

No. 608,569.

Patented Aug. 9, 1898.

B. L. BONNELL.
RAILROAD SWITCH.
(Application filed Apr. 9, 1898.)

No Model.

2 Sheets—Sheet 2.

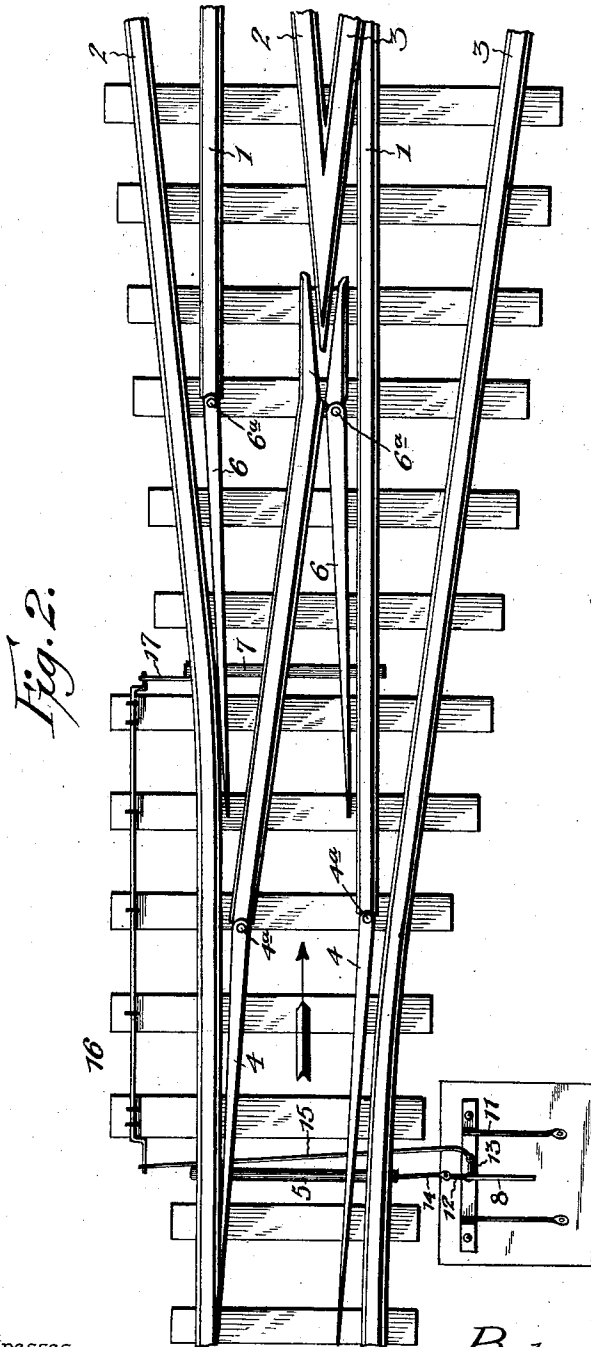
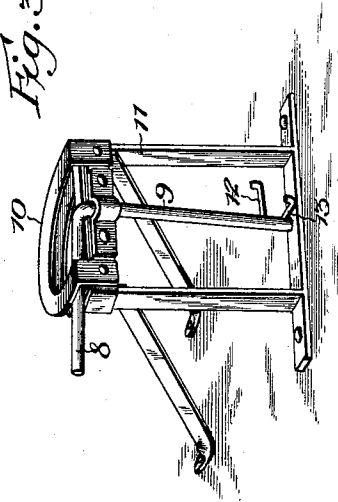


Fig. 2.

Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

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RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 608,569, dated August 9, 1898.

Application filed April 9, 1898. Serial No. 677,051. (No model.)

To all whom it may concern:

Be it known that I, BERTRAND L. BONNELL, a citizen of the United States, residing at Donnellson, in the county of Lee and State of Iowa, have invented a new and useful Railroad-Switch, of which the following is a specification.

My invention relates to railroad-switches, and particularly to a three-throw split switch, the object in view being to provide a three-throw switch of simplified construction, whereby the two sets of switch points or rails may be operated from a single switch-stand and by the manipulation of a single switch-lever.

It is also an object of my invention to provide such means for operating the pairs of switch points or rails as to enable said pairs to be arranged at a suitable distance apart to obtain an easy deflection of the wheels of rolling-stock from the direct line of the main track, and thus avoid the straining of either the wheels or the switch mechanism.

Further objects and advantages of this invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of a switch mechanism constructed in accordance with my invention, the parts being shown in full lines set to open the main track and in dotted lines set to open the left siding-track. Fig. 2 is a similar view showing the parts of the mechanism set to open the right siding-track. Fig. 3 is a detail view in perspective of the switch-stand.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

1 designates the main-track rails, 2 the left siding-track rails, and 3 the right siding-track rails. Also 4 represents the main switch-points, connected by a transverse switch-bar 5 for simultaneous swinging movement about their fulcrum-points, which are indicated at 4^a, and 6 indicates the auxiliary switch-points, fulcrumed at 6^a and connected for simultaneous swinging movement by a transverse switch-bar 7.

The switch-lever 8 is capable of an approximately semicircular swinging movement to

impart a corresponding approximately semicircular swinging movement, or movement of one hundred and eighty degrees, to the switch shaft or spindle 9, said switch-lever being mounted in a suitable guide 10, forming a part of the switch-stand 11. The stand may be provided with any suitable locking devices (not shown) for maintaining the switch-lever in either of its adjusted positions.

The switch-lever is capable of three distinct set positions, respectively, at the limits of its movement, as shown, respectively, in full and dotted lines in Fig. 1, and at a central or intermediate point or at an angle of ninety degrees from its terminal positions, as indicated in Fig. 2. Also the switch shaft or spindle carries a plurality of cranks 12 and 13, set on the quarter at an angle of ninety degrees to each other, the former being connected by a rod 14 with the switch-bar 5 and the latter by a connecting-rod 15, a crank-shaft 16, and a link 17 with the switch-bar 7. The parts are so mounted that the crank 12 is capable of swinging movement through an arc of which the base is perpendicular to the line of movement of the switch-bar 5 and of which the altitude is toward the switch-points, whereby in swinging the crank-arm 12 from one terminal position to the other it moves the switch-bar 5 through a distance equal to the altitude of the arc described by said arm, or equal to the radius of said arc. On the other hand, the crank-arm 13 travels in an approximately semicircular arc of which the base is parallel with the direction of movement of the switch-bar 7, whereby the amplitude of the throw imparted by the crank-arm 13 to the connected parts is equal to the diameter of the arc described thereby. In other words, while the crank-arms 12 and 13 travel in arcs of approximately equal radius the amplitude of vibration imparted by the crank-arm 12 to the connected parts is equal to the radius of its arc, while the amplitude of vibration imparted by the crank-arm 13 to the connected parts is equal to the diameter of the arc described thereby.

Furthermore, a complete vibration of the crank-arm 12 from one limit of its movement to the other or from one terminal of its path to the other imparts an advance and a return movement to the switch-bar 5, said advance

and return movements being of equal extent, whereby in moving the crank-arm 12 from one limit of its movement to the other the switch-points 4 are moved from their set position with relation to one main-track rail to their set position with relation to the other main-track rail and then back again to their set position with relation to the first-named main-track rail, while the complete vibration of the crank-arm 13 or the movement thereof from one limit of its movement to the other simply caused the connected parts to move the switch-points 6 from their set position with relation to one rail to their set position with relation to the other rail. In the same way the movement of the switch shaft or spindle through an angle of ninety degrees will move the main switch rails or points from one set position, as indicated in full lines in Fig. 1, to the other set position, as indicated in full lines in Fig. 2, while auxiliary switch rails or points 6 will only move one-half of the distance from one set position to the other. Hence in moving the switch-lever from the position shown in full lines in Fig. 1 to the position shown in Fig. 2 the main switch-rails will be moved from that position shown in full lines in Fig. 1, in which the main track is open, to that position shown in Fig. 2, wherein the right siding-track formed by the rails 3 is open, while the same amount of movement of the switch-lever will cause the auxiliary switch-rail 6 to move from the position shown in full lines in Fig. 1 to an intermediate position. (Indicated in Fig. 2.) A second movement of the switch-lever from the position shown in Fig. 2 to that shown in dotted lines in Fig. 1 will return the main switch-rails 4 to their initial position, (shown in full lines in Fig. 1,) but will swing the auxiliary switch-rails 6 to the limit of their movement to open the left siding-track, as shown in dotted lines in Fig. 1.

From the above description it will be seen that the described relative movements of the main and auxiliary switch-rails is due to the position of the operating-cranks 12 and 13 upon the quarter; but the advantage of this arrangement, in that the auxiliary switch-rails receive a motion of greater amplitude than the main switch-rails, resides in the fact that the auxiliary switch-rails may be located a considerable distance from the main switch-rails, and hence at a point in the mechanism where the deflection of the auxiliary switch-rails from the lines of the fixed rails may be gradual, and hence avoid straining either the rolling-stock or the switch mechanism. It has been common heretofore where both pairs or sets of switch-rails have been operated from a single stand to position the switch-rails with their swinging ends approximately in the same transverse plane; but by the operating means above described I am enabled to locate the auxiliary switch-rails at any desired distance from the main switch-rails, and hence not only avoid complication in con-

struction, but obtain the desired movements of the parts, both as to direction and amplitude, and avoid abrupt deflection of the switch-rails from the lines of the adjacent track-rails. Obviously the connecting crank-shaft 16 may be made of any desired length to suit the interval required between the main and auxiliary switch-rails, and in practice I prefer to locate the free ends of the main switch-rails whereby said auxiliary switch-rails do not at any point overlap the main switch-rails. In the drawings the said parts are located in closer relation proportionately than they will be in practice; but it will be understood from the foregoing description that the interval between the main and auxiliary switch-rails may be set without reference to the operating mechanism, as the connecting crank-shaft 16 is adapted to convey the motion efficiently to any desired point. Furthermore, it will be understood that the amplitude of movement of the auxiliary switch-rails may be varied to suit particular conditions of use by varying the lengths of the crank-arms on the connecting crank-shaft 16; but in practice I have found it sufficient under ordinary circumstances to depend wholly upon the relative positions of the crank-arms on the operating-shaft or spindle to obtain the necessary movements of the parts.

In the drawings the crank-shaft 16 is shown at that side of the track which is near the left siding; but it will be understood that I do not desire to limit myself to the arrangement thereof upon that side, as it is obvious that it may be arranged upon either side without changing its efficiency in the capacity described. Furthermore, it will be understood that a further advantage of the single-switch-lever construction resides in the fact that a single signal-lamp is sufficient to indicate the position of the switch or to indicate whether the main track is open or not, whereas with the duplicate-switch-stand construction it is of course necessary to employ a signal-lamp for each stand.

Various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having described my invention, what I claim is—

1. In a switch mechanism, the combination with separate pairs of switch-rails, of an operating shaft or spindle carrying cranks, and independent means of connection between each crank and one pair of switch-rails, substantially as specified.

2. In a switch mechanism, the combination with separate pairs of switch-rails located at remote points, of an operating shaft or spindle having cranks respectively connected by independent means with said pairs of switch-rails, said cranks being set upon the quarter

to give an amplitude of movement to one pair of rails in excess of the other pair, substantially as specified.

3. In a switch mechanism, the combination with separate pairs of main and auxiliary switch-rails, the latter having an amplitude of movement in excess of the former, of an operating shaft or spindle having cranks respectively connected by independent means with said pairs of switch-rails, and capable of movement through an arc approximating a semicircle, the diameters of the arcs described by said crank-arms being respectively perpendicular to and parallel with the direction of movement imparted to the connections of the main and auxiliary switch-rails, substantially as specified.

4. In a switch mechanism, the combination with separate pairs of switch-rails, of an operating shaft or spindle having perpendicularly-disposed cranks each capable of movement through an arc approximating a semicircle, and connections between each crank and one pair of switch-rails, the connections

for one pair of switch-rails including a horizontally-disposed connecting crank-shaft, substantially as specified.

5. In a switch mechanism, the combination with pairs of main and auxiliary switch-rails located at remote points, the auxiliary switch-rails having an amplitude of movement which exceeds that of the main switch-rails, of an operating shaft or spindle having cranks respectively connected with said pairs of switch-rails, and each capable of movement through an arc approximating a semicircle, and the amplitude of movement imparted by the cranks to the respective connected switch-rails being of different extents, substantially as specified.

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

BERTRAND L. BONNELL.

Witnesses:

ANNA S. MCCONKEY,
E. R. McMURRAY.