W. QUINTAL.

SWITCH OPERATING DEVICE.

APPLICATION FILED JUNE 27, 1911.

1,054,791.

Patented Mar. 4, 1913.

3 SHEETS—SHEET 1.

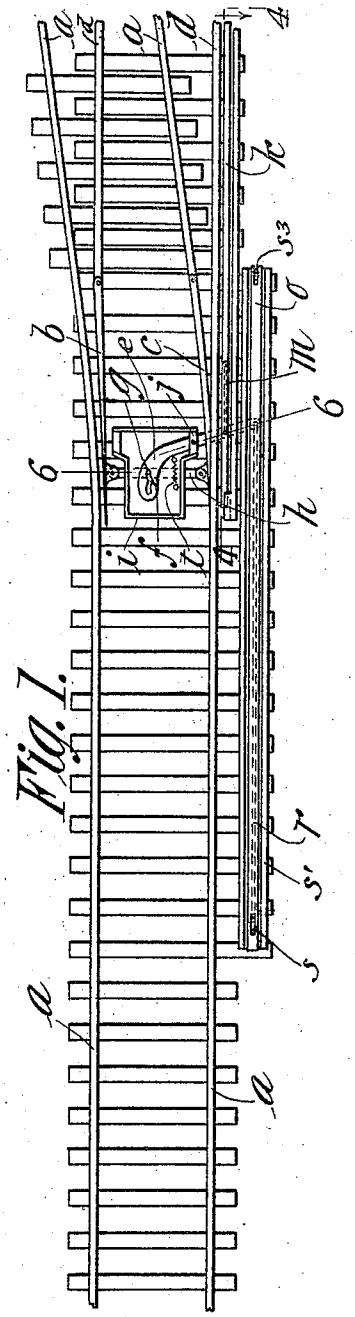

Fig. 1.

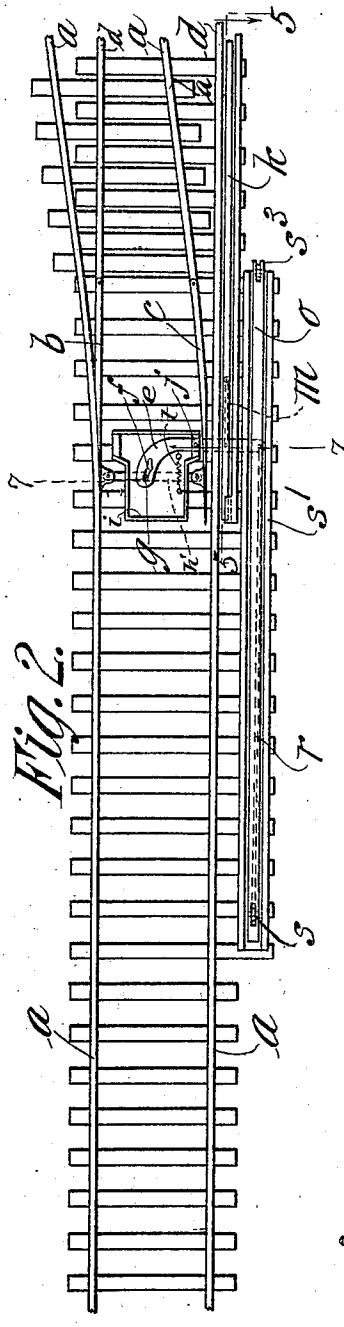

Fig. 2.

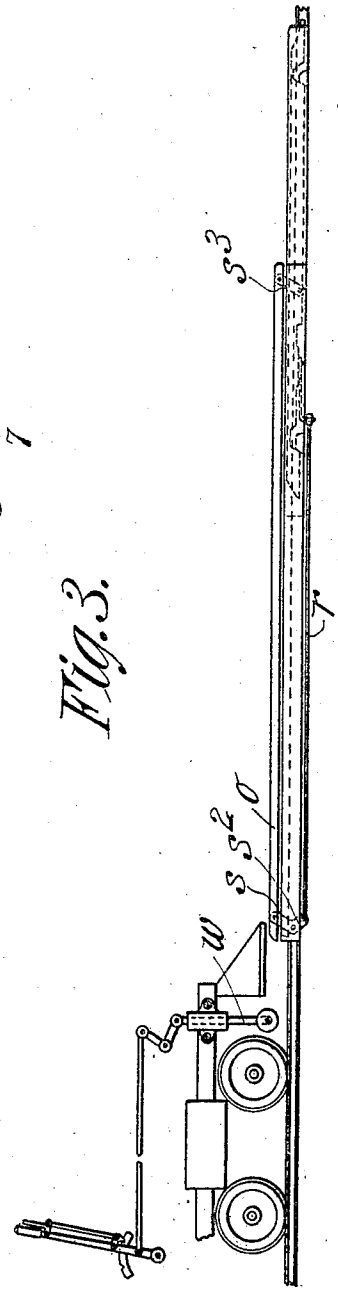

Fig. 3.

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3 SHEETS—SHEET 2.

Fig. 4.

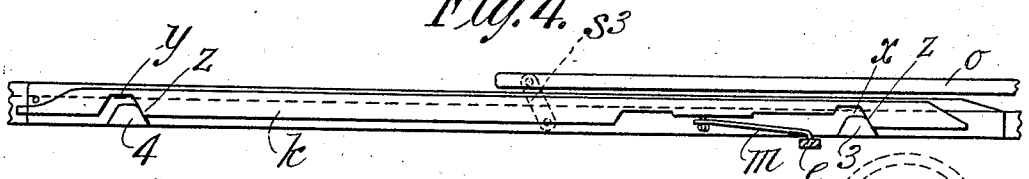


Fig. 5.

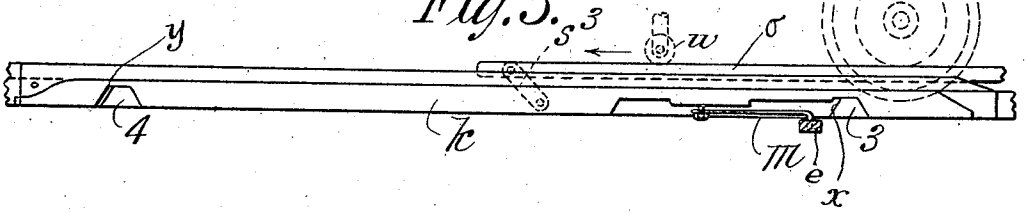


Fig. 6.

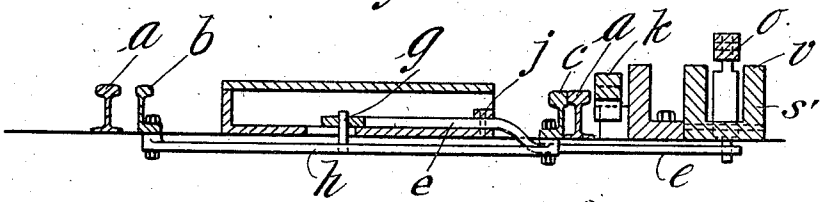
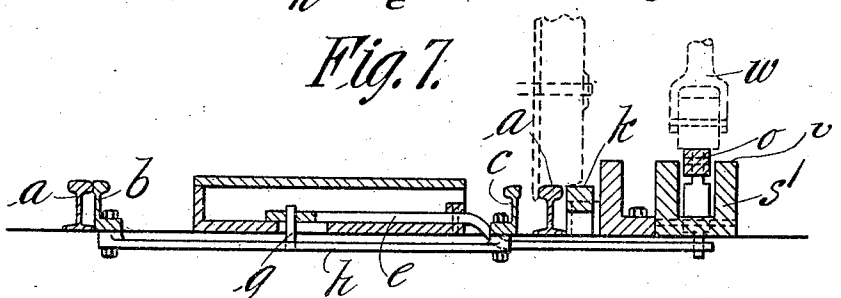


Fig. 7.



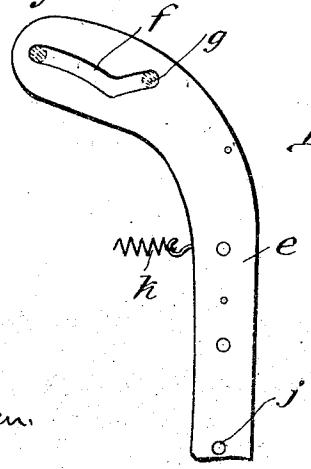


Fig. 12.

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3 SHEETS—SHEET 3.

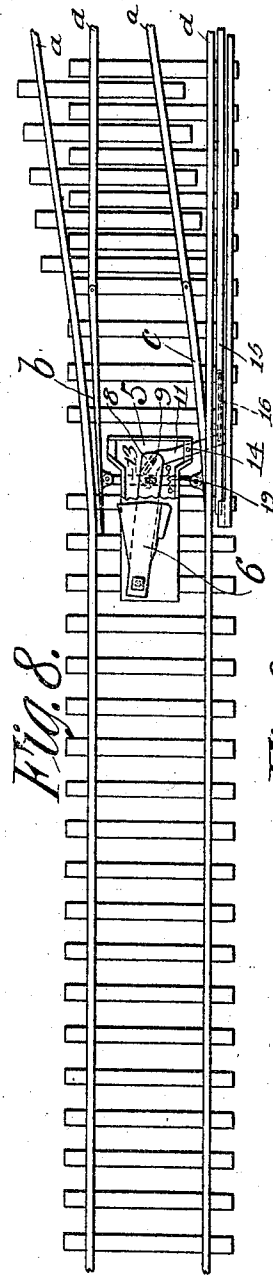

Fig. 8.

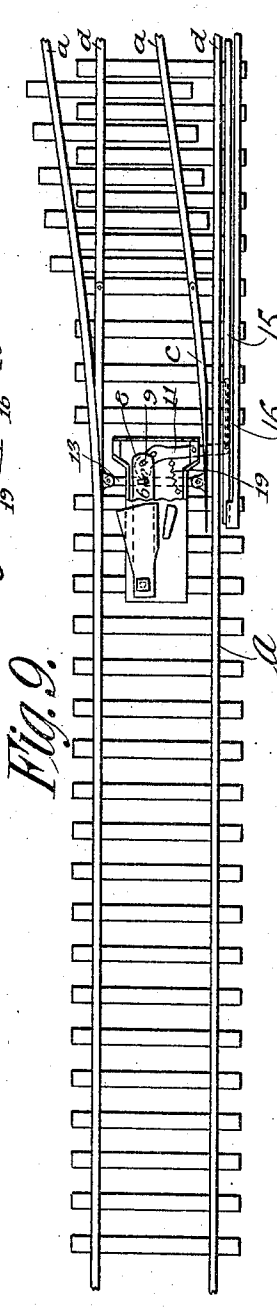

Fig. 9.

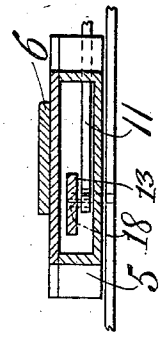

Fig. 11.

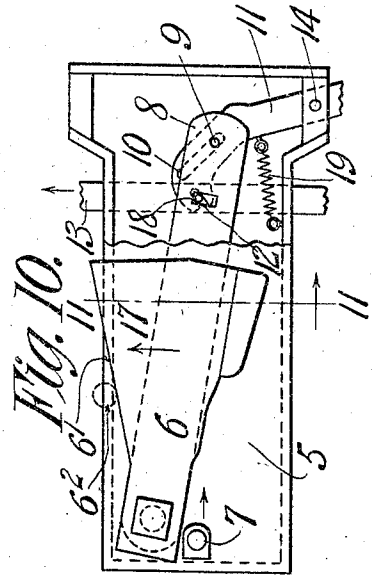

Fig. 10.

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UNITED STATES PATENT OFFICE.

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SWITCH-OPERATING DEVICE.

1,054,791. Specification of Letters Patent. Patented Mar. 4, 1913.

Application filed June 27, 1911. Serial No. 635,566.

To all whom it may concern:

Be it known that I, WILFRED QUINTAL, a citizen of the United States of America, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Switch-Operating Devices, of which the following is a specification.

This invention relates to improvements in automatically operated railway switches and is especially designed for automatically switching a moving train from one track to another without manual assistance.

Broadly, the invention consists in locating either between the rails, or outside of the same, a device which is adapted to be struck by a part or projection carried on the train. The movement of this part transmits a movement from the device to a member which is located so as to be held down by the tread portion of the wheel during the passage of the train into the switch. The movements of the device and member throw the switch so as to permit the train to move onto the siding, or other track, and to hold the switch in this open position until the last car has passed thereover.

It is the usual custom, in the operation of switches, to transfer a moving train from one track to another, for one of the trainmen to unlock the switch and throw it by hand until the car has passed, and then throw the switch back again. This operation requires a great deal of time and practically requires bringing the train to a dead stop before the switch can be thrown by the trainman. By means of my improvement, the engineer can cause the switch to be opened from his cab, thus saving time in allowing the train to proceed without coming to a stop, and to permit the automatic closure after the train has entered the siding.

In the drawings forming part of this application,—Figure 1 is a plan view showing the switch in a closed position, that is with the main line open. Fig. 2 is a view similar to Fig. 1 with the switch opened and the main line closed. Fig. 3 is a side elevation showing the relative arrangement of the projection on a portion of the engine and the depressible bar operable therefrom, and by which the switch is operated. Fig. 4 is a detail view in elevation, partly in section, on line 4—4, Fig. 1, which shows the bar that is operated by the projection on the engine, and before the car-wheel strikes the second bar for holding the switch open. Fig. 5 is a detail view in elevation, partly in section on the line 5—5, Fig. 2, which shows the position of the parts with the car-wheel in place on the second bar that holds the switch open. Fig. 6 is a transverse sectional view on the line 6—6, Fig. 1, illustrating the position of the operative parts in their normal position with the switch closed. Fig. 7 shows the position of the parts when the switch is opened on the line 7—7, Fig. 2. Fig. 8 is a modification showing the operative devices placed between the rails and showing the switch closed. Fig. 9 is a view similar to Fig. 8 showing the switch opened. Fig. 10 is an enlarged view of the operative parts within the casing. Fig. 11 is a transverse, sectional view on the line 11—11, Fig. 10. Fig. 12 is an enlarged detail view showing the operating lever, the form of slot therein, and the position the pin occupies in the slot both in the open and closed position of the switch points.

Referring to the drawings, *a* designates the rails of the main track or line; *b* and *c* the movable point or tongue members of the switch rails *d*; *e* an operating lever having an angular-shaped slot *f* in the inner end thereof for receiving the pin *g* which extends upward from the rod *h* that connects the two movable point members *b* and *c* together. The pin *g*, as shown in Fig. 1, is at the right-hand end of the slot *f* when the switch-points *b* and *c* are closed. This pin is retained in this position and against the wall or end portion of the slot by means of the spring *t* which is the normal position of the parts; and, as the pin is secured to the bar *h* to which the points *b* and *c* are secured, this spring will constantly maintain the main line open and the points in a closed position. With the pin in this position it is acting toward or against the pin *j*. The right-hand end of the slot is formed on an arc of a circle, the center of which is the pivot-pin *j*. When the projection *w* on the engine engages the bar *o* and moves the bar *k* downward flush with the upper surface of the rails (see Fig. 7) the lever *e* is operated about its pivot *j*, and during the first portion of the movement or travel, the pin *g* will remain stationary and also the bar *h* because the right-hand end

of the slot is formed on an arc of a circle whose center is the pin *j*. During the latter part of the movement of the lever *e*, the pin *g* and bar *h* are moved so as to move the points *b* and *c* into the position shown in Fig. 2, that is with the main line closed and the switch open. As the inner end of the lever *e* travels from the position shown in Fig. 1 to that shown in Fig. 2, it is clear that the pin *g* and bar *h* will be moved and the switch points opened. The left-hand end of the slot *f* extends practically parallel with the sides of the lever *f* and intersects or leads into the right-hand end of the slot which is formed on the arc of a circle about *j* as a center. Consequently when the pin *g* leaves the right-hand end of the slot and travels along the left-hand end it will be moved the same distance as this end of the lever travels. The weight of the train will then retain the switch points open, as shown in Fig. 2. After the train has passed, the spring *t* will automatically return the points to their original position, as shown in Fig. 1.

The operating lever *e* is pivoted to a casing *i* at the point *j* and is attached to the depressible bar *k* by means of the link *m*, the outer end of the lever *e* being attached to the bar *o* by means of the flexible connection *r*. A bell-crank lever *s* is interposed between the connection *r* and the bar *o* and pivoted to the casing s^1 at s^2.

s^3 designates a link which supports the opposite end of the bar in a parallel ruler manner.

t designates the spring which is attached to the operating lever *e* and a fixed part of the casing *i*. This spring serves to hold the bar *o* elevated, as shown in Figs. 3, 4, and 6. The bar *o* is placed in the casing member s^1 with its upper surface normally projecting above the upper edge *v* a slight distance.

The link *m* causes the bars *o* and *k* to move together: because when the bar *o* is struck by the projection *w* on the engine this bar is depressed which causes its motion to be transmitted to the lever *e* by means of the connection *r*. The link *m* is also attached to the lever *e*, and the bar *k*. Therefore when the bar *o* is depressed the bar *k* will be simultaneously moved downward. Therefore, when the projection *w* on the engine, (which is shown at the left of Fig. 3,) strikes the bar *o*, the bar *k* falls downward and forward into the position shown in Fig. 7, (that is it falls from the elevated position shown in Fig. 6 to the flush position shown in Fig. 7), the wheel of the engine, shown in dotted lines in Fig. 7, holding the bar *k* downward, thus opening the switch points, as shown in Fig. 2. The pin *g*, meanwhile, has traveled from its position shown in Fig. 1 to the opposite end of the slot *f*, as shown in Fig. 2. After the projection *w* has left the bar *o*, the weight of the train serves to hold the switch open, and the passing of the last car-wheel from the rear end of the train permits its upward return to the closed position shown in Fig. 1. The bar *k* that is attached to the lever *e* is provided with notches *x* and *y*, and these notches afford shoulder portions *z* which rest on projections 3 and 4. These notches and shoulder portions permit the bar *k* to move backward and forward and up and down.

Referring to the modifications shown in Figs. 8, 9, 10 and 11: 5 designates a box which is located between the rails of the track and which serves to contain the operative parts for moving the switch. In this respect it differs from the construction just described in which the operative parts are located outside of the rails. Referring to the details of this modification,—6 indicates a lever which is pivoted to the upper portion of the box 5 and this lever is adapted to be struck by the projection 7 on the moving train. Attached to the lever 6 is a bar 8 that is provided with a pin 9 which works in a slot 10 of the lever 11, the outer end of the lever being provided with an outwardly opening slot or recess 12 which receives a pin on the bar 13, which bar is connected to the movable members *b* and *c*. The lever 11 is pivoted to the box 5 at 14 and is attached to the parallel arranged bar 15 by means of the link 16, the bar 15 being located adjacent the rails *a* and engaged by the tread portion of the car-wheels in order to hold the switch open while the train is passing, in the same manner as described above in connection with Figs. 1 to 7. When the projection 7 strikes the lever 6, the bar 8 is moved in the direction of the arrow 17 causing the pin 9 on the lever 8 to slide down the slot 10, which, being an inclined one, causes the inner end of the lever 11 to be moved away from the pin 18 on the bar 13, and out of the slot 12. This action permits the bar 8 to move the bar 13 into the open position shown in Fig. 9. At the same time the bar 15 falls into a position that is flush with the upper surface of the rails. The wheels of the train of cars now engage the bar, as before described, and hold the switch points *b* and *c* open. The spring 19 will return the switch to the closed position after the train has passed into the spur-track. During this return movement the pin 18 reenters the slot 12 and the pin 9 moves to the opposite end of the slot 10, whereby the switch is held locked again in its closed position, as shown in Fig. 8.

It will be noticed that in Figs. 8, 9, and 10 the piece 6 is provided with an inclined edge 6^1 at its left side, the purpose of which is to throw the switch points *b* and *c* into a closed position by means of a projection

42 on the engine, should the main line for any reason be left open, which might happen should the returning spring 19 become broken.

What I claim, is:—

1. In an automatic switch-operating device comprising switch members, a pair of depressible bars located outside of one of the rails of the main line, said bars being normally in different horizontal planes, one of them being adapted to be struck by a projection on the moving train which simultaneously depresses the second bar flush with the top of the rail and into the path of the tread of the moving wheels, connections between the two bars and the switch members, whereby the switch may be held in open position during the passage of the train thereover, and means for returning the switch members to the normal position after the train has passed.

2. In an automatic switch-operating device comprising switch members, a pair of longitudinally arranged depressible bars located outside of one of the rails of the main line, said bars being normally in different horizontal planes, one of them being adapted to be struck by a projection on the moving train which simultaneously depresses the second bar flush with the top of the rail, and into the path of the tread of the moving wheels, connections between the two bars and the switch members, whereby the switch may be held in open position during the passage of the train thereover, means for returning the switch members to the normal position after the train has passed, and means for holding the switch locked in its closed position.

3. An automatic switch-operating device comprising a longitudinally extending bar member adapted to be operated from the moving train, a second bar located adjacent one of the main rails and operable from said bar member into a position flush with the upper surface of the main rail, a lever connected to the second bar, connecting means between the lever and the point members of the switch, whereby when the first bar is operated by the moving train the switch will be opened, said connecting means between the lever and the point members including a slot in the lever and a pin entering the same for holding the switch members against movement when in a closed position.

4. In an automatic switch-operating device comprising switch members, a pair of longitudinally extending bars located outside of one of the rails of the main line, one of them being adapted to be struck and depressed by a projection on the moving train which simultaneously depresses the second bar, connections between the two bars and the switch members, whereby the switch may be held in open position during the passage of the train thereover, and means for returning the switch members to the normal position after the train has passed.

WILFRED QUINTAL.

Witnesses:
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