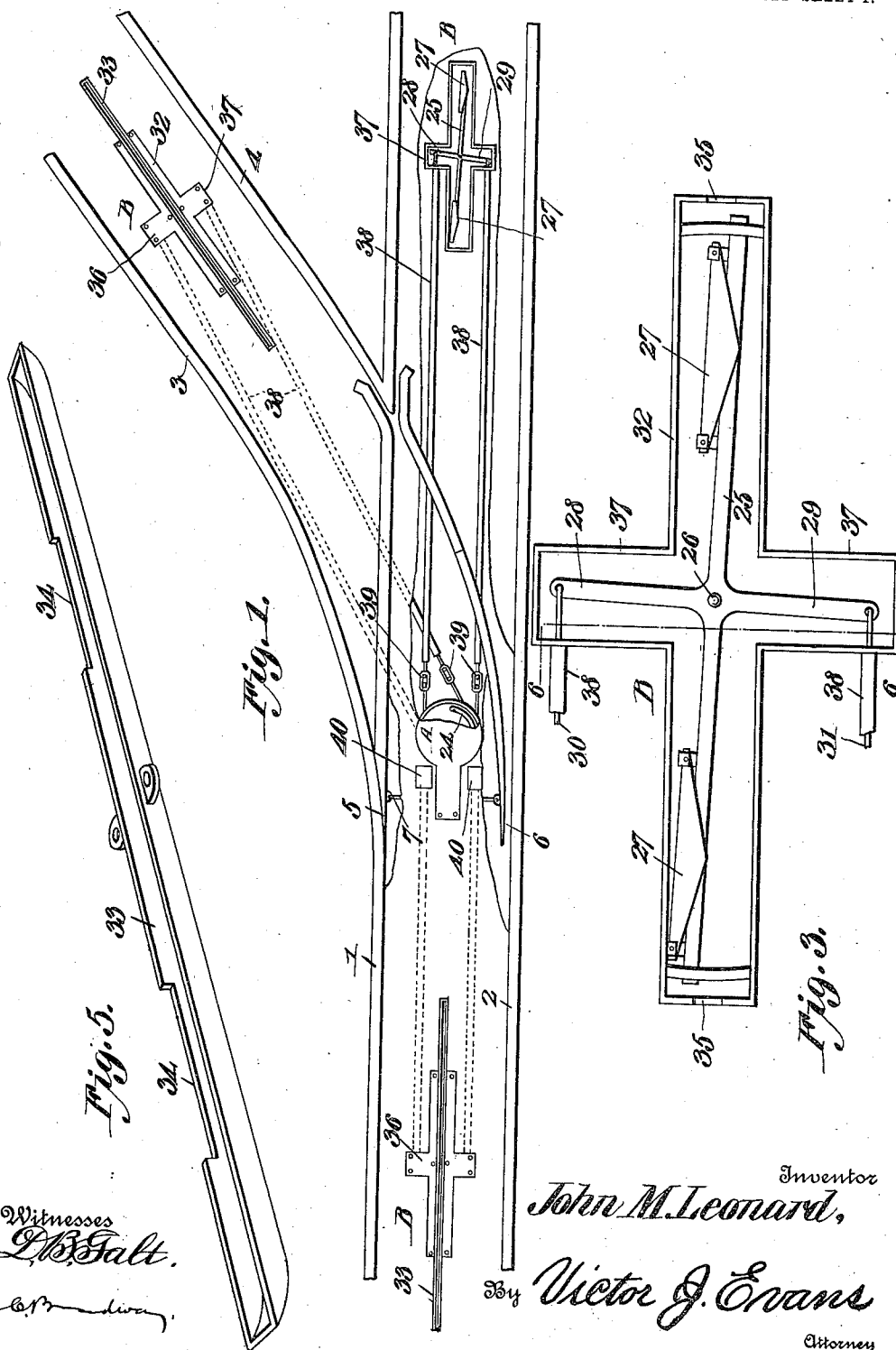


J. M. LEONARD.
 SWITCH THROWING MECHANISM.
 APPLICATION FILED JAN. 7, 1911.

1,015,044.

Patented Jan. 16, 1912.

3 SHEETS—SHEET 1.



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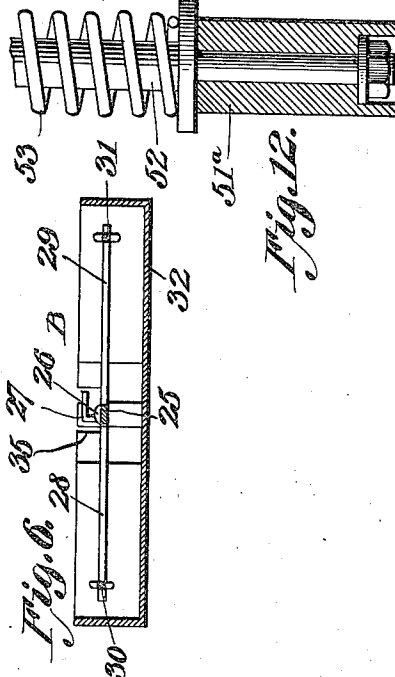
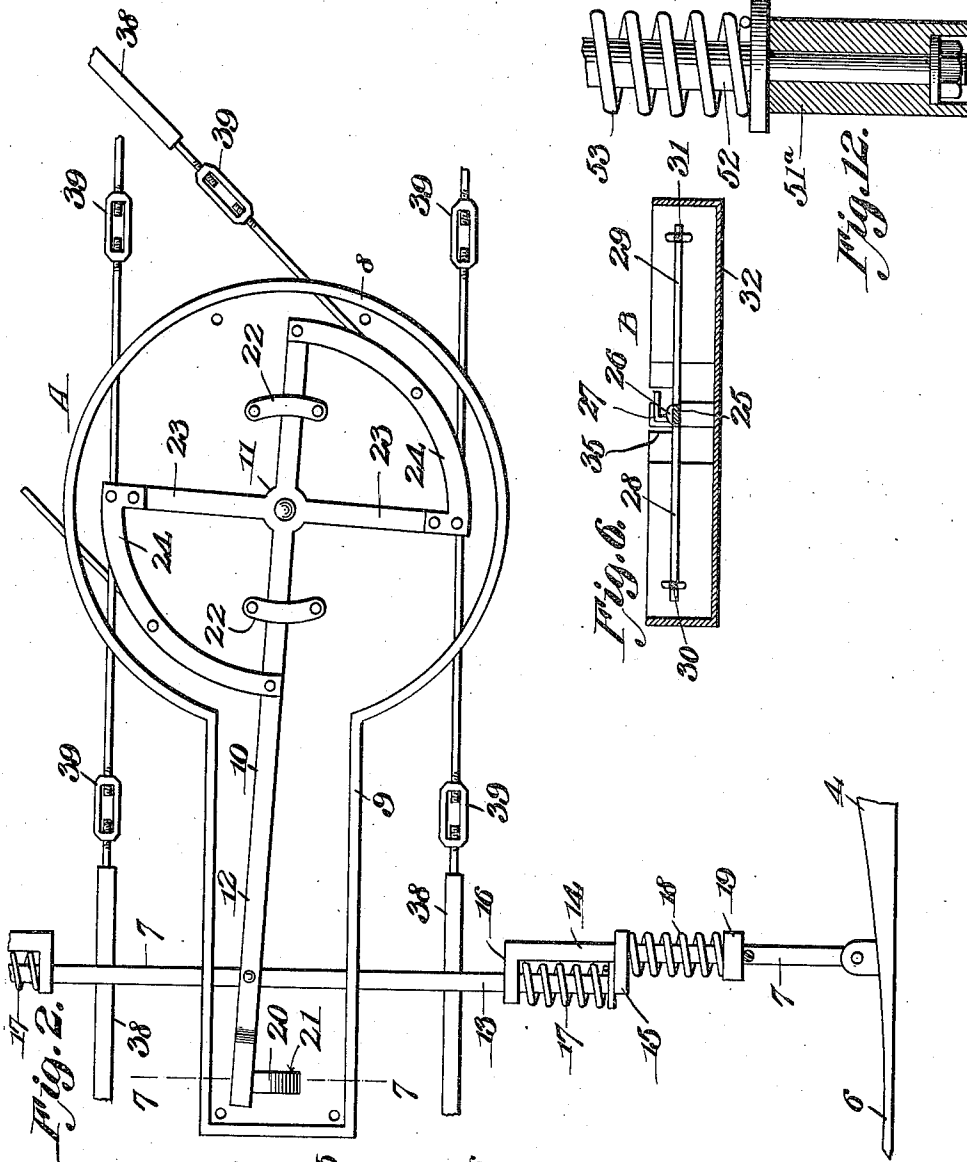
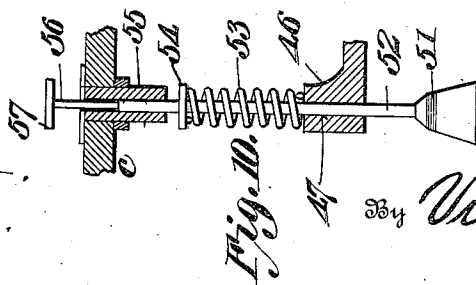


Fig. 2.
 Witnesses
L. B. Felt
by



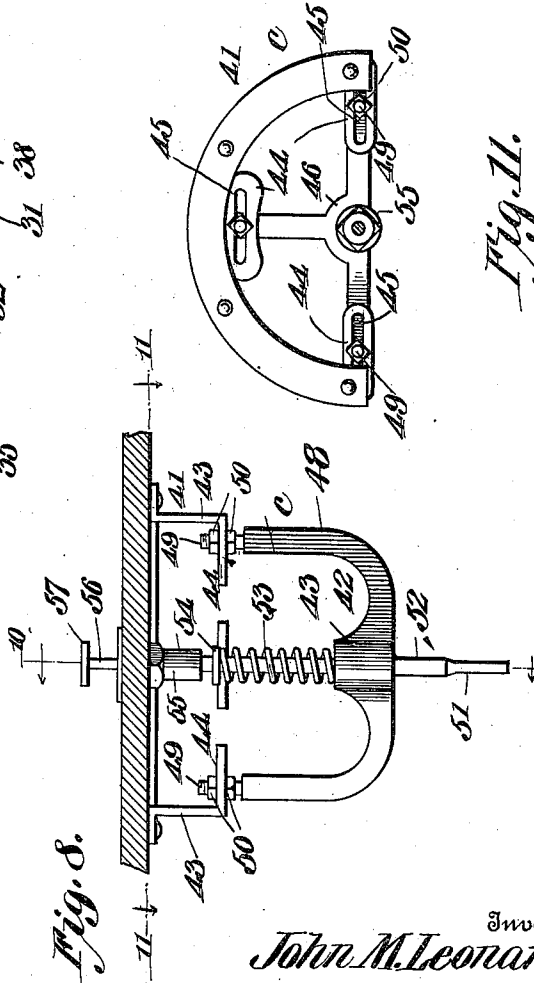
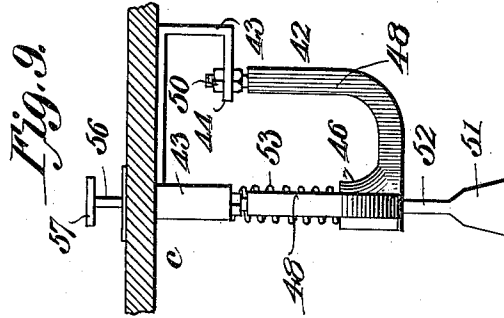
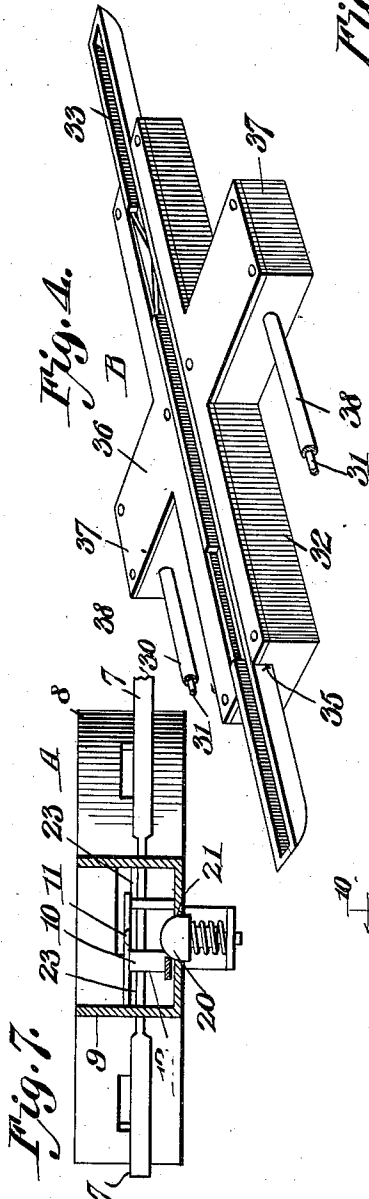
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHN M. LEONARD, OF MARQUETTE, MICHIGAN.

SWITCH-THROWING MECHANISM.

1,015,044.

Specification of Letters Patent.

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Application filed January 7, 1911. Serial No. 601,291.

To all whom it may concern:

Be it known that I, JOHN M. LEONARD, a citizen of the United States, residing at Marquette, in the county of Marquette and State of Michigan, have invented new and useful Improvements in Switch-Throwing Mechanism, of which the following is a specification.

This invention relates to switch throwing mechanisms for street or steam railways, whereby the motorman or engineer can control the track switches to throw them open or closed so that the car or locomotive will not have to come to a stop or a switchman be required to operate the switch.

The invention has for one of its objects to improve and simplify the construction and operation of mechanisms of this character so as to be comparatively inexpensive to manufacture and install, reliable and efficient in use, and composed of comparatively few parts so that the likelihood of derangement will be reduced to a minimum.

Another object of the invention is the provision of novel means connected with the switch points for throwing the latter to open or closed position, the said means being connected with trips located in the road bed at opposite sides of the switch so that an approaching car or train can pass through a switch on the main line into a branch, without stopping the car or train.

Another object of the invention is to provide a simple, effective and novel switch which can be operated by a device carried by a car or locomotive truck and depressed for engagement with the trip to cause the latter to open or close the switch.

With these objects in view, and others as will appear as the description proceeds, the invention comprises the various features of construction and arrangement of parts which will be more fully described herein-after and set forth with particularity in the claims appended thereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a plan view of a portion of a track at a switch equipped with the improved operating mechanism, a portion of the road bed and parts of the mechanism being broken away as shown in section to reveal the details of the construction. Fig. 2 is an enlarged plan view of the trip operated switch throwing device. Fig. 3 is an enlarged view of one of the trip devices.

Fig. 4 is a perspective view of one of the containing boxes for a trip. Fig. 5 is a perspective view of a trough located at each trip for guiding the shoe on the car into engagement with the trip. Fig. 6 is a detail sectional view on the line 6—6 of Fig. 3. Fig. 7 is a detail sectional view on the line 7—7 of Fig. 2. Fig. 8 is a front view of the shoe or trip operating device of a car. Fig. 9 is a side view thereof, portions being broken away. Fig. 10 is a sectional view on the line 10—10 of Fig. 8. Fig. 11 is a detail sectional view on the line 11—11 of Fig. 8. Fig. 12 is a detail view of a modified form shown.

Similar reference characters are employed to designate corresponding parts throughout the several views.

In the present instance the road bed is shown paved. The various parts of the switch throwing mechanism are set into the paving that is flush with the rails, but it is to be understood that where the mechanism is used on railway tracks the various parts will be fastened to the cross ties.

Referring to the drawings, 1 and 2 designate the rails of the main track and 3 and 4 the rails of a siding or branch track, there being the usual switch points 5 and 6 for switching cars between the main line and branch. The switch points 5 and 6 are connected together by a rod 7 extending transversely to the track, and located in the road bed is a switch point throw device A which is operatively connected with the rod 7. This device A comprises a circular casing 8 having a radial extension 9, the casing being normally closed by a cover shaped to fit on the top thereof, and in the casing is a lever fulcrumed at 11 with one end projecting into the extension 9. This end 12 of the lever is connected with the rod 7 so as to move the latter longitudinally by the rocking of the lever in throwing the switch points open or closed. Connection between the lever and rod comprises two rods 13 and 14 that have overlapping ends slidably connected together by eyes 15 and 16, the rod 14 passing through the eye 15, and the rod 13 passing through the eye 16 and interposed between the eyes is a spring 17. Behind the eye 16 is another spring 18 which is held in place by a collar 19, the springs 17 and 18 encircling the rods 13 and 14. This construction forms a flexible connection between the operating lever 10 and the con-

necting rod 7 of the switch points and allows a certain yielding effect should the operating lever be given too great a movement by the trip devices. The end 12 of the lever passes over a spring pressed stop or bolt 20 that projects upwardly through an opening 21 on the bottom of the extension 9 of the casing 8, and this yielding holds the lever in either of its operative positions and does not form a positive lock to prevent movement of the lever by the trip device. The lever oscillates in guides 22 fastened to the casing 8 and radiating from the lever are oppositely disposed arms 23 which have their outer ends connected with arcuate members 24 that are in turn connected with the lever 10 so that a double sector frame is produced. It is to this frame that the various trip devices in the road bed are operatively connected.

Each trip device B consists of a horizontal lever 25 that is centrally fulcrumed at 26, and on the ends of the lever, which latter extends longitudinally of the track, are abutments 27 that are adapted to be engaged by a shoe device carried by the car, the shoe engaging abutment being triangular, as clearly shown in Fig. 3. The lever which will be six feet in length more or less has laterally extending arms 28 and 29 that are respectively connected by parallel rods 30 and 31 with the opposite sides of the double sector frame formed by the lever 10, so that when the trip lever 25 is tilted in one direction the switch points will be thrown open, and when tilted in the opposite direction the switch points will be thrown closed. These abutments 27 are located slightly below the surface of the pavement so as to be out of the way of wheels of passing vehicles. Each trip lever is mounted in a box or casing 32 which is embedded in the road bed and extending longitudinally of the casing is a shoe trough or guide 33 which is in the form of a long bar of U-shape cross section that has openings 34 through which the abutments 27 can be projected so as to be in the path of the shoe or device on the car when the motor-man depresses such device, and it is to be observed that only one abutment 27 can be projected into the trough at a time. The ends of the casing 32 are formed with recesses or seats 35 for receiving the trough and at the opposite sides of the trough are sectional cover plates 36 so as to exclude dirt, snow or ice from the trip box or casing. Extending from the lateral extensions 37 of each casing 32 are tubes 38 embedded in the pavement to inclose the operating rods 30 and 31, but these tubes terminate short of the throw device A, and the rods 30 and 31 are provided with turn buckles 39 to afford proper adjustment of the parts. Over the turn buckles are removable cover plates 40 set

into the pavement and removable so as to provide access to the turn buckles. In the present instance three trip devices B are shown, one being located in the branch track, and one in the main track at each side of the switch and the connections between the trip levers are such that the inner abutments or the abutments nearest the switch of the left hand trip and of the trip in the branch track will be projected into the shoe trough, while the inner abutment of the right hand trip will be retracted from the trough. It will be seen that when one trip is operated to throw the switch open the other trips will simultaneously move because of their mechanical connection with the switch throwing device A, and by reason of the particular relation of the trips to each other it is obvious that if the switch is thrown closed for a car to pass from the main track to the branch, another car approaching in the opposite direction can cause the switch to open.

Mounted on each car is a trip operating device C which can be thrown into coöperative relation with the trips as the car approaches the switch. This device C comprises a hanger composed of two sections or frames 41 and 42 disposed under the car platform or truck, the frame 41 consisting of downwardly extending members 43 that have inwardly projecting lugs 44, the said lugs being provided with openings or slots 45 extending transversely to the car. The frame 42 is in the form of a spider having a central hub 46 that is provided with a non-circular bore 47, and extending upwardly from the hub are members 48 that have threaded terminals 49 projecting through the slots in the arms or lugs 44. On these threaded terminals are clamping nuts 50 for securely holding the parts of the hanger together. By properly adjusting the nuts the lower shoe carrying section 42 of the frame can be raised or lowered to set the shoe to the proper point, and furthermore the said section 42 can be adjusted laterally so as to bring the shoe into proper alinement with the troughs of the trip devices B in the road bed.

Projecting below the hanger is a shoe 51 that has a shank 52 of non-circular cross section that slides in the bore of the hub 46 and is prevented from turning therein. The shoe is normally held raised by a spring 53 that encircles the shank or stem of the shoe and has its upper end bearing against a shoulder or collar 54. The upper end of the stem or shank enters a socket 55 set in the platform, and in this socket is disposed the stem 56 of a foot pressed button 57. In order to throw the shoe into operative position the motorman has merely to place his foot on the button 57 and press downwardly, and in doing this the shoe can be thrown into

the trough of a trip device B to strike the abutment of the trip that projects into such trough. As soon as the switch is thrown the button 57 is released so that the shoe will be raised from the surface of the road bed or pavement.

From the foregoing description taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention relates, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative and that such changes may be made when desired as are within the scope of the claims.

Having thus described the invention what is claimed as new is:—

1. In a switch throwing mechanism, the combination of track switch points, a device located between the points and operatively connected therewith for moving the points to open or closed positions, a plurality of trips operatively connected with the said device and all operated at the same time, each trip device consisting of a member extending longitudinally of the track and pivoted at its center, and abutments on the ends of the members to be engaged by a car carried element for actuation thereby.

2. In a switch operating mechanism, the combination of switch points, an oscillatory element connected therewith to move the points to open or closed positions, devices connected with the element at opposite sides of the center of oscillation and extending along the track, a trip consisting of a cruxiform structure centrally pivoted and having opposite arms connected respectively with the said devices, and abutments on the extremities of the other arms and movable alternately to and from a longitudinal line passing through the pivotal center of the cruxiform structure to be struck by a car carried shoe.

3. In a switch throwing mechanism, a trip device comprising a casing having a longitudinal trough provided with openings adjacent its ends, a lever centrally pivoted in the casing, abutments on the ends of the lever and opposite the respective openings and so arranged that one abutment will be projected into the trough and the other retracted therefrom, and a plurality of elements connecting the lever with the switch and movable longitudinally in opposite directions.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN M. LEONARD.

Witnesses:

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A. WEST.