J. A. DUGGAN.

Safety Railway Switch.

No. 167,652. Patented Sept. 14, 1875.

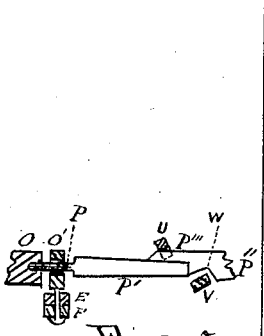

Fig. 5.

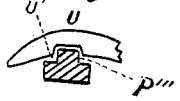

Fig. 6.

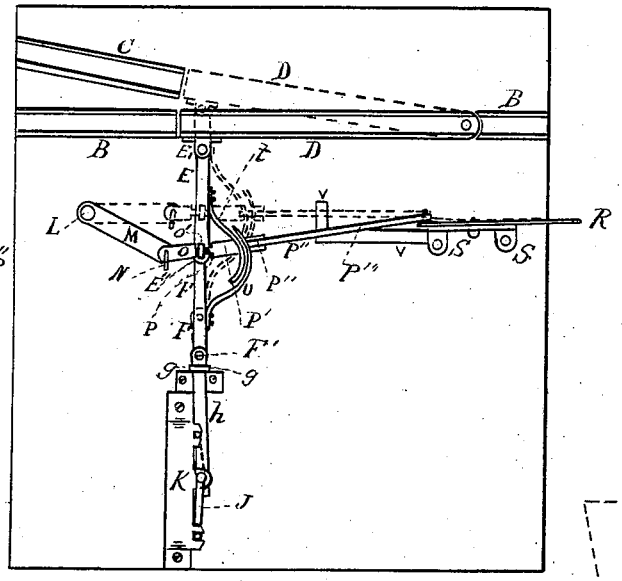

Fig. 1

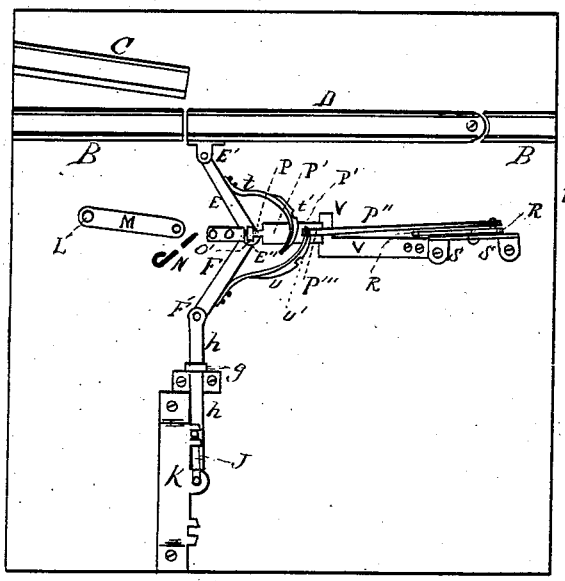

Fig. 2

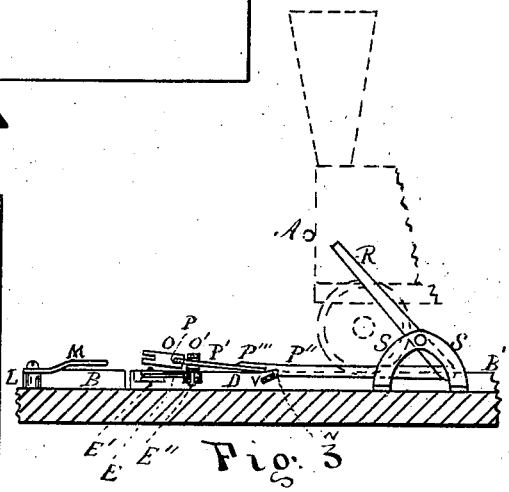

Fig. 3

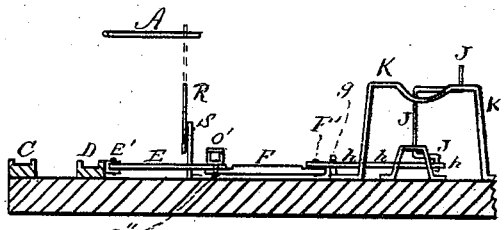

Fig. 4

Witnesses
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UNITED STATES PATENT OFFICE.

JOHN A. DUGGAN, OF QUINCY, MASSACHUSETTS, ASSIGNOR OF ONE-THIRD HIS RIGHT TO JOHN B. F. RAMSDELL, OF SAME PLACE.

IMPROVEMENT IN SAFETY RAILWAY-SWITCHES.

Specification forming part of Letters Patent No. **167,652**, dated September 14, 1875; application filed February 20, 1875.

To all whom it may concern:

Be it known that I, JOHN A. DUGGAN, of Quincy, in the county of Norfolk and State of Massachusetts, have invented a new and Improved Safety Attachment for Railroad-Switches; and I do hereby declare that the following, when taken in connection with the accompanying drawings, is a full, clear, and exact specification.

This is an attachment to an ordinary switch to prevent accident. Under ordinary conditions the switch is operated by the switchman in the usual manner. A rod projects from the engine, and as the engine approaches a switch, if the switch is not misplaced, the said rod passes over my safety attachment without disturbing it; but if the switch be misplaced my attachment assumes such a position as to be struck by the rod upon the engine, and the blow it receives, as will be seen below, replaces the switch. In other words, if the main track is clear, my attachment is not touched by the rod. If the switch turns into a side track, my attachment is elevated, and, being struck by the rod, turns the switch into the main track.

Let it be understood, first, that the said rod is not in the hands of the engineer or fireman to be used at will, but that it is a fixture upon the engine, so that whether the engine-driver notices the condition of the switch or not, the rod does its work; and, second, that my attachment only comes into use in case the switch is misplaced, to prevent accident. At all other times the switch is operated by the switch-tender in the ordinary manner.

The nature of my invention, in detail, is described below.

In the accompanying illustration, Figure 1 is a plan view of a switch having my safety attachment, and shows the attachment when the main track is clear, the switch having been placed in proper position by the switch-tender. The broken lines in this figure show the position of my attachment when the switch has been turned to a side track by the switch-tender. Fig. 2 is a plan view, showing the condition and position of my attachment when, the switch having been left misplaced, as seen by broken lines, Fig. 1, it has been replaced by the rod upon the approaching engine, thus preventing accident. Fig. 3 is a part longitudinal section, illustrating my invention after having been struck from the engine, a portion of which is shown by broken lines. Fig. 4 is a part cross-vertical section, illustrating my invention, when the switch is correctly placed by the switch-tender, so as to make a clear main track. Fig. 5 is a detached elevation of the lever P P′ P″ P‴, as below described. Fig. 6 is a cross-section of the same.

Similar letters of reference indicate corresponding parts.

A is a rod projecting a sufficient distance from the engine, and placed at a proper height to strike the lever R when the switch is misplaced. This rod is intended to be a fixture upon the engine, and will always remain in position. It will not be in the hands of the engine-driver. B is the main track. C is the side track. D is the switch, or that portion of the track which can be moved, so as to guide a train upon the side track, if desired. In Figs. 1 and 2 the switch D is correctly placed, so as to keep the train upon the main track. E is a lever, hinged at E′ to a projection fixed to the rail D, and at E″ to the lever F. In Fig. 5 the pin projecting downward from the swivel *o′* will be seen, which pin connects the levers E and F. The lever F is connected by a pin at F′ with the lever *h*. The lever *h* passes under a guide, *g*, and connects with the ordinary crank J on the frame K.

When the switch-tender moves the switch he turns the crank in the ordinary manner, and, by means of crank J, lever *h* running under a guide or bridge, *g*, and levers F and E, the switch-rail D is moved back and forth. Thus far my safety attachment plays no part, but simply moves as much as necessary with the levers E F, and keeps them stiff at the point E″.

Swinging horizontally from a post, L, is a lever, M. A pin, N, connects the lever M with the lever or connecting-piece *o*. This pin N is made weaker than the rest of my device, to the end that it may break when the rod from the engine strikes my attachment, as in Fig. 2; still it is strong enough to hold while the switchman works the switch, such working bringing but little strain upon it. P P′ P″

P‴ is a lever extending from the connecting-piece *o* to the lever R. The part P of the lever is a screw, attaching the whole lever to the connecting-piece *o*. This will be plainly seen in Fig. 5. This screw P passes through the swivel *o'*, which attaches to the levers E F above described. The part P′ is flat, and has a raised portion, P‴, which serves a purpose hereafter explained. The part P″ connects with the lever R, which swings in the frame S. Figs. 5 and 6 well show the shape and position of the part P″. *t* and *u* are curved levers, proceeding from levers E and F, and setting over and fitting upon the ridge portion P‴, by means of slats *t' u'*. (See Fig. 6.) V is a spring-locking device, springing into the notch W, Fig. 5, when the switch is replaced by a blow from the engine.

The practical operation of my invention is as follows: I will suppose that the switch has been carelessly left misplaced. It would then be in the position shown by broken lines in Fig. 1. The rod A, projecting from the approaching engine, strikes the lever R. The pin N, made purposely weak, breaks, the connecting-piece *o* presses against the swivel *o'*, being violently pulled in that direction by the lever P P′ P″ P‴, which is connected with the lower end of lever R. The drawing back of the lever P′ P″ pulls the raised part P‴ from the slats *u' t'*, releasing levers *u t*. The levers E F are drawn back at the point E″, and the rail D is replaced. The whole device then assumes the position seen in Figs. 2 and 3. The switch is instantly fastened in position by the spring V, which flies into the notch W upon the under side of the lever P″. The lever R draws lever P″ P′ P, the lever P′ releases levers *t u*, the lever or screw P draws connecting-piece *o* and swivel *o'*, the swivel *o'* draws levers E F, the lever E replaces rail D, the pin N breaks between lever M and connecting-piece *o*, and the spring V locks the switch. It will be seen that when the switch is in proper position, as in Figs. 1 and 4, the lever R lies so nearly horizontally that the rod A passes over it without disturbing it; but when the switch is misplaced the lever R is nearly perpendicular, and is struck by the rod A, with the result above mentioned.

There may be various devices which can be used in place of the spring-locking device V, and I therefore do not confine myself to this particular method of locking the switch.

After the switch has been replaced by the engine a new pin may be inserted, and the switch-tender attend to his duties as usual. The ordinary working of the switch is not at all affected by my safety attachment.

If desired, connection may be had between the rod A and the cab of the engine, so that the rod A can be lifted over the lever R; as, for example, an additional rod or rope may run back to the cab, so that the rod A may be lifted, and immediately sprung back into place upon being released.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The lever M and connecting-piece *o*, connected with the weak pin N, as combined with the lever P P′ P″ P‴, as and for the purpose specified.

2. The combination of the connecting-piece *o* and parts of lever P P′, with swivel *o'* and levers E F, as and for the purpose above set forth.

3. The combination of levers E F, levers *t u*, having slats *t' u'*, and ridge P‴ upon lever P′, as above described, and for the purpose specified.

4. The combination, with the lever P P′ P″ P‴, of the nearly-upright lever R, made of sufficient length to be struck by the rod A, and lying in a nearly-horizontal position when the track is clear, as hereinbefore set forth.

JOHN ADAMS DUGGAN.

Witnesses:

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E. H. OBER.