

D. A. BEEZLEY.
SAFETY LOCKING SWITCH.
APPLICATION FILED MAY 28, 1909.

955,311.

Patented Apr. 19, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

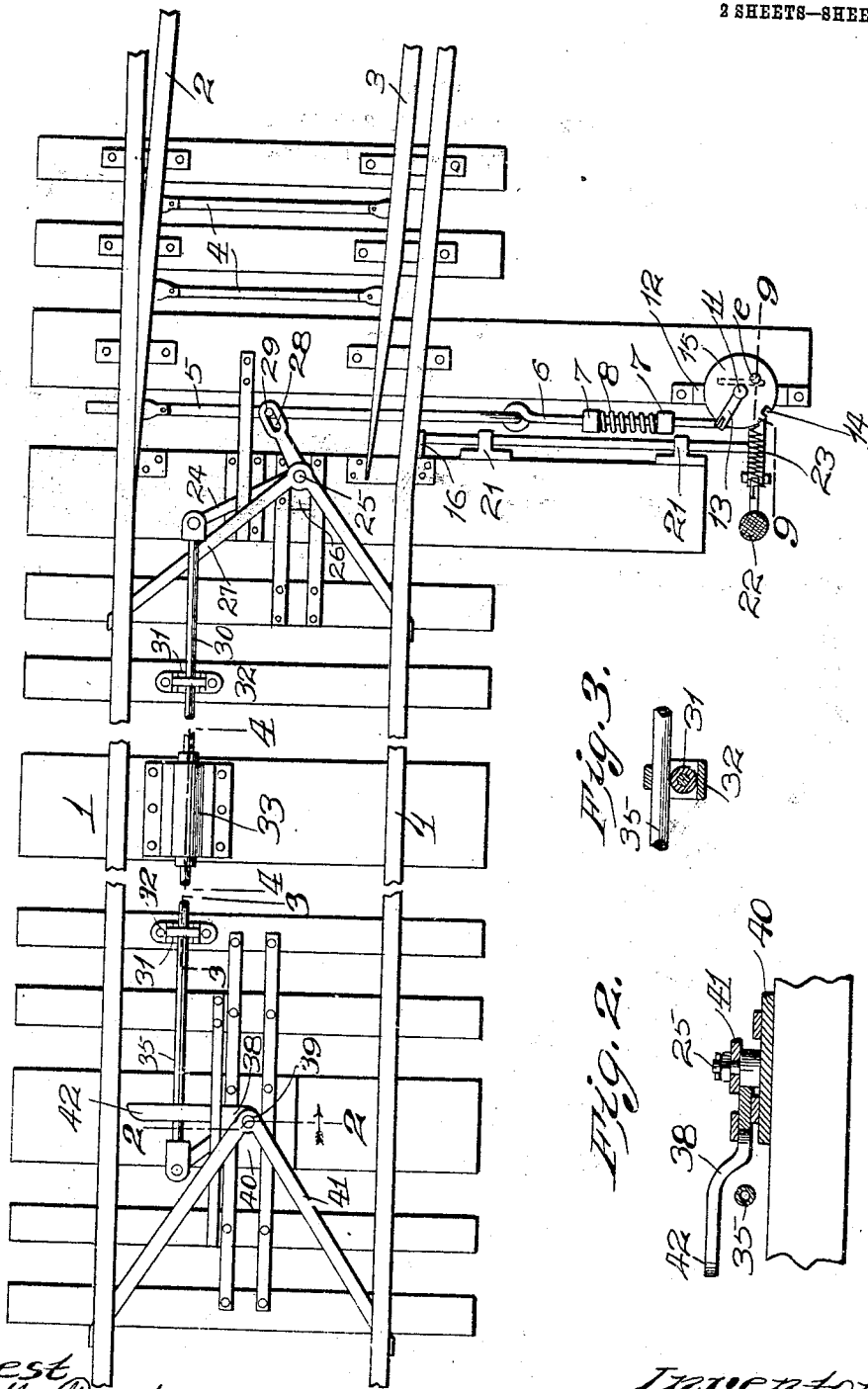


Fig. 3.

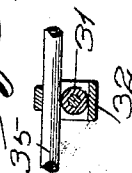
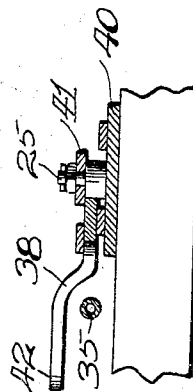


Fig. 2.



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2 SHEETS—SHEET 2.

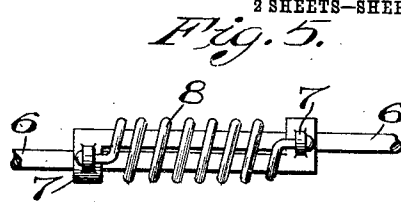
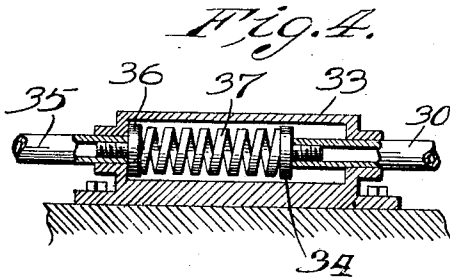


Fig. 10.

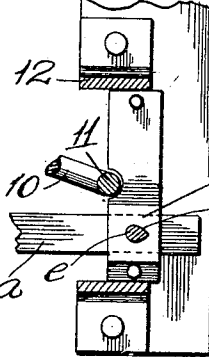


Fig. 9.

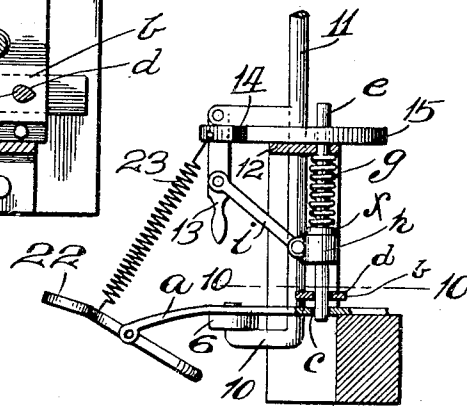


Fig. 6.

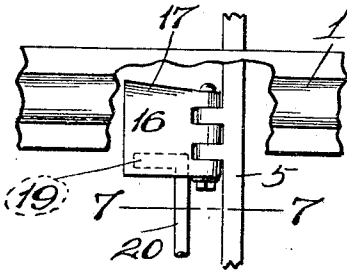


Fig. 7.

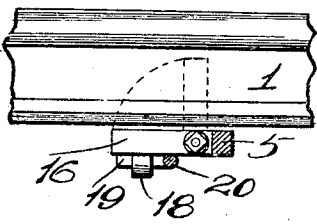


Fig. 8.

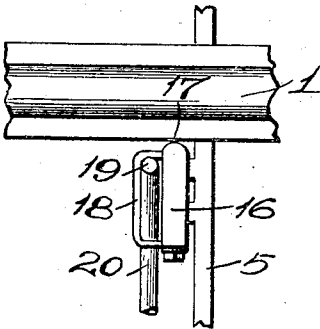
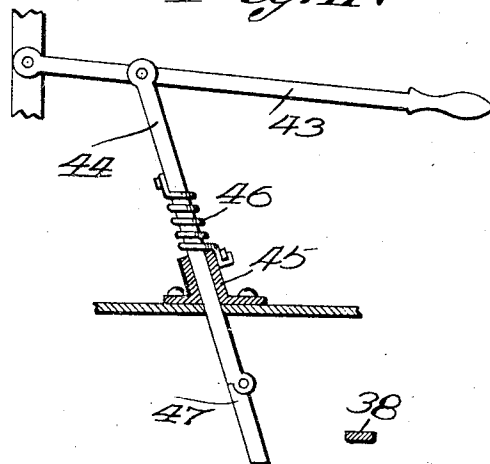


Fig. 11.



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UNITED STATES PATENT OFFICE.

DOLPHYFUS A. BEEZLEY, OF KANSAS CITY, KANSAS, ASSIGNOR OF ONE-THIRD TO
FRANK H. FARRIS, OF ST. LOUIS, MISSOURI.

SAFETY LOCKING-SWITCH.

955,311.

Specification of Letters Patent.

Patented Apr. 19, 1910.

Application filed May 28, 1909. Serial No. 499,034.

To all whom it may concern:

Be it known that I, DOLPHYFUS A. BEEZLEY, a citizen of the United States, and a resident of Kansas City, Kansas, have invented certain new and useful Improvements in Safety Locking-Switches, of which the following is a specification.

My invention relates generally to railway switches and more particularly to switch operating mechanism and a safety locking means therefor, and the object of my invention is to provide simple means whereby the movable rails of a switch are shifted by an approaching engine so that the latter will pass along the main track and which switch rails are automatically locked after movement, thus insuring the passage of the engine over the main track rails, which action reduces to a minimum the danger of an engine running into an open switch.

A further object of my invention is to provide simple means whereby a foot pedal used in connection with my improved switch operating mechanism is locked when in a set position, and my present invention is an improvement on the safety locking switch for which application for patent was filed by me February 17th, 1908, Serial Number 416,404.

To the above purpose my invention consists in certain novel features of construction and arrangement of parts as hereinafter described, claimed and shown in the accompanying drawing in which:—

Figure 1, is a plan view of a portion of a railway track with my improved switch arranged therein; Fig. 2, is an enlarged transverse section taken on the line 2—2 of Fig. 1. Fig. 3, is an enlarged section taken on the line 3—3 of Fig. 1. Fig. 4, is an enlarged section taken on the line 4—4 of Fig. 1. Fig. 5, is a side elevation of a spring connection made use of between two sections of a switch shifting bar. Fig. 6, is a detail plan view of a portion of one of the track rails and showing the locking plate. Fig. 7, is a vertical section taken on the line 7—7 of Fig. 6. Fig. 8 is a plan view similar to Fig. 6, and showing the locking plate moved into a locking position. Fig. 9, is a sectional view taken on line 9—9 of Fig. 1. Fig. 10, is a horizontal section taken on the line 10—10 of Fig. 9. Fig. 11 is a detail section showing the means carried by the en-

gine or car for engaging the switch operating mechanism.

Referring by characters to the accompanying drawings, 1 designates the main track rails, 2 the movable switch rails, 3 the movable switch point of the main track, which latter is connected to the switch rails 2, by the transverse bars 4, connecting the movable rails 2, and 3, adjacent their points is a switch bar 5, to the end of which is pivotally connected the main end of a connecting rod 6, made in two parts with the meeting ends overlapping and arranged to slide on one another by providing loop 7, on the ends of the two sections. A stiff spring 8, is arranged on the overlapping parts of the rod 6, the ends of which are rigidly fixed to the loops 7, (see Fig. 5.) The outer end of the outer section of rod 6, is pivotally mounted on the end of a crank arm 10, formed on the lower end of a vertically disposed shaft 11, which is arranged for rotation in a switch stand 12, of ordinary construction, and said shaft 11, is operated by a hinged handle 13, which engages in notch 14 formed in the edge of a plate 15, carried by the stand 12.

16 denotes a locking plate which is hinged to the bar 5, immediately adjacent the point where the said bar passes beneath the main track rail 1, which is adjacent the switch stand 12, and the rear edge of this plate is slightly inclined lengthwise and rounded in cross section as designated by 17. Formed or fixed on the under side of the plate 16, is a strap 18, which lies parallel with the bar 5, and fitting loosely through the said strap is a finger 19, which is formed integral with and projects laterally from the inner end of the rock shaft 20, operating in the bearings 21, and provided on its outer end with a laterally projecting pedal 22. Means for locking the pedal in its elevated position consist of a plate *a*, pivoted to said pedal and which plate slides beneath a strap *b*, fixed on the tie which supports the switch stand, and formed through said plate and strap are apertures *c*, and *d*, which coincide when the plate *a*, is moved to its rearward limit of movement by the pedal 22. Arranged to slide through the plate 15, and through the aperture *d*, in the strap *b*, is a pin *e*, on which is fixed a collar *f*, and positioned on said pin between the collar and plate 15, is an expansive coil spring *g*. Loosely ar-

ranged on the pin *e*, below the collar *f*, is a collar *h*, and pivotally connecting the same with the handle 13, is a link *i*. The pedal 22 occupies a position immediately in front of the stand 12, and connecting said pedal and stand is a retractile coil spring 23.

24 designates a bell crank, fulcrumed on a pin 25, between the main track rails 1, and adjacent the bar 5, which pin is fixed on a suitable base 26, and supported at its upper end by braces 27, anchored to the ties or track rails. Formed in the end of the short arm of this bell crank is a slot 28 through which passes a pin 29, carried by the switch bar 5. Pivotally connected to the end of the long arm of the bell crank is an end of a tube or rod 30, which extends a suitable distance away from the switch, and supporting said tube are rollers 31, arranged in boxes 32, which are fixed to the ties and arranged at suitable distances apart. The end of the tube 30, opposite the end connected to the bell crank passes through one end of the tubular housing 33, and fixed on this end of said tube within the housing is a disk 34. Passing through the opposite end of the housing 33 is a tube or rod 35, which is a counterpart of the tube or rod 30, and fixed on the end of said tube 35, within the housing 33, is a disk 36. Loosely arranged between the disks 34 and 36, is an expansive coil 37, which is weaker or of less resistance than the spring 8. The tube 35, is in direct alinement with the tube 30, and pivotally connected to the end of said tube 35 opposite the end provided with the disk 36, is the short arm of a bell crank 38, fulcrumed on a pin 39, fixed in a suitable base 40, and held at its upper end by braces 41, anchored to the track rails. The long arm of this bell crank 38, is elevated relative to the short arm, and the outer end of said long arm being rounded off as designated by 42.

The means carried by the engine or car for actuating the switch throwing mechanism just described, is shown in Fig 11, and comprises a hand lever 43, located so as to be readily grasped by the engineer, and pivotally connected to said lever is the upper end of a rod 44, operating through a housing 45, and said rod being normally drawn down by a retractile coil spring 46, connected at one end to the bearing and at the opposite end to the rod.

Hinged to the lower end of the rod 44, in such a manner as to swing forward and upward, is a contact finger 47, which as the engine moves toward the switch, engages against the long arm of the bell crank 38.

The operation is as follows: Assuming that the switch and switch operating mechanisms are in the positions seen in Fig. 1, and that an engine approaching the switch is operating on the main line, the finger 47 carried on the

engine, will contact with the elevated long arm of the bell crank 38, thus shifting same on its pivot, which movement moves the tubes 35 and 30, lengthwise toward the switch. The shock and jar of this contact and movement, is materially reduced by the yielding resistance offered by the spring 37. The movement of the tube 30, swings the bell crank 24, on its pivot, and by reason of the pin and slot connection 29 and 28, the bar 5, is shifted toward the switch stand, thus shifting the rails 2 and 3, so as to close the switch and open the main line. As the bar 5, is shifted, the inner part of the rod 6 is likewise moved toward the switch stand, as the outer part of said rod is held against movement by its connection with shaft 11, which is held by the handle 13, the result will be the expansion of the spring 8, thereby storing power therein. The locking plate 16, carried by the bar 5 will be withdrawn from its position beneath the track rail 1, which movement is possible, owing to the sliding connections between the plate 16, and the finger 19, on the end of the shaft 20, and as soon as the said plate is free from the rail it will be swung into a vertical position as shown by dotted lines in Fig. 7, owing to the retractile action of the spring 23, which rocks the shaft 20, and causes the finger 19, to bear against the under side of the plate 16. When the plate 16 is thus swung upward, its beveled and rounded rear edge bears against the edge of the track rail, thus locking the switch rails in their closed positions and leaving the main track open.

To open the switch after the operation just described, has taken place, the pedal 22 is depressed, which movement swings the plate 16 downward into a horizontal position beneath the track rails 1, and the spring 9, which was previously expanded, will now contract, thus shifting the switch rails into open position and causing the various parts to return to their normal positions. When the switch is in proper position to receive an approaching engine, the engineer elevates the finger 47, by engaging and lifting the hand lever 43, and thus the bell crank 38 will not be engaged. The end of the bell crank 38 is rounded off, in order that the finger 47 will readily ride over the bell crank when the engine is backing.

The pedal 22 is locked in its elevated position, while the handle 13 is in either one of the notches 14, for when so positioned, the lower end of the pin *e*, occupies the aperture *c*, thus holding the plate *a*, against outward movement. The pin *e*, is forced downward by the coil spring *g*. When the handle 13, is unlocked and elevated, the link *i*, being elevated raises the pin *e*, so that the lower end thereof is disengaged from the aperture *c*, in the plate.

A switch of my improved construction is

simple, easily installed, positive in action, and operates and locks automatically when the bell crank 38, is engaged by the contact finger carried by an approaching engine.

5 I claim:—

1. The combination with movable switch rails and a switch stand of a flexible switch bar connecting the rails and stand, means adapted to be engaged by an approaching
10 car for shifting the switch bar, a locking plate carried by the switch bar for engaging one of the track rails to hold the switch rails locked after movement, means connect-
15 ed to the locking plate for disengaging the same from the track rails, and means for locking the plate disengaging means in its set position.

2. In a switch operating mechanism of the class described, the combination with
20 movable switch rails and a switch stand, of a flexible bar connecting the rails and stand, a retractile coil spring arranged between two portions of the flexible bar, a locking plate hinged to the flexible bar and adapted
25 to engage against one of the track rails, and means whereby the locking plate is locked.

3. In a switch operating mechanism of the class described, the combination with

movable switch rails and a switch stand of a flexible bar connecting the rails and stand, 30 a retractile coil spring arranged between two portions of the flexible bar, a locking plate hinged to the flexible bar and adapted to engage against one of the track rails, means whereby the locking plate is locked in
35 its set position, and means located in front of the switch for imparting movement to the flexible bar.

4. The combination with movable switch rails and a switch stand, of a flexible switch
40 bar connecting the rails and stand, means adapted to be engaged by an approaching car for shifting the switch bar, a locking plate carried by the switch bar for engag-
45 ing one of the track rails to hold the switch rails locked after movement, a rock shaft for imparting movement to the locking plate, and means whereby the rock shaft is held against movement in one direction.

In testimony whereof, I have signed my
50 name to the specification in the presence of two subscribing witnesses.

DOLPHYFUS A. BEEZLEY.

Witnesses:

E. L. MINER,

W. H. PETERSON.