No. 819,647. PATENTED MAY 1, 1906.

A. H. GORE.

SWITCH OPERATING DEVICE.

APPLICATION FILED JAN. 23, 1906.

2 SHEETS—SHEET 1.

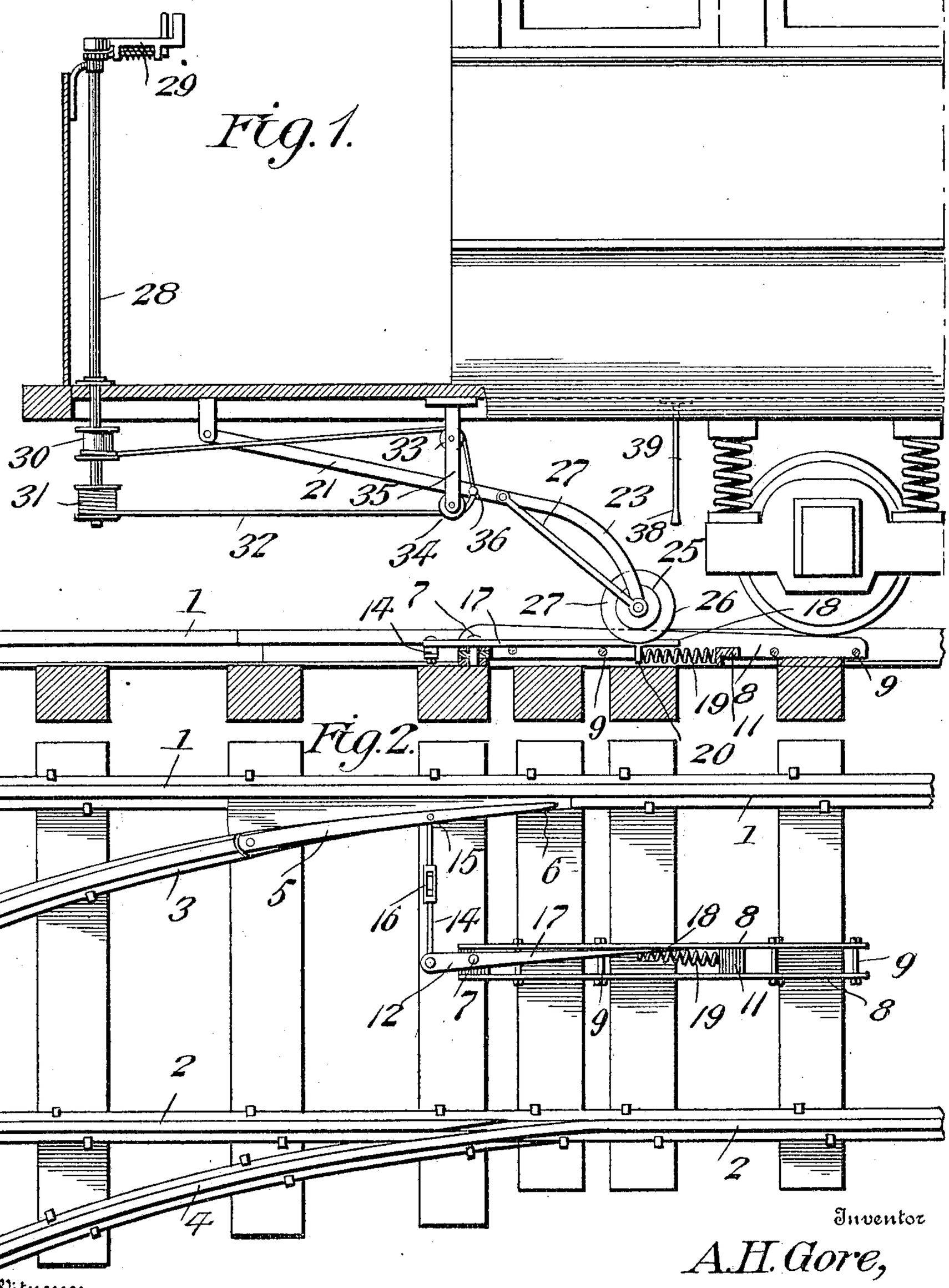

Fig. 1.

Fig. 2.

Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

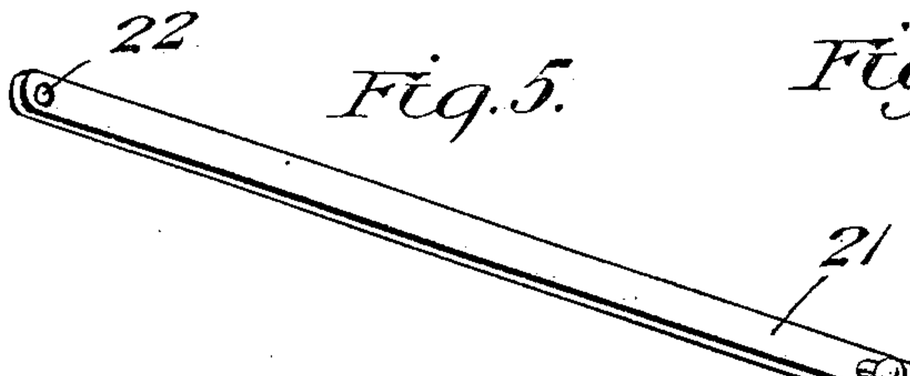
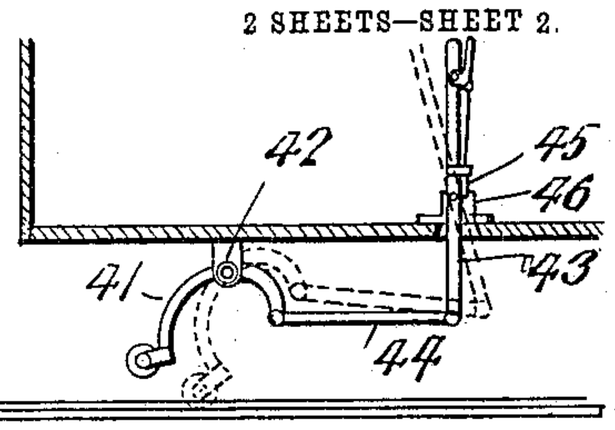


Fig. 9.



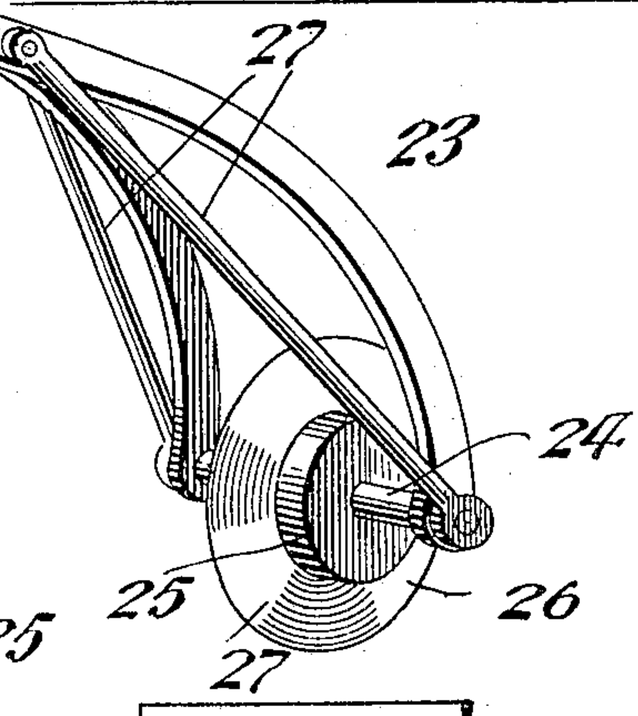


Fig. 6.

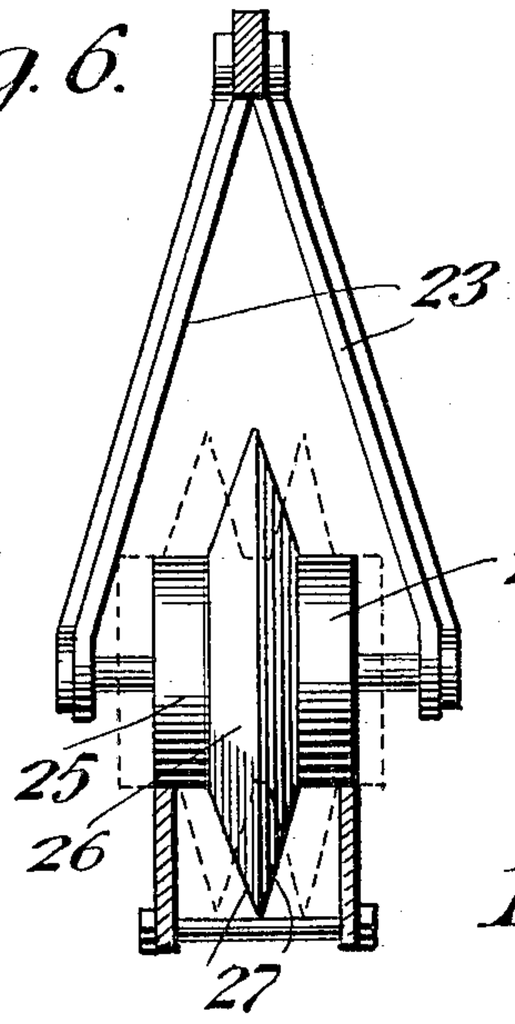


Fig. 7.

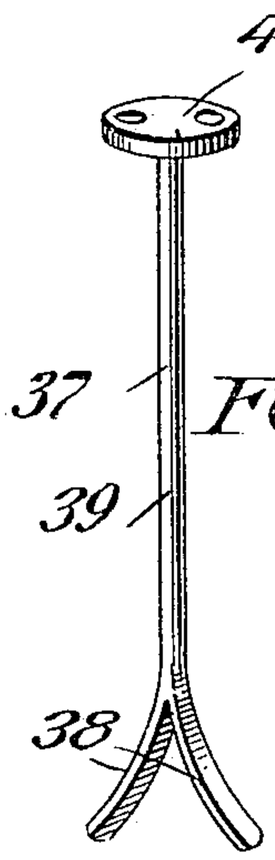


Fig. 8.

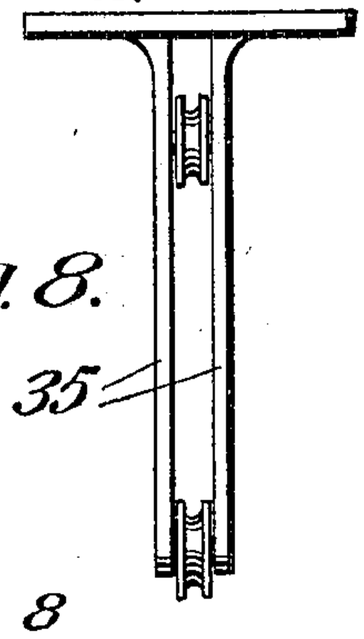


Fig. 3

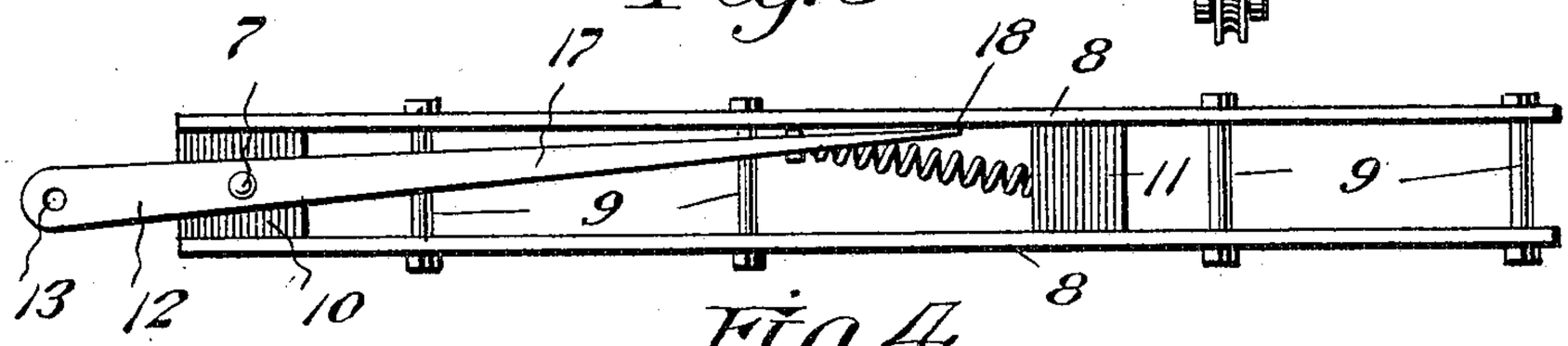
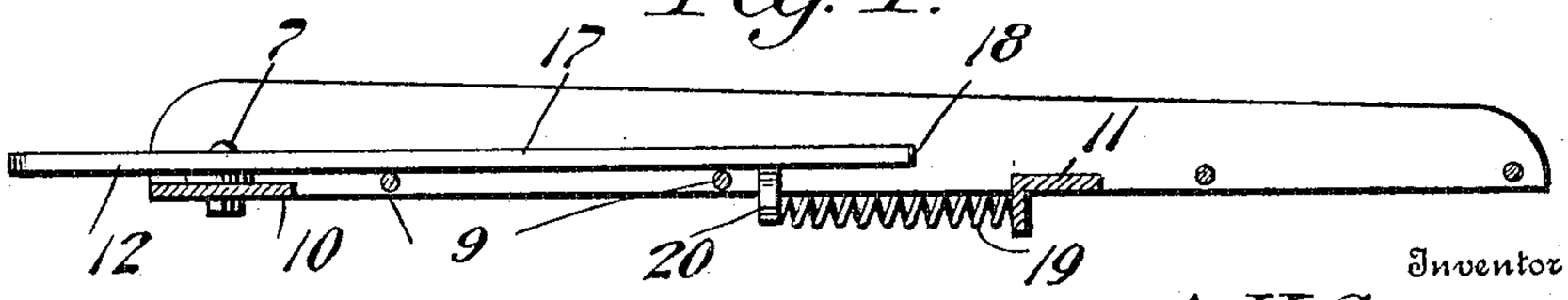


Fig. 4.



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Witnesses

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UNITED STATES PATENT OFFICE.

ALFRED H. GORE, OF SHELBYVILLE, INDIANA.

SWITCH-OPERATING DEVICE.

No. 819,647. Specification of Letters Patent. Patented May 1, 1906.

Application filed January 23, 1906. Serial No. 297,495.

To all whom it may concern:

Be it known that I, ALFRED H. GORE, a citizen of the United States, residing at Shelbyville, in the county of Shelby and State of Indiana, have invented new and useful Improvements in Switch-Operating Devices, of which the following is a specification.

This invention relates to switch-operating devices, being designed with special reference to street-railways and suburban lines, the object of the invention being to provide simple and reliable mechanism under the control of the motorman, whereby a switch may be opened or closed with certainty without requiring the motorman to leave his position on the car-platform.

With the above general object in view the invention consists in the novel construction, combination, and arrangement of parts, as hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a sectional side elevation of a portion of a car and road-bed, showing the switch-operating mechanism. Fig. 2 is a plan view of the road-bed adjacent to a switch. Fig. 3 is an enlarged plan view showing the shifting-lever and the manner of mounting the same. Fig. 4 is a sectional elevation of the parts shown in Fig. 3. Fig. 5 is an enlarged perspective view of the trip-frame and rotary trip. Fig. 6 is a vertical section through the same and also through the frame of the shifting-lever, showing the relation between the trip and said frame. Fig. 7 is a detail view of the trip-centering device. Fig. 8 is a detail view of the guide-frame for the flexible connection between the trip-frame and the operating-staff. Fig. 9 is a reduced sectional elevation showing a modified form of lever arrangement for shifting the position of the rotary trip.

Like reference-numerals designate corresponding parts in all figures of the drawings.

In order to illustrate the nature and operation of the switch-throwing mechanism contemplated in this invention, I have shown in Fig. 2 a section of a railway adjacent to a switch, 1 and 2 designating the main rails and 3 and 4 the switch-rails, one of the latter being provided with a pivoted switch-rail or extension 5, the extremity 6 of which is adapted to be moved laterally toward and away from the adjacent main rail by the mechanism, hereinafter described, for the purpose of opening and closing the switch in a manner readily understood by those familiar with the art to which this invention appertains.

In carrying out the present invention I employ a switch-shifting lever which is arranged, by preference, about midway between the track-rails, as shown in Fig. 2. This lever is fulcrumed on a vertical axis at 7 on a frame comprising parallel rails 8 8, connected together and held at a suitable distance from each other by bolts 9. This frame is provided at suitable points with cross-bars 10 and 11, the first-named cross-bar forming the support for the fulcrum or pivot 7 of the shifting-lever.

The shifting-lever has two arms arranged directly in line with each other, one of the arms 12 having pivotally connected thereto at 13 a connecting-rod 14, which is pivotally attached at its opposite end, at the point 15, to the pivoted switch-rail or extension 5. The rod 14 is rendered longitudinally extensible by means of a turnbuckle 16 to enable the proper adjustment to be obtained between the shifting-lever and pivoted switch-rail and between said switch-rail and the main rail. The other arm 17 of said lever is made tapering toward its extremity 18, which is adapted to lie against the inner surface of one or the other of the rails 8 8, the point of the lever 17 being held against one rail or the other by means of an expansive spring 19, which is interposed between the cross-bar 11, above referred to, and a lip or shoulder 20 on the under side of the lever 17. This spring acts as a detent to prevent the extremity of the lever 17 from moving away from the limit of its lateral movement, and thus the open or closed position of the switch is maintained.

Upon the car is mounted a shifting or tripping device which comprises a trip-frame 21, having one end pivotally connected at 22 to the car body or platform, while the other end is forked, as shown at 23, and carries an axle 24, upon which is mounted a rotary trip adapted to revolve freely about the axis of the axle 24. This rotary trip comprises laterally-extending cylindrical treads 25, adapted to roll upon the rails 8 8, and an intermediate flange 26, which is beveled on opposite sides, as shown at 27, so as to bring the flange to a comparatively sharp edge, as best shown in Fig. 6. The arms of the fork 23 are set at a sufficient distance apart to permit a limited amount of movement of the rotary trip lengthwise of the axle 24 in order that said trip may accommodate itself to the shifting-

lever hereinabove described and in connection with which it operates.

27 designates braces for strengthening the fork 23.

The trip-frame 21 is raised and lowered for throwing the trip into and out of operation by the following means: An operating-staff 28, similar to an ordinary brake-staff, is mounted in or upon the car-platform, as shown in Fig. 1, and provided with a suitable crank-handle 29. Beneath the platform said staff is provided with pulleys or drums 30 and 31, upon which a flexible connection 32 is wound in reverse directions. The connection or cable 32 extends over and around the guide-pulleys 33 and 34 on a frame 35, connected to the car-body, as shown in Fig. 1, and said connection is attached at 36 to the trip-frame 21, the latter passing between the parallel members of the guide-frame 35 and being steadied and guided in its up and down movements by said frame.

As the trip-frame 21 moves upward the rotary trip carried thereby comes in contact with a trip-centering device 37, embodying, essentially, a centering-fork or upwardly-converging arms 38, carried by a suitable support, such as a rod or post 39, provided with a flanged head 40, by which it is secured to the bottom of the car or the platform thereof. The flange 26 of the trip engages the arms of the fork 38, and thus in the upward movement of the trip the latter is brought automatically to a central position on the axle 24. In this way the trip is brought to a position adapting it to operate with certainty on the switch-shifting lever 17 irrespective of the angle of said lever.

To throw the switch, the motorman depresses the trip by means of the connections above described, which places the trip in position to roll upon the rails 8 8 with the flange 26 midway between the same. In the movement of the car the trip rides against one side or the other of the shifting-lever 17 and rocks the same from one inclined position to the other, thus swinging the pivoted switch-rail correspondingly. If the switch is already in the desired position, it is of course not necessary to depress the trip. The rails 8 serve to steady the rotary trip and enable the same to act smoothly and gradually on the switch-shifting lever without undue jar or strain.

Instead of the lever arrangement illustrated in Fig. 1 the rotary trip may be mounted in the free end of an arcuate trip-frame 41, as shown in Fig. 9, said lever 41 being fulcrumed on a bracket 42, connected to the car-platform. In connection with the frame 41 a straight operating-lever 43 may be used, the same extending upward through the car-platform and being operatively associated with the trip-frame 41 by means of a connecting-rod 44. The lever 43 may be provided with a suitable thumb-latch 45 to engage a stationary rack 46. The operator, by vibrating the hand-lever 43 back and forth, may correspondingly raise and lower the rotary trip for shifting the switch in the manner hereinabove described.

Having thus described the invention, what I claim is—

1. In switch-operating mechanism, the combination of a laterally-movable switch-rail, a switch-shifting lever located between the track-rails and operatively connected with the switch-rail, a rotary trip carried by the car and movable on its longitudinal axis, and supporting-rails on which said rotary trip bears arranged at opposite sides of the shifting-lever.

2. In switch-operating mechanism, the combination with a laterally-movable switch-rail, a switch-shifting lever located between the track-rails and operatively connected with the switch-rail, a trip-supporting rail extending alongside the switch-shifting lever, and a rotary trip carried by the car and comprising a flat tread adapted to bear on the trip-supporting rail, and a flange adapted to engage the shifting-lever while the tread bears on the supporting-rail.

3. In switch-operating mechanism, the combination of a pivoted switch-rail, a switch-shifting lever located between the track-rails and operatively connected with the switch-rails, trip-supporting rails arranged in parallel relation on opposite sides of the shifting-lever, and a rotary trip carried by the car and comprising oppositely-located flat treads and an intermediate flange adapted to engage the shifting-lever while the treads engage the supporting-rails.

4. In switch-operating mechanism, the combination of a laterally-movable switch-rail, a switch-shifting lever mounted between the track-rails and operatively connected with the switch-rail, an oscillatory trip-frame carried by the car, a rotary trip journaled on said frame and movable into and out of the plane of the shifting-lever, a guide-frame within which the trip-frame moves, guide-pulleys mounted on said guide-frame, an operating-staff on the car, and a flexible connection attached to said staff and trip-frame and passing over said guide-pulleys.

5. In switch-operating mechanism, the combination of a laterally-movable switch-rail, a switch-shifting lever mounted between the track-rails and operatively connected with the switch-rail, a rotary trip carried by the car, means for moving said trip into and out of position to engage the shifting-lever, means permitting said rotary trip to move lengthwise of its axis of rotation, and a centering device for automatically positioning said trip at a point between the limits of its axial movement.

6. In switch-operating mechanism, the combination of a laterally-movable switch-

rail, a switch-shifting lever mounted between the track-rails and operatively connected with the switch-rail, a rotary trip carried by the car, means for moving said trip into and out of position to engage the shifting-lever, means permitting said rotary trip to move lengthwise of its axis of rotation, and a centering-fork secured to the car-body and having downwardly-diverging arms with which the trip engages, said arms acting to center the trip, substantially as described.

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

ALFRED H. GORE.

Witnesses:
M. R. MONTGOMERY,
CHARLES F. BENEDICT.