

C. C. & W. L. BENDER.
 AUTOMATIC SAFETY ATTACHMENT FOR RAILWAY SWITCHES.
 APPLICATION FILED MAR. 9, 1908.

906,094.

Patented Dec. 8, 1908.
 2 SHEETS—SHEET 1.

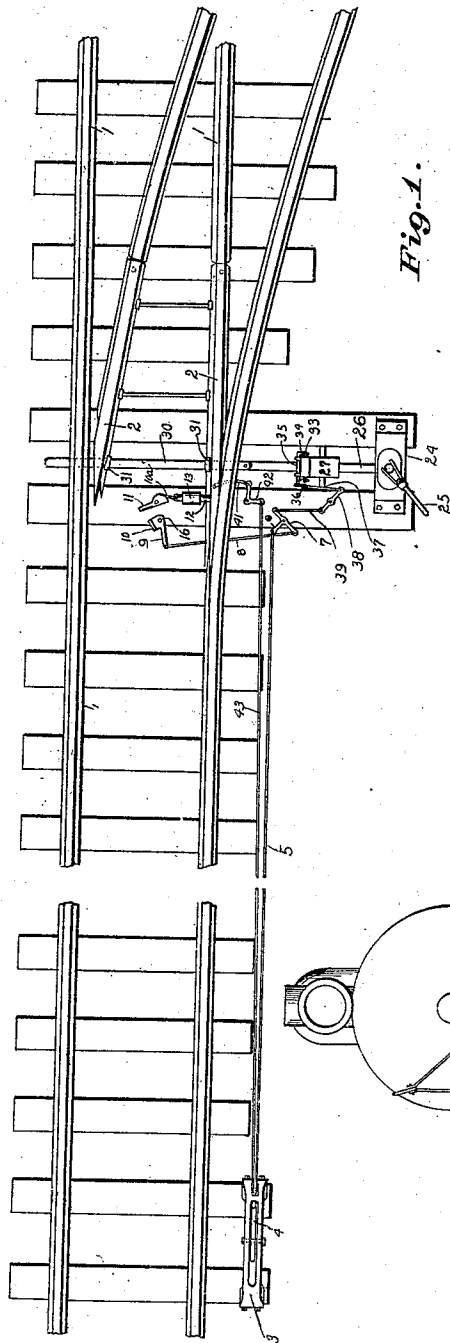


Fig. 1.

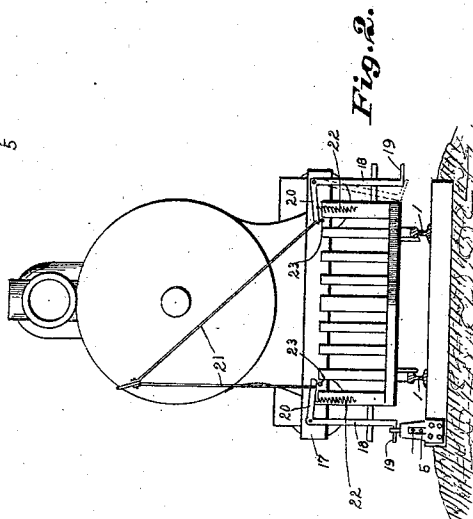


Fig. 2.

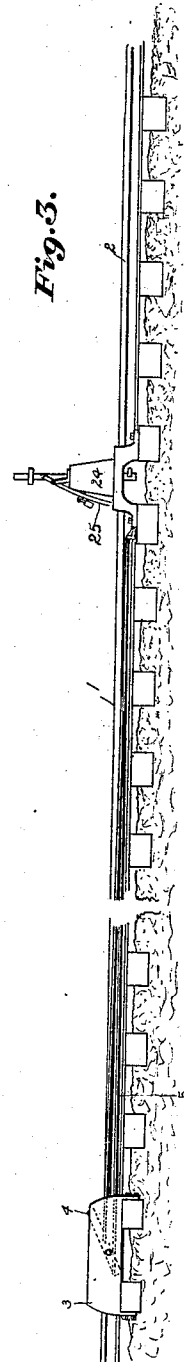


Fig. 3.

Witnesses.

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Fig. 4.

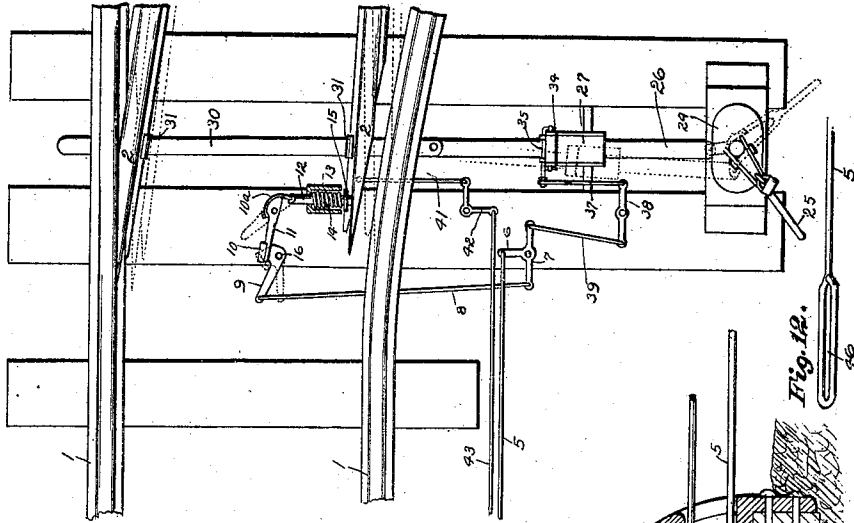


Fig. 9.

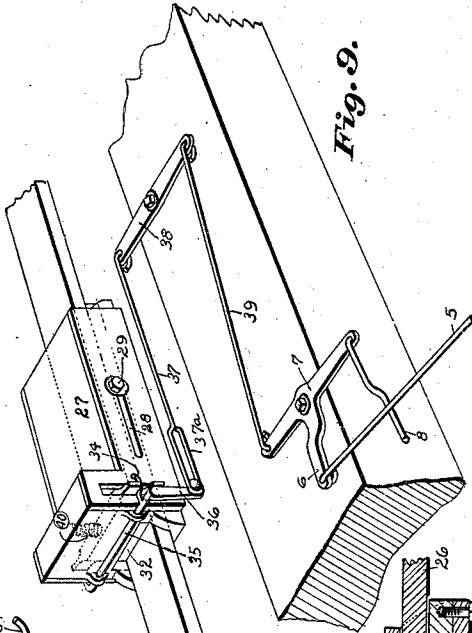


Fig. 10.

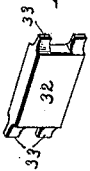


Fig. 11.

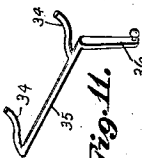


Fig. 8.

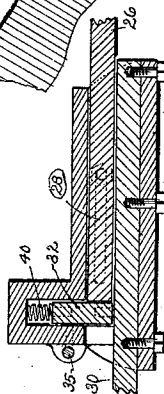


Fig. 7.

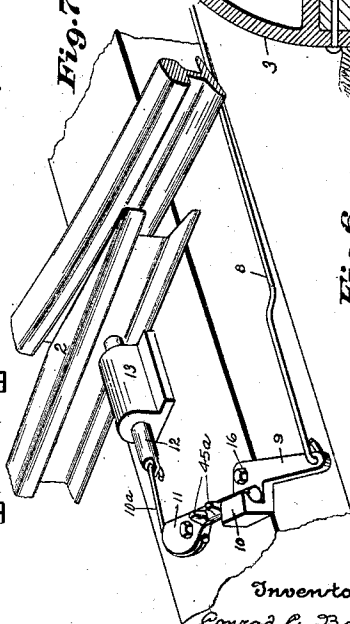


Fig. 5.

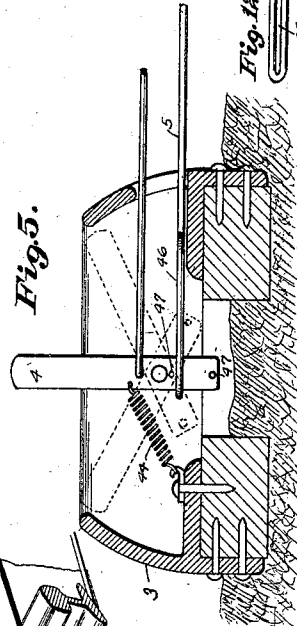


Fig. 6.



Fig. 12.



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UNITED STATES PATENT OFFICE.

CONRAD C. BENDER, OF CANTON, AND WILLIAM L. BENDER, OF MASSILLON, OHIO.

AUTOMATIC SAFETY ATTACHMENT FOR RAILWAY-SWITCHES.

No. 906,094.

Specification of Letters Patent.

Patented Dec. 8, 1908.

Application filed March 9, 1908. Serial No. 419,950.

To all whom it may concern:

Be it known that we, CONRAD C. BENDER and WILLIAM L. BENDER, citizens of the United States, said CONRAD C. BENDER residing at Canton and WILLIAM L. BENDER at Massillon, in the county of Stark and State of Ohio, have jointly invented certain new and useful Improvements in Automatic Safety Attachments for Railway-Switches; and we do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, and to the numerals and figures of reference marked thereon, in which—

Figure 1 is a plan view showing the switch operating mechanism and showing the switch closed. Fig. 2 is a view showing the front of a locomotive and illustrating the switch actuating mechanism connected thereto. Fig. 3 is a side elevation of the switch actuating mechanism. Fig. 4 is a plan view showing portions of the main track and switch and illustrating the switch actuating mechanism designed to be released by the mechanism carried by the locomotive and the switch open. Fig. 5 is a vertical section of the lever box showing the lever properly connected and in position to be actuated by the passing of a locomotive. Fig. 6 is a detached view of a tool for setting the spring retaining lever. Fig. 7 is a view showing one of the main line rails and the switch points and illustrating the position of the levers designed to hold the switch actuating spring in compression. Fig. 8 is a vertical section of the switch throwing bars showing their coupling. Fig. 9 is a view showing the switch throwing bars and their couplings and the mechanism designed to couple and uncouple the switch throwing bars. Fig. 10 is a detached view of the coupling block. Fig. 11 is a detached view of the coupling block rock shaft and its levers. Fig. 12 is a view of the slotted end of switch rod.

The present invention has relation to devices for automatically actuating a switch by a passing train, which devices co-act with the devices connected to and carried by a locomotive.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

In the accompanying drawing, 1 represents the main railway rails and 2 the switch points. These parts are of usual construc-

tion and need no detailed description. At one side of one of the railway rails is located the train switch operating lever inclosing box 3, which is so located that the lever 4 can be actuated by a passing train as hereinafter described. The lever 4 is pivoted a short distance above its bottom or lower end and is brought into a vertical position when the switch is to be actuated by a passing train.

Below the pivotal point of the lever 4 is located the rod 5, which rod extends to and is connected to the arm 6, which arm is formed integral or connected to the rock bar 7 said arm and rock bar constituting what might be termed a T lever. At one end of the rock bar 7 is attached the rod 8, which rod is extended and connected to the spring holding lever 9, which spring holding lever is provided with the flange 10, said flange being for the purpose of engaging and holding the spring releasing lever 11, which spring releasing lever is connected to the switch pushing plunger 12, which plunger is located through the housing 13 and around which plunger is located the spring 14, which spring is held in tension when the plunger 12 is brought into the position shown in Fig. 5 by means of the head 15 located at the end of the plunger 12, the opposite end of the spring being held by the housing 13.

It will be understood that when the spring releasing lever 11 is held in the position illustrated in Fig. 4 the plunger will be held out of action and the spring confined in tension but when the lever 9 is rocked upon its pivotal point 16 as hereinafter described the spring holding lever will be released thereby releasing the plunger and allowing the spring to force the plunger and the switch rail 2 toward the adjacent track rail.

For the purpose of actuating the parts just above described the cow catcher or pilot frame 17 of the locomotive is provided with the downward extending bars 18 and the contact arms 19. The top or upper ends of the downward extending bars 18 are each provided with the lateral arms 20 to which are attached the cords or their equivalents 21, which extend from the lateral arms to a spring lever in engine cab where engineer or fireman can actuate the arms 18 by means of the cords, or their equivalents 21.

For the purpose of holding the downward extending bars 18 in proper position for engaging the trip lever 4, the springs 22 are provided, which springs are for the purpose

of pulling upon the lateral arms 20, when the cords 21 are released. When desired to render the actuating tripping device ineffective, which is under the control of engineer or fireman, it may be done by tightening the cords 21, or their equivalents, thus expanding the springs 22 and moving the arms 18 inwardly so that lower ends will rest against base of pilot frame where they will not come in contact with trip lever 4. The springs however should be so adjusted as to tension that they will simply hold the bars 18 against any swinging movement, thereby insuring the arm 19 to engage the lever 4 when said arm comes in the path of said lever. When the arm 19 strikes the lever 4 it will move the top or upper end of said lever forward or to the right as shown in Fig. 5, and in dotted lines, which movement pulls the rod 5 and rocks the lever 9 upon its pivotal point, thereby releasing the spring holding lever 10, at which time the switch is closed by means of the spring 14.

For the purpose of insuring proper engagement as between the lever 4 and the arms 19 carried by the downward extended arms 18 stop pins 23 should be provided and may be located as shown in Fig. 2.

It will be understood that provision must be made for actuating the switch to open and close the same independent of the mechanism designed to actuate the switch by a passing train and in order to provide for this, any switch stand 24, of the desired type may be used as in the usual way which is provided with an operating lever 25, which operating lever is connected to the switch bar 26, which switch bar extends into the box or what might be termed coupling head 27, the sides of which coupling head are provided with the elongated slots 28, through which elongated slots the pins or lugs 29 pass and connect to the switch bar 26, the pins or lugs 29 serve as a lock to prevent switch bars 26 and 30 from becoming disengaged when actuating the switch by means of switch stand.

To the switch bar 26 is connected the switch actuating bar 30, which is of the usual construction and provided with the flanges 31 to push and pull the switch points. When the switch is closed by the lever 25 or opened by said lever the coupling 27 moves with the switch bars 26 and 30 and maintains a rigid connection of same. It will however be understood that when the switch is actuated by a passing train the coupling as between the switch stand and the switch rails must be released. In order to provide for this a vertically movable block 32 is provided, which movable block when brought to its lower position is in engagement with the switch bar 26 so that there can be no relative movement as between said switch bar 26 and the coupling block 27, but when the block 32 is elevated so as to free it from engagement with

the end of the switch bar 26 the coupling head 27 and the switch bar 30 are free to move upon the switch bar 26, and in order to elevate the block 32 so as to free the connection between the switch bars 26 and 30 the block 32 is provided with the spaced lugs 33 between which spaced lugs are located the arms 34, which arms are securely connected or formed integral with the rock bar 35 to which rock bar is connected or formed integral the downward extended arm or lever 36 to which downward lever is connected the bar 37 by elongated slot 37^a, which is pivotally connected to the rock bar 38, which rock bar is pivoted intermediate its ends to a railway tie or its equivalent and to the opposite end from that to which the bar 37 is connected is attached the rod 39, said bar being actuated by the rock-bar 7 so that when the rock-bar 7 is actuated by the rod 5 the lever 36 will be rocked, which in turn lifts the block 32 by means of arms 34 and the lugs 33 thereby freeing coupling between the switch bars 26 and 30 and at the same time the spring 14 is released.

It will be understood that when the switch points are operated by the lever 25 the block 32 should not be moved and in order to provide for this the link 37 is provided with the slot 37^a, which permits coupling-head 27 as shown in Fig. 9, to move toward switch-stand, when switch is closed by hand, without moving lever 36 and rock-bar 35 or disturbing the block 32.

For the purpose of moving the block 32 down and into the position shown in Fig. 8, the spring 40 is provided, which spring rests against the top of the block 32 and the under face of the elevated portion of the coupling 27.

It will be understood that the lever 4 should be elevated when the switch points 2 are thrown into the position shown in Fig. 4, by the switch lever 25, and in order to provide for this the flexible cable or connection 41 is provided, said cable being connected to one of the switch points and to the bell crank 42, which bell crank is pivotally attached to a tie or its equivalent. To this bell crank is attached the rod 43 which rod is connected to the lever 4 at a point above its pivotal point so that when the switch point 2 is moved from its closed position Fig. 1, to its open position Fig. 4 the lever 4 will be elevated by the pull of the rod 43. When the switch points 2 are brought into the positions illustrated in Fig. 1 the cable 41 will be slackened thereby allowing the spring 44 to pull the lever 4 into the position shown in dotted lines and completely housing it until the switch is again thrown open.

It will be understood that some force must be applied to bring the spring compression lever 11 into position to be locked by the lever 9, and after switch has been actuated by a train, and in order to provide leverage a bar

45 is provided, which is attached to the lever 11 by means of two upwardly projecting lugs 45^a, by which the lever 11 can be brought around to such a position that same can be locked as illustrated in Fig. 7.

For the purpose of allowing the switch actuating lever 4 to be moved by the spring 44 without in any way interfering with the mechanism designed to release the spring 14, the rod 5 is provided with the slot 46, thereby allowing the lower end of the lever 4 to be moved by spring 44 or rod 43 without actuating the rod 5, but when the lever is thrown forward or moved by the train the lower end of the switch actuating lever 4 will pull the rod 5 and release the connection between switch-bars 30 and 26 in coupling block 27, and simultaneously with the releasing of said coupling just described, rod 5 in connection with rod 8 and lever 9 will also release spring 14 designed to actuate or close the switch.

For the purpose of holding the rod 5 in proper relative relationship with reference to the switch actuating lever 4, said lever is provided with the pins 47.

The instant the lever 4 is actuated by the train mechanism it moves the rod 5, which releases the locking block in coupler 27, thus allowing the bar 30 and the coupling block 27 to slide upon switch bar 26 simultaneously with the releasing of the actuating spring 14, which immediately throws the switch point and holds same in rigid position. In order to operate the switch after same has been actuated by the train it will be necessary to insert the bar 45 between the lugs 45^a located on the spring compressing lever 11 and with the additional leverage thus received will easily compress spring 14. After the lever 11 has been set, the hand switch lever is actuated so as to move the switch bar 26 back into coupling block 27 and back of the movable block 32, and thus allow the block 32 to be forced downward by the spring 40 located above said block and at the end of bar 26 thus completing the rigid connection between switch 26 and 30 necessary to operate the switch manually and when the parts are in this position the switch can be operated in the usual manner.

For the purpose of providing a support for the sliding movement of the coupling 27, a bar such as 27^a should be properly arranged and held in fixed position with reference to said coupling head in any convenient and well known manner. It will also be understood that the various movable parts such as the coupler 27 and the housing for the springs and lever should be protected by suitable housings which are common and need no detailed description.

For the purpose of moving the plunger 12 when the lever 11 is brought into engagement with the flange 10 formed upon the

lever 9 the connecting strap 10^a is provided and connected in any convenient and well known manner to the rounded end of the lever 11. This strap should be formed of such material that, that portion coming in contact with the lever 11 will yield or bend so that it will hug the end of the lever against which it comes in contact.

Having fully described our invention what we claim as new and desire to secure by Letters Patent, is—

1. The combination with a railway switch, a lever adapted to be operated by a train, a plunger and a spring adapted to actuate the plunger, said plunger adapted to close the switch point, a spring compression lever and a spring locking lever adapted to hold said spring compression lever and mechanism intermediate the spring locking lever and the train actuated lever adapted to release the spring locking lever, substantially as and for the purpose specified.

2. The combination of a railway switch and means whereby the same may be manually operated, a spring adapted to close the switch independently of the means for manually operating said switch, means for holding the spring in compression and means for releasing the spring and unlocking the means for manually actuating the switch by the passing of a train and means carried by the train adapted to actuate the switch actuating and releasing lever, substantially as and for the purpose specified.

3. In a railway switch of the class described, the combination of an inclosing box, a lever pivoted intermediate its ends and adapted to be elevated above the box, means carried by a train adapted for engagement with the lever when in elevated position, a rod connected to the lever adapted to be actuated by a train below its pivotal point, a lever connected to the opposite end of said rod, a rod connected to said lever, a rock bar actuated by the rod connected to the lever, a second rod connected to said rock bar, a rock shaft adapted to be actuated by said second rod, and a block actuated by the rock shaft, switch bars slidably connected together and adapted to be locked against sliding movement by the block actuated by the rock shaft, substantially as and for the purpose specified.

4. In a railway switch, the combination of a downward extended arm carried by a locomotive, said downward extended arm provided with an actuating arm, means extended from said actuating arm to actuate the downward extending arm, a switch actuating lever pivoted intermediate its ends, a spring releasing rod, actuated by the lever pivoted intermediate its ends, a spring releasing lever and means intermediate the aforesaid rod and lever to release the spring releasing lever and switch bars slidably con-

nected together, substantially as and for the purpose specified.

5 5. In a switch of the character described, the combination of manually actuated switch mechanism, said mechanism consisting of a manually actuated lever and switch bars slidably coupled together and means for locking the sliding action of said switch bars, switch points, one of said switch points having
10 connected thereto a flexible connection, a lever connected to one end of said flexible connection, a rod, a switch actuating lever pivoted intermediate its ends and adapted to be elevated by the pull of the flexible connection, substantially as and for the purpose
15 specified.

20 6. In a railway switch, the combination of switch bars and a manually actuated switch lever, a coupling block provided with a block adapted to lock the switch bars, when in its lowermost position and means for elevating the block and a switch actuating lever adapted to be actuated by the passing of a train, a spring adapted to close the switch points

when released and means intermediate the switch actuating lever and the spring to release the tension of the spring, substantially as and for the purpose specified. 25

7. In a railway switch, the combination of a switch actuating lever located in the path of means carried by the train to actuate said lever in the direction of the movement of the train, switch points and a spring adapted to close the switch points, means for releasing the spring, a switch bar adapted to close the switch points independent of the spring and means for releasing said switch bar simultaneously with the releasing of the spring, substantially as and for the purpose specified. 30 35 40

In testimony that we claim the above, we have hereunto subscribed our names in the presence of two witnesses.

CONRAD C. BENDER.
WILLIAM L. BENDER.

Witnesses:

J. A. JEFFERS,
F. W. BOND.