

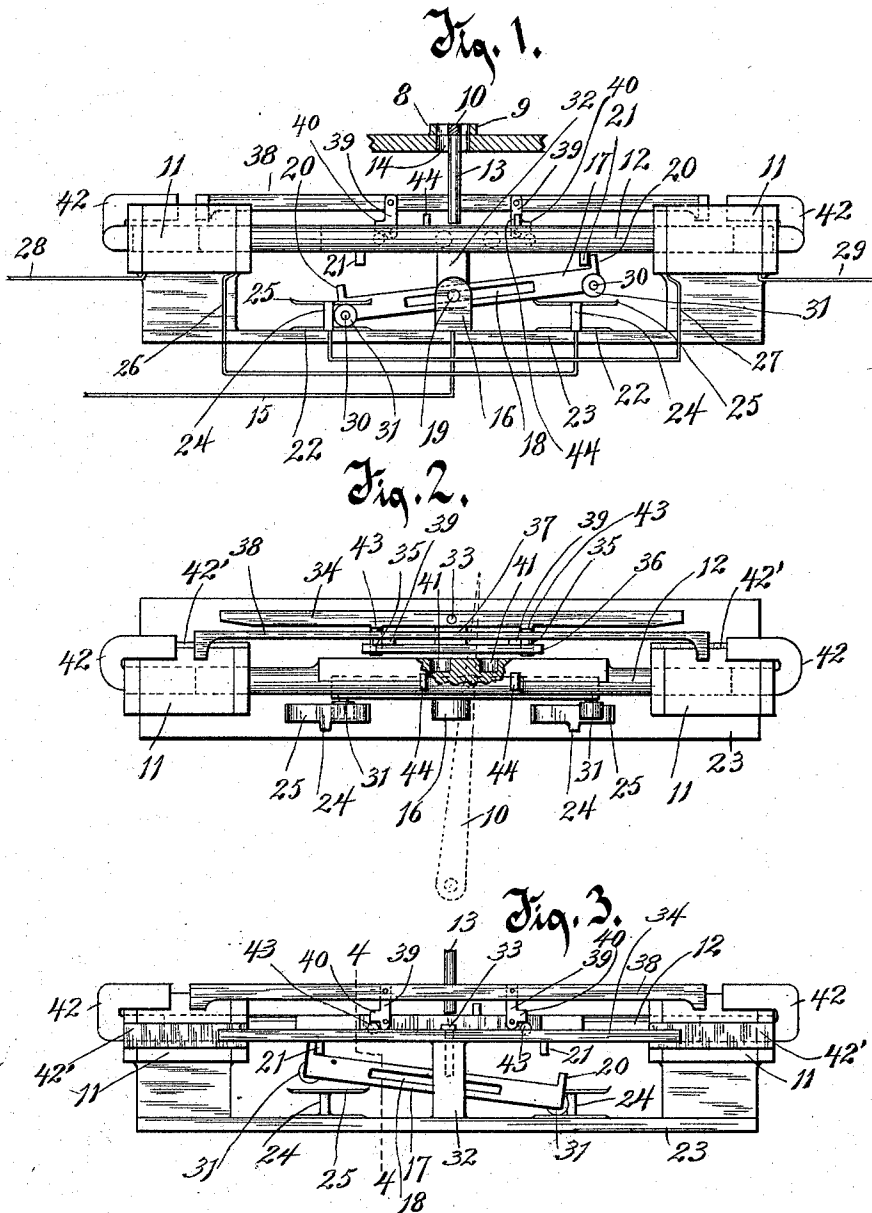
(No Model.)

3 Sheets—Sheet 1.

A. F. SCHINNER.
RAILWAY SWITCH.

No. 527,293.

Patented Oct. 9, 1894.



Witnesses.

A. Keeney
Anna V. Faust

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(No Model.)

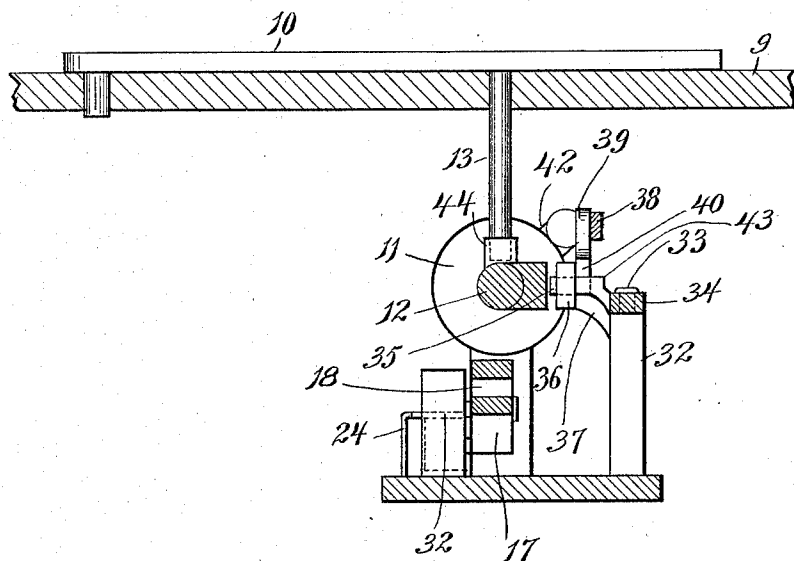
3 Sheets—Sheet 2.

A. F. SCHINNER.
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Fig. 4.



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(No Model.)

3 Sheets—Sheet 3.

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Fig. 5.

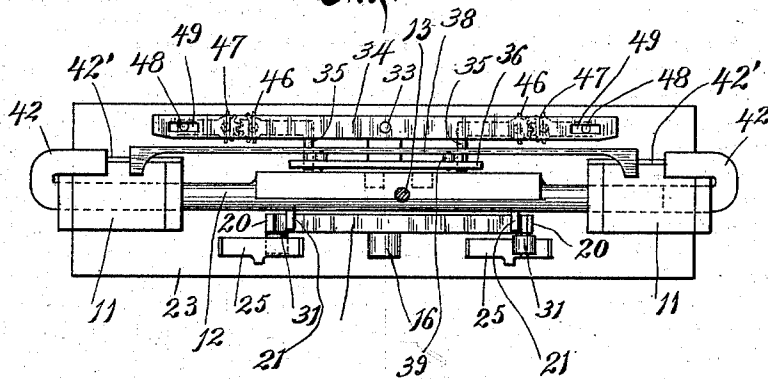


Fig. 6.

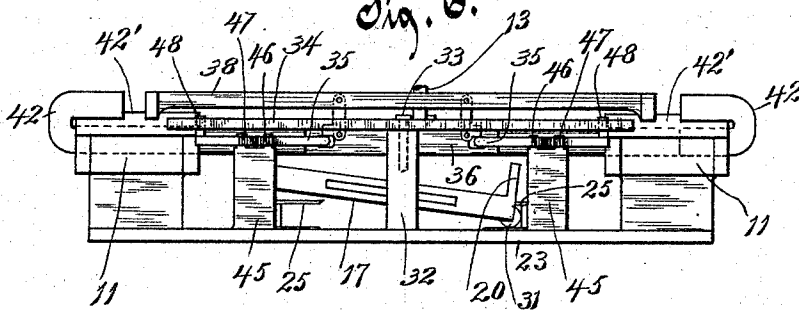


Fig. 7.

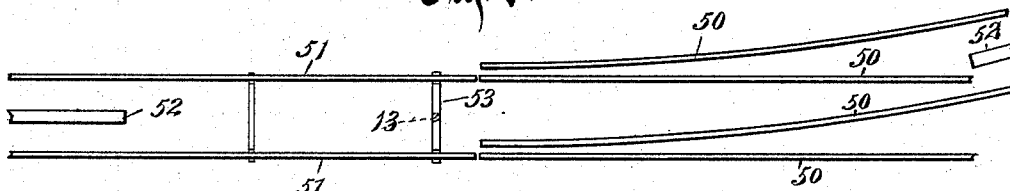
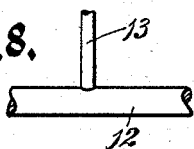


Fig. 8.



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UNITED STATES PATENT OFFICE.

AUGUSTIN F. SCHINNER, OF MILWAUKEE, WISCONSIN.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 527,293, dated October 9, 1894.

Application filed March 28, 1894. Serial No. 505,463. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTIN F. SCHINNER, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Railway-Switches, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

My invention has relation to improvements in railway switches.

The invention has particular reference to improvements in the device covered by my Letters Patent No. 514,037, dated February 6, 1894.

The improvements consist in the devices and their parts, or equivalents, as hereinafter more fully described and claimed.

In the accompanying drawings, Figure 1, is an elevation of the switch-operating magnets, and devices therewith for securing a closure of the electric circuits. Fig. 2, is a plan view of Fig. 1, with a part broken away. Fig. 3, is an elevation of the reverse side to that shown in Fig. 1. Fig. 4, is a transverse section on an enlarged scale taken on the line 4—4 of Fig. 3. Fig. 5, is a plan view showing a construction to prevent the locking pins from binding in the recesses therefor in the reciprocating core. Fig. 6, is an elevation of Fig. 5. Fig. 7, is a plan view of railroad track and switch; and Fig. 8 is a detail of the core 12, showing the arm 13 rigid therewith for shifting the tracks.

Like numerals of reference denote like parts throughout the several views.

On Sheet 1 of the drawings, the device is shown as adaptable to street car railways, only a fragment of one of the tracks being shown. It will be understood, however, that the arrangement of the tracks in this form is exactly in accordance with the trackway shown in my former Letters Patent No. 514,037, dated February 6, 1894, with a contact bar arranged therebetween in the road-bed, similar to that shown and described in said Letters Patent, the contact bar being electrically energized by suitable movable and controllable devices on the cars, when desired, as a car passes over the plate, by contact therewith.

Referring now particularly to Sheet 1 of the drawings, the numeral 8 indicates a sec-

tion of one of the main rails of the track; 9, a section of one of the siding rails, and 10 the energizing switch point. Beneath the road-bed, on the side where the switch point is located, are disposed two electro-magnets 11, 11, consisting of coils of wire which surround a movable core 12, of magnetizable material. The switch point is provided with a downward extending arm 13, which arm passes through a transverse elongated slot 14, and its lower end terminates just above the movable core 12, and in close proximity thereto.

An insulated wire 15 leads from the central contact bar (not shown) to a metal post 16. A tilting and sliding metal bar 17 is provided medially with an elongated longitudinal slot 18, by which it is pivoted and supported on the post 16, conveniently by means of a pin 19 fixed in the post, and projecting into the slot of the bar. The bar 17 is provided with upward projecting fingers 20, 20, one near each end, adapted severally to engage fingers 21, 21, fixed in the core 12. Beneath the extremities of the bar 17 are metal plates 22, 22. These plates, as well as the supports for the magnets, are insulated by means of the insulating strip 23. Metal posts 24, 24 extend upward from the insulating strip 23 and are formed or provided at their upper ends with metallic spring plates 25, 25, parallel with and immediately above the plates 22. The metal plates 22, 22 are inversely connected electrically with the magnets 11, 11 by the insulated conductors 26 and 27, respectively, which magnets are in turn electrically connected to a rail of the railway track by the wires 28 and 29, respectively, and are thereby grounded, thus providing a circuit or discharge for an electric current through the magnets. Pins 30, 30 project out laterally from one face of the bar 17, and on these pins are journaled small rollers 31, 31, which rollers are adapted to pass alternately between sets of the plates 22 and 25, said plates having their opposite ends preferably inclined or beveled, to form flaring mouths for the ready passage of the rollers 31 therebetween, as well as for the exit of the rollers.

Projecting up medially from near one edge of the insulating base strip 23 is a post or upright 32, said post or upright having pivot-

ally secured thereto, by a pin 33, a bar 34. This bar is provided with forward-projecting pins 35, 35 which pins pass through apertures in another shorter bar 36, said bar 36
 5 formed rigid with the post or upright 32 by an integral forward and upward projecting arm 37. Another bar 38 is arranged between and above the bars 34 and 36. This bar 38 has pivoted thereto the upper ends of arms 39,
 10 39, the lower ends of said arms being pivoted to the bar 36, and provided with laterally-extending lugs 40, 40, which lugs rest on the pins 35 of the pivoted bar 34. An enlarged medial portion of the core 12 is provided with
 15 recesses 41, 41 which are adapted alternately to receive the respective pins 35, 35.

Projecting from the outer ends of the magnets are supplemental metallic cores 42, 42, which are bent around at right angles so as
 20 to bring their ends into alignment with the angular ends of the bar 38.

In the operation of my device, when the magnet 11 at the right in Fig. 1 is energized, and when the parts are in the position there
 25 shown, the core will be drawn into the magnet, and the finger 20 (at the right) being in contact with the adjacent pin 21, the bar 17 is drawn thereby toward the right. It will be apparent that as the roller 31 at the left
 30 hand end of bar 17 is held between the plates 22 and 25, said end of the bar 17 is prevented from intermittingly breaking contact with the plate 22. In my former Letters Patent hereinbefore referred to the ends of the bar
 35 17 alternately rested upon the plates similar to plates 22, 22, the ends of the bar being unprovided with the rollers, and the plates 25 also being omitted from the construction. In that form, therefore, no means were provided
 40 for preventing the ends of the tilting and sliding bar from intermittingly breaking connection with the metallic plate similar to 22, which was quite liable to occur through jolting of the parts occasioned by heavy travel
 45 on the road-bed, or by the passage of the car itself along the tracks. As the bar 17 is drawn to the right in the manner just explained, the pin 20 thereof is by electric energy held in contact with the adjacent pin 21, until the
 50 core and switch point have reached the limit of their movements to the right, and by the same energy is held in that position until the electric circuit is broken, which occurs when the electric energy is no longer supplied from
 55 the cart to the plate between the tracks. When the bar 17 has thus reached the limit of its movement toward the right, the roller 31 at the left passes from between the plates 22 and 25, and thereupon, by gravity, the longer arm
 60 of the bar 17 (at the right) falls down so as to bring the roller 30 at the right in position to pass between the plates 22 and 25 at the right, when the bar 17 is drawn toward the left in its next movement. When the elec-
 65 tric magnet 11 at the right is energized in the manner explained, and the bar 17 is drawn toward the right, other actions take place.

A plate 42' attached to the right hand magnet also attracts the right hand end of bar 34, and inasmuch as the core 12 has been
 7 shifted to such a position as to bring one of the recesses 41 of the core into alignment with the right hand pin 35, said pin by the turning of the bar 34 on its pivot will be made to
 7 enter and engage the recess 41, and thereby hold the core locked in its position to the
 8 right. The right hand end of bar 38 is also attracted by the corresponding supplemental core 42, and said bar thereby caused to be
 8 moved rectilinearly toward the right, thereby causing the arms 39 to be turned to oblique positions.

Inasmuch as the right hand end of bar 34 is swung inward in the manner just explained, and inasmuch as the arms 39 rest on
 8 the pins 35 of this bar, the lug 40 of the right hand arm 39 will when the bar 38 is swung inward as just described engage a shoulder
 9 43 of the pin 35, whereby the bar 34 is held to its adjusted position. It will of course be understood that both of the pins 35 are provided with these shoulders 43. The left hand magnet is also provided with an attached
 10 plate 42' for attracting the left hand end of bar 34 at the proper time.

In my former Letters Patent the arm similar to 13 in the present invention was connected directly to the core, so that immediately upon the movement of the core in either direction the switch point would begin to turn. In the construction illustrated on Sheet 1 of the drawings which has particular reference to street-car railways, as it is necessary that the core 12 should have considerable play, before movement is imparted to the switch point, and as the swing of the switch point is necessarily limited the arm 13 is not connected directly to the core, but its lower end extends in close proximity thereto, and is operated by pins 44, 44 arranged a suitable distance apart, and adapted to respectively engage the end of the arm 13 on the reverse movements of the core, and thereby turn the switch.

When the longer right hand end of the bar 17 has fallen by gravity in the manner explained, and the roller contacts with the plate 22, ready for passage between said plate and the upper plate 25, in this position the electric circuit at this point is complete from the plate between the railway tracks through the wire 15, post 16, bar 17, plate 22 at the right, wire 26, magnet 11 (at the left) and wire 28, so that when the circuit is again closed through the plate between the tracks, the movement of the core and of the switch point, will, by electric energy, be reversed. The moment such contact with the plate is made, of course the core and the bar 17 are drawn toward the left, and exactly the same operation takes place at that end, as that just described in regard to the right hand end.

In Figs. 5 and 6 the construction is the same as in the other figures of the drawings, ex-

cepting that the pins 35 instead of being formed rigid with the bar 34 and projecting forwardly therefrom, have their inner ends bent at right angles, and extended under the bar 34, and pivoted to posts 45, 45, said pivoted ends provided with segmentally arranged teeth, indicated by the numerals 46, 46. These segmental teeth engage with similar teeth on the ends of arms 47, 47, also pivoted to the posts 45, 45, the opposite ends of said arms provided with upward extending pins 48, 48, which work in elongated slots 49, 49 in the bar. This arrangement of the pins 35 I deem an improvement over the construction shown in other figures of the drawings. When the pins 35 project rigidly from the bar 34, the turning of said bar horizontally on its pivot 33 would have a tendency to bind whichever pin that may be engaging a recess 41, in withdrawing the pin from the recess. By the arrangement of the intermeshing segmental teeth shown in Figs. 5 and 6, however, this difficulty, it is thought, is successfully overcome. In Fig. 5 I also show the fingers 21, 21 as extending laterally from the core 12, instead of depending therefrom as shown in Figs. 1 and 3. This arrangement, perhaps, will be found advantageous, inasmuch as the pins 20 when engaged by fingers 21, arranged in this manner, will have a greater energized surface to bear against, and consequently a more effective means provided for holding the ends of the bar 17 in their raised position.

In Fig. 7, is illustrated a plan view of the permanent tracks of a steam railroad, with the movable tracks adjacent. The contact bars intermediate the tracks, which bars were not shown on Sheet 1 of the drawings, are also illustrated in this view. The permanent tracks are indicated by the numerals 50, 50 the movable tracks by the numeral 51, and intermediate contact bars by the numeral 52. The movable rails are united by an iron strap 53, in the usual manner. In order to throw these movable rails from one side to the other, the upward extending arm 13 of the core, is shown as connected medially therewith. This arm 13, at its lower end is connected rigidly to the core 12 (Fig. 8) instead of terminating short thereof as shown on Sheet 1. It is necessary that this arrangement should be employed in connection with steam railroads, in order to secure sufficient strength for throwing the switch rails. It is apparent that as the arm 13 is actuated by the movements of the core, the movable tracks are thrown from one side to the other.

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

1. The combination, of electro-magnets, a reciprocative core, said core provided with projecting pins, a metal bar provided with end rollers and having fingers, the bar being so mounted on a metal post connected electrically to an electric supply that a finger on the bar will engage a pin on the core, and the

bar be moved endwise by the movement of the core, the bar being also adapted to tilt by gravity when its point of support on the post is changed by the movement of the bar endwise, opposite sets of metal plates between which the rollers at opposite ends of the bar are adapted to pass alternately as the bar is tilted in reverse directions, the sets of plates being connected electrically, respectively, to the electro-magnets, the bar and the plates being adapted by their connections and contacts to transmit an electric current from the electric supply to one or the other of the electro-magnets, substantially as set forth.

2. In a device for shifting a railroad switch, the combination, of electro-magnets, a metal core reciprocative endwise in the magnets, said core provided with recesses at suitable distances apart, the core being connected mechanically to, and so as by its movement to actuate, the switch, a shifting bar arranged to be shifted mechanically by the movement of the core, said bar in its alternate positions adapted to close and complete electric circuits through the magnets for actuating the core, and a horizontally swinging bar, its opposite ends being alternately drawn toward the respective magnets by the alternate energizing of the magnets, said horizontally swinging bar provided with projecting fingers, each finger adapted alternately to engage a recess of the core as said recess is brought into alignment therewith by the reciprocation of the core, substantially as set forth.

3. In a device for shifting a railroad switch, the combination of electro-magnets, a metal core reciprocative endwise in the magnets, said core provided with recesses at suitable distances apart, the core being connected mechanically to, and so as by its movement to actuate, the switch, a shifting bar arranged to be shifted mechanically by the movement of the core, said bar in its alternate positions adapted to close and complete electric circuits through the magnets for actuating the core, a horizontally swinging bar, its opposite ends being alternately drawn toward the respective magnets by the alternate energizing of the magnets, said horizontally swinging bar provided with projecting fingers, each finger adapted to alternately engage a recess of the core, as a recess is brought into alignment therewith by the reciprocation of the core, and a stationary bar between the swinging bar and the core, said stationary bar provided with openings through which the fingers of the swinging bar project, substantially as set forth.

4. In a device for shifting railroad switches, the combination, of electro-magnets, a metal core reciprocative endwise in the magnets, said core provided with recesses at a suitable distance apart, the core being connected mechanically to, and so as by its movement to actuate, the switch, a shifting bar arranged to be shifted mechanically by the movement

of the core, said bar in its alternate positions adapted to close and complete electric circuits through the magnets for actuating the core, a horizontally swinging bar, its opposite ends being alternately drawn toward the respective magnets by the alternate energizing of the magnets, pivoted arms each having one end bent at an angle to form a pin, and its other end formed into segmental teeth, and through pivoted arms connected to the swinging bar and operated thereby, said arms provided at one end with teeth meshing with

the teeth of the angular arms, each pin of an angular arm adapted to engage a recess of the core as a recess is brought into alignment therewith by the reciprocation of the core, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTIN F. SCHINNER.

Witnesses:

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ANNA V. FAUST.