No. 889,457. PATENTED JUNE 2, 1908.

W. GOLDIE.

METALLIC TIE.

APPLICATION FILED DEC. 10, 1906.

2 SHEETS—SHEET 1.

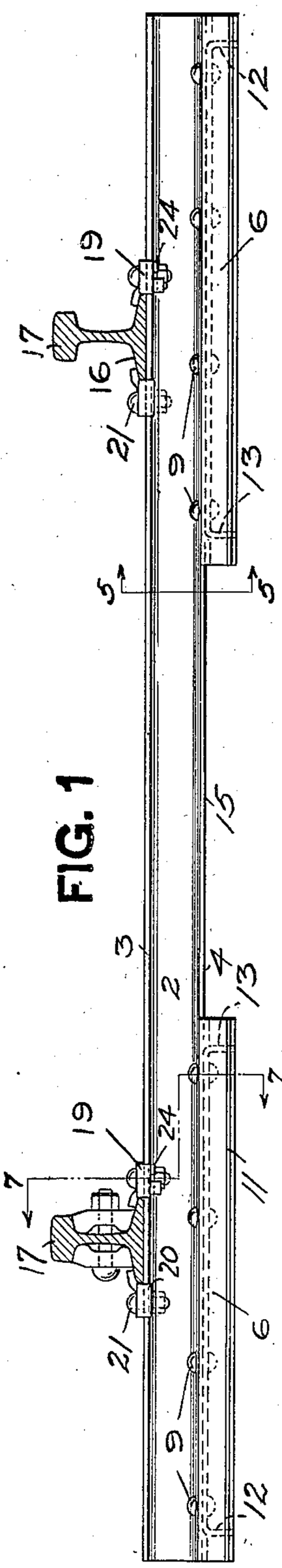

FIG. 1

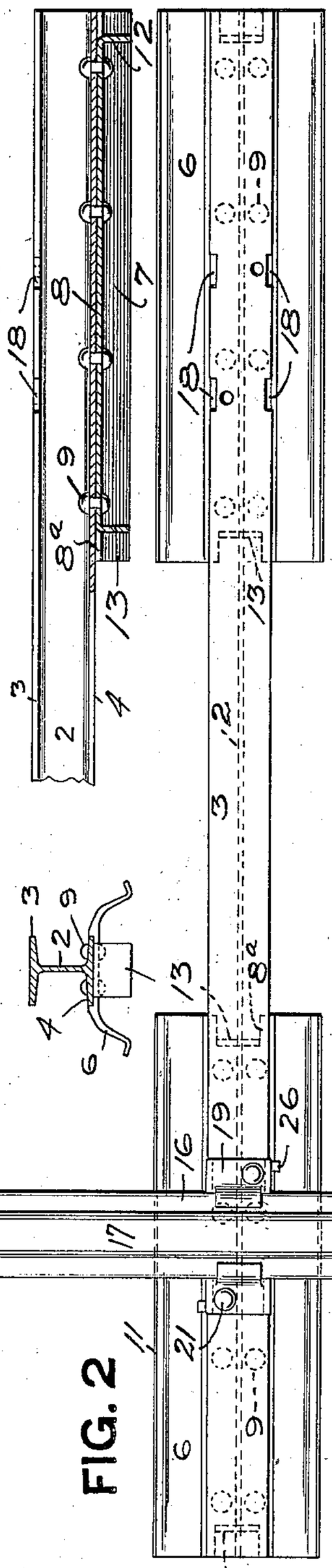

FIG. 4

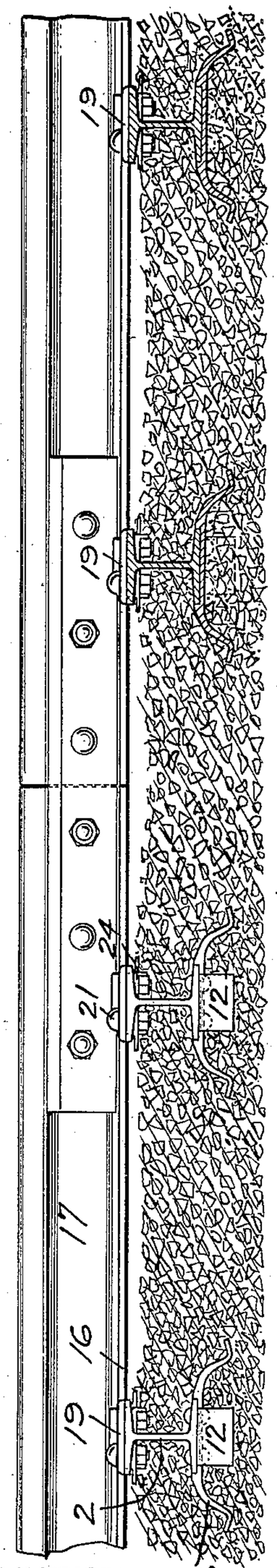

FIG. 3

FIG. 2

FIG. 5

WITNESSES.

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2 SHEETS—SHEET 2.

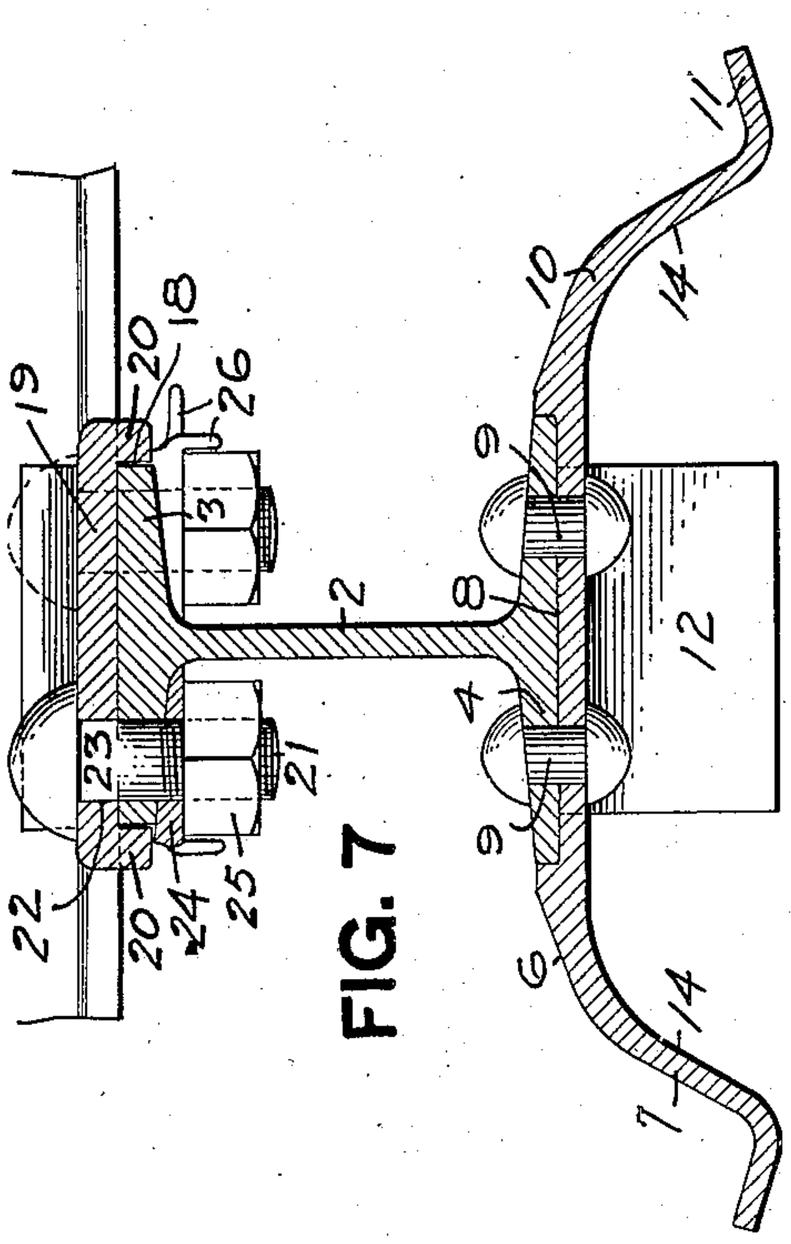

FIG. 7

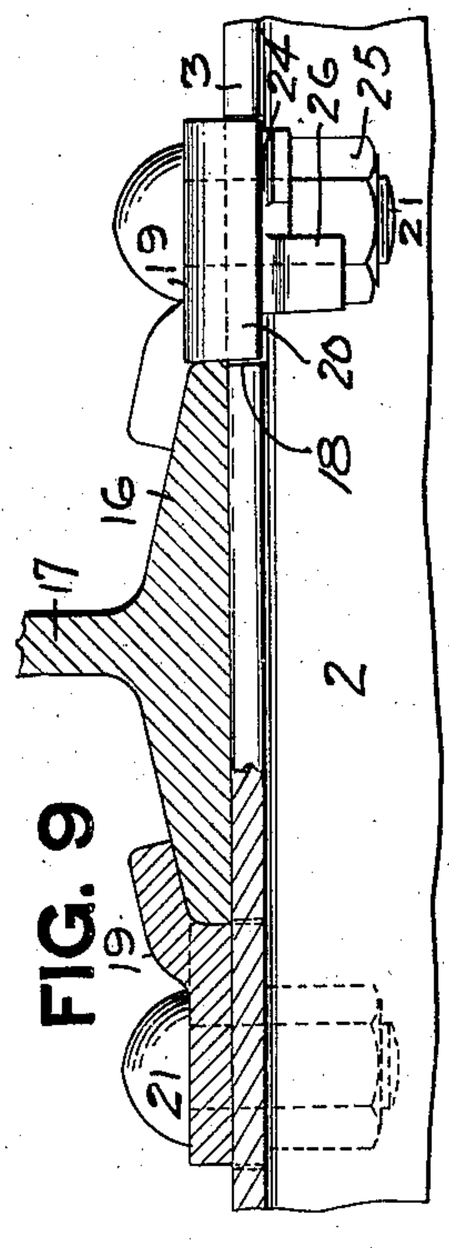

FIG. 9

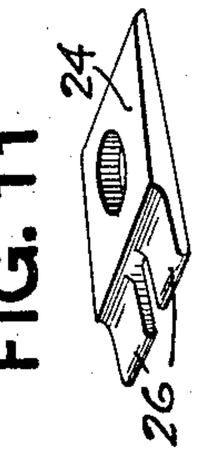

FIG. 11

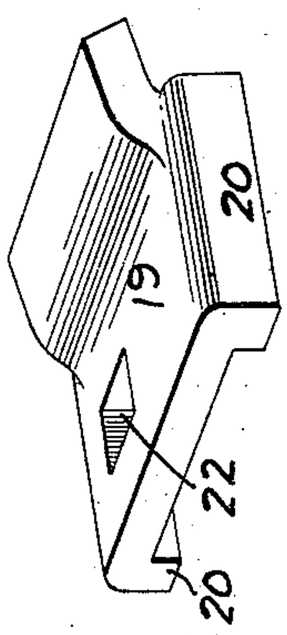

FIG. 10

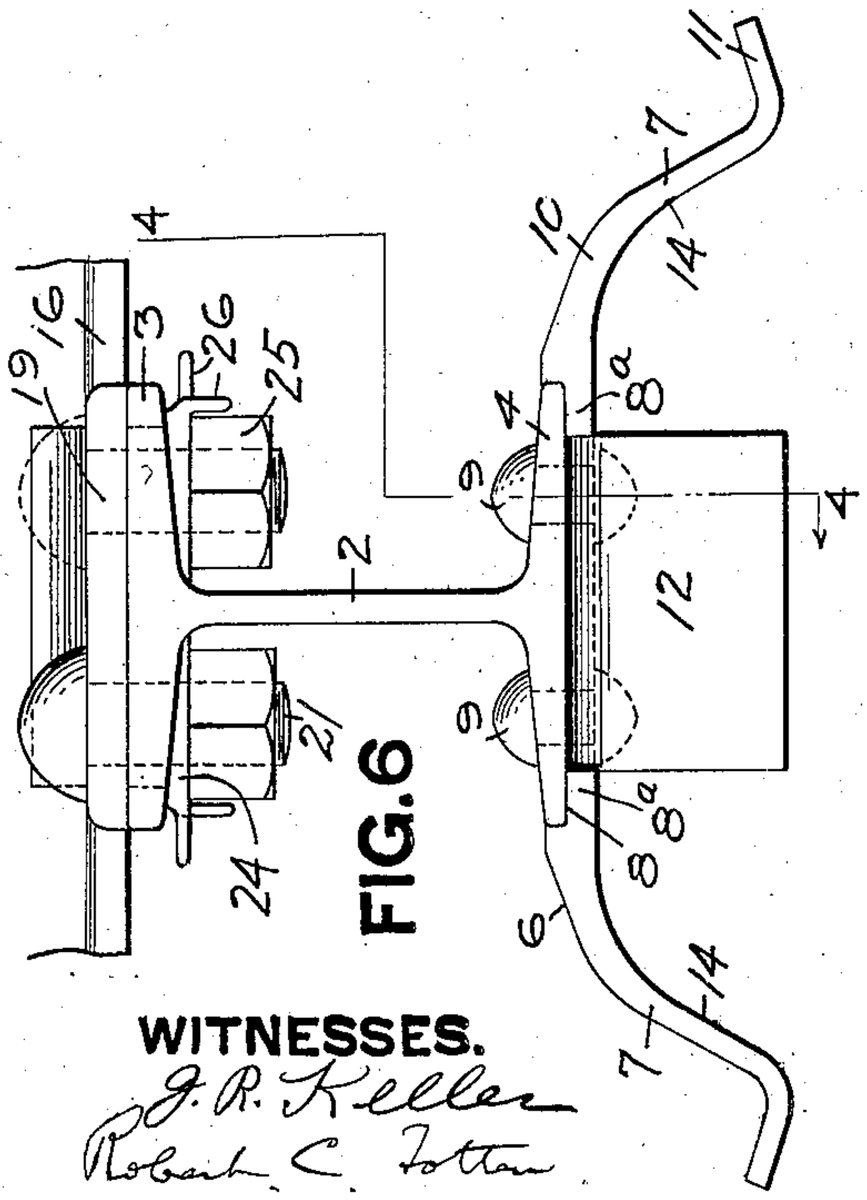

FIG. 6

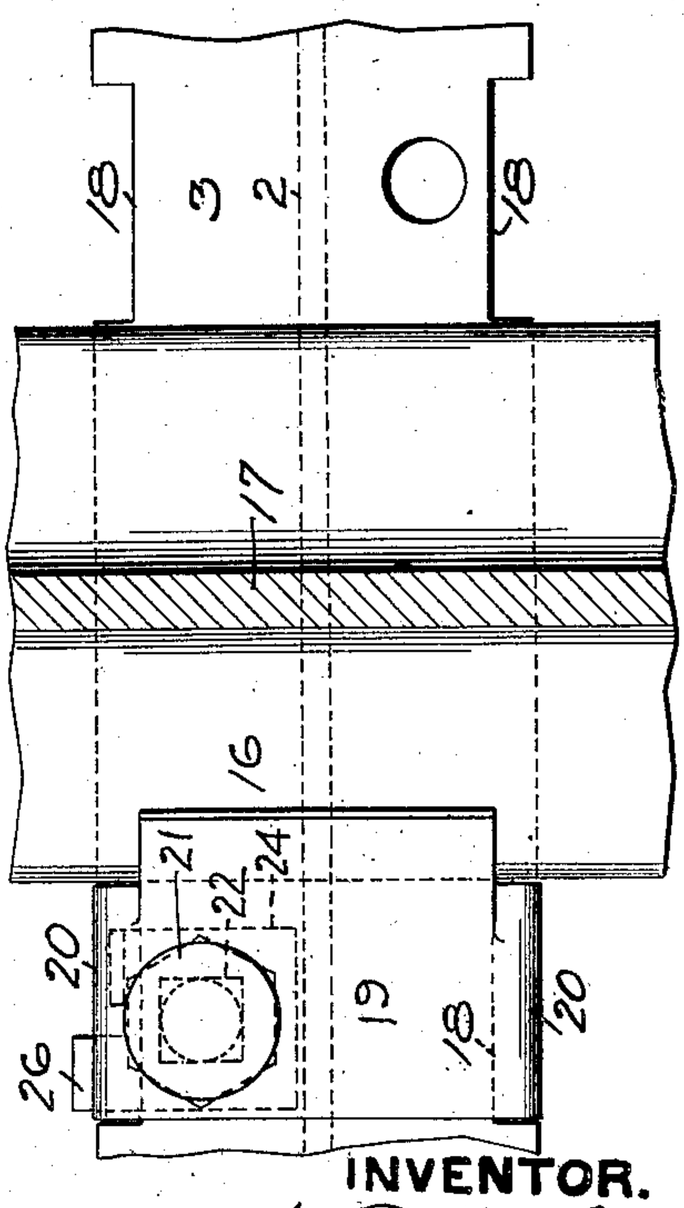

FIG. 8

WITNESSES.

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UNITED STATES PATENT OFFICE.

WILLIAM GOLDIE, OF WILKINSBURG, PENNSYLVANIA.

METALLIC TIE.

No. 889,457. Specification of Letters Patent. Patented June 2, 1908.

Application filed December 10, 1906. Serial No. 347,103.

To all whom it may concern:

Be it known that I, WILLIAM GOLDIE, a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Metallic Ties; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to metallic ties, its object being to provide a metallic tie having full stiffness of body between the rails, and having wide bearings under the rails which will grip and hold the ballast and so give broad support for the rails without fear of center binding, and provide for a positive holding of the rails against spreading; and to produce the tie at a reasonable cost.

To these ends my invention consists, generally stated, in a metallic tie formed of a flanged beam having secured to the base thereof at each end inverted trough shaped sections by which the ballast under the rails is inclosed and held and a more perfect support obtained, while as the bearing in the central part of the tie is narrower than the width of the trough shaped sections, though the central part of the tie aids in supporting the load, yet all fear of center binding of the tie upon the ballast is overcome on account of the reduced surface bearing of the mid portion of the tie.

It also consists in certain other improvements which will be hereinafter more fully set forth and claimed.

In the accompanying drawing Figure 1 is a side view of the tie; Fig. 2 is a top plan view; Fig. 3 illustrates a portion of track in which the improved tie is employed; Fig. 4 is a longitudinal section on the line 4—4 Fig. 6; Fig. 5 is a cross section on the line 5—5 Fig. 1; Fig. 6 is an enlarged end view; Fig. 7 is an enlarged section on the line 7—7 Fig. 1; Figs. 8 to 11 are details illustrating the position of the clip, rail and tie and means for holding the same.

The main portion of the tie is a flanged beam, preferably of the section illustrated in the drawing, namely, an **I**-beam 2 with relatively wide flanges 3, 4, this beam extending for the full length of the tie. It is preferable that the upper flanges 3 of the beam shall be made of greater thickness than the lower flanges 4, because it is desirable to have full thickness of metal for securing the rail to the top flanges of the tie, while the lower flange 4 is strengthened at the ends by means of the inverted trough shaped sections 6 which have the flanges or sides 7, preferably inclined, and the seats 8 to receive the end portions of the lower flanges of the beam, and in connection therewith serve to strengthen the portion of the beam which carries the greatest load, the inverted trough section 6 being united to the beam by a series of rivets 9 through the base of the beam within the seat 8.

As shown in the drawing it is preferable to thicken up the metal of the trough section on each side of the base flanges, as at 10, and then to carry the same by a gradually decreasing thickness or by a slight taper down to the lowest bearing point of the inverted trough. Beyond this bearing point the edge of the inverted trough is bent or curved slightly upward forming the upwardly curved outer edge portions 11 as fully described in an application filed by me Nov. 12th, 1906, Serial No. 343,067. It is desirable that the tie shall be held against lateral creeping action and for that purpose I bend down at the ends of the trough sections the flanges 12, 13 forming an abutment within and at each end of each trough section and adapted to act with the upwardly inclined converging inner faces 14 of the trough section to bind or hold the ballast under the rails, while at the same time permitting tamping of the ballast both under the edge flanges 11 and between the sides 7 and the end flanges 12 or 13 of the trough section. In this way I provide at each end of the tie directly under its body portion two downwardly extending flanges, one outside of the rail and the other inside of the rail, each one surrounded with the ballast which is properly tamped within the trough sections 6 and under the mid portion 15 of the main body, and which serve to hold the entire tie against creeping action. In order to support the tie body where it extends beyond the outer end flange 12 it will be seen that the flange is made of narrower width than the seat 8 and consequently leaves at each edge of said seat or recess a lip 8^a of sufficient width to give full support to the outer edges of the base flanges 4 of the beam 2. As thus constructed it is evident that while I obtain the full strength and stiffness of the flanged beam in the tie I am enabled to use a flanged beam of relatively light weight, as compared with those where the beam itself provides the main bearing surface for the support of the tie; and that by

the employment of the separate inverted trough sections riveted to this beam I am enabled to obtain a much greater support for the portions of the tie under the rails, the drawing illustrating for example a tie having its inverted trough portions as wide as 10½ inches, while the flanged beam itself is only illustrated as about 4 inches in width. The much greater bearing surface under the rails therefore acts to do away with any tendency to center binding of the track, while the weight of the tie is not increased materially over a large single I-beam or like section. The employment of this inverted trough section also provides for the holding of the ballast, the inclined inner faces 14 of the side flanges 7 forcing the ballast upwardly under the weight of the passing trains and compacting it so that a very firm support for the outer portions of the tie under the rails is obtained, and as this tie is tamped the material can be worked either under the lateral edges 11 or between the downwardly inclined side flanges 7 and the end lips or flanges 12 or 13. As a result of this the track can be easily leveled and maintained at a level because it provides for confining and thereby compacting the ballast under the main portions of the track, while through the downwardly extending end flanges of the trough section located practically at the end of the track and in position within the rails, a very firm holding against lateral creeping is obtained, though the base flanges of the main beam are fully supported out to the ends of the inverted trough section. The construction also lends itself very thoroughly to the employment of concrete filling under the inverted trough sections, making it practicable to introduce such filling at the ends of the said sections and in that way provide rigid pillars within the inverted troughs, giving support to the track and obtaining even a broader bearing on the ballast than could be obtained by said trough sections as the cement can flow outwardly within the ballast and fill the same below and beyond the trough sections, and also fully enveloping the end flanges 12 and 13 of the trough section and anchoring them in place.

In order to properly secure the rails to the upper flanges of the ties and hold the rails against lateral spreading by means other than the mere bolts binding the clips upon the base flanges 16 of the rails 17 I prefer to form in the top flanges 3 of the main beam 2 angular grooves or slots 18 just outside the rail when located at proper gage; and I provide the clips 19, as illustrated in the drawing, which have the down-turned lip portions 20 fitting into the grooves or slots 18 and so forming a secure means to hold against spreading of the track. To hold this clip 19 upon the rail and bring it to its seat upon the top flanges 3 of the main beam I prefer to employ one or more bolts 21 which, as shown, pass through the clip and the top flange of the main beam of the tie and are secured in that position in any suitable way. I prefer to form the bolt hole 22 in the clip 19 angular to receive like angular portions 23 of the bolt, and I prefer to employ the washer 24 fitting over the bolt below the top flanges 3 on the beam 2 and having an inclined upper face adapted to fit directly against the tapering under face of the flange 3 and form a proper bearing for the nut 25 so that it can be secured firmly to place. As the nuts are so located under the upper flanges of the main beam, and may be covered with ballast, it is important to positively hold them from turning, and for this purpose I form at the outer edge of the tapering washer 24 the locking lips 26 which can be turned down in line with the nut 25 and positively lock it. Two such lips are preferably formed on the washer as shown to accommodate the washer to any shape of nut and provide holding means if one lip be broken off. After the nut is screwed tightly to place, the lip can be turned down to lock it by a blow of a hammer.

In the use of this fastening device, after the rail has been seated on the tie and placed at the proper gage, the clip 19 is seated so that its depending lips 20 enter within the slots 18 of the top flanges and then through the bolt and nut construction above described the parts are firmly held together. The rail is thus held from any spreading action and the bolt relieved from much, if any, lateral strain, and while permitting the use of a flanged beam as the main element of the tie, makes it practicable to hold the rail from spreading by means other than the securing bolt. Like clips may be employed on the inner side of the rail.

What I claim is:

1. A metallic tie having its main element consisting of a flanged beam, and having inverted trough-shaped sections secured at each end thereof and extending on both sides of the rail, each such trough section being formed with sides extending outwardly and at a slight downward incline and having a more extended surface on the outer side of the rail than on the inner side thereof.

2. A metallic tie having its main element consisting of a flanged beam and having secured to the base flanges thereof at each end inverted trough-shaped sections with sides extending outwardly and at a slight downward incline close to the outer edges thereof and having upwardly curved outer edges.

3. A metallic tie having its main element consisting of a flanged beam and having secured to the base flanges thereof at each end inverted trough-shaped sections, said trough-shaped sections having the central portions thereof bent downwardly at each end to form depending lips.

4. A metallic tie having its main element consisting of a flanged beam and having secured to the base flanges thereof at each end inverted trough-shaped sections, said trough-shaped sections having the central portions thereof bent downwardly at the end to form depending lips, said depending lips being narrower than the width of the base flanges of the main beam and the trough sections thereby providing supporting lips extending beyond the depending flanges bent from its body.

5. A metallic tie formed of a flanged beam having its upper flanges of substantially the same width and of greater section than its lower flanges, and having sections secured to the under face of the lower flanges and supporting the same.

6. A metallic tie formed of a beam having base flanges and inverted trough-shaped end sections having a seat on the upper face thereof corresponding to the base flanges of the beam which is seated and secured therein.

7. A metallic tie having top flanges with slots or recesses formed therein outside the rails, in combination with a rail holding clip having downwardly extending lips fitting into the recesses in the edges of the beam, a bolt passing through the clip and tie flange and held from turning by the clip, and a tapering washer fitting between the inclined under face of the flange and the nut engaging with said bolt.

8. A metallic tie having top flanges with slots or recesses formed therein outside the rails, in combination with a rail holding clip having downwardly extending lips fitting into the recesses in the edges of the beam, a bolt passing through the clip and tie flange and held from turning by the clip, and a tapering washer fitting between the inclined under face of the flange and the nut engaging with said bolt, said tapering washer having locking lips formed thereon and adapted to be bent against the nut.

9. In combination with a beam having tapering under faces, and a bolt and nut connection therewith, a washer having a tapering body corresponding to that of the beam, and locking lips formed thereon and adapted to be bent against the nut.

In testimony whereof, I the said WILLIAM GOLDIE have hereunto set my hand.

WILLIAM GOLDIE.

Witnesses:

ROBERT C. TOTTEN,

J. R. KELLER.