

F. H. HEATH.  
RAIL JOINT.

No. 474,129.

Patented May 3, 1892.

Fig. 1.

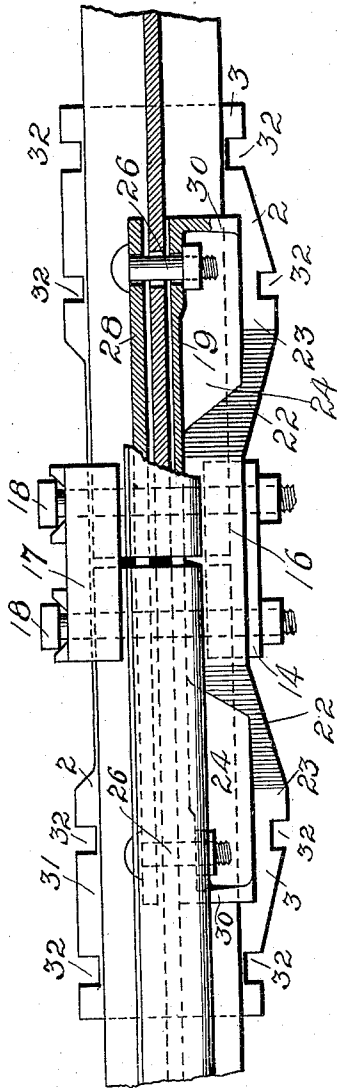
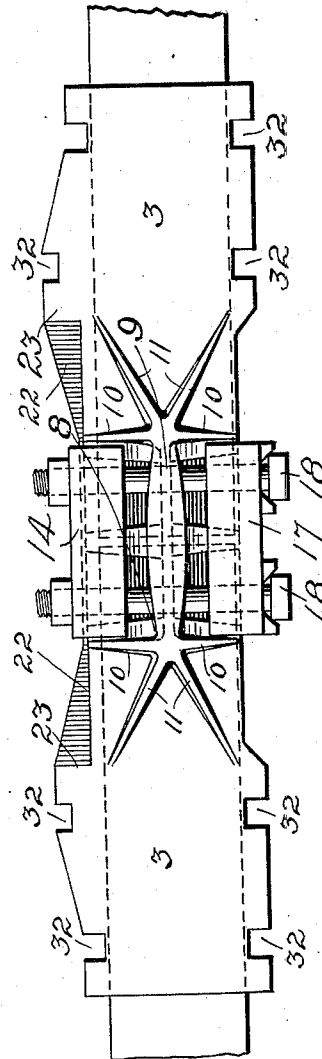


Fig. 2.



Witnesses.  
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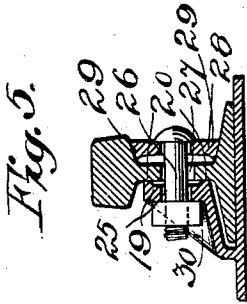


Fig. 5.

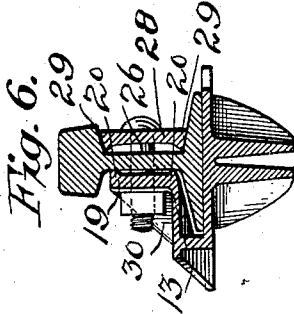


Fig. 6.

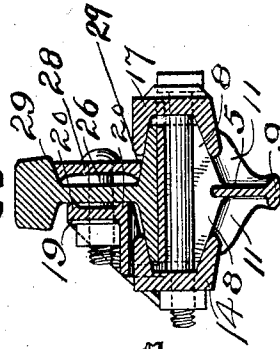


Fig. 7.

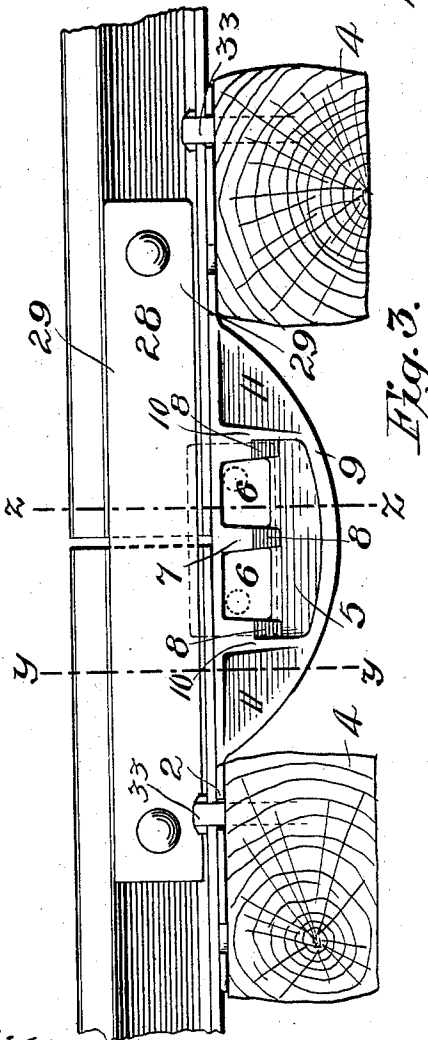


Fig. 3.

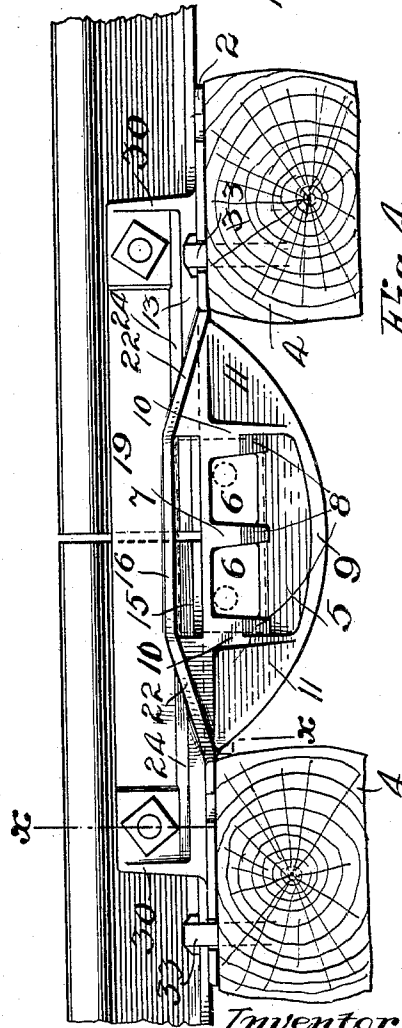


Fig. 4.

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# UNITED STATES PATENT OFFICE.

FREDERICK H. HEATH, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO THE  
HEATH RAIL JOINT COMPANY, OF WATERLOO, IOWA.

## RAIL-JOINT.

SPECIFICATION forming part of Letters Patent No. 474,129, dated May 3, 1892.

Application filed November 18, 1891. Serial No. 412,263. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK H. HEATH, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Rail-Joints, of which the following is a specification.

My invention relates to a new and improved rail-joint in which the qualities of a tie-plate, rail-chairs, truss-joint, fish-plate, angle-bar, and rail-fastening are all combined within a very small compass and in an extremely simple, light, cheap, and durable form.

The object of the invention is to provide a joint for rails which will have the fewest possible parts and at the same time fulfill every requirement of a tie-plate, rail-support, and joint-fastening; and to this end it consists in a plate adapted to extend across the tops of adjoining ties, in connection with a peculiarly-formed system of integral trusses and integral brace or angle-bar adapted to engage the web of the rail to align the rails, a fish-plate for the other side of the rail and secured on the opposite side of the rail from the angle to the same and said angle-bar by bolts passing through them, and clamps for fixing the rail or rails on said plate.

My invention will be more readily understood by reference to the accompanying drawings, in which—

Figure 1 is a plan view of a device embodying my invention, a portion thereof being broken away for clearness. Fig. 2 is a plan view of the rail-joint inverted. Fig. 3 shows the fish-plate side of my joint, the rail-clamps being removed. Fig. 4 is a view of the other side under like conditions. Fig. 5 is a cross-section on the line  $xx$  of Fig. 4. Figs. 6 and 7 are cross-sections on the line  $yy$  and  $zz$ , respectively.

There are three parts or portions of my rail-joint, which, serving most important purposes, are all formed in a single piece. These three parts are the tie-plate 2, the upper surfaces of the ends 3 of which serve as the rail-chairs, and which plate extends not only between the ties, but clear across tops of both of them. The upper surface of the plate and the chair portions are all in the same plane. The plate in two ways is strengthened against any depression, warping, or breaking. The

first and most important of these is the depending truss, which extends down between the ties 4. This truss itself is made up of several parts, all of which are integral one with the other and with the plate—namely, the main central web 5, which is provided with the openings 6 for the accommodation of the clamping-block bolts. Extending down from the edges of the rail and forming a part of and projecting from the sides of the web are the block or bracket portions 7, which have the inclined sides 8.

On the lower edge of the web 5 I form the expanded rib 9, giving the web a much greater strength. From the ends of this web the transverse and diagonal trusses 10 and 11 extend slantingly up from the central web to the edges of the plate. Second, the web is strengthened by the truss angle-bar or brace arranged on one side of the plate and extending nearly the full length thereof. The inwardly-projecting part is raised and supported upon the vertical projection 13, formed integrally with the plate, and, as will be seen, constituting very reliable trusses over the points of the plate where they meet the inner edges of the ties, thereby preventing any bending or breaking of the plate at these points. The ends of the angle-bar or brace extend about half-way out on the rail-chairs, the vertical portion 13 being straight and lying parallel with the outer edge of the rail-base.

To accommodate the inner and upper clamping-flange of the block 14, I cut away the vertical parts 13 at the middle of the rail-joint, making the opening 15, the top of which is formed by the lower surface of the middle and horizontal portion 16 of the angle-bar and the bottom by the edge of the rail-plate 2. The block 14 has the flaring inner sides adapted to engage the top of the rail-base and the inclined edges 8 of the depending truss, and this block, with the block 17, which is similarly constructed, is clamped in place by the bolts 18 passing therethrough and through the openings 6 beneath the plate, the same being secured as shown. The inner upright portion 19 of the angle-bar or brace is hollowed out slightly on the inside to make the two bearing-edges 20. This hollowing is done both to accommodate the raised letters on the rails and also to give

a firmer grip upon the rail-web. The distance between the inner edges 20 and the inner side of the vertical part 13 is somewhat greater than the width of the part of the rail-base to be accommodated therein. The opening beneath the inwardly-extending parts is also higher than the rail-base, so that rails of different sizes may be secured together in the same joint. Further, in this way the bearing of the angle-plate against the web of the rail is insured. I prefer to raise the middle part of the angle-bar, as shown, and extend the inwardly and upwardly slanting side trusses 22 from the outer edges of the extended parts 23 of the rail-chairs, the inner ends of these trusses being merged into the end of the angle-bar just above the ends of the clamping-blocks 14. The outer portions 24 of the angle-bar or brace are preferably slanted up from the outer edges, so as to reduce the heights of the ends of the part 13, and hence strengthen it.

At the ends of the part 19 I provide the bolt-holes 25, these ends of the bar being thickened, as shown. The bolts 26 extend through these holes and through enlarged holes 27 in the web of the rail, the heads of the bolts being secured in the fish-plate 28, which has the inclined edges 29, adapted to engage the lower side of the tread of the rail and the upper side of the base thereof. The width of this fish-plate is such that it can in no case enter so far as to strike and lie flat against the web of the rail, the office of the plate being, in connection with the angle-bar, to insure the alignment of the rails and also to strengthen the rails themselves and prevent the settling of the tread. To prevent drawing over of the upper edge of the angle-bar, I provide the small brackets 30, formed integrally therewith. At the ends of the plate the edges are extended, as shown at 31 and 23, so as to permit the making of the notches 32 in the edges of the plate to admit the rail-spikes 33, as shown in Figs. 3 and 4. The heads of these spikes jut over onto the top of the rail on the inside of the joint and at the ends of the joint on the other side also, thereby furnishing an extra fastening for the railroad-rails. The short bolts 26, fastened in the angle plate or bar, which is formed integrally with the base, prevents creeping of the rails. It is obvious that the rail-joint may be employed not only at actual joints of ends of rails, but when such a support is required may be arranged at intermediate points of a single rail.

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

1. The combination, with the rail or rails, of a tie-plate arranged between and extending over adjoining ties, an angle-bar formed integrally with and on the upper surface of said plate and having an inner vertical part to engage the web only of the rail, said vertical part provided with holes, the rail web or webs having holes registering therewith, and

bolts arranged therein, for the purpose specified.

2. The combination, with the rail or rails, of a tie-plate whereon the same are adapted to rest, said plate adapted to extend between and across adjoining ties, clamping-blocks thereon, an angle-bar formed integrally with said plate and having, as described, the inner vertical part to engage the rail web or webs only, a fish-plate arranged to engage the tread and the base of the opposite side of the rail or rails, and bolts passing through said plate, through the web or webs, and through the angle-bar, whereby the rail or rails are aligned, strengthened, and fastened, substantially as described.

3. The combination, in a rail-joint, of the rail or rails, with a plate upon the upper surface of which the same are adapted to rest, clamping-blocks for securing the rails on the plate, bolts for fastening the said blocks and extending beneath the said plate, an angle-bar raised on one edge of the plate and having the inwardly-extending part and the inner vertical part to be bolted to the web of the rail and engaging the web only, said inwardly-extending part consisting of a higher horizontal portion and the slanting end parts, and the brackets 30, arranged to strengthen the angle-bar, all parts of said bar being formed integrally with said plate, substantially as described.

4. The combination, with the plate, adapted to extend across adjoining ties, of the clamping blocks and bolts therefor for securing the rail or rails thereon, said plate provided with a centrally-depending and integral truss, an integral angle-bar formed on the top of the plate and extending in to engage the web or webs only of the rail or rails, the fish-plate arranged to engage the other side of the rail or rails, and bolts extending through and locking together said fish-plate, rail, web, and bar, substantially as described.

5. The combination, with the plate, of the angle-bar formed integrally therewith, and rail clamps and bolts for securing together the bar and rail or rails to be aligned thereby, the space beneath the angle-bar and brace being larger than the rail-base, whereby the bearing is had on the web of the rail, substantially as described.

6. The combination, with the rail or rails, of the tie-plate 2, having the rail-chair ends whereon the rails are adapted to rest, said ends being wider than the rest of the rail, the vertical part or ledge 13, arranged parallel with the base of the rail or rails, the inwardly-extending part having the raised middle portion 16, side trusses 22, extending from the rail-chair ends thereto, the inner vertical part 19, said part grooved on its inner side, whereby bearing-surfaces are provided at the upper and lower surfaces thereof, and the brackets or braces 30, arranged substantially as described, all of said parts being formed integrally.

7. The combination, with the rail or rails, of the tie-plate having the rail-chair ends whereon the rails are adapted to rest, said ends being wider than the rest of the rail, said plate provided with a centrally-depending truss having divided ends extending up to the edges of the plate, means for clamping the rail or rails thereon, and the vertical part or ledge 13, arranged upon the upper surface of the plate and parallel with the rail-base, and the inwardly-extending part jutting inward over the rail-base and having the vertical portion 19 integrally tied or braced therewith, said vertical part and the web or webs having coincident bolt-holes and bolts arranged therein, whereby said part and web or webs are drawn into firm engagement, substantially as and for the purpose specified.

8. The combination, with the rail or rails, of the tie-plate 2, having the extended rail-chair ends, whereon the rails are adapted to rest, said ends being wider than the rest of the rail, said plate provided with an integral centrally-depending truss having divided ends extending up to the edges of the plate, means for clamping the rail or rails thereon, the vertical part or ledge 13, arranged upon the upper surface of the plate and parallel with the rail-base, the inwardly-extending part jutting inward over the rail-base and

having the vertical portion 19 integrally tied or braced therewith, and a fish-plate to engage the base and the tread of the opposite side of the rail, said vertical part, the web, and fish-plate provided with coincident bolt-holes, bolts arranged therein, and nuts thereon, whereby said three parts are drawn into solid engagement, substantially as and for the purpose specified.

9. The combination, with the rail or rails, of the plate 2, whereon the same are adapted to rest, the ends of the said plate being provided with the extended edges 23 and 31, notches 32 therein, the integral angle-bar or brace having the inner part adapted to engage the web or webs of the rail or rails, clamping-blocks for securing the same on the plate, the side of said plate opposite said angle-bar, which is integral with the plate, being without vertical projection, the ties and spikes 33, driven into the same and arranged in said notches, the heads of said spikes engaging the tops of the rail base or bases, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 5th day of November, 1891.

FREDERICK H. HEATH.

In presence of—

C. G. HAWLEY,  
F. S. LYON.