

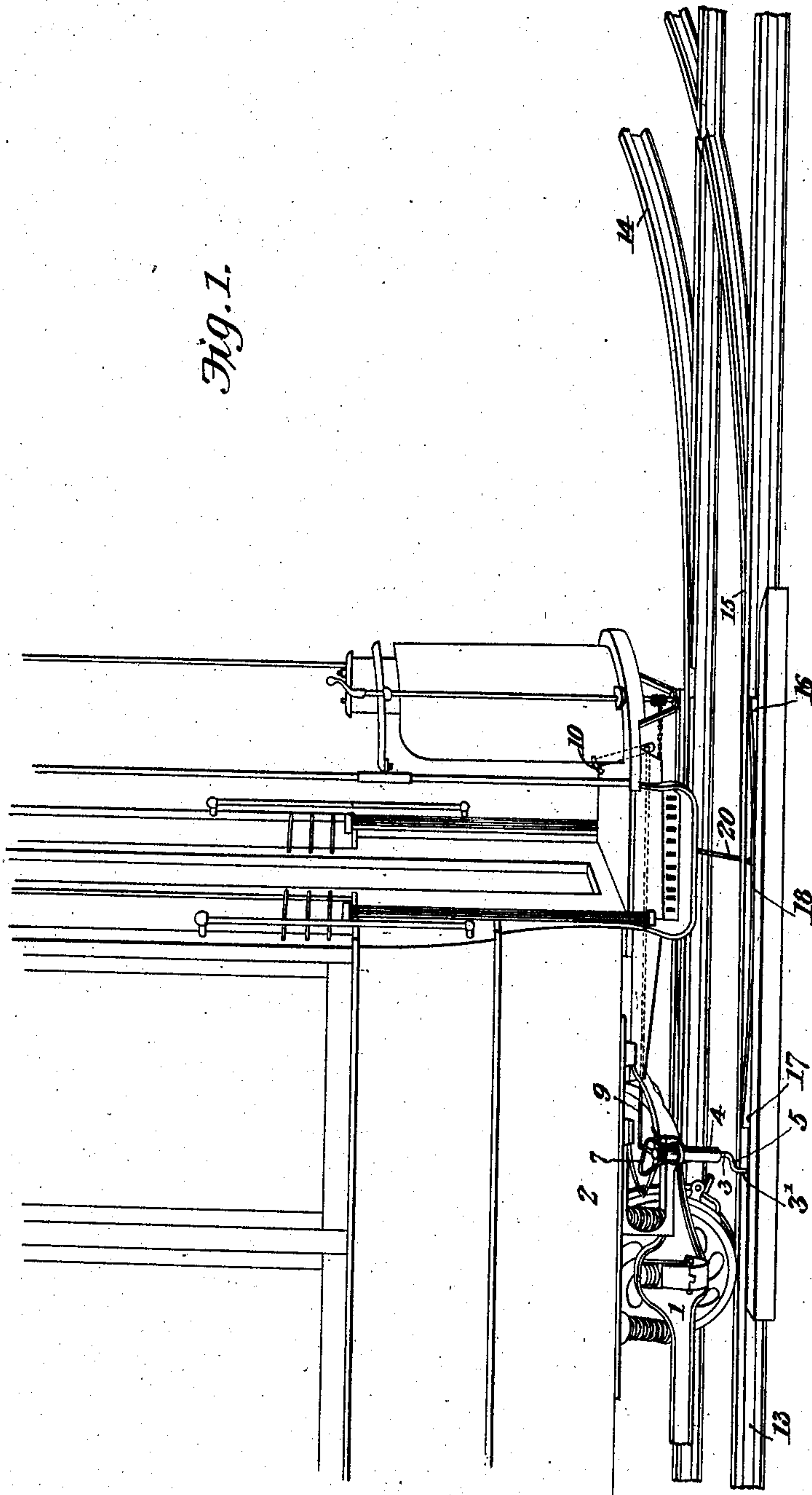
No. 827,407.

PATENTED JULY 31, 1906.

T. BAMFORD.  
SWITCH MECHANISM FOR RAILWAYS.

APPLICATION FILED APR. 27, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

*E. J. Stewart*  
*Charles Bradway*

*Thomas Bamford* INVENTOR

By

*C. A. Snow & Co.*

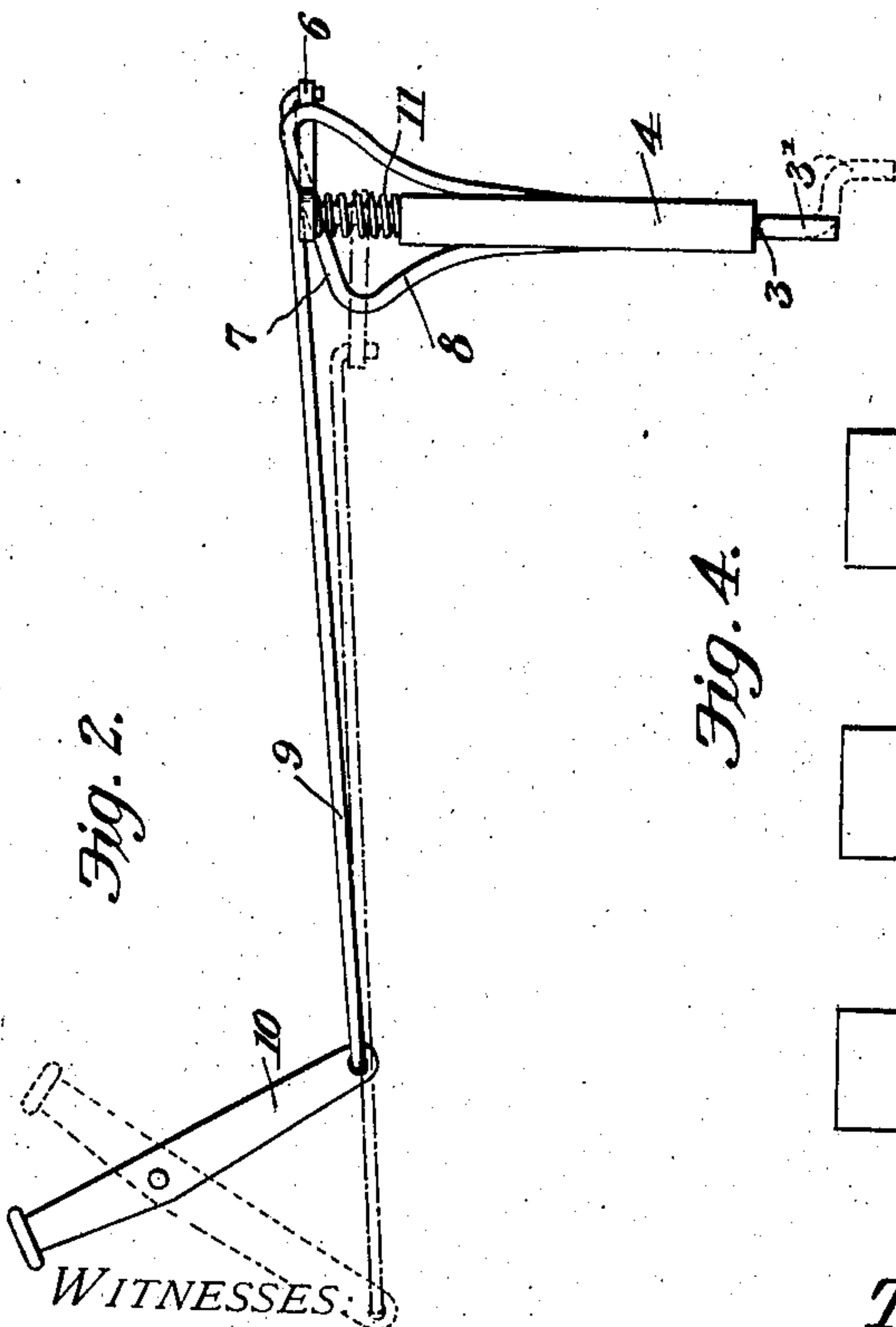
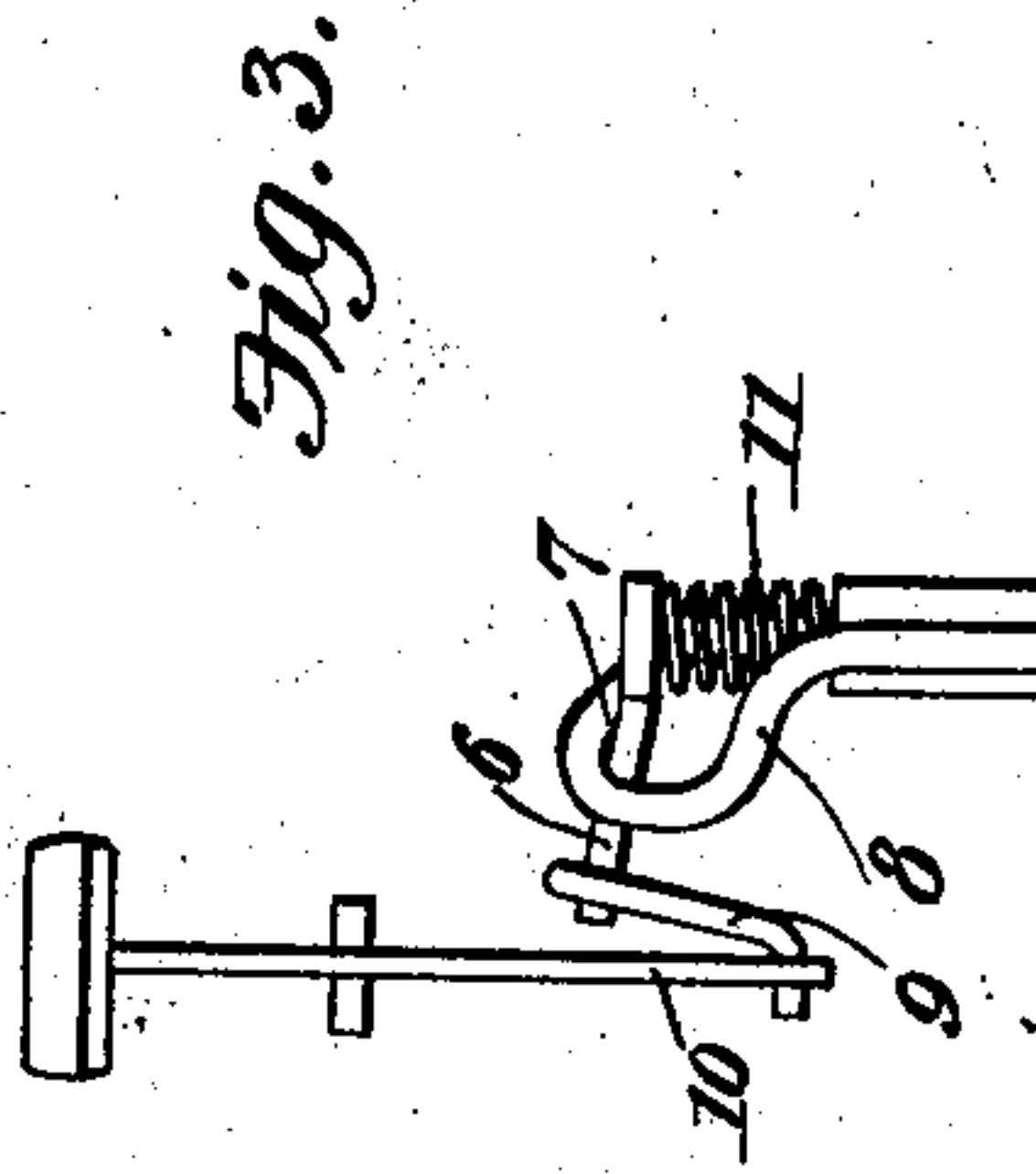
ATTORNEYS

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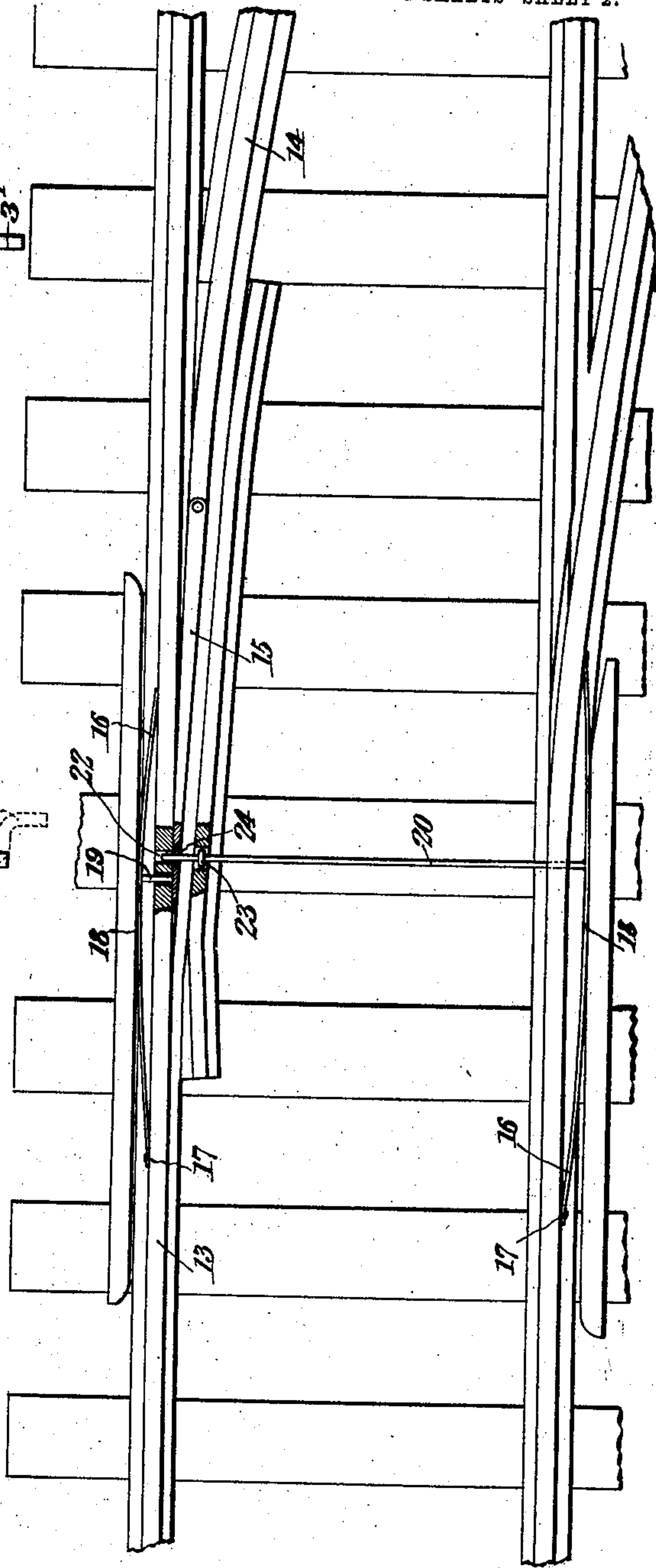
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2 SHEETS—SHEET 2.



WITNESSES:  
*E. J. Stewart*  
*Chatter Roadway*

Fig. 4.



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# UNITED STATES PATENT OFFICE.

THOMAS BAMFORD, OF LEBANON, ILLINOIS.

## SWITCH MECHANISM FOR RAILWAYS.

No. 827,407.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed April 27, 1906. Serial No. 314,075.

*To all whom it may concern:*

Be it known that I, THOMAS BAMFORD, a citizen of the United States, residing at Lebanon, in the county of St. Clair and State of Illinois, have invented a new and useful Switch Mechanism for Railways, of which the following is a specification.

The present invention relates to a switch mechanism for use in connection with street and interurban railways of that type adapted to be mounted on the cars, so that the motorman or engineer can throw the switch without stopping the car and dismounting to actuate the track-switch, as has been hitherto necessary.

The objects of the invention are to provide a switch-throwing mechanism of the character which is of simple and inexpensive construction and which is positive and reliable in operation.

Furthermore, it is an aim of the invention to so construct the switch-throwing mechanism that it can be applied to cars of standard construction without any alteration being necessary and to equip the track-switch with the necessary means cooperating with the switch-throwing mechanism carried by the car for moving the switch without any substantial change in the regular track construction.

With these and other objects in view the invention consists of the various features of construction and arrangement of parts, as will be hereinafter more fully described, and pointed out with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a perspective view of a front portion of an electric car with the switch-throwing mechanism applied thereto. Fig. 2 is a side elevation, on an enlarged scale, of the said mechanism. Fig. 3 is a front view thereof, and Fig. 4 is a plan view of the track and switch therefor.

Referring to the drawings, 1 represents one of the trucks of the car, on which is supported the body 2. The car can, however, be of the single-truck type. In either case the switch-throwing mechanisms are preferably mounted on the trucks. When the car is of the double-ended construction—that is to say, having the necessary controlling apparatus at both ends, so that the car can be operated from either—four throwing mechanisms

are provided, so that any desired switch can be operated by the motorman.

Each switch-throwing mechanism comprises a vertical shaft 3, which is mounted so as to have a combined longitudinal and oscillatory movement, and for this purpose is arranged in a bearing-sleeve 4, suitably supported on one corner of the truck. The lower end of the shaft 3 or “drop-rod,” as it may be called, is provided with a depending finger 3', arranged at the end of a short crank 5. The finger and crank may be made separate from the drop-rod, so as to permit of renewal or forged integral therewith. The upper end of the drop-rod is provided with an arm 6, which serves as an operating-crank and as a wiper cooperating with an inclined surface 7, so that as the crank is turned longitudinal movement is imparted to the rod. This inclined surface is carried by a frame 8, to which the guiding-sleeve 4 may be mounted, and the entire structure is supported on the truck 1. The outer end of the upper arm 6 is connected by a link 9 with an operating-lever 10, which is mounted on the floor of the car at the front platform and adapted to be operated by the foot.

If desired, a push-button to be operated by the foot may be employed, in which case the link is connected with the push-button by a bell-crank lever, as will be readily understood. The parts are held in their normal position and are returned thereto after being actuated by means of a helical compression-spring 11, arranged on the upper end of the push-rod and held between an abutment 12 on the rod and the upper end of the guide-sleeve. When the parts are in normal position, the switch-throwing finger 3' is raised and project outwardly in a lateral direction with respect to the axis of the push-rod. When the switch-throwing mechanism is actuated by the motorman, the finger is depressed and simultaneously turned to extend rearwardly, as shown in dotted lines, Fig. 2, so as to be in operative position to cooperate with the mechanism on the track for throwing the switch.

Referring to Fig. 4, 13 represents the rails of a main line, and 14 the rails of a turnout, crossover, or Y track, and 15 the switch for controlling the tracks 14 with relation to the main tracks. As shown, the track construction is of standard design. Disposed at the outside of the rails 13 are springs 16, with which the fingers on the lower ends of the



drop-rods are adapted to cooperate to actuate the switch. These springs preferably take the form of a steel leaf of considerable length, each fastened by bolting or otherwise to a rail 13 at a point a few feet on the approach side of the switch, as indicated at 17.

The springs extend about an equal distance to the rear of the point of the switch as they do to the front thereof. They are flexed outwardly, so that at their middle portions 18 there is considerable clearance between them and the adjacent sides of the rail 13. On the surfaces adjacent the rails the springs are provided with inwardly-projecting actuating-rods 19 and 20. The rod 19 engages the switch and moves it to a closed position, whereas the rod 20 engages the switch to move it to an open position. These rods are guided in openings in the webs of their adjacent rails 13. The opening for the rod 19 is a sufficient support for its free end; but in the case of the rod 20 its free end is supported in an opening 22 in the other rail. On the rod 20 is a shoulder, adjustable nut, or other device 23, which engages the switch and moves it to its open position. The rod 20 passes freely through an opening 24 in the switch, so that if the switch has been moved to its open position the rod can be retracted by its spring without drawing the switch closed. So, also, the push-rod 19 is not mechanically connected with the switch, so that after it has moved the latter closed it has no tendency to open it.

The operation is as follows: Assuming the car is approaching the switch and it is desired to pass through the same, the motorman actuates the operating-lever of the left-hand-switch-throwing mechanism at a suitable time before the switch is reached, and causes the finger on the end of the drop-rod to move to the position shown in dotted lines in Fig. 2. The finger thus moves along the outside of the left-hand rail and wipes along the convex surface of the spring 16. The spring yields to the finger and causes the switch to close so that the wheels pass through the switch in the usual manner, it being assumed that the switch was previously in its open position. Should it be desired that the succeeding car should pass through the switch to the rails 14, the motorman operates the lever of the right-hand-switch-throwing mechanism, so that the rod 20 is moved inwardly by the finger of the right-hand mechanism passing over the spring 16 of the right-hand rail, so as to move the switch into its open position. The switch is thus opened so that the car can freely pass without stopping from the main rails 13 to the rails 14.

Flanking each of the spring-plates 16 are guides 25, supported on ties for the rails or in any other desired manner, which serve to retain the springs in position and prevent destruction thereof by traffic in the road. The inner

surfaces of these guides are concaved to conform to the convex surface of the springs so as to engage the latter and prevent the collection of dirt and other foreign matter between them, and thus interfere with the operation of the apparatus.

I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof; but I desire to have it understood that the apparatus shown is merely illustrative, and that the invention can be carried out by other means.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a switch-throwing mechanism, the combination of a longitudinally movable and oscillatory member, a crank for oscillating the same, a stationary means cooperating with the crank for moving said member longitudinally when the crank is actuated, a spring which returns the said member to its inoperative position, and a switch actuated by said member.

2. In a switch-throwing mechanism, the combination of a longitudinally movable and oscillatory member, an arm for oscillating the same, a stationary inclined surface cooperating with the said arm for moving the member longitudinally, a compression-spring which oscillates and moves the member to its initial position, a switch, and means on said member for operating the switch.

3. In a switch-throwing mechanism, the combination of a longitudinally movable and oscillatory rod, a sleeve for supporting the same, a crank on the upper end of the rod, an inclined guide cooperating with the said arm for producing longitudinal movement of the rod, a spring on the rod which abuts against the end of the sleeve, a crank on the lower end of the rod, a finger carried by the latter crank, an actuating mechanism connected with the upper crank, and a switch adapted to be operated by said finger.

4. In a switch-throwing mechanism, the combination of a truck, and a switch, with a switch mechanism mounted on the truck for actuating the switch, said mechanism comprising a rod, a crank for oscillating the rod, means for supporting the rod on the truck, a frame supported on the truck which is provided with an inclined surface with which the crank cooperates to move the rod longitudinally, a lever connected with the crank for actuating it, and means on the lower end of the rod for operating the switch.

5. The combination of a car-truck, and a switch-throwing mechanism arranged on each side thereof, with a switch, track-rails, a means adjacent one of the rails and actuated by one of said mechanisms for opening the switch, and an independent means adjacent the other rail and actuated by the other mechanism for closing the switch.



6. The combination of a car-truck, a switch-throwing mechanism on each side of the same, and an operating-lever for each mechanism on the platform of the car, with a switch, a means on one side of the switch which is operated by one of said switch-throwing mechanisms for moving the switch only in one direction, and means on the opposite side of the switch which is operated by the other mechanism for moving the switch in the opposite direction.

7. The combination of a car-truck, switch-throwing mechanisms arranged on opposite sides thereof, and means on the platform of the car for operating said mechanisms independently, with a switch, a pair of rails, a spring located adjacent each rail and adapted to be operated by one of said mechanisms, and means for opening or closing the switch when the springs are actuated.

8. The combination of a car-truck, a switch-throwing mechanism arranged on opposite sides thereof, and means on the platform of the car for operating said mechanism independently, with a switch, a pair of rails, a spring arranged on the outside of each track and flexed outwardly, and a rod attached to each spring and adapted to engage the said switch for actuating it.

9. The combination of a car-truck, a switch-throwing mechanism arranged on opposite sides thereof, and means on the platform of the car for operating said mechanisms independently, with a switch, a pair of rails, a spring at the outside of each rail disposed with a portion thereof on the approach side of the switch, means for securing the spring at its approach end to the rail, and a rod on each spring which extends through the adjacent rail and engages the switch for operating it.

10. The combination of a car, and a switch-throwing mechanism thereon, with a switch, rail, a member located at the outside of the rail and arranged to be actuated by the switch-throwing mechanism, and means co-operating with the said member for actuating the switch.

11. The combination of a car, and a switch-throwing mechanism thereon, with a switch, rail, a spring normally flexed outwardly from the side of the rail and secured at one end to the latter and free at its opposite end, and an inwardly-extending member attached to the said spring for actuating the switch.

12. The combination of a car, and a switch-throwing mechanism thereon, with a switch, rails, a spring convexed outwardly from the outside of the rail with one end secured to the latter and the other end free, a guard disposed along the outside of the spring, and a rod attached at substantially the middle of the spring and extending inwardly through the adjacent rail to engage the switch.

13. The combination of a car, independent switch-throwing mechanisms mounted thereon, and means for operating the same, with a switch, a pair of rails, an outwardly-curved spring extending along the outside of each rail, means on the spring adjacent the switch for moving the latter in one direction, and a rod on the other spring for moving the switch in the opposite direction which is guided at one end in the adjacent rail and at its opposite end in the other rail.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS BAMFORD.

Witnesses:

CHAS. REINHARDT,  
HENRY REINHARDT.