieu of a visual signal, if desired.

In many cases it will be advisable to place a secondary or repeating signal or indicator in the immediate vicinity of the switch, the movements of which are controlled by and dependent upon those of the distant signal, so that before moving the switch the switchman may be enabled to know with certainty that the distant signal has performed its office. This auxiliary or repeating signal may be placed in the same circuit, or in a secondary circuit, the manner of arranging and operating the same being well understood by those skilled in the art, and not necessary to be described here.

I do not desire to restrict myself to the use of any particular form of signal, either audible or visual, as any of the well-known forms of signals operated or controlled by electromagnetism may be used. Nor do I wish to confine myself to the particular form of locking device which I have described and shown

in connection with my invention, as the invention may be applied with equal convenience and facility to any of the various forms of locking mechanism in use on railway-switches without departing from its principles, as hereinbefore set forth.

I claim as my invention—

1. A normally-closed electric circuit which includes one or more electric signals so arranged as to be maintained in a position denoting safety by the action of a constant current traversing said circuit, in combination with a circuit-breaker attached to the locking apparatus of a switch, when arranged, substantially as specified, so that the signal-circuit must be interrupted before the switch-rails can be moved from their normal position, and cannot be restored until the said rails have been replaced in such position.

2. A normally-closed electric circuit which includes one or more signal-operating magnets so arranged as to be maintained in a position denoting safety by the action of the current traversing said circuit, in combination with two separate circuit-breakers, one of said circuit-breakers being attached to or operated by the locking apparatus of the switch, and the other attached to or operated by the movable rails of the switch, substantially as specified.

3. The movable rails D D and the locking device G, in combination with the circuit-breaker  $g_1$ , for operating a visual or audible electric signal or signals.

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

STEPHEN C. HENDRICKSON.

Witnesses:

FRANK L. POPE,  
WM. ARNOUX.