

No. 670,339.

Patented Mar. 19, 1901.

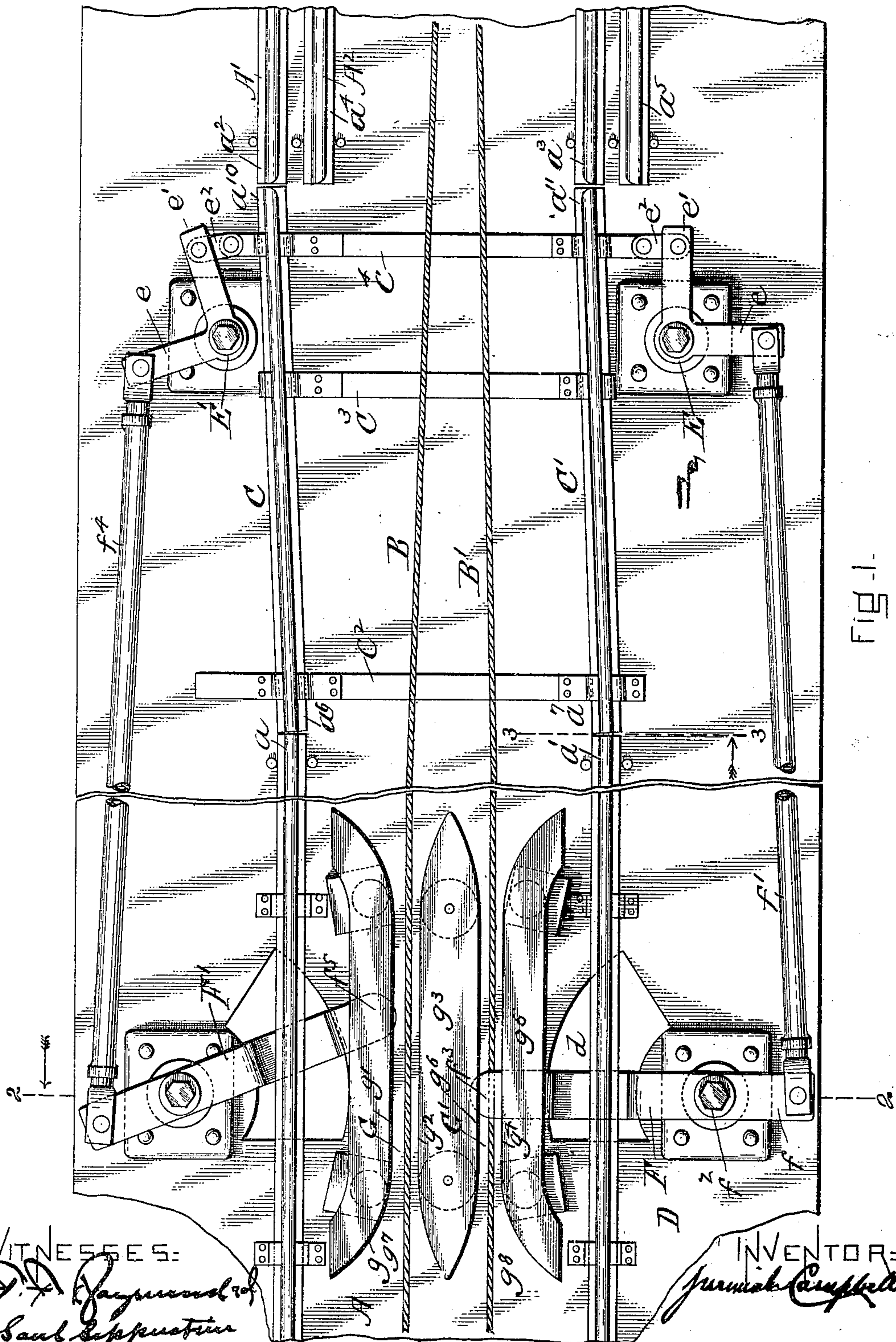
J. CAMPBELL.

AUTOMATIC SWITCH DEVICE.

(Application filed Jan. 26, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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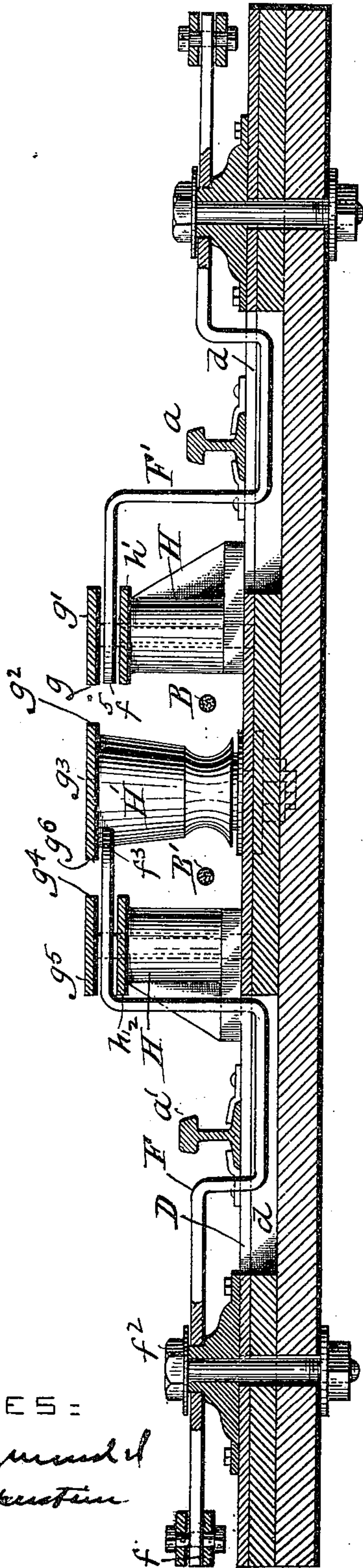


FIG. 2.

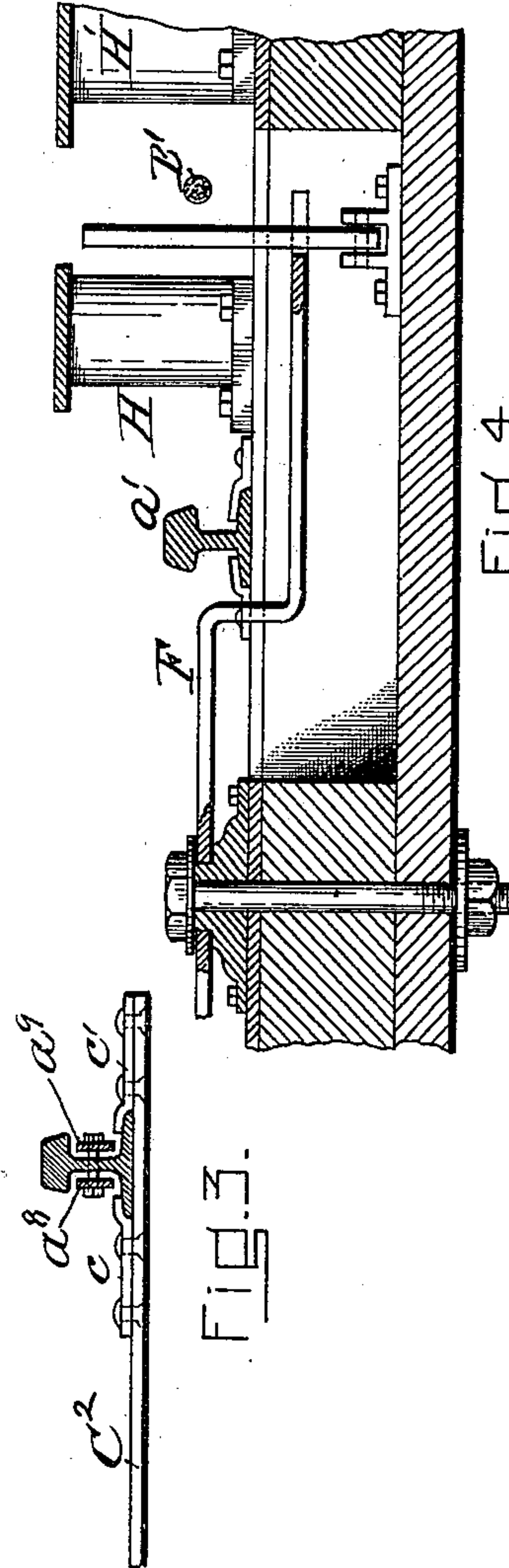


FIG. 3.

FIG. 4.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

JEREMIAH CAMPBELL, OF NEWTON, MASSACHUSETTS.

## AUTOMATIC SWITCH DEVICE.

SPECIFICATION forming part of Letters Patent No. 670,339, dated March 19, 1901.

Application filed January 26, 1901. Serial No. 44,836. (No model.)

*To all whom it may concern:*

Be it known that I, JEREMIAH CAMPBELL, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented a new and useful Improvement in Automatic Switch Devices, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to means whereby cars actuated or propelled upon a common track and intended for different destinations automatically operate a switch by which the common track upon which they are is connected with the branch upon which they should run.

I have represented the invention as applied to the double-cable railway described in my Letters Patent of the United States No. 542,077, dated July 2, 1895. The invention of this patent is illustrated as applied to a means for receiving and transporting coal or other material in tram-cars which are drawn by cables first over a track common to both cables and then over branch tracks which are common to one and over which the tram-cars which are operated by that cable only pass, and I have herein illustrated as a means for moving the cars two cables, both of which are common for any desired distance to a single track and are then individual to a branch track, each cable acting, as in the construction of my said patent, to draw the cars attached to it over the single or main track and to then draw them over its own branch track. I have also represented my present invention as adapted to use the kind of tram-car described in the said patent and as adapted for the same purpose; but I do not wish to be understood as limiting the invention to the use of cables as a car-actuating means or to the use of tram-cars alone or to any special purpose.

I will now describe the invention in detail in conjunction with the drawings, wherein—

Figure 1 is a view in plan of a double-cable railway provided with my invention. Fig. 2 is a view in vertical section, enlarged, upon the dotted line 2 2 of Fig. 1. Fig. 3 is a view in vertical section and elevation upon the dot-

ted line 3 3 of Fig. 1. Fig. 4 is a view in vertical section of a modified form of lever connection, to which reference is hereinafter made.

Referring to the drawings, A represents the main-track section, A' one branch track from same, and A<sup>2</sup> another branch track. In fact, in the construction shown the main line runs into the two lines, which I have called "branches."

B is the cable common to the main track and the branch A', and B' is the cable common to the main track and the branch A<sup>2</sup>. The cables run parallel with each other between the rails of the main track and are separated from each other by any desired means. The grips of the tram-cars are arranged so that the cars which are to take the branch track A' have their grips located to engage the cable B, while the cars which take the branch track A<sup>2</sup> have their grips arranged to engage the cable B'. These parts are common to my patented construction. I will now describe my improvement, which I have combined with them.

C C' are the switching-rails, which connect the rails  $a a'$ , respectively, to the main track, either with the rails  $a^2 a^3$  or the rails  $a^4 a^5$  of the two branch tracks. The ends  $a^6 a^7$  of these switching-rails are loosely connected to the ends of the rails  $a a'$  of the main track, preferably by fish-plates  $a^8 a^9$ , loosely attached by bolts to the webs of each pair of abutting rails—viz.,  $a a^6$  on one side of the track and the rails  $a' a^7$  on the other side of the track. The switch-rails are movable bodily from these rails backward or forward to make connections with either of the branch tracks A' A<sup>2</sup> in the usual way and so that their ends  $a^{10} a^{11}$  are either in line with the rails  $a^2 a^3$  of branch track A' or with the rails  $a^4 a^5$  of the branch track A<sup>2</sup>.

The switch-rails, their supports, their operating means, and the devices connected therewith to operate them, adapted to be actuated by the cars, are all mounted upon a single iron or steel supporting-plate D, which is suitably mounted upon any desired structure and which forms a rigid level base for the support of the rails and their actuating devices and also serves to accurately tie or connect all the parts and to hold them to-



5 together. Upon this plate D are metal cross-  
 bars  $C^2 C^3$ , which are fixed to the supporting-  
 plate D and upon the surface of which the  
 rails are movable. The switch-rails are also  
 10 attached to the movable cross-bar  $C^4$ , arranged  
 over said plate D, and to which the rails are  
 secured by means of metal holders or clips  
 $cc'$ , arranged to lap upon the base of the rail  
 and bolted to the movable cross-bar  $C^4$ . (See  
 15 Fig. 3.) This movable cross-bar is connected  
 at each of its outer ends, respectively, with  
 the rock-levers E and E', each of which has  
 the arms  $e$  and  $e'$ , and is pivoted to the metal  
 base-plate D. The arms  $e'$  of the rock-levers  
 20 are connected to the ends of the cross-bar  $C^4$   
 by the links  $e^2$ . The arm  $e$  of the rock-lever  
 E is connected with the end  $f$  of the switch-  
 ing-lever F by means of a connecting-rod  $f'$ ,  
 pivoted to the arm  $e$  of the rock-lever E and  
 25 to the end  $f$  of the lever F. The lever F is  
 pivoted or fulcrumed at  $f^2$  upon the base-  
 plate D, and it extends beneath the rail  $a'$  of  
 the main track A and is of a length to permit  
 its end  $f^3$ , when the lever bears a right-angu-  
 30 lar relation to the track, to cross the line of  
 the cable B and to be in line with the cable-  
 grip of the cars which are drawn by the said  
 cable, and in the structure represented in Fig.  
 1 I have shown the lever so shaped that its  
 35 said end is above the line of the cable, the  
 foundation-plate D having a long slot  $d$  in it,  
 through which the lever extends in passing  
 underneath the rail. The lever is represented  
 as bent downward and upward upon the in-  
 40 ner and outer sides of the rail; but I would  
 here say that I do not confine myself to any  
 special type or form of lever connection with  
 the actuating and connecting rod  $f'$ . The  
 arm  $e$  of the rock-lever E' is connected by a  
 45 connecting-rod  $f^4$ , which is like the connect-  
 ing-rod  $f'$ , with the lever F', which is pivoted  
 to the plate D and which is like the lever F and  
 which has its end  $f^5$ , when in operative posi-  
 50 tion, over the cable B and in a position to be ac-  
 tuated by the contact of the grips of the cable-  
 cars which are drawn by the cable B with it.  
 In order to govern the position or line of  
 movement of the cables B B' and of the grips  
 at the time of their engagement or contact  
 55 with the said levers F F', I have arranged be-  
 tween the rails  $a a'$  of the main track A cable  
 and grip guides, one pair of which operate  
 to guide the grips of the cars drawn by the  
 cable B and the other the grips of the cars  
 60 which are attached to the cable B'. The  
 guideways I have lettered G G', respectively.  
 The guideway G is formed by the edge  $g$  of  
 the metal plate  $g'$  and the edge  $g^2$  of the metal  
 plate  $g^3$ , and the guideway G' is formed by  
 65 the edge  $g^4$  of the metal plate  $g^5$  and the edge  
 $g^6$  of the metal plate  $g^3$ . These guiding edges  
 of both guideways are curved outward to pro-  
 vide flaring or enlarged entrances  $g^7$  and  $g^8$   
 to the guideways G and G', and their rear  
 ends are represented as similarly flared out-  
 ward. The edges within these ends are

straight and parallel with each other and form  
 relatively long narrow sections of the guide-  
 way. The ends  $f^3 f^5$  of the levers F F' ex-  
 70 tend across or span these guideways, but not  
 at the same time, as the switch-rails are always  
 in operative relation with one or the other of  
 the branch tracks; but if not in operative re-  
 lation with the branch over which the tram-  
 75 car should run then the lever which is oper-  
 ated by its grip is the one which extends  
 across the guideway, through which the grip  
 passes, and upon contact of the grip of said  
 tram-car with the end of the lever the lever  
 80 is moved from a position which causes its  
 end to span the guideway to a position which  
 is inclined in respect to it, and which moves  
 its end from the guideway, (see Fig. 1,) and  
 this causes the switch-rails to be automatic-  
 85 ally moved to connect the main track with the  
 branch upon which the tram-car is to run.  
 This movement of the switch-rails at the  
 same time moves the other lever from an in-  
 operative position with respect to the other  
 90 guideway to an operative position with regard  
 to it, and so that it may be moved by the  
 grip of the tram-car which passes through its  
 guideway, so that when it is necessary the  
 switch-rails may be moved to make connection  
 95 with the other branch. Of course if the switch-  
 rails are in proper position for shifting a  
 tram-car the operating-lever for that car does  
 not then span the guideway, but is removed  
 from it, so that a contact with the grip does  
 not then ensue. 100

There may be arranged below the guide-  
 plates  $g' g^5$  the plates  $h$  and  $h'$ , which may be  
 of the same shape and between which the  
 parts of the levers F F' may extend, and the  
 105 edges of these plates may also serve as guid-  
 ing edges for the grips, and when they do so  
 serve they preferably have the shape of the  
 edges of the guiding-plates  $g' g^5$ . Their main  
 purpose, however, is to support the ends of  
 the levers and prevent their being turned 110  
 down upon contact of the grips with them.  
 These guiding and supporting plates are rep-  
 resented as mounted upon metal pedestals or  
 supports which are rigidly bolted to the base-  
 plate D, the plates  $g'$  and  $h'$  being supported 115  
 by and bolted to the pedestal H, the plate  $g^3$   
 being supported by and bolted to the central  
 pedestal H', and the plates  $g^5$  and  $h$  being  
 supported by and bolted to the pedestal H<sup>2</sup>.  
 The plate  $g^3$ , it will be seen, is centrally dis- 120  
 posed between the plates  $g'$  and  $g^5$ , and one  
 edge forms the side of the guideway G and its  
 other edge a side of the guideway G'.

In Fig. 4 I have represented a modified  
 form of the lever connection between the 125  
 guideways and the connecting-rods, the lev-  
 erage being there represented as obtained by  
 means of vertical levers pivoted at their lower  
 ends below the base-plate and connected with  
 the ends of straight levers, which in the main 130  
 correspond to the levers F F'. It will be un-  
 derstood that the upper ends of these verti-



cal levers are adapted to be moved to operate the switch by the same means which operate the levers F F'.

While I have described the levers as operated by the grips, I would not be understood as limiting the invention to this means for operating them, as they may be operated by any other part of the cars or projections from them.

I prefer that the connecting-rods be made of gas or water pipe.

The operation of the invention has been described in connection with the description of its construction, and it is only necessary to briefly say that each car which passes along the main track has means which are guided to a switch-controlling lever and with which in passing it is brought into contact to move the switch, if it shall be necessary so to do, for the purpose of making the connection between the main track and the branch upon which it is to pass, and that this movement of a switch brings into position means by which the switch may be returned by the car which carries the devices which are adapted to engage said means, the movement of the devices for turning the switch in one direction bringing into position the devices for moving it in a reverse direction.

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

1. In a railway of the character specified, having a main track over which cars for different destinations pass, and branches for said cars, a switch connecting said main track with the branches, comprising two rails, the ends abutting the rails of the main track bearing constant relation therewith, forming the pivots upon which they are moved, and their outer ends making connection either with the rails of the branch A' or the rails of the branch A<sup>2</sup>, a movable cross-bar connected with said switch-rails, rock-levers with which the ends of the cross-bar are connected, connecting-bars connecting the rock-levers with operating-levers, the said operating-levers being against the main-track section and each having a section which alternately bears an operative relation to a portion of cars passing over said main track whereby the contact of certain cars with one of the levers will cause the switch to be turned in one direc-

tion and the contact of other cars with the other lever will cause the switch to be turned in an opposite direction.

2. The combination of a main-track section, branch sections and intermediate switching connection to connect the main-track section with one or the other of the branches, duplicate means for moving the cars common to the main section but individual to a branch whereby cars which are common to one branch only are also adapted to be moved over a main track common to both branches, guiding devices in said main track for guiding the connections between said cars and their respective actuating devices, levers extending into or across said guideways connected with the switching-section of the track, the movement of one of which to operate the switch leaves it in operative position and causes the other to be moved from an inoperative to an operative position and which are operated only by cars which require that the switch be shifted that they may continue their connection with their individual actuating device.

3. The combination of a single base-plate of iron or steel, a section of a main track laid upon it, a switching track-section adapted to connect the main section with one or two branching sections, also laid upon said plate, two car-drawing cables passing over said plate, one for each branch track, and adapted to draw the cars for that branch, switch-operating devices mounted upon said plate, guiding devices also mounted upon said plate for guiding the grips connecting the cars with said cables and for guiding the cables, and two switch-operating levers both forming a part of the switching device, each of which is individual to a single guideway and is movable to and from the same by the cars of one or the other branch line, according as may be necessary, the cars operating one of the switch-levers to throw the switch in one direction, acting to move one lever out of operative position and the other lever into operative position to be operated by the cars of the other branch.

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Witnesses:

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J. M. DOLAN.