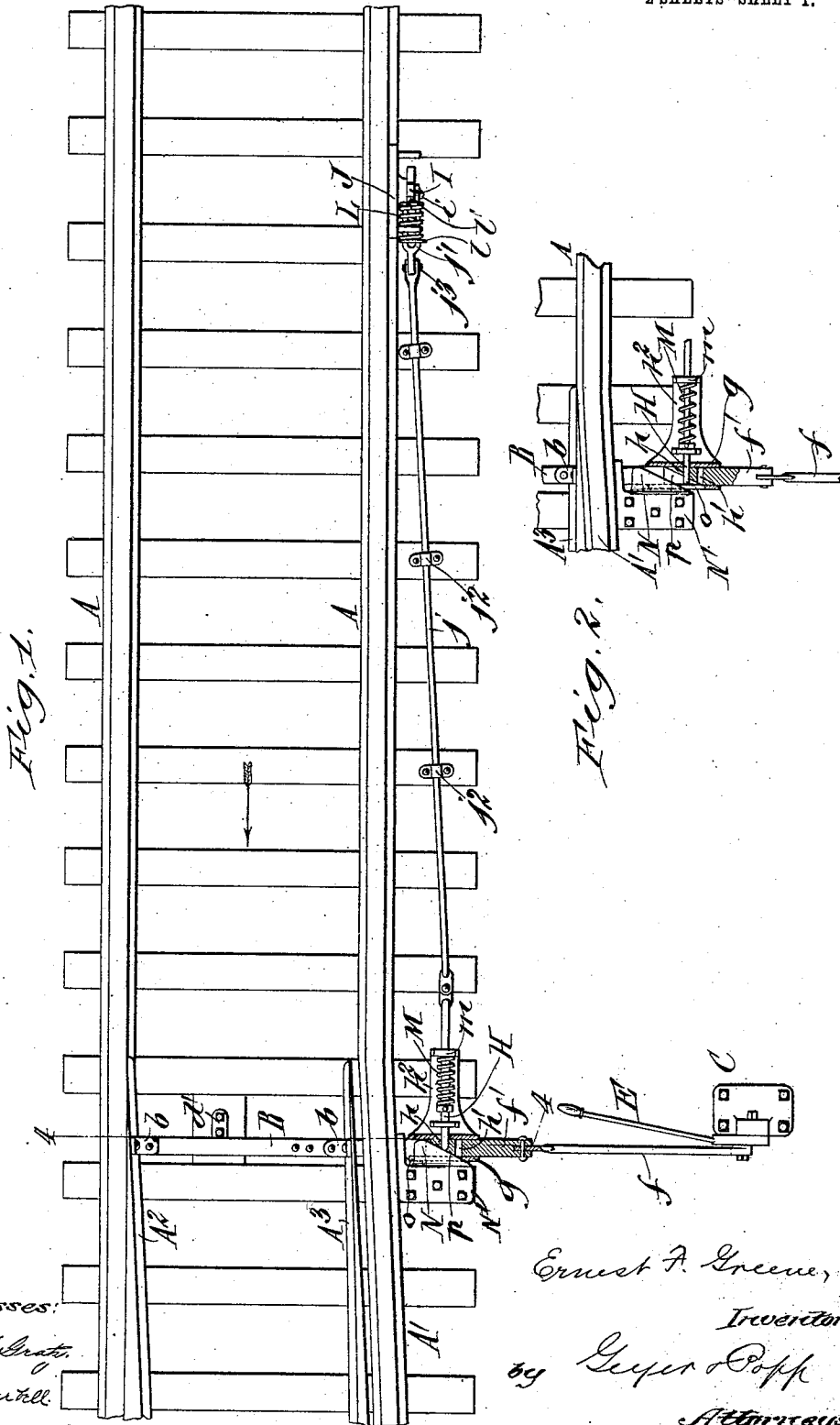


No. 848,986.

PATENTED APR. 2, 1907.

E. F. GREENE.  
RAILWAY SWITCH.  
APPLICATION FILED FEB. 14, 1906.

2 SHEETS—SHEET 1.



Witnesses:  
Louis W. Grady,  
Ruth T. Felt.

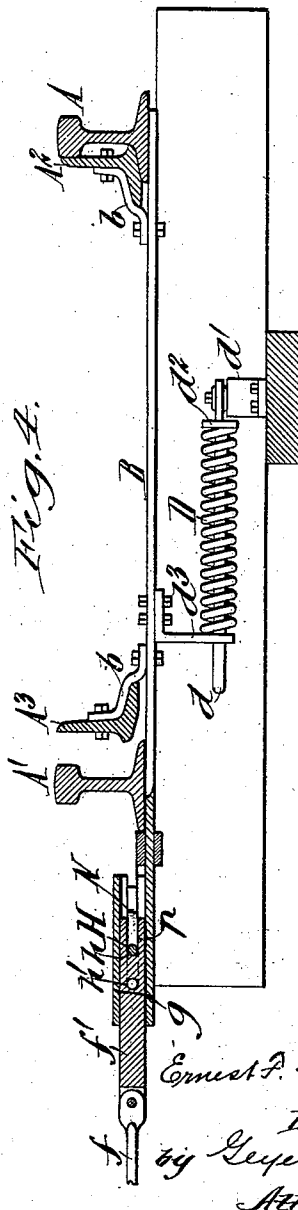
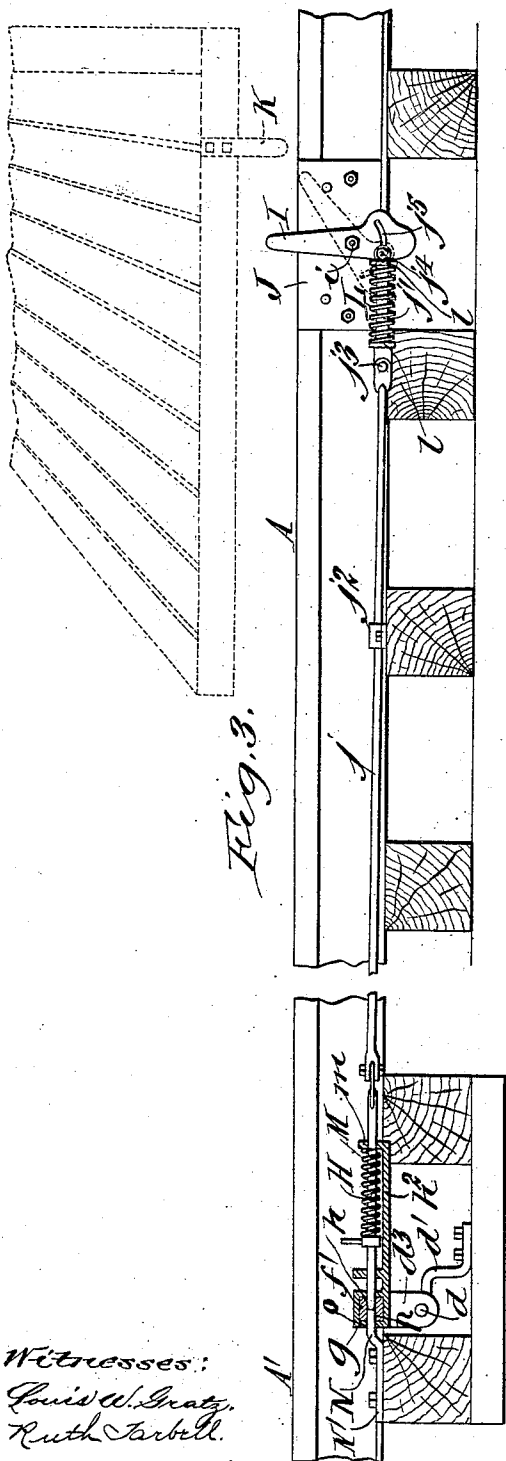
Ernest F. Greene,  
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Attorneys

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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

ERNEST F. GREENE, OF SILVER CREEK, NEW YORK.

## RAILWAY-SWITCH.

No. 848,986.

Specification of Letters Patent.

Patented April 2, 1907.

Application filed February 14, 1906. Serial No. 300,970.

*To all whom it may concern:*

Be it known that I, ERNEST F. GREENE, a citizen of the United States, residing at Silver Creek, in the county of Chautauqua and State of New York, have invented a new and useful Improvement in Railway-Switches, of which the following is a specification.

This invention relates to that class of railway-switches which are so constructed that in case the switch is opened inadvertently or maliciously it will be closed automatically by an approaching train on the main track, causing the train to continue its course upon said track and averting an accident.

The object of my invention is to provide a simple safety-switch of this kind which is reliable in operation.

In the accompanying drawings, consisting of two sheets, Figure 1 is a sectional top plan view of a switch embodying the invention, showing the position of the parts when the switch is open. Fig. 2 is a similar view of the switch-operating mechanism, showing the position of the parts when the switch is closed. Fig. 3 is an enlarged sectional side elevation of the switch, showing the trigger or trip-lever about to be actuated by the tappet on the locomotive-pilot. Fig. 4 is a transverse section in line 4 4, Fig. 1, on an enlarged scale.

Similar letters of reference indicate corresponding parts throughout the several views.

A indicates the rails of the main track, A' one of the rails of the siding, and A<sup>2</sup> A<sup>3</sup> the switch points or rails, which are connected by angle-bars *b* with a tie-bar B, so as to move in unison in the usual manner. This tie-bar passes under the rails and extends beyond the same on the side at which the usual switch-stand C is located.

D is a spring acting upon the tie-bar B and tending to shift the same in the proper direction to close the switch. In the construction shown in the drawings this spring is applied to a horizontal guide-rod *d*, attached at one end to a standard *d'*, the spring bearing at one end against a shoulder *d<sup>2</sup>* of said rod and at its other end against a depending lug *d<sup>3</sup>* of the tie-bar.

The switch-stand C may be of any suitable or well-known construction, and the switch-operating lever E is connected with the adjacent end of the tie-bar B by a rod *f* and a bar *f'*, which latter enters a horizontal sleeve or socket *g*, formed on or secured to the tie-bar. The bar *f'* is detachably connected

with this sleeve by a suitable coupling, preferably consisting of a sliding bolt H, passing through a hole in the side of the sleeve and one of two holes *h h'* in the bar. The latter is supported and guided on a plate or bracket *h<sup>2</sup>*, carried by the tie-bar B, and is operated by a trigger I through the medium of a rod *j* and a forked link *j'*. This trigger is pivoted beside the track-rail and adapted to be tripped by a tappet or projection K on the locomotive-pilot for withdrawing the coupling-bolt H, as hereinafter described. In the construction shown in the drawings the trigger is pivoted between its ends to a fixed support or upright plate J by a transverse pin *i*, so as to swing lengthwise of the track. The bar *j* slides in suitable guides *j<sup>2</sup>*, secured to the ties, while the link *j'* is pivoted at its front end to said bar by a horizontal pin or bolt *j<sup>3</sup>* and at its other end to the lower arm of the trigger I by a bolt *j<sup>4</sup>*, passing through a slot *j<sup>5</sup>* in the latter.

L is a spring applied to the link *j'* between a shoulder *l* thereof and a loose washer *l'* bearing against the trigger I. The slot *j<sup>5</sup>* is curved concentrically with the pivot of the trigger and permits the upper arm of the latter to swing backward independently of the link *j'*, as shown by dotted lines in Fig. 3, while the spring L serves to return the trigger to the upright position shown by full lines in said figure, in which position the front end of its slot bears against the rear bolt *j<sup>4</sup>* of the link, ready to operate the link and withdraw the bolt H when the trigger is tripped forwardly by a train approaching the switch in the direction of the arrow in Figs. 1 and 3. By the above-described connection the trigger is prevented from buckling or breaking the connecting-rod *j* and link *j'* in case the trigger should be tripped rearwardly by a locomotive backing on the main track past the same.

M is a spring tending to move the coupling-bolt H into engagement with the bar *f'* and surrounding the bolt between a collar or shoulder thereon and a lug *m* of the plate *h<sup>2</sup>*.

N is a shifting or setting device acting upon the coupling-bolt H in such manner as to automatically move the trigger I to its projected or operative position when the switch is opened. This device preferably consists of a fixed cam or wedge extending horizontally into the sleeve *g* through a longitudinal slot *o* in one side thereof, the cam being carried by a base-plate N', secured to the adja-

cent tie. The front end of the coupling-bolt bears against the oblique working face of this cam in both positions of the switch, so that when the bar  $f'$  and the sleeve  $g$  are shifted forwardly in opening the switch the coupling-bolt which takes part in this movement is at the same time shifted or retracted lengthwise in its guides by riding over the oblique face of the cam, thereby swinging the trigger I from the lowered position shown by dotted lines in Fig. 2 to the elevated position shown by full lines in said figure. The face of the cam trends in the proper direction to produce the longitudinal movement of the bolt, and its length and pitch are such as to shift the bolt sufficiently to elevate or set the trigger, but not far enough to uncouple the bar  $f'$  from the sleeve  $g$ , as shown in Fig. 1. As shown in the drawings, the bar  $f'$  has a longitudinal slot  $p$ , which receives the cam and permits the necessary longitudinal movement of the bar in the sleeve to operate the switch.

The operation of the switch is as follows:  
 The coupling-bolt H normally interlocks with the inner hole  $h$  of the bar  $f'$ , and when the switch is closed the coupling-bolt projects to its full limit into the sleeve  $g$ , as shown in Fig. 2, causing the trigger I to assume the depressed or inoperative position shown by dotted lines in Fig. 3. When the switch-lever E is swung toward the track, the switch is opened in the usual manner and its closing-spring D is compressed, the switch-lever being locked by any suitable or customary means. (Not shown.) The bracket or plate  $h^2$  takes part in this movement of the switch-rails, and as the coupling-bolt is carried by this bracket it is moved laterally over the face of the cam N, shifting it rearwardly and elevating the trigger into the path of the tappet K on the locomotive-pilot, as shown by full lines in Fig. 3. In this position of the parts the coupling-bolt H prevents the spring D from shifting the sleeve  $g$  outwardly on the bar  $f'$ , which latter is held against movement in either direction by the locked switch-lever E. Assuming now that the open switch is misplaced, the tappet K of a train approaching on the main track will strike the trigger and swing its upper arm forwardly, thereby swinging its lower arm in the opposite direction and causing the connections  $j j'$  to withdraw the coupling-bolt H from the hole of the bar  $f'$ . This breaks the connection between the sleeve  $g$  and the locked bar  $f'$ , and the spring D now reacts and shifts the switch-rails to their closed position. At the same time the coupling-bolt is moved laterally toward the receding end of the cam N, allowing the spring M to move the bolt forwardly and lowering the trigger to its inoperative position. The sleeve  $g$  slides outwardly on the bar  $f'$  during the closing movement of the switch-rails, and

the outer hole  $h'$  of the bar is so arranged that at the moment the switch-rails reach their closed position the spring-bolt H interlocks with said hole under the reaction of its spring M, thereby automatically locking the switch in that position.

The trigger is located a sufficient distance in advance of the switch to insure closing the latter before the train passes over it.

By this improved construction all danger of derailling a train in case the switch should be left open by accident or design is effectually averted.

In order to restore the parts to their normal position, the coupling-bolt H is withdrawn by hand and the bar  $f'$  is retracted sufficiently by means of the switch-lever E to bring its inner hole  $h$  into register with the hole of the sleeve  $g$ , when the coupling-bolt is again allowed to interlock with said bar. In this position of the parts the switch can be opened and closed, by means of the switch-lever, like an ordinary switch, but cannot be opened without projecting the trigger I above the track, as hereinbefore described.

I claim as my invention—

1. The combination of the main track, the switch-rails, means for automatically closing the switch-rails, a manual shifting device for the last-named rails, a coupling connecting the switch-rails with said shifting device, a trip device connected with said coupling, and automatic setting or projecting means for the trip device constructed and arranged to act upon said coupling when the switch is moved from its closed to its open position, whereby the trip device is projected through the medium of the coupling, substantially as set forth.

2. The combination of the main track, the switch-rails, means for automatically closing the switch-rails, a manual shifting device for the last-named rails, a coupling-bolt detachably connecting the switch-rails with said shifting device and taking part in the movements of the switch-rails, a trip device connected with said bolt and arranged to be operated by a train on the main track, a spring applied to said bolt and acting to retract the trip device, and automatic setting or projecting means for the trip device constructed and arranged to act upon said coupling-bolt when the switch is moved from its closed to its open position, substantially as set forth.

3. The combination of the main track, the switch-rails, means for automatically closing the switch-rails, a shifting device for the last-named rails, a coupling connecting the switch-rails with said shifting device, a trip device connected with said coupling and adapted to be operated by a train on the main track, and a fixed cam arranged to be engaged by the coupling when the switch is opened for automatically setting the trip device, substantially as set forth.

4. The combination of the main track, the switch-rails, a spring for closing said rails, a manual switch-shifting device, a connection between said shifting device and the switch-rails consisting of a sleeve or socket connected with one of said parts and a rod connected with the other part and entering the socket, a sliding bolt for coupling said rod and socket movable with the switch-rails, a trip device for withdrawing said bolt arranged to be operated by a train on the main track, and a stationary cam arranged to be engaged by said bolt when the switch is opened, for shifting the bolt lengthwise and setting the trip device, substantially as set forth.

5. The combination of the main track, the switch-rails, a spring for closing said rails, a manual switch-shifting device, a connection between said shifting device and the switch-rails consisting of a sleeve or socket connected with one of said parts and a rod connected with the other part and entering the socket, a sliding bolt for coupling said rod and socket movable with the switch-rails, a trip device connected with said bolt and arranged to be operated by a train on the main track, and a fixed cam extending into said sleeve and arranged to shift the coupling-bolt rearwardly when the switch is moved to its open position, substantially as set forth.

6. The combination of the main track, the switch-rails, a spring for closing said rails, a manual switch-shifting device, a connection between said shifting device and the switch-rails consisting of a sleeve or socket connected with one of said parts and a rod connected with the other part and entering the socket, a sliding bolt for coupling said rod and socket movable with said sleeve, a spring tending to move said bolt forwardly, a trip device for withdrawing the bolt arranged to be operated

by a train on the main track, and a fixed cam extending through the side of said sleeve and having an oblique face over which the front end of the coupling-bolt rides when shifted laterally in opening the switch, substantially as set forth.

7. The combination of the main track, the switch-rails, a spring for closing said rails, a manual switch-shifting device, a connection between said shifting device and the switch-rails consisting of a sleeve or socket connected with one of said parts and a rod connected with the other part and entering the socket, said rod having a plurality of bolt-holes either of which is adapted to register with a hole of the sleeve, a spring-pressed coupling-bolt for the sleeve and the rod adapted to engage one of the holes of said rod in one position of the switch-rails and the other hole thereof in another position of said rails, and an actuating device connected with said bolt and arranged to be tripped by a train on the main track, substantially as set forth.

8. The combination of the main track, the switch-rails, means for automatically closing the switch-rails, a manual shifting device for the last-named rails, a coupling connecting the switch-rails with said shifting device, a trip-lever arranged to be actuated by a train on the main track, a link connected at one end with said coupling and having its opposite end attached to said lever by a pin-and-slot connection, and a spring applied to said link and tending to swing said lever to its operative position, substantially as set forth.

Witness my hand this 8th day of February, 1906.

ERNEST F. GREENE.

Witnesses:

C. F. GEYER,  
E. M. GRAHAM.