(No Model.)

2 Sheets—Sheet 1.

# A. WULFF.

## AUTOMATIC RAILROAD SWITCH.

No. 314,554. Patented Mar. 24, 1885.

Fig. 1.

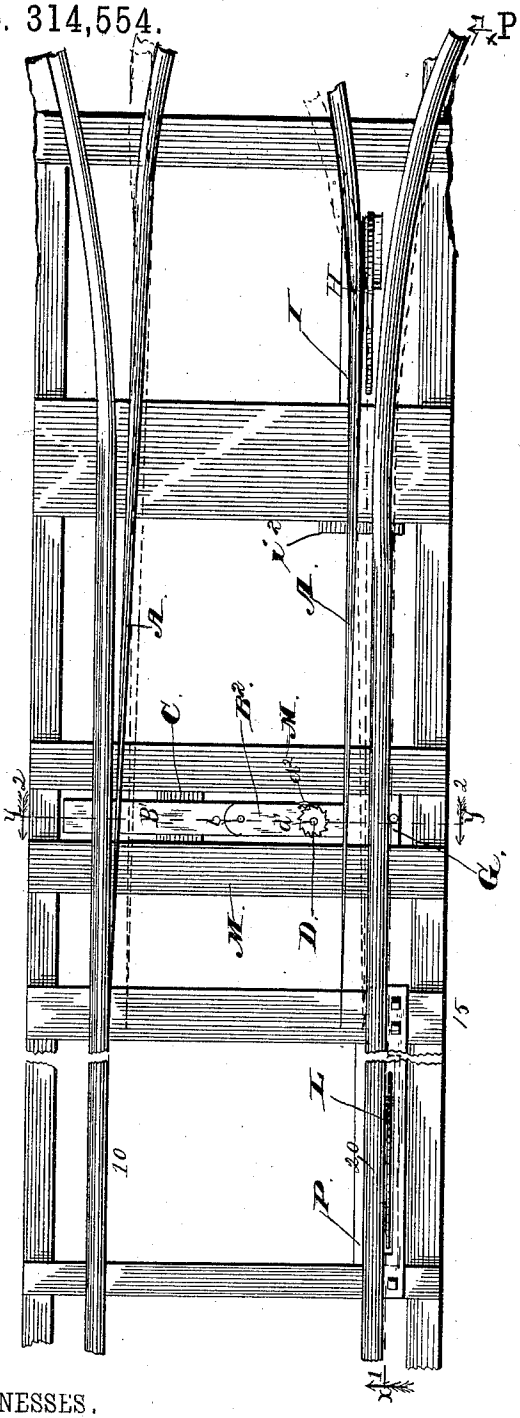
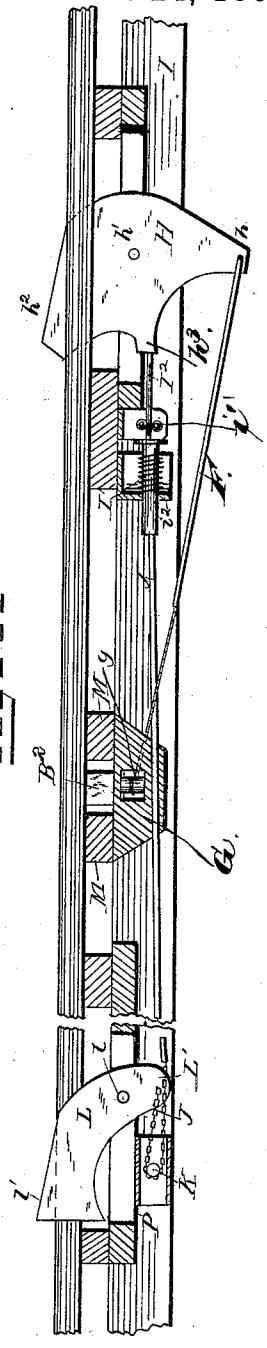



Fig. 2.




WITNESSES.

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D. C. Watson

INVENTOR

Adolph Wulff

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ATTORNEY

(No Model.)

2 Sheets—Sheet 2.

# A. WULFF.

## AUTOMATIC RAILROAD SWITCH.

No. 314,554. Patented Mar. 24, 1885.

Fig. 3.

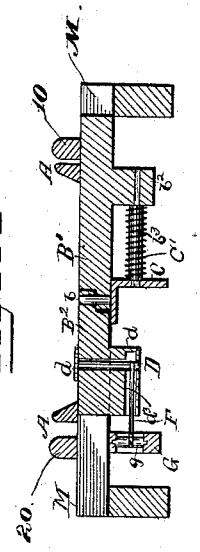
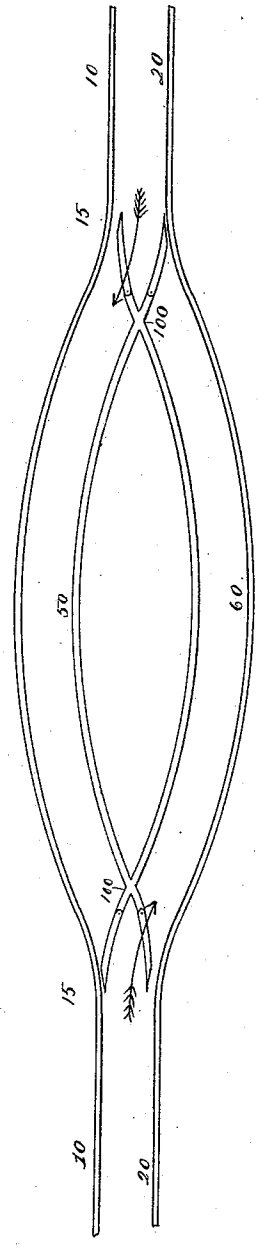



Fig. 4.

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# UNITED STATES PATENT OFFICE.

ADOLPH WULFF, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO ALEXANDER RAMSEY, OF SAME PLACE.

## AUTOMATIC RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 314,554, dated March 24, 1885.

Application filed April 28, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLPH WULFF, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Automatic Railroad-Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to automatic switches for railroad-tracks; and the novelty consists in the construction, arrangement, and adaptation of parts, as will be more fully hereinafter set forth, and specifically pointed out in the claims.

The invention appertains to that class of single-track railroads in which, at designated points along the route, a double track is laid, in order that one train may pass another, each train taking the double track to the right, and each train automatically opening the switch to the main track as it leaves the double-track portion. This arrangement of tracks and automatically-moving switch-rails has been before devised, and springs have been employed to replace the switch-rail in order that the next train in the opposite direction may take the double track to the right and avoid catastrophe; but springs in such relations are not reliable, loss of power due to frequent expansion and contraction, owing to changes of temperature, and snow upon the track being serious objections to their use.

The object of this invention is to provide a positive means for operating the switch-rails to open the way automatically from the double to the main track, a positive means for locking it thus open until the train has entirely left the double track and has proceeded a distance upon the main track, and positive means for unlocking the switch-rails to allow them to assume their normal position.

To these ends the invention consists in the mechanisms and combinations of mechanisms fully illustrated in the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a top plan view of a section of a railroad-track with my improved switch in position. Fig. 2 is a longitudinal vertical section on the line *x x* of Fig. 1, looking in the direction indicated by arrows 1. Fig. 3 is a transverse section taken on the line *y y* of Fig. 1, looking in the direction indicated by arrows 2; and Fig. 4 is a diagram showing the relation of the single main track with the sidings and switches.

For convenience I have shown but one set of contrivances for automatically operating the switch at one end of the double section; but it will be understood that each siding as it comes into the main track has a similar construction.

Referring to Fig. 4, the arrangement of tracks will be seen, as 10 representing one rail, and 20 the other rail, of the main track; but from a point marked 15, in either direction, these rails diverge from each other, each serving as a part of one of the single tracks of a double track, as at 50 and 60, the inner rail of either single track crossing the other, as seen at 100. At a point outside of such crossing is pivoted the continuations of these inner rails, such pivoted portions on either side moving together and comprising the automatic switch-rails, (shown in Fig. 1,) and designated by the letter A. The normal position of these rails A is seen in Fig. 1—that is to say, in a position to close the way to the left-hand track in either direction and leave the track to the right open.

Referring to Figs. 1, 2, and 3, B designates a moving cross-bar, made in two parts, B′ B², pivoted together at or near the center at *b*, the part B′ having a downwardly-projecting lug, $b^2$, a rigid arm, $b^3$, from which operates through a guide-plate, C, secured to the cross-ties, a spring, C′, surrounding the arm $b^3$, and abutting with one extremity against the lug $b^2$, and with the other against the said guide-plate C, said spring serving with a constant force to hold the switch-rails A in the position mentioned— that is to say, with the right track normally open.

The part $B^2$ of the bar B has a downwardly-projecting lug or stud, *d*, and a shaft, D, is journaled vertically in the part $B^2$ at this point, said shaft having upon its upper end a ratchet-plate, *d′*, with the notches or teeth of which is engaged a spring-pawl, $d^2$. The lug *d* has a horizontal recess, $d^3$, which extends beyond

the plane of the shaft D, through which is led a cable or chain, F, one end of which is secured to the shaft D, and passing around a pulley or roller, *g*, in a frame, G, fixed to the cross-ties M, has its other end secured to the arm *h* of a lever, H, pivoted at *h'* to the frame I, and having an arm, $h^2$, which extends above the horizontal plane of the track when the switch-rails A are in their normal position, as seen in Fig. 2. The lever H is held in this position by the action of the spring C', and it is arranged sufficiently distant from the stationary rail to the right to allow the flanges of the car-wheels to pass freely between it and such rail, it being understood that the switch-rail A to the left serves to force the train upon the right-hand track; hence it will be seen that the train in either direction leaves the main track and takes the track to the right without operating any portion of the switch mechanism, and that it is only when the train leaves the double-track section to again assume the main line that the lever H lies in the path of the tread of the wheel.

The arm or lever H has a locking-arm, $h^3$, as shown, and loosely held in rollers *i'* and guide-plate $i^2$ is a bolt, $I^2$, which bolt is held against the locking-arm $h^3$ by the constant force of the spring I', which spring abuts against the guide-plate $i^2$ at one end, and is secured to the bolt at the other. When the train in passing from the right-hand track of the double-track section presses down the lever H until the upper part of the arm $h^3$ passes below the path of the bolt $I^2$, the spring I' forces the said bolt into the recess in the lever above the said arm $h^3$, and the lever is locked in this position; but it must be understood that this action on the part of the lever H has, through the chain or cable F, forced the cross-bar B against the action of the spring C' over to the left hand, and carried the switch-rails A to the position shown in dotted lines in Fig. 1—that is to say, with the right-hand track of the double section open to the main line 10 20.

It is important to this art that the shifting of the switch be positive, and in view of this I provide not only that the entire gravity of the locomotive be brought into play to insure the speedy and certain operation of the switch-rails for the purpose of automatically opening the way to the main line, but I provide positive means for holding the switch-rails in that position until the entire train is clear of the switch-junction. It will be seen, however, that if the switch-rails were to remain in that position, the next train arriving in the opposite direction would find the track to the right closed. To avoid catastrophe from such cause, I provide positive means for unlocking the lever H and for reopening the track, as seen in Fig. 4.

At a sufficient distance from the junction-point 15 to allow any train to have entirely cleared such point I pivot to a framing, P, at *l*, a lever, L, one arm, *l'*, of which extends above the track, and to the lower arm, L', of which is secured a cable, J. This cable J passes over a pulley or roller, K, to reverse the action of the lever, and is attached at the other end to the bolt $I^2$; hence when the train reaches this point and operates the lever L as suggested the bolt $I^2$ is withdrawn until it is disengaged from the arm $h^3$, and the spring C' forces the switch-rails back into the position shown in Fig. 1 in full lines.

What I designate as the cable J may be made in part of connected rods or gas-pipe sections, which may be supported on rollers in any suitable manner.

While means for automatically shifting switch-rails for a similar purpose have been before devised, I mention as important advantages of the construction shown and described the following:

First. The cross-bar B is formed in two parts hinged together, and whatever legitimate action accrues to my contrivance the result is attained by one of these parts "pulling" upon the other. The cable F acts in one direction to "pull" the part $B^2$, and thereby the part B' in one direction, and the spring C' acts in the other direction upon B' to pull the part $B^2$, and in the ordinary working of the switch neither of these parts "push" the other. The parts being hinged together allows them to knuckle out at the center when from any cause one part pushes against the other.

Second. The ratchet upon the shaft D allows slack to be readily taken up, the pawl $d^2$ holding all taken up against release.

Third. The action of the levers H and L are positive.

Fourth. The arrangement of the levers H is important as allowing a train to pass in close proximity without affecting them, and as being in a position to receive positive force.

I am aware that springs have been used to hold switch-rails against the action of levers operated by passing cars, and such feature is not sought to be covered, broadly, in this application.

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

1. In a switch, substantially as described, the combination, with the spring C', the switch-rails and their operating means, as described, of a collapsible cross-bar, as B, formed in two parts hinged together to allow the rails to give in one direction, as and for the purposes set forth.

2. The shifting-levers H and hinged cross-bar B, combined with a cable connecting the two, the spring C', and means, substantially as described, for taking up slack in the cable, as set forth.

3. In a switch, substantially as described, the combination, with the switch-rails, the shifting-lever and chain or cable connecting said lever with the cross-bar, the shaft D, having ratchet-disk $d'$, and the spring-pawl $d^2$, as and for the purposes set forth.

4. In combination with the switch-rails, the cable-lever H and shaft D, the two-part cross-bar B, having lugs $b^2$ $d$, the plate C, the spring C′, and roller $g$, as set forth.

5. The lever H, having arms $h$ $h^2$ $h^3$, and arranged as specified, combined with the bolt $I^2$, spring I′, the cable J, and lever L, as set forth.

6. The combination, with the switch-rails, the two-part hinged bar B, and springs C′ I′, of the levers H and L, the bolt $I^2$, the shaft D, rollers K $g$, and the chains connecting the levers with the bolt $I^2$ and bar B, as and for the purposes set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ADOLPH WULFF.

Witnesses:
J. MAINZER,
A. HENSCHEL.