

J. H. BRIGGS.  
 TRAMWAY RAIL.  
 APPLICATION FILED APR. 7, 1909.

944,982.

Patented Dec. 28, 1909.

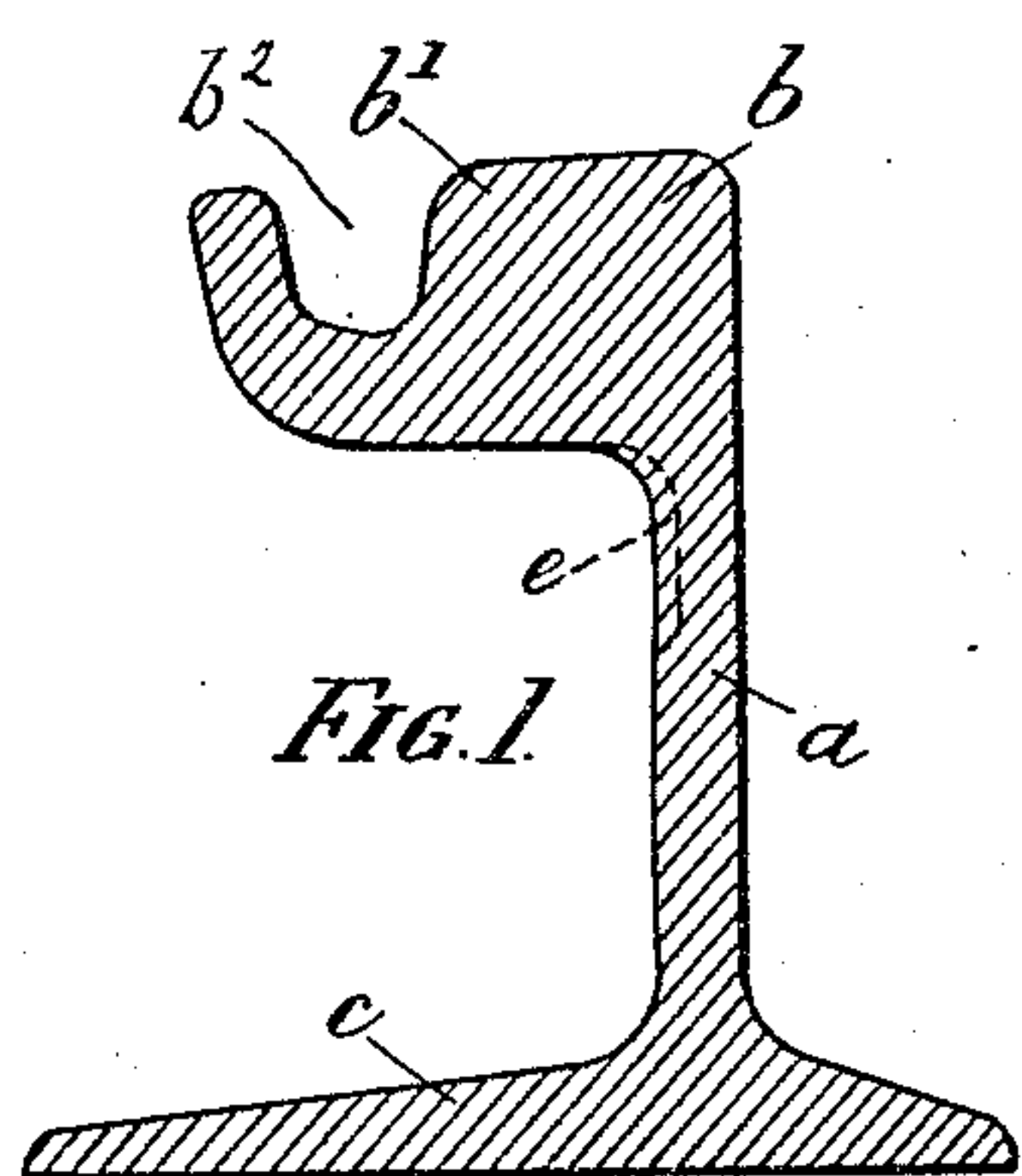


FIG. 1.

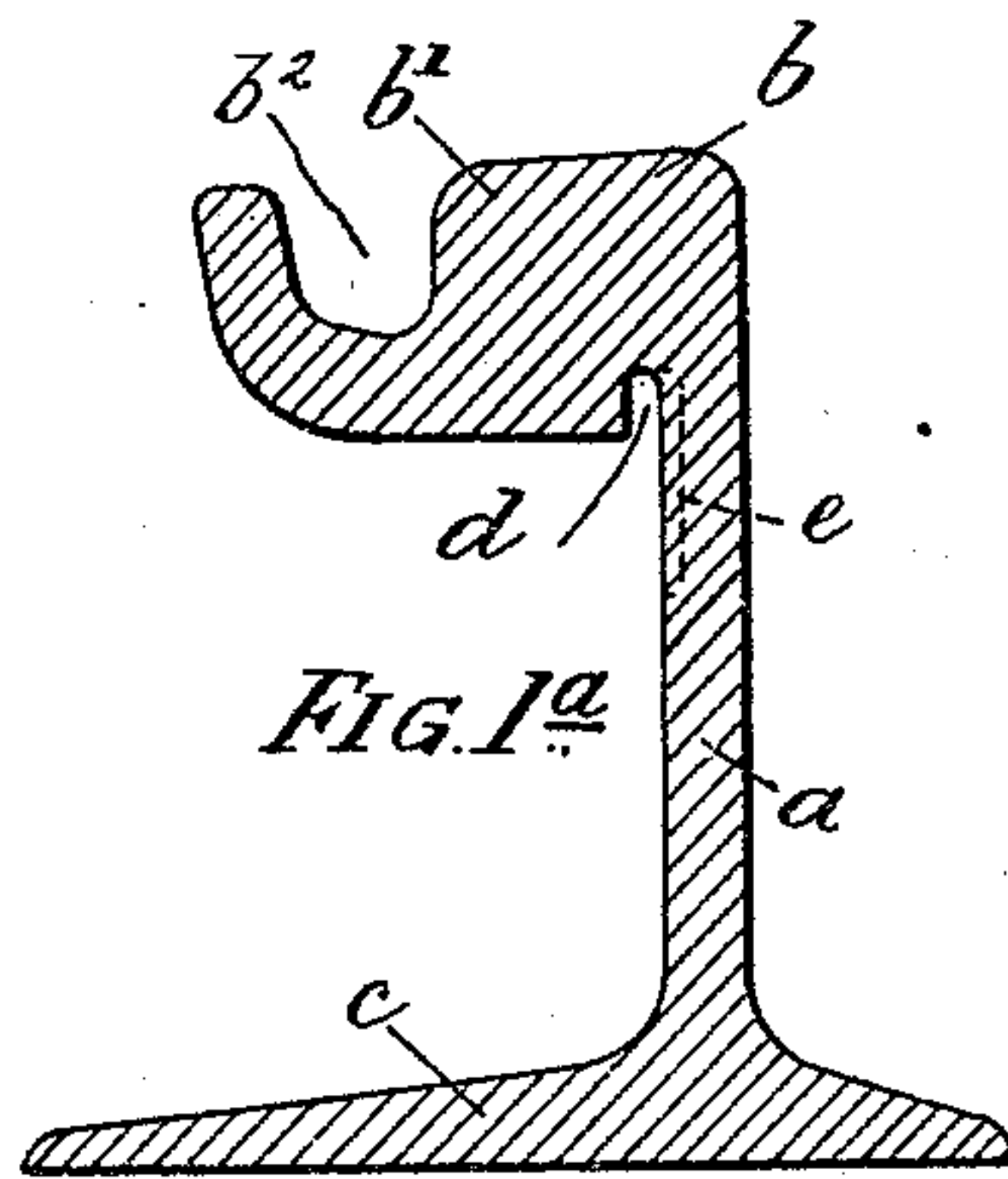


FIG. 1<sup>a</sup>.

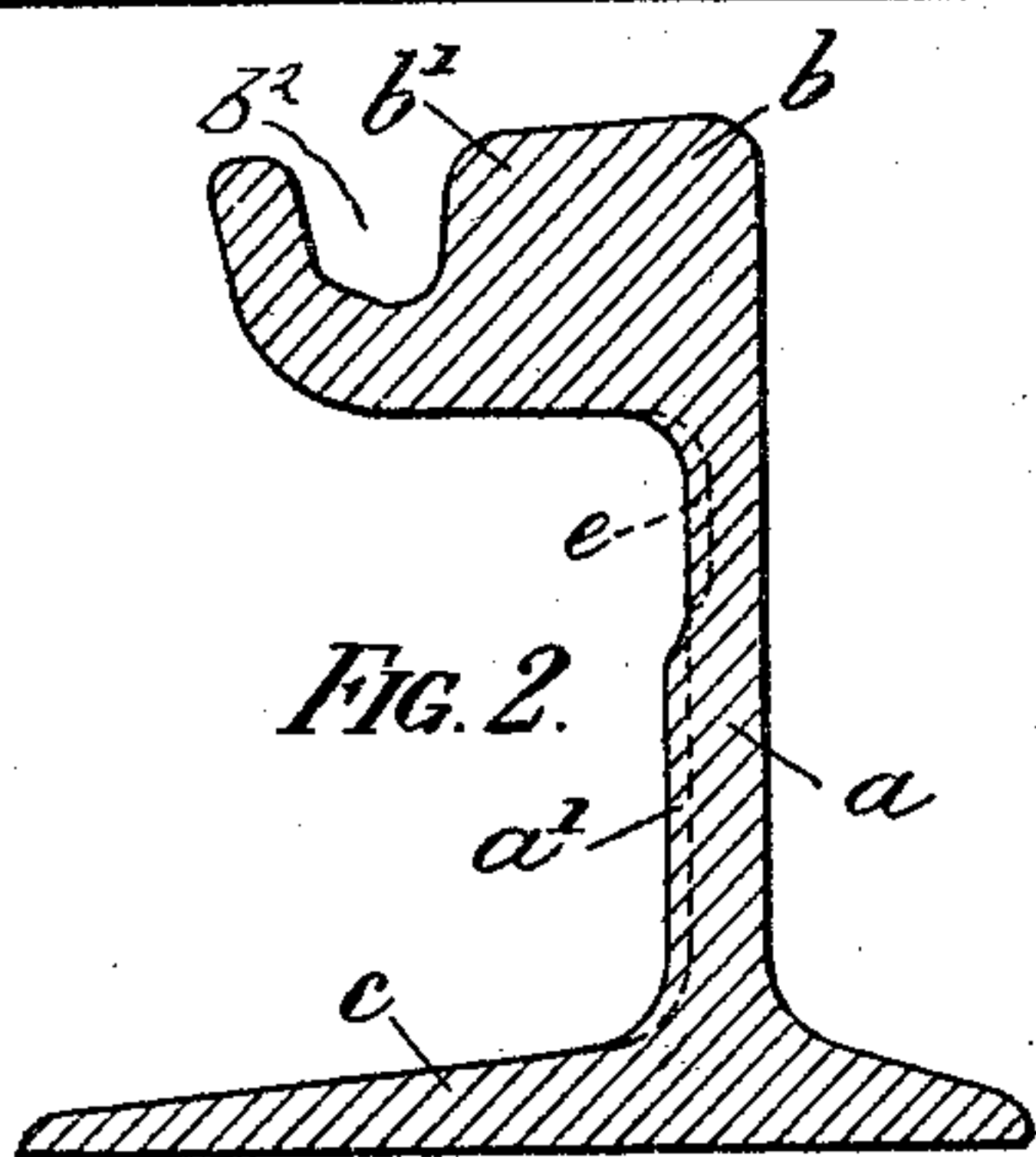


FIG. 2.

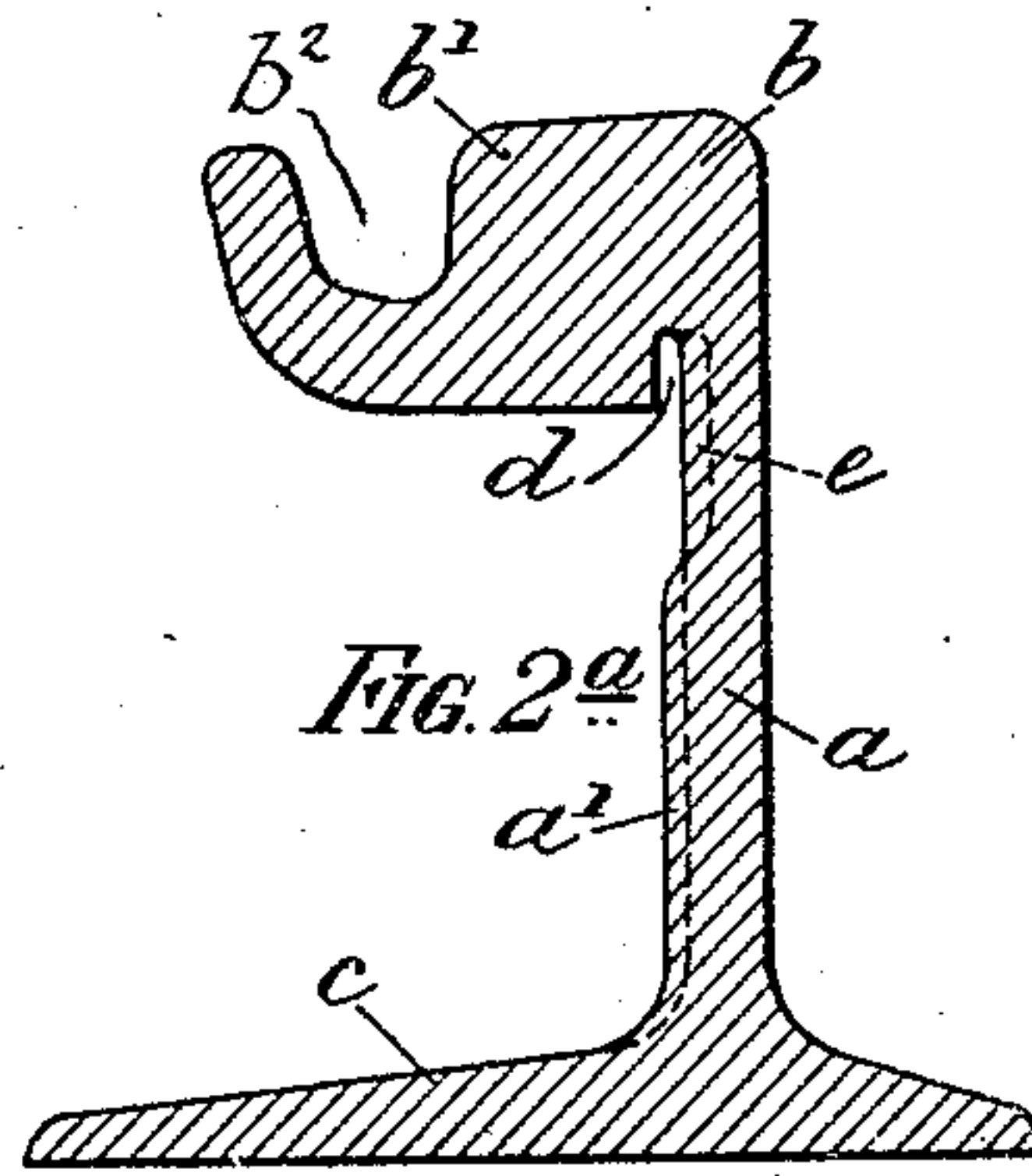


FIG. 2<sup>a</sup>.

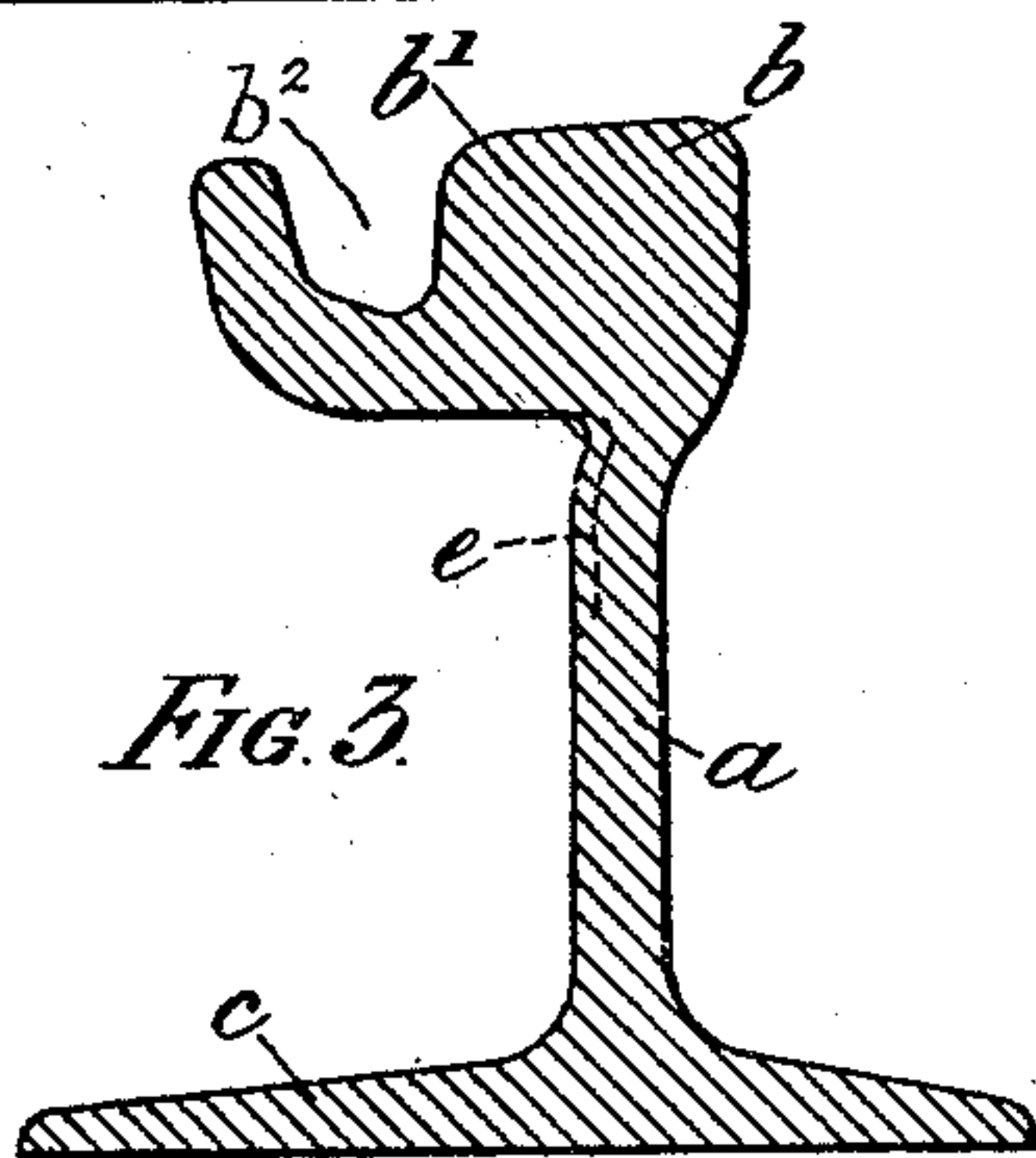


FIG. 3.

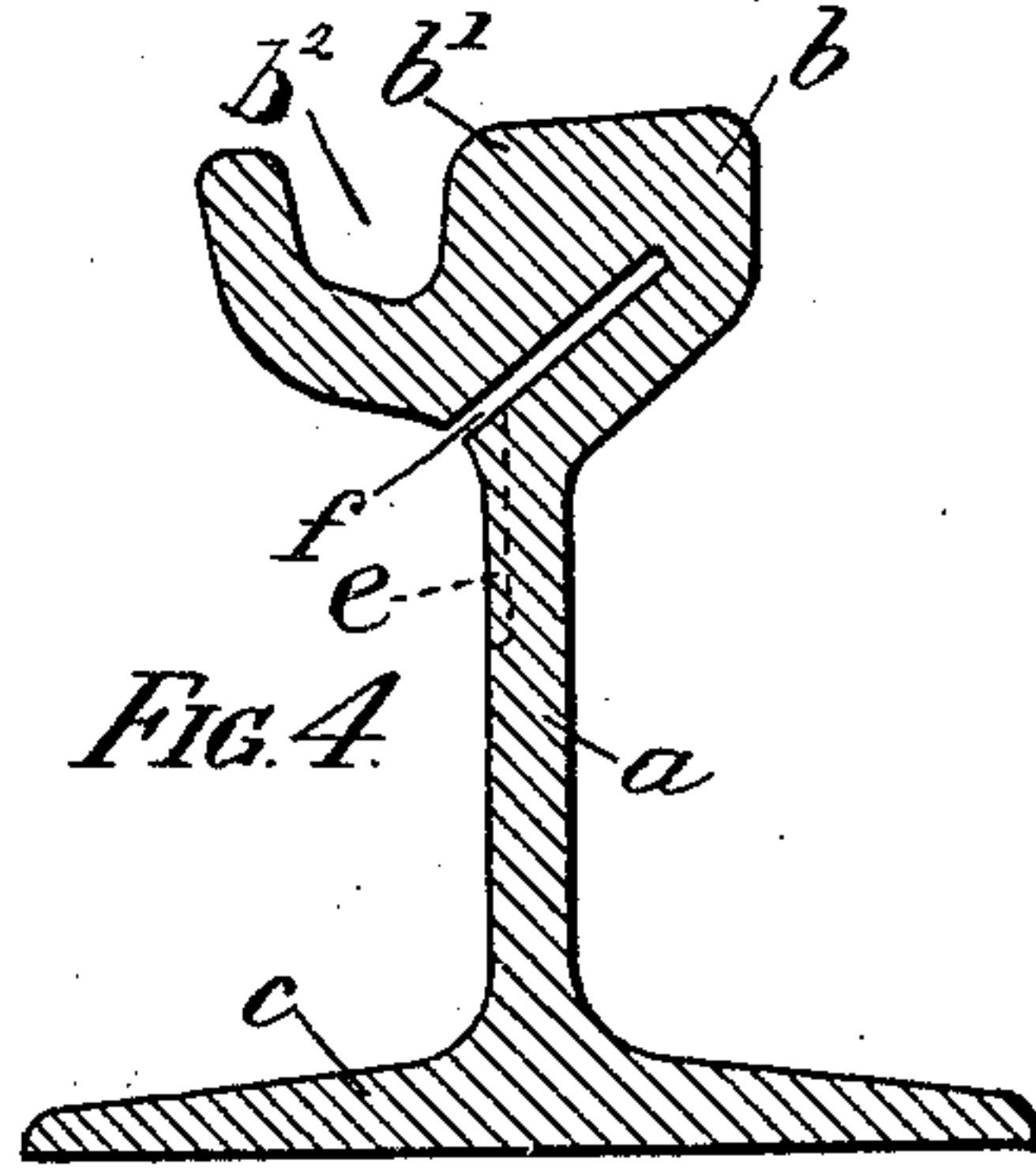


FIG. 4.

WITNESSES

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# UNITED STATES PATENT OFFICE.

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## TRAMWAY-RAIL.

944,982.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed April 7, 1909. Serial No. 488,475.

*To all whom it may concern:*

Be it known that I, JAMES HAINSWORTH BRIGGS, a subject of the King of Great Britain, residing at 13 Claremont road, Headingley, Leeds, in the West Riding of Yorkshire, England, ironmonger, have invented certain new and useful Improvements in Tramway-Rails, of which the following is a specification.

10 The object of the present invention is to minimize the formation of lateral or transverse corrugations on the running surface of tram rails of the simple girder type commonly employed in ordinary road tram lines  
15 in the heads of which rails there are grooves or recesses to receive the flange of the wheels, and with this object the rails, over the whole length of the tram line or such portions as may be liable to corrugation, are so constructed that if the vehicle wheels tend to  
20 climb the crown of the rail in the manner referred to in the specification to Letters Patent No. 904174 of 1908 granted to the present applicant either from the cause therein specified or by the wheel flange  
25 climbing the check, or for other similar reason, this action will necessarily take place on a comparatively unsupported part of the rail head and any such climbing tendency  
30 instead of causing the wheel to rise as at present will, by concentration of weight on the inner side of the rail head, result in depressing this part of the rail in such a manner that, although the rail deflection is of  
35 small amount, the wheel cannot obtain the foot-hold which is necessary for climbing, thus allowing the wheel to run evenly on the outer or rigidly supported part of the rail tread. Consequently with rails so constructed  
40 ed that the inner side yields in the manner described, the wheel does not climb the rail at all, and lateral corrugation of the rail surface due to this cause is obviated. Accordingly, by the present invention such  
45 tram rails are rolled or otherwise constructed so that the inner side of the rail tread tends to yield under abnormal distribution of the wheel load so that the load will be thrown on that part of the crown of the rail  
50 which is more directly supported by the web or at all events will be fairly distributed over the tread surface, this deflection of the comparatively unsupported or inner side of the rail necessarily eliminating any possibility of climbing. In the preferred construction this result is obtained by rolling the

rails with the central vertical plane of the web outside the vertical plane through the medial line of the tread surface of the rail crown, thereby leaving the inner side of the rail head less supported by the rail web than the outer side, and the resulting flexibility may be enhanced and confined to that region by making the rail web of reduced thickness near the top on the inner side or  
60 (which comes to the same thing) making the web with vertical reinforcing corrugations or ribs which do not extend quite to the top of the web.

Instead of the web being as a whole on the  
70 outer side of the medial plane of the rail tread, it may be bent laterally or otherwise so formed that only the upper portion of the web lies on the outer side of this plane; for example an ordinary tramway rail can be  
75 converted into a rail such as contemplated in the present invention in which the junction of the web and the crown of the rail lies on the outer side of the medial plane of the rail tread by a horizontal or inclined  
80 longitudinal slot in the body of the rail head which slot in transverse section extends from the inner side of the rail head toward the outer side and preferably beyond the medial plane of the rail tread. If the web  
85 as a whole is displaced to the outer side as described, the resulting flexibility, which should be confined as far as possible to the upper part of the web, may be augmented by a longitudinal slot in the body of the rail  
90 head on the inner side of the web, but in this case the slot need not be horizontal or inclined toward the outer side of the rail but may be vertical. In all these various modifications, however, the underlying principle  
95 is the same, viz: to construct the rail with the web and crown in such relation to each other that lateral shifting of the load toward the inner side of the rail head will produce a substantially vertical deflection of the inner  
100 side of the rail head with the result already mentioned.

In illustration of the invention a number of rail sections embodying my invention are shown in the drawings appended to this  
105 specification.

In Figure 1 the upright rail web  $a$  is shown as immediately beneath the extreme outer side  $b$  of the rail crown, the inner side  $b'$  thereof being thus overhung to a very considerable extent;  $b^2$  denotes the recess or groove formed in the rail head to receive the



flange of the wheels. Fig. 2 shows the rail web and crown in the same relation but with the rail web formed with vertical corrugations or ribs  $a'$  on the inner side extending from the foot  $c$  of the rail toward but short of the junction of the web and head. Such corrugations may be formed on both sides and may extend over the entire depth of the web, although usually on the inner side they would be as shown in Fig. 2. Instead of the web being in the extreme outer position shown in Figs. 1 and 2 it may of course be in any position intermediate between that and the central position, namely, with the medial planes of the web and tread coincident.

Figs. 1<sup>a</sup> and 2<sup>a</sup> are sections similar to Figs. 1 and 2, but with a longitudinal slot or groove  $d$  extending along the under side of the rail crown close to the inner side of the web.

In Fig. 3 while the lower part of the web  $a$  is substantially co-planar with the middle line of the tread, the upper part is bent outwardly so that the central plane of the junction between crown and web lies on the outer side of the center of the rail tread. The flexibility in the neck may be increased if necessary by thinning it as indicated in dotted lines at  $e$  in Figs. 1, 1<sup>a</sup>, 2, 2<sup>a</sup>, 3 and 4.

Fig. 4 shows a rail with crown and web in the ordinary relation geometrically but with an inclined longitudinal slot  $f$  in the rail head which in effect gives a result equivalent to that obtained by forming the rail as shown in Fig. 3.

It will be seen that with rails constructed in the manner described, a lateral shifting of the wheel load toward the inner side of the head produces a deflection of the inner side without simultaneously raising the outer side, either at all or to any sensible extent, and further that this deflection of the inner side is substantially vertical and involves little or no sidewise movement of the inner side of the tread in the direction of the wheel flange such as would arise for

example if the rail web were made more or less flexible over its entire depth.

Having thus described the nature of this invention and the best means I know of carrying the same into practical effect, I claim:—

1. A roadway tram rail, comprising a foot, an upright web and a head having a groove to accommodate a wheel flange, said web and head being disposed with the central plane of the web at its junction with the rail head on the outer side of the central line of the rail tread; substantially as described.

2. A tram rail of the girder type comprising a foot, a web and a head, said web and head being disposed with the central plane of the web at its junction with the rail head on the outer side of the center line of the rail tread, and said web being weakened locally on its inner side adjacent to the junction with the rail head.

3. A tram rail of the girder type comprising a foot, a web and a head, said rail being slotted longitudinally throughout its length on its inner side near the junction of the rail head with the web substantially as and for the purpose specified.

4. A tram rail of the girder type comprising a foot, a web and a head, said rail having an upwardly and outwardly inclined longitudinal slot on its inner side near the junction of the rail head with the web, substantially as described.

5. A girder rail, having a foot, a web extending upwardly from the center of the foot, and a head connected to the upper end of the web and having a tread and guard, the tread and guard being on the same side of the center of the web as the junction of the web and head; substantially as described.

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

JAMES HAINSWORTH BRIGGS.

Witnesses:

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C. E. TAYLOR.