

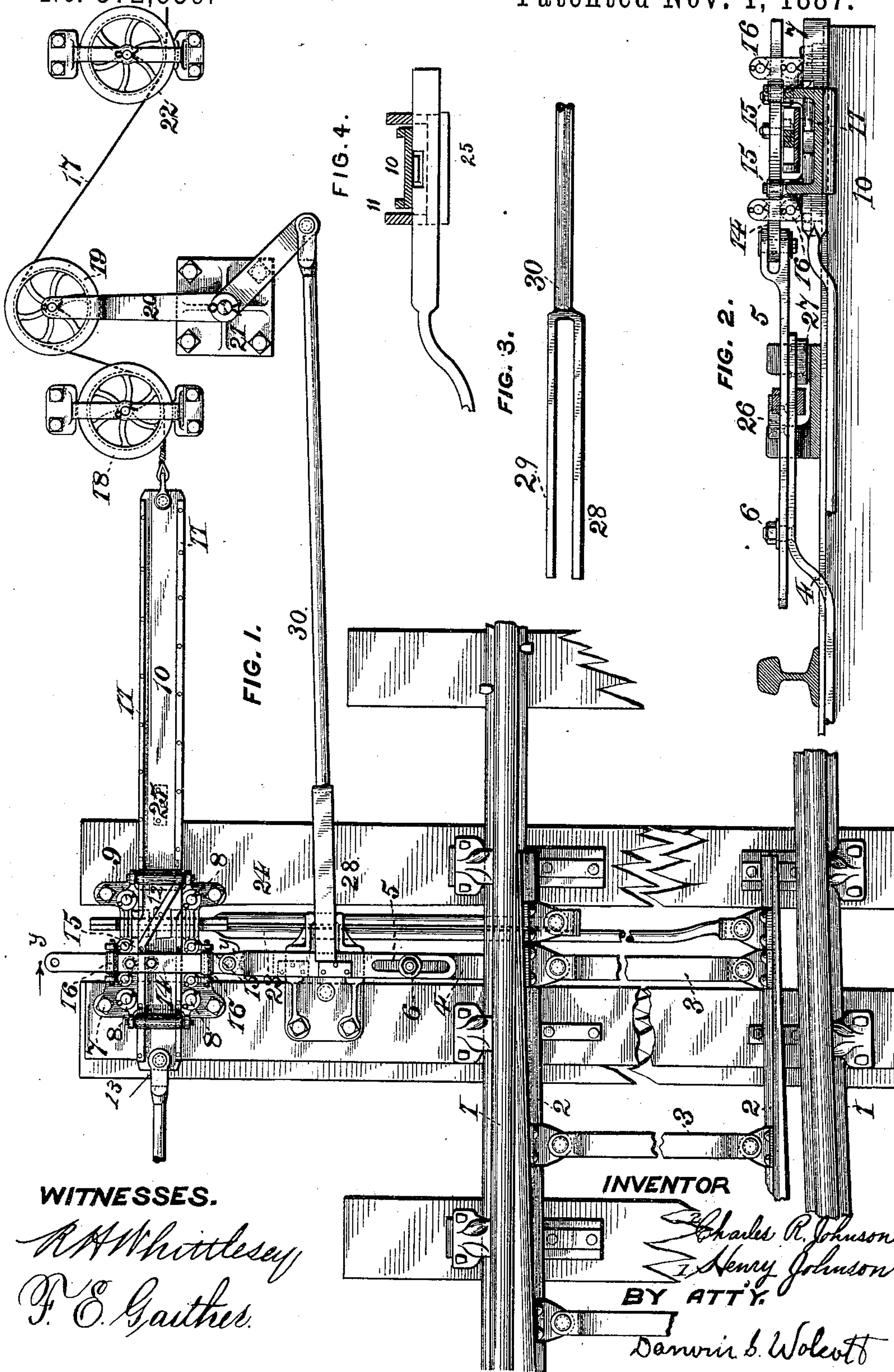
(No Model.)

H. & C. R. JOHNSON.

MECHANISM FOR OPERATING SWITCHES AND SIGNALS.

No. 372,539.

Patented Nov. 1, 1887.



UNITED STATES PATENT OFFICE.

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MECHANISM FOR OPERATING SWITCHES AND SIGNALS.

SPECIFICATION forming part of Letters Patent No. 372,539, dated November 1, 1887.

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To all whom it may concern:

Be it known that we, HENRY JOHNSON, residing at Swissvale, in the county of Allegheny and State of Pennsylvania, and CHARLES R. JOHNSON, residing at Allegheny, in the same county and State, subjects of the Queen of Great Britain, have invented or discovered certain new and useful Improvements in Mechanism for Operating Switches and Signals, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a top plan view of a portion of a switch or siding and the mechanism for operating the switch-points and the signals governing such points. Fig. 2 is a sectional view on the line *x x*, Fig. 1. Fig. 3 is a detail view of the fork. Fig. 4 is a transverse sectional view of the switch-rail, locking-bars, and the locking mechanism.

The invention herein relates to certain improvements in mechanism for operating the movable rails or points of switches or sidings and the signals operating the same, and has for its object such a construction and arrangement of parts as will effect the locking of the points when opened or closed to main line, will prevent the shifting of the signal until both of the points or movable rails have been properly shifted, and will also shift the signal to "danger" when the points have been improperly shifted or without a corresponding movement of the operating mechanism.

In general terms, the invention consists in the construction and combination of parts, substantially as more fully hereinafter described and claimed.

The main rails 1 and movable rails or switch-points are arranged in the ordinary manner, the movable rails being rigidly connected together by the bars 3, and one of said rails being connected to the shifting mechanism by the bars 4 and 5, connected together by a bolt, 6, passing through a slot in the bar 5 and a hole in the bar 4. The slot in the bar 5 is made of a length at least equal to the amount of movement of the movable rails or points, and the two bars are clamped together by the bolt 6 sufficiently tight as not to slip on one another during the ordinary movement of the switch-points.

Within convenient proximity of the switch-points is arranged a frame, 7, having a series of vertical posts or pins, 8, arranged along its

sides, and on the posts are placed the friction-rollers 9, which serve as guides for the movement-plate 10.

On the upper side of the plate 10 is secured a rib, 11, arranged along one edge of the plate for a portion of its length, then crossing the plate diagonally, as at 12, and then along the other edge to the end of the plate. This rib is constructed to engage friction-rollers 13, depending from the bar 14, passing transversely across the plate 10, and connected at one end to the bar 5. This bar 14 is guided and held from lateral and vertical movement by the friction-rollers 15, mounted on vertical pins projecting up from the bed or frame 7, and by the rollers 16 on horizontal pins suitably arranged in standards or posts on the frame.

It will be readily understood from the above that while the rollers 13 are in engagement with the portions of the rib 11 along the edges of the plate 10 that the switch-points will be held in one or the other of their different positions, and that when the plate is moved longitudinally, thus bringing the diagonal portion 12 of the rib into engagement with the rollers 13, the switch-points will be shifted in accordance with the direction of movement of the plate.

To one end of the plate 10 is connected a wire, 17, leading to a signal (not shown) for indicating the position of the switch-points. This wire passes around the guide-pulley 18, mounted in a frame secured in any suitable manner in the line of movement of the plate 10, then around the pulley 19, mounted in one arm of the lever 20, which is pivoted to a plate, 21, so located that the pulley is normally held, by means to be hereinafter described, considerably to one side of the line of movement of the plate 10. From the pulley 19 the wire passes around the pulley 22 and thence to the signal, the pulley 22 being arranged in line with the pulley 18 and plate 10, as shown. The signal is so connected to the plate that a full movement of the latter is necessary to shift the signal.

In order to insure the shifting of both switch-points before the signal is changed, rods 23 and 24 are connected one to one of the switch-points and the other to the other switch-points. These rods extend side by side to and under the plate 10, a suitable groove being formed in the frame 7 to guide and hold the rods in posi-

tion. In the upper edge of both rods is formed a notch, which will be in line with a block or rib, 25, (shown in dotted lines,) on the under side of the plate 10 when the switch is in position to give clear main line. The block or rib 25 is so located as to engage the rods 23 and 24 just after the portion 12 of the rib 11 has engaged the rollers 13 and shifted the points so that the rails will be open to the siding, or when the plate 10 is moved to the right in Fig. 1 to shift the switch-points for "clear" main line the rib 25 will pass through the notches in the rods 23 and 24 just prior to the engagement of the portion 12 of the rib 11 with the rollers 13; hence, if both points have not been shifted so as to bring the notches in the rods 23 and 24 in line with the block or rib 25 it will be impossible to complete the movement of the plate and shift the signal.

It will be observed that the rib 25 is not intended to serve as a lock, but simply as a guard to prevent such a movement of the plate 10 as will shift the signal in case both switch-points have not been shifted. The rib 25 is not in engagement with the rods 23 and 24 when the plate 10 is at either limit of its movement.

It sometimes happens that an engineer will disregard a signal and run a train through a switch which has not been properly set for the train, and in order to prevent the breaking of the switch-points and its connections or derailing the train it is customary to interpose a spring between the shifting rod and the movable rails, which will allow the rails to be moved by the wheels of the train and return them to position after the train has passed; but at times the shock is so violent as to break some portion of the switch, and in such case, as the signal is not shifted, it would indicate a wrong position of the movable rails. In order to prevent such a condition of the track, the shifting-bar is formed in two pieces, yieldingly connected together, as above described, so that the bar 4 will slip along the bar 5 when the rails are moved without a corresponding movement of the movement-plate 10, the part 5 being held by the rib 11. In order to shift the signal in correspondence with such accidental movement of the switch points, blocks 26 and 27 are secured to the bars 4 and 5, as shown in Fig. 2, against which the prongs 28 and 29 of the bar 30 are caused to bear in the normal condition of the switch mechanism by the pressure exerted by the wire 17 on the pulley 19, mounted, as above stated, in one arm of the lever 20, the other arm of said pulley being connected to the bar 30.

The pulley 19 and lever 20 are so constructed and arranged that the tension of the wire 17 will always cause the prongs 28 or 29 to bear against one or the other of the blocks 26 and 27 during the normal working of the switch. As shown in Fig. 1, the movable rails, being set for a siding or derail switch, the upper prong, 28, bears against the block 26 on bar 5, and the signal is set to "danger." If, now, a train should pass along the main line, the

movable rails will be shifted, causing the bar 4 to slide along the bar 5 without affecting the signal. If, however, the switch-points should be set for "clear" main line, in which case the block 27 would be in engagement with the under prong, 29, and the switch-points should be shifted by a train passing out of the siding, the bar 4, carrying the block 27, will be moved along the bar 5, thereby shifting the block 27 out of line with the prong 29, and thereby permitting the bar 30 to move to the left, Fig. 1, under the pressure exerted by the wire, and at the same time affording so much slack in the wire that the signal will be shifted to "danger." After such an accidental movement of the switch-points, it is necessary for the switch-operating mechanism to be readjusted before the signal can be set and held to "safety."

In lieu of the above-described yielding connection between the bars 4 and 5, they may be connected by a spring of sufficient tension to withstand the strain of the ordinary switch-point movement, but will yield when subjected to an accidental independent movement of the points, such as hereinbefore referred to.

We claim herein as our invention—

1. In an apparatus for operating switches, the combination of the movable switch rails or points, a reciprocating movement-plate connected with said points and constructed to shift the same, locking-bars connected to each of the switch-rails, and a block or lug moving with the movement-plate and arranged to engage the locking-bars during the movement of the plate, substantially as set forth.

2. In a switch and signal apparatus, the combination of the movable switch rails or points, a yielding jointed connection from the rails to the operating mechanism, and mechanism connected to the signal and operated by the independent movement of one of the members of the jointed connection, substantially as set forth.

3. In a switch and signal apparatus, the combination of the movable rails or points, the rods 4 and 5, forming the connection from the points to the operating mechanism and connected together by a yielding joint, and mechanism connected to the signal and operated by the independent movement of one of said rods, substantially as set forth.

4. In a switch and signal apparatus, the combination of the movable rails or points, the rods 4 and 5, connected together, as described, and provided with the blocks 26 and 27, the forked rod 30, normally engaging said blocks, the lever 20, carrying the pulley 19, and the signal-wire 17, passing around said pulley, substantially as set forth.

In testimony whereof we have hereunto set our hands.

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CHARLES R. JOHNSON.

Witnesses:

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R. H. WHITTLESEY.