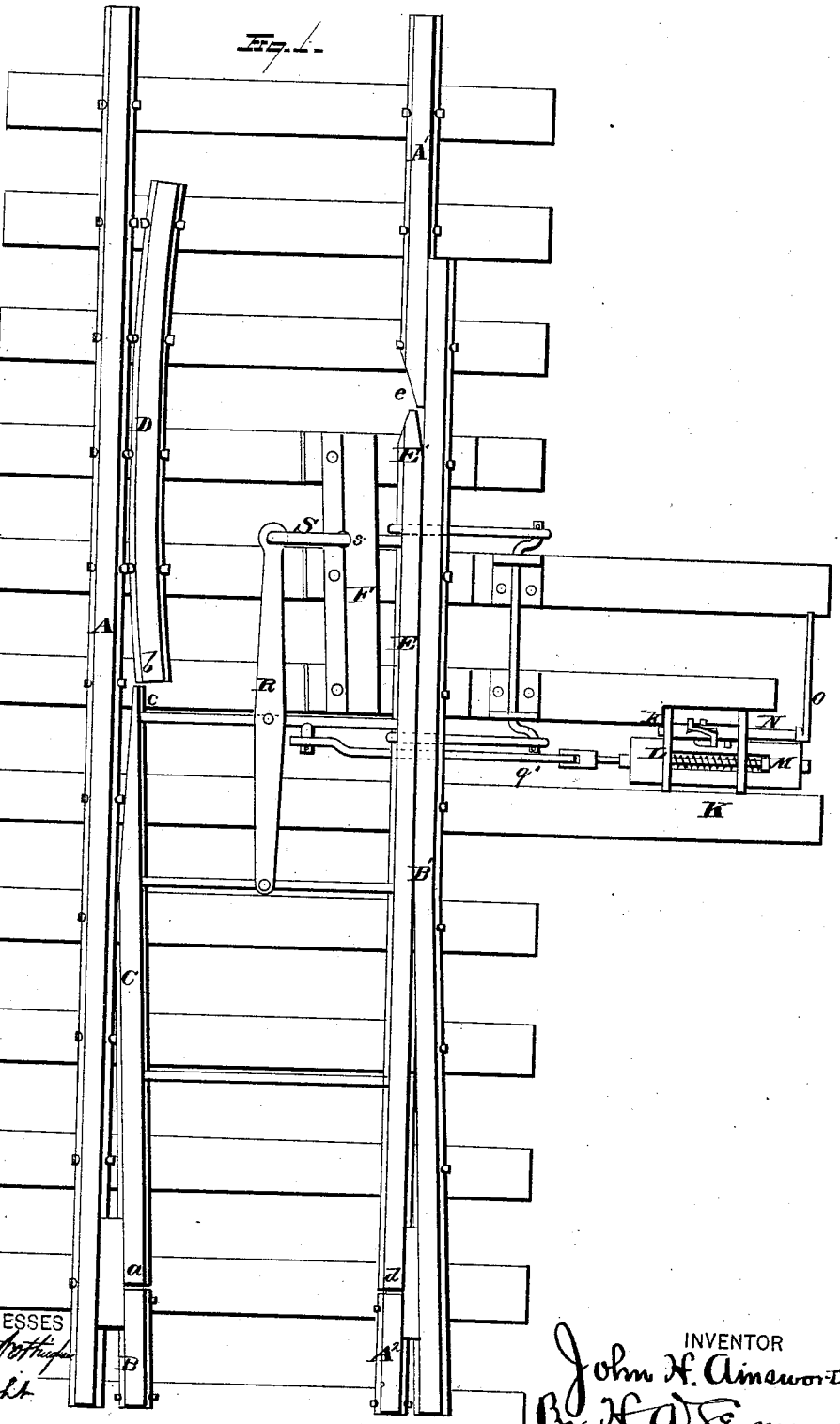
3 Sheets—Sheet 1.

J. H. AINSWORTH.

Railway Switch.

No. 196,284. Patented Oct. 23, 1877.

Fig. 1.



WITNESSES

Ed. S. Northington

A. M. Bright

INVENTOR

John H. Ainsworth.

By H. A. Seymour.

ATTORNEY

3 Sheets—Sheet 2.

J. H. AINSWORTH.

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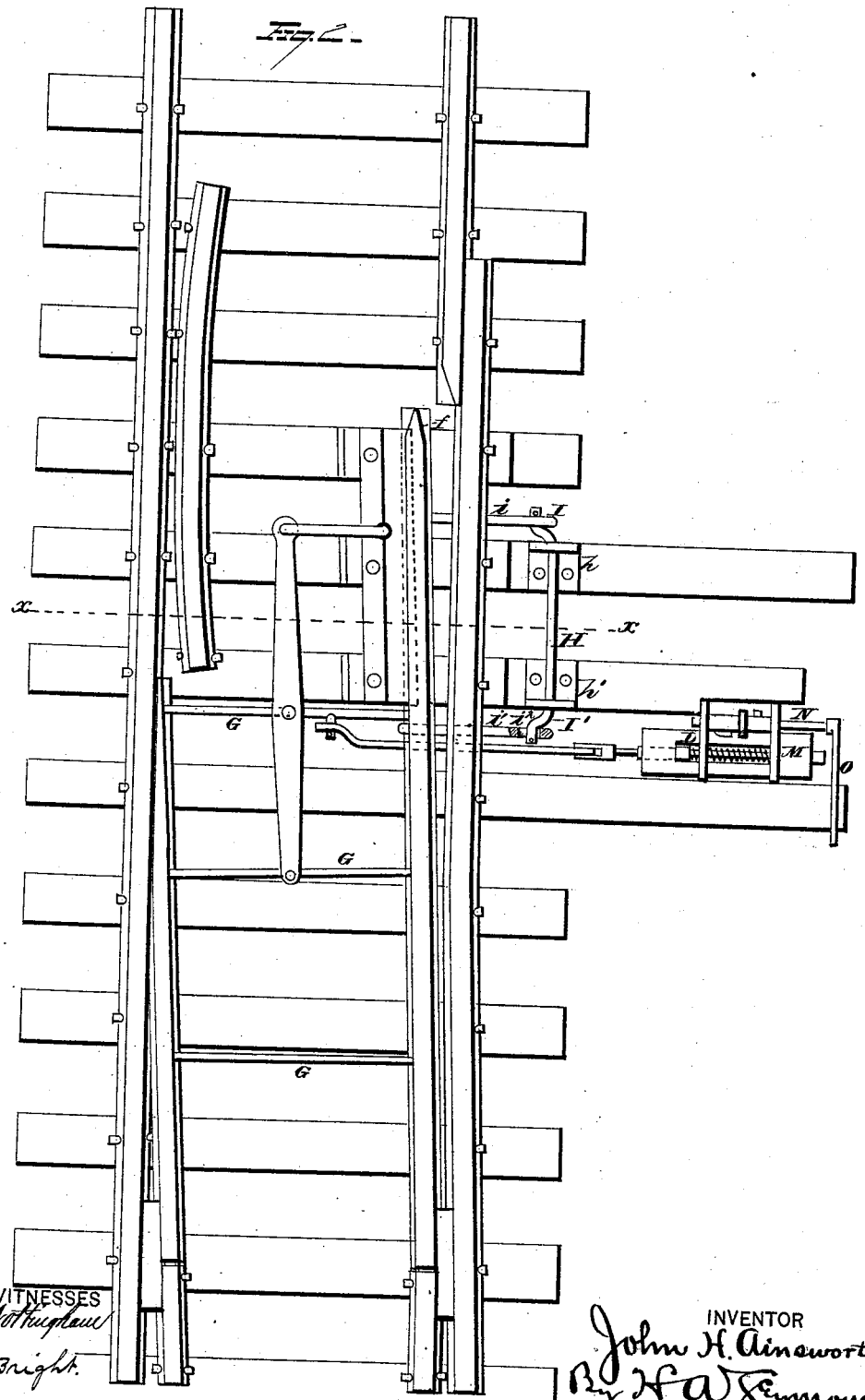
Fig. 2.



WITNESSES

E. S. Northington

A. W. Wright.

INVENTOR

John H. Ainsworth

By H. A. Seymour.

ATTORNEYS

3 Sheets—Sheet 3.

J. H. AINSWORTH.

Railway Switch.

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Fig. 3.

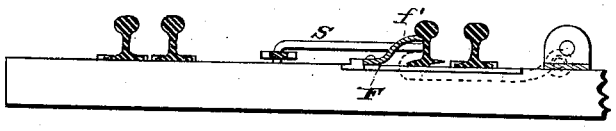


Fig. 4.

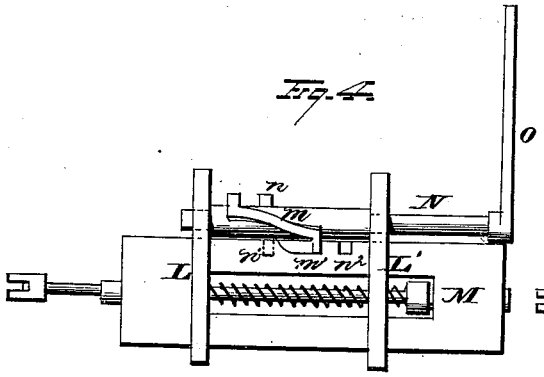


Fig. 5.

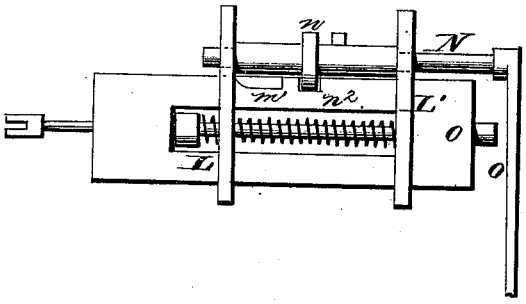
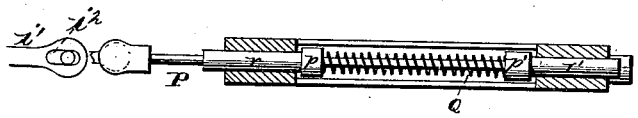


Fig. 6.



WITNESSES

Ed. L. Nottingham

A. W. Bright

INVENTOR

John H. Ainsworth.

By H. A. Seymour.

ATTORNEYS

UNITED STATES PATENT OFFICE.

JOHN H. AINSWORTH, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN RAILWAY-SWITCHES.

Specification forming part of Letters Patent No. **196,284**, dated October 23, 1877; application filed August 7, 1877.

To all whom it may concern:

Be it known that I, JOHN H. AINSWORTH, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Switches; 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in railway-switches; and the same consists in a railway-switch of such construction that when the train is running from the main track onto the siding, the flanges of the wheels will be guided by the blunt-pointed end of the long and main switch-rail, thus forcing the wheels onto the siding without causing the flanges of the opposite wheels to strike the point of the tapered switch-rail.

My invention further consists in the combination, with two switch-rails of unequal length, of a central longitudinal brace-rod, one end of which is movably secured to the tie-bars connecting said switch-rails, while the opposite end extends beyond the end of the short switch-rail, and is secured to the end portion of the long switch-rail, whereby both switch-rails are securely braced and stiffened throughout their length.

My invention further consists in the combination, with the switch-rails and suitable actuating mechanism, of a crank-shaft provided with two cranks of equal length, and links or bars connecting said cranks with the switch-rail. The link or bar farthest from the movable end of the main switch-rail is provided with an oblong slot, to allow for the difference in the throw of the switch-rail at the respective points of crank attachment, whereby the links are snugly held in place when the switch is either opened or closed, and all chattering of such connecting parts is thereby obviated.

My invention further consists in the switch-stand, the construction and arrangement of the several parts of which will more fully appear from the following description and claims.

In the accompanying drawings, Figure 1 is a plan view of my improved switch in a closed position. Fig. 2 shows the switch when open. Fig. 3 is a transverse section taken through line *x x* of Fig. 2, showing the form of the longitudinal brace, and also the shape of the switch-rails. Fig. 4 is an enlarged view of the switch-stand, the several parts of which are in position for holding the switch closed. Fig. 5 is a similar view, illustrating the position of the parts when the switch is open; and Fig. 6 is a longitudinal section of the switch-stand.

A represents the outer rail of the main track, and A^1 A^2 are the ends of the inner rails of the same. B is the outer rail of the siding. The inner rail B′ of the siding is located outside the main track, and extends beyond the end A^1 of the main rail, in order that the tread of the wheels of a passing train, either on the main track or to or from the siding, may have a bearing on the rail B′, and thus run smoothly over the end of main-track rail A^1 without battering the same.

C represents the tapering switch-rail, the heel *a* of which is pivoted to the outer side rail B in any desired manner. D is a guard-rail, the end *b* of which is located in close proximity to the point *c* of the tapering switch-rail. This guard-rail prevents the flanges of the wheel from striking the point *c* of the tapering switch-rail when the switch is open.

Between the ends A^1 A^2 of the inner rails of the main track is placed the main switch-rail E, the heel *a* of which is pivoted to the main rail A^2. The opposite end of the main switch-rail is formed with a blunt point, E′, while the adjacent end of the main track-rail A^1 is cut away at an angle on its inner side at *e*.

The object in forming the opposing ends of the main track-rail A^1 and the main switch-rail E with inclined ends, as above set forth, is as follows: When the switch is closed, the flanges of the wheels are prevented from striking the ends of the rails, and all danger arising from such source is obviated, and as the treads of the wheels have a bearing on the side rail B′, but little wear is produced on the reduced ends of these rails.

When the switch is open, as illustrated in Fig. 2, and a train is passing from the main track onto the siding, the flanges of the wheels will strike the inner incline *f* of point E′, and the wheels be thus forced over onto the side rail B′. The tapered end of the main rail, in conjunction with the blunt-pointed switch-rail,

together constitute ample flange-room for the wheels, and prevent any binding of the flanges between the ends of said rails.

Another important advantage is derived from this construction above described, in that the flanges of the opposite wheels are prevented from grinding against the end of the tapered switch-rail, and hence the latter serves as a means for carrying the wheels onto the siding instead of operating to guide or force the wheels onto the side rails. This latter result is due to the blunt-pointed main switch-rail, which operates to guide the wheels onto the siding, and as the outer surfaces of the wheel-flanges bear on the inner surface of the main switch-rail, the lateral strain is sustained by said main switch-rail. In order that this lateral strain may be effectually resisted a longitudinal brace, F, is firmly secured to two or more ties, in a line parallel with the main switch-rail when the latter is in an open position. Brace F is constructed with a raised flange, f', whereby the flange of the main switch-rail will enter the recess between the flange and ties, and thus allow the edge of the brace-flange to bear upon the web of the switch-rail near its tread. This construction and arrangement of the longitudinal brace affords a firm continuous lateral bearing for the main switch-rail, and operates to prevent the latter from turning, as the brace firmly supports the upper portion of the rail.

The tapered and main switch-rails are connected by the usual tie-bars G, of any desired number and construction.

The following means are employed for actuating the switch: H is a crank-shaft, supported in bearings h h', secured to the ties; or said bearings may be provided with a single base, which will span the supporting-ties. I I′ are cranks of equal length. Crank I is connected with the forward portion of the main switch-rail by means of a link or rod, i, and crank I′, which is located nearest the heel of the switch, is connected to the rail by a bar, i^1. As the throw of the rail decreases from its point to its heel, the bar i^1 is provided with an oblong slotted bearing, i^2, within which engages the crank I′. The oblong bearing allows of a slight lost movement on the part of crank I′, and hence, when the crank-shaft is turned full open or closed, the cranks I I′ will bear snugly against the connecting bars or links, and prevent any chattering of the switch as the train is passing over the same. K represents the switch-stand, the base K of which is bolted or otherwise secured to the ties or other firm support. L L′ are upright standards, provided with openings for the reception of the slide M, which latter is actuated by means of the rock-shaft N, journaled in the standards L L′. Shaft N is provided with a worm or face cam, m, which partially surrounds the same, and also with a stop, n, which is located between the ends of the worm m and on the opposite side of the shaft.

Worm m engages in a correspondingly-shaped groove, m', formed in the side of the slide, while the stop n engages in notches n^1 n^2, formed on opposite ends of the worm-groove m'. Rock-shaft N is operated by means of a hand-lever, O, secured to the outer end of the shaft. It will be observed that when the switch is closed the slide is securely locked against accidental displacement by means of the stop n engaging with the notch n^1, formed in the slide; when the switch is opened, it is then securely locked by the stop n engaging with the notch n^2. P is a draft-rod extending through the slide M. Upon the ends of said rod are placed the sliding collars p p', which serve as bearings or stops for the ends of the spiral or other spring Q, surrounding the rod P. Sliding collars p p' are limited in their outward movement by the smaller collars r r', which latter are rigidly secured to the draft-rod. To the inner end of draft-rod P is pivoted one end of a link, q, the opposite end of which is pivoted to one of the tie-bars.

The purpose of the spring Q is as follows: When the switch is closed the several parts of the switch-stand and actuating mechanism will be in the position illustrated in Fig. 4. The spring is there shown as compressed between the sliding collars p p', and this is effected as follows: As the slide M is moved away from the switch to close the same, the slide engages with the sliding collar p, against which bears the inner end of the spring, and thus compresses the spring between the sliding collars p p', the collar p' abutting against the fixed collar r', and held stationary thereby. While the switch is in a closed position the force of the spring acts to keep the switch closed. When the switch is thus locked in a closed position, and the main track clear, a train may run from the siding onto the main track without disturbing the switch, as the flanges of the wheels will enter between the side rail and the main switch-rail and open the switch, allowing the train to pass safely onto the main track. After the train has left the switch the spring serves to automatically close the same and keep the main track clear. When the switch is open the spring is in the position illustrated by Fig. 5. In this position the spring is compressed between the outer end of the slide and the collar p, which latter is prevented from longitudinal movement by means of the fixed collar r on the draft-rod. Hence the spring acts against the collar p, and operates to keep the switch open.

In order that the main and tapering switch-rail may be kept parallel throughout their length, I provide a parallel brace-rod, R, the rear end of which is secured to the tie-bars, while the forward end extends beyond the point of the tapering switch-rail, and is secured to the main switch-rail by a bar, S, the latter passing through an opening, s, in the longitudinal brace, whereby the end of the main switch-rail is firmly braced when the switch is either opened or closed.

It is evident that the bar connecting the

draft-rod of the switch-stand with the tie-bar may be provided with an oblong slotted bearing, and the crank be made to engage directly therewith, if desired.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a railway-switch, the combination, with the main rail, having a tapered end, of the main switch-rail, constructed with a blunt-pointed end, substantially as and for the purpose set forth.

2. The combination, with the main rail having a tapered end, and the side rail, extending beyond said tapered end, of the main switch-rail, constructed with a blunt-pointed end, substantially as and for the purpose set forth.

3. The combination, with a tapered switch-rail, of a main switch-rail, constructed with a blunt-pointed end, and the main rail, formed with a tapered end, whereby the flanges of the wheels are guided by the main switch-rail, and prevented from striking the tapered switch-rail, substantially as and for the purpose set forth.

4. The combination, with the tapered and main switch-rails, of a parallel brace-rod, the rear end of which is secured to the tie-bars, and the forward end to a rod attached to the main switch-rail, substantially as set forth.

5. The combination, with the switch-rails, of a crank-shaft provided with cranks of equal length, and connecting bars or links, one of which has an oblong slotted bearing, substantially as set forth.

6. The combination, with the switch-rails, slide, and intermediate mechanism, of a rock-shaft provided with a worm and stops, whereby a half-revolution of the shaft operates to open or close the switch and lock the same, substantially as set forth.

7. The combination, with the switch-rails, connecting-bar, and slide, of the draft-rod provided with fixed collars, sliding collars on the draft-rod, and a spring arranged between said sliding collars, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 4th day of August, 1877.

JOHN H. AINSWORTH.

Witnesses:
G. W. HARRISON,
JNO. A. BELL.