(No Model.)

R. J. DAVIDSON.

RAILWAY SWITCH.

No. 422,573. Patented Mar. 4, 1890.

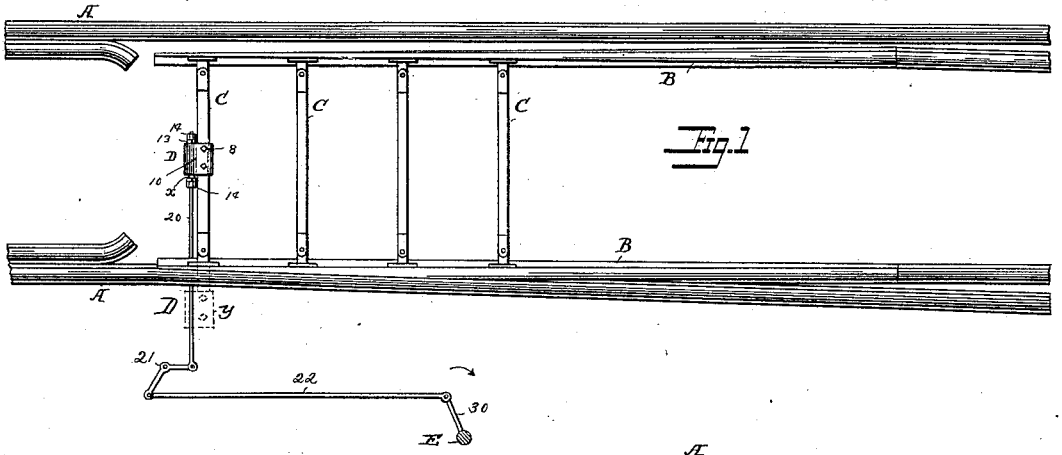

Fig. 1.

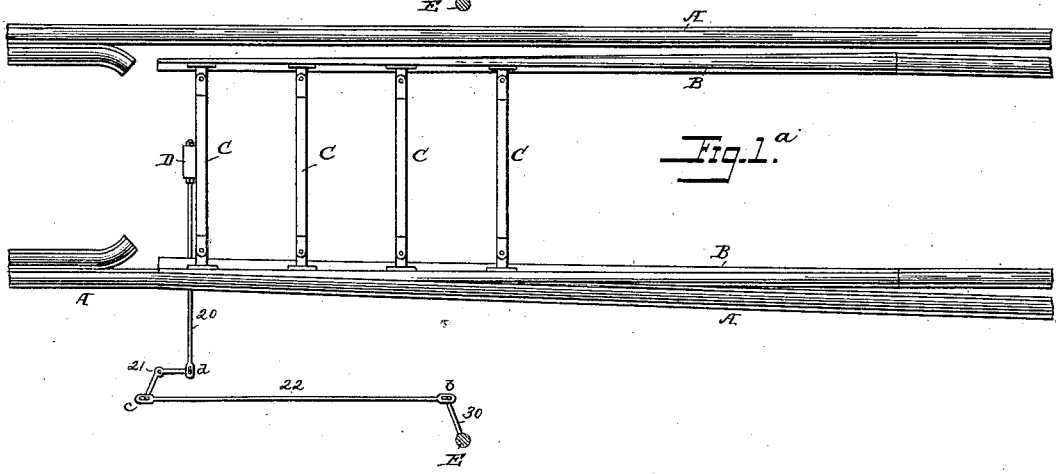

Fig. 1.a

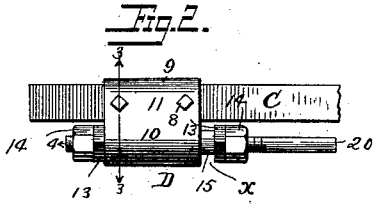

Fig. 2.

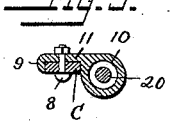

Fig. 3.

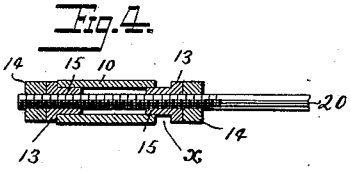

Fig. 4.

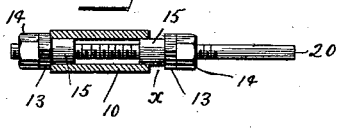

Fig. 5.

Witnesses,
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UNITED STATES PATENT OFFICE.

ROBERT J. DAVIDSON, OF HILLBURN, NEW YORK, ASSIGNOR TO THE RAMAPO IRON WORKS, OF SAME PLACE.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 422,573, dated March 4, 1890.

Application filed December 21, 1888. Serial No. 294,318. (No model.)

To all whom it may concern:

Be it known that I, ROBERT J. DAVIDSON, a citizen of the United States, residing at Hillburn, county of Rockland, and State of New York, have invented a new and useful Improvement in Railway-Switches, of which the following is a full, clear, and exact specification.

This invention relates, generally, to railway-switches, and particularly to the means by which they are connected to the switch-stand and through which the switch rails or points are moved laterally, its object being, primarily, to provide the connection between the switch-rails and the means for operating them with devices by which the lost motion incident to the wear of the connections may be taken up and compensated for. Heretofore it has been proposed to compensate for the ultimate wear between the connections by many methods which it is believed have not met the evil and cured the defective working of the switch rails or points.

The present improvements consist, broadly, in imparting a greater movement to the switch-stand than is necessary to the complete lateral movement of the switch-rails, and to compensate for this greater throw of the "stand" lost motion is provided in the first instance between one of the connections and the switch-rails, which motion, as the ultimate wear is created in the moving parts of the connections, is lessened or wholly taken up as the lost motion incident to wear increases.

As a better understanding of the invention will be more readily had from a detailed description thereof, further preliminary reference thereto will be omitted and such description now be given, referring to the accompanying drawings, in which—

Figures 1 and 1ª are plan views of a pair of main rails and switch rails or points having the improved connection applied thereto and illustrating its mode of operation. Fig. 2 is an enlarged plan view of a portion of one of the tie-bars connecting the switch rails or points together provided with the improved connection. Fig. 3 is a cross-section of the same taken on the line 3 3 of Fig. 2. Fig. 4 is a longitudinal vertical section taken on the line 4 4 of Fig. 2; and Fig. 5 is a similar section, the set-nuts and nuts and sleeves being shown in elevation.

Referring now particularly to Figs. 1 and 1ª, A represents a pair of rails of the main track, and B the switch rails or points operating in connection with said main rails and coupled together in the usual manner by tie-bars C, to either of which the improved connection D may be applied in order to adjust the switch rails or points laterally, as is well understood.

The lost motion in the connections between the switch-stand E and the switch rails or points incident to the wear of the parts is illustrated particularly in Fig. 1ª, wherein the loops *b c d* diagrammatically indicate the lost motion respectively between the switch-stand lever 30 and rod 22, rod 22 and one end of bell-crank lever 21, and between the other end of said bell-crank lever and the connecting-rod 20. With this understanding of what said figure illustrates, it will be observed that if the throw of the switch-stand lever 30 were equal in the first instance to the movement to be imparted to the switch rails or points, and which of course would effectually perform its duty so long as no wear occurred in the connections, as soon as lost motion is formed between either of the connections, or all of them, as shown, the throw of the switch-stand lever will be an idle one until said motion is taken up, when the switch-rails will be moved; but as the throw of the stand is no more than it was in the first instance it consequently fails to move the switch-rails the complete distance, said movement lacking the extent of the lost motion of the complete throw. This defective operation of the switch is obviated by the present improvements, which contemplate that the switch-stand lever 30 shall have in the first instance—that is to say, when the parts are all new—a throw greater than is necessary to the complete lateral movement of the switch rails or points. In order, however, to compensate for this increased movement of the stand-lever there is provided between the connection D and the connecting-rod 20 a "play" equal to the amount of throw the said lever 30 has over the necessary movement it

is requisite should be imparted to the switch-rails. Thus in Fig. 1 the nut 13 on the rod 20 is removed a short distance (as at *x*) from the end of the connection D. If, now, the stand-lever 30 be moved in the direction of the arrow, the rod 20 will be moved idly until its nut 13 contacts with the connection D, when the switch-rails will be moved during the remainder of the throw of the lever 30 in unison therewith and their lateral movement be a complete one.

Now, let it be supposed that the connections have become worn and lost motion been formed therein, so that the throw of the stand-lever 30 is not great enough to impart the complete movement to the switches. The nut 13—take, for example, Fig. 1[a]—will be moved up toward the end of the connection D a distance to lessen the play (at *x*, Fig. 1) between it and said connection and sufficient to compensate for the lost motion created by the wear of the parts at *b c d*. If, now, the stand-lever 30 (having the greater movement referred to) be thrown, its first movement will be to take up the lost motion at said points, and then during the remainder of its throw move the switch-rails in unison therewith and their complete movement be effected.

The construction of the improved connection D by which this operation is attained is shown in detail in Figs. 2 to 5, and consists, essentially, of a forged hub 10, adapted to be connected to the operating or connecting rod 20, and provided with an extending flange 11, that may be secured to a tie-bar C, as shown. The outer edge of the flange 11 is provided with a lip 9, and the flange is of such width that the tie-bar will lie snugly between the hub 10 and said lip, thus preventing any play between the hub and the tie-bar should the securing-bolts 8 become loosened or the holes through which they pass become worn.

The connecting-rod 20 may be secured directly to the switch-stand E or other operating means, or, as shown, may be attached to one end of the bell-crank lever 21, the other end of which lever is connected by a rod 22 with the switch-stand or other levers and rods operating the switch rails or points from a distance. The opposite end of the operating or connecting rod 20 is passed through the hub 10 of the connection D, and is screw-threaded for some distance from its end, upon which are mounted, and upon opposite sides of the hub 10, a pair of nuts 13 14, the former of which confine the rod in place in the hub and the latter acting as jam-nuts to prevent the nuts 13 from working loose.

In order to form a more effective connection between the rod and hub, the hole through which the rod extends in the latter is made of a greater diameter than that of the rod, so that considerable space is left between the rod and the hub. The rod, however, is seated in said hub by forming integral with the nuts 13 sleeves 15, of such size as to pass with a nice fit into the hub 10, between its walls and the rod, and thus support the latter centrally therein and prevent any movement other than that heretofore set forth between the hub and rod. The nut and sleeve being integral, the former will form a shoulder which may abut against the end of the hub 10, and thus limit the lateral movement of the rod and cause them to move in unison.

When the lost motion incident to wear occurs in the connections, as before set forth, said motion will be compensated for by moving either or both of the nuts 13 up toward or in contact with the ends of the hub 10, thus diminishing or entirely removing the play left between the rod and hub and cause the rod and switch-rails to be moved in unison.

While the connection D is shown as secured to the center of one of the tie-bars C, it is to be understood that said bar or either of them may be extended to the outside of the rails, as at *y*, Fig. 1, and the connection secured to the tie-bar at that point. So, too, instead of being secured to the first one of the bars, it may be secured to either of them, as may be desired.

What I claim is—

1. The combination, with the switch rails or points, of a switch-stand lever for operating the same, having a throw greater than is necessary to the complete movement of the switch-rails, connections between the switch-stand lever and the rails operated by the said lever, and adjustable stops normally situated at a distance apart to allow lost motion in the movements of the said connections, substantially as set forth.

2. The combination, with the switch rails or points, of a switch-stand lever for operating the same, having a throw greater than is necessary to the complete movement of the said switch-rails, a connection carried by the switch-rails, a connecting-rod operated by the said lever, and adjustable stops which engage with opposite faces of the said connection and are normally situated at a distance apart greater than the distances between the faces with which they engage, substantially as set forth.

3. The combination, with the switch rails or points and the switch-stand lever for operating the same, of a connecting-rod interposed therebetween and provided with means, such as the nuts 13, for compensating for the wear in the operating-connections, and the hub through which the connecting-rod passes and with which the said nuts engage, substantially as described.

4. The combination of the tie-bar and the switch-rails carried thereby, a hub secured thereto, a connecting-rod passing through said hub, and adjustable nuts on said rod on each side of the hub of a size larger than the openings through which the rod passes, for adjustably stopping the movement of the said rod through the hub, substantially as described.

5. The combination of the tie-bar and the

switch-rails carried thereby, a hub secured thereto, a connecting-rod passing through said hub, and adjustable sleeved nuts on said rod on each side of the hub, having heads larger than the openings in the hub through which the rod passes for adjusting the movement of said tie-bar, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT J. DAVIDSON.

Witnesses:
WILLIAM A. REDDING,
ISAAC F. RUSSELL.