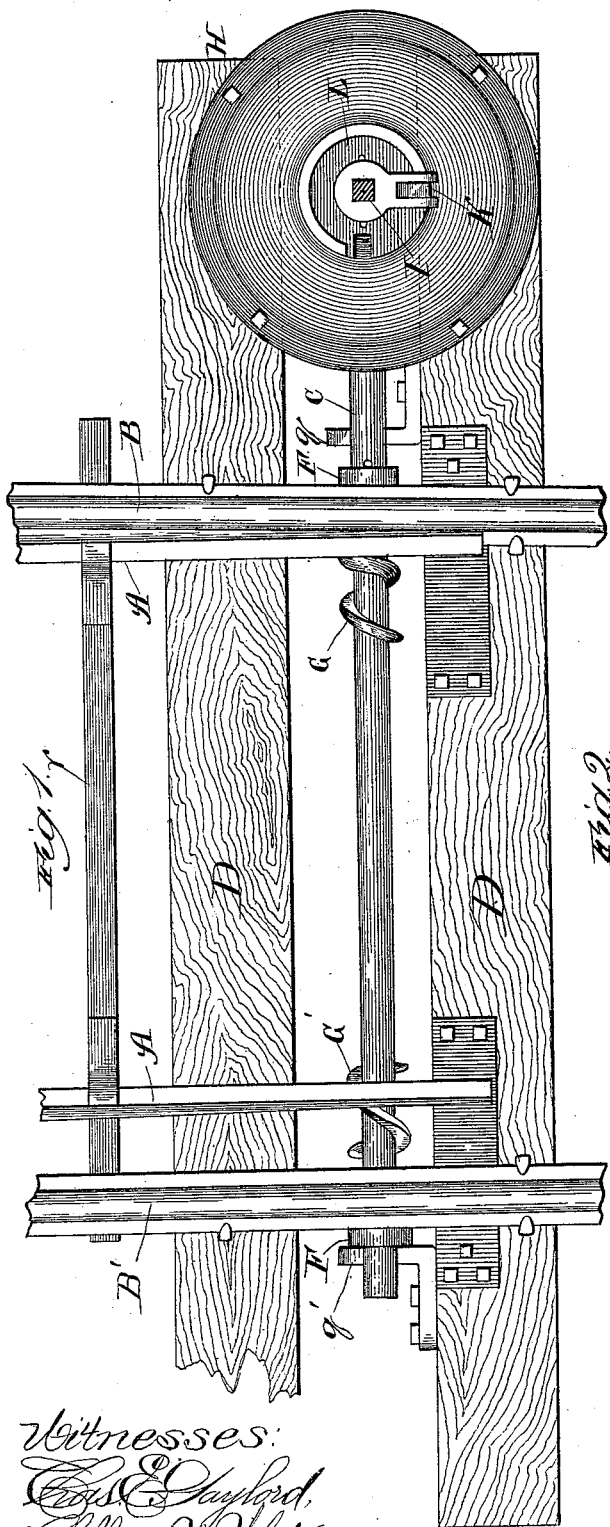


(No Model.)

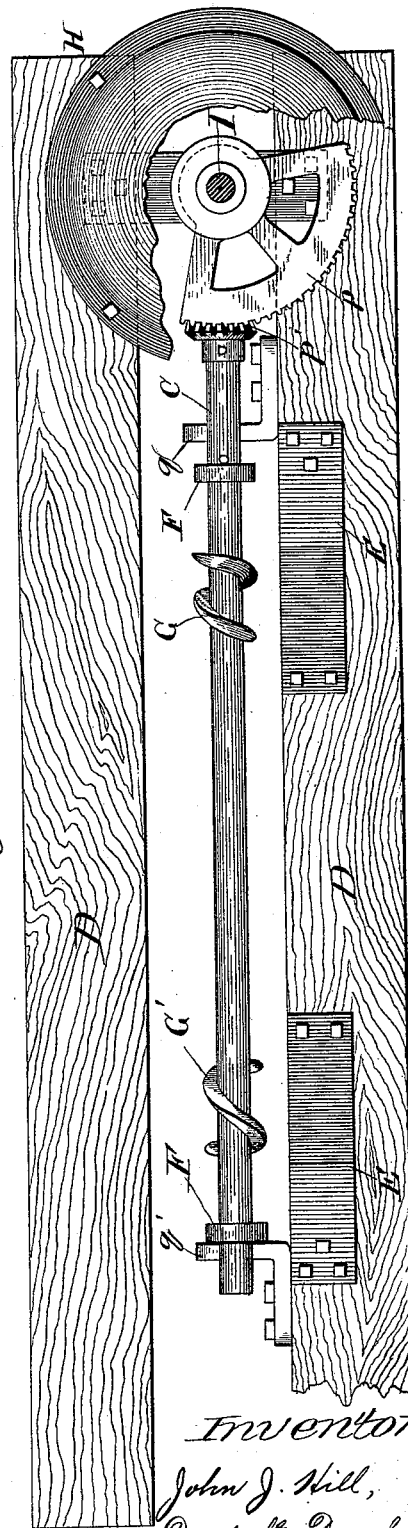
J. J. HILL.  
RAILROAD SWITCH APPLIANCE.

No. 419,443.

Patented Jan. 14, 1890.



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# UNITED STATES PATENT OFFICE.

JOHN J. HILL, OF CHICAGO, ILLINOIS.

## RAILROAD-SWITCH APPLIANCE.

SPECIFICATION forming part of Letters Patent No. 419,443, dated January 14, 1890.

Application filed October 15, 1889. Serial No. 327,055. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN J. HILL, a subject of the Queen of Great Britain, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Railroad-Switch Appliances, of which the following is a specification.

My invention relates to an improvement in the class of devices employed on railroads for controlling the switches, and the common form of which involves for each device a switch-stand having its spindle connected with the switch-rails (which are tied together) by a connecting-rod reciprocated longitudinally back and forth by turning the switch-stand spindle to produce throwing of the switch. In an appliance involving the construction thus generally outlined, the locking of the switch in the position to which it is thrown is accomplished solely by locking means provided on or at the device from which the switch is operated, and which is commonly a suitable form of switch-stand, and as the throw of the switch in either direction is limited, in the sense that it is invariable as to its extent, if the main rails or either of them happen to have spread, as they frequently do, the extent of throw of the switch-rail is insufficient to cause it to reach the adjacent main rail, thus leaving them separated. This has in the past been the cause of many serious accidents to trains by derailing them in passing over the switches, and is liable to continue a cause with the common construction of switch appliance referred to.

The object of my improvement is to provide a construction of switch-operating appliance which shall serve to accomplish the throwing of the switch-rails by a positive rotary action of the switch-bar against each switch-rail, the switch-bar being connected with and actuated from the switch-stand; and it is also my object to provide on the switch-bar itself means for locking each switch-rail against the main rail toward which it is thrown, and also means thereon for holding the main rails against spreading with relation to each other or to the switch-rails.

In the accompanying drawings, Figure 1 is a plan view of my improvement shown as

applied in operative position to the switch in a railroad-track, of which a broken portion is represented; and Fig. 2 is a similar view, partly broken, showing my improved device without the rails of the track.

A and A' are the rails of a split switch, and B and B' the main rails of the track. These parts may be of the ordinary construction, involving tie-bars *r* for the point-rails.

C is the switch-bar, which should be in the form of a cylindrical rod, as shown, extending across the bases of the rails near the points of the switch-rails A and A', being supported in suitable bearings, as by brackets *q* and *q'*, secured to the side of a head-block D, on which are also fastened the bed-plates E for the point-rails. On the bar C, against the outer edge of each main rail B and B', is a stop F, preferably in the form of a collar, and the stops serve to brace or confine the main rails against spreading. On the switch-bar, near opposite ends of the portion thereof extending between the main rails, are screw-threads in the form of worms G and G', each of which, as shown, extends about once and a half around the bar, though it may extend further. Between each stop F and the adjacent end of the worm nearest it is sufficient space, and preferably somewhat more than sufficient to accommodate a main rail, which crosses the bar C, with its inner flange, or, at least, the base thereof, lower than the height of the worm-thread, and the pitch of each worm affords sufficient width between all points thereon in a straight line from each other lengthwise of the switch-bar to accommodate the point-rail crossing the bar C, with their bases reaching below the height of the worm-threads. It will be noticed that the two worms do not correspond exactly as to their relative positions on the switch-bar—that is to say, the corresponding ends should not be in line with each other. This is to avoid their both beginning to act simultaneously, the one to unlock one switch-rail when the opposite one begins to throw the other switch-rail, the unlocking worm thus always having some lost motion to perform its function before the throw by the other worm is begun. The switch-bar C leads to an operating device, which may be in the form of a switch-

stand H, having its spindle I provided toward its lower end with a suitable gear—such as the segmental rack *p*—engaging with a suitable gear—such as the beveled gear-wheel *p'*—on the adjacent end of the switch-bar, and toward its upper end the spindle carries the operating-lever K, (shown to be of the common drop-lever form,) which serves to lock the appliance by being permitted to swing into a notch in a table L of the switch-stand at each end of the throw.

The operation is as follows: With the parts in the relative positions shown in the drawings the switch-rail A is locked against the main rail B. This condition was produced by turning the spindle I toward the right to cause the gear mechanism to rotate the switch-bar accordingly, and thereby cause the thread of the worm G to play against the inner side of that switch-rail to force it to the end of its throw, the turning being, however, slightly further than to effect the throw in order to bind or wedge the switch-rail, and thus effectually lock it against the respective main rail B. When the switch requires throwing in the opposite direction, the spindle I is turned accordingly, and effects release or unlocking by the worm G of the rail A before the worm G' begins to bear against the inner side of the base of the switch-rail A' to throw the latter, and locking of this last-named rail is produced in the same manner as described of the rail A. It will be noticed that the only real strain on the worms, which are formed of steel, is their pressure exerted from the switch-stand against the switch-rails, since the strain of a passing train does not by the outward pressure of the flanges of its wheels (which do not of course reach down to the worms) against the inner sides of the switch-rails exert any strain against the worms, and that the main rails are firmly clamped by the stops F against spreading, so that the throw of the switch-rails is always sufficient to meet the main

rails and effect locking against the latter of the switch.

The construction illustrated and described may be variously changed without departing from the spirit of my invention; hence I do not wish to be understood as limiting my invention to the exact details shown and described.

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

1. In a railroad-switch appliance, a rotary switch-bar C, having worms G and G' to engage the switch and provided with stops F for the main rails, substantially as and for the purpose set forth.

2. In a railroad-switch appliance, a rotary switch-bar C, having worms G and G' to engage the switch and provided with stops F for the main rails, and a switch-stand H, having its spindle geared to the switch-bar, substantially as and for the purpose set forth.

3. In combination with the main rails B and B', switch-rails A and A', a rotary switch-bar C, supported to extend below and across the said main and switch rails and provided with worms G and G', respectively, engaging the rails A and A', and with stops F, confining the main rails against spreading, substantially as and for the purpose set forth.

4. In combination with the main rails B and B', switch-rails A and A', a rotary switch-bar C, supported to extend below and across the said main and switch-rails and provided with worms G and G', respectively, engaging the rails A and A', and with stops F, confining the main rails against spreading, a gear-wheel *p'* on the bar C, and a switch-stand H, having a gear *p* on its spindle engaging with the gear *p'*, the whole being constructed and arranged to operate substantially as described.

JOHN J. HILL.

In presence of—

W. H. DYRENFORTH,  
H. J. FROST.