

(No Model.)

2 Sheets—Sheet 1.

P. J. BORIS.
STREET RAILWAY SWITCH.

No. 505,077.

Patented Sept. 12, 1893.

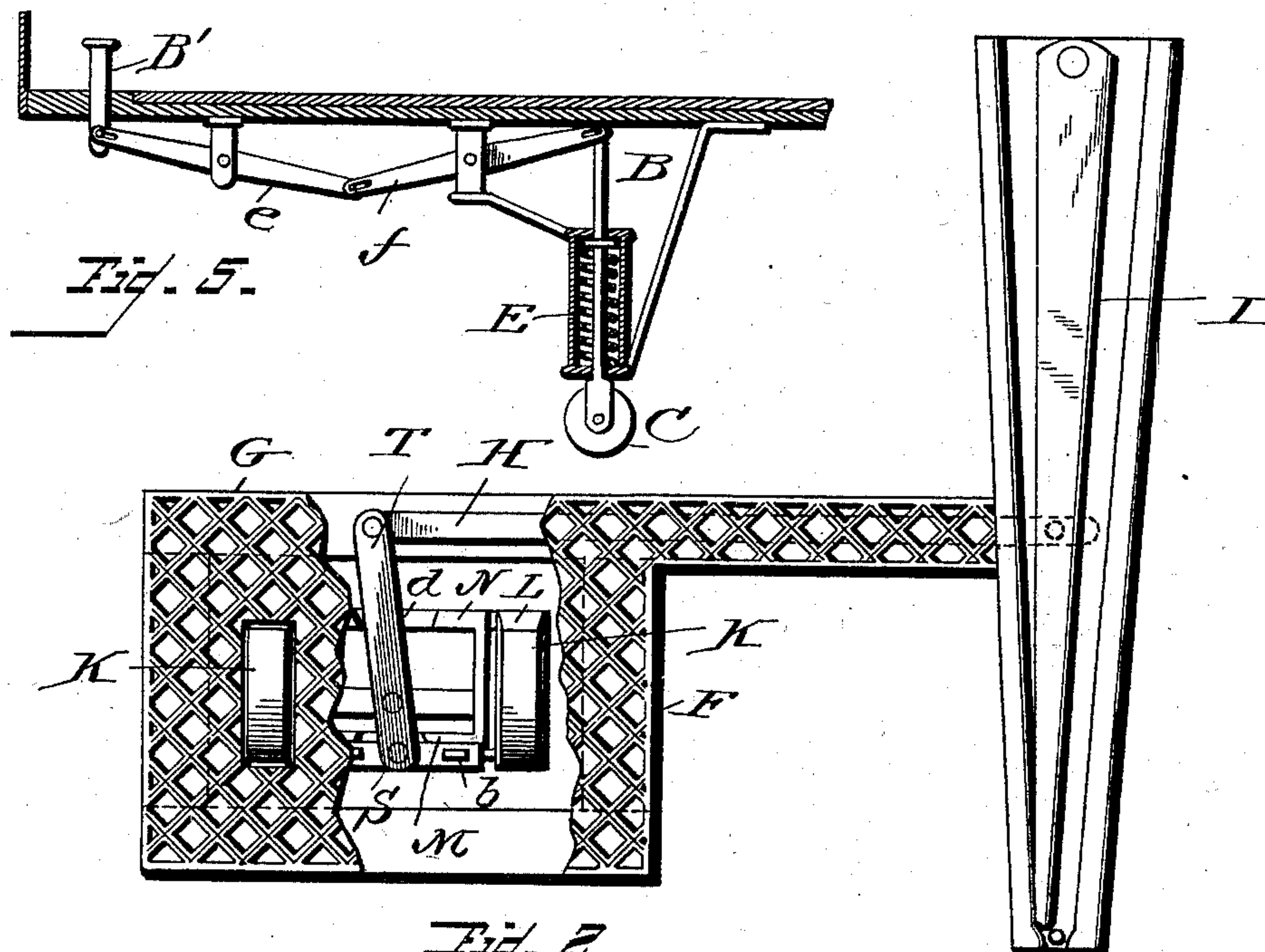
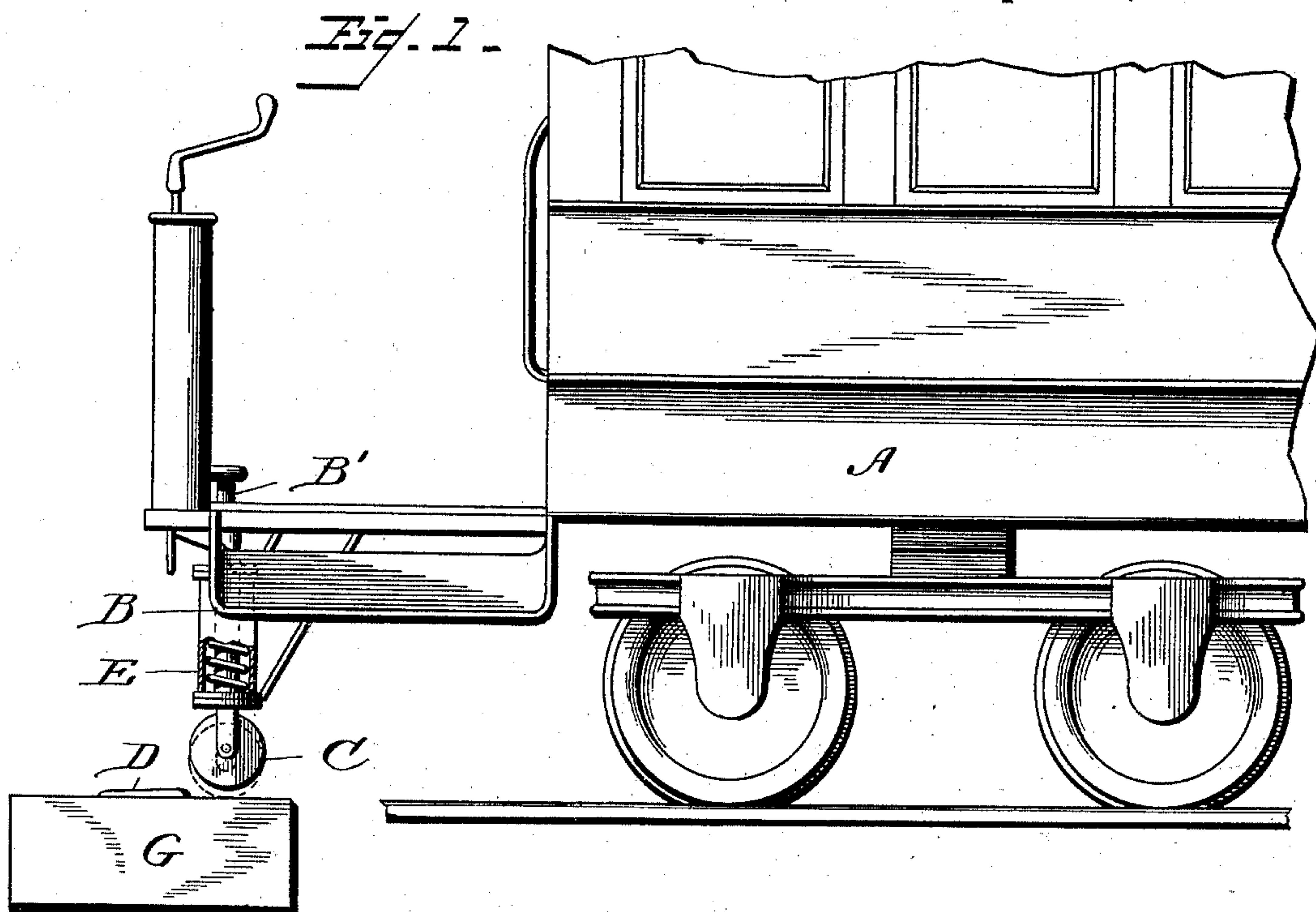


Fig. 2.

Witnesses
Wm. H. K. K. K.
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by Finckel & Finckel,
Assoc. Attys.

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2 Sheets—Sheet 2.

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Fig. 3.

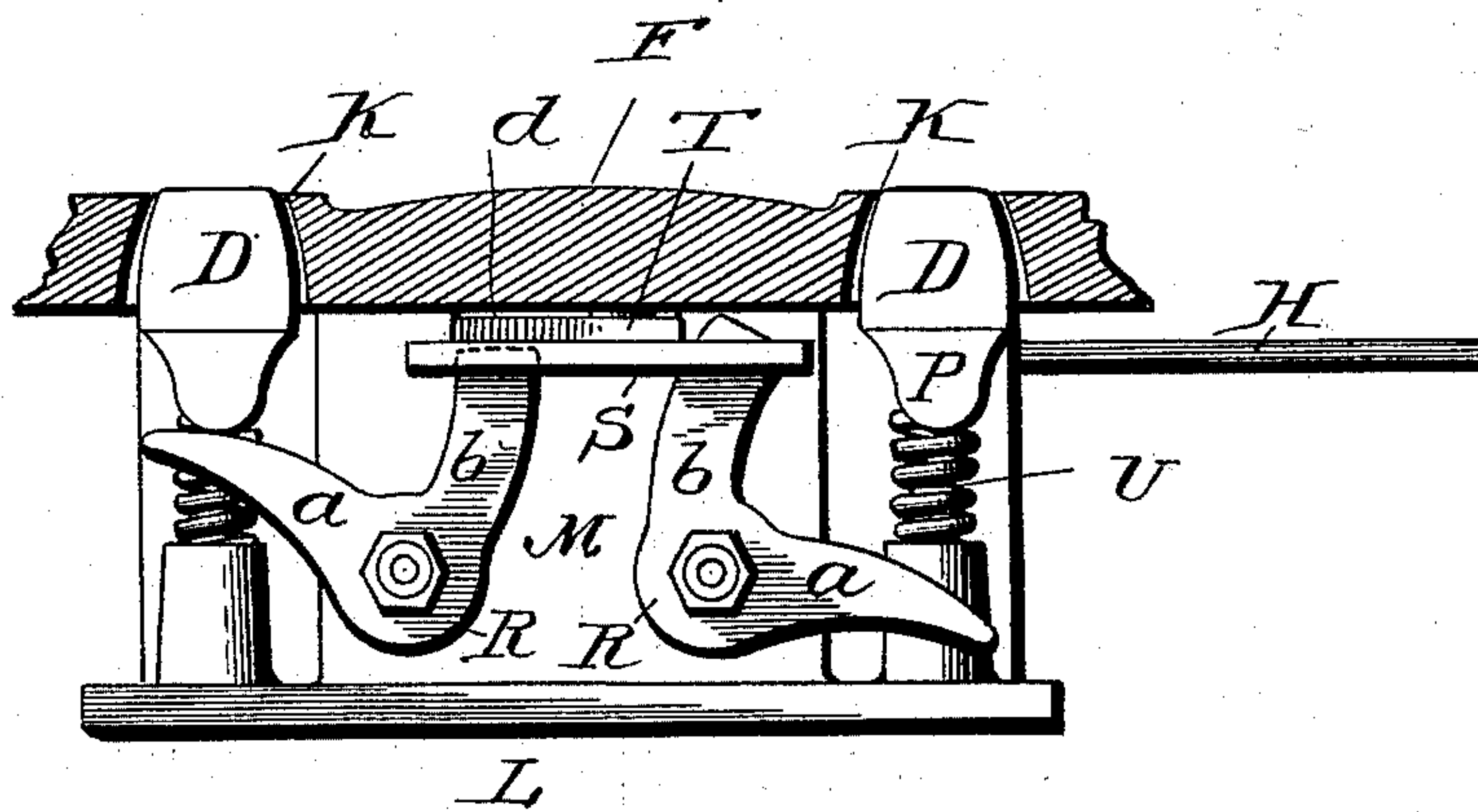
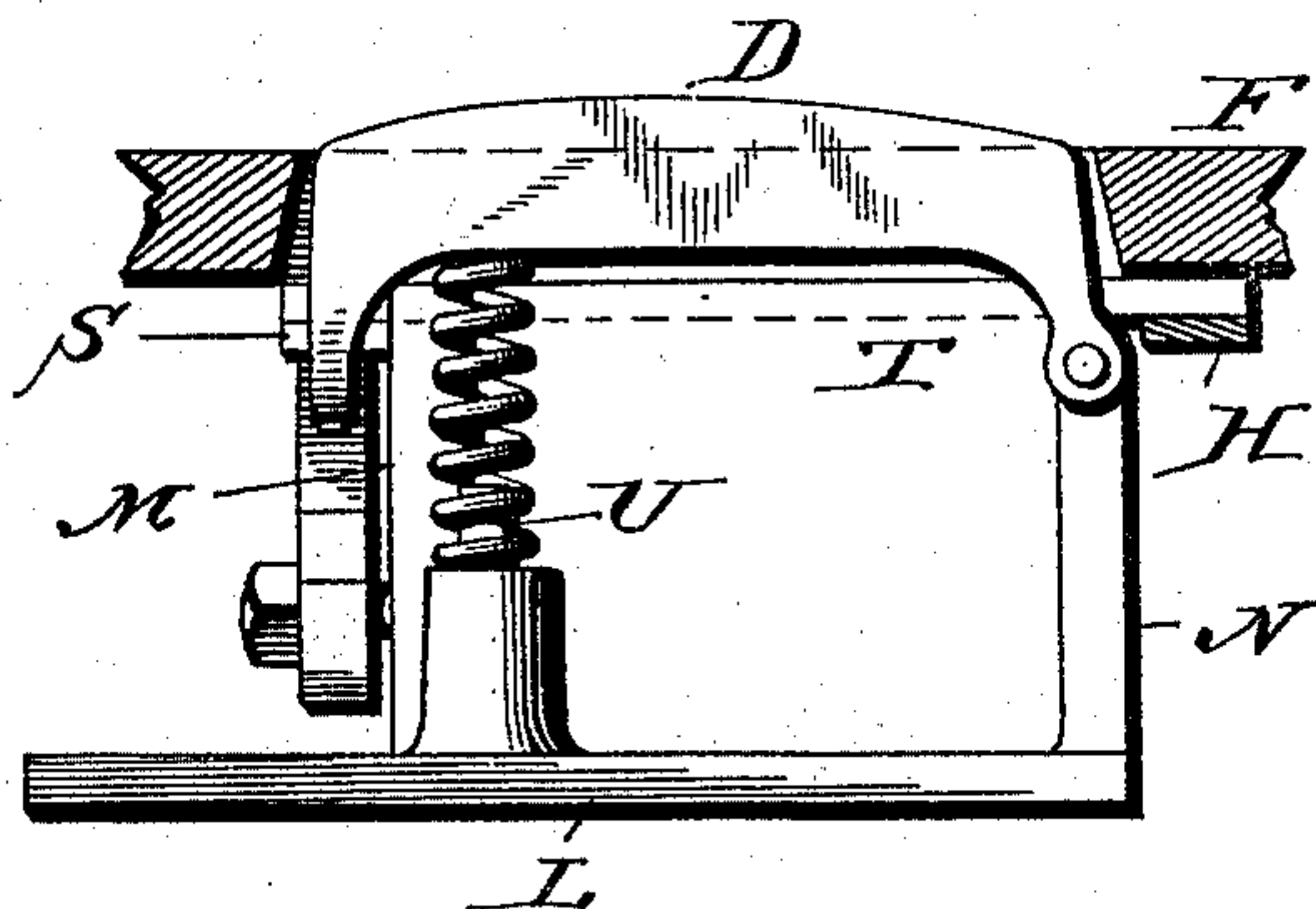


Fig. 4.



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UNITED STATES PATENT OFFICE.

PIERRE J. BORIS, OF BOSTON, MASSACHUSETTS.

STREET-RAILWAY SWITCH.

SPECIFICATION forming part of Letters Patent No. 505,077, dated September 12, 1893.

Application filed September 1, 1892. Serial No. 444,827. (No model.)

To all whom it may concern:

Be it known that I, PIERRE J. BORIS, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Street-Railway Switches, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to that class of street railway switches in which the movement of the switch is effected by means of the moving car, and has for its object the production of a switch which will be simple and cheap in construction, will be reliable in its operation, will operate with the least degree of friction and wear, will be durable and not liable to get out of order by repeated operation, and will not be affected by frost or ice.

To these ends the invention consists in the combination, substantially as hereinafter more fully set forth, of a box-like casting or frame suitably arranged between and below the level of the rails of the track, a plate above this casting having in it two elongated slots parallel to the track, a pedal moving in each slot and depressed by the moving car but returning to its normal position after action, two vertical bell-crank levers (of peculiar construction, as hereinafter described) each pivoted to the casting or frame and each having one arm engaging with a bar attached to a system of levers connected to the switch and its other arm extended under the pedal and in such relation thereto that the depression of the pedal will effect the movement of the bell-crank lever; the effect of this arrangement being that the depression of one or the other of the pedals will effect the movement of the switch to one side or the other.

In the accompanying drawings:—Figure 1 is a view in elevation of a part of a car upon the rails and provided with an appliance to operate from the platform of the car for moving the switch, and also a view of a pedal projecting above the level of the road bed. Fig. 2 is a plan view of the switch and appliances for moving the same, a part of the covering plate being broken away to show the mechanism under the same. Fig. 3 is a side elevation of the casting or frame, pedals, bell-crank levers, and slotted bar. Fig. 4 is an

end elevation of the same; and Fig. 5 is a view partly in section and partly in elevation, of a device attached to the car and used to effect the movement of the switch.

In these several figures the same letters refer to the same parts.

Referring to the drawings, the letter A designates one end of a street car having suitable brackets under its platform in which are supported two spring plungers, B B, one on each side. The upper ends of these plungers project slightly above the level of the platform of the car so that they can be depressed by the feet of the driver or motor man, and each plunger at its lower end carries a roller C, which, when the plunger is depressed engages with the pedal D under the same.

Plungers operated from the car have been used on automatic railway switches and any suitable form may be used. In the form shown in the drawings the return of the plunger to its normal position, after having been depressed, is effected by means of the spiral spring E.

F is a plate of metal, preferably of cast iron, which is located midway between the rails of the track on the level of the road bed, and is firmly secured to a rectangular frame or casing G preferably of wood, supported in any suitable manner. This plate covers the mechanism for moving the switch and also the transverse rod H attached to the tongue I of the switch. The plate F is preferably from one to one inch and a half in thickness, and may be curved to correspond with the curvature of the road bed. In this plate are two rectangular elongated slots K parallel to one another and having their longer sides parallel to the rails of the track. The pedals D move in these slots, and at the surface of the plate the walls of the slots approach closely to the sides of the pedal, but are inclined outward, as shown in Figs. 3 and 4, the object being to permit the free movement of the pedal when depressed; but when the pedal is in its normal position to secure such a close approximation of the inclined sides of the pedal to the upper edges of the slot as will prevent water or other matter from entering the case or chamber inclosing the moving parts of the switch.

L is a box-like casting of iron having a base plate and walls M, N, at opposite ends, which is arranged within the wooden casing G.

The elongated pedals D are solidly constructed of iron and are each hinged to the back wall N of the box-like casting. The upper faces of these pedals are preferably slightly curved, so as to permit the easy passage of the roller over the surface of the pedal. The pedal is wider at the bottom than at the top and the sides are slightly curved, as are also the top edges, the object of this construction of the sides being to secure a tight fit of the pedal in the slot when the former is in its normal position. Upon the under side of the free end of the pedal is a projection P having a curved surface.

To the front wall M of the casting L are pivoted two bell-crank levers R and the lower arm *a* of each of these levers extends respectively under one of the pedals while the other arm *b* of each of the pedals engages a slot C in a bar S parallel with the wall M and pivoted to a lever T pivoted to the cross bar O on the casting. The switch tongue I is connected to this lever T by the rod H. The lever T is below the level of the top of the walls N and vibrates in recesses D cut in the edges of the walls and in which the movement of the lever is limited.

The movement of all the parts is so proportioned that when the switch is in one position the arm *a* of one of the levers R will be in contact with the end of that one of the pedals which is over that lever, while the arm *a* of the other lever will be depressed as shown in Fig. 3; but when the switch is turned in the other direction the position of the levers R will be reversed and the arm *a* of the other lever will be in contact with the pedal above the same. The curved form of the projections P in connection with the curved form of the arms *a* secures a movement of the levers R but with little friction. The return of the depressed pedal to its normal position after the passage of the roller C over the face of the same is effected by means of a spring. A suitable form and arrangement of the same is shown in Figs. 3 and 4. It will be observed that all the parts have a positive motion and that they are independent of each other, so that the movement of the tongue does not affect the movement of the pedals.

The operation of the device is as follows:—

When the car approaches the switch the driver or motorman depresses one or the other of the plungers, according to the direction in which he desires to move the switch tongue, and maintains this pressure on the plunger until he has passed beyond the pedal. The pedal is consequently depressed and acting upon the arm *a* of its bell-crank lever draws the bar S to that side of the casting. This movement of the bar S operates the lever T, which in turn moves the connecting rod H and switch

tongue. The elongated form of the pedals secures their depression for a sufficiently long time to effect the full movement of the switch.

In some cases it is desirable to locate the plunger B near the wheels of the car, in which case the device shown in Fig. 5 may be used. In this device the part (B') which is depressed by the foot of the driver or motor man is connected to the plunger by a system of levers (*e. f.*).

Having thus described my invention, what I desire to secure by Letters Patent of the United States is—

1. In a railway switch, the combination of a key or pedal adapted to be operated by a part on the car, a switch tongue moved by the action of the pedal, the pedal being detachably connected with the tongue, and means for automatically returning the pedal to the position in which it is engaged by the car without moving the tongue, as set forth.

2. In a railway switch, the combination of a key or pedal adapted to be operated by a part on the car, a chamber having a slot to receive the pedal and in which the latter is movable, a switch tongue moved by the action of the pedal, the pedal being detachably connected with the tongue, and means for automatically returning the pedal to the position in which it is engaged by the car without moving the tongue, as set forth.

3. In a railway switch, the combination of the keys or pedals D adapted to be operated by a part on the car, the bell-crank levers R detachably engaged by the pedals, transverse bar S, lever T, rod H, the switch tongue, and means constructed automatically to return the pedals to the position in which they are engaged by the car whereby the pedals will assume said position without moving the tongue, substantially as shown and described.

4. The combination, substantially as and for the purpose set forth, of the two elongated pedals arranged parallel to one another and parallel with and between the rails of a railway, the vertical bell crank levers independent of the pedals, each having one arm extending under a pedal respectively, and the other arm engaging a movable bar S transverse to the rails, the said bar, the rod H transversely to the switch tongue and a pivoted bar connecting said transverse bars.

5. The combination, substantially as and for the purpose set forth, of the box-like casting L, consisting of a base plate and walls M, N, elongated pedals hinged to the wall N, the bell-crank levers R. pivoted to the wall M, the slotted bar S, the lever T pivoted to the bar S, the bar H. connecting the switch tongue and the lever T, and the switch tongue I.

6. The combination of a casing G placed between the tracks of a railway and below

the level of the road-bed, the plate F supported on the casing having slots K with walls inclining outward, the casting L, pedals D D hinged to the casting and moving
5 in the slots, means for restoring said pedals to their normal position when pressure upon them has ceased, the projection P with curved faces on said pedals, the vertical bell-crank levers R pivoted to the casting, the
10 slide bar S, the lever T pivoted to the casting, the bar H, and the switch tongue I, all

constructed, arranged and operating as described.

In testimony whereof I have signed my name to this specification, in the presence of 15 two subscribing witnesses, on this 29th day of August, A. D. 1892.

PIERRE J. BORIS.

Witnesses:

ALEX. L. HAYES,
FRANK G. BARKER.