

(No Model.)

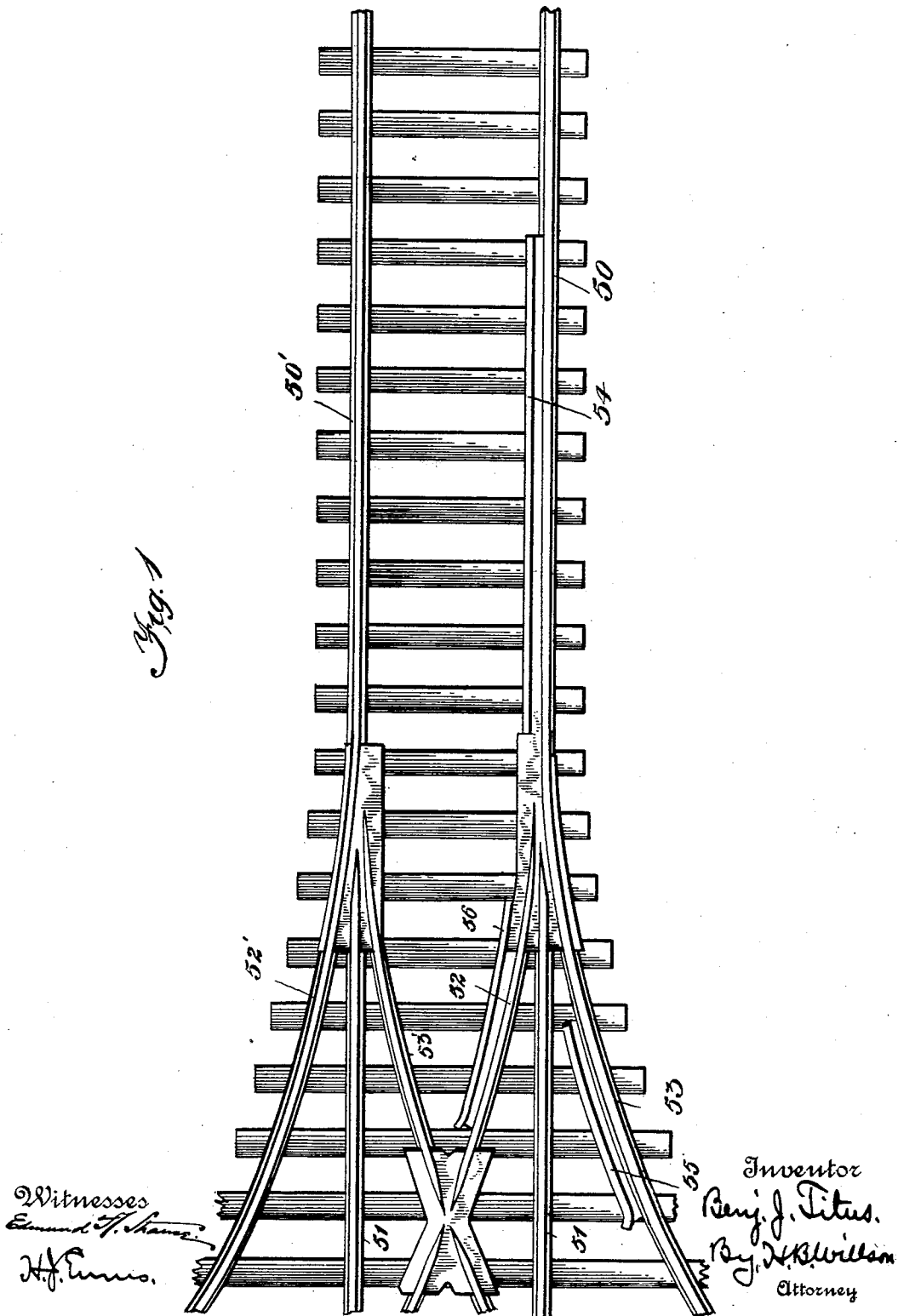
5 Sheets—Sheet 1.

B. J. TITUS.

AUTOMATIC SWITCHING DEVICE FOR STREET RAILWAY CARS.

No. 588,036.

Patented Aug. 10, 1897.



(No Model.)

5 Sheets—Sheet 2.

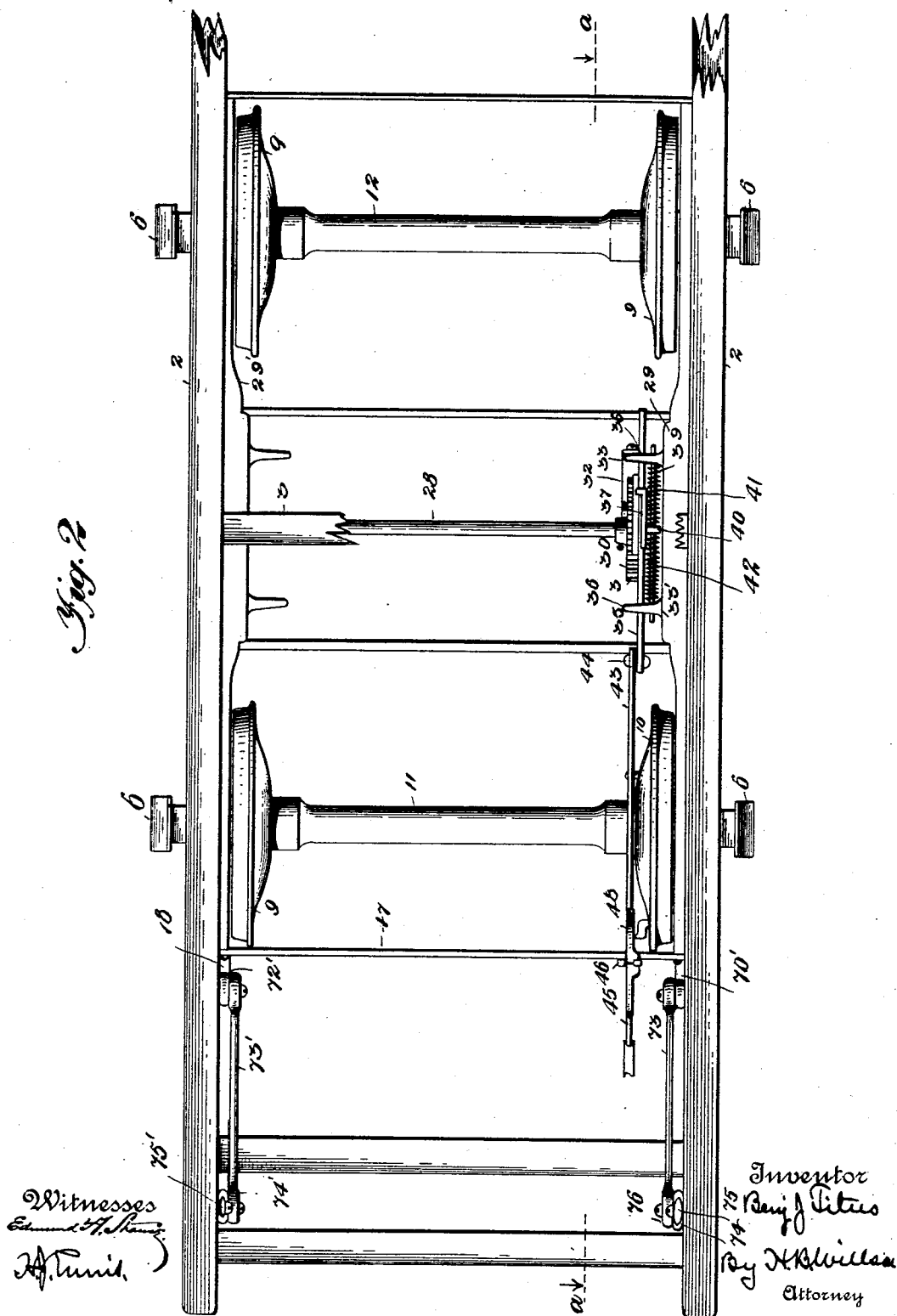
B. J. TITUS.

AUTOMATIC SWITCHING DEVICE FOR STREET RAILWAY CARS.

No. 588,036.

Patented Aug. 10, 1897.

Fig. 2



Witnesses
E. H. Smith
H. Titus

Inventor
B. J. Titus
By H. B. Williams
Attorney

(No Model.)

5 Sheets—Sheet 3.

B. J. TITUS.

AUTOMATIC SWITCHING DEVICE FOR STREET RAILWAY CARS.

No. 588,036.

Patented Aug. 10, 1897.

Fig. 3

Witnesses
Edmund H. Kautz
H. Titus

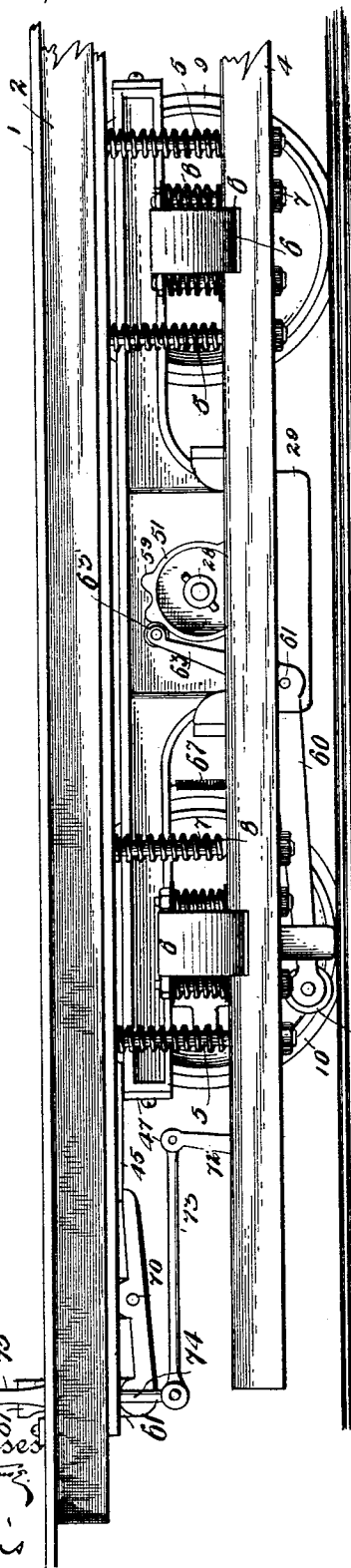
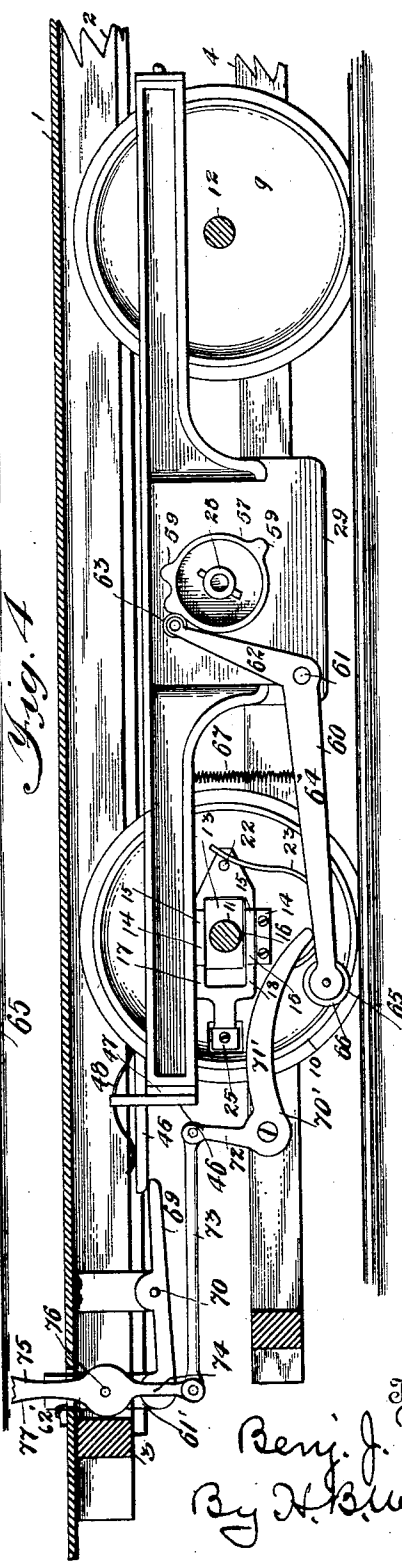


Fig. 4



Inventor
Benj. J. Titus.
By H. B. Wilson
Attorney

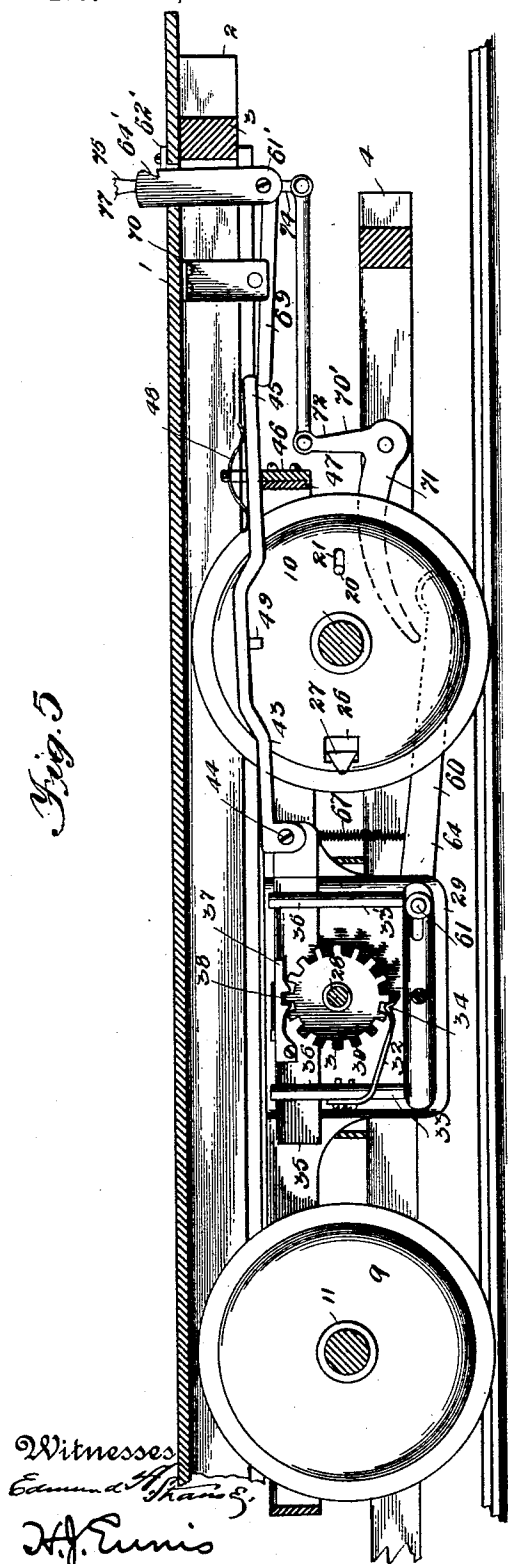
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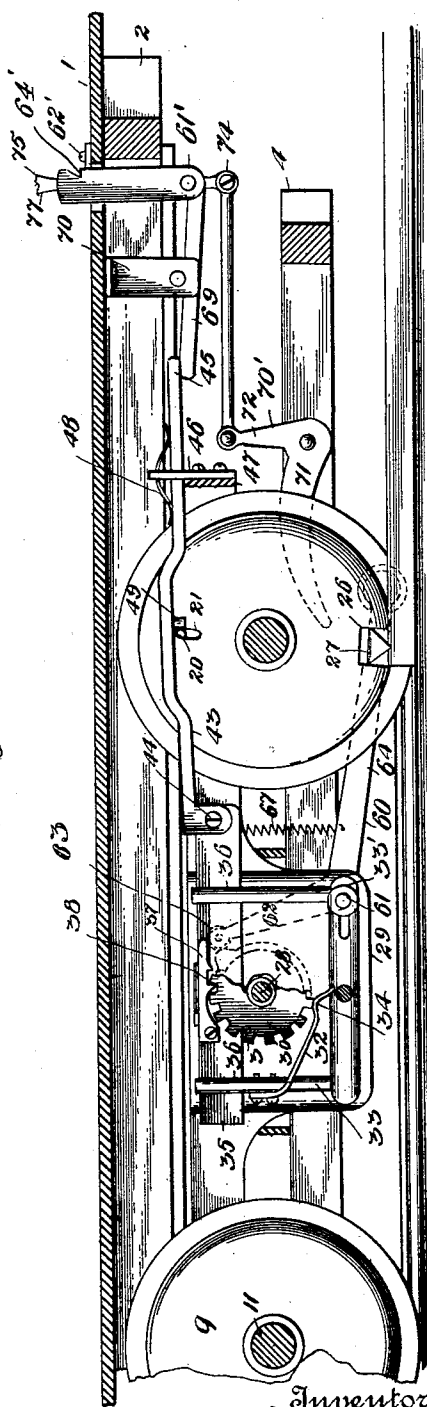
Patented Aug. 10, 1897.

Fig. 5



Witnesses
Edmund H. Thomas
J. A. Eunis

Fig. 6



Inventor
Benj. J. Titus.
By H. B. Wilson
Attorney

(No Model.)

5 Sheets—Sheet 5.

B. J. TITUS.

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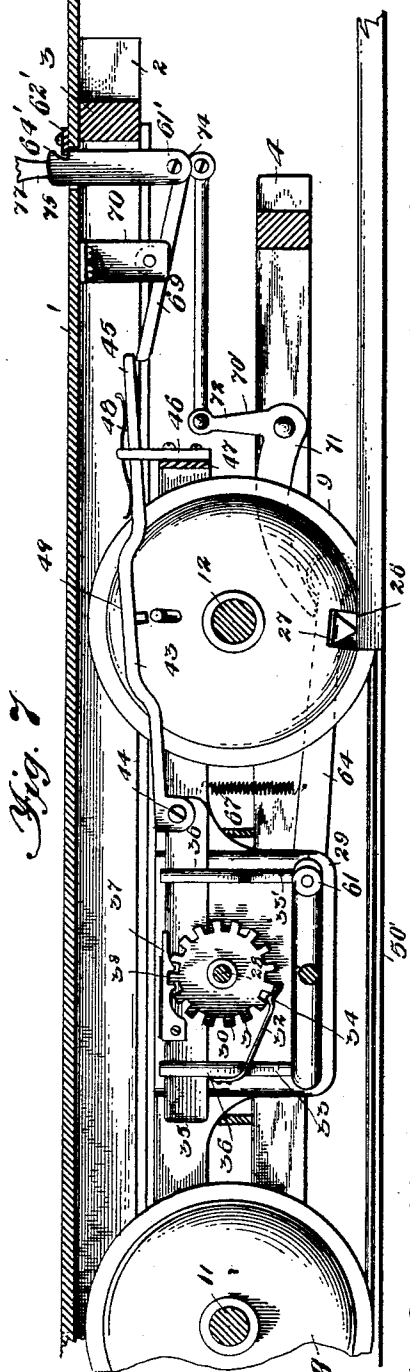
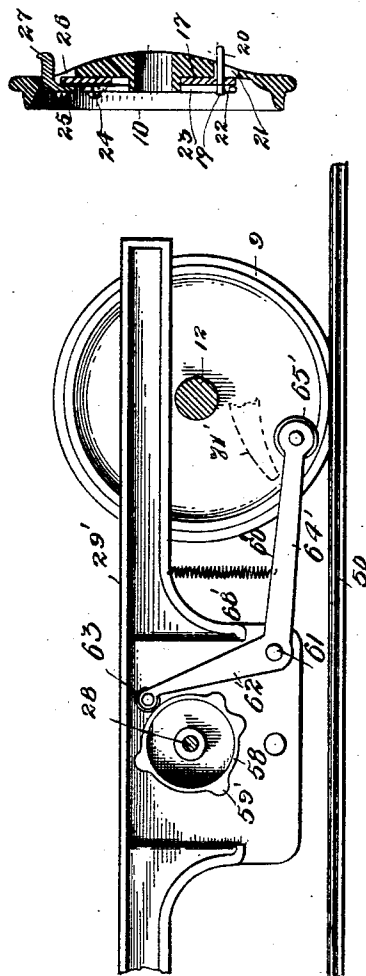
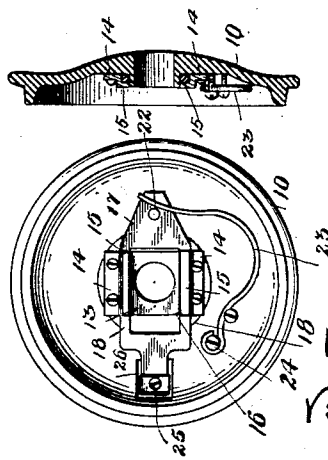


Fig. 2

Fig. 10

Fig. 11

Fig. 8 Fig. 9



Witnesses
Edmund H. Sherry.
H. F. Curtis

Inventor
Benj. J. Titus
By H. B. Willson
Attorney

UNITED STATES PATENT OFFICE.

BENJAMIN JAMES TITUS, OF DETROIT, MICHIGAN.

AUTOMATIC SWITCHING DEVICE FOR STREET-RAILWAY CARS.

SPECIFICATION forming part of Letters Patent No. 588,036, dated August 10, 1897.

Application filed November 19, 1896. Serial No. 612,761. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN JAMES TITUS, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Automatic Switching Devices for Street-Railway Cars; and I do declare the following to be a full, clear, and exact description of the invention, such as it will enable others skilled in the art to which it appertains to make and use the same.

My invention has relation to improvements in automatic switches for street-railway cars; and the object is to provide a simple and reliable device of this class.

To this end the novelty consists in the construction, combination, and arrangement of the same, as will be hereinafter more fully described, and particularly pointed out in the claims.

In the accompanying drawings the same reference-numerals indicate the same parts of the invention.

Figure 1 is a plan view of a section of the track and switch. Fig. 2 is a top plan view of the car-truck with the platform removed. Fig. 3 is a side elevation of the car and track. Fig. 4 is a longitudinal section on the line of one of the car-switch levers. Fig. 5 is a similar view on the dotted line *a a* of Fig. 2. Fig. 6 is a similar view on the same line, showing the parts in a different position. Fig. 7 is a similar view on the same line, showing the manner of throwing the switching devices out of operation. Fig. 8 is a side elevation of the car-wheel which automatically operates the switch-lever. Fig. 9 is a vertical transverse section of the same. Fig. 10 is a similar view taken at a right angle to the section shown in Fig. 9, and Fig. 11 is a detail section of the side opposite to that shown in Fig. 7.

1 represents the car-platform, 2 2 the side beams, and 3 3 the cross-beams, all of which are supported on the longitudinal truck-beams 4 4 by the usual springs 5 5.

6 6 represent the usual journal-boxes, secured to the beams 4 4 by stud-bolts 7 and springs 8 in the usual manner.

9 9 9 and 10 represent the car-wheels, fixed on the axles 11 12, journaled in the boxes 6 6. The wheels 9 9 9 are of the ordinary con-

struction, while the wheel 10 is formed with an integral rectangular hub 13 on its outside.

14 14 are guide-brackets secured on the outside of the wheel, their rabbeted parallel ends 15 lying parallel to the contiguous parallel sides 16 of the hub 13.

17 represents a plane frame, the central parallel arms 18 18 of which have a longitudinal sliding movement in guide-brackets 14 14. One end of this sliding frame 17 is provided with a fixed transverse stud 19, the end 20 of which extends through a radial slot 21 in the wheel, and the opposite end 22 is engaged by the free end of a C-shaped spring 23, secured to the outer face of the wheel 10 by a screw 24, the tendency of the said spring being to keep the stud 19 in toward the center of the wheel. The opposite end of this frame 17 is provided with a fixed arm 25, the V-shaped inner end 27 of which projects through a slot 26 in the wheel. This V-shaped end 27 of the arm 25 is located on the inner face of the wheel and a short distance inside of the periphery of the flange of the wheel.

28 is a transverse shaft mounted in the side pieces 29 29', and 30 is a wheel fixed on said shaft and revolving with it. This wheel is formed with a series of rectangular radial teeth 3, and 32 is a check-spring secured at one end to the bracket 33 on the side piece 29, its free end being formed with a V-shaped tooth 34, which is adapted to rest between any two contiguous teeth and prevent back motion of said wheel.

35 is a longitudinal slide-bar mounted in guide-slots 36 36 in brackets 33 33', and on one side of said bar is pivoted a gravity-pawl 37, the free end of which is provided with a notch 38, adapted to engage one of the teeth on the wheel 30 to move the wheel and shaft 28 a distance equivalent to one tooth.

39 is a guide-rod rigidly fixed in the brackets 33 33' a short distance from and parallel with the slide-bar 35, and 40 is an arm fixed on said bar, its projecting end encompassing said rod and sliding freely on it as the bar is reciprocated.

41 42 are spiral springs encompassing said rod, the spring 41 being located between the bracket 33 and one side of the arm 40, while the spring 42 is located on the opposite side of

the arm, between it and the bracket 33', and as the bar 35 and arm 40 are moved forward the spring 41 is compressed. When the bar is released, this spring restores the bar to its normal position, the spring 42 acting as a cushion to break the jar of the returning bar.

43 represents a longitudinal lever, its rear end being fulcrumed by a bolt 44 to the forward end of the bar 35, while the forward end 45 of said lever is supported in guide-brackets 46, fixed to a transverse brace 47 on the forward end of the truck.

48 is an elliptical spring centrally secured in the upper end of said bracket 46, its free ends serving to press the end of the lever 43 down in the guide-bracket and at the same time allow it to rise vertically as occasion requires.

49 is an integral detent on the lever 43 in line with the stud 19 on the wheel 10, but normally out of its path, so that as the wheel 10 revolves the stud 19 just clears this detent 49; but if the stud 19 be pushed outwardly from the center it then travels in the path of the detent 49, engaging it to force the lever 43 forward, which in turn draws the bar 35 and pawl 37 forward with it, which rotates the wheel 30 one tooth. After the stud 19 has released the detent 49 the spring 41 restores the bar and lever to their normal position.

50 51' are the rails of the main track, and 51 51' are the continuations of the same.

52 52' are the switch-rails extending to the right-hand side, the rail 52 being continuous with the main-track rail 50'.

53 53' are the switch-rails extending to the left-hand side, the rail 53 being formed continuous with the main-line rail 50.

54 is a longitudinal fixed bar extending above and parallel with the rail 50. 55 is a similar bar running parallel with the switch-rail 53, and 56 is a bar, similar to the bar 55, extending parallel with the rail 52.

Assuming that the car is on the rails 50 50', the wheel 10 being on the rail 50, as said wheel revolves the end 27 of the arm 25 on the frame 17 comes in contact with the rail-bar 54. This forces the arm 25 in toward the center, and consequently forces the stud 19 on the other end of said frame 17 out from the center and into the path of the detent 49 on the lever 43 to operate the slide-bar 35 and turn the wheel 30 one tooth, as hereinbefore described, and as this operation takes place at every revolution of the wheel 10 it follows that the number of times the wheel 30 and shaft 28 are operated depends on the length of the fixed rail-bar 54.

57 and 58 represent two disks fixed on the opposite ends, respectively, of the shaft 28, and the peripheries of these disks are provided with a series of arbitrarily-arranged lugs 59.

60 is a bell-crank lever fulcrumed on a bolt 61 in the side piece 29, its shorter vertical arm 62 being provided with a friction-roller 63, which rests against the periphery of the disk 57, while its longer horizontal arm 64 ex-

tends forwardly alongside of the car-wheel on the said side of the truck.

65 represents a friction guide-wheel journaled in the outer end of said arm, its beveled edge 66 extending on the outside of the rail 50' and normally a short distance above it, which is its position when the arm 62 rests against the periphery of the disk 57 between the lugs 59. If, however, the disk 57 is turned so that one of its lugs rests in line with the end of the arm 62, the lug forces the arm outward, thereby throwing the horizontal arm 64 downward, so that the beveled face 66 comes in contact with the outside of the rail 50', causing that car-wheel to follow the course of the rail 52', thereby switching the car around onto the right-hand switch-rails 52' and 52, after which the end 27 of the arm 25 comes in contact with the rail-bar 56, which, as before described, rotates the shaft 28 and moves the lug 59 out of contact with the arm 62. A spiral spring 67 restores the lever 60 to its normal position and raises the guide-wheel 65 above the surface of the rail. A similar bell-crank lever 60' is mounted on the opposite side of the truck, its shorter arm 62' being in operative contact with the periphery of the disk 58, which is also provided with a series of arbitrarily-arranged lugs 59'.

The longer arm 64' of this lever 60' extends horizontally alongside of the car-wheel 10, and its forward end is provided with a beveled friction guide-wheel 65', so that when it is lowered by the action of the disk 58 it engages the outside of the rails 50 53 and conducts the car onto the left-hand switch-rails 53 53'.

If neither of the guide-wheels 65 or 65' is down to engage its respective rails, then the car continues its straight course from the rails 50 50' onto the rails 51 51. A spiral spring 68 serves to restore the bell-crank lever 60' to its normal position after it has been released by the lugs 59' on the disk 58.

69 represents a horizontal lever fulcrumed in a bracket 70, secured underneath the car-platform, its rear end resting under the forward end of the lever 43 and said forward end pivoted to a bar 61, extending vertically upward through a slot in the guide-plate 62, secured to the car-platform. In its normal position this bar 61 projects a short distance above the car-platform and within convenient reach of the motorman's foot, in which position the lever 43 is free to be operated by the wheel mechanism heretofore described. When it is desirable to throw this automatic mechanism out of gear, the motorman presses down on the vertical bar 61' and pushes it forward to engage its notch 64' in the guide-plate 62', which retains it in this position. This movement throws the rear end of the lever 69 upward and raises the forward end of the lever 43, which lifts its detent 49 out of the path of the stud 19 on the wheel 10, and consequently the shaft 28, disks 57 and 58, and their respective

bell-crank levers, carrying the guide-wheels 65 65', retain their normal position, and the car is neither guided to the right nor the left, but continues its journey onto the straight tracks 51 51.

70' represents a bell-crank lever fulcrumed on the truck-frame, its longer horizontally-curved arm 71 resting on top of the forward end of the arm 64 of the bell-crank lever 60, while its shorter vertical arm 72 is pivoted by a connecting-rod 73 to the short arm 74 of a vertical lever 75, fulcrumed on a bolt 76, secured to one side of the truck. The handle 77 of this lever 75 extends upward through the car-platform, on one side thereof, and within convenient reach of the motorman. A similar bell-crank lever 70', having a curved arm 71', is in contact with the forward end of the arm 64' of the guide-lever 60' on the opposite side of the truck, the shorter vertical arm 72' of which is connected by a rod 73' to the lower arm 74' of the hand-lever 75', and it will readily be seen that either one of these hand-levers 75 75' may be operated to depress their respective track guide-wheels 65 or 65' to engage the rails, as hereinbefore described, and switch the car to the right or left, as desired, independently of the automatic means for controlling said track guide-wheels 65 65', as above set forth.

From the above description it will be seen that a car equipped as set forth and traveling over a track such as described and provided with the fixed track-bars, such as 54, 55, and 56, would travel over an entire predetermined route, switching to the right or left, as occasion required, without any attention whatever from the motorman or requiring an attending switchman. Should it be necessary in an emergency to change the route of the car, the motorman by controlling the hand-levers 75 75', as set forth, can direct its course over the rails to the right or left at will.

Although I have specifically described the construction and relative arrangement of the several elements of my invention, I do not desire to be confined to the same, as such changes or modifications may be made as clearly fall within the scope of my invention without departing from the spirit thereof.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

1. In a car-truck the transverse shaft 28, a toothed wheel 30 fixed therein, a slide-bar 35 provided with a pawl 37 adapted to engage said teeth on the wheel 30, a lever 43 pivoted to said bar 35, and provided with an integral detent 49, the car-wheel 10 formed with the slots 21 26, the sliding frame 17 secured to said wheel and provided with the stud 19 and arm 25 27, the disk 57 provided with the lugs 59 fixed on the end of the shaft 28, and the bell-crank lever 60, its shorter vertical arm 62 in operative contact with the periphery of said disk 57, and its longer horizontal arm 64 provided with a guide-wheel 65 extending forward of the axle of the car-wheel 10 and parallel with the track, in combination with the rails 50 50' and 52 52', and the fixed longitudinal track-bar 54, substantially as and for the purpose set forth.

2. In a car-truck the bell-crank lever 60 having its horizontal arm 64 provided with a guide-wheel 65, the bell-crank lever 70 in operative contact with the said arm 64, the rod 73, and the vertical hand-lever 75, in combination with a car-track substantially as shown and described.

3. In a car-truck the car-wheels 9 and 10, the latter of which is provided with a sliding frame 17 formed with a stud 19 adapted to be automatically operated by a track-bar 54, in combination with the lever 43 having detent 49 located in the path of the stud 19 on the wheel 10, the slide-bar 35, pivoted to said lever 43 and provided with a pawl 37, a toothed wheel 30 fixed on a shaft 28 and in the path of said pawl 37, the disks 57 and 58 fixed on said shaft 28, the bell-crank levers 60 60', the shorter arms of which are in operative contact with said disks and their longer arms extending parallel with the rails, and provided with guide-wheels 65 65', the lever 69 having its free end in operative contact with the free end of the lever 43 and its opposite end pivoted to a vertical bar 61, the upper end of which projects above the car-platform, substantially as and for the purpose set forth.

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

BENJAMIN JAMES TITUS.

Witnesses:

EDWARD WILDMAR,
WEBSTER G. CAMPBELL.