No. 677,007. J. N. WILSON. Patented June 25, 1901.

AUTOMATIC RAILWAY SWITCH.

(Application filed Nov. 28, 1900.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 1.

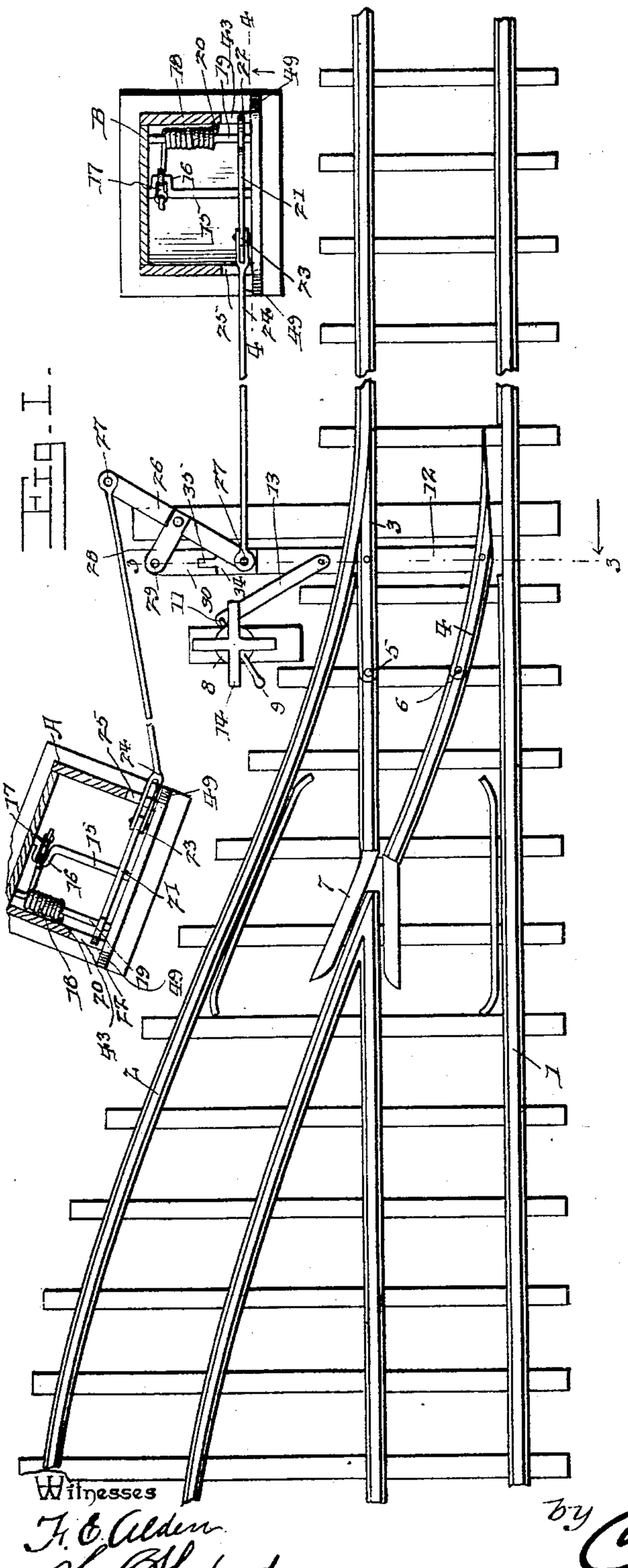
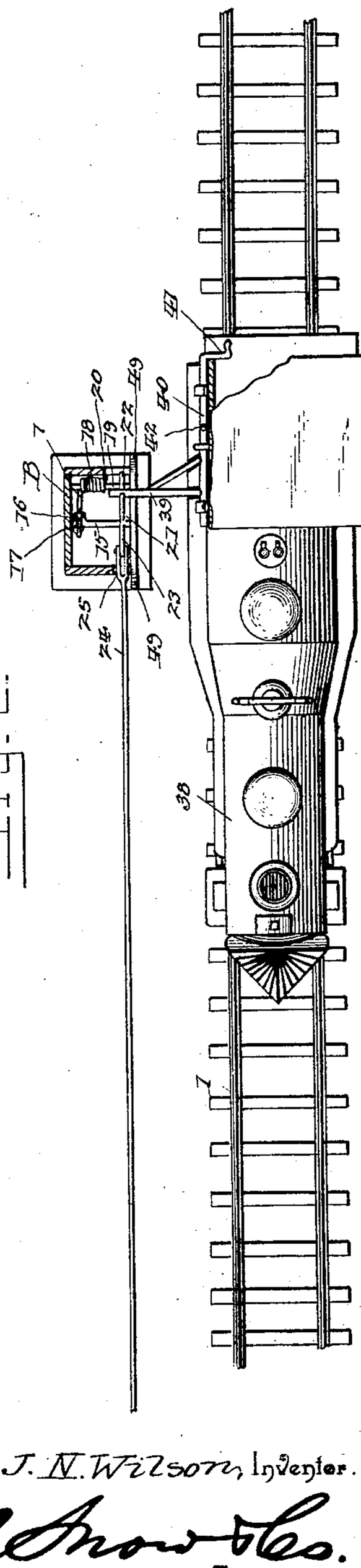


FIG. 2.



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(No Model.) 2 Sheets—Sheet 2.

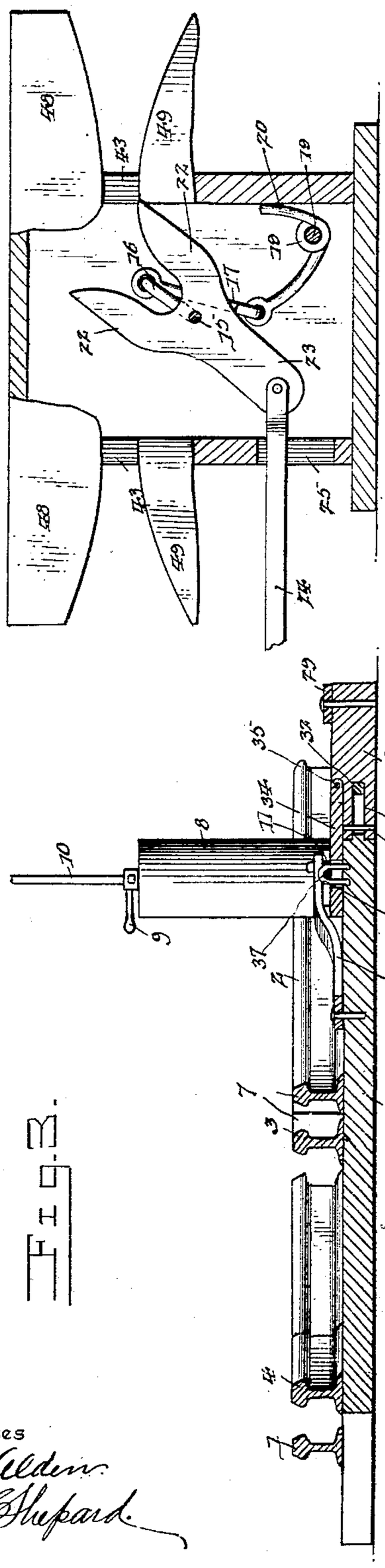

FIG. 4.

FIG. 3.

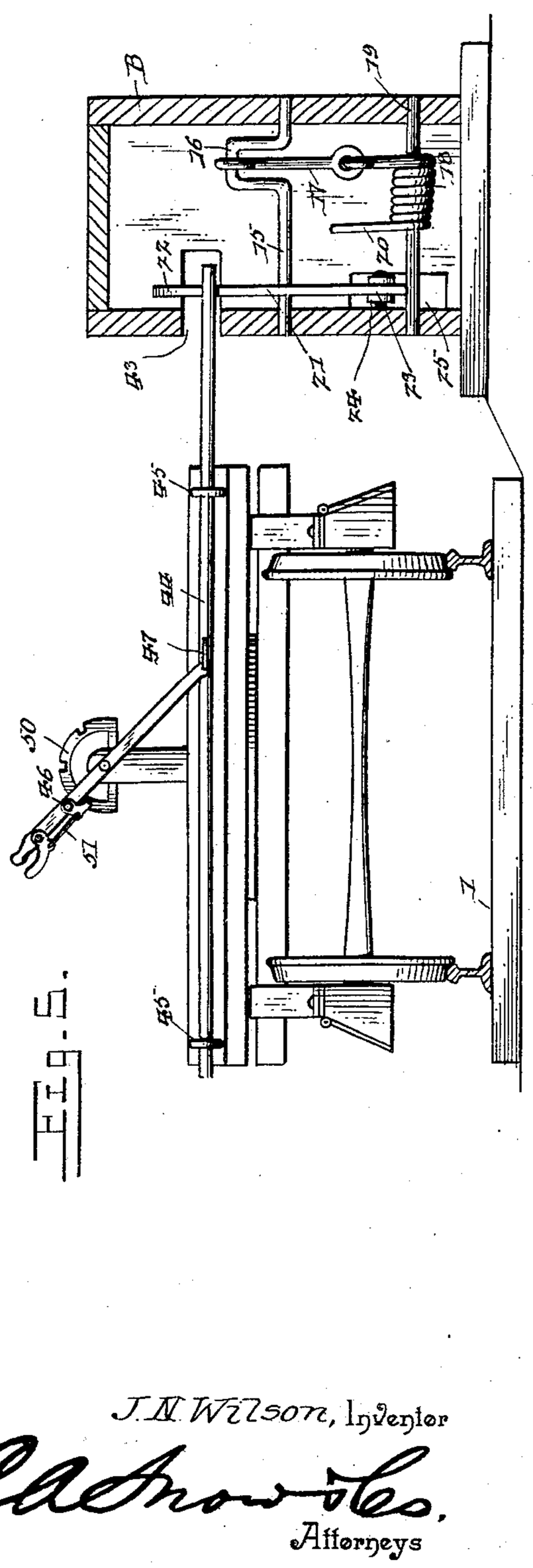

FIG. 5.

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UNITED STATES PATENT OFFICE.

JAMES NEWTON WILSON, OF BASIN SPRINGS, TEXAS.

AUTOMATIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 677,007, dated June 25, 1901.

Application filed November 28, 1900. Serial No. 38,032. (No model.)

To all whom it may concern:

Be it known that I, JAMES NEWTON WILSON, a citizen of the United States, residing at Basin Springs, in the county of Grayson and State of Texas, have invented a new and useful Automatic Railway-Switch, of which the following is a specification.

This invention relates to railway-switches, and has for its objects to provide for automatically throwing the switch by a passing train and to combine the present improved trip mechanism with an ordinary switch-stand, so that the latter may be operated by hand independently of the train-operated mechanism.

With these and other objects in view the present invention consists in the combination and arrangement of parts, as will be hereinafter more fully described, shown in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that changes in the form, proportion, size, and minor details may be made within the scope of the claims without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings, Figure 1 is a top plan view of a portion of a railway-track having the present switch-operating device applied thereto. Fig. 2 is a detail top plan view illustrating the manner of actuating the present trip mechanism from the locomotive of a train. Fig. 3 is an enlarged transverse sectional view taken on the line 3 3 of Fig. 1. Fig. 4 is an enlarged detail sectional view taken on the line 4 4 of Fig. 1. Fig. 5 is an elevation of the rear-end car of a train, showing the manner of actuating the trip mechanism to return the switch to its original position, the casing of the trip being in section.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

Referring to the drawings, 1 designates the main track, and 2 a siding, which is in connection therewith by means of the opposite movable switch-rails 3 and 4, which are pivotally connected to the respective intermediate fixed rail-sections 5 and 6, respectively, and the usual frog 7. Ordinarily the movable rail-sections are thrown or operated through the medium of an ordinary switch-stand 8, having a hand-lever 9, connected to a vertical shaft 10, mounted within the stand and provided at its lower end with a lateral arm 11. The free end portions of the movable rail-sections are connected by means of a switch-bar 12, which projects at the side of the track toward the switch-stand and is operatively connected to the arm of the shaft by means of a link or rod 13, so that by throwing the lever in either direction the movable rail-sections will be operated to open and close the switch. As is common, the shaft 10 is extended above the switch-stand and provided with a suitable signal 14 to indicate when the switch is open and when it is closed.

In carrying out the present design to automatically operate the switch by a passing train there is provided opposite trip mechanisms, which are duplicates in construction and are housed within the respective boxes or casings A and B, which are located at opposite sides of the switch-stand, so that one of the devices throws the switch-rails in one direction and the other throws them in the opposite direction, in order that the train may automatically return the switch to its original position after passing over the same. Each box or casing is substantially rectangular in shape and is provided with an intermediate rock-shaft 15, that is disposed transversely with respect to the track and has its opposite ends journaled in the adjacent sides of the box. Adjacent to that end of the shaft which is opposite the track there is provided a substantially U-shaped or double crank 16, which carries a link 17, having its free end connected to the free end of a coiled spring 18, that encircles a transverse rod 19, mounted adjacent to the bottom of the box. The opposite end 20 of the spring is secured to the adjacent end of the box. Fixed to the opposite end of the rock-shaft and adjacent to the inner face of the box there is provided a trip-head 21, which projects in opposite directions above and below the shaft. The upper portion of the head is bifurcated, so as to form a two-tined fork 22, the inner edges of which are rounded or beveled inwardly, so as to readily receive and guide the trip-actuating device into the bifurcated portion of the trip-head. This head is preferably in the form of a metal plate, and the lower portion thereof forms an arm 23 for engagement with

the adjacent end of a connecting-rod 24, whereby connection is had between the trip device and the slidable switch-bar for operating the movable switch-rails. A suitable opening 25 is provided in the inner end of the box for the reception of the connecting-rod.

The intermediate connection between the outer end of the connecting-rod and the movable switch-bar is formed by means of an intermediately-fulcrumed rock-lever 26, which is conveniently mounted upon an extension of one of the road-bed ties and has its opposite free ends pivotally connected to the respective connecting-rods 24, as indicated at 27. This rock-lever is normally disposed substantially transversely with respect to the track and is arranged adjacent to one side of the outer end of the movable switch-bar which projects beyond the track. An arm 28 projects laterally from the fulcrumed portion of the rock-lever and has its outer end connected to the adjacent end of the switch-bar by a pivotal connection 29, so that by operating the connecting-rods 24 simultaneously in opposite directions the lever 26 will be rocked, thereby moving the switch-bar endwise and throwing the switch-rails in one direction or the other.

In order that the switch-rails may be moved without also actuating the trip mechanism, the switch-bar has been formed in two sections 12 and 30, as best indicated in Fig. 3 of the drawings. The outer end portion 30 is comparatively small and has its inner end provided with a horizontal bifurcation 31 for the slidable reception of the vertically-slotted and intermediate tongue 32 of the other section, a stop-pin 33 passing through the bifurcated portion of the outer section and also through the slot of the tongue, so as to prevent endwise separation of the bar-sections. These sections are normally rigidly connected by means of a lock-bar 34, which has its outer end hinged to the upper side of the section 30, as indicated at 35, and overlaps the adjacent end of the other section, which carries a staple 36, that projects upwardly through a suitable slot or perforation in the free end of the lock-bar for the reception of a suitable lock 37 to prevent accidental release of the lock-bar. When the switch is to be operated by the train-operated trip mechanism, the bar-sections are rigidly connected, as will be understood; but when it is desired to operate the switch by hand and independently of the trip mechanism the lock 37 is removed and the lock-bar swung upwardly, as indicated by dotted lines in Fig. 3, so that the bar-section 12 may freely slide upon the bar-section 30, and thereby free to be operated from the switch-stand without also operating the trip mechanism. This is an important feature, as the springs of the trip mechanism are powerful, so as to guard against accidental operation of the device, and therefore difficult to be manually overcome by manipulation of the switch-stand.

The manner of actuating the trip mechanism is shown in Fig. 2, wherein has been shown a locomotive 38 approaching the first trip device and provided with a lateral trip-arm 39, which is carried by a rock-shaft 40, mounted longitudinally upon the outside of the cab of the locomotive and having a rear terminal-operating crank-handle 41 for convenient manipulation to throw the trip-arm outwardly into a substantially horizontal position for engagement with the upper bifurcated end of the trip-head 21 within the first trip mechanism. Normally the trip-arm hangs downwardly by reason of its weight and is thrown upwardly by manipulation of the crank-handle, the shaft being provided with a lateral stop projection 42 to strike against the side of the cab, and thereby limit the upward throw of the arm to insure the proper position thereof to engage the trip-head. The adjacent side of the box or casing of the trip mechanism is provided with a slot 43, as best shown in Fig. 5 of the drawings, for the reception of the outer end of the trip-arm 39, and the trip-head is normally inclined outwardly or toward an approaching train, as shown in Fig. 4, so that the outer tine of the fork is immediately below the entrance of the slot in order that the trip-arm may pass over the said tine and strike the inner edge of the opposite tine, thereby throwing the trip-head and the rock-shaft over into their opposite positions, drawing the connecting-rod 24 inwardly and through the rock-lever 26, and operating the switch-rails to open or close the switch, according to the arrangement thereof. Ordinarily the device is arranged so that the first trip mechanism will open the switch in order that the train may pass onto the siding.

It will be understood that the trip-heads within the respective boxes are normally inclined outwardly in opposite directions, so as to be tripped by a train approaching in either direction, and therefore when the first trip B is thrown inwardly the opposite trip will also be thrown inwardly through its connections with the rock-lever 26, and thus it is essential that the trip-arm on the locomotive be returned to its inoperative position before it reaches the other trip A, as otherwise the switch would be closed before the last car had passed therethrough. However, the trip-arm is automatically returned to its normally-inoperative position just as it leaves the first trip mechanism, as the weight of the arm is sufficient to throw it downwardly. After the last car has passed through the switch it is automatically opened to give a clear main track in the manner illustrated in Fig. 5 of the drawings. The rear end of the last car is provided with a trip-rod 44, which is longer than the width of the car, so that it may project at one side or the other thereof, and is also mounted to slide endwise in opposite directions through suitable guides 45, carried by the platform of the car. A suit-

able operating-lever 46 is fulcrumed intermediate of its ends upon some convenient portion of the car and has its lower end pivotally connected to an intermediate portion of the trip-rod by means of a swinging link 47, whereby the rod may be slid in opposite directions to project either end at the adjacent side of the car. Thus by throwing the trip-rod outwardly it will engage the trip mechanism A, and thereby close the switch.

It will of course be understood that the opposite end of the siding is also provided with a similar trip device for automatically operating the switch at said opposite end of the siding, whereby trains may be conveniently switched without requiring the manual operation of the switches.

It is preferable to house the trip mechanism within a box or casing in order that it may be protected from the weather, and the purpose of the slot 43 is to give access to said mechanism and also to form a guide for the trip-actuating device carried by the train, whereby said device is conveniently and effectively guided to the trip-head, and thus insures the proper engagement of the trip-actuating device with the rocking head.

As best illustrated in Fig. 1 of the drawings, it will be seen that the signal 14 is always in operative relation to the inner part of the switch-bar, which is directly connected to the movable switch-rails, whereby said signal is actuated whether the switch be operated from the switch-stand or by the train-operated switch mechanism, or, in other words, the signal is actuated by the movable switch-rails, no matter how the latter are thrown.

The locomotive and cars of a train have a lateral rocking motion, and to compensate for the consequent elevation and depression of the trip-operating device carried by the train, so as to insure a proper entrance thereof into the guide-slot in the boxing or casing, the latter is provided at each end of the guide-slot with the opposite longitudinally-disposed guide projections 48 and 49, the inner edges of which merge into the corresponding top and bottom edges of the slot and diverge outwardly therefrom, so as to form a wide entrance into the slot for the reception of the trip-operating device at either its upper or lower limit. These guides are preferably formed by extending the front of each casing in opposite directions and increasing the width of each end of the guide-slot 43, formed therein.

It is desirable to lock the trip-operating rod 44 against accidental longitudinal motion, and to carry into effect this object there is provided a segmental rack 50, as shown in Fig. 5 of the drawings, which is arranged concentrically with respect to the fulcrum of the lever 46, the latter being provided with a suitable ratchet device 51 to take into the respective notches or teeth of the rack, and thereby lock the rod 44 at its opposite limits and at its intermediate position.

Although I have shown the rock-lever 26 entirely exposed, it is designed to have the same housed within a suitable casing, with openings for the passage of the respective connecting-rods. Also the rod 10 of the switch-stand is designed to extend above the signal 14, as indicated in Fig. 1, so as to support and display an illuminated signal for use at night. Moreover, instead of mounting the trip-operating device upon the cab of the locomotive it may be mounted upon the forward portion of the boiler thereof, with the operating-handle located within convenient reach from the cab.

What is claimed is—

1. The combination with the movable rail-sections of a railway-switch, and the switch-bar thereof, of a train-operated switch mechanism therefor, comprising a box having a horizontal slot opening through opposite ends thereof, a spring-actuated rock-shaft mounted within the box and transversely of the slot, a trip-head fixedly connected to the rock-shaft and projecting at opposite sides thereof, one end of the trip-head being arranged transversely across the slot, and its opposite end having an operative connection with the switch-bar.

2. In a railway-switch, the combination with a switch-bar, of a train-operated trip mechanism, and a manually-operated switch-stand, both of which members are operatively connected to the switch-bar, and means for rendering inoperative the trip mechanism to permit of an operation of the switch-bar by the switch-stand without actuating the trip mechanism, for the purpose set forth.

3. In a railway-switch, the combination with a switch-bar, of a manually-operated switch-stand therefor, a tensioned train-operated trip mechanism also connected to the switch-bar, the tension upon said trip mechanism being substantially too great to be overcome by manual manipulation of the switch-stand, and means for disconnecting the trip mechanism from the switch-bar to permit of an operation of the latter by actuation of the switch-stand.

4. In a railway-switch, the combination of a switch-bar, a manually-operated switch-stand therefor, and a train-operated trip mechanism having an operative connection with the switch-bar, said connection being constructed to be rendered inoperative to permit of an operation of the switch-bar by the switch-stand without actuating the trip mechanism, for the purpose set forth.

5. In a railway-switch, the combination with the movable rail-sections thereof, of a two-part switch-bar, a slidable connection between the parts thereof, removable means for fixedly connecting said sections or parts, a manually-operated switch-stand operatively connected to that part of the switch-bar which

is directly connected to the movable rail-sections, and a train-operated trip device operatively connected to the other part of the switch-bar.

6. In a railway-switch, the combination with the movable rail-sections thereof, of a two-part switch-bar having its inner part connected to the movable rail-sections, and provided at its outer end with a slotted tongue, the outer part having a longitudinal bifurcation slidably receiving the tongue, a stop-pin extending transversely of the bifurcation and also through the slot of the tongue, a lock-bar hinged to the outer part of the switch-bar and overlapping the inner part thereof, detachable means for locking the lock-bar to the inner part of the switch-bar, and a train-operated trip device operatively connected to the outer part of the switch-bar.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES NEWTON WILSON.

Witnesses:
W. S. CRAVEN,
W. H. OMOHUNDRO.