

No. 789,375.

PATENTED MAY 9, 1905.

W. W. McCLUNG.
RAILWAY SWITCH.
APPLICATION FILED JAN. 11, 1905.

2 SHEETS—SHEET 1.

Fig. 1.

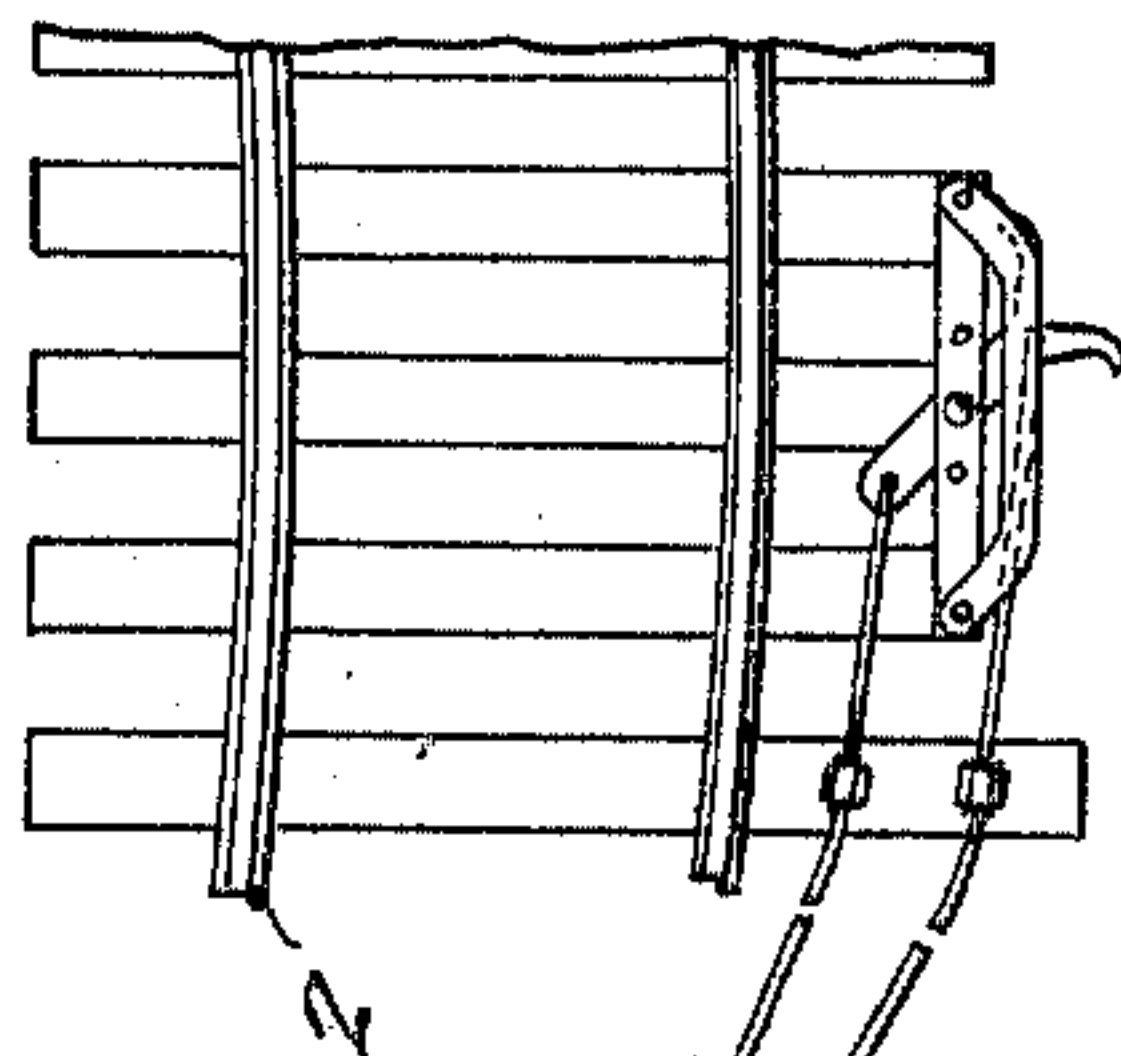
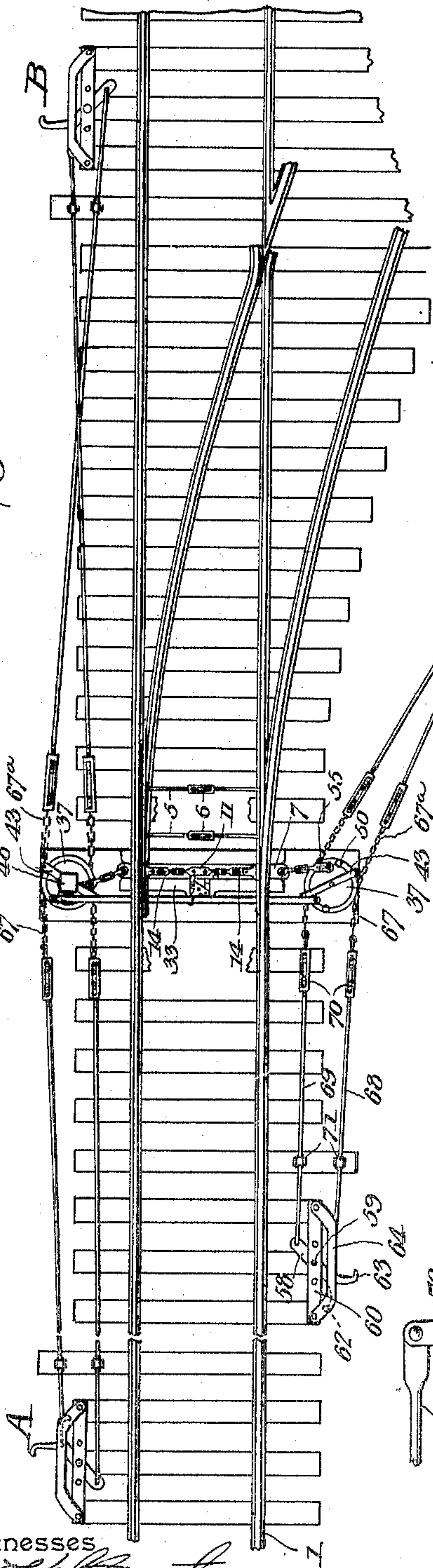


Fig. 8.

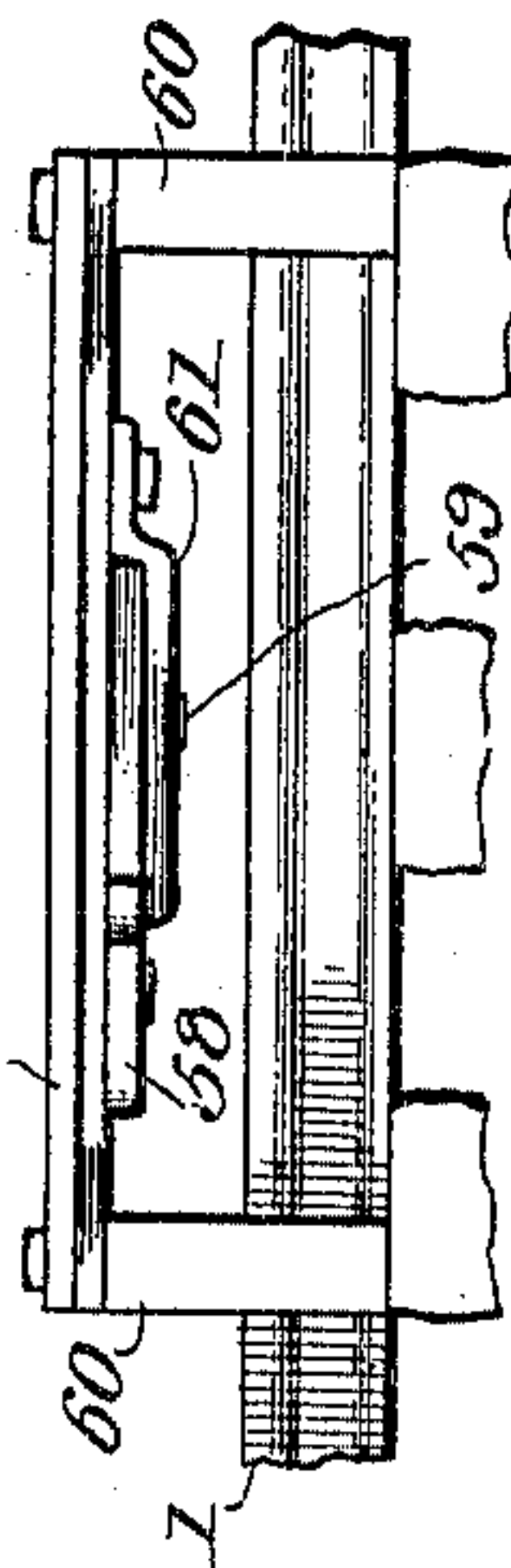


Fig. 9.

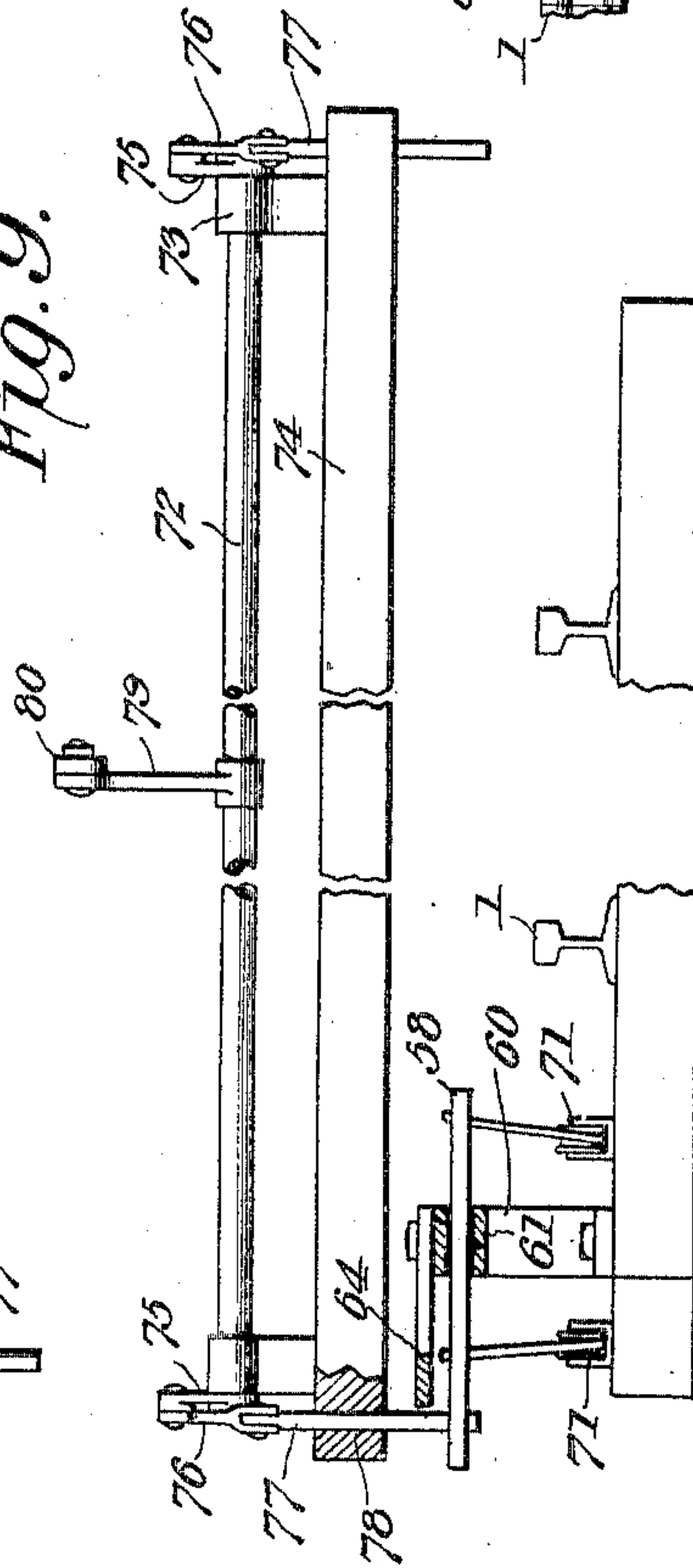
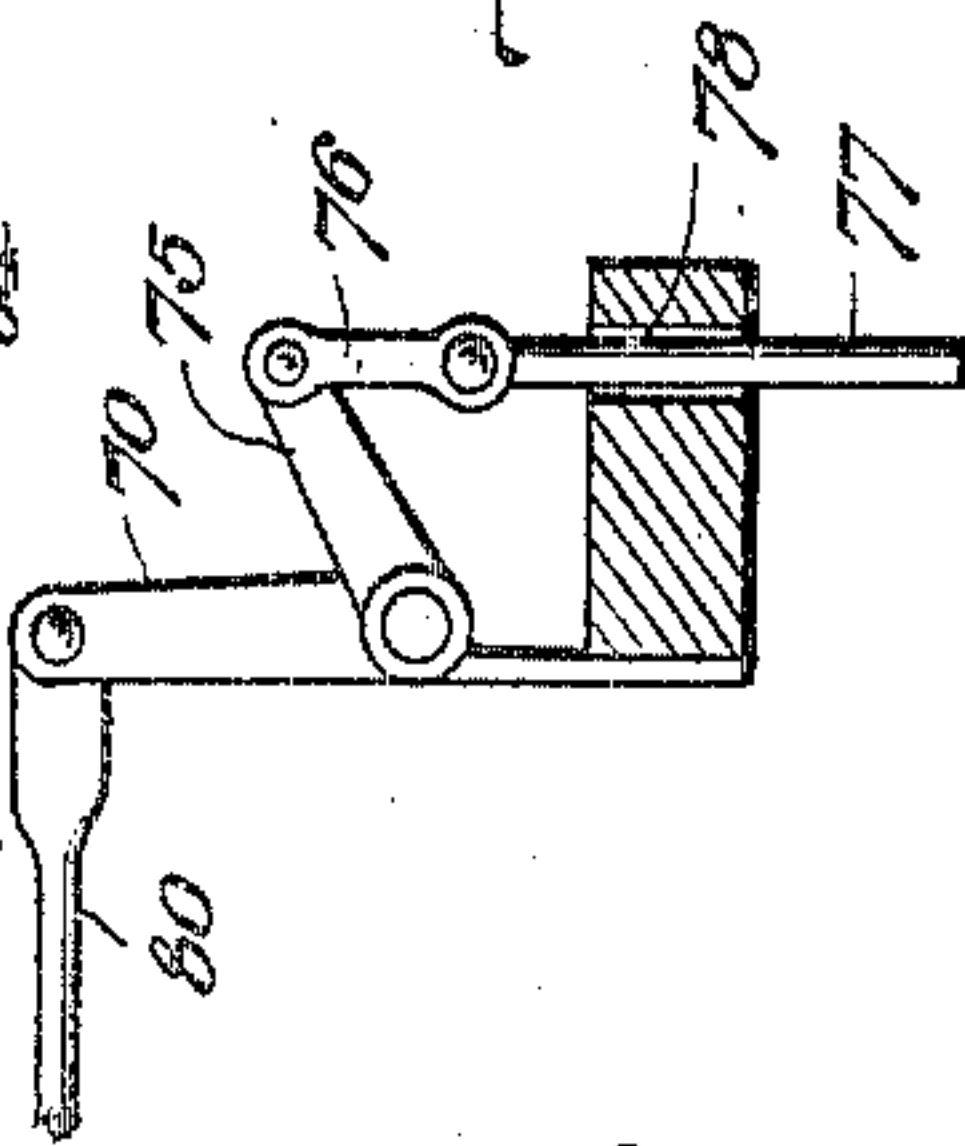


Fig. 10.



Witnesses

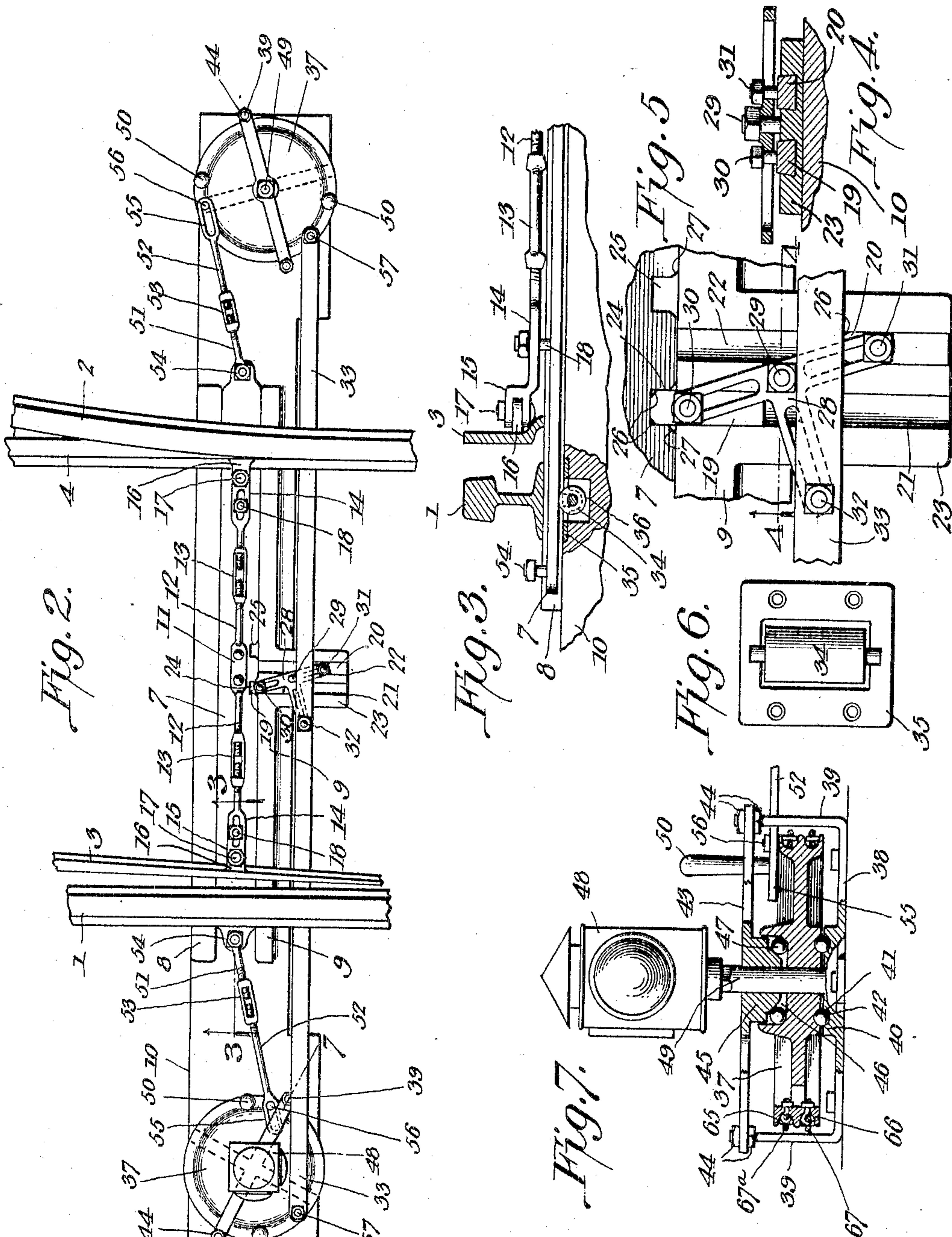
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 789,375, dated May 9, 1905.

Application filed January 11, 1905. Serial No. 240,650.

To all whom it may concern:

Be it known that I, WILLIAM W. McCLUNG, a citizen of the United States, residing at Karns City, in the county of Butler and State of Pennsylvania, have invented a new and useful Railway-Switch, of which the following is a specification.

This invention relates to railway-switches, and has for its object to effect throwing of the switch by a train in a simple and improved manner, thereby to always have the switch under the control of the engineer.

A further object of the invention is to effect locking of the movable switch-rails at their opposite limits, so as to prevent accidental throwing of the rails by wheel-flanges, and to effect releasing of the switch prior to the moving of the switch-rails, so as to prevent injury to any of the parts of the switch-throwing mechanism.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a plan view of a switch mechanism embodying the features of the present invention. Fig. 2 is an enlarged detail plan view of the switch-bar and adjacent parts. Fig. 3 is a detail sectional view on the line 3 3 of Fig. 2. Fig. 4 is an enlarged sectional view on the line 4 4 of Fig. 5, the parts being in an intermediate unlocked position. Fig. 5 is an enlarged detail plan view of the switch-locking means. Fig. 6 is a detail view of one of the antifriction-rollers for the support of the switch-bar. Fig. 7 is an enlarged detail sectional view on the line 7 7 of Fig. 2. Fig. 8 is an enlarged elevation of one of the car-actuated trip devices. Fig. 9 is a detail view of the car device in coöperative relation with one of the trip devices. Fig. 10 is an end elevation of the car device.

Like characters of reference designate corresponding parts in each and every figure of the drawings.

To illustrate the application and operation of the present apparatus, there have been shown in the accompanying drawings the main track 1, a portion of a siding 2, and the movable switch-rails 3 and 4, all of which are of common or approved form, and therefore may be varied considerably without affecting the spirit of the present invention. As usual, the movable switch-rails 3 and 4 are connected by braces 5, having turnbuckles 6.

The switch-bar 7 of the present invention is mounted to work back and forth transversely beneath the movable switch-rails and the adjacent rails of the main track and works in a guideway formed by spaced guide-bars 8 and 9, suitably secured to the top of a cross-tie 10. Ordinarily switch-bars are riveted or bolted directly to the switch-rails, and therefore it is impossible to take up looseness occasioned by wear, wherefore it is an important feature of the present invention to provide an adjustable connection between the switch-bar and the switch-rails, which is accomplished in the following manner: A center bracket 11 is riveted or otherwise secured to the middle of the top of the switch-bar 7 and is provided at opposite ends with substantially horizontal upwardly-offset bars or stems 12, which are threaded at their outer ends for engagement with turnbuckles 13. A slotted link 14 has a threaded terminal engaged with the adjacent turnbuckle and its outer end slightly elevated and forked, as at 15, to receive an ear or projection 16 upon the adjacent switch-rail, to which it is secured by a bolt 17 or other suitable fastening. A connection 18 rises from the switch-bar 7 and is projected into the slot of the link 14, so as to guide the latter when the turnbuckles are operated to accommodate the connection between the two switch-rails to the proper distance therebetween. From this description it will be understood that the connecting means between the switch-bar and the switch-rails is carried by the bar and has an adjustable connection with each switch-rail, said connecting means including turnbuckles for

the purpose of accommodating the connection to the required distance between the switch-rails.

It is proposed to lock the switch-rails at their opposite limits in order that the switch may always be completely open or completely closed, thereby to prevent accidental throwing of the switch-rails by the passage of wheel-flanges. This object is attained by means of a pair of bolts, (designated 19 and 20,) which work in guideways 21 and 22 in the nature of grooves formed in the top of the guide member 9, the latter being increased in width intermediate of its ends, as at 23, to give the desired length to the guideways. The adjacent edge of the switch-bar is provided with a pair of notches or seats 24 and 25, suitably spaced to alternately receive the respective bolts or latches 19 and 20—that is to say, when one of the bolts or latches is engaged with its corresponding seat or keeper the other bolt or latch is out of engagement with its keeper, wherefore the seats or keepers are spaced at an interval greater than that which separates the latches. By preference the forward extremity of each latch is beveled at its two corners, as indicated at 26, while the corners of the walls at the entrance of each seat or keeper are correspondingly beveled, as at 27, to permit of each latch partially entering its seat or keeper before it comes into actual longitudinal alinement therewith, for a purpose as will hereinafter appear. For the purpose of alternately working the slidable latches or bolts back and forth there is a substantially T-shaped lever 28 fulcrumed upon the lateral extension 23 of the guide-bar 9, as indicated at 29, with the ends of the head of the lever having loose pivotal connections 30 and 31 with the rear ends of the respective latches. The free extremity of the lever has a loose pivotal connection 32, with a shift-bar 33 working endwise beneath the rails of the track in substantial parallelism with the switch-bar 7 and movable reversely thereto.

To prevent binding of the switch-bar 7, each end thereof is supported upon an antifriction-roller 34, journaled in an open frame 35, which is supported across a socket or recess 36, formed in the top of the tie 10.

The mechanism for moving the switch-bar back and forth is the same at each side of the track, and therefore a description of one of such mechanisms is deemed sufficient. The cross-tie 10, which supports the switch-bar, is projected a suitable distance beyond each side of the track for the support of a rotatably-shiftable member 37 in the nature of a wheel, either spoked or a disk. This wheel or shiftable member is supported within a frame 38, preferably in the form of a cross, which is spiked or otherwise secured to the cross-tie, with the opposite ends of one of the members of the frame turned up to produce posts

or standards 39, which rise for a suitable distance above the top of the shiftable member 37. A central elevated boss portion 40 is provided upon the base and has a concentric ball-race 41 formed in the top thereof for the reception of antifriction-balls 42, the lower end of the hub of the wheel having a concentric ball-race to receive the tops of the balls 42, whereby the wheel has an antifriction-bearing upon the base. A cross-bar 43 extends diametrically across the top of the wheel and has its opposite ends pierced by the upper threaded extremities of the posts or standards 39, there being suitable nuts 44, carried by the posts and embracing the end portions of the cross-bar to adjustably support the latter. A pendent cone 45 is carried by the middle portion of the cross-bar 43 and enters a seat 46 in the top of the hub of the wheel 37, there being suitable antifriction-balls 47 contained in the seat and engaged by the cone. By adjusting the cross-bar 43 vertically through the medium of the nuts 44 the antifriction-bearing of the wheel may be conveniently maintained in proper condition to prevent wobbling of the wheel and to insure smooth rotation thereof. If desired, a signal-lamp 48 may be mounted upon either or both of the wheels 37, preferably by means of a spindle 49, fixed to and rising centrally from the hub of the wheel loosely through the cone 45 and the cross-bar 43, whereby the lamp will be rotatably shifted simultaneously with the wheel to properly indicate an open switch or an open main track. While it is primarily intended to actuate the switch from a passing train, the wheel or shiftable member 37 may be manually actuated by means of a pair of handles 50, rising from the wheel at diametrically opposite points and at opposite sides of the cross-bar 43. As a quarter rotation of the wheel 37 is sufficient to effect throwing of the switch-rails, the cross-bar 43 does not interfere with the handles.

Connection is had between each end of the switch-bar 7 and the adjacent shiftable member 37 by means of a pair of links 51 and 52, connected by a turnbuckle 53, the link 51 being pivotally attached to the switch-bar, as at 54, while the link 52 is provided with a longitudinal slot 55, loosely engaging a fastening or projection 56, rising from the wheel 37 adjacent its outer edge, whereby rotary movement of the wheel 37 will tend to shift the switch-bar 7 back and forth, and thereby throw the movable switch-rails from one limit to the other. It is also designed to actuate the shift-bar 33 from the wheel 37, and therefore each end of said bar is pivotally connected to the wheel, as at 57.

Each of the wheels or rotary shiftable members 37 is controlled by a train-actuated trip, which is best indicated in Figs. 1, 8, and 9 of the drawings, there being four of such

trips divided into sets of two, with a set at each side of the track and a trip at each side of the switch-bar. These trips are of course duplicates in every particular, and each trip consists of a substantially horizontal lever 58, fulcrumed intermediate of its ends, as at 59, upon an elevated or arched support 60, rising from the ends of adjacent cross-ties at the outer side of the track, there being a yoke-shaped guard 61 hung from the under side of the supporting-bracket 60 and straddling the lever. The outer free end of the lever is forked or bifurcated to provide bowed or arcuate trip portions 62 and 63. Another guard member, 64, has its ends secured to the top of the bracket 60, with its intermediate portion offset upon the outer side thereof so as to overhang the outer end portion of the lever, and thereby prevent undue tilting thereof in a vertical direction. As best indicated in Fig. 7 of the drawings, the outer peripheral edge of the wheel or member 37 is provided with a pair of annular grooves 65 and 66, there being a chain or cable 67 embracing the wheel in one of the grooves, with its opposite end extending toward the trip device and connected to the adjacent ends of cables 68 and 69 by means of suitable turnbuckles 70, the cable 69 being connected to the inner end of the lever 58 and the other cable, 68, connected to the outer end of said lever. Suitable guides 71 are mounted upon one of the ties between the trip device and the adjacent wheel 37, so as to receive the cables 68 and 69, and thereby retain the latter close to the tops of the ties out of possible engagement by a passing train. The trip device at the opposite side of the switch-bar is connected to the wheel 37 in a similar manner, the chain or cable member 67^a thereof being located in the other peripheral groove of the wheel, whereby each lever 58 is set automatically by the tripping of the other lever.

The car device for engagement with the respective tripping-levers 58 has been shown in Figs. 9 and 10 and includes a rock-bar 72, mounted in bearings 73 upon a frame-bar 74 of the locomotive, there also being a similar device upon the last car of the train whenever it is desired to reset the switch after passing the same. Upon each extremity of the rock-bar there is a crank 75, located at the outer side of the adjacent bearing 73, with a link 76 depending from the crank and carrying a vertically-disposed trip-rod 77, working through a suitable guide, preferably an opening 78, in the frame-bar 74. Any suitable means for rocking the bar 72 may be employed—such, for instance, as a crank-arm 79, rising from an intermediate portion of the bar, and a connecting rod or bar 80, leading therefrom to any suitable point of control.

In practice, the main track being open, as indicated in Figs. 1 and 2 of the drawings,

when a train approaches the switch from the left the car device is actuated to lower the trip-bars 77 so as to strike the forked member 63 of the trip device upon the right-hand side of the track, whereby the adjacent wheel 37 will be rotated in the direction of the arrow on Fig. 2 and the shift-bar 33 will be moved in the direction of the arrow applied to Fig. 2, whereby the lever 28 will be rocked to withdraw the latch 20 from the switch-bar 7 before motion is imparted to the switch-bar, by reason of the fact that the connection 56 on the wheel 37 moves in the slot 55 during the initial movement of the shift-bar 33 without imparting movement to the switch-bar. The length of the slot 55 and the relation of the pivotal connection 57 of the shift-bar 33 with the wheel or member 37 is so related as to permit of the latch 20 being entirely withdrawn from the switch-bar 7 before the connection 56 reaches the inner end of the slot 55, whereupon the switch-bar 7 will then be shifted to the left and the switch thereby opened. When the switch-bar 7 reaches the limit of its left-hand movement, the latch 20 will be engaged with its seat or keeper 25 and the switch-rails thereby locked against accidental movements. In view of the fact that the switch-bar 7 and the latches 19 and 20 move at right angles to one another it is necessary to slightly enlarge the entrances of the seats or keepers 24 and 25 to permit of each latch entering its keeper before the switch-bar reaches the limit of its movement, the latch of course finally snugly seating itself in the back of the keeper, so as to lock the switch-bar against endwise looseness. After the train passes upon the switch the latter may be left open, or it may be closed by engaging the car device with the trip-lever 58 on the siding. It will therefore be understood that the two trip devices at one side of the track are sufficient to control the switch for opening and closing the switch to permit of trains passing to and from the siding. However, it is proposed to also control the switch by trains passing in either direction along the main track, and therefore other trip (devices designated in general by the reference characters A and B) are provided at the opposite sides of the track and connected to the adjacent wheel or shifting member 37 in the manner hereinbefore described. By this arrangement the switch-rails may be controlled from four different points, and when one trip device is actuated the other three are set. By preference the trip device designated A is located a suitable distance in front of the adjacent trip device upon the other side of the track in order that these trip devices may be independently and not simultaneously actuated by the car device.

Having fully described the invention, what is claimed is—

1. In a switch mechanism, the combina-

tion of a switch-bar, means for locking the bar at its opposite limits and including a shift-bar working in substantial parallelism with the switch-bar, and a car-actuated trip device including a rotatable member, the switch-bar being connected to one side of the rotatable member and the shift-bar connected to the opposite side of said member to simultaneously move the two bars in opposite directions.

2. In a switch mechanism, the combination of a switch-bar, means for locking the bar at its opposite limits and including a shift-bar, and a car-actuated trip device including a rotary member, the shift-bar being connected to the rotary member at one side of its axis for simultaneous endwise movement with the rotary member, and the switch-bar having a slidable connection with the rotary member at the opposite side of its axis to permit movement of the shift-bar prior to movement of the switch-bar.

3. In a switch mechanism, the combination of a switch-bar having keepers, latches for alternate engagement with the keepers to lock the switch-bar, a substantially T-shaped lever connected to the latches, a shift-bar connected to the lever, a rotary shifting element connected to the shift-bar and the switch-bar to operate the same in opposite directions, a connection between the shifting element and the switch-bar to permit of an initial movement of the shift-bar prior to the moving of the switch-bar, and a car-actuated trip connected to the shifting element.

4. In a switch mechanism, the combination of a switch-bar guideway having a latch-guideway intersecting the same transversely, a switch-bar working in its guideway and provided with a keeper, a latch working in the latch-guideway for cooperation with the keeper, a lever fulcrumed upon the guideway and connected to the latch, a shift-bar connected to the lever, and a car-actuated trip device connected to the shift-bar and the switch-bar.

5. In a switch mechanism, the combination of a switch-bar guideway having an intermediate lateral extension provided with a pair of latch-guideways intersecting the switch-bar guideway, a switch-bar working in its guideway and provided with a pair of notches for alternate engagement with the respective latch-guideways, latches working in the latch-guideways, a substantially T-shaped lever fulcrumed upon the extension at a point between the latch-guideways and connected to the two latches, a shift-bar connected to the lever, and a car-actuated trip device connected to the shift-bar and the switch-bar.

6. In a switch mechanism, the combination with a switch-bar, of a rotary shifting element connected thereto, an intermediately-

pivoted car-actuated trip device, and a flexible connection embracing the rotary shifting element and connected to the trip device at opposite sides of the pivot thereof.

7. In a switch mechanism, the combination with a switch-bar, of a rotary shifting element having a pair of peripheral grooves, car-actuated trip devices located at opposite sides of the shifting element, a cable embracing the shifting element in each groove thereof with its ends connected to one of the trip devices for simultaneous movements in opposite directions, and a connection between the shifting element and the switch-bar.

8. In a switch mechanism, the combination with a switch-bar, of a rotary shifting element connected to the switch-bar, a substantially horizontal car-actuated trip-lever fulcrumed intermediate of its ends with its outer free end forked to produce opposite trip elements, and connections extending from the lever at opposite sides of its fulcrum to the rotary shifting element.

9. In a switch mechanism, the combination with a switch-bar, of a rotary shifting element connected to the switch-bar, a trip-supporting bracket, a substantially horizontal car-actuated trip-lever fulcrumed intermediate of its ends upon the bracket, a guard carried by the bracket and embracing one side of the lever, another guard carried by the bracket and offset laterally therefrom to lie across the other side of the lever, the outer end of the lever being forked to produce opposite trip elements, and connections extending from the lever at opposite sides of its fulcrum to the rotary shifting element.

10. In a switch mechanism, the combination of a switch-bar, a latch to lock the switch-bar, a shift-bar connected to the latch, a rotary shifting element, the switch-bar and the shift-bar being connected to the rotary element at opposite sides thereof, the connection between the switch-bar and the shifting element including a slidable part to permit movement of the shift-bar before the switch-bar is moved.

11. In a switch mechanism, the combination of a switch-bar, a latch to lock the switch-bar, a shift-bar to control the latch, a rotary shifting element, the shift-bar being connected to the rotary shifting element, a slotted connecting-bar between the switch-bar and the shifting element, a projection carried by the rotary shifting element and working in the slot of the connecting-bar to permit movement of the shift-bar prior to the switch-bar, and a car-actuated trip connected to the rotary shifting element.

12. In a switch mechanism, the combination with a switch-bar, of bar-shifting means including a supporting-base having a ball-race and upstanding posts, a rotary member mounted concentrically upon the base and provided with a ball-race, antifriction-balls

occupying the two ball-races, the top of the rotary element having a central socket, anti-friction-balls contained in the socket, a cross-bar supported upon the posts and provided
5 with a cone entering the socket and engaging the balls therein, a connection between the rotary element and the switch-bar, and actuating means for the rotary element.

In testimony that I claim the foregoing as my own I have hereto affixed my signature 10 in the presence of two witnesses.

WILLIAM W. McCLUNG.

Witnesses:

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E. E. DOYLE.