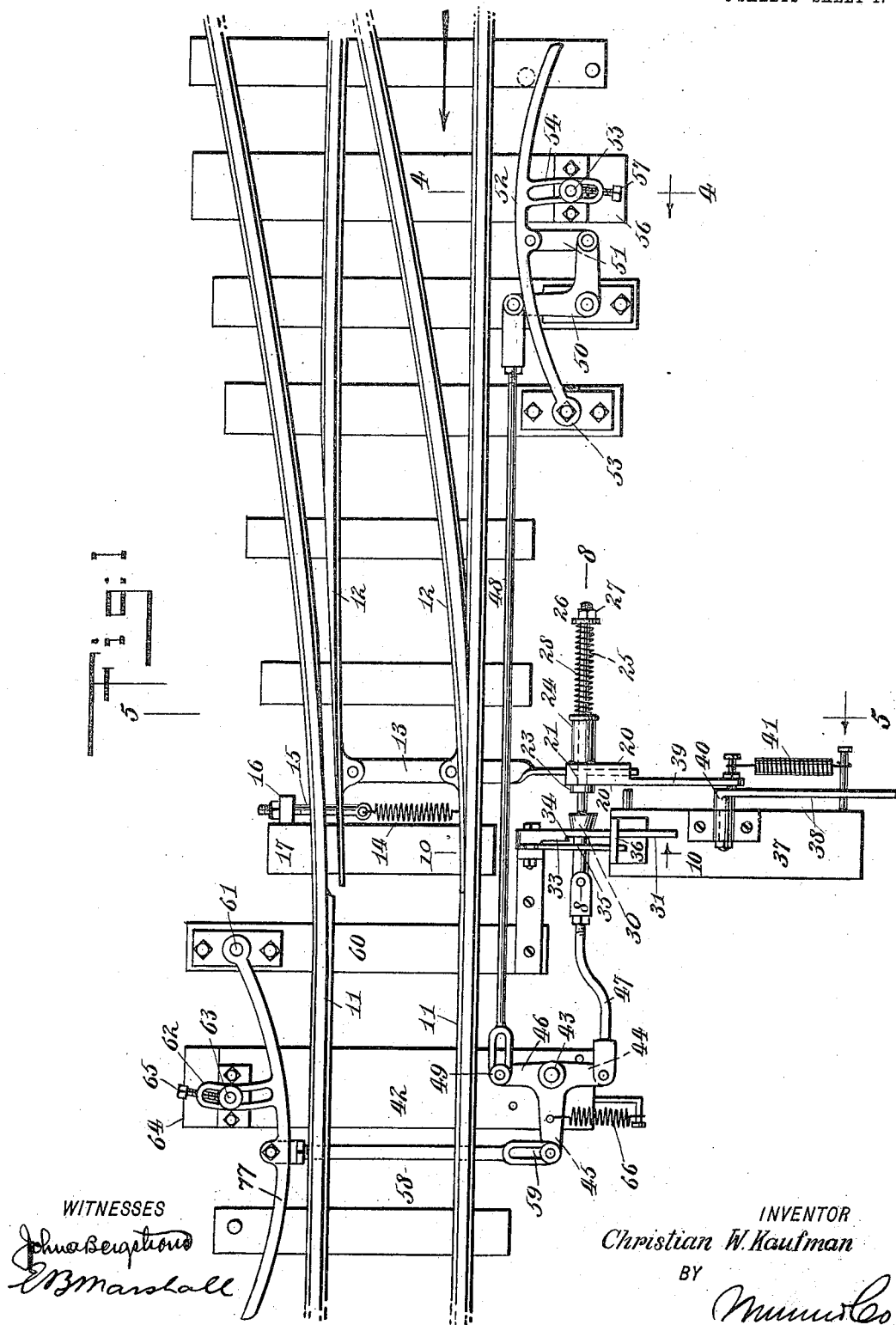


C. W. KAUFMAN.
 AUTOMATIC SWITCH.
 APPLICATION FILED AUG. 23, 1909.

961,413.

Patented June 14, 1910.

3 SHEETS—SHEET 1.



WITNESSES

John Berapthous
B. Marshall

INVENTOR

Christian W. Kaufman

BY

Munn & Co
 ATTORNEYS

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3 SHEETS—SHEET 2.

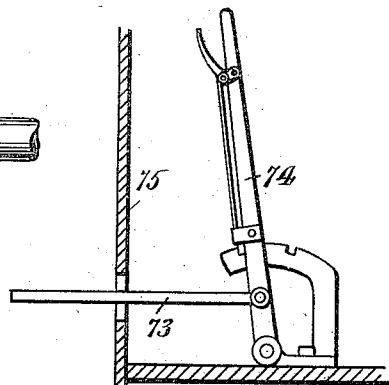
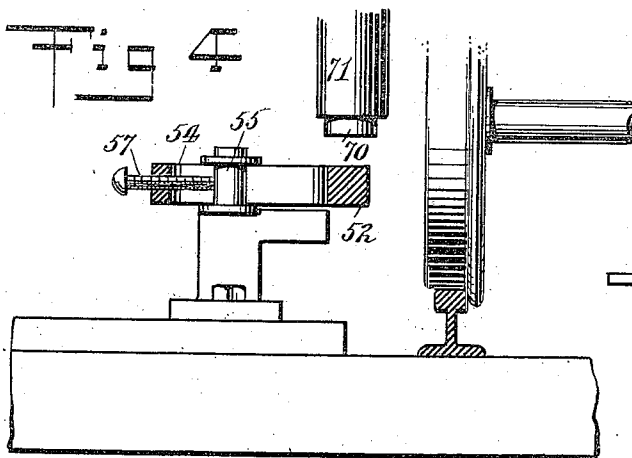
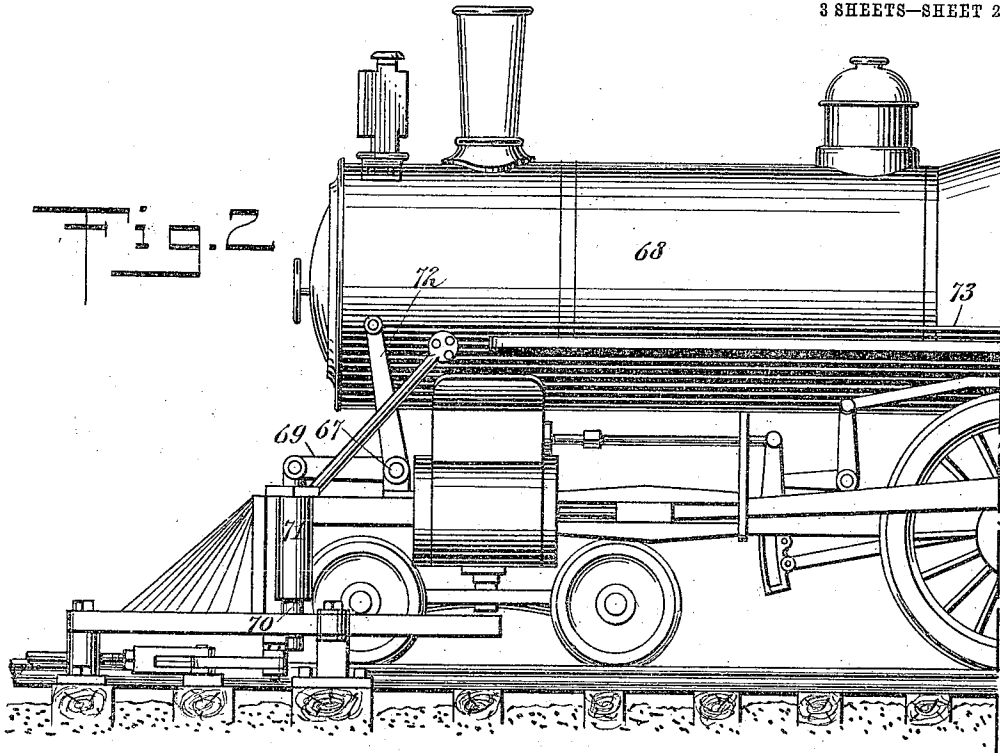


Fig. 3

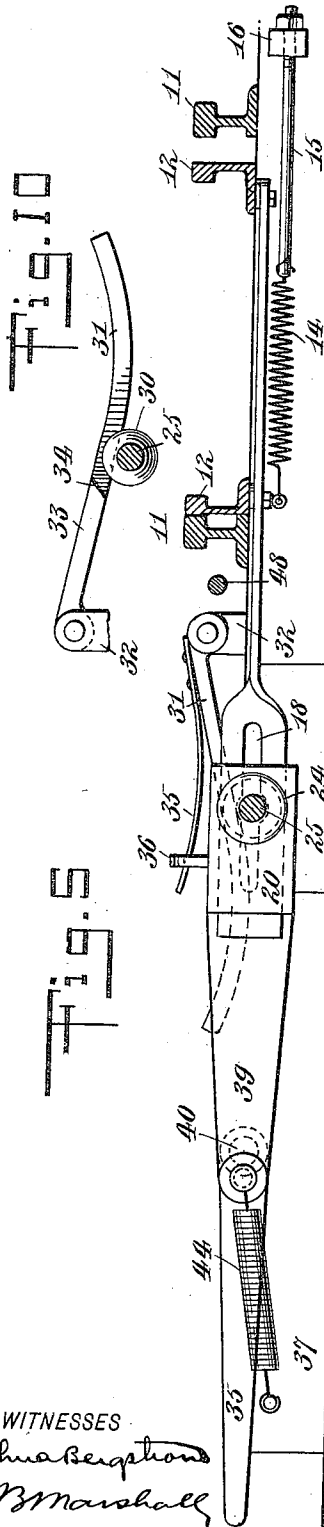
WITNESSES
John A. Serpentine
J. Marshall

INVENTOR
Christian W. Kaufman
 BY
Mumford & Co.
 ATTORNEYS

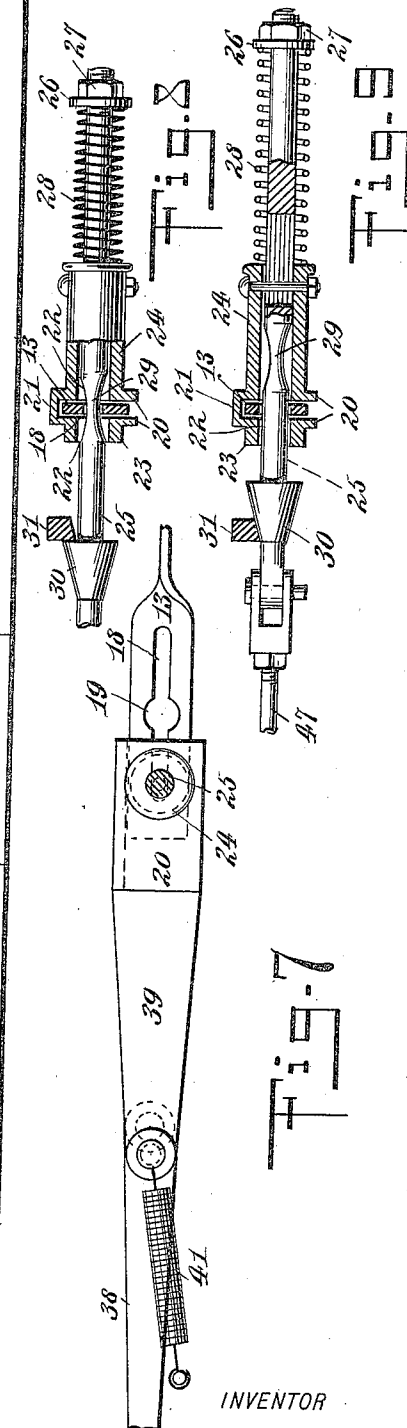
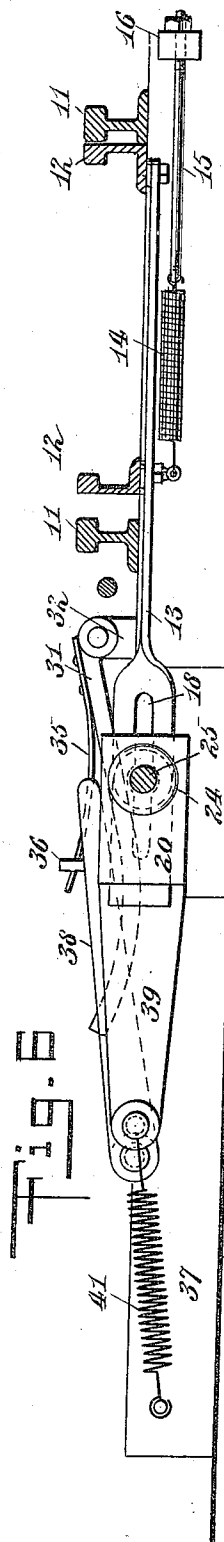
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3 SHEETS—SHEET 3.



WITNESSES
John A. Bergstrom
W. B. Marshall



INVENTOR
Christian W. Kaufman
 BY *Munn & Co.*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

CHRISTIAN W. KAUFMAN, OF SHENANDOAH, PENNSYLVANIA.

AUTOMATIC SWITCH.

961,413.

Specification of Letters Patent. Patented June 14, 1910.

Application filed August 23, 1909. Serial No. 514,113.

To all whom it may concern:

Be it known that I, CHRISTIAN W. KAUFMAN, a citizen of the United States, and a resident of Shenandoah, in the county of Schuylkill and State of Pennsylvania, have invented a new and Improved Automatic Switch, of which the following is a full, clear, and exact description.

My invention relates to switches, and it has for its object to provide one which is adapted to be operated by a locomotive or car passing along the tracks in either direction, the switch being also adapted to be operated manually.

Another object of the invention is to provide means adapted for drawing the switch rails in one direction, with means to prevent the said movement, which is adapted to be freed by the movement of a locomotive or car along the tracks.

Still another object of the invention is to provide means adapted to lock the said means after it has been freed by a locomotive or car.

Still other objects of the invention will appear in the following complete description.

In this specification I will describe the preferred form of my invention, it being understood that the scope of the invention is defined in the appended claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a plan view showing my switch as applied to the switch rails on a track; Fig. 2 is a view of a locomotive on which is mounted the mechanism adapted to operate the switch; Fig. 3 is a fragmentary sectional view of the cab of a locomotive showing the means for operating the mechanism on the locomotive; Fig. 4 is an enlarged sectional view on the line 4—4 of Fig. 1, showing the means to operate the flange herein-after described, disposed in close proximity to the rail; Fig. 5 is an enlarged sectional view on the line 5—5 of Fig. 1, with the hand lever in one position; Fig. 6 is a similar view with the hand lever thrown to the opposite position; Fig. 7 is a view of the bar and guide plate after the trigger bar has been moved to permit the bar to move relatively to the guide way; Fig. 8 is an enlarged sectional view on the line 8—8 of Fig.

1, showing the trigger bar after it has been moved to free and permit the bar to move relatively to the guide plate; Fig. 9 is a similar view before the trigger bar has been moved; and Fig. 10 is a sectional view on the line 10—10 of Fig. 1, showing the lever adapted to lock the trigger bar.

By referring to the drawings it will be seen that the main rails 11 and the switch rails 12 are of the usual type, the switch rails 12 being secured to a bar 13 disposed laterally of the rails. A spring 14 is secured to one of the switch rails 12 and to a bolt 15 secured to a flange 16, which in turn is secured to one of the ties 17, this spring 14 being adapted to move the switch rails 12 in the direction of the flange 16. The bar 13 projects beyond one of the main rails 11, and it has an elongated slot 18 therein, which is enlarged at 19 intermediate its terminals, forming an annular orifice. The terminal of the bar 13 is disposed in a guide having lateral guide plates 20, which are connected at their top by a web member 21, the guide plates 20 having openings 22 therethrough, which are normally in alignment with the annular opening 19 in the bar 13. Each of the guide plates 20 has a collar 23 and 24 respectively, the circumferences of these collars registering with the openings 22. A trigger bar 25 is disposed through the openings 19 and 22, this trigger bar 25 projecting beyond the collar 24 and having a flange 26, which is held in place by a nut 27 at its terminal, there being a spring 28, which is disposed around the trigger bar 25 between the flange 26 and the collar 24. The trigger bar at the point 29 is cut away so that its diameter at this point is much less than the diameter of its body. The trigger bar 25 is also provided with a cone-shaped shoulder 30, the base of which projects beyond the trigger bar 25 on all sides. A locking lever 31 is pivoted to a standard 32, this locking lever 31 having a curved under surface adapted to engage the cone-shaped shoulder 30 on the trigger bar 25. There is an offset 33 at one side of the locking lever 31, the outer end of the offset 33 being inclined at 34, so that the base of the cone-shaped shoulder 30 may travel on the inclined surface 34 and delay the offset 33, so that the shoulder 30 may be freed from the locking lever 31 and the trigger bar 25 may be moved longitudinally thereto. A spring 35 is provided, which is

adapted to hold the locking lever 31 yieldingly downward, the terminal of this spring 35 engaging a loop member 36, the other terminal of the spring 35 being secured to the locking lever 31.

Pivoted to a frame member 37 there is a hand lever 38, the guide plates 20 being elongated at 39, the terminal of which is pivoted to the hand lever 38 near its fulcrum 40. A spring 41 is provided, one terminal of the spring being secured to the frame member 37 and the other terminal of the spring being secured to the pivoted connecting link 39 of the guide member with the hand lever. Pivoted to a frame member 42 there is a lever 43, the lever 43 having a load arm 44 and two power arms 45 and 46 respectively. A link 47 is provided, which connects the load arm 44 with the trigger bar 25. Disposed substantially parallel with the main tracks 11 there is a rod 48, the rod 48 being connected with the power arm 46 of the lever 43 by a pin and slot connection 49. The other terminal of the rod 48 is articulated to one arm of a bell crank lever, the other arm of the bell crank lever being connected by a link 51 with a flange 52, the flange 52 being pivoted to a tie at 53. There is a yoke 54 secured to the flange 52, a pin 55 being secured to a tie 56, the pin 55 being adapted to travel in the yoke 54 which is curved. There is a threaded orifice at the end of the yoke 54 in which meshes a screw 57, the screw 57 being adjusted relatively to the yoke 54 so that the inner terminal of the screw 57 will engage the pin 55 at a predetermined distance from the end of the yoke 54. A rod 58 is disposed transversely of the tracks 11, there being a pin and slot connection 59 between the rod 58 and the power arm 45 of the lever 43. The rod 58 is pivoted to a flange 77, the flange being pivoted to a tie 60 at 61. A yoke 62 projects outwardly from the flange 77, a pin 63 being disposed within the yoke 62, the pin being secured to a tie 64. As with the yoke 54, the yoke 62 has a threaded orifice at its outer end in which meshes a screw 65, the screw 65 having the same function as the screw 57. The yoke 62 is curved like the yoke 54.

A spring 66 is provided, one end of the spring being secured to the power arm 45 of the lever 43, the other end of the spring being secured away therefrom, so that the spring is adapted to move the power arm 40 of the lever 43 away from the main rails 11.

In the drawings, the means of operating the flanges which is to be mounted on a locomotive or car, is shown mounted on a locomotive. It will be understood that the mechanism which I provide for operating the flanges 52 may be mounted on any part of a train which is adapted to travel along the tracks.

As shown in the drawings, a rock shaft 67 is provided, which is journaled to a locomotive 68, there being radially disposed arms 69 secured to the terminals of the rock shaft 67, a trip 70 being articulated to the outer terminal of each of the arms 69. These trips 70 are disposed in the collars or guides 71, the collars or guides being secured to the frame of the locomotive. The rock shaft 67 also has a radially disposed arm 72 disposed between its terminals, a rod 73 being articulated to the arm 72, this arm also being articulated to a lever 74 mounted in the cab 75 of the locomotive.

It will be understood that in the operation of my invention it is possible to move the switch rails 12 by the hand lever 38, for when the annular opening 19 in the bar 13 is in alinement with the openings 22 in the guide plates 20, the spring 28 will move the trigger bar 25 so that its cut-away portions 22 will be drawn within the collar 24, and the bar 13 and the guide plates 20 will be locked by the body of the trigger bar. When locked in this way, the bar 13 will be moved by a movement of the hand lever 38, inasmuch as the lever 38 is pivoted to the elongation 39 of the guide members, and, as has been stated, the guide members are secured relatively to the bar 13 by the body of the trigger bar 25. As the switch rails 12 are secured to the bar 13, the switch rails 12 are operated by a movement of the hand lever 38. Not only is it possible to move the switch rails 12 by a movement of the hand lever 38, but mechanism is provided for permitting the spring 14 to move the switch rails 12, and for freeing the bar 13 from the guide plates 20 to permit this movement. This freeing of the bar 13 from the guide plates 20, and thereby permitting the movement of the switch rails 12, is brought about by means of the flanges 52, which are engaged by the trips 70 of the locomotive 68, the trips being adapted to be thrown into operative position by means of the lever 74, the lever 74 operating the rod 73 and the arm 72 which rocks the shaft 67, which causes the arms 69 to move downwardly, thereby carrying with them the trips 70. When the trips 70 are downwardly disposed, that is, in operative position, they engage the flanges 52 when the locomotive passes along the track at the side of the said flanges. Preferably two flanges 52 are provided, one disposed at either side of the track and at either side of the switch. When the locomotive 68 travels along the track, and the trip 70 engages the flanges 52 and 77, it tends to push the flanges outwardly, and when the flanges are pushed outwardly they operate the rods 48 and 58 respectively, which in turn operate the lever 43.

The pin and slot connections 49 and 59

are provided, so that the lever 43 may be operated by either of the rods 48 or 49, without operating the other rod. When the lever 43 has been operated by either of the rods 48 or 49, it draws the trigger bar 25, which is connected by the link 47, so that its cut away portion 29 is disposed in the openings 19 and 22, and as the said cut away portion 29 is less in diameter than the width of the slot 18, the bar 13 is free to move relatively to the guide plates 20, and the spring 14 moves the switch rails 12 as has been described. At the same time that the cut away portion 29 of the trigger bar 25 has been moved into the openings 19 and 22, the cone-shaped shoulder 30 of the trigger bar 25 has been moved beyond the locking lever 31, and the spring 28 has been compressed. In this position the switch is closed, and there is no danger of a through train being side-tracked. When it is desired to again move the switch rails 12, the hand lever 38 is moved inwardly, and as the hand lever 38 is connected to the elongation 39 of the guide members 20, the guide members 20 are moved inwardly carrying with them the trigger bar 25. As the trigger bar 25 is moved inwardly, its shoulder 30 travels up the inclined surface 34 of the offset 33, thereby freeing the shoulder 30 from the locking lever 31, permitting the trigger bar 25 to be drawn longitudinally by the spring 28, the openings 22 in the guide plates 20 having been moved into alinement with the annular opening 19 in the bar 13, by the movement of the guide plates 20. When the trigger bar 25 has been moved by the spring 28, so that its body is disposed in the annular opening 19 and in the openings 22, the guide plates 20 and the bar 13 will be held relatively to each other until one of the flanges 52 or 77 is moved outwardly by the trip 70 of the locomotive or car, which will again draw the trigger bar so that it will permit the bar 13 to move relatively to the guide plates 20, thus permitting the spring 14 to again close the switch.

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

1. In an automatic switch, main rails, switch rails, means adapted for moving the switch rails relatively to the main rails, means for preventing said movement of the switch rails adapted to be freed by a projecting member on the locomotive, a projecting member on a locomotive adapted to free the said means, a lock adapted to engage the second-mentioned means after it has been freed, and means in connection with the lock adapted to release the second-mentioned means from the lock.

2. In an automatic switch, rails, a bar secured to and adapted to move the rails in one direction, a trigger bar adapted for en-

gaging the bar to prevent its movement, means adapted for operating the trigger bar, a lock for engaging the trigger bar when it is in a predetermined position, and means adapted for freeing the trigger bar from the lock on the lateral movement of the trigger bar.

3. In an automatic switch, rails, a bar secured to and adapted to move the rails, a guide plate, a trigger bar adapted for holding the bar relatively to the guide plate, means adapted for operating the trigger bar, a lock for engaging the trigger bar when in a predetermined position, and means adapted for freeing the trigger bar from the lock on the movement of the guide plate.

4. In an automatic switch, a bar, a guide plate, a trigger bar adapted for detachably securing the bar relatively to the guide plate, a lock adapted for engaging the trigger bar, and an offset in connection with the lock with which the trigger bar is adapted to engage to free the trigger bar from the lock when it is moved in a predetermined direction relatively thereto.

5. In an automatic switch, a bar, a hand lever, means adapted to connect the hand lever with the bar, a trigger bar, a lock for the trigger bar, and means adapted for freeing the trigger bar from the lock which is adapted to be operated by the movement of the hand lever.

6. In an automatic switch, a bar, a guide plate, a trigger bar adapted for detachably connecting the bar to the guide plate, a hand lever to which the guide plate is pivoted, a lock for the trigger bar, and means in connection with the guide plate adapted to free the trigger bar from the lock.

7. In an automatic switch, a bar, a guide plate having a collar, a trigger bar disposed in the collar adapted for detachably connecting the bar to the guide plate, a hand lever to which the guide plate is articulated, a lock for the trigger bar, and means in connection with the collar adapted to free the trigger bar from the lock.

8. In an automatic switch, a bar, a guide plate having a collar, a trigger bar disposed in the collar adapted for detachably connecting the bar to the guide plate, a lock for the trigger bar, and means in connection with the collar adapted to free the trigger bar from the lock.

9. In an automatic switch, a bar, a guide plate having an opening therein, a trigger bar disposed in the opening adapted for detachably connecting the bar to the guide plate, a lock for the trigger bar, and an offset adapted to free the trigger bar from the lock when the trigger bar is moved by the guide plate in a predetermined direction.

10. In an automatic switch, switch rails, a bar having a slot, the width of which increases at one point, a trigger bar having an

- enlargement disposed in the slot, the enlargement being adapted normally to abut against the sides of the slot next to the said point where the width of the slot increases, means adapted for moving the trigger bar so that its enlargement is freed from the slot, and means adapted for holding the trigger bar yieldingly with its enlargement at the point of the enlargement of the slot.
11. In an automatic switch, switch rails, a bar having a slot, the width of which increases at one point, a trigger bar having an enlargement disposed in the slot, the enlargement being adapted normally to abut against the sides of the slot next to the said point where the width of the slot increases, means adapted for moving the trigger bar so that its enlargement is freed from the slot, a flange adapted to be moved relatively to the rails, and means connecting the flange with the first-mentioned means by which the flange is adapted to operate the said first-mentioned means.
12. In an automatic switch, switch rails, a bar having a slot, the width of which increases at a given point, a trigger bar having an enlargement disposed in the slot, the enlargement being adapted normally to abut against the sides of the slot next to the said point where the width of the slot increases, means adapted for holding the trigger bar yieldingly with its enlargement at the point of the enlargement of the slot, a flange adapted to be moved relatively to the switch rails, and means connecting the flange with the trigger bar by which the former is adapted to operate the latter.
13. In an automatic switch, switch rails, a bar having a slot and an indenture which communicates with the slot, the bar being secured to the switch rails, a guide plate having an orifice with which the indenture in the slot is adapted normally to register, a trigger bar having an enlargement disposed through the openings in the guide plate and the slot in the bar, a spring adapted for holding the trigger bar in a predetermined position, and means adapted for moving the trigger bar against the pressure of the spring.
14. In an automatic switch, switch rails, a bar having a slot and an indenture which communicates with the slot, the bar being secured to the switch rails, a guide plate having an opening with which the indenture in the bar is adapted to register, a trigger bar having an enlargement disposed through the opening in the guide plate and the slot in the bar, a spring adapted for holding the trigger bar in a predetermined position, a flange adapted to be moved relatively to the rails, and means connecting the flange with the trigger bar by which the former is adapted to operate the latter.
15. In an automatic switch, switch rails, a bar having a slot and an indenture which communicates with the slot, a guide plate having an opening which is adapted to register with the indenture in the bar, a trigger bar having an enlargement disposed through the opening in the guide plate and the slot in the bar, a collar secured to the guide plate, the inner circumference of which registers with the opening in the guide plate, the continuation of the trigger bar being disposed through the collar, a nut at the terminal of the trigger bar, a spring disposed on the trigger bar, one terminal of which abuts against the nut, the other terminal abutting against the collar, and means adapted to move the trigger bar against the pressure of the spring.
16. In an automatic switch, main rails, switch rails adapted to be moved relatively thereto, a bar having a slot and an indenture which communicates with the slot, the bar being secured to the switch rails, a guide plate having an orifice which is normally in alinement with the indenture in the bar, a trigger bar having a shoulder disposed through the opening in the guide plate and the slot in the bar, means adapted for moving the trigger bar relatively to the bar, and means adapted for moving the guide plate relatively to the main rails.
17. In an automatic switch, switch rails, a bar having a slot and an indenture which communicates with the slot, the bar being secured to the switch rails, a guide plate having an orifice with which the indenture in the slot is adapted normally to register, a trigger bar having an enlargement disposed through the openings in the guide plate and the slot in the bar, a spring adapted for holding the trigger bar in a predetermined position, means adapted for moving the trigger bar against the pressure of the spring, and means adapted for locking the trigger bar when so moved.
18. In an automatic switch, main rails, switch rails, a bar secured to the switch rails, means adapted for moving the switch rails relatively to the main rails, means adapted for holding the bar in a predetermined position, means adapted for freeing the second-mentioned means, and means adapted for locking the second-mentioned means when it has been moved to free the bar.
19. In an automatic switch, a bar, a guide plate, means adapted for holding the bar relatively to the guide plate, means adapted for freeing the first-named means and means adapted for engaging the first named means after it has been moved to free the bar.
20. In an automatic switch, a bar, a guide plate, means adapted for holding the bar relatively to the guide plate, means adapted for moving the first-named means to free

the bar, and a lock adapted for engaging the first-mentioned means when so moved.

21. In an automatic switch, a bar, a guide plate, means adapted for holding the bar 5 relatively to the guide plate, means adapted for moving the first-named means to free the bar, a lock adapted for engaging the first-mentioned means when so moved, and an automatic means in connection with the 10 lock by which the first-named means is operated to hold the bar relatively to the guide plate when the first-mentioned means is moved to a predetermined position.

22. In an automatic switch, a bar, a guide 15 plate, means adapted for holding the bar to move the guide plate, means adapted for moving the first-named means to free the bar, a lock adapted for engaging the first-mentioned means when so moved, an auto- 20 matic means in connection with the lock by which the first-named means is operated to hold the bar relatively to the guide plate when the first-mentioned means is moved to a predetermined position, and a hand lever 25 articulated to the guide plate.

23. In an automatic switch, a bar, a guide plate, a trigger bar having a shoulder which is adapted for detachably securing the bar 30 to the guide plate, and a lock adapted for engaging the shoulder of the trigger bar, adapted for preventing it from moving in one direction.

24. In an automatic switch, a bar, a guide 35 plate, a trigger bar having a shoulder which is adapted for detachably securing the bar to the guide plate, a lock adapted for engaging the shoulder of the trigger bar, adapted for preventing it from moving in 40 one direction, and an offset in connection with the lock with which the shoulder is adapted to engage to free the trigger bar from the lock when it is moved in a prede- 45 termined direction relatively thereto.

25. In an automatic switch, a bar having 45 a slot and an indenture in communication with the slot, a guide plate having an opening normally in alinement with the indenture, a trigger bar having an enlargement 50 normally disposed in the indenture and opening, and a lock adapted for engaging a shoulder on the trigger bar, adapted for preventing the movement of the trigger bar in one direction relatively to the lock.

26. In an automatic switch, a bar having 55 a slot and an indenture in communication with the slot, a guide plate having an opening normally in alinement with the indenture, a trigger bar having an enlargement normally disposed in the indenture and 60 opening, a lock adapted for engaging a shoulder on the trigger bar, adapted for preventing the movement of the trigger bar in one direction relatively to the lock, and an offset in connection with the lock, with

which the shoulder is adapted to engage to 65 free the trigger bar from the lock when it is moved in a predetermined direction relatively thereto.

27. In an automatic switch, a bar having a slot and an indenture in communication 70 with the slot, a guide plate having an opening normally in alinement with the indenture, a trigger bar having an enlargement normally disposed in the indenture and opening, a lock adapted for engaging a shoulder 75 on the trigger bar, adapted for preventing the movement of the trigger bar in one direction relatively to the lock, an offset in connection with the lock, with which the shoulder is adapted to engage to free the trigger 80 bar from the lock when it is moved in a predetermined direction relatively thereto, and means adapted for holding the trigger bar yieldingly with its shoulder away from the lock. 85

28. In an automatic switch, a bar, a guide plate, a trigger bar having a shoulder which is adapted for detachably securing the bar 90 to the guide plate, a lock adapted for engaging the shoulder of the trigger bar, adapted for preventing it from moving in one direction, and means adapted for holding the trigger bar yieldingly with its shoulder away from the lock.

29. In an automatic switch, a pivoted 95 flange adapted to be engaged by a member adapted for moving relatively thereto, a pin secured in position relatively to the pivot of the flange, a yoke having a slot in which the pin is disposed, the yoke being secured 100 to the flange, switch rails, and means adapted for moving the switch rails, adapted to be operated by the flange.

30. In an automatic switch, a pivoted 105 flange adapted to be engaged by a member adapted to be moved relatively thereto, a pin disposed at a distance from the pivot of the flange, a yoke secured to the flange having a slot in which the pin is disposed, adjustable means secured to the yoke adapted 110 for limiting the play of the pin in the slot, switch rails, and means adapted for moving the switch rails adapted to be operated by the flange.

31. In an automatic switch, a bar, a guide 115 plate, a trigger bar having a shoulder for detachably securing the bar to the plate, a lock adapted for engaging the shoulder on the trigger bar for preventing its movement in one direction, a pivoted flange adapted 120 to be engaged by a member adapted for moving relatively thereto, and means adapted for moving the trigger bar, adapted to be operated by the flange.

32. In an automatic switch, rails, a flange 125 adapted for moving relatively to the rails, a rod, means by which the flange is adapted for operating the rod, a lever, the rod being

articulated to one arm of the lever, a trigger bar, a link connecting the other arm of the lever with the trigger bar, and a bar having a slot connected with the switch rails by which they are adapted to be operated, the trigger bar having an enlargement disposed in the slot, adapted for preventing the movement of the bar.

33. In an automatic switch, rails, a flange adapted for moving relatively to the rails, a rod, means by which the flange is adapted for operating the rod, a lever, the rod being articulated to one arm of the lever, a trigger bar having a shoulder, a link connecting

the other arm of the lever with the trigger bar, a bar, a guide plate, the trigger bar being adapted for detachably securing the bar to the guide plate, and a lock adapted for engaging the shoulder of the trigger bar for preventing it from moving in a predetermined direction.

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

CHRISTIAN W. KAUFMAN.

Witnesses:

EDWARD FLEMING,
FRANK KANTNER.