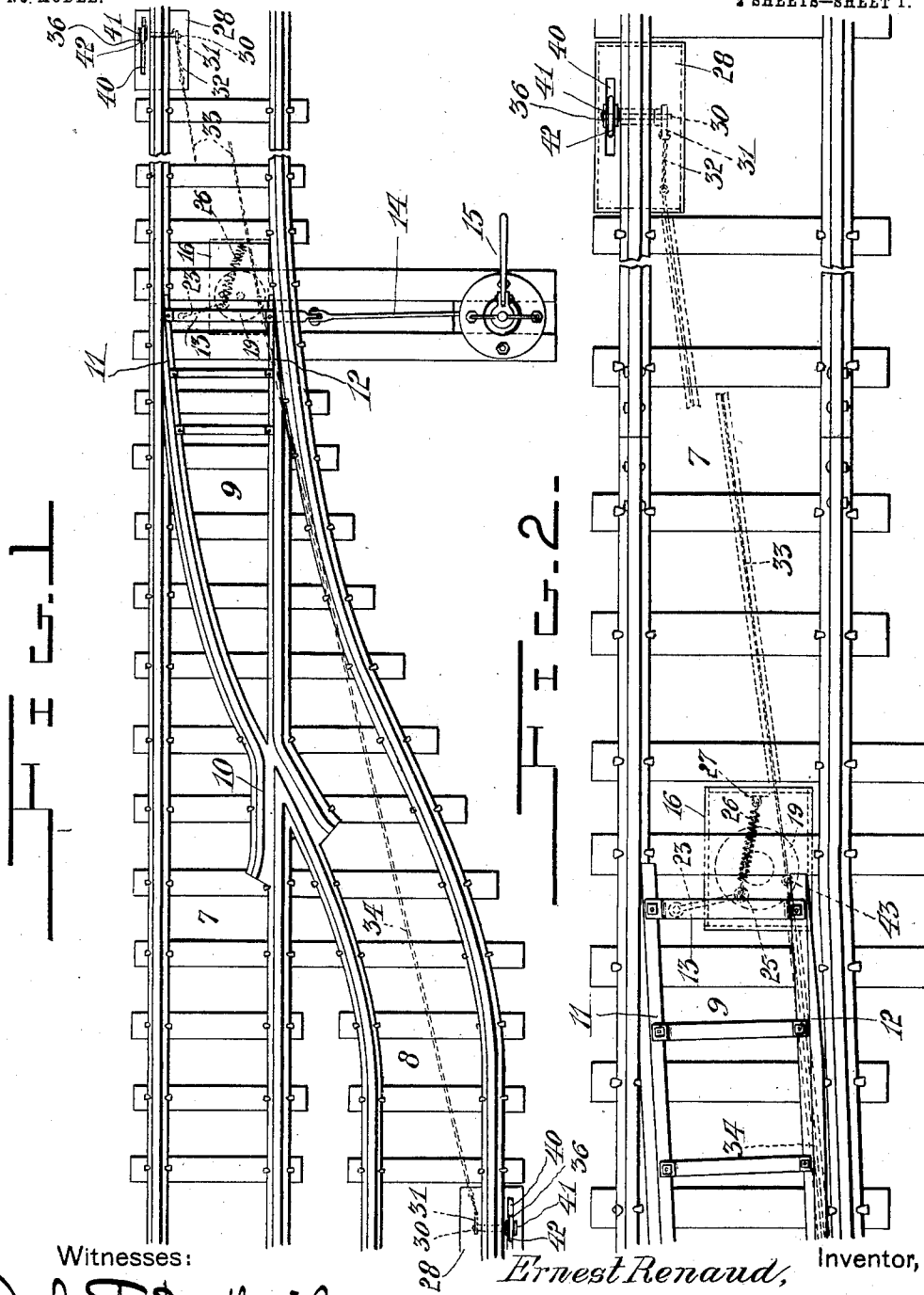


E. RENAUD.
SAFETY DEVICE FOR RAILWAY SWITCHES.

APPLICATION FILED DEC. 15, 1902.

NO. MODEL.

2 SHEETS—SHEET 1.



Witnesses:

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2 SHEETS—SHEET 2.

FIG. 5.

FIG. 3.

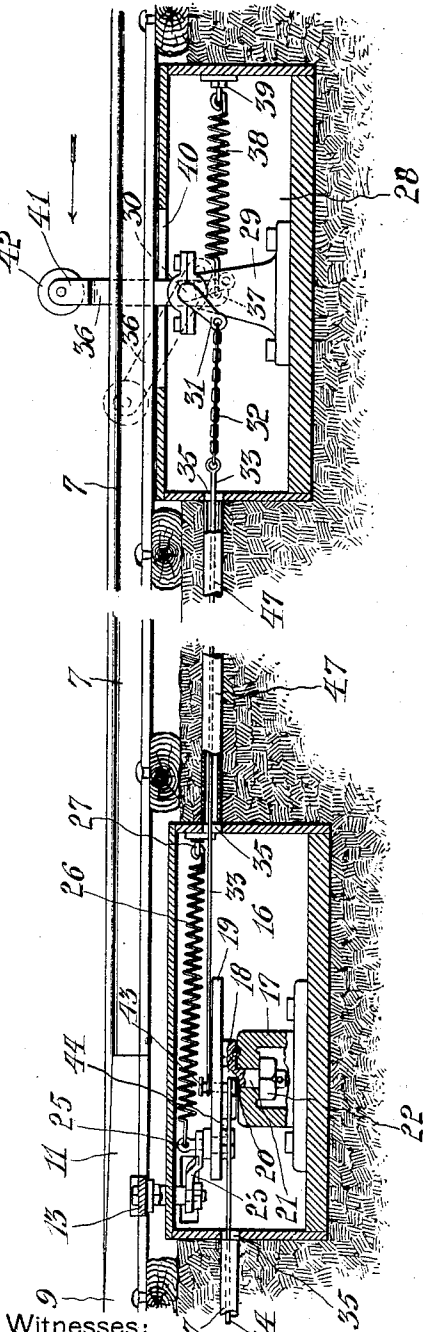
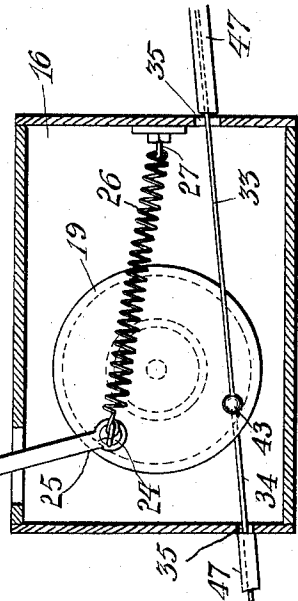
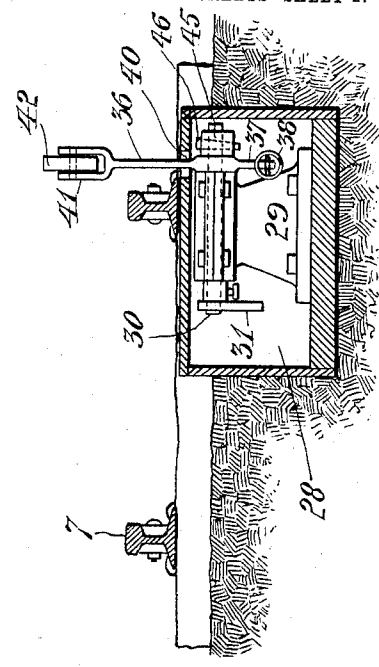


FIG. 6.

FIG. 4.



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UNITED STATES PATENT OFFICE.

ERNEST RENAUD, OF HOLYOKE, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO HENRI BEAUCHEMIN, OF ST. JOHNS, CANADA, AND FREDERIC BEAUCHEMIN, OF FARNHAM, CANADA.

SAFETY DEVICE FOR RAILWAY-SWITCHES.

SPECIFICATION forming part of Letters Patent No. 737,481, dated August 25, 1903.

Application filed December 15, 1902. Serial No. 135,192. (No model.)

To all whom it may concern:

Be it known that I, ERNEST RENAUD, a subject of the King of Great Britain, residing at Holyoke, county of Hampden, State of Massachusetts, have invented certain new and useful Improvements in Safety Devices for Railway-Switches; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to railroad-switches, and my object is to provide an automatically-operated switch which will be effective in preventing any accident resulting to a passing train by the negligence of a switchman in leaving the switch in a wrong position. Where my invention is employed as a siding-switch and a train approaches on the main track in a direction such that it could run upon the siding in case the switch is left in a wrong position, the train will automatically throw the switch into the proper position to allow the train to pass the siding. Also if a train is already upon the siding and it is to move upon the main track, in case the switch has been left in a wrong position to allow it to pass to the main track the train will automatically operate the switch and throw it into the proper position.

In its general construction the invention includes, with a switch, a spring or similar means adapted to maintain the switch in either an opened or closed position and automatic operating devices for effecting the proper movement of the switch.

The invention consists in the construction and combination of parts to be more fully described hereinafter, and definitely set forth in the claims.

In the drawings, Figure 1 represents in plan a portion of a railway-track, showing an application of my switch to connect a siding with the main track. Fig. 2 represents upon an enlarged scale a portion of the track and apparatus shown in Fig. 1. Fig. 3 is a vertical longitudinal section taken through a box containing a portion of the switch mechanism. Fig. 4 is a sectional plan of the same box. Fig. 5 is a vertical longitudinal section

of a box containing a portion of the controlling mechanism. Fig. 6 is a vertical cross-section of the box shown in Fig. 5, taken in a plane at right angles to that of Fig. 5.

Throughout the drawings and specification the same numerals of reference indicate like parts.

Before proceeding to a detailed description of my invention it may expedite matters to say that its entire mechanism may be divided into two groups—namely, the switch mechanism, which is closely connected with the switch and the purpose of which is to maintain the switch in either its open or closed position and to move the switch between these positions, and controlling mechanism located at more or less remote points upon the track and the purpose of which is to affect the aforesaid switch mechanism at the proper times to bring about the desired movement of the switch.

Referring more particularly to the parts, 7 represents the main track and 8 represents the siding, these tracks being connected by a suitable switch 9, including a frog 10 and switch points or rails 11 and 12. The switch-points 11 and 12 are connected by a suitable horizontal bar or link 13, the extremity of which connects with a second link 14, which may be operated by a suitable switch handle 15, this lever sufficing for operating the switch by hand, as will be readily understood. It should be said, however, that this switch-lever is never locked in any particular position, but is perfectly free to turn at all times.

Between the rails at the switch-point and below the bed of the track there is provided a switch-box 16, which may be constructed of wood or similar material and containing a pedestal 17, which constitutes a step-bearing for the hub 18 of a disk 19, there being a ball-race 20 therebetween provided with balls to reduce the friction in the well-known manner. Below this point the hub has a vertical downward extension 21, constituting a stud, which is mounted in a bore provided in the aforesaid pedestal 17, a nut 22 sufficing for maintaining the same in position. A link 23 connects this disk 19 with the aforesaid bar 13, the stud 24, which connects the link 23

with the disk, terminating above in an eye 25, to which is attached a helical spring 26, as indicated, a nut 44 being provided upon the extremity of the stud, as shown. From this arrangement it should appear that a rotation of the disk could effect a movement of the switch-rails 11 and 12 into either of their extreme positions, and it should be stated that these two extreme positions correspond to extreme positions of the disk 19 with the aforesaid stud 24 lying upon either side of the longitudinal central line of the disk, as will be readily understood, and evidently the spring 26 affords means for constraining the switch-rails toward either the closed or opened position, according to whether the spring lies on the left or right side of the vertical axis of the stud 21. Thus in the position in which the parts are shown in Fig. 4 the spring 26 is constraining the switch-rails, so that a train could run from the main track to the siding, or vice versa. The extremity of the spring may be carried in a suitable anchor-bolt 27, secured to the end wall of the switch-box 16 aforesaid.

At suitable points upon the main track and the siding there are provided controlling-boxes 28, which are substantially similar in construction, each of which is preferably constructed of wood and contains a bracket or pedestal 29, constituting a horizontal bearing for a shaft or spindle 30. Each of these shafts carries rigidly a lever 31, and to the extremities of these levers there are attached chains 32, which chains attach, respectively, to pull rods or links 33 34. These pull-rods pass through openings 35 in the boxes 16 and 28 and pass through suitable ducts or conduits 47, which connect the boxes in the manner indicated. Each of these shafts 30 is also further provided with a rigid lever 36, having a short lower arm 37, to which lower arms are attached springs 38, anchored at 39 to the walls of the boxes 28. The upper arms of these levers pass through openings 40 in the tops of the boxes and are bifurcated at their extremities, as indicated at 41, at which point they carry contact-rollers 42. These levers 36 are held in place by collars 45 and gibs 46. It will appear that these rollers are arranged quite near the rail, and it should be understood that they are intended to be touched by the passing train, which train, by the way, is supposed to pass in the direction of the arrow shown in Fig. 5. The pull-rods 34 may be attached by a suitable stud 43 to the disk 19, as stated.

The mode of operation of this switch will be now described. Suppose that a train is passing in the direction of the arrow shown in Fig. 5 and that the switch has been left opened—*i. e.*, in position to allow the train to pass onto the siding, the switch having been negligently left in a wrong position. When the train reaches the box 28, some part of the train will engage the contact-roller 42, depressing the lever 36, which is then main-

tained in an erect position by the spring 38 and the chain 32. Depressing this lever in this manner pulls upon the pull-rod 33, and this effects a rotation of the disk or wheel 19. This operation effects the movement of the switch-rails 11 and 12 by means of the link 23. As soon as the wheel 19 has been rotated sufficiently to bring the spring 26 upon the opposite side of the central line from that in which it is shown in Fig. 4 the spring 26 itself will then effect the further movement of the switch and operates to maintain it in the closed position, as will be readily understood. If a train approaches from the opposite direction and upon the siding, supposing the switch to have been left in the wrong position to pass the train to the main track, it operates the mechanism at its corresponding controlling-box 28 in the same manner as that described, producing a pull upon the pull-rod 34 and bringing about the desired operation at the switch-box.

It should appear that though this switch can be operated automatically this automatic operating mechanism does not prevent the normal operation or control of the switch by the ordinary hand-lever.

Suppose that a freight-train arrives at the switch and is intended to take the siding to allow a passenger-train to pass going in the same direction. Suppose that the train is to pass from right to left, as viewed in Fig. 1. The brakeman operates the switch-lever 15 so as to throw open the siding, whereupon the train runs onto the siding. Suppose that the brakeman omitted to throw the switch into its former position to allow the following train to pass, the switch then being in the position in which it is shown in Fig. 1 with its connected mechanism in the position in which it is shown in Fig. 4. The lever 36 on the main controlling-box would then be in an elevated position, in which it is shown. The approaching train would then operate the lever, depressing it into the position indicated in the dotted lines. This operates to shut the siding and allows the following train to pass the switch. If the brakeman, however, had reclosed the switch, the lever 36 on the main controlling-box would have then occupied the position in which it is shown in the dotted lines and the apparatus would not be affected by the passing train. Supposing that the brakeman had left the switch closed after the following train had passed—that is, in such a position not adapted to pass a train from the siding to the main track—as the freight-train proceeded toward the main track it would automatically operate the corresponding lever 36 and throw open the switch, as will be readily understood.

It should appear that the levers 36 are complementary in their action and that when one is erect the other is in its depressed position. Furthermore, the erect position of each lever corresponds to the wrong position for the switch for that train which is adapted to op-

erate that lever. In other words, when the main-track lever 36 is erect the switch is in a wrong position to pass the train on the main track, and when the siding-lever 36 is erect the switch is in a wrong position to pass a train from the siding to the main track. It should appear that these levers are maintained in their erect position by the coöperation of their corresponding springs 38 and the chain 32, which pull in opposite directions.

It should appear that a train could pass in the opposite direction to the arrow shown in Fig. 5 without throwing the switch. When a train passes in this direction, the lever is depressed, extending the spring 38, which returns it again to its erect position, if it occupied that position before the train passed. The presence of the chain 32 evidently admits of this reverse movement of the lever without affecting the switch.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following claims or of mechanical equivalents to the structures set forth.

What I consider new, and desire to secure by Letters Patent, is—

1. In combination, switch-points, a rotatable member, a connection between said switch-points and said rotatable member, a tension-spring, the extremity whereof is attached to said rotatable member at a point beyond the axis thereof, and automatic means for actuating said rotatable member by a passing train.

2. In combination, switch-points, a rotatable member, a link connecting said switch-points with said rotatable member, a tension-spring attached to said rotatable member at a point beyond the axis thereof, members adapted to be depressed by a passing train, and connections between said members and said rotatable member.

3. In combination, a switch, a member adapted to constrain said switch toward an open or a closed position, a second member adapted to be actuated by a passing train, means for connecting said second member with said first member, said means including a flexible connection, and means constraining said second member.

4. In combination, switch-points, a rotatable member, a link connecting the same, a tension-spring attached to said rotatable member at a point beyond the axis thereof whereby said switch-points may be constrained toward an open position or a closed position, levers adapted to be depressed by a passing train, means for connecting said levers with said rotatable member, said means including flexible connections whereby said rotatable

member may be actuated by a movement of said levers in one direction only.

5. In combination, a switch, a member adapted to constrain said switch toward an open or a closed position, a lever adapted to be depressed by a passing train, a connection between said lever and said member including a cable, and a spring constraining said lever so as to maintain said cable substantially taut.

6. In combination, a switch, a member adapted to constrain said switch toward an open or a closed position, a lever adapted to be depressed by a passing train, a connection between said lever and said member including a chain, whereby a reverse movement of said lever may occur without actuating said switch, and a spring adapted to return said lever after said reverse movement.

7. In combination, a lever adapted to be depressed by a passing train, a switch, a cable connecting said lever with said switch, and springs the force whereof is exerted upon said lever in a direction opposed to that of said cable, whereby a reverse movement of said lever is permitted.

8. In combination, a switch, a spring adapted to constrain said switch toward an open or a closed position, a lever adapted to be depressed by a passing train, a connection between said lever and said switch including a flexible member, whereby a forward movement of said lever may actuate said switch, and a second spring constraining said lever in a forward direction.

9. In combination, a switch adapted to connect a main track and a branch track, members located respectively on said main track and said branch track, said members each having a depressed position, and an erect position in which they are adapted to be struck by a passing train, connections between said members and said switch, the erect position of one of said members corresponding to the depressed position of the other of said members.

10. In combination, a switch adapted to connect a main track and a siding, a member located adjacent to said main track, means whereby deflection of said member in one direction may actuate said switch, a second member located adjacent to said siding, means whereby deflection of said second member in one direction may actuate said switch, said last two means including flexible connections.

11. In combination, a switch adapted to connect a main track and a siding, a lever located adjacent to said main track, means whereby the deflection of said lever by a train passing in the direction to go upon said siding may actuate said switch, a second lever located adjacent to said siding, means whereby the deflection of said lever by a train passing in a direction to go upon said main track may actuate said switch, and means whereby said levers may be deflected in a reverse direction without affecting said switch.

12. In combination, switch-points, a bar connecting the same, a disk, a step-bearing therefor, a link connecting said disk with said bar, a spring, one extremity whereof is fixed, the other extremity whereof is attached to said disk at a point beyond the center thereof, pull-rods leading from said disk, and automatic means for operating said pull-rods.

13. In combination, switch-points, a member adjacent thereto, means for rotatably supporting said member upon a substantially vertical axis, a spring, the extremity whereof is attached to said member, the said extremity of said spring being adapted to pass around the remote side of the axis of said member when said member rotates, a lever having a substantially horizontal axis, mechanism connecting said lever with said rotatable member, said lever being adapted to be depressed by a passing train, and a roller carried thereby.

14. A switch adapted to connect a main track and a siding, said switch comprising, in combination, switch-points, a bar connecting the same, a rotatable disk, a link attached to said bar, a stud connecting said link with said rotatable member, a spring attached to said stud, the other extremity of said spring being attached at a point beyond the axis of

said rotatable member, pull-rods attached to said rotatable member and connecting with remote points upon said main track and said siding, horizontal shafts located at said remote points, levers carried thereby and adapted to actuate said pull-rods, other levers carried by said shafts and adapted to be actuated by a passing train, and springs adapted to constrain said shafts in a normal position.

15. In combination, switch-points, a bar connecting the same, a rotatable member, a link connecting said rotatable member with said bar, a spring adapted to constrain said rotatable member in either direction, a pull-rod leading from said rotatable member, a chain connected thereto, a lever connected to said chain, a second lever rigid with the first lever and adapted to be deflected by a passing train, a spring attached to said second lever and adapted to maintain said chain taut and said second lever erect, and a hand-lever adapted to control said switch-points.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ERNEST RENAUD.

Witnesses:

T. MYNARD,
A. FORGUES.