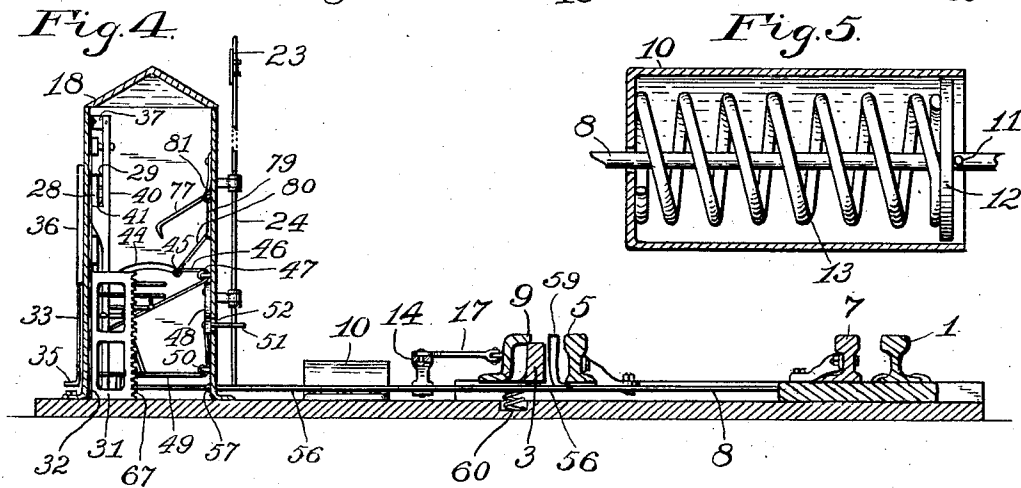
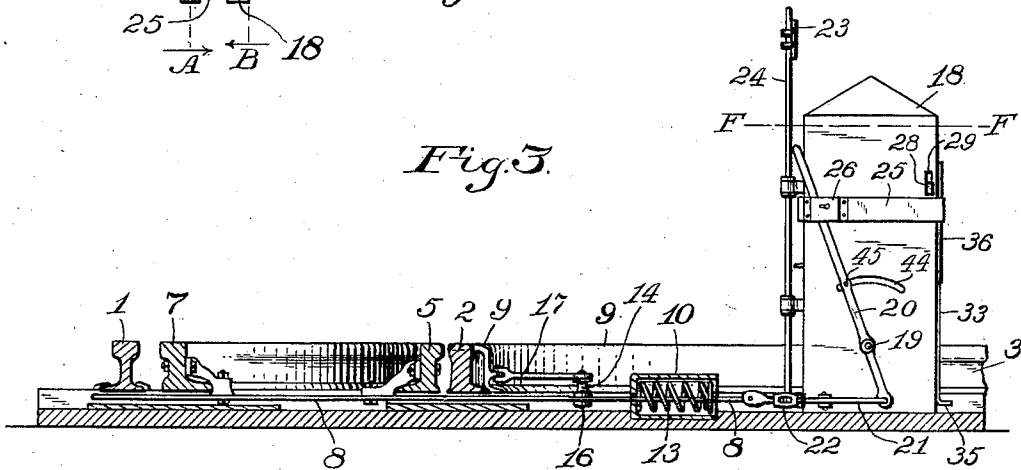
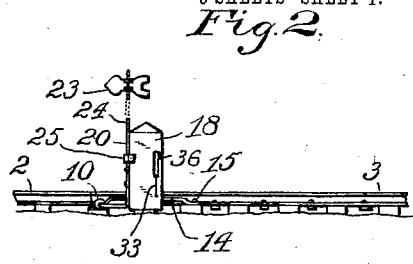
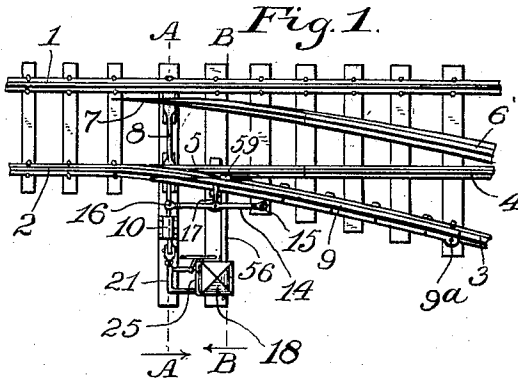


No. 869,009.

PATENTED OCT. 22, 1907.

O. MORKERT.
AUTOMATIC RAILWAY SWITCH ADJUSTER.
APPLICATION FILED MAY 27, 1907.

3 SHEETS-SHEET 1.



WITNESSES:

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M. D. Beatty.

INVENTOR:

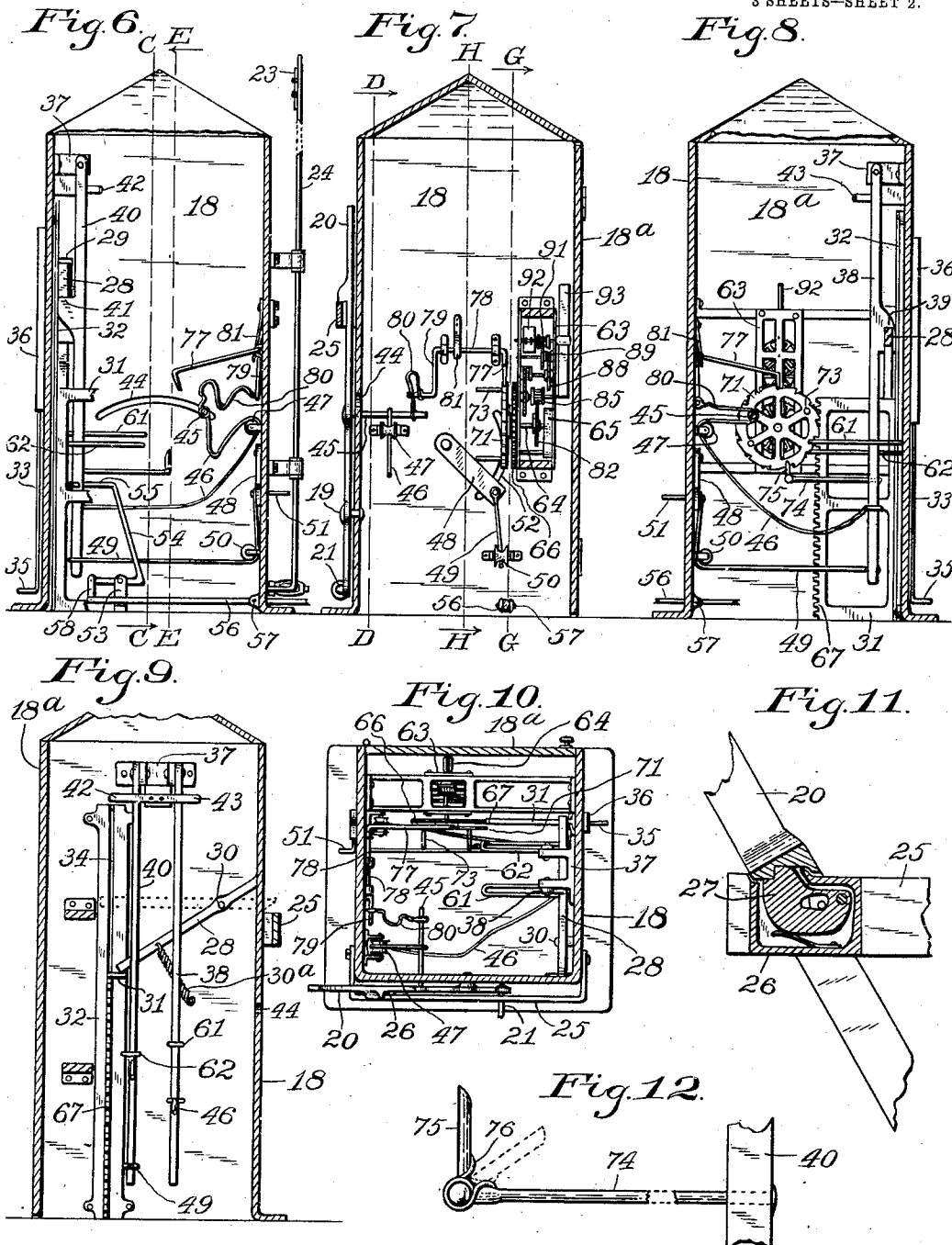
Owen Morkert,
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3 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

OWEN MORKERT, OF PERRY TOWNSHIP, TIPPECANOE COUNTY, INDIANA.

AUTOMATIC RAILWAY-SWITCH ADJUSTER.

No. 869,009.

Specification of Letters Patent.

Patented Oct. 22, 1907.

Application filed May 27, 1907. Serial No. 375,846.

To all whom it may concern;

Be it known that I, OWEN MORKERT, a citizen of the United States, residing in Perry township, in the county of Tippecanoe and State of Indiana, have invented certain new and useful Improvements in Automatic Railway-Switch Adjusters; and I do declare the following to be a full, clear, and exact description of the invention, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to apparatus for automatically adjusting or closing railway switches after they have been opened or set for side tracks, so that trains running on the main tracks may be prevented from running into sidings accidentally.

The object of the invention is to provide an automatic railway switch adjuster comprising mechanism that may be depended upon to operate reliably for closing switches which may have been carelessly left open by those using the switches, a particular object of the invention being to improve and simplify switch adjusting apparatus in order to enable operators to adopt automatic adjusters at reasonable expense for preventing wrecks at switches, due to trains running into open switches, a further object being to provide an automatic switch adjuster which may be controlled by separate mechanism, either instantly after having been used or at predetermined time afterward.

A still further object of the invention is to provide an automatic switch adjuster which may be connected to ordinary split switches with little or no alteration in the commonly used rails and switch apparatus, which improved apparatus may be so constructed as to be durable, efficient and economical in use.

The invention consists in an automatic switch adjuster comprising an operating spring for closing the switch, a lever for opening the switch, mechanism for latching the lever, automatic mechanism for releasing the latch at a predetermined time after the lever has been latched, an automatic mechanism to be controlled by car wheels for releasing the latch, and mechanism controlled by the car wheels for delaying action of the operating spring until the wheels have passed from the switch points. And the invention consists further in the novel elements and combinations and arrangements of elements as hereinafter particularly described and referred to in the appended claims.

Referring to the drawings Figure 1 is a fragmentary plan view showing a railway switch and section of railway track in connection therewith, and the improved switch adjuster arranged in connection therewith; Fig. 2, a fragmentary side elevation thereof; Fig. 3, a transverse sectional view approximately on the line A A in Fig. 1; Fig. 4, a transverse sectional view approximately on the line B B in Fig. 1; Fig. 5, a sec-

tional view of the housing of the operating spring and the spring mounted therein; Fig. 6, a fragmentary sectional view reproducing portions of the apparatus shown in Fig. 4, being approximately on the line B B in Fig. 1; Fig. 7, a fragmentary sectional view approximately on the line C C in Fig. 6; Fig. 8, a fragmentary sectional view approximately on the line D D in Fig. 7; Fig. 9, a fragmentary sectional view approximately on the line E E in Fig. 6; Fig. 10, a fragmentary horizontal sectional view approximately on the line F F in Fig. 3; Fig. 11, a fragmentary sectional view showing an automatic lock for the operating lever of the switch; Fig. 12, a fragmentary view showing a portion of the mechanism for releasing the lever latch at a predetermined time; Fig. 13, a fragmentary vertical sectional view similar to Fig. 6, but showing parts of the mechanism in different operative positions; Fig. 14, a fragmentary vertical sectional view approximately on the line G G in Fig. 7, with parts of the mechanism shown in different positions to that in which they appear in Figs. 4, 6, 8, 9 and 13; Fig. 15, a fragmentary vertical sectional view approximately on the line H H in Fig. 7 showing parts of the mechanism in positions different from those in preceding figures; Fig. 16, a fragmentary side view of the gearing in a portion of its frame turned down horizontally which is used for releasing the operating lever latch to close the switch at a predetermined time; Fig. 17, a fragmentary sectional detail showing parts of the gearing; Fig. 18, a side elevation showing parts of the gearing; and, Fig. 19, a fragmentary sectional view as on the line B B in Fig. 1, showing modifications in the construction of the apparatus for releasing the operating lever latch.

Similar reference characters in the drawings designate corresponding elements or features throughout the different figures thereof.

In the drawings the numeral 1 designates the continuous main track rail; 2, the main track rail that is deflected to form one of the siding rails 3, a portion of the latter being especially constructed for the purpose of invention; 4, the main track rail having a switch point 5 that normally connects with the rail 2; 6, the other siding rail having a switch point 7 that is connected by a switch rod 8 for throwing the switch point 7 against the rail 1, and moving the switch point 5 away from the rail 2 for opening the switch or setting it for the siding. A portion of the siding rail 3 is lower than the other rails and has a shifting rail 9 movable laterally thereon, the shifting rail 9 being connected at one end thereof by a pivot 9^a to a suitable connection so that the pivoted end lies upon the rail 3, while the other end of the rail 9 may be shifted slightly when the switch is shifted, but when the weight of a locomotive or car is on the rail 9, neither it nor the switch can be shifted, as will further appear.

A housing 10 is secured near the switch rails, and the

switch rod 8 extends through the housing and is provided with a suitable stop 11 against which is seated a plate 12, and an operating spring 13 is seated against one end of the housing and against the plate 12, so that the spring will normally force the switch rod 8 in the direction necessary to close the switch as in Fig. 1, so that a train cannot enter the siding. A lever 14 is mounted at one end thereof on a stationary pivot 15 near the rail 3, and is connected by a pivot 16 at its other end to the rod 8, a rod 17 connecting the lever 14 to the rail 9 at its free end, whereby the switch points and the rail 9 are connected together.

A switch stand 18 is suitably constructed and mounted in a stationary manner near the housing 10, and has a pivot 19 on which an operating lever 20 is mounted between its ends, the lower end of the lever having a rod 21 connected thereto which is connected by a turn buckle 22 to the switch rod 8. A target 23 or indicator is secured to the top of a staff 24 which is mounted on the switch stand 18 and connected to the rod 21 for indicating the position of the switch. The housing 18 is provided with a guard 25 on the exterior thereof which permits the lever 20 to operate between it and the housing, and the guard is provided with a lock 26 having an automatic locking device 27 which may be operated by a suitable key, the device 27 being adapted to automatically lock the lever 20 when the switch is closed or set for the main track, and the lever may be unlocked by manipulating the device 27 so as to withdraw the latter from contact with the lever. The housing 18 forms an upright inclosure for other mechanism, as will further appear.

A lever latch 28 is mounted in the switch stand so as to be projectible through an opening 29 in one side of the stand, the latch being preferably mounted on a pivot 30 so that one end of the latch may be projected through the opening when the opposite end of the latch swings about the pivot, one end of the latch constituting an operating arm for its control, and when the arm is pulled by a spring 30^a and descends the latch will be withdrawn within the stand, and in order to project the latch through the stand to latch the lever 20, a cross head 31 is arranged under the operating arm of the latch in a guide 32, and is provided with an operating rod 33 that extends through a slot 34 in a side of the switch stand, the slot being provided with a cover 36 so that by means of the handle 35, the cross head may be lifted to operate the latch 28. A pivot block 37 is secured in the upper portion of the switch stand. A tumbler bar 38 is pivoted at one end thereto and provided with a lug 39 for engaging the operating arm of the latch 28 to hold it when the latch is withdrawn and normally prevent operation of the latch. Another tumbler bar 40 having a lug 41 is pivoted also to the pivot block 37 so that both tumbling bars extend downwardly and swing towards or from the operating lever of the latch 28, the lug 41 being adapted to engage and hold the latch 28 when it is projected to lock the lever 20. Springs 42 and 43 normally hold the tumbling bars towards the latch 28. The side of the stand 18 on which the lever 20 is mounted has a curved slot 44 therein in which operates an arm 45 that is secured to the lever 20, and a cable 46 is connected to the arm and runs over a guide pulley 47 which is mounted in the stand, the cable being connected to the tumbler bar 38

for withdrawing it from the latch 28, while the operating lever 20 is opening the switch so that the operating lever may be fastened temporarily by the latch 28. The other tumbling bar 40 may be operated by hand to release the latch 28 by means of an arm 48 which is pivoted in the switch stand and a cable 49 that is attached to the arm and connected to the tumbling bar 40, the cable being guided by a pulley 50 that is suitably mounted in the stand, the arm 48 being provided with an operating handle 51 that extends to the exterior of the switch stand through a slot 52.

The tumbling bar 40 ordinarily will be operated automatically by suitable mechanism. A fulcrum stand 53 is supported in the switch stand 18 and pivotally supports a bell crank 54 that has a hook 55 connected to the tumbling bar 40. A lever 56 is arranged horizontally and mounted on a pivot 57 within the switch stand, the lever being connected by a rod 58 to the bell crank 54. The lever 56 extends to and under the rail 3 and is provided with a push bar 59 that stands close to the gage side of the rail 3 and flush with the tops of the rails to be engaged by the flange of a passing wheel of a train on the track, so as to be depressed for disengaging the tumbling bar 40 from the latch 28. The push bar 59 is held in its normal position by a spring 60 suitably mounted under the lever 56 at or near the rail 3. The tumbling bars 38 and 40 are provided with guides 61 and 62 respectively to prevent lateral play thereof.

In order to close the switch automatically at a predetermined time, as for instance ten minutes or fifteen minutes after the switch has been opened, a suitable mechanism is provided for timing the operations, and such mechanism may be variously constructed. A suitable train of gearing is illustrated herein comprising a frame 63 in which is mounted a rotative main shaft 64 provided with a power spring 65 that is connected to the shaft and also to the frame, there being a winding gear wheel 66 mounted rotatively on the shaft and connected with a rack bar 67 that is attached to the cross head 31, and a ratchet wheel 68 is secured to the shaft 64 adjacent to the wheel 66, the latter having a pawl 69 mounted thereon and engaging the ratchet wheel 68, so that the spring 65 will be wound partially every time the cross head 31 is operated. The spring may also be wound independently by means of a key 64^a on the shaft 64. A ratchet wheel 70 is secured also to the shaft 64, and adjacent to it a ratchet wheel 71 is mounted rotatively on the shaft and provided with a pawl 72 that engages the ratchet wheel 70, the wheel 71 being provided with one or more laterally extending pins 73. An arm 74 is secured rigidly to the tumbling bar 40 and has a finger 75 pivoted thereto that is normally held in operative position by a spring 76, the finger 75 being held in the path of the pin or pins 73 so that the tumbling bar 40 may be operated when the wheel 71 is actuated in the proper direction, and if the wheel 71 is turned in reverse direction it may proceed by reason of the finger 75 yielding when engaged. A dog 77 is attached to a rock shaft 78 which is suitably journaled in the stand 18 and provided with an operating arm 79 to which is connected a cable 80 that is connected also to the arm 45. The dog 77 will normally engage the ratchet wheel 71 to prevent the timing mechanism from operating, and when the dog

is disconnected by the operation of the operating lever 20, the mechanism will begin operations. The shaft 78 is provided with a friction spring 81 to prevent accidental movement thereof. A gear wheel 82 is mounted rotatively on the shaft 64 and is provided with a pawl 83 which engages a ratchet wheel 84 that is secured to the shaft 64. A gear wheel 82 engages a suitably mounted pinion 85 which drives a gear wheel 86, and this drives a pinion 87 which in turn drives a gear wheel 88 that rotates with it, the latter engaging and driving a pinion 89 whereby a gear wheel 90 is rotated, the latter engaging and driving a pinion 91 that is mounted on a shaft provided with fan blades 92 and 93 that retard the motion of the mechanism, and consequently control the period of time at which the switch is to be closed. The time may be varied by changing the sizes of the fan blades or the number thereof.

The apparatus for locking the lever latch 28 may be simplified somewhat by employing the construction shown in Fig. 19, in which an arm 94 is connected by a pivot 95 to the lever 56 to take the place of the tumbling bar 40, the arm having a lug 96 to engage the latch 28. A link 97 which is flexible, is connected to the lever 56 and also to the arm 94 for drawing the latter away from the latch 28, and a spring 98 is secured to the arm 94 and engages the lever 56 to push the arm 94 toward the latch 28, this construction being desirable in simple forms of apparatus, especially if the timing mechanism is not desired.

It is to be understood that the term "cable" used herein, is intended to mean a fabric cord, or a chain or a wire cable.

In practical use in order to open the switch to the siding, the operating lever 20 is to be moved against the pressure of the spring 13, the lever of course being previously unlocked, and the lever will be moved to the opposite end of the guard 25 and held by hand while the handle 35 is to be lifted so as to operate the latch 28 to hold the lever, the latch itself being locked by the tumbling bar 40. The movement of the cross head 31 in operating the latch 28 will cause the spring 65 to be wound about the shaft 64. During the movement of the lever 20, the arm 45 will pull on the cable 46 and withdraw the tumbling bar 38 so as to release the latch 28, to permit the latch to be projected in front of the lever 20, and the movement of the arm 45 will pull on the cable 80 and cause the dog 77 to be disengaged from the ratchet wheel 71 so that when the lever 20 is latched temporarily, the switch being open, the timing mechanism will be in operation until the wheel 71 has traveled the desired portion of a revolution, when the pin 73 will engage the finger 75 and thereby actuate the tumbling bar 40 so that the latter will release the latch 28, and it in turn will release the lever 20, permitting the spring 13 to close the switch and shift the lever 20 which will become automatically secured by means of the lock 26.

In order to be certain that the switch will be closed promptly after having been used, it may be desirable to close it immediately, and this will be done when the wheels of the train going in or out of the siding pass over the rail 9, a wheel flange pressing down the push bar 59 which will cause the tumbling bar 40 to release the latch 28, and then the latch will withdraw so as to release the operating lever 20, but the spring 13 will not

shift the switch until the wheels pass from the rail 9, being prevented by the lever 14, or in passing out of the switch the re-adjustment of the switch cannot take place until the last wheel passes from the switch point 7, after which the spring 13 will instantly close the switch. If the instantaneous closing mechanism fails from any cause to act then the timing mechanism will act in the predetermined time. If desired however, the spring 60 may be removed so that the tripping of the lever 56 will not take place by means of the wheel flanges, or if this arrangement is preferred to be used it is evident that the timing apparatus may be disconnected if it is not desired to use it.

Having thus described the invention, what is claimed as new is—

1. An automatic railway switch adjuster including an operating lever, a latch for the lever, a tumbling bar to hold the latch in engagement with the operating lever, a key-lock to automatically engage and hold the operating lever securely, and a spring to force the operating lever away from the latch when released therefrom and into engagement with the key-lock.
2. An automatic railway switch adjuster including an operating lever, a movable latch for the lever, a tumbling bar to hold the latch in engagement with the operating lever, means for moving the latch into engagement with the operating lever and simultaneously into engagement with the tumbling bar, a key-lock to automatically engage and hold the operating lever securely, and a spring to force the operating lever away from the latch when released therefrom and into engagement with the key-lock.
3. An automatic railway switch adjuster, including an operating lever, a movable latch for the lever, a tumbling bar to hold the latch in engagement with the operating lever, means for moving the latch into engagement with the operating lever and simultaneously into engagement with the tumbling bar, a tumbling bar for normally engaging the latch to prevent movement thereof into engagement with the operating lever and having operating devices connected therewith and also with the operating lever for releasing the latch during advance of the operating lever towards the latch, a key-lock to automatically engage and hold the operating lever securely, and a spring to force the operating lever away from the latch when released therefrom and into engagement with the key-lock.
4. An automatic railway switch adjuster including an operating lever, a movable latch for the lever, a locking device to hold the latch in engagement with the operating lever, means for moving the latch into engagement with the operating lever and the locking device, a key-lock to engage and hold the operating lever securely, track rails, switch-points cooperating with the track rails and connected with the operating lever, a pivoted lever connected with the locking device to disengage it from the latch and having a push bar thereon at a side of a track rail, and a spring to move the switch points and force the operating lever away from the latch when released therefrom and into engagement with the key-lock.
5. An automatic railway switch adjuster including main track rails, a pair of movable switch points, a switch rod connected to the switch-points, an operating lever connected to the switch rod, a movable latch for the operating lever, a locking device to hold the latch in engagement with the operating lever, means for moving the latch into engagement with the operating lever and the locking device, a key-lock to engage and hold the operating lever securely, a rotative shaft, means for normally rotating the shaft, a ratchet wheel mounted on the shaft to rotate therewith and provided with a projection, an arm mounted on the locking device and projecting into the path of the projection of the ratchet wheel, means for governing the speed of the rotative shaft, a dog to normally engage and stop the ratchet wheel, connections between the dog and the operating lever, and a spring to move the switch-points and force the operating lever away from the latch when released therefrom and into engagement with the key-lock.

6. An automatic railway switch adjuster including main
track rails, a pair of movable switch-points, a switch-rod
connected to the switch-points, an operating lever connected
to the switch rod, a movable latch for the operating lever, a
5 locking device to hold the latch in engagement with the op-
erating lever, means for moving the latch into engagement
with the operating lever and the locking device, a key-lock
to engage and hold the operating lever securely, a pivoted
lever connected with the locking device to disengage it
10 from the latch and having a push-bar thereon at a side
of a track rail, a shifting rail movable laterally on one of
the track rails, a pivoted lever connected to the shifting
rail and also to the switch rod, a rotative shaft, means for
normally rotating the shaft, a gear wheel rotative on the

shaft and operated by the means for moving the latch, con- 15
nections between the gear wheel and the shaft to rotate
the shaft, means for locking the shaft and having connec-
tion with the operating lever for the control thereof, means
connecting the shaft with the locking device of the latch, 20
and a spring to move the switch-points and force the op-
erating lever away from the latch when released therefrom
and into engagement with the key-lock.

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

OWEN MORKERT.

Witnesses:

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A. C. ULREY.