

No. 782,157.

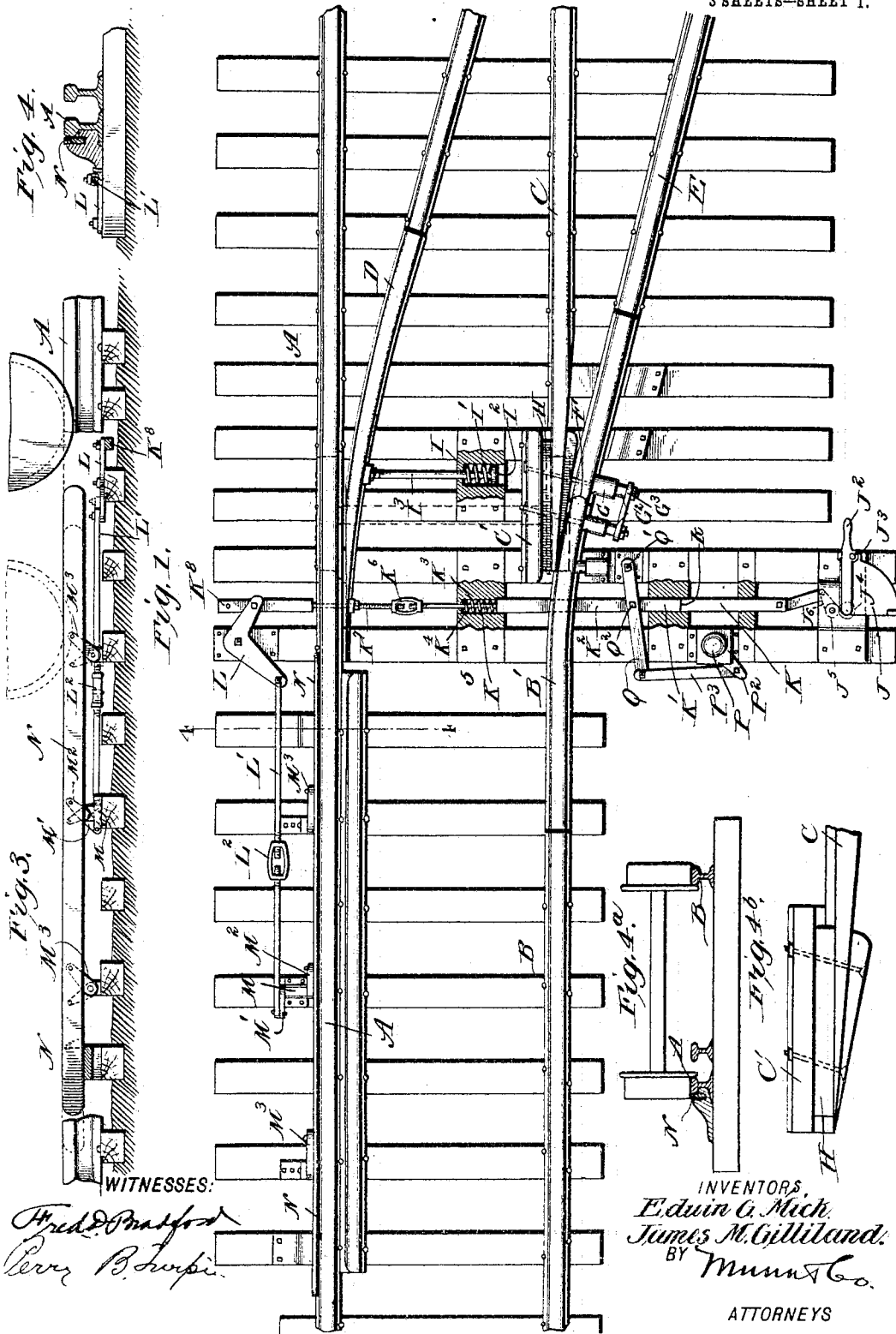
PATENTED FEB. 7, 1905.

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RAILWAY SWITCH.

APPLICATION FILED APR. 2, 1904.

3 SHEETS—SHEET 1.



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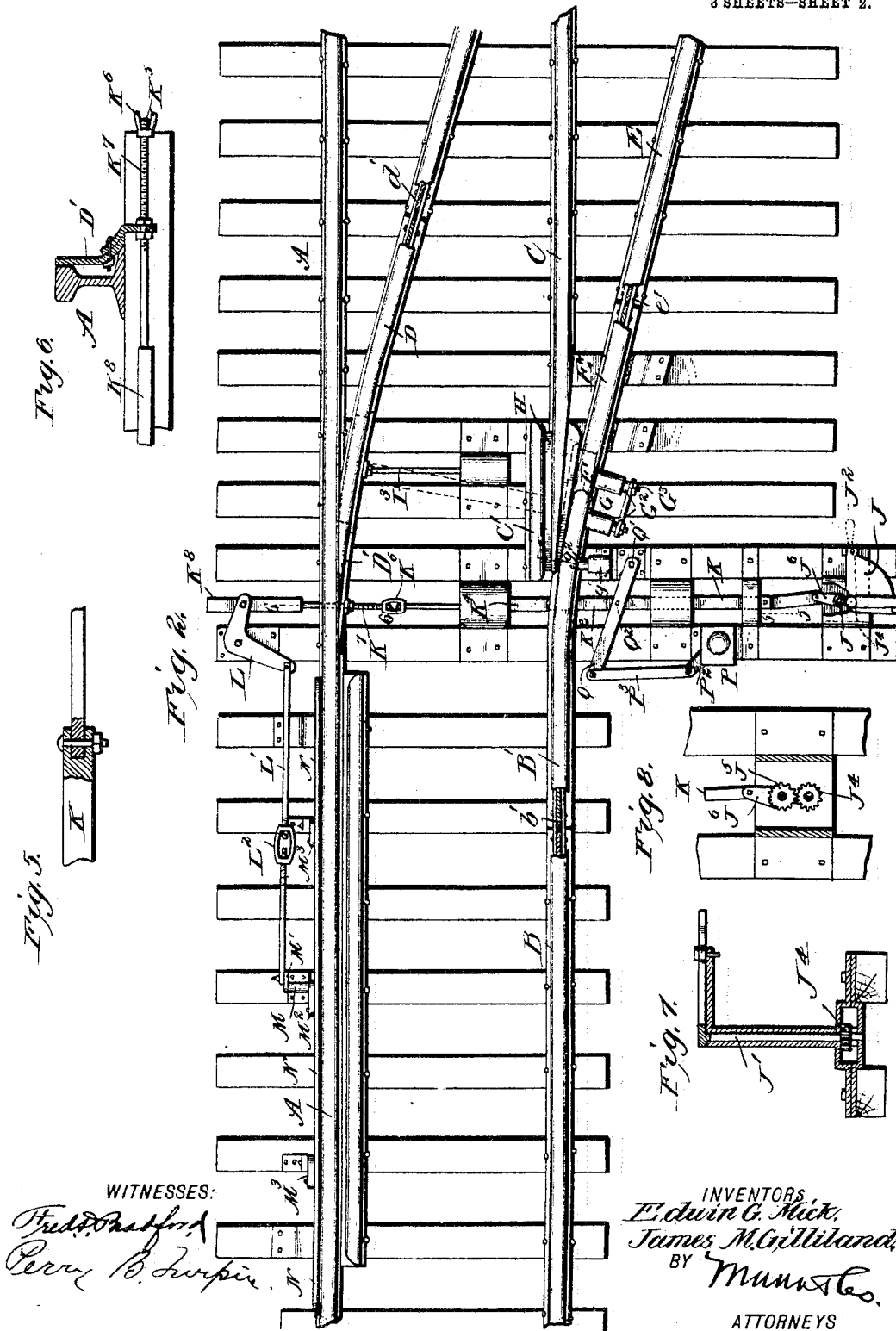
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RAILWAY SWITCH.

APPLICATION FILED APR. 2, 1904.

3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 9.

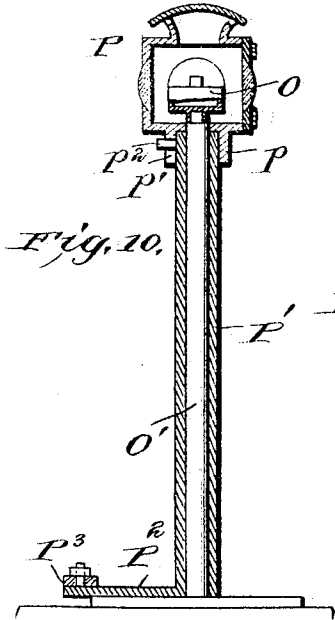
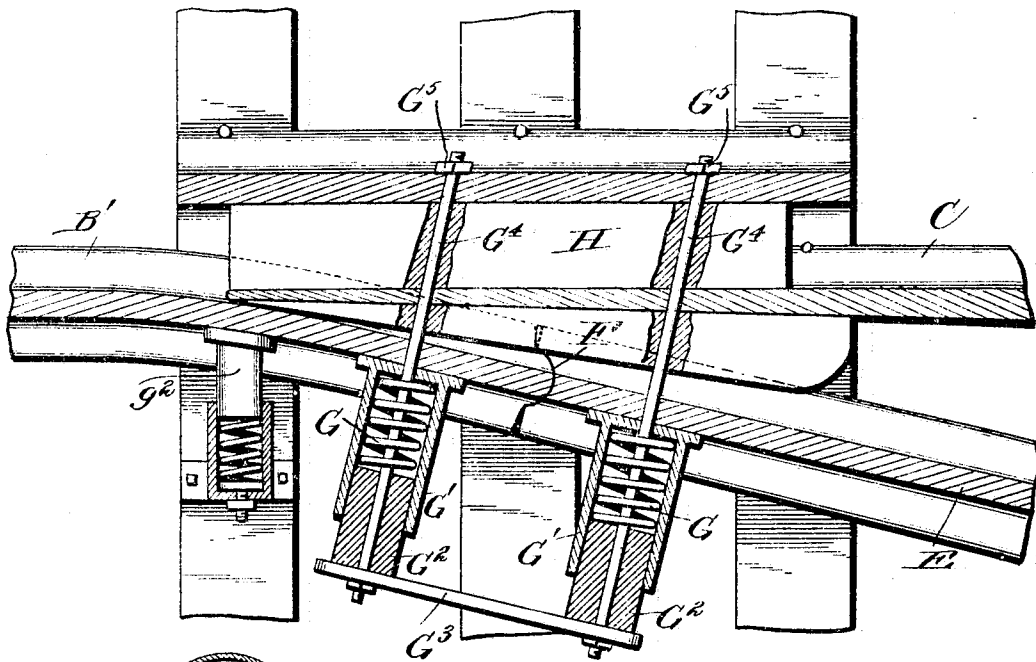


Fig. 10.

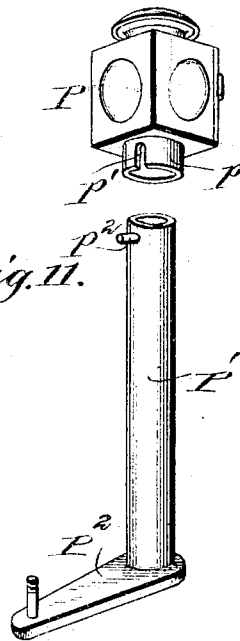


Fig. 11.

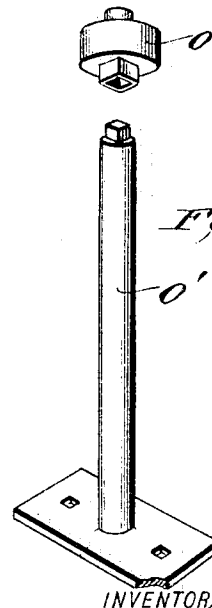


Fig. 12.

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UNITED STATES PATENT OFFICE.

EDWIN G. MICK AND JAMES M. GILLILAND, OF NEWCASTLE, PENNSYLVANIA.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 782,157, dated February 7, 1905.

Application filed April 2, 1904. Serial No. 201,210.

To all whom it may concern:

Be it known that we, EDWIN G. MICK and JAMES M. GILLILAND, citizens of the United States, residing at Newcastle, in the county of Lawrence and State of Pennsylvania, have made certain new and useful Improvements in Railway-Switches, of which the following is a specification.

This invention is an improvement in railway-switches; and it consists in certain novel constructions and combinations of parts, as will be hereinafter described and claimed.

In the drawings, Figure 1 is a top plan view, partly in section, of a switch embodying our invention, the main line being open. Fig. 2 is a similar view with the switch open. Fig. 3 is a detail side view showing the pressure-bar for restraining the automatic switch-operating means from action when the weight of the train is on such pressure-bar. Fig. 4 is a detail cross-section on about line 4 4 of Fig. 1. Fig. 4^a is a section somewhat similar to Fig. 4, showing the operation of the wheels in depressing the pressure-bar. Fig. 4^b is a detail view illustrating the arrangement of bolts for connecting the roller-point and the guard-rail. Fig. 5 is a detail elevation, partly in section, on about line 5 5 of Fig. 2. Fig. 6 is a detail cross-section on about line 6 6 of Fig. 2. Fig. 7 is a vertical sectional view, and Fig. 8 is a horizontal section, showing the operating device and its connections with the crank and pitman for operating the switch. Fig. 9 is a sectional plan view showing the construction in the region of the point between the adjacent ends of the uniting-sections of the main line and siding. Fig. 10 is a vertical section of the lamp-shaft and the lantern thereon and the tube for rotating the lantern. Fig. 11 is a detail perspective view showing the lantern and its tube detached, and Fig. 12 is a detail perspective view showing the lamp and its shaft or standard detached.

In carrying out our invention we provide, together with the main line and the switch or siding, means for positively operating the switch in one direction, automatically-operating devices in the form of springs, which operate the switch in the opposite direction, and a

pressure-bar which is connected with the switch and is arranged when moved to one position to be held by the weight exerted by wheels on said pressure-bar, so that the weight of the train on the pressure-bar will restrain the action of the automatically-operating switch-operating devices until the train has passed off such pressure-bar, when the automatic devices will readjust the switch. The purpose of this construction, as will more fully appear hereinafter, is to permit a brakeman or other operator on the train, by means of the operating devices, to positively open the switch to the position shown, for instance, in Fig. 2. This operation tends to throw the pressure-bar from the position shown in Fig. 3 to that indicated in dotted lines in the same figure, and in this position the weight of a car exerted by one or more wheels on such pressure-bar will hold the pressure-bar in such position and will keep the switch open until the last wheel of the train has passed off the pressure-bar, when the spring devices will readjust the switch-point from the position shown in Fig. 2 to that shown in Fig. 1, so that a brakeman after he has once set the switch and the first wheels of the locomotive have passed on the pressure-bar can get on the train after locking his switch-lever and the switch will automatically readjust to open the main line.

In the construction shown the track includes the unbroken main rail A, the main-rail sections B and C in alinement with each other and opposite the rail A, the rail-section C being in the form of a switch-point at C', as shown in Figs. 1 and 2, the switch-point D movable at its point D' against and clear of the rail A, as shown in Figs. 2 and 1, the switch-rail E, and the rail-sections B' and E', jointed at b' and c' at their ends adjacent to the rails B and E and coinciding at their meeting ends at F, as shown in Figs. 1 and 2, so that the ends F of the rails B' and E' may be moved in and out between the positions shown in Figs. 1 and 2, the rails B' and E' being forced by the wheels of a train when they pass onto the point D' from the position shown in Fig. 1 to that shown in Fig. 2 and being readjusted by the springs (best shown in Fig. 9) from the

position shown in Fig. 1 to that shown in Fig. 2 in the operation of the invention. In effecting the joints at d' between the point D and its coinciding switch-rail and also at b' and e' we may simply employ fish-plate straps bolted to the meeting ends of the rail and lying in the hollows of the rails, as will be understood from Fig. 1 of the drawings. At their meeting ends the sections B' and E' are rounded, one being made concave and the other convex to fit therein, and the joint is sufficiently loose to permit the movement of the sections between the different positions shown in Figs. 1 and 2.

To press the sections B' and E' normally in the position shown in Fig. 1, we provide springs G, operating in barrels G', secured on the outer sides of the sections B' and E' on opposite sides of the joint F and pressing against heads G², operating in the outer ends of said barrels and connected together by a bar G³, from which rods G⁴ pass inwardly through the heads G² and the springs G, thence through the rail-sections B' and E', and thence through the point of the rail C and through the frog H and are secured by nuts G⁵, as best shown in Fig. 9. This construction serves to normally hold the rail-sections B' and E' in the position shown in Fig. 1 and to readjust them to such position from the position shown in Fig. 2, and in order to aid the springs G we prefer to provide a supplemental spring g , operating in the barrel g' upon a rod g^2 , projecting from the rail-section B', as shown in Figs. 1, 2, and 9 of the drawings.

A spring I, operating in an opening I' on the track against a head I² on a rod I³, connected with the switch-point D, operates to press such switch-point normally from the position shown in Fig. 2 to that shown in Fig. 1, and thus aids in opening the main line and in holding such main line open except when it is positively closed by the operation of the switch-lever.

The switch-stand J has a shaft J', provided with a handle-lever J², which may be locked at J³, and is provided at its lower end with a pinion J⁴, meshing with a pinion J⁵, to which is connected a crank J⁶, connected with one end of a pitman K, whose other end operates in an opening K', formed in the bed of the track by means of suitable castings or beams, and such end of the pitman K operates against the outer end of a switch-bar K², which is movable in an opening K³ and has a shoulder K⁴ pressed against a spring K⁵ to press the switch-bar normally to the position shown in Fig. 1. This switch-bar is broken into sections at K⁶, with the sections connected by a turnbuckle K⁶, as shown in Figs. 1 and 2, for purposes of adjustment, and the section K⁷ is connected with the switch-point D and extends beyond the same at K⁸ and connects with one arm of a bell-crank lever L, whose other arm is connected by a pitman L', hav-

ing for purposes of adjustment a turnbuckle L², with one crank-arm, M', of a short shaft M, having another crank-arm, M², which is connected with the pressure-bar N, the latter being supported on opposite sides of the crank-shaft M by links M³ of equal length with the crank M², so the pressure-bar M will be properly supported throughout its length and may be rocked between the position shown in full lines and that indicated in dotted lines in Fig. 3 of the drawings. In the operation of the described construction it will be noticed that when the switch-point D is thrown from the position shown in Fig. 1 to that shown in Fig. 2 the pressure-bar N will be moved by the action of the cranks M' and M² from the position shown in full lines, Fig. 3, to that shown in dotted lines in the same figure, in which the cranks and links M² and M³ will pass the center, so that if a wheel be run on the rail, as indicated in dotted lines, Fig. 3, it will prevent the pressure-bar from moving between the position indicated in dotted lines and that shown in full lines and will thus hold the switch-point D until the last wheel of a train has passed off the pressure-bar N, it being understood that this pressure-bar is made in practice of sufficient length to extend between any two wheels on the same side of a train, so that they cannot readjust between the wheels, but will be held down until the last wheel of the last car has passed over the pressure-bar. At such time the automatically-operating devices will act to readjust the switch-point D and the rail-section B' and E' from the position shown in Fig. 2 to that shown in Fig. 1. In operation it will be understood that after the brakeman has manipulated the lever J² to open the switch, as shown in Fig. 2, and the first wheel of a train has moved onto the pressure-bar the brakeman can then throw the lever J² back to the position shown in Fig. 1 and lock it in such position, as is usual, the break at k between the pitman K and the switch-bar K² permitting the reverse movement of the pitman K without moving the switch-point. Thus the switchman can set the switch devices to open the switch and can after the train has moved onto the pressure-bar get on the train and the train move on in safety, knowing that the switch will automatically readjust to open the main line by the action of the spring before described.

The lamp O is mounted on the upright or shaft O', which does not rotate, and the lamp is held from rotating by keying it upon the upper end of the rod O', as shown in Fig. 12. The lantern or lamp-casing P, which may have glasses of different colors, is supported upon the sleeve P', which rotates about the upright O' and has at its lower end a crank P², connected by a pitman P³ with one end of a lever Q, which lever is pivoted at its other end Q' and is connected between its ends at

Q² with the switch-bar, so that as the switch-bar moves back and forth it will operate to give the lantern a quarter-turn to bring the red or green light into alinement with the track. It will be noticed that the lamp does not revolve, but that the lantern revolves about the lamp or light. This is important, as if the lamp were revolved by the operation of the switch devices the sudden operation might operate to extinguish the light, and this we avoid by making the lantern or lamp-casing to revolve about the fixed lamp or light. As shown, the lantern P is separate from its sleeve P' and has at its lower end a depending tubular portion p, fitting over the upper end of the sleeve P' and having at p' a slot which receives a pin p² on the sleeve P', so the lantern will be positively operated with the movements of the sleeve P'.

From the foregoing description the construction and operation of the several parts will be understood. It will be understood that as the train passes from the siding onto the main track the switch will open automatically by the pressure of the flanges of the wheels, permitting the train to pass through the switch onto the main line. In this operation it will be seen that as the train comes from the siding passing onto the switch-rail the flange of the wheel will force the rails into position to permit the train to pass onto the main track and also to operate the pressure-bar in moving thereon.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. The improvement in switches herein described, comprising the main-line rail, the switch-point movable at its point end toward and from said main-line rail, the opposite rail-sections B and C, the switch-rail section E, the rail-sections B' and E', coinciding at one end with each other, and at their other ends with their respective rail-sections, springs for pressing the rail-sections B' and E' normally to position to close the main line, a switch-bar connected with the switch-point to operate the same, a spring for normally adjusting the switch-point to position to open the main line, a bell-crank lever, connection between one arm of said lever and the switch-point, a shaft having a crank-arm connected with the other arm of the bell-crank lever, said shaft also having a second crank-arm, a pressure-bar carried by the crank-arm, and links supporting the pressure-bar, all being arranged substantially as and for the purposes set forth.

2. In a switch the combination with the main line having the stationary point and the guard-rail adjacent thereto and the switch or siding, the main line and switch or siding having rail-sections coinciding at one end with each other, of means for operating the switch in one direction, automatically-operating de-

VICES for operating the switch in the opposite direction, a pressure-bar arranged when moved to one position to be held by the weight exerted by wheels thereon, and means for adjusting the pressure-bar to such position by the operation of the switch-operating means whereby the weight of the train on the pressure-bar may restrain the action of the automatically-operating switch-operating devices.

3. The combination in a switch, of the switch-point, the rail-sections of the main line and siding coinciding at their meeting ends opposite the switch-point, and movable jointly at such ends toward and from the switch-point, such meeting ends of the rail-sections being interlocked by a convex and concave joint, substantially as set forth.

4. The combination in a switch with the main-line rails, and the switch-rails, of a switch-point, a switch-bar connected with the switch-point, a spring for moving the switch-bar in one direction whereby to automatically throw the switch-point to open the main line, and an operating device detached from but acting on the switch-bar whereby to positively operate the same to throw the switch-point to position to open the switch whereby the operator may move the switch and may then readjust the operating devices and lock the same without disturbing the switch, substantially as set forth.

5. The combination with the switch and the devices for operating the switch including a switch-bar and an operating device detached from and arranged to operate the switch-bar, of a lamp, a lantern or casing turning about the lamp, and connections between the switch-bar and said lantern or casing, substantially as set forth.

6. The combination with a switch, and a moving part operating in connection therewith, of a lever arranged for operation by said moving part, a lantern or lamp-casing supported to turn and having a crank-arm and a connection between said crank-arm and lever, substantially as set forth.

7. The combination of a shaft or upright for supporting the lamp, the sleeve turning about the said upright, and having a crank-arm, the lantern fitting on the upper end of said sleeve and held to turn therewith, a pitman connected with crank-arm, a lever connected with the pitman and operating means connected with the lever, whereby to operate the same to turn the lamp-casing or lantern as the switch is operated, substantially as set forth.

8. In a switch the combination with the switch-point, and means for operating the same to open the main line, of a pressure-bar, a shaft having a crank-arm connected with the pressure-bar to operate the same and also having a crank-arm whereby to operate the shaft, an intermediate lever connected

with said crank-arm and connections between the said lever and the switch-point, substantially as set forth.

9. In a switch the combination with the main-
5 line and switch rails, of the switch-point, the rail-sections B' and E' opposite said switch-point and coinciding at their meeting ends and movable jointly at such meeting ends, and spring devices for readjusting said rail-
10 sections B' and E' to normal position substantially as set forth.

10. A switch having, in connection with a suitable switch-point, rail-sections B' and E' opposite the same, and coinciding at their
15 meeting ends and movable jointly at such meeting ends and jointed at their opposite ends adjacent to their respective rails, and springs operating on said rail-sections B' and E' at their meeting ends substantially as set forth.

20 11. The combination with rail-sections B' and E' coinciding at their meeting ends, of cups on the outer sides of said sections adjacent to their meeting ends, springs in said cups, heads operating in the cups against the
25 opposite outer ends of the springs, a bar connecting said heads, and rods extending through the heads and rail-sections and secured or anchored at their inner ends substantially as set forth.

30 12. The combination of the main line and switch-line having the rail-sections meeting and coinciding at one end and movable jointly at such meeting ends, and springs engaging such sections on opposite sides of the joint
35 between such sections, whereby to operate the same in one direction, substantially as set forth.

40 13. The combination with a switch and a bar for operating the same, of an operating device detached from but arranged to operate said bar, and means whereby the switch when op-

erated may be restrained from movement in the opposite direction, whereby the operator may move the switch and may then readjust his hand operating devices and lock the same
45 without disturbing the switch, substantially as set forth.

14. The combination in a switch with the rail-sections B' and E' coinciding at their meeting ends and movable jointly at such ends,
50 the fixed point-section opposite the joint between such rail-sections B' and E', rods connected with the fixed point and extending thence through the movable rail-sections B' and E' and springs operating in connection
55 with said rods on opposite sides of the joint between the rail-sections B' and E' and arranged to actuate such rail-sections toward the fixed point-section, substantially as set forth.

15. The combination of the lamp, the up-
60 right supporting the lamp, a sleeve turning about the upright and having a crank-arm, a lantern or casing fitting on the upper end of said sleeve and turning therewith, a pitman connected with said sleeve, a lever pivoted at
65 one end and connected at its other end with the pitman, and a switch-bar connected with said lever between its ends and arranged to operate the same to turn the lantern substantially as set forth.

70 16. The improvement in switches herein described comprising a switch-point, and rail-sections of the main line and siding, such sections coinciding at their meeting ends opposite the switch-point and being movable
75 jointly at such ends toward and from the switch-point substantially as set forth.

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