C. W. REINOEHL & C. W. LONG.

SWITCH STAND.

APPLICATION FILED JULY 17, 1909.

941,814. Patented Nov. 30, 1909.

2 SHEETS—SHEET 1.

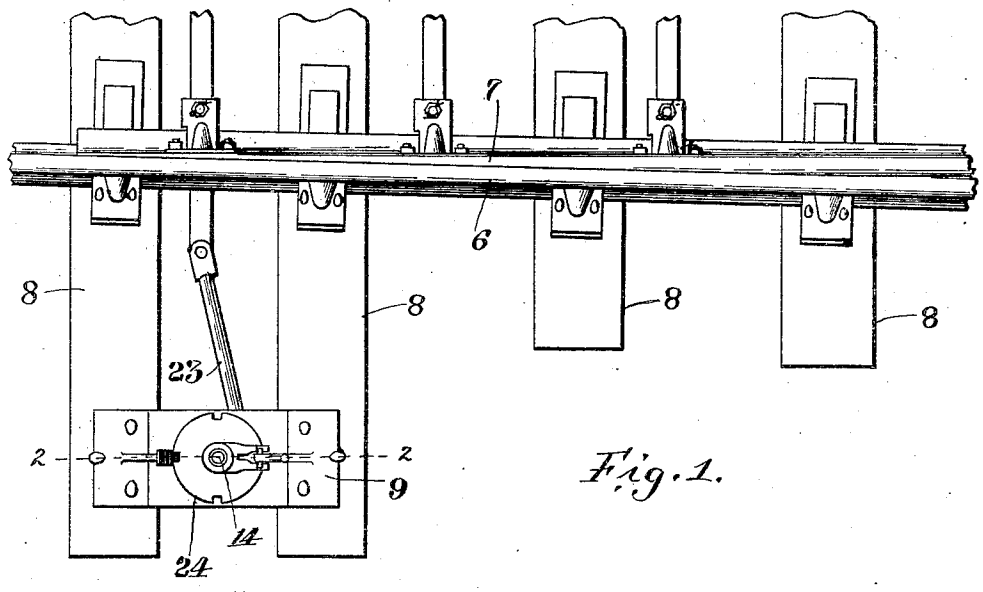


Fig. 1.

Fig. 4.

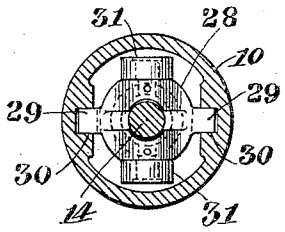


Fig. 5.

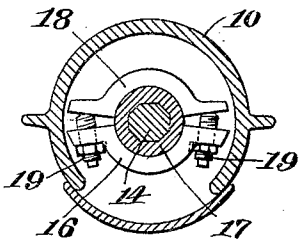


Fig. 6.

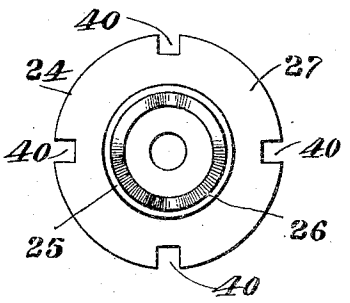


Fig. 7.

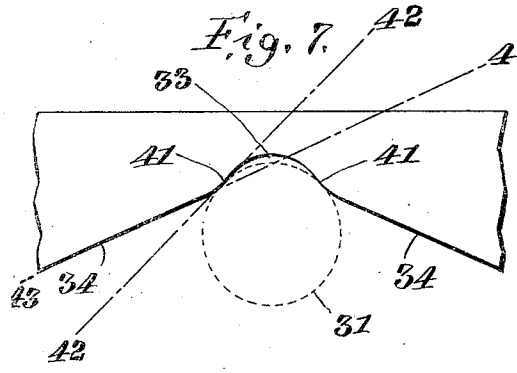
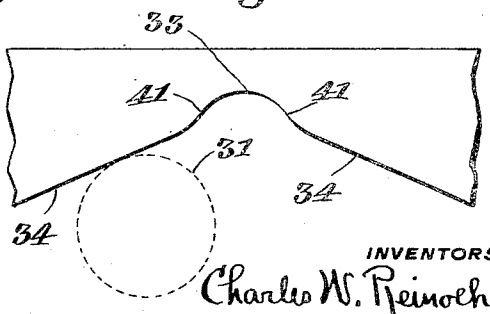


Fig. 8.



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2 SHEETS—SHEET 2.

Fig. 3.

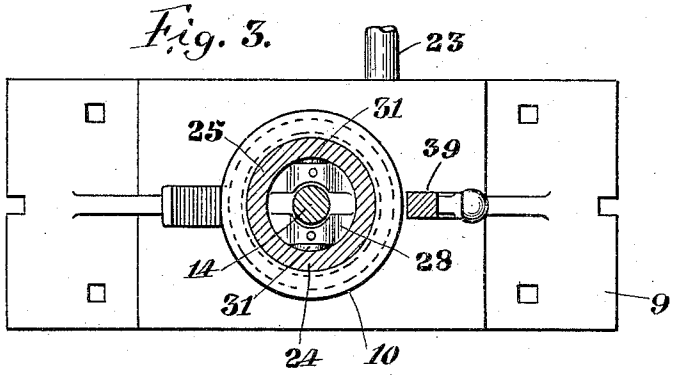
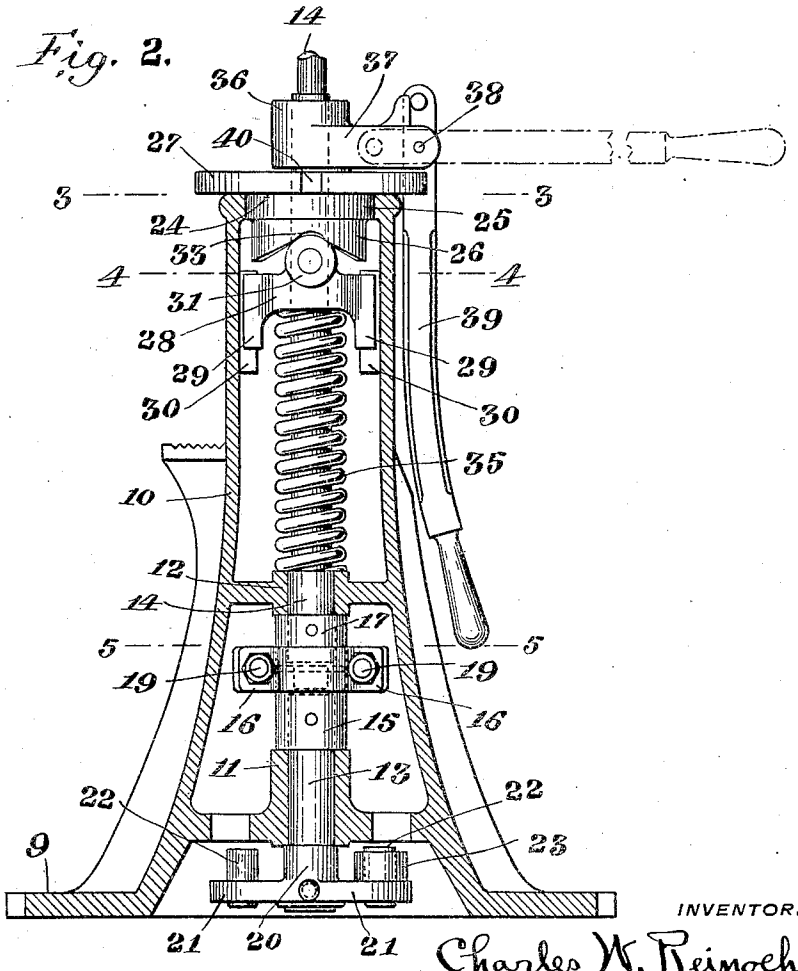


Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES W. REINOEHL, OF STEELTON, AND CHARLES W. LONG, OF FORT HUNTER, PENNSYLVANIA.

SWITCH-STAND.

941,814. Specification of Letters Patent. **Patented Nov. 30, 1909.**

Application filed July 17, 1909. Serial No. 508,092.

To all whom it may concern:

Be it known that we, CHARLES W. REINOEHL and CHARLES W. LONG, citizens of the United States, the said REINOEHL residing at Steelton, Dauphin county, State of Pennsylvania, and the said LONG residing at Fort Hunter, Dauphin county, State of Pennsylvania, have invented certain new and useful Improvements in Switch-Stands, of which the following is a specification.

The object of our invention is to provide a novel, simple and efficient railroad switch-operating mechanism whereby the switch rail may be held in a normal position by the pressure of a spring and against which pressure the switch rail may be moved, the parts being so constructed and arranged that when the switch rail is moved by or against the spring pressure, such pressure against the switch rail when it is in or adjacent said normal position will be greater than when the switch rail is moved farther from said normal position, thus effectually retaining the switch rail in said normal position by one degree of spring pressure, and permitting the switch rail to be moved in a direction away from said normal position under a lesser degree of pressure after the initial movement of the switch rail has overcome the greater degree of pressure.

The invention will be hereinafter more fully described and particularly pointed out in the claims.

In the drawings:—Figure 1 is a plan view of a portion of a railroad switch having our improved operating mechanism applied thereto. Fig. 2 is a vertical section on line 2—2 of Fig. 1, omitting the cross-ties and spikes. Fig. 3 is a horizontal section on line 3—3 of Fig. 2. Fig. 4 is a horizontal section on line 4—4 of Fig. 2. Fig. 5 is a horizontal section on line 5—5 of Fig. 2. Fig. 6 is a bottom view of the upper controlling member. Fig. 7 is a development of a portion of the member provided with the cam faces, showing the roller coacting therewith, enlarged. Fig. 8 is a view similar to Fig. 7, showing the parts in a different position.

6 designates the main rail, 7 the switch rail, and 8 the underlying cross-ties. The switch rail 7 is made tapering as shown, and it is mounted to be moved to a position against the main rail 6 and to a position away from the main rail 6 to open and close the switch, as is common and well known.

Mounted on the cross-ties 8 adjacent the main rail 6, is the main frame or support of the switch-operating mechanism. This frame or support comprises a base 9 spiked to the cross-ties 8, and a hollow standard 10 rising from the base 9. Within the lower portion of the hollow standard 10 are two centrally-disposed, vertically-arranged bearings 11 and 12 located one above the other as shown. In the present embodiment of our invention, these bearings are cast integral with the main support 10. Fitted to the bearing 11 is a lower vertical shaft 13, and fitted to the bearing 12 is an upper vertical shaft 14 which extends up through the standard in line with the lower shaft 13 and forms in effect a continuation thereof.

Secured to the upper end of the shaft 13 is a collar 15 provided with lateral arms 16, and secured to the lower end of the shaft 14 is a collar 17 provided with lateral arms 18 which are arranged in the same horizontal plane with and adjacent to the arms 16. The arms 16 are provided with adjustable screws 19 which are adapted to abut against the arms 18 and thereby cause the shafts 13 and 14 to turn as a unit and at the same time provide a means whereby one shaft may be adjusted with relation to the other circularly about the axis thereof. The lower end of the shaft 13 extends below the bearing 11, and has secured thereto a collar 20 which is provided with laterally-extending crank arms 21. Each crank arm 21 carries a vertical pin 22 and connected to one pin 22 is one end of a rod 23, the other end of which is connected to the switch rail 7 in the usual manner.

Located at the top of the standard 10 and mounted on the shaft 14, is a member 24 comprising a central collar 25 rotatably fitted to the shaft 14, an annular flange 26 extending downwardly into the standard 10, and a horizontal flange 27 resting upon the top of the standard and projecting beyond the outer edge thereof. The bottom of the flange 26 is provided with cam faces which will be hereinafter described.

Located directly beneath the member 24

is another member 28 which surrounds the shaft 14 and is slidingly fitted thereto to permit its movement toward and from the member 24 longitudinally of the shaft 14. The lower member 28 is not only guided by the shaft 14 in its movement toward and from the member 24, but it is also guided by lateral, vertically-arranged guide-bars 29 which are formed on the member 28 and fitted to vertical guide-ways 30 formed in the support or standard 10. The engagement of the guide-bars 29 with the walls of the guide-ways 30 also prevents rotation of the member 28 about the shaft 14. The lower member 28 is provided with parts adapted to engage and coact with the cam faces on the bottom of the flange 26, and in the present embodiment of our invention these parts of the lower member 28 coacting with the upper member 24 are anti-friction rollers 31, two in number and rotatably mounted on pins 32 projecting from opposite sides of the member 28 in line with each other. The rollers 31 rest normally in sockets 33 formed in opposite sides of the flange 26, and diverging downwardly from the side walls of each socket 33 and forming continuations thereof are cam-faces 34 for a purpose hereinafter described. The parts or rollers 31 of the lower member 28 are forced into engagement with the upper member 24 by the action of a spring 35 encircling the shaft 14 and having its lower end bearing against the top of the bearing 12 and its upper end bearing against the bottom of the lower member 28. The vertical movement of the upper member 24 under the influence of the spring 35 is prevented by a collar 36 secured to the shaft 14 directly above the upper member 24. The collar 36 forms a part of a lever support 37 which extends laterally from the shaft 14 and has pivotally connected thereto as at 38 a locking lever 39 which may be moved on the pivot 38 either to the full line or to the dotted line position shown in Fig. 2. When the lever 39 is lowered to the full line position shown in Fig. 2, it extends into one of four equidistant lever-receiving notches 40 which are formed in the outer portion of the flange 27 of the upper member 24. When the lever 39 is in the lowered or full line position extending through one of the notches 40, the sides of the lever engage the side walls of the notch and thus lock the lever 39, its support 37 and the upper member 24 and shaft 14 together to cause them to turn as a unit. When, however, the lever 39 is raised to the dotted line position, it is disengaged from the upper member 24, and it may then be turned to turn the lever support 37 and the shaft 14 fixed thereto independently of the upper member 24 and also independently of the lower member 28, for a purpose hereinafter explained.

Each side wall 41 of each socket 33 forms a cam face leading to and extending at an angle from the adjacent cam face 34. In Figs. 7 and 8 one dot-and-dash line 42 indicates the angle of one cam face or socket side wall 41, and another dot-and-dash line 43 indicates the angle of the adjacent cam face 34 connected therewith. It will therefore be seen that when the parts occupy the position shown in the drawings, the upper member 24 will be prevented from turning about the axis of the shaft 14 by the engagement of the rollers 31 with the sockets 33. It will also be seen that if sufficient pressure be exerted upon the upper member 24 to turn it about the axis of the shaft 14, the rollers 31 will be dislodged from engagement with the sockets 33 and will be forced downwardly against the action of the spring 35 and engaged by the cam faces 34; and it will be seen, further, that it will require a greater degree of pressure to turn the upper member 24 when the rollers 31 are in engagement with the cam faces or socket sides 41 than when the rollers 31 are in engagement with the cam faces 34, due to the different angles of the cam faces 34 and 41 with respect to the lower member 28.

The operation, briefly described, is a follows. When the parts occupy the position shown in the drawings, the switch rail 7 is in a normal position against the main rail 6, and it is held in such normal position by the engagement of the rollers 31 with the sockets 33, the rollers 31 being pressed into engagement with the sockets by the action of the spring 35, and the pressure of the spring 35 being such as to firmly hold the switch rail 7 in said normal position. If, in this position of the parts, a car wheel passes the switch in the direction from the heel to the point of the switch rail 7, the flange of the car wheel passing between the main rail 6 and switch rail 7 will move the switch rail 7 in a direction away from the main rail 6 sufficiently to permit the car wheel flange to pass between the two rails. When the switch rail 7 is thus moved from its normal position against the main rail 6, the rod 23 is operated to turn the shafts 13 and 14 and therewith the upper member 24. During the initial movement of the switch rail 7 away from the main rail 6, the upper member 24 is turned sufficiently to cause two of the cam faces 41 on opposite sides of the member 24 to engage the rollers 31 and move the lower member 28 downwardly against the action of the spring 35; and, as the switch rail 7 continues to move away from the main rail 6, two of the cam faces 34 on opposite sides of the upper member

24 come into engagement with the rollers 31 and continue to force the lower member 28 away from the upper member 24 against the action of the spring 35. After the car wheel flange has escaped the switch rail 7, the pressure of the spring 35 will act upon the lower member 28 in a manner to cause the rollers 31 to act first upon the cam faces 34 and then upon the cam faces 41 to return the upper member 24 to the position shown in the drawings, and at the same time return the rollers 31 into engagement with the sockets 33 and the switch rail into the normal position against the main rail 6. The angles of the cam faces 34 and 41 with respect to the lower member 28 and the path of movement thereof are such that the pressure of the spring 35 against the switch rail 7 will be greater when the rollers 31 are in engagement with the cam faces 41, and the switch rail 7 is in or near its normal position against the main rail 6, than when the rollers 31 are in engagement with the cam faces 34 and the switch rail 7 is away from its normal position. It will therefore be seen that during the greater part of the movement of the switch rail toward and from the main rail 6, the switch rail is relieved of much of the pressure necessary to hold it in the normal position, thus decreasing the friction and minimizing the jarring of the various parts, and consequently increasing the efficiency and prolonging the life of the mechanism.

When it is desired to operate the mechanism by hand to move the switch rail 7 with respect to the main rail 6, the lever 39 is raised to the position shown by dotted lines in Fig. 2, thus unlocking the upper member 24 from the shaft 14 and leaving the shafts 13 and 14 free to be operated by the hand lever 39 in a manner to adjust the switch rail 7 toward and from the main rail as desired.

We desire it to be understood that many changes may be made in the mechanism herein shown and described, without departing from our invention, and we also desire it to be understood that the parts may be constructed and arranged to hold the switch rail in any desired normal position without departing from our invention.

We claim:—

1. In a railroad switch-operating mechanism, the combination with the main rail and the switch rail movable to and from a normal position, of a support adjacent thereto, a switch-operating part connected to the switch rail, a spring, and means for causing said spring to exert one degree of pressure against said part when the switch rail is in a normal position and another degree of pressure against said part when the switch rail is moved to a position away from said normal position.

2. In a railroad switch-operating mechanism, the combination with the main rail and the switch rail movable to and from a normal position, of a support adjacent thereto; a member having two cam faces; a member coacting with said cam faces; a spring pressing one of said members into engagement with the other member; and connections between one of said members and the switch rail, said cam faces being arranged on different angles with respect to the second named member and positioned to engage the latter and move said switch rail in one direction to a normal position.

3. In a railroad switch-operating mechanism, the combination with the main rail and the switch rail movable to and from a normal position, of a support adjacent thereto; a member provided with a socket and a cam face, one side wall of said socket forming a cam face extending from the first named cam face at an angle with respect thereto; a member coacting with said cam faces; a spring pressing one of said members into engagement with the other member; and connections between one of said members and the switch rail, said cam faces being positioned to engage the second named member and move said switch rail in one direction to a normal position and the second named member into engagement with said socket.

4. In a railroad switch-operating mechanism, the combination with the main rail and the switch rail movable to and from a normal position, of a support adjacent thereto; a rotatable member; a second member supported against rotation by the first named member; one of said members having two cam faces coacting with the other member; a spring pressing one of said members into engagement with the other member; and connections between one of said members and the switch rail, said cam faces being arranged on different angles with respect to the member engaged thereby and positioned to engage the latter and move said switch rail in one direction to a normal position.

5. In a railroad switch-operating mechanism, the combination with the main rail and the switch rail movable to and from a normal position, of a support adjacent thereto; a rotatable member; a second member supported against rotation by the first named member; one of said members being provided with a socket and a cam face, one side wall of said socket forming a cam face extending from the first named cam face at an angle with respect thereto, said cam faces coacting with the other member; a spring pressing one of said members into engage-

ment with the other member; and connections between one of said members and the switch rail, said cam faces being positioned in respect to the member engaged thereby to engage the latter and move said switch in one direction to a normal position and the member engaging said cam faces into engagement with said socket.

In testimony whereof we affix our signatures, in the presence of two witnesses.

CHARLES W. REINOEHL.
CHARLES W. LONG.

Witnesses:
H. WEARY,
WM. R. MILLER.