

W. GOLDIE & W. GOLDIE, JR.
METALLIC TIE.

APPLICATION FILED JAN. 16, 1907.

Patented Sept. 14, 1909.

3 SHEETS—SHEET 1.

933,833.

FIG. 1

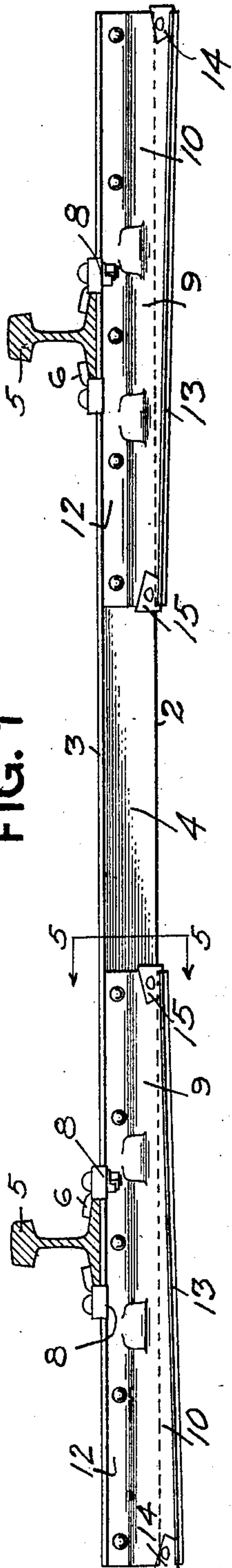


FIG. 2

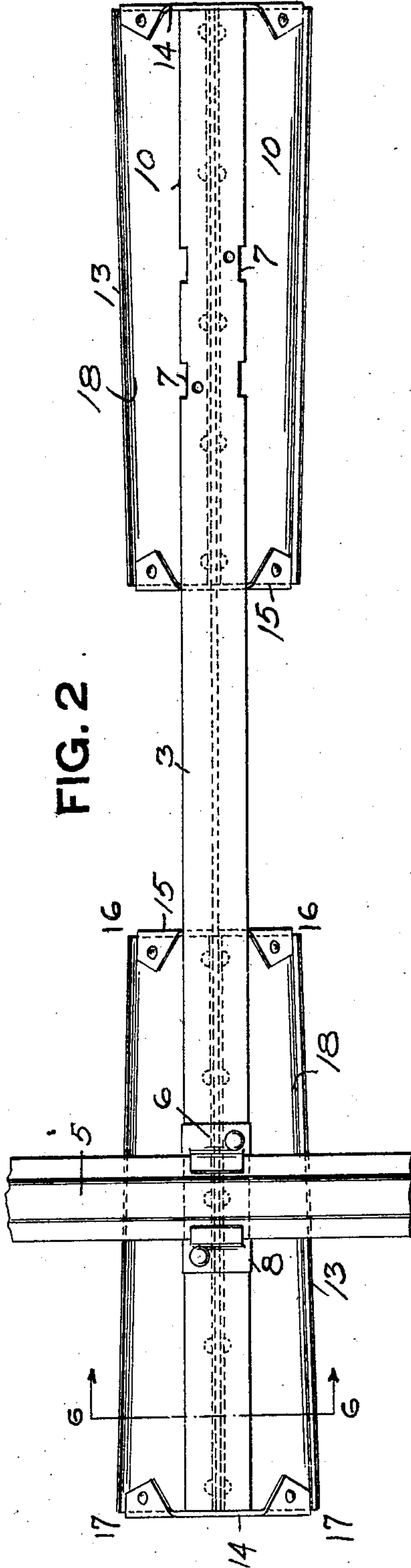
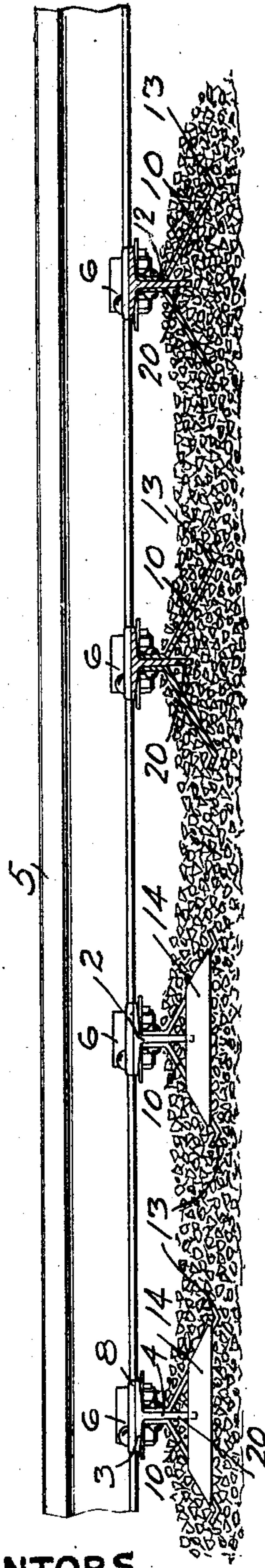


FIG. 3



WITNESSES.

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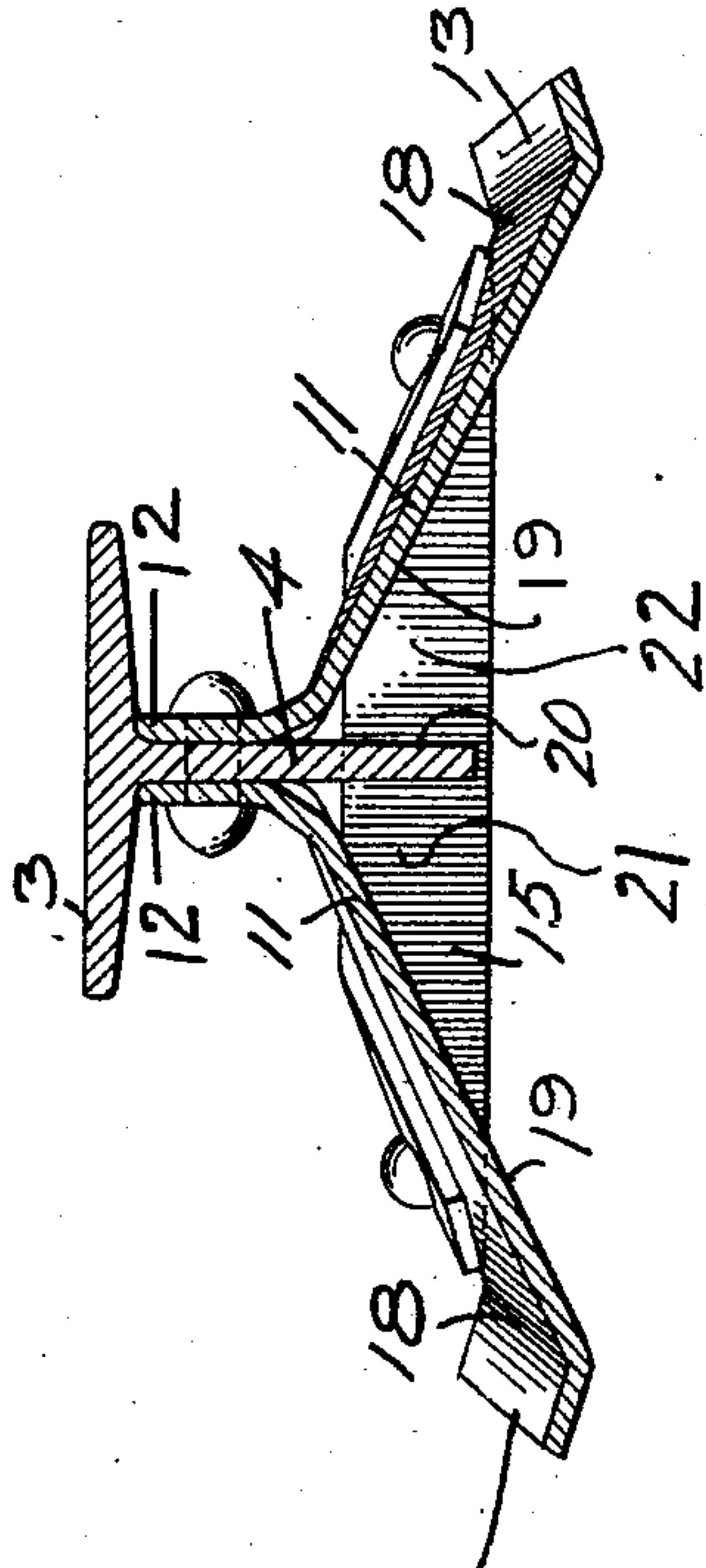
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METALLIC TIE.

933,833.

3 SHEETS—SHEET 2.

666



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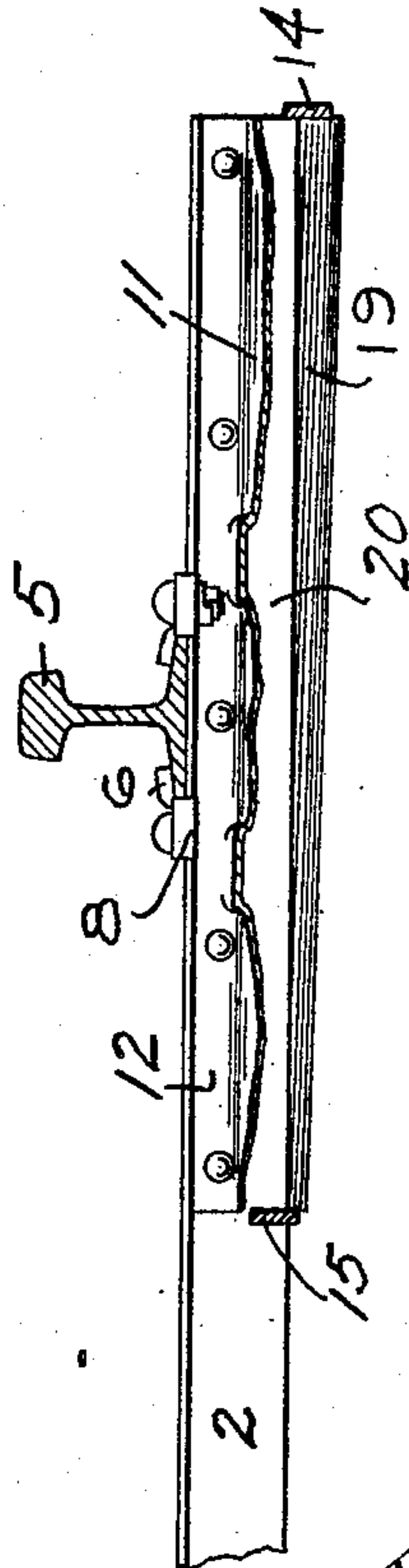
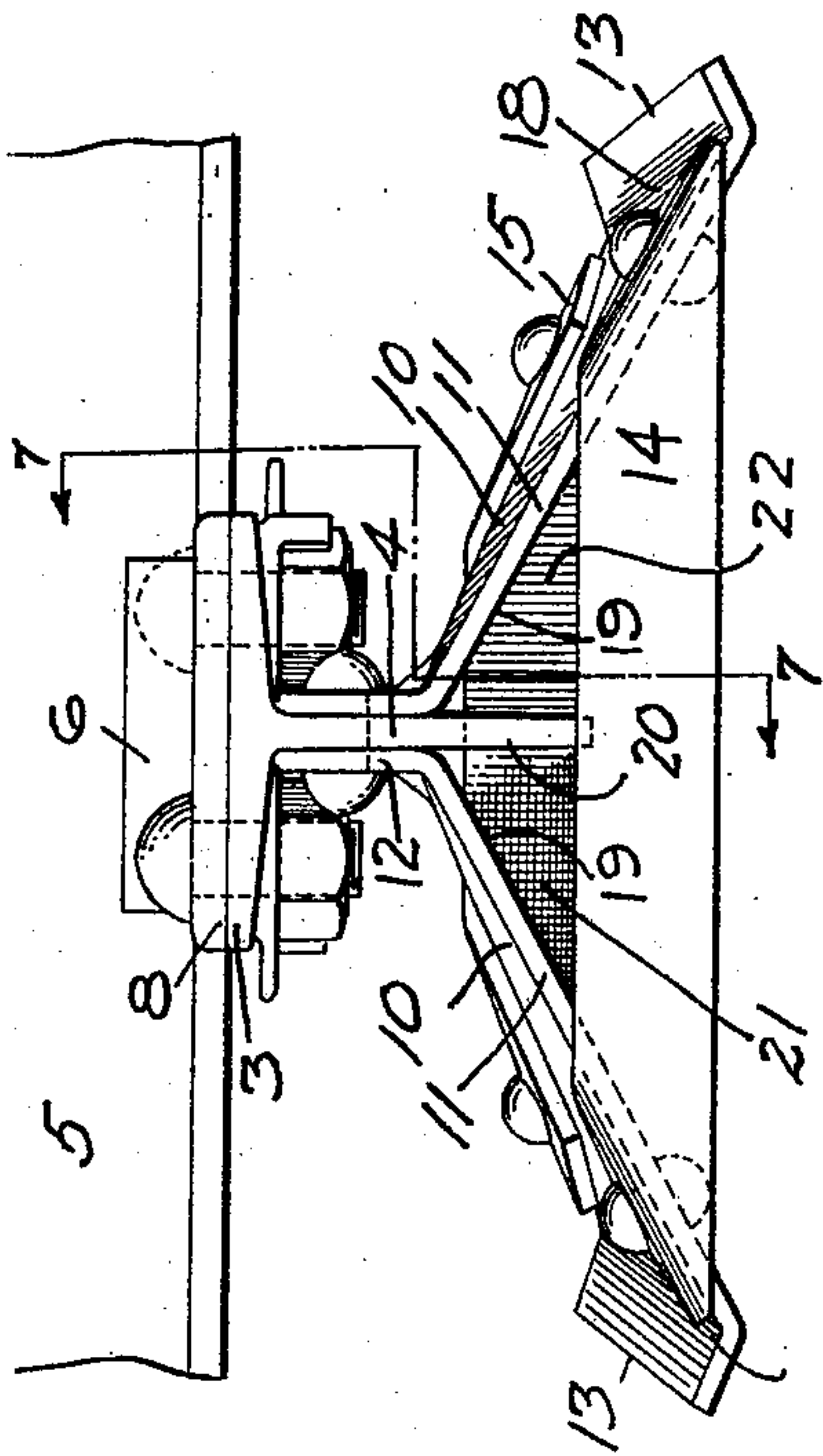
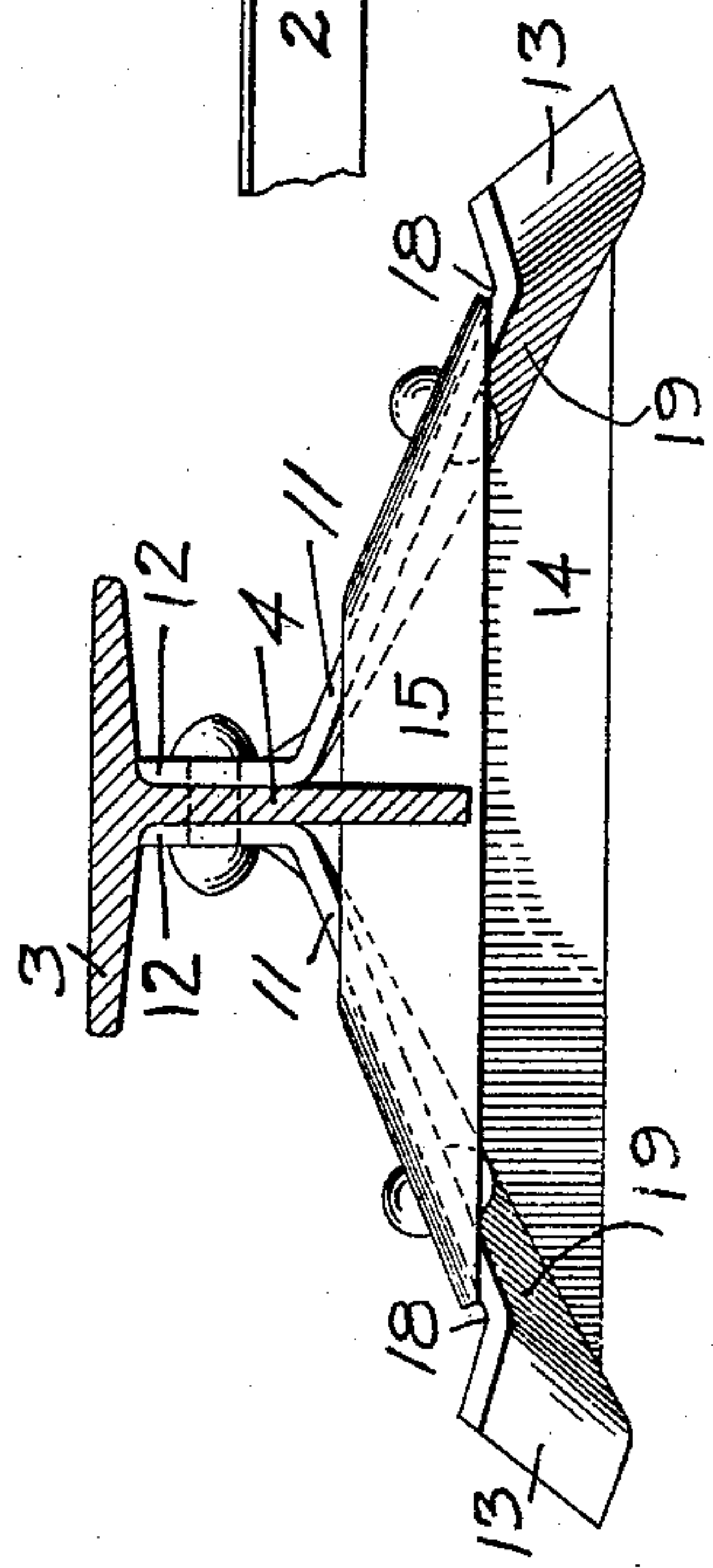


FIG. 4



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METALLIC TIE.

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3 SHEETS—SHEET 3.

933,833.

FIG. 11

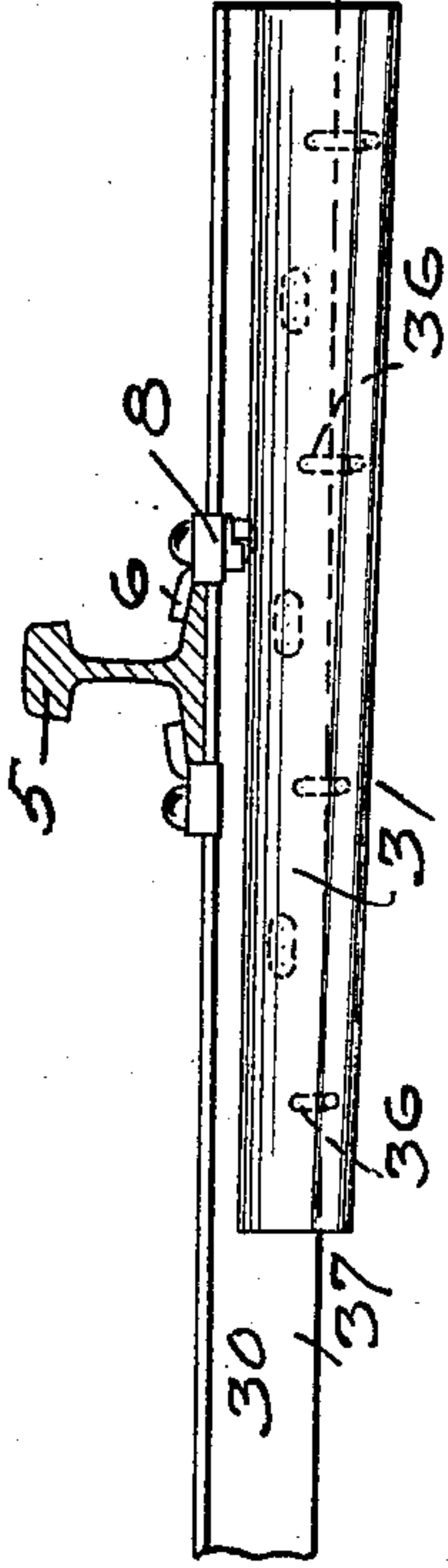


FIG. 12

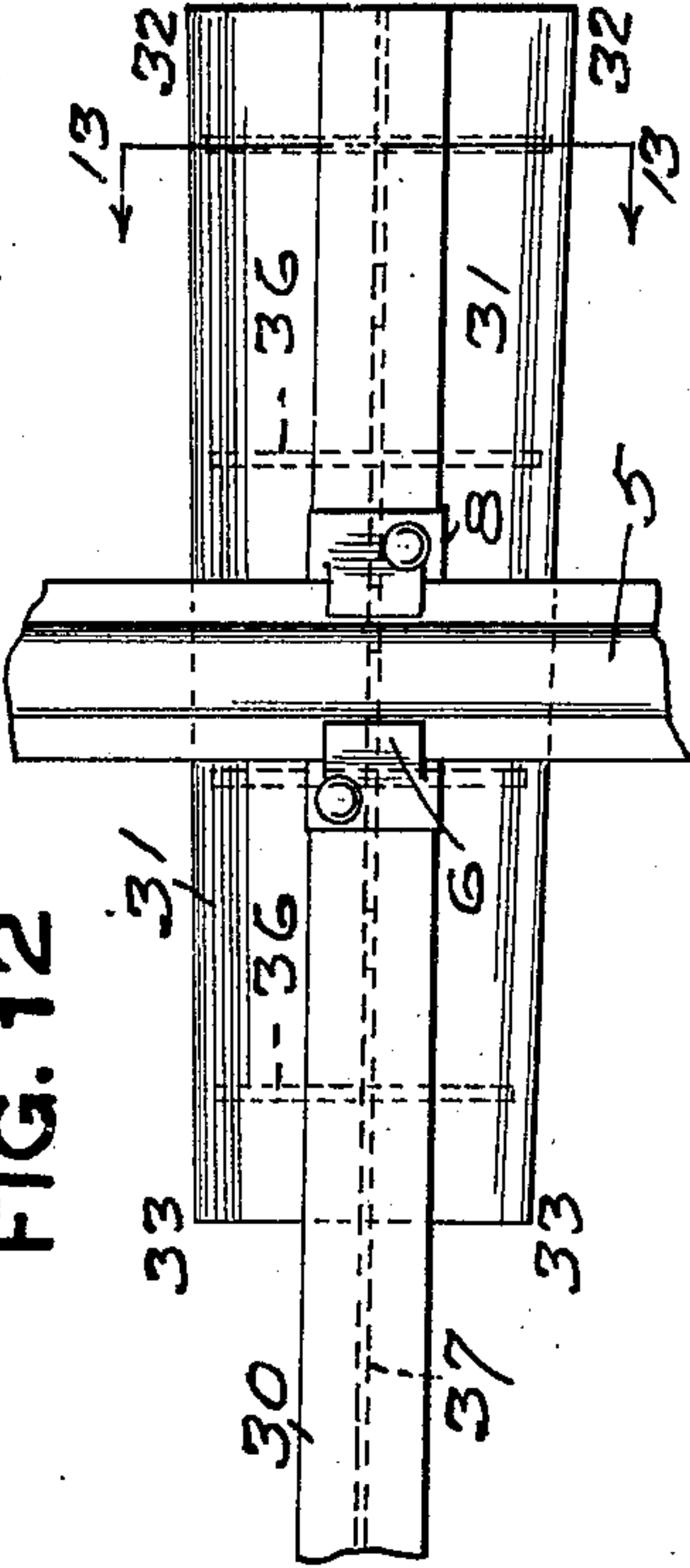


FIG. 13

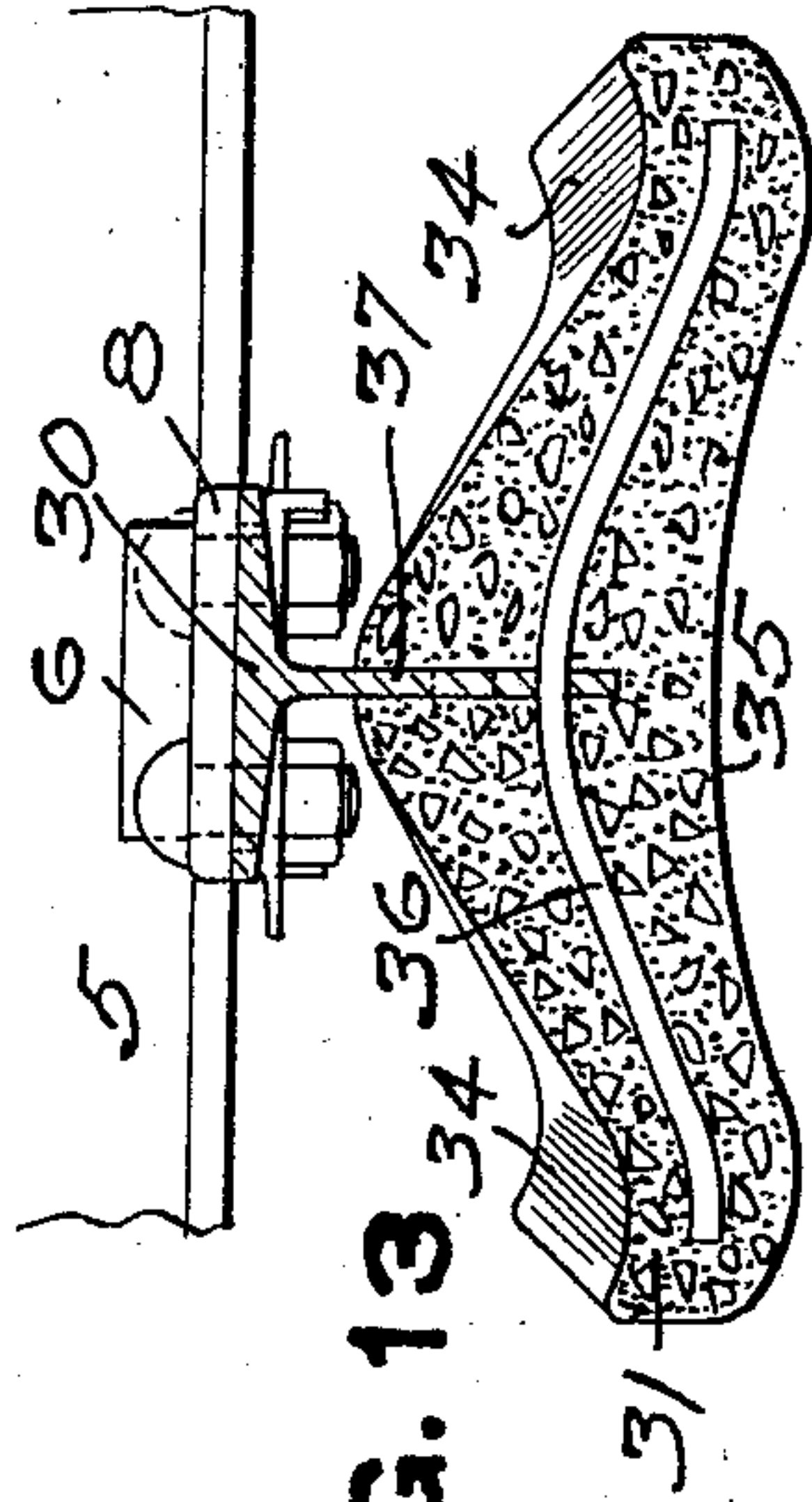


FIG. 8

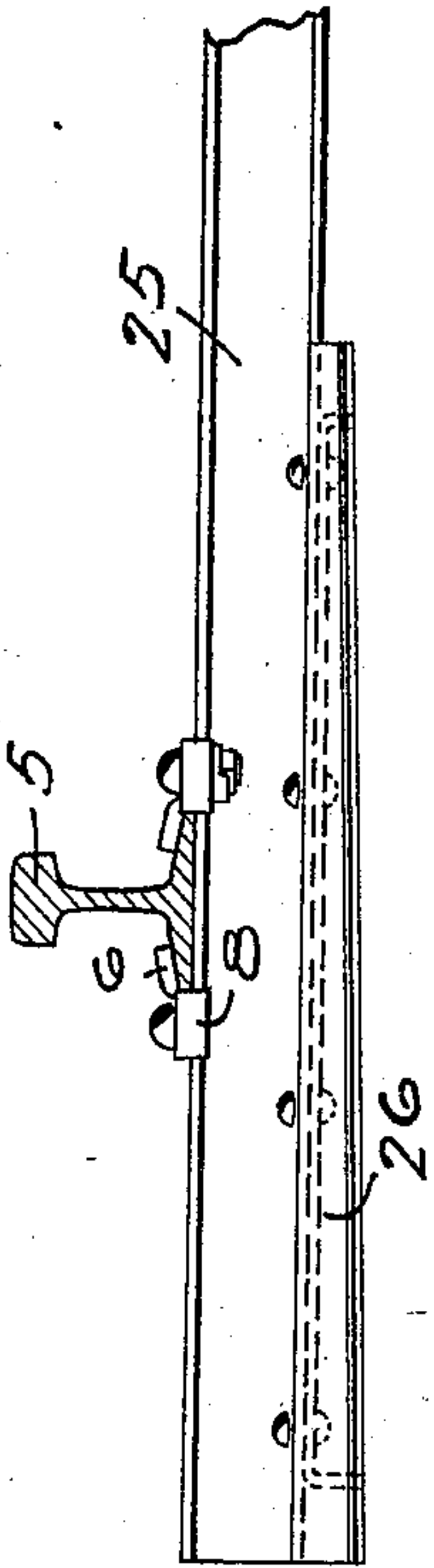


FIG. 9

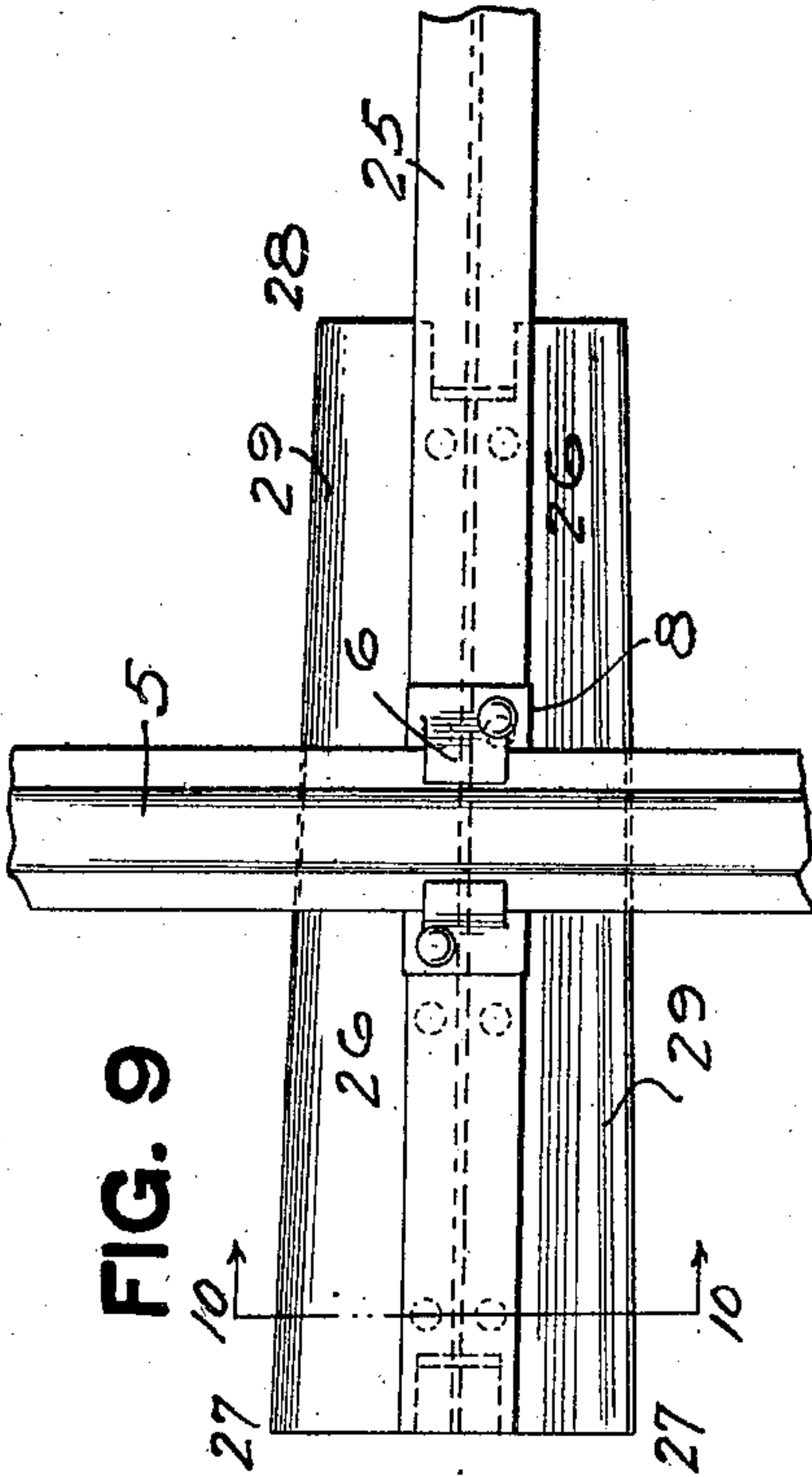
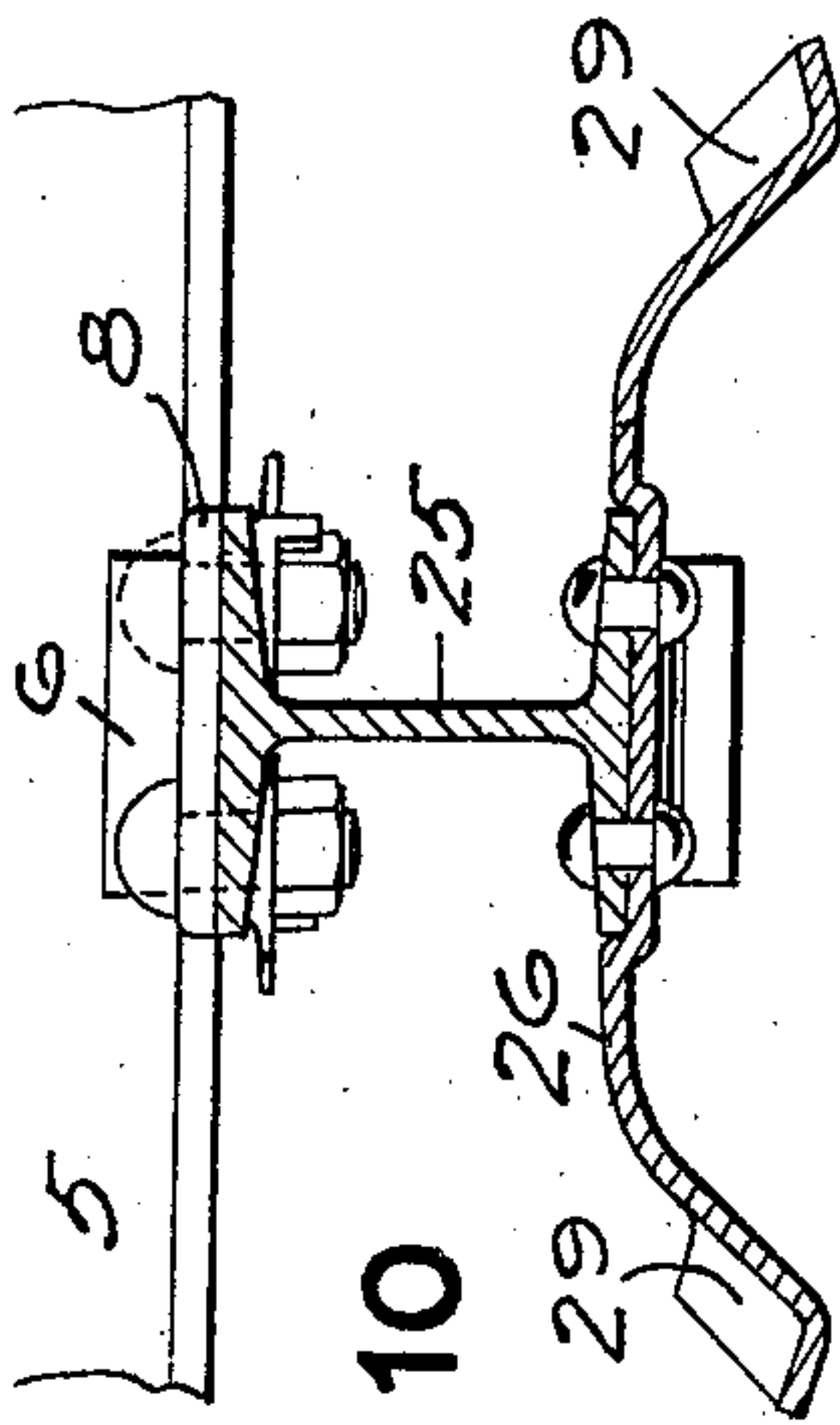


FIG. 10



WITNESSES.

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UNITED STATES PATENT OFFICE.

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METALLIC TIE.

933,833.

Specification of Letters Patent. Patented Sept. 14, 1909.

Application filed January 16, 1907. Serial No. 352,634.

To all whom it may concern:

Be it known that we, WILLIAM GOLDIE, a resident of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, and
5 WILLIAM GOLDIE, JR., a resident of Bay City, county of Bay, and State of Michigan, have invented a new and useful Improvement in Metallic Ties; and we do hereby declare the following to be a full, clear, and exact de-
10 scription thereof.

Our invention relates to metallic ties, its object being to provide a metallic tie of the same general type as set forth in applica-
15 tions for patents filed by William Goldie, one of the present applicants, November 12, 1906, Serial No. 343,067, and December 10, 1906, Serial No. 347,103, but improved in certain particulars.

The tie of the present invention embodies
20 certain broad features of invention which may be employed either in metallic or any preferred form of tie. For example, it has at its outer ends fan-shaped supports, that is, supports narrower at their inner ends
25 than at their outer ends, and preferably of greater length outside of the rails than between the rails, so giving greater area of support outside the rails than between the rails. The tie is made drooping toward
30 its outer ends. For example, where it has a separate main beam it is provided with supports which are of greater depth at their outer ends than at their inner ends, so bearing upon the ballast as to hold the same
35 more firmly and have a slight tendency to work it inwardly under the supports, the supports being also preferably formed outwardly and downwardly inclined so as to also hold and compact the ballast. These
40 supports are provided on their upper surfaces with drainage gutters which are downwardly inclined from the inner ends toward the outer ends so as to provide for drainage
45 to the outer portion of the tie and so to the outer portion of the ballast. In its preferred form we employ a T-beam and the supports or inverted trough sections are preferably formed of two skirts outwardly and downwardly extending and secured to the web of
50 the beam and having the peculiarities above set forth as well as other peculiarities hereafter fully described and claimed.

In the accompanying drawings Figure 1 is a side view of the improved tie showing
55 the rails applied thereto; Fig. 2 is a top or

plan view of the tie; Fig. 3 is a view of a section of track showing a rail resting on a number of the metallic ties, two of which are shown in section; Fig. 4 is an end view of the tie; Fig. 5 is a cross section on the
60 line 5—5 Fig. 1; Fig. 6 is a like cross section on the line 6—6 looking in the opposite direction; Fig. 7 is a sectional view along the line 7—7 Fig. 4; Figs. 8, 9 and 10 show my invention as applied to another form of
65 tie such as that embodied in the said application Serial No. 347,103; and Figs. 11, 12 and 13 show the invention as applied to a composite tie such as one having a main element formed of a metallic beam and the sup-
70 ports formed of concrete.

As the invention is preferably formed of metal we will describe it more fully in connection with Figs. 1 to 7 which embody the
75 preferred metallic construction thereof. The main portion of the tie embodying the present invention is a flanged beam preferably a T-beam or bar as shown, this T-bar 2 being arranged as shown with its head or
80 flanges 3 forming the top portion of the tie and its web 4 extending downwardly therefrom. This T-beam extends for the full length of the tie and its top portion provides a broad surface for the support of the
85 rail 5 which is secured thereto by any suitable means, such as by the clips 6 which are shown as bolted to the top flanges 3, the clips 6 fitting into notches or seats 7 formed in the top flanges 3 outside of the rail so as
90 to hold the rail against spreading through the downwardly extending lips 8 of the clips fitting in the seats 7 in the head of the T-beam. The bolts extend through the clip and top flanges and are secured in any suit-
95 able way. Like means for holding may also be employed on the inside of the rail if desired.

The tie has the inverted trough sections or supports 9 formed at the end portions thereof, these being shown as formed of
100 what we have termed "skirts" 10, which are bolted to the webs 4 of the T-beam, and as shown project outwardly and at a slight downward incline so as to provide very broad bases or supports for the tie at
105 its ends. In the construction illustrated these skirts are formed of the main inclined bodies 11, the vertical ribs 12 which are riveted to the webs 4 and the upwardly inclined outer edge portions 13. These skirts
110

are formed of plate metal of proper thickness pressed to shape and as they can be pressed cold they can be quickly and cheaply formed and riveted to the main flanged beam, so providing an inexpensive form of tie having the peculiarities of very broad supports at the end portions, while between the same there is only the body of the flanged beam which has little or no bearing upon the ballast and so overcomes any possibility of the center binding of the tie. To prevent spreading of the inverted trough formed of these skirts under the weight of the train we provide cross straps 14, 15, one at the outer and the other at the inner end of the inverted troughs, these straps being formed of ordinary strap metal carried over onto the main body portions 11 and riveted thereto as shown, these straps also providing anchorage of the metallic tie in the ballast and holding against lateral travel of the tie.

It will be noticed that while providing positive anchorage of the tie in this way they give free space for the tamping of the ballast either under the inclined lips 13 of the skirts or below or above the cross straps connecting the outer ends thereof. These skirts 10 are formed wider at their outer ends than at their inner ends, for example, in a well balanced tie where a T-beam with a top or head, say $4\frac{1}{2}$ inches wide and about 4 inches deep, the inner end of the trough section may have a spread of about 11 inches, such as between the points 16—16, while its outer end will have a spread of about 13 inches such as between the points 17—17, the outer edges of the trough section being straight and gradually increasing in width accordingly. By thus widening the portion of the trough section beyond the rail greater bearing surfaces of the trough sections are provided outside of the rails than between the rails and this is very desirable as tending to distribute the load more over the portions of the ballast outside of the rails than between the rails. For the same reason it is also desirable that the portion of the trough section outside of the rail shall be longer than the portion thereof between the rails and this can be accomplished without increasing the length of the tie in the manner illustrated in the drawing. Such form of support therefore gives a more perfect distribution of the load upon the ballast. It will also be noticed that the outer edges of the skirts forming the trough section are set at a downward incline from the inner edge of the trough section to its outer edge, such as from the point 16 to the point 17, and that as so set the up-turned outer edges 13 of the skirts provide a gutter 18 on the upper surface of the trough section by which any water gathering on the outer surface of the same is carried out to its outer edge and drained thereby to the outer portion of the ballast. This down-

wardly and outwardly inclined position of the trough section also serves the further purpose of so inclosing the ballast as to give a slight tendency to the ballast to work inwardly toward the central portion of the track rather than outwardly toward the ends of the tie, which might serve to expel the ballast from under the tie. While this tendency is slight it acts in connection with the upwardly inclined inner faces 19 of the trough section to further compact the ballast and force it upwardly within the trough section or under the skirt portions, so providing a natural tendency for the solid compacting of the ballast under the end portions of the ties and directly under the rails while holding the ballast to place. It will be noticed in this connection with the web portion of the main T-beam extends downwardly some distance within the trough section as at 20. This is desirable in that it provides an abutment against which the ballast can be packed as it is tamped under the upwardly extending edge portions 13 and under the skirt portions 11, the upwardly inclined under faces 19 of the skirt portions with this central rib portion 20 together with the cross straps 14 and 15 practically forming two pockets 21 and 22 within which the ballast is confined, the ballast being compacted by the weight of the load or by the tamping so as to be confined within these pockets, bearing against the central ribs and the inclined faces of the trough section. The central web 4 of the main beam as it extends for the full length of the tie including the said portions 20 within the trough sections, also forms an anchor against the twisting of the tie, holding against the ballast not only within the trough sections but between the same, though it naturally works down into the ballast between said cross sections and prevents any possibility of center binding of the tie upon the road-bed as above referred to.

In the use of the tie it is found that through its inverted trough portions a very strong hold is obtained upon the ballast, as it is possible to provide skirt portions of such width as to give a broad bearing on the ballast and thereby to provide proper support for the rails without the employment of so many cross ties, while it is unnecessary to carry the ballast close up to the rail itself and the amount of ballast employed for the purpose may therefore be reduced. The parts composing the ties are either of ordinary well known sections or of parts which can be quickly made from plate metal and pressed to shape when riveted together, so that the tie can be made at relatively small cost.

While we prefer to employ the invention with the skirts riveted to the webs of the main beam, and to make the tie entirely of metal as shown in the main figures hereof,

yet it is evident that the construction can be varied both in structure and material, and employ the special features of invention applicable generally to such ties. For example, in a metallic tie the special features of the tie with the drooping outer ends, of the tie with the fan-shaped or spreading supports wider at their outer ends than at their inner ends, and of the tie with the peculiar gutter construction above referred to, may be constructed as shown in Figs. 8 to 10 embodying generally the features of the application filed by said William Goldie on December 10th, 1906, Serial No. 347,103, in which the main beam 25 is an I-beam and the fan-shaped supports 26 at the ends are riveted to the base thereof, such fan-shaped supports being wider at their outer ends 27 than at their inner ends 28 as shown in said figures, and providing a tie drooping or deeper at its outer ends than in any other portion and also providing a tie with the drainage gutters 29 extending at a downward incline from the inner ends of the supports to the outer ends of the supports. As shown in Figs. 11 to 13 these particular features of the invention may also be employed in connection with a composite concrete tie, the tie illustrated having the main beam 30 extending for its full length and having built up upon the end portions thereof the fan-shaped supports 31 broader at their outer ends 32 than at their inner ends 33, and of greater length outside of the rails than inside the rails, so giving greater area outside the rails than between the rails, these concrete supports having downwardly inclined gutters 34 extending from their inner ends to the outer ends and also preferably having their lower faces concave as shown at 35; the concrete portions being reinforced by the bands or strips 36 extending through the web 37 of the main beam.

What we claim is:

1. A railroad tie comprising two separate supporting portions and a connecting portion of slight bearing surface, said supporting portions being inclined downwardly from their inner to their outer ends and the bottoms thereof being lower at their outer than at their inner ends.

2. A railroad tie having supports at its outer ends, said supports having on their upper faces downwardly and outwardly inclined gutters.

3. A metallic tie having its main element formed of a flanged beam and having supports at each end, each such support being formed of separate outwardly extending skirts riveted to the flanged beam.

4. A metallic tie having its main element formed of a T-beam and having supports at each end, each such support being formed of separate outwardly extending skirts riveted to the web portion thereof.

5. A metallic tie having its main element formed of a flanged beam and having supports at each end, each such support being formed of separate skirts riveted to the flanged beam and thereby forming trough-shaped base portions.

6. A metallic tie having its main element formed of a T-beam and having separate skirt portions provided with vertical ribs riveted to the web of the beam, the main body portions thereof extending outwardly and at downward inclines from the beam at the ends thereof and thereby forming trough-shaped base portions.

7. A metallic tie having its main element formed of a flanged beam and separate skirt portions riveted thereto and extending outwardly and at downward inclines therefrom at the ends, and connecting straps riveted to the skirt portions.

8. A metallic tie having its main element formed of a flanged beam and having trough sections secured thereto at the ends and extending on both sides of the rail, the portions of the trough sections outside of the rails being longer and deeper than the portions of the trough sections between the rails.

9. A metallic tie having its main element formed of a flanged beam and having trough sections secured thereto at the ends and extending on both sides of the rail, the portions of the trough sections outside of the rails being wider and deeper than the portions thereof between the rails.

10. A metallic tie having its main element formed of a flanged beam, having trough sections secured thereto at the ends and extending on both sides of the rail, the portions of the trough sections outside of the rails being longer and wider and deeper than the portions thereof between the rails.

11. A metallic tie having its main element formed of a flanged beam, and having trough sections secured thereto at the ends, said trough sections extending transversely of the beam outwardly and downwardly to lines near their outer edges, which outer edges extend upwardly, and said outer edges being set at a downward incline from the inner ends of the trough sections to the outer ends thereof, thereby forming inclined draining gutters.

In testimony whereof, we the said WILLIAM GOLDIE and WILLIAM GOLDIE, Junior, have hereunto set our hands.

WILLIAM GOLDIE.
WILLIAM GOLDIE, Jr.

Witnesses as to William Goldie:

ROBERT C. TOTTEN,
GRACE C. RAYMOND.

Witnesses as to William Goldie, Jr.:

WM. A. WRIGHT,
JESSIE HALL.