No. 692,372. Patented Feb. 4, 1902.

L. T. SHEFFIELD, Dec'd.

M. J. SHEFFIELD, Executrix.

METALLIC RAILWAY TIE.

(Application filed May 17, 1901.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

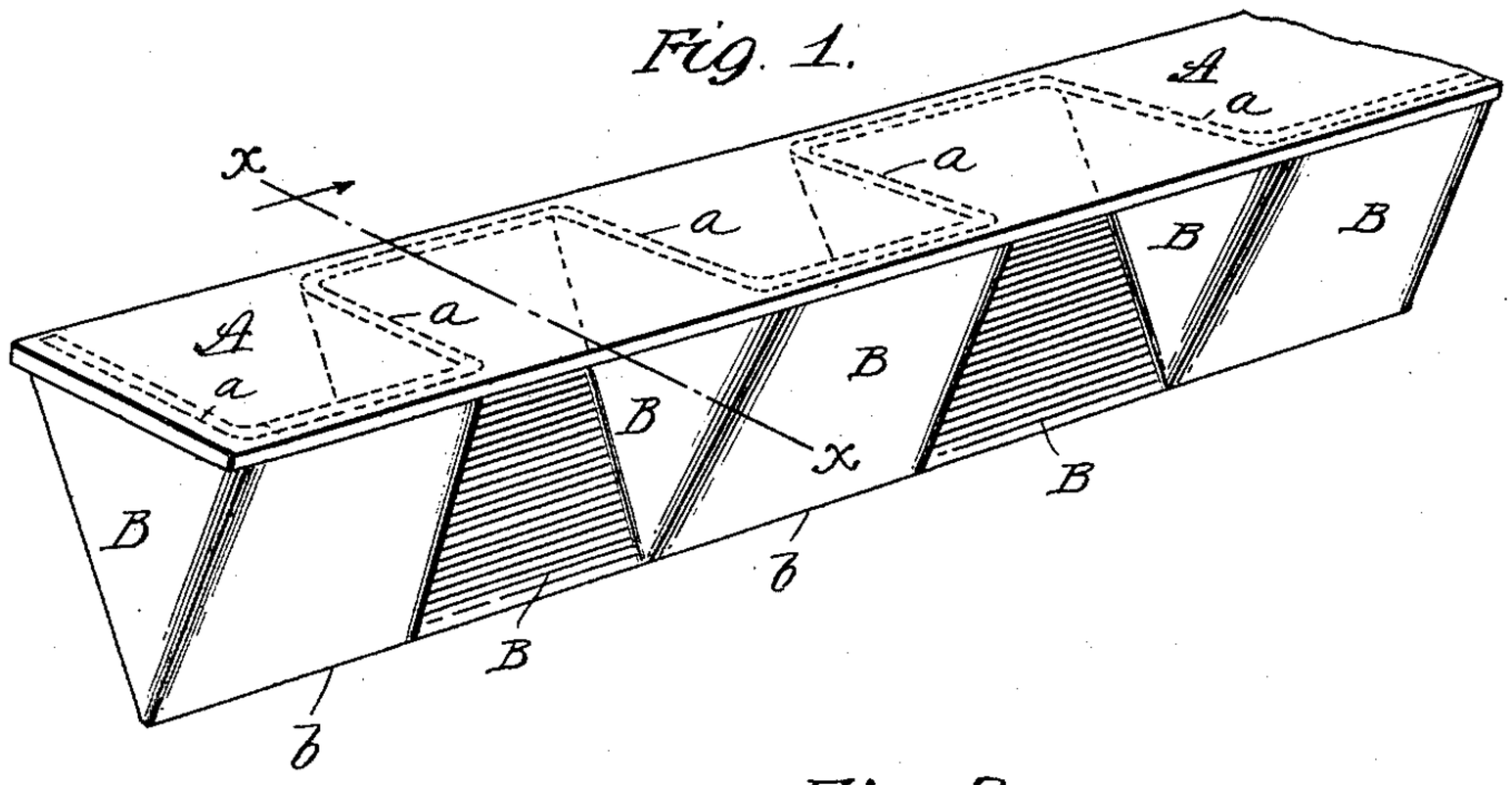

Fig. 2.

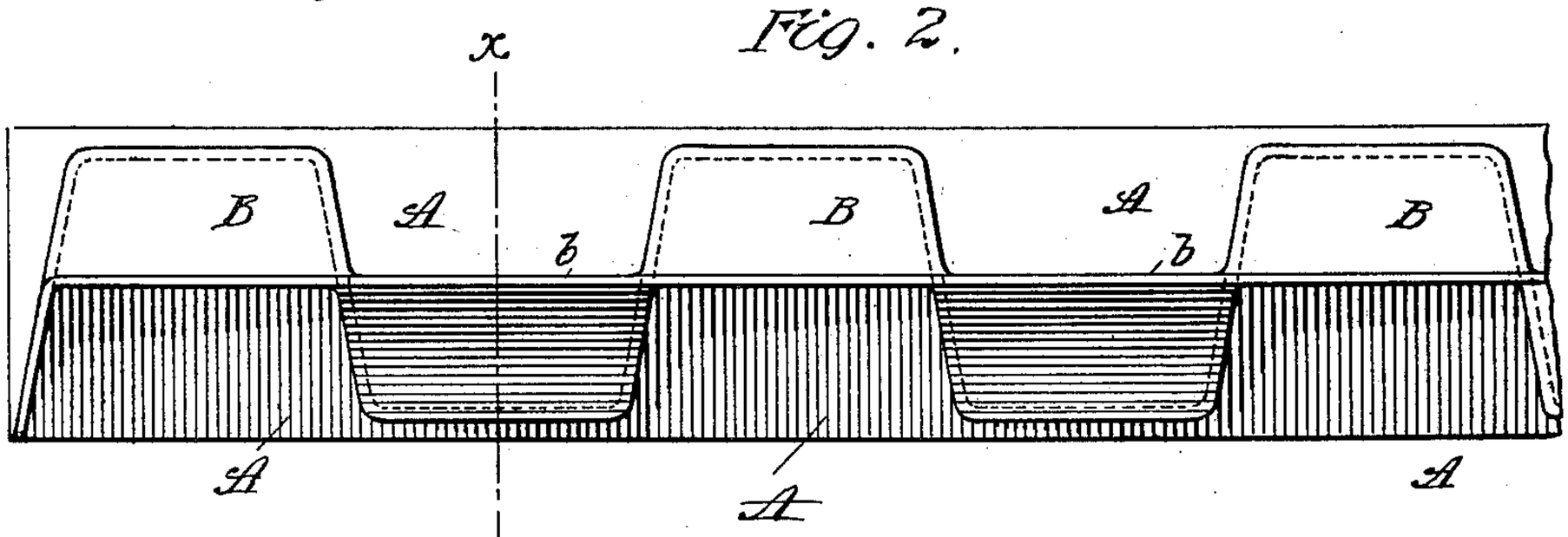

Fig. 3

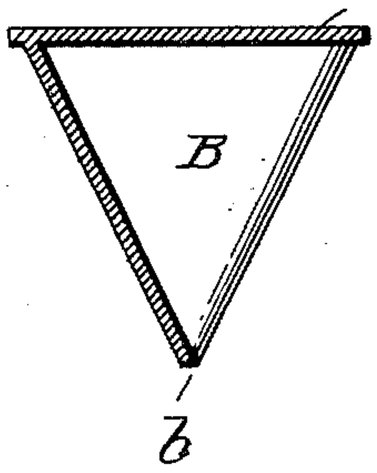

Fig. 4.

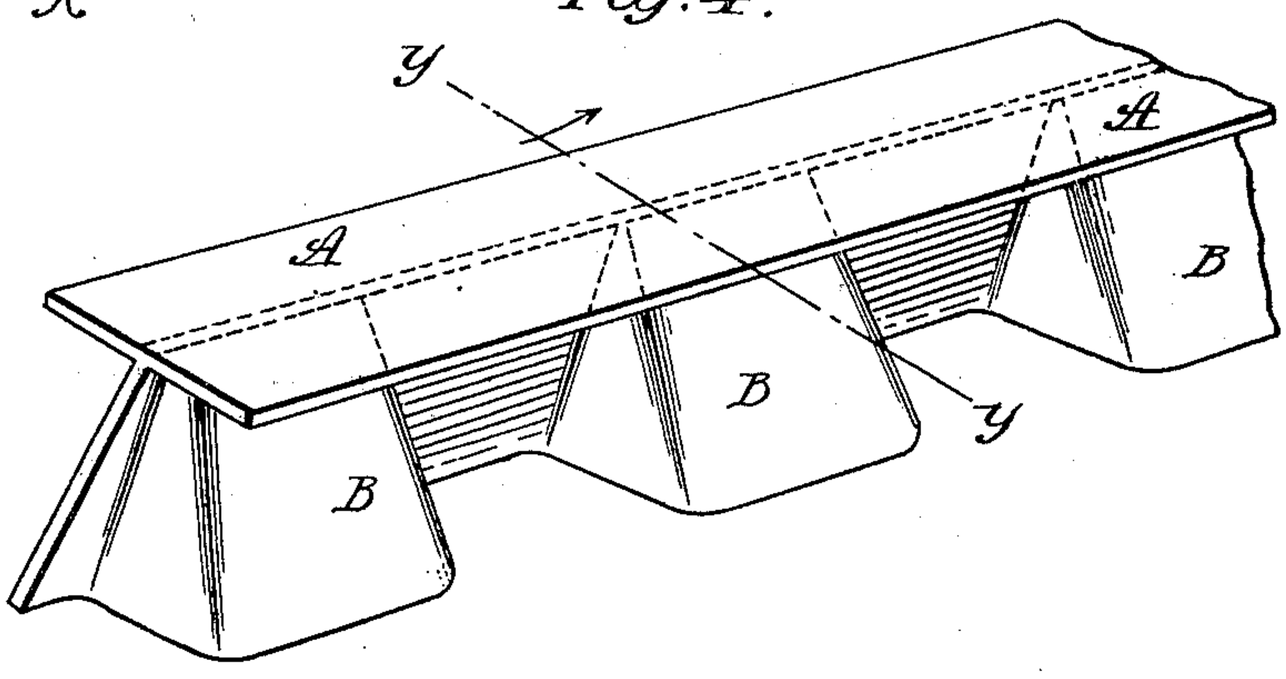

Fig. 5.

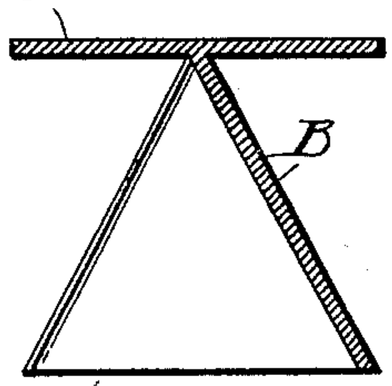

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Fig. 6.

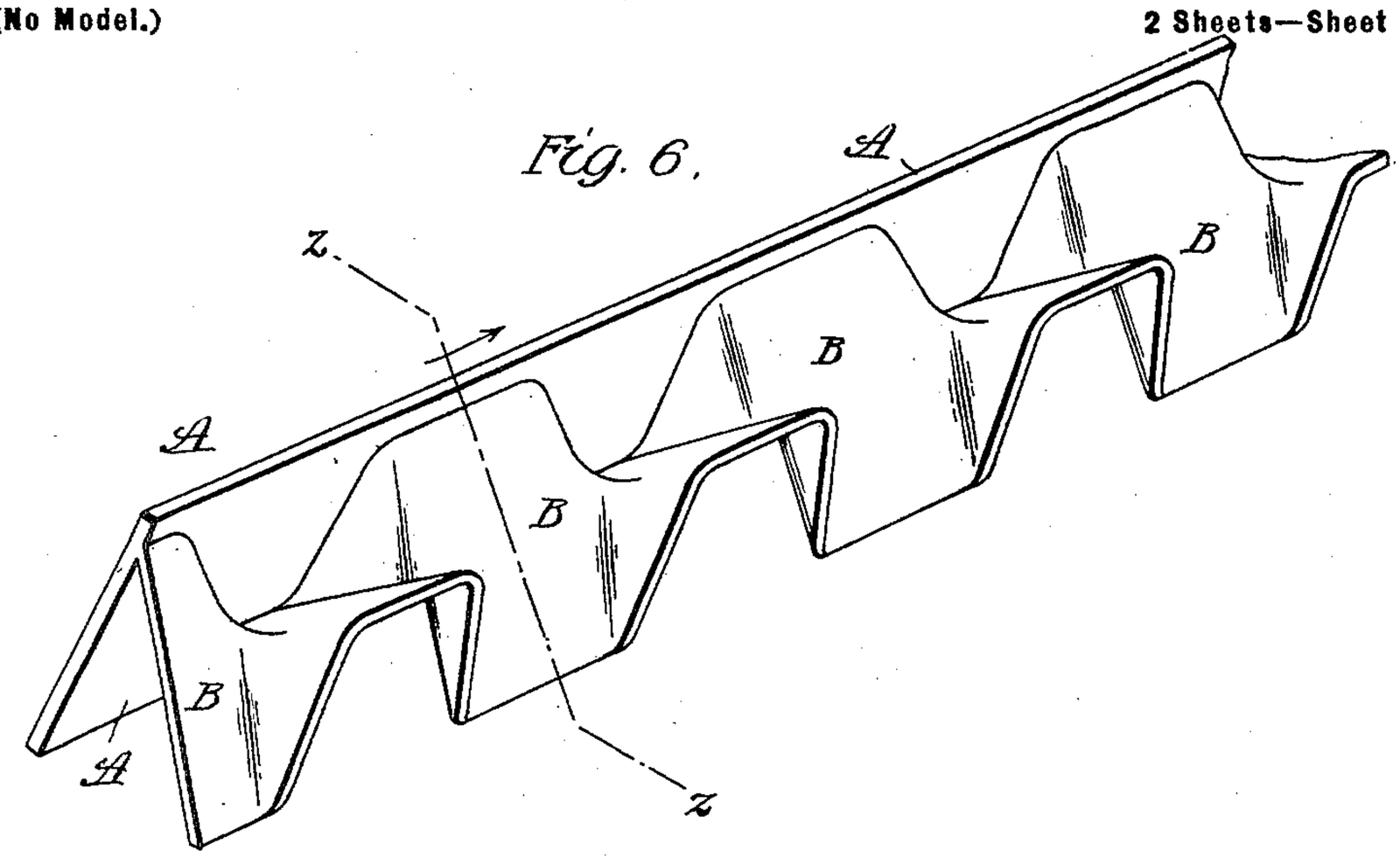


Fig. 7.

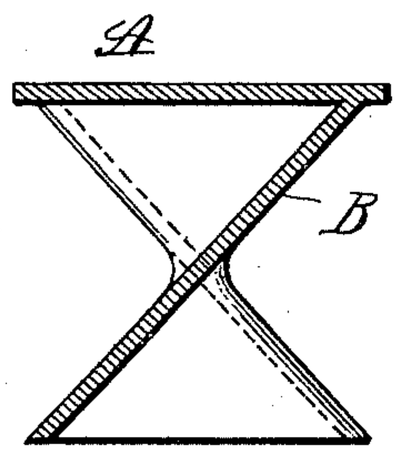


Fig. 8.

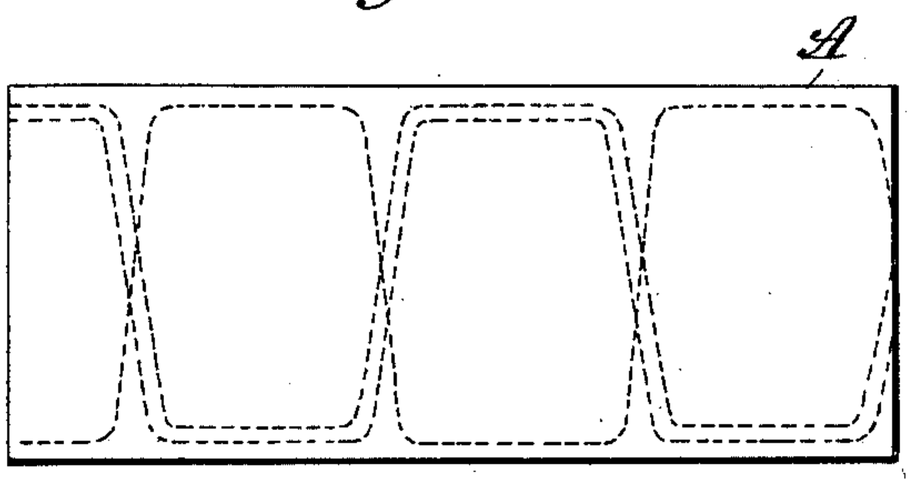
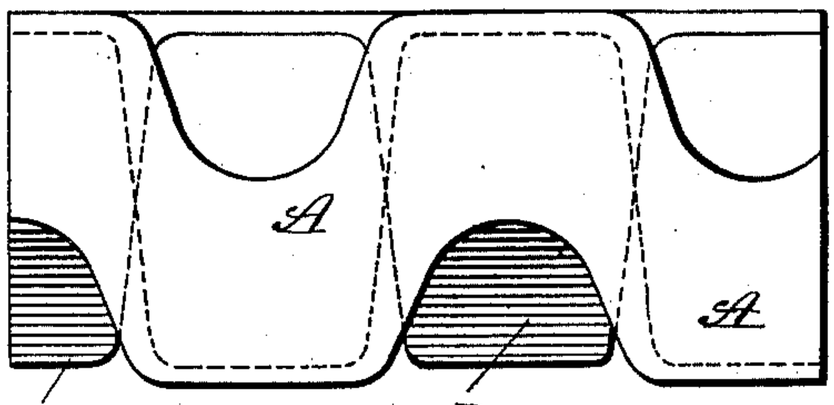


Fig. 9.



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METALLIC RAILWAY-TIE.

SPECIFICATION forming part of Letters Patent No. 692,372, dated February 4, 1902.

Application filed May 17, 1901. Serial No. 60,679. (No model.)

To all whom it may concern:

Be it known that I, LUCIUS T. SHEFFIELD, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have made certain new and useful Improvements in Metallic Railway-Ties, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of a part of a tie embodying the principle of and one form of my improvement. Fig. 2 is a bottom view of Fig. 1. Fig. 3 is a transverse sectional view of Figs. 1 and 2, taken on the line *x x* and looking in the direction of the arrow. Fig. 4 is a perspective view of a portion of a tie embodying another arrangement of my improvement for securing the same result. Fig. 5 is a transverse section of Fig. 4, taken on the line *y y* and looking in the direction of the arrow shown in Fig. 4. Fig. 6 is a like view of another modification or arrangement of my improvement adapted to secure the operation of the principle involved, the portion of the tie shown being in this instance set at an angle in order to disclose more effectively the arrangement and contours of the depending web or flange. Fig. 7 is a transverse section of Fig. 4, taken on the line *z z* looking in the direction of the arrow shown in Fig. 6. Fig. 8 is a top view of a portion of the same tie shown in Figs. 6 and 7, the double dotted lines indicating the location of the origin of the depending flange or web relative to the rail-bearing member and the single dotted lines the corresponding location of the bottom edge or lip thereof. Fig. 9 is a top view of a still further modification, showing a variation in the form of the rail-bearing member as applied to the same style of web or flange shown in Figs. 6 to 8.

My invention relates to railway-ties constructed of metal—as, for instance, preferably steel—adapted to be used as a substitute for the wooden ties now generally employed.

Hitherto devised metallic ties have proved objectionable, because, among other reasons, of their lack of stability in the road-bed or ballast. The hardness and smoothness of the metallic surface and its insufficient extent prevent the requisite frictional engagement between such metallic ties and the ballast or road-bed, which is secured in the case of timber ties by tamping and packing the ballast tightly against their comparatively soft impressionable and more extended surfaces. Former constructions of metallic ties have accordingly proved undesirably liable to move or slip in the road-bed after their alinement and leveling in the required position relative thereto and have thus failed to afford the requisite stability of bearing for the rails. Moreover, previous metallic devices for the purposes in hand have proved ill adapted to leveling and alinement by the present methods of tamping generally applied in the case of ties consisting of timber. Previous designs for metallic ties have also proved objectionable, because requiring in their construction an excessive use of metal and in embodying forms difficult, if not impossible, to be worked out economically. Previous attempts at metallic railroad-ties have also proved failures, because the shape and construction of such ties were such as to render it impossible to apply to the tie a sufficient mass or weight of ballast to insure the loading down of the tie thereby to such an extent as to prevent it from rising or springing upward vertically out of the road-bed under strains developed by the passage of rolling-stock.

The object of my invention therefore is to provide a metallic tie possessing such peculiarities of shape and construction as to insure its ready and economical manufacture from the point of view of material and machinery and particularly its stability in the road-bed and its being readily and permanently placed and maintained in the required position by the use of substantially the same methods as are at present employed in the case of ties composed of wood. I attain these objects by constructing my metallic ties in the way and so as to embody the novelties and configuration which I will now describe.

My improved ties may, broadly speaking, be described as consisting, essentially, of two parts or members, preferably integral, the one a rail-bearing member presenting horizontal surfaces at at least those points required in order to support the bottoms of the

rails and such fastening devices as may be employed, the other a ballast-engaging web or flange member B, angularly and obliquely disposed in its relation to the aforesaid rail-bearing member and possessing the special novel characteristics which I will now describe. The web or flange member is disposed centrally and longitudinally of the rail-bearing member and consists, essentially, of a preferably-continuous sheet of metal contorted in such fashion as to present along one of its longitudinally-disposed edges a sinuous or serpentine line and along its oppositely-disposed longitudinal edge a substantially straight line, as shown in the drawings, where, for instance, in Fig. 1, the double-dotted lines *a a* show the disposition of the superior longitudinal edge of the web or flange at its juncture with the rail-bearing member of my tie and the line *b b* indicates the shape and direction of the inferior longitudinal edge of such web or flange. The result of this construction is, as appears by the drawings, to produce a series of pockets transversely arranged relative to the tie and opening alternately in opposite directions, the walls of said pockets presenting metallic surfaces arranged at a plurality of angles, so as to directly oppose after being filled with ballast or earth movement of the tie in any conceivable direction, the retaining effect of the surfaces of the pockets opening toward one side of the central longitudinal axis of the tie being balanced by the similar effect of the similar reverse surfaces of the alternating oppositely-disposed pockets opening toward the opposite side of said axis and the equipoise of the tie being thus maintained by reason of the disposition of said flange member centrally and longitudinally relatively to the rail-bearing member. My tie when thus located in the required position relative to the road-bed and the rail may be tamped or packed with ballast or other filling in the manner usually employed with wooden ties and will remain firmly fixed and immovable as against any tendency to disturbance arising from the use of the railroad under normal conditions.

The arrangement of my peculiar web or flange relative to the rail-bearing member of the tie may be varied in many ways, some of which are illustrated in the drawings; but it will be observed that in all these examples the aforesaid disposition of the flange member centrally of the rail-bearing member is carefully retained. For instance, Fig. 1 shows my improved flange member so related to the rail-bearing member as to connect with the latter along the aforesaid sinuous or serpentine longitudinal edge thereof, the substantially straight edge of the flange constituting in this instance the inferior or bottom edge of the tie. In Fig. 4 this arrangement has been reversed, and the substantially straight edge of my flange or web has been combined with the rail-bearing member, while the opposite sinuous or serpentinely-disposed edge in this instance constitutes the inferior or bottom edge of my improved tie.

Fig. 6 illustrates a still further carrying out of the principle involved, presenting a form of my flange or web in which the aforesaid contortion of the sheet metal has been duplicated inversely—that is to say, the origin of the flange or web at its line of junction with the rail-bearing member of my tie is sinuously or serpentinely disposed, as shown in Fig. 1. From its line of origin the contortions of the flange are carried out, as further illustrated in Fig. 1, until the surfaces angularly-disposed toward each other are brought to a common substantially straight line of merger, lying in a plane substantially parallel to that of their aforesaid origin, and starting from this line of merger the surfaces again expand at divergent angles, so as to present throughout the inferior or lower half of the web or flange substantially the same arrangement of angles and surfaces relative to each other and to the rail-bearing member as is embodied in the form illustrated in Fig. 4. By the embodiment of my invention thus illustrated in Fig. 6 the resistance of my tie to forces tending to move it out of the normal and required position in the road-bed is duplicated, though for all ordinary uses and purposes the forms shown in Figs. 1 and 4 are believed to be amply sufficient.

The shape of the superior or rail-bearing member of my said tie may be varied from that shown in Figs. 1, 4, and 6, in which it consists of a horizontally-disposed rectangular sheet of metal to such a form, for instance, as is illustrated in Fig. 9, in which for the purpose of economizing material and facilitating construction the said horizontally-disposed rail-bearing member is of sinuous or serpentine conformation following the shape of the line of attachment thereto of the superior terminal of the flange or web shown in Fig. 1.

The two aforesaid members of my improved tie may be separately constructed and united to each other in any convenient manner; but they are preferably made integral with each other out of one piece of material, as by pressing or rolling the same through the instrumentality of suitably-shaped dies, as will be readily understood.

I am aware that metallic railroad-ties have been heretofore described as consisting of a superior or rail-bearing member having a corrugated ballast-engaging flange or member depending therefrom; but the latter member in such ties has been vertically disposed relatively to the rail-bearing member, and the corrugations have been of such configuration as to present only partial resistance to the movement of the tie and only in directions transverse to the line of the rails. I am also aware that metallic railroad-ties have been heretofore described as consisting of a superior or rail-bearing member having depending therefrom throughout both of its longitu-

dinal edges an obliquely-disposed and an obliquely-corrugated ballast-engaging flange member; but in such cases, owing to the construction of the tie and its two flanges as aforesaid, it has been impossible to reach, for tamping and ballasting purposes, both sides of the aforesaid depending corrugated flanges and therefore impossible by means of the ballast or tamping to successfully lock the tie as an entirety against transverse lateral or upward vertical movement in the road-bed.

What I claim as new, and desire to secure by Letters Patent, is the following, viz:

1. A metallic tie comprising a horizontally-disposed rail-bearing member and, angularly disposed in relation thereto, a single centrally and longitudinally disposed and sinuously-distorted flange or web member, the surfaces of which are inclined obliquely to the rail-bearing surface and convergent from a sinuously-disposed origin toward a substantially straight line of termination, substantially as and for the purposes described.

2. A metallic tie comprising a horizontally-disposed rail-bearing member and disposed in relation thereto at oblique angles a single centrally and longitudinally disposed and sinuously or serpentinely distorted flange or web member, the surfaces of which are obliquely inclined relatively to the horizontal bearing-surface of the rail-bearing member and divergent from a straight line of origin toward a sinuously-disposed line of termination, substantially as and for the purposes described.

3. A metallic tie comprising a horizontally-disposed rail-bearing member and disposed in relation thereto at oblique angles a single centrally and longitudinally disposed and sinuously or serpentinely distorted flange or web member, the surfaces of which are obliquely inclined relatively to the horizontal bearing-surface of the rail-bearing member and convergent from a sinuously-disposed origin toward a substantially straight line of juncture or convergence and from such last-mentioned line of juncture or convergence divergent toward a correspondingly sinuously or serpentinely disposed line of termination, substantially as and for the purposes described.

LUCIUS T. SHEFFIELD.

Witnesses:
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WM. L. COLLINS.