

(No Model.)

R. E. DANIELS.
METAL RAILROAD TIE.

No. 482,997.

Patented Sept. 20, 1892.

Fig. 1

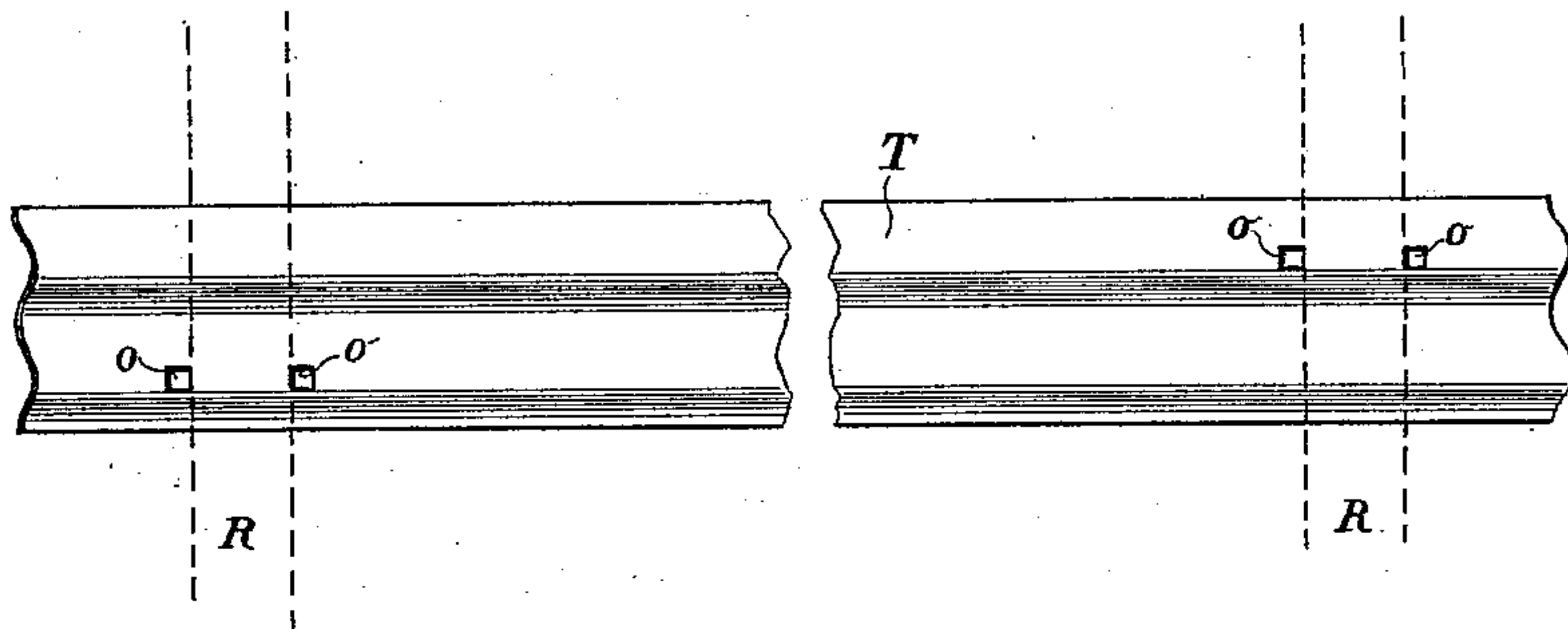


Fig. 2



Fig. 3

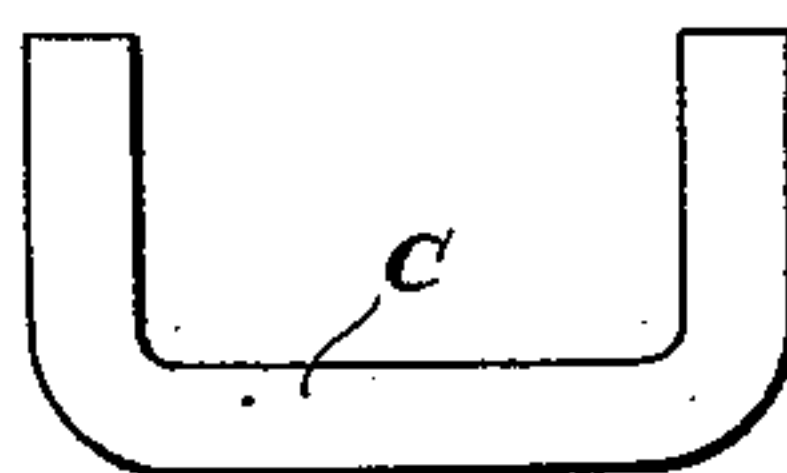
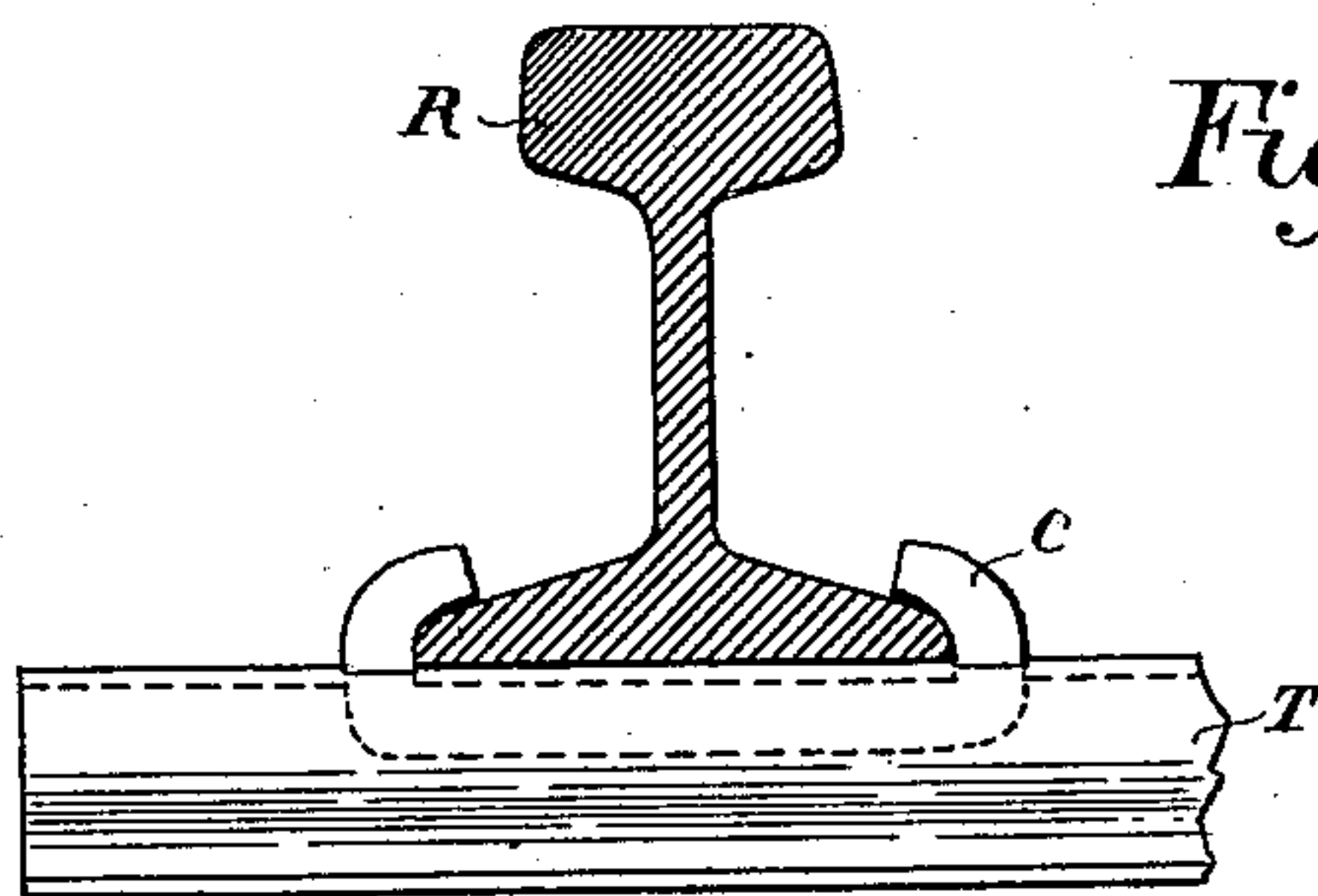


Fig. 4



Witnesses:

C. Campbell
Horace Smith

Inventor:

Robert E. Daniels
By *L. D. Woodward*
Attorney.

UNITED STATES PATENT OFFICE.

ROBERT E. DANIELS, OF YOUNGSTOWN, OHIO.

METAL RAILROAD-TIE.

SPECIFICATION forming part of Letters Patent No. 482,997, dated September 20, 1892.

Application filed December 3, 1891. Serial No. 413,924. (No model.)

To all whom it may concern:

Be it known that I, ROBERT E. DANIELS, a citizen of the United States, residing at Youngstown, in the county of Mahoning and State of Ohio, have invented certain new and useful Improvements in Metal Railroad-Ties; and I do hereby declare the following to be a full, clear, and exact description of my invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

The object of my invention is a metal railroad-tie of such form of construction and means of securing the rails thereto that, while so large a bulk of material is not required as to render the same impractical because of expense, it is convenient to handle, has the greatest elasticity to be secured from such ties without detriment to other qualities, is tenacious of place in the road-bed, holds the rails by such a means that, while the loosening of spikes common with wooden ties is done away with and the spreading of rails can never occur, the tendency of the tie to turn upon the "center," so called, is reduced to the minimum, and, generally, that meets the requirements of a perfect metal railroad-tie to take the place of timber ties, which, on account of the increasing scarcity of timber, are difficult to obtain, are perishable from decay and fires, and are otherwise objectionable in the construction and maintenance of railway-lines. I accomplish this object by the means hereinafter described, and illustrated in the drawings, in which—

Figure 1 is a view of the upper surface of my tie T, broken to exhibit end sections only, and showing in each end the openings o o, provided for the application of the clamps C. Fig. 2 is a view showing the form of the tie T in transverse section. Fig. 3 is a side view of the clamp C as it appears before application, and Fig. 4 is a transverse sectional view of the rail R in place upon a section of the tie T and exhibiting the two fastened together by the clamp C.

In the manufacture of my tie I prefer for quality and economy to make use of old steel rails, which I reduce in the rolls to a sheet longitudinally corrugated by two similar and parallel upward corrugations, intermediate

between and connecting which appears a parallel downward curvature, presenting in all curvatures in transverse view, as seen at Fig. 2 of the drawings, segments less than one-half a circle, for a reason that will presently appear, and having at each longitudinal outer side of the upward corrugations lateral flanges.

This tie may be of any length, breadth, and thickness desired; but I have found by experiment that for the standard-gage railroad a length of eight and one-half feet by a breadth of eight inches, with a quarter-inch thickness, is preferable. This tie, of course, like all metal ties, should be properly coated with paint or other suitable material to protect it against oxidation.

It is a well-understood fact among advanced railroad-construction men that the greatest possible degree of elasticity in the rail-foundations is of very high importance to reduce the grind between the rail and wheels and the wear of locomotives and rolling-stock, as well as to mitigate the vibration and jar, that are always proportionate to the rigidity of such foundation. It is also a well-known law of physics that metals exhibit the greatest rigidity in angles and in curves greater than a half-circle, wherein opposite curvatures counteract tendencies to elasticity, and that it is only in curves that are less than a half-circle that the maximum of elasticity is obtainable. It is therefore because of these two facts, which, as I have demonstrated by experiment, act an important part in railroad-ties, that I maintain the transverse lines of my tie everywhere in curves less than a half-circle, except, as stated, at the flanges upon its longitudinal edges or sides, which are designed to assist it in maintaining position in the road-bed. For these reasons my tie is an improvement over all other metal railroad-ties, none of which except mine are constructed in recognition of the fact and law above expressed.

At suitable points inward from each end, for the rest of the rail foot-flange thereon, I make the openings o o through the highest part of a corrugation, these openings appearing in opposite corrugations at opposite ends, for a means of fastening the rails R by the use of the clamps C. The openings o o are

preferably rectangular and in each end of the tie are aligned longitudinally with it, separated from each other a distance measured by the breadth of the rail foot-flange.

- 5 The clamp C is a bar of fibrous iron or of low-carbon steel (about ten-high carbon being the best) that will bend cold under strokes of a sledge and remain as bent, with capability of being straightened again without break-
 10 ing, and is in form, before application to use, the three sides of a rectangle, as seen at Fig. 3. When applied, its horizontal part extends along the under surface of the tie between the two openings o o, its vertical parts extending
 15 upward therethrough and bent to a clasp over the upper surface of the foot-flange of the rail. As already intimated in the application of the clamps C, the bend of the upright parts to the clasp described is effected by blows of a sledge,
 20 and it will be seen that in taking up track the thus-bent portions may be easily straightened by means of a suitably-formed crow-bar used as a lever with the rail-head for a fulcrum.

I am aware that the clasps C are not new
 25 in metal railroad-ties, except as combined with such parts of the mechanism described as are new. I am also aware that metal railroad-ties formed of longitudinally - corrugated sheets of metal and exhibiting in transverse
 30 section curved lines are old; but I am not aware that such ties having such curvatures, each less than a half-circle, thereby giving the greatest elasticity, were ever known prior to my invention; nor am I aware that a metal
 35 railroad-tie was ever made until my invention, in which the openings o o appear at opposite ends of the tie and not in the same corruga-
 tion, as above described.

What I claim is—

- 40 1. In metal railroad-ties, the tie T, consist-

ing of a sheet of rolled metal of suitable length, breadth, and thickness, having from end to end two parallel upwardly-arched corrugations and intermediate between them a similar but downward-arched corrugation, 45 each less than a half-circle in transverse lines, which are everywhere upon a curve, except in the flanges which appear upon the side edges of the tie, substantially as described, and for the purpose expressed. 50

2. In metal railroad-ties that have two or more upwardly-arched longitudinal corruga-
 tions, the openings o o, appearing in groups of two aligned longitudinally with the tie and a
 55 suitable distance apart, each group located at opposite ends of the tie, but not in the same corrugation, substantially as described in the foregoing specification, and for the purpose therein expressed.

3. In metal railroad-ties, the tie T, formed 60 of a suitable sheet of rolled metal, having from end to end two parallel upwardly-arched corrugations and an intermediate downwardly-curved corrugation, each less than a half-
 65 circle in transverse lines, which are everywhere upon a curve, except in the flanges which appear upon the edges of the tie, and in which tie upon the highest portions of the upwardly-arched corrugations appear the
 70 openings o o in groups of two at each end of the tie, but upon opposite corrugations, substantially as described, and for the purpose expressed.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ROBERT E. DANIELS.

Witnesses:

J. J. SHEETS,
 LON BLACKBURN.