No. 757,111. PATENTED APR. 12, 1904.

J. M. HANSEN.

METALLIC RAILWAY TIE.

APPLICATION FILED DEC. 9, 1903.

NO MODEL.

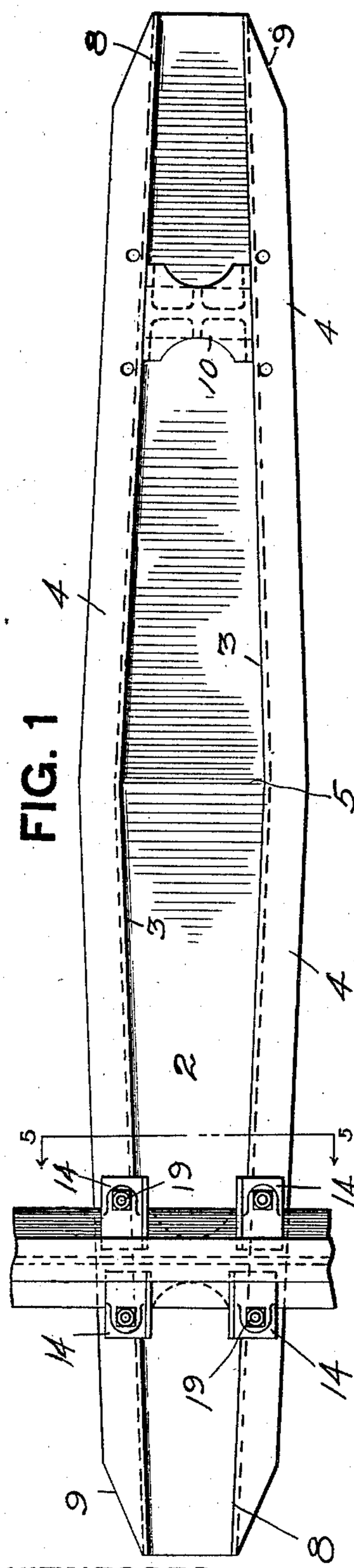

FIG. 1

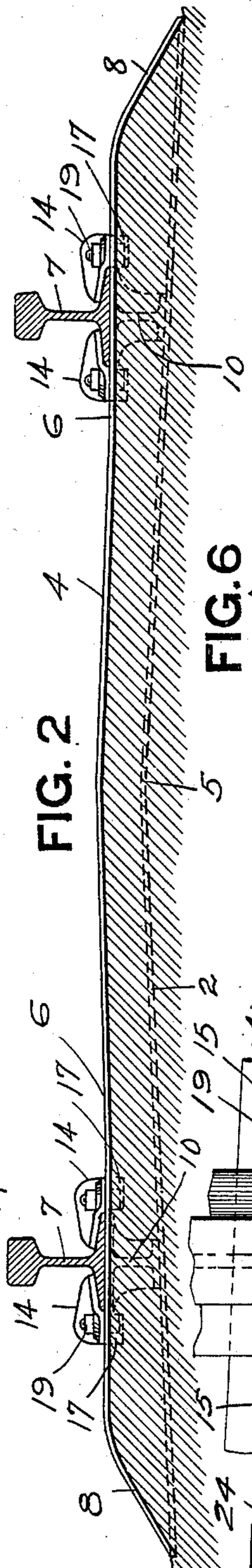

FIG. 2

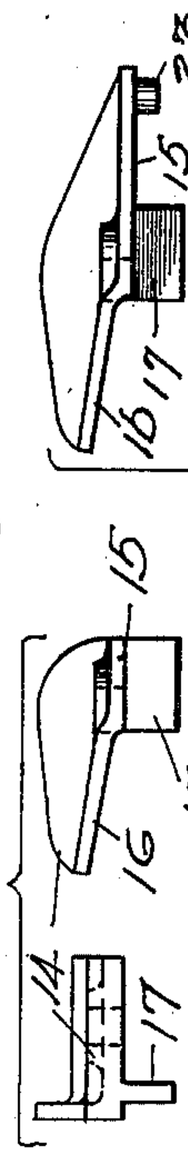

FIG. 6

FIG. 7

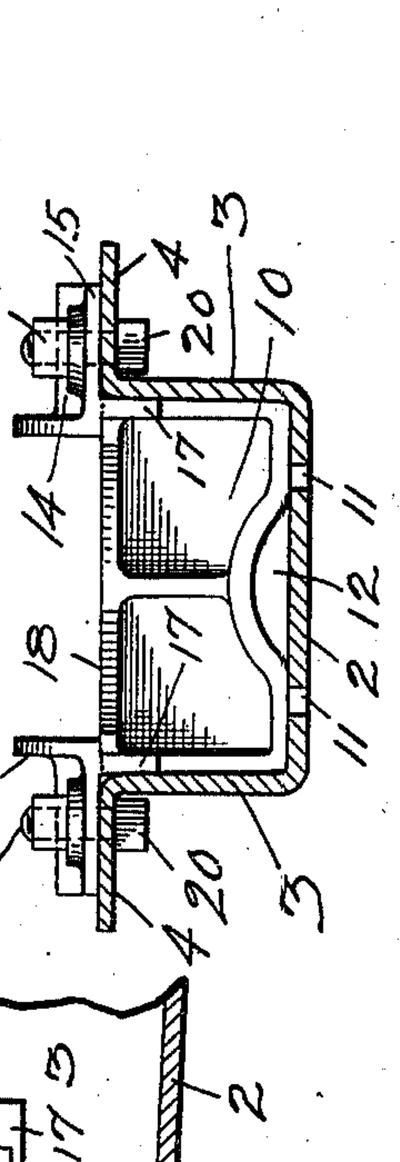

FIG. 5

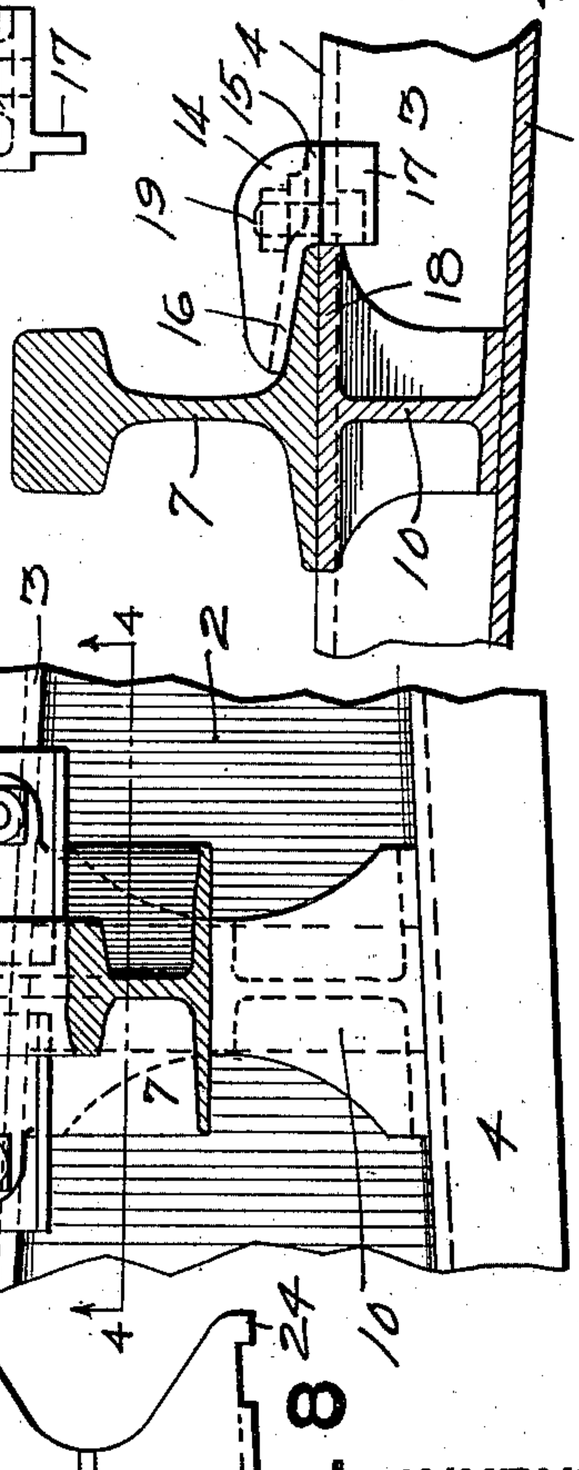

FIG. 4

FIG. 3

FIG. 8

WITNESSES.

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UNITED STATES PATENT OFFICE.

JOHN M. HANSEN, OF PITTSBURG, PENNSYLVANIA.

METALLIC RAILWAY-TIE.

SPECIFICATION forming part of Letters Patent No. 757,111, dated April 12, 1904.

Application filed December 9, 1903. Serial No. 184,493. (No model.)

To all whom it may concern:

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

My invention relates to railway cross-ties; and its object is to provide a metallic cross-tie which can be formed of plate metal without waste, which is strong, and which is so constructed that it will be self-draining, will resist movement in the ballast laterally of the road-bed, and which presents no difficulties in tamping the ballast thereunder.

In the accompanying drawings, Figure 1 is a plan view of my improved tie. Fig. 2 is a side view of the same. Fig. 3 is a plan view of an end portion thereof on an enlarged scale. Fig. 4 is a vertical section on the line 4 4, Fig. 3. Fig. 5 is a transverse section on the line 5 5, Fig. 1. Fig. 6 is a detail view of one of the rail-securing clips. Fig. 7 shows a modification of this clip, and Fig. 8 is a plan view showing a modification of the rail-supporting casting.

My improved tie is formed of plate metal bent into trough shape, having the bottom 2, substantially vertical sides 3, and outwardly-projecting flanges 4. Heretofore trough-shaped metallic ties have been designed; but in most cases these have been designed to be placed in inverted position. One difficulty with such ties is in tamping the ballast thereunder, it being difficult to work the ballast up into the inverted trough-body.

My tie, while of general trough shape, is designed to be placed in upright position—that is, with the bottom 2 resting on the ballast and the sides 3 projecting upwardly therefrom. In this manner no difficulties are offered to tamping, it being just as easy to work the ballast under the bottom 2 and flanges 4 thereof as it is to work the ballast under the ordinary wooden tie.

It will be evident that with an upright trough, such as shown, water will collect in said tie, which if allowed to remain will result in the rapid rusting and destruction of the tie. This has been a difficulty with some prior designs of trough-shaped metallic ties. In my design, however, I provide for draining the water, the trough being formed so that its bottom 2 slopes from its central portion 5 toward both ends, as indicated in Fig. 2. Any water, therefore, which falls into the tie will readily flow off. On curves and similar places where the ties are placed in an inclined position this inclination of the bottom of the trough is not necessary; but in all usual positions of the tie it is desirable. The flanges 4 of the tie also slope from the central portion of the tie down to about the point 6, Fig. 2, and are then horizontal to form a proper support for the base of the rail 7. Provision is also made for preventing movement of the tie in the ballast laterally of the road-bed, and to this end the tie is made of varying width, preferably being wider at its central portion and tapering thence toward both ends, as shown in Fig. 1. As a consequence movement of the tie laterally of the road-bed cannot occur without also moving a portion of the ballast in which said tie is embedded. As a further aid to prevent lateral movement of the tie the outer ends of the flanges 4 are bent downwardly, as indicated at 8. These downward-bent portions of the flanges project into the ballast and form practically end bearings against the ballast. Inasmuch as the ballast of tracks usually slopes or tapers down at both sides, it is desirable to have these bent-down portions 8 of the flanges formed on a gradual curve, as shown, so that the entire length of the downwardly-bent portion will bear against the ballast, which might not be the case if the flanges were bent down abruptly at the extreme end of the tie, as in that case the entire bent-down portions would not bear against the ballast if the latter tapered off quite abruptly.

The tie described can be formed from a plate of substantially uniform width, so that there is no waste, the plate merely being sheared off at the corners, as at 9, but otherwise being of the same width from end to end. This plate can be either bent or pressed, preferably the latter, into the shape shown, widest at its middle portion and narrowest at its ends. The metal which would be saved by narrow-

ing the ends is thrown into the side walls 3, thus making the tie deeper at its ends than at the middle and giving increased strength under the rail.

As a consequence the design is very economical, as it is possible to use quite light material and still secure sufficient strength, this being especially so as the weight transmitted through the rails is taken care of by a rail-supporting casting 10, which fits the inner contour of the trough and distributes the load uniformly over the entire cross-section of the tie. This casting is provided with a pair of dowels 11, fitting into holes punched in the bottom 2 of the trough, so that no rivets or other fastening means are necessary. The lower faces of these castings are grooved or cored, as shown at 12, to provide openings for the drainage of the water.

The rails are secured in place by means of four clips 14, secured to the flanges 4 of the trough. These clips are provided with horizontal portions 15, resting on the flanges of the trough, projecting portions 16, adapted to project over the flanges of the rail-base, and vertical portions 17, projecting down into the trough and bearing against the inside of the side walls 3 thereof. The top plate 18 of the casting 10 is extended at the corners, so as to bear against these downwardly-projecting portions 17 of the rail-clips. In this manner said clips hold the top of the rail-supporting castings in place.

The clips 14 are held in place by ordinary bolts 19, having square heads 20 and passing through the holes formed in the flanges 4 in such proximity to the side walls 3 of the trough that the latter will be in such proximity to the square heads 20 of the bolts as to prevent the latter from turning. This is of considerable value in facilitating the fastening of the rail-clips, as it requires no additional hand or tool to prevent the bolts from turning while turning the nuts to place. Furthermore, by this arrangement the side walls of the trough act as a bolt-lock, thus preventing the turning of the bolt, and it is only necessary to provide a suitable nut-lock to insure that the fastening means will not become loose. This bolt-lock, it will be observed, is obtained without any additional part being supplied and without adding to the cost of manufacturing the tie.

It will be observed that lateral movement of the rail is resisted by two clips and two bolts on each side of the rail. In some cases it may be desirable to relieve the bolts of the shear, and one way of doing this is by extending the horizontal portion 15 of the clip backward some distance, as shown in Fig. 7, and forming thereon a dowel 23, which in turn fits into a hole in the flange of the tie. By using such dowel the bolt will be put in tension only, and the extension of the horizontal portion 15 will even reduce this tension on the bolt to some extent, for the reason that the lever on which the bolt works will be considerably longer. In some cases also it might be desirable to extend the corners of the top plate 18 of the rail-supporting casting 10 so as to go around or interlock with the projections 17 of the rail-clips, as shown at 24, Fig. 8. By this means all four clips are compelled to work in unison, and if one of them should yield laterally all of the others would have to move with it, and consequently there is twice as much resistance against lateral displacement of the rails as without such extensions.

It will be understood that various modifications in the details of the tie described may be made without departing from the spirit of my invention and that all of the various features of the tie described need not be necessarily combined in a single structure.

What I claim is—

1. A metallic railway-tie comprising a plate bent or pressed into trough shape and having the bottom thereof sloping from the center toward both ends.

2. A metallic cross-tie comprising a plate bent or pressed into trough shape and having the bottom thereof sloping from the center toward both ends, said trough being provided with outwardly-projecting flanges at the upper edges of its sides.

3. A metallic railway-tie comprising a plate bent or pressed into trough shape and having the bottom thereof sloping from the center toward both ends and having outwardly-projecting flanges at the upper edges of its side, said flanges being curved downwardly at their ends.

4. A metallic railway-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly, said trough member being of varying width and having its bottom sloping from the center toward both ends.

5. A metallic railway-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly, said trough member being of varying width and having its bottom sloping from the center toward both ends and having outwardly-projecting flanges at the upper edges of its sides.

6. A metallic railroad-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly, said trough member being of varying width and having outwardly-projecting flanges at its upper edges, said flanges being curved downwardly at their ends.

7. A metallic railway-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly, said trough-shaped member having vertical sides and being of greatest width at its central portion and tapering thence toward both ends.

8. A metallic railway-tie comprising a trough-shaped member adapted to be placed

with its sides projecting upwardly and being of greatest width at its central portion and tapering thence toward both ends, said trough-shaped member having vertical sides and having outwardly-projecting flanges at the upper edges of sides.

9. A metallic railway-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly and being of greatest width at its central portion and tapering thence toward both ends and having outwardly-projecting flanges at the upper edges of its sides, said flanges being curved downwardly at their ends.

10. A metallic railway-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly and being of greatest width at its central portion and tapering thence toward both ends and having its bottom sloping from its central portion toward both ends.

11. A metallic railway-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly and having outwardly-projecting flanges at its upper edges, said trough-shaped member being of greatest width at its central portion and tapering toward both ends and having its bottom sloping from its central portion toward both ends.

12. A metallic railway-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly and having outwardly-projecting flanges on its upper edges, said trough-shaped member being of greatest width at its central portion and tapering toward both ends and having its bottom sloping from its central portion toward both ends, and said flanges being curved downwardly at their ends.

13. A metallic railway-tie comprising a plate of substantially uniform width bent or pressed into trough shape of greatest width and least depth at its central portion and decreasing in width and increasing in depth toward its ends.

14. A metallic cross-tie comprising a plate of substantially uniform width bent or pressed into trough shape with outwardly-projecting flanges at its edges and being of greatest width and least depth at its central portion and decreasing in width and increasing in depth toward its ends.

15. A metallic cross-tie comprising a plate of substantially uniform width bent or pressed into trough shape of greatest width and least depth at its central portion and decreasing in width and increasing in depth toward its ends, and being bent so that its bottom slopes from its central portion toward both ends.

16. A metallic railway-tie comprising a plate of substantially uniform width bent or pressed into trough shape and having outwardly-projecting flanges at its edges, said trough being of greatest width and least depth at its central portion and decreasing in width and increasing in depth toward its ends, and said flanges being curved downwardly at their ends.

17. A metallic railway-tie comprising a trough member adapted to be placed with its sides projecting upwardly and having outwardly-projecting flanges at the upper edges of its sides, the bottom of said trough sloping from its central portion toward the ends and the outwardly-projecting flanges being horizontal near its ends to form a seat for the rail.

18. A metallic railway-tie comprising a plate bent or pressed into trough shape and having the bottom thereof sloping from its central portion toward both ends, and rail-supporting members in said trough and having openings in their lower edges.

19. A metallic railway-tie comprising a trough-shaped member adapted to be placed with its sides projecting upwardly and having outwardly-projecting flanges at its upper edges, rail-securing clips, and bolts with non-circular heads passing through the flanges of said trough member and in close proximity to the side walls thereof whereby the latter act as bolt-locks.

20. A metallic railway-tie comprising a trough-shaped member placed with its sides projecting upwardly and having openings in its bottom, and rail-supports in said trough and provided with dowels projecting into the holes in the bottom of said trough.

21. A metallic railway-tie comprising a trough-shaped body placed with its sides projecting upwardly and having holes in its bottom, rail-supports in said trough and provided with dowels projecting into the holes in the bottom of the trough, and rail-securing clips secured to said trough and having portions bearing against the upper corners of the rail-support.

22. A metallic railway-tie comprising a trough-shaped member placed with its sides projecting upwardly, rail-securing clips secured to said trough, and a rail-support in said trough provided with extensions at its corners interlocking with said rail-securing clips.

23. A metallic railway-tie comprising a trough-shaped member having outwardly-projecting flanges on its upper edges, rail-clips secured to said flanges and having a horizontal portion projecting over the rail-base and vertical portions projecting down into the trough and bearing against the side walls thereof.

24. A metallic railway-tie comprising a trough-shaped member having outwardly-projecting flanges, a rail-clip secured to said outwardly-projecting flanges and having a horizontal portion adapted to project over the rail-base and having a rearwardly-projecting

portion resting on the trough-flanges and having a dowel projecting through a hole in said flanges.

25. A metallic railway-tie comprising a trough-shaped body provided with outwardly-projecting flanges, rail-securing clips secured to said flanges and provided with vertical portions projecting down into the trough and bearing against the side walls thereof, and rail-supports in said trough and having their corners bearing against the downwardly-projecting portions of the rail-clips.

In testimony whereof I, the said JOHN M. HANSEN, have hereunto set my hand.

JOHN M. HANSEN.

Witnesses:
ROBERT C. TOTTEN,
ROBT. D. TOTTEN.