(No Model.) 2 Sheets—Sheet 1.

G. L. WARREN.

SAFETY SHIFT OR LOCK FOR SPLIT SWITCHES.

No. 531,238. Patented Dec. 18, 1894.

Fig 1.

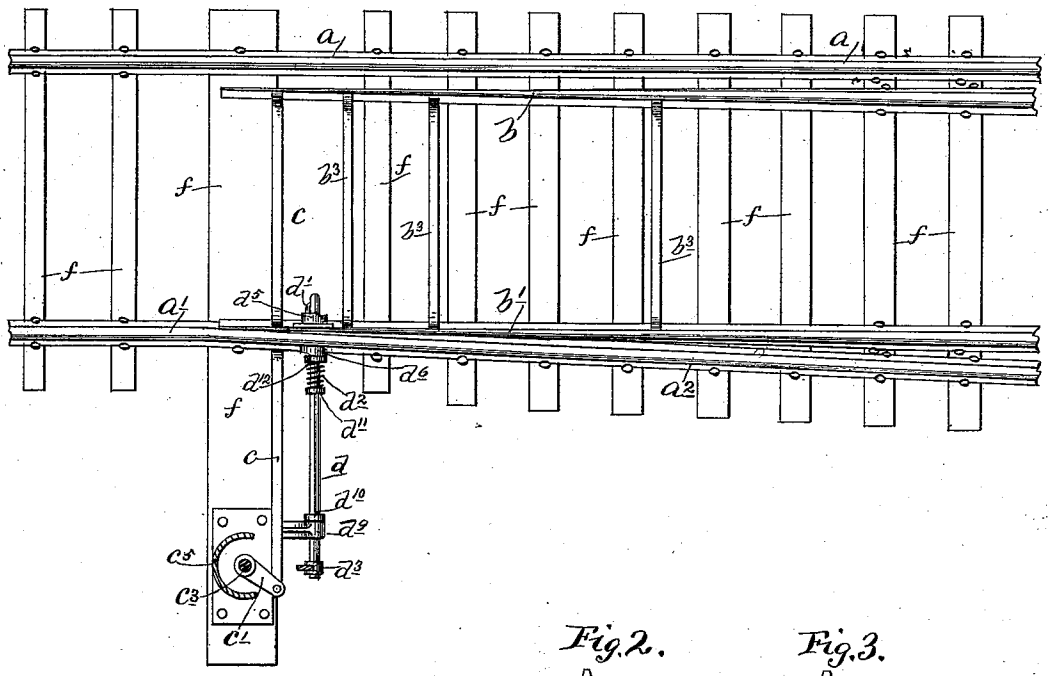


Fig. 2.

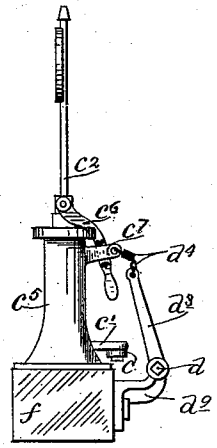


Fig. 3.

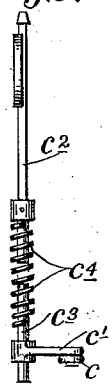
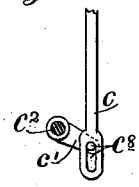


Fig. 8.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

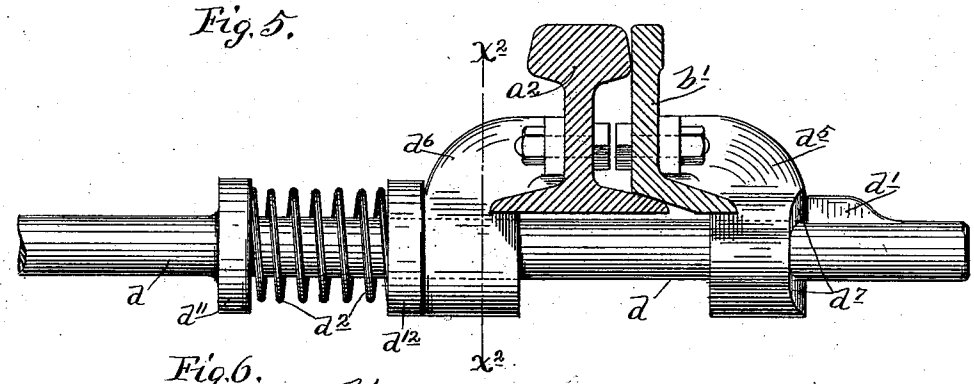

Fig. 6.

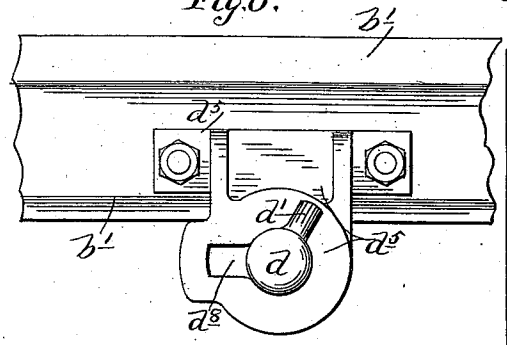

Fig. 4.

Fig. 7.

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UNITED STATES PATENT OFFICE.

GEORGE L. WARREN, OF ST. PAUL, MINNESOTA, ASSIGNOR OF ONE-HALF TO WATTS N. DAVIS, OF SAME PLACE.

SAFETY SHIFT OR LOCK FOR SPLIT SWITCHES.

SPECIFICATION forming part of Letters Patent No. 531,238, dated December 18, 1894.

Application filed June 18, 1894. Serial No. 514,864. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. WARREN, 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 Safety Shifts or Locks for Split Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention has for its object to provide an efficient and reliable safety shift or lock, for split or point railway switches.

The device is designed for co-operation with an automatic switch-stand, or with the ordinary non-automatic switch-stand by slight changes in the switch-stand connections, for insuring the closing of the main line, after a train has run through the closed switch from the branch, and for holding the main line closed, notwithstanding breakage of the switch-stand or tie-bars connecting the movable points, which frequently happens in the service.

To this end, my invention consists of the novel devices and combinations of devices, hereinafter fully described and defined in the claims.

The accompanying drawings illustrate the invention, wherein like letters refer to like parts.

Figure 1 is a plan view of a split or point railway switch, having my safety device applied thereto, with some of the parts shown in section, and other parts broken away. Fig. 2 is an end elevation of the switch-stand detached. Fig. 3 is a detail of the divided switch-shaft, employed in the automatic stands. Fig. 4 is a plan view of the safety device, as applied to the rails, shown on a larger scale than in Fig. 1, with some parts broken away. Fig. 5 is a vertical section on the lines X′ X′ of Fig. 4, looking in the direction of the arrow on Fig. 4. Fig. 6 is an inner end elevation of the safety device, with some parts broken away; and Fig. 7 is a vertical section, on the line X^2 X^2 of Fig. 5, looking outward or toward the switch-stand. Fig. 8 is a plan view of the slot and pin connection between the switch-bar and crank used when applying the safety device for co-operation with the non-automatic switch stand.

Having regard to the switch proper, a a' a^2 represent the fixed or stock-rails, and b b' the movable or point rails; and of these, the parts a a' b' co-operate to form the main line track, and the parts b a^2 co-operate to form the switch or branch track. c is the ordinary switch-bar, connecting the points b b' with the crank-arm c', on the divided or sectional switch-shaft c^2 c^3. The said shaft sections c^2 c^3 are connected by the stiff torsional spring c^4, as shown in Fig. 3, and are mounted in the usual way in the stand c^5. The upper section c^3 of said switch shaft is provided with the usual slotted-lever c^6, engageable with the locking lug or staple c^7, projecting from the stand, when the shaft is in the switch-locking position. This construction affords an ordinary automatic switch, which, in virtue of the divided shaft c^2 c^3 and the torsional spring c^4, will permit a car, engine or train, to run through the closed switch from the branch, and has been relied upon to again close the main line automatically, after the car has passed from the branch onto the main line. In this action, the spring c^4 would yield, to permit the movable points to be thrown over against the rail a, by the camming action of the wheel flanges, when on the rail a^2, against the point b'; and the said spring c^4 was supposed to be strong enough to draw the points back, after the car had passed through the switch, so as to close the main line; but in practice, it has been found that the automatic switch is not perfectly reliable to automatically close the main line. Under the rough usage of the service, sufficient slack will be developed, either by the lost motion in the parts, or by the weakening of the spring c^4, to permit the movable points to remain partly open after a train has run through from the branch track. This of course, will cause derailment of a train running on the main track, or will throw the same at full speed into the branch. Moreover, if the tie-bars b^2 connecting the movable points, or the switch-stand should become broken, as often happens by a trailing coupling or brake-rigging, the switch is almost sure to be left in its open or half open position.

With the common non-automatic switch-stand, if a train should be run through the closed switch from the branch-track, the rail will be turned down, or the switch-stand will be broken. Any or all of the above conditions at the switch, is almost sure to wreck a train on the main line.

To overcome all these limitations, is the object of my improvement.

For this purpose, I provide a rocking shift-rod or bar d, having on its inner end a lug d', which in one position of the rod will engage with one of the movable points, and in another position of the rod, will release the said points, permitting the same to be operated by the ordinary switch-lever. The rod d is subject to a spring d^2, reacting against the adjacent fixed or stock rail, or other suitable fixed base of resistance, and serves when the rod is in its locking position, to yieldingly hold the movable point in position to close the main line and restore the switch to its closed position, in case a train should run through the switch from the branch. The outer end of the rod d is provided with an operating lever d^3, having attached to its upper end a padlock and chain, indicated at d^4, which when the lever d^3 is in its locking position, can be made fast to the stand lugs c^7, to secure both the switch-lever c^6 and the safety shift lever d^3 in their switch locking position.

In my preferred construction, I provide a pair of bearing brackets d^5 d^6, which are bolted respectively, the former to the inner face of the point rail d', and the latter to the outer face of the stock rail a^2. These brackets d^5 d^6 are notched to receive the foot-flanges of the rail, over which they extend, and form a close fit with the top surfaces of said foot flanges and the webs of the rails to which they are bolted. The said brackets d^5 d^6 are also provided with beveled cam surfaces d^7, for co-operation with the lug d', on the rocking rod or bar d, when turning the same into its locking position; and both are also provided with passages d^8, for the lug d', extended from the bearing seats for the rod d, in proper position, to permit the bracket to move over the said lug d', when the lever d^3 and the rod d, are in their unlocked and releasing position. It is only necessary that the inner bracket d^5 should have the cam surface d^7 and the cam-lug passage d^8; but the outer bracket d^6 is made in the same way as a matter of convenience and economy of construction, and in order to permit the said brackets d^5 and d^6 to be interchanged at will. In other words, the said brackets d^5 and d^6 are exactly alike, and when in position, the cam-lug passages d^8 will stand in a reverse relation to each other, and will permit the rod d to be removed from the bracket, without removing any of the other parts.

The outer end of the rod d works freely through a fixed bearing bracket d^9, secured to the switch stand member of the cross-ties f, or other suitable fixed support. The rod d is provided with a pair of fixed collars d^{10} and d^{11}, and with a loose collar d^{12}. The fixed collar d^{10} co operates with the fixed bearing d^9, to limit the outward movement of the rocking-rod or bar d; and the collars d^{11} d^{12}, embrace between them, the spring d^2, encircling the rod d.

The lug d' on the rod d, and the operating lever d^3, are so related to each other, and to the passage d^8 in the bracket d^5, that when the said lever d^3 is in the position shown in Fig. 2, the said cam-lug will be in a switch-locking position; and that when the said lever d^3 is thrown to the ground or onto a suitable stop-block (not shown), the cam-lug d' will be in line with the passage d^8. Hence, with this safety device, constructed as above described, it is obvious that when the lever d^3 is thrown to the ground, the switch may be operated in the ordinary way from the switch-shaft c^2 c^3, entirely independent of the safety device; inasmuch, as when in the said position, the bracket d^5 will move with the point d', freely over the rod d, with the cam-lug d' working through the passage d^8. When in this releasing position, however, the stop d^{10}, working against the bearing-bracket d^9, will prevent the spring d^2 from throwing the rod d outward beyond its proper position, for engagement with the low part of the cam-surface d^7 on the bracket d^5, when the switch is turned back by the switch shaft c^2 c^3, into its closed position with the main line. Hence, when the lever d^3 is turned up into the position shown in Fig. 2, the lug d' engaging with the cam-surface d^7, will operate on the bracket d^5, and the movable point b' with a camming action, thereby compressing the spring d^2 and clamping the movable point b' tightly against the stock-rail a' a^2, and thus holding the switch in its closed position. When the safety device is thus in its locked position, if a train should run in through the switch, from the branch, the spring d^2 would yield, permitting the point b' to be thrown over by the wheel-flange toward or into contact with the rail a, thereby drawing with it the rod d, and setting the spring d^2 under increased tension, which would become instantly effective, to restore the switch to its normal position, after the train had passed, so as to maintain a closed main line. In this action, the spring c^4 of the automatic switch-stand would act in its customary way, and would co-operate with the spring d^2, to close the switch; but the spring d^2 should be strong enough to close the switch itself, even if the spring c^4 in the stand should become broken or weakened.

The fact that the ordinary switch-lever c^6 cannot be locked in its switch closing position, without raising the lever d^3 and throwing the safety device into its locking position, is of course, a point of additional security; inasmuch as the brakeman or switchman must lock the safety device, if he closes and locks the switch.

The fact that the brackets d^5 d^6 are secured as described, the former to the point rail d', and the latter to the stock rail a^2, as described, and that both are held by the rod d, which passes through the same, and is of a length to permit the complete movement of the point-rail b' without passing off from the rod, prevents the point-rail b' from jumping upward, under the weight of the locomotive or cars, at the stock ends of the same. This is an important point of advantage, for additional safety, inasmuch as wrecks frequently occur by the jumping of the point rail.

If the safety device is to be applied, for use in co-operation with an ordinary non-automatic switch-stand, it will be necessary to extend the switch-bar c and provide a slot in the outer end of the same, in which the pin on the crank-arm c' may work, so as to permit the switch-bar to have a limited movement toward the rail a, independent of the crank-arm c', when the switch shaft is in its locked position. When the connection between the switch-bar and the switch shaft crank are thus modified, the safety will work on a non-automatic switch-stand; but in that event, reliance would have to be placed upon the safety device alone for the locking of the switch, in its closed position, and the switch-lever c^6, would have to be given a slight excessive motion inclosing the switch, and be then turned backward slightly to bring the lever into engagement with the lock-lug or staple c^7. This slot and pin modification, for application of the safety device to a non-automatic switch-stand, is shown at c^8, in Fig. 8.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a point or split switch and an automatic switch-stand, of a supplemental safety shift or lock applied to the movable points, cooperating with the switch-stand but also operative independent of the same, when in locked position, to yieldingly hold the movable point of the main line in its closed position and to close the same, if forced open, and operative, when unlocked, to release said points, for permitting the same to be thrown by the ordinary switch-levers, substantially as and for the purposes set forth.

2. A safety shift or lock, for split switches, comprising a rocking horizontal rod or bar having a lug engageable with and disengageable from one of the movable points and a spring applied to said rod and tending, when the rod is in its locking position, to hold the said points in position to close the main line, and means for rocking said rod from its locking to its releasing position or vice versa, substantially as described.

3. The combination with a split switch, of a pair of depending brackets rigidly secured one to the movable point and the other to the adjacent fixed or stock rail and a rod or bar extending through the depending parts of said brackets below the rails, and cooperating with said brackets and rails to prevent the upward jumping of the movable or point rail, substantially as described.

4. A safety shift or lock for split switches, comprising a rocking shift rod or bar having a cam-lug on its inner end, suitable bearings for said rod including a pair of brackets securable one to the movable point and the other to the adjacent fixed rail, the inner member of which is engageable by said cam-lug, when in locking position, and is provided with a passage for the same when in releasing position, a spring reacting against said outer bracket and a fixed collar on said rod, and a hand-lever for rocking said rod, substantially as described.

5. The combination with a split switch and a switch-stand of the bearing brackets d^5 d^6, the inner member, at least, of which has the cam surface d^7, and the cam-lug passage d^8, fixed one to the movable point b' and the other to the fixed rail a^2, of the rocking rod d, seated in said brackets d^5 d^6 and an outer end bracket d^9 and provided with the cam d', fixed collars d^{10} and d^{11}, the spring d^2, the loose collar d^{12}, the hand-lever d^3 and the padlock and chain d^4, carried by the lever d^3, for securing both the ordinary switch-lever and the safety-lever d^3, to the stand, in their switch locking position, all substantially as described.

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

GEORGE L. WARREN.

Witnesses:
JAS. F. WILLIAMSON,
FRANK D. MERCHANT.