(No Model.)

S. S. LEACH.

RAIL CROSSING.

No. 467,817. Patented Jan. 26, 1892.

Fig. 1.

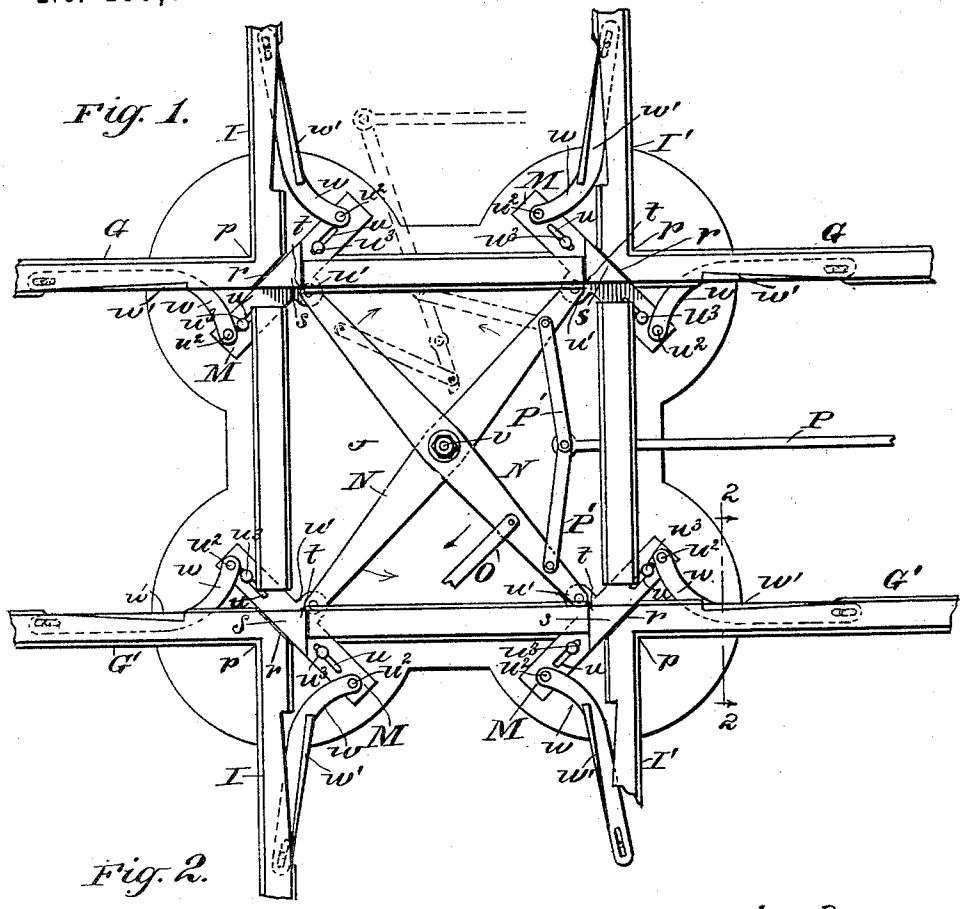


Fig. 2.

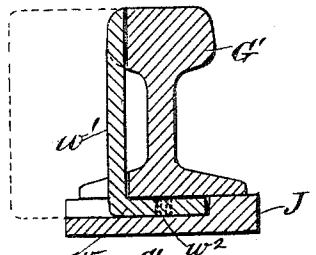


Fig. 3.

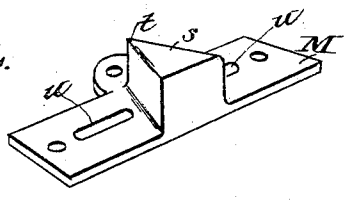
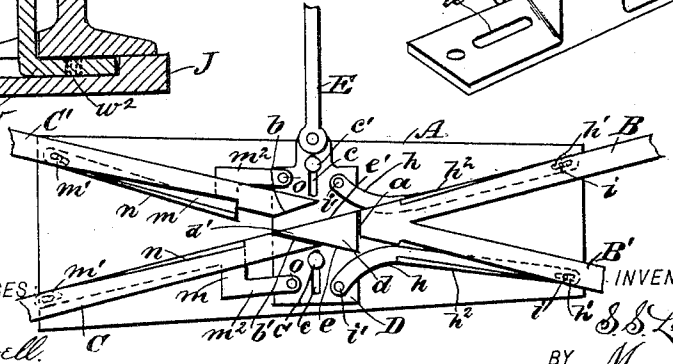


Fig. 4.



WITNESSES:

J. C. Buswell.

C. Sedgwick

INVENTOR:

S. S. Leach

BY Munn & Co

ATTORNEYS

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

SMITH S. LEACH, OF CAMBRIDGE, MASSACHUSETTS.

RAIL-CROSSING.

SPECIFICATION forming part of Letters Patent No. 467,817, dated January 26, 1892.

Application filed July 2, 1891. Serial No. 398,254. (No model.)

To all whom it may concern:

Be it known that I, SMITH S. LEACH, of Cambridge, in the county of Middlesex and State of Massachusetts, have invented a new and useful Rail-Crossing, of which the following is a full, clear, and exact description.

This invention relates to an improvement in rail-crossings, and has for its objects to provide a simple practical device which is adapted to provide a rail-crossing at any angle, which makes each rail of such a crossing continuous when in service and also connectable to a switch or signal-stand for manipulation, if desired.

To these ends my invention consists in certain parts and their combinations, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, and to the letters of reference marked thereon.

Figure 1 is a plan view of the device connected to tracks that cross at a right angle and with obvious changes of proportion illustrates a track crossing at any angle. Fig. 2 is an enlarged transverse section of a track-rail and a part of the improvement thereto connected, taken on the line 2 2 in Fig. 1. Fig. 3 is an enlarged perspective view, detached, of a sliding block that is an essential feature of the invention; and Fig. 4 is a plan view of the improvement as applied to a rail-crossing near a switch commonly known as a "frog," and in a track crossing at a very acute angle the parts would have the relative disposition here shown.

The rail intersection shown in Fig. 4 is designed to take the place of an ordinary frog and subserve its purpose in a superior manner, affording a reliable crossing that will obviate all jar incidental to ordinary frogs by providing means to close the gaps between the ends of the rails that are to be traversed in advance of the passage of car-wheels over the same. In the figure mentioned, A represents a flat base-plate of suitable dimensions for efficient service, and B B′ C C′ converging track-rails that are seated upon the base-plate and thereto secured by any proper means. A sufficient space is allowed between the two sets of rails B B′ C C′ at their ends to permit the introduction of a gap-closing device that is one of the features of the improvement.

The rails B B′ respectively represent converging rails of two railroad-tracks that are designed to cross and are joined at their ends *a*, the apex of the angle thus produced being truncated a proper degree, producing an end wall at the terminal of the rail junction.

Transversely of the base-plate A a slide-block D is located on it at such a point with relation to the end portions of the rails B B′ C C′ that one edge of the block will be adjacent to the truncated end *a* of the rails B B′ and the opposite edge approach and extend below the base-flanges of the rails C C′ near their converging terminals, said rails being respectively aligned with the other rails B B′.

The ends *b b′* of the track-rails C C′ are sloped from their inner edges outwardly a proper degree to produce parallelism between these beveled ends and the line of direction of the rails of the other track—as, for example, the beveled end *b* of the track-rail C′ is parallel to a line drawn along the rails B C and the sloped end *b′* of the rail C is in a parallel plane with the plane of direction given to the rails C′ B′.

It is essential for the effective operation of the device that the block D be retained in place and permitted to slide transversely on the base-plate A. Any preferred means may be employed to adapt the block for such a movement, one feasible and simple expedient being shown, which consists in slotting the bed-piece of the block at two points *c* in alignment and parallel with the side edges of the same for the reception of guide-pins *c′*, which latter are inserted through the slots loosely and into the bed-piece firmly, so as to permit a limited reciprocation of the slide-block D upon the base-plate A. A triangular projection *d* is formed on or secured to the top face of the block D, having one of its sides adjacent to and parallel with the end wall *a* of the joined rails B B′, the degree of angularity given to the apex *d′* disposing the remaining sides of the triangle parallel with the beveled ends *b b′* of the rails C C′.

It will be seen from the description of parts that the longitudinal movement of the slide-block D will cause an impingement of one side *e* of the projection *d* upon the beveled end *b′* of the rail C and an alignment of its opposite side *e′* with the inner side edges of the aligning rails B C, a reverse movement of the

slide-block causing the side e' of the triangular projection d to have contact with the beveled end b, producing an alignment of the side e with the inner edges of the rails B' C'.

Means to operate the sliding block D manually consist of a pusher-bar E, that is secured to one end of the block and which is designed to be extended to any suitable point and engage a shifting-lever or other similar device on a switch or signal stand of approved construction, (not shown,) whereby the block and its projection d may be manipulated to align it with a track which is to be traversed.

Preferably the shifting of the slide-block D is effected manually; but to provide a safeguard against accidental displacement of a car or train that may be moved across the track intersection while it is not properly adjusted a self-acting attachment is provided, which is constructed, essentially, as follows: Between the rails B B' and the base-plate A similar link-bars h are located and held to vibrate laterally by a loose engagement with the rails named, there being a longitudinal slot h' formed in each link-bar near the outer end for a loose engagement therewith of the depending studs i, that project from the lower sides of the rails. The link-bars h are curved edgewise and outwardly near their opposite ends, which ends i' are pivoted near the ends of the sliding block D. Along the outer edges of the link-bars h upwardly-extending flanges h^2 are formed on each, which flanges for efficient service are made to lie in lateral recesses formed in the rails B B', so that when the links are moved toward the rails and have contact therewith their outer edges will align with the exterior surface of the rails they engage, and thus avoid obstruction to the travel of wheel-flanges, which in service are caused to press the flanges h^2 toward the rails B B' by their contact. On the rails C C' there are link-bars m, that have their outer ends m' pivoted to the lower side of the track-rails in like manner to the bars h, said bars having vertical flanges n, that are adapted to enter recesses in the inner edges of the rails they are pivoted upon and align with these edges when in closed adjustment. At a proper distance from the apex d' of the triangular closing-piece d the link-bars m are bent outwardly edgewise, so as to project a portion m^2 of each bar exterior of the rail it is pivoted to, which portions are projected toward the ends of the sliding block D and are pivoted thereto by bolts o or similar means, as indicated in Fig. 4. The connection of the link-bars m with the sliding block D and rails C C' adapts these parts to coact with the link-bars h and rails B B', causing the block to be longitudinally moved and its triangular portion d aligned edgewise with track-rails that are to be traversed when a car-wheel flange presses against the vertical flange of either of the link-bars, thus effecting an automatic adjustment of the sliding-block portion d, which will afford a safe unbroken rail-surface for the smooth travel of a car or train over the frog or track-crossing.

In Fig. 1 is shown the application of the device to a track-crossing of four single rail intersections, the rails G G' I I', that compose them, being supported on the base-plate J, which is of suitable form and sufficient area to sustain the tracks in proper relative position and may be integral throughout or be made up of parts firmly secured together, so as to have a level top surface. At the corners where the tracks cross each other gaps are formed to permit the free travel of car-wheels over each pair of track-rails, four points of junction p being produced between the converging rails G I, G' I, I' G, and G' I', each pair of these converging rails having their points of junction truncated, as at r. A sliding block M, having a vertical projection s formed on or secured thereto, is provided to fill the gap at each corner where the tracks cross. The vertical projections s have angles t, which lie opposite the truncated walls r, the side opposite each angle t forming a wall that is parallel with and adjacent to said walls r, and, as shown, the sides forming the angles t are parallel with the ends of rail portions that lie between the extensions of these rails that are joined at r. It is essential that the size of the projections s be so proportioned to the breadth of the ends of the track-rails that when the blocks M are longitudinally moved and their projections s caused to impinge on said rail ends the inner edges of the latter-named parts will align with the inner edges of the track-rails they approach. Each slide-block M is slotted at u to receive guide-pins u^3, that are inserted through and affixed in the base-plate J. On the inner edge of each slide-block M an ear u' is formed, which ears have a pivoted engagement with the ends of two crossed connecting-bars N, that are centrally pivoted upon the base-plate J, as at v in Fig. 1. Two link-bars w are provided for each sliding block M and are pivoted thereto near each end of the blocks, as at u^2. Said link-bars, having a form similar to the shape of the links h, (shown in Fig. 1,) extend in a space formed for their reception below the track-rails I I' G G' and are thereto loosely secured in the same manner as the link-bars h are connected with the track-rails B B'. Each link-bar w is furnished with a vertical flange w', that may fold into lateral recesses formed in the sides of the rails they are pivoted upon or be angularly projected therefrom to receive the lateral impact of car-wheel flanges.

Preferably the sliding blocks M are provided with means to manipulate all simultaneously, so as to properly dispose their projections s in alignment with track-rails that are to be traversed.

The preferred means for operating the slide-blocks M consists of a single pusher-bar O, that is pivoted upon one of the crossed connecting-bars N. Said pusher-bar (shown

broken) may be prolonged below the tracks to any convenient point for attachment to a device whereby it may be longitudinally actuated. A pusher-bar P, connected to both of the crossed bars N, may also be utilized in like manner. The outer end portion of the pusher-bar P (shown broken) may be extended and connected to any preferred type of switch-stand that will afford means to slide the bar named, and if such a switch mechanism is furnished with a signal, as is usual, the manipulation of the switch mechanism to set the blocks M in alignment with proper track-rails will display a signal to show the condition of the tracks at a crossing provided with the improvement.

The flanged link-bars *w*, by their loose attachment to the blocks M and track-rails I I′ G G′, coacting with the crossed connecting-bars N, provide for the automatic adjustment of the sliding blocks in their direction of travel by cars on each of the tracks at the crossing, thereby obviating the contingency of an accident if said cars are made to traverse the track intersection without a manual adjustment of the shifting device.

As is indicated by dotted lines in Fig. 1, other linked connections may be provided between the swinging connecting-bars N and the pusher-bar P. Hence I do not wish to limit the means for connection to the exact devices shown.

Whenever desired, the automatic device may be depended upon entirely, which will probably be done at all track-crossings where a clear-track signal is not maintained. When such a signal is operated, it is preferable to operate the blocks in connection therewith and hold the automatic device in reserve or omit it altogether, as the automatic operation, being more sudden, will cause somewhat more rapid wear of the moving parts.

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

1. The combination, with crossing rail-sections, two of which at the angle formed by their point of meeting are truncated, as shown at *r*, and the adjacent ends of the other two rails being spaced from each other and from the truncated portion *r* at angles thereto, of a solid triangular block *s*, movable across the gap formed between the rail-sections, with its base parallel with the truncated portion *r* to bring its sides against the respective ends of the other rail-sections, fill the gap between the aligned sections, and leave a flange clearance between the end of the crossing rail-section and that face of the block which aligns the inner faces of said two aligning rail-sections, substantially as set forth.

2. The combination, with the crossing rail-sections having gaps at their four points of intersection, the apices of the outer angles formed thereby being truncated, as shown at *r*, and the adjacent ends of the other rail-sections being spaced apart at an angle with each other and also spaced from the truncated portion *r*, of separate and independent triangular blocks sliding oppositely in parallel planes in diagonally-opposite gaps, centrally-pivoted crossed levers pivoted at their outer ends to the said blocks, and means for opening and closing the said levers to simultaneously slide the blocks, substantially as set forth.

3. In a railway-crossing, the sliding plate M, having transversely across its upper face the solid triangular block *s* and longitudinal guide-slots *u* at opposite sides thereof, substantially as set forth.

4. The combination, with a base-plate and track-rails thereon crossing at an angle, aligning rails having spaces between, of a transverse sliding block, a space-closing projection thereon, and link-bars having vertical flanges and loosely secured by their ends to the rails and block, substantially as described.

5. The combination, with a base-plate and track-rails thereon intersecting at an angle, having spaces between aligning track ends at points of intersection, of a sliding block for each rail intersection, a triangular projection thereon, which may be moved with the block to align with either of the crossed rails on their inner edges, guide-flanges connected to the rail-sections and blocks, and devices that will coact to move all the blocks and flanges simultaneously, substantially as described.

6. The combination, with a base-plate and track-rails thereon intersecting at four points, having spaces between aligning track ends at points of intersection, of a sliding block for each rail intersection and loosely secured on the base-plate, a triangular projection thereon which may be moved with the block to align with either of the crossed rails on their inner edges, vertically-flanged guide-bars loosely secured at their ends to the corners of the blocks and also to track-rails, crossed connecting-bars pivoted by their ends to the blocks and to the base-plate at their centers, and a pusher-bar loosely joined to the crossed connecting-bars, substantially as described.

7. The combination, with a base-plate, four track-rails crossing thereon at an angle, four sliding blocks, each placed diagonally between rails where they cross and all held to slide on the base-plate, link-bars having a pivoted connection on the ends of the sliding blocks and a pin-and-slot connection with the track-rails, and triangular vertical projections on the sliding blocks, edges of which will close spaces between aligning track ends, of two crossed centrally-pivoted connecting-bars joined to ears on the sliding blocks, so as to slide the blocks when the bars are swung, a pusher-bar, and links pivoted between the connecting-bars and the pusher-bar, substantially as described.

SMITH S. LEACH.

Witnesses:
ADOLPH SCHUBERT,
SOPHUS HAAZENSEN.