No. 827,323. PATENTED JULY 31, 1906.

J. A. POSEY.

ELECTROMECHANICAL SWITCH THROWER.

APPLICATION FILED SEPT. 14, 1905.

3 SHEETS—SHEET 1.

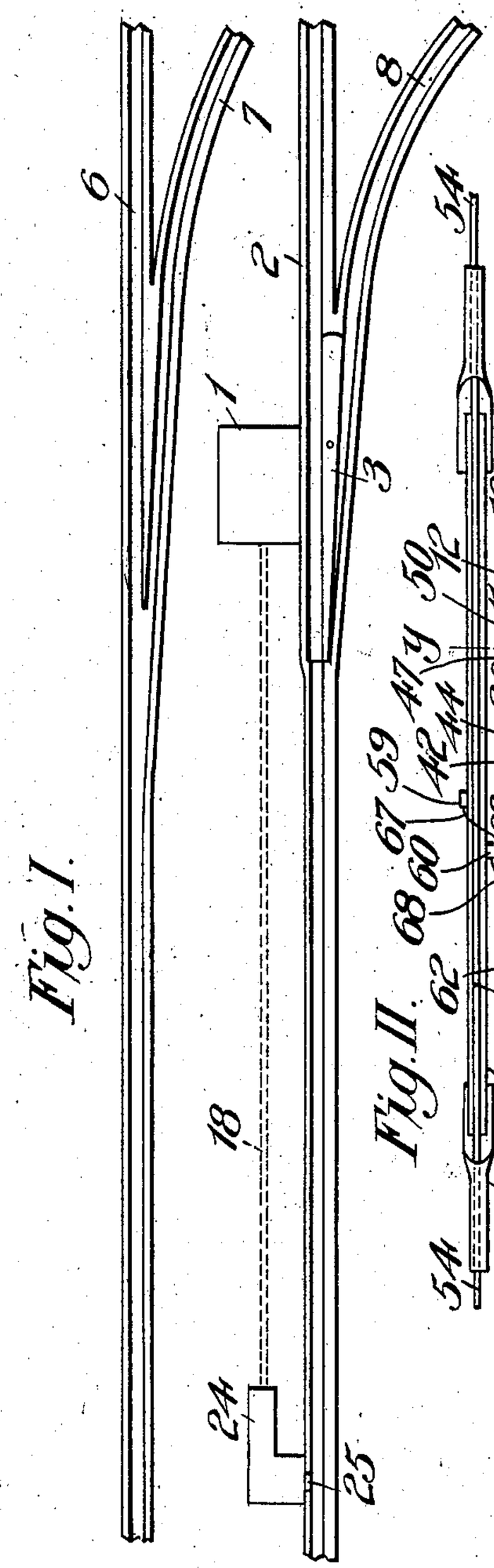

Fig. I.

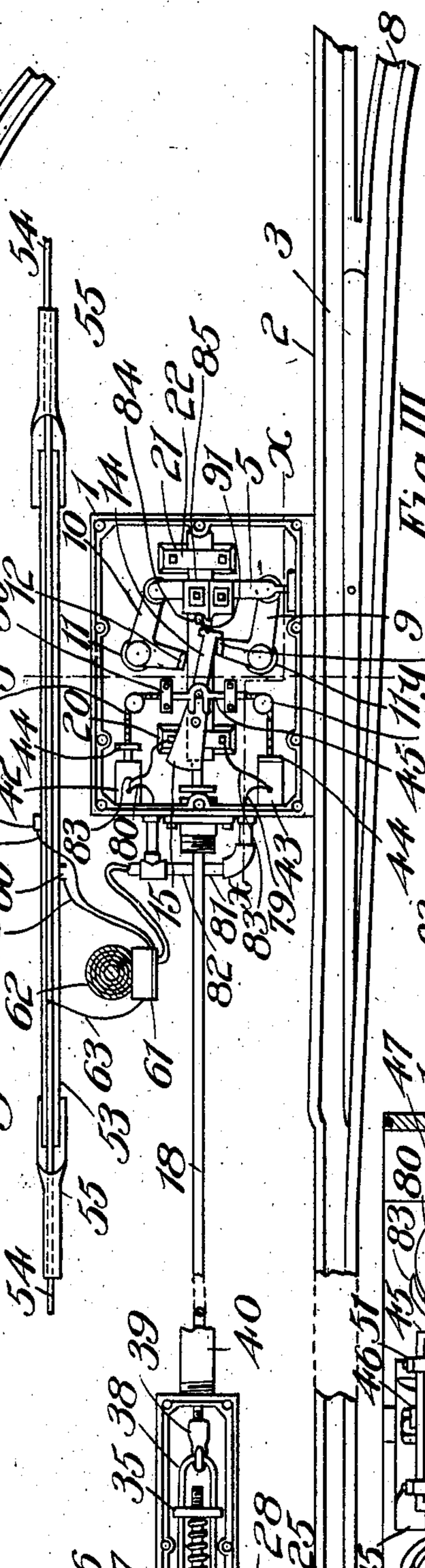

Fig. II.

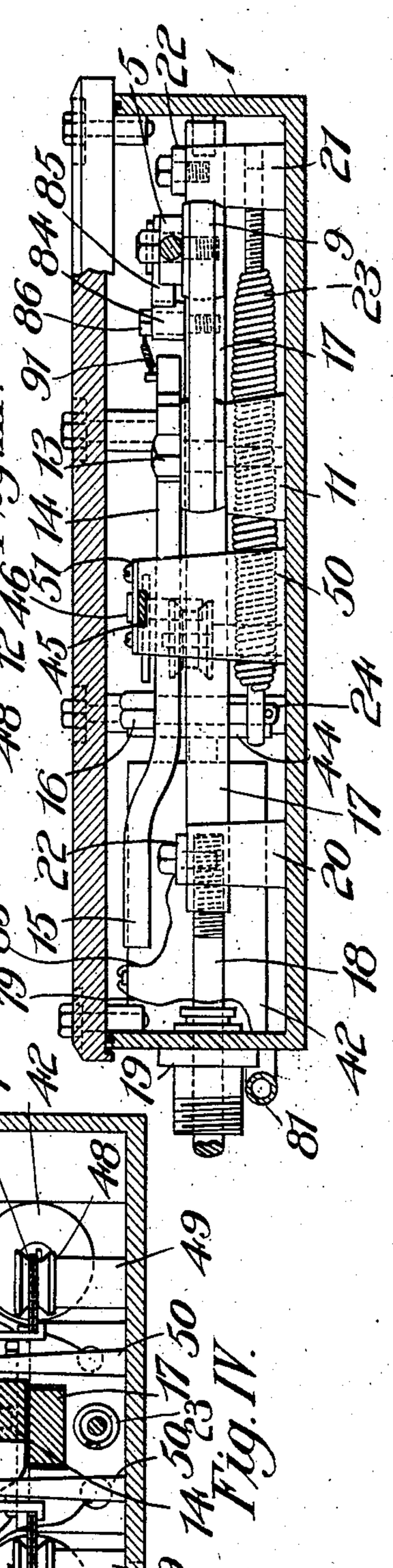

Fig. III.

Fig. IV.

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3 SHEETS—SHEET 2.

Fig. V.

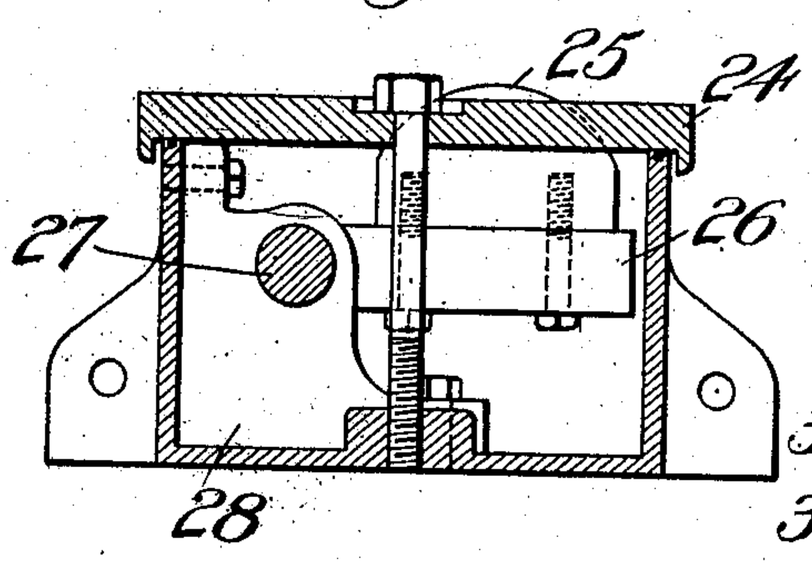


Fig. VI.

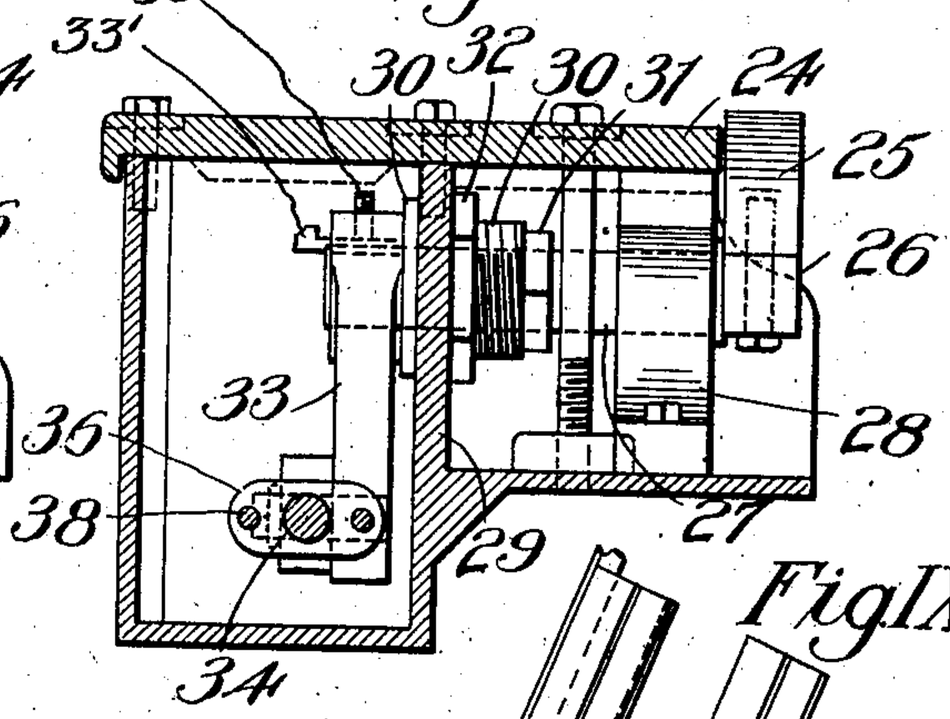


Fig. VII.

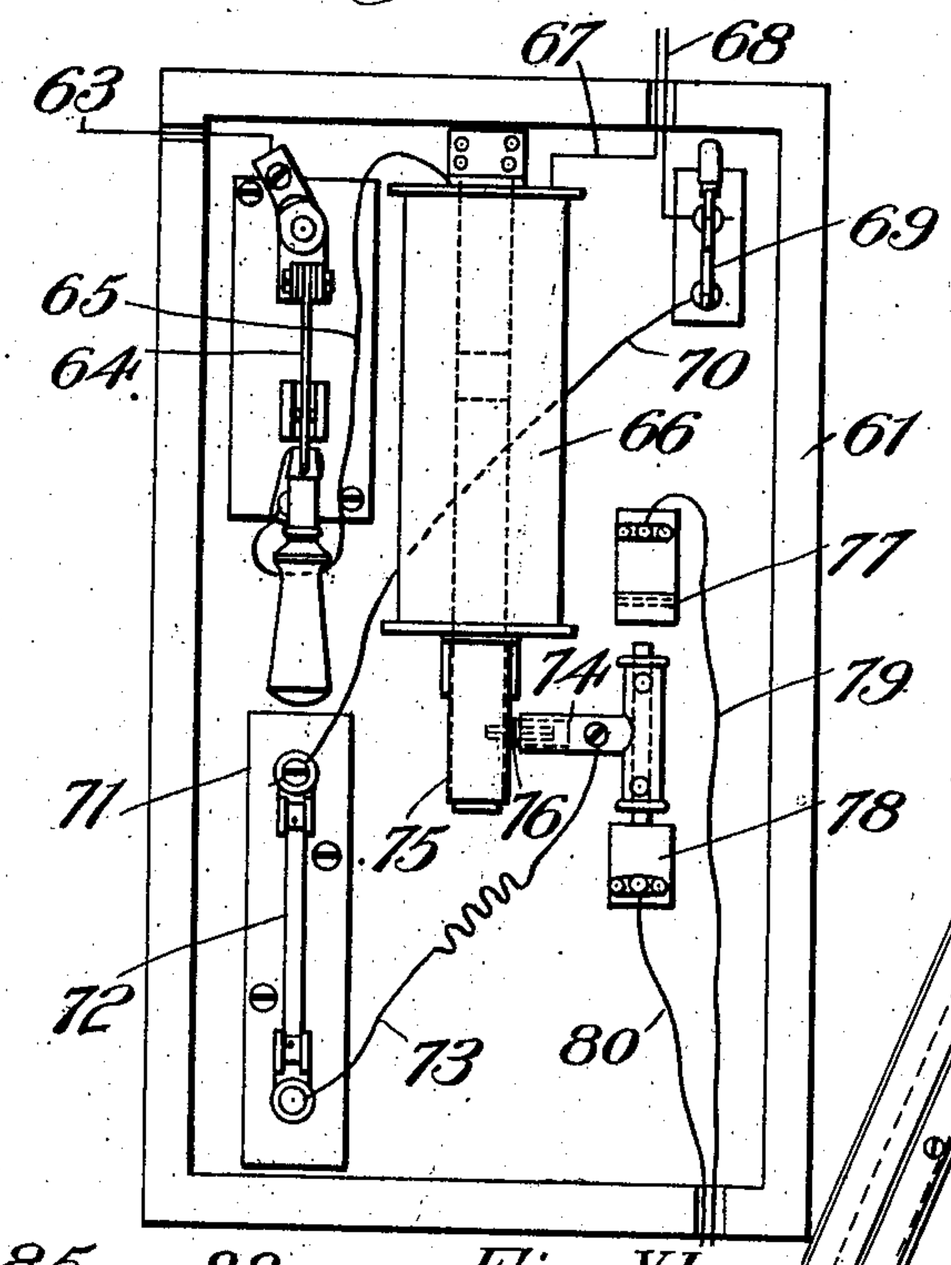


Fig. VIII.

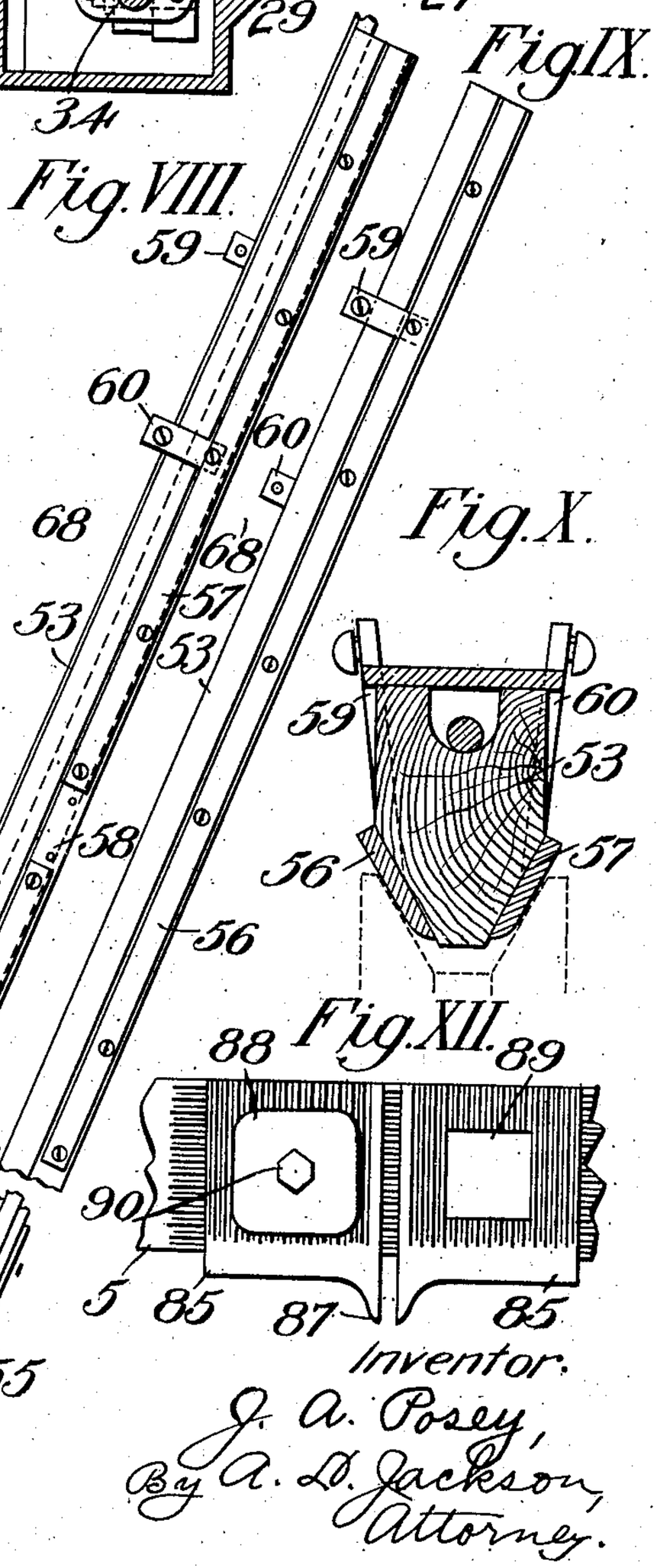
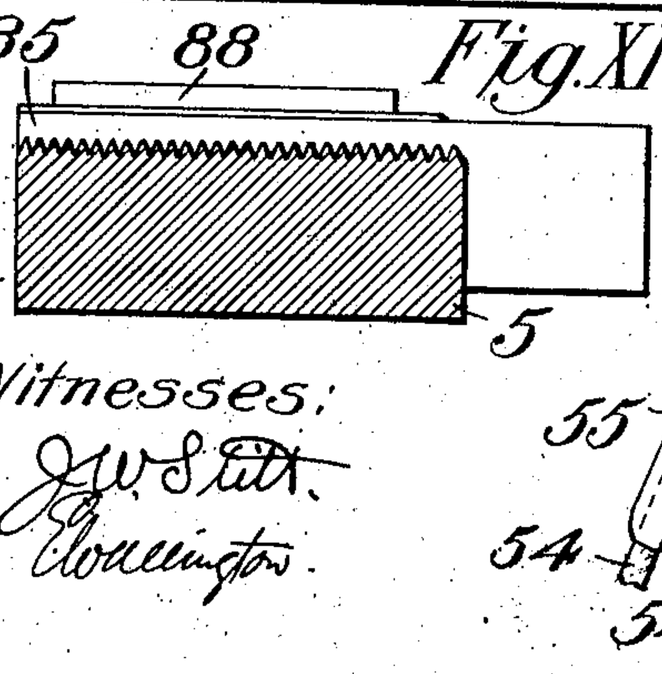


Fig. IX.

Fig. X.

Fig. XII.

Fig. XI



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No. 827,323. PATENTED JULY 31, 1906.

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ELECTROMECHANICAL SWITCH THROWER.

APPLICATION FILED SEPT. 14, 1905.

3 SHEETS—SHEET 3.

Fig. XIII.

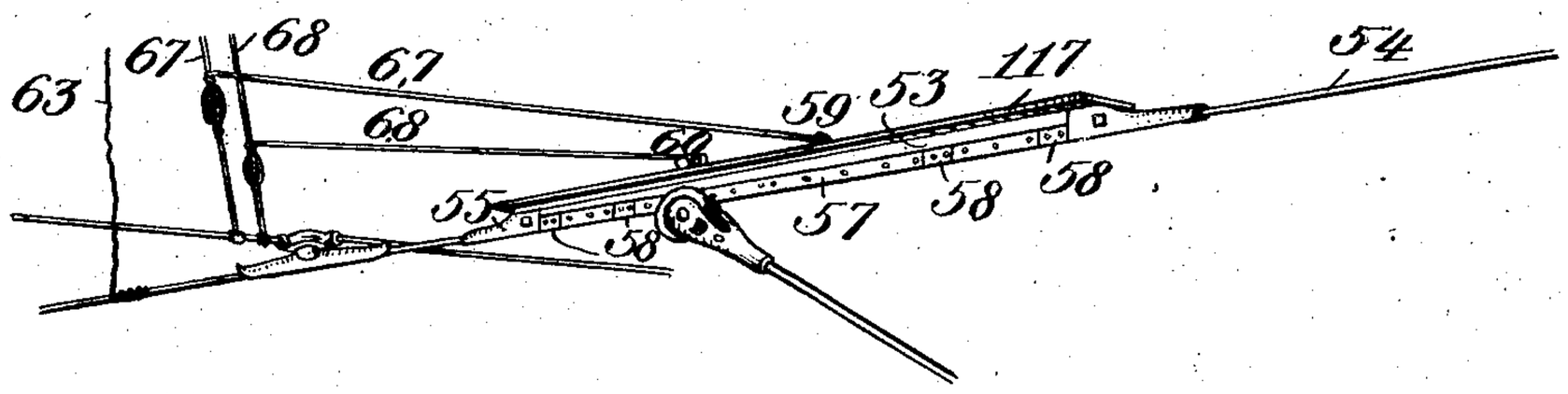


Fig. XIV.

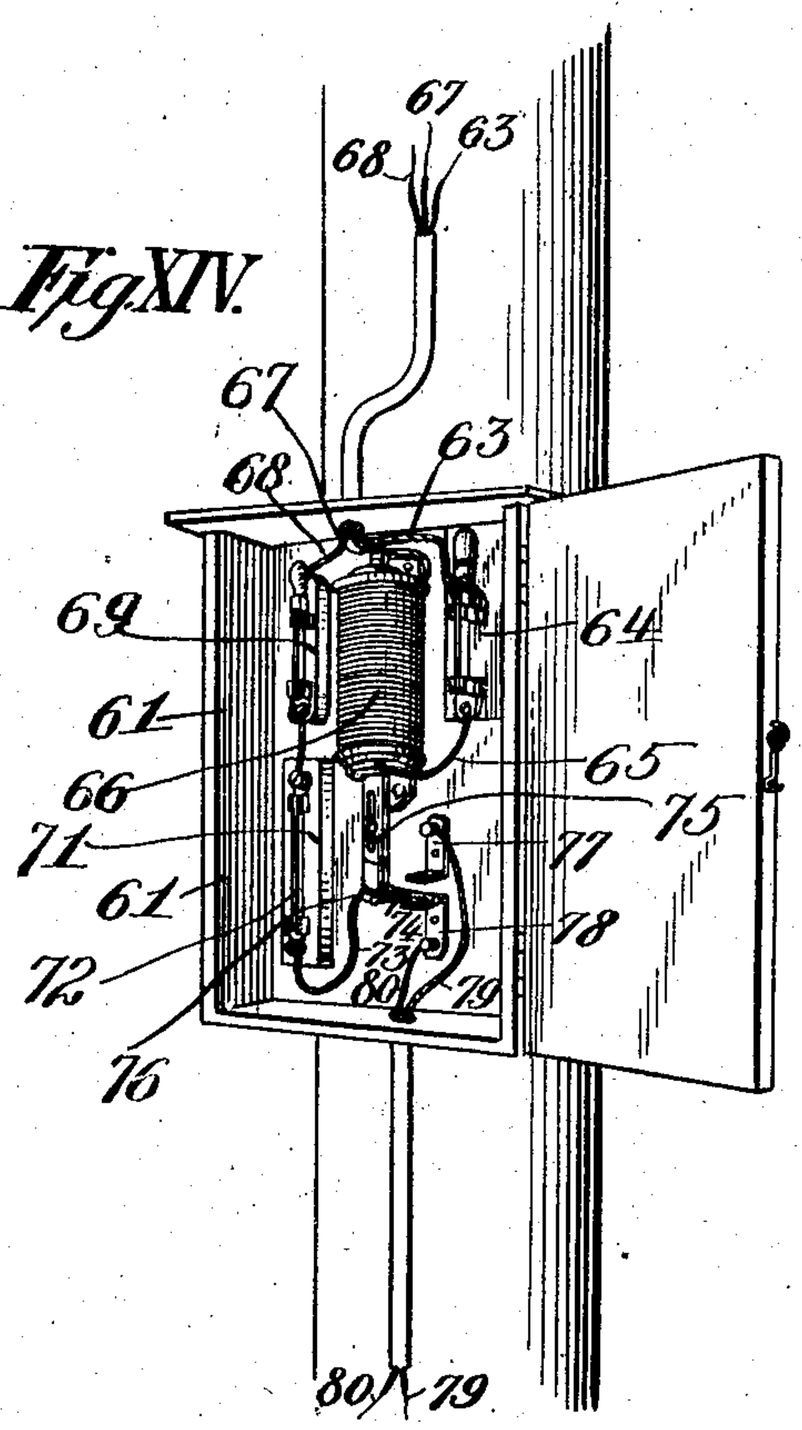
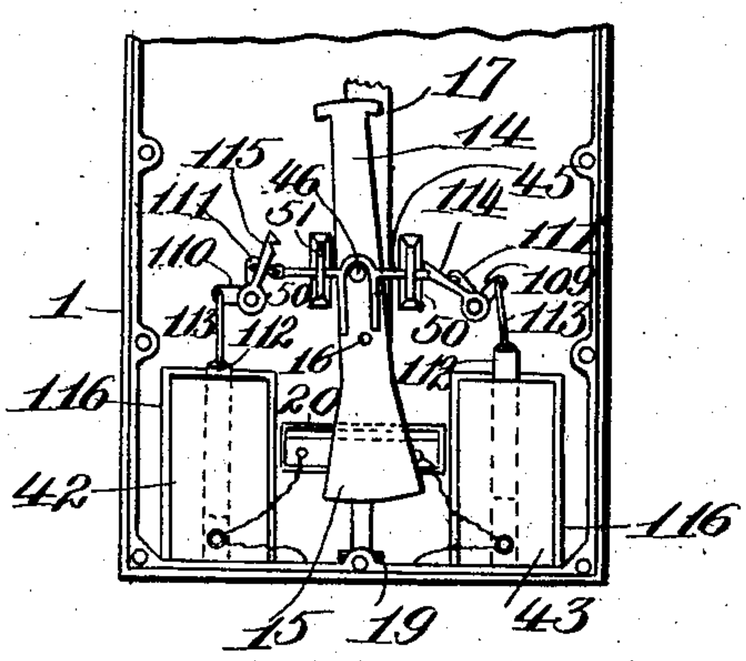


Fig. XV.



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UNITED STATES PATENT OFFICE.

JAMES A. POSEY, OF MIDLOTHIAN, TEXAS, ASSIGNOR TO POSEY AUTOMATIC SWITCHING COMPANY, OF FORT WORTH, TEXAS, A CORPORATION OF DELAWARE.

ELECTROMECHANICAL SWITCH-THROWER.

No. 827,323. Specification of Letters Patent. Patented July 31, 1906.

Application filed September 14, 1905. Serial No. 278,440.

To all whom it may concern:

Be it known that I, JAMES A. POSEY, a citizen of the United States, residing at Midlothian, Texas, have invented an Electromechanical Switch-Thrower for Railways, of which the following is a specification.

This invention relates to certain improvements in switching devices; and it consists of certain improvements of the switching devices shown and described in my pending applications—to wit, an application filed January 21, 1905, Serial No. 242,132, and an application filed March 14, 1905, Serial No. 250,095; and the object is to simplify the construction of the devices described in said applications and to provide improvements by which the operation is facilitated.

Other objects and advantages will be fully explained in the following description, and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings, which form a part of this application and specification.

Figure I is a broken railway-track, showing in plan view the arrangement of the switching devices. Fig. II is a diagrammatic view showing a plan view of the boxes containing the mechanical devices for throwing the switches and illustrating the manner of applying electric power to control the operation of the mechanical devices. Fig. III is a vertical section taken along the line *x x* of Fig. II. Fig. IV is a vertical section taken along the line *y y* of Fig. II. Fig. V is a vertical section taken along the line *z z* of Fig. II. Fig. VI is a vertical section taken along the line *v v* of Fig. II. Fig. VII is an elevation of the circuit-changing mechanism, the box-cover being removed to expose the mechanism contained therein. Fig. VIII is a side view of the devices for making contact with the trolley-wire or feed-wire for the purpose of obtaining electric power, showing one half of the contact-making devices with the roof removed, the other half being like the half shown. Fig. IX is a side view of the other side of the devices, with the roof removed, shown in Fig. VIII, a portion of the end of the devices being broken and turned ninety degrees to illustrate a plan view. Fig. X is a cross-section of the devices shown in Figs. VIII and IX. Fig. XI is a cross-section of the switch-throwing bar and a side elevation of the switch-lock applied to said bar. Fig. XII is a plan view of the switch-lock, one of the locking-washers being removed and the switch-bar being broken away. Fig. XIII is a perspective view of the contacting device as shown in Figs. VIII, IX, and X with the view of roof and wire connections added and its application to the trolley-wire and contact with the trolley-wheel. Fig. XIV is a perspective view of the circuit-changing mechanism as shown in Fig. VII. Fig. XV is a broken plan view illustrating a variation in the lock for the operating-hook.

Similar characters of reference are used to indicate the same parts throughout the several views.

This invention consists of the herein-described mechanical devices, which are actuated by the wheels of a passing car for throwing the switch-tongue of a railway, and of certain controlling means which are actuated by electric power. The motorman on a car can by the electric controlling means set the mechanical devices at will so that the car-wheel will actuate the mechanical devices to turn the switch-tongue in the desired direction.

The switch-throwing mechanism is contained in a water-tight box 1, which is placed against the rail 2, on the opposite side of which lies the pivoted switch-tongue 3 for switching the car to a branch road. A switch-tongue-shifting bar 5 is pivotally connected to the switch-tongue 3, which bar is used to turn the car from the main-line rails 2 and 6 to the branch-line rails 7 and 8 when the motorman so directs his car. The shifting-bar 5 is pivotally connected to bell-crank levers 9 and 10, which are fulcrumed on pedestals 11. The levers 9 and 10 have upwardly-projecting lugs 12, which form the means for the engaging of these levers by an operating device. These levers are held in place by screw-bolts 13, which engage the pedestals 11. The levers 9 and 10 are actuated by a vibratable hook 14, which is provided with a catch on each side. Means are provided for causing said hook to engage either one of the lugs 12, and thus actuate either lever 9 or lever 10. The hook 14 has a rear extension 15 from its pivotal bolt 16, so that the hook will not be obstructed in operation by friction against

the pull-bar 17, the bolt 16 being screwed into the pull-bar 17. The pull-bar 17 is adapted for reciprocal motion longitudinally in the box 1.

A pull-rod 18 is connected with the pull-bar 17 and enters the box 1 through a packing-box 19. The pull-bar 17 is provided with bearing-pedestals 20 and 21, which may be formed integral with box 1. Suitable straps 22 hold the pull-bar in its bearings. The pull-bar 17 is held normally in the position shown in Fig. III by a spiral spring 23, which is connected with the pedestal 21 and to a lug 24, projecting downwardly from the pull-bar 17, and which is carried by the pull-bar 17.

The pull-rod 18 is actuated by the wheels of passing cars by the following-described means: A box 24 is bolted to the rail 2. A depressible shoe 25 is bolted to an arm 26 of a crank-shaft 27. The shaft 27 is journaled in bearings 28 and in the partition 29. A packing-box 30 is mounted in the partition 29 for the shaft 27 to make the part of the box beyond the partition water-tight. A lock-nut 32 and a packing-gland 31 are provided for the stuffing or packing box 30. A pull-rod crank 33 is attached to shaft 27 by means of a key 33′, which is provided with a set-screw 33″. The pull-rod 18 is connected to the crank 33 yieldingly. A supplemental pull-rod 34 pivotally engages the crank 33, and the opposite end of this rod is threaded and screwed into a collar 35. Another collar 36 is mounted on the rod 34, and the rod moves loosely through the collar 36. A spiral spring 37 is mounted on the rod 34 between the collars 35 and 36. A stirrup 38 is provided, and both legs thereof pass through both collars 35 and 36, and suitable nuts at collar 36 prevent the withdrawal of the stirrup from the collars. A hook 39 engages the stirrup 38, and the pull-rod 18 is screwed into the shank of the hook 39. A pipe 40 incloses the rod 18 and is connected to the box 1 and screwed into box 24. The box 1 and that part of box 24 which contains the crank and expansible connection of the pull-rod are closed water-tight by suitable covers. The pull on the rod 34 will be against the spring 37 by reason of the collar 36, and the collar 36 pulls on the stirrup 38, which engages the hook 39. The spiral spring can be compressed more or less by screwing the rod 34 more or less into the collar 35. A pin 41 may be provided to limit the movement of the collar 36 on the rod 34.

Electrical devices are provided for setting the hook 14 whereby a motorman on a passing car can set the hook 14 to engage either one of the levers 9 or 10. Normally this hook is not in engagement with either one of the levers. Magnets 42 and 43 are mounted in the box 1 against one end thereof. These magnets are provided with cores and armatures 44, connected to said cores. A yoke 45 engages loosely, by means of an elongated U-shaped recess therein, an upstanding pin 46, and this yoke is connected to the armatures 44 by means of cables or sprocket-chains 47, which turn on idle pulley-wheels 48, mounted on pedestals 49. The yoke 45 has bearings in the top of pedestals 50 and is held on said pedestals by straps 51. If magnet 43 is energized, its armature will be drawn against the magnet and the hook 14 will be pulled toward the side of the box 1 in which magnet 43 is located, as shown in Fig. II. If magnet 42 is energized, its armature will be drawn against the end thereof and the hook 14 would be drawn toward the side of the box in which magnet 42 is located and the hook would actuate the lever 10 when a car passed.

Means are provided for energizing the magnets 42 and 43. The trolley-wheel of the car is deflected from the trolley-wire, and contact-making bars are provided for making contact with the trolley-wheel. A block of wood 53 or other suitable insulating material is placed under the trolley-wire 54. A brass saddle 55 is placed on the trolley-wire at each end of the wooden block 53 and attached to the wooden block.

Fig. VIII illustrates how the trolley-wire is bent up to go on top of the wooden block into the groove in the top of the wooden block 53. On one side of the block 53 is attached a metal bar 56, which extends uninterruptedly almost the entire length of the block 53. On the other side of the block 53 is another metal bar 57, which would be coextensive with bar 56 if it was not intercepted near each end by a bar of fiber 58, which is of the same size in cross-section as the metal bar 57.

Fig. X illustrates the arrangement of the wooden bar and the metal bars, the position of the trolley-wheel being shown in dotted outline. A brass strip 59 is attached to bar 56, and a brass strip 60 is attached to bar 57. The trolley-wheel carries the electric current from the bar 56 to bar 57 and the fiber strip or bar 58 being interposed in the bar 57 for the purpose of interrupting the flow of the electric current, a roof 117 covering the contact device on the trolley-wire. The switching of the current is accomplished by a circuit-changer, which may be contained in a box 61 and located at any convenient place, as on a pole 62, which supports the guy-wire for the trolley-wire. A wire 63 is attached to the trolley-wire 54 and to the switch 64. A wire 65 continues the flow of electricity to the magnet 66, and a wire 67 completes the connection between the magnet 66 to the long metal bar 56. A wire 68 is connected to bar 57 by means of the strip or contact 60. From the bar 57 the wire 68 leads to the switch 69. A wire 70 leads from switch 69 to fuse-block 71, which is provided with a five-hundred-volt two-ampere no-arc fuse 72. A

wire 73 connects the fuse 72 with the contact-making arm 74. The arm 74 can be extended out onto the left or opposite side of the armature 75 in the same manner as shown in Fig. 7 to the right of magnet 66 and connecting with contacting plate analogous to plates 77 and 78. In order to make the contact more certain, if necessary, two or more sets of plates 77 and 78 may be placed opposite each other, and the contacting arm or arms can be extended between the plates in any desired number, they being properly wired to carry the current through the same in a more efficient manner. This arm is carried by the core-armature 75 of the magnet 66, the arm 74 being connected to the core-armature 75 by a fiber plug 76, so that there will be no electrical connection between the arm and the core-armature. The no-arc fuse 72 is employed to prevent short-circuiting the trolley-wire 54 in case of accidental interruption of the electric current between the fuse 72 and the operating-magnets 42 and 43 or the grounding of the current. The arm 74 carries points for making contact with the metal bars 77 and 78. The arm 74 stands normally in contact with the contact 78, which is slightly elastic, so that the contact will be certain. The contact 77 is made considerably elastic, so as to prolong the contact. The contact 77 will maintain connection for an instant even after the current ceases to flow in the magnet 66, as the contacting plate 77 will fall about half the distance moved by the point on the arm 74. A wire 79 leads from plate 77 to magnet 43, and a wire 80 leads from plate 78 to magnet 42. The wires 79 and 80 may enter box 1 through pipes 81 and 82. The terminals of wires 79 and 80 may be grounded by wires 83, which connect with the pedestals 20.

In operation if the motorman wishes to continue on the main line of the railway he must turn his controller to cut off the main current of electricity from the car-motor while the trolley-wheel is passing the contact-making devices or current-shifting devices. (The car passes the distance of the current-shifting devices by acquired momentum.) While this is being done the current is flowing from the trolley-wire 54 through wire 63, thence through magnet 66, over terminal wire 67 to the long bar 56. It is there transferred by the trolley-wheel to the short bar 57, thence over wire 68 to switch 69, thence over wire 70 to fuse-block 71, through fuse 72, thence over flexible wire 73 to arm 74, thence to plate 78, thence over wire 80 to magnet 42 in box 1. This will energize magnet 42 and draw the hook 14 to that side of the box to engage lever 10, and the wheel of the car will strike the shoe 25 and shift switch-tongue 3, or if the hook 14 is already at that side of the box it will be held to that side of the box and be actuated by the depression of the shoe 25. During this operation the plate contact-point carried by arm 74 will remain in contact with plate 78 notwithstanding that a current is flowing through the magnet 66. The reason for this is that the magnet 42 does not draw sufficient current to energize magnet 66. Hence the devices stand in position shown in Fig. VII. As soon as the trolley-wheel passes the contact-making devices the motorman turns his controller to start the current through the car-motor. If the motorman wishes to direct his car to the side track, he simply leaves his controller in position with the current in communication with the car-motor. In performing this operation the magnet 66 is grounded through the motor on the car, and therefore the motor draws sufficient current to energize magnet 66 and draw the core 75 within the magnet 66, and thus draw the contact-point carried by arm 74 to plate 77. In this case current is fed to the car-motor through wire 63 to magnet 66, through this magnet over wire 67 to the long bar 56 on the current-shifting devices, thus taking the place of the trolley-wire. Therefore the current for setting the devices for turning the switch-tongue to direct the car to the side track is transferred by the trolley-wheel from the long bar 56 to the short bar 57. From bar 57 the current goes over wire 68, through switch 69, thence over wire 70 to fuse-block 71, through fuse 72, thence over flexible wire 73 into contact-arm 74, through plate 77, over wire 79 to magnet 43 in box 1. The magnet 43 will thus be energized and draw the hook 14 to that side of the box 1. When the car passes, the wheel will depress the shoe 25 and cause the hook 14 to engage the lever 9, as shown in Fig. II. The object in intercepting the bar 57 with fiber strips 58 is to create a blank to give time for energizing the magnet 66 before the magnets in box 1 are energized when the controller is on. Also when the trolley-wheel is passing off the other end of the current-shifting devices a blank is created and the magnets in box 1 are dead before the magnet 66 is dead. If no blank was created at the commencement and at the close of operation, there would be burning contacts at plates 77 and 78 at each commencement and at each close of the contact-making.

A locking device is provided to lock the switch-tongue against accidental displacement. The locking devices consist of a roller 84 and a locking-plate 85 in two parts. The roller is mounted on a spindle-bolt 86, which is screwed into the pull-bar 17. The locking-plate 85 is mounted on the switch-bar 5. The switch-bar 5 is corrugated longitudinally, and the lock has corrugations which mesh with the corrugations of the bar 5. The corrugations prevent displacement of the lock by the roller 84. The two plates forming the lock have the corners adjacent to the roller

extended to form a locking-lug 87. The object in making the lock in two parts is to form an adjustable lock. This can be done by spreading the two parts apart more or less to receive the roller 84 on one side or the other. Locking-washers 88 are provided for holding the locking-plates in any position in which they may be placed. The plates 85 are corrugated on top, and the washers are corrugated to mesh with the plates. The plates have large openings 89 to permit moving the same laterally without being limited by the bolts which hold the washers in place. The washers 88 are secured on the plates 85 by suitable bolts 90. In order to prevent the possible displacement of the hook 14, an expansion-spring 91 is secured to the forward end of the hook and the other end secured to the bolt 86. The expanded spring 91 will aid in holding the hook 14 in either of its shifted positions, though the said spring will be sufficiently yieldable to allow the ready movement of the hook to be set as desired by the magnets 42 and 43.

I show a variation of the locking device for the hook 14. Instead of the spring 91 I may use the locking devices illustrated in Fig. XV. Bell-crank levers 109 and 110 are provided with suitable fulcrums. Each lever is connected to the yoke 45 by means of a link 111. The other arms of these levers are connected to the core-armatures 112 by links 113. Locking-arms 114 and 115 are formed integral with the levers 109 and 110, respectively. When magnet 42 operates the hook 14, the arm 114 locks the hook against accidental displacement. When magnet 43 operates the hook 14, the arm 115 locks the hook against accidental displacement. Instead of attaching the magnets 42 and 43 to the end of the box, pockets 116 may be formed integral with the box 1 and the magnets 42 and 43 placed loosely therein.

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

1. An electromechanical switch for railways comprising a pivoted switch-tongue, a bar capable of reciprocal motion connected to said tongue, levers pivotally connected to said bar, a hook normally disengaged from said levers, electrical devices for setting said hook to engage either one of said levers, locking devices for preventing displacement of said hook when set to engage one of said levers, and mechanical devices for actuating said hook.

2. An electromechanical switch for railways comprising a pivoted switch-tongue, a shifting bar connected to said tongue, levers pivotally connected to said bar, a vibratable hook normally disengaged from said levers but adapted to engage either one of said levers, means for setting said hook to engage either one of said levers at will consisting of a yoke engaging said hook loosely, a magnet on each side of said hook, armatures for said magnets, means for energizing said magnets, means connecting the ends of said yoke to said armatures, and means for actuating said hook.

3. An electromechanical switch for railways comprising a pivoted switch-tongue, a shifting bar connected to said tongue, levers pivotally connected to said bar, a vibratable hook normally disengaged from said levers but adapted to engage either one of said levers, a yoke capable of reciprocal motion and having a U-shaped recess for engaging said hook loosely, said hook having a pin projecting up in said recess, a magnet on each side of said hook, armatures for said magnet, means for energizing either one of said magnets at will, means for connecting said armatures with the ends of said yoke, and means for actuating said hook.

4. An electromechanical switching device for railways comprising a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook adapted to engage either one of said levers, an actuating-bar carrying said hook, a depressible shoe operatively connected to said actuating-bar, and elastic devices forming a joint in said bar consisting of a collar screwed on a section of said bar, a collar loosely mounted on said section, a spiral spring on said bar between said collars, a stirrup engaging said collars and adapted to pull against said spring, and a hook connected to said stirrup and to the other section of said bar.

5. An electromechanical switching device for railways having a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook adapted to engage either one of said levers, an actuating-bar carrying said hook, a depressible shoe operatively connected to said bar, an elastic joint for said actuating-bar, and a waterproof box for said joint and the connection of said bar with said depressible shoe.

6. An electromechanical switching device for railways having a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook adapted to engage either one of said levers, an actuating-bar carrying said hook, a depressible shoe, a crank-shaft for said shoe, a crank rigid with said shaft, an elastic joint for connecting said actuating-bar and said crank, and a waterproof box for said crank and said joint, the journal for said crank-shaft being provided with a stuffing-box in the side of said waterproof box.

7. An electromechanical switching device comprising a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook normally disengaged from said levers, electrical devices whereby a motorman on a passing car may with the same controller for operating the car set said hook to engage

either one of said levers, an actuating-bar carrying said hook, a depressible shoe operatively connected to said actuating-bar, and elastic devices forming a joint in said bar consisting of a collar screwed on a section of said bar, a collar loosely mounted on said section, a spiral spring mounted on said bar between said collars, a stirrup engaging said collars and adapted to pull against said spring, and a hook connected to said stirrup and to the other section of said bar.

8. An electromechanical switching device for railways comprising a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook adapted to engage either one of said levers, electrical devices for setting said hook to engage either one of said levers, an actuating-bar carrying said hook, a depressible shoe operatively connected to said bar, an elastic joint for said actuating-bar, and a waterproof box for said joint and the connection of said bar with said depressible lever.

9. An electromechanical switching device for railways comprising a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook normally disengaged from said levers, electrical devices for setting said hook to engage either one of said levers, an actuating-bar carrying said hook, a depressible shoe, a crank-shaft for said shoe, a crank rigid with said shaft, an elastic joint for connecting said actuating-bar and said crank, and a waterproof box for said crank and said joint, the journal for said crank-shaft being provided with a stuffing-box in the side of said waterproof box.

10. An electromechanical switching device for railways having a shifting switch-throwing bar, a locking-yoke attached rigidly to said bar and provided with a locking-lug projecting therefrom, a locking-roller yieldingly mounted and adapted to be engaged by said lug on either side thereof, and means for expanding said lug to make said locking devices adjustable.

11. An electromechanical switching device for railways having a switch-throwing bar, a locking-yoke rigidly attached to said bar and provided with a locking expansible lug projecting from the side thereof, and a roller yieldingly mounted and adapted to engage said lug on either side thereof.

12. An electromechanical switching device for railways having a switch-throwing bar, a locking-yoke rigidly attached to said bar, the adjacent surfaces of said yoke and said bar being corrugated to mesh with each other, a lug carried by said yoke, means for expanding said lug, and a locking-roller yieldingly mounted and adapted to engage said lug on either side thereof.

13. An electromechanical switching device for railways having a switch-throwing bar, a locking-yoke rigidly attached to said bar and provided with a lug projecting therefrom, means for expanding said lug whereby said switching device is made adjustable, locking-washers for holding said yoke in place at different adjustments, and a locking-roller yieldingly mounted and adapted to engage said lug on either side thereof.

14. An electromechanical switching device for railways having a switch-throwing bar, a locking-yoke rigidly attached to said bar and provided with a lug projecting therefrom, means for expanding said lug, locking-washers having the sides adjacent to said yoke corrugated, the surface of said yoke adjacent to said washers being corrugated transversely to said bar and meshing with the corrugations of said washers, and a locking-roller yieldingly mounted and adapted to engage said roller on either side thereof.

15. An electromechanical switching device for railways having a switch-throwing bar, a locking-yoke mounted on said bar and provided with a lug projecting therefrom, means for expanding said lug, the adjacent surfaces of said yoke and said bar being corrugated longitudinally to said bar, locking-washers for securing said yoke on said bar, the adjacent surfaces of said washers and said yoke being corrugated and meshing with each other transversely to said bar, and a roller yieldingly mounted and adapted to engage said lug on either side thereof.

16. An electromechanical switching device for railways having a switch-throwing bar, a locking-yoke mounted on said bar and provided with a lug projecting therefrom, the adjacent surfaces of said bar and said yoke being corrugated and meshing with each other longitudinally to said bar, locking-washers for securing said yoke on said bar, the adjacent surfaces of said washers and said yoke being corrugated transversely to said bar and meshing with each other whereby said washers hold said yoke at different adjustments on said bar, and a locking-roller yieldingly mounted and adapted to engage said lug on either side thereof.

17. An electromechanical switching device for railways having a switch-throwing bar, a locking-yoke mounted on said bar and provided with a lug projecting therefrom, said yoke being in two parts and each part carrying a part of said lug, means for holding the parts of said yoke at different adjustments on said bar, and a locking-roller yieldingly mounted and adapted to engage said lug on either side thereof.

18. An electromechanical switching device for railways having a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook adapted to engage either one of said levers, independent magnets for setting said hook to engage either one of said levers, means including a circuit-changing device for energizing either one of said magnets at

will, and mechanical means for actuating said hook.

19. An electromechanical switching device for railways having a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook normally disengaged from said levers, a magnet on each side of said hook adapted to set said hook to engage either one of said levers, mechanical means for actuating said hook, and means for energizing either one of said magnets at will consisting of a detachable electrical connection of one of said magnets with a supply source of electricity and a connection of the other one of said magnets capable of being electrically connected with the supply source of electricity, and a magnet in circuit with the supply source of electricity capable of being electrically operated through and in connection with the motor-controller on an electric car to change said connection from one magnet to the other, or such other electrical power used for moving a railway switch-tongue, electrically or electromechanically operated.

20. In an electromechanical switching device for railways, mechanical devices operable by the wheels of a passing car for opening or closing the switch-tongue of a railway, a magnet for setting said devices to open the switch, a magnet for setting said devices to close the switch, one magnet having a detachable electrical connection with a supply source of electricity, the other magnet having a connection capable of being electrically connected to the said source of electricity, and an actuating-magnet adapted to change the electrical connection of one of said magnets to the other magnet.

21. In an electromechanical switching device for railways, mechanical devices for opening and closing the switch-tongue of a railway, a magnet for setting said devices to open the switch, a magnet for setting said devices for closing a switch, contact-making plates electrically connected to each of said magnets, an actuating-magnet carrying contact-making arms and points insulated therefrom adapted to make contact with said plates, electrical connection of said points with a supply source of electricity, a safety-fuse interposed in the electrical connection between said points and the supply source of electricity, and means for energizing said actuating-magnet, said actuating-magnet being in a circuit with the supply source of electricity.

22. In an electromechanical switching device for railways, mechanical devices for opening and closing a switch, a magnet for setting said devices for closing the switch, a magnet for setting said devices for opening the switch, elastic contact-making plates connected to each of said magnets, contact-carrying arms provided with contact-making points normally in engagement with one or more of said plates and provided with other contact-making points adapted to contact with the opposite corresponding plates, a wooden block for deflecting the trolley-wheel of a car from the trolley-wire momentarily, a long metal bar attached to said block on one side thereof, a shorter metal bar attached to the other side of said block, the trolley-wheel contacting with said bars, electrical connection of the short bar with said contact-carrying arms, and means of adapting the same to the trolley-wire and diverting the current without cutting or severing the trolley-wire, and a magnet electrically connected with the long bar and with the trolley-wire for actuating said contact-carrying arms.

23. In an electromechanical switching device for railways, mechanical devices operable by the wheels of a passing car for opening and closing a switch, and electrical devices for setting said mechanical devices to be operated by the wheels of a passing car consisting of the trolley-wire of an electric railway and a trolley-wheel, a wooden block deflecting the trolley-wheel from the trolley-wire, a roof for said block, brass saddles supporting said block at each end on the trolley-wire, metal bars attached to the outside of said wooden block and forming a track for the trolley-wheel, fiber bars intercepting one of said metal bars near the ends thereof, a circuit including an actuating-magnet connected with said trolley-wire and to the long metal bar, contact-making arms carried by the armature of said actuating-magnet, electrical connection of said arms with said short metal bar, contact-plates, contact-points carried by said arms, and reduction-magnets operatively connected to said plates and to said mechanical devices.

24. In an electromechanical switching device for railways, mechanical devices operable by the wheels of a passing car for opening and closing a switch, and electrical devices for setting said mechanical devices to be operated by the wheels of a passing car consisting of the trolley-wire of an electric railway, a trolley-wheel, a wooden block for deflecting the trolley-wire from the path of the trolley-wheel, a roofing mounted on said block a long metal bar on one side of said block and a shorter metal bar on the other side of said block forming a path for the trolley-wheel, a circuit-changing magnet provided with a core-armature electrically connected with said long bar and with the trolley-wire, arms carried by said armature and carrying contact-making points, electrical connection of said short metal bar with said arms, a safety-fuse intercepting said connection, contact-making plates, said contact-making points being adapted to contact with either of said plates, and magnets operatively connected with said mechanical de-

vices and electrically connected to said plates.

25. In an electromechanical switching device for railways, a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook adapted to engage either one of said levers, independent operating-magnets for setting said hook to engage either one of said levers, means including a circuit-changing magnet for energizing either one of said magnets at will, means for causing said circuit-changing magnet to be energized before said operating-magnets are energized and for prolonging the energization of said circuit-changing magnet after the energization of said operating-magnets has ceased, and mechanical means for actuating said hook.

26. In an electromechanical switching device for railways, a switch-throwing bar, levers pivotally connected to said bar, a vibratable hook adapted to engage either one of said levers and normally disengaged from said levers, electrical devices for setting said hook to engage either one of said levers, locking devices actuated by said electrical devices for preventing displacement of said hook when set to engage one of said levers, and mechanical devices for actuating said hook.

In testimony whereof I set my hand, in the presence of two witnesses, this 28th day of August, 1905.

JAMES A. POSEY.

Witnesses:

A. L. JACKSON,

E. WALLINGTON.