

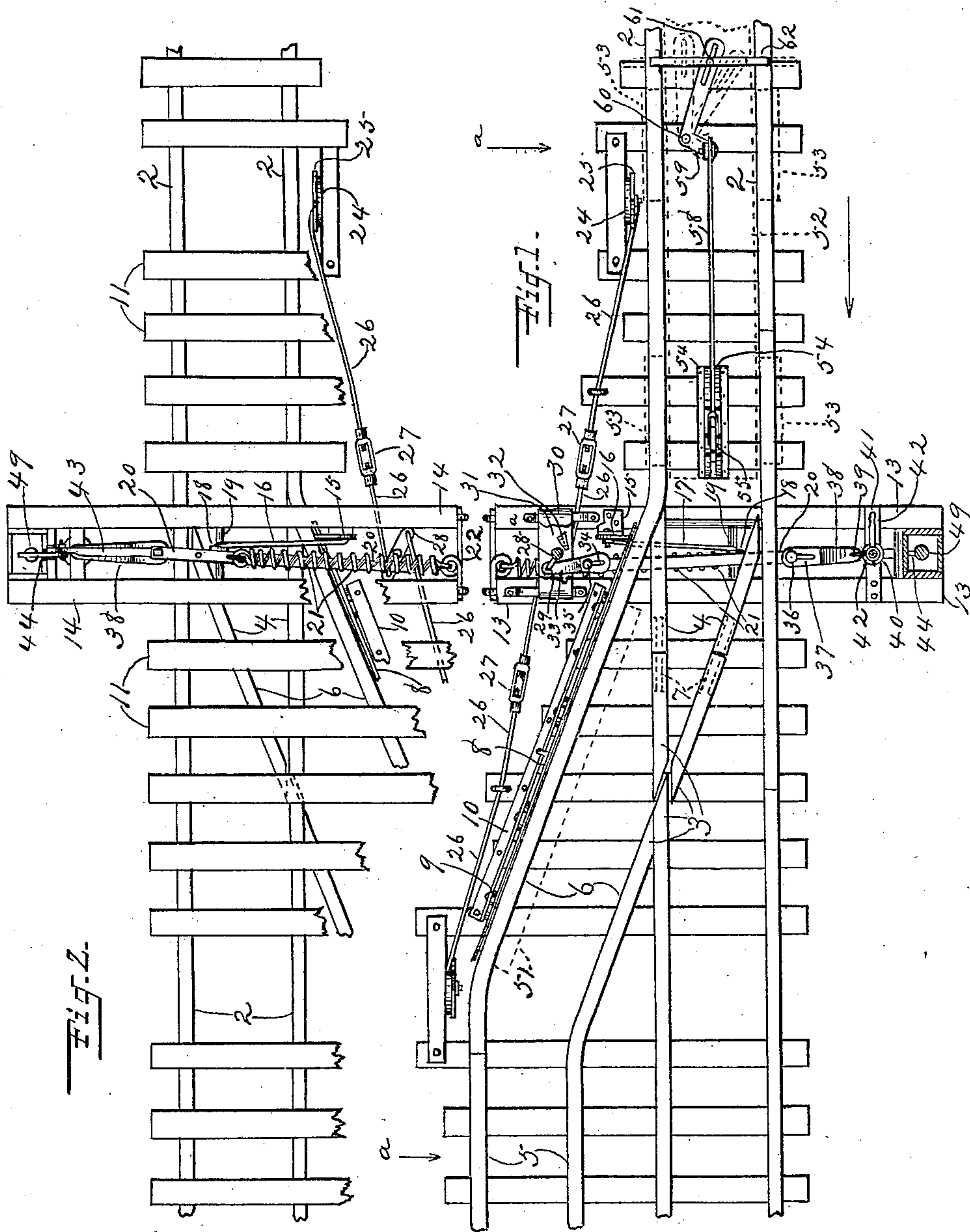
W. E. DEWEIN, G. S. ROBERTS & J. B. VAN PELT.  
AUTOMATIC SWITCH.

APPLICATION FILED APR. 3, 1908.

921,810.

Patented May 18, 1909.

3 SHEETS—SHEET 1.



WITNESSES:  
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J. M. Boston.

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By G. P. Richards,  
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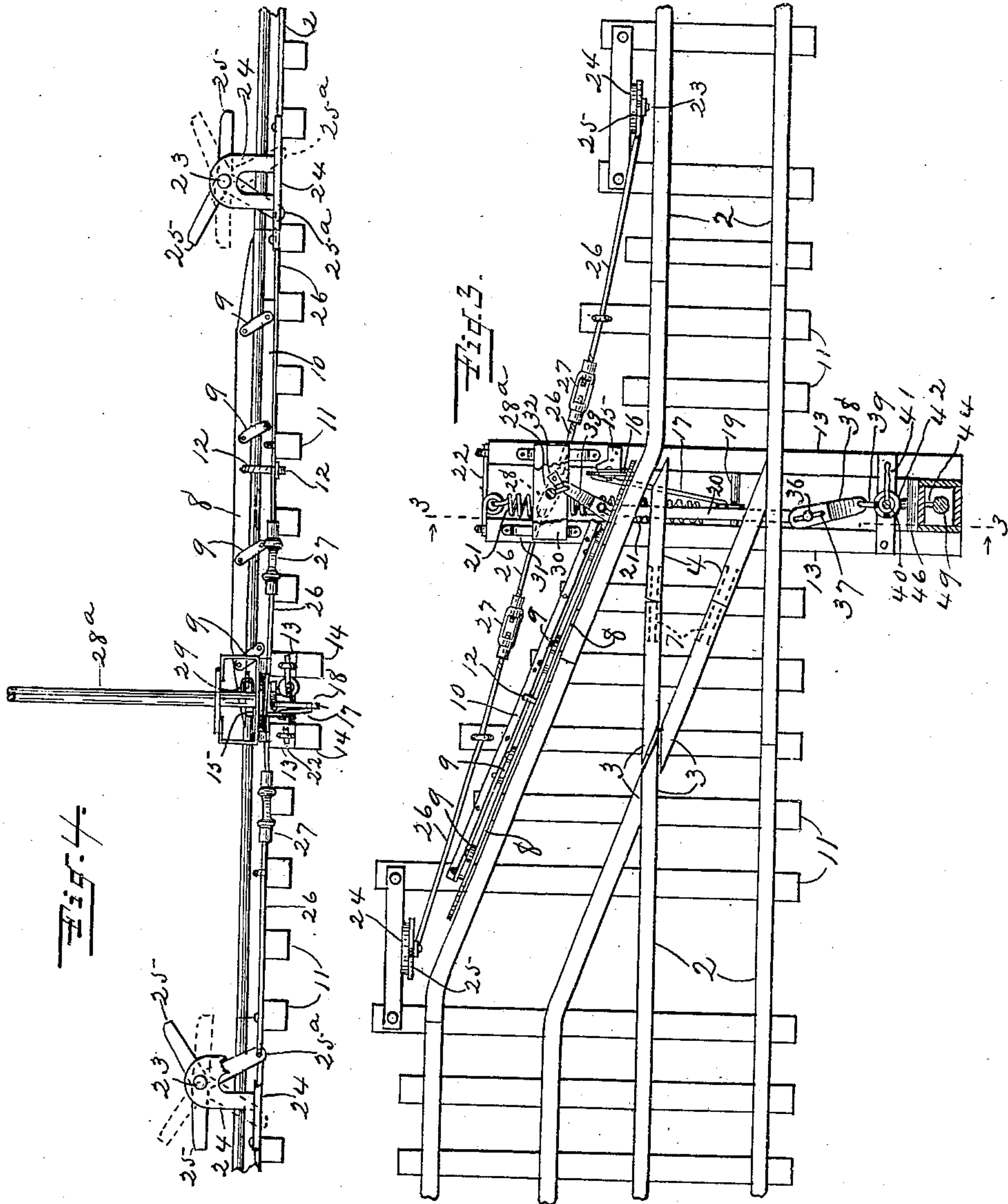
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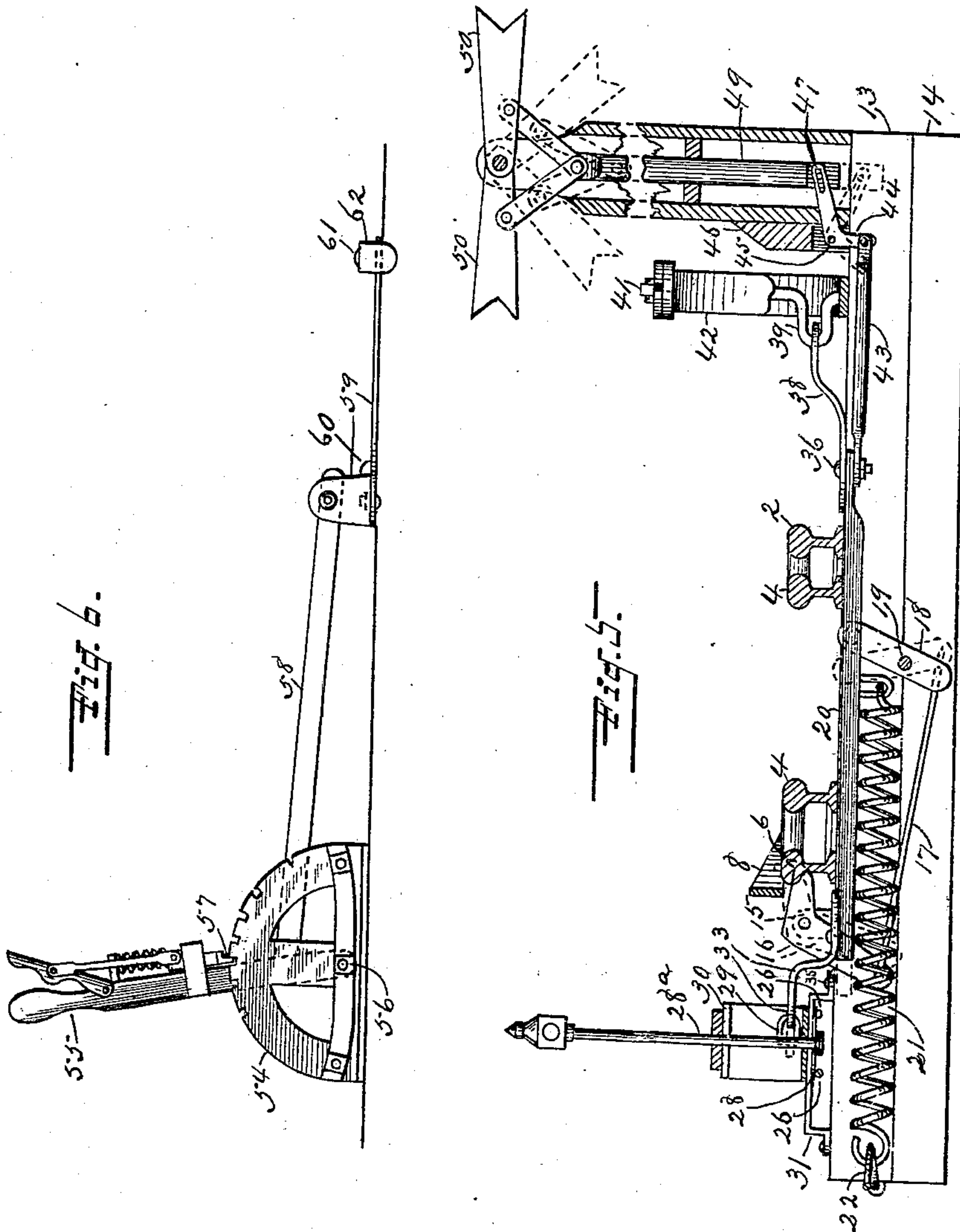
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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC SWITCH.

No. 921,810.

Specification of Letters Patent.

Patented May 18, 1909.

Application filed April 3, 1908. Serial No. 425,049.

*To all whom it may concern:*

Be it known that we, WILLIAM E. DEWEIN, GEORGE S. ROBERTS, and JOHN B. VAN PELT, citizens of the United States, and residents of Galesburg, in the county of Knox and State of Illinois, have invented a new and useful Automatic Switch.

The invention relates not only to the switch *per se*, but also to the semaphore, switch-stand, signal-lights and means by which they are actuated.

The necessity of a switch and its accompaniments which may be successfully and with certainty actuated by means carried by a train either approaching or leaving it is too well known to here require detailed recital. However, a brief resumé of the objects of the invention will be given.

Switches are frequently located at the lower edge of a hill or grade. In this event it is practically impossible to stop a heavy train at that point and then for a trainman to get off, throw the switch and the train get in motion to climb the hill. To obviate this, the train is stopped at the top of the grade, where the trainman gets off, runs to the switch, which is frequently a half-mile or more distant, and throws it, whereupon the train is run past the switch and onto the side track, or passing track, when the trainman throws the switch to again open the main track. To provide means whereby the engineer from his position in the cab controls the tracks, the semaphore, the switch-stand and lights, without stopping the train and without leaving the engine, constitutes one object of the invention.

To subserve economy in operating expenses, first, by saving in the running time, and second, in effecting a great saving of fuel, which is lost because of stopping and starting the train, constitutes another object of the invention.

To provide means whereby the switch may be manually operated constitutes still another object of the invention.

To provide means for automatically locking the switch after it has been likewise (automatically) thrown, and while the train is passing to and onto the side or passing track constitutes still another object of the invention.

To provide a simple and efficient means which may be carried on a suitable part of an engine or car and readily actuated by the

engineer or motorman to contact the trippable means which actuates the switch points, semaphore and signal lights constitutes another object of the invention.

To provide for saving the water which is ordinarily blown out of the smokestack when starting an engine, especially when drawing a heavy train, constitutes a still further object.

That the mechanism constituting the means above recited be durable, strong and simple, is a prime requisite, and to provide such means for carrying out these ends constitutes still another object.

The principal object of the invention, however, is to prevent wrecks on open switches, by providing mechanism which is so constructed that the action of the train controls it utterly, and in which the main track is always open except during the time that the train is passing from the main to the passing track or vice versa.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts for co-action, and the scope of which will be pointed out in the accompanying claims.

In the accompanying drawings, in which the same reference numeral indicates the same part in the different figures:—Figure 1 is a top plan, partly broken away and partly in section, the parts being shown as in normal positions, or automatically set for the main track; Fig. 2, a bottom plan, the parts in the same positions as at Fig. 1; Fig. 3, a top plan, partly broken away, the parts shown as set for the siding or passing track; Fig. 4, a side elevation, the parts in the same positions as at Fig. 1, seen in the direction of the arrows *a—a*; Fig. 5, a sectional view in the line 3—3 in Fig. 3; and Fig. 6, an enlarged side elevation of the lever-mechanism for operating the means which actuates the switch, semaphore and switch-lights.

In order to render more clear the general idea of the invention, it may here be noted that the device consists in pivoted or rocking means positioned near the tracks, which means controls the parts hereinbefore pointed out, and which is itself adapted to be contacted and tripped by means carried on and by the engine and under direct control of the engineer. And while we have herein shown and shall hereinafter describe our improvements in connection with a steam railway,



we wish it to be understood that it is equally applicable to electric railways and street car systems.

There is such similarity in the construction of switches and side-tracks that our invention may readily and practically be adapted to any of which we are aware.

In the track-construction illustrated in the drawings 2 represents the rails of the main track; 3, the frog; 4, the switch-points; 5, the siding; and 6, the angular approach thereto. These, as is common, are all stationary or fixed except the switch-points, which are loosely secured at one end between fish plates 7 in order that their free ends may swing to adapt themselves to either the main track or the siding. An auxiliary rail 8, which is shown as a knife-rail tapered to a point at each end, is pivoted by hinges 9 to an angle-iron support 10 spiked to the ties 11 along the outer side of the approach 6, and is held from movement in one direction by a tie-rod 12 which passes through the horizontal base of the support 10. The inner end of the knife-rail extends over the elongated ties 13 which are preferably supported on other ties 14, and these ties together form an open box-like structure in which are mounted numerous parts of our improvements. It is left open at its ends in order to facilitate the escape of water, and is also open at its top for ready and convenient access to the mechanism.

Pivoted to the upstanding arm of a bracket 15 is a bell-crank-shaped dog 16, to the lower end of which is pivoted one end of a connecting rod 17, the other end of which is pivoted to the lower end of a rocker 18 fulcrumed at its midlength on a pintle 19 and its upper end pivoted to the edge of a switch-shifting plate 20 to which the terminals of the switch-points are also movably secured. To the under side of the plate 20 and near its midlength is fixed one end of a heavy retractile spring 21, the other end of which is secured to the eye of a bent rod 22 fixed to the end of the ties 13. It will be evident that thus secured the terminals of the switch-points will be normally drawn to at all times hold them in the position shown best at Fig. 1, or for a "clear" main track.

Fulcrumed at 23 to a strong supporting-bracket 24 located preferably near each end of the switch is a substantially Y-shaped tripping-lever 25, to the stem 25<sup>a</sup> of which is secured one end of a connecting rod 26 fitted with a turn-buckle 27, the inner ends of said rods being respectively pivoted to opposite ends of a rocker 28 (Fig. 2,) fixed at its midlength on the switchlight standard 28<sup>a</sup>. Suitable means, 30, of support for the standard 28<sup>a</sup> is provided on its base 31 with a lug or stop 32 (Figs. 1 and 3) for a purpose presently described. At one side the standard 28<sup>a</sup> is provided with a projection 29 to which

is hinged one end of a link 33 provided near the end with a longitudinal slot 34 in which is mounted the head of a pin 35 fixed to the shifting-plate 20. A similar pin 36 is fixed to the other end of said plate and is mounted in a slot 37 in another link, 38, the distant end of which is provided with an eye adapted for engagement with the laterally bent arm 39 of the switch-stand standard 40 which is fitted at its top with a hand-lever 41.

42 represents an ordinary switch-stand.

To the lower side of the plate 20 is secured by the pin 36 one end of a draw-bar 43, its other end being connected to one arm of a bell-crank lever 44 fulcrumed at 45 to any suitable support 46. The other arm of the lever is pivoted to the semaphore standard 49 at 47. In the event of it being desirable or necessary to manually operate the switch-points, signal light and semaphore, the brakeman or other operator will, by throwing the lever 41 to the position shown at Fig. 3, draw on the bar 43 to move the plate 20 and thereby the parts just recited to the position shown at same figure, in position for a train to pass upon the siding. The switch may be locked in this position by any of the well known means. The dog will fall from beneath the knife-rail and the latter will fall by its own gravity. The depending arm of the lever 44 will be forced outwardly, and (said lever rocking on its fulcrum,) the other arm will be driven upwardly and carry with it the standard 49 to thereby raise the semaphore arms 50. Although we have described a means for manually locking the switch it need not be so done after the front wheels of the engine have passed onto the knife-rail, as the weight thereof and of those following will depress the rail and hold it in contact with the dog and thus lock the switch. The knife rail is of such length that no trucks will be sufficiently long to stride it, thus eliminating danger of "splitting" a train passing onto the siding. Immediately, moreover, when the train has passed from the auxiliary rail and onto the siding, the spring will act to retract the moving parts to their normal positions and leave the main track clear for the passage of another train.

To actuate the forked levers 25 any suitable device adapted to be carried on or by the engine or cars and to be actuated by a trainman may be employed. At Fig. 1 we have illustrated a simple and preferred means for accomplishing this object, where are shown in outline the floor 52 and wheels 53 of a locomotive. A portion of this means is also shown at Fig. 6. A split-segment rack 54 is suitably fixed within the cab. A lever-bar 55 is fulcrumed at 56 and provided with a latch 57 for engagement with the notches of the rack in an ordinary manner. Secured to the bar 55 is one end of a rod 58, the other end of which engages the vertically bent end



of one arm of a horizontally disposed elbow-lever 59 fulcrumed at 60 to any suitable part of the engine or car. The other arm of the lever is slotted for the reception of a boss 61 fixed to a trip 62 mounted to have endwise movement or transversely of the engine. The operator by throwing the lever 55 forwardly will cause the rod 58 also to move forwardly, whereby the trip 62 will be moved to the left (see dotted lines) and in position to contact the upstanding arm of a tripping lever at that side of the engine. A movement of the lever 55 in a reverse direction will cause the trip to move to the right (see the other dotted lines) or in position to contact a tripping lever 25 at the opposite side of the track. This movement to either side of the engine depends upon the direction of movement of the engine, for unless it was adapted to so move, a tripping lever would be necessitated at each side of the track.

It will be evident that the rods 26 may extend any ordinary distance and even around curves, where they may be employed to actuate signal lights and semaphores not at or near the switch. Any preferred semaphore, switch-stand and signal light may be used, our invention not contemplating broadly any specific form and construction thereof except as pointed out in certain of the claims hereto appended. If preferred, the ends of the trip may be equipped with rollers or wheels in order to effect a rolling contact with the forked levers; however, we do not deem this necessary.

We now proceed to the description of the operation.

Assume the parts to be in the relative positions shown at Fig. 1, and a train on the main track and moving in the direction of the arrow at said figure. Should it be desired to run through on the main track, the operator will not move the lever 55 to actuate the trip 62, as the main track is already clear. But should he desire to run onto the siding or passing track, he will throw said lever the proper way to move the strip to strike the upwardly projecting arm of the tripping lever 25, throw its stem rearwardly, and through the medium of the connecting rods 26 throw the switch-points over to the position shown at Fig. 3, in which position they are securely locked by reason of the rocker 28 having turned the projection a partial revolution and thereby thrown the link past center, where said parts are restrained by the stop 32. The same operation will give a partial revolution to the switch-light and will raise the semaphore arms. The parts will remain in locked position until the trip has contacted and thrown the second tripping lever, which act frees the above recited parts from locked engagement. They are held, however, in side-track-engaging position by the knife-rail bearing on the dog 16 until the

last car of the train has passed over said rail, whereupon the spring will act to set the two parts for the main track, and show a "clear" signal by giving a partial revolution to the switch light and releasing the semaphore arms 50.

One-half only of the switch is shown. The operation at the portion not shown is identical with that described. The diagrammatical outline engine shown is presumed to have passed over the switch in a direction contrary to that of the arrow at Fig. 1, and to have left the track in normal position, the main track being clear.

Having thus set forth the construction and operation, the purposes and advantages of our invention, we claim as new and desire to secure by Letters Patent the following, namely:—

1. In combination with a main and a side track, switch-points, a shifting plate to which they are attached, a pivoted rocker secured at one end thereto, a connecting rod to one end of which the other end of the rocker is secured, a lever to which the other end of the rod is secured, and a depressible knife rail adapted to actuate said lever, and to be actuated by the weight of the engine and cars passing thereover.

2. In combination with a main and a side track, switch-points, a shifting plate to which they are secured, a pivoted rocker secured at one of its ends to the plate, a connecting rod to one end of which the other end of the rocker is secured, a lever to which the other end of the rod is secured, a spring fixed to said plate to draw it in one direction, and a depressible knife rail adapted to actuate said lever and to be actuated by the weight of the engine and cars passing thereover.

3. In combination with a main and a side track, switch points, shifting means to which they are secured, a pivoted rocker secured at one of its ends thereto, a connecting rod to one end of which the other end of the rocker is secured, a lever to which the other end of the rod is secured, a switch light adapted to be given a partial revolution by said shifting means, and a depressible knife rail adapted to actuate said lever and to be actuated by the weight of the engine and cars passing thereover.

4. In combination with a main and a side track, switch-points, shifting means to which they are secured, a pivoted rocker secured at one of its ends thereto, a connecting rod to one end of which the other end of the rocker is secured, a lever to which the other end of the rod is secured, a semaphore, means actuated by said shifting means for actuating it, and a depressible knife rail adapted to actuate said lever and to be actuated by the weight of the engine and cars passing thereover.

5. In combination with a main and a side



track, switch-points, shifting means to which they are secured, levers adapted to be tripped by a passing train, a rod secured to each of said levers, a rocker secured to the other ends  
5 of the rods and adapted to be actuated thereby, means whereby said rocker will actuate said shifting means, and means whereby said last named means will be automatically returned to its normal position.

10 6. In combination with a main and a side track, switch-points, shifting means to which they are secured, a pivoted rocker secured at one of its ends thereto, a connecting rod to one end of which the other end of the rocker  
15 is secured, a lever to which the other end of the rod is secured, a switch-light standard including a lateral projection, a link secured at one end to said projection and at its other end to said shifting means, and a depressible  
20 knife rail adapted to actuate said lever and to be actuated by the weight of the engine and cars passing thereover.

7. In combination with a main and side track, switch-points, shifting means to  
25 which they are connected, a pivoted rocker secured at one of its ends thereto, a connecting rod to one end of which the other end of the rocker is secured, a lever to which the other end of the rod is secured, a semaphore  
30 standard, a pivoted elbow-lever, one arm of which is secured thereto, a draw-bar to which its other end is secured, the opposite end of the draw-bar being secured to said shifting means, and a depressible knife rail  
35 adapted to actuate said lever and to be actuated by the weight of the engine and cars passing thereover.

8. The combination with a main and a side track, switch-points, shifting means to  
40 which they are secured, levers adapted to be tripped by a passing train, a rod secured to each of said levers, a rocker secured to the other ends of the rods and adapted to be actuated thereby, means for connecting the  
45 rocker and said shifting means whereby the latter is actuated, a semaphore, and means interposed between it and said shifting means whereby the latter actuates the former, of a depressible knife rail adapted to actuate said  
50 levers and to be actuated by the weight of the engine and cars passing thereover, a bell-crank dog, one arm of which said auxiliary rail is adapted to contact, a connecting rod secured to the other arm of said dog,  
55 and a second rocker, one of its arms secured to the connecting rod and the other to said shifting means.

9. The combination with a main and a side track, switch-points, shifting means to  
60 which they are secured, levers adapted to be tripped by a passing train, a rod secured to each of said levers, a rocker secured to the other ends of the rods and adapted to be actuated thereby, means for connecting the  
65 rocker and said shifting means whereby the latter is actuated, a semaphore, and means interposed between it and said shifting means whereby the latter actuates the former, of a depressible knife rail adapted to actuate  
70 said levers and to be actuated by the weight of the engine and cars passing thereover, a bell-crank dog, one arm of which said auxiliary rail is adapted to contact, a connecting rod secured to the other arm of said dog, a  
75 second rocker, one of its arms secured to the connecting rod and the other to said shifting means, and means for drawing said last named means in one direction.

10. The combination with a main and a side track, switch-points, shifting means to  
80 which they are connected, means adapted to be tripped by a passing train, a rod secured to each of said means, a rocker secured to the other ends of the rods, a switch-light standard fixed centrally of the rocker, a lateral  
85 projection from said standard, a slotted link provided also with an eye engaged with said projection, a boss on said shifting means adapted for engagement with the slot in said link, a switch-stand standard, there being a  
90 lateral projection therefrom, a link engaged with said projection and provided with a slot at its inner end, a boss on said shifting means adapted for engagement with said slot, a draw-bar engaged with said shifting  
95 means, a semaphore, means intersposed between the drawbar and semaphore whereby the former is actuated, an auxiliary rail, a bell-crank dog, one arm of which said rail is adapted to contact to actuate it, a connect-  
100 ing rod secured to the other arm of said dog, a second rocker, one of its arms secured to the connecting rod and the other to said shifting means, and means for drawing said last recited means in one direction. 105

In witness whereof we have hereunto set our hands this 19th day of March, 1908 at Galesburg, Illinois.

WILLIAM E. DEWEIN.  
GEORGE S. ROBERTS.  
JOHN B. VAN PELT.

Witnesses:

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