No. 889,456. PATENTED JUNE 2, 1908.

W. GOLDIE.

METALLIC TIE.

APPLICATION FILED NOV. 12, 1906.

2 SHEETS—SHEET 1.

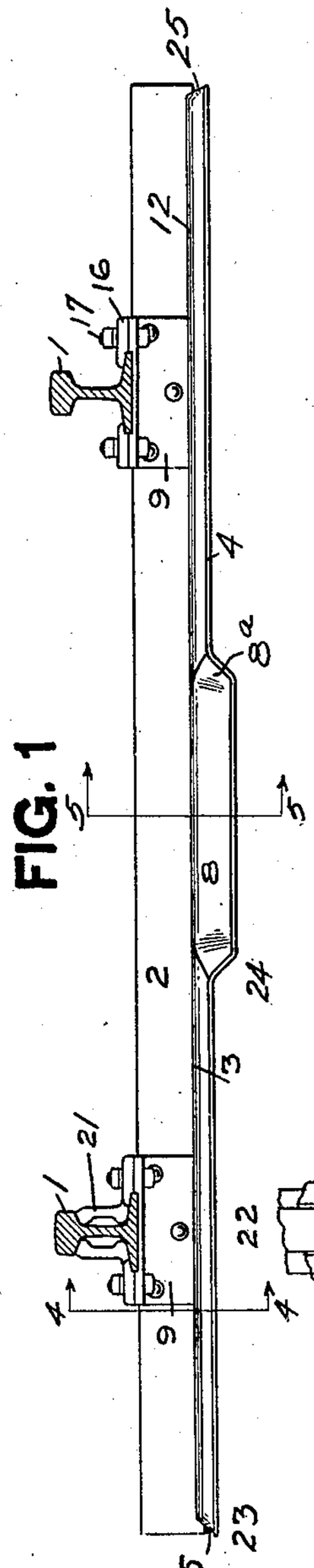

FIG. 1

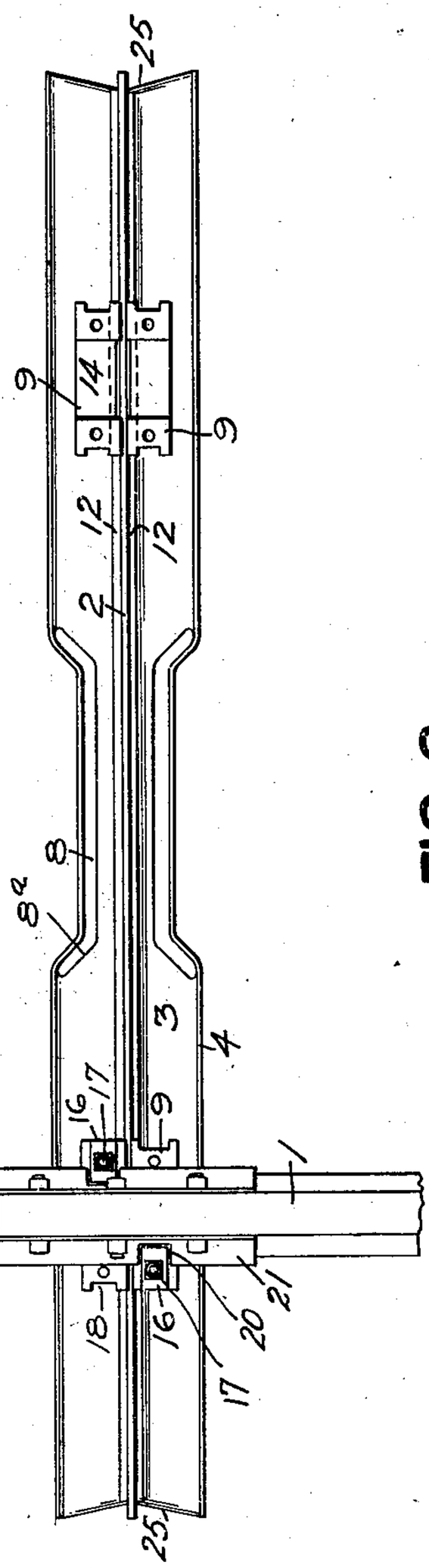

FIG. 2

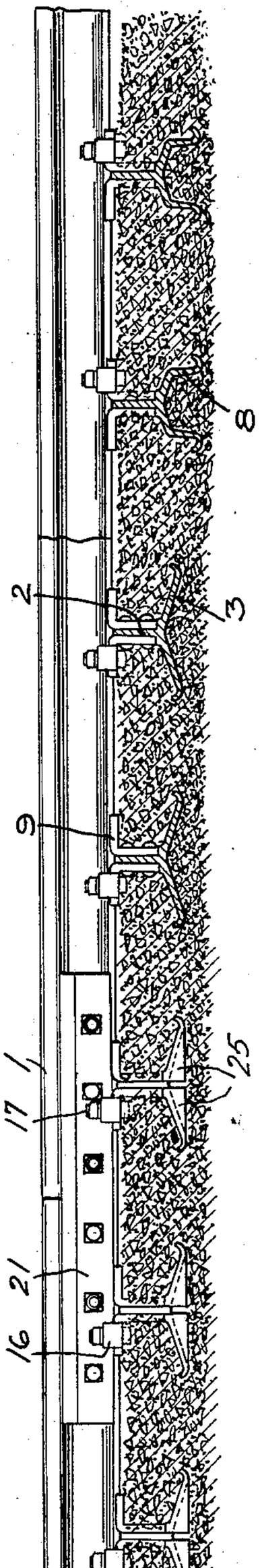

FIG. 3

WITNESSES.

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2 SHEETS—SHEET 2.

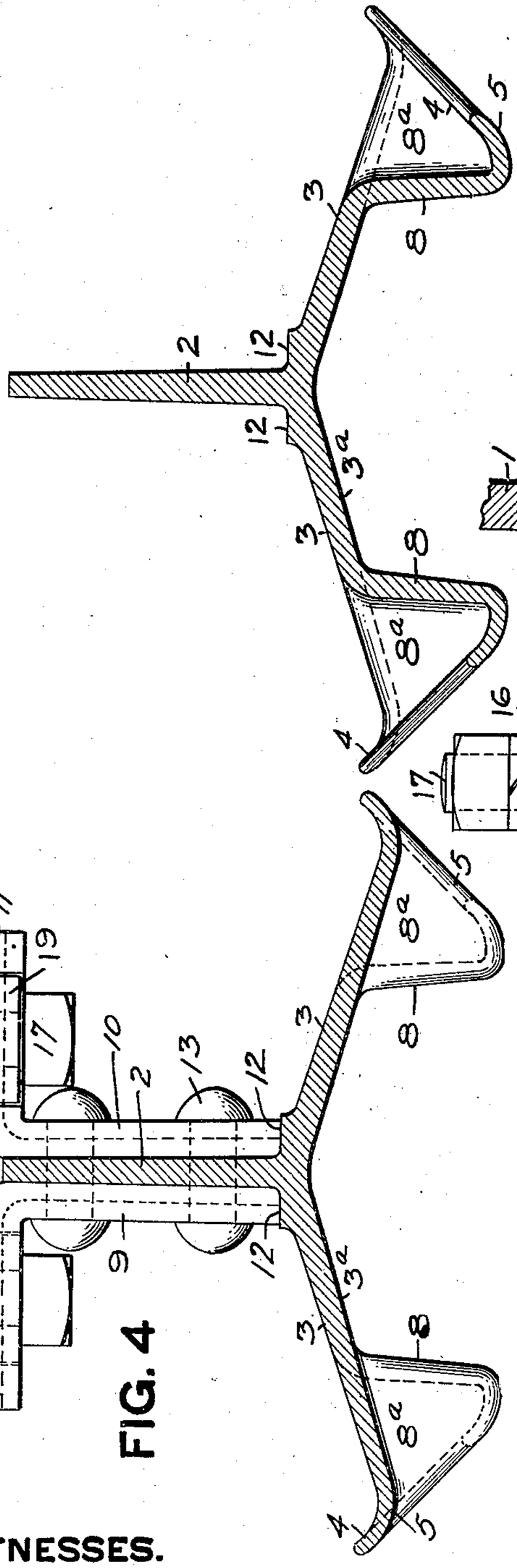

FIG. 5

FIG. 4

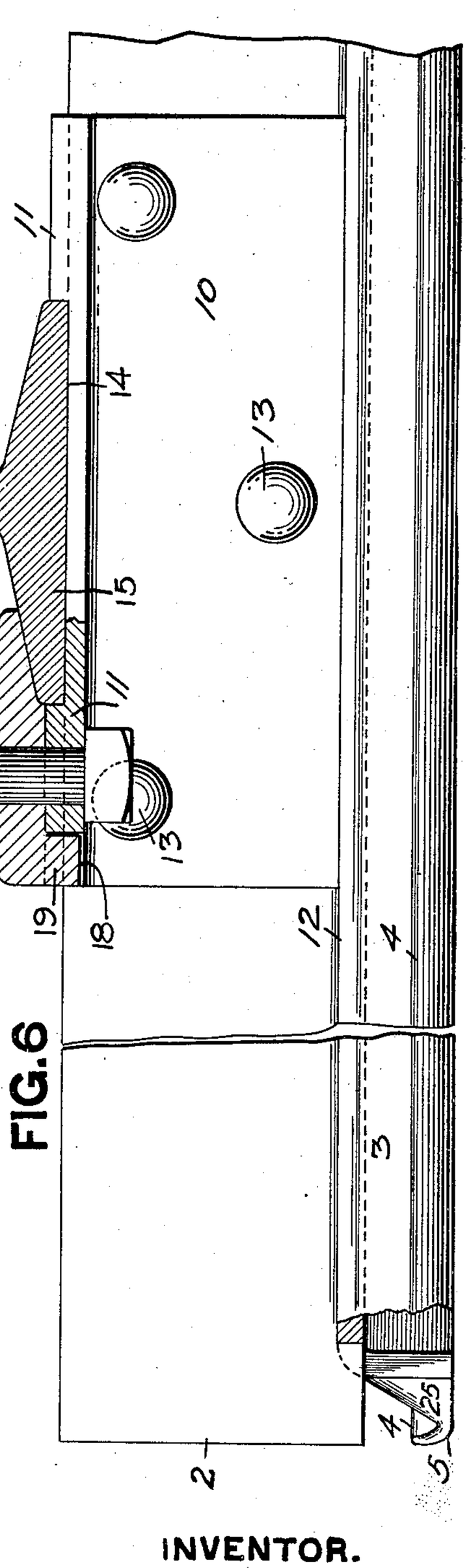

FIG. 6

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WILLIAM GOLDIE, OF WILKINSBURG, PENNSYLVANIA.

METALLIC TIE.

No. 889,456. Specification of Letters Patent. Patented June 2, 1908.

Application filed November 12, 1906. Serial No. 343,067.

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 railroad ties, its object being to provide a metallic tie adapted to sustain the rails and at the same time one which will have stiffness of body between the rails, and provide some resiliency between the rails and the ballast while it is adapted to hold the ballast and prevent it from working out from underneath the tie, and also provides easy means of tamping, and holds against longitudinal creeping of the ties in the ballast.

It consists, generally stated, in a metallic tie having a vertical portion and having outwardly extending base flanges set at a slight downward incline to a line close to the outer edges of the tie and having beyond the same upwardly curved outer edges to direct the ballast under the tie in tamping; these base flanges being preferably arranged under and on each side of the rails, leaving a narrow central portion to the tie and the trough sections formed by these base flanges outside of the rails being longer than the portions thereof between the rails. It also consists in other improvements as 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 or plan view thereof; Fig. 3 is a side view of a portion of the track illustrating the invention, the same being partly broken away; Fig. 4 is a section through the line 4—4 Fig. 1; Fig. 5 is a section through the line 5—5 Fig. 1; and Fig. 6 is an enlarged detail section showing the method of holding the clip from turning and thereby preventing creeping of the rails.

The rail 1 illustrated in the drawing is of the ordinary section and does not require detailed description. The metallic tie embodying my invention has the vertical web portion 2 and the outwardly and downwardly extending base flanges 3, the tie therefore having the form of an inverted **T**, the laterally extending portions of which extend downwardly and outwardly for the greater width thereof as illustrated. This section can be easily rolled and the wide base flanges obtained, it being preferred that the base of the tie shall extend for ten inches or more in width so as to obtain a very wide bearing upon the ballast. It will also be noticed that while the base flanges are set at a downward incline extending close to the outer edges they have the upwardly curved outer edge portions 4 which are joined to the main portions of the base flanges by the base curves 5, and as shown these base flanges are made gradually tapering, this being desirable for rolling while at the same time on account of their construction the desired resiliency in the tie upon the ballast is obtained, and the ballast being confined by the downwardly and outwardly extending base flanges is prevented from spreading and working out from under the tie, but on the contrary, will naturally work up the inclined bottom faces 3^a thereof, finally bringing the track to a firm bed. At the same time the outwardly curved edge portions 4 provide means for easy tamping, as they give inclines to direct the ballast under the flanges so as to pass beyond the lowest points or curves 5 of the flanges between which it will be gripped by the faces 3^a and confined under the tie. Any sand or grit arising from the grinding of the ballast on the under face of the tie will also be confined in the same manner and prevented from escaping from under the same. Furthermore, these ties can be set close to each other on the bed, on account of the inverted **T**-form thereof, it only being necessary that there shall be a few inches between the outer edges of the base flanges of the adjacent ties, because free space for swinging the tools in tamping is provided on account of the **T**-section employed, while the upwardly curved outer edges of the base flanges enable the tamper to work the ballast easily under the tie.

In the mid-portion of the tie I bend down the base flanges to form the central girder portions 8, such girder portions having approximately vertical walls, and being joined to the main portions of the base flanges by the shoulder portions 8^a. The central girder portions serve to stiffen the body of the tie where it is subjected to greatest strain in case of center binding of the tie on the ballast, and also by reducing the width of the bearing of the tie upon the ballast in the mid-portion as compared with the width of bearing in the outer portions of the base flanges upon the ballast, overcomes the liability to center binding of the tie upon the ballast, the

girder portions on account of their substantially vertical position also naturally working down into the body of the ballast and overcoming liability to center binding.

To provide for support of the rails upon the ties at suitable spaces apart I provide the rail supports 9 which are formed of angle pieces having vertical portions 10 and horizontal portions 11. These rail supports are riveted to the web portion 2 of the tie and it will be noticed that in the rolling of the tie I provide the horizontal shoulders 12 directly under the rail supports, the body of the base flanges being carried out on a horizontal line to form such shoulders and then tapered down and carried on an incline. By this construction a positive support at the base of the vertical portions 10 of the rail supports is obtained, and great load upon the rivets 13 is overcome. These rail supports have the depressed seats 14 formed in their upper face corresponding in width to the base flanges 15 of the rails, and so providing for holding the track to perfect width of gage, the rail being seated in the recesses and all liability to rail spreading being overcome. The rail supports can be made cheaply by rolling a bar bearing the depressed seat on one face and shearing and bending to shape. The rails are held to the rail supports by means of suitable clips 16 which are held by bolts 17 passing through the clips and the horizontal portions 11 of the rail supports. Where it is desired to anchor the rails and keep them from longitudinal creeping I prefer to form in the outer face of the horizontal portions 11 of the rail supports the notches 18 and to provide the clips at their outer ends with downwardly extending lips 19 fitting into said notches, so that the clips are held from turning both by said lips 19 and the bolts passing through the clips and rail supports. The inner edges of the clips can be made to extend either into slots 20 formed therefor in the edges of the angle bars 21 connecting the rails, or else may contact with the ends of said angle bars and hold the same from creeping and thereby hold the rails from any creeping action.

The tie is made of such length that the distance between the center line of the rail supports, such as at the point 22 and the end 23 of the tie is greater than the distance between the said center line 21 of the rail support and the depressed portion 24. This gives a greater support upon the ballast for the portion of the tie outside of the rail than the portion inside. In this way I am enabled to obtain a much more extended surface bearing of the ties upon the ballast and to obtain a greater surface bearing beyond the rails than between the same, so overcoming any tendency to center binding while providing a very stiff tie, which is stiffened in the center portion by the reduced or girder portions which at the same time act to work down into the ballast and prevent center binding of the tie thereon.

In the laying of the track the ties embodying the invention can be assembled and connected to the rails either by seating each tie in the ballast and securing the rails thereto, or by connecting certain ties to the rails at considerable intervals apart supporting these rails and ties above the bed, and then passing the ties under and bolting them to the rails, and finally lowering the track upon the ballast, the ballast having been distributed properly under downwardly extending base flanges of the ties and cleared away if necessary for the reception of the central girder portions thereof. The track can then be properly tamped and leveled and the ballast filled in between the ties. It is preferable to fill the ballast on both sides of the web portions of the tie, the ballast in this way extending under the base flanges to give support thereto and hold the ties in place. As the skeleton form of the tie and the inverted T-shape thereof give space for the swinging of the ballasting tools, the ties can be set much closer to each other than the ordinary wooden railroad ties, and tamping is made easy through the upwardly curved outer edge portions of the base flanges. In the laying of the track while the ballast may be filled around the vertical girder portions it is not packed particularly hard around the same and the greater depth of such girder portions renders it more difficult to tamp under the same, so that center binding of the track as ordinarily laid is prevented, and in the use of the track the substantially vertical walls of such girder portions will work down into the ballast much more easily than the outwardly spreading main portions of the base flanges which give great bearing surface on the ballast and so provide a broad support for the tie thereon.

In sustaining the weight brought upon the track by the passing trains the base flanges are somewhat resilient, and they have a slight yielding motion under the passing load until they are positively packed down to their seat in the ballast, in this resembling the action of the ordinary wooden ties, while at the same time on account of the downward and outwardly extending points of the flanges they grip and hold the ballast which is gradually worked up and packed under the same, liability of the working out of the ballast under the tie being prevented. The shoulders 8^a formed at the ends of the girder portions prevent creeping of the ties in the ballast, the ballast holding against the inner and outer faces of these shoulders, and so preventing such creeping. To aid in preventing creeping action the base flanges themselves are bent down at the ends of the ties as at 25, being brought down to about the level of the

lowest points of the base flanges. This also prevents the working out of the ballast at the ends of the ties and the escape of the dust caused by the grinding of the metallic ties on the stone or like ballast which is collected and confined by the outwardly and downwardly extending base flanges, and such outer lips 25. In carrying the load as above stated, the extension of the tie bodies beyond the rails or rail supports gives great surface and direct support to the rails from passing trains, which support is greater outside of the rails than between them and the inner central girder portion. By so providing broad bearing surface for the outer portions of the ties and diminishing the bearing surface in the mid-portion thereof, and stiffening the mid-portion by the central girder portion, a very solid track is obtained which is sustained against bending action between the ties, and while the central girder portions seat themselves in the ballast without causing center binding and the shoulders of such girder portions prevent creeping of the ties.

The rails are sustained against outward movement or strain by fitting within the depressed seats 14 of the rail supports so that while saving metal in the tie body itself by dispensing with continuous top flanges I am enabled to provide broad faced supports and positive shoulders on the ties for sustaining the same and resisting spreading action. I am also enabled by the engagement of the clips with the rail supports to prevent longitudinal creeping of the track itself, by preventing the turning of the clips and through their engagement with the angle bars of the rails.

What I claim is:

1. A metallic tie having a vertical web portion and outwardly extending base flanges set at a slight downward incline and having a downwardly extending central girder portion bent therein.

2. A metallic tie having a vertical portion provided with base flanges extending outwardly and at a slight downward incline to a line close to the outer edges thereof, and having beyond said line upwardly curved outer edges to aid in tamping, and having the central portion of the tie narrower than the base flanges.

3. A metallic tie formed of a vertical web portion and downwardly and outwardly projecting base flanges forming trough sections extending under and on each side of the rails, the central portion of the tie between said trough sections being narrower than the trough sections and the portions of the trough sections outside of the rails being longer than the portions of the trough sections between the rails.

4. A metallic tie formed of a vertical web and outwardly extending base flanges set at a slight downward incline and having central girder portions bent downwardly therein, the distance between the ends of the ties and the central point of the rail supports thereon being greater than the distance between the central points of the rail supports and the central girder portion.

5. A metallic tie formed of an inverted T-bar and rail supports riveted to the web portion thereof and having depressed seats to receive the rail base.

6. A metallic tie formed of an inverted T-bar, and rail supports riveted to the vertical web thereof and having horizontal extensions provided with depressed seats to receive the rail base.

7. A metallic tie having a vertical web portion and outwardly extending base flanges, said flanges having horizontal seats at the base of the web portion and extending out thence at a slight downward incline, and rail supports resting on the horizontal shoulders of the base flanges and secured to the web portion of the tie.

8. A metallic tie formed of an inverted T-bar and rail supports secured thereto, having horizontal portions extending out, such horizontal portions having notches in their outer edges, and rail clips having downwardly extending lips fitting in said notches and extending over the rail base and bolted to the rail supports.

9. The combination of rails connected by angle bars, a metallic tie formed of an inverted T-bar having rail supports bolted to the web portion thereof and provided with horizontal extensions having angular faces and clips having downwardly extending flanges fitting to said angular faces and extending over the rail base and engaging with the angle bar thereof.

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

WILLIAM GOLDIE.

Witnesses:
ROBERT C. TOTTEN,
J. R. KELLER.