

(No Model.)

R. S. EASTMAN.  
AUTOMATIC RAILWAY SWITCH.

No. 410,961.

Patented Sept. 10, 1889.

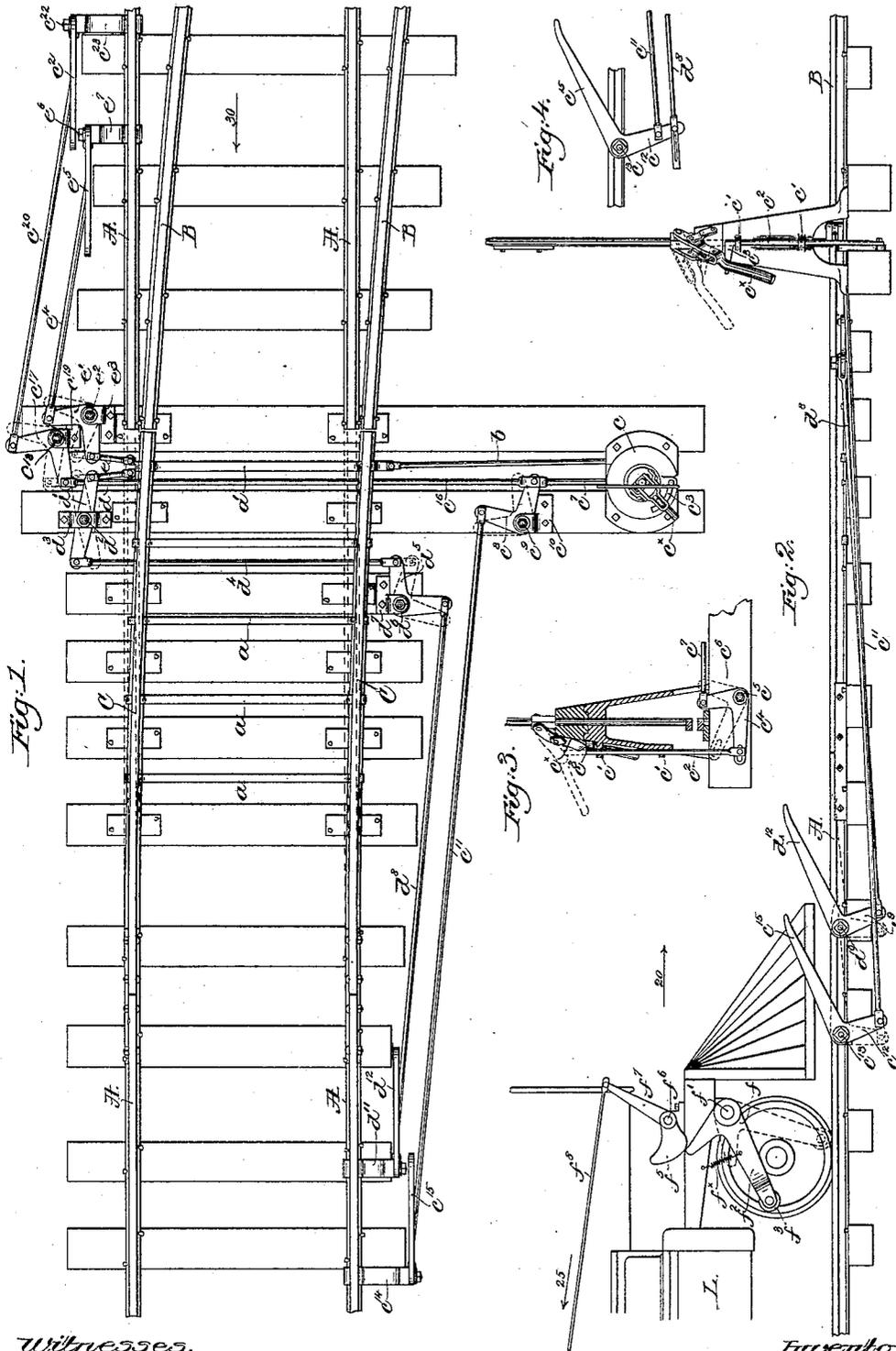


Fig. 1.

Fig. 3.

Fig. 2.

Fig. 4.

Witnesses,  
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# UNITED STATES PATENT OFFICE.

RICHARD S. EASTMAN, OF MANCHESTER, NEW HAMPSHIRE, ASSIGNOR OF ONE-HALF TO ALONZO W. GLINES, OF BOSTON, MASSACHUSETTS.

## AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 410,961, dated September 10, 1889.

Application filed May 11, 1889. Serial No. 310,401. (No model.)

*To all whom it may concern:*

Be it known that I, RICHARD S. EASTMAN, of Manchester, county of Hillsborough, State of New Hampshire, have invented an Improvement in Automatic Railway-Switches, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide improved mechanism for automatically throwing a railroad-switch from a moving train, which may readily be applied to switches and switch-stands now in common use.

My invention consists of the movable switch-rails, switch-stand, and a vertically-movable operating-lever, vertical movement of which locks and unlocks the said switch-rails, combined with mechanism actuated from a moving train, whereby the said operating-lever may be raised to first unlock the said switch-rails and thereafter moved to throw the same into desired position, and means for automatically locking the said switch-rails in such position.

Figure 1 shows a plan view of a switch embodying my invention; Fig. 2, a side elevation thereof, and Figs. 3 and 4 details to be referred to.

The rails A, constituting the main-line track, the rails B, the side or branch track, and the movable switch-rails C, herein shown as of the kind known as "facing point-switch," are all located in usual manner. The movable switch-rails C are connected together by the usual tie-bars *a*, one of which, as *a'*, has attached to it in usual manner the switch-rod *b*, extending to the switch-stand *c*.

The switch-stand herein shown and which I prefer to employ is of the class commonly termed "spindle-switches," and is unlocked and locked by the raising and lowering of the operating-lever *c<sup>x</sup>*, thus making it possible to throw the switch only when the operating-lever is in its most elevated position.

The tie-bar *a'* at its end opposite the switch-rod *b* is somewhat enlarged, and has attached to it the two rods *d e*, one of which, as *d*, has its outer end attached to one end of the lever *d'*, pivoted at *d<sup>2</sup>* to a suitable plate *d<sup>3</sup>*, bolted or otherwise secured to one of the

ties. A rod *d<sup>4</sup>* is attached to the other end of the lever *d'*, said rod passing beneath the rails to the other side of the track, where it is attached to one arm of the bell-crank lever *d<sup>5</sup>*, pivoted at *d<sup>6</sup>* to the plate *d<sup>7</sup>*, secured to a tie, as shown. The other arm of the said bell-crank lever *d<sup>5</sup>* is connected by means of the rod *d<sup>8</sup>* with one arm of the bell-crank track-lever *d<sup>9</sup>*, pivoted at *d<sup>10</sup>* to a plate or casting *d<sup>11</sup>*, which is herein shown as secured to the rail A; but said plate or casting may be secured to a tie, if desirable. The other arm *d<sup>12</sup>* of said bell-crank track-lever *d<sup>9</sup>* is somewhat longer and rises at an incline to a point, preferably, somewhat above the tread of the rail, as shown. The other rod *e*, which is attached to the tie-bar *a'*, is at its opposite end connected to one arm of the bell-crank lever *e'*, pivoted at *e<sup>2</sup>* to the plate *e<sup>3</sup>*, secured to one of the ties, the other arm of said bell-crank lever *e'* being connected by means of the rod *e<sup>4</sup>* with the bell-crank track-lever *e<sup>5</sup>*, pivoted at *e<sup>6</sup>* to the plate or casting *e<sup>7</sup>*, secured to the rail A, the said lever *e<sup>5</sup>* being similar to the lever *d<sup>9</sup>* described, the elevated arms in each case pointing toward the switch.

The switch-stand *c* has suitable guides *c'* for the vertically-movable bar *c<sup>2</sup>*, the upper end of which is provided with an arm *c<sup>3</sup>*, extending, preferably, at right angles to said bar, the said arm resting directly beneath the operating-lever *c<sup>x</sup>* when said operating-lever is in the position shown in full lines on the drawings—viz., when the switch is thrown upon a side track. The lower end of the vertically-movable bar *c<sup>2</sup>* is connected to one arm of the bell-crank lever *c<sup>4</sup>*, pivoted at *c<sup>5</sup>* to a plate *c<sup>6</sup>*, secured to the side of one of the ties, upon which the switch-stand rests or is secured. (See Fig. 3.) The other arm of the said bell-crank lever *c<sup>4</sup>* is connected by means of the rod *c<sup>7</sup>* to one arm of the bell-crank lever *c<sup>8</sup>*, pivoted at *c<sup>9</sup>* to the plate *c<sup>10</sup>*, also preferably secured to the same tie. The other arm of the bell-crank lever *c<sup>8</sup>* is connected by the rod *c<sup>11</sup>* with one arm of the bell-crank track-lever *c<sup>12</sup>*, pivoted at *c<sup>13</sup>* to the plate or casting *c<sup>14</sup>*, secured to the rail, the said lever *c<sup>12</sup>* having an elevated arm *c<sup>15</sup>* substantially the same as the lever *d<sup>12</sup>* described.

Connected with the same arm of the bell-crank lever  $c^8$  as the rod  $c^7$ , and preferably at the same pivotal point, as shown, is the rod  $c^{16}$ , said rod extending beneath the rails to the opposite side of the track, where it is attached to one arm of the bell-crank lever  $c^{17}$ , pivoted at  $c^{18}$  to the plate  $c^{19}$ , secured to a tie, as shown. The other arm of the said bell-crank lever  $c^{17}$  is connected by the rod  $c^{20}$  to the bell-crank track-lever  $c^{21}$ , pivoted at  $c^{22}$  to the plate or casting  $c^{23}$ , secured to the rail, said lever  $c^{21}$  being similar to the lever  $e^5$  described.

The locomotive L, a portion only of which is shown in Fig. 2, is provided, preferably near its forward end, with the bell-crank lever  $f$ , pivoted at  $f'$  in a suitable bearing secured to the frame, one arm of said lever, as  $f^2$ , being provided at its lower end with a roll  $f^3$ . The other and shorter arm of the said lever is acted upon by the cam  $f^5$  on the shaft  $f^6$ , said shaft having an outwardly-extended arm  $f^7$ , under the control of the rod  $f^8$ , extending back to the cab, where it may be operated at will by the engineer. The lever  $f$  is normally kept in its elevated position, as shown, by the action of the spring  $f^x$ .

The operation of my improved device for automatically throwing a switch is as follows: Suppose the switch-rails C to have been thrown upon the side track B, as shown in full lines, Figs. 1 and 2, and by reason of carelessness or otherwise left in that position. The long arms of the track-levers  $c^{12}$   $d^9$  and  $c^{21}$  and  $e^5$  are now all in their most elevated positions, and the operating-lever  $c^x$  is in its lowermost position, thereby locking the switch in this position, it being necessary to raise the said lever before the switch can be moved or thrown back into the main-line position. Suppose a train to be coming from the direction indicated by the arrow 20, the engineer, seeing the switch turned onto the side track B, will pull the rod  $f^8$  in the direction of arrow 25, which by reason of the action of the cam  $f^5$  upon the short arm of the lever  $f$  will throw the long arm  $f^2$  thereof down into its dotted-line position, Fig. 2. As the locomotive approaches the switch the roll  $f^3$  on the lever  $f$  will first engage the long arm  $c^{15}$  of the track-lever  $c^{12}$ , pushing the same down into its dotted-line position, and, acting through the rod  $c^{11}$ , lever  $c^8$ , rod  $c^7$ , and lever  $c^4$ , will raise the vertically-movable bar  $c^2$  into its dotted-line position, thereby raising the operating-lever  $c^x$  sufficiently to unlock the switch. While the track-lever  $c^{12}$  is still depressed, and before releasing it, the roll will engage the long arm  $d^{12}$  of the track-lever  $d^9$ , depressing the same, and, acting through the rod  $d^8$ , lever  $d^5$ , rod  $d^4$ , lever  $d'$ , and rod  $d$ , will pull the switch C over into its dotted-line position, Fig. 1, thus completing the main line and allowing the train to pass on in safety.

As the operating-lever  $c^x$  can only be dropped to lock the switch when said switch is in one or the other position, it is evident that as soon as the operating-lever has been raised to unlock the switch by the vertically-movable bar  $c^2$  and the switch is moved said operating-lever will be held in its elevated position during rotation of the switch-spindle until it has reached its other position, when it will drop by gravity, thus automatically locking the switch in that position. It will readily be seen that if a train should approach the switch from the direction indicated by arrow 30 a similar depression of the track-levers  $c^{21}$  and  $e^5$  will exert a pull upon the rods  $c^{20}$  and  $e^4$  and throw the switch in precisely the same manner.

Fig. 4 shows a modification of the track-lever acted upon by the moving train. In this case only one track-lever is employed, instead of two, as before.

The rod  $d^8$ , having a lost motion, allows the pull to be exerted first upon the rod  $c^{11}$ , which controls the locking device, to thus unlock the switch, when by further movement of the lever the rod  $d^8$  is engaged to thus throw the switch.

I do not desire to limit myself to the precise construction of the various operating parts shown, as it is evident the same may be varied in a variety of ways and still come within the scope of my invention.

I claim—

The movable switch-rails, a switch-stand, and a vertically-movable operating-lever, and mechanism intermediate between the said lever and switch-rails, whereby the said switch may be moved into one or another position by said operating-lever, and means controlled by the vertical movement of the said operating-lever for locking the said switch-rails in one or another position, combined with two track-levers located one at a greater distance from the switch-rails than the other and on the same side of the said switch-rails, to be acted upon and depressed by a moving train, and intermediate connecting mechanism between the said track-levers and the said switch-rails and operating-lever, one of the said track-levers when depressed raising the operating-lever vertically to unlock the switch-rails, while the other of the said track-levers when depressed moves the said switch-rails into desired position, and means for automatically locking the switch-rails in such position, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RICHARD S. EASTMAN.

Witnesses:

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ALONZO W. GLINES.