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C. F. McDONALD.

SAFETY DEVICE FOR RAILWAY SWITCHES.

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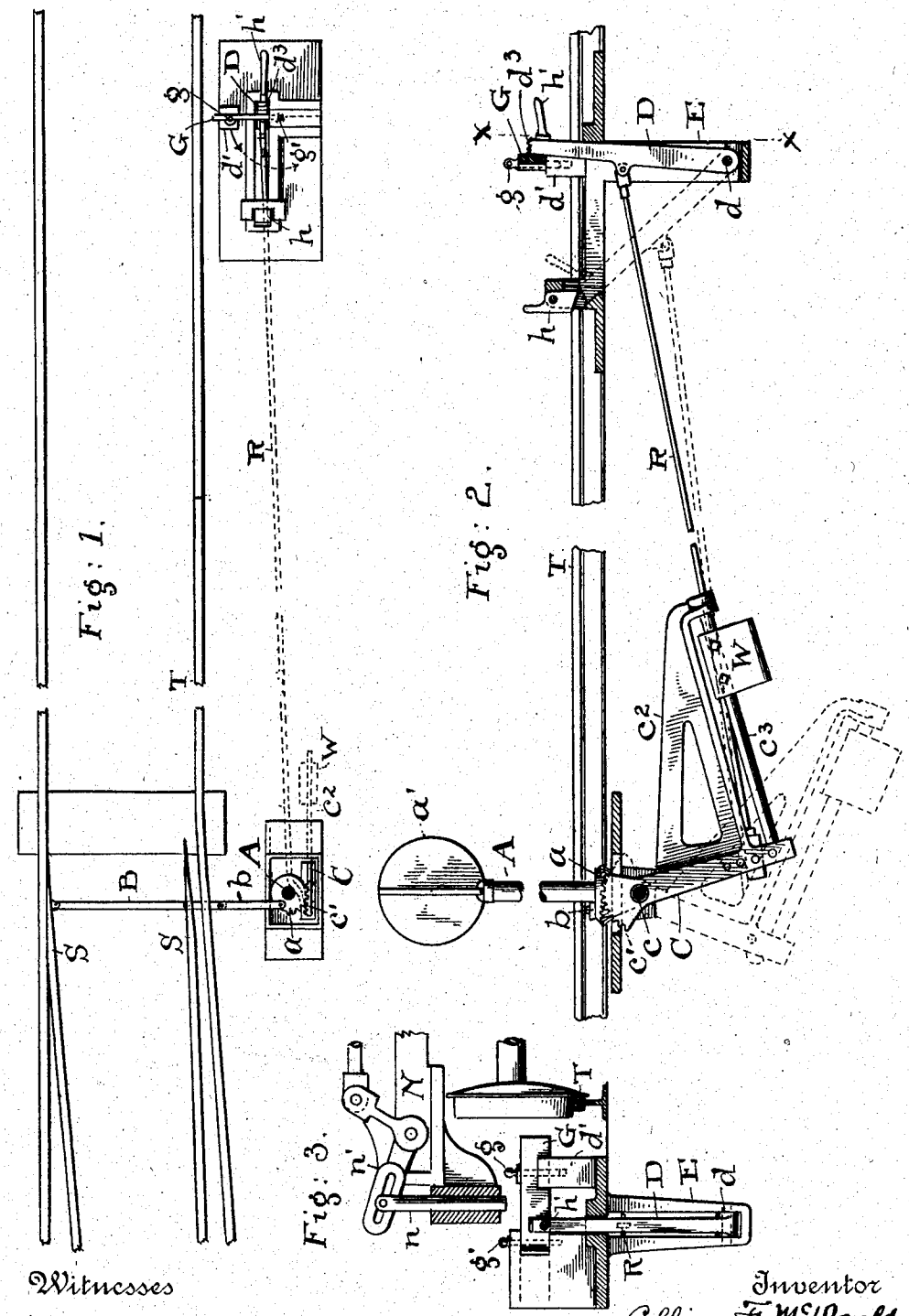

Witnesses

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SAFETY DEVICE FOR RAILWAY-SWITCHES.

No. 796,000. Specification of Letters Patent. Patented Aug. 1, 1905.

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To all whom it may concern:

Be it known that I, COLLINS F. McDONALD, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Safety Devices for Railway-Switches; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to safety devices for railway-switches; and the invention consists in a construction, combination, and arrangement of parts whereby an open switch on a through track or wherever the device may be employed is automatically and positively closed through initial actuation from an approaching train or locomotive and the switch closed in time to save the train from possible wreckage, all substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of the invention in connection with a car-track and switch, and Fig. 2 is a side elevation thereof. Fig. 3 is a cross-section on line x x, Fig. 2, looking to the left with a portion of a car and parts thereon as hereinafter fully described.

As thus shown the entire device will be seen to be simple in construction and arrangement and absolutely certain in action when occasion arises. It will also be seen that the entire mechanism is built without recourse to springs or other questionable means, so far as operation is concerned, and that every actuation of operative parts is positive and definite. Thus, starting with S as the switch, it is seen as open in Fig. 1 and in position for an accident as a train approaches on the main track T if it be not closed before or by the time a train arrives. Hence I provide said switch with closing means designed to be actuated from the first approaching train, whether it be passenger or other train, and said means comprise an immediate switch-connecting bar or rod B, connected by a link b with a cam or crank-wheel a about the base of the target-standard A. The said gear a may be full or mutilated, and standard A is rotatably supported to change or set target a', and link b is connected with said gear to operate or throw the switch. A so-called "secondary" actuating-lever C is pivoted near its top at c and provided with a toothed segment c' above said pivot-engaging gear a, and said lever has a forwardly-extending arm c^2, carrying a rod or bar c^3 at its bottom, on which is a slidable weight W, adapted to be fixed here or there, according to the weight required for actuating said lever when the trip mechanism is released, as will now be seen, At the starting-point of all this mechanism I provide an initial or operating arm D, pivoted at its bottom in a suitable bracket-support E and which may have any practical shape or form, and a rod R connects this lever, pivoted at its bottom at d, with lever C at the other end, and said rod is adjustable up and down on lever C to give more or less throw to the several operating parts. Thus weight W becomes an actuating part for both switch S by or through rotating gear a and the front lever D to draw said lever downward the instant it is released. Having, therefore, the connecting-rod R between levers C and D they necessarily work together, and one must work when the other does and in unison therewith.

Now, having the said parts constructed and operatively located and connected as shown and described, the safety element in the entire structure is found in the comparatively fragile and breakable element or part G. This special part in one sense is a latch or lock for arm D, as in Fig. 1 and full lines, and is adapted to release the same and set the train of mechanism in operation when the latch is released, as appears in dotted lines, Fig. 2, and as a switchman will do by hand. Preferably the part or latch G is made of cast-iron and of such weight and strength that it will serve all the purposes of every-day use for confining lever D, and yet weak or breakable enough to yield when struck suddenly by a device or projection n on a car N, arranged to travel across the place of this device when lowered. In other words, the device G is in the path of said projection when it is down and the switch is open. When the switch is closed, the parts are down and out of the way of said device or projection n and it passes over them as if they were not there. This, of course, is the normal condition, and it is only when a careless switchman has forgotten his duty or for some other reason the switch has been left open that this safety mechanism is designed to act, and in such case it must act, and act effectually. It is then that lever D is locked back by the breakable latch or part G by means

of a pin g; but when the part G is struck by the projection or shoe on a car or locomotive the said part is broken into pieces, and instantly weight W asserts itself and draws arm D down and throws lever C back, and thereby rotates gear a and closes the switch, and all at the same instant.

The weight or counterweight W need only be heavy enough to give instant actuation upon the breaking of the part G, and when said part or latch is broken the switch automatically closes, because of the great speed at which some trains generally reach such places, and the speed of a train is taken into account in placing the immediate safety parts, including the breakable part G and lever D, at suitable distances in advance of the switch itself, thus in any event closing the switch before the car or locomotive can reach it, whatever its speed of travel. A final precaution for this mechanism is provided in the locking mechanism for lever D, whereby said lever must necessarily remain locked, as in dotted lines, and thus hold the switch closed. To this end I preferably provide lever D with serrations or teeth d^3, transversely at its upper end, which are adapted to be engaged by a gravity pawl or dog h and hold the lever from self-opening or being opened except by hand. Any auxiliary lock for pawl h may be used so as to require a certain and particular key for opening it, and a handle or hand-stem h' on lever D serves to lay hold of and carry it back to be confined by part G and pin g.

Lever C and arm c^2 may be in one or more pieces, and any suitable breakable material or its equivalent may be used in lieu of cast metal for part G, the idea being to clear said part away when the locomotive projection strikes it and releases the confined arm D. So may there also be other mechanical changes here and there and not depart from the spirit and intent of this invention, if substantially the same functions be performed.

Obviously an entirely new latch part G for arm D must be provided in every case when a switch has been closed by a passing train, and a pivot-pin g' for said part on bracket E serves to make exchange of the parts convenient. The shoe or projection n on the locomotive strikes the safety-latch G between the two pins g and g'. The elevation of said parts in respect to the track or rail H is about as seen in Fig. 3, and they are located just outside the track.

Practically arm or lever D is the initial switch-controlling member, as it is also the means personally handled by the switchman in throwing the switch open or shut. When he shuts it, he releases the latch part G by withdrawing pin g, and the switch automatically shuts itself just as when a train shuts it; but to open the switch the pull is against counterweight W.

One of the most material advantages resulting from the use of a breakable or fragile part or member in the switch-throwing mechanism is the fact that thereby no shock is imparted to the mechanism in the organization or system, so that no other part of the mechanism is at all affected when the piece G is broken or severed as it is struck by an approaching train whatever the speed.

Normally the projection or shoe n on the train is down in position to strike piece G and need be raised only when an approaching train is itself to take the switch. Then the engineer or other person, according to the location of said projection, raises it sufficiently to clear the said piece, and this can be done through a bell-crank n' or other suitable means.

A spring may be used for counterweighting lever C and arm c^2 or their equivalent in this organization; but a weight is preferred.

What I claim is—

1. In safety devices for railway-switches, an initial actuating-lever for operating the mechanism and breakable means confining said lever, whereby when the locomotive strikes said breakable means the said lever is released and the switch is automatically closed.

2. In safety devices for railway-switches, a pivoted lever for controlling said safety devices and a breakable latch mechanism confining said lever.

3. A safety switch-controlling mechanism comprising an initial lever located at the side of the track and having the switch-throwing parts operatively connected therewith, and a confining part for said lever constructed to be broken when struck by a sufficient blow and release the said lever.

4. In safety mechanism for railway-switches, a pivoted initial controlling-lever and a breakable confining-latch for said lever pivoted to swing across the path thereof and means to temporarily lock the free end of said latch.

5. A safety mechanism for railway-switches comprising a pivoted initial controlling-lever for said mechanism, a counterweight arranged to draw said lever into inclined position, and a breakable latch for said lever.

6. The switch mechanism comprising the secondary and initial levers and a link between them, a counterweight connected with said parts, a breakable safety-latch for said initial lever and an automatic catch for said lever when released from said latch.

7. The switch, the counterweighted secondary lever and the mechanism operatively connecting said parts, in combination with the initial lever, the breakable latch for confining the same and the automatic lock for engaging said lever when released from said latch.

8. In railway-switches, an initial lever, a breakable device temporarily confining said

lever and a car provided with a downward projection arranged to travel in the line of said breakable device.

9. In railway-switches, a primary lever for controlling the line of switch mechanism and a breakable part confining said lever, in combination with a secondary lever and a switch and means operatively connecting said lever with said switch and said primary lever, a counterweight mechanism on said secondary lever and a car provided with a movable downward projection adapted to strike said breakable part confining the primary lever.

In testimony whereof I sign this specification in the presence of two witnesses.

COLLINS F. McDONALD.

Witnesses:
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