2 Sheets—Sheet 1.

L. H. PARKHURST.

Switch-Operating Mechanism.

No. 227,089. **Patented April 27, 1880.**

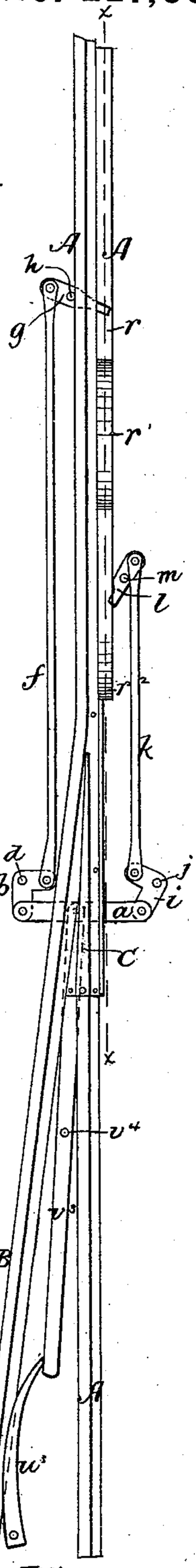
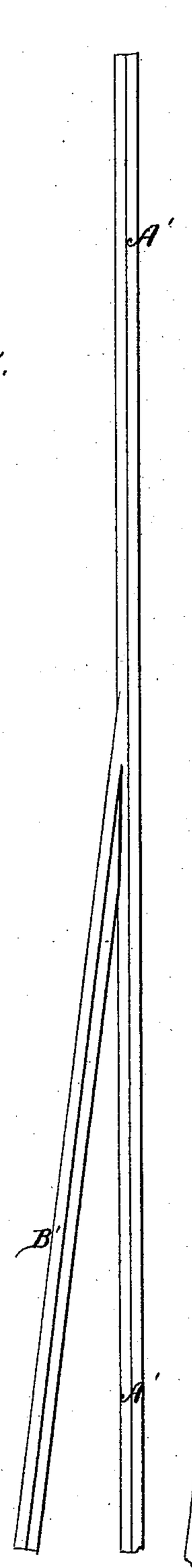


Fig. 1.



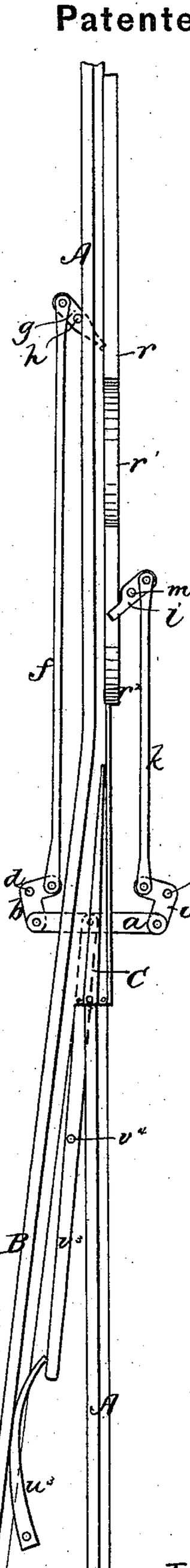
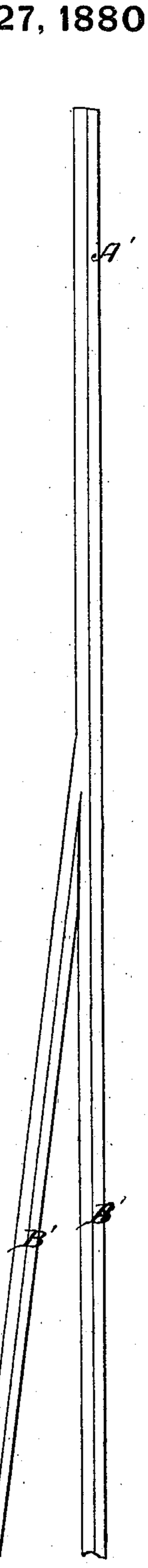


Fig. 2.



Witnesses.
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Geo. W. Pierce.

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by Wright Brown
Attys.

2 Sheets—Sheet 2.

L. H. PARKHURST.

Switch-Operating Mechanism.

No. 227,089. **Patented April 27, 1880.**

Fig. 3.

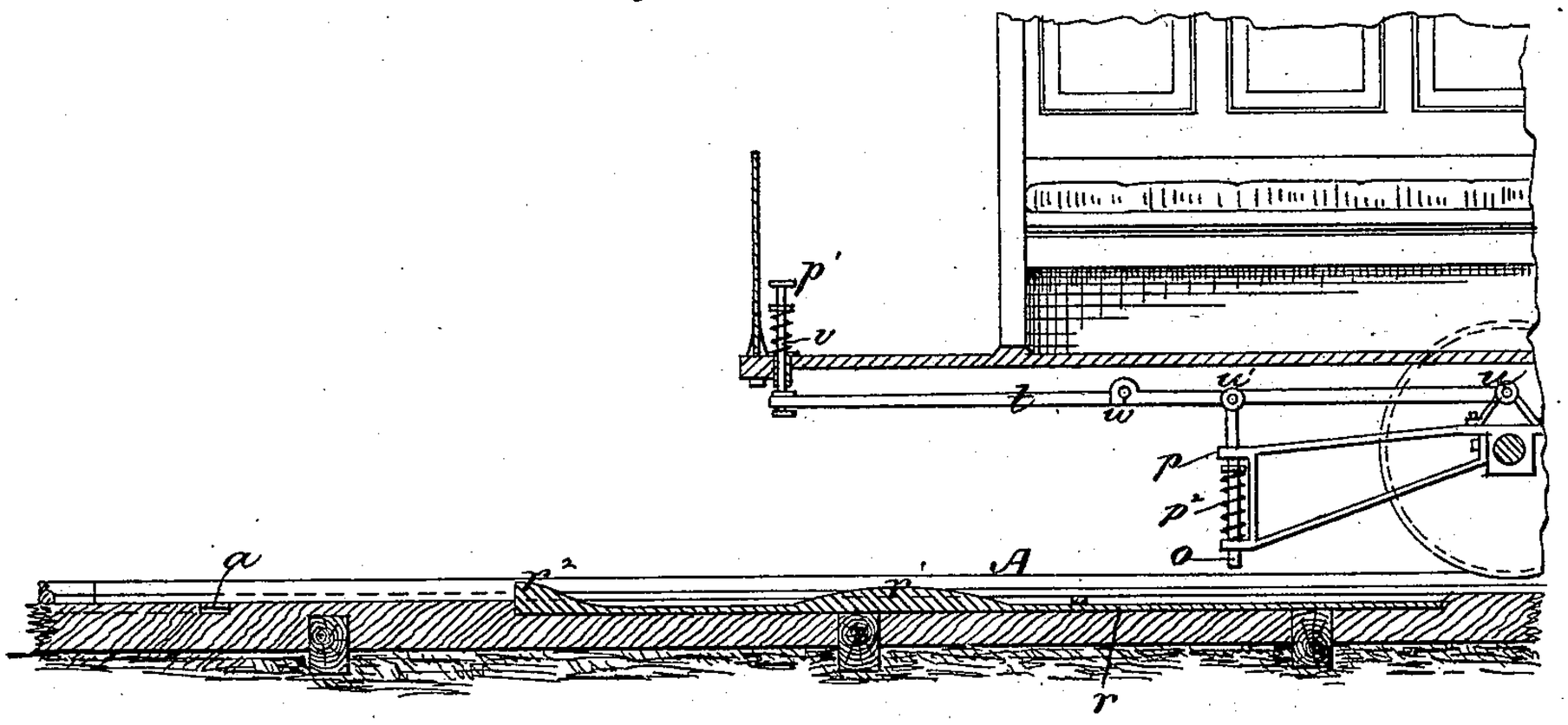
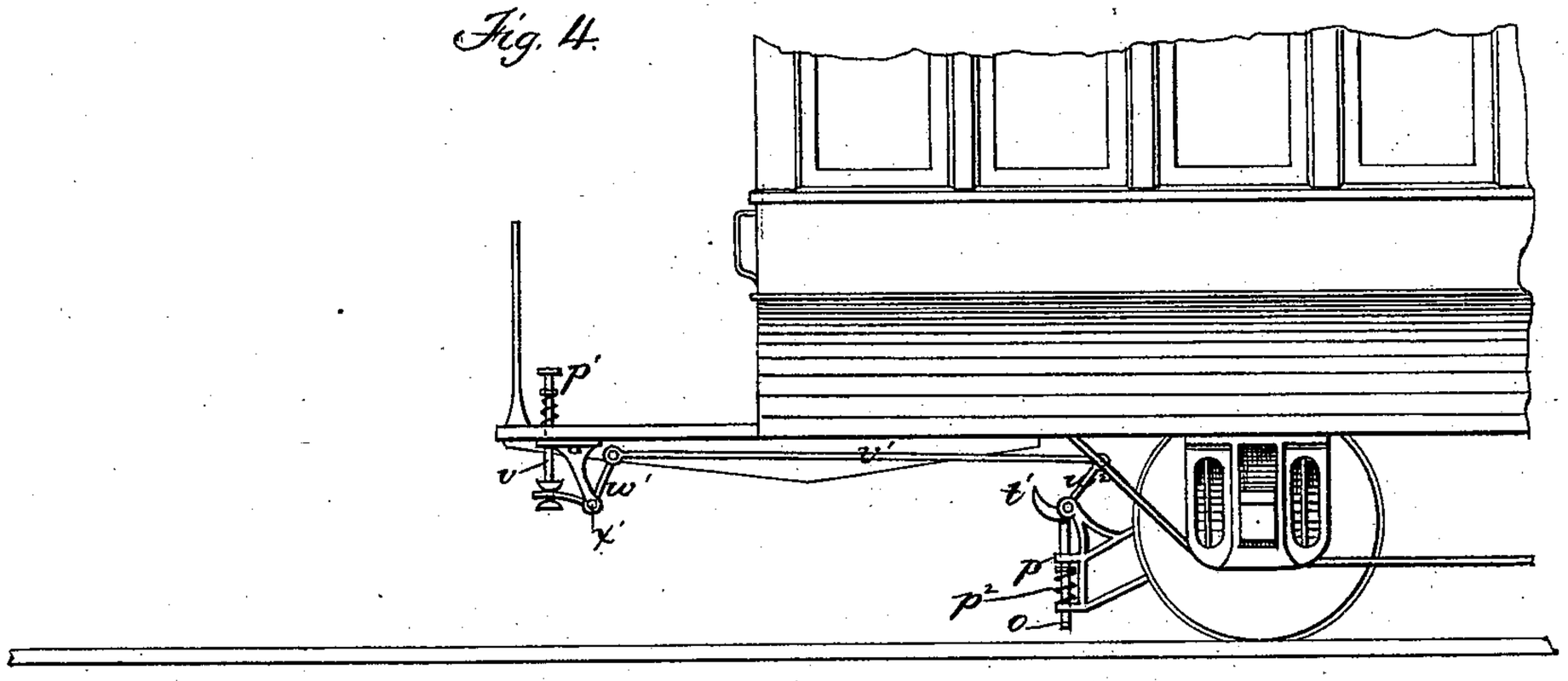


Fig. 4.



Witnesses.
L. W. Fairchild
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UNITED STATES PATENT OFFICE.

LOUIS H. PARKHURST, OF BOSTON, MASSACHUSETTS.

SWITCH-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 227,089, dated April 27, 1880.

Application filed August 14, 1879.

To all whom it may concern:

Be it known that I, LOUIS H. PARKHURST, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Switch-Operating Mechanism, of which the following is a specification.

This invention has for its object, first, to provide means whereby a switch-rail at a branch or siding of a street-railroad track can be operated by an approaching car to connect the branch with the main track; secondly, to provide means whereby the switch-rail can be operated by an approaching car to make the main track continuous when the branch has previously been connected with the main track; thirdly, to provide means whereby the switch-rail can be operated by a receding car on the branch track to make the main track continuous.

To these ends my invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a plan view of a portion of a street-railroad track provided with my invention, having a branch or side track, showing the main track continuous and the branch disconnected. Fig. 2 represents a similar view, showing the branch connected to the main track. Fig. 3 represents a vertical section of a portion of a street-car, showing a part of the track. Fig. 4 represents a side view of a portion of a street-car, showing a modification.

Similar letters of reference indicate like parts in all the figures.

In the drawings, A A′ represent the main-track rails of a street-railroad. B B′ represent the rails of a branch or side track; and C represents a pivoted switch-rail located on the main-track rail A, and adapted to be moved to make said rail continuous, as shown in Fig. 1, or to connect the rail B of the branch therewith, as shown in Fig. 2.

The arrangement of the rails A A′, B B′, and C is of the usual or any suitable kind, and forms no part of my invention; and it will be understood that when the switch-rail is in the position shown in Fig. 1 a car approaching on the main track in the direction indicated by the arrow will continue on the main track, and when the switch-rail is moved to the position shown in Fig. 2 the car will leave the main track and run onto the branch.

Heretofore, so far as I am aware, excepting in cases where the apparatus known as the "platform-switch" is employed, the switch-rail has had to be moved from one position to the other by an attendant, and often the car has to be stopped while the switch-rail is being moved.

In carrying out my invention I provide means whereby the approaching car on the main track is enabled to move the switch-rail from either of the positions shown to the other position without requiring the services of a special attendant or the stoppage of the car. Said means are divided, preferably, into two independent parts, the first for moving the switch-rail to connect the branch with the main track, and the second for making the main track continuous. Each of said parts co-operates with an attachment on the car, and each part consists, essentially, of a lever or movable device located in close proximity to one of the main-track rails, and adapted to be moved by the attachment on the car, and intermediate mechanism connecting said lever or movable device with the switch-rail.

In the embodiment of my invention shown in the drawings the switch-rail is connected to a transverse movable plate, *a*, located under the rails A B, and adapted to slide longitudinally. One end of the plate *a* is pivoted to a bell-crank lever, *b*, which is pivoted at *d* to a fixed bed or support. The bell-crank lever *b* is connected by a long rod, *f*, with a short lever, *g*, which is pivoted at *h* to a fixed support, and extends under the rail A, its inner end projecting beyond the flange of the rail, and being exposed when the switch-rail is in the position shown in Fig. 1, so that it will lie in the path of a movable attachment, hereinafter described, on a car, and be turned on its pivot by said attachment. The motion thus given the lever *g* is imparted, through the connecting-rod *f* and bell-crank lever *b*, to the plate *a* and switch-rail C, and the latter is moved to the position shown in Fig. 2.

The lever *g* is located at a sufficient distance from the switch-rail to enable the attachment on the car to act on said lever before the car

reaches the switch-rail. The plate *a* is also connected to a bell-crank lever, *i*, which is pivoted to a fixed support at *j*, and is connected by a rod, *k*, with a lever, *l*, which is pivoted at *m*, and is located in close proximity to the rail A, preferably nearer the switch-rail than the lever *g*.

When the switch-rail is in the position shown in Fig. 1 the lever *l* is arranged to lie outside of the path of the attachment on the car, so that the lever will not be moved by the attachment; but when the switch-rail is in the position shown in Fig. 2 the lever *l* is turned so that its end lies nearer the rail A and within the path of the attachment, so that the latter will strike the lever and turn it on its pivot, thereby moving the switch-rail, through the levers *k i* and plate *a*, to the position shown in Fig. 1. The lever *l* is also at such distance from the switch-rail as to enable the last-described operation to be performed before the car can reach the switch-rail.

The above-mentioned attachment on the car may be made in a variety of forms, the essential features being that it shall be adapted to be displaced from its normal position by an attendant on the car, and when displaced it shall project to strike the lever *g* or the lever *l*, as the case may be.

In the present instance the attachment consists of a bolt, *o*, (shown in Figs. 3 and 4,) adapted to rise and fall in guides *p*, attached to the car-truck, and operated by a lever or a system of levers terminating in a pedal, *p'*, or other suitable device on the car-platform within convenient reach of the driver. By depressing the treadle the driver is enabled to depress the attachment *o*, and when the treadle is released a spring, p^2, raises the attachment above the plane in which the levers *g l* lie. In Fig. 3 the means for depressing the rod *o* are a lever, *t*, pivoted at *u* to the car-truck, pivoted at *u'* to the rod *o*, and having a slot in its outer end which receives the treadle-rod *v*, the latter having shoulders above and below the lever.

The lever *t* has a rule-joint, *w*, which permits the outer end of the lever to swing upwardly without moving the rod *o* in case the end of the car-body should tilt or move upwardly.

In Fig. 4 the bolt *o* is depressed by a cam, *t'*, which is rotated by means of an arm, u^2, attached to said cam, a rod, *v'*, pivoted to said arm, a bell-crank lever, *w'*, pivoted to the rod *v'* and to a bracket on the car-platform at *x'*, and a treadle-rod, *v*, passing through one arm of the lever *w'* and having shoulders above and below said lever. This arrangement allows considerable freedom of movement of the end of the car-body independently of the trucks.

r represents a smooth bed-plate lying beside the rail A under the path in which the attachment *o* moves when depressed. Said plate affords a smooth bearing for the end of the attachment *o*, preventing the latter from being injured by striking against angles or rough surfaces, such as would be afforded by the pavement adjoining the track, and affording a support for the end of the levers *g l*, which prevents said levers from being bent by heavy downward pressure.

The plate *r* may be of any desired length. I prefer to extend it far enough from the switch-rail to enable the driver to depress the attachment *o* a considerable length of time before the attachment reaches the lever *g*, so as to afford plenty of time for the operation.

Between the levers *g l*, I provide the plate *r* with a raised portion, *r'*, which is adapted to raise the attachment *o* after the lever *g* has been turned, and before said attachment reaches the lever *l*, thereby preventing the driver from inadvertently holding the attachment down and operating the lever *l* immediately after operating the lever *g*. I also provide the plate *r* with a raised portion, r^2, adapted to lift the attachment as it reaches the end of the plate *r*, to prevent the attachment from being carelessly held down until it strikes the pavement beyond the plate *r*.

When it is desirable to make the main track continuous after a car has passed onto the branch, I provide automatic means whereby the car leaving the main track on the branch moves the switch-rail to the position shown in Fig. 1. Said means consist of a pivoted curved lever, w^3, located by the side of the rail B, and a lever, v^3, pivoted at v^4, connected at one end to the plate *a*, and bearing at its other end against the lever w^3. Said lever w^3 is in such proximity to the rail B when the switch-rail is in the position shown in Fig. 2 that it will be moved away from the rail B by the flange of a car-wheel passing over said rail. The motion thus given the lever w^3 is imparted to the switch-rail through the lever v^3, and moves the switch-rail to make the rail A continuous, as shown in Fig. 1.

The last-described mechanism is intended for regular use, and the devices whereby the switch-rail is made continuous by the approaching car on the main track are provided for occasional use—as, for instance, when the automatic devices above described fail to leave the main track continuous, or when a car intended to run on the main track accidentally operates the lever *g*, and thereby connects the branch with the main track.

Heretofore it was proposed to run cars from a crossing by placing at such crossing a frog having projecting arms, against which the car-wheels impinged to set the frog to one or the other of the crossing rails.

Having every reason to believe that I am not the first inventor of the combination, with a pivoted switch-point, of a rearwardly-extending lever or heel and mechanism connected therewith to reset the switch-point to the main line by the wheel of the car after the car has passed the point upon the siding, I hereby disclaim such combination.

I clain as my invention—

1. A switch-operating mechanism consisting of a horizontally-vibrating switch-point

and shifting-levers attached thereto and operated by mechanism on a car to direct said car from the main to a side track, or to continue it upon the main track, and mechanism to automatically make the main track continuous upon the passage therefrom of a car to the branch, substantially as shown and described.

2. The combination, with a switch-point, of two independent sets of switch-operating levers arranged to be actuated by mechanism on the car, and in conjunction with the switch-rail of the main track and forward of the switch-point, substantially as and for the purpose described.

3. The combination, with a switch-point, of two sets of switch-operating levers arranged forward of the switch-point alongside the main-track rail, and operated independently to open a siding or make continuous the main track, substantially as described.

4. The combination, with the pivoted switch-rail, of a transverse sliding plate, *a*, connected to the switch-rail, a pivoted curved lever, w^3, adapted to be moved laterally by a car-wheel passing over the track, and a pivoted lever, v^3, adapted to communicate the motion of the curved lever w^3 to the switch-rail, as set forth.

5. The raised surface or plate r', located by the side of the main-track rail between the levers *g* and *l*, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 7th day of August, 1879.

LOUIS H. PARKHURST.

Witnesses:
GEO. W. PIERCE,
C. F. BROWN.