(No Model.) 2 Sheets—Sheet 1.

S. GOODHUE.

RAILWAY SWITCH.

No. 265,257. Patented Oct. 3, 1882.

Fig. 1.

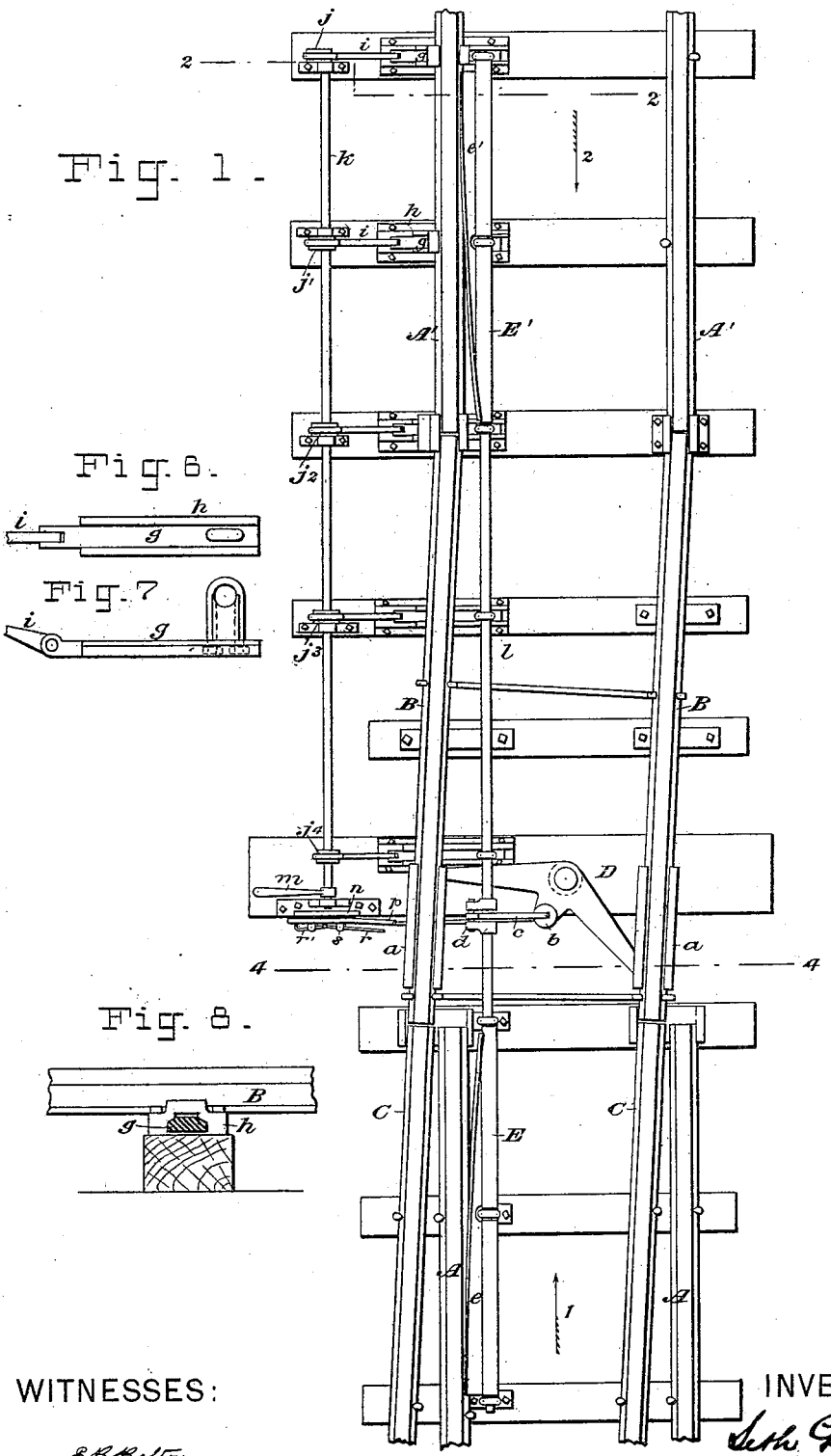

Fig. 6.

Fig. 7.

Fig. 8.

WITNESSES:

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

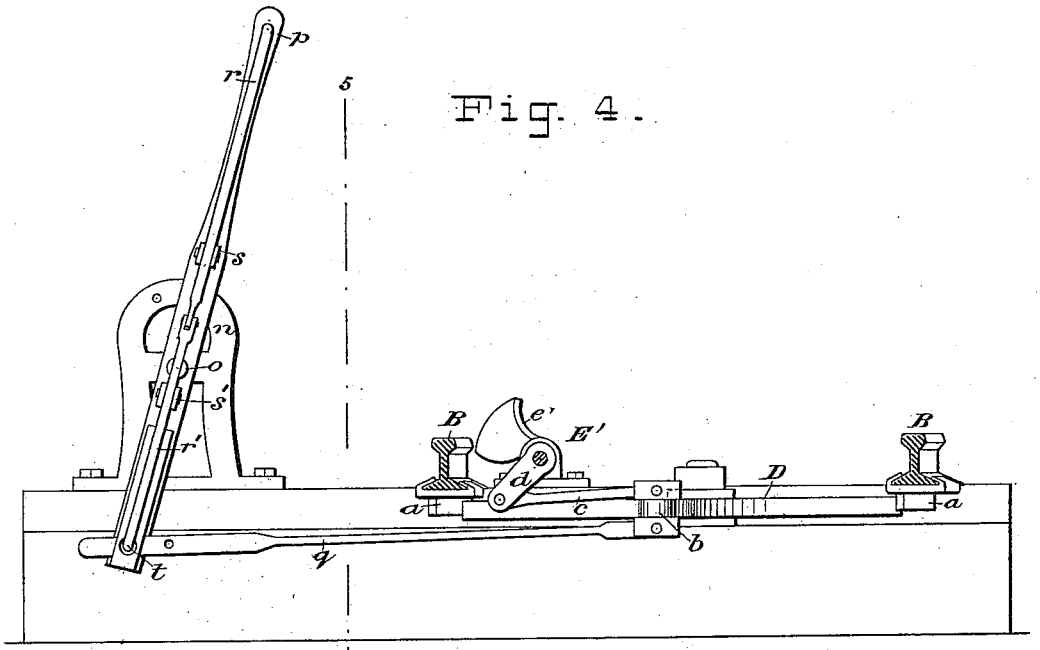


Fig. 6.

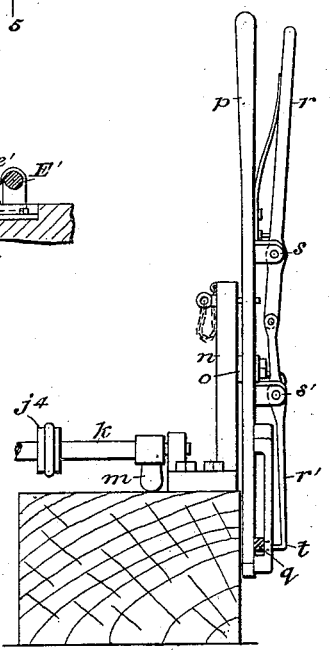


Fig. 2.

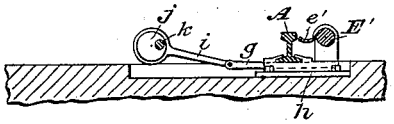
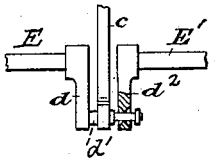


Fig. 3.



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UNITED STATES PATENT OFFICE.

SETH GOODHUE, OF WILMOT, NEW HAMPSHIRE.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 265,257, dated October 3, 1882.

Application filed April 14, 1882. (No model.)

To all whom it may concern:

Be it known that I, SETH GOODHUE, a citizen of the United States, residing at Wilmot, in the county of Merrimack and State of New Hampshire, have invented certain Improvements in Railway-Switches, of which the following is a specification.

This invention relates, in the main, to automatic switches for railways to be used in connection with sidings, the object being to provide against trains being derailed and to insure their keeping the main track automatically. Provision is made, however, for throwing the train onto the siding and for shifting the switch-rails by hand in case of necessity.

The novel features of the invention will be set forth in the claims.

In the drawings which serve to illustrate my invention, Figure 1 is a plan of a switch embodying the same. Fig. 2 is a cross-section on line 2 2 in Fig. 1. Fig. 3 is a detached view of the coupling-crank in the rotating lever-shaft. Fig. 4 is a cross-section on line 4 4 in Fig. 1, but drawn to a larger scale. Fig. 5 is a view of the hand shifting-levers, taken at right angles to Fig. 4. Figs. 6 and 7 are respectively a plan and side elevation of one of the slides which form bearings for the rotating lever detached and enlarged; and Fig. 8 is a cross-section of one of the chairs in which the said slides are mounted so as to play under the fixed track-rails.

In general, my invention employs what I denominate a "rotating lever," arranged along the track, which lever has a spiral concave flange, upon which the flange of the locomotive-wheel acts to rotate said lever, and this lever is coupled by a crank and connecting-rod with a rail-shifting lever. Means are also provided for throwing a section of this rotating lever to one side, so that the wheel-flanges may not act upon it, and the train be permitted thus to pass onto the siding. Means are also provided for shifting the switch by hand, while at the same time the hand-lever will remain disengaged from the shifting-bar when its use is not required.

Let A A represent the main-track rails adjacent to the free ends of the switch-rails B B, and A′ A′ the main-track rails adjacent to the pivoted ends of the switch-rails. C C represent the rails of the siding with which the switch-rails may be brought into coincidence, as shown in Fig. 1. All of the above rails are or may be laid in the usual manner.

D is the rail-shifting lever, which is mounted between the rails and constructed to operate on the switch-rails, substantially as shown in my Patent No. 234,977, of November 30, 1880—that is to say, when it is oscillated on its fulcrum-pivot its arms take against the rails, or against shoulders or projections fixed thereon, and shift the rails from side to side. In the present construction this lever D is arranged below the level of the rails, and its arms impinge against blocks *a a*, secured to their bases.

The lever D has a third arm, *b*, which is coupled by a link or connecting-rod, *c*, with a crank, *d*, on the shaft of the rotating lever. This lever is made in two sections, E and E′, the former of which is mounted rotatively in fixed bearings along the inside of a main-track rail, A, and substantially parallel thereto. On this section the crank *d* is formed or fixed, as shown in Fig. 3.

On the section E is formed or fixed a spirally-arranged flange, *e*, which makes by preference about a quarter turn or twist, and which is made hollow or concave, as seen in Figs. 2 and 4. This flange lies close to the head of the rail, and the arrangement is such that when the wheel passes along (in the direction of arrow 1 in Fig. 1) its flange takes over the turned-up edge of the spiral flange and gradually turns the lever E on its axis. This movement of the lever acts through the crank *d*, rod *e*, and shifting-lever D to shift the switch-rails into coincidence with the main-track rails, and thus prevents the train from being derailed. For want of room the flanged portion of the section E is shown to be quite short; but it may be of any desired length. I contemplate making this flanged part about twenty-four feet long. It is also arranged at some distance from the switch.

The section E′ is constructed the same as section E, except that its flange *e′* is arranged to twist in the opposite direction. This is because the flange *e′* is to be acted on by the wheel of a locomotive moving in the direction of arrow 2, Fig. 1. In either case, however, the rotating shafts which bear flanges *e e′* turn

in the same direction, and the switch-rails are shifted to coincide with the rails of the main track. This section E′ is intended to be as long as the section E.

In some cases it will be necessary for a train moving in the direction of arrow 2 to run onto the siding; but it is obvious that this cannot take place without some means are employed to prevent the flange of the locomotive-wheel from acting on the flange e'. I have provided means for preventing this, which I will now describe.

I mount the section E′ rotatively on sliding plates g, (see Figs. 1, 2, 6, and 7,) which are mounted in chairs h, that support the track-rail A′ and switch-rail B. The plates g are free to slide under the rail. These plates g are connected by rods i with eccentrics $j\ j'\ j^2$, &c., formed on or fixed to a shaft, K, mounted rotatively in fixed bearings at the side of the track and substantially parallel thereto. The section E′ is coupled rather loosely to the section E at the crank d, which coupling is shown detached in Fig. 3. The wrist d' of the crank is fixed to or in the crank d on the section E, but has a little looseness or play in the crank d^2 on section E′. This loose coupling is such as to compel one section to turn with the other; but at the same time it will permit the section E′ to be swung around and away from the track-rail far enough for the wheel-flange to miss it. To enable the crank-pin d' to act positively on crank d^2 without lost motion, and yet to permit of the slight necessary movement of the section E′, it is only necessary to flare the bearing in crank d^2 a little at both sides of said crank, the pin, however, fitting snugly at the center of the bearing. This is accomplished by turning the shaft k through the medium of the handle m on its end. The eccentrics $j\ j'$, &c., have different amounts of throw or eccentricity, j having the greatest throw and j^4 the least, whereby the section E′ is caused to move least near the coupling and most at the other end. Owing to the spiral arrangement and position of the flange e', it will be seen by inspection of Fig. 1 that the end of the flange farthest from the coupling stands nearest the rail, so that it will only be necessary to shift that end of the section E′ a little in order to clear the wheel-flange.

Where the sections E and E′, taken together, are very long they might be made in one piece and the coupling omitted. In this case I would rely wholly upon the flexibility of the shaft-sections to permit the section E′ to be moved or swung away from the rail; or any form of flexible coupling might be substituted for that shown in Fig. 3—as a universal joint, for example.

In lieu of the eccentrics $j\ j'$, &c., cranks of different lengths might be employed, and any number deemed necessary may be used.

In some cases it may be desirable to shift the switch by hand; but it is important that the hand mechanism should not interfere with the automatic devices. I provide for this by the mechanism best shown in Figs. 4 and 5.

A bearing-frame, n, is mounted on the tie, and to this is pivoted, at o, a hand-lever, p. At the lower end of this lever is constructed a keeper, through which is passed the flattened end of a shifting-rod, q, the other end of which is coupled to the arm b of the lever D. Normally the rod q is free to slide in the keeper in the lever p, so that the lever D is free to play without affecting the lever p.

On the face of the lever p are mounted two elements, $r\ r'$, of a compound lever fulcrumed respectively at $s\ s'$. On the lower end of the element r' is a pin, t, arranged to engage a hole in the rod q and the end of the lever p, but normally held withdrawn (see Fig. 5) by a spring, u.

When it is desired to shift the switch-rails by hand the lever p is swung on its fulcrum until the pin t comes opposite the hole in the rod q, when the operator compresses spring u by squeezing together p and r, and the pin t is caused to pass through and couple the lever and rod together. The switch may now be shifted by swinging lever p.

When it is desired that a train coming from the direction indicated by arrow 2 shall go on to the siding the switchman moves the section E′ away from the rail A by means of a hand-lever, m, on the eccentric shaft k, which lever is by preference mounted, as shown, at the same place with the lever p. Both the levers m and p should be provided with chains and padlocks in the usual way to prevent their being shifted by unauthorized persons. The lever m is preferably arranged to move through a semicircle and to lie in a horizontal position normally.

The concavity of the spiral flanges $e\ e'$ on the sections E E′ causes the wheel-flange to so act on them as to draw them toward the track-rails. When they are made flat the tendency is for the wheel-flange to wedge or force them off from the rail. The sections E E′ may be considered as one lever having two oppositely-arranged spiral flanges.

I am aware that spirally-flanged levers for the wheel-flange to act upon in producing mechanical effects are not new, and I make no broad claim to these, and I make no broad claim herein to the shifting-lever D, as this was shown in my patent before mentioned; but

What I do claim is—

1. The mechanism for shifting the switch-rails, comprising the rotating lever provided with two spiral flanges arranged oppositely, said lever being arranged at the inside of the track-rails, as shown, the shifting-lever arranged between the switch-rails, and one of its arms coupled to a crank on the rotating lever, the main-track rails and the switch-rails, all combined and arranged substantially as set forth.

2. The mechanism for setting over the ro-

tating lever so that the wheel-flange may not act upon it, comprising the said lever mounted on sliding bearings, the shaft *k*, mounted to rotate in fixed bearings, the eccentrics mounted on said shaft and having different degrees of eccentricity, and the connecting-rods *i i*, all combined and arranged substantially as set forth.

3. The combination, with the main-track and switch rails and the shifting-lever, of the rotating lever made in two sections, E E′, provided with the concave spiral flanges *e e′*, arranged oppositely, and the said sections loosely coupled together, the connecting-rod *c*, arranged to couple the arms *b* of the shifting-lever with the crank *d*, the eccentric shaft *k*, the eccentrics mounted thereon, and the connecting-rods *i i*, all arranged to operate substantially as set forth.

4. The combination, with the switch-rails, the shifting-lever D, the rotating lever coupled thereto, and the connecting-rod *q*, of the hand shifting mechanism, comprising the lever *p*, provided with a keeper and hung on a suitable fixed frame, said frame, the lever *r*, spring *u*, and lever *r′*, provided with a pin, *t*, all arranged to operate substantially as and for the purposes set forth.

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

SETH GOODHUE.

Witnesses:
ROBERT C. CARR,
ROBERT FRAME.