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 Electric Switch for Street-Railways, of which the following is a specification.

This invention relates to electrically-controlled switches for street-railways; and the object is to provide a method of operating the switches of the track from the car, so that a motorman will not have to stop a car for the purpose of turning a switch.

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 1 is a side elevation of a car-platform with the contact making and controlling mechanism applied thereto and showing relative positions of the same to the rail fixtures of the track. Fig. 2 is an end elevation of a car-platform, illustrating the same devices as are shown in Fig. 1. Fig. 3 is a plan view of a track and switch and the contacts, showing the switch-operating mechanism in dotted outline. Fig. 4 is a plan view of the switch-operating mechanism. Fig. 5 is a detail view, being a side elevation of the depressible lever which is used to throw the switch.

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

The drawings show rails or tracks 1 and 2. Metallic contacts 3 and 4 are suitably mounted inside of the rails and preferably adjacent to one of the track-rails. A depressible lever 5 is mounted on one of the rails by means of a suitable casing 6, the lever being fulcrumed on the rail. A connecting-rod 7 engages the lever 5. The rod 7 is provided with an elastic joint 8. This joint is formed by attaching a cylindrical casing 9 to one section of the rod 7, forming a head 10 on the other section, and placing a spiral spring 12 on the latter section between the head 10 and the bottom of the casing 10. The rod 7 is pivotally connected to the shifting bar 11, which carries the reversing-hook 13. The bar 11 is held against displacement by the straps 14. The bar 11 is held in its normal position by the spiral spring 15. The bar 11 will be moved longitudinally whenever a wheel 55 passes over the lever 5. As soon as the wheel releases or passes off of the lever 5 the spiral spring 15 draws the bar 11 back to its normal position. The hook 13 moves with the bar 11 and is subject to a vibratory movement caused by the electrical appliances. A magnet consisting of parts 16 and 17 is mounted on the yoke 18. The part 16 is electrically connected to the contact 4 by wire 19, and the part 17 is electrically connected to the contact 3 by means of the wire 20. An armature 21 is yieldingly mounted on the stud 22 by means of a spring 23, the stud 22 being integral with the frame 24. The armature 21 and the hook 13 are connected together by the rod 25. Consequently whenever the armature is moved by the magnets the hook 13 is also moved. The contact-making devices are carried by the cars and will be described below. The magnets and the shifting bar 11 and connecting mechanism are mounted on a plate or platform 26, which is a part of the casing for mounting said mechanism underground. Levers 27 and 28 are fulcrumed on the plate 26 and pivotally connected to the switch-yoke 29, which has a transverse movement under the straps 30. The yoke 29 is pivotally connected to the switch-tongue 31 by means of a pivot-stud 32, the switch-tongue 31 being pivotally connected to rail 2 by pivot-bolt 33. The switch-tongue serves to direct a car along the main tracks 1 and 2 or to the side tracks 34 and 35, as may be determined by the motorman. The tongue 31 vibrates between the side-track rail 33 and guard-rail 36. The hook 13 actuates the levers 27 and 28 by means of pins 37 and 38. Without any electricity to move armature 21 a depression of the lever 5 in the position shown in Fig. 4 would cause the lever 28 to throw the switch-tongue 31 to the guard-rail and a car would be sent to the side track or branch road.

The mechanism for making contact is carried by the cars and is illustrated in Figs. 1 and 2. Levers 39 and 40 are fulcrumed in the two platforms of the car. Rods 41 and 42 are pivotally connected to levers 39 and 40 and pivotally connected to a counter-lever 43, which may be suitably fulcrumed on the bottom of the car. Springs 44 and 45 are carried by the rocker-shafts 46 and 47, which...
are mounted in hangers 48 and 49. Rocker arms 50 and 51 are pivotally connected to rods 41 and 42 and rigidly mounted on the shafts 47 and 46, and the springs 45 and 44 are rigidly mounted on the same shafts. Consequently a movement of the rods 41 and 42 will operate the springs 45 and 44 to raise or lower the same. The springs 44 and 45 have insulated joints 52. The springs 44 and 45 may be electrified by electricity from the car just as the lights in the car are supplied by mechanism carried by the car, or a storage battery 53 may be attached to the car and electricity furnished by the battery. A wire 54, leading from one pole of the battery 53, is connected to the spring 44 below the insulated joint 52. A wire 55 is connected to wire 54 and with the spring 45, which is directly in-line with the spring 44. In the same manner a wire 56, leading from the other pole of the battery 53, is connected with the other pair of springs 44 and 45, which are to contact with the contact 3, the outside pair of springs 44 and 45 contacting with the contact 4. With the above-described arrangement the outside pair of springs 44 and 45 may be connected with the positive pole of battery 53, and the inside pair of springs 44 and 45 may be connected with the negative pole of battery 53. Normally the springs 44 and 45 are carried some distance from the ground; but all the springs can be lowered by either lever 39 or 40, which may be placed at a convenient location for the motorman.

In operation suppose the switch-tongue is in the position shown in Fig. 3. A motorman who wishes to go on track 27 and 28 has nothing whatever to do with the switching mechanism. The car-wheel will depress lever 37 and throw the tongue 31 against the guardrail 36. The operating mechanism is in the same position in both Figs. 3 and 4. When the lever 5 is depressed, the hook 13 will actuate the pin 38, and thus shift the switch-bar 20, which carries the tongue with it. If the motorman wishes to continue on the main track 1 and 2, he will have to lower the springs 44 and 45 to make contact with the contacts 3 and 4. This will energize the magnets 16 and 17, and the armature 21 will engage the magnets and draw the hook 13 away from pin 38, so that this hook will not move the tongue 31. The switching to the branch road is accomplished automatically; but to go along the main track the motorman must press on his lever to keep from being side-tracked to the branch lines. If the tongue is in the position of the dotted line against the guardrail 36 and the motorman wants to go along the main track, he must move his lever and make contacts to throw the hook 13 against pin 37, so that when the wheel depresses the lever 5 the hook will engage pin 37 and throw the switch-tongue to the position shown in Fig. 6. It will be understood that in the last supposed case the levers 27 and 28 would be occupying different positions, and the pin 37 would be nearer to the catch of hook 13. If the switch-tongue was lying against the guardrail 36 and the motorman wished to go on the side track, he would not have to do anything with the switching mechanism. The lever 5 would be depressed; but no effect would be produced or no change would take place, because the pin 37 would be nearest the catch of hook 13, but would not be engaged by the hook, because the armature would not have drawn the hook toward the pin 37, and the hook would miss the pin 37. The pin 38 would be at its limit toward the lever 5, and the hook would merely go back against the pin 38 without moving this pin.

The necessity for two sets of springs 44 and 45 on each car is to prevent the moving of the switch-tongue by the rear wheels after the front wheels have passed over the lever and before the car passes over the switch-tongue. The illustrations show only one branch line. It is apparent that a branch line may be operated on either side of the main line. Many changes may be made without departing from my invention.

It will be noted that under some conditions the switching is done automatically and that the motorman can always control the switching without stopping the car. Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An electric switch for railways comprising a hook pivoted and having a vibratory and a longitudinal movement, a depressible lever operable by the wheels of a passing car, a switch-bar having a pivotal connection with the switch-tongue of the railway-track, and bell-crank levers provided with suitable fulcrums and pivotally connected to the ends of said switch-bar and carrying pins in the short arms thereof capable of being engaged by said hook.

2. An electric switch for railways comprising a pivoted hook having vibratory and longitudinal movement, a depressible lever operable by the wheels of a passing car, a switch-bar having pivotal connection with the switch-tongue of the railway-track, bell-crank levers provided with suitable fulcrums and pivotally connected to said switch-bar and carrying pins capable of being engaged by said hook, and electrical devices whereby a motorman on a passing car may control the movement of said hook.

3. An electric switch for railways comprising an actuating-bar parallel with the railway tracks, mechanical means for effecting longitudinal motion of said bar, a vibratory hook carried by said bar, a lever for placing the switch-tongue for the main line, a lever for placing the switch-tongue for a branch line, and a...
and electric controlling means to cause said hook to engage either one of said levers.

4. An electric switch for street-railways comprising a depressible lever, a hook capable of vibratory and longitudinal movement connected to said lever, levers operatively connected to the switch-tongue of the railway-track, electrical devices connected to said hook and provided with contacts adjacent to the railway-tracks, and contact-making devices carried by the car, said hook being adapted to engage either one of said levers.

5. An electric switch for railways comprising a depressible lever, a hook capable of vibratory and longitudinal movement connected to said lever, bell-crank levers capable of independent operation pivotally connected to the switch-tongue of the railway and carrying pins adapted to be engaged by said hook, electrical devices connected to said hook and provided with contacts adjacent to the railway-tracks, and means for electrifying said contacts and electrical devices.

6. An electric switch for railways comprising a lever for setting the railway-switch tongue for a branch line, a lever for setting said tongue for the main line, a hook capable of longitudinal movement and vibratory movement adapted to engage either one of said levers, electric controlling means for setting said hook to engage either one of said levers, a bar carrying said hook and capable of longitudinal motion, and a depressible lever operatively and yieldingly connected with said bar.

7. An electric switch for railways comprising levers operatively connected to the switch-tongue, a switch-tongue-operating hook adapted to engage either one of said levers, a movable armature connected to said hook, a magnet for operating said armature, contacts electrically connected to said magnet, and means carried by a car for supplying electricity to said contacts.

8. An electric switch for railways comprising switch-tongue-operating devices, electrical devices operatively connected to said switch-tongue-operating devices, contacts adjacent to the railway-tracks and connected to said electrical devices, rods mounted on the car and capable of longitudinal motion, levers for operating said rods, springs pivotally connected to said rods and adapted to engage said contacts, and means for supplying electricity to said springs.

In testimony whereof I set my hand, in the presence of two witnesses, this 11th day of January, 1905.

JAMES A. POSEY.

Witnesses:
A. L. JACKSON,
A. C. FRENCH.