

UNITED STATES PATENT OFFICE.

WILBUR J. HARRIS, OF MOUNT PLEASANT, OHIO.

SWITCH-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 619,172, dated February 7, 1899.

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To all whom it may concern:

Be it known that I, WILBUR J. HARRIS, of Mount Pleasant, in the county of Jefferson and State of Ohio, have invented a new and Improved Switch-Operating Mechanism, of which the following is a full, clear, and exact description.

My invention relates to an improvement in the mechanism for operating switches, particularly street-railway switches.

The invention comprises the novel features hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a top plan view of my device, showing one rail of a track. Fig. 2 is a similar view, partially in section and with the cover-plate removed, so as to show the working mechanism; and Fig. 3 is a sectional elevation taken upon the line 3 3 of Fig. 2.

The object of my invention is to provide a simple mechanism which may be operated by the flange of the car-wheel to throw the switch in the direction desired and to provide a controlling apparatus therefor which may be set by the motorman.

In the drawings, A represents one rail of the track. Pivoted at the inner side of this rail is a bar or lever B. This is provided with inclined surfaces B² upon one side, adapted to act as cam-surfaces and to be engaged by the flanges of the car-wheels. The pivot *b* of this lever extends downwardly beneath the rail and at its lower end has a lever B' secured thereto. This lower lever B' is pressed toward the rail by a spring C. This serves to hold the upper lever B close against the side of the rail and in position where it may be engaged by the wheel-flange.

Upon the end of the lever B' is pivoted a connecting rod or link D. Beneath the outer end of this connecting-rod is a spring G, which holds the same elevated, but permits the end to be depressed. The free end of this rod is secured by a link or staple *d*, passing about the same, but permitting slight side motion and free end motion.

To one side of the box or casing I, which contains the working mechanism, is secured a thin plate F, which lies just below the nor-

mal position of the end of the connecting-rod D. Upon each side of the plate are pivoted bell-crank levers E and E', having the arm *e* of each extending toward the plate. These ends of levers E and E' have springs *e'* secured thereto and directly receiving the thrust of the rod D. These springs are of sufficient strength to throw the switch-point, but will yield if an exceptionally large throw is given to the block B by a wide wheel-flange or from any other reason. The end of the lever E extends above the plate F and the end of the lever E' extends below the plate F. The other arms of these levers are connected to a common rod H, which extends in the same direction as the rail and is of such a length as to reach the switch-point. This rod H is surrounded by a tube J, which permits free motion therein and protects the rod. This tube may be buried, if desired.

Opposite the switch-point M is a box N, within which is pivoted a bell-crank lever K. One end of this lever is pivotally connected to the rod H and the other end to a link L, which is also pivoted to the switch-point M. It will be seen that an outward movement of the free end of either of the bell-crank levers E or E' will cause a reciprocation of the rod H and through the connection of the bell-crank lever K a side swinging of the switch-point M. The direction of movement of the switch-point M will depend upon which one of the bell-crank levers E or E' is moved outwardly. This will depend upon which of the levers the connecting-rod D engages. This rod D, being supported by a spring G, will ordinarily engage the end of the lever E. It may, however, be depressed, so as to pass beneath the plate F, and thus engage the end of the lever E'. This result is obtained as follows: To the cover of the box I is pivoted a lever N. This lever rests upon the upper surface of the rod D and has an upwardly-projecting portion passing through a slot in the cover, to which it is pivoted. This projects above the surface of the cover, so that it may be engaged by a wheel mounted upon the car or in any other manner be depressed at will. When so depressed, the connecting-rod D will engage the lever E'. The spring C will normally hold the operating mechanism in such position as to hold the switch thrown to one

position. If this is not the position desired for the car, the lever N will be depressed, so that when the flanges of the wheels strike the lever B the switch will be thrown into the opposite position. This operating mechanism may be inclosed in a box, as shown, and thoroughly protected against damage from any ordinary means. The slight projection of the lever N is of such nature that no accident is liable to happen thereto. If engaged by the wheels of a truck, it will simply be depressed and rise when freed from pressure. The whole mechanism is extremely simple and not liable to get out of order.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. A switch-operating mechanism comprising a pivoted bar adapted to be moved by contact with the car-wheel flanges, a connecting-rod attached to the bar and capable of a limited movement at its free end, two pivoted levers having corresponding ends located one above the other, springs attached to said levers and normally held at a slight distance from the face thereof, said springs being adapted to receive the thrust of the connecting-rod, oppositely-acting connections from these levers to the switch-point, and means for controlling the vertical position of the connecting-rod at will, substantially as described.

2. A switch-operating mechanism comprising a pivoted bar adapted to be moved by contact with the car-wheel flanges, a connecting-rod attached to the bar and capable of a limited vertical movement at its free end, two pivoted levers having corresponding ends located one above the other, springs carried thereby and adapted to be engaged by the connecting-rod, a separating-plate between the ends of said levers, oppositely-acting connections from these levers to the switch-point, and means for controlling the vertical position of the connecting-rod at will, substantially as described.

3. A switch-operating mechanism, comprising a pivoted bar adapted to be moved by contact with the car-wheel flanges, a connecting-rod attached to the bar and capable of a limited vertical movement at its free end, two pivoted levers having corresponding ends located one above the other and adapted to be engaged by the connecting-rod, oppositely-acting connections from these levers to the switch-point, and means for controlling the vertical position of the connecting-rod at will, substantially as described.

4. A switch-operating mechanism, compris-

ing a pivoted bar adapted to be moved by contact with the car-wheel flanges, a connecting-rod attached to the bar and capable of a limited vertical movement at its free end, two pivoted levers having corresponding ends located one above the other and adapted to be engaged by the connecting-rod, a separating-plate between the ends of said levers, oppositely-acting connections from these levers to the switch-point, and means for controlling the vertical position of the connecting-rod at will, substantially as described.

5. A switch-operating mechanism, comprising a pivoted bar adapted to be moved by contact with the car-wheel flanges, a connecting-rod attached to the bar and capable of a limited vertical movement at its free end, two pivoted levers having corresponding ends located one above the other and adapted to be engaged by the connecting-rod, oppositely-acting connections from these levers to the switch-point, and a lever extending above the surface of the roadway and engaging the connecting-rod whereby the latter may be depressed at will, substantially as described.

6. A switch-operating mechanism, comprising a pivoted bar adapted to be moved by contact with the car-wheel flanges, a connecting-rod attached to the bar and capable of a limited vertical movement at its free end, a spring normally holding the connecting-rod up, two pivoted levers having corresponding ends located one above the other and adapted to be engaged by the connecting-rod, oppositely-acting connections from these levers to the switch-point, and means for controlling the vertical position of the connecting-rod at will, substantially as described.

7. A switch-operating mechanism, comprising a pivoted bar adapted to be engaged by the car-wheel flanges, a covered lever or arm connected to move therewith, a connecting-rod attached to said lever or arm and capable of a limited vertical movement at its free end, a spring normally holding said rod up, two pivoted bell-crank levers having pivots on opposite sides of the connecting-rod, and their free ends located one above the other and adapted to be engaged by the connecting-rod, a rod connected to both bell-crank levers and leading to alongside the switch-point, a bell-crank lever connected to the opposite end of this rod and a link connecting said lever with the switch-point, substantially as described.

WILBUR J. HARRIS.

Witnesses:

CHAS. E. HARRIS,
J. A. WHITE.