

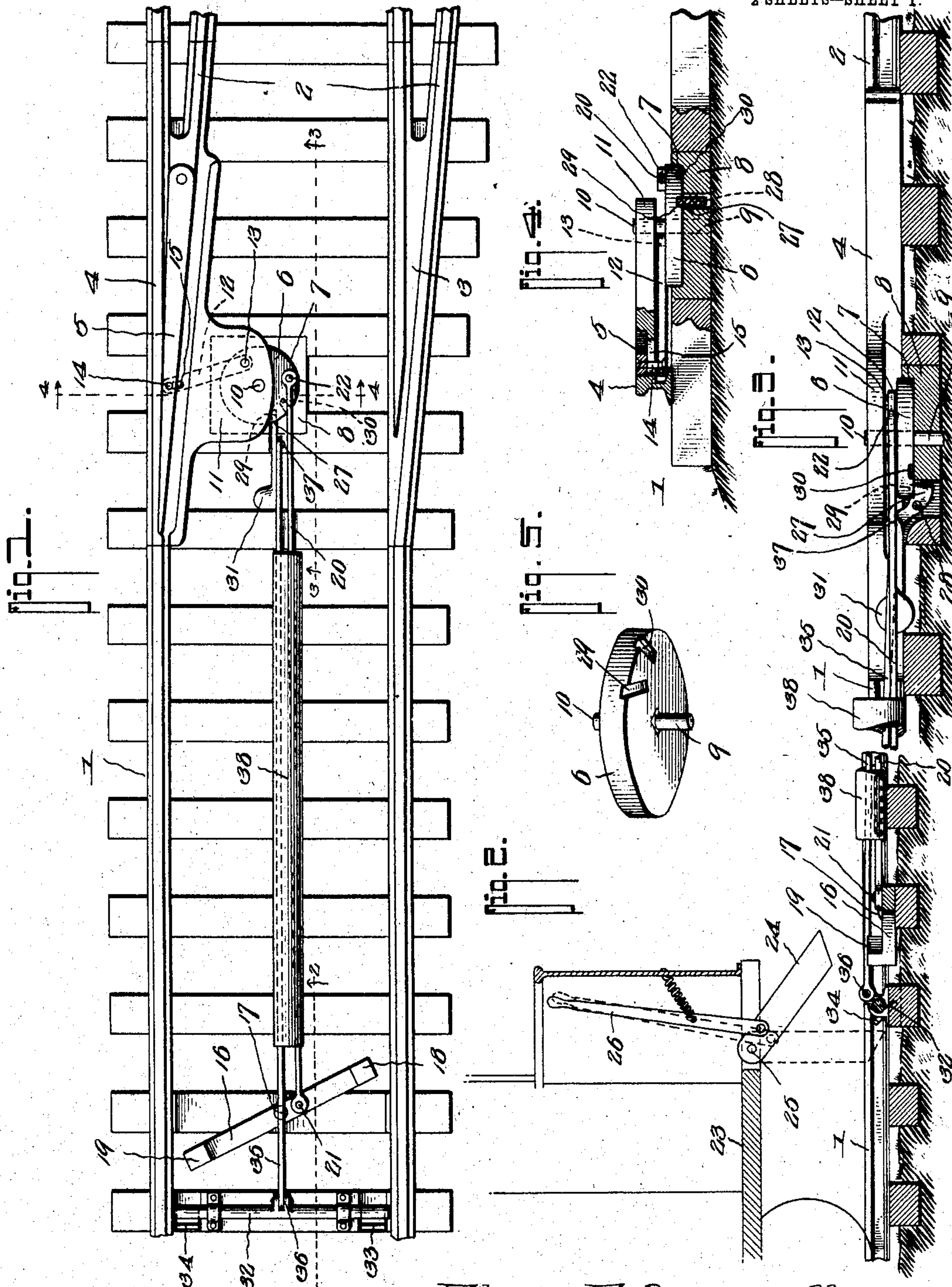
No. 791,748.

PATENTED JUNE 6, 1905.

E. E. CAMPBELL.
SWITCH OPERATING MECHANISM.

APPLICATION FILED DEC. 27, 1904.

2 SHEETS—SHEET 1.



Witnesses
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H. A. Shepard

Elmer E. Campbell, Inventor.
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Attorneys

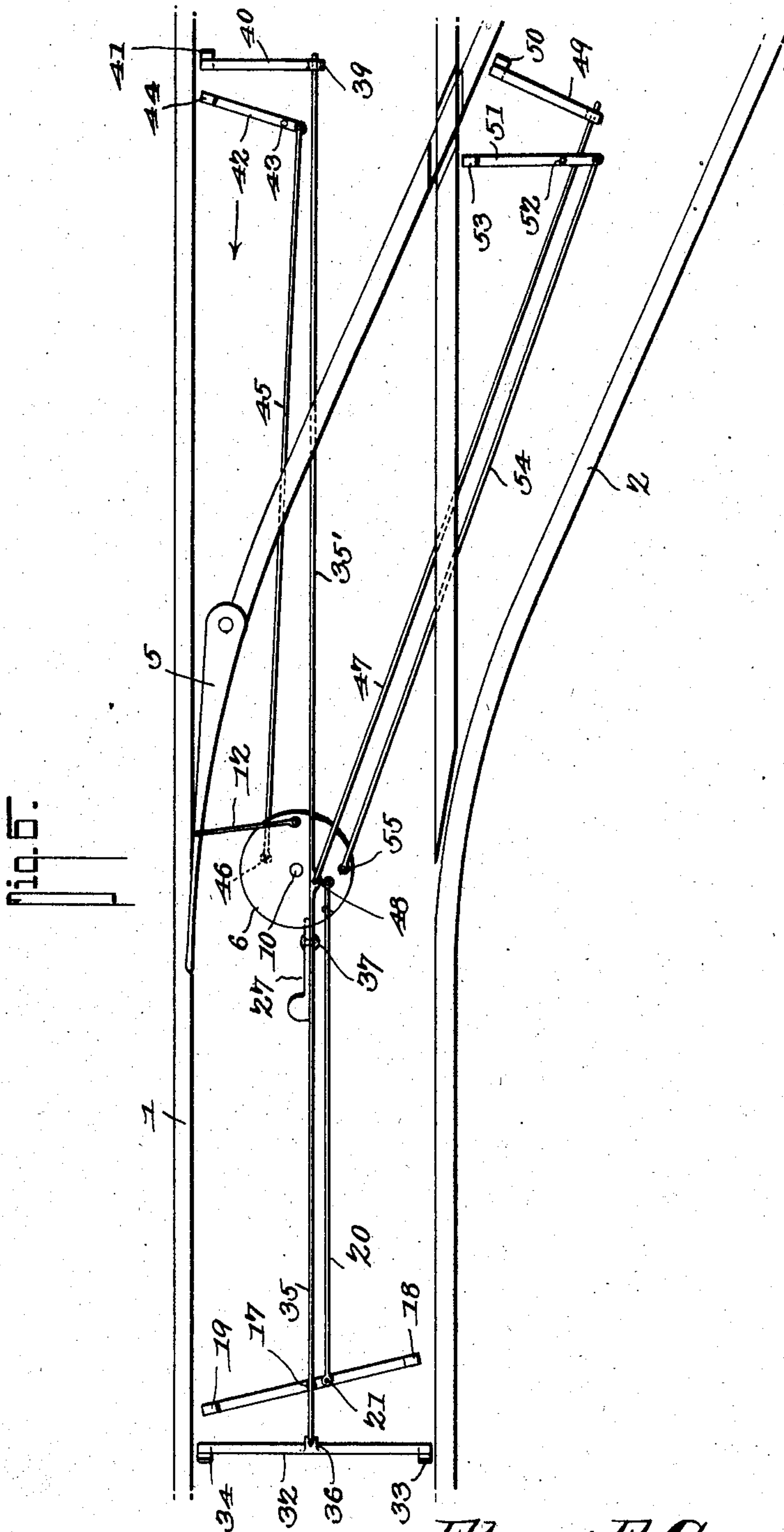
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UNITED STATES PATENT OFFICE.

ELMER E. CAMPBELL, OF ELWOOD, INDIANA.

SWITCH-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 791,748, dated June 6, 1905.

Application filed December 27, 1904. Serial No. 238,421.

To all whom it may concern:

Be it known that I, ELMER E. CAMPBELL, a citizen of the United States, residing at Elwood, in the county of Madison and State of Indiana, have invented a new and useful Switch-Operating Mechanism, of which the following is a specification.

This invention relates to street-railway switches, and has for its object to improve the operating mechanism therefor and to effect the operation of pivotal switch-tongues from the car without interrupting the passage of the latter.

It is furthermore designed to effect a locking of the switch-tongue after being thrown from one limit to the other limit, so as to prevent the tongue from being thrown into an intermediate position in the path of the wheels of the rear truck under the action of the rear wheel of the front truck when leaving the switch-tongue.

A still further object of the invention is to initially effect the unlocking or releasing of the switch-tongue from the car and then to throw the switch-tongue after being released, thereby to insure the prompt shifting of the switch-tongue and to prevent jamming and breakage of any of the parts of the tongue-actuating 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 street-railway track, including a pivotal switch-tongue and the switch-actuating mechanism of the present invention. Fig. 2 is a detail longitudinal sectional view on the line 2 2 of Fig. 1 and including a fragmentary sectional view of the front portion of a car carrying means for tripping and actuating the switch-throwing mechanism. Fig. 3 is a fragmentary sectional view on the line

3 3 of Fig. 1. Fig. 4 is a detail cross-sectional view on the line 4 4 of Fig. 1. Fig. 5 is a detail perspective view of the rotary shifting member. Fig. 6 is a diagrammatic view illustrating an embodiment of the invention arranged to throw the switch-point by cars passing in either direction over the main track and by cars passing from the switch or intersecting track to the main track.

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

In explanation of the drawings forming a part of this application, 1 designates an ordinary street-railway track, and 2 a branch or switch including a rigid frog 3 and a frog 4, having a pivotal tongue or point 5. Between the two frogs is a rotary disk or turn-table 6, mounted in a depressed seat 7 in a block or boxing 8, which is set in the road-bed flush with the top thereof. This rotary member has a lower journal 9, mounted in the base or boxing 8, and an upper journal 10, mounted in an extension 11 of the frog 4, said extension overlapping the greater portion of the rotary member, so as to protect the same. A link 12 is pivotally connected, as at 13, to the under side of the rotary member and its opposite end pivotally connected to a pin 14, depending from the switch-point and passing through a slot 15, formed transversely through the bottom of the frog 4. By this construction rotating movements of the member 6 will operate through the link 12 to swing the switch-point from one limit to the other.

To provide for rotatably shifting the member 6, a substantially horizontal swinging cross-head 16 is located between the rails of the track at a suitable distance in front of the switch-point and mounted to swing upon a pivotal support 17, located midway between the ends of the head and set into the road-bed. At opposite ends of the cross-head are the respective upstanding projections or shoulders 18 and 19. A connecting-rod 20 has one end pivotally connected to the cross-head, as at 21, and its opposite end pivoted to the top of the rotary member 6, as indicated at 22, whereby swinging movements of the cross-head will be transferred to the member 6 and

thence through the link 12 to the switch-point 5.

The car device for tripping the swinging cross-head 16 has been shown in Fig. 2 of the drawings, wherein 23 indicates the front platform of a street-car, from which depends a trip-arm 24, pivotally hung from the platform, as at 25, and having a controlling-lever 26, rising through a suitable opening in the platform into position for convenient access by the motorman for the purpose of lowering the trip into position to strike the adjacent shoulder of the trip, and thereby actuate the mechanism for throwing the switch-point. It will here be explained that there is a trip at each side of the car, one for each of the shoulders 18 and 19 upon the swinging cross-head. The full-line position of the trip in Fig. 2 is its normal inoperative position, while the dotted position indicates the trip as swung downwardly so as to strike the adjacent shoulder of the cross-head, and thereby swing the same forwardly until the trip wipes past said cross-head.

It is a common experience to have the switch-tongue swung to an intermediate position and in the path of the wheels of the rear truck by the action of the rear wheel of the front truck in passing from the heel or pivotal end of the point, thereby resulting in damage to the switch and delay to the car. To obviate this disadvantage, it is proposed to lock the switch-tongue at each limit, and this is carried out by means of a gravity-latch 27, fulcrumed intermediate of its ends, as at 28, within a suitable socket or recess in the boxing 8, with its lower end arranged for alternate engagement with the notches or seats 29 and 30, formed in the under side of the rotatable member 6. The upper and forward end of this latch is weighted, as at 31, so as to normally lie at its lower limit with the rear and lower end of the latch in engagement with one of the seats in the under side of the rotary member 6. It is of course necessary to disengage the latch 27 from the member 6 prior to throwing the switch-point, and this is accomplished by means of a rock-bar 32, mounted transversely between the rails of the track in front of the cross-head 16 and provided at opposite ends with upstanding trip projections or shoulders 33 and 34, disposed in the paths of the respective trip members 24, carried by the car. A connecting-rod 35 is pivotally connected at one end to the rock-bar, as at 36, and its opposite end is pivotally connected to the latch 27, as at 37, whereby when the bar 32 is rocked forwardly under the action of one of the car devices the rod 35 will be shifted forwardly and the lower end of the latch 27 moved downwardly out of engagement with the rotary member 6, thereby releasing the switch-point prior to the engagement of the car device with the adjacent

trip-shoulder of the swinging cross-head 16. If desired, the connecting-rods 20 and 35 may be inclosed within a suitable tubular casing 38, so as to protect the same against the action of traffic across the road-bed. After the switch-point has been released the car device strikes the adjacent shoulder of the cross-head 16, thereby swinging the switch-point from one limit to the other. By reason of the fact that one or the other of the trip-shoulders of the cross-head is adjacent the rear side of one of the trip projections of the rock-bar 32 the car device engages the cross-head immediately upon disengaging the rock-bar, thereby rotatably shifting the member 6 before the latch 27 can gravitate back into the original notch upon the under side thereof. It will of course be understood that the rotation of the member 6 is just sufficient to bring the other notch thereof into position to receive the gravity-latch, whereby the switch-point will be automatically locked at each limit thereof.

As thus far described the present device is arranged to throw the switch-point by cars passing in one direction only on the main line; but it is proposed to provide for actuating the switch-point by cars passing in either direction and also by cars passing from the switch or intersecting line to the main line, as indicated in Fig. 6 of the drawings, to which reference will now be had. In this figure the previous description and reference characters apply, as hereinbefore set forth. Instead of terminating the latch-rod 35 at its connection 37 with the latch 27 this rod is continued, as at 35', for a suitable distance beyond the switch-point 5, where it is connected to a pendent crank-arm 39, carried by a rock-bar 40, mounted between the rails of the main track and provided with an upstanding trip projection 41, corresponding to the trip projection 34 of the rock-bar 32, so that a car passing in the direction of the arrow on Fig. 6 will operate to rock the bar 40, so as to produce a pull upon the rod 35, and thereby release the latch 27 from the rotatable member 6. Between the rock-bar 40 and the member 6 is a horizontally-disposed lever 42 fulcrumed intermediate of its ends, as at 43, and provided upon its longer portion with an upstanding trip 44, there being a rod or bar 45 pivotally connected to the other end of the lever, with its other end passing beneath the member 6 and pivotally connected to the under side thereof, as indicated at 46, the connection of the rods 20 and 45 with the member 6 being at opposite sides of the pivotal support 10 of the latter, whereby a pull upon either of these rods will operate to open the switch-point 5, and thereby permit a car to pass in either direction along the main line. By reason of the fact that the switch-point 5 is always locked it is always necessary to release and to move the point

away from the adjacent main rail to enable a car to pass in either direction along the main line.

When a car passes from the switch or intersecting line 2 to the main line, it is of course necessary to have the switch open with the movable point 5 against the adjacent main rail, and if the switch-point is away from the adjacent main rail it is necessary to move the point back into engagement with the rail, and to accomplish this the latch 27 is released by a pull upon the rod 47, which is loosely connected to the rod 35, as at 48, the intermediate portion of the rod passing beneath the adjacent main rail and connected to a pendent crank-arm carried by the rock-bar 49, having a trip 50 to be actuated by the car device. After the member 6 has thus been released it is rotated by means of a lever 51, fulcrumed, as at 52, and provided at one end with an upstanding trip 53, there being a rod 54 pivotally connected to the outer end of the lever 51, with its opposite end pivotally connected to the rotatable member 6, as at 55, so that a pull upon the rod 54 will rotate the member 6 to swing the switch-point 5 against the adjacent main rail.

By the arrangement last described the switch-actuating means may be released by a car passing in either direction along the main line and also by a car passing from the switch to the main line. Moreover, the point may be opened and closed by a car in passing in one direction along the main line (from the left to the right in Fig. 6 of the drawings) and may be closed, or, in other words, moved away from the adjacent main rail, by a car passing in the other direction along the main line, while a car passing from the switch to the main line may open the point if the switch be closed.

The adaptation of the invention as in Fig. 6 requires no change whatsoever from the embodiment shown in Figs. 1 to 5, inclusive, and requires merely the addition of trip devices to release the latch and to operate the point-throwing member 6, all of which is accomplished in a very simple and efficient manner.

From the foregoing description it will be seen that the present switch-throwing mechanism is complete in itself and capable of being fitted to pivotal switch-points as now commonly used in street-railways without requiring any change or alteration whatsoever in the mounting of the switch and in the road-bed. Moreover, the switch-point is effectually locked at its opposite limits, so as to prevent displacement thereof by the action of car-wheels in leaving the heel of the switch-point, and the mechanism is so arranged as to effect release and the shifting of the switch-point from a passing car without interrupting the passage of the latter.

Having fully described the invention, what is claimed is—

1. The combination with a switch-tongue, of a rotary shifting member connected to the tongue and provided with a pair of seats, means for operating the shifting member and including a car-actuated trip, a gravity-latch for alternate engagement with the seats of the shifting member, and latch-controlling means including a car-actuated trip.

2. The combination with a switch-point, of a rotary shifting member having a pair of seats in its under side and connected to the switch-point, means for operating the shifting member and including a car-actuated trip, a vertically-swinging latch underlapping the shifting member for alternate engagement with the seats, and latch-controlling means including a car-actuated trip.

3. The combination with a switch-point, of a shifting member connected to the point, means to lock the shifting member at its opposite limits, a rock-bar disposed transversely of the track and provided with a car-actuated trip projection, a connecting-rod extending between the rock-bar and the locking means, a swinging cross-head mounted in rear of the rock-bar and provided with a car-actuated trip projection, and a connecting-rod between the cross-head and the shifting member.

4. The combination with a switch-point, of a rotary shifting member located between the rails of the track and connected to the switch-point, a latch engaging the shifting member to lock the same at its opposite limits, a rock-bar disposed transversely of the track and provided with a car-actuated trip, a connecting-rod between the rock-bar and the latch, a swinging cross-head mounted transversely of the track and in rear of the rock-bar, and a connecting-rod between the cross-head and the rotary shifting member.

5. The combination with a switch-point, of a rotary shifting member mounted between the rails of the track and connected to the switch-point, the under side of the shifting member being provided with a pair of seats, a gravity-latch for alternate engagement with the seats to lock the shifting member at opposite limits, a rock-bar mounted transversely of the track and provided with a car-actuated trip, a connecting-rod between the rock-bar and the gravity-latch, a swinging cross-head mounted transversely of the track in rear of the rock-bar, and a connecting-rod between the cross-head and the shifting member.

6. The combination with a main line and a switch including a pivotal point, of a point-shifting member connected to the point, means for locking the shifting member at opposite limits of the switch-point, a set of car-actuated trip devices located at one side of the switch-point for successively releasing and throwing the shifting member to open and

close the switch-point, another set of car-actuated trip devices located at the opposite side of the switch-point for successively releasing the shifting means and throwing the same to
5 close the switch, and a third set of car-actuated trip devices located in the switch and successively operating to release the shifting member and open the switch.

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

ELMER E. CAMPBELL.

Witnesses:

H. C. AUSTILL,
F. H. RHIES.