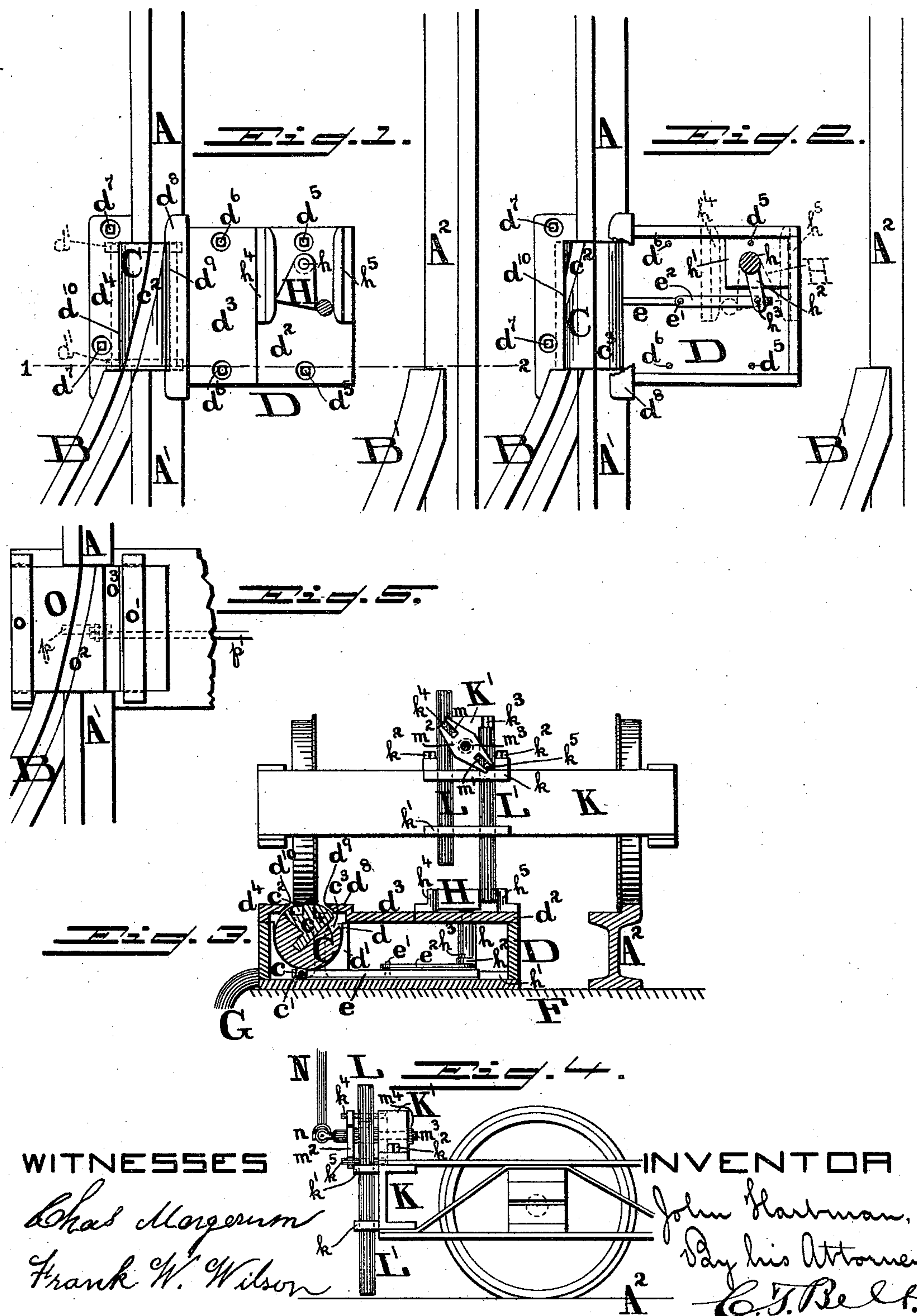


J. HARTMAN.  
RAILWAY SWITCH.

Patented Apr. 2, 1895.





# UNITED STATES PATENT OFFICE.

JOHN HARTMAN, OF PHILADELPHIA, PENNSYLVANIA.

## RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 536,786, dated April 2, 1895.

Application filed December 21, 1893. Serial No. 494,347. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN HARTMAN, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Switches, of which the following is a specification.

My invention has relation to automatic railway-switches and has for its object the provision of certain new and useful improvements therein, to the end that the construction thereof may be simplified, the efficiency increased and the operation of the same more perfectly controlled.

My invention has relation particularly to street railways and consists of a reciprocating switch-member and its operating mechanism and an actuating medium, carried by the car, which, when once set or adjusted, will insure a certain predetermined condition of the switch, at the time of the passage thereof of such car, regardless of the previous position of said switch, avoiding the misplacement of the latter and the consequences thereof all as hereinafter more fully described and claimed and as illustrated in the accompanying drawings, wherein—

Figure 1 is a plan view of the improved switch in one of its positions and Fig. 2 a similar view of the same in the other position, the switch-box cover being removed and the contents exposed to view. Fig. 3 is an end view of a car-truck provided with the improved actuating device, and a cross-section, on line 1—2 of Fig. 1, of the switch-box and switch-member illustrating the operative relation of the respective parts. Fig. 4 is a side elevation of that portion of said truck which sustains the switch actuating device aforesaid. Fig. 5 is a plan view, partly broken away, of a modified form of my said invention.

Referring to said drawings, A A' A<sup>2</sup> represent sections of the main track of a street railway system; B B', the side rails or branches thereof, and C a horizontally disposed cylindrical switch-member which is interposed between the ends of section A and the opposite ends of section A' and side rail B, and is supported at its ends in correspondingly curved bearings or recesses *d* in the bearing

blocks *d'*, which latter are located at opposite sides of the interior of the switch-box D, in which bearings said switch-member is adapted for rotation under the impulse of the switch-rod *e*, which is pivotally connected to the lug *c* thereof through the medium of the pin *c'*.

As shown more clearly in Fig. 3, the switch-box rests upon the cross-ties F which support the rails, at one end projecting outside the line of those rails between the ends of which it is interposed and at the other end extending past the middle of the track or way, the lid of said box being divided into sections *d*<sup>2</sup> *d*<sup>3</sup> *d*<sup>4</sup>, secured in place by the bolts *d*<sup>5</sup> *d*<sup>6</sup> *d*<sup>7</sup>, sections *d*<sup>2</sup> *d*<sup>3</sup> being in or about the plane of the flanges of the rails and the section last mentioned having an upwardly projecting flange *d*<sup>8</sup> which overlaps the flanges of and at its top is flush with the treads of the rail-sections A A', between which flange *d*<sup>8</sup> and the lid section *d*<sup>4</sup> the ends of the adjacent rail-sections are embraced and thereby secured in alignment, which is quite necessary where the rails are flat, or of the form usually employed for street railways, instead of being of the "girder" type as shown. Said flange and section have oppositely disposed recesses *d*<sup>9</sup> *d*<sup>10</sup> in their upper parts which conjointly form a longitudinal opening through which the upper portion of the switch-member C projects, the edges of said recesses being beveled or following the curvature of the periphery of said switch-member and are thereby permitted to be brought into close relation without interfering with the rotation of the latter, preventing the access of dirt, &c., to the interior of the switch-box, while the drain-pipe G serves to lead off any water which may find its way thereinto.

Midway between rail-sections A A<sup>2</sup>, or in the center of the track or way, is located an oscillating lever or cam H, the edges of which taper in the direction from whence the car comes, said lever being sustained on the upper end of the vertical rock-shaft *h*, outside the switch-box, which shaft has bearings in the block *h'* in said box and in the lid-section *d*<sup>2</sup> of the latter and is provided, between its ends, with a laterally projecting arm *h*<sup>2</sup>, to which the switch rod *e* is pivotally connected, through



the pins  $e' h^3$ , the link or connection  $e^2$ , said lid-section having thereon, at each side of and a certain distance from the lever H, the guides  $h^4 h^5$  which, for convenience of construction, are preferably of angle-iron and serve as guards to prevent injury to said lever by passing vehicles.

In Figs. 3 and 4 are shown the end of a car-truck K provided with horizontal ledges  $k k'$ , disposed one above the other, and having secured thereon, by the bolts  $k^2$ , the block  $K'$ , each of said ledges having a pair of vertical openings therein, the openings of one ledge being in alignment with those of the other, forming slide-ways for the rods  $L L'$ , and said block having vertical grooves in its face, as shown at  $k^3$ , for reception of the rear ends of the pins  $k^4 k^5$  in said rods, serving to prevent the turning of the latter in said openings, while the forwardly projecting ends of said pins engage with notches  $m m'$  in the forked link  $m^2$ , said link being secured on the rock-shaft  $m^3$ , which, at its rear end, has its bearings in the block  $K'$  and is secured against dislodgment therefrom by the collar  $m^4$ , and at its forward end is coupled at  $n$  the lower end of the shaft N. Obviously, the turning of this last mentioned shaft causes the rocking of the shaft  $m^3$  and the link  $m^2$  thereon and, by reason of the engagement of the pins in the rods  $L L'$  with the notches of said link, effects the raising of one and the lowering of the other of said rods.

As will be observed, the switch-member C has in its upper side a diagonal groove  $c^2$  and a straight groove  $c^3$  adapted respectively for interposition between and rendering continuous the rail-section A and side rail B, and said section A and the section  $A'$ , at will, the bottom of each of said slots being flush with the flanges of the particular rails between which it is placed, and the upper side of the metal which forms the sides of said grooves being flush with the treads of such rails. Groove  $c^2$  is located in a detachable section  $c^4$  of the switch-member C which may be of harder metal than the main portion of said member and, when worn out, may be replaced by another section, and the groove  $c^3$  is formed by one side of said section and a longitudinal recess in the edge of the opening in which the section is secured.

Now, suppose a car provided with the rods  $L L'$  to be approaching the switch and it be desired to have the car turn off the main track. In such event the driver, motor-man or other person in charge turns the shaft N, through the use of a hand-wheel, crank or other convenient device, in such direction as to cause the depression of the rod  $L'$  sufficiently to cause its lower end to pass between the guide  $h^5$  and the lever H, forcing the latter into the position shown in Figs. 1 and 3, where it is limited against further movement by the other guide  $h^4$ , and causes the rotation of the switch-member C; through the

shaft  $h$ , arm  $h^2$ , link  $e^2$  and switch-rod  $e$ ; in such manner as to bring the diagonal groove  $c^2$  between the rail section A and the branch rail B, as shown in said Fig. 1, said groove forming a turnout for the flange of the car-wheel and the metal at the left side of the groove, affording a tread surface for said wheel. On the other hand, if it be desired to have the car continue straight on, the shaft N is turned in the reverse direction and the depression of the rod L and the raising out of operation of rod  $L'$  thereby secured, the lower end of said rod L passing between the lever H and the guide  $h^4$  and forcing said lever into the position shown in dotted lines in Fig. 2, causing the rotation of the switch-member C in the other direction and the placing of the straight groove  $c^3$  between the rail-sections A  $A'$ , as shown in the figure last mentioned, the operation of the switch being thus controlled from the car without necessitating the operators leaving the same.

What I claim as my invention is as follows:

1. The combination in a railway switch, of the cylindrical switch-member having a detachable grooved section extending throughout its length, said member having its axis in the horizontal plane with the railway, and adapted to be rotated between the adjacent ends of a track rail, as set forth.

2. The combination with a railway switch, of the cylindrical switch-member having a longitudinal cavity, and having its axis in the horizontal plane with the railway, and the section located in the said cavity, and adapted to be rotated with the said switch-member between the adjacent ends of a track rail, as set forth.

3. The combination in a railway switch, of the cylindrical switch-member having a detachable section extending through its length, and adapted to be rotated between the adjacent ends of a track rail having its axis in the same horizontal plane with the latter, as set forth.

4. The combination of the longitudinally grooved switch-member, with the switch box containing the said switch member and having a longitudinal opening, and means housed by the switch box and operated by a propelled car to bring the grooves of the said switch-member into continuity and discontinuity with the said switch box opening, as set forth.

5. The combination of a switch-box, interposed between the ends of adjacent rail-sections, containing the switch-operating mechanism and having concavities therein; a rotary switch-member connected with said mechanism and having its bearings in the concavities, the lid of said box being sectional, certain of the sections of which having oppositely disposed flanges which overlap and retain the ends of the rail-sections between them, substantially as specified.

6. The combination of a switch-box inter-



posed between the ends of adjacent rail-sections, having concavities therein and provided with a sectional lid; a rotary switch-member having its bearings in the concavities and provided with a rod or pitman, certain sections of said lid having oppositely disposed flanges which overlap and retain the ends of the rail-sections between them; a vertical rock-shaft provided with a lateral arm or extension having bearings in another lid-section and in the bottom of the box; an approximately wedge-shaped lever on said shaft and a link connecting the arm of the latter

and the rod or pitman; a suitably propelled railway-car and an actuating device carried thereby, adapted for contact with either of the inclined sides of said lever, substantially as specified. 15

In testimony whereof I have hereunto set my hand this 28th day of November, A. D. 1893. 20

JOHN HARTMAN.

Witnesses:

FRANK W. WILSON,  
WM. H. POWELL.