

No. 742,080.

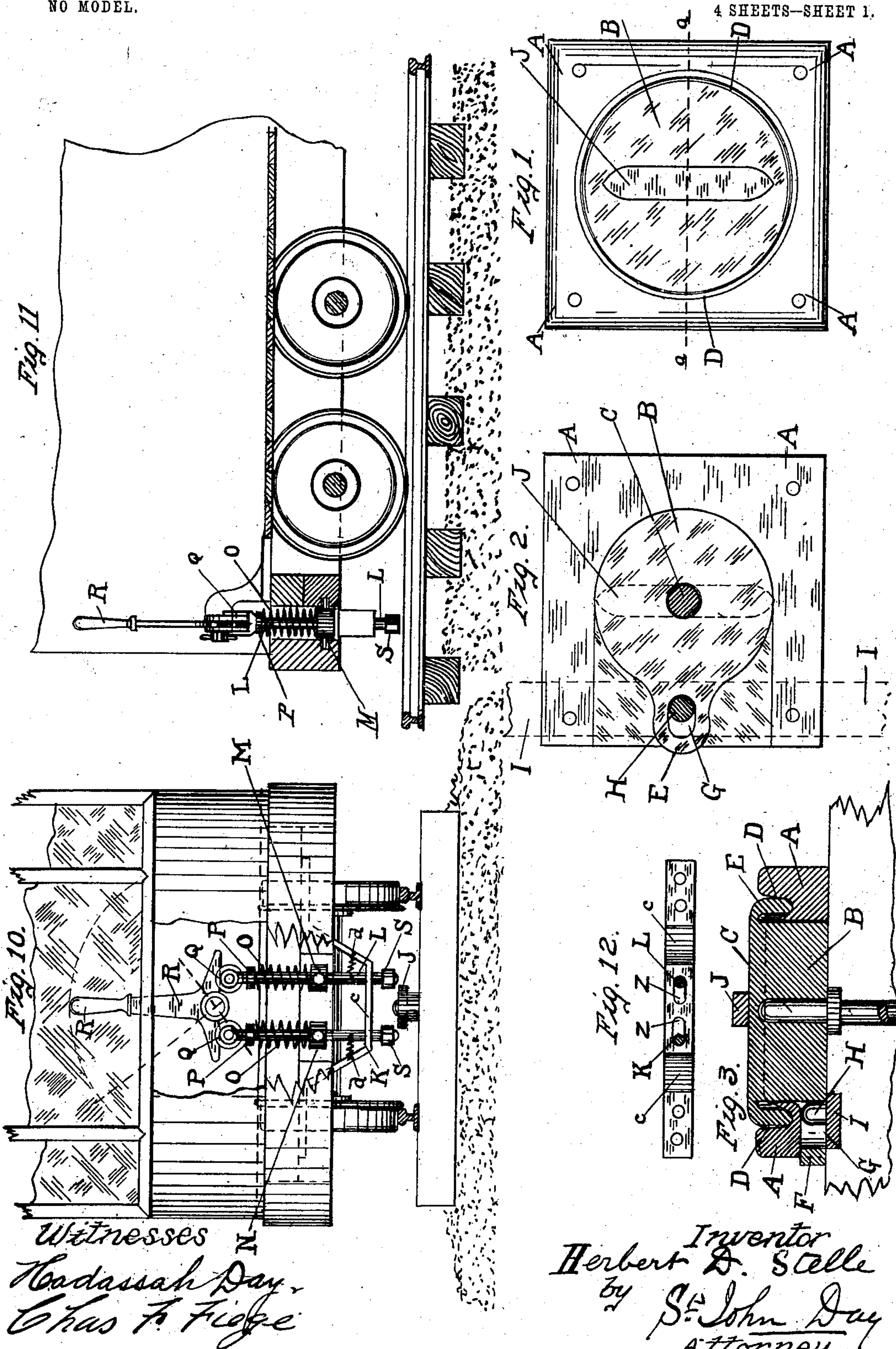
PATENTED OCT. 20, 1903.

H. D. STELLE.  
SWITCH OPERATING MECHANISM FOR RAILWAYS.

APPLICATION FILED NOV. 22, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses  
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4 SHEETS—SHEET 2.

Fig. 4.

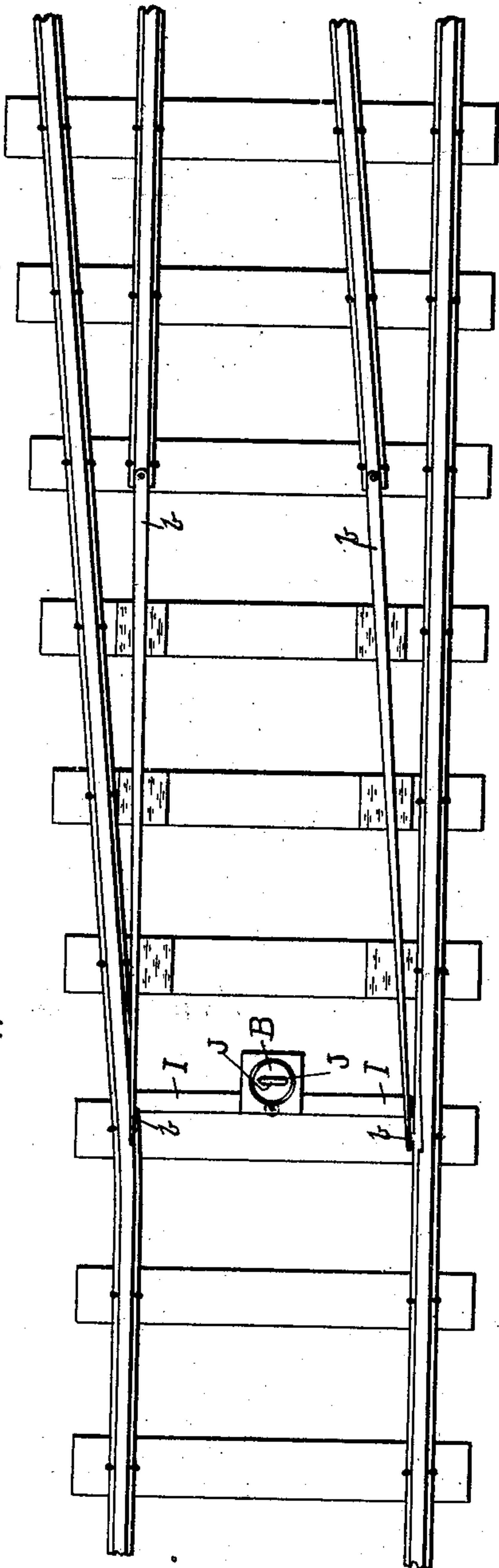
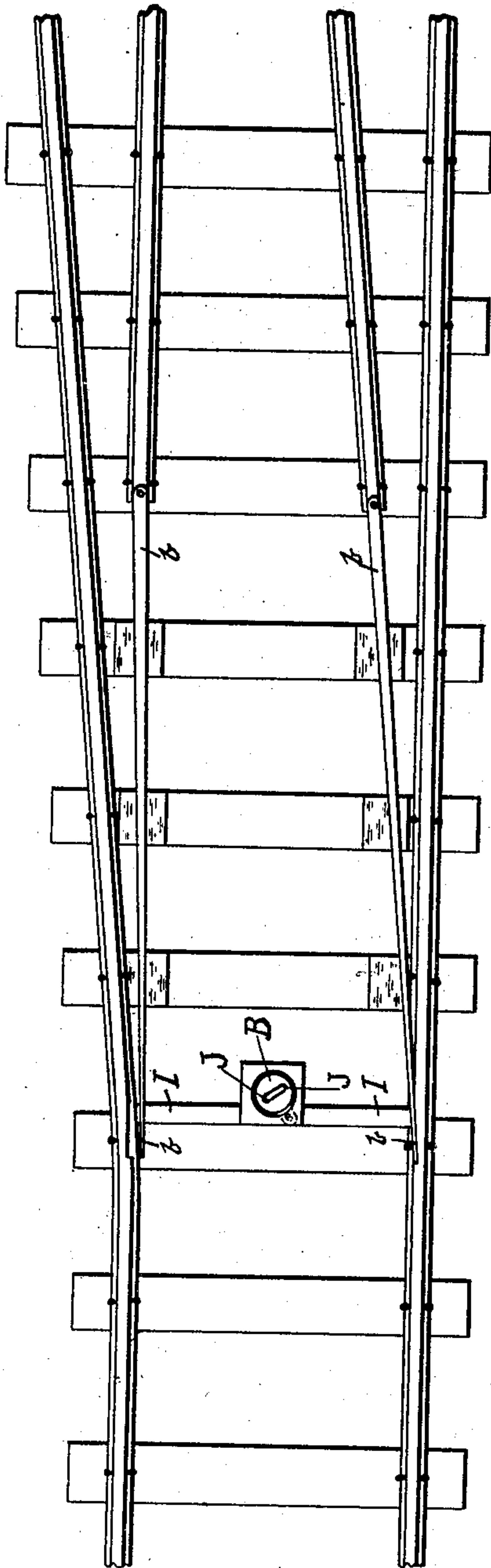


Fig. 5.



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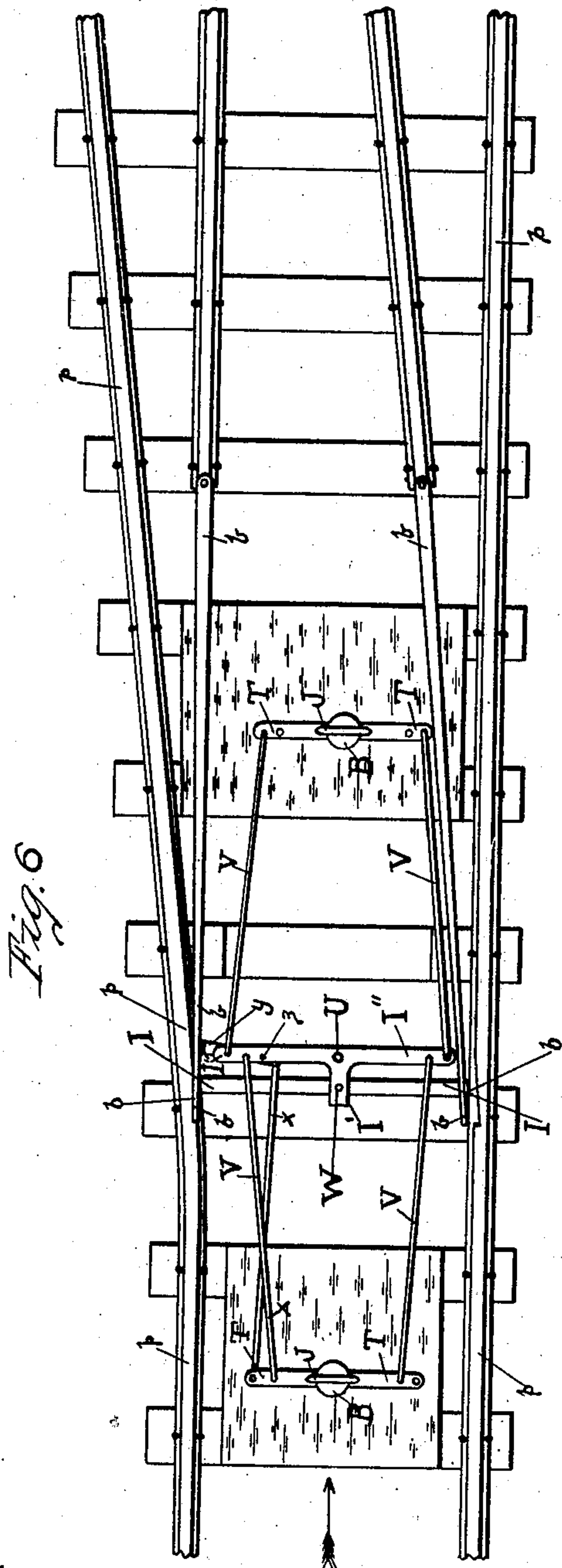


Fig. 6

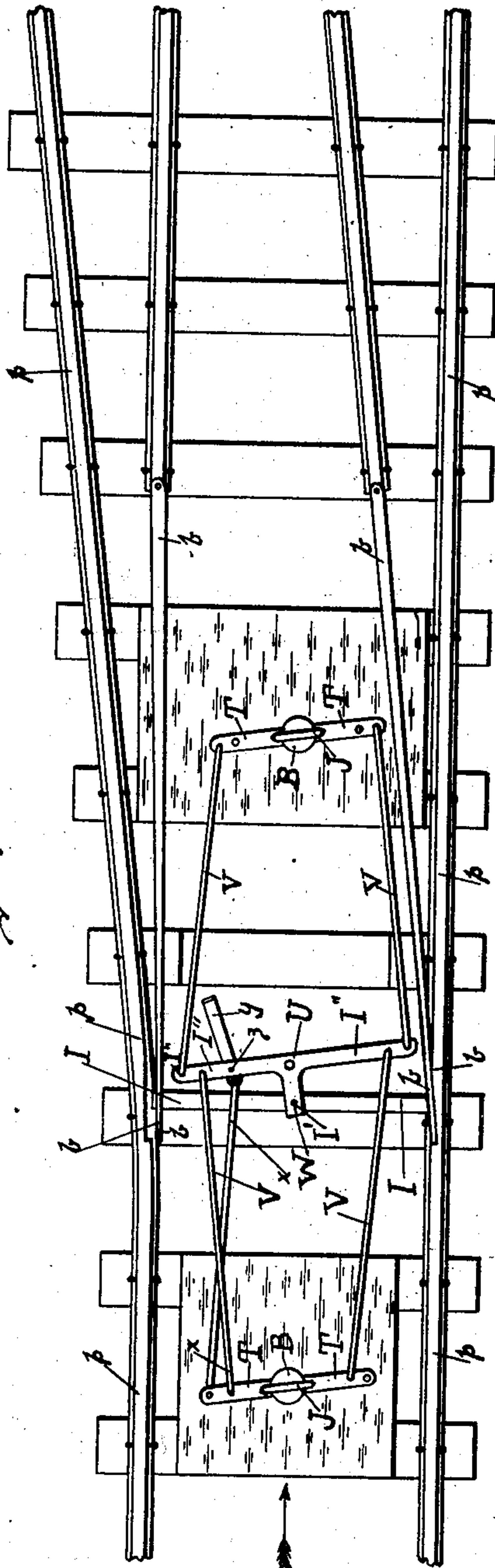


Fig. 7

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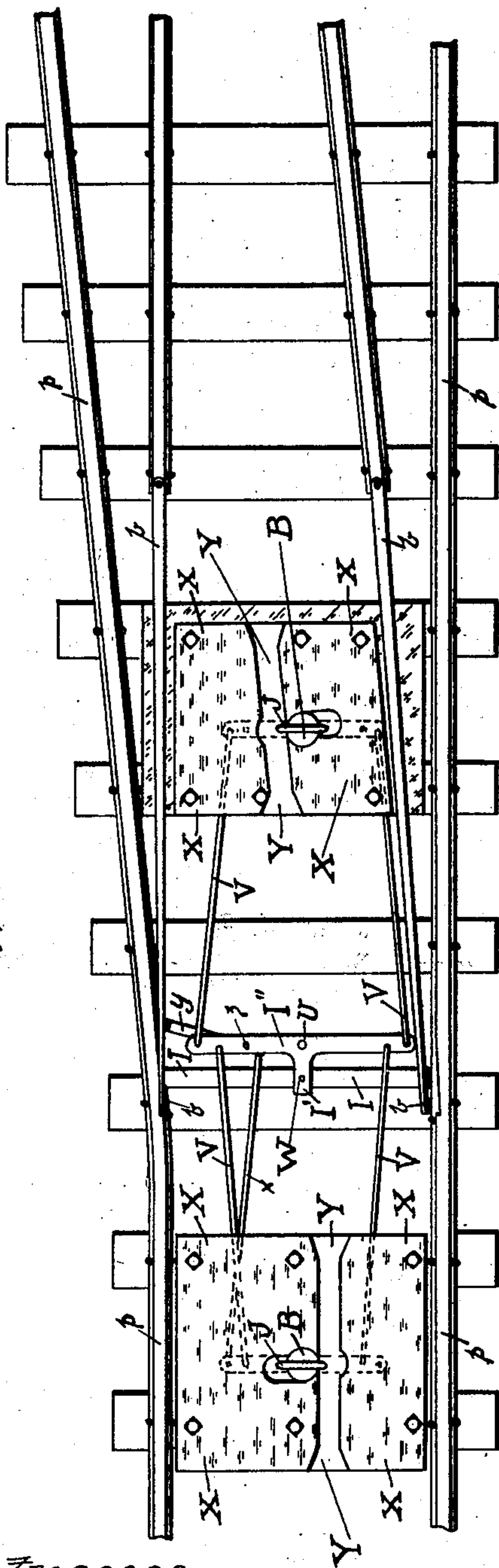
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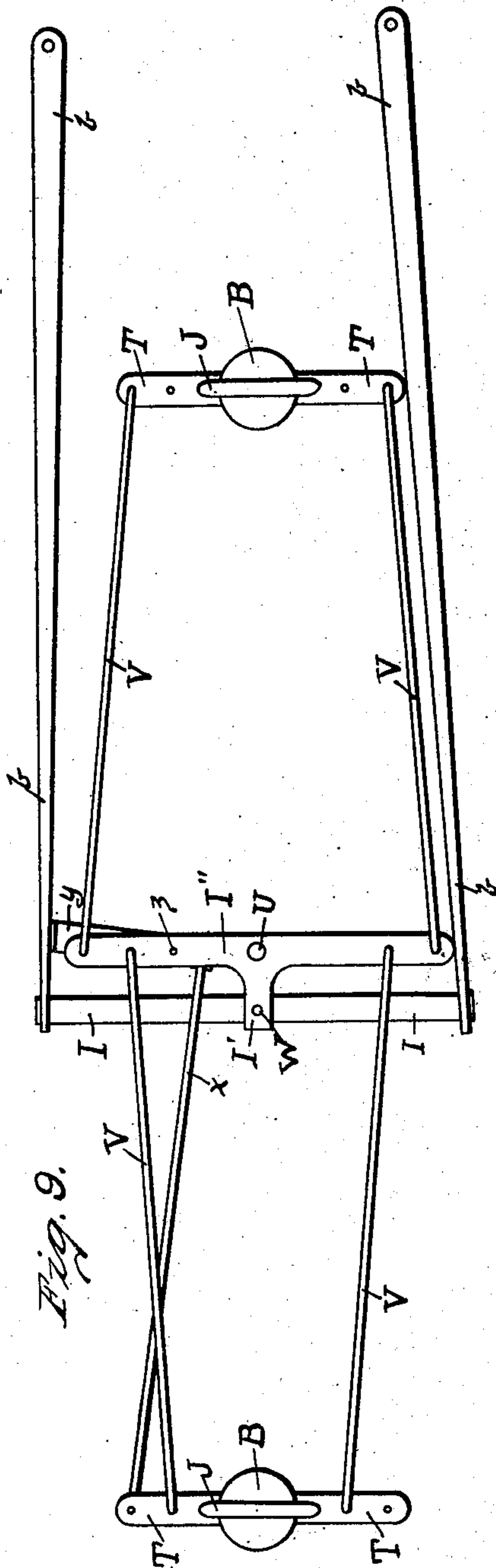
4 SHEETS—SHEET 4.

Fig. 8.



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Fig. 9.



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# UNITED STATES PATENT OFFICE.

HERBERT D. STELLE, OF DENVER, COLORADO, ASSIGNOR OF ONE-THIRD  
TO J. B. ROWRAY, OF LOS ANGELES, CALIFORNIA.

## SWITCH-OPERATING MECHANISM FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 742,080, dated October 20, 1903.

Application filed November 22, 1902. Serial No. 132,501. (No model.)

*To all whom it may concern:*

Be it known that I, HERBERT D. STELLE, of 926 Corona street, in the city of Denver, in the county of Arapahoe, in the State of Colorado, and at present residing at No. 241 North Marengo avenue, in the city of Pasadena, in the county of Los Angeles, State of California, have invented Improved Switch-Operating Mechanism for Railways, of which the following is a full, clear, and exact description or specification, reference being had to the annexed sheets of drawings, and to the letters marked thereon.

This invention relates to switches for railways and to a device for effecting their operation from or by the driver, motorman, or conductor on the cars, engines, or other vehicles or motors which travel or are propelled upon said railways and in such manner that the necessity of almost stopping railway cars or engines or other vehicles or motors when the switch has to be thrown by the conductor of a car or train of cars and requiring the conductor to dismount therefrom in order to operate the switch-throwing handle is dispensed with.

This invention consists primarily and principally of a device securely fastened to a pivot firmly held down to the ties upon which the rails of a railway are laid, and this device is situated between the rails and movable switch-points of a track, as hereinafter particularly described. The upper part of this device consists of a short horizontal bar capable of pivotal movement and situated transversely to the track. This bar has curved-shaped ends, as hereinafter described, and is strongly fastened to or constructed in one piece with a circular part carried upon a pivot, while the upper part thereof has a lip which dips into a circular groove in a box or equivalent part of the apparatus, which as far as practicable maintains the operative parts free from dust, dirt, snow, and other obstructions and insures the moving parts of the device from being hindered in their operation thereby. This part of the device is formed at its bottom with a short horizontal projecting lever projecting outward in a direction at right angles to the aforesaid transverse or cross bar—that is to say, longitudinally of the track. The outer

end of this short horizontal lever is connected to a cross-bar which again connects the terminals of the switch-points, so that in whatever direction this device is moved rotatably upon its pivot the switch-points are correspondingly moved, and the main line is thereby either closed or opened or the switch-points are closed or opened into the side track, as may be required. The movement of this device for the purposes which have been set forth is effected by means of mechanism carried upon the footboard, floor, or foot-plate of the car or engine or other vehicle or motor traveling or operated upon a line of railway and in such convenience of position to the motorman or driver or conductor that it enables a striker to be lowered and to come in contact with one end of the bar forming the upper part of the device hereinbefore mentioned. When either of the strikers is lowered, it on coming into contact with the aforesaid pivotally-carried cross-bar causes the cross-bar and parts connected therewith to be rotated through a sufficient angle to move the switch-points in either direction necessary to open or close the main line or side track, and the device which has now been described constitutes the essential or radical feature of my said invention. This device may be used singly and in direct connection with the bar joining together the switch-points, or it may be and is preferably used in connection with levers and connecting-links, as hereinafter described.

Upon the annexed drawings, Figure 1 is a plan, upon a large scale, of the essential or radical feature of my said invention. Fig. 2 is an inverted plan of the same corresponding to Fig. 1. Fig. 3 is a transverse section of the same on the line *a a*, Fig. 1. Fig. 4 is a plan, upon a much smaller scale, of my invention applied to directly—that is to say, without intermediate levers and links—to operate a railway-switch, showing the switches in the position of the main line being opened and the switch closed. Fig. 5 is a plan of the same, showing the main line closed and the switch open. Fig. 6 shows my device used in connection with levers and connecting-links for operating the switch-points in a line of railway-track, this figure indicating the



main line open and the switch closed. Fig. 7 is a plan corresponding to Fig. 6, but wherein the switch-operating parts—namely, the levers and links, also the switch-points—are in the position of the main line being closed and the switch open to the side track. Fig. 8 is a plan corresponding to Fig. 6, but wherein covering-plates are shown closing over part of the levers and links and having in them guides or grooves for directing the striker into operative contact with the mechanism whereby the switch is moved into its two positions—that is to say, of being opened or closed to the main lines or to the side track, as the case may be. Fig. 9 is an enlarged plan of the switch-operating mechanism alone wherein levers and links are employed in connection with railway-switches, as shown on a smaller scale at Figs. 6 and 8. Fig. 10 is an end elevation of part of the front end of a motor-car, shown partly in section and illustrating the mechanism for operating the strikers. Fig. 11 is in part a longitudinal section and in part a diagram showing in side elevation the striker-operating mechanism at the front end of the car and corresponding to Fig. 10. Fig. 12 is an inverted plan of the guide-bar having oblong holes in it through which the two striker-bars are operated in the manner hereinafter set forth.

With reference to Figs. 1, 2, and 3 of the annexed drawings, which, as aforesaid, illustrate the essential or radical feature of my present invention, this part of the device consists of a sufficiently strong cast-iron or steel box or framing A, preferably square in plan, as shown by these figures. This box or framing A has an opening within it whereinto the iron or steel part B more or less easily fits, and at the center of this part of the device there is a pivot C, which may be carried in a tie, as shown at Fig. 3, or it may be otherwise suitably and with sufficient rigidity supported, so as to constitute the central support of the device upon which the movement for operating the switch-points takes place. The box or framing A is constructed with a circular recess or gutter D, whereinto the lip E at the upper part of the central portion B dips, while the form of these parts is such that it prevents either dust, dirt, snow, or other impeding matter from collecting within and about the moving parts of the mechanism or interfering with the action thereof. In the direction of the line of railway the circular or central part B has projecting from it the short lever F, in which there is an elongated hole or slit G, as shown more particularly at Figs. 2 and 3. This slot engages with the vertical post or pin H, Figs. 2 and 3, which projects upward from the switch-point-connecting plate I. (Shown in full lines in Fig. 3 and in dotted lines in Fig. 2.) Upon the center of the upper part of the circular part B of this device and transversely to the direction of the line of railway, which, in other words, is crosswise of the track, there

is fastened or formed the contact or striker bar J. (Shown in full lines in Figs. 1 and 3 and in dotted lines in Fig. 2.) By one of the strikers, which are to be hereinafter more fully described, coming into contact with either of the curved ends of the bar J it follows that the movement of the car, engine, or other vehicle or motor traveling upon the railway causes the circular part B and all connected with it to be moved rotatively upon the pivot C until the bar J has been moved thereby to a sufficient angle to allow of the striker coming out of contact with either end of the bar J and that this movement of the bar J, the cylindrical part B, and the short lever-bar F causes the bar I, connecting the switches or switch-points, to be moved either to the right or to the left for the purpose of either opening or closing the main line or the side track in the direction wherein the striker, which is lowered by the motorman or conductor, as hereinafter described, desires to operate the switch to either open or close the main line or the side track to a car, engine, or other vehicle or motor being propelled upon a line of railway fitted with the apparatus constituting this invention.

As shown by Figs. 10, 11, and 12, the striking apparatus consists of the two bars K and L, respectively. These bars are carried in pivoted guides M and N either in the framing of the car, as shown at Figs. 10 and 11, or such pivoted bearings that may be otherwise suitably carried at the ends of the car or vehicle. The bars K and L are passed through these pivoted bearings M and N, as shown, each having a spiral spring O surrounding it, each of these spiral springs O being compressed between the pivotal bearings M and N and the collar P at the upper end of each bar K and L. The upper ends of the bars K and L are each mounted with a grooved antifriction-roller Q. Into the grooves of these rollers Q the cross-arms of the lever-handle R enter, as shown in Figs. 10 and 11, so that by moving the handle R in either the right or left hand direction, as shown by the curved dotted arc in Fig. 10, either of the bars K or L is depressed into contact with the one or other end of the cross-bar J and according to which of the contact rollers or strikers S, maintained on the bars K or L, it is which comes in contact with the end of the transverse bar J and according also to the direction in which the car, vehicle, engine, or motor is moving upon a line of railway, so the switch-moving device is operated to either open or close the switches of the main line or side track, and thus the necessity of the conductor leaving the car, train, or other vehicle traveling on the railway is dispensed with, all that is necessary being that the motorman should depress that striker at the front end of the car which will move the switch-points to the siding if he desires the car or train to pass into the siding from the main



line or not to depress the strikers, in which case the main line being open the motorman will continue the journey of his car or train of vehicles along the main line.

5 It is here explained that while when it is necessary to move the switches to open the side track one of the front strikers should be depressed in order to operate the device constituting the radical or essential feature of this invention the opposite striker at the rear or trailing end of the car or train of cars is depressed by the conductor to throw back the switch-operating device to its normal position—that is to say, of the main line being open and the side track closed—so that after a car or train of cars or other vehicles has passed over a switch operated by the radical part of the device constituting this invention the switch in its relation to the main line may be left in its normal condition—that is to say, with the main line open and the side track closed.

With reference to Figs. 6, 7, 8, and 9 of the annexed drawings two of the essential radical devices (hereinbefore described, and shown at Figs. 1, 2, and 3) are used, in combination with the links and levers, to operate the switch-points on a line of railway.

In the arrangement as hereinbefore described, and shown at Figs. 4 and 5 more especially, the motorman and conductor have to depend upon their judgment, more especially as to the instant or time at which they lower either of the strikers S, for operating the bar J and the devices with which the bar J is connected, this being due to the fact that the strikers S and the bar J do not come into contact until the body of the car has commenced to pass over, and therefore covers out of sight of the motorman or conductor the bar J and its connections.

With the apparatus shown at Figs. 6, 7, 9 and at Fig. 8 more especially it will be seen that while the striker S at the front end of the car comes in contact with the bar J the entire car has passed over the switch-point-moving mechanism before the striker at the rear end of the car is brought into contact with the bar J at the other end of the switch-point-moving apparatus. By this arrangement the motorman in approaching the bar J of the apparatus sees the bar J sufficiently in front of him to depress the corresponding striker S at the proper time, and the conductor sees all the rest of the apparatus from the rear end of the car in time to depress the rear striker S before reaching the bar J. When the bar J and the other apparatus shown at Figs. 1, 2, and 3 is used in duplicate, as shown at Figs. 6, 7, 8, and 9, it is provided with a lever T at the end part thereof which moves pivotally with the apparatus itself on being operated by the striker S from the cars, and intermediately between the two operating devices to which the bars J are attached or form part of there is pivoted to the ties of the railway or to a metallic plate the

long cross-lever I'', which cross-lever I'' is connected to T T by links V V V V, by which arrangement it is insured that when either of the levers T is moved upon its axis by one of the strikers S lever I'' is correspondingly moved upon its axis or pivot. The lever I has a short horizontal projecting arm I', Figs. 6, 7, 8, and 9, connected by a pin W with the cross-bar I, which connects the switch-points b b, and as either of the levers T is moved by the striker of a passing car, train of cars, or other vehicle in either direction it moves the lever I, and thereby operates the switch-points b b in precisely the same manner as the single device shown at Figs. 1, 2, and 3 operates the said switch-points.

For the purpose of insuring correct guidance of either of the strikers S into contact with and so as to operate the pivoted cross-bar J of the apparatus it is preferred to use at each end of the apparatus a plate X, in each of which there is a groove Y of sufficient width to receive the striker S when depressed by the motorman or conductor, and so soon as the switch-points have been moved in the requisite direction the motorman or conductor removes his hand from the handle R, when the strikers S at once return to their normal position, as shown at Figs. 10 and 11, and pass over the remainder of the switch mechanism without being in contact therewith, the compression of the springs O causing both strikers S S to be returned to their normal position or same level, as shown at Figs. 10 and 11.

It is explained that the strikers S S each consist of a hard-steel roller, each carried pivotally upon the lower end of each bar K and L, and that the bars K and L, while being free to move pivotally on pivots M and N, have their lower parts passed through oblong holes Z in the guide-bar c c, as shown inverted at Fig. 12, and a spiral spring d being applied to each to maintain the striker-bars M and N in their normal vertical position, but allowing them to move on the pivots M and N, while the springs d d always tend to draw them back to their normal position, as shown at Fig. 10.

With reference to the arrangement of my invention as shown at Figs. 6, 7, 8, and 9, it will be observed that one of the levers T is there shown as having a link x connecting it to the short end of a lever y, carried upon the lever I'', by a pivot z. When the device is operated as hereinbefore described, so as to close the main line by one of the switch-points b being moved close against the rail p and the other switch-point b being simultaneously moved from the other rail p, then the switch-point b is locked against the rail p by means of the lever y, operated by the link x, having become moved on its pivot z into the position shown at Figs. 6, 8, and 9.

Having now described the nature of my said invention and the best system, mode, or manner I am acquainted with for carrying



the same into effect, I desire to observe in conclusion that what I consider novel and original and therefore claim as the invention, to be secured to me by Letters Patent, is as follows:

1. The switch-operating mechanism consisting of two of the pivotal striking-bars and lever devices operating a pair of switch-points, and connected to an intermediate lever, where-  
10 by the switch-points are opened or closed to the main line or side track, substantially as hereinbefore described.

2. The device for locking the switch-points consisting of a lever carried pivotally upon  
15 the intermediate lever and operated by a link connecting it to one of the levers and pivotal striking-bars substantially as hereinbefore described.

3. The central circular part of the device  
20 carrying the striking-bar and lever below connected to the switch-points, having a deep lip projecting down into a circular gutter in the box or framing of the apparatus, all operating in the manner and for the purposes  
25 substantially as hereinbefore described.

4. The combination consisting of two pivots, the two circular parts and striking-bars above, said circular part carrying levers be-

neath, said circular parts coupled to an intermediate lever by links, the striker on the  
30 car, engine or other vehicle operating these pivotal devices, and thereby moving the intermediate lever and the switch-points in either direction required so as to open or close the  
35 main line or the side track, substantially as hereinbefore described.

5. The combination consisting of two pivots, the two circular parts and striker-bars and levers beneath the circular parts, the intermediate lever, the links connecting the in-  
40 termediate lever with the end levers, all connected pivotally with the bar connecting the switch-points, the switch-points, the pressure-lever, carried pivotally upon the intermediate  
45 lever for pressing one of the switch-points against the main-line rail, all operating together in the manner and for the purposes substantially as hereinbefore set forth.

In testimony whereof I have hereunto set my hand and seal, this 5th day of September, 50  
A. D. 1902, in the presence of two subscribing witnesses.

HERBERT D. STELLE. [L. S.]

Witnesses:

J. B. ROWRAY,  
St. JOHN DAY.