

Fig. 1.

Witnesses
B. M. Offutt, P.
Philip S. McLean.

Inventor
R. B. Swank
Attorney

920,214.

R. B. SWANK.
RAILWAY SWITCH.
APPLICATION FILED MAY 7, 1908.

Patented May 4, 1909.
4 SHEETS—SHEET 2.

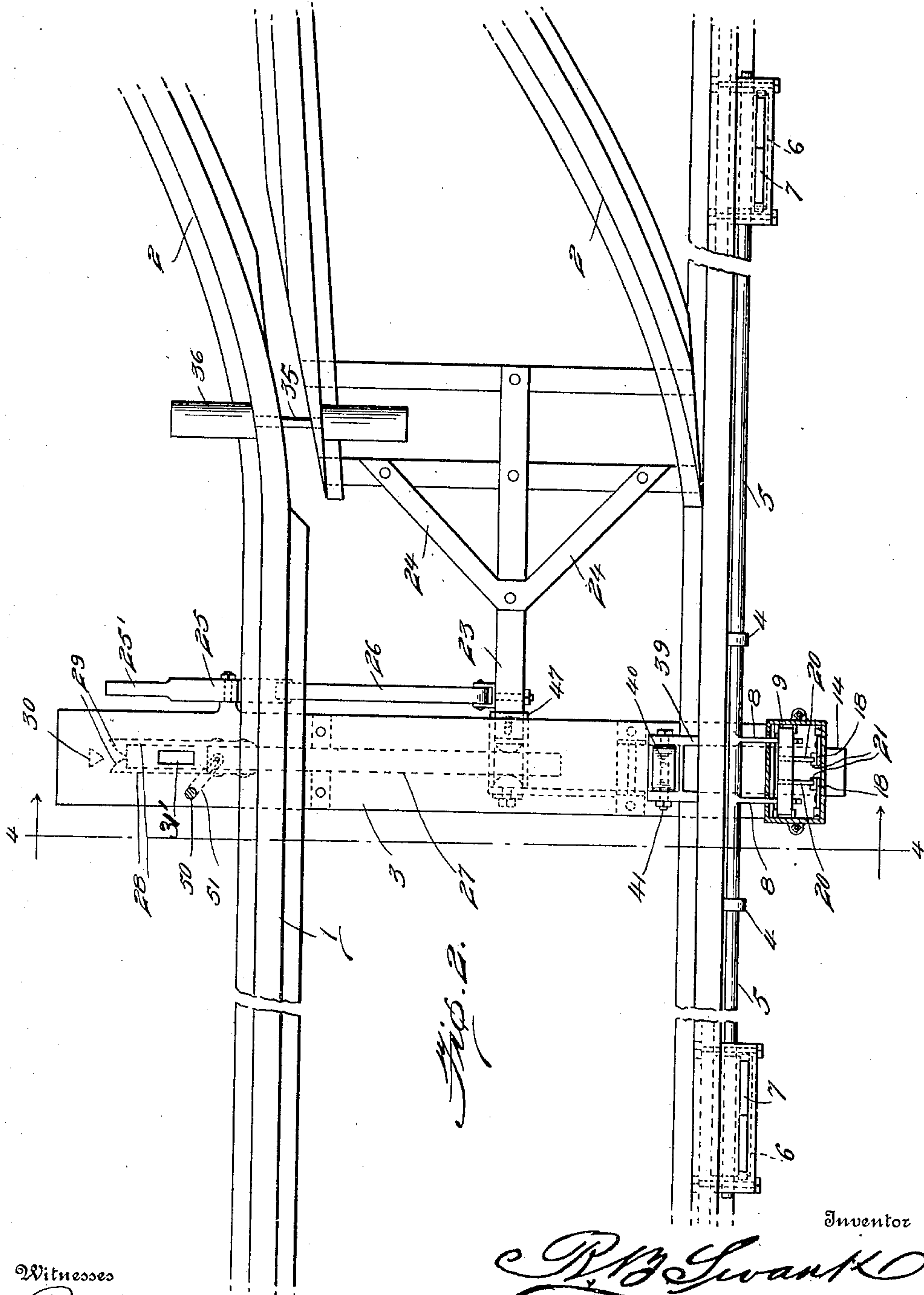


Fig. 2.

Witnesses
B. M. O'Leary
Philip S. McLean.

Inventor
R. B. Swank
By *John F. Moore*
Attorney

920,214.

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4 SHEETS—SHEET 3.

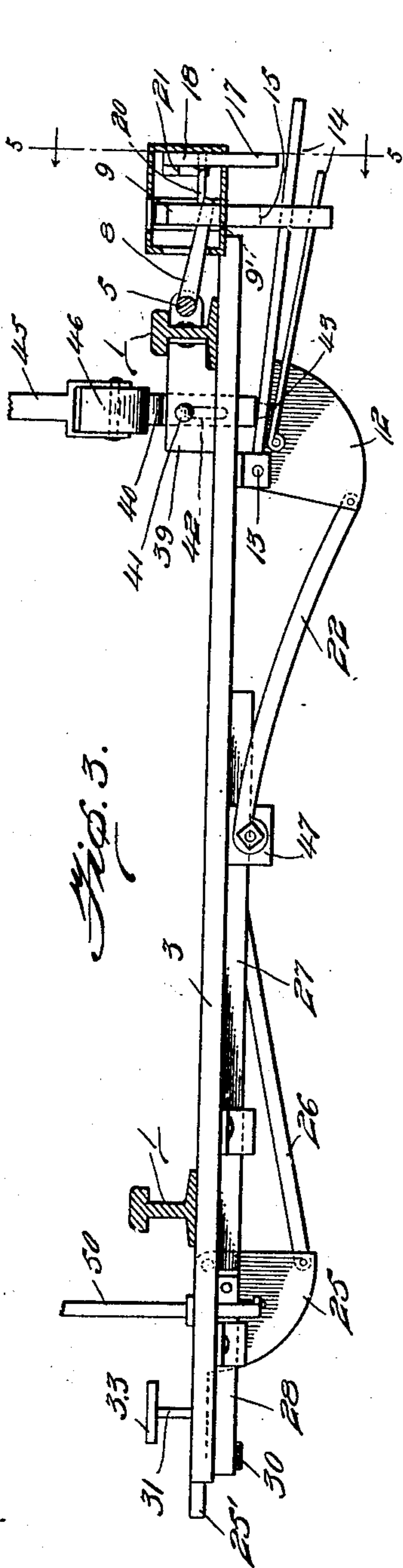


Fig. 3.

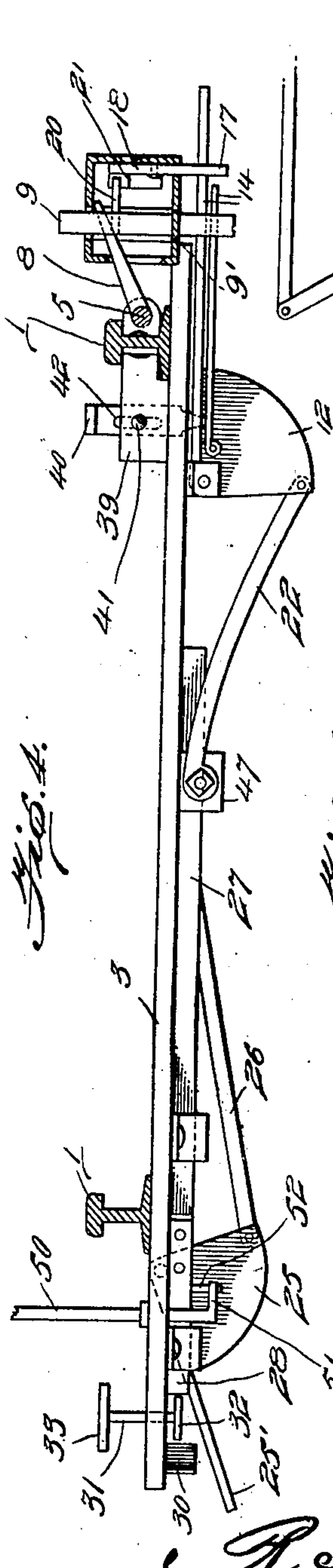


Fig. 4.

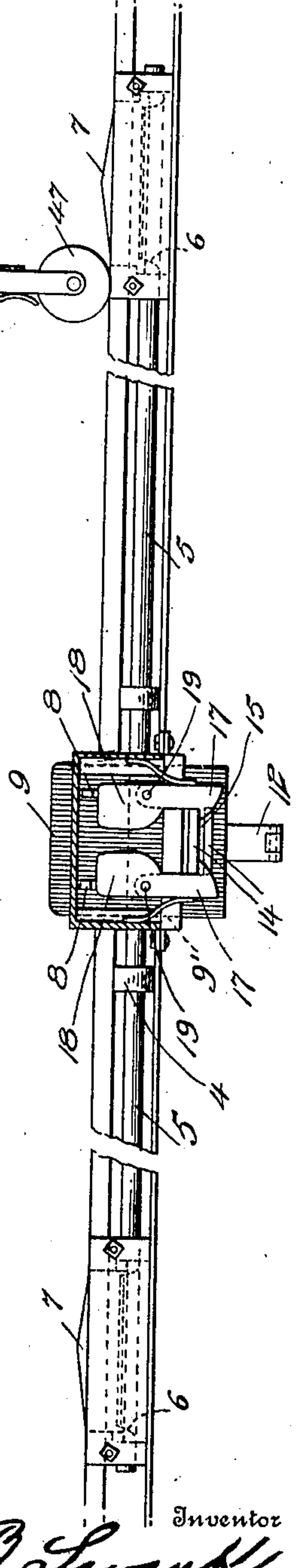


Fig. 5.

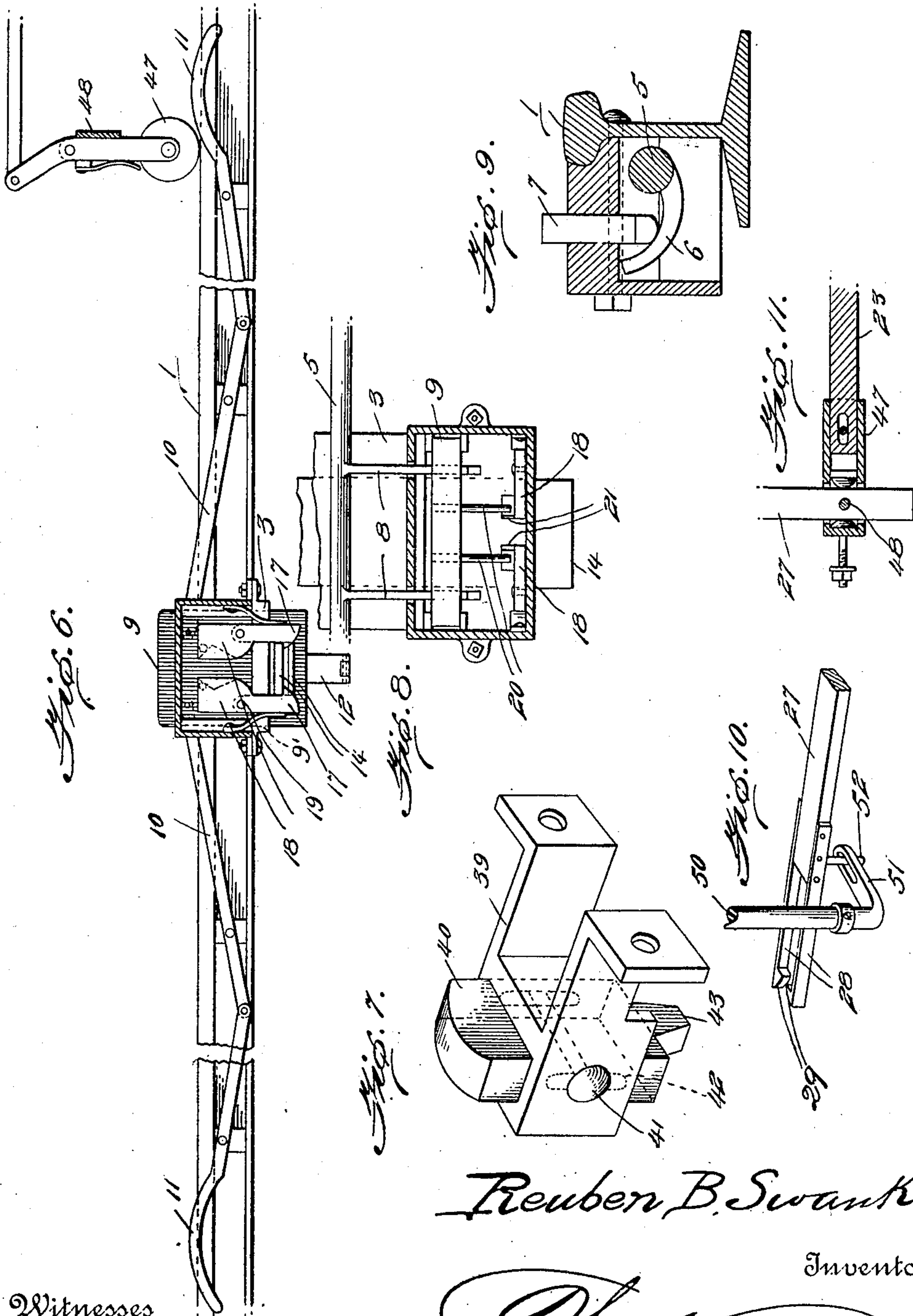
Witnesses
Philip S. McLean
Philip S. McLean.

Inventor
R. B. Swank
By *James P. Moore*
Attorney

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B. M. Offutt
Philip S. McLean

Reuben B. Swank
Inventor
By J. M. Moore
Attorneys

UNITED STATES PATENT OFFICE

REUBEN B. SWANK, OF DAYTON, OHIO.

RAILWAY-SWITCH.

No. 920,214.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, REUBEN B. SWANK, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Railway-Switches, of which the following is a specification.

My invention relates to improvements in railway-switches, and has for its object the provision of a device of this character which may be controlled from the train so that the switch may be operated at will or automatically, the impulse of the train serving as the motive power for operating the switch.

Another object of my invention is the provision of an automatically operated switch, means for automatically locking the same either open or closed, and safety mechanism for preventing accidental shifting of the switch.

A still further object of the invention is to provide a railway switch which may be operated either manually or automatically, which shall be of simple and durable construction, and which shall be practical and efficient in every particular.

Another object of my invention is to provide a device for use in connection with a switch or other such place to form an adjustable brace to hold the rails in the proper spaced relation and prevent spreading of the same.

With the above and other objects in view, my invention consists in the combination with the main or stationary track, switch rails, means for shifting the switch rails, means for locking the switch rails in any position, and means carried by the passing vehicles and controllable at will for releasing the locking mechanism and operating the shifting means to throw the switch.

The invention also comprises an automatic switch embodying certain other novel features of construction, combination and arrangement of parts substantially as disclosed herein and as illustrated in the accompanying drawings, in which:

Figure 1, is a top plan view of my improved railway switch, the switch being closed and locked in the normal position. Fig. 2, is a like view of the same, the switch being locked open. Fig. 3, is a cross sectional view of the track and switch taken on the line 3—3 of Fig. 1. Fig. 4, is a like

view taken on line 4—4 of Fig. 2. Fig. 5, is a side elevation of the switch and the operating means therefor. Fig. 6, is a similar view of a slightly modified form of operating means for throwing the switch. Fig. 7, is a detail view of the re-setting means operated by the latter part of the train to return the switch to normal position. Fig. 8, is an enlarged plan view of the means for locking the switch in the open position. Fig. 9, is a detail view of the rocker shaft mechanism and the depressible shoe for operating the same. Fig. 10, is a broken detail view of the lamp post attachment for the switch. Fig. 11, is a similar view of the joint between the slide bar and shift bar.

In the drawings: The numeral 1, designates the main track and 2, the switch or side track. A supporting plate 3, is secured to the base of the rails on the main track and extends across the track. The shifting mechanism for the switch is mounted on this supporting plate. Journaled in the brackets 4, and extending along the outside of the track is a rock shaft 5, which extends to a point some distance in advance of the switch proper. This shaft is provided with curved rocker arms 6, which are adapted to be contacted by the depressible block or shoe 7. This shoe is so disposed adjacent to the tread of the rail as to be depressed by the auxiliary switch-setting wheel 47, supported in bracket 48, depending from the locomotive, and thus communicate a partial rotation to the rock shaft. Rocker arms 8, are also provided on the rock shaft at a point over the supporting plate, the said rocker arms adapted to engage and depress the plunger 9, located in guideways 9', in the end of the supporting plate. The means for actuating the plunger may vary, for instead of using a rock shaft, a series of levers 10, may be fulcrumed to the side of the rail, as shown in Fig. 6, the adjacent ends of the levers being in engagement and the outer end of the last lever extending slightly above the tread of the rail and being rounded as at 11, so as to be contacted by the switch opening wheel and depressed, the levers in turn communicating the motion to the plunger and depressing the same. A quadrant member 12, is pivoted at 13, to the under face of the supporting plate so as to perform the functions of a bell crank.

14 represents a pair of superposed bars or

levers consisting of an upper and lower lever the upper lever extending out from about the fulcrum point of the crank lever 12, through an elongated slot or opening 15, in the plunger. The uppermost of the levers 14, is engaged by the oppositely disposed hooks 17, on the latch members 18, the latch members being pivoted to the outer end of the supporting plate at 19. The plunger is provided with lugs 20, near the upper end on its outer face, which when the plunger is depressed, are adapted to ride up on the inclined lugs 21, or projections on the inner face of the latch members, thereby rocking the latch members inward and freeing the hooks from engagement with the upper lever 14.

Pivoted to the lower arm or angle of the crank lever is the connecting rod 22, which is pivoted to the end of the shift bar 23, the shift bar being connected between the switch rails by means of the braces 24. Another angular lever 25, is pivoted to the supporting plate beneath the opposite rail, and this lever is actuated by the connecting rod 26, which has its inner end pivotally connected to the shift bar 23.

A slide bar 27, is mounted under the supporting plate and has its inner end connected to the shift bar so as to be shifted in unison with said bar. Secured on opposite sides of the end of the slide bar are the spaced latch springs 28, having coacting hooked ends 29. A stationary triangular lug or post 30, is mounted on the supporting plate which has a sharp entering edge so that as the slide is projected, the triangular post acts as a wedge, spreading the spring jaws and being engaged finally by the hooks on said jaws. To open the jaws, a key 31 is inserted through the opening 31', in the supporting plate between the spring jaws which carries a spreader 32, so that as the key is rotated by means of the lateral arms 33, on its upper end, the spreader causes the jaws to be opened or distended thereby freeing the triangular post, so that by depressing the arm 25' of the crank lever 25, the slide bar is withdrawn and the switch shifted, for the switch and slide bar act in unison. The hooks on the slide bar thus act as a lock for securing the switch in its normal closed position.

The switch is kept normally closed by means of the powerful coiled springs 34, the springs being mounted on opposite ends of the rod 35, and bearing upon opposite faces of the main and switch rails as shown in the top plan views. The springs are preferably inclosed in the cylindrical casings 36, to protect them from injury and keep them in working order. Another form of spring for shifting the switch and holding it closed is illustrated in Figs. 1 and 2, it being in the form of a bar spring 37 doubled upon itself

and engaged between the switch rail and main rail so as to hold the switch closed under tension. This form of spring preferably has angular ends 38, engaged in proper seats in the rails so as to hold the spring in position, and if desired this form of spring may be used in conjunction with the coiled springs as shown in the drawings to make sure of the proper closing of the switch. When the switch is so closed by reason of the action of the springs, it is locked in such position by means of the spring jaws on the slide bar making interlocking engagement with the stationary triangular post on the supporting plate.

After the switch has been thrown and a train passed onto the side track, the switch is automatically returned to its normal position in the following manner: A block or support 39, is arranged on the inner side of the outer rail on which is guided the vertical slide or plunger 40, the support carrying a retaining bolt 41, which passes through a slot 42, in the plunger slide and allows the same to have a limited vertical movement. The lower end of this re-setting plunger projects down through the supporting plate and rests on the stud 43, which is carried by the lowermost of the outstanding levers 14, the stud passing upward through a slot 44, in the upper lever. A depending post or bracket 45, is carried by the last car in the train, and a wheel 46, is journaled in said bracket. When the switch is open, the crank lever supports the re-setting plunger in the uppermost position as shown in Fig. 4. After the cars have gone in on the side track, the depending wheel carried by the last car, depresses the re-setting plunger. This plunger in its downward movement first engages the stud 43, carried by the lower trip lever, this lever in turn working in the slot in the switch setting plunger 9, drawing this plunger downward. This plunger when depressed, by reason of its cam connection with the latch hooks causes them to tilt outward thereby freeing the upper locking lever 14. After the hooks are thus disengaged or unlocked, the plunger in its further downward movement engages the upper pivoted lock lever, depressing the same, rocking the crank lever, which by reason of the connecting rod 26, shifts the switch over and closes it. The springs assist in closing the switch as soon as the latch hooks are released, and these springs are strong enough to force the switch closed when the hooks are released without any further depression of the plunger. When the switch is thus closed, it is locked by means of the spring jaws on the slide bar engaging with the triangular lug. The switch cannot then again be opened until the spring jaws are spread by means of the key to allow of their disengagement from

the locking lug and the angular arm of the foot lever 25, is depressed to throw the switch open, and when thus opened, the latch hooks again engage the locking lever to lock the switch open, so that the switch is positively locked in either the open or closed positions.

The brackets depending from the pilot of the locomotive and from the last car are both hinged so that by means of the levers 45, the auxiliary switch setting wheels carried thereby may be hinged up out of the way so as not to affect the switch. These wheels are controlled from the cab and from the last car respectively and when it is desired to go in on the switch, these wheels are hinged up so as not to contact the parts of the switch. The switch which is normally closed, is then unlocked by means of the key and is thrown open by depressing the foot lever, it being held locked open by means of the latch hooks. If it is desired to leave the switch in this open position, the bracket wheel on the last car is left up so as not to engage the plunger, but if desired to leave the switch in closed and locked position, this wheel is left down, so that as the last car passes over, the plunger is depressed by the wheel, the latch hooks released and the switch closed and locked in the manner before described. Both switch operating wheels are held down normally by means of the springs 46, so that the wheels normally act as a safeguard to prevent the train from accidentally running into an open switch, for if the switch be left open and the operating wheel carried by the pilot is down in the normal position, it will engage the shoe and cause operation of the rock shaft to actuate the plunger, which in turn will release the latch hooks to permit the springs to force the switch closed, the switch when so closed again becoming automatically locked by means of the spring jaws. The same result would be obtained by employing the lever construction operating means illustrated in Fig. 6. As the shift bar 23 of the switch has a swinging radial movement while the slide bar has only a straight sliding movement, the joint between the two bars must be of a yielding character to allow for the lost motion between the two bars. This is accomplished as shown in detail in Fig. 11, by providing a boxing 47, which is attached to the slide bar, and which receives the end of the shift bar, the bolt 48, connecting the two parts. In order to indicate the position of the switch in the dark, a lamp or other visible signal may be employed which is supported on the lamp post 50, the said post being journaled in an upstanding position on the supporting plate, the lower end of the post having an angular slotted extension 51, which is engaged by the pin or bolt 52, on the slide bar, so that as the slide bar is

operated in opening or closing the switch, the signal post is rotated accordingly to display the proper signals.

As the switch operating means, (either the depressible shoe or the lever construction shown in Fig. 6, according as to which form is used) is located considerably in advance of both ends of the switch, the resetting wheel usually carried by the last car may be dispensed with, because the switch setting wheel depending from the engine pilot has to be raised to allow the wheel to clear the switch setting mechanism located in advance of the switch to permit the train to run in on the switch, then after the train has passed the switch, the setting wheel may again be lowered in time to engage the second switch setting mechanism located beyond the switch. In this way the setting wheel carried by the pilot may be utilized for resetting the switch over which the train has just passed, or an additional resetting wheel may be carried by the last car in the manner before described.

From the foregoing description taken in connection with the drawings, the operation and advantages of my improved railway switch will be readily understood and appreciated, and it will be evident that I have produced a device which accomplishes all the objects herein aimed at in a satisfactory manner.

I claim:

1. In a railway switch, the combination of a slide-bar, a shift-bar connection between said slide-bar and the switch-rails, crank-levers connected to said shift-bar, one of said crank-levers, being adapted to force open the switch, resilient means for holding the switch closed, superposed levers carried by the other crank-lever means to engage one of said superposed levers for locking the switch open, means from the other superposed lever to release the means for engaging the first-referred to superposed lever, and means engaged by a passing train to actuate one of said crank-levers.

2. In a railway switch, the combination of a slide-bar, a shift-bar connection between said slide-bar and the switch-rails, crank levers connected to said shift-bar, one of said crank-levers being adapted to force open the switch, resilient means for holding the switch closed, superposed levers carried by the other crank-lever, locking hooks to engage the upper one of said superposed levers to lock the switch open, connections from the other of said superposed levers to release said locking-hooks, train actuated means for actuating one of said crank-levers means from said slide-bar to lock the switch closed.

3. In a railway switch, the combination of a slide-bar, a shift-bar connection between the switch-rails and said slide-bar,

crank-levers connected to said shift-bar, one of said crank-levers being adapted to force open the switch, resilient means for holding the switch closed, superposed levers carried
5 by the other of said crank-levers, locking hooks to engage the upper one of said superposed levers to lock the switch open, connections from the other of said superposed levers to release said locking means for
10 actuating one of said crank-levers, additional train-actuated means to release said locking hooks independent of the action of one of said superposed levers.

4. In a railway switch, the combination
15 of springs to hold the switch closed, a shift bar connected to the switch-rails, a slide-bar connected to the shift-bar, locking means carried on the slide-bar to hold the switch closed, means for releasing said lock, lever-
20 connections with the shift-bar for forcing the switch open, a lever operated by opening movement of the switch, and hooks adapted to engage the lever for locking the switch open.

25 5. In a railway switch, the combination of the main track, the switch, the supporting plate, the shifting mechanism mounted on the supporting plate, the rock-shaft having curved rocker arms, the depressible shoe
30 for engaging said rocker arms, the switch setting wheel supported from the locomotive, the rocker arms on said shaft over the supporting plate, the plunger adapted to be depressed by said rocker arms, guide-
35 ways for the plunger, a series of levers for actuating the plunger and the switch closing wheel for engaging said levers.

6. In a railway switch, the combination of the main track, the switch, elastic means
40 connected with said switch for closing the switch, the supporting plate, the shifting mechanism mounted on the supporting plate, the rock-shaft having curved rocker arms, the switch setting wheel supported
45 from the locomotive, the rocker arms on said shaft over the supporting plate, the plunger adapted to be depressed by said rocker arms, guideways for the plunger, a series of levers for actuating the plunger
50 and the switch closing wheel for engaging said levers.

7. In a railway switch, the combination of the main track, the switch, elastic means connected with said switch and consisting of
55 a coil spring arranged on one side of the switch and a spring of curved form arranged on the opposite side of said switch, the supporting plate, the rock-shaft having curved rocker arms, the switch setting wheel
60 supported from the locomotive, the rocker arms on said shaft over the supporting plate, the plunger adapted to be depressed by said rocker arms, guideways for the plunger, a

series of levers for actuating the plunger and the switch closing wheel for engaging
65 said levers.

8. A railway switch, springs to hold the switch closed, a shift bar connected to the switch rails, a slide bar connected with the shift bar, a lock carried by the slide bar to
70 hold the switch closed, means for releasing said lock, lever connections with the shift bar for forcing the switch open, levers operated by the opening movement of the switch, hooks engaging the levers to lock
75 the switch open, and depressible means and connections adapted to be acted upon by passing trains to release said hooks to permit closing of the switch.

9. A railway switch, a support connected
80 with the stationary rails of the switch, a slide bar mounted on said support, a shift bar connected between the switch rails and the slide bar, crank levers journaled to the support and connected with the shift bar,
85 one of the crank levers serving to force the switch open, springs tending to hold the switch closed, superposed levers carried by the other of the crank levers, hooks to engage the uppermost of the superposed levers
90 to lock the switch open, the lowermost lever being a trip lever and connections from the trip lever to release the locking hooks, means to be acted upon by passing trains to actuate the trip lever, means also to be acted upon
95 by passing trains to release the locking hooks independent of the trip lever, means carried by the slide bar to lock the switch closed, and means to release said last-named locking means.
100

10. In combination with a railway switch, a bowed spring interposed between the stationary main track rail and one of the movable switch rails, coil springs connected between the stationary switch rail and the
105 other movable switch rail to assist the bowed spring in holding the switch closed, and a protective casing inclosing the coil springs.

11. In a railway switch, the combination of a shift-bar connected to the switch-rails,
110 a slide-bar, provided with spaced-apart resilient-members having meeting hooked-ends, means adapted to engage said hooked ends for locking said slide-bar in position, and flexible connection between said shift-
115 bar and said slide-bar.

12. In a railway switch, the combination of a shift-bar connected to the switch-rails, a slide-bar provided with spaced-apart resilient-members, having meeting hooked ends,
120 means adapted to engage said hooked ends for locking said slide-bar in position said shift-bar having a slidable sleeve adapted to receive said slide-bar, said slide bar having pivotal connection with said sleeve.
125

13. A switch, a longitudinal shaft, de-

pressible members for rocking said shaft, devices carried by passing trains for operating the depressible members, means for locking the switch open, means tending to hold the switch closed, means for releasing the locking means, and connections whereby the rocking motion of the shaft operates the releasing means.

14. In combination with the switch rails, a slide bar connected with said switch rails, spring locking jaws carried by the slide bar, a locking lug to be engaged by said jaws, and means for spreading the jaws to free them of the locking lug.

15. In combination with the switch rails, a slide bar connected with the switch rails, means holding the switch normally closed, spring jaws carried by the slide bar, a locking lug to be engaged by the spring jaws, a

device for freeing the jaws from the locking lug, and means for opening the switch.

16. In combination with a switch, a slide bar connected with the switch rails, springs normally holding the switch closed, spring jaws carried by the slide bar and a locking projection to be engaged by the spring jaws, a device for freeing the jaws from engagement with the locking projection, means for opening the switch, means to lock the switch open, and means to release said last-named locking means.

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

REUBEN B. SWANK.

Witnesses:

A. STODINGS,
W. K. BODA.