(No Model.)

# J. T. RICHARDSON.

## RAILWAY FROG.

No. 319,024. Patented June 2, 1885.

Fig. 1.

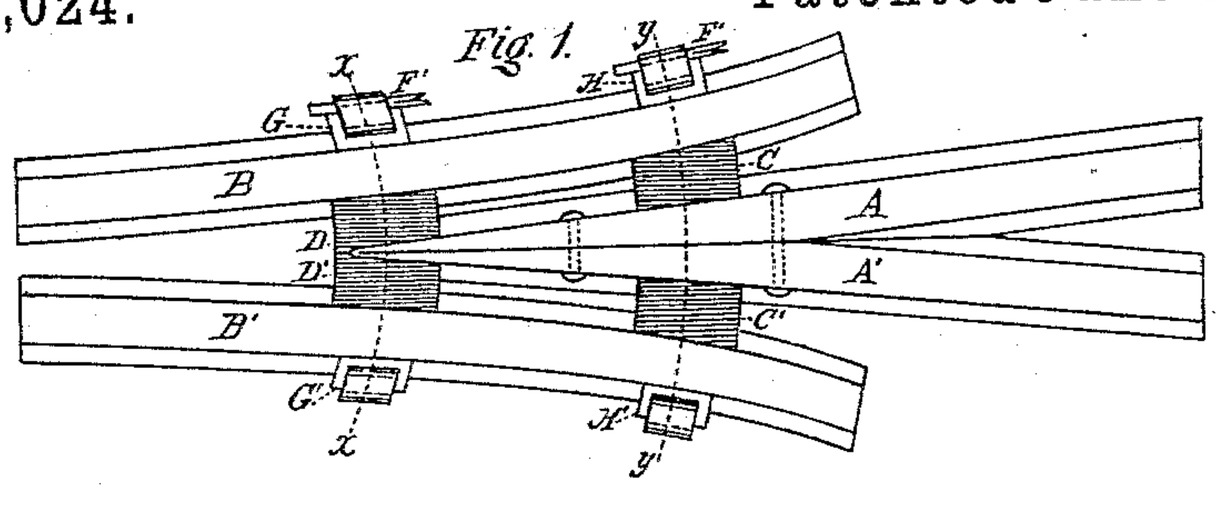



Fig. 2.

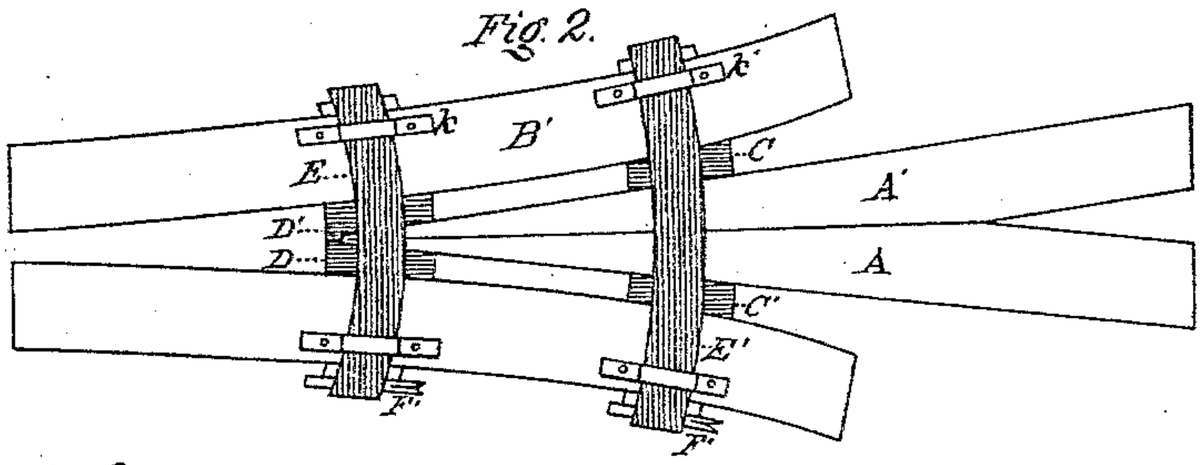



Fig. 3.

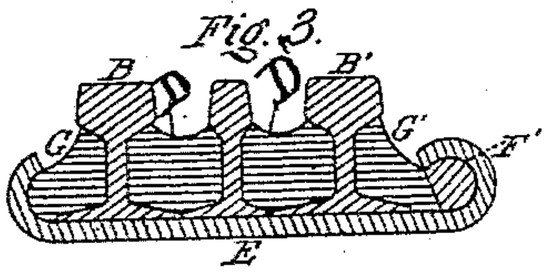



Fig. 5.

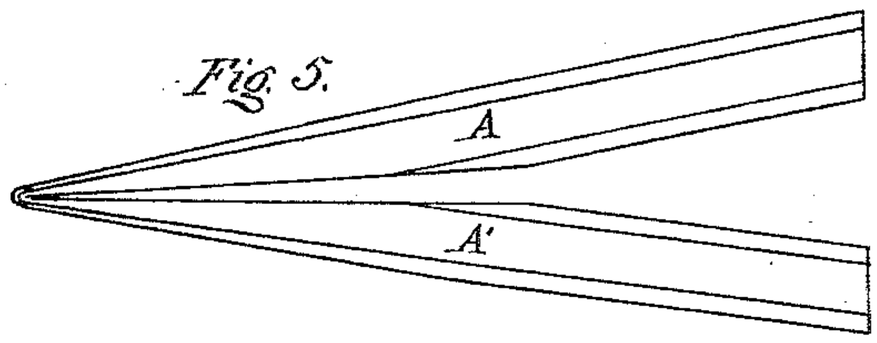



Fig. 4.

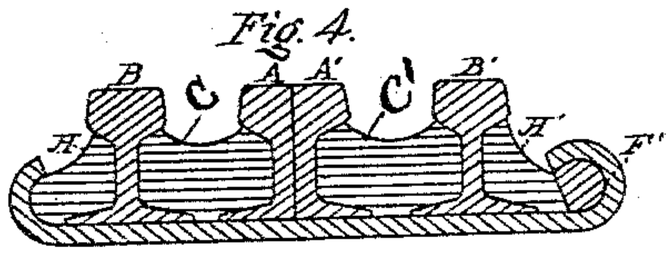



Fig. 8.

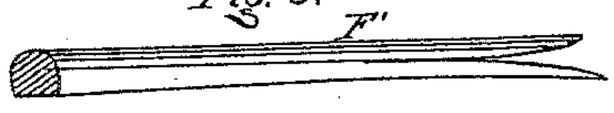



Fig. 7.

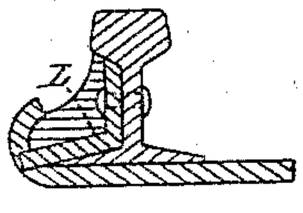
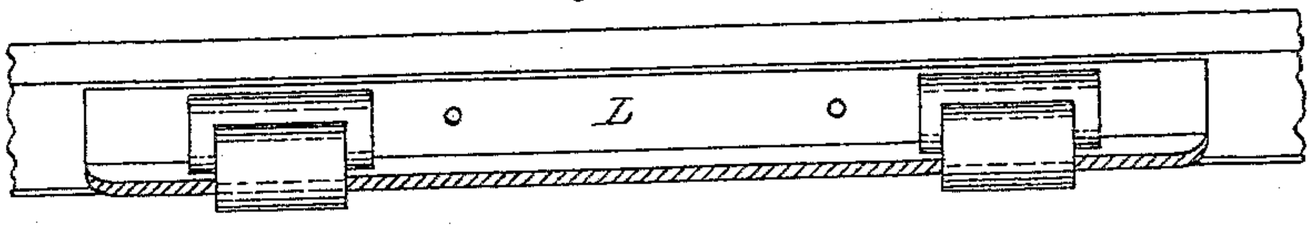



Fig. 6.




Witnesses.

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# UNITED STATES PATENT OFFICE.

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## RAILWAY-FROG.

SPECIFICATION forming part of Letters Patent No. 319,024, dated June 2, 1885.

Application filed June 26, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN T. RICHARDSON, a citizen of the United States, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Railway-Frogs; 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 the letters of reference marked thereon, which form a part of this specification.

My invention is an improvement upon a patent granted me May 29, 1877, which was entitled a "railroad-frog." It related to that class of railway-frogs having brace-blocks made to fit and bear against the under side of the head and the base of the rail, in combination with binding-bars, keys, and throat-pieces, so as to dispense with bolts, and thus to secure economy and durability in the construction, and permit any part of the frog to be taken out when worn and replaced when the frog is in the track.

My present invention consists, principally, in the combination, with holding devices, of a single section of rail so wrought and bent as to enable me to secure a solid point or tongue and at the same time avoid the necessity of dovetailing or riveting two sections of rail together at the required angle to constitute the point or tongue, as is the usual mode of construction.

It also further consists in an improved construction of binding-bars and keys, in connection with keepers or holders for the better retention of the binding-bars and keys in place.

Figure 1 is a plan view of my improved railway-frog. Fig. 2 is a plan view of the bottom of the frog. Fig. 3 shows a transverse vertical section taken in the line *x x* of Fig. 1. Fig. 4 is also a transverse vertical section taken in the line *y y* of Fig. 1. Fig. 5 is a plan view showing a single section of rail partially bent to constitute the frog angle and point. Fig. 6 is a longitudinal section of the wing-rail of the frog, showing the angle-bar in place. Fig. 7 is a vertical section of Fig. 6, showing the relative positions of the angle-bar, brace-block, and clamp in place. Fig. 8 is a plan view of the key, showing the general shape of the same.

A A′ are the inner or rail sides of the angle that constitutes the point or tongue of the frog, and is composed of two webs, the rail being so planed as upon being bent about centrally the two webs admit of being brought into close lateral contact until they commence to diverge from each other at or near the heel of the point. The said webs then upon being riveted together constitute a solid point, and by this mode of construction obviate all necessity of dovetailing or bolting two sections of rail, and thus incurring the liability of working loose and slipping apart longitudinally.

B B′ are the outer or wing rails, bent to the required curves.

Between the rails are throat-pieces C C′ and D D′, of a size requisite to maintain the required throat-space between the rails of the frog. These pieces are of a shape to fit the rails, bearing principally on the upper side of the base and the under side of the head of the rail. The throat-pieces C C′ have the same shape on each side, and are located near the heel of the point. The throat-pieces D D′, located at the end of the point, have each on one side the same shape as pieces C C′; but on the opposite side they are shaped to fit the tapered end of the point and bear solidly on the same, with a portion extending in front of the point. These throat-pieces are not fastened to any part of the frog, but are held in place simply by the clamping-power of the binding-bars.

Beneath the rails and directly under the throat-pieces are the binding bars or clamps E E′, the ends of which are curved upward to a degree of curvature that will not strain the texture of the metal, and at the same time will conform to the corresponding curved or convex surface of the keys F F′ and the brace-blocks G and H.

G G′ and H H′ are the brace-blocks, made to fit the rails, bearing only and equally on the upper surfaces of the bases and the under side of the heads of the rails. The brace-blocks G and H have their sides curved to fit accurately to the curved ends of the binding-bars E E′, and the brace-blocks G′ and H′ have their sides inclined to suit the plane surfaces

of the keys F F′. Said keys F F′, as shown in Fig. 7, are tapered or wedge-like longitudinally, split a portion of their length, and made with sides of unlike conformation, the one side being flat or inclined regularly longitudinally and the other side convex or curved transversely to fit snugly between said brace-blocks and the ends of the binding bars or clamps E E′, a conformation that prevents the keys from working out longitudinally under the vibration of trains moving thereover.

In order, also, to prevent either a forward or backward movement of the clamps, and thereby to secure the permanent engagement of the co-operating parts of the frog with each other, I place keepers or clips *k k′* of ribbon metal over the clamps when in position and rivet the extremities of the keepers upon the bottom and through the outer flange of the wing-rail, as shown in Fig. 2. Moreover, as a reenforcement to the keepers *k k′* in their said function in cases where heavy and frequent trains pass over the frog and cause frequent and severe vibration to the entire structure, I rivet a short section of angle-bar L to the outer side of the webs of the wing-rails before placing the brace-blocks in position, and by notching the horizontal flanges of the angle-bars, as shown in Figs. 6 and 7, to a depth about equal to the thickness of the binding bars or clamps and in length to the breadth of said clamps, I secure when in position nicely-adjusted seats that contribute in conjunction with the keepers to confine said binding-bars to their original place of adjustment, where their binding-power is at a maximum. This is obvious, since upon inspection it will be perceived that the wing-rails converge slightly toward the point of the frog, and therefore if the clamps slip from their places it will most probably be forward, and in this case will admit of the different parts of the frog working apart, to the peril of the entire structure.

By the use of the plano-convex-shaped key, Fig. 8, in preference to the beveled key, greater strength and a larger engaging-surface in contact with a similar terminally-conformed clamp is thereby secured, and hence in the same ratio the friction is increased without increase of material and enhancement of cost—advantages of manifest importance—as demonstrated by my experience in practice. Hence it is obvious with the brace-blocks bearing solidly against the base and the under side of the head of the rail, and the curved ends of the clamps on the one side and the interposition of the plano-convex keys on the other between the blocks and curved ends, to tighten or wedge up the whole with the co-operating keepers, as aforementioned, that the parts of the frog will be held rigidly in place and strictly in a vertical as well as in a horizontal line, and the strain will therefore be equal on all the parts.

When in use, this frog is laid upon the cross-ties in the usual manner, with the binding-bars between the cross-ties, the usual spikes being driven into the ties against the rails to confine the frog in place, the ends of the rails of the frog being secured to the track-rails by chairs or any desired form of joint-splices.

It is also obvious that from the peculiar construction of this frog, whenever any part shall have become unduly worn the split keys can be closed together and driven out, which will loosen all the parts, and permit any part to be removed, when the parts may again be fastened together by the binding-bars, keys, and brace-blocks, the frog remaining upon the ties and in place, thus effecting a great saving in the time and expense of repairs.

I am aware of Patent No. 215,548, and make no claim to the subject-matter claimed therein.

I claim—

1. A railroad-frog consisting of two solid points, constructed substantially as described, curved wing-rails, throat-pieces adapted to fit the point and wing-rail, brace-blocks bearing against the wing-rails, binding-bar having a split end, substantially as described.

2. The combination, with the point and wing-rail throat and brace-bars of a frog, of a curved binding-bar, and clips *k* for securing the bar in place, substantially as described.

3. The combination, with the wing-rail of a frog and the binding-bars therefor, of a section of angle-bar having notches, secured to the outer side of the wing-rails and between the binding-bars, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN T. RICHARDSON.

Witnesses:

J. A. MEANS,

JNO. B. LANDIS.