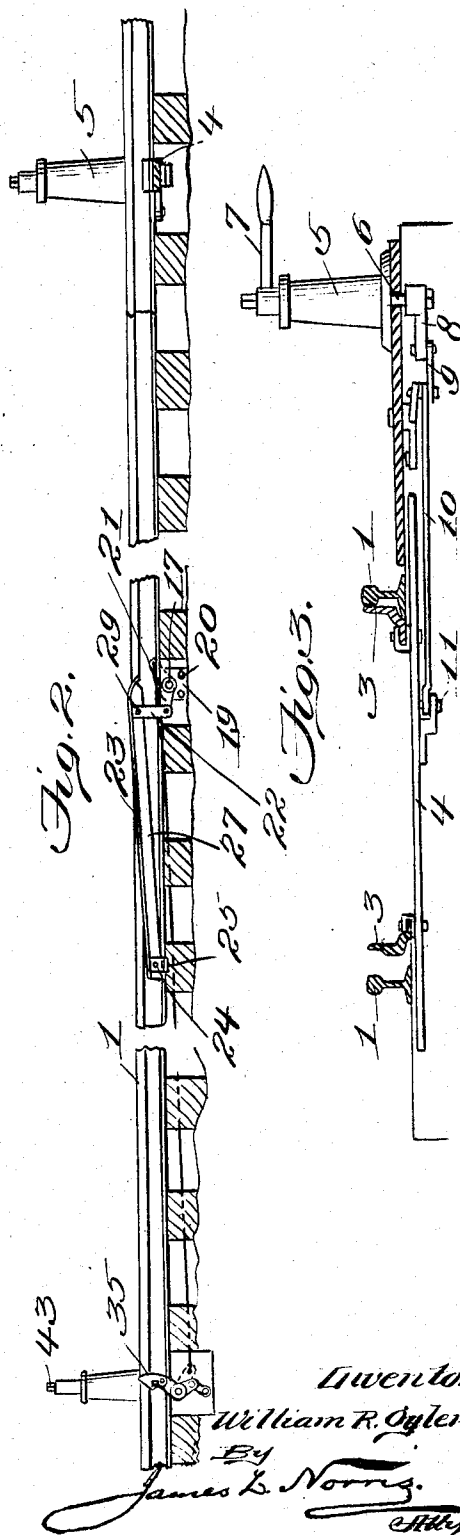
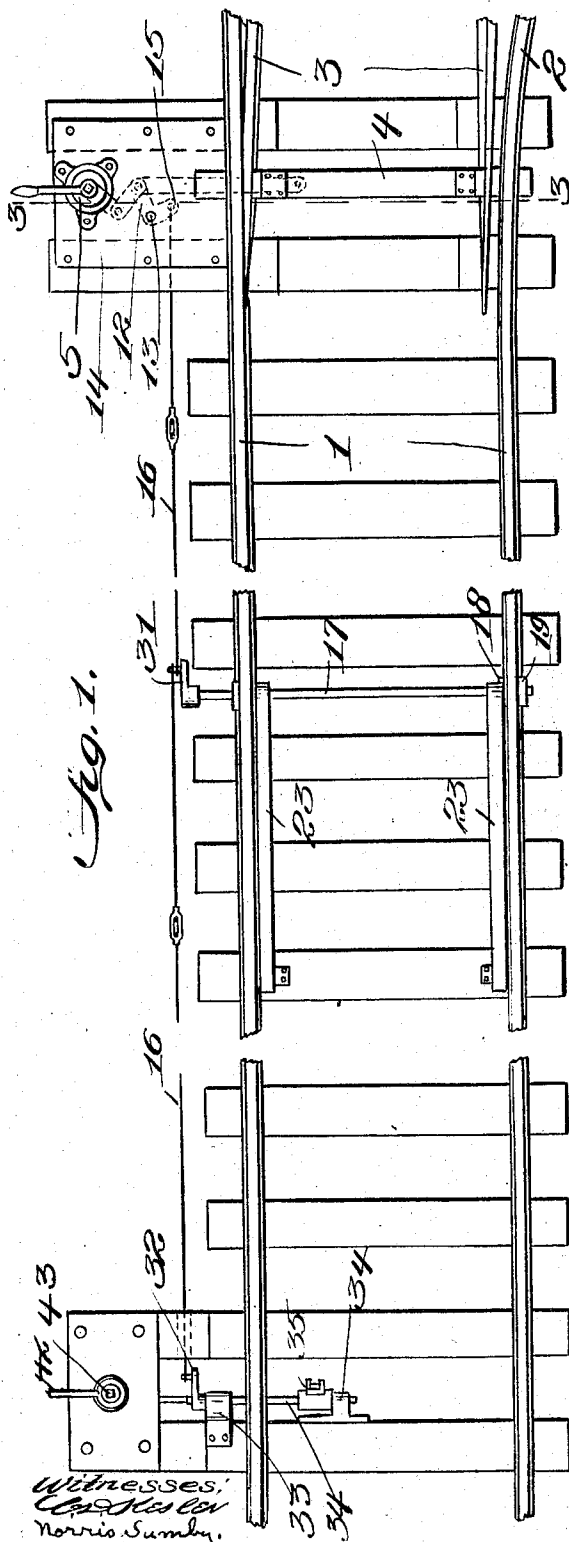


W. R. OYLER.
 SIGNALING AND OPERATING MECHANISM FOR SWITCHES.
 APPLICATION FILED JULY 14, 1908.

942,099.

Patented Dec. 7, 1909.

2 SHEETS—SHEET 1.



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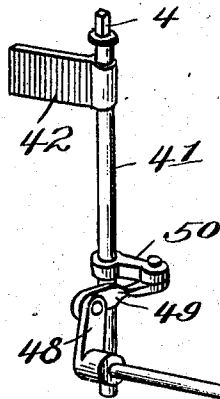


Fig. 4.

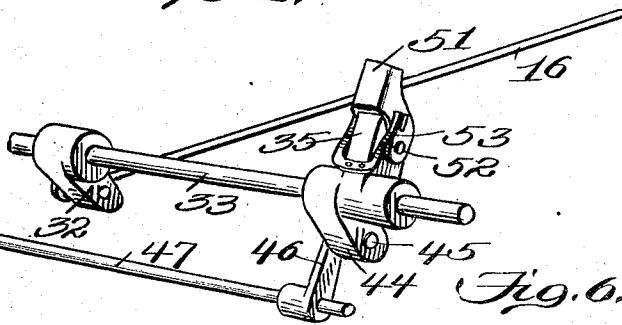


Fig. 5.

Fig. 6.

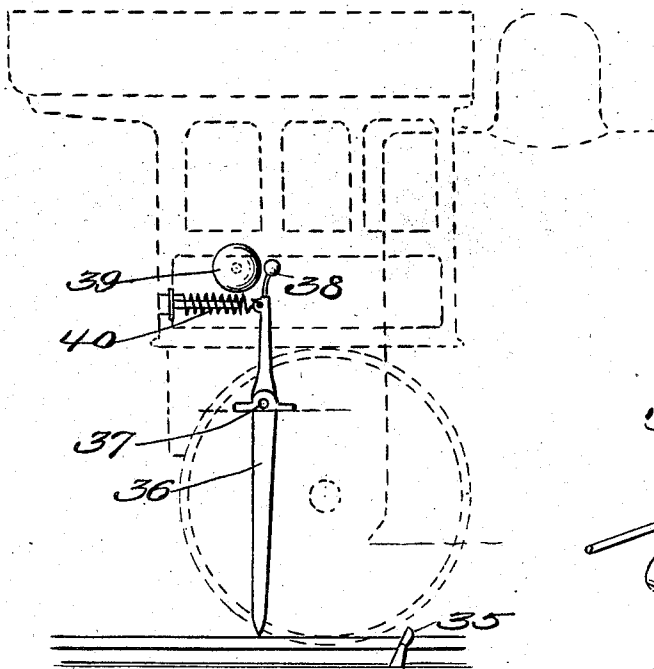


Fig. 8.

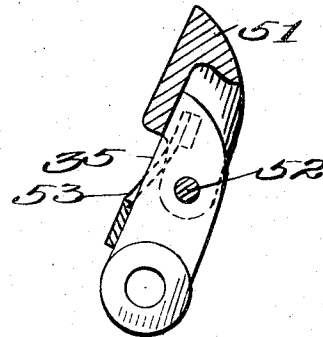
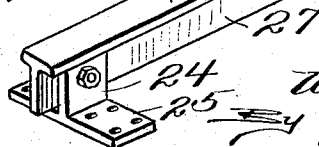
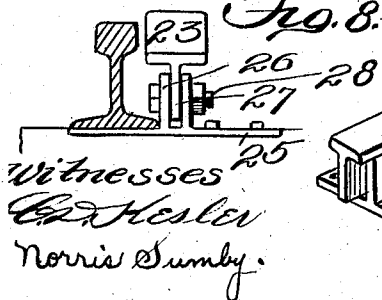
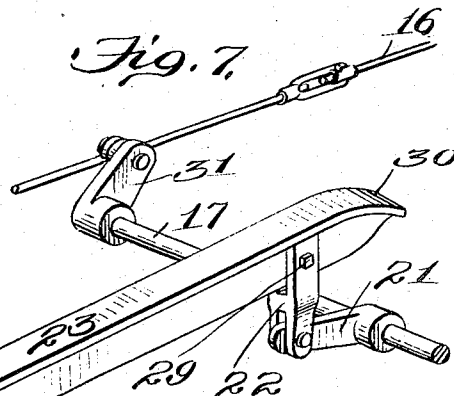


Fig. 7.



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UNITED STATES PATENT OFFICE.

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SIGNALING AND OPERATING MECHANISM FOR SWITCHES.

942,099.

Specification of Letters Patent.

Patented Dec. 7, 1909.

Application filed July 14, 1908. Serial No. 443,456.

To all whom it may concern:

Be it known that I, WILLIAM R. OYLER, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented new and useful Improvements in Signaling and Operating Mechanism for Switches, of which the following is a specification.

My present invention relates to improvements in signaling and operating mechanism for preventing collisions, derailments or other accidents at railway switches, and it has for its primary object to provide a novel and improved mechanism of this character which is operable automatically and positively with relation to the switch without requiring or depending for its operation upon human agency so that absolute certainty is insured, the mechanism being so connected with relation to the switch that should the switch be in open position, such for instance as after a local train has taken a siding, a signal upon the track at a suitable distance in advance of the switch will be set in danger or warning position, and by preference, an alarm operating device will also be set in operative position so as to sound an audible signal of an appropriate character in the cab of an approaching locomotive, and at a suitable distance beyond the signal devices is provided means for positively and automatically setting the switch in closed position before the approaching train reaches the same so that the train after passing the signal devices must restore the switch to closed or proper position before reaching it, the switch operating and signal devices being connected at all times and by a continuous connection with the switch so that the latter cannot be moved without setting the signal and the alarm operating device and also the switch operating mechanism in proper position.

A further object of the invention is to provide signaling and switch operating mechanism of this character which is of a simple and improved construction, and when the switch is in closed position or in a position to permit passage of trains upon the main line, there will be no part of the mechanism projecting above the tracks or rails so that damage to these parts in operating snow plows or other track-clearing apparatus is impossible.

To these and other ends, the invention

consists in certain improvements, and combinations and arrangements of parts, all as will be hereinafter more fully described, the novel features being pointed out particularly in the claims at the end of the specification.

In the accompanying drawing: Figure 1 is a plan view of a section of a track equipped with switch operating, signaling and alarm setting mechanism constructed in accordance with my present invention; Fig. 2 represents a vertical sectional view of the track and the switch mechanism shown in Fig. 1; Fig. 3 represents a transverse section of the track upon the line 3—3 of Fig. 1; Fig. 4 is a perspective view of the alarm sounding device and the stationary signal which is arranged beside the track at a suitable distance from the switch and indicates the position occupied by the latter; Fig. 5 is a diagrammatic view showing a locomotive cab equipped with one form of audible alarm which is operable automatically as the locomotive passes a given point upon the track should the switch be in open position; Fig. 6 is a detail sectional view of the alarm operating device; Fig. 7 is a perspective view of one of the treadles which is operable by the flanges of the locomotive wheels for automatically restoring the switch to a proper position; and Fig. 8 is an end elevation of the said treadle showing it mounted in cooperative relation with one of the rails.

Similar parts are designated by the same reference characters in the several views.

Safety appliances for protecting railway trains at switches may be constructed in accordance with my present invention so as to be applicable generally to steam or electric railways of various types wherein a switch is employed and, in the accompanying drawing, I have shown one specific embodiment of the invention applied to such a switch. It will be understood, however, that I have shown only one form of the invention and that various modifications and changes in the construction and arrangement of the parts and the relative proportions and sizes of these parts may also be modified or varied in order that the invention may be applied to the best advantage in each particular case in practice.

In the operation of railways, it is customary to side-track freight and local trains from the main track in order to permit the

passage of limited or faster trains, and as the resetting of the switch after the passage of such freight or local trains upon the siding depends upon human agency, it frequently occurs that there is a failure through carelessness or otherwise to reset the switch for the main line, the train following in those cases being either derailed at the switch or passes upon the siding and collides with the stationary local or freight train. According to the present invention, the resetting of the switch does not depend upon human agency, it being reset automatically by the following train as it passes a point a suitable distance in advance of the switch, and as an additional precaution, a stationary signal is displayed beside the track and an alarm is sounded in the cab of the locomotive to warn the engineer of the position of the switch in order that the train may be under control or it may be stopped before reaching the switch.

In the present embodiment of my invention, the rails 1 of the main track are connected to a siding or turn-out 2 by means of a suitable switch, that shown in the present instance being provided with the usual pair of switch points 3 which are connected by a cross bar 4, these switch points when in one position serving to direct trains upon the siding, while when it occupies a reverse position, it conducts trains along the main line. This switch is as usual capable of operation at a point in proximity thereto in order that certain trains, such as freights, may take the siding. Any suitable switch shifting means may of course be provided, that shown in the present instance comprising a switch stand 5 having a vertical shaft 6 provided with a crank or lever 7, the lower end of the shaft being fitted with a crank 8 which is connected by a link 9 to the switch operating rod 10, the latter being pivotally attached at 11 to the cross bar 4 which connects the switch points, a turning movement of the shaft 6 of the switch stand in an appropriate direction serving to set the switch points so as to permit a train to pass from the main track onto a siding, the switch being shown set in such position in Fig. 1.

Attached to the switch operating rod 10 is a lever arm 12, the said lever being pivoted at 13 upon a suitable supporting plate 14. This lever is also provided with an angularly arranged arm 15 to which is attached a connecting member 16 which may be composed of a pipe or other suitable means for transmitting motion from the switch to the operating mechanism and signaling devices therefor. This member 16 extends along the track preferably at the outer side thereof for a suitable distance in advance of the switch where it connects with a shaft 17 which extends transversely of

the track and preferably beneath the rails thereof. This shaft is preferably arranged from the switch a distance equal to the length of the trains which usually take the siding so that a train may pass over the switch and then back upon the siding without interfering with the switch operating mechanism which is connected to this shaft. This shaft may be supported in any suitable way, but it is generally preferable to provide a pair of bearing members 18 and 19 for each rail, these bearing members being in the form of a pair of similarly formed blocks having oppositely arranged flanges at their upper ends so as to engage the base flange of the rail, the blocks being clamped firmly in cooperative relation with the rail by means of bolts 20 which pass through the blocks. By supporting the said shaft upon the rails in this manner, the necessity of boring through the rails and thus weakening the same is obviated. Upon each end of the shaft 17 immediately inside of the respective rails are arranged a pair of crank arms 21 which are fixed to the said shaft and have upwardly extending links 22 pivoted to their free ends. A pair of treads or flange engaging members 23 are also mounted immediately adjacent to the inner side of each rail, these members being pivotally supported at those ends thereof which are farthest removed from the switch by means of brackets 24, these brackets each having a base plate 25 which is adapted to rest upon and to be spiked to the cross tie, and each bracket has a pair of laterally spaced up-standing portions 26 which form a socket between them to receive the corresponding end of the treadle. In the present instance, the treadle or flange engaging members are each of T-form in cross section so as to form a relatively wide top and a depending web or flange which not only serves to stiffen the treadle longitudinally so as to prevent bending thereof, but it also provides convenient means for the attachment of the treadle to be bracket 24 and the link 22, this depending web 27 resting between the up-standing portions 26 of the bracket and is pivoted thereto by means of a bolt 28, while this web portion at the opposite end of the treadle rests between the forked arms at the upper end of the link 22 and is pivoted thereto by means of the bolt 29.

The treadle is so mounted that the forward end thereof which is supported by the bracket 24 is always below the plane of the tops of the rails while the opposite end of the treadle or the end nearer the switch is adapted to be raised by a rotation of the shaft 17 in one direction, thereby throwing the treadle into an inclined position so that it will be engaged by the wheel flanges and will be depressed as the train passes over the same. In order to permit trains to ap-

proach these treadles from the direction of the switch without interfering therewith, the said end of each treadle is beveled or rounded off as at 30 so that the treadles will be depressed should a train approach them from the switch. These treadles are elevated so as to engage the wheel flanges of an approaching train by means of the connecting member 16 which is attached to a crank 31 fixed upon the shaft 17, the treadles of course being elevated when the switch is set for the siding, and as a train passes over these treadles, the wheel flanges will depress the treadles, producing a pull upon the connecting member 16 which operating through the lever arms 12 and 15 will restore the switch automatically to closed position.

In order to notify the engineer on an approaching train of the position or condition of the switch at such point as to enable the engineer to put his train under control, the connecting member 16 is extended along the track farther in advance of the switch and is connected in the present instance to a stationary visual signal which is arranged beside the track and also to a device for setting an alarm upon the approaching locomotive or train so as to warn the engineer at a suitable point in advance of the switch as to the position occupied thereby. In the present instance, the member is connected to a crank 32 arranged upon a shaft 33, the latter being rotatably supported beneath the rails upon suitable bearing brackets 34 and is provided with a tripping device 35 which is arranged to project in an operative position above the track when the shaft 33 is rotated by the setting of the switch for the siding, and while the switch is set for the main track, this tripping device will be lowered so as to occupy an inoperative position. This tripping device is arranged to cooperate with a part carried by the locomotive or moving train so as to operate a suitable alarm which is arranged in the cab, and in the present instance a lever 36 is pivoted at 37 to the locomotive, the lower end of this lever being arranged in the path of the tripping device so as to be engaged by the latter when in an operative position above the track, and the upper end of this lever in the present instance is provided with a striker 38 which is arranged to sound a bell or other audible signal 39, the striker being moved away from the bell as the lower end of the lever 37 is engaged by the tripping device upon the track and is actuated so as to deliver a blow upon the bell by a spring 40. I have shown, however, only one form of alarm, and it will be understood of course that any other suitable alarm may be provided upon the locomotive, and if so desired, the whistle of the locomotive may be sounded as a warning signal to the engineer. However, when the switch is set for the main

track, the tripping device will be depressed so that it will not engage the lever and the alarm of course in that case would not be sounded.

A visual signal is also arranged in the present instance beside the track, the signal in the present instance comprising a vertical standard 41 having a semaphore or blade 42 which is used during daylight and is arranged to extend transversely of the track when the switch is set for the siding, and when the switch is set for the main track, this semaphore or blade will extend parallel to the track. The upper end of the standard is provided with a stem 43 whereby a lantern may be mounted thereon at night. This stationary signal is also operated by the continuous operating member 16, although in the present instance it is indirectly operated from the shaft 33 which operates the tripping device for the alarm, the shaft 33 being provided with a crank arm 44 which coöperates with the pin 45 of a second crank arm 46, the latter being fixed to a transverse shaft 47 which in turn is provided on its outer end with a crank arm 48, the latter being connected by a link 49 to a crank arm 50 fixed to the signal standard 41. It may happen sometimes that a train will pass over the alarm tripping device while moving in a direction from the switch, and in order to permit such a backing movement of a train while the tripping device is in elevated or operative position, the upper end of this tripping device is pivoted to form a latch 51 which is attached to the tripping device by the transverse pivot 52 whereby this latch portion may be swung or tilted in one direction without operating the alarm sounding device upon the train, although when this latch portion is engaged by a part upon a train approaching the switch, it will actuate the tripping device so as to sound the alarm. This latch portion is yieldingly retained in operative position by means of a spring 53.

In operating railways equipped at the switches with safety mechanism constructed in accordance with my invention, the occurrence of collisions, derailments and other accidents is practically impossible, as the act of moving the switch so as to set it for a siding positively sets the flange engaging treadles in operative position, and a train cannot pass these treadles without having the flanges of the wheels engage and depress them, the positive connection between the treadles and switch causing the latter to be returned to normal or proper position before the train reaches the same. Not only is the switch automatically reset to normal position by the train itself before it reaches the switch, but ample warning is given the engineer so that he may reduce speed or stop if necessary before reaching the switch, the

tripping device being set in position to actuate an alarm upon the locomotive or train itself at such a distance from the switch as will afford ample time to stop the vehicle, and this alarm tripping device is also positively set in warning position by the act of setting the switch for the siding. Furthermore, as an additional precaution, a signal beside the track is also positively set in warning or cautionary position by the act of setting the switch for the siding. Thus it will be observed that all the mechanism is operated positively and without depending upon human agency in any respect, the signal and alarm devices being of necessity set in warning or cautionary position as long as the switch is set for the side track, and the switch operating mechanism being likewise positively connected to the switch so that a train traveling along the main track cannot possibly pass the switch while it is set for the side track. When the switch is properly set for the main line, the alarm tripping device and the switch operating treadles are of course in an inoperative position so that they are not operated by the train, and while in such position, they would not form obstructions for snow plows or other track-clearing apparatus. By mounting the wheel flange engaging members or treadles so that they occupy a gradually inclined position, it is obvious that ample time is afforded in which the switch and connected parts may be operated without shock, and by constructing these inclined treadles of appropriate length in practice, they may be easily operated by trains moving at high speed.

I claim as my invention:—

1. The combination of a railway switch, a treadle arranged immediately adjacent to the inner side of a rail in advance of the switch and operative by a wheel flange upon a train, a bracket pivotally supporting one end of the treadle, the opposite end of the treadle being gradually inclined upwardly, a shaft extending transversely of the rail and having a crank thereon, a link pivotally connecting said crank and the upper end of the treadle, said link preventing tilting or lateral movement of the treadle with respect to the rail, and a connection between said shaft and switch for positively setting the switch in a predetermined position when said treadle is depressed by the passage of a train thereover approaching the switch.

2. The combination of a railway switch, a pair of treadles arranged at a given point in advance of the switch and in immediate proximity to the inner sides of the rails, means for pivotally mounting those ends of the treadles farthest removed from the switch at such elevations as to clear the wheel flanges, a shaft extending transversely of the track and beneath the two rails, a pair of cranks on said shaft, a pair of links

pivotally connected to said cranks and attached to the vertically movable ends of the treadles, said links preventing tilting or lateral displacement of the treadles with respect to the rails and serving to positively depress the treadles when said shaft is rotated in one direction, and an operative connection between said shaft and the switch whereby the latter will be set in predetermined position by the simultaneous depression of said treadles.

3. The combination of a railway switch, a shaft arranged transversely of the track in advance of the switch and provided with a pair of cranks, and a pair of treadles arranged immediately within the respective rails, each treadle being of T-form in cross section, a pair of brackets cooperating with the web of the respective treadles at the forward ends thereof, a pair of links straddling and pivotally attached to the web portions of the treadles at the opposite ends thereof, a crank attached to the outer end of said shaft, and a connection extending along the track and connecting the said crank upon said shaft to the switch, said connection serving to positively elevate the treadles into inclined position when the switch is set for a siding and for positively setting the switch for the main track when the inclined treadles are depressed by the wheel flanges on a passing train.

4. The combination of a railway switch, a signal arranged at a suitable point upon the track in advance of the switch, treadles arranged upon the track at a point between said switch and signal, said treadles being automatically operative by a passing train and connected to operate said switch and a single rigid connection between the switch treadles and signal for positively setting the signal in warning position when the switch is set for a siding and for returning the signal to clear position when the switch is reset for the main track.

5. The combination of a railway switch, means for setting the same, a shaft mounted transversely of the track at a suitable distance in advance of the switch and operatively connected to the switch setting means, a crank arm rigidly mounted on said shaft between the rails of the track and provided with an extension that is pivoted thereon to form a latch, a spring connecting said crank and latch to yieldingly retain the latter in an operative position, an alarm adapted to be carried upon a locomotive or train and provided with a part arranged to be actuated by said latch when the train approaches the switch and capable of moving past the latch without operation when moving from the switch, and train-operated devices arranged along the track between the said latch and switch for positively setting the latch in inoperative position when the switch

is set in one position and for permitting the latch to occupy an operative position when the switch is set in a different position.

6. The combination of a railway switch, 5
a signal arranged upon the track a suitable distance in advance of the switch, switch throwing mechanism also arranged upon the track at a point between the signal and switch and operative automatically by a 10
passing train, and a continuous rigid operative connection between the switch the signal and the switch throwing mechanism, for positively setting the switch throwing mechanism in operative position to be actuated 15
by a passing train and to set the signal in warning position and for positively setting the switch for the main track and for restoring the signal to clear position when the switch throwing mechanism is actuated by a 20
passing train.

7. The combination of a railway switch, a signal arranged upon the track at a suitable distance in advance of the switch, an alarm

tripping device also arranged upon the track in advance of the switch, switch throwing 25
mechanism arranged upon the track between the signal and switch, and a continuous operative connection for the signal alarm tripping device, and switch throwing mechanism for setting the switch throwing mechanism and tripping device in operative position and the signal in warning position when the switch is set for a siding and for positively resetting the switch for the main track and for restoring the alarm tripping device 35
to an inoperative position and the signal to a clear position when the switch throwing mechanism is actuated by a passing train.

In testimony whereof I have hereunto set my hand in presence of two subscribing 40
witnesses.

WILLIAM R. OYLER.

Witnesses:

CLAS. S. HYER,
JAMES L. NORRIS, Jr.