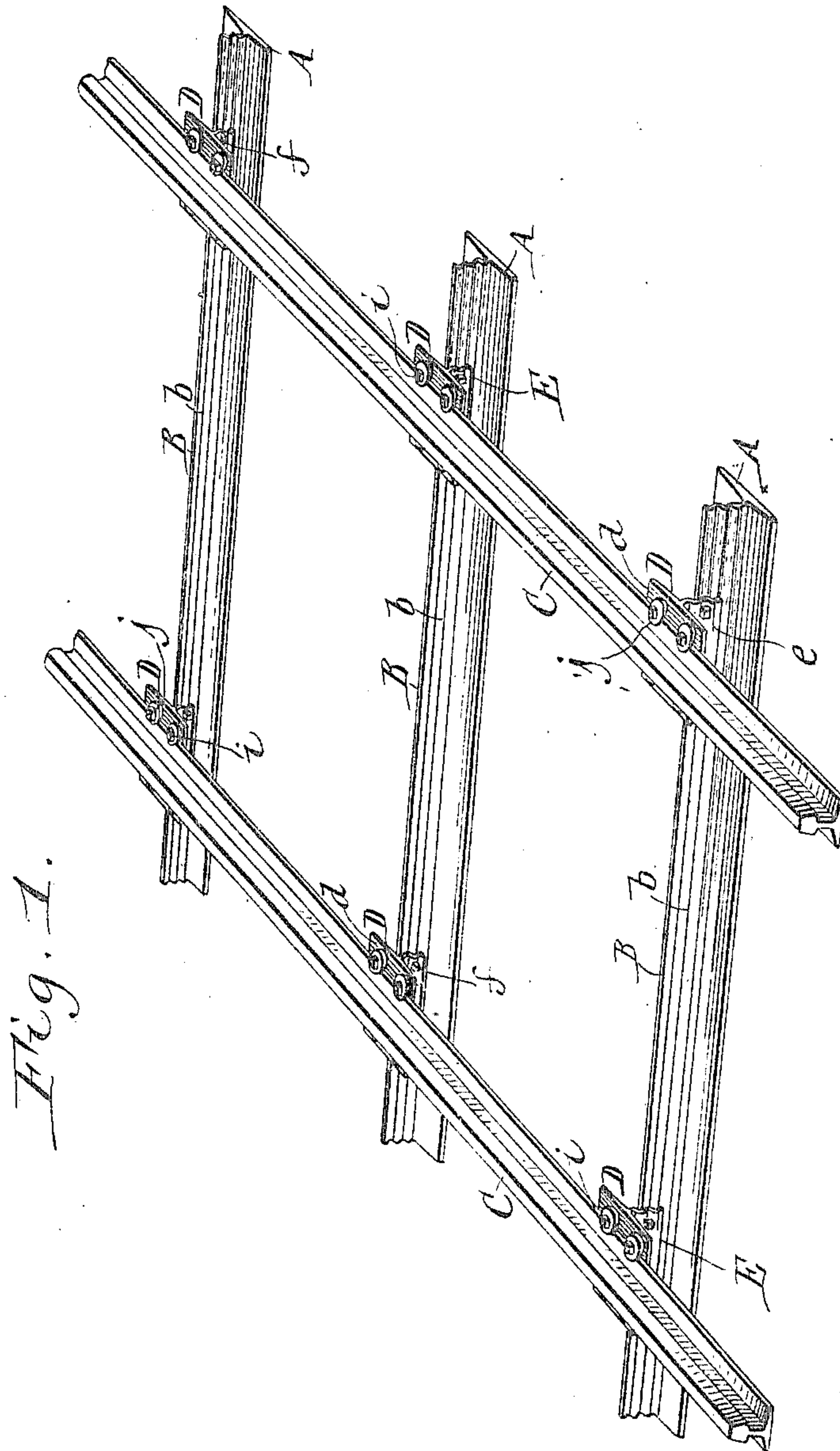


No. 811,782.

PATENTED FEB. 6, 1906.

P. T. LARGE.  
METALLIC RAILWAY TIE.  
APPLICATION FILED SEPT. 14, 1905

2 SHEETS—SHEET 1



Witnesses:  
Louis W. Gratz.  
Emma M. Graham.

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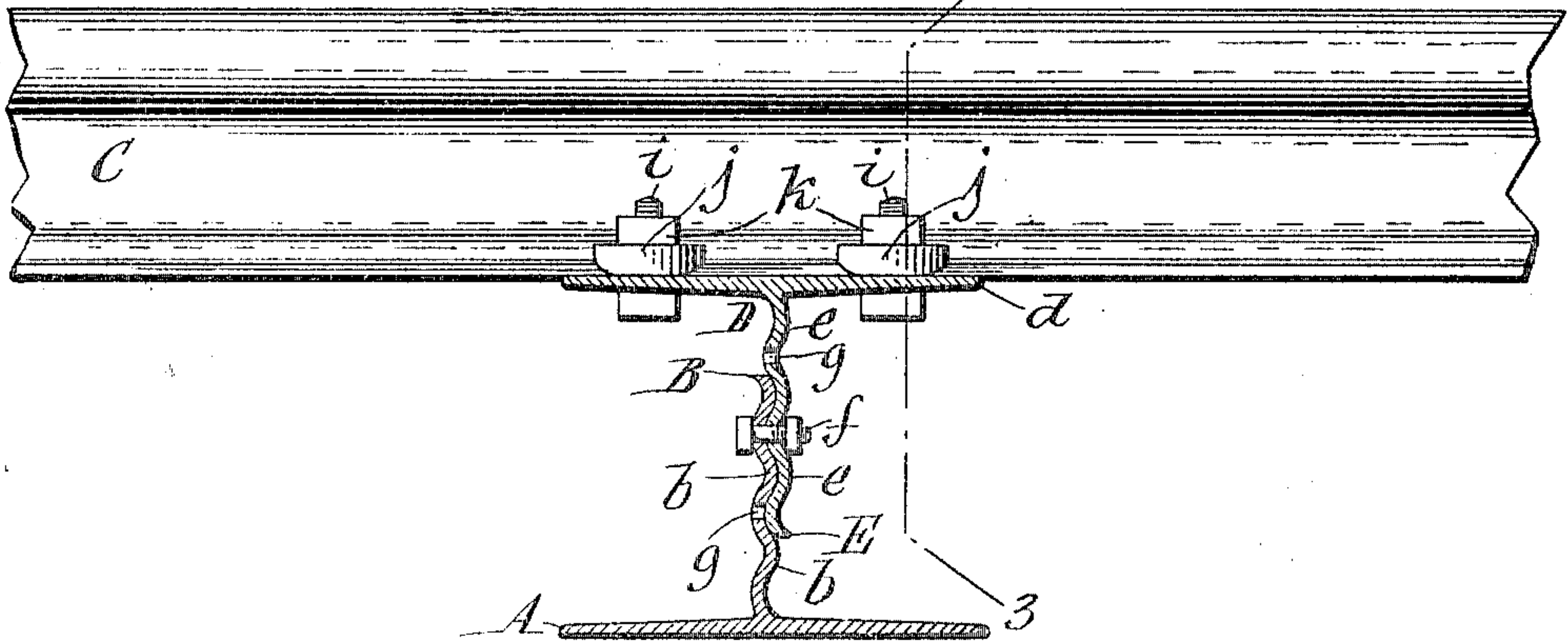
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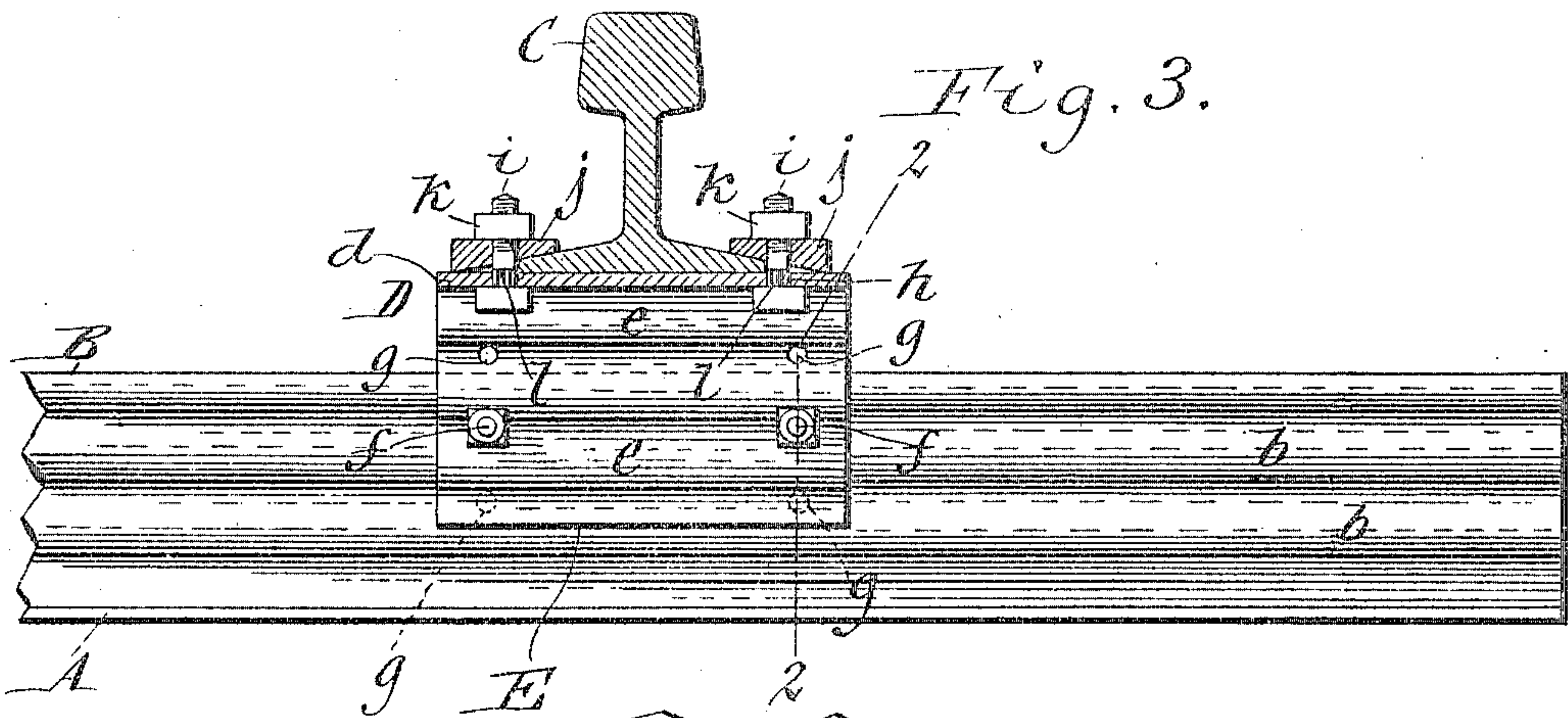
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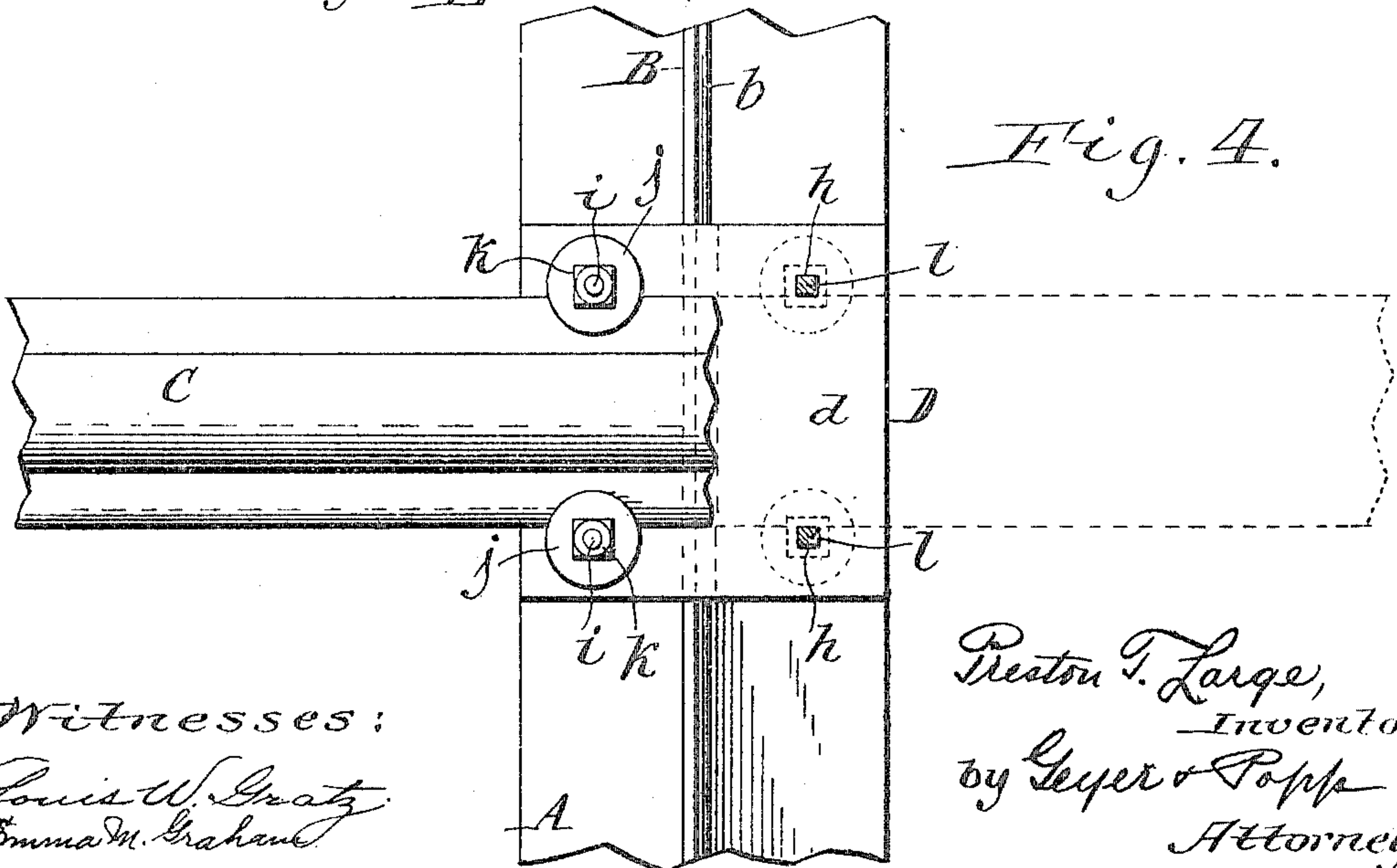
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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# UNITED STATES PATENT OFFICE.

PRESTON T. LARGE, OF NORTH TONAWANDA, NEW YORK.

## METALLIC RAILWAY-TIE.

No. 811,782.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed September 14, 1905. Serial No. 278,422.

*To all whom it may concern:*

Be it known that I, PRESTON T. LARGE, a citizen of the United States, residing at North Tonawanda, in the county of Niagara and State of New York, have invented new and useful Improvements in Metallic Railway-Ties, of which the following is a specification.

Metallic railway-ties as heretofore constructed have been comparatively stiff and rigid, causing them to be soon crushed or battered by the constant pounding of the trains passing over the rails which rest on the ties. In order to overcome this objection, the ties must yield slightly under the load which is placed upon the same.

The object of this invention is the production of a metallic railway-tie which overcomes the objections and embodies all the desirable features above referred to, while at the same time materially reducing the cost of the tie.

In the accompanying drawings, consisting of two sheets, Figure 1 is a perspective view of a railway equipped with my improved ties. Fig. 2 is a vertical cross-section, on an enlarged scale, taken in line 2 2, Fig. 3. Fig. 3 is a vertical section of the same at right angles to Fig. 2 and taken in line 3 3 therein. Fig. 4 is a fragmentary top plan view, partly in section, of my improved tie and adjacent parts.

Similar letters of reference indicate corresponding parts throughout the several views.

The body of my improved tie is constructed from a bar which has the form of an inverted T in cross-section and comprises a horizontal base or plate A and a vertical web or stem B projecting upwardly from the central part of the base and extending lengthwise thereof. This web is provided with a plurality of corrugations *b*, which extend horizontally throughout the length thereof. As the train passes over the rails C C, which are supported by the ties, the webs of the latter yield slightly under the vertical pressure of the load. The capacity of thus yielding vertically is due to the longitudinal corrugations of the webs, which convert the same into springs, which are elastic or resilient in a vertical direction, but are perfectly rigid in a horizontal direction.

The yield of the tie under the pressure of the load is sufficient to cushion the blow or jar to which the same is subjected by the train passing over the same; but the resilience of

these corrugations causes them to restore the tie to its normal condition after the load leaves the rails. By thus enabling the ties to yield under the pressure of the load the same are prevented from being broken or worn rapidly, thereby avoiding frequent renewal of the same and maintaining the railway in the best state of efficiency.

My improved tie can be tamped properly in the road-bed as readily as a wood tie, and the same contains a ratio of strength in the direction of its length which is equal to a tie of twice its weight as ordinarily constructed, thereby effecting a considerable saving in material and cost.

Although various means may be employed for connecting the rails with my improved tie, I prefer the means shown in the drawings, which are constructed as follows: D D represent rail-holders, which are of the same shape in cross-section as the ties, but considerably shorter, and each of which comprises a horizontal top or tie-plate *d*, upon which a rail rests, with its under side and a vertical web E projecting downwardly from the central part of the tie-plate and having longitudinal corrugations *e*. Two of such rail-holders are arranged over a tie near opposite ends thereof and have their webs projecting downwardly along one side of the web. The corrugations on the cooperating portions of the webs of each rail-holder and tie fit into one another and are connected by bolts *f*, passing transversely through the same if the parts are assembled on the ground, but if the parts are assembled in the shop the same are connected by rivets. The use of rivets for connecting the tie and holders is cheaper and stronger than the use of bolts, but the employment of the latter permits of replacing rail-holders more readily when broken.

The corrugations of the rail-holders increase the elastic support for the rails. Furthermore, the interlocking portions of the webs of the rail-holder and tie form a plurality of cooperating shoulders which take the vertical strain of the load placed upon the tie, and thus prevent the connecting bolts or rivets between these webs from being sheared off.

In the manufacture of the ties from long bars short lengths or remnants are produced, which are commonly known as "crops" or "crop ends." These remnants can be advantageously used by cutting them up into



short sections of the required length for use as rail-holders, thereby effecting a considerable saving in cost.

By lapping the webs of the rail-holders over the webs of the tie a greater or less extent the aggregate height of the tie and holder may be varied to suit different uses of the tie. When the tie is to be used on an ordinary road-bed, it is desirable to increase the height of the tie and holder, so that the same may be embedded to a greater extent in the ballast, and thus secure greater stability; but when the tie is to be used on bridges or other unballasted places the holder should be lowered to reduce the aggregate height of the tie and holder and prevent undue lateral deflection thereof when under the strain of a load. This vertical adjustment of the rail-holders relatively to the tie is preferably effected by providing a plurality of openings *g* for the bolts *f* at different heights either in the web of the tie or that of the holder, which openings are so spaced that they register while shifting the corrugations of the holder-web into engagement with different corrugations of the tie-web.

In the completed condition of the railway the tie and holders are completely embedded in the ballast, except the tie-plates, which are exposed. An even surface is thus produced between the rails, which facilitates draining of this space. Inasmuch as the ballast fills in between the corrugations of the tie and holder the latter are held down in place more effectually, thus requiring less frequent tamping.

Various means may be employed for connecting the rails with the tie-plates, the preferred means (shown in the drawings) being as follows: *h* represents openings formed at opposite ends of the tie-plates, so that they are arranged along the outer edges of the base of the rails, which rest on the tie-plate between said openings. *i* represents vertical bolts arranged in the openings *h* and bearing with their inner sides against the edges of the rail-base and with their heads against the under sides of the tie-plates. *j* represents washers having beveled under sides which rest partly on the base of the rail and partly on the adjacent upper side of the tie-plate. The upper ends of the bolts *i* pass through these washers and are provided with nuts *k*, which bear against the upper sides of the same. Upon

tightening these bolts the rail is held securely down upon the tie-plate, and inasmuch as the rail bears with opposite edges of its base against the bolts *i* on opposite sides of the tie-plate the same is held against lateral displacement, thus securing the rail firmly to the tie. The shanks of the rail-bolts *i* are made square or non-circular adjacent to their heads, as shown at *l*, and the openings of the tie-plate which receive these portions of the rail-bolts are of corresponding shape and fit the same comparatively snug. By this means the nuts of the rail-bolts can be tightened or loosened without the necessity of holding the heads of these bolts against turning by a separate tool, thereby facilitating the erection, repairing, or altering of the railway.

I claim as my invention—

1. A metallic tie having a horizontal base and a vertical web which is corrugated horizontally, substantially as set forth.

2. A metallic tie having a horizontal base and a horizontally-corrugated web which projects upwardly from the central part of the base, substantially as set forth.

3. A metallic tie having a vertical web which is corrugated horizontally and a rail-holder having a vertical web which is corrugated horizontally and secured to the web of said tie, substantially as set forth.

4. A metallic tie having a horizontal base and a horizontally-corrugated web projecting upwardly from the central part of said base, and a rail-holder having a horizontal top plate and a web projecting downwardly from said top, and having horizontal corrugations which fit into the corrugations of the web on said base, substantially as set forth.

5. A metallic tie having a horizontal base and a horizontally-corrugated web projecting upwardly from the central part of said base, a rail-holder having a horizontal top plate and a web projecting downwardly from said top and having horizontal corrugations which fit into the corrugations of the web on said base, and bolts connecting the webs of the tie and the rail-holder, substantially as set forth.

Witness my hand this 31st day of August, 1905.

PRESTON T. LARGE.

Witnesses:

THEO. L. POPP,  
E. M. GRAHAM.