

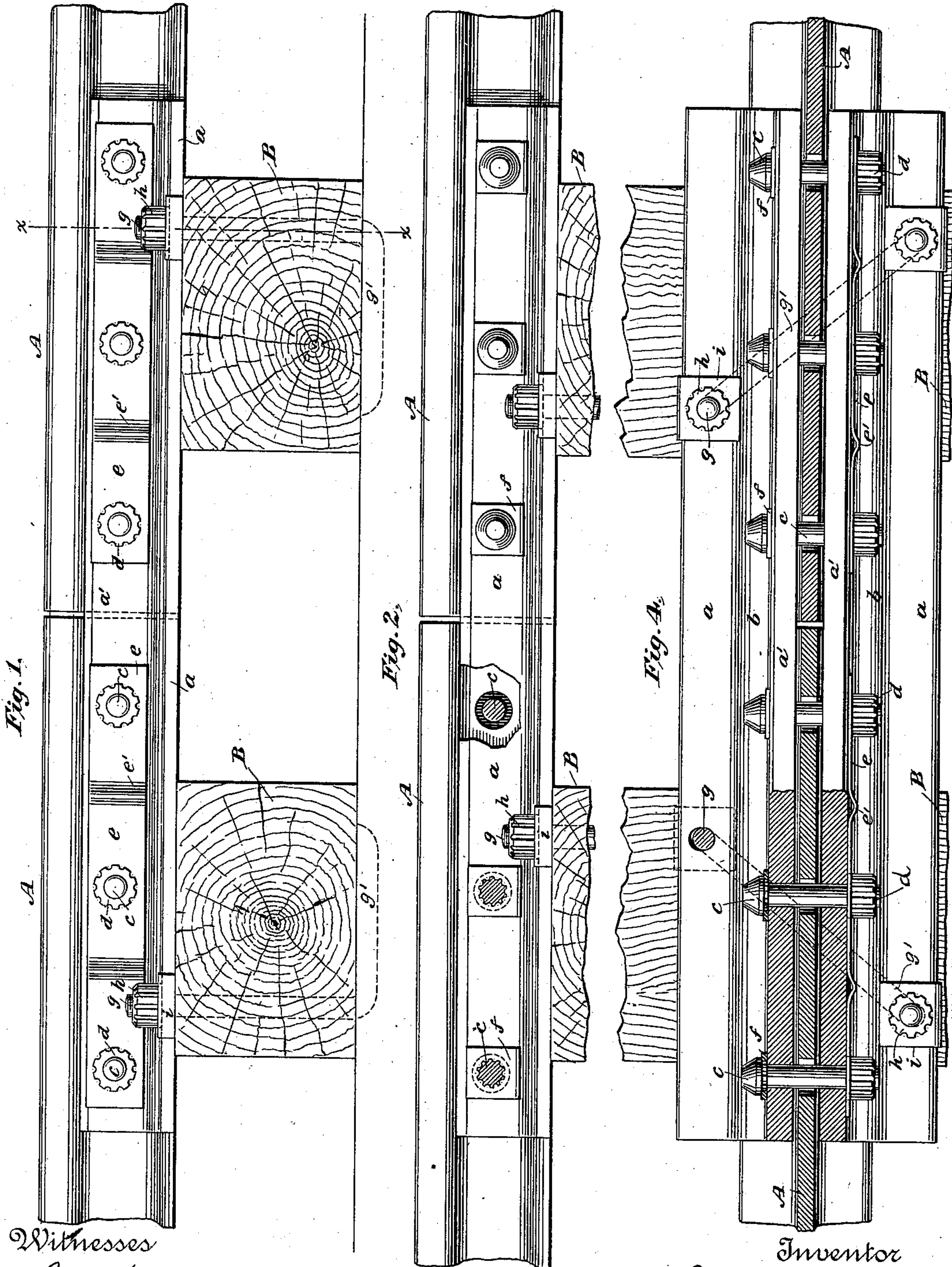
(No Model.)

2 Sheets—Sheet 1.

H. D. CONE.  
RAILWAY RAIL JOINT.

No. 373,052.

Patented Nov. 15, 1887.



Witnesses

Geo. W. Breech.

Edward Thorpe.

By his Attorney

Inventor  
Henry D. Cone

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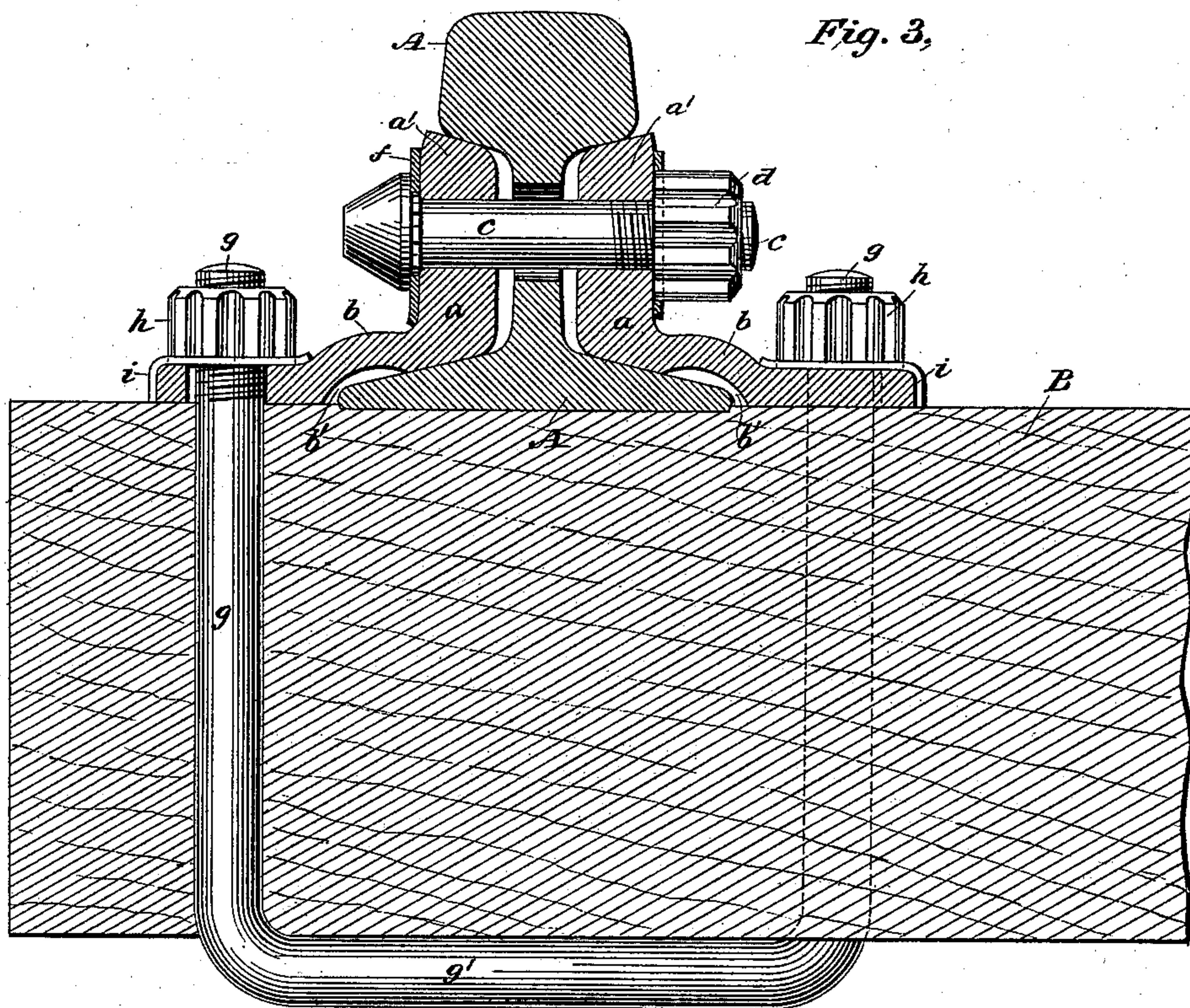
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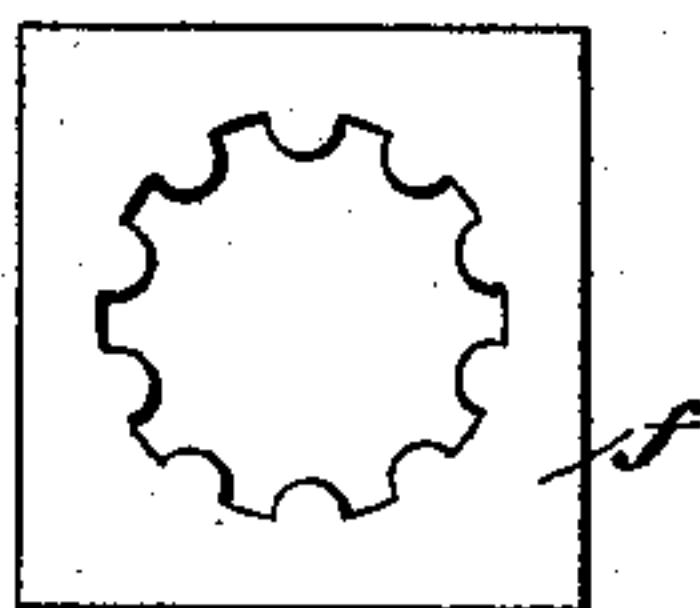
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*Fig. 5.*



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# UNITED STATES PATENT OFFICE.

HENRY D. CONE, OF STOCKBRIDGE, MASSACHUSETTS.

## RAILWAY-RAIL JOINT.

SPECIFICATION forming part of Letters Patent No. 373,052, dated November 15, 1887.

Application filed June 10, 1887. Serial No. 240,885. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY D. CONE, a citizen of the United States, residing at Stockbridge, in the county of Berkshire and State of Massachusetts, have invented a new and useful Improvement in Railway-Rail Joints; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification.

The object of my complete invention is to fasten together the ends of adjoining rails by a strong, durable, and safe joint that will prevent the jumping or vertical motion of the rail ends, and yet will allow for the expansion and contraction of the rails under the influence of heat and cold, and will also have a slight elasticity or yielding capacity without in any way loosening or weakening the joint.

Another object of my invention is to provide a superior means for fastening the angle-plates to the ties or sleepers; and a still further object is to secure the fastening nuts and bolts in such a way as to prevent their turning or loosening.

The invention consists of various devices and combinations, which are specified in the claims at the close of this specification.

In order that they may be fully understood, I have represented in the accompanying drawings, and will proceed to describe, the mode in which I prefer to embody them for practical use.

In the said drawings, Figure 1 is a side elevation of my improved joint, showing the side on which the nuts of the transverse bolts are screwed. Fig. 2 is an elevation view of the other side of the joint, the heads of some of the transverse bolts being removed to show the construction of the bolt underneath the head and the shape of the bolt-hole in the rail. Fig. 3 is a vertical cross-section on the line *xx* of Fig. 1. Fig. 4 is a top or plan view with the head of the rail broken away. Fig. 5 is a detail view.

Similar letters indicate similar parts of the different figures.

Referring to the drawings, A A are the rails, which may be of any usual form or construction.

B B are the ties or sleepers, which are preferably made of wood.

*a a* are angle splice-plates. The plates *a a* are constructed in the manner shown in Fig. 3. The upright member *a'* of this plate is made of greater thickness than the other parts of the plate. The purpose of this is to give the head of the rail a strong vertical support, and to afford a wide bearing-surface at the upper and lower ends of this upright member of the plate under the head and above the flange of the rail, respectively. The flange of the angle-plate is made much wider than in the ordinary form of angle-plate, and is adapted to be secured to the ties. Between the flange and the upright member of the plate is a connection, *b*, which is preferably recessed at its underside, in a manner substantially as shown. The recessed portion *b* is made of such a thickness of metal that while it is strong and durable it is at the same time sufficiently elastic and yielding to give the entire joint a little play without loosening any of the fastenings, and to act somewhat as a spring, in the manner hereinafter described.

Each joint is made by two angle-plates, one on each side of the rails. Each angle-plate extends over at least two ties; and I prefer to have the point of meeting of the rails between the two ties, as shown.

The angle-plates are clamped in their positions against the opposite sides of the rails by means of the transverse bolts *c* and their nuts *d*. The bolt-holes in the angle-plates are preferably made to fit the bolt snugly; but the holes in the rails are enlarged to permit of the expansion and contraction of the rails. The nuts *d* are preferably fluted or grooved, as shown. I do not here claim this form of nut, as I have reserved that claim for a separate patent.

*e* is a lock-plate for holding the nuts of the transverse bolts. I prefer the form of lock-plate shown, though any other suitable locking device may be employed in my invention. I do not herein claim this form of lock-plate, as I have reserved that claim for a separate application.

To prevent the transverse bolt also from turning in the nut I construct the under part of the bolt-head with grooves, as shown in Fig. 2. Under the bolt-head I place a lock-plate, *f*, which is made to correspond in shape with the grooved or fluted portion of the said bolt-



head, so as to receive that portion of the bolt-head and serve as a lock-plate to the bolt. It is evident that the bolt cannot turn without turning this lock-plate *f*, and I prevent the lock-plate from turning by making its lower side bear against the angle-plate.

When the entire invention is used, the flanges of the angle-plates are fastened to the ties as follows: A yoke-bolt, *g*, is passed up through the tie from below and its threaded ends pass through the flanges of the two angle-plates, one on each side of the rail. The yoke-bolt is preferably placed in a diagonal position, as shown in Fig. 4. Nuts *h*, preferably fluted, are then screwed onto the ends of the yoke-bolt. As these nuts are screwed down upon the yoke-bolt, the connecting-arm *g'* of the bolt is drawn solidly up into or against the tie, so that the connecting-arm has a firm bearing against the material of the tie, and the flange of the angle-plate is drawn down and pressed against the surface of the tie and held fast in that position. In this way the angle-plates are fastened firmly to the ties. Each one of the nuts *h* of the yoke-bolt is locked in its position by means of a small lock-plate, *i*, shaped to fit the exterior of the nut. The nut is held fast by the lock-plate and the lock-plate is prevented from turning by a flange passing down over the edge of the flange of the angle-plate. This lock-plate is held in its place by frictional contact with the nut.

I prefer to so construct the angle-plates that when the nuts *d* have been screwed home on the bolts *c* and the angle-plates fastened in this way to the rails, the bottom of the rail itself resting on the tie, the under side of the flange of each angle-plate will not rest upon the tie, but will be a short distance above it; or if the tie be grooved to permit the flange of the rail to set into it, the lower side of the flange of the angle-plate is a little higher above the level of the under side of the rail than the surface of the tie on which the angle-plate flange is ultimately to rest is above the bottom of the groove or slot made in the tie to receive the rail. In this position the nuts *h* are screwed home on the bolts *g*, and the flange of the angle-plate is forced down upon the tie. The pressure thus produced upon the rail-flange forces the rail down snugly into its seat in the tie, partially embedding the rail bottom or base in the wood of the tie. At the same time the recessed connection *b* of the angle-plate is strained out of its normal position. As the connection *b* is recessed at its under side, it is separated by an open space, *b'*, from the outer portion of the flange of the rail. Consequently when the nut *h* presses the flange of the angle-plate down, the pressure tends to cause the lower end of the upright member of the angle-plate to move inward or toward the web of the rail. If in this operation that member of the angle-plate cannot be pressed closer to the rail-web, then the recessed connection *b* is strained still more. The elasticity of this recessed connection *b* tends constantly to bring

it back to its normal position. This can only be accomplished by forcing the lower end of the upright member of the angle-plate in nearer to the web of the rail. Consequently the elasticity of the connection *b* makes it act in the manner of a spring, tending to press the lower portion of the upright member of the angle-plate nearer the web of the rail. As the angle-plate is worn by use, the lower portion of the upright member is pressed closer to the rail-web by the elasticity of the connection *b*, and thus the wear of the angle-plate is compensated for by the action of its recessed connection *b*, and the joint remains firm and solid for a much greater length of time than it otherwise would. In order to permit of this elastic action of the angle-plates, the bolt-holes in the flanges of the angle-plates are enlarged, as shown.

The advantages of the yoke-bolt are that it has a complete and continuous bearing in the wooden tie, and when a rocking strain is brought upon the rail the upright arms of the bolt cannot separate at their lower ends, as they are tied together by their connecting-arm. Moreover, the yoke-bolt *g*, when placed in a diagonal position, as shown, incloses a material portion of the tie, and even if the tie splits or becomes cracked, the fastening still remains firm, the yoke-bolt operating to hold the parts of the tie together.

Parts of my invention may be used without others. Thus my improved angle-plate may be used without the yoke-bolts, but in connection with spikes, to secure it to the ties; but I prefer to use the entire invention in the form shown in the drawings. In case spikes are used the elasticity of the angle-plates will reduce the violence of the strains upon the spikes, and the spikes will retain their bearing in the ties for a greatly-increased length of time.

As parts of my invention can be employed separately or in other combinations, I do not limit my claims to the entire combination before set forth.

What I claim as new, and desire to secure by Letters Patent, is—

1. The rail splice-plate constructed, substantially as before set forth, with an upright member adapted to fit in between the head and flange of the rail, and a flange adapted to be secured to the sleepers, and with the connection between said upright member and said flange recessed at its under side.

2. The combination, substantially as before set forth, of two adjacent railway-rails and a splice-plate constructed with an upright member adapted to fit between the heads and flanges of said rails, a flange adapted to be secured to the sleepers, and the connection between said upright member and said flange separated by an open space from the outer portion of the flanges of the rails.

3. The combination, substantially as before set forth, of the railway-rails, the splice-plates at opposite sides of said rails, the sleeper beneath the rails, and the yoke-bolt by which the



said rails, splice-plates, and sleeper are secured to each other.

4. The combination, substantially as before set forth, of the railway-rails, the splice-plates, the sleeper beneath the rails, the yoke-bolt by which the said rails, splice-plates, and sleeper are secured to each other, and the locking devices for the nuts of said yoke-bolt.

5. The combination, substantially as before set forth, of the railway-rails, the splice-plates, the sleeper beneath the rails, the transverse bolts by which the said splice-plates and rails are secured together laterally, and the yoke-bolt by

which the rails, the splice-plates at the opposite sides thereof, and the sleeper are secured to each other. 15

6. The combination, substantially as before set forth, of the splice-plate, the bolt having its shaft grooved for a short distance under the bolt-head, and the lock-plate fitted to said grooved portion of the bolt-shaft. 20

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