

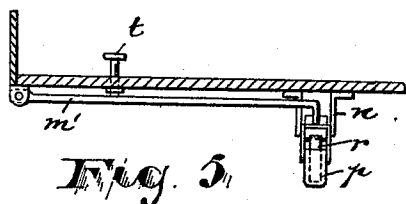
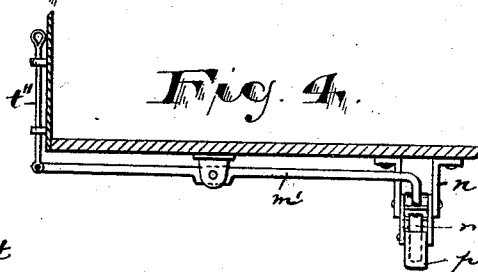
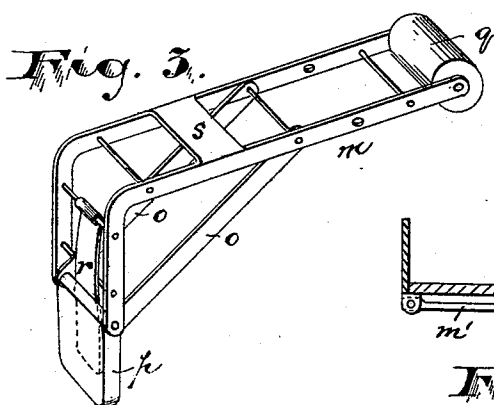
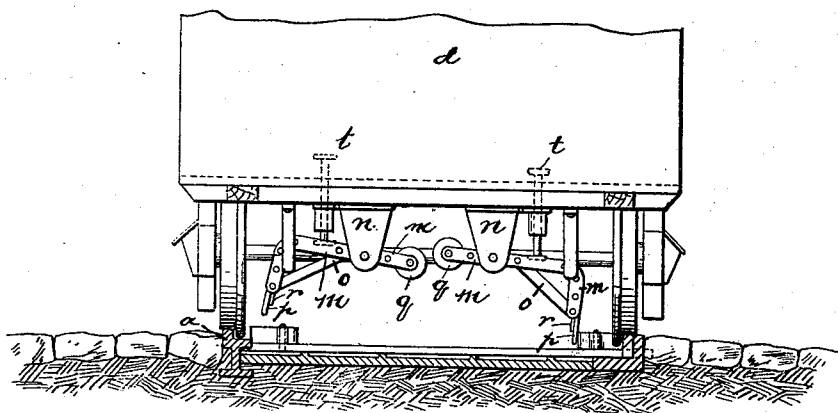
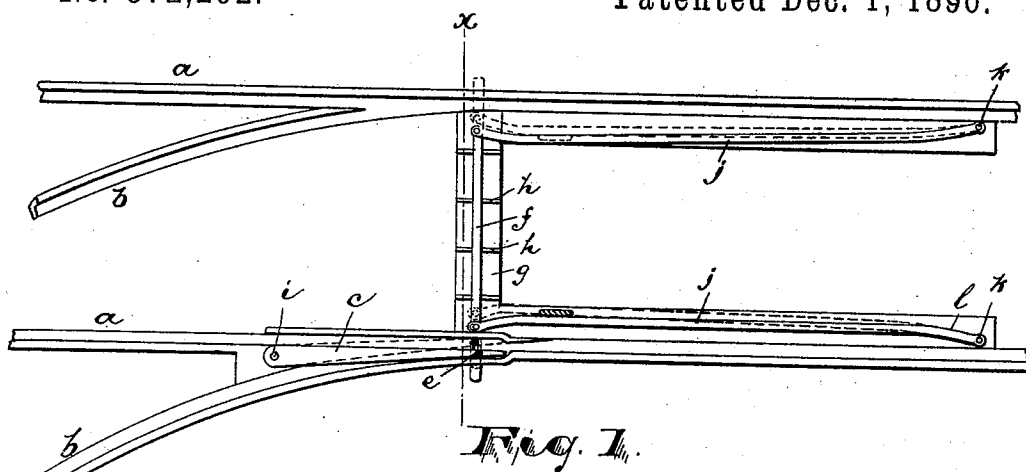
(No Model.)

2 Sheets—Sheet 1.

E. D. FARNSWORTH.  
SWITCH OPERATING DEVICE.

No. 572,292.

Patented Dec. 1, 1896.



Witnesses

Inventor:

Robert Sollberger  
Beatrice Charles

Erwin D. Farnsworth,

By Drake & Co. Attys.

(No Model.)

2 Sheets—Sheet 2.

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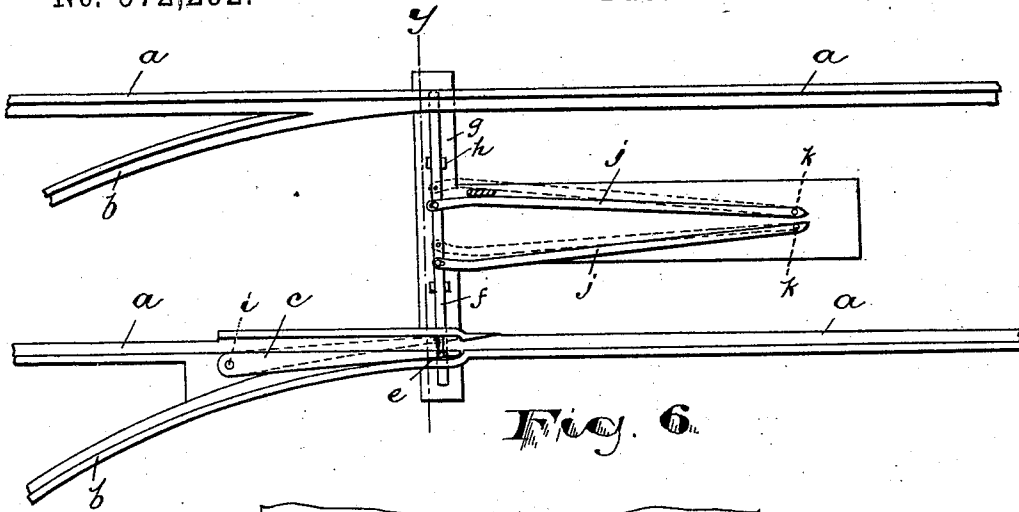


Fig. 6.

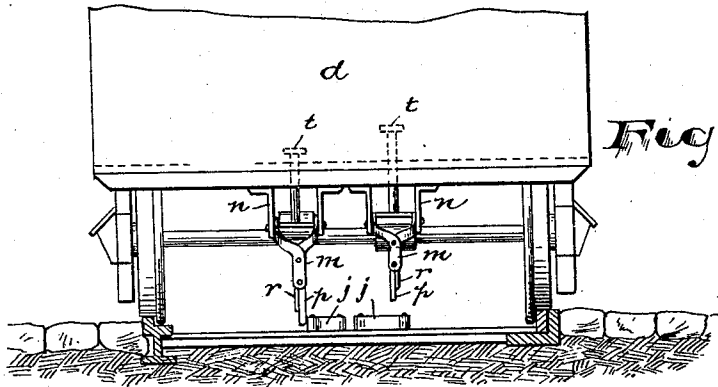


Fig. 7.

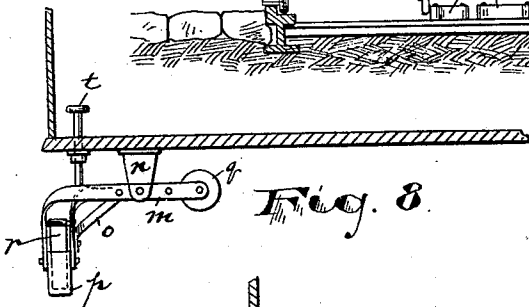


Fig. 8.

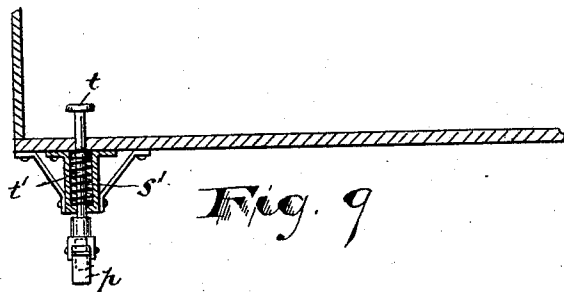


Fig. 9.

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# UNITED STATES PATENT OFFICE.

ERWIN D. FARNSWORTH, OF NEWARK, NEW JERSEY.

## SWITCH-OPERATING DEVICE.

SPECIFICATION forming part of Letters Patent No. 572,292, dated December 1, 1896.

Application filed February 2, 1895. Serial No. 537,036. (No model.)

*To all whom it may concern:*

Be it known that I, ERWIN D. FARNSWORTH, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Switch-Operating Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of this invention is to reduce the cost of construction and enable the switching operations to be conducted more easily and conveniently, and to secure other advantages and results, some of which will be referred to hereinafter in connection with the description of the working parts.

The invention consists in the improved car mechanism for operating the switch and in the arrangement and combinations of parts, all substantially as will be hereinafter described and finally pointed out in the clauses of the claim.

Referring to the accompanying drawings, in which like letters indicate corresponding parts in each of the several views, Figure 1 is a plan of a railway embodying certain features of my invention. Fig. 2 is a sectional view of the track and an elevation of a portion of a car having the improved switch-operating device. Fig. 3 is a perspective view of a lever adapted to be fulcrumed upon the under side of the car and to be employed in operating the switch-tongue. Fig. 4 is a detail of the switch-operating device, illustrating a modification of the construction; and Fig. 5 is another detail likewise showing a modified construction of the switch-operating device. Fig. 6 is a plan of a railway, indicating a modification in the construction of the switch-tongue-operating mechanism. Fig. 7 is a sectional view of the track and shows an elevation of the car and the relation of the latter to the switch-operating device, and Figs. 8 and 9 are sectional details also illus-

trating further modifications of the construction. 50

In said drawings, *a a* are the main-line rails, *b b* are the siding-rails, *c* is a switching-tongue of any ordinary construction adapted to lead the car from the main line to the siding, and *d* indicates the car, the wheels of which are suited to run upon the said tracks and to engage the switching-tongue and be directed thereby upon the siding-rails in the usual manner. The said switching-tongue is connected by a pivot *e* to a transverse bar *f*, which extends from one rail to the other, preferably fitting in perforations in said rails. Said transverse bar is seated upon a plate *g* and slides longitudinally thereon and is held from lateral motion by lugs or projections *h*, the said projections being disposed at frequent intervals to protect the said bar and prevent it from being bent by heavy vehicles, &c., passing thereover. By moving the bar *f* longitudinally back and forth the switching-tongue is turned on its pivot *i* from its open to its closed position, and vice versa. To said transverse bar *f* are pivoted levers *j j*, and these latter are also pivoted at points, as *k k*, at a distance from the bar *f*, and are disposed so that one or the other will lie in an inclined position with respect to the main-line rails and where certain switch-operating devices of the car will engage the inclined surface and thus throw said levers and bar *f* and the switching-tongue *c* to or from their open or closed positions. 80

When one of the levers *j* is thrown from an initial inclined position to its position parallel or approximately parallel with the rail, the other lever is thrown to an inclined position, so that the switching mechanism of the car will engage the incline thereof and throw the parts back to said initial position. The said levers *j j* form a pair at each switch and present to the car mechanisms very long inclines, so that when the said switch-operating devices of the car engage the said inclines the rapid movement of the car and its said switch-operating devices will produce only a slow or easy movement of the switch, thus reducing the impact and avoiding any liabil- 95

ity to produce a rupture or disarrangement of the parts. By making the levers  $j j$  in a pair, as shown, I am enabled to secure the long inclination desired without adding much to the weight to be moved in operating the switch. These levers  $j j$  are disposed apart at their pivotal ends  $k$  and are preferably arranged closely adjacent to the rails, as indicated in Fig. 1, so that there will be no opportunity of vehicle-wheels being caught in sharp angles, as they would were the two levers pivoted on one pin or pivot. The ends of the levers  $j j$  are preferably curved more or less sharply at their ends, so that the switch-operating device of the car will not engage the extremity of the lever and will become disengaged from the said levers  $j j$  before passing the extremities of said levers, and thus there can be no binding of the parts, so that the weighted lever of the car cannot operate as referred to. The levers  $j j$  also rest upon plates  $l$ , which are in the preferred construction disposed longitudinally adjacent to the rails  $a a$ , although they may be as in Fig. 6, where a single plate is arranged midway between the tracks, the one plate carrying the two levers. By having the plates and their levers  $j j$  at the sides of the track, as in Fig. 1, a full space is provided for the horse's feet, enabling him to travel freely along the track without danger of having his shoes caught or of being otherwise injured.

The switch-operating devices consist of weighted levers, which are fulcrumed upon hangers  $n$ , fastened to the bottom of the car in any suitable position. I have shown a variety of methods of arranging the said levers, but the preferred construction and arrangement is shown in Figs. 2 and 3, where each lever is shown to consist of an angular frame which may be of a single casting or, and preferably, of wrought-iron made in jointed parts. The parts of the frame forming the angle are braced by stays  $o$ , and the said frame at one end is provided with a contact-tongue  $p$ , adapted to engage one of the levers  $j j$  of the track, and at the other end is provided with a weight which normally holds the levers so that the contact-tongue is elevated above the plane of engagement with the said levers  $j j$ . Said weights  $q$  may be integrally cast with the frame or, and preferably, may be independent pieces. The contact-tongue of each frame is joined to the said frame so as to have an independent movement thereon, a pivotal connection being preferable. The said tongue is held in normal position to engage the lever  $j$  by a spring  $r$ , the said spring being of sufficient strength to enable the lever  $j$  and its connections to be operated; but should the said parts be blocked in their operation by stones or other obstructive matter on the track the said spring will then give and thus prevent the frame from being dis-

arranged or forced from proper operative relation to the car or hangers. The said frame  $m$  is provided with bearings  $s$ , adapted to receive the pressure from the foot-piece  $t$ . The foot-pieces are arranged to slide in suitable bearings in or of the platform, as indicated in Figs. 2 and 9. The said foot-pieces are held in elevated positions by the power of the weights  $q$ , the latter being of sufficient strength to not only hold the contact-tongues in elevated positions, but also the said foot-pieces. I may employ a spring  $s'$  to assist the weight or to hold the foot-piece and the contact-piece in an elevated position when the weight is not employed, as in Fig. 9.

It is evident that the switch-operating mechanisms of the car, as well as the switch mechanisms of the track, may be modified or varied in construction. The switch-operating levers may be arranged longitudinally with respect to the car, as indicated in Figs. 7 and 8, or transversely, as in the preferred construction of Fig. 2.

In Fig. 9 I have shown a construction in which the contact-piece  $p$  is hinged directly to the lower end of a sliding plunger  $t'$  in vertical line with the foot-piece, so that by a simple depression of the foot-piece  $t$  the contact-piece is brought directly into the plane of the lever  $j$ .

In Fig. 4 the switch-operating mechanism of the car is shown to be operable by the hand, the handle  $t''$  in this case extending up in front of the dashboard of the car. In this case the handle is coupled to an intermediate lever  $m'$ , which extends longitudinally backward to the bearings  $s$  of the lever  $m$ , said lever  $m$  being stationed farther back from the end of the car, so as to leave room for other parts. The intermediate lever may be operated by the foot-piece  $t$ , as in Fig. 5. The foot-piece projecting above the platform of the car, as shown, is preferably removable from its bearings, so as to be transferred from one platform to the other and thus not be in position to interfere with or obstruct the standing-space when not in use.

I am aware that other changes may be made without departing from the spirit or scope of this invention, and so I do not wish to be understood as limiting myself to the exact constructions shown and positively described.

In operating the invention the driver or motorman simply depresses the foot-piece and brings the contact-piece  $p$  into the horizontal plane of the inclined lever  $j$  prior to the passage of the car over the same. The inclined bar is, when an engagement is made, caused to vibrate on its pivot as the car advances and with the transverse bar  $f$  and the switch-tongue  $c$  move to its open or closed position, as will be understood.

Having thus described the invention, what I claim as new is—

1. The combination with the car, of the angular lever weighted at one end and at the other provided with the hinged contact-piece and a spring, *r*, controlling said contact-piece,  
5 substantially as set forth.

2. The combination with the angular frame fulcrumed upon the car, of a hinged contact-piece, a spring, *r*, for holding the same in normal position to engage the switch mechanisms, and a depression-piece adapted to  
10

throw said frame into position to make a contact, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 24th day of January, 1895.

ERWIN D. FARNSWORTH.

Witnesses:

CHARLES H. PELL,  
BEATRICE CHARLES.