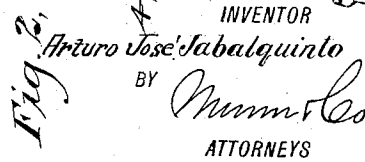
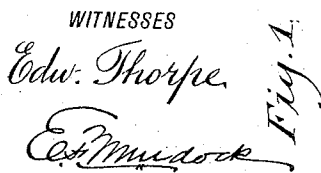


966,212.

2 SHEETS—SHEET 1.

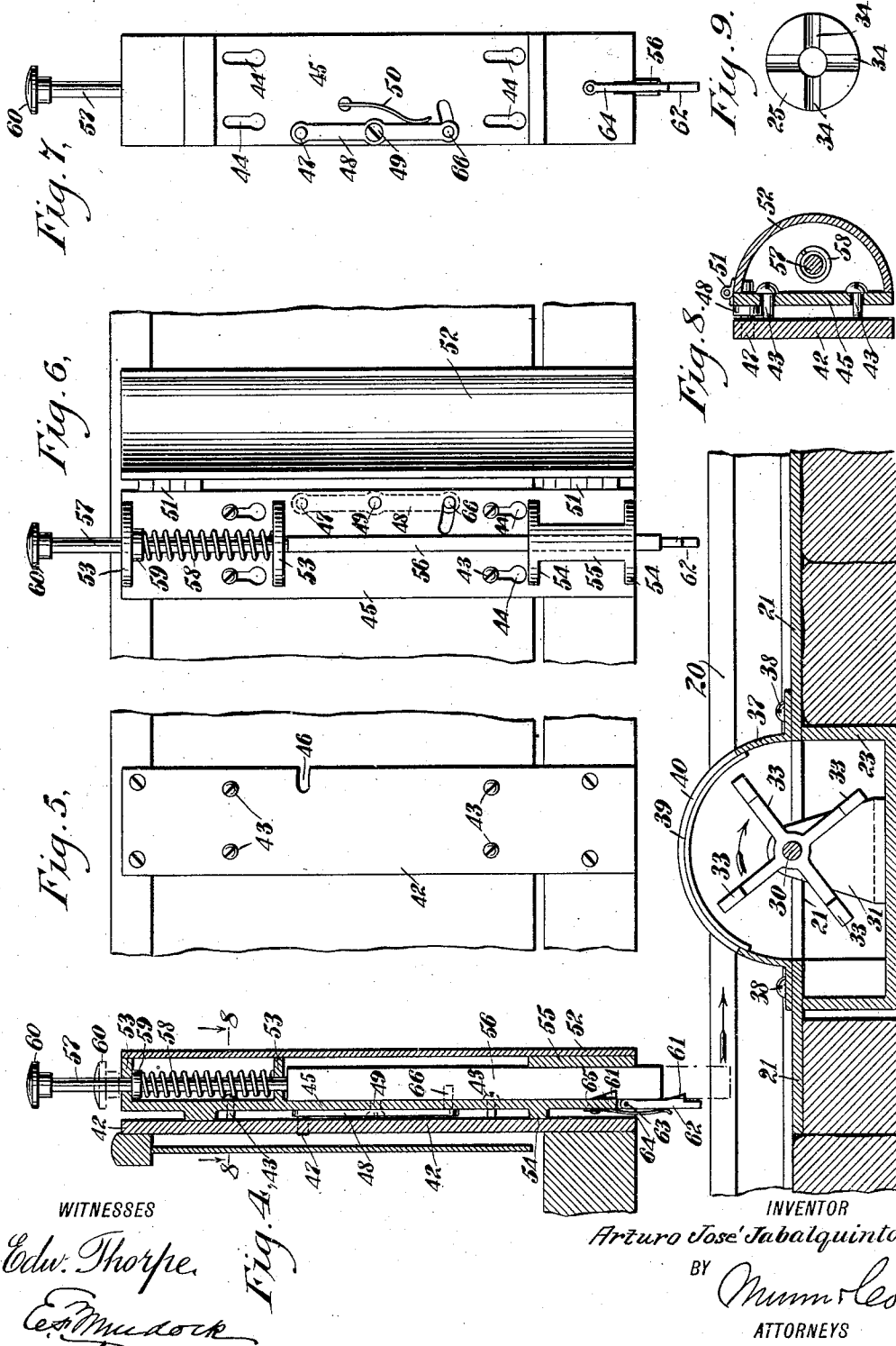


A. J. JABALQUINTO.
AUTOMATIC RAILWAY SWITCH.
APPLICATION FILED OCT. 15, 1908.

966,212.

Patented Aug. 2, 1910.

2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

ARTURO JOSÉ JABALQUINTO, OF SANTIAGO, CHILE.

AUTOMATIC RAILWAY-SWITCH.

966,212.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed October 15, 1909. Serial No. 522,770.

To all whom it may concern:

Be it known that I, ARTURO JOSÉ JABALQUINTO, a citizen of the Republic of Chile, and a resident of Santiago, Chile, have invented a new and Improved Automatic Railway-Switch, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are; to provide a mechanism whereby a railway switch is operated by an implement mounted upon the body of the car; to provide a mechanism wherein the operative parts are protected against damage by accidental insertion of deleterious matters; to provide a mechanism in which the operating power is materially increased by a system of levers and cam surfaces; to provide suitable protecting devices whereby the fixed structures are protected from damage by passing vehicles; to provide an operating device which is removably supported in the car structure and adapted to be shifted therein; and to provide a mechanism which is efficient and durable.

One embodiment of the present invention is disclosed in the structure illustrated in the accompanying drawings, in which like characters of reference denote corresponding parts in all the views, and in which—

Figure 1 is a plan view of the switch station constructed and arranged in conformity with this invention; Fig. 2 is a similar view, the cover of the supporting casing being removed to expose the contained operating mechanism; Fig. 3 is a sectional view, taken on the line 3—3 in Fig. 2, showing the important connections between the operating mechanism and the pivoted rail of the switch; Fig. 4 is a vertical section on the line 4—4 in Fig. 2 of the moving and stationary elements of the switch operating mechanism; Fig. 5 is a front elevation of the car dash-board, showing the means for attaching the switch operating mechanism; Fig. 6 is a front elevation of the switch operating mechanism, being shown in position upon the car dash-board, and showing the casing for the said mechanism thrown open; Fig. 7 is a rear elevation of the switch operating mechanism; Fig. 8 is a cross section of the switch operating mechanism, taken

on the line 8—8 in Fig. 4; and Fig. 9 is a detail view of the rear face of the cam drum for throwing the switch.

The application of the present invention most desired is that in which it is employed in connection with electric urban railways. Wherever the switch arm 10 is employed in a railway system there is located on the approach side of the said arm a lever 11. The lever 11 is pivoted at 12 on a suitable vertical standard 13, to which it is connected against disadjustment by a nut 14. The forward end of the lever 11 is bifurcated, as shown at 15, to receive a hook arm 16 extended laterally from a plate 17. The plate 17 is a depended from the switch arm 10, being fixedly secured thereto by any suitable fastening device, such as screws 18. The plate 17 is extended below the flange 19 of the track rail 20, and also below the metal plate covering 21, the upper edge of which is flush with the road bed. The plate 21 rests upon and is secured to ties 22, which likewise support the track 20. The outer end of the hook arm 16 is depended to extend between the arms of the bifurcated end 15 of the lever 11. The plate 21 is ample to cover the chamber formed by the walls 23, which constitute a box-like structure for the lever 11 and the mechanism for operating the same. In the drawings the plate is shown in ampler dimensions, being rectangular in shape.

The lever 11, and with it the switch arm 10, are operated in opposite directions by a spring 24 on the one side, and a cam drum 25 on the opposite side. The spring 24 is anchored upon the track upon the road 24^a, whereby the spring normally exerts a strain upon the bifurcated end of the lever, tending to throw the switch arm 10 against the main, or straight line track 26. It is permitted to do so whenever the cam drum 25 is rotated to present to a roller 27 mounted on the end of the lever 11, one of the two oppositely disposed depressions 28 in the cam surfaces of the said drum 25. Whenever the cam heads 29 are presented to the roller 27 the lever 11 is rotated about the pivot 12 to retract the bifurcated end 15 to place the switch arm 10 in the position shown in full lines in Figs. 1 and 2 of the drawings.

The mechanism for operating the lever 11 is most clearly shown in Figs. 2 and 4 of the drawings. It consists principally in a main shaft 30, which is suitably mounted in bearings formed in a casing 23 and in a standard 31. The shaft 30 is extended transversely to the road bed, and has fixedly mounted thereon a hub 32, from which are radially extended four arms 33, 33. The arms 33, 33 are of sufficient length to extend above the road bed and to be impinged upon and moved by a member depending from the moving car structure, as will hereinafter be more fully set forth and explained. Likewise fixedly mounted upon the shaft 30 is the cam drum 25. This drum is constructed either solidly or in a hollow form. On the one side of the said drum is provided a track like surface having depressions 28, 28 and cam heads 29, 29 constructed and arranged to reciprocate the lever 11 in conjunction with the spring 24. The rear surface of the drum 25 is provided with four oppositely and radially disposed grooves 34, 34 (see Fig. 9). In these grooves there plays a detent 35, the head 36 whereof is suitably formed to drop into the said grooves and to maintain the desired position of the arms 33, 33, and to prevent the vibration of the road causing the roller 27 to wander on the cam heads 29, 29.

The outer mechanism for reciprocating the lever 11 is maintained at a level below the plate 21, which, as stated, is the same level as the road bed. A single exception exists, however, in that the arms 33, 33, in rotating, pass above the upper surface of the plate 21 to extend into the path of the tripping mechanism carried by the moving car. It is to protect these arms 33, 33, and at the same time cover the mechanism above described, that a dome shaped cover 37 is secured to the plate by means of suitable fastenings, such as screws 38, 38. The dome of the cover 37 is sufficient to permit the arms 33, 33 to rotate about the shaft 30 without impinging upon the said cover or a slide 39, which is provided to cover a slot 40 formed in the dome shaped cover 37. The slot 40 is of sufficient width to permit the passage lengthwise of the said groove, of the tripping mechanism carried by the car. The slide 39 is provided with a rounded or beveled forward edge 41, by which the said slide is moved backward to uncover the slot 40 when struck by the trip above mentioned. The slide 39 is maintained in the position shown in Fig. 1 of the drawings, covering the said slot, by any suitable means, such as a weighted arm or a spring adapted to throw the cover into position and to yield against the lateral thrust of the said tripping mechanism when the same is operated to so move the said slide.

The mechanism above referred to as the

tripping mechanism is illustrated in Figs. 4 to 8, inclusive, of the drawings. The dashboard is provided with a plate 42 fixedly attached thereto. Mounted upon said plate are retaining hooks 43, 43, the heads of which are projected from the said plate 42 to form studs adapted to extend within eyelets 44, 44 formed in the back 45 of the casing for holding the tripping mechanism. The plate 42 is also provided with a recess 46 extended horizontally from the outer edge of the same. This recess is designed to receive a pin 47 mounted on the end of a lever 48, which is pivotally mounted at 49 upon the rear side of the back 45, and whereby the plate is held from rising sufficiently to carry the heads of the studs out of the eyelets 44, 44 when in operation the lever 48 is maintained in operative position so as to retain the pin 47 in the recess 46, by a leaf spring 50. Fixedly mounted at 51, 51 upon the back 45 is a half tubular cover 52. Mounted upon the front side of the back 45 and formed to correspond to the inner shape of the said cover 52, are brackets 53, 53. At the lower end of the back 45 there are extended brackets 54, 54, between which is extended a body 55, integrally formed with the said brackets 54, 54 and adapted to have formed therein a rectangular slot to receive a rectangular section 56 of the trip plunger and to form a guide for the same. The upper brackets 53, 53 are provided with circular perforations to pass and form a guide for a cylindrical rod section 57 of the said trip plunger. When mounting the trip plunger 56, 57 on the back 45, it is passed from the lower end upward, extending the rod section 57 through the body 55 and upward through the intermediate bracket 53. As it is passed from the intermediate bracket 53 to the upper bracket 53, it is threaded through a spiral spring 58, and then through a collar 59, and thence through the upper bracket 53. The collar 59 is fixedly attached to the rod section 57, causing the spring 58 to lift the plunger 56, 57 until the said collar is forced against the under side of the upper bracket 53. When thus placed in position the rod section is provided with a hand pad 60. The lower end of the rectangular section 56 is contracted sufficiently to permit the same to be readily extended through the slot 40 of the cover 37. It is provided with a notch 61, into which plays a detent 62, which is pivotally mounted at 63 on the body 55 of the casing. The detent 62 is thrown forward into locking position by a leaf spring 64, which is fixedly secured at 65 upon the back 45. The operation of the trip mechanism thus described is as follows: The car is provided with the plate 42. The trip mechanism contained within the back 45 and cover 52 is lifted into position until the heads of the studs 43, 43

are protruded through and seated in the narrow extensions of the eyelets 44, 44, the cover 52 having been opened and the lever 48 moved by the handle 66 to carry the pin 47 outward until the studs 43, 43 have been firmly seated in the elongated eyelets 44. In this position it will be found that the pin 47 aligns with the recess 46. When the handle 66 is now released, the spring 50 throws the lever 48 about the pivot 49 to extend the said pin 47 into the recess 46 and retain it in such position. The mechanism is now in position to be operated. On approaching the switch station the motorman, by means of the pad 60, presses the trip plunger 56, 57 until the detent 62 rests within the notch 61 to hold the said plunger in its lowered position, as shown by dotted lines in Fig. 4 of the drawings. In this position the spiral spring 58 has been compressed and is maintained under tension. The lower end of the rectangular section 56 is held in position so that it will pass into and through the slot 40, striking one of the arms 33 to carry the same until the shaft 30 has been rotated one-quarter revolution, in which position the plunger leaves the arm 33, and in which position the shaft 30 is maintained by the spring 35 striking into one of the grooves 34, 34 in the back of the cam drum 25. The plunger passes out of the cover 37. Upon entering the slot 40 the plunger strikes the grooved edge 41 of the slide 39 and forces the said slide to one side. The slide 39 is retracted against a suitable spring or gravity pressure, and the head of the detent 62 is formed slightly larger in dimension to the plunger 56, 57 so that the detent rubs against the side of the said slide and the side of the slot. This rubbing action of the slide and side of the slot upon the detent is sufficient to raise the said detent out of engagement with the notch 61, permitting the spring 58 to raise the plunger 56, 57. This release occurs as the plunger passes out of the slot by reason of the fact that the pressure on the slide 39 is greatest at this point. If it be desired that this action shall be more positive, any convenient and suitable tripping device, such as a projection, on this slide or side of the slot, might be provided to positively trip the detent 62 to withdraw the same from engagement with the plunger 56, 57.

The end of the lever 11 which carries the rollers 27 is supported upon a wheel 67, which is mounted upon a bracketed plate 68. By means of this mounting any tendency to bind on the pivotal mounting of the lever is corrected.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An automatic railway switch, comprising a switch operating mechanism perma-

nently located on the track in advance of the switch thereof, embodying a lever suitably connected with the movable rails and extended horizontally under the track bed, a drum cam mounted horizontally and having a series of cam heads and depressions adapted to move in the path of the end of said lever, a yielding contact power exerting member to maintain said lever in contact with said cam, and a series of radially extended arms extending to said cam; a trip mechanism removably mounted on the moving cars and adapted to rotate said cams to operate said levers; a covering casing for said switch operating mechanism having a slot extended parallel with the track for the passage of said trip mechanism; and a cover for said slot.

2. An automatic railway switch, comprising a switch operating mechanism permanently located on the track in advance of the switch thereof, embodying a lever suitably connected with the movable rails and extended horizontally under the track bed, a drum cam mounted horizontally and having a series of cam heads and depressions adapted to move in the path of the end of said lever, a yielding contact power exerting member to maintain said lever in contact with said cam, and a series of radially extended arms extending to said cam; a trip mechanism removably mounted on the moving cars and adapted to rotate said cams to operate said levers; a covering casing for said switch operating mechanism having a slot parallel with the track for the passage of said trip mechanism, and a cover for said slot having an inclined top to receive the impact of said trip mechanism to move the said cover out of the path of said trip mechanism.

3. An automatic railway switch embodying a rotary shaft extended transversely across the road bed and operatively connected with the movable member of a switch to open and close the same by the rotation of said shaft, comprising a wheel having radially extended arms adapted to reach above the surface of the ground; a dome shaped cover for said wheel shaped to the path of said arms; and a slot in said cover extended parallel with the said road bed and adapted to expose the said arms to the action of a member depended from the car moving over said bed.

4. An automatic railway switch embodying a rotary shaft extended transversely across the road bed and operatively connected with the movable member of a switch to open and close the same by the rotation of said shaft, comprising a wheel having radially extended arms adapted to reach above the surface of the ground; a dome shaped cover for said wheel shaped to the path of said arm; a slot in said cover ex-

tended parallel with the said road bed and adapted to expose the said arms to the action of a member depended from the car moving over said bed; and a cover for said slot adapted to be deflected by said member depended from said car to expose the said slot.

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

ARTURO JOSÉ JABALQUINTO.

Witnesses:

D. MURILLO P.,

FRANCISCO J. VALENGUELO.