(No Model.) 6 Sheets—Sheet 1.

J. M. PARLOW & C. W. TOBEY.

RAILWAY SWITCH.

No. 419,061. Patented Jan. 7, 1890.

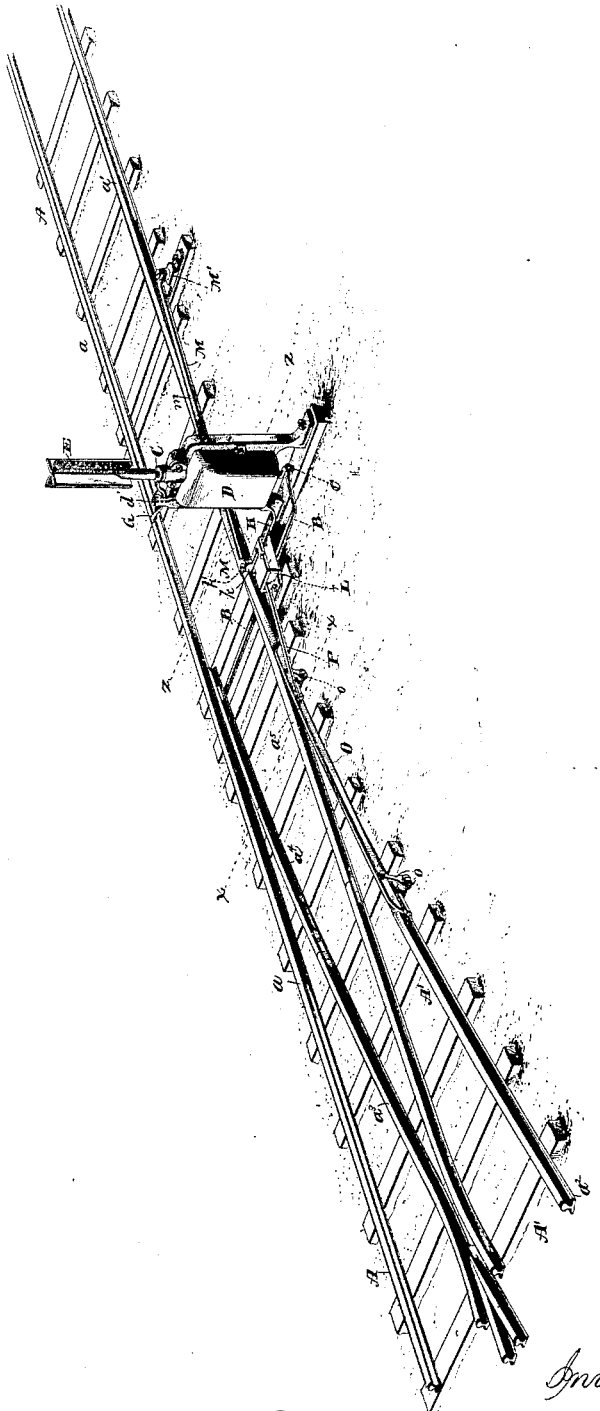

Fig. 1.

Witnesses
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Pindle & Russell, their attys.

(No Model.) 6 Sheets—Sheet 2.

J. M. PARLOW & C. W. TOBEY.

RAILWAY SWITCH.

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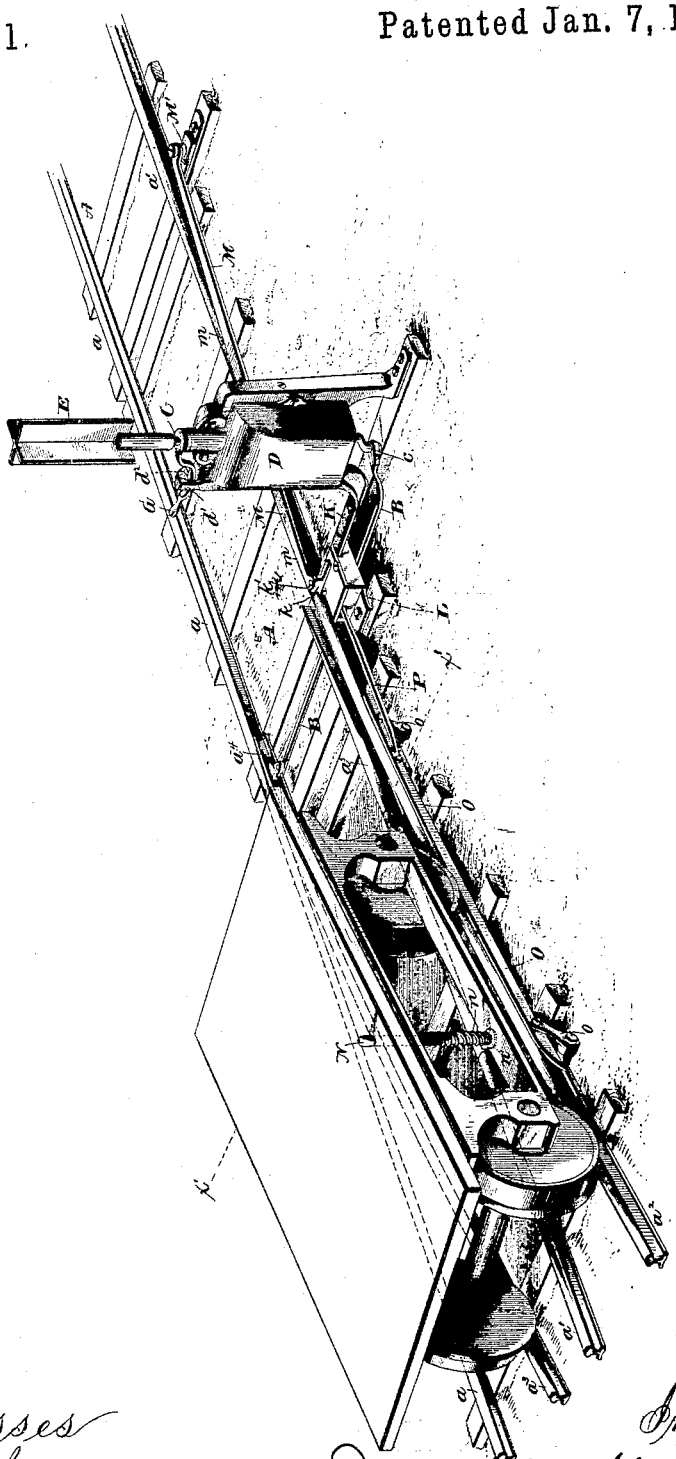

Fig. 2.

Witnesses
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(No Model.) 6 Sheets—Sheet 3.

J. M. PARLOW & C. W. TOBEY.

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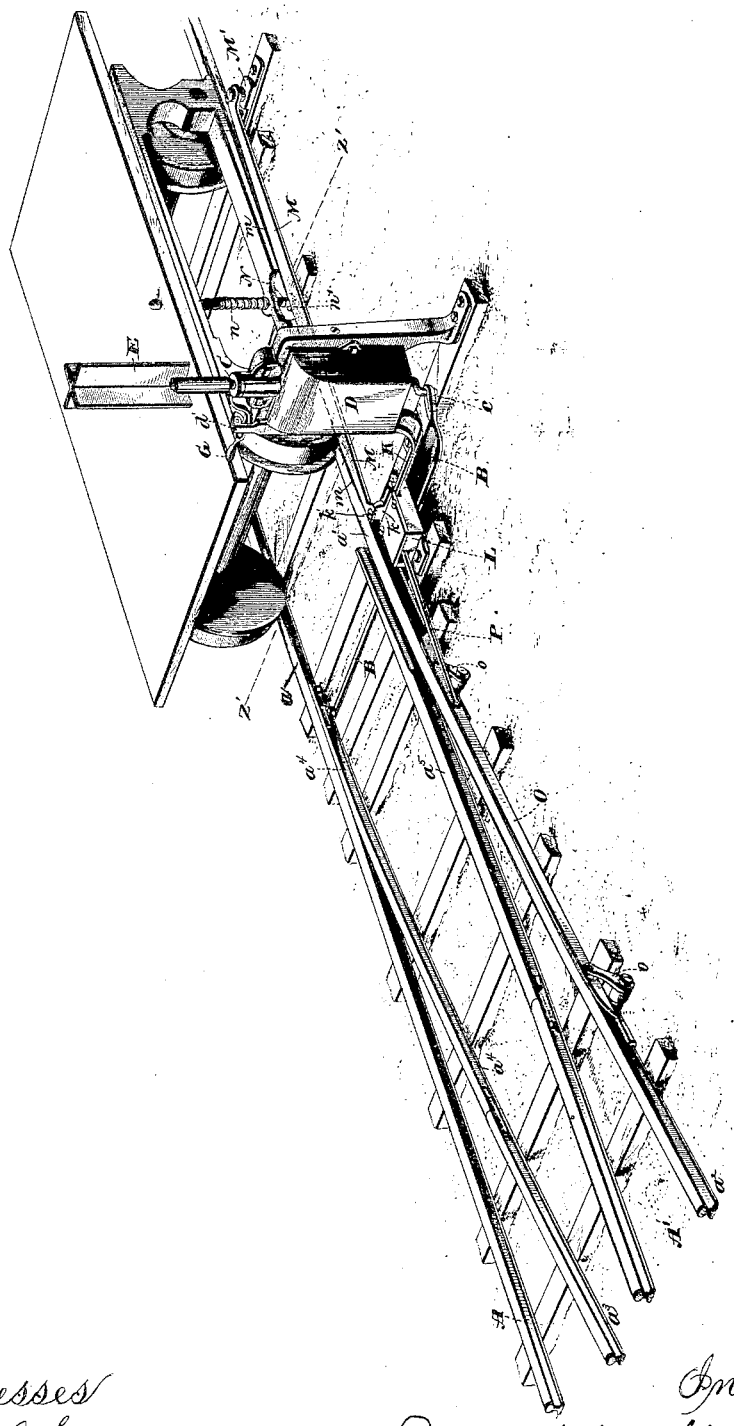

Fig. 3.

Witnesses
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(No Model.) 6 Sheets—Sheet 4.

J. M. PARLOW & C. W. TOBEY.

RAILWAY SWITCH.

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Fig. 4.

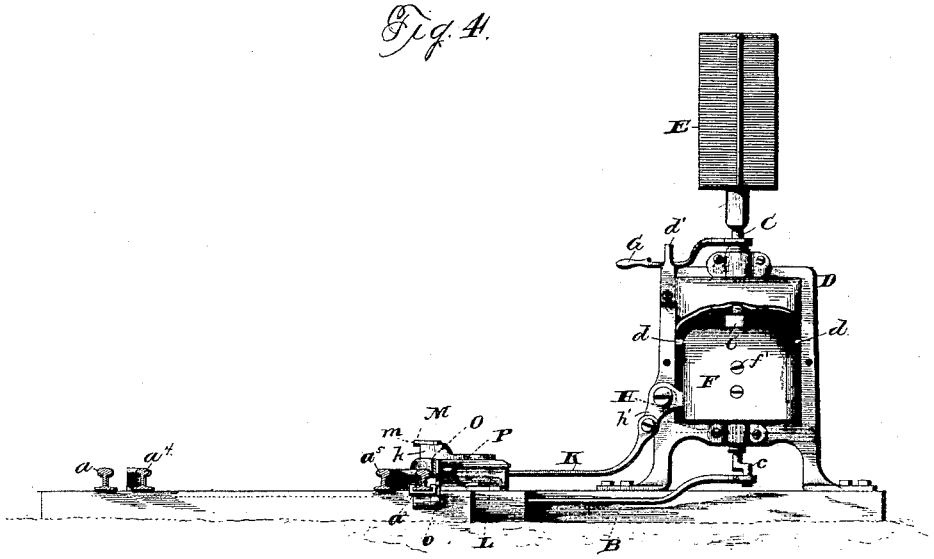
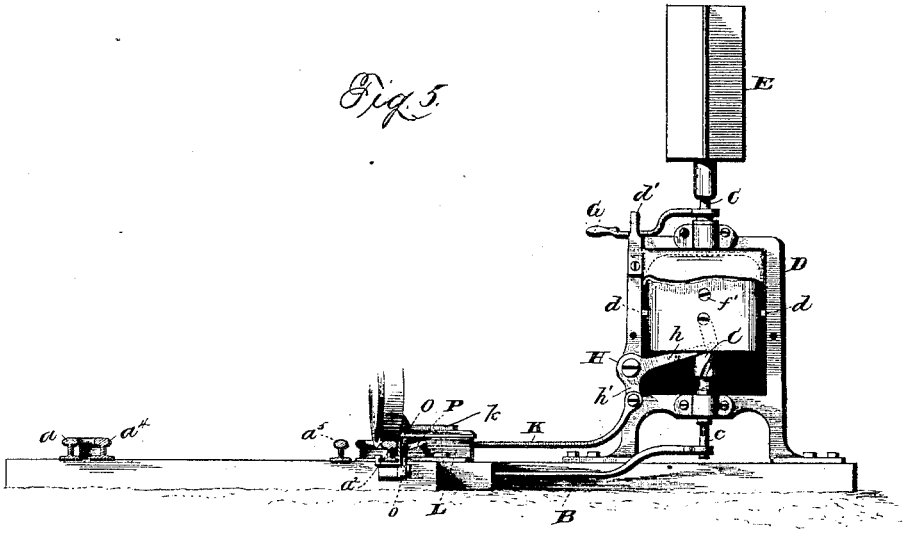


Fig. 5.



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J. M. PARLOW & C. W. TOBEY.

RAILWAY SWITCH.

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Fig. 6.

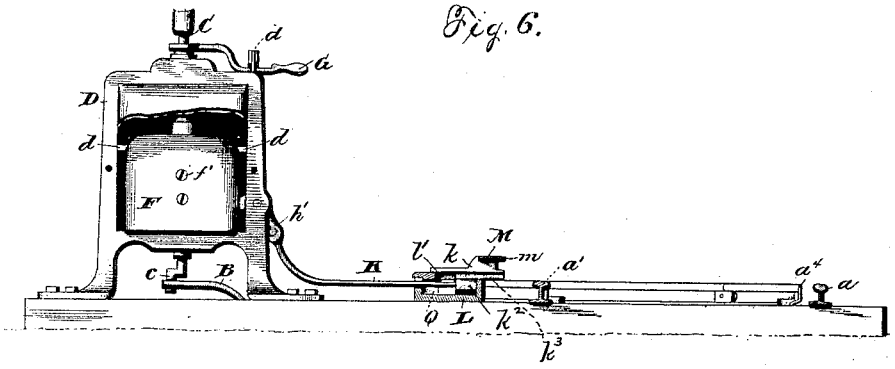


Fig. 7.

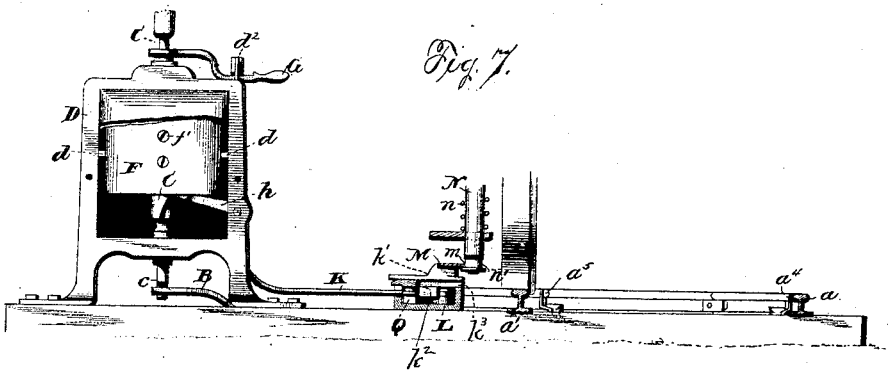
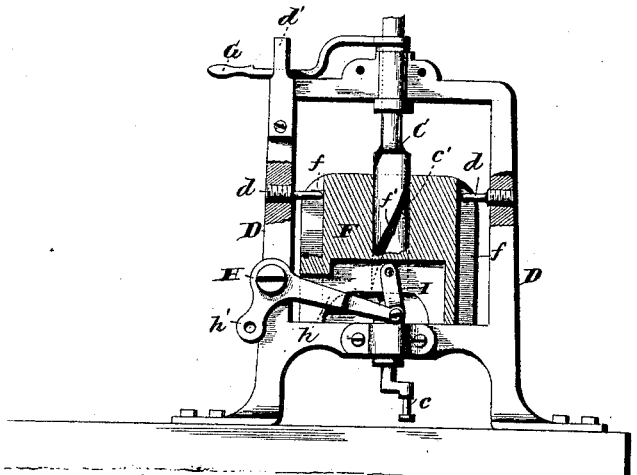


Fig. 8.



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J. M. PARLOW & C. W. TOBEY.

RAILWAY SWITCH.

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Fig. 9.

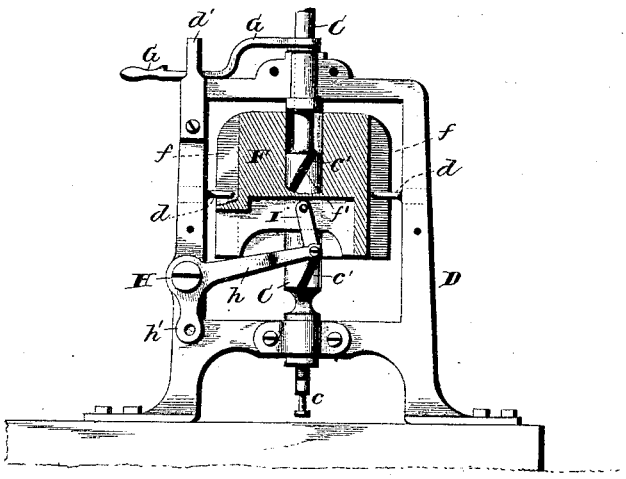


Fig. 10.

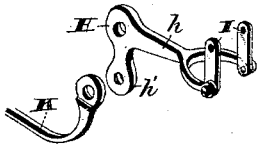


Fig. 12.

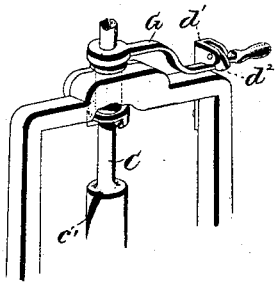


Fig. 13.

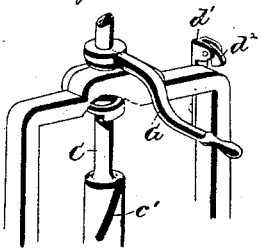


Fig. 11.

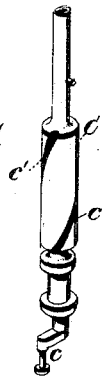
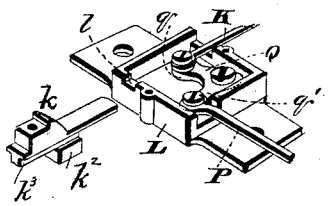


Fig. 14.

Fig. 15.

Fig. 16.



Witnesses
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Inventors
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UNITED STATES PATENT OFFICE.

JAMES M. PARLOW AND CHARLES W. TOBEY, OF NEW BEDFORD, MASSACHUSETTS.

RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 419,061, dated January 7, 1890.

Application filed May 2, 1889. Serial No. 309,328. (No model.)

To all whom it may concern:

Be it known that we, JAMES M. PARLOW and CHARLES W. TOBEY, of New Bedford, in the county of Bristol, and in the State of Massachusetts, have invented certain new and useful Improvements in Railway-Switches; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of our switch mechanism with the parts occupying their normal positions, the main track being open and the switch closed. Fig. 2 is a like view of the same with the switch opened by an engine or car upon the side track. Fig. 3 is a perspective view of said mechanism with the switch opened by an engine or car upon the main track. Figs. 4 and 5 are respectively sections of the track upon lines $x\,x$ and $x'\,x'$ of Figs. 1 and 2, the casing of the target-box being broken away to show the interior construction of parts. Figs. 6 and 7 are like views, respectively, upon lines $z\,z$ and $z'\,z'$ of Figs. 1 and 3. Fig. 8 is an enlarged side elevation, partly in section, of the switch-operating weight and its connecting parts when occupying their normal positions. Fig. 9 is a like view of the same when said weight has been raised by the opening of the switch. Fig. 10 is a perspective view of the lever employed for raising the operating-weight. Fig. 11 is a like view of the switch-operating shaft separated from its connecting parts. Figs. 12 and 13 are enlarged perspective views of the upper portion of the target-box, and show, respectively, the positions of parts when the switch is closed and when it has been opened by means of the hand-lever. Figs. 14 and 15 are cross-sections of said shaft and lever at the point where the latter is pivoted upon the former, and Fig. 16 is an enlarged perspective view of the connections between the shifting-bars and the weight-raising devices, the upper side of the housing being removed.

Letters of like name and kind refer to like parts in each of the figures.

The object of our invention is to enable the movements of a railway-switch to be more easily effected; and to such end our invention consists in a railway-switch which is controlled from and operated by a moving engine or car, substantially as and for the purpose hereinafter specified.

Our invention is applicable to any form of rail or switch; but for convenience we will illustrate it in connection with the usual T-rails a and a', which are shown as constituting the main track A, and other similar rails a^2 and a^3, that constitute the intersecting side track A′ of an ordinary switch. The connection between such tracks is formed by making continuous the inside rail a' of the main track A and the outside rail a^2 of the side track A′, and pivoting one of the outside rails a^4 of said side track and one of the opposite rails a^5 of said main track, so as to permit their free ends to be moved simultaneously in the same direction.

When moved in one direction the pivoted rail a^5 of the main track will be brought into line with the inside rail a' of said track and make the same continuous, while when said rails are moved in an opposite direction the said rail a^4 will be moved against the outside rail a of said main track, and said rail a^5 simultaneously moved away from the inside rail a', whereby said main and side tracks will become continuous for a car moving upon either of the same toward the other.

The free ends of the pivoted switch-rails are tapered, as shown, so that when either is moved against its contiguous rail there shall be no shoulder or abrupt angle formed at their points of union. Said ends are connected together by means of a bar B, that extends to and is pivoted upon a crank c, which is provided upon the lower end of a vertical shaft C, that is journaled within a suitable housing D and carries upon its upper end a double-faced target E. The length of said crank is substantially equal to the travel of the switch-rails, so that when said shaft is turned until the crank is farthest from the tracks the switch will be closed and the main line open, while by giving to said shaft one-fourth of a revolution said switch-rails will be moved in an opposite direction, so as to close the main track and open the side track.

The normal position of the switch-rails is

shown in Fig. 1, where the side track is closed and the main track open, and such position is insured by means of a block F, which is contained within the housing D, surrounds the shaft C, and is adapted to be moved vertically a certain distance within the latter without change of horizontal position by means of two vertical grooves *f* and *f*, Fig. 8, that are formed in opposite sides of said block and engage with fixed guide-pins *d* and *d* within said housing.

The central portion of the shaft C is enlarged and provided upon opposite sides with spiral grooves *c'* and *c'*, which have the same circumferential direction, and are engaged by two pins *f'* and *f'*, that project into the same from the block F. As thus arranged the rotation of said shaft will cause said block to be raised, while upon the liberation of the former the weight of the latter will cause it to move downward to place and simultaneously give to said shaft one-quarter of a revolution. The pitch of the said spiral grooves is such as to cause said shaft to be rotated by the vertical movements of said block, or the latter to be moved vertically by the rotation of said shaft. The last-named movement is effected by means of a lever G, which has one end connected with the upper end of said shaft and its outer free end adapted to be swung about one-fourth of the distance around the axis of said shaft. When the parts occupy their normal positions, the lever is in a line with the switch-bar B, its outer end being locked against a stop *d'* by means of an automatically-tripping latch d^2, and in order to use said lever said latch must be raised. In order that the switch may be operated by other hereinafter-described means, the connection between said lever and shaft is such, as shown in Figs. 14 and 15, as to permit the latter to be partially rotated without moving the former, while said lever cannot be moved without simultaneously moving said shaft.

In order that the switch may be opened from or by a car when approaching the same upon the main track, we employ the following mechanism, viz: Pivoted within the lower portion of the housing D, upon the side next to the track, is an L-shaped lever H, which has one arm *h* connected horizontally with the block F by a short bar I, that has its ends pivoted upon said parts, as shown in Fig. 8. The second arm *h'* of said lever extends downward and has pivoted upon its end one end of a bar K, that from thence extends nearly to the track and has its opposite end contained within a housing L, which furnishes a guide for the same and enables it to move longitudinally within certain limits.

Arranged alongside of but above the level of the inner rail *a'* of the main track is a bar M, which has one of its ends connected with the contiguous end of the bar K, through the medium of a short reciprocable piece or bar *k*, pivotally connected at one end on its upper side to said bar M by a screw *k'*, and having on its under side, near its other end, a lug k^2, adapted for engagement with but not attached to that end of the bar K which is contained in the housing L. To guide the bar *k* in its reciprocations there is provided on its under side a reduced portion k^3, which engages with a guideway *l*, formed in the housing L, and with the sides of a slot *l'*, formed in the cover of such housing. The slot *l'* is of sufficient length to permit all needful movement of the bar *k*. This form of connection between the bars K and M permits of an independent movement of the former and its connected mechanism without causing any movement of the bar M. At its opposite end the bar M is pivoted upon a bearing M', that is secured to or upon the end of a track-tie or other fixed support, the arrangement being such as to permit of such horizontal movement of the end of said bar M as will cause the weight F to be raised and the switch to be opened. The edge *m* of said bar M adjacent to the track is slightly curved, and the end which is connected with the bar K is as much, at least, nearer than its opposite end to said track as the distance that it must be moved in order to throw the switch-rails.

The bar M is engaged, when desired, by means of a bar N, which is arranged upon the side of an engine or car in such position as to enable it to impinge upon the inner edge *m* of said bar M when said engine or car is upon the main track and moving toward the switch, the relative positions of said parts with regard to said track being such as to cause the passage of said bar N along said bar M to move the latter just the necessary distance to shift the switch.

The bar N is arranged to move vertically, so as to permit it to be raised above the shifting-bar M, and it is normally held in such raised position by means of a spring *n*, so that when it is not required that the switch be opened there will be no contact between said parts, but when it is desired to open said switch it is only necessary to depress said bar N to an engaging position as the engine approaches said bar M and the further movements will be automatically performed. In order that the engagement of said bar N with said bar M may be automatically maintained until the former passes beyond the latter, a circumferential groove *n'*, which corresponds in width to the thickness of the bearing-edge *m* of said bar M, is provided in the lower portion of said bar N, which groove engages with said bar-edge and effectually resists the upward pressure of the spring *n* until said parts have passed out of engagement, after which said bar N is automatically returned to its normal position.

The switch-rails are operated from the side track by means of a bar O, which is arranged in an edgewise position beside the outside rail a^2 of the side track, near its junction with the rail *a'* of the main track, and is pivoted

to and supported by two short pivoted bars *o* and *o*, and is capable of such longitudinal and vertical motion thereon as is necessary in order to place its upper edge above said rail a^2, and also upon a level with the upper side of the same, such motion being forward and downward toward the main track and rearward and upward in an opposite direction.

The front end of the bar O is connected with the bar K by means of a rod P and an L-shaped lever Q, the latter of which is pivoted upon or within the housing L, with one of its arms *q* connected with said bar, while said rod is secured at one end upon the side of said bar O and has its opposite end pivoted to the second arm *q'* of said lever Q. As thus arranged a downward pressure upon said bar O will operate to raise the weight-block F and shift the switch-rails, while upon releasing said bar from such pressure it will be automatically returned to its elevated position as said switch-rails resume their normal positions. The ends of said bar O are rounded, so as to render easy and without shock the passage of the wheels of a car or engine over the same. If, now, a car or engine upon the side track is moved toward the main track, the wheels upon the rail a^2 will engage with and depress the bar O and shift the switch-rails before any weight is thrown upon the same, and as soon as the last wheel has left said bar the rail-shifting mechanism is left free and will act as soon as said switch-rails are relieved from weight. When a car is passing from the main track to the side track, the weight thrown upon the switch-rails would ordinarily hold the same in place after the switch-shifting devices of the main track were released; but by means of the bar O such position of said switch-rails is insured, and they will be firmly locked in place until after the last wheel has passed from off said bar, the length of which is such as to cause the wheels of one truck to be engaged with one of its ends before the wheels of the preceding truck have left its opposite end.

It will be seen that the shifting mechanism of the side track supplements the main-track shifting mechanism and operates to hold the switch open when once it has been opened from the main track, and that the shifting action of the last-named mechanism necessarily involves a corresponding movement of said side-track mechanism. When, however, the switch is opened from the side track, there is no necessity for a movement of the main-track shifting-bar M, and therefore the connection between said bar and the bar K is such as to cause the latter to be positively moved by an outward movement of the connecting end of the said bar M, while when said bar K is moved outward through the action of the bar O or of the hand-lever G said shifting-bar M is not disturbed.

The construction described enables a switch to be easily and safely operated from an engine or car while the same is in motion, and will materially lessen the time, labor, and expense heretofore necessary in the switching of cars at stations.

Having thus described our invention, what we claim is—

1. In combination with the main and side sections of a railway-track and a switch which normally is in position to permit passage of cars on the main track, a longitudinally-movable bar arranged adjacent to one of said sections, which by the direct engagement with it of a part of a moving engine or car will shift said switch, substantially as and for the purpose specified.

2. In combination with the main and side sections of a railway-track and a switch which normally is in position to permit passage of cars on the main section, a depressible longitudinally-movable bar arranged adjacent to said track and adapted to be directly engaged by a part of a moving engine or car, whereby the shifting of the switch may be effected, substantially as and for the purpose shown.

3. In combination with the main and side sections of a railway-track and the movable switch-rails, a bar supported on pivotal bearings adjacent to said track, which is automatically held in position to be engaged by a moving engine or car, and when so engaged may be given a downward and longitudinal movement to effect the shifting of said switch-rails, substantially as and for the purpose set forth.

4. In combination with the main and side sections of a railway-track and the movable switch-rails, a longitudinally-movable bar arranged adjacent to one of said sections and adapted to be engaged by a part of a moving engine or car, whereby the shifting of the switch-rails may be effected, and means to automatically return such switch-rails to their original position upon the disengagement of said bar from said engine or car, substantially as and for the purpose shown and described.

5. In combination with the main and side sections of a railway-track and a switch which normally is held automatically in position to permit the passage of cars on the main section and is shiftable by mechanism controlled by a moving engine or car upon said main track, a bar arranged adjacent to said side section, which, when said switch is shifted, is automatically lowered and held in such position by the engagement of the car-wheels, whereby said switch is retained in its shifted position until the moving engine or car has passed entirely upon said side section, substantially as and for the purpose specified.

6. In combination with the main and side sections of a railway-track and a switch which normally is in position to permit the passage of cars on the main section, a bar arranged adjacent to said main section and adapted for engagement by a moving engine or car,

whereby said switch may be shifted, a shaft interposed between said bar and said switch, and a weight arranged upon said shaft, whereby said switch when shifted may be automatically returned to normal position, substantially as and for the purpose shown.

7. In combination with the main and side sections of a railway-track and a switch which normally is in position to permit the passage of cars on the main section, a horizontally-movable bar arranged adjacent to said main section and adapted for engagement by a moving engine or car, whereby said switch may be shifted, a shaft interposed between said bar and said switch, and a block or weight arranged upon said shaft, whereby said switch when shifted may be automatically returned to normal position, substantially as and for the purpose set forth.

8. The combination, with the main and side sections of a railway-track and the movable switch-rails, of a laterally-movable switch-shifting bar arranged adjacent to the main section and adapted to be operated at will from a moving engine or car upon the main section to shift said switch-rails, and mechanism upon said side section to automatically hold them in their shifted position until said engine or car has passed entirely upon said side sections, substantially as and for the purpose shown and described.

9. The combination, with the main and side sections of a railway-track and the movable switch-rails, of a horizontally-movable bar arranged adjacent to said main section and adapted to be operated at will from a moving engine or car upon said main section to shift said switch-rails, and a depressible bar arranged adjacent to said side section to automatically hold them in their shifted position until said engine or car has passed entirely upon said side section, substantially as and for the purpose shown and described.

10. In combination with the main and side sections of a railway-track and a switch, a shaft whose rotation is adapted to cause the shifting of said switch, a block or weight mounted on said shaft and engaging therewith, and means for raising said block or weight, whereby said shaft may be rotated, substantially as and for the purpose specified.

11. As an improvement in railway-switches, in combination with a shaft which by rotation is adapted to shift the switch-rails and is provided with a spiral peripheral groove, a weight or block that is adapted to be moved longitudinally over said shaft and to engage with such groove, substantially as and for the purpose shown and described.

12. As an improvement in railway-switches, the combination of a vertical rail-shifting shaft which is provided with a spiral peripheral groove, a weight or block that incloses the shaft and engages said groove, and means whereby said block may be moved vertically, so as to cause said shaft to rotate, substantially as and for the purpose specified.

13. As an improvement in railway-switches, the combination of the switch-rails, the connecting-bar, the spirally-grooved crank-shaft, the inclosing-weight that engages with such groove, the lifting-lever for raising such weight, and the shiftable bar with its connections, whereby said weight may be raised by the action of an engine or car, substantially as and for the purpose shown.

In testimony that we claim the foregoing we have hereunto set our hands this 24th day of April, A. D. 1889.

JAMES M. PARLOW.
CHARLES W. TOBEY.

Witnesses:
CHARLES H. ROBBINS,
JOSEPH T. TOBEY.