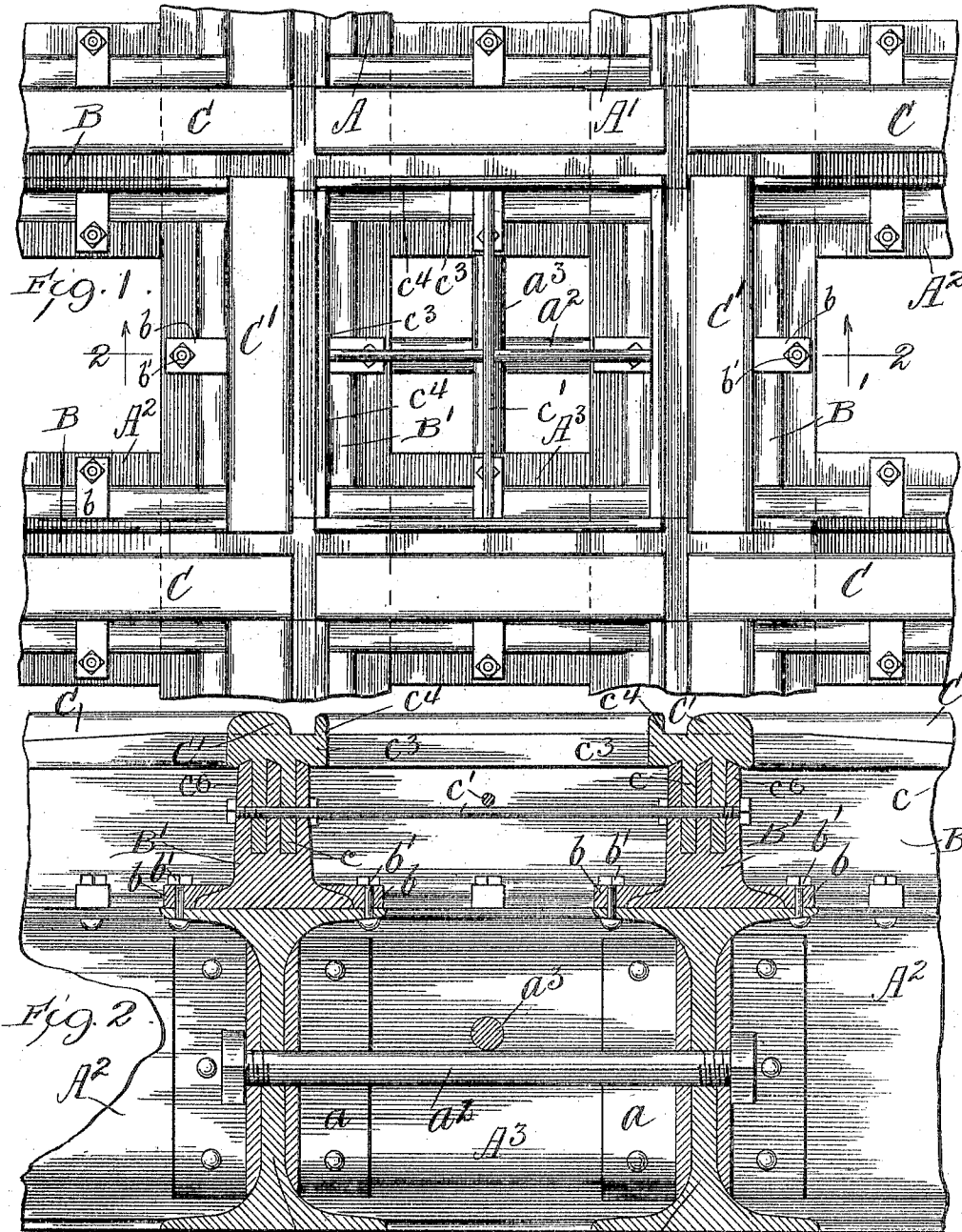


No. 816,911.

PATENTED APR. 3, 1906.

E. HAYWARD.  
RAILWAY FROG AND CROSSING.  
APPLICATION FILED JULY 21, 1904.

2 SHEETS--SHEET 1.



Witnesses: A  
Harry R White  
Ray White.

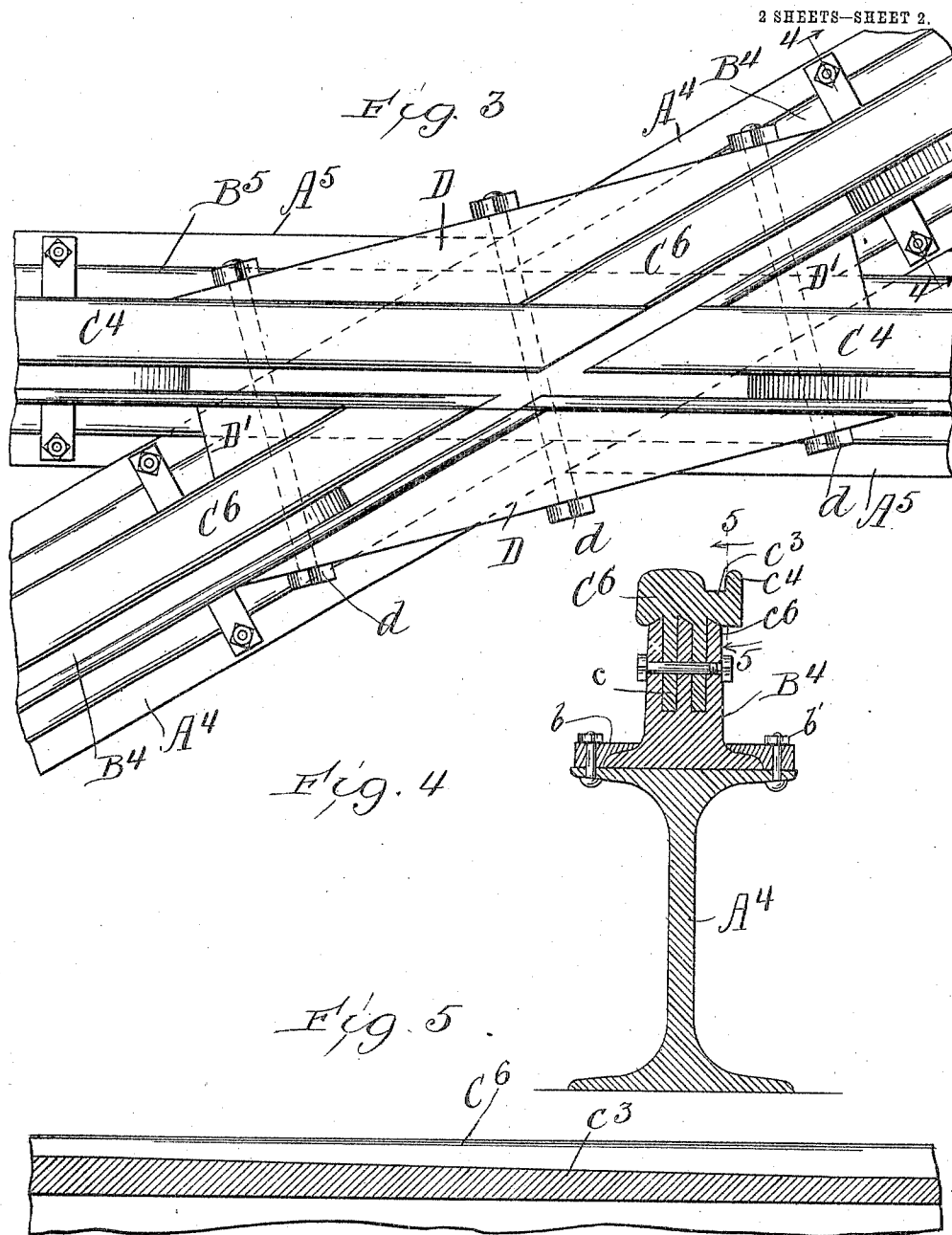
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Eugene Hayward  
By *Charles H. Allen* Att'y.

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2 SHEETS—SHEET 2.



Witnesses:

Ray White

Samuel White

Inventor

Eugene Hayward

By Charles H. Atty.

# UNITED STATES PATENT OFFICE.

EUGENE HAYWARD, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO SAMUEL F. RUSH AND ONE-THIRD TO JOHN B. MORRIS, OF CHICAGO, ILLINOIS.

## RAILWAY FROG AND CROSSING.

No. 816,911.

Specification of Letters Patent.

Patented April 3, 1906.

Application filed July 21, 1904. Serial No. 217,460.

*To all whom it may concern:*

Be it known that I, EUGENE HAYWARD, a citizen of the United States, and a resident of the city of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Railway Frogs and Crossings; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in railway frogs and crossings, and has for its object an exceedingly strong and rigid structure adapted to afford frogs adapted for use at switches and at the angles of the crossings, so constructed as to avoid the jolting and vibration due to the truck passing over the open spaces between the rail ends at the crossing-rail.

It is also an object of the invention to provide a construction wherein a rigid frame is provided for the crossing adapted to support the structure in positive alinement and affording a continuous smooth running-surface for the car-wheel.

The invention consists in the matters hereinafter described, and more fully pointed out, and defined in the appended claims.

In the drawings, Figure 1 is a fragmentary top plan view of a crossing embodying my invention. Fig. 2 is a section taken on line 2 2 of Fig. 1. Fig. 3 is a plan view of an oblique frog embodying my invention. Fig. 4 is a section taken on line 4 4 of Fig. 3. Fig. 5 is a fragmentary section taken on line 5 5 of Fig. 4.

As shown in said drawings, said crossing comprises a suitable frame which in the present instance is constructed of structural metal, such as the I-beams A and A', arranged parallel at their centers a distance apart approximately corresponding with the distance from center to center of the track-rails to be supported thereon. Extending transversely of said I-beams at any desired angle and affording a support for the crossing-track are I-beams A<sup>2</sup>, which are rigidly secured to the I-beams A and A' and are in alinement with an intermediate section of I-beam A<sup>3</sup>, which fits between the I-beams A and A'. As shown, all the abutting I-beams are rigidly secured together by means of an-

gle-plates a, which fit in the intersecting angles formed by the I-beam-supporting frame, and are bolted through the webs of said I-beams, affording a rigid frame at the proper angle for the track. Said frame is further stiffened or braced by bolts a<sup>2</sup> and a<sup>3</sup>, of which the former extends through the I-beams A and A' and the angle-plates secured thereagainst, and the latter extends through the webs of the I-beam sections A<sup>3</sup>. Supported upon the rigid frame thus formed are the crossing-frogs, in the present instance shown as right-angle frogs, though obviously the angle is immaterial. Each rail of said frog comprises a rail-base B, which is rigidly secured upon the I-beam beneath the same by means of brackets or clamps b, which are shaped on their under sides complementally with the flange of the rail-base and adapted to engage over the same. Said clamps are each provided with one or more bolt-apertures registering with corresponding bolt-apertures in the flanges of the I-beam upon which the rail-base rests and are adapted to be secured thereto by means of bolts which extend through said brackets and the flanges. The rail-base, as shown, is provided with an upwardly-extending rib having arranged therein one or more longitudinal, parallel, and upwardly-opening channels, affording parallel upwardly-directed webs c<sup>6</sup>, having inclined upper faces between which fit complementary downwardly-extending webs c of the rail C, the under side of the head of which is provided with upwardly and inwardly directed faces complementary with those at the top of the webs c<sup>6</sup>. The rails are secured to the rail-base by means of a bolt c', which extends through the webs c of the rail-head and c<sup>6</sup> of the rail-base on opposite sides of the track, which act not only to rigidly secure the rail-head and rail-base together, but as well equally space the oppositely-disposed rails from each other.

The rail-bases B, which receive the rail-heads C, extend continuously across the under frame for the crossing and are rigidly secured thereto, as before described, and act as a brace for the relatively short I-beam sections A<sup>3</sup>, which fit between the I-beams A and A', and the rail-bases B' fit between and closely to the rail-bases B, upon the continuous I-beams A and A', to which they are rigidly connected, in alinement with the simi-

larly - constructed track-rails which abut against the outer sides of said rail-bases B and rail-heads C. As shown, each of the rail-heads is provided with a continuous inwardly-directed flange  $c^3$ , which extends for a considerable distance on each side of the crossing and which is planed or shaped at each extremity to incline gradually upward, as shown in Fig. 2, so that the trucks of a passing car are elevated slightly in passing the crossing, owing to the car-wheel flanges engaging upon the flange  $c^3$  and running upwardly thereon. This permits but a small fraction, if any, of the weight to be supported upon the tread-surface of the rail, thus supporting the truck-wheels over the spaces at the intersections of the rails.

Each of the continuous rail-heads C and C' is cut across to afford a groove to permit the passage of the wheel-flanges therethrough. On the inner edge of each of the inwardly-directed flanges  $c^3$  is provided an upwardly-directed rib  $c^4$ , which serves as a guard-rail.

Obviously frogs for railways such as hereinbefore described may be constructed at any desired angle. In switch or crossing frogs, as shown in Figs. 3 and 4, an I-beam A<sup>4</sup> affords a continuous support for the rail-bases B<sup>4</sup>, which are secured thereon, as before described, and which at their ends abut against a continuous rail-base B<sup>5</sup>, which extends through the frog, supported on the I-beams A<sup>5</sup> A<sup>5</sup>, which abut against the sides of the I-beam A<sup>4</sup> at the desired angle and are rigidly secured thereto in any suitable manner. The continuous rail-head C<sup>4</sup> rests in and is supported on the rail-base B<sup>5</sup>, as described with reference to the crossing-frogs and the rail-heads C<sup>6</sup>. Angle-blocks D D, corresponding with the outer angle of the intersecting rails, are secured in said angles, and wedge-blocks D' are fitted to the inner angles and bolts  $d$  engage therethrough and serve to lock the rails rigidly together.

As shown, the inclined flanges  $c^3$ , having an inner guard-rail rib  $c^4$ , are employed, as before described.

The operation is as follows: The construction is exceedingly rigid, inasmuch as the structural members break joints across the frog, thus interlocking the parts. The inwardly-directed flanges  $c^3$  are positively supported on one of the webs  $c^6$  of the rail-base and are planed at the ends to afford a gradual approach to the frog, elevating the wheels just sufficient to permit the same to pass the intervening spaces between the tracks without vibration or concussion.

While I have described a structural-steel base or foundation for the device the same may obviously be modified or a different base employed and the rail-heads and rail-bases may be varied in form to suit the requirements of the particular road using the same. I therefore do not purpose to limit myself

otherwise than necessitated by the prior art and stated in the claims, as obviously many details of construction may be varied without departing from the principle of my invention.

I claim as my invention—

1. A railway-frog comprising a base or foundation, rail-bases secured thereto each provided with a longitudinal channel therein rail-heads having downwardly-directed webs adapted to engage in the channels of the rail-bases, an inwardly-directed horizontal flange of the rail-head adapted to support the wheels on the wheel-flanges over the frog and a rib on the inner edge of said horizontal flange acting as a guard-rail.

2. In a railway-crossing, a subbase of structural steel, beams rigidly engaged together at their points of intersection, a rail-base rigidly supported thereon, each comprising parallel members extending across the frog and parallel members at an angle thereto and abutting against the same, clamping-plates engaging said bases to the subbase rail-heads removably supported on and engaged to the rail-bases and an inwardly-directed flange on each rail-head adapted to support the wheel over the intersection of the rail-heads.

3. The combination in a railway-frog, of a rail-base comprising a flanged bottom portion, a central upwardly-directed rib having a plurality of longitudinal channels therein affording upwardly-directed longitudinal webs and having inclined upper faces.

4. In a railway-frog, the combination with a rail-head provided with downwardly-directed unflanged webs and inclined faces adjacent the same, of a rail-base having webs provided with inclined faces complementary with the faces on said rail-head, a flange on the inner side of the rail-head adapted to be engaged by the wheel-flange of the car-trucks, and an upwardly-directed rib on the inner edge of said flange acting as a guard-rail.

5. In a railway-frog a subbase comprising I-beams rigidly engaged together at an angle, track-rails thereon each provided with an inwardly-directed flange positioned for the wheel-flange to track thereon and an upwardly-directed rib on the margin of said flanges acting as a guard-rail and inwardly-directed clamps engaged on the subbase adapted to engage over the rail-bases and secure the rails in place.

6. In a railway-frog a subbase, rail-bases thereon provided with a plurality of upwardly-opening channels, laterally-directed clamps rigidly engaging the rail-bases on said subbases, rail-heads provided with a plurality of downwardly-directed webs adapted to engage in said channels and transverse rods engaging oppositely-disposed rails together.

7. In a railway-crossing the combination with a rigidly-constructed base or foundation affording a support for the rails of the crossing, of a rail-base for each rail rigidly secured

upon said foundation and each provided with a plurality of narrow longitudinal channels therein, rail-head, webs thereon adapted to engage in the channels of the rail-base and an inwardly-directed flange on each rail-head adapted to carry the wheels upon the flanges in passing the crossings, a rib on each of said flanges acting as a guard-rail, the rail-bases of one track extending continuously over the crossing, the rail-heads of the other extending continuously across the same and notched transversely to permit the passing of the flanges of the wheels along the other track.

8. In a railway-crossing, a base or foundation comprising parallel I-beams spaced a distance apart to afford a support for one of the tracks abutting an intermediate, aligned I-beam affording a support for the other track, angle-plates in the intersecting angles of the foundation thus formed, rigidly connecting said I-beams, track-rail secured upon the said foundation or base, an inwardly-directed flange on each of said track-rails adapted to be engaged by the flanges of the wheels in passing the crossing and an upwardly-directed rib on each side acting as a guard-rail.

9. A structural-steel base for the purpose specified comprising parallel I-beams adapted to support the rails of one track and abutting and intermediate I-beam spaced to support the rails of the other track, angle-plates rigidly bolted in the intersecting angles of said I-beams, bolts rigidly connecting the web of oppositely-disposed I-beams.

10. The combination with a structural-steel base or foundation of a railway-crossing

thereon comprising track-rails, two of which extend continuously over the crossing, the other of which are afforded by abutting and intermediate track-rail sections, metallic brackets adapted to engage over the rail-flanges and to be rigidly secured to the foundation, inwardly-directed flanges on each of said track-rails upon which the track-wheels are supported on the wheel-flanges in passing the crossing, an upwardly-directed rib on the inner edge of each flange acting as a guard-rail.

11. The combination with a structural-steel foundation of a rail-base comprising a bar of rail length laterally flanged at its bottom providing an upwardly-directed central rib thereon, parallel upwardly-directed webs on said ribs having inclined upper faces and adapted to receive between the same the complementary webs of a rail-head adapted to fit in the upper inclined faces of said web.

12. A crossing comprising a plurality of beams extending the length thereof and parallel with one track, parallel beams at an angle therewith and abutting against the same, continuous track-rails on said last-named beams, track-rails on said first-named beams and abutting against the said continuous rails and transverse rods engaging oppositely-disposed rails together.

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

EUGENE HAYWARD.

Witnesses:

WELLINGTON W. WITHEMBURY,  
HJALMAR S. RUDD.