

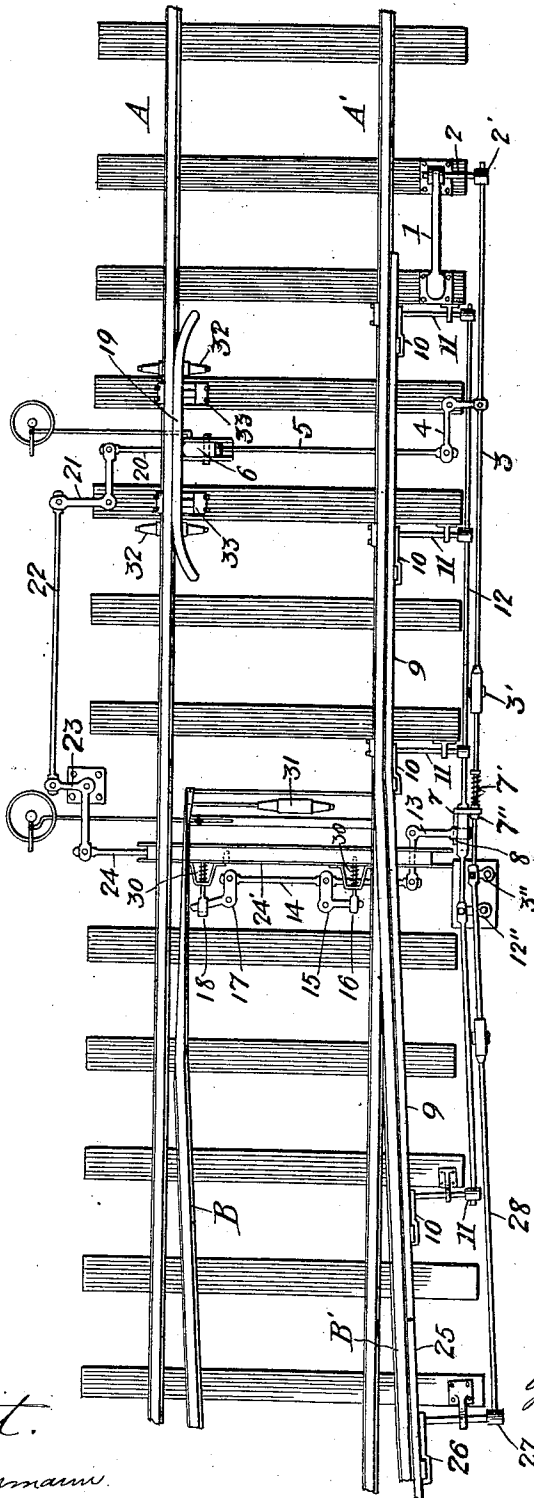
No. 859,324.

PATENTED JULY 9, 1907.

R. M. McGEE.
AUTOMATIC RAILWAY SWITCH.
APPLICATION FILED OCT. 15, 1906.

2 SHEETS—SHEET 1.

Fig. 1.



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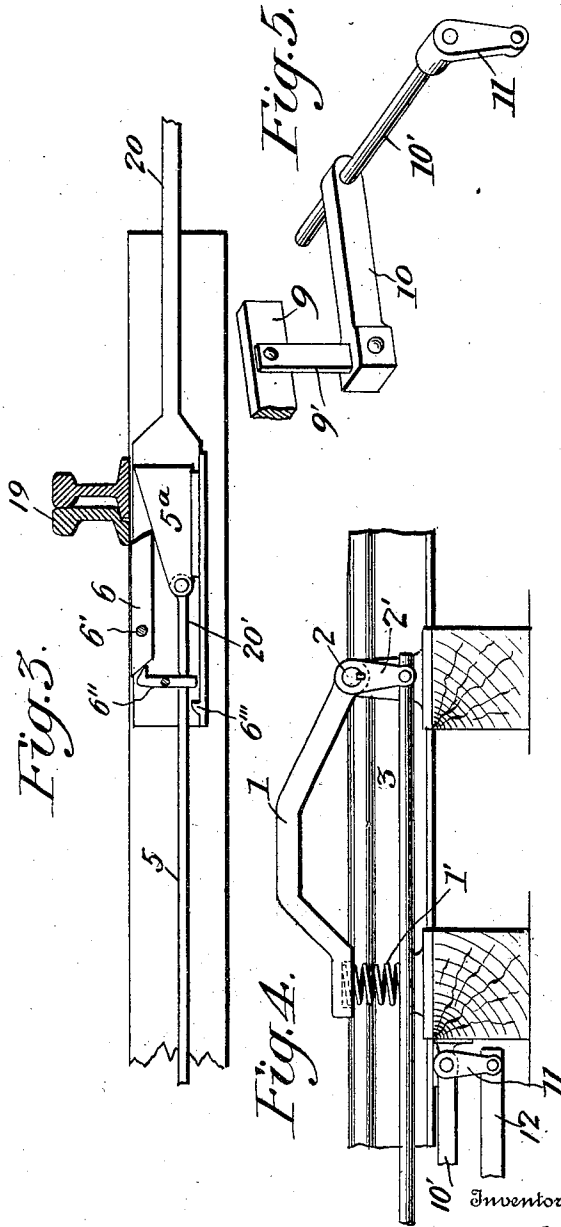
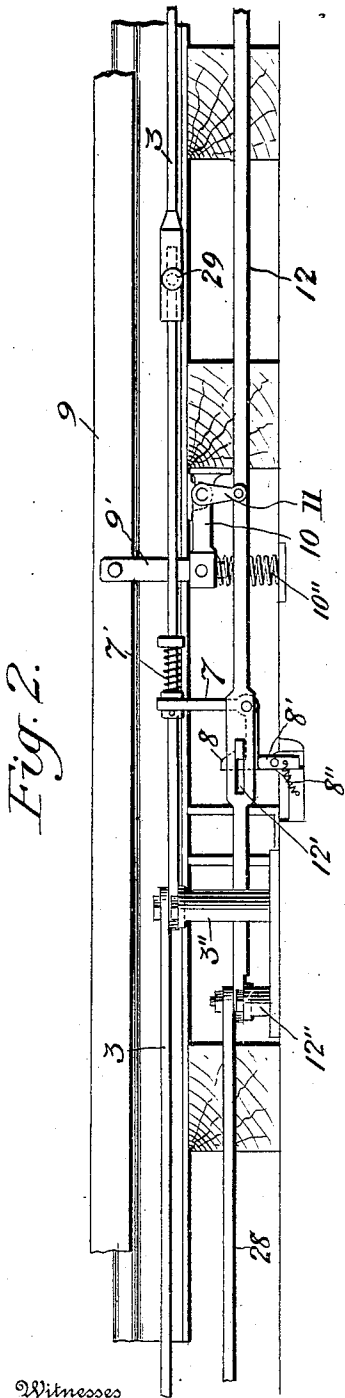
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2 SHEETS—SHEET 2.



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AUTOMATIC RAILWAY-SWITCH.

No. 859,324.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, RICHMOND M. MCGEE, a citizen of the United States, residing at Dallas, in the county of Dallas and the State of Texas, have invented certain new and useful Improvements in Automatic Railway-Switches; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of the invention is to provide a simple and efficient automatic switch operating mechanism by means of which a railway switch may be opened by an engine or car, intended to be run upon a siding or turnout and which will be automatically closed after the engine or car has entered the siding.

In order that there may be no false or accidental operation of the switch the invention contemplates the provision of means for positively locking the switch in either position, car actuated means for shifting the lock to permit the switch to be opened, which means preferably operate automatically when released to return the lock to its normal condition, actuating mechanism for the switch points to open the switch, which actuating mechanisms includes a sliding rail operated by the wheel treads to throw the switch, and a detent which is normally retracted to render the sliding rail inoperative, and a track trip adapted to be actuated by a suitable apparatus on the engine or car, said track trip serving, first, to throw the locking mechanism into positive connection with a depressible rail or detector bar by means of which the lock is actuated, and, second, to move the detent adapted to connect the sliding rail section with the switch point operating means into operative position so that the switch points are first unlocked and then positively moved into the desired position by the passing car or train, only when the apparatus on the car or train is set to effect this result.

In the accompanying drawings, Figure 1 is a plan view of a simple form of switch embodying the invention, Fig. 2 is an enlarged side elevation of the central portion of the mechanism showing the lock controlling and actuating mechanisms, Fig. 3 is a detail view of the sliding rail with the shiftable detent by means of which said sliding rail is rendered either operative or inoperative as the case may be, Fig. 4 is a side elevation of the track trip, Fig. 5 is a perspective view of the detector bar and the means for connecting the same with the lock shifting apparatus.

Referring to the drawings, A and A' indicate the rails of the main line of a railway, and B and B' indicate the rails of a siding or turnout, which are adapted to be connected to the main line rails by the well known form of split rail switch points. The normal position of the switch is that shown in Fig. 1 in which the points

are set to open the main line and close the siding and the points are normally held in this position by means of a spring 31, as will be understood by those skilled in the art.

Connected to the respective switch points is a tie bar 24 which operates in a stationary channel bar 24' and in order to hold the switch in its respective positions there are mounted upon one side of the channel bar two normally pressed spring locking bolts 16 and 18 which are adapted to be projected by the springs 30, into one or the other of two registering sockets or recesses in the tie bar 24.

Mounted on the ties, somewhat in advance of the switch, is a track trip, consisting of a rock lever 1 connected to a horizontal shaft 2, the rear end of said lever is normally raised by a stout spiral spring 1' interposed between the end of said lever and a base or pedestal connected to the tie. On the end of said shaft 2 there is connected a crank arm 2' to which is pivotally connected a pull rod 3. Slidably connected to said rod 3 is a generally rectangular latch 7 having an upturned end 8, the connection between the said latch 7 and the rod 3 being effected by means of a fork or clevis in the end of said latch which is engaged between a fixed collar 7'' on the rod 3 and a spiral spring surrounding said rod so that as the rod 3 is pulled to the right by the depression of the lever 1, the latch 7 is rocked on its pivot to throw the end 8 up, for a purpose to be more particularly hereinafter described.

The latch 7 is pivoted to a second pull rod 12 which is connected by a series of crank arms 11, shafts 10', links 10 and pendent brackets 9' to a depressible rail section or detector bar 9 which extends along parallel with the main rail section A' and the turnout rail section B' for a considerable distance on both sides of the switch. The detector bar 9 is normally held in its elevated position by means of spiral springs 10'' resting upon suitable foundations on the right of way and engaging the under sides of the links 10 below the brackets 9' as clearly illustrated in Fig. 2. At a point opposite the switch points the rod 12 is provided with an elongated slot 2' through which operates one end of a bell crank lever 13 which latter is connected at its opposite end with a sliding rod 14 to which is pivotally connected the end of bell crank levers 15 and 17, the opposite ends of which are connected to eyes in the locking bolts 16 and 18, respectively, so that as the lever 13 is moved in one direction or the other the respective bell crank levers 15 and 17 will be correspondingly moved to either retract the locking pins connected thereto or permit the same to be moved forward by the corresponding springs to lock the tie rod 24 in its respective positions. The forward end of the detector bar 9 is provided with a long gradual taper in order that the

treads of the wheels engaging the same may gradually depress the bar without sudden jar or shock to the apparatus.

Adjacent to the main rail A and somewhat in advance of the switch is a sliding rail section 19 which is provided with intumed ends having a gradual curve to permit the same to be engaged by and move inwardly by flanges of the wheels, without undue shock. The sliding rail section 19 is conveniently mounted in suitable chairs 33 mounted on the ties and is normally held in contact with the inner face of the rail A by means of springs 32. The sliding rail section is the effective element for shifting the switch to open the siding to an oncoming car or train and to accomplish this the rail 19 is adapted to be operatively connected with the tie bar 24 by means of a rod 20, bell crank 21, connecting rod 22 and bell crank 23, the last mentioned element being pivotally connected to the tie rod 24, as shown in Fig. 1. Normally the rail section 19 has no positive connection with the rod 20, but, in order to positively connect said rail 19 and rod 20 to throw the switch, I provide a detent or ratchet 6 which is pivoted on a horizontal pintle 6' mounted in the forked end 20' of said rod 20. The detent 6 being pivoted eccentrically, normally lies in a position to carry its forward end below the sliding rail 19 so that the latter may move freely back and forth without operating the switch. In order to move the ratchet or detent 6 into position to connect sliding rail 19 and pull rod 20 there is provided a wedge like block 5^a adapted to slide within the forked end of the rod 20 and operatively connected by a pull rod 5 with a bell crank 4 pivoted to one of the ties and connected at its other end with the rod 3. A hook 6'' adapted to engage the end of the detent 6 serves to hold the latter in its raised position after it has been set by the momentary operation of the treadle 1 and the pull rod 3 and said hook 6'' is adapted to be tripped to release the detent 6 by means of a suitable stationary stop 6''' engaging the depending end of said hook when the rod 20 is advanced by the sliding rail 19.

The latch 7, as heretofore described, is pivoted to the pull rod 12, and the object of this latch is to afford a positive connection between said pull rod and the bell crank 13 when said latch has been set by the track trip 1. Normally the latch 7 occupies a position in which the hooked end 8 thereof lies below the pull rod 12, but when said latch has been moved by the rod 3 so as to lift the hooked end 8 thereof, the latter moves into engagement with the forward end of the bell crank 13 which projects through the slot 12' in rod 12 and effectively locks the end of said bell crank lever to the rod 12 as shown in Fig. 2, so that, when said bar 12 is moved to the right, the bell crank lever 13, locked to said rod by the latch 7 will likewise be moved. When the latch 7 has been raised, it may be conveniently held in position by a small trigger 8' pivoted below the hooked end of the latch 60 and normally held in upright position by a spring 8'', until bar 12 is pulled far enough to release said trigger, after which the latch 7 is held in its adjusted position by the hooked end 8 engaging the end of the bell crank lever 13. As soon as the direction of movement of the bar 12 is changed the hook 8 will

be released permitting the latch 7, under the influence of spring 7', to swing downward and causing the hooked end 8 thereof to rock the trigger 8' backward and hold the same until the subsequent action of the latch 7 resets the parts.

On the turnout or siding, and at the end of the detector bar 9, there is provided a relatively short support bar or section 25 similarly mounted and disposed as said bar 9 and connected by means of a link 26 and the crank 27 with a pull rod 28 which is conveniently connected with the rod 3 by means of the crank 3'' pivoted at one side of the right of way. In order that the actuation of rod 28 may not effect rod 3 in any way, a yielding telescoping joint 3' is provided in rod 3. The purpose of the auxiliary detector bar 25 is to permit a train on the siding to unlock the switch to permit the same to be thrown by the wheels of the car or train, as the latter passes through the siding on to the main line.

The practical operation of the apparatus as heretofore described is substantially as follows. When a car or train on the main line A—A' approaches the siding or turnout, from the right, and it is desired that it shall enter the siding or turnout, the engineer or motorman sets a suitable trip actuating device on the engine or car to engage with the pivoted lever 1, which upon being struck by the trip actuator is depressed, causing the crank 2' to rotate and exercise a pull, in a direction opposite to that of the direction of the train upon rod 3. This pulling movement upon rod 3 effects two separate operations, each necessary to the actuation of the switch to open the siding. The first is to swing the latch 7 upon its pivot until the hooked end 8 thereof engages the end of the bell crank 13 which projects through the slot in rod 12 and thereby locks said bell crank 13 to the rod 12. The second operation is to swing bell crank 4 so as to exercise a pull upon rod 5 which draws the wedge 5^a under the detent 6 and lifts the forward end of the latter into position to project behind the lower flange of the sliding rail 19 and thereby lock said sliding rail 19 to the switch setting rod 20. Immediately after the actuation of the trip 1 the front wheels of the car or train engage the detector bar 9 pressing the same downward and forward causing the cranks 11 connected thereto to pull the rod 12 to the right and, inasmuch as said rod 12 is coupled by latch 7 to bell crank 13, said bell crank will be swung upon its pivots to exercise a pull upon rod 14 thereby causing bell crank 15 to retract lock pin 16 from engagement with the tie bar 24 and simultaneously to rock bell crank 17 to allow lock pin 18 to be moved forward by its spring 30 in position to engage a corresponding socket in the tie rod 24 to lock the latter to the channel bar 24' after the switch has been thrown. It will be noted that the detector bar 9 is engaged and depressed by the car or train until the latter has passed completely on to the siding. After the tie bar 24 has been unlocked the forward wheels of the train engage the sliding rail 19 and force the latter inwardly against the tension of the springs 32. The inward movement of said sliding rail 19 causes detent 6 to exercise a pull upon rod 20 which rocks bell crank 21 and by means of connecting rod 22 and bell crank 23 pulls tie bar 24 and moves the switch points against the tension of spring 31 to open the switch to the siding. As the first set of wheels pass the sliding rail 19 the detent 6 is released from latch 6'' as the latter is swung on

its pivot by means of detent 6''' which is fastened to a stationary point. The train or car then passes from the main line on to the siding and as the last wheels leave the detector bar 9, the latter by reason of the springs 10'', is lifted, thereby reversing the movement of the locking mechanism, unlocking pin 18 and permitting spring 31 to throw the switch points to open position, restoring the apparatus to its normal condition.

Should a train already on the siding desire to enter the main line, the forward wheels engaging auxiliary detector rail 25 depress the same and by reason of its connection with rod 28 by means of the link 26 and crank 27 moves said rod 28 forward, which has the same effect in operating the latch 7 as rod 3 connected to track trip 1. The forward wheels engaging the detector bar 9, thereupon actuate bell crank 13 and rod 14 to retract pin 16 and unlock the switch and as the flanges of the forward wheels passes between rail B and the switch point it will positively throw the switch to open a clear way to the main line and tie bar 24 will be engaged by locking pin 18 to lock the switch in this position until the last wheel of the car or train passes off the opposite end of detector bar 9 which will again move to its elevated position, release locking pin 18, permit spring 31 to throw the switch to its normal position and allow locking pin 16 to lock the tie bar 24 to the channel bar 24' as before.

Having thus described my invention, I claim:

1. In an automatic railway switch, the combination of the movable switch points, car actuated means for shifting said points, said means including a normally retracted detent, a car operated positive lock for said switch and a car actuated trip for moving the detent into operative position to render the point shifting means operable.
2. In an automatic railway switch, the combination of the movable switch points, car actuated means for shifting

said points, said means including a normally retracted detent, a positive lock for holding the switch in either position, car actuated means for operating said lock, and a car actuated trip for moving the detent into operative position to render the point shifting means operable.

3. In an automatic railway switch, the combination of the movable switch points, car actuated means for shifting said points, said means including a normally retracted detent, a positive lock for holding the switch in either position, car actuated means for operating said lock, said lock actuating means including a normally inoperative connector, and a car actuated trip for moving the connector and the detent into their respective operative positions to render the lock actuating means and point shifting means operable.

4. In an automatic railway switch, the combination of the movable switch points, a shifting bar thereupon, a lever system for shifting said bar, a sliding rail for actuating said lever system, a normally retracted detent adapted to operatively connect the sliding rail and lever system, and a track trip adapted to be operated from a passing car serving to move the detent into position to connect the sliding rail and the lever system and effect the shifting of the points.

5. In an automatic railway switch, the combination of the movable switch points, a shifting bar thereupon, a lever system for shifting said bar, a sliding rail for actuating said lever system, a normally retracted detent adapted to operatively connect the sliding rail and lever system, a lock for holding the sliding bar in either position, a depressible rail, a pull rod connected to said rail and having a normally inoperative connection with the locking apparatus, a latch for positively connecting the pull rod and the locking apparatus, and a track trip connected to said latch and to said detent for moving the same into their respective operative positions to render the lock and the point shifting means operable.

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

RICHMOND M. MCGEE.

Witnesses:

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MARION N. CHRESTMAN.