(No Model.)

R. S. EASTMAN.

AUTOMATIC RAILWAY SWITCH.

No. 410,961. Patented Sept. 10, 1889.

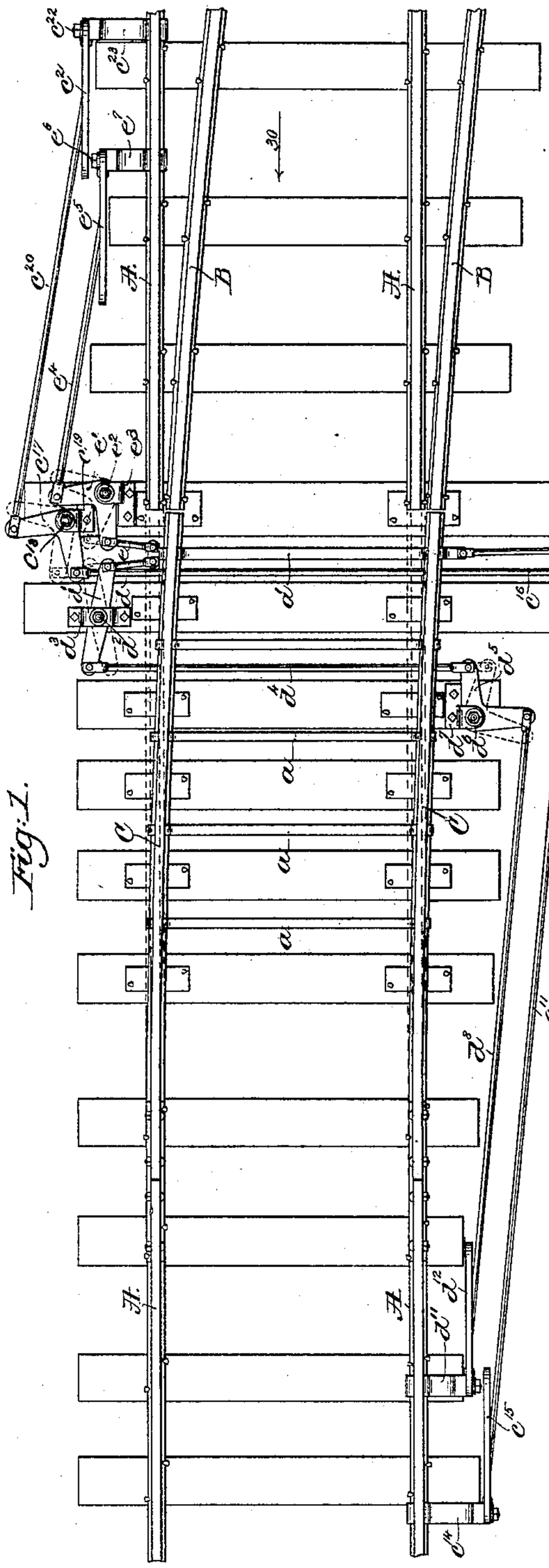

Fig. 1.

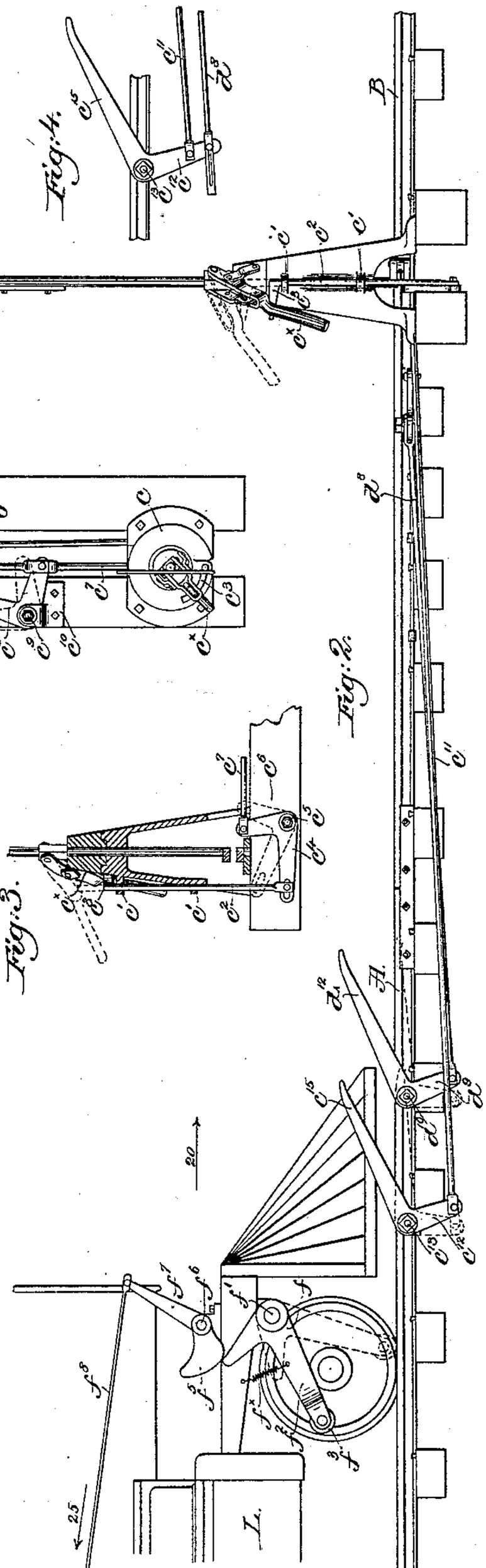

Fig. 2.

Fig. 3.

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 $c^{\times}$, 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^2 to a suitable plate d^3, bolted or otherwise secured to one of the ties. A rod d^4 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^5, pivoted at d^6 to the plate d^7, secured to a tie, as shown. The other arm of the said bell-crank lever d^5 is connected by means of the rod d^8 with one arm of the bell-crank track-lever d^9, pivoted at d^{10} to a plate or casting d^{11}, 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^{12} of said bell-crank track-lever d^9 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^2 to the plate e^3, secured to one of the ties, the other arm of said bell-crank lever *e'* being connected by means of the rod e^4 with the bell-crank track-lever e^5, pivoted at e^6 to the plate or casting e^7, secured to the rail A, the said lever e^5 being similar to the lever d^9 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^2, the upper end of which is provided with an arm c^3, extending, preferably, at right angles to said bar, the said arm resting directly beneath the operating-lever $c^{\times}$ 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^2 is connected to one arm of the bell-crank lever c^4, pivoted at c^5 to a plate c^6, 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^4 is connected by means of the rod c^7 to one arm of the bell-crank lever c^8, pivoted at c^9 to the plate c^{10}, also preferably secured to the same tie. The other arm of the bell-crank lever c^8 is connected by the rod c^{11} with one arm of the bell-crank track-lever c^{12}, pivoted at c^{13} to the plate or casting c^{14}, secured to the rail, the said lever c^{12} having an elevated arm c^{15} substantially the same as the lever d^{12} 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 $f^\times$.

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 $c^\times$ 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 $c^\times$ 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 $c^\times$ 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^1 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:
GEO. W. GREGORY,
ALONZO W. GLINES.