

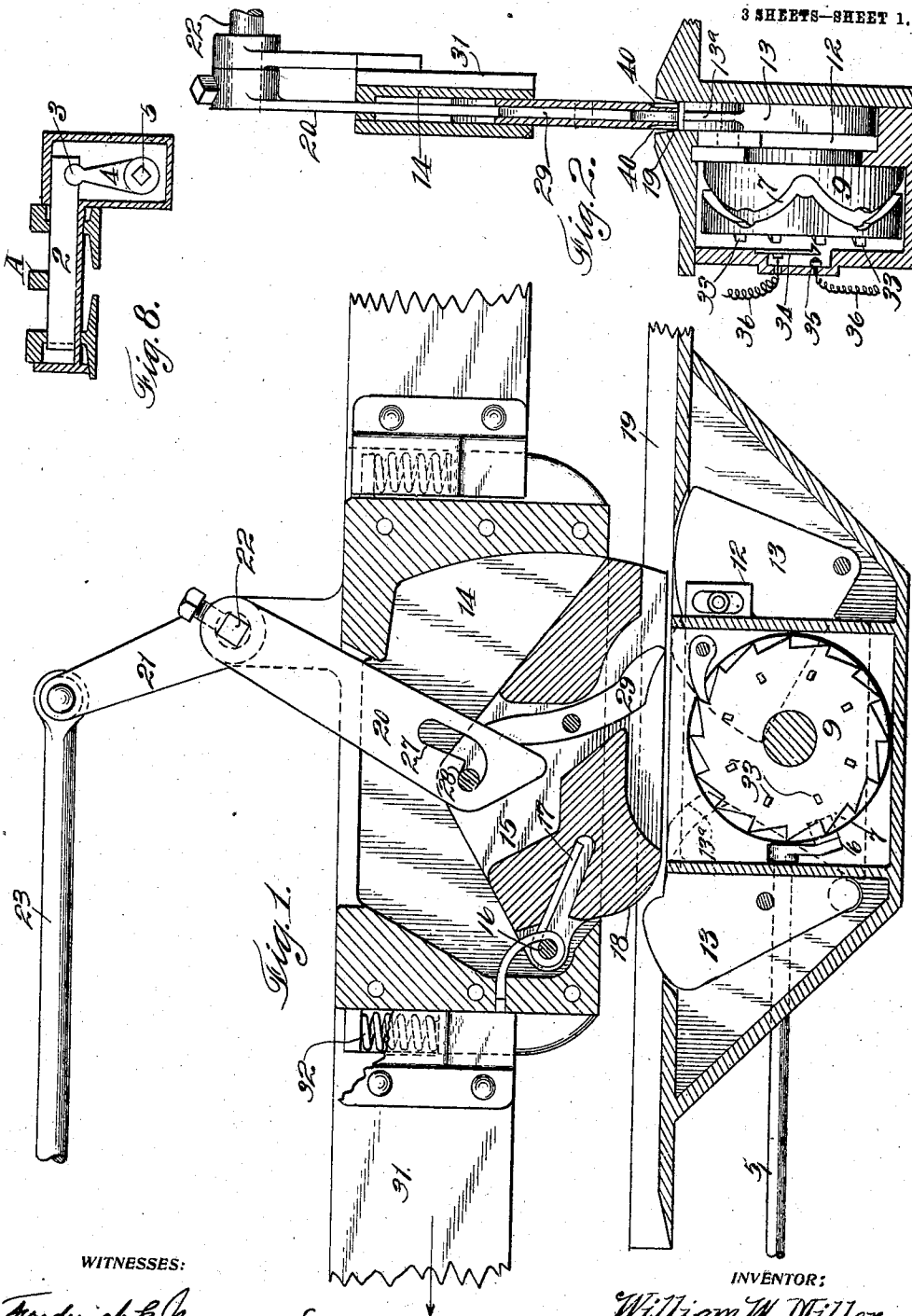
No. 858,888.

PATENTED JULY 2, 1907.

W. W. MILLER.  
RAILWAY SWITCH.

APPLICATION FILED DEC. 17, 1906.

3 SHEETS—SHEET 1.



**WITNESSES:**

Frederick E. Maynard  
 Jr source

**INVENTOR:**

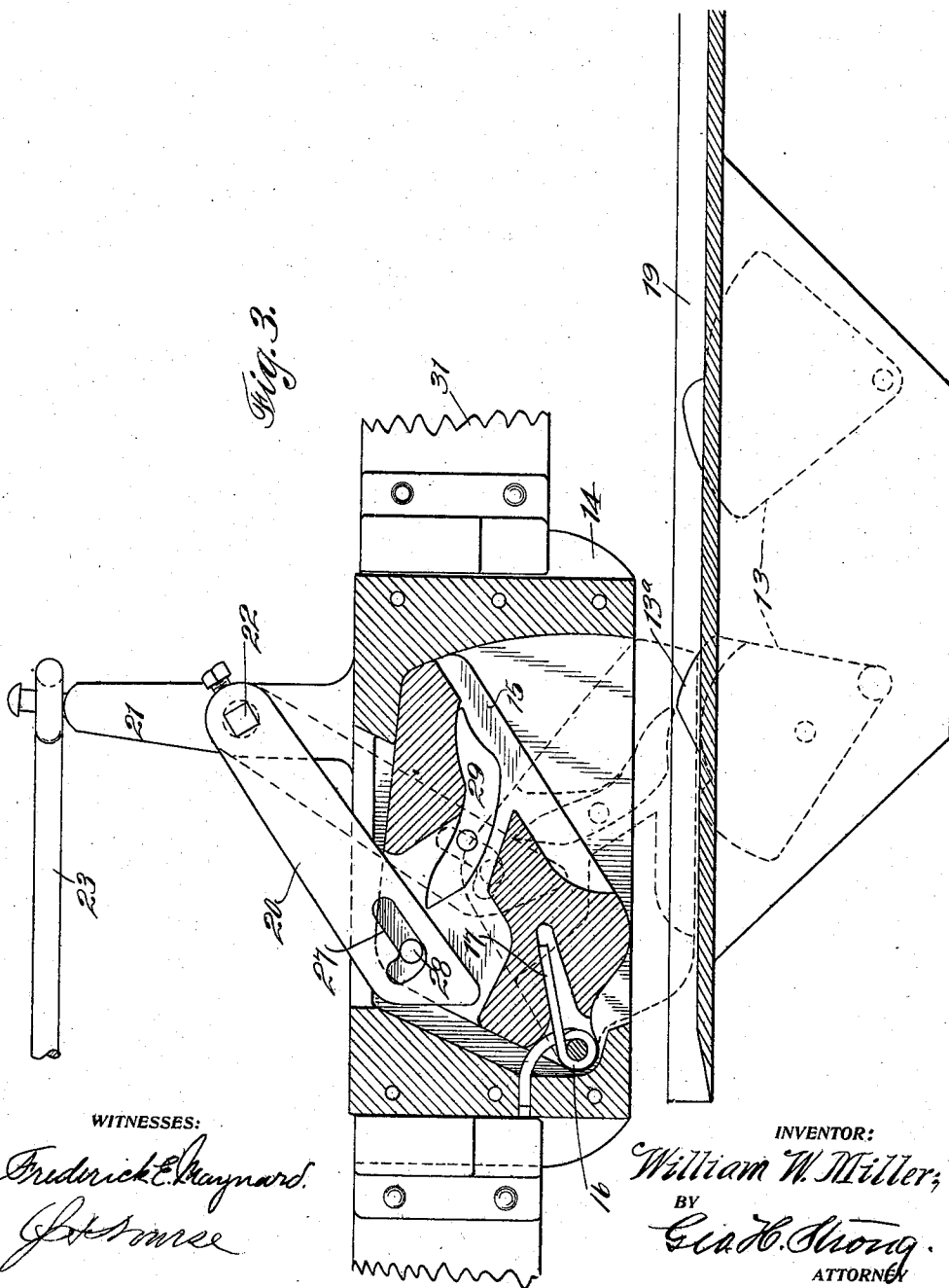
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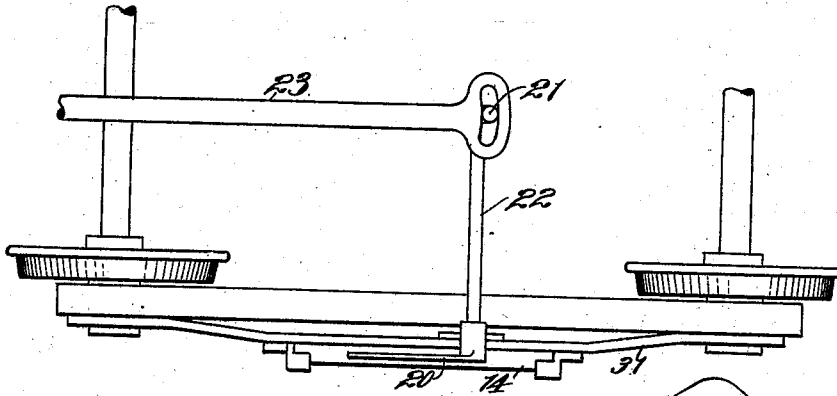


Fig. 4.

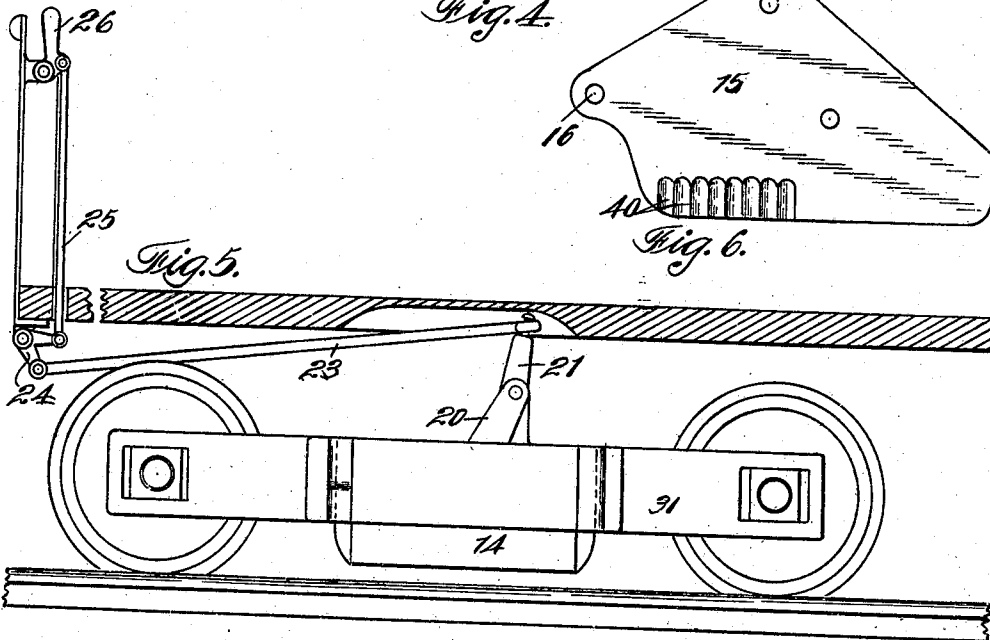


Fig. 5.

Fig. 6.

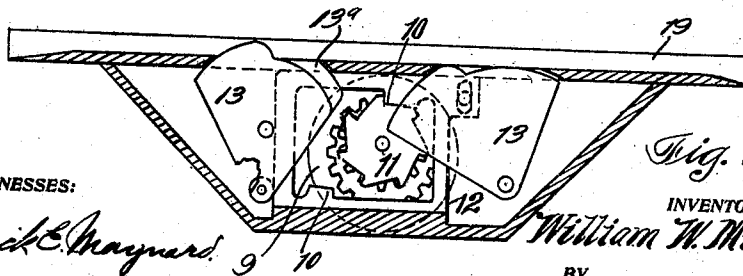


Fig. 7.

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# UNITED STATES PATENT OFFICE.

WILLIAM W. MILLER, OF OAKLAND, CALIFORNIA.

## RAILWAY-SWITCH.

No. 858,888.

Specification of Letters Patent.

Patented July 2, 1907.

Application filed December 17, 1906. Serial No. 348,140.

To all whom it may concern:

Be it known that I, WILLIAM W. MILLER, a citizen of the United States, residing at Oakland, in the county of Alameda and State of California, have invented new and useful Improvements in Railway-Switches, of which the following is a specification.

My invention relates to railway switches, and mechanism by which such switches may be operated, with means for locking the switch at any point, and rendering it safe.

It consists in details of construction and in the combination of parts which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a vertical section longitudinally, and Fig. 2 is a vertical section transversely of the device. Fig. 3 shows the lifted position of the plate. Figs. 4 and 5 show the device attached to a car truck. Fig. 6 is a side view of the plate. Fig. 7 is a sectional view of switch throwing mechanism; and Fig. 8 is a section view through rails.

The point rail A which is to be thrown is located as is usual in such switches, and it is moved by means of a connecting rod 2 which unites the rail with the crank pin 3, which crank pin is carried upon the rocker-arm 4. This rocker-arm is fixed upon the end of a shaft 5 of considerable length which extends parallel to the line of track, and which has upon its opposite end a rocker-arm 6 which engages a cam 7 formed in a drum 9. This drum is revolved so as to actuate the rocker-arm and throw the switch either one way or the other by means of pawls 10 engaging the teeth of the ratchet-wheel 11, and these pawls are carried by a slidable shuttle 12. This shuttle is actuated by oscillating segments 13, and it is with the operation of these segments that my present invention is particularly concerned. This operation is effected by mechanism carried upon the car and having attachments convenient to be operated by the motorman or other official.

14 is a frame or casing which may be carried upon the car truck, or otherwise conveniently disposed, and within this casing is a pivoted oscillating plate or carrier 15 fulcrumed at 16, and normally raised into the casing by a suitable spring as at 17. This plate 15 has a downwardly projecting tongue 18 which, when the plate is lowered, enters a groove or channel 19, within which the oscillating plate 15 is located so that this projection or tongue 18 will be in line of travel of the plates or cams 13, and when the car passes over the apparatus, the first cam reached will be moved so as to move the side or shuttle 12, and through it and its pawl 10 engaging the ratchet 11, which is mounted upon the drum carrying the cam 7, the latter will be rotated, and by its engagement with the rocker-arm 6, will act to throw the switch rail as desired. As a car progresses an engagement with the following cam 13 restores the parts

to their normal position by the reverse action of the shuttle 12 whenever desired.

The part 15 is actuated by an arm 20 extending upwardly to a slot in the frame 14, and by means of a rocker-arm 21 mounted upon the same shaft 22 with the arm 20, and a connecting rod 23 leading from the arm 21, connection is made with a bell-crank lever or equivalent device as at 24, and thence through a rod 25, with a handle 26 conveniently located with relation to the operator.

The arm 20 has a curved slot 27 made in its lower part, and a pin 28 upon the part 15 travels in this slot, so that when by movement of the lever 20, the plate 15 has been lowered to bring the lug 18 into line with the cams 13 the pin 28 will have moved through the slot 27 to a point shown in Fig. 1, where it locks the plate and prevents its moving, thus insuring the lug 18 acting properly upon the cams 13.

After the switch-throwing operation has been completed, the arm 20 may be moved with relation to the pin 28 so that the plate 15 will be released and allowed to return to its normal position within the casing 14. This return may be effected either manually by the system of lever connections hereinbefore described, or the lever 20 may be moved to bring the pin 28 into line with the vertical portion of the slot 27, by means of a short lever 29 fulcrumed with relation to the lever 20 as shown, and this lever extending down into a channel 19 behind the lug 18 contacts with the upwardly projecting fin 13<sup>a</sup> of the second cam 13, and thus moves the lever 20 automatically and releases the parts so that the plate 15 may be returned to its normal position by the action of the spring 17. In order to relieve this portion of the apparatus from the ill effects of vibration caused by the movements of the car, I have shown it mounted upon an elastic plate 31, the ends of which are fitted to the journal-boxes or contiguous axle attachments of the wheel-trucks in such a manner as to yield to the sway and motion of these parts. Spiral springs 32 serve to compensate for vertical movements.

In order to signal to any appropriate station that the switch has been correctly moved, the drum 9 carries lugs or projections 33 and these act to depress an arm 34 as they pass. This arm in turn completes a circuit through the contact 35, and the wires 36 to actuate the distant signal.

Corrugations 40 are made in the sides of the plate 15 and serve to remove accumulations of dirt, etc., from the slot 19.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. In a railway switch, a switch rail, a cam-carrying drum, reciprocating connections between the cam and the rail, a reciprocating shuttle, mechanism whereby the reciprocation of the shuttle actuates the drum-rotating means, and depressible mechanism carried by the car

adapted to engage the shuttle-actuating devices in locked engagement, said last-named mechanism including a fulcrumed plate, a lever connected therewith and actuated from the operators position, and interlocking members between the lever and plate.

2. In a railway switch, the combination of a switch rail; a revoluble cam-carrying drum; connections between said cam whereby the switch rail is reciprocated; a shuttle; fulcrumed, oscillating segments by which the shuttle is actuated; a plate carried upon a car and depressible so as to successively engage the segments; mechanism adapted to lock the plate in its depressed position until it has acted upon the segments; and means carried by one of said segments adapted to disengage the lock after the return of the segments to their normal position.

3. In a railway switch, a switch rail, a drum having a peripheral cam, means connecting said cam with the switch rail, a ratchet and reciprocating shuttle acting thereon and connections whereby the cam drum is actuated by the movements of the shuttle, cams engaging the shuttle, a plate carried by the car having a downwardly extending rib, mechanism by which the plate may be depressed to engage the shuttle moving cams, whereby said cams are successively moved to reciprocate the shuttle in opposite directions.

4. In a railway switch, a switch rail, a revoluble cam drum, a pawl and ratchet mechanism, a shuttle by which said mechanism is actuated to revolve the cam drum, connections between said drum whereby the switch rail is thrown by successive impulses, and mechanism carried by the car adapted to engage the shuttle moving cams to throw the switch and means to lock said mechanism, said last-named mechanism including a fulcrumed plate on the car and a lever actuated from the operators position for depressing the plate to actuate the cam drum.

5. In a railway switch, a switch rail, mechanism including a revoluble cam drum, pawl and ratchet and reciprocating shuttle, cams by which the shuttle is actuated to throw the switch by two successive movements, a device carried by the car, said device consisting of a fulcrumed plate, a lever connected therewith and means for actuating said lever from the operator's position whereby the plate is depressed to engage the shuttle actuating cams, a pin upon the plate and a curved locking slot in the lever whereby the plate is retained and locked in its depressed position.

6. In a railway switch, a switch rail, a cam drum, pawl and ratchet and reciprocating shuttle and connections whereby the switch rail is moved, cams whereby the shuttle is reciprocated, a fulcrumed plate carried upon the car, a lever having a substantially right-angled slot made in the end, a pin carried upon the plate engaging said lever, said pin traveling in the slot when the plate is depressed whereby the lever and plate are locked in the depressed position, a second lever fulcrumed to the plate having an end projecting so as to be engaged when the plate passes over the final cam of the switch-actuating mechanism, whereby said lever is moved to disengage the lock of the first named lever.

7. In a railway switch-actuating mechanism of the character described, a plate connecting with the journal-boxes and having a yielding movement with relation to the truck, and a switch throwing mechanism mounted on said plate.

8. In a railway switch actuating mechanism of the character described, an elastic plate having its ends adjustably carried with relation to the car axles, a switch-actuating mechanism located with relation to the switch, a mechanism

carried upon the plate and means for depressing it to engage the switch-actuating means.

9. In a railway switch of the character described, a switch-actuating mechanism, means carried upon the car and capable of depression to engage the switch-actuating means, an elastic plate carried by the car upon which the depressible device is carried, and means by which independent elastic vertical and transverse movements of said device are permitted.

10. In a railway switch of the character described, an interlocking switch-actuating mechanism, a mechanism carried upon the car and depressible to engage the switch-actuating mechanism, said car-carrying mechanism including a plate fulcrumed on the car and a lever engaging said plate and means for interlocking said depressible mechanism in position to act.

11. In a railway switch, a switch tongue or point, mechanism whereby said tongue is moved in a plurality of stages to complete the throw, a manually controlled mechanism carried upon the car and depressible to engage the switch-throwing mechanism, said manually controlled mechanism including a plate fulcrumed on the car and a lever engaging said plate and means whereby the mechanism is automatically locked at each stage of its movement.

12. In a railway switch, a switch rail, a cam-carrying drum, reciprocating connections between the cam and the rail, a reciprocating shuttle, mechanism whereby the reciprocation of the shuttle actuates the drum-rotating means, electric signaling connections, and electric contacts with means by which they are energized in unison with the rotation of the drum.

13. In a railway switch, a switch rail, a cam-carrying drum, reciprocating connections between the cam and the rail, a reciprocating shuttle, mechanism whereby the reciprocation of the shuttle actuates the drum-rotating means, electric contacts and signaling connections and means carried in unison with the movements of the switch-throwing means, whereby an electrical circuit is energized and deenergized.

14. In a railway switch of the character described, a switch-actuating mechanism, a depressible plate carried upon the car and movable to engage the switch throwing mechanism, said plate having a structure or corrugation adapted to remove accumulations from the channel in which it operates.

15. In an apparatus of the character described, switch-actuating means including a cam drum and fulcrumed oscillating segments, a plate carried upon the car and depressible to engage and actuate the segments, mechanism to lock the plate in its depressed position until the segments have been returned to their normal position, and a fin carried by one of the segments, said fin acting to disengage the plate locking devices after the last segment has been passed.

16. In a railway switch of the character described, a switch rail actuating mechanism, including pivoted oscillating segments, a plate carried upon the car and depressible so as to successively engage the segments, mechanism to lock the plate in its depressed position until it has acted upon the segments, and a fin carried by the second segment, said fin acting to disengage the lock after the return of the segments to their normal position.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM W. MILLER.

Witnesses:

S. H. NOURSE,

FREDERICK E. MAYNARD.