

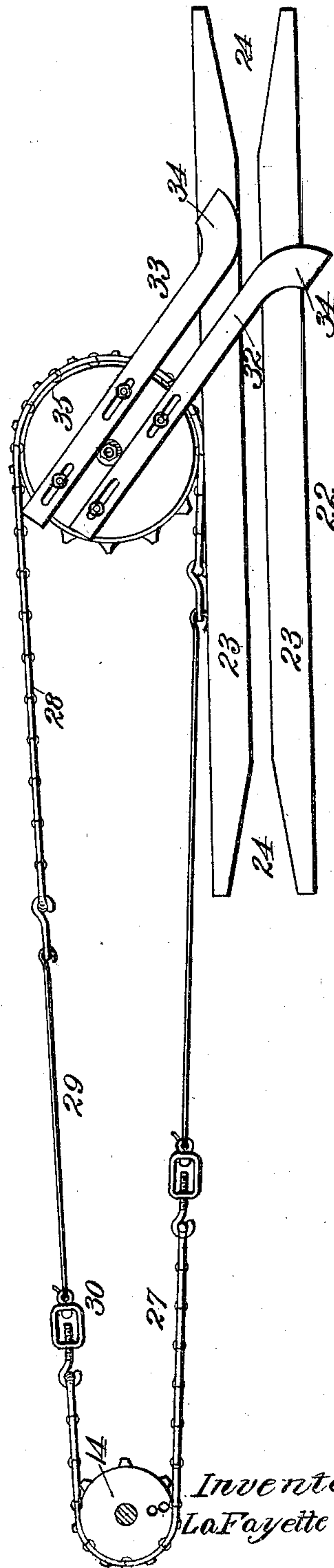
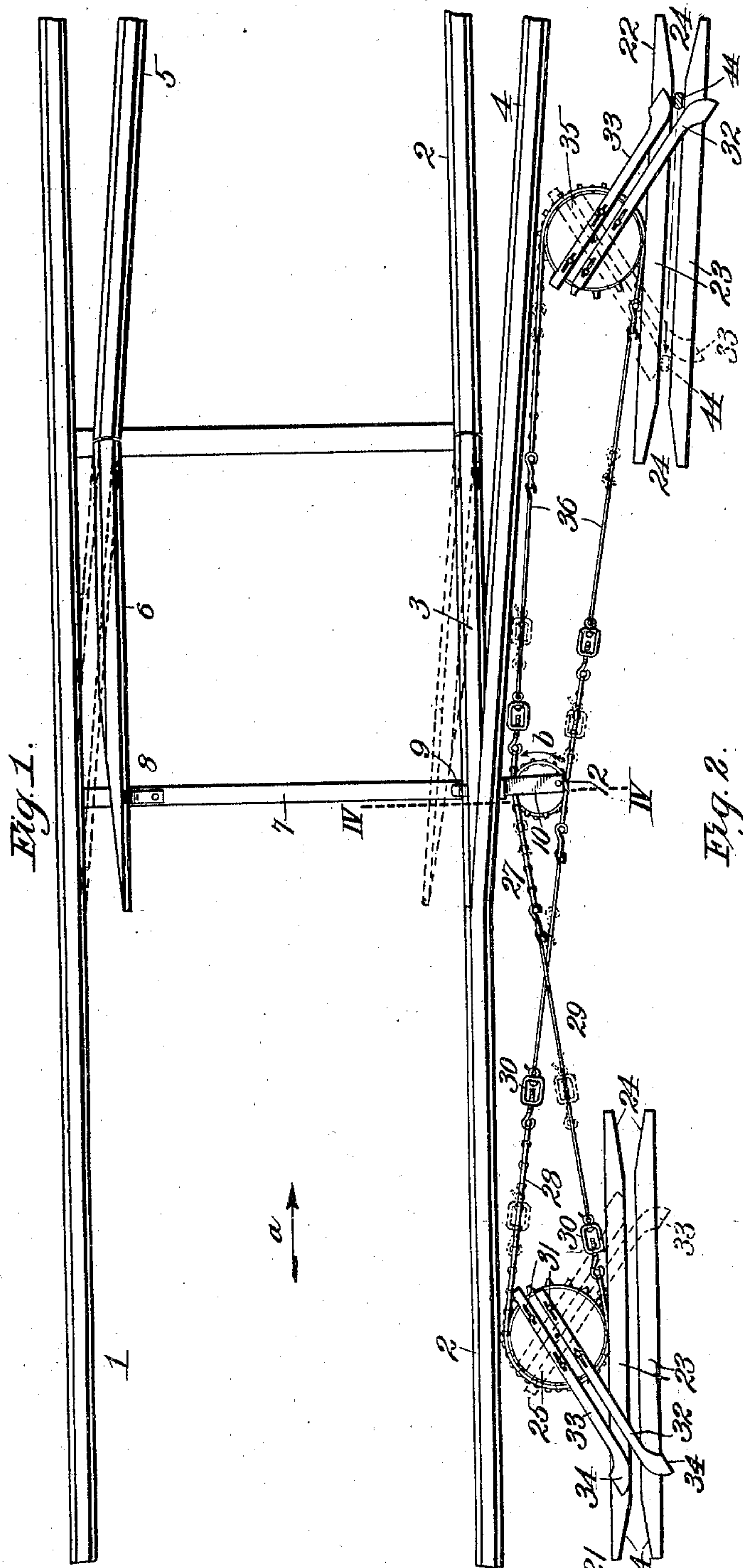
LA FAYETTE PIERCE.

AUTOMATIC RAILWAY SWITCH OPERATING MECHANISM.

(Application filed Jan. 3, 1902.)

3 Sheets—Sheet 1.

(No Model.)



Witnesses:

Arthur M. Arthur
H. C. Rodgers,

By Fischer & Thorpe attys:

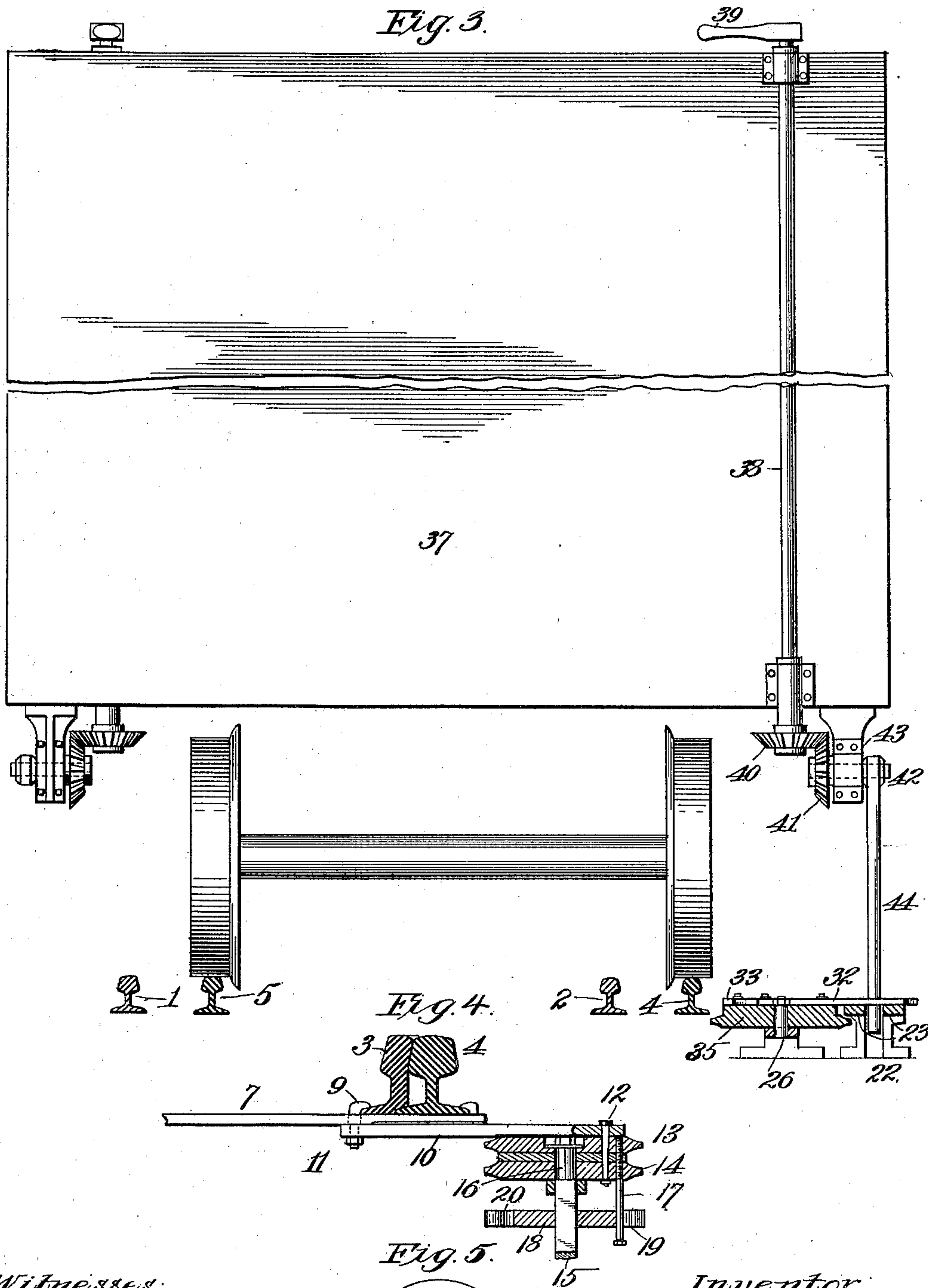
Inventor:
LaFayette Pierre

LA FAYETTE PIERCE.
AUTOMATIC RAILWAY SWITCH OPERATING MECHANISM.

(Application filed Jan. 8, 1902.)

(No Model.)

3 Sheets—Sheet 2.

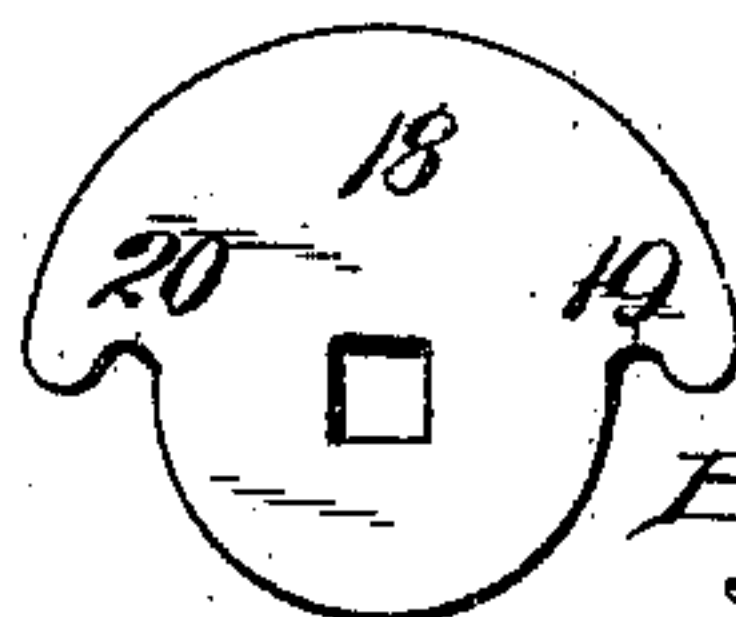


Witnesses:

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No. 709, III.

Patented Sept. 16, 1902.

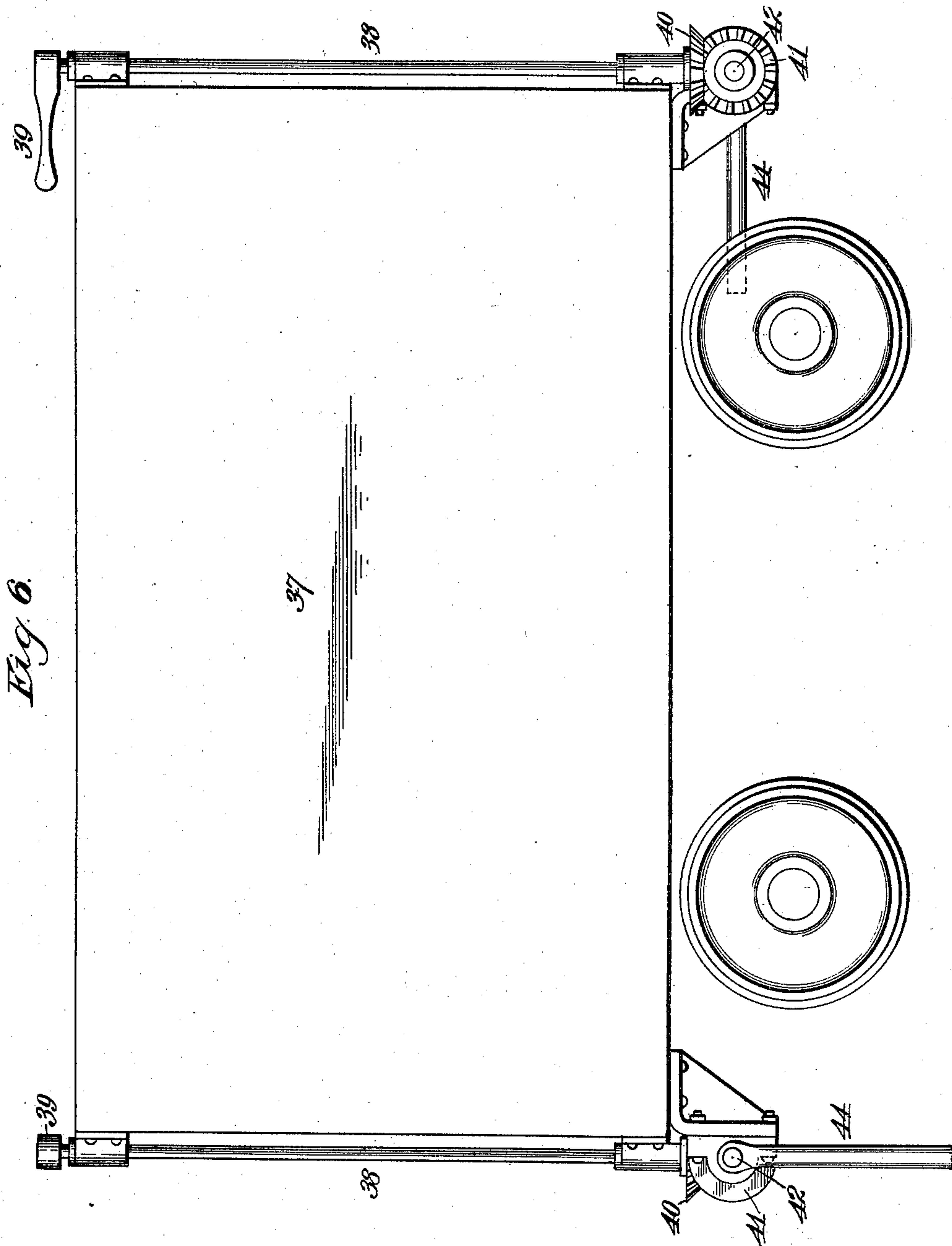
LA FAYETTE PIERCE.

AUTOMATIC RAILWAY SWITCH OPERATING MECHANISM.

(Application filed Jan. 3, 1902.)

(No Model.)

3 Sheets—Sheet 3.



Witnesses:

Arthur M. Arthur
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UNITED STATES PATENT OFFICE.

LA FAYETTE PIERCE, OF MOUNDSVILLE, MISSOURI.

AUTOMATIC RAILWAY-SWITCH-OPERATING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 709,111, dated September 16, 1902.

Application filed January 3, 1902. Serial No. 88,264. (No model.)

To all whom it may concern:

Be it known that I, LA FAYETTE PIERCE, a citizen of the United States, residing at Moundsville, in the county of Vernon and State of Missouri, have invented certain new and useful Improvements in Automatic Railway-Switch-Operating Mechanisms, of which the following is a specification.

My invention relates to automatic railway-switch-operating mechanisms, and more especially to that class whereby an instrumentality attached to a moving car shall open or close the switch, according to the direction of travel.

My object is to produce a mechanism of this character which throws the switch efficiently and reliably and locks it in its closed or open position against accidental movement.

A further object is to produce a mechanism of this character which is simple, strong, durable, and inexpensive of construction and which can be applied easily, quickly, and at small expense to any of the ordinary railway-switches now in use.

With these objects in view the invention consists in certain novel and peculiar features of construction and combinations of parts, as hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 is a plan view of a railway-switch as equipped with operating mechanism embodying my invention. Fig. 2 is an enlarged view of a part of the same. Fig. 3 is an end view of a car as equipped with instrumentalities for operating the switch, said figure also showing part of said mechanism in vertical section. Fig. 4 is an enlarged vertical section taken on the line IV IV of Fig. 1. Fig. 5 is a plan view of the plate for limiting the movement of the switch-operating mechanism. Fig. 6 is a side view of the car shown in Fig. 3.

Referring to the drawings in detail, where like reference-numerals designate corresponding parts in all the figures, 1 2 designate the rails of the main track, the rail 2 embracing a movable portion or switch-rail 3 of the usual type, the point of said rail being limited as to movement in one direction by contact with the outer side-track rail 4. The inner side-track rail is composed of the stationary

portion 5, parallel with portion 4, and the switch-rail 6, parallel with rail 3 and adapted at times to bear against the inner side of rail 1. Rails 3 and 6 are connected rigidly together by the cross-bar 7, underlying said rails and rails 1 and 4 and provided with a foot-plate 8, embracing tightly the inner flange of switch-rail 6, and with a clamping-bolt 9, embracing the flange of switch-rail 3, and pivotally secured upon bolt 9, at the inner side of cross-bar 7, is a link 10, said relation of parts being secured by the retaining-nut 11 engaging bolt 9 below link 10. The outer end of the link is pivotally connected by pin 12 with a double sprocket-wheel, the same comprising the upper section 13 and lower section 14, journaled and secured upon the cylindrical upper end 16 of the rigid shaft 15. Depending rigidly from said double sprocket-wheel is a pin 17, adapted to limit the movement of the sprocket-wheel in either direction to a little more than a half-revolution by contact with shoulder 19 or 20 of stop-plate 18, preferably mounted upon said standard, as shown. The object in having this movement slightly exceed a half-revolution is to throw the pivot-pin 12 slightly beyond the plane of alinement occupied by bolt 9 and the axis of said wheel, as will be understood by reference to Fig. 1. In said figure it will be noticed that link 10 is slightly out of alinement with cross-bar 7 with the switch closed, so that the tendency of the switch to spring open and permit trains passing in the direction indicated by the arrow *a*, Fig. 1, from the main line to the side track shall be prevented, because such tendency is to rotate the double sprocket-wheel in the direction indicated by the arrow *b*, which movement cannot continue, because the pin 17 is arrested by the shoulder 19 of the stop-plate. On the other hand, when the switch is opened—that is, occupies the position shown in dotted lines—in order that a train may pass from the main to the side track, or vice versa, it is obvious that the switch cannot be closed, because the tendency is to rotate the double sprocket-wheel in the direction opposite to that indicated by the arrow *b* and against the immovable shoulder 20 of the stop-plate, which shoulder being beyond the plane of alinement of pivot-bolt 9 and

the axis of the sprocket-wheel, like shoulder 19, provides a positive lock against accidental movement of the switch, as will be readily understood.

5 At the outer side of rails 2 and 4 and at opposite ends of the switch are located, respectively, slotted ways 21 and 22, which being of identical construction will be covered by a single description, as follows: The way is
10 composed of two parallel bars 23, having their inner edges diverging at their ends, as at 24, so as to provide flaring mouths for the way. Between way 21 and rail 2 is a sprocket-wheel 25, journaled on a suitable standard 26
15 and connected by a crossed flexible connection with sprocket-wheel member 13, said crossed connection comprising a sprocket-chain section 27 engaging sprocket-wheel member 13, a sprocket-chain section 28 en-
20 gaging sprocket-wheel 25, and flexible rods or wires 29 connecting the ends of one sprocket-chain section with the ends of the other, a turnbuckle 30 being mounted on each con-
25 nection, so as to take up slack and keep the connection between the sprockets taut.

Secured rigidly yet adjustably, as by the pin-and-slot connection 31, to the sprocket-wheel 25 are a pair of parallel levers 32 33, having their outer ends bent outwardly, as at
30 34, so as to provide a flaring mouth between them for a purpose which hereinafter appears. These levers occupy about the same horizontal plane as the upper surface of way 21 and in operation are swung from the posi-
35 tion shown in full to the position shown in dotted lines, a distance slightly exceeding a quarter-revolution, owing to the fact that the movement imparted to the double sprocket-wheel by wheel 25 slightly exceeds a half-revo-
40 lution. The levers 32 33 are adjustable, so that in case of any change in the relative position between the ways and levers the latter may be readjusted in order that the inner or inoperative one—viz., 33 in Fig. 2—shall not
45 project beyond the inner side of the inner bar 23 of the way and therefore interfere with the introduction therein of the instrumentality carried by the car when the latter is travel-
50 ing in the direction indicated by the arrow *a*, Fig. 1, and in this connection it will be understood, owing to the quadrant curve of lever 33 forming one side of the flaring mouth of said levers, that should such instrumen-
55 tality strike said inner lever nothing will be broken, because the lever will yield inwardly.

Located between the way 22 and rail 4 is a sprocket-wheel 35 of precisely the same construction and arrangement as wheel 25 and provided likewise with a similar pair of ad-
60 justable levers to operate over way 22 and project toward the outer or inner end of the same, accordingly as the first-named levers project toward the outer or inner end of way 21. This sprocket-wheel 35 is connected to
65 double sprocket-wheel member 14 by a connection 36 of precisely the same construction as that which connects sprocket-wheel 25 and

section 13, except that the connection 36 is not a crossed connection.

Referring now to Fig. 3, 37 designates a car 70 of any preferred type and provided at diagonally opposite corners of its ends with vertical shafts 38, suitably journaled and provided at their upper ends with handles 39, whereby the engineer or brakeman can oper- 75
ate them, a pawl-and-ratchet mechanism (not shown, because old and in common use for analogous purposes) being utilized to lock the shaft at the desired point of adjustment. Secured upon the lower ends of said shafts 80
are bevel-gears 40, meshing with similar bevel-gears 41 on short shafts 42, journaled in bearing-brackets 43, depending from the car, said shafts being provided with crank-arms 44, which normally are held in a horizontal or in- 85
operative position.

In the practical operation of the mechanism it will be apparent that a car traveling in the direction indicated by the arrow *a* on the main track may continue on such track 90
or pass onto the side track, at the will of the person in control. If it is desired to follow the latter course, the person in charge causes the crank-arm at the right-hand side of the car to assume and be locked in a vertically- 95
pendent position, in which position it enters the flaring mouth of way 21 and strikes the outermost lever—viz., the lever 32—which intersects the way. This lever, together with the connected parts, is swung from the posi- 100
tion shown in full lines to the position shown in dotted lines, Fig. 1, at which time the switch is open and the lever 33 normally inward of the way is bridging the same and ready for operation by a train proceeding in 105
the opposite direction. The corresponding levers at the opposite side of the switch are at the same time disposed toward the train, which has been switched upon the side track in order that said crank-arm may on enter- 110
ing the way 22 strike the outermost or intersecting lever and by the time it assumes the position shown in full lines effect the complete and reliable closure of the switch. The switch being closed, a train passing from the 115
side to the main track will strike lever 32 of sprocket-wheel 35 and after throwing it to the position shown in dotted lines, Fig. 1, will open the switch, so that the train can pass onto the main track, after which it will en- 120
gage lever 33, intersecting the way 21, (see dotted lines,) and after swinging it to the position shown in full lines effect the closure of the switch. It will thus be seen that the pas-
sage of a train from the main to the side track 125
or from the side track to the main track will automatically result in leaving the switch closed, and thereby guard against possibility of accident.

It is to be understood, of course, that this 130
switch mechanism may be employed also to operate street-railway switches and that the distance between the double sprocket-wheel and sprocket-wheels 25 and 35 may be varied

according to the particular circumstances—that is to say, the wire portions 29 of said connections may be of any desired length—it being obviously unnecessary to provide
5 chains of any greater length proportionately than those herein shown.

It will be apparent that the mechanism for operating the switch will serve equally as well for operating signals of any type.

10 From the above description it will be apparent that I have produced an automatic railway-switch-operating mechanism which embodies the features of advantage enumerated as desirable in the statement of inven-
15 tion and which obviously is susceptible of change in minor particulars without departing from the essential spirit and scope or sacrificing any of the advantages of the invention.

Having thus described the invention, what
20 I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic railway-switch-operating mechanism, the combination of main and side tracks, and a switch operating in conjunction
25 therewith, of a wheel, a link pivotally connecting said wheel with said switch, train-operated means for rotating said wheel, a stop-plate having shoulders and a pin depending from said wheel and adapted to engage said shoulders alternately and when so engaged to oc-
30 cupy a position out of the vertical plane occupied by the axis of the wheel to the pivotal point of connection of the link with the switch.

2. In an automatic railway-switch-operating
35 mechanism, the combination of main and side tracks, and a switch operating in conjunction therewith, of a wheel, a link pivotally connecting said wheel with said switch, wheels geared to the first-named wheel by flexible connec-
40 tions, one of said connections being a crossed connection, parallel levers secured to each wheel, ways parallel with the main and side tracks and each intersected by one of its le-

vers or the other accordingly as the switch is opened or closed, an adjustable train-carried
45 arm for passing successively through said ways, and operating said levers, causing the first one to open and the second one to close the switch, and means to limit the movement of the first-mentioned wheel to slightly more
50 than a half-revolution, substantially as described.

3. In an automatic railway-switch-operating mechanism, the combination of main and side tracks, and a switch operating in conjunction
55 therewith, of a sprocket-wheel, a link pivotally connecting said wheel with said switch, sprocket-wheels at opposite ends of the switch, a crossed and flexible connection connecting the first-named wheel and the sprocket-wheel
60 at the main-track end of the switch, an endless connection between the first-named wheel and the other sprocket-wheel, said connections each consisting of chain-sections engag-
65 ing the wheels, and wires or flexible rods connecting the chain-sections and provided with turnbuckles for tensioning the same, parallel levers secured to each wheel and having
70 outwardly-curved and flaring ends, ways parallel with the main and side tracks and each intersected by one of its levers or the other accordingly as the switch is open or closed, an adjustable train-carried arm for passing
75 successively through said ways, and operating said levers, causing the first one to open and the second one to close the switch, and means to limit the movement of the first-mentioned sprocket-wheel to slightly more
80 than a half-revolution, substantially as described.

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

LA FAYETTE PIERCE.

Witnesses:

J. H. WARD,
R. K. KEITH.