H. SHEMWELL.

AUTOMATIC SWITCH.

APPLICATION FILED AUG. 24, 1909. RENEWED JULY 26, 1910.

998,644. Patented July 25, 1911.

Fig. 1.

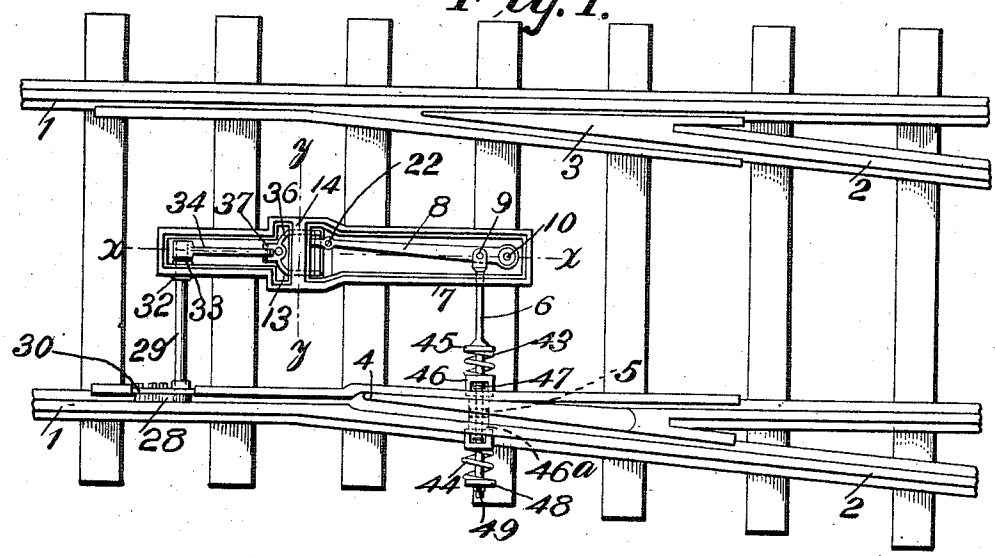


Fig. 2.

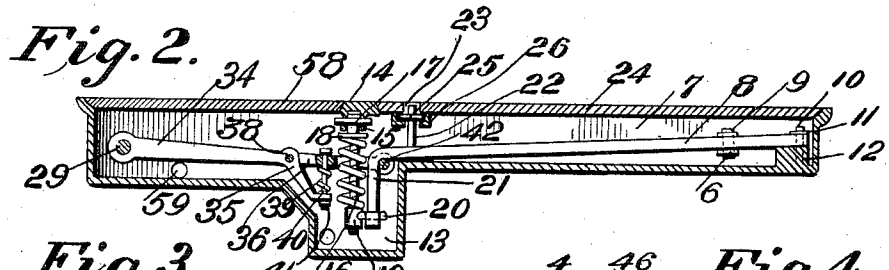


Fig. 3.

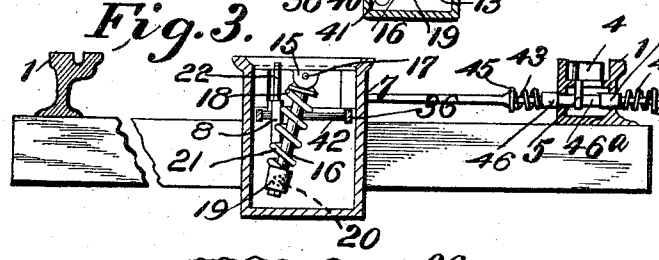


Fig. 4.

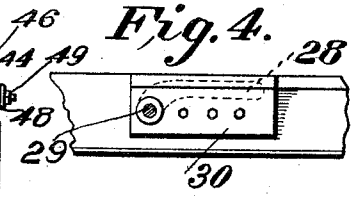


Fig. 5.

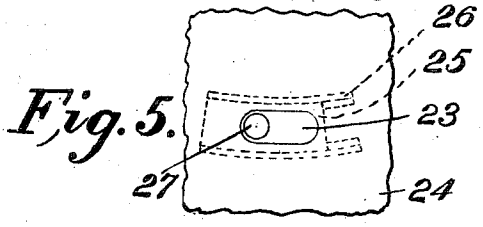
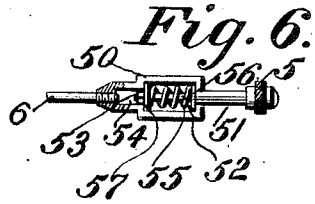


Fig. 6.



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HAROLD SHEMWELL, OF ASHEVILLE, NORTH CAROLINA, ASSIGNOR TO AMERICAN AUTOMATIC RAILWAY SWITCH COMPANY, A CORPORATION OF ALABAMA.

AUTOMATIC SWITCH.

998,644. Specification of Letters Patent. Patented July 25, 1911.

Application filed August 24, 1909, Serial No. 514,378. Renewed July 26, 1910. Serial No. 573,845.

To all whom it may concern:

Be it known that I, HAROLD SHEMWELL, a citizen of the United States, residing at Asheville, in the county of Buncombe and State of North Carolina, have invented new and useful Improvements in Automatic Switches, of which the following is a specification.

My invention relates to switches of the type adapted to be thrown from the car or train, and its object is to improve and perfect the type of switch operating mechanism covered by the patent to Farmer, No. 816,308, dated March 27, 1906, wherein the essential features comprise a disappearing lever, for operating the switch point, which is temporarily brought into operating position by mechanism actuated by the car wheel and, while in this position, thrown by mechanism on the car to set the switch point in the desired position.

The principal object of my invention is to provide a spring means so arranged as to yieldingly oppose any tendency of the lever and switch point to become moved or displaced from either extreme of their operating positions—and which is preferably so disposed as also to yieldingly resist the upward movement of the lever as it rises for engagement with the switch throwing mechanism on the car. A distinct advantage gained by the latter arrangement is that the spring is put under a greater tension at the time the point is being thrown and thereby exerts its maximum power to urge the lever in the direction it is moving and lock it in either of its operating positions.

A further object is to prevent possible breakage in the system of cranks and levers operated by the car wheel for raising the switch throwing lever into operating position, should such lever be caught or blocked so that it could not be raised. To this end I interpose a yielding or spring connection in said system which will take up the movement, imparted by the car wheel, when the switch lever becomes blocked.

A further object is to provide a yielding connection between the switch throwing lever and the switch point so that, should the point become locked or blocked, such connection would yield and prevent breakage when the car strikes and moves the said lever.

My invention further comprises the details of construction and arrangement of parts hereinafter more particularly described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a top plan view of my switch mechanism complete. Fig. 2 is an enlarged transverse cross-sectional view along the line x—x of Fig. 2. Fig. 3 is a transverse cross-sectional view along the line y—y of Fig. 1. Fig. 4 is a detail view showing in dotted lines the lever which is actuated by the car wheel for lifting the switch throwing lever. Fig. 5 is an enlarged detail plan view, broken away, of the slot for the pin of the switch throwing lever, the means for effecting a closure of the slot being shown in dotted lines. Fig. 6 illustrates a modified form of yielding connection between the switch throwing lever and switch point.

Similar reference numerals refer to similar parts throughout the drawings.

I have illustrated my invention in connection with the rails 1 of the main track and the rails 2 of a siding or switch track. These tracks are connected at one side by the usual frog 3 and at the other side are provided with the customary form of switch point 4. This switch point has depending below it a lug or flange 5, to which an operating rod 6 is connected in a novel manner hereinafter described. The inner end of this rod passes through the side wall of a boxing or casing 7 and is there connected to a switch throwing lever 8, by means of a pin 9, which passes through the bifurcated end of the rod and through a suitable opening in the lever 8. This lever is pivotally connected at one end to the casing by means of a pin or bolt 10. This bolt has a washer 11 at its top and its lower end is seated in a suitable opening in a boss 12 formed integral with the bottom of the casing. The opening in the lever, through which the pin 10 passes, is much larger than the pin so that the lever is capable of play in vertical as well as horizontal planes. For this purpose the opening through which the rod 6 passes through the casing is also made sufficiently large to provide for the resulting vertical play of the rod, which is small at that point.

The forward end of the lever 8 extends to a point near the center of the casing 7 and is there bent downwardly at right angles so that its end depends into a receptacle or depressed portion 13 of the casing. The casing 7 has a cross-brace 14 which extends

transversely above the receptacle 13 of the casing. Between lugs 15, formed integral with the underface of this cross-brace, a rod 16 is pivotally suspended by having a pin 17 pass through an eye formed at the upper end of the rod and through the lugs 15. This rod has, near its upper end, a fixed shoulder or stop 18 and at its lower end a sliding stop 19 having a stud 20 projecting therefrom at right angles and passing through an opening at the end of the lever 8. A coiled spring 21 is interposed between the stop 18 and the movable stop 19.

The means by which the switch throwing lever is engaged by the mechanism carried by the car and adjusted in the desired direction, consists of a pin or stud 22 fixed to or formed integral with the lever and disposed near the point where the same is bent downwardly. This pin 22 works in a slot 23 in a removable cover plate 24 of the casing 7. To prevent leaving this slot open for the access of dirt or water into the casing, I provide a sliding guard 25, which slides in arcuate guides 26 formed in the underface of the cover plate 24, and struck on an arc having the pin 10 as a center. This guard plate has an opening 27 therein but slightly larger than the pin 22 and as the pin moves from right to left it moves the guard plate with it and keeps the slot closed, as seen in Fig. 5. The opening 27 leaves the pin free to move vertically therethrough.

The mechanism for lifting the pin 22 on the switch throwing lever into position to be actuated by the mechanism on the car, such for instance as is described in the patent to Farmer, hereinabove referred to, or in the pending application of the said Farmer, Serial No. 462,864, but which are not here shown as they form no part of my present invention, comprises a lever 28 bent down at its forward end and there keyed or fixed to a rod 29. This rod is journaled at one end in a plate 30 which is connected by bolts to the rail, which is shown with an inner flange and tread portion cut away to receive this plate and the lever 28. At its inner end, the rod enters the forward end of the casing 7, passing through bosses 32 and 33, to give an extended bearing surface therefor. The inner end of the rod, which projects into the casing, is keyed or otherwise fixed to a crank 34, the inner end of which is bent downwardly and then horizontally to form the spring seat 35 which depends into the compartment 13. A yoke-piece 36 has a pair of lugs 37 which are pivotally connected to the crank 34 by a pin 38. A coiled spring 39 is interposed between the spring seat 35 and the yoke 36, a pin 40 passing down through the yoke and the spring and having a nut 41 screwed on its lower end and adjustable against the under side of the seat to regulate the tension of the spring and hold the crank and yoke together with a yielding connection. At the forward end of the yoke a transverse horizontal pin 42 is fastened. This pin passes under the bent end of the lever 8 and engages its under side adjacent to the pin 22. The weight of the lever 8 and other parts press the crank 34 and hold the lever 28 in the position shown in Fig. 4.

The yielding connection between the lever 6 and the flange 5 on the switch point, as illustrated in Fig. 3, comprises a pair of coiled springs 43 and 44 disposed on opposite sides of the switch point, the spring 43 being interposed between a fixed washer 45 on the rod 6 and a metal frame 46, which is slipped on the rod and held against the coiled spring 43, interposed between it and the stop 45, by nuts 47. The opening in the outer end of frame 46 is large enough to permit the nuts 47 to pass through it. A short cylindrical bearing 46^a is interposed between the frame and lug 5. Similar parts are provided in connection with the spring 44, except that its outer end bears against a washer 48 held in place by a nut 49 on the outer end of the rod. The tension of the springs 43 and 44 is such as to move the switch point against normal resistance without yielding, but in cases where the switch point is blocked or frozen in place, the spring 43, if the lever 8 is moving to the right, or the spring 44, if it is moving to the left, will yield and permit the lever to make its full movement even though the switch point does not move, thereby preventing the breakage of parts which would be a cause of continual trouble unless thus provided against.

I provide a cover plate 58 for the forward end of the casing containing the crank 34. The frame 7 is adapted to be seated in the pavement between the tracks, with its cover plates 24 and 58 flush with the pavement surface and with no part projecting above the pavement where it can be injured or disarranged.

In operation, the flange of the wheel of an approaching car strikes the lever 28 depressing it, rocking the rod 29, raising the crank 34 and, through the spring 39, lifting the yoke 36 and the lever 8 until the pin 22 projects above the cover plate 24 and is engaged by the mechanism on the car, which, for example, is set to throw the lever from the position shown in Fig. 5 over to the right. As the lever 8 is raised, the stop 19 rides up the rod 16 and compresses the spring 21. While the spring 21 is thus under compression, the car mechanism engages the pin 22 and forces the lever to slide along the pin 42 toward the right hand side of the yoke. This movement will cause the rod 16, which was inclined toward the left, to swing to a vertical position and then to

an inclined position toward the right. In passing from one to the other inclined position, the spring 21 will be further compressed, the distance between the stops 18 and 19 becoming shorter as the rod approaches a vertical or intermediate position. The tendency of the spring therefore is to force and hold the lever 8 at one end or the other of the yoke and to resist any tendency to approach an intermediate position and therefore any tendency on the part of the switch point to shift from the position in which it is set. As the lever 8 is moved to the right, the motion will be transmitted through the rod 6 and the spring 43 to the boxing 46 and the flange 5 of the switch point, causing the switch to shift to the right and throw the switch to open the main line. If in any way the lever 8 should become locked or any obstruction should prevent the pin 22 from lifting when pressure is applied to the crank 34, the coil spring 39 will take up the motion derived from the lever 28 and prevent the breakage of parts. A further very important result obtained by this spring locking mechanism is that of preventing split switches. It will be noted that each wheel of the car or train, as it passes over the lever 28, will depress the same. This will lift the crank 34 and the lever 8 and bring the spring 21 under considerable compression. In its compressed condition, the spring exerts its maximum power to hold the lever 8 in its extreme position to the right or the left, and by this means exerts its maximum power to hold the switch point rigidly in its set position, thereby avoiding the possibility of a split switch and making it impossible for the subsequent shaking and jarring of the train to shift the point to an intermediate position or in any manner effect its position except to hold it more firmly, in the manner just described, in the position in which it is set.

As a simplified construction, a single spring may be used in place of the two springs 43 and 44, as will be seen by reference to Fig. 6. In this figure the rod is connected to a frame 50 having an opening at its outer end to receive a rod 51 which is connected to the lug 5 by having bolts threaded onto the rod and positioned one on each side of said lug. This rod 51 has a reduced portion 52 disposed within the frame 50 and which has threaded on its end a nut 53, which works in a socket 54 in the frame. A coiled spring 55 is interposed in the frame between the washer 56, which abuts against the shoulder formed by reducing the rod 51, and a washer 57 which abuts against the nut 53. The frame 50 will slide freely over the rod 51. If now the rod 6 is moved to the right and the maximum resistance met, the frame pressing against the washer 57 will compress the spring, while the outer end of the spring is held by the nut 56 which bears against the shoulder of the rod 51 and is held thereby against movement to the right while the forward end of the frame is free to slide over the rod 51. If the direction of movement of the rod 6 is to the left and the resistance of the spring is overcome, the frame 50 will move the washer 56 and compress the spring against the washer 57, which is held against movement to the left by the nut 53.

By the construction and arrangement of the parts described, it is practically impossible for my mechanism to become broken or disarranged in the ordinary course of use until the parts are worn out. The casing 7 is provided with drainage openings 59 to prevent water standing therein.

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

1. In a switch, the combination with a switch-point, of a normally depressed switch-throwing device, means for elevating said device, and yielding means which tend to hold said device depressed and automatically lock the switch in either thrown position.

2. In a switch, the combination with a switch-point, of a normally depressed switch-throwing device, means for elevating said device, and a spring which tends to hold said device depressed and automatically lock the switch in either thrown position.

3. In a switch, the combination with a switch-point, of a normally depressed switch-throwing device, means for elevating said device, and a coiled spring which is compressed by the elevating of said device and which automatically locks the switch in either thrown position.

4. In a switch, the combination with a switch-point, of a normally depressed switch-throwing device, a flexible means for elevating said device and which is adapted to be operated by the wheel of a car, and means which tend to hold said device depressed and automatically locks the switch in either thrown position.

5. In a switch operating mechanism, the combination with a switch point, of an operating mechanism therefor comprising a lever pivoted at one end and having its free end both vertically and laterally adjustable, a substantially vertically disposed spring connected to said free end and adapted to oppose both the vertical and transverse adjusting movements of said free end of the lever, car actuated means to elevate the free end of the lever into operating position, and a connection from said lever to the switch point, substantially as described.

6. In a switch operating mechanism, a switch-point, a pivoted lever, operating connections between said lever and switch-point, a pivoted rod, a sliding connection between said rod and lever, a spring surround-

ing said rod and bearing against said lever, said rod being so positioned, with relation to the plane of movement of the lever, as to cause the maximum compression of the spring by said lever when the latter is in an intermediate operating position, and which causes the pressure of the spring, angularly exerted against said lever, to tend to hold the latter in an extreme operating position.

7. In a switch operating mechanism, a switch-point, a normally depressed pivoted lever operatively connected to said point, a rod pivotally mounted in line with the lever when in an intermediate position, a coiled spring surrounding said rod and pressing against the free end of the lever which is in sliding engagement with said rod, means to elevate said lever against the resistance of said spring, and means to limit the lateral travel of the lever in each direction, said coiled spring, as the lever passes its intermediate position, tending to urge and hold the lever in the extreme position toward which it is traveling.

8. In a switch operating mechanism, the combination with a switch-point, a lever for operating said point, the free end of said lever being vertically and horizontally adjustable, operating connections between said lever and point, mechanism adapted to be operated by the wheel of the approaching car to raise said lever into position to be engaged by a passing car and adjusted to throw the switch-point, and a yielding connection in said mechanism to absorb the movement imparted by the wheel to raise said lever in the event that the lever is prevented from responding thereto.

9. In a switch operating mechanism, the combination with a switch-point, a normally depressed switch-throwing device, a rod connecting said device and switch-point, a lever adapted to be operated by the car wheel, a rock shaft connected to said lever, a crank on said rock shaft, a spring supported member at the free end of said crank which engages said device to lift same, as and for the purposes described.

10. In a switch operating mechanism, the combination with a switch-point, a normally depressed switch-throwing device, a yielding connection between said device and switch-point, means to elevate said device into operating position comprising a crank, mechanism operated by the car wheel for oscillating said crank, a yoke-member pivoted to the free end of said crank so as to swing vertically, and a coiled spring interposed between said crank and yoke-member, said yoke-member engaging said switch-throwing device to elevate same, as and for the purposes described.

11. In a switch operating mechanism, a switch-point, a pivoted lever for operating said point, an operating connection between said lever and point, a casing in which said lever is disposed, the free end of said lever being bent downwardly, a rod pivoted to the casing and disposed in line with the lever when in an intermediate position, a coiled spring surrounding said rod, a stop fastened to said lever and slidable on said rod and against which said spring presses, said rod standing at an angle when the lever is in either thrown position so that the tendency of the spring is to hold it in that position.

12. In a switch throwing mechanism, a switch point, a throwing lever connected to said point and pivoted at one end, yielding means which tend to hold said lever in either of its thrown positions, and car actuated means to set said lever for being shifted by the car and which simultaneously increases the power of said yielding means as applied to said lever, as and for the purposes described.

13. In a switch throwing mechanism, a switch point, a car actuated lever for throwing said point, which is pivoted at one end and operatively connected to said point, a coiled spring having a fixed bearing at one end and at its other end adapted to engage the free end of said lever and yieldingly hold the latter in either of its thrown positions, and car actuated means which increase the tension of said spring during the shifting movements of said lever substantially as described.

14. In a switch mechanism, a member operatively connected to the switch-point, car operated devices to first lift and then laterally shift said member to throw the switch-point, and a spring which resists both said movements.

15. In a railway switch, a movable switch-point, a device connected to said point and adapted to be brought into position to be operated by a moving car or train to throw said point from one operating position to another, means to yieldingly resist the movement of said device from either of its operating positions to the other, and means to increase the resistance effect of said latter means during the time the said device is in position to be operated.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

HAROLD SHEMWELL.

Witnesses:
ANNETTE L. EPPS,
PHILIP R. MOALE.