(No Model.) 2 Sheets—Sheet 1.

# A. R. MILLIKEN.

## RAILROAD SWITCH.

No. 541,667. Patented June 25, 1895.

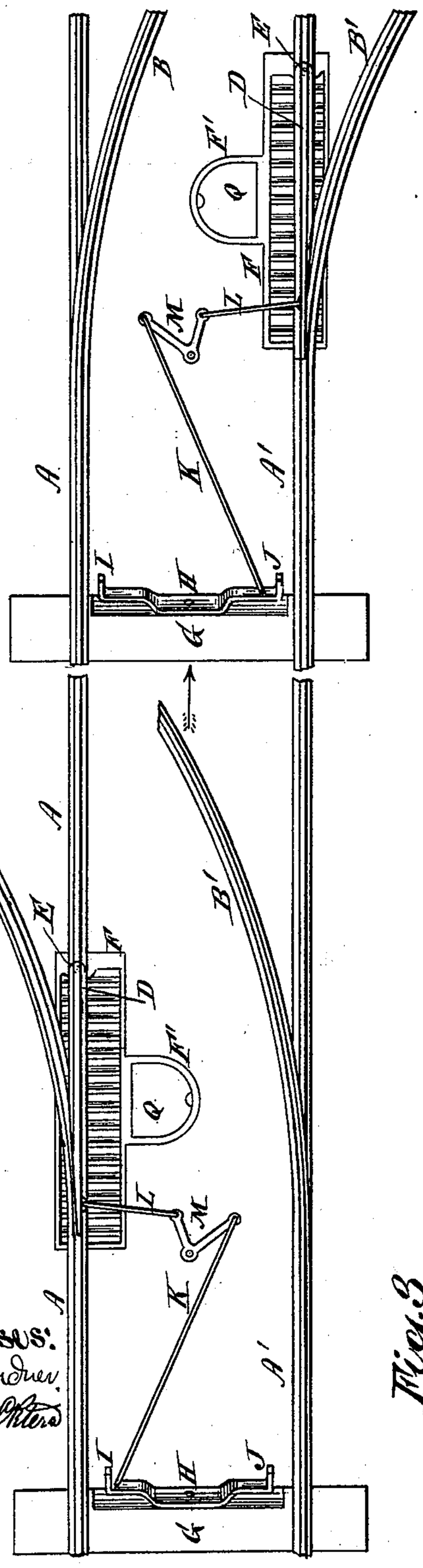


Fig. 1.

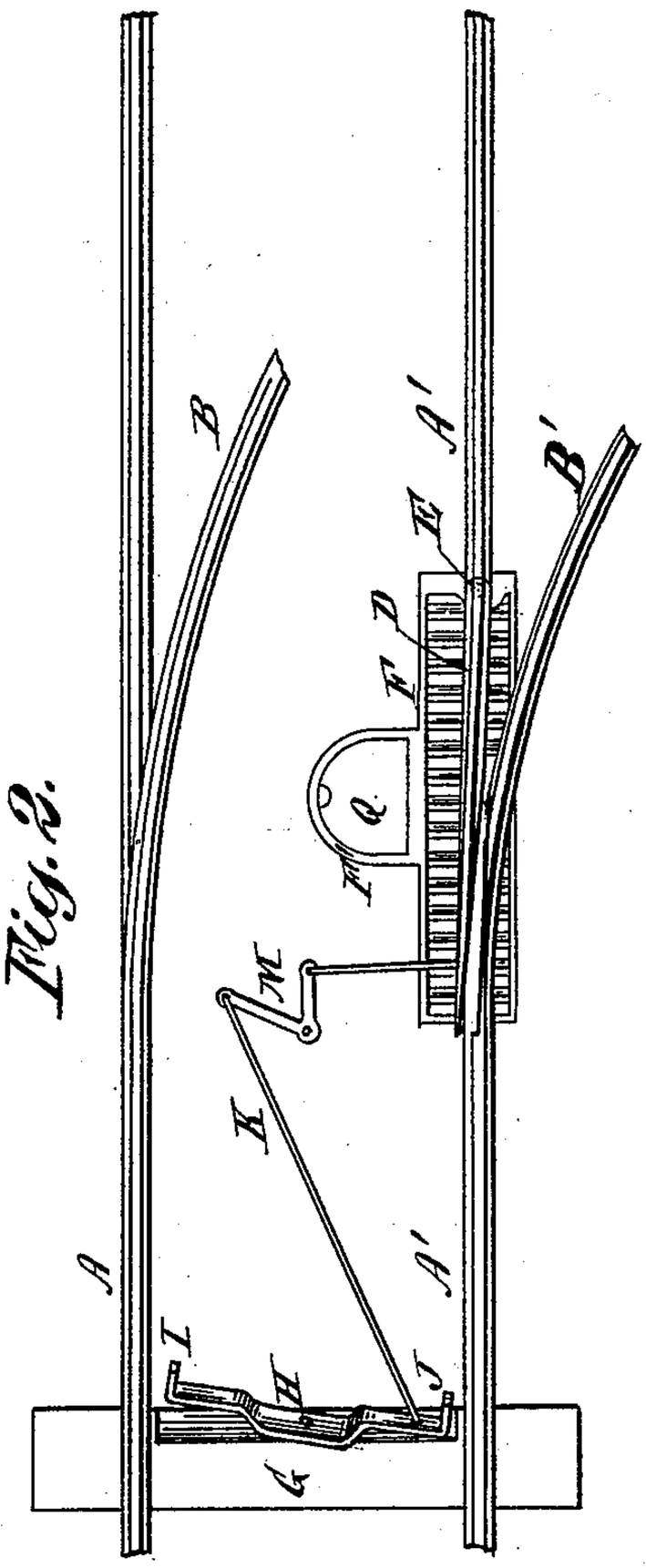


Fig. 2.

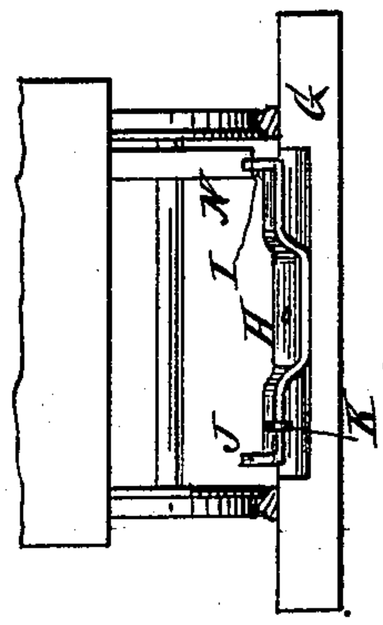


Fig. 3

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By his Attorney
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(No Model.) 2 Sheets—Sheet 2.

# A. R. MILLIKEN.

## RAILROAD SWITCH.

No. 541,667. Patented June 25, 1895.

*Fig. 4.*

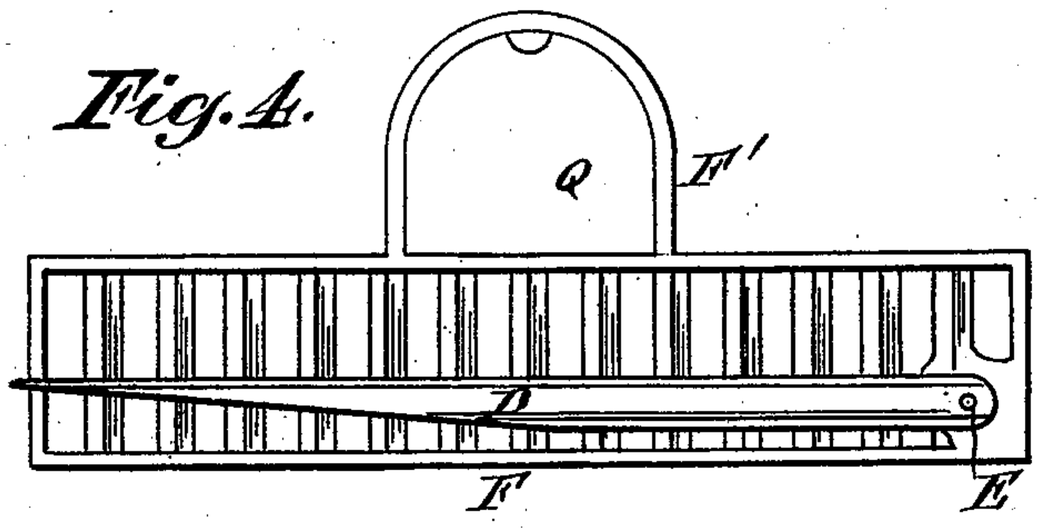



*Fig. 5.*

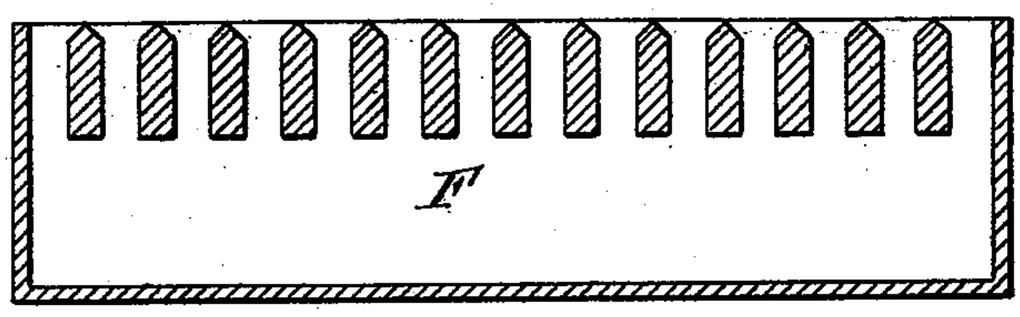
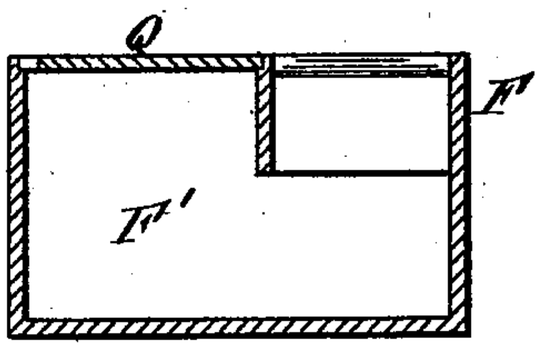



*Fig. 6.*

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# UNITED STATES PATENT OFFICE.

ALEXANDER R. MILLIKEN, OF NEWARK, NEW JERSEY.

## RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 541,667, dated June 25, 1895.

Application filed August 22, 1894. Serial No. 520,989. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER R. MILLIKEN, a citizen of the United States, and a resident of Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Railroad-Switches, of which the following is a specification.

My invention relates to certain new and useful improvements in automatic switches and switch plates particularly designed for electric railways, the objects being, first, the production of a switch of simple and inexpensive construction, reliable and efficient in operation, and adapted to be automatically opened and closed, or shifted from one position to the other, by the force of a moving car; secondly, the production of a switch plate, (and dirt receiver arranged below the plate) specially designed for use with my automatic switch, to facilitate the easy movement, or shifting thereof, and also adapted to prevent the switch from being clogged, or its free movement retarded, by dirt, stones, ice, snow, &c.

With these several objects in view my invention consists in the features of improvement hereinafter fully described and pointed out in the claims.

Referring to the accompanying drawings, illustrating my invention, in the several features of which like parts are similarly designated, Figure 1 is a diagrammatic view of two sections of a railway-track, each provided with a switch and switch-plate embodying my improvements, showing the switch closed in each case. Fig. 2 is a diagrammatic view of a single section provided with the same switch and plate and showing the switch open. Fig. 3 is an end view of a car-truck provided with a projection to operate the switch. Fig. 4 is a top plan view of my improved switch-plate; Fig. 5, a vertical section thereof, and Fig. 6 a cross-section thereof.

A, A′ represent the main tracks of a railroad, and B, B′, branch tracks.

D, is the switch-rail pivoted at E, and resting upon the switch plate F. A short distance from the switch rail D, a tie or platform G, is suitably secured in place, and one edge of this tie is beveled so as to form an incline on the face of the tie adjacent to the switch-rail D, as shown, and upon the upper edge of this incline a switch lever H, is centrally pivoted, this lever being provided at its curved or cam-shaped ends, with upwardly extending projections I, J. This switch lever is connected to the switch-rail D, by means of the rods K, L, and bell crank, M, the rod K, extending from the outer arm of the bell crank to the opposite end of the switch lever so as to exert sufficient leverage to move or shift the switch rail, when force is applied to move the switch-lever, as hereinafter described.

The cars employed on a road using my improved switch will be provided with a suitable projection or arm N, (as shown particularly in Fig. 3) located at some part of the car in front of the trucks. This projection N, may be either a fixed or a movable projection. When fixed it will be located on the car-body with reference to the projection of the switch-lever it is intended to engage, and will project downwardly slightly below the track level. When movable it may be supported in a variety of ways, none of which are shown in the drawings as they are all well known mechanical devices. For instance one form may consist of a rod extending through the car-platform and within easy reach of the driver, and this rod may be spring-controlled, or provided at its lower end with a rack-bar, so that it can be readily adjustable to different vertical positions. Instead of this construction a series of projections may be employed located at different points on the car-body, and of different lengths, for purposes which will presently be described.

The operation is as follows: A car moving in the direction of the arrow, Fig. 1, will follow the main tracks A and A′ unless the switch is moved to open the branch tracks B and B′, as shown in Fig. 2. It is intended that this shall only be accomplished by contact of the projection on the car with the proper projection of the switch-lever. Hence when a car of the line whose route follows the branch tracks B B′ approaches the closed switch of Fig. 1, the projection N will be brought into position to strike or engage the projection I of the switch-lever H, thus throwing the switch to its open position, Fig. 2. When the projection N strikes the projection I the switch-

lever moves freely on its pivot until the cam-shaped projection I moves down the incline a sufficient distance to disengage the projections I and N. The swinging movement of the switch-lever H is communicated by the lever-arm K to the bell-crank M, and the latter turning on its pivot operates the arm L to move the switch D to its open position.

While as stated the switch operating projections on the car may be arranged, by any suitable mechanical means, to be adjusted in position when required for the switch moving operation, in many cases it will not be necessary to make these projections adjustable, but on the contrary they may be fixed. For instance the projection may be located on the car at such a point that it will freely pass all switch levers on the line, excepting the switch, or switches, it is necessary for that particular car to operate, and the switch lever can be provided with a series of projections at each end, and each of these projections may be located to engage the projections on cars of a certain line. These details are easily within the control of the master mechanics of the different intersecting roads as they are of course familiar with the route to be followed by each car, the switches to be opened, or closed, or avoided entirely, and can arrange the switch operating projections accordingly.

In Figs. 4, 5 and 6, of the drawings I have illustrated my improved switch plate and dirt receiver, and will now proceed to describe the same. The switch-plate F consists of a corrugated metal plate, having a slot between each pair of corrugations, these slots extending preferably the full length of the corrugations, or nearly so. Instead of a corrugated plate, a series of grate-bars may be employed, but in either case, the corrugated plate, and the grate-bars, are secured to the open top of a metal box or receptacle. When the grate bars are used they will extend across the top of the box and will have open spaces between each pair of bars, and when the plate is used the corrugations will extend laterally across the plate. In either case, the corrugations or the bars, will have their upper edges rounded or beveled. The box or receptacle is preferably of rectangular form, and is provided with a side-extension F′, provided with a removable cover Q, by means of which access can be had to the receptacle and any accumulation of dirt, stones, snow, ice, &c., readily removed. The switch D, when in motion moves on the corrugations, or bars, substantially in a direction at right-angles to said corrugations or bars, and thus comes in contact only with the narrow upper edges thereof, moving freely thereon and with very little friction. It will be seen by this construction that the switch can not get clogged or its free operation be retarded to any appreciable extent by dirt, snow, ice, stones, &c., as such substances will pass down between the grate-bars, or through the slots between the corrugations into the receptacle from which its removal can be readily accomplished.

While I have described and shown the switch plate in connection with my automatic switch, it is obvious that it is not restricted to use with a switch of any particular construction.

What I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic switch, a switch lever centrally pivoted at the top of an incline located between the rails, and adapted to be forced forward and downward by engagement with a suitable projection on the car, thereby actuating suitable levers to open and close the switch, substantially as described.

2. In an automatic switch, a switch lever centrally pivoted upon an incline located between the rails and provided with projections adapted to engage projections on the car, thereby actuating suitable levers to open and close the switch, substantially as described.

3. An automatic switch comprising a pivoted switch rail, a rod extending from said rail to the inner arm of a bell crank lever, a second rod extending from the outer arm of said bell crank to the inner arm of a switch lever centrally pivoted on an inclined surface, and carrying upwardly extending projections, and means such as the force of a moving car, for operating said switch mechanism by the engagement of projections on the car with the projections of the lever, substantially as described.

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