

(No Model.)

2 Sheets—Sheet 1.

E. E. BAILEY.
RAILWAY SWITCH.

No. 541,822.

Patented July 2, 1895.

Fig. 1.

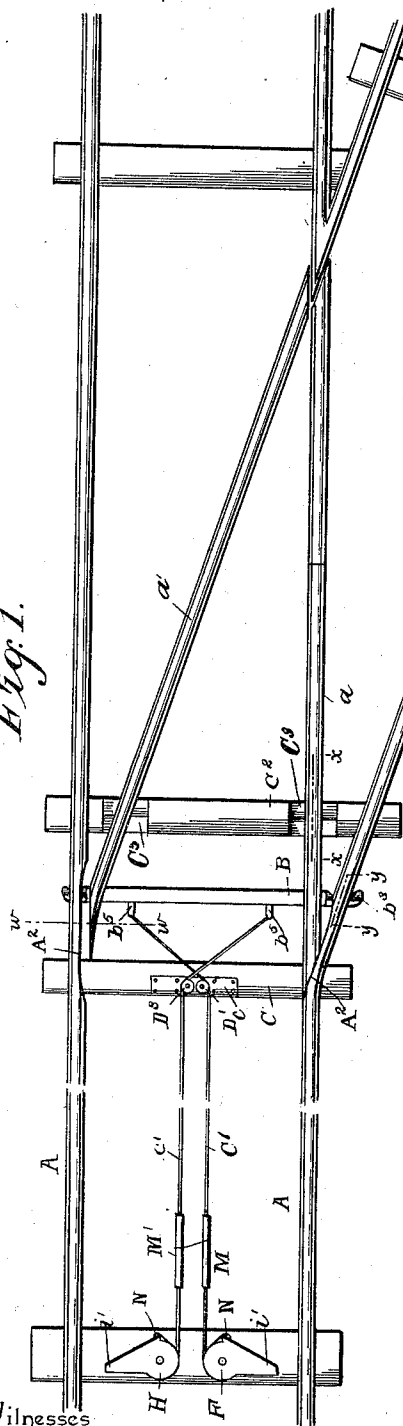


Fig. 4.

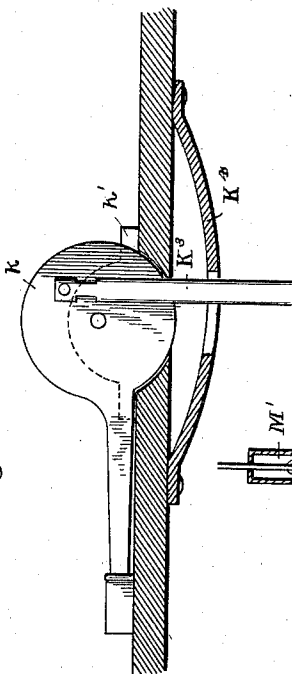


Fig. 5.

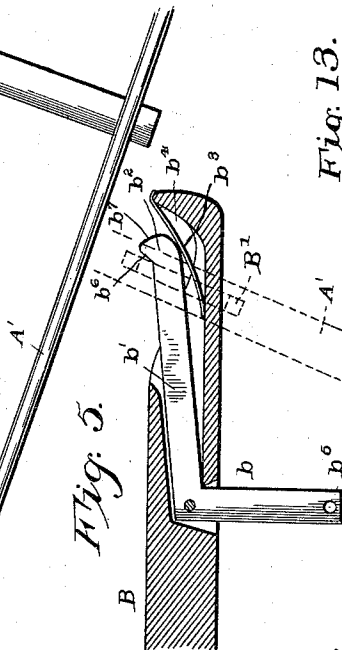


Fig. 6.

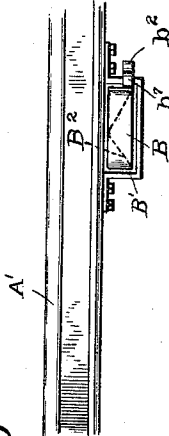


Fig. 12.

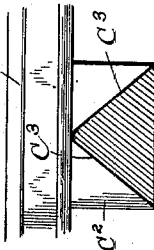


Fig. 11.

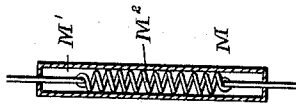
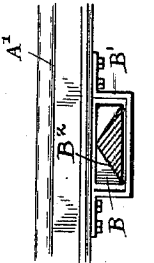


Fig. 13.



Witnesses

Chas. A. Ford.

J. B. Owens.

By his Attorneys.

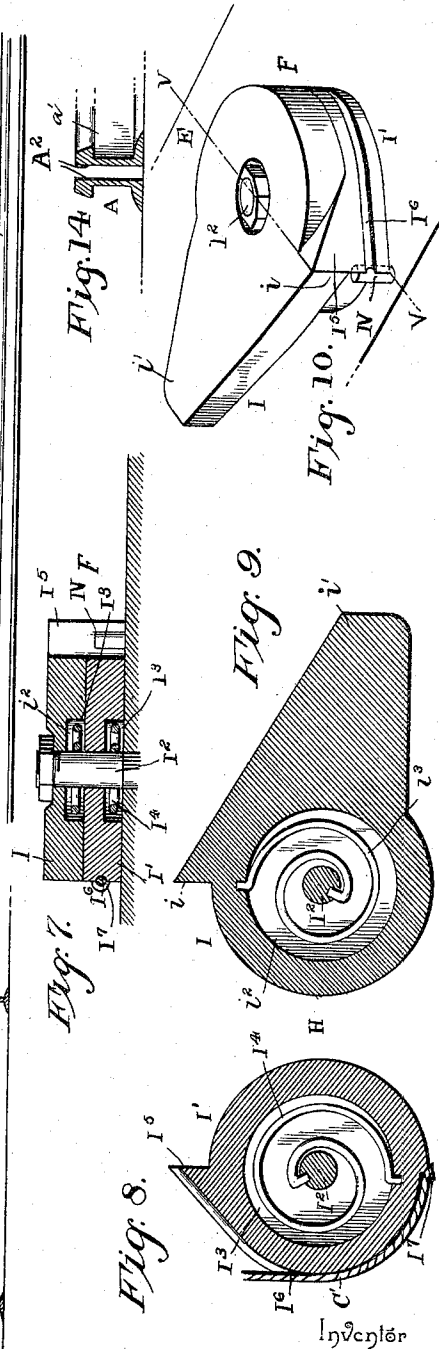
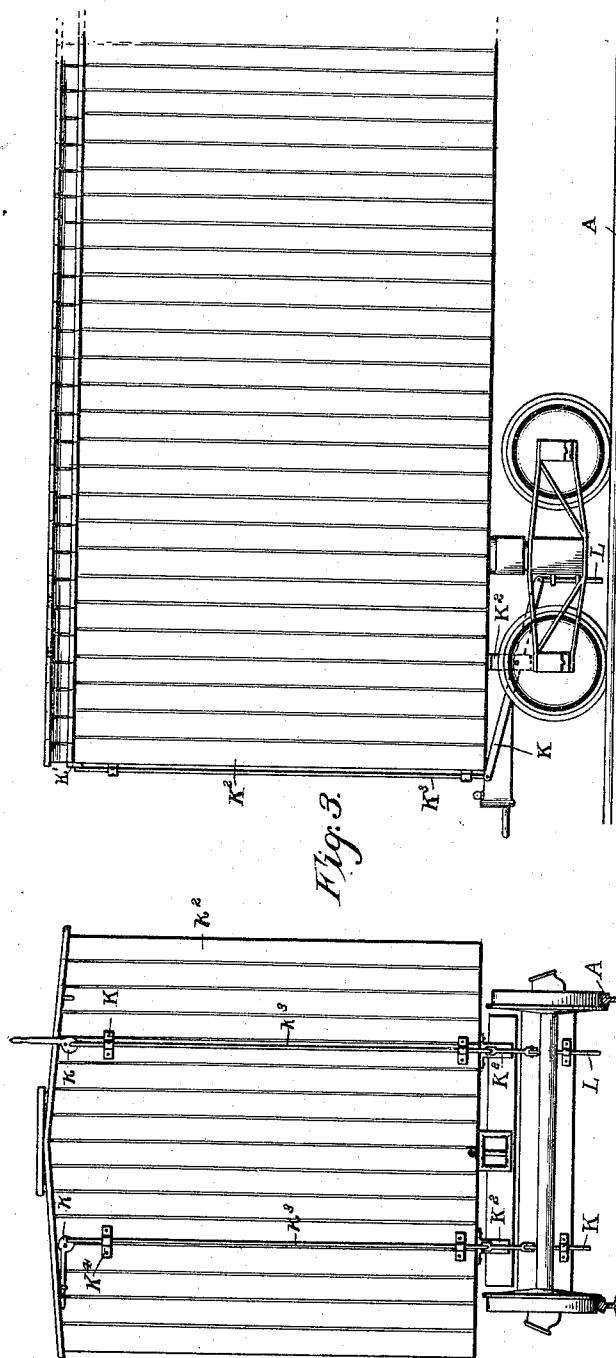
E. E. Bailey.

Cash & Co.

E. E. BAILEY.
RAILWAY SWITCH.

No. 541,822.

Patented July 2, 1895.



Chas A Ford.
J. B. Emerson

Fig. 2.

By h i s Attorneys.

Eben E. Bailey.

Chas. Snow & Co.

UNITED STATES PATENT OFFICE.

EBEN E. BAILEY, OF LAFAYETTE, INDIANA.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 541,822, dated July 2, 1895.

Application filed September 26, 1894. Serial No. 524,169. (No model.)

To all whom it may concern:

Be it known that I, EBEN E. BAILEY, a citizen of the United States, residing at Lafayette, in the county of Tippecanoe and State of Indiana, have invented a new and useful Railway-Switch, of which the following is a specification.

My invention relates to an improvement in those railway switches which are operated by a detent on the car, and engaging a portion of the switch so as to throw it; and the principal object of the invention is to so improve the construction of these appliances that their operation will be more positive and sure, and at the same time make them strong and durable enough to withstand the shock of the striking detent.

To these ends the invention consists of certain improved features of construction, and combination and arrangement of parts which will be more fully described hereinafter and finally embodied in the claims.

In the accompanying drawings, Figure 1 represents a plan view of a single switch, having my improved operating mechanism applied; Fig. 2, a front elevation of a car, showing the construction and arrangement of the detents; Fig. 3, a side elevation of the car, showing the same device; Fig. 4, a detail of the mechanism for operating the detent; Figs. 5 and 6, enlarged views of details of the switch mechanism; Fig. 7, a sectional view of one of the armed drums for drawing the operating cables, and taken on the line V V of Fig. 10; Fig. 8, a horizontal section of the lower section of the same showing it inverted; Fig. 9, a similar section of the upper portion of the drum also showing it inverted; Fig. 10, a detailed perspective view of the connection between the two sections of the drum; Fig. 11, a detail view of the cable tightener; Fig. 12, a detail section on the line x x of Fig. 1; Fig. 13, a detail section on the line y y of Fig. 1; Fig. 14, a detail section on the line w w of Fig. 1.

The reference letter A indicates the main track, and A' the switch, which is of that class wherein the rail sections *a* and *a'* are pivoted and swing laterally to open or close the switch. Located at a point near the ends of these rails *a* and *a'*, and movable laterally in its bed, is the beam B, which projects be-

yond the rails of the track and is pivotally connected to the movable rail sections *a* and *a'*. Secured to the under side of the stationary rails, beneath which the beam B passes, are the loops B', which are two in number and are rigidly fixed to their respective rails.

Pivotally secured to the ends of the beam B are the two bell crank levers *b*, which are countersunk in the ends of the beam and have a long arm *b'* projecting longitudinally with the beam. A hook *b*² is formed on the end of the long arm, and projects over the side of the loops B', and is held normally in engagement therewith by the spring *b*³, which is arranged in the cavity *b*⁴. The hooks *b*² are formed with the two inclined faces *b*⁵ and *b*⁷, whereby, when the beam B is moving to the right, the face *b*⁷ will engage the side of the loop B', and automatically snap in place; and when moving to the left, after having been engaged as explained, the inclined face *b*⁵ will allow the hook to be disengaged without operating the lever *b* otherwise. By this means a train passing out the switch, or from right to left on the main track, may open the switch by the flanges of the wheels wedging themselves between the movable and stationary rails and thus forcing face *b*⁵ of hook *b*² out of engagement with the loop B'. The hooks *b*² are a distance apart not quite equal to the distance that the rails of the track are apart, thus permitting the hooks to alternately engage the loops on the beam B. The short arms *b*⁵ of the bell-cranks *b* project out at right angles to the beam B, and are respectively connected to the cables C' and c'. The cable C' extends from the short arm *b*⁵ of the lever *b*, across the cross-tie C, and around the pulley D' of the plate *c*. From this point the cable C' extends down the main track parallel with its rails until it reaches the drum F.

The cable c' extends diagonally across the cable C' and around the pulley D³, of the plate *c*, from which point it proceeds to the remaining drum H, and is secured thereto as its companion. Thus it will be seen that upon pulling on either of the cables C' or c', the lever *b*, to which the cable is connected, will be swung on its fulcrum, and the hook *b*² disengaged from its corresponding loop B', after which the beam B will be free to move in its bed, thus engaging the formerly disengaged

hook b^2 , and changing the switch-rails a and a' . In this position the switch remains until the drums are operated to change the disposition.

5 The drums F and H are duplicates of each other, and a description of one will suffice for all. Figs. 7, 8, 9, and 10 show the details of these devices. Referring to these: I and I' indicate two circular sections, the top and 10 bottom respectively. Section I', the bottom section, consists of a circular metallic casting, pivotally mounted upon the rigid standard I², arising from the tie beneath the drum. This section is provided with the cavity I³, in 15 which the spiral spring I⁴ is arranged and disposed so as to give the section a normal tendency from right to left. Formed integral with the periphery of the section I', and projecting outwardly and upwardly therefrom, is 20 the stud I⁵. This stud is formed with an abrupt shoulder on its right-hand side, and the left-hand side is inclined or tapered so as to gradually merge in the regular periphery of the section. Formed in this tapering side 25 of the stud I⁵, and extending around the periphery of the section to the opposite side, is the groove I⁶, which terminates in an eye I⁷. To this eye the cable, say c' , is connected, and the cable extends through the groove I⁶, 30 around the section to the stud I⁵. Thus it will be seen that the spring I⁴ gives the section I' a tendency to the left, and will cause the section to return automatically to its normal position.

35 The upper or top section, I, of the drums, consists of a circular body portion, revolubly mounted on the spindle or standard I², and of a size equal to that of the lower section. Formed integral with the section I, and in a 40 position that will normally occur over the stud I⁵, is a companion stud i , which projects outwardly from the upper section, and which engages the upper part of stud I⁵ whenever either section is rotated toward the stud of its 45 companion. Thus stud i is formed with an abrupt shoulder adapted to engage with the corresponding shoulder of stud I⁵, while the remaining side of the stud i tapers gradually out and is formed into the arm i' . This arm i' 50 extends out from its section a distance sufficient to afford a leverage sufficient to permit turning the section on its axis, and by means that will hereinafter appear.

Formed in the interior of the section I, and 55 in the lower side thereof, is a cavity i^2 , which is adapted for the reception of the helical spring i^3 , and this spring is disposed oppositely to the spring i^4 , so as to give the section I an opposite tendency.

60 It will be seen that the cable is connected only to the lower section I', and that the two sections are only connected when the lugs are moving toward each other. Hence, upon striking the arm i' , the section I will move 65 from right to left and cause the studs or lugs I⁵ and i to engage, which will move section I' in a similar direction. This will draw on its

cable and tend to wind it around the section. When the arm i' is released, the top section will swing back to its normal position, and 70 the bottom section will swing in the same direction, so as to automatically replace the parts or sections in the proper position. N indicates two stops, which consist of studs arising vertically from the tie beneath the 75 drums H and F, and located one adjacent to each lug I⁵. The purpose of these stops is to limit the inward movement of the sections I'. These stops are short enough to allow the sections I to pass over them and to engage with 80 the lower portion of the lug I⁵. Now, for illustration, suppose the arm i' of drum H be struck and the two sections rotated as explained. The cable c' will be drawn and the 85 right-hand lever b released from loop B', and made to move to the left, thus engaging the left-hand loop B' and the corresponding hook b^2 , and opening the switch as to side track A'. When the arm i' is released, the spring i^3 will 90 swing the arm and its section back to the normal position and ready for a second operation, while the section I' will, by its spring, be made to move in the same direction until 95 stopped by the stop N on the tie, which will place the parts in their normal position. If the drum F be revolved, as was drum H, the same operation will ensue.

The devices for operating the drums are arranged on the locomotive, and, if so desired, 100 on all the cars, and consist of the vertically-movable detents K and L, secured to the truck-beams and arranged so that one will always be in position to engage one of the drums. These detents are normally raised out of en- 105 gagement with the drums, and are operated by the lever K', which is pivoted in the loop K², and connected at one end to their respective detents, while their remaining ends are connected to the vertically-extending rods K³. 110 These rods, K³, project up to the top of the car, or to the floor of the cab, according to the appliance to which they are connected, and are held incapable of lateral displacement on the keepers K⁴. The upper ends of these rods 115 are connected to the cam lever k , and are pivotally mounted in the boxes k' , and arranged so that the rods K³ may be moved vertically by operating the cam levers. By this means either of the detents K or L may be raised or 120 lowered; so as to engage or disengage the drums of the switch mechanism.

When one train has passed, the drums and their attachments will be left in the position 125 in which they were placed to admit the passage of the train, and when a second train arrives, and its operators desire to take a course different from that taken by the first train, the detents K or L should be operated to effect the result, as before described. The purpose of the two sections of the drums and 130 their oppositely-disposed springs is to permit the drums to be revolved by the detents K or L, so as to draw on the cables; and so that, when not operating, the arms i' will be re-

turned ready for a second operation. This necessarily requires two oppositely-moving sections, provided with means (studs I^2 and i') for causing them to be revolved in unison when moving in one direction only, and for allowing section I to operate independently when moving in the opposite direction.

In the practice of my invention, an engine is usually equipped with the detents K and L, and as the engine is moving over the track the detent necessary to close the switch is kept down, so that all switches open by neglect or chance are closed, and those already closed are left unaffected. Supposing, however, that it is desired to enter a switch: the detents are reversed, and the detent necessary to the opening of a switch lowered, so that it will engage drum II and shift rails a and a' .

A train passing out the switch A' , or from right to left on the track, does not require any engagement with operating cords, since the formation of the hook b^2 will permit the beam B, and consequently the switch-rails, to move laterally upon the engagement of the flanges of the wheels with the said rails, all of which will be understood.

Figs. 12, 13, and 14 illustrate the formation of the rails and adjacent cross-ties, whereby snow and other foreign matter are prevented from clogging up the parts. Thus, Fig. 12 shows the tie C^2 to be formed with beveled faces C^3 , located two directly under each rail a and a' and having its upper edge terminating in a slightly rounded portion upon which the respective rails rest. By this structure it is quite impossible for the snow, dust and other foreign matter falling on the tie to be retained, since it must fall off as soon as deposited thereon. I have shown but two ties under the rails a and a' in the drawings, since this is all that is necessary to an illustration of the invention, but in practice the ties will be arranged, as usual, about every twelve or eighteen inches apart. When so arranged all ties which are located under rails a and a' will be formed with the faces C^3 , as shown.

Fig. 13 shows how the beam B is to be provided with beveled faces B^2 , similar to face C^3 , and adapted to be located adjacent to the stationary rails A of the track. These faces operate similar to the faces C^3 and do not require further description.

Fig. 14 shows how the rail A are formed with a vertical face A^2 to correspond with the similar face or end on each of the switch-rails, whereby foreign matter is prevented from being caught between the two parts and the same clogged. These features of construction, those illustrated by Figs. 12, 13 and 14, are also shown in Fig. 1 in top plan.

Each of the cables is provided with the tension devices M, which consist of a barrel M' and spring M^2 , and by which the tension of the cables is insured.

Having described the invention, I claim—
1. A railway switch comprising the combi-

nation of two movable rail sections, a cable connected to the sections, a winding drum to which the cable is also connected, a spring for giving the drum a tendency to a normal position, an arm pivotally mounted adjacent to the drum, a spring also for giving the arm a tendency to a normal position, and means capable of connecting the arm and drum and operating to connect them only when the former is moving to operate the switch, whereby the arm will operate the switch when moved in one direction, and will not operate it when moving in the opposite direction, substantially as described.

2. A railway switch comprising the combination of two movable rail sections, a laterally-movable bar to which they are pivotally connected, two loops or eyes rigid on the roadbed, two hooks on the bar and adapted to alternately engage the loops or eyes upon moving the bar in its bed, cables connected to the hooks and arranged to disengage the engaged hook and loop, and to move the bar to which the hooks are attached, thus operating the switch, and means for drawing on the cables, whereby the switch is operated, substantially as described.

3. A railway switch comprising the combination of two movable rail sections, a laterally-movable bar pivotally connected to each, two eyes or loops rigid on the roadbed, two swinging hooks pivoted to the bar and adapted to alternately engage the loops whereby the switch is locked in the desired position, actuating cables connected to the hooks, a drum over which each cable is wound, a spring for moving the drum back to its normal position after being operated, an arm adjacent to each of the drums, a spring operating with the arm and having a tendency to move the arm in a direction opposite to that of the drum spring, and means capable of connecting the arms and drums and operating to so connect them only when the former are moved to operate the switch, substantially as described.

4. A switch comprising the combination of two movable rail sections, cables connected thereto, whereby they are operated, drums, over one of which each of the cables is wound, a spiral spring arranged in each drum and operating to hold the drums in their normal positions, an arm pivoted above each of the drums and having a spiral spring located therein, whereby it is given a tendency to move in a direction opposite the tendency of the drum, and means capable of connecting the arm and drum and operating to connect them only when the former is moved to operate the switch, whereby the cables may be operated to move the switch and whereby the arms and drums will be returned to their normal positions, substantially as described.

5. In a railway switch, the combination of two movable rail sections, a cable connected thereto whereby they may be operated, a drum mounted on the bed of the track and over which the cable is wound, said drum having

a lug projecting outwardly and upwardly from the same, a stop on the track with which the lower portion of the lug on the drum is engaged, an arm mounted above the drum and
5 capable of engaging the lug thereof, and a spring or springs for returning the drum and arm to their normal positions, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

EBEN E. BAILEY.

Witnesses:

CHARLES E. LUKE,
DE WITT C. WILSON.