H. G. GILLMOR.

MEANS OF FORMING JOINTS AND BONDS IN RAILS.

APPLICATION FILED DEC. 4, 1905.

898,869. Patented Sept. 15, 1908.

2 SHEETS—SHEET 1.

FIG. 2.

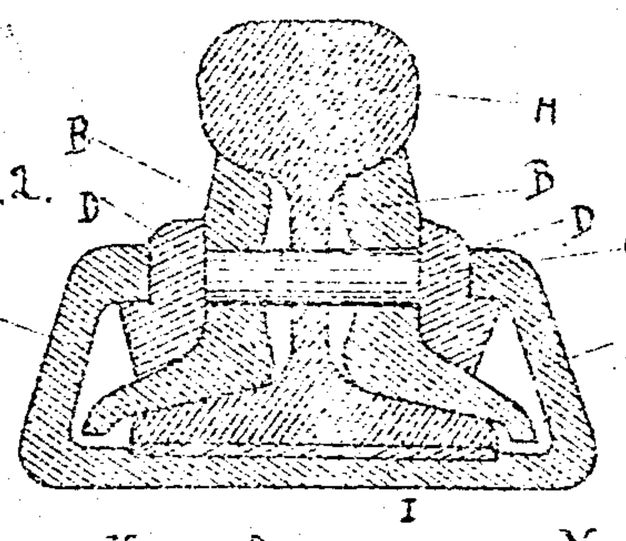
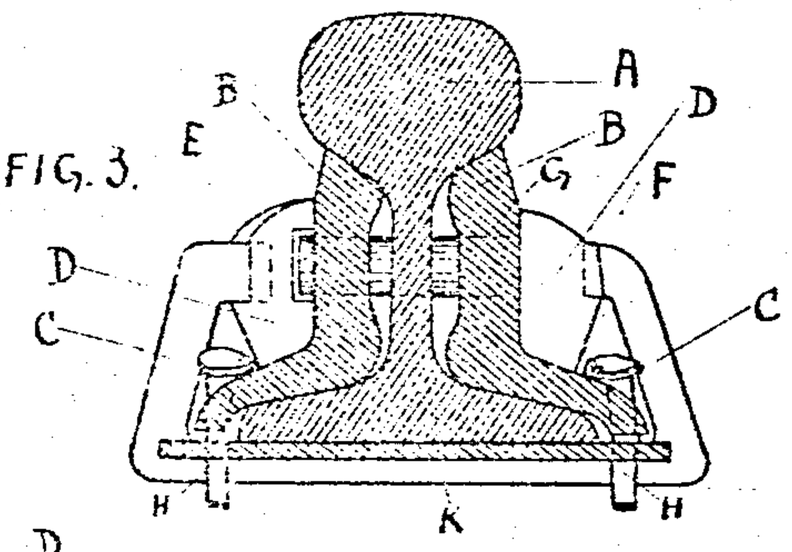


FIG. 3.



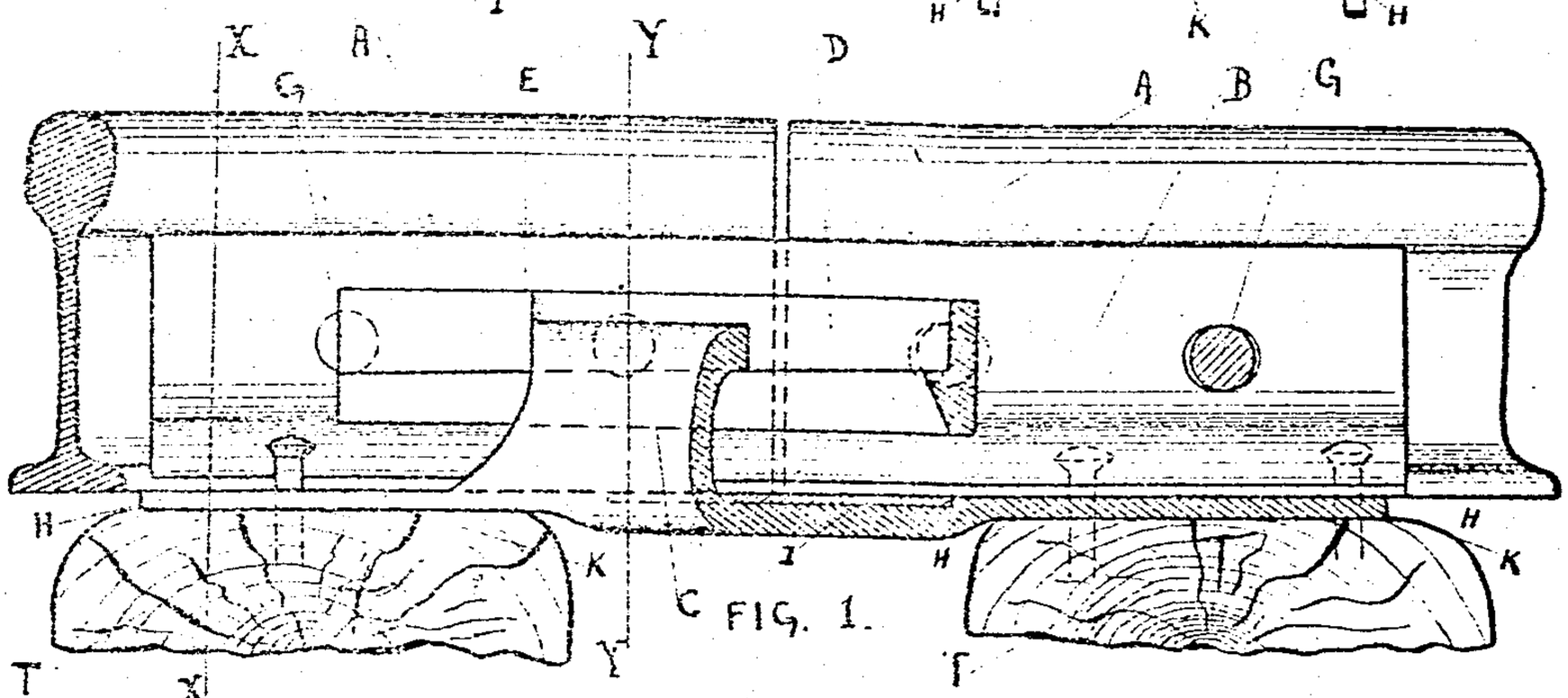


FIG. 1.

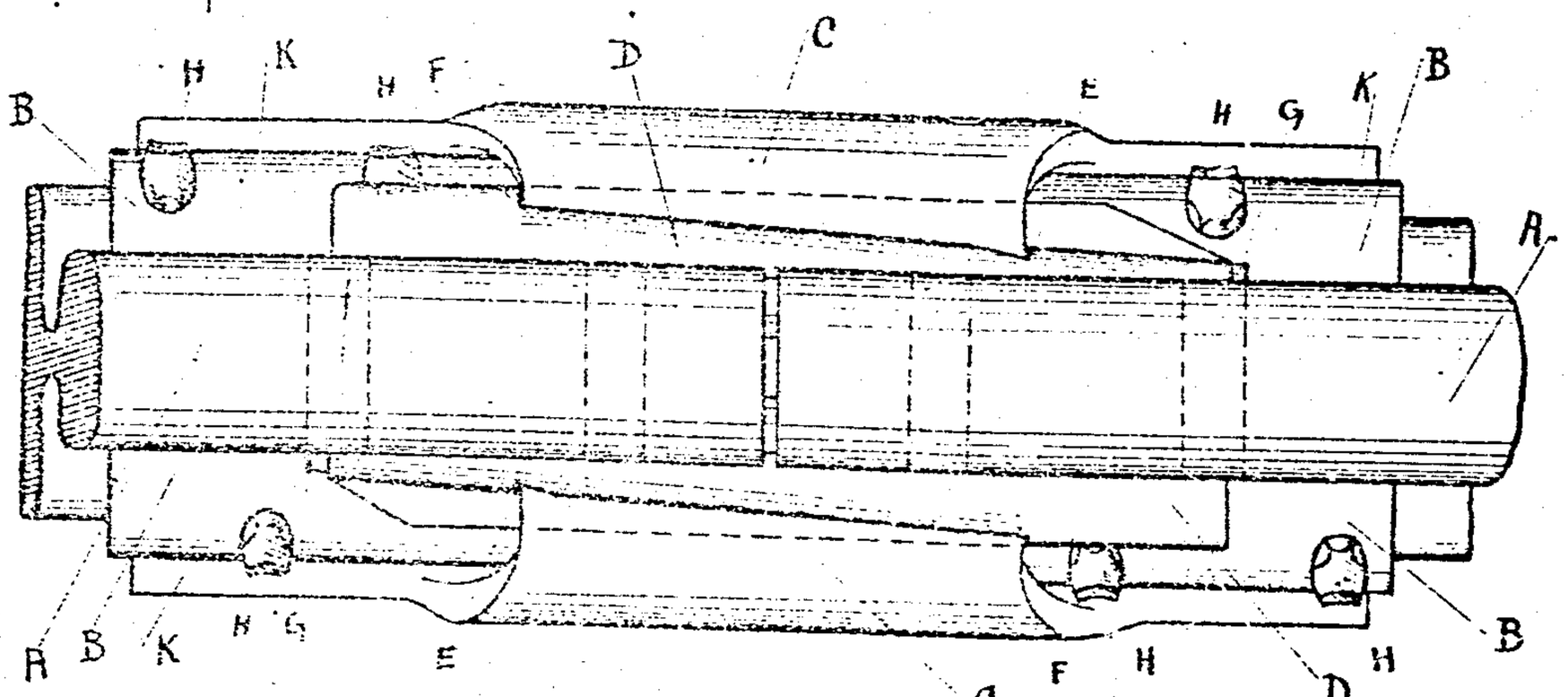


FIG. 4.

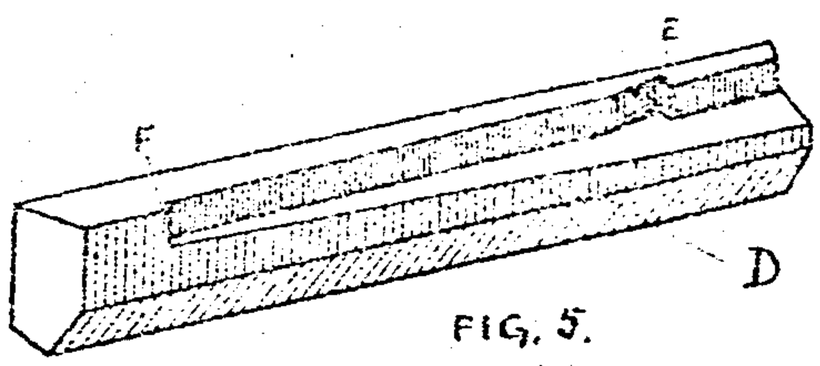


FIG. 5.

WITNESSES

L. H. Bonnesta.

N. S. Williams.

INVENTOR

H. G. Gillmor

H. G. GILLMOR.

MEANS OF FORMING JOINTS AND BONDS IN RAILS.

APPLICATION FILED DEC. 4, 1905.

898,869.

Patented Sept. 15, 1908.

2 SHEETS—SHEET 2.

FIG. 6.

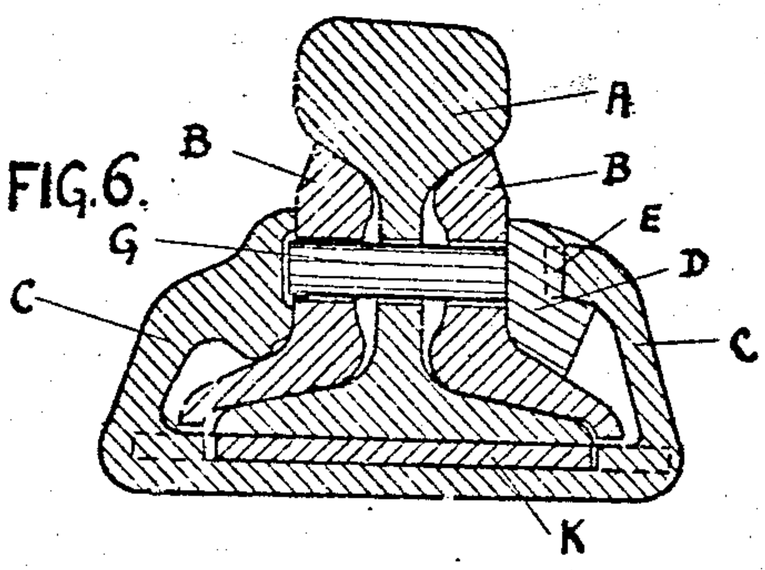
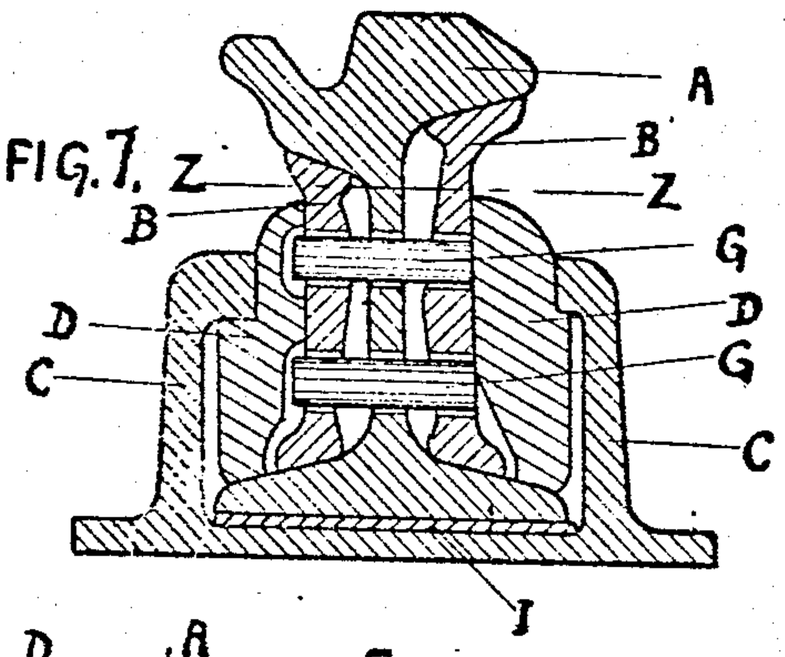


FIG. 7.



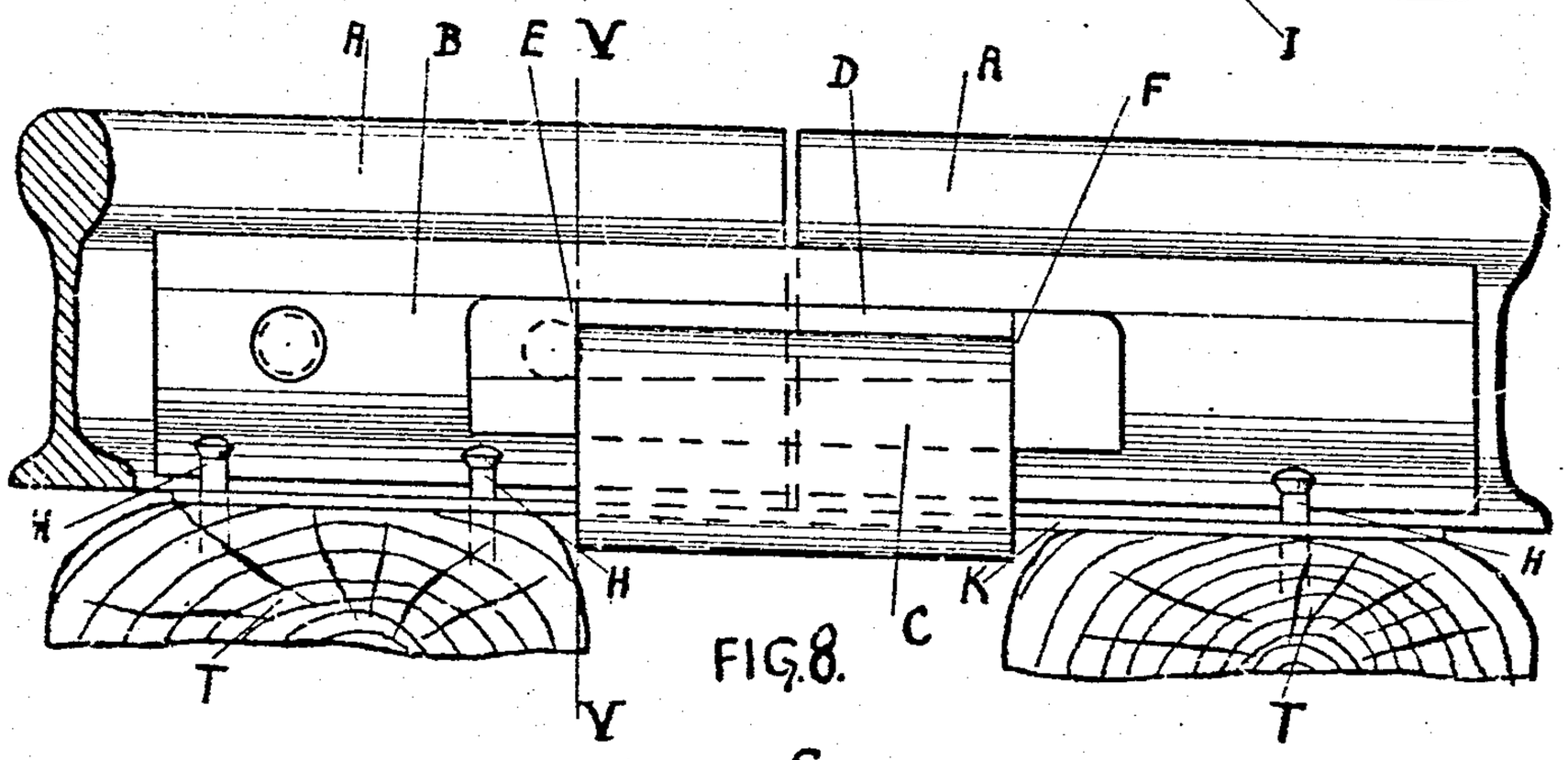


FIG. 8.

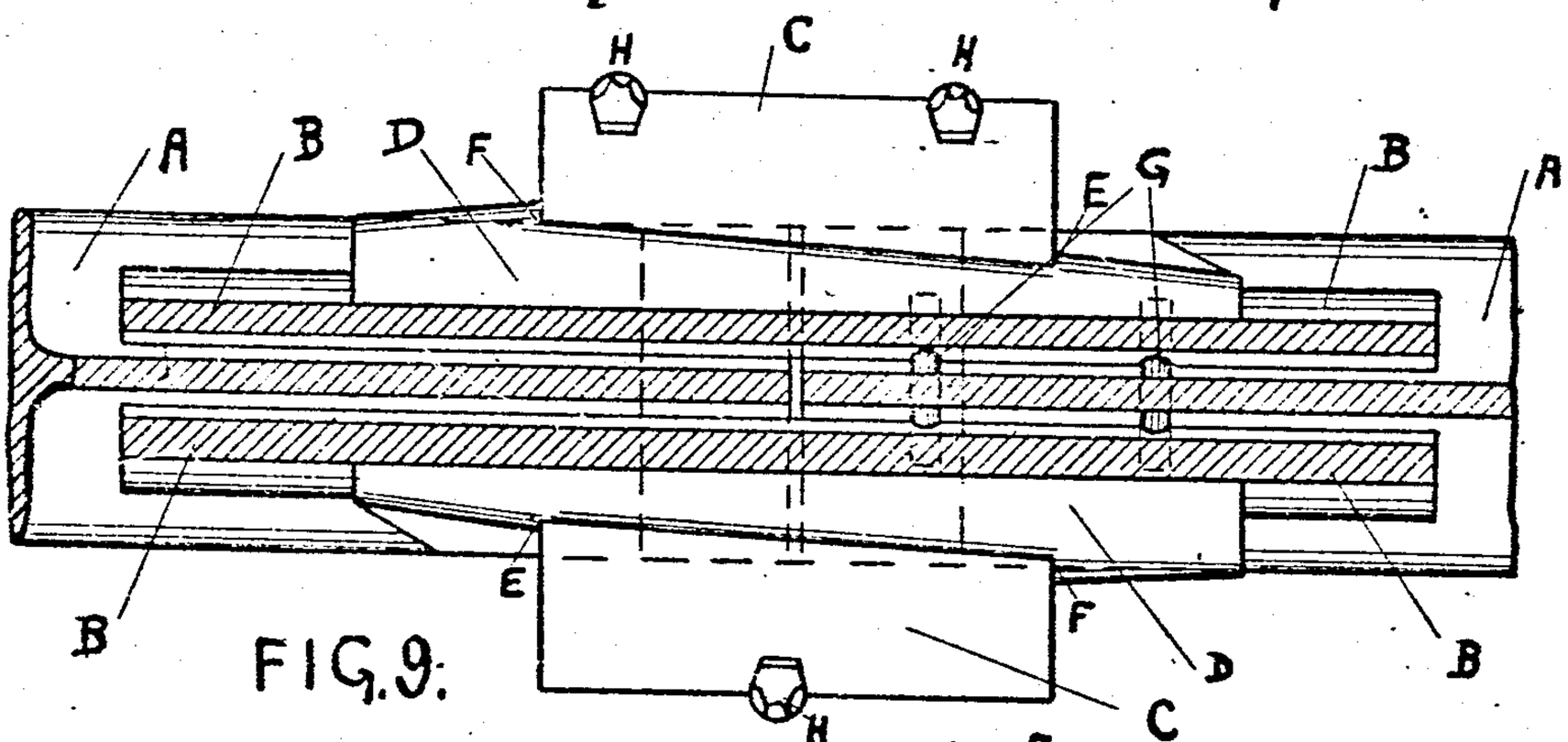


FIG. 9.

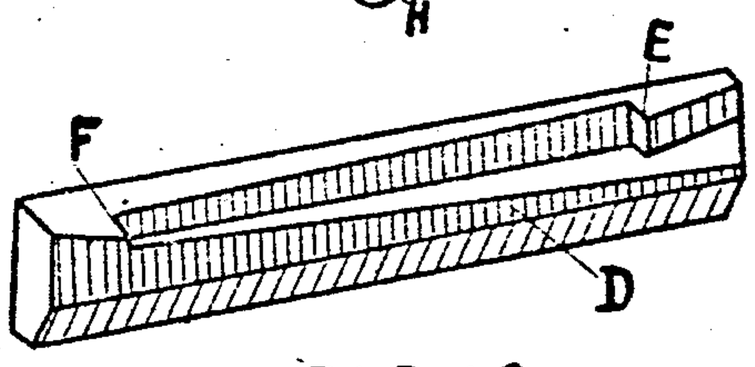


FIG. 10.

Witnesses
H. H. Bennett.
H. E. Williams.

Inventor
H. G. Gillmor.

UNITED STATES PATENT OFFICE.

HORATIO G. GILLMOR, OF BATH, MAINE.

MEANS OF FORMING JOINTS AND BONDS IN RAILS.

No. 898,869. Specification of Letters Patent. Patented Sept. 15, 1908.

Application filed December 4, 1905. Serial No. 290,161.

To all whom it may concern:

Be it known that I, HORATIO G. GILLMOR, a citizen of the United States, residing at Bath, in the county of Sagadahoc, State of Maine, have invented an Improvement in the Means of Forming Joints and Bonds in Rails, of which the following is a specification, accompanied by drawings.

My invention relates to railway rail joints, although the uses of the means employed to form the rail joints are not limited to such joints, for my invention may be used in any connection in which they may be found applicable.

One of the objects of my invention is to provide an efficient means of joining rails free from parts liable to work loose after once having been properly placed.

Another object of my invention is to provide such support for the rail ends as to prevent deflections of the rail at the joint.

Another object of my invention is, in the cases where the rail is used as a portion of an electrical circuit, to provide for an electrical conductivity through the joint as nearly as possible equal to or greater than the electrical conductivity of the unjointed portion of the rail.

Further objects of the invention will hereinafter appear; and to these ends the invention consists of a rail joint for carrying out the above objects embodying the features of construction, combinations of elements and arrangement of parts having the general mode of operation substantially as hereinafter described and claimed in this specification and shown in the accompanying drawings, in which—

Figure 1 is a side elevation partly in section, illustrating a form of the rail joint. Fig. 2 is a vertical section through the parts at the plane indicated by "Y Y" in Fig. 1. Fig. 3 is a vertical section through the parts at the plane indicated by "X X" in Fig. 1. Fig. 4 is a plan view of the joint. Fig. 5 is a view of one of the forms of the locking wedge used in making up the joint. Figs. 6 and 8 are a section at the plane indicated by "V V" and a side elevation, respectively, illustrating a modified form of the joint. Figs. 7 and 9 are, respectively, a vertical section and a longitudinal section at the plane indicated by "Z Z", looking down on the joint, illustrating an application of the joint to a girder rail. Fig. 10 is a view of a modified form of the locking wedge used in making the joint.

Similar letters refer to similar parts throughout the several views.

"A A", etc. are the rails to be joined.

"B B", etc. are angle bars or fish plates.

"C C", etc. is a clamp or chair.

"D D", etc., are locking wedges having double wedging surfaces and are arranged to interlock at "E" with the chair or clamp "C" when the wedge is driven to its final position, so as to prevent movement of the wedge "D" in relation to the chair or clamp "C", and having stops "F" which will come into contact with the end of the clamp or chair "C" when the wedge is driven, to prevent the wedge from being driven too far.

"G G", etc., are pins or rods traversing the angle bars "B" and the vertical web of the rail "A".

"H H", etc., are spikes of the type ordinarily used for securing rails and chairs to the ties or sleepers "T".

"I" is a flat piece of a ductile metal such for example as copper or zinc, having higher electrical conductivity than steel or iron, held in contact with the bottom of the flange of the rail by the clamp or chair "C" under the action of the wedges "D D".

"K K", etc., are plates extending from tie to tie at the joint, provided with spiking aperture through which the spikes "H H", etc. are driven, and may either be formed with the chair or clamp "C", as shown in Figs. 1 to 4 inclusive, or as a separate plate interlocking with the chair or clamp as illustrated in Figs. 6 and 8.

The joint is made up by placing the rails with their ends on the plate "K K", placing the angle bars or fish plates "B B" in position as shown, inserting the pins "G" in the holes provided for them in the angle bars and rails, and then placing the clamp (where the clamp is made separately from the plates "K") and inserting and driving up the wedge or wedges "D D", until the wedge and chair or clamp interlock at "E".

As shown in the drawings, the wedges "D" are provided with double wedging faces and the clamp "C" has corresponding wedge surfaces. Through the wedging action of one set of surfaces of the wedge and clamp, lateral pressure is brought upon the angle bars "B" to force them into their proper positions, engaging with the under surfaces of the heads of the rails and the upper surfaces of the flanges; and the dimensions of the wedges are so fixed that the elasticity of the

arms of the clamp "C" will, with the wedges driven, exert pressure upon the wedges "D" and hence upon the angle bars "B". The elasticity of the clamp arms is sufficient to allow the arm to spring sufficiently as the wedge is being driven to permit the interlocking surfaces of the wedge and clamp to pass one another and the interlocking of the clamp and wedge is affected automatically by the elasticity of the clamp, causing the clamp arms to spring back and interlock the surfaces of the wedge and clamp arm at "E".

Since the rails and angle bars ordinarily employed are produced by rolling, there will be slight irregularities of the surfaces of the rail and angle bars and the contact between the angle bar and the rail will at first be at high spots of each instead of over the whole surfaces. In bolted joints as ordinarily formed the wearing of the surfaces of contact of the joint under service conditions causes slackness of the joint even when the bolts have originally been well tightened and the nuts have not slackened. With the ordinary type of bolted joint, the vibrations to which the parts are subjected generally causes loosening of the nuts, which further permits the angle bars to leave firm contact with the rail ends. These difficulties of the bolted joint are overcome in my joint through the continuing pressure brought upon the angle bars through the wedges by the elasticity of the arms of the clamp, and the interlocking of the wedge with the clamp prevents any movement of the wedge relative to the clamp. This continuing pressure exerted upon the angle bars causes their surfaces to continue in firm bearing contact with the rail ends as the spots of contact between the angle bars and the rail wear down with the rail in service. The other wedging surfaces of the wedge and clamp provide for vertical pressure when the wedge is driven, and force the flange of the angle bar and the plate "K" into intimate contact with the flange of the rail; and, since the wedges extend some distance each side of the joint and bear upon the under surfaces of the heads in the clamp arms, they with the clamp and plate "K" form a truss to strengthen the joint.

To secure the rails against bodily movement in the direction of length; and, at the same time, provide for the changes in length of the individual rails on account of the changes in temperature, pins "G" are provided which traverse the two angle bars and the web of the rail. Generally it will be sufficient to fit these pins on one side of the joint only and they may be made to fit the holes in the angle bars and rail closely. It will be found in some cases desirable to make these pins with a taper and drive them into the holes so as to give a good bearing of the pins in the holes. In cases where it is desirable to fit pins both sides of the joint, the holes in the angle bars at one side of the joint are made elliptical in shape so as to provide for the small changes in length of the rail due to changes in temperature. The angle bars are notched and the underlying plates "K" have apertures which, when the joint is made up, come in line with the notches in the angle bars. Spikes of the ordinary type are driven to engage with the notches in the angle bars "B" and pass through the apertures in the plates "K" and will hold the angle bars and plates firmly in position upon the ties. Since the pins "G" fitted at one side of the joint fit the holes in the angle bars and rail fairly closely, one end of each rail will be anchored to the ties and any stress in the rail tending to produce movement of the rail as a whole in the direction of its length will be resisted by the ballasting material in which the ties are bedded. The other end of each rail at a joint, being either fitted without pins or with elongated holes in the angle bars, if pins are used, will be free to move through the small distance necessitated by the changes in length due to changes in temperature. Where the joint is made to come between two ties or sleepers, as in the joint illustrated in Figs. 1 to 4; the spikes traverse the angle bars and underlying plate "K" and piercing two ties all contribute to the anchoring of the fixed end of the rail. In practice it will be found that the allowance for expansion at the joint may be so made that at the lowest temperature to which the rails are subjected the joint will be but very slightly open, whereas at the higher temperature the joint will be close and the rails under some compressive strains, the rails being sufficiently rigidly secured to hold them in position against such compressive strains.

The end pins "G" in any joint may be made to project slightly beyond the face of the angle bars on opposite sides at the ends of each joint, and a portion of the small end of the wedges grooved so that when the wedges are in place the pins and groove of the wedge will form a stop. Similarly when a single wedge clamp of the type shown in Figs. 6 and 8 is employed the pins "G" may all be made to project and engage with apertures of the clamp so as to lock the clamp in position longitudinally on the rails.

The surfaces of contact of the angle bars and the plate "K" extending under the rail ends at the joint, are in area several times the area of any right section of the unjointed portion of the rail; and these surfaces, by the pressure exerted upon them, are brought into and retained in intimate contact, so that, where the rails form a part of the electrical circuit, should the conductivity per unit of area at the surfaces of contact between the rails or splice bars and the plate "K" be less than the conductivity per unit of sectional area of the continuous portion of the rail, the total con-

ductivity through the surfaces of contact (on account of the greater area of these surfaces) and through the sectional area of the material going to make up the joint may still be at least equal to the conductivity of the continuous unjointed portion of the rail.

In many conditions of service a joint made up in the manner described, without special preparation of the surfaces of contact in the joint, will have sufficient conductivity to meet the requirements of continued service. Since, however, the electrical conductivity at the surfaces of contact in the joint depends so greatly upon the condition of these surfaces, in my invention they are, where necessary, protected from the corrosive action of the atmosphere and other elements present; by having their surfaces coated with zinc, tin or some other element less subject to oxidation than is the case with the steel or iron employed as a material in the manufacture of these parts. In the relatively small parts such as the angle bars and plate "K" this is done by galvanizing, tinning or plating in the usual way. The portions of the surfaces of the rail ends coming into contact with these parts in the made joint may be given a metallic protective coating by removing all scale and grease or dirt by sand blast, filing etc., heating the surface to a proper temperature with a gasolene or other suitable torch and causing a stick of zinc, tin or suitable compound to melt upon the surfaces to be coated and uniformly spread over these surfaces with a brush or other suitable appliance. To still further increase the conductivity at the joint in cases where circumstances may make this necessary, provision is made for placing, as shown in the illustrations, a plate or sheet of some material of relatively high conductivity, such for example as copper, aluminum or zinc, between the bottoms of the flanges at the rail ends and the clamp so that the vertical wedging action of the clamp will draw the surfaces of this plate into intimate contact with the bottom of the flanges of the rail ends and form a suitable bond. Where copper is employed for this bond, the surfaces would ordinarily be coated with a metal, such for example as tin, less subject to oxidation than is copper, to insure better metallic surfaces at the contact of the bond with the bottoms of the rail flanges.

In Figs. 6 and 8 the base plate "K" is separate from the clamp and is notched at the sides to receive the clamp arms and prevent movement of the base plate relative to the clamp; and one clamp arm is arranged to engage directly with the surfaces of one of the angle bars.

In Figs. 7 and 9 the clamp takes the form of a chair, the base of which is carried out transversely instead of along the rails, and fitted with spiking apertures as would be desirable for a joint placed on a tie.

The constructions shown in Figs. 6 to 9 inclusive, carry out the same objects attained by the construction shown in the other figures, although the forms of the parts differ somewhat. Their functions, however, are substantially the same in all of the constructions shown.

The automatic interlocking of the wedges and clamp arms may be effected either by providing a projection on the clamp arm which, as the wedge is being driven into position, will spring the resilient arm outward and, when the wedge reached the locking position, be brought back by the resiliency of the arm and cause their projection on the clamp to engage with a notch on the wedge, as in Figs. 1 to 5 inclusive; or a projection may be provided on the wedge face as in Figs. 6 to 10 inclusive, the action of which will be entirely similar, the clamp arms springing outward to permit the projections to pass, being returned by the resiliency of the arms when the projection has passed, and interlocking the clamp arm and projection on the wedge. The same ends might be met by forming the clamp and clamp arms of rigid material and the wedges in a resilient material, which instead of bearing over the greater portion of their length would bear near the ends and therefore be capable of springing sufficiently to permit the interlocking parts to pass as the wedge is being driven and spring into engagement with the clamp when the wedge is in position.

Obviously some features of this invention may be used without others, and the invention may be embodied in widely varying forms.

Therefore without limiting the invention to the constructions shown and described, nor enumerating equivalents, I claim and desire to secure by Letters Patent the following:

1. A self locking wedge clamp, comprising a clamp body with suitably formed, resilient, arms extending upwardly and inwardly and a self locking wedge constructed with wedging surfaces to engage with the clamp body and other bodies to secure pressure between the clamp and said bodies, the said wedge and one of the said clamp arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position, for substantially the purposes set forth.

2. A self locking wedge clamp, comprising a clamp body with suitably formed, resilient, arms extending upwardly and inwardly, and self locking wedges each constructed with wedging surfaces to engage with the clamp body and other bodies to secure pressure between the said clamp and other bodies, the said wedges and said clamp arms being constructed with suitably formed surfaces

adapted, automatically, to interlock to prevent slackening of the wedges when driven into position, for substantially the purposes set forth.

3. A self locking wedge clamp, comprising a clamp body with suitably formed, resilient, arms extending upwardly and inwardly, and a self locking wedge constructed to engage with the clamp body and other bodies to secure pressure in two directions, approximately at right angles, between said clamp and other bodies, the said wedge and one of the said clamp arms being constructed with suitably formed surfaces adapted automatically to interlock to prevent slackening of the wedge when driven into position, for substantially the purposes set forth.

4. A self locking wedge clamp, comprising a clamp body with suitably formed, resilient, arms extending upwardly and inwardly; and self locking wedges, each constructed with double wedging surfaces to engage with the clamp body and other bodies to secure pressure in two directions approximately at right angles between said clamp and other bodies, the said wedges and the said clamp arms being constructed with suitably formed surfaces adapted automatically to interlock to prevent slackening of the wedges when driven into position, for substantially the purposes set forth.

5. A rail joint; comprising the rails; a chair, having resilient arms extending upwardly and inwardly; and self locking wedges, constructed to engage with the chair and other parts of the joint at opposite sides of the rails to retain them in surface and alinement, each of the said wedges and the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedges when driven into position; for substantially the purposes set forth.

6. A rail joint; comprising the rails; a chair, having resilient arms extending upwardly and inwardly; self locking wedges, constructed to engage with the chair and other parts of the joint at opposite sides of the rails to retain them in surface and alinement, each of the said wedges and the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedges when driven into position; and means to prevent movement of one rail with respect to the chair and wedges; for substantially the purposes set forth.

7. A rail joint comprising the rails; a chair or clamp body having resilient arms extending upwardly and inwardly; self-locking wedges constructed to engage with the chair and other parts of the joint at opposite sides of the rails to retain them in surface and alinement, each of the said wedges and the said chair arms being constructed with suitably formed surfaces adapted automatically to interlock to prevent slackening of the wedges when driven into position; means to prevent movement of one rail with respect to the chair and wedges; and a base plate interlocking with the said chair or clamp body and extending for a portion of its length beyond the edges of the bases of the rails and provided with spiking apertures; for substantially the purposes set forth.

8. A rail joint; comprising the rails; a chair having resilient arms extending upwardly and overturned inwardly at their upper edges; and self locking wedges, constructed with double wedging surfaces to engage with the chair and other parts of the joint at opposite sides of the rails to secure an upward pressure of the parts of the joint upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, each of the said wedges and the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedges when driven into position; for substantially the purposes set forth.

9. A rail joint comprising the rails; a chair having resilient arms extending upwardly and overturned inwardly at their upper edges; self-locking wedges constructed with double wedging surfaces to engage with the chair and other parts of the joint at opposite sides of the rails to secure an upward pressure of the parts of the joint upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, each of the said wedges and the said chair arms being constructed with suitably formed surfaces adapted automatically to interlock to prevent slackening of the wedges when driven into position; and means to prevent movement of one rail with respect to the chair and wedges; for substantially the purposes set forth.

10. A rail joint; comprising the rails; a clamp body or chair, having resilient arms extending upwardly and overturned inwardly at their upper edges; self locking wedges, constructed with double wedging surfaces, to engage with the clamp body or chair and other parts of the joint at opposite sides of the rails to secure an upward pressure of the parts of the joint upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, the said wedges and the said clamp or chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedges when driven into position; means to prevent movement of one rail with respect to the clamp body or chair and wedges; and

a base plate, interlocking with the clamp body or chair and extending for a portion of its length beyond the edges of the bases of the rails and provided with spiking apertures; for substantially the purposes set forth.

11. A rail joint; comprising the rails; a fish bar; a chair, having resilient arms extending upwardly and inwardly; and a self locking wedge, constructed to engage with the chair and other parts of the joint at the side of the rails opposite to the fish bar to retain the rails in surface and alinement, the said wedge and one of the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position; for substantially the purposes set forth.

12. A rail joint; comprising the rails; a fish bar; a chair, having resilient arms extending upwardly and inwardly; a self locking wedge, constructed to engage with the chair and other parts of the joint at the side of the rails opposite to the fish bar to retain them in surface and alinement, the said wedge and one of the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position; and means to prevent movement of one rail with respect to the fish bar, chair and wedge; for substantially the purposes set forth.

13. A rail joint comprising the rails; a fish bar; a chair or clamp body having resilient arms extending upwardly and inwardly; a self-locking wedge constructed to engage with the chair and other parts of the joint at the side of the rails opposite to the fish bar to retain them in surface and alinement, the said wedge and one of the chair arms being constructed with suitably formed surfaces adapted automatically to interlock to prevent slackening of the wedges when driven into position; means to prevent movement of one rail with respect to the fish bar, chair and wedge; and a base plate, interlocking with the clamp body or chair and extending for a portion of its length beyond the edges of the bases of the rails and provided with spiking apertures; for substantially the purposes set forth.

14. A rail joint comprising the rails; a fish bar; a chair, having resilient arms extending upwardly and inwardly, one of the said arms being overturned inwardly at its upper edge; and a self locking wedge constructed with double wedging surfaces to engage with the chair and other parts of the joint at the side of the rails opposite to the said fish bar to secure an upward pressure of the parts of the joint upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, the said wedge and one of the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position; for substantially the purposes set forth.

15. A rail joint comprising the rails; a fish bar; a chair having resilient arms extending upwardly and inwardly, one of the said arms being overturned inwardly at its upper edge; and a self locking wedge, constructed with double wedging surfaces to engage with the chair and other parts of the joint at the side of the rails opposite to the said fish bar to secure an upward pressure of the parts of the joint upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, the said wedge or wedges and one or both of the said chair arms being constructed with suitably formed surfaces adapted automatically to interlock to prevent slackening of the wedge when driven into position; and means to prevent movement of one rail with respect to the chair and wedges; for substantially the purposes set forth.

16. A rail joint comprising the rails; a fish bar; a clamp body or chair having resilient arms extending upwardly and inwardly one of the said arms being overturned inwardly at its upper edge; a self locking wedge constructed with double wedging surfaces to engage with the clamp body or chair and other parts of the joint at the side of the rails opposite to the fish bar to secure an upward pressure of the parts of the joint upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, the said wedge and one of the arms of the said clamp body or chair being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position; means to prevent movement of one rail with respect to the fish bar and wedge; and a base plate, interlocking with the said clamp body or chair and extending for a portion of its length beyond the edges of the bases of the rails and provided with spiking apertures; for substantially the purposes set forth.

17. A rail joint; comprising the rails; a fish bar, having a flange projecting beyond the edge of the bases of the rails, provided with spiking apertures in said projecting flange; a chair, having a base provided with spiking apertures coöperating with the spiking apertures in the projecting flange of said fish bar and resilient arms extending upwardly and inwardly, one of the said arms being overturned inwardly at its upper edge; a wedge, constructed with double wedging surfaces to engage with the chair and other parts of the joint at the side of the rails op-

posite to the said fish bar to secure an upward pressure of the parts of the joints upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, the said wedge and one of the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position; means to prevent movement of one rail with respect to the chair and other parts of the joint; and spikes traversing the coöperating apertures in the fish bar flange and chair base at one side of the rails and the apertures in the chair base at the other side thereof; for substantially the purposes set forth.

18. A rail joint; comprising the rails; a fish bar, having a flange projecting beyond the edges of the bases of the rails provided with spiking apertures in said projecting flange; a clamp body or chair having resilient arms extending upwardly and inwardly, one of the said arms being overturned inwardly at its upper edge; a self locking wedge constructed with double wedging surfaces to engage with the clamp body or chair and other parts of the joint at the side of the rails opposite to the fish bar to secure an upward pressure of the parts of the joint upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, the said wedge and one of the said clamp or chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position; means to prevent movement of one rail with respect to the fish bar, chair and wedge; a base plate interlocking with the said clamp body or chair and extending for a portion of its length beyond the edges of the bases of the rails and provided with spiking apertures, those at one side of the rails coöperating with the spiking apertures in the projecting flange of the said fish bar; and spikes traversing the coöperating apertures in the fish bar flange and base plate at one side of the rails and the apertures of the base plate at the other side thereof; for substantially the purposes set forth.

19. A rail joint; comprising the rails; fish bars; a chair, having resilient arms extending upwardly and inwardly; and a self locking wedge or self locking wedges, constructed to engage with the chair and other parts of the joint to secure pressure upon the parts of the joint, the said wedge or wedges and one or both of the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position; for substantially the purposes set forth.

20. A rail joint; comprising the rails; fish bars; a chair, having resilient arms extending upwardly and inwardly; and a self locking wedge or self locking wedges, constructed with double wedging surfaces to secure an upward pressure of the parts of the joint upon the lower surfaces of the heads and bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, the said wedge or wedges and one or both of the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedge when driven into position; for substantially the purposes set forth.

21. A rail joint; comprising the rails; fish bars; a chair, having resilient arms extending upwardly and inwardly; a self locking wedge or self locking wedges, constructed to engage with the chair and other parts of the joint to secure pressure upon the parts of the joint, the said wedge or wedges and one or both of the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedges when driven into position; and means to prevent movement of one rail with respect to the fish bars and chair for substantially the purposes set forth.

22. A rail joint; comprising the rails; fish bars; a chair, having resilient arms extending upwardly and overturned inwardly at their upper edges; a self locking wedge or wedges constructed with double wedging surfaces to engage with the chair and other parts of the joint to secure an upward pressure of the parts of the joint upon the lower surfaces of the bases of the rails and a downward pressure of the parts of the joint upon the upper surfaces of the bases of the rails, the said wedge or wedges and the said chair arms being constructed with suitably formed surfaces adapted, automatically, to interlock to prevent slackening of the wedges when driven into position; and means to prevent movement of one rail with respect to the fish bars and chair; for substantially the purposes set forth.

23. A rail joint comprising the rails; fish bars, having flanges extending beyond the edges of the base of the rails provided with spiking apertures therein; means to prevent relative movement longitudinally of the fish bars and one rail; a rail chair, comprising a base provided with spiking apertures adapted to coöperate with the spiking apertures in the flanges of the fish bars and suitably formed arms extending upwardly and inwardly; spikes passing through the coöperating apertures of the chair base and fish bar flanges; a suitable wedge or wedges constructed to exert wedging forces between the chair and other parts of the joint and automatically to interlock with an arm of the chair when driven

into position, for substantially the purposes set forth.

24. A rail joint, comprising the rails; fish bars, having flanges extending beyond the edges of the base of the rails provided with spiking apertures therein; means to prevent relative movement, longitudinally, of the fish bars and one rail; a rail chair, comprising a base provided with spiking apertures adapted to coöperate with spiking apertures in the flanges of the fish bars and two suitably formed arms extending upwardly and inwardly; spikes passing through the coöperating apertures of the chair base and fish bar flanges; and a suitable wedge or wedges constructed with double wedging surfaces to exert wedging forces in directions approximately at right angles between the chair and the other parts of the joint and automatically to interlock with an arm of the chair when driven into position, for substantially the purposes set forth.

25. A rail joint comprising the rails, fish bars, means to prevent relative movement longitudinally of the fish bars and one rail, a clamp body or chair having suitably formed arms extending upwardly and inwardly, a self locking wedge or wedges constructed to exert wedging forces between the chair and other parts of the joint and automatically to interlock with one or both of the arms of the chair when driven into position, and a base plate interlocking with the said clamp body or chair and extending for a portion of its length beyond the edges of the bases of the rails and provided with spiking apertures, for substantially the purposes set forth.

26. A rail joint comprising the rails, fish bars, means to prevent relative movement longitudinally of the fish bars and one rail, a clamp body or chair having suitably formed arms extending upwardly and inwardly, a self locking wedge or wedges constructed with double wedging surfaces to exert wedging forces in directions approximately at right angles between the chair and other parts of the joint and automatically to interlock with one or both of the arms of the chair when driven into position and a base plate interlocking with the said clamp body or chair and extending for a portion of its length beyond the edges of the bases of the rails and provided with spiking apertures, for substantially the purposes set forth.

27. A rail joint, comprising the rails; fish bars, having flanges extending beyond the edges of the base of the rails provided with spiking apertures therein; a base plate extending, for a portion of its length, beyond the base of the rails and provided with spiking apertures coöperating with the spiking apertures in the flanges of the fish bars; spikes passing through the coöperating apertures in the flanges of the fish bars and the base plate; a clamp constructed to so engage with the base plate as to prevent longitudinal movement; and a suitable wedge or wedges constructed to exert wedging forces between the clamp and the other parts of the joint and automatically to interlock with an arm or arms of the clamp when driven into position, for substantially the purposes set forth.

28. A rail joint, comprising the rails; fish bars, having flanges extending beyond the edges of the base of the rails, provided with spiking apertures therein; a base plate extending, for a portion of its length, beyond the base of the rails and provided with spiking apertures coöperating with the spiking apertures in the flanges of the fish bars and base plate; spikes passing through the coöperating apertures in the flanges of the fish bars and the base plate; a clamp constructed to so engage with the base plate as to prevent longitudinal movement; and a suitable wedge or wedges constructed with double wedging surfaces to exert wedging forces in directions approximately at right angles between the clamp and the other parts of the joint and to automatically interlock with an arm or arms of the clamp when driven into position, for substantially the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

H. G. GILMOR.

Witnesses:
J. J. McCole,
L. W. Gue.