

(No Model.)

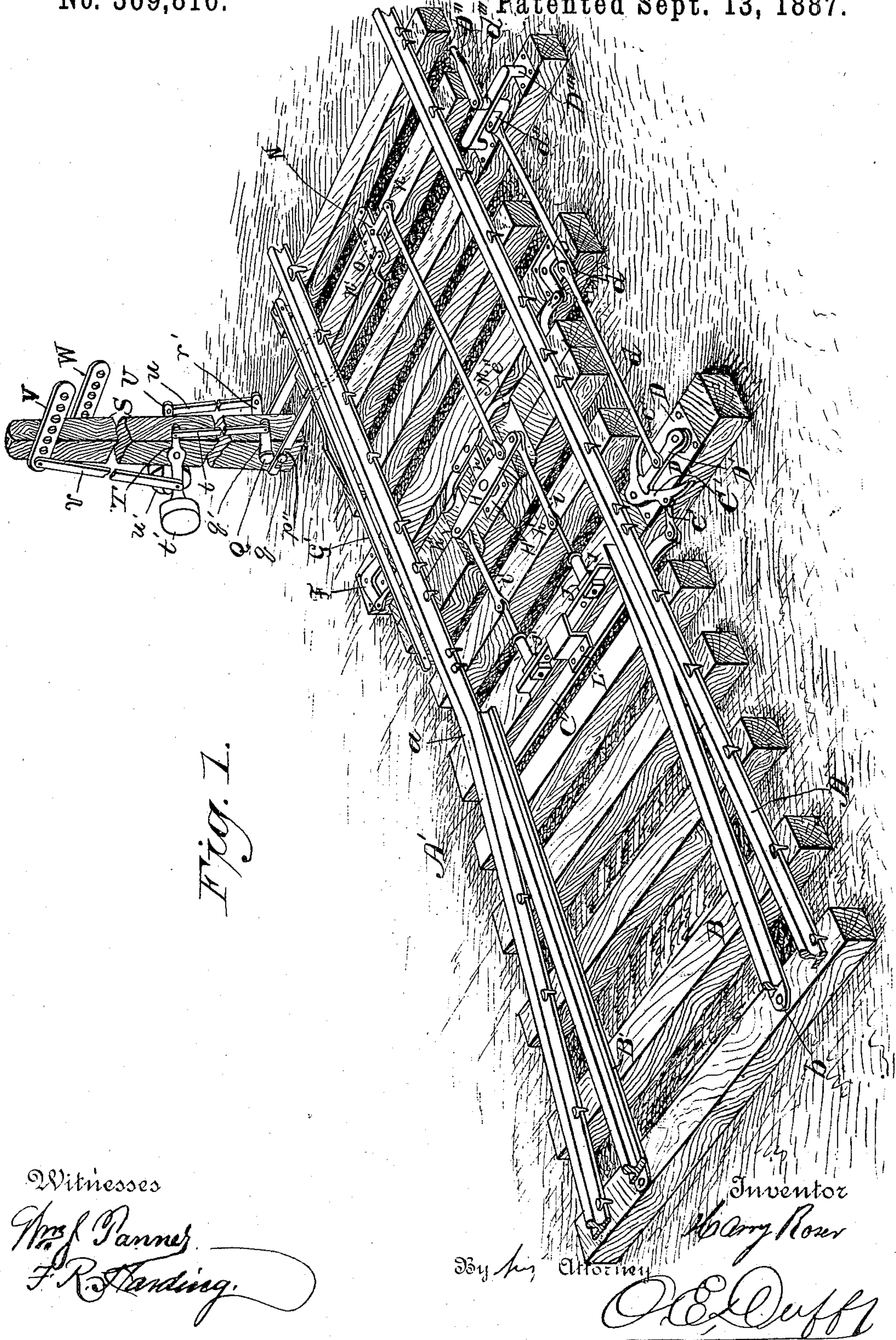
3 Sheets—Sheet 1.

H. ROSER.

MEANS FOR OPERATING RAILWAY DANGER SIGNALS IN CONNECTION  
WITH SWITCHES.

No. 369,816.

Patented Sept. 13, 1887.





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3 Sheets—Sheet 2.

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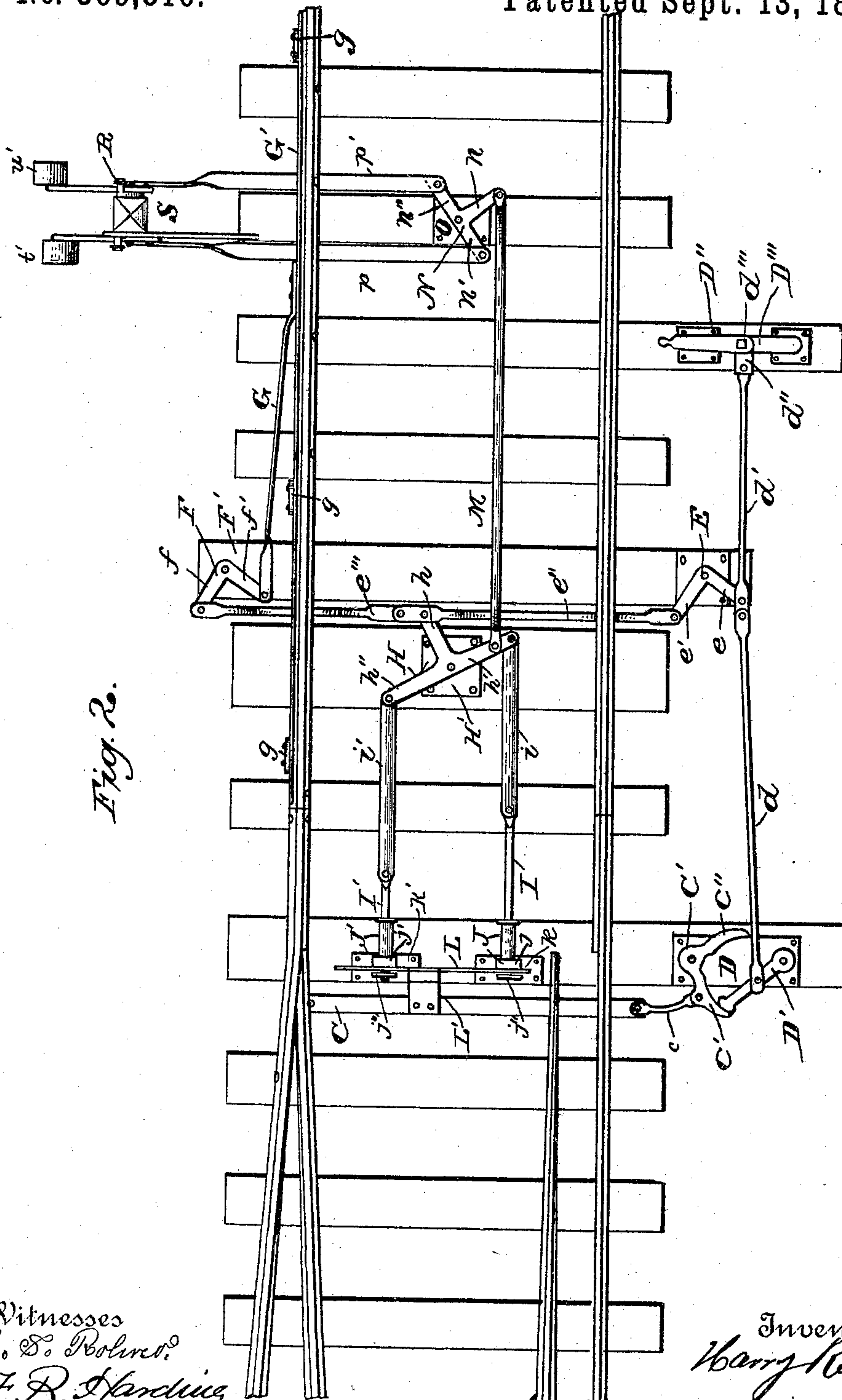


Fig. 2.

Witnesses  
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F. R. Harding

By his Attorney

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(No Model.)

3 Sheets—Sheet 3.

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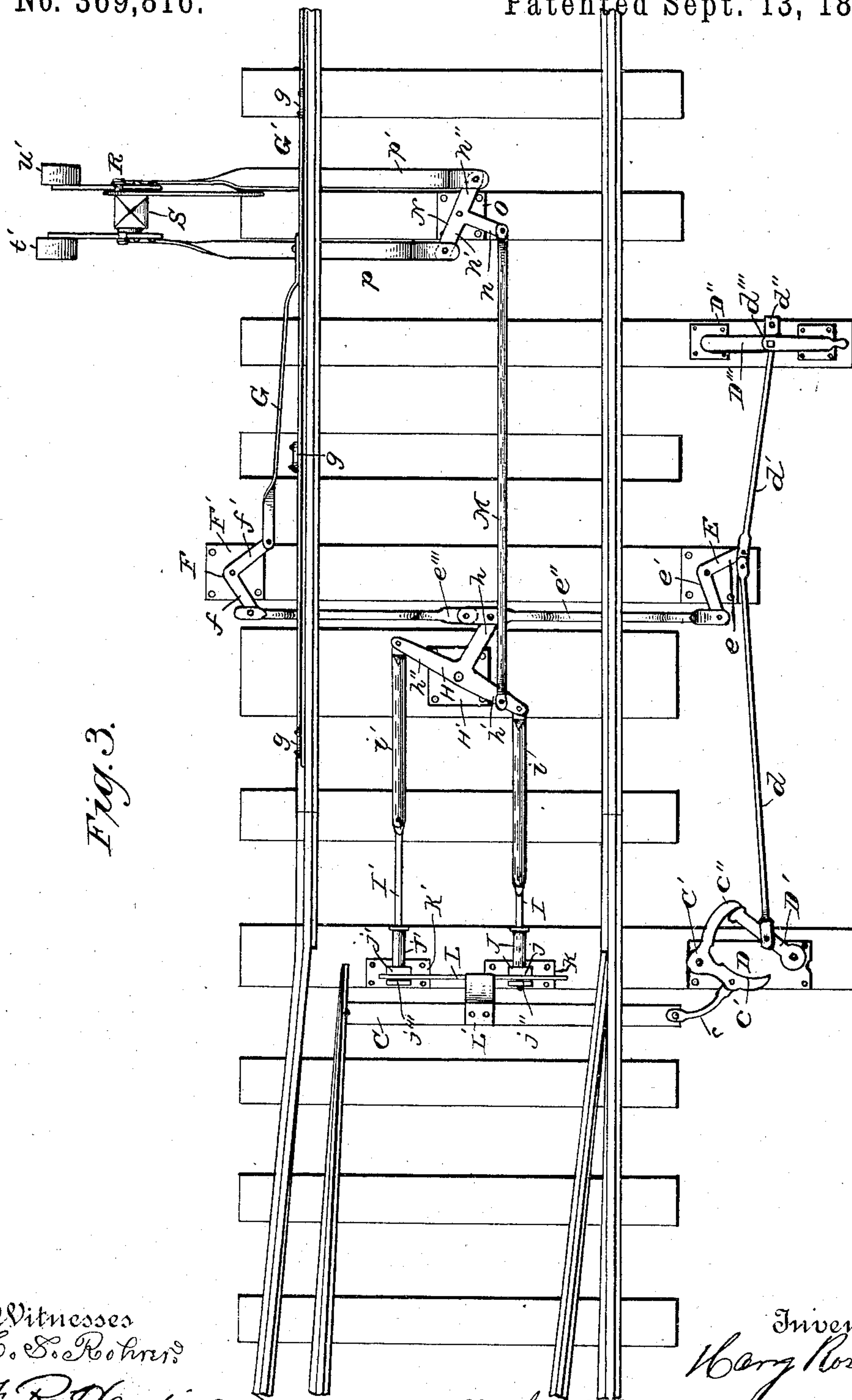


Fig. 3.

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# UNITED STATES PATENT OFFICE.

HARRY ROSER, OF NEW YORK, ASSIGNOR TO EDWIN THORNE, OF MILL-BROOK, AND JAMES H. SWIFT, OF SOUTH AMENIA, NEW YORK.

MEANS FOR OPERATING RAILWAY DANGER-SIGNALS IN CONNECTION WITH SWITCHES.

SPECIFICATION forming part of Letters Patent No. 369,816, dated September 13, 1887.

Application filed June 11, 1886. Serial No. 204,849. (No model.)

*To all whom it may concern:*

Be it known that I, HARRY ROSER, a subject of the Queen of Great Britain, now a resident of New York city, in the county and State of New York, have invented certain new and useful Improvements in Means for Operating Railway Danger-Signals in Connection with Switches; and I do hereby declare that the following is a full, clear, and exact description of the invention, 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 part of this specification.

My invention relates to railway-switches and their connected signaling apparatus, and has for its object to furnish, first, an easily-operated and reliable switch; second, a secure locking device therefor; third, a signal which shall invariably indicate the exact position of the switch, and, fourth, an automatic switch-actuating device which shall only be in operative position when needed—that is to say, when the switch is only partly thrown—all in combination and operated from the same lever.

With these objects in view I have devised the improved construction, arrangement, and combination of parts which I shall now proceed to fully describe, the particular points of novelty in which I shall specifically set forth in the claims.

In the drawings, Figure 1 is a perspective view of my improved construction, the switch being shown neither open nor closed and the various parts at the middle of their throw. Fig. 2 is a top plan view showing the parts in the position they assume when the switch is set for the main; and Fig. 3 is a similar view, the parts being shown in the position they assume when the switch is set for the siding.

Like letters of reference mark the same parts wherever they occur in the different figures.

Referring to the drawings by letter, A A' are the main-line rails suitably supported on cross-ties, as is usual, the rail A being continuous and the rail A' bending outward at *a* and forming the side track or switch rail.

B B' are the switch-tongues, the tongue B being pivoted at *b* near the rail A and adapted to be thrown against the said rail in order to

set the switch for the siding and cause the train to pass from the main to the side track, of which one rail is laid as a continuation of said tongue. The tongue B', when the switch is set for the main, forms part of the main line, and when the switch is set for the siding it lies a short distance from the main rail A' to permit the switching off of a train, as described.

The two switch-tongues are connected near their points by a bar, C, by which they are maintained in a parallel position and caused at all times to move in unison. At one end of the bar C a link, *c*, is pivoted, the outer end of said link being pivoted to the arm *c'* of an elbow or V-shaped bar or lever, C', pivoted on a plate, D, secured to a cross-tie. At the other end of the plate D is pivoted a bar, D', whose free end rests between the spreading arms *c'* *c''* of the V-shaped bar or lever C'; and to the center of this bar D' is pivoted a link, *d*, connected at its end to another link, *d'*, which in its turn is pivotally connected to a horizontal crank-arm, *d''*, projecting from an upright shaft, *d'''*, having a suitable operating-handle, D'', and mounted in a suitable bearing, D''', secured to a cross-tie. This train of devices constitutes the complete switch-operating mechanism, and for this purpose solely the links *d d'* might be made as one rigid link. The purpose, however, for making them in two pivoted together will shortly appear.

Pivoted to a cross-bar, as seen, is an elbow-lever, E, having arms *e e'*, the former of which at its end is pivoted to the link *d'* at or near the pivot which connects with link *d*, while the latter, *e'*, is pivotally connected to a link, *e''*, which passes under the rail A, and at its other end is pivotally connected with another link, *e'''*, which passes under the rail A', and at its outer end is pivotally connected to the arm *f* of an elbow-lever, F, pivoted to one of the cross-ties or to a plate, F', secured on top thereof. The other arm, *f'*, of the elbow-lever F is pivoted to a link, G, which at its other end is pivoted to a flat bar, G', set parallel to the rail A' and connected thereto by links *g g g*, which are pivoted at their upper ends to the bar G', which will cause it to move vertically alongside the rail, always maintaining a horizontal position, and into a position to be actuated by a passing train. This



train of devices from the elbow-lever E completes the automatic switch-actuating mechanism, and for this purpose only the links  $e''$   $e'''$  might, as with the links  $d$   $d'$  in the actuating mechanism, be made in one piece. A double-elbow or T lever, H, having arms  $h$   $h'$   $h''$ , and pivoted to a cross-tie or to a plate, H', secured on top thereof, has the free end of arm  $h$  pivotally connected to link  $e''$  at or near the pivot which connects it with the link  $e'''$ , and the ends of arms  $h'$   $h''$  pivotally connected to links or pitmen  $i$   $i'$ , which are in turn pivoted to the outer ends of locking-bolts I I', which are guided in barrels or tubes J J', secured to perforated lugs  $j$   $j'$ , attached to plates  $k$   $k'$ , secured to a cross-tie. On the same plates, at a short distance from the lugs  $j$   $j'$ , are secured perforated lugs  $j''$   $j'''$ , whose perforations are in line with those of lugs  $j$   $j'$ . Between the two sets of lugs is a space in which slides a bar, L, which, by means of the arm L', is connected rigidly with the plate or bar C, which connects the two switch-tongues B B', so that when the bar C is moved in actuating the switch the bar L will move in unison with it. This bar L is provided with two, or preferably four, perforations, two of which are coincident and in line with the perforations in the lugs carried on the plates  $k$   $k'$  when the switch is set for the siding, and the other two when it is set for the main, so that there will be no impediment to the locking-bolts when they are alternately brought forward. This train of devices from the T-lever H completes the locking and unlocking mechanism.

On the arm  $h'$  of the T-lever H is pivoted a link, M, whose opposite end is pivoted to the arm  $n$  of another T-lever, N, pivoted to a plate, O, secured to a cross-tie. To the other arms,  $n'$   $n''$ , of the lever N are pivoted links  $p$   $p'$ , which pass under the rail A' and are at their outer ends provided in their under edges with notches  $p''$   $p'''$ , to engage pins projecting from arms  $q$  and  $r$  of elbow-levers Q and R, pivoted on opposite sides of a signal-post, S, planted at the side of the track. To the other arms,  $q'$  and  $r'$ , of these elbow-levers are pivoted the lower ends of links  $t$  and  $u$ , which at their upper ends are pivotally connected with levers T U, pivoted to the sides of signal-post S and having weights  $t'$  and  $u'$  at their outer ends. To these levers, on the opposite side of their pivots from the points of connection of the links  $t$  and  $u$ , are pivotally connected the lower ends of links  $v$  and  $w$ , whose upper ends are pivotally connected to the short arms of signal-bars V and W, pivoted to the signal-post.

The train of devices from the T-lever H last described forms the complete switch-indicator or signaling apparatus.

The operation of my invention may be described as follows: The switch being set for the main, the parts in position shown in Fig. 2, and it being desired to throw it to the siding, the handle or hand-lever D'' is operated in either direction, turning the shaft  $d'''$ , and

with it the crank-arm  $d''$ , drawing upon the links  $d'$  and  $d$ , and thus causing the bar D' to turn on its pivot until it impinges against the arm  $c''$  of the V-shaped bar C'. This causes the bar C' to move on its pivot, carrying the arm  $c'$  around away from the rail, which action, through the medium of link  $c$ , causes the bar C, which connects the switch-tongues B B', to move, carrying with it the switch-tongues until the tongue B abuts and lies snug against the rail A, as seen in Fig. 3. The switch is now set for the siding, and to again return it the operations are simply reversed. Should this operation be interrupted by accident before it is completed, the parts will be in substantially the position shown in Fig. 1, with the parallel bar G' raised above the track, and the approaching train, if not properly warned by the signal, as hereinafter explained, or if unable by any reason to stop, will run on said bar G' as well as the rail, pressing it down, and through the medium of the link G, elbow-lever F, with its arms  $f$   $f'$ , links  $e''$   $e'''$ , and elbow-lever E, causing the links  $d$   $d'$  to move, thus actuating the switch-operating mechanism, as before described, and setting the switch. It is to be understood that this automatic switch-actuating mechanism will be always situated in front of the switch, and if a single track is used for trains running in both directions, two such mechanisms might be used, although not absolutely necessary.

It will be noticed in the operation of the switch-actuating mechanism that the first half of the movement of the bar D' has no effect upon the switch-tongues, the end of the bar simply sliding over the arm  $c'$  of the V-shaped lever C'. This last motion is provided to give an opportunity for the withdrawal of the locking-bolt then in engagement, which is effected through the medium of the link  $e''$ , operating to turn the T-shaped lever H on its pivot, and thus, through the medium of the pitmen  $i$   $i'$ , to withdraw the bolt I' and insert the bolt I when the switch has been moved.

In order to warn the engineer of an approaching train, the signal-bars V and W are provided, the former being located above the latter, and otherwise marked, if desired, to distinguish them from each other.

When the switch is set for the main, the signal-bar V will be in a horizontal position and the signal-bar W lying flat against the side of the signal-post. When the switch is partially open, both will be horizontally displayed, and when the switch is set for the siding the bar W will be horizontal and the bar V folded against the post, the operation being as follows:

When the T-lever H is operated to unlock the switch, its movement will cause the link M to be drawn toward the switch, causing the T-lever N to turn, and through its arms  $n'$   $n''$  to push the link  $p$  and pull the link  $p'$ , the slots by means of which these links engage the elbow-levers Q and R allowing sufficient interval to elapse before moving said elbow-levers to permit the switch-operating mechanism



ism to get into play, such lost motion being equivalent in time to the lost motion of the bar D', as before described. The movement of the switch is thus simultaneous with the movement of the proper signal to "safety," and such signal remains at "danger" until the movement is nearly completed, when it is drawn down. As soon, however, as the movement commences at about the instant the locking-bolt is removed, the folded signal, freed from the restraint of its slotted link, which is withdrawing, will assume the horizontal position, being carried to it by its weight, and thus in the act of changing show both signals at "danger," as seen in Fig. 1.

The devices herein shown and described are all shown and described in another application of mine now pending in the United States Patent Office, except the signals and their operating devices, and consequently only the devices and their combinations with the other devices are claimed in this application.

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

1. The combination, with the switch and actuating mechanism, of the switch-lock consisting, essentially, of the bolts or plungers secured to a vibrating lever, and a plate secured to the switch-rails and provided with seats for the ends of the bolts or plungers, the signals, and the set of levers, substantially as described,

whereby the signals are partially set while the lock is being released and the signal completely set while the switch is being thrown, substantially as set forth.

2. The combination, with the switch and its actuating mechanism and the locking and unlocking mechanism having in its construction the T-lever H, of the signaling apparatus having a link-connection with the T-lever, and the hand-lever for operating both mechanisms, also having a link-connection with said T-lever, substantially as set forth.

3. The signaling apparatus consisting, essentially, of two signal-bars pivoted on opposite sides of the post, links depending therefrom, pivoted weighted bars, to which said links are connected at their lower ends, links depending from said weighted bars, pivoted elbow-levers, to one arm of which the lower ends of said links are pivoted, notched bars engaging the other arms of said elbow-lever, a T-lever to which said notched links are pivoted, and links connecting said T-lever with the operating-lever, as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

HARRY ROSER.

Witnesses:

ARTHUR FITCH,  
B. A. BIRGE.