A. M. MITCHELL.

AUTOMATIC SWITCH THROWING DEVICE.

APPLICATION FILED DEC. 26, 1908.

935,043. Patented Sept. 28, 1909.

Fig. 5.

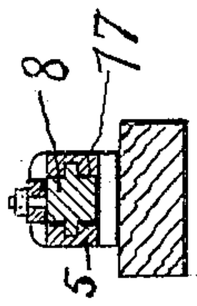

Fig. 4.

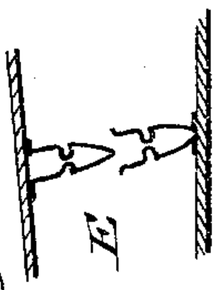

Fig. 1.

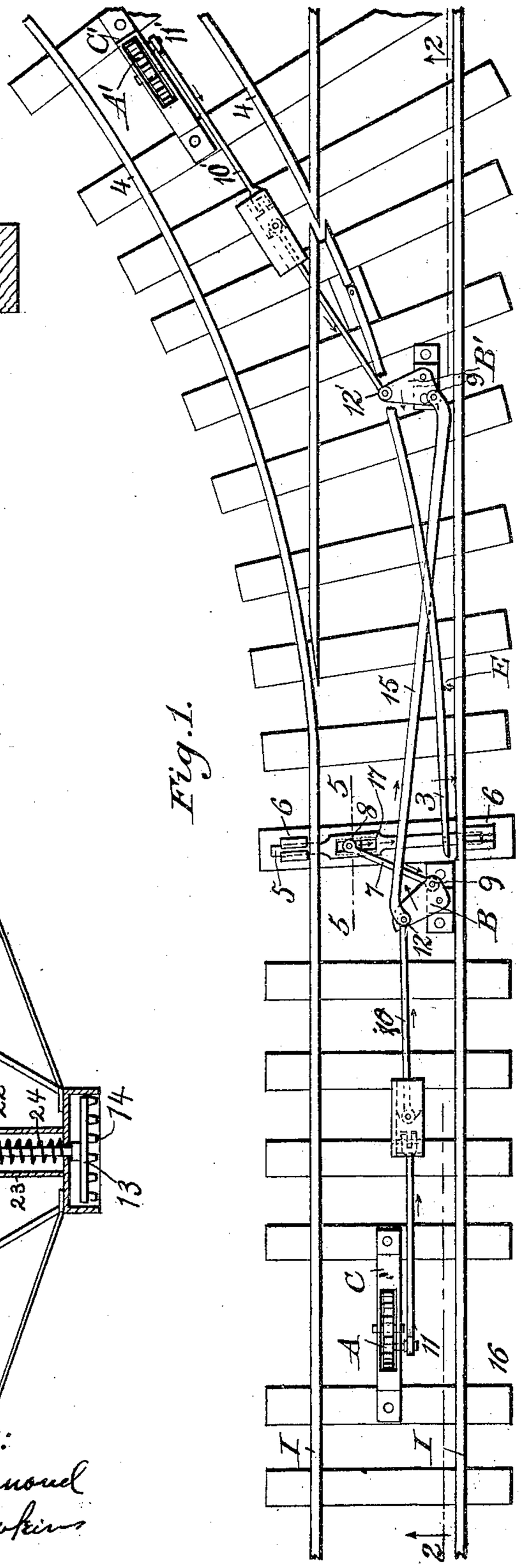

Fig. 2.

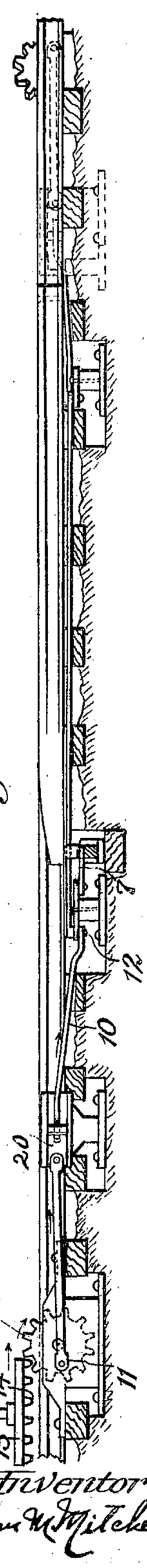

Fig. 3.

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AUTOMATIC SWITCH-THROWING DEVICE.

935,043. Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed December 26, 1908. Serial No. 469,504.

To all whom it may concern:

Be it known that I, ARTHUR M. MITCHELL, a citizen of the United States, residing at Nashville, in the county of Davidson and State of Tennessee, have invented new and useful Improvements in Automatic Switch-Throwing Devices, of which the following is a specification.

My invention relates to switch operating mechanism for railways and more particularly to devices which are actuated by mechanism carried by a railway car and under the control of the engineer or other operator.

One object of my invention is to provide an automatic switch-throwing device which will be positive and reliable in operation and in which the mechanism is simple and without complicated parts.

Another object is to arrange a switch-throwing device which can be operated by the actuating mechanism on the train when moving in either direction.

A further object is to provide actuating mechanism which can be placed in operative or inoperative position by pneumatic pressure under control of the engineer or other operator on the train or car.

These and other objects will be understood from the following description, taken in connection with the accompanying drawings, in which—

Figure 1 is a plan view of a main track and branch or siding provided with my improved switch-operating device; Fig. 2 is a longitudinal vertical section of the same on the line 2—2, and showing also the actuating mechanism carried by the car; Fig. 3 is a vertical section of the actuating mechanism, showing the same in retracted or non-actuating position; Fig. 4 is a detail view of the spring retaining device to restrain and hold the switch point when thrown into closed or switching position against the outside track rail; and Fig. 5 is a cross-section on the line 5—5 of Fig. 1, through the transverse operating bar secured to the switch point.

Referring to the drawings, 1, 1, indicate the main track rails, and 4, 4, a branch or siding which may be connected with the main track by means of the switch-point 3, pivoted at 3′ and secured at the free end to the transverse operating-bar 5, sliding in guides 6, 6, which may be secured to the ties upon either side of the track.

For the purpose of sliding the transverse operating bar 5 to throw the switch point into open or closed position, I have shown the link 7, pivotally secured to a block 8, arranged to have a certain amount of movement in a recess or channel 17 in the bar 5, and secured by means of a tongue and groove joint or other sliding connection. The link 7 is connected by means of an angle-plate or bell-crank lever B, and connecting-rod 10, with the cross-head 20, which is alternately moved in a covered guide-box by means of the pitman 11, pivoted to the gear or pinion A. The protective housing C, in which the pinion A is mounted, is provided with inclined ends and incloses the greater portion of the pinion, leaving only the uppermost teeth exposed.

In order that the switch-point may be thrown by the actuating device as a car moves into or approaches from the branch or siding, I connect the angle-plate B through a link 15 with a similar angle-plate B′ which is connected with a pinion A′ in the siding or branch by mechanism similar to that above described in the main track, the corresponding parts being indicated by the same numerals and letters primed.

The actuating device carried by the car which I prefer to employ comprises a rack 13, having teeth 14, adapted to engage with the pinion in the track when in its lower or actuating position shown in Fig. 2, but will pass over the pinion when in upper or non-actuating position shown in Fig. 3. For the purpose of raising or lowering the rack into either position, I have shown the rack secured to a stem 21, carried by a piston or plunger 22 operating in a cylinder 23, which may be supplied with pneumatic pressure by means of a train-pipe under the control of the engineer. A spring 24 serves to retract and hold the parts in raised position.

The operation of my automatic switch-throwing mechanism will be understood from the foregoing description. When it is desired to throw an approaching switch, the engineer throws the valve connecting the air-pipe leading to the cylinder 23, with the source of pneumatic pressure, lowering the rack into position to engage the track pinion. As the link mechanism is moved to throw the switch point into closed or switching position, the parts of the spring-clip device E will be brought into engagement and will prevent any jarring or chattering movement of the switch point and will hold the

same closed until the switch point is positively moved into open position by the reverse movement of the switch-throwing mechanism when the pinion C′ is actuated by the rack as the car or train moves into the branch or siding. In case it is desired to leave the switch point in the closed position the engineer releases the pneumatic pressure in the cylinder, and allows the spring to retract the rack before the pinion C′ has been reached.

The rack and pinion are so proportioned that a single engagement will rotate the pinion through a half revolution. Inasmuch as it is desirable that the link 7 should have a greater throw or longitudinal movement than that of the transverse bar and switch-point, I provide for a certain amount of lost motion by connecting the link 7 to a block 8, sliding in a channel in the bar, the amount of travel or lost motion being regulated by the proportions of the block and slot or channel. It is evident that the slot may be shortened or closed to any extent desired by inserting a stop piece.

It will be observed that I have provided for a large difference in longitudinal travel between the link 10 and the transverse bar connected with the switch-point, thereby providing a sufficient leverage to insure positive action and also reducing the shock to the moving parts. These several advantages accomplished by my improved automatic switch-actuating mechanism will be appreciated by railway engineers and others skilled in this art.

It is evident that various changes may be made in the proportions and in the arrangement of parts without departing from the spirit of my invention.

I claim:—

1. In an automatic switch-throwing device, the combination with a movable switch-point, of an operating bar connected to said switch-point and provided with a longitudinal slot or channel, a block adapted to slide in said slot and actuate said bar, a link connected to said block and to an angle-plate or bell-crank lever, a pitman or connecting rod operatively connected to said angle-plate and provided with a pinion vertically mounted in the trackway and arranged to coöperate with an actuating device upon a moving vehicle to throw the switch-point into closed or open position, substantially as set forth.

2. In an automatic switch-throwing device, the combination with a movable switch-point, of an operating bar connected to said switch-point and provided with an adjustable longitudinal slot or channel, a block adapted to slide in said slot and actuate said bar, a link connected to said block and to an angle-plate or bell-crank lever, a pitman or connecting rod operatively connected to said angle-plate and provided with a pinion vertically mounted in the trackway, an actuating-device carried by a moving vehicle arranged to coöperate with said pinion to move the switch-point to open or closed position, and means under control of an operator upon the vehicle for lowering said actuating-device into operative position or raising the same into inoperative position, substantially as set forth.

3. In an automatic switch-throwing device, the combination with a movable switch-point, of an operating bar connected to said switch-point and provided with an adjustable longitudinal slot or channel, a block adapted to slide in said slot and actuate said bar, a link connected to said block and to an angle-plate or bell-crank lever, a pitman or connecting rod operatively connected to said angle-plate and provided with a pinion vertically mounted in the trackway, an actuating-device carried by a moving vehicle arranged to coöperate with said pinion to move the switch-point to open or closed position, a piston mounted in an air-chest or cylinder and having a piston-rod connected with said actuating-device, and means for supplying said cylinder with pneumatic pressure, substantially as described.

4. In an automatic switch-throwing device, a switch-point pivotally mounted for lateral movement toward or from the adjacent rail of the track, a transverse operating-bar connected to the free end of the switch-point, guides for said operating-bar, means for sliding said bar in either direction in said guides, and restraining means adapted to yieldingly hold the switch-point when thrown into closed position comprising coöperating spring-clamping and receiving devices connected respectively to the switch-point and the adjacent rail, substantially as set forth.

5. In an automatic switch-throwing device for connecting a main track and a branch track or siding, a switch-point pivotally mounted to move laterally toward or from the adjacent rail of the main track, a transverse operating-bar connected with the free end of the switch-point, similar operating mechanism located in the main trackway and in the branch trackway comprising a pitman provided with a vertically mounted pinion and a connecting rod connected to an angle-plate rotatable about a vertical pivot, the adjacent angle-plate in the main track being connected by a link to the transverse operating-bar, and a link operatively connecting the angle-plates in the respective operating mechanism of the main and branch tracks, substantially as described.

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Witnesses:
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