

(No Model.)

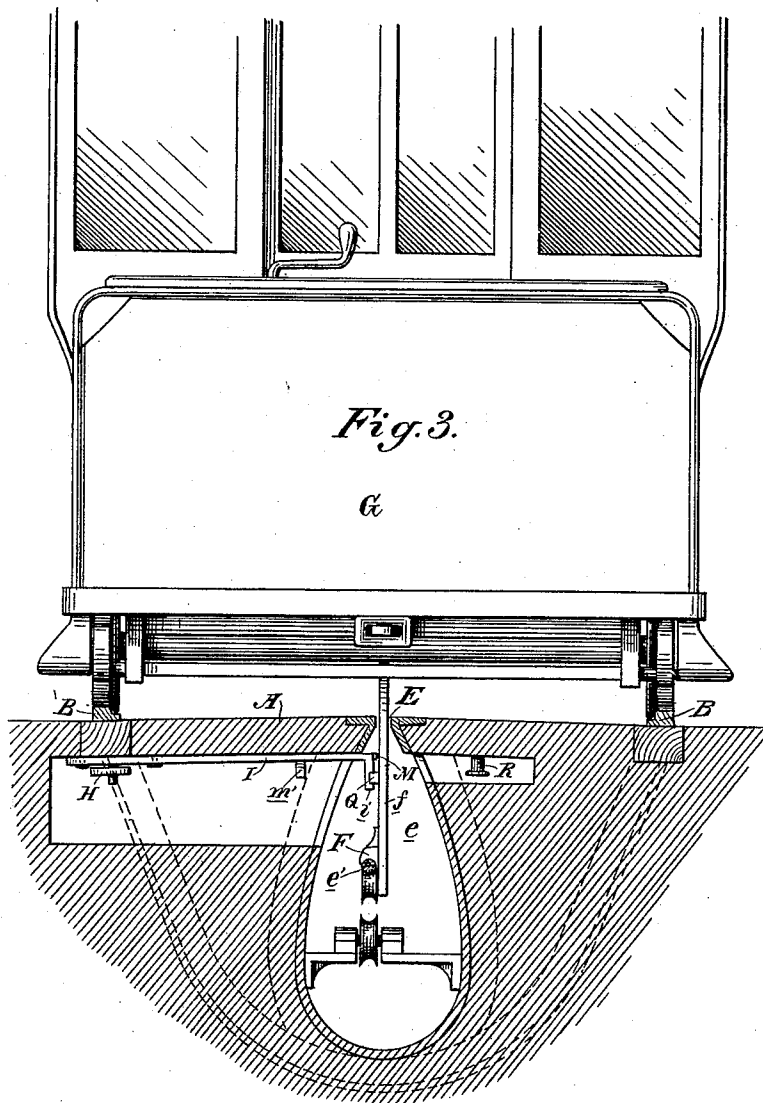
2 Sheets—Sheet 2.

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AUTOMATIC SWITCH FOR CABLE RAILWAYS.

No. 429,869.

Patented June 10, 1890.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC SWITCH FOR CABLE RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 429,869, dated June 10, 1890.

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To all whom it may concern:

Be it known that I, HOUGHTON SAWYER, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Automatic Switches for Cable Railways; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates generally to the class of cable railways, and especially to those switch mechanisms which are designed to be operated automatically by the passing car.

My invention consists in the novel construction and arrangement of the switch-operating levers hereinafter fully described, and specifically pointed out in the claims.

The general object of my invention is to effect an economy in the operation of the road by dispensing with the services of a switchman, effecting this result by a mechanism adapted to be operated automatically by the grip-shank of a passing car.

The particular object of my invention is to provide a simple, effective, automatic switch mechanism of that class in which one or more levers are pivoted within the tube or tunnel of the railway, said levers being connected with the throw-rail of the switch and adapted to be operated by the passing grip.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a bottom view of my mechanism within the tube or tunnel. Fig. 2 is a top view of the road-bed, showing the main and branch tracks and the switch or throw rail. Fig. 3 is a vertical cross-section of the tube or tunnel, showing a car in end elevation.

A is the road-bed of the railway, having the main-line track B and the branch-line track C. D is the usual switch or throw rail. E and E' are the continuous slots of the main and branch line tubes or tunnels *e*, in which the cables *e'* are supported and travel, and through these slots passes the shank or stem *f* of the grip F, which is secured to the car G, traveling on the road-bed above. All these parts constitute or form portions of an ordinary cable railway.

Within the upper portion of the main tube or tunnel, and supported by suitable means,

is the main lever H. This lever is pivoted at the point *h* and has one of its ends provided with a slot *h'*, fitting over and engaging a downwardly-extending pin passing through an elongated opening *a* in the road-bed, and its upper end attached to the switch or throw rail D. The other end of the main lever H is connected suitably with a slide-bar I, secured and guided suitably in the top of the tube or tunnel, having a downwardly-extending end flange *i*, as shown. This slide-bar I is simply one means of obtaining contact of the grip with lever H, as will be presently explained.

J is the return-lever for the switch-rail, pivoted at *j* in the top of the branch-line tube or tunnel, and having its free or outer end adapted to be projected partially or completely across the plane of the grip-slot of the branch line, whereby the passing grip-shank is adapted to come in contact with it and force it to one side. The other end of this lever is connected to the adjacent end of an intervening link L, pivoted freely at *l*, and having its other end freely connected, as by slot and pin, (shown at *l'*), with the end of a set-lever M, which is pivoted at *m*. This set-lever extends in a normal position at one side of and parallel with the main slot and crosses the branch slot at its point of junction with the main slot. On its inner edge it is provided with a contact-flange *m'*, against which an arm O, extending from the main lever H, is adapted to impinge.

The operation of the mechanism as far as described is as follows: When in a normal position, (and by this I mean when the main-line track is open,) the main lever H and its connected parts lie entirely on one side of the main-line slot. The set-lever M lies wholly upon the same side and does not project into the plane of said slot, so that it is entirely unobstructed. Now upon the grips of those cars which are intended to turn off to the branch track I provide on one side of the grip-shank an inclined lug or cam Q, which is adapted to come in contact with the end flange *i* of the slide-bar I and move it in a direction at right angles with the slot. On those cars which are intended to proceed upon the main track I do not place upon their grips such a

lug or cam, and therefore they are enabled to pass by this mechanism without affecting it and continue upon the straight or main track. Now when the car here shown, which is a
 5 branch-line car, approaches the switch the cam or inclined lug Q on the side of its grip-shank comes in contact with the flange i of the slide-bar I and forces said bar over. This movement turns the main lever H on its piv-
 10 otal center, thereby throwing the switch-rail D over to open the branch track. This same movement of the lever accomplishes a second result—namely, its arm O comes in contact with the flange m' on the edge of the set-lever
 15 M, thereby throwing the point of said lever over toward the grip-slot of the main line, and so that it partially crosses the plane of said slot. The grip of the car upon reaching said set-lever M now passes its shank on one
 20 side thereof, so as to throw it still farther over, thereby fully opening the grip-slot of the branch track and closing the grip-slot of the main track, said lever being limited by any suitable stop, as shown by R. This
 25 movement of the set-lever also acts to throw the return-lever J across the plane of the grip-slot of the branch track, so that when the car reaches that point on the branch track its grip, coming in contact with said re-
 30 turn-lever, will throw the set-lever back to its former position, and said set-lever, coming in contact with the arm O of the main lever, will return said lever to its normal position, thereby returning the throw-rail to open the
 35 main track, and returning the slide-bar I to position to be operated upon by the next branch-line car, but leaving the way unob-structed for the main-line car.

The slide-bar I, as heretofore mentioned,
 40 is only to effect a convenient contact between the inclined lug or cam Q on the grip-shank and the lever H. It is not essential as an intermediary, for the contact between lug and lever might be direct by locating the lever
 45 end nearer to the plane of the grip-slot by bending or curving said end, or by making the lug wider, all of which constructions are well known in this class of devices.

I am aware that in automatic switches of
 50 this general class it has been proposed to use pivoted levers in the tube or tunnel which traverse the path of the traveling grip, whereby said grip acts upon them, and through
 55 suitable connections moves the throw or switch rail. I do not, therefore, claim herein, broadly, the employment of such pivoted levers and connections with the switch or
 60 throw rail. In my device it will be observed that the arrangement is such as to keep the main line normally open with no obstructions whatever, and consequently no interference with its continuous grip-slot, so that the main-
 65 line cars pass always without any obstruction or without the necessity of operating any de-vice; but when the branch-line car approaches it is provided with the lug or cam, which is necessary to reach over to one side of the slot

and engage the operating devices. It will also be observed that my switch-operating main lever does not approach the grip-slot, 70 but is entirely to one side of it, and in no wise interferes with the passing grip, and, further, that the end of said lever is connected di-rectly with the throw or switch rail without the intervention of other levers, links, &c., 75 thus presenting a simple and effective construction and not liable to get out of order.

If found desirable, in order to avoid any danger (which may be due to a jar or other movement) of displacing the set-lever M, I 80 may provide a suitable automatic clamp catch or latch for holding said lever firmly in position and releasing it when required. Though any such device may be used—as, for ex-ample, a simple latch—I have here shown a 85 clamp which consists of oppositely-pivoted jaws S, which are adapted to engage a pin or stud s on the set-lever. These jaws are piv-oted to one another by a pin s' , which is seated in the tube or tunnel and provides a fixed 90 fulcrum, and their other ends are freely slotted over pins s^2 on the main lever, whereby they are connected with and operated by said lever. Their operation is as follows: When the set-lever M is moved back by the return-lever J 95 to its normal position, and thereby returns the main lever to its normal position, said lever, drawing backwardly on the ends of the piv-oted jaws, closes said jaws upon the pin s of the set-lever, and as long as the parts are in 100 this position said lever is held and will not be liable to be displaced; but when the passing grip operates the parts, as heretofore de-scribed, the main lever, moving forwardly, presses against the ends of the jaws, thereby 105 spreading them and releasing the pin of the set-lever, so that it may be pushed over by the arm O.

Having thus described my invention, what I claim as new, and desire to secure by Letters 110 Patent, is—

1. In a cable railway, a switch-operating mechanism consisting of a pivoted main lever lying wholly to one side of the grip-slot and connected at one end with the throw-rail of the 115 switch, a projection on the side of the grip-shank of the moving car for operating the main lever to move the throw-rail of the switch, a pivoted set-lever lying normally to one side of the grip-slot of the main line and 120 crossing the grip-slot of the branch line, and a connection between the main lever and set-lever for moving the latter over into the path of the grip, whereby said grip throws it fully over to open the branch-line slot, substan- 125 tially as herein described.

2. A switch-operating mechanism for cable railways, consisting of the pivoted main lever connected at one end with the throw-rail of the switch, the pivoted return-lever adapted 130 to cross the plane of the grip-slot of the branch line, the pivoted set-lever connected with said return-lever, a contact-connection between said set-lever and the main lever, whereby the

set-lever is thrown into the path of the moving grip to throw the return-lever into said path, and a projection or cam on the side of the grip of the moving car for operating the main lever, substantially as herein described.

3. In an automatic switch mechanism for cable railways, the combination of the pivoted main lever connected at one end with the throw-rail of the switch, the pivoted return-lever adapted to cross the plane of the grip-slot of the branch track, the pivoted set-lever and a connection between it and the return-lever, the arm of the main lever for coming in contact with the set-lever, and the projection or cam on the side of the grip of the moving car for operating the switch-operating main lever, substantially as herein described.

4. In a switch-operating mechanism for cable railways, the combination of the pivoted main lever connected with the switch or throw rail, the pivoted set-lever operated thereby, and the return-lever connected with said set-

lever, and a catch latch or clamp for automatically engaging and disengaging the set-lever to hold it in place and release it, substantially as and for the purpose herein described.

5. In a switch-operating mechanism for cable railways, the pivoted switch-operating lever, the pivoted set-lever, and the pivoted return-lever connected therewith, in combination with the pivoted jaws adapted to engage a pin or lug of the set-lever to hold it in position, the ends of said jaws being connected with the switch-operating lever, whereby they are operated to automatically engage and disengage the set-lever, substantially as herein described.

In witness whereof I have hereunto set my hand.

HOUGHTON SAWYER.

Witnesses:

C. D. COLE,
J. H. BLOOD.