(No Model.) 2 Sheets—Sheet 1.

A. JOHNSON & W. S. CAMPBELL.

SAFETY SWITCH.

No. 518,607. Patented Apr. 24, 1894.

Fig. 1.

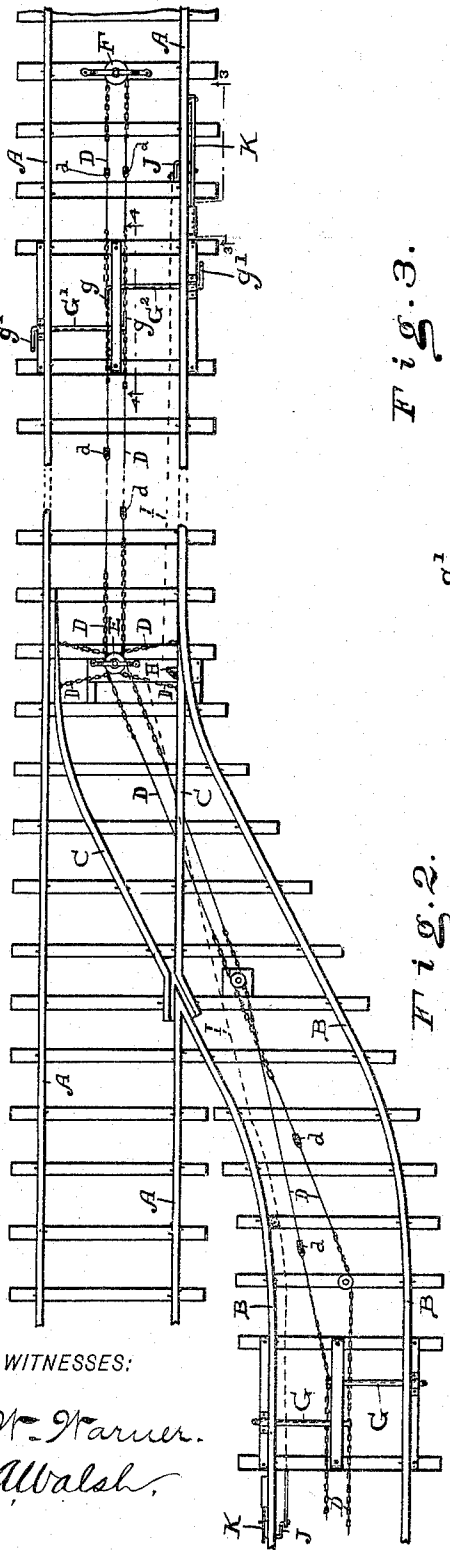


Fig. 3.

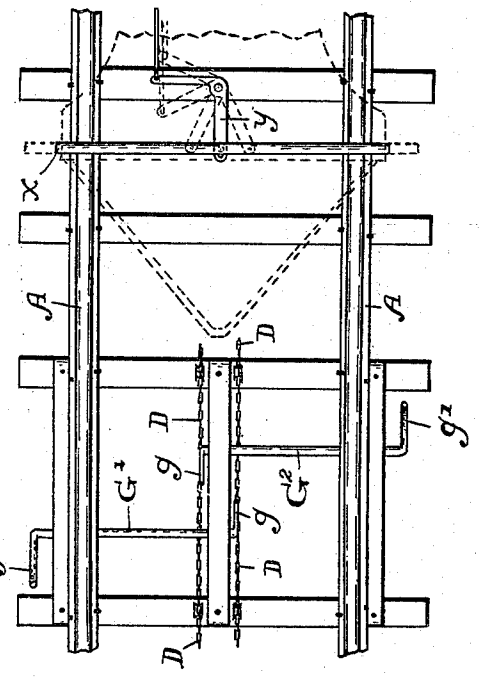
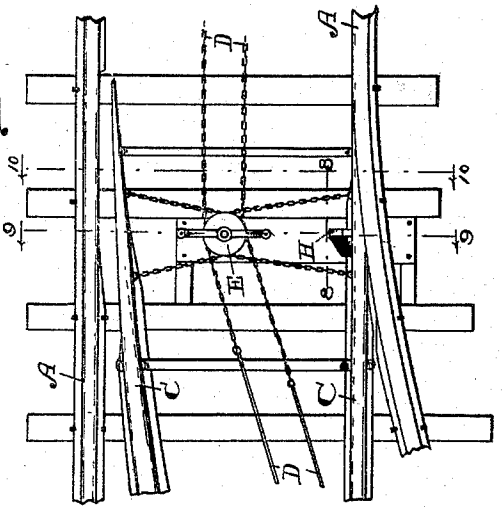


Fig. 2.



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WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

A. JOHNSON & W. S. CAMPBELL.

SAFETY SWITCH.

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Fig. 4.

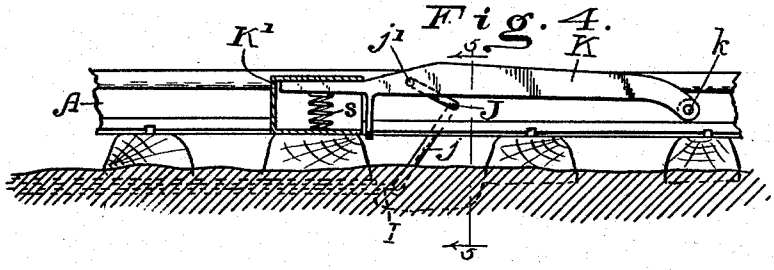


Fig. 5.

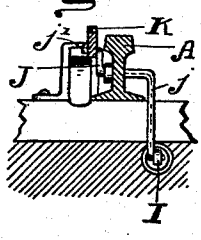


Fig. 6

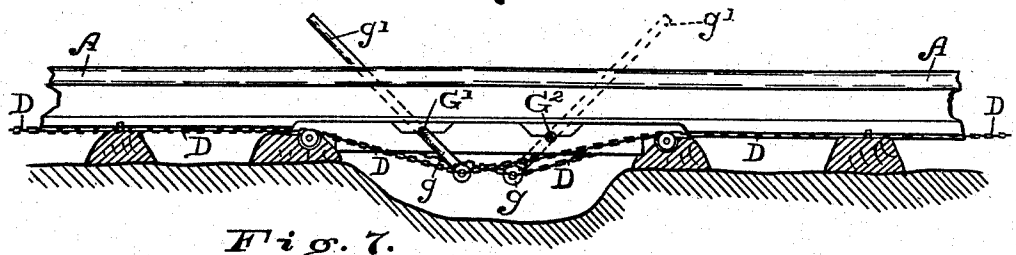


Fig. 7.

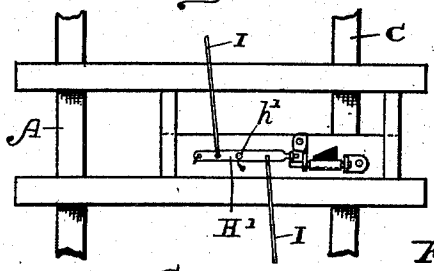


Fig. 8.

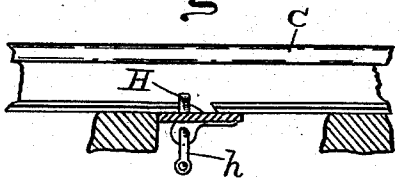


Fig. 9.

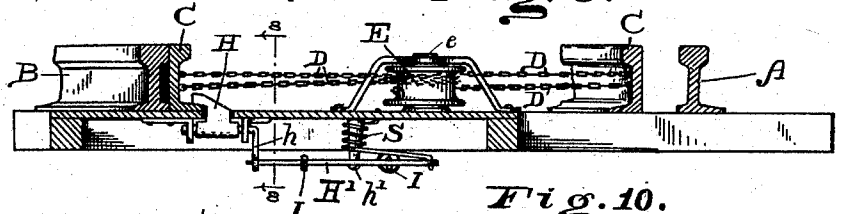
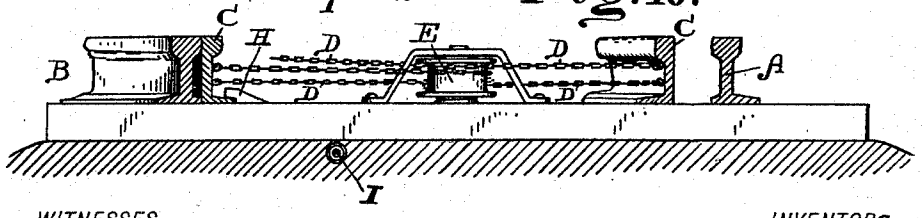


Fig. 10.



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UNITED STATES PATENT OFFICE.

ALFRED JOHNSON AND WILLIAM S. CAMPBELL, OF WEST POINT, INDIANA.

SAFETY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 518,607, dated April 24, 1894.

Application filed December 11, 1893. Serial No. 493,377. (No model.)

To all whom it may concern:

Be it known that we, ALFRED JOHNSON and WILLIAM S. CAMPBELL, citizens of the United States, residing at West Point, in the county of Tippecanoe and State of Indiana, have invented certain new and useful Improvements in Safety-Switches, of which the following is a specification.

Our invention relates to safety switches for railway tracks; and it consists in certain improved means whereby the switches may be operated to be both opened and closed by a moving train, and also whereby the switch may be locked for the main track, and unlocked by the moving train at the proper time.

A switch provided with our said improvements will be first fully described, and the novel features thereof then pointed out in the claims.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a plan view of a railway track and switch provided with our said improvements; Fig. 2 a detail plan view of a portion of the same, on an enlarged scale; Fig. 3 a view of the mechanism on the moving train, by which the switch is operated; Fig. 4 a side elevation of the device by which the switch lock is operated, a portion of the inclosing casing being broken away; Fig. 5 a transverse sectional view thereof on the dotted line 5 5; Fig. 6 a detail view showing the levers by which the switch is operated; Fig. 7 an under side plan of the switch lock; Fig. 8 a transverse sectional view of the same alongside one of the track rails on the dotted line 8 8 in Fig. 2; Fig. 9 a view on the dotted line 9 9 in Fig. 2; and Fig. 10 a view on the dotted line 10 10.

In said drawings the portions marked A represent the rails of the main track; B the rails of the side track; C the switch rails; D chains, ropes or wires by which the switch rails are operated; E a sheave between the points of said switch rails around which the chains run; F sheaves, at a point distant from the switch, around which said chains also run; G′ G² rock-shafts bearing crank-arms by which said chains are operated; H a lock or catch by which the switch rails are locked in position; I chains or ropes by which said lock is operated; J a rock-shaft carrying crank-arms for operating said rods I, and K levers pivoted to the track for operating said rock-shafts J.

The rails A B and C, severally, are or may be of an ordinary and well-known construction, and will not, therefore, be further described herein, except incidentally in describing the invention.

The chains D are attached at one end to one of the switch rails C, and run thence first to the sheave E, around said sheave, thence to a sheave F, around said sheave, back to the sheave E, and thence to the other one of said switch rails C. They are attached at an intermediate point to crank-arms *g* on the rock-shafts G′ G². It will thus be observed that when one of said rock-shafts is moved, it will throw the switch in one direction or the other, as will presently be more fully described. There are tension springs *d* in the chains D.

The sheave E is located at a central point between the two switch rails C, and is mounted on a pivot *e* around which it loosely revolves. It serves simply to carry the ropes or chains D and hold them to a common point, so that uniformity of movement may be secured.

The sheaves F are commonly idle sheaves, and serve to keep the chains or ropes D in proper position for operation. But one of these sheaves is shown,—at the right-hand end of Fig. 1,—but in actual construction there is a similar sheave at the other end between the side track rails B, beyond the point where it is broken away in the drawings, both ends being alike in this particular. These sheaves might be made the means of operating the chains or ropes D, if desired.

The rock-shafts G′ and G² run transversely of the tracks, and are mounted in suitable bearings secured to the rails or ties, and are provided at the inner ends with the crank-arms *g*, and at the outer ends with crank-arms *g′*. The crank-arms on the inner ends are secured to the ropes or chains D, and the crank-arms on the outer ends extend up and are

adapted to be struck and operated by the mechanism on the moving train. By means of these two rock-shafts, with their crank-arms, the switch can be operated from either position to the other from a train moving in either direction. To illustrate: Suppose a train is coming from the right toward the left, (on the drawings.) The strike X thereon would be arranged to come in contact with the arm g' on the rock-shaft G^2, in order to shift the switch so that the train would run onto the side track. Were a train coming from the left toward the right, and it was desired to throw the switch, behind the train, so that said train could back in onto the side track, the strike on the train would be set so as to come in contact with the arm g', on the rock-shaft G', which would accomplish the same result so far as the switch is concerned. If the rock-shafts were moved and the switch set in the other position from that shown, then the train coming from the right would have its strike set to operate through the rock-shaft G'; or a train coming from the left would operate through the rock-shaft G^2. By having the operating mechanism both upon the front end of the train, or engine, and upon the rear end, or caboose or rear car, it will be observed that the switch can be shifted when, and as, desired. In other words, either rock-shaft will operate the switch from either position to the other, being arranged to operate it from one position when its strike-lever G' is inclined one way, and to operate it to the other position when said strike lever is inclined the other way.

The lock H is arranged as shown in Fig. 9 to engage with one of the switch rails C and hold it firmly in place, thus locking the switch to the position desired. In form it is a wing mounted on a rock-shaft and pivots, and having a crank-arm h to which a lever H' mounted on a pivot h' is connected, a spring S is also connected to the lever H', and holds it in that position, which keeps the lock H into engagement, except when forcibly disengaged by a pull on one of the rods I. As shown in Fig. 8, a notch is cut into the foot flange of the switch rail C, which permits the projecting point of the lock H to pass down through it, and said projecting point in use passes to the top of said foot flange, and thus makes the lock more secure, as shown in Fig. 9.

The rods I are simply suitable rods or other connections running from the crank-arms h on the locks H to the crank-arms on the rock-shafts J. The rock-shafts J are mounted in bearings, preferably in the web of the railroad rails, and are provided with crank-arms j which connect with the rods I, and with other crank-arms j' which connect with the levers K. The levers K are mounted on pivots k which are preferably attached to the railroad rails. At the other end said levers enter housings K', and within said housings are springs s, which are of sufficient rigidity that any ordinary pressure, such as the weight of a person standing on the rail, will not compress them, but which are compressed by the weight of the passing train. The operation is that the train in passing depresses this lever K, rocking the rock-shaft J, through its crank-arm j, and thus, through the crank-arm j', pulling on the rod or chain I, swinging the lever H' on its pivot, and thus throwing the lock H over on its pivots or shaft down out of the way of the switch rail C, which switch rail is then free to be operated, and may be operated by the strike on the train coming in contact with one of the crank-arms g' as heretofore described.

Upon the locomotive or one of the cars (preferably upon both the locomotive and the caboose) we provide a strike or contact device preferably in the form of a bar X which may be projected on either side to come in contact with one of the arms g'. A bell-crank lever Y and any suitable operating devices connected thereto are the means of operating it. As shown by the full lines in Fig. 3, this strike when at rest does not project far enough to come in contact with either of the arms g', but will pass between them. As shown by the dotted lines, however, it may be thrown out far enough on either side to come in contact with the corresponding arm.

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

1. The combination, in a safety switch for railways, of the switch rails, a single pulley located between the points of said switch rails, a distant single pulley between the two rails, a rope or chain attached at its ends to the points of the switch rail and passing first around the single pulley between said points and thence around the single distant pulley, rock-shafts extending transversely of the track and located between the two pulleys, one extending to each side of the track, crank-arms on said rockshafts connected to the two strands of rope or chain, respectively, and other crank-arms upon said rock-shafts extending up alongside the track, and the contact device upon the moving train adapted to be shifted to come in contact with either of said crank-arms, whereby the switch may be operated from either position by a train moving in either direction, substantially as shown and described.

2. The combination of the switch rails C, and a pivoted lock H therefor, a lever H' connected to said lock, a rod I connected to said lever and running to a distant point, a rock-shaft J at said point to which it is connected, a lever K pivoted to the track and connected to and operating said rock-shaft, and a spring s for operating said lever K in the reverse direction, substantially as shown and described.

3. The combination, with a railway switch,

and mechanism for operating said switch from a moving train, of a pivoted lock H also connected by means of a rock-shaft and crank-arm with said mechanism, said lock being adapted to engage with the flange of the rail, said flange being cut away to receive said lock, substantially as shown and described.

In witness whereof we have hereunto set our hands and seals, at West Point, Indiana, this 2d day of December, A. D. 1893.

ALFRED JOHNSON. [L. S.]
WILLIAM S. CAMPBELL. [L. S.]

Witnesses:
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JOHN M. HAGGARD.