

No. 690,823.

Patented Jan. 7, 1902.

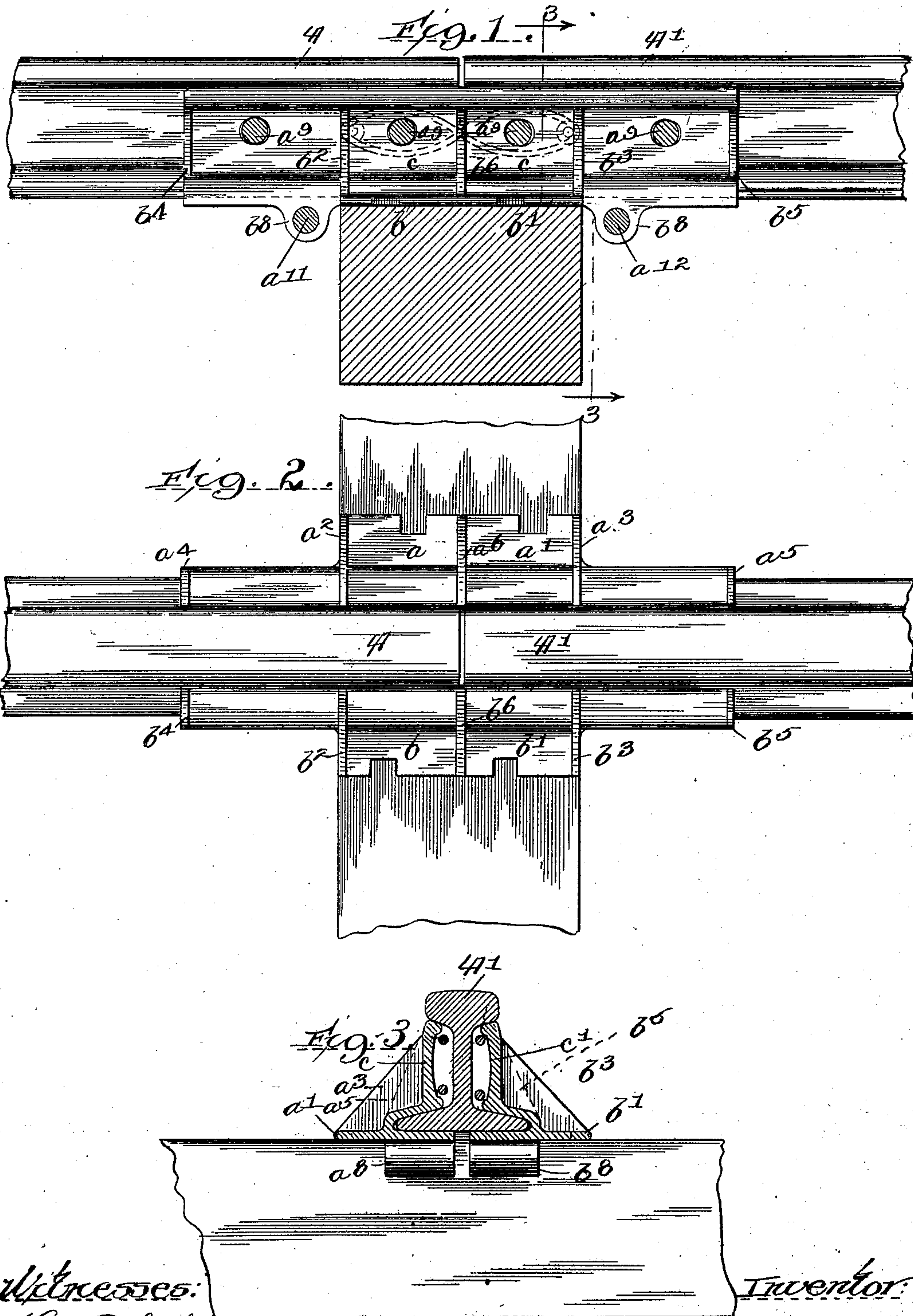
F. BAIN.

RAILWAY RAIL JOINT.

(Application filed Sept. 12, 1901.)

(No Model.)

2 Sheets—Sheet 1.



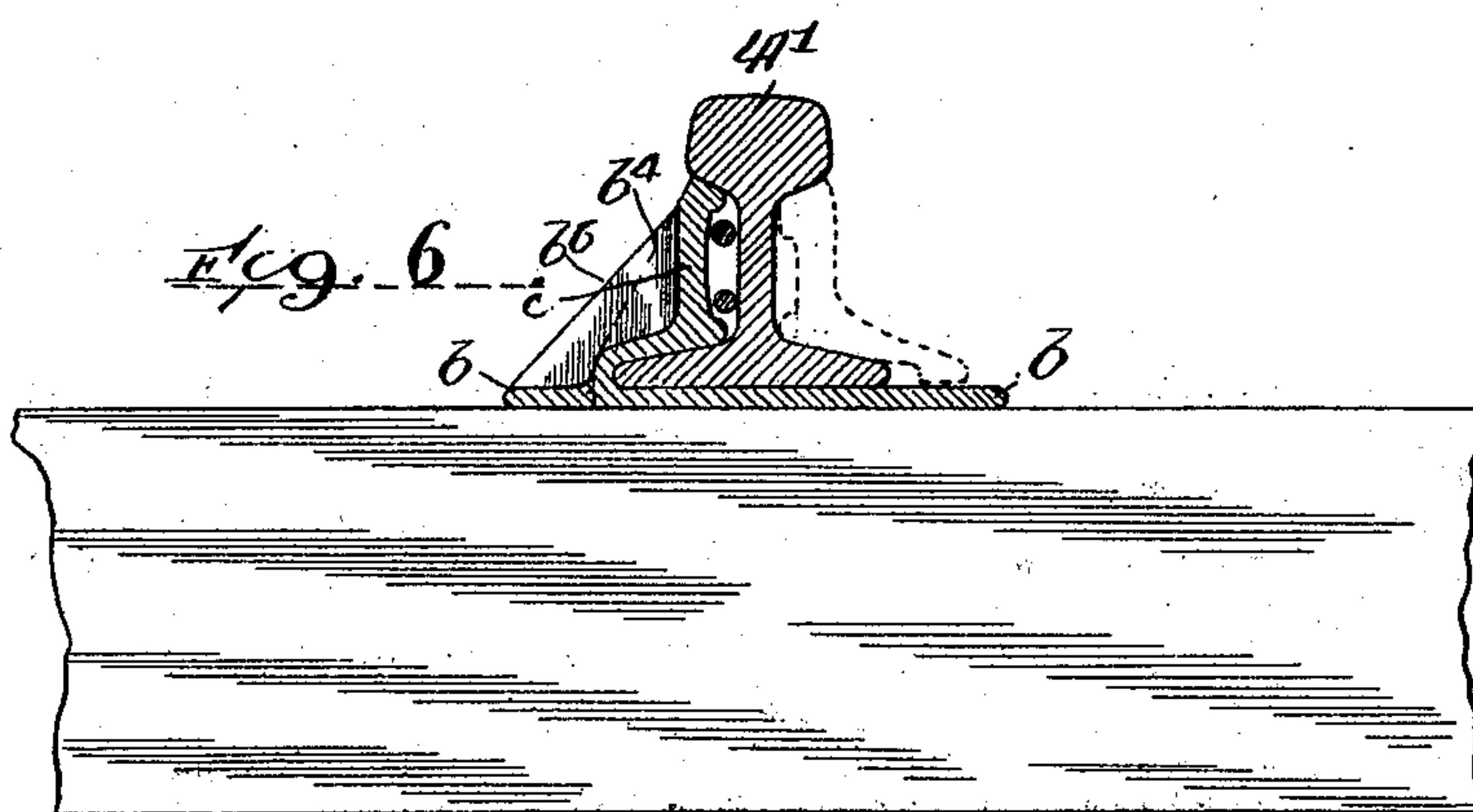
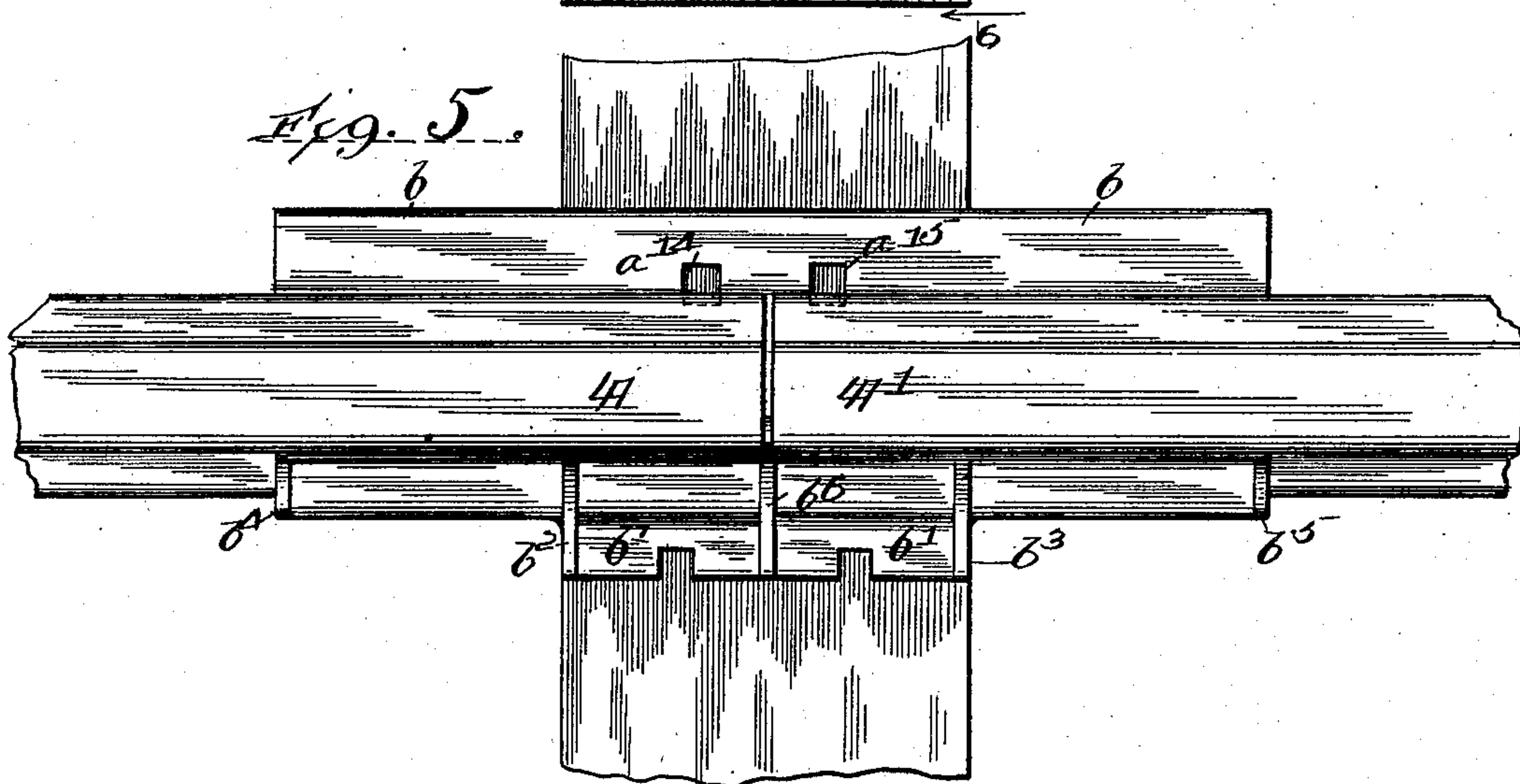
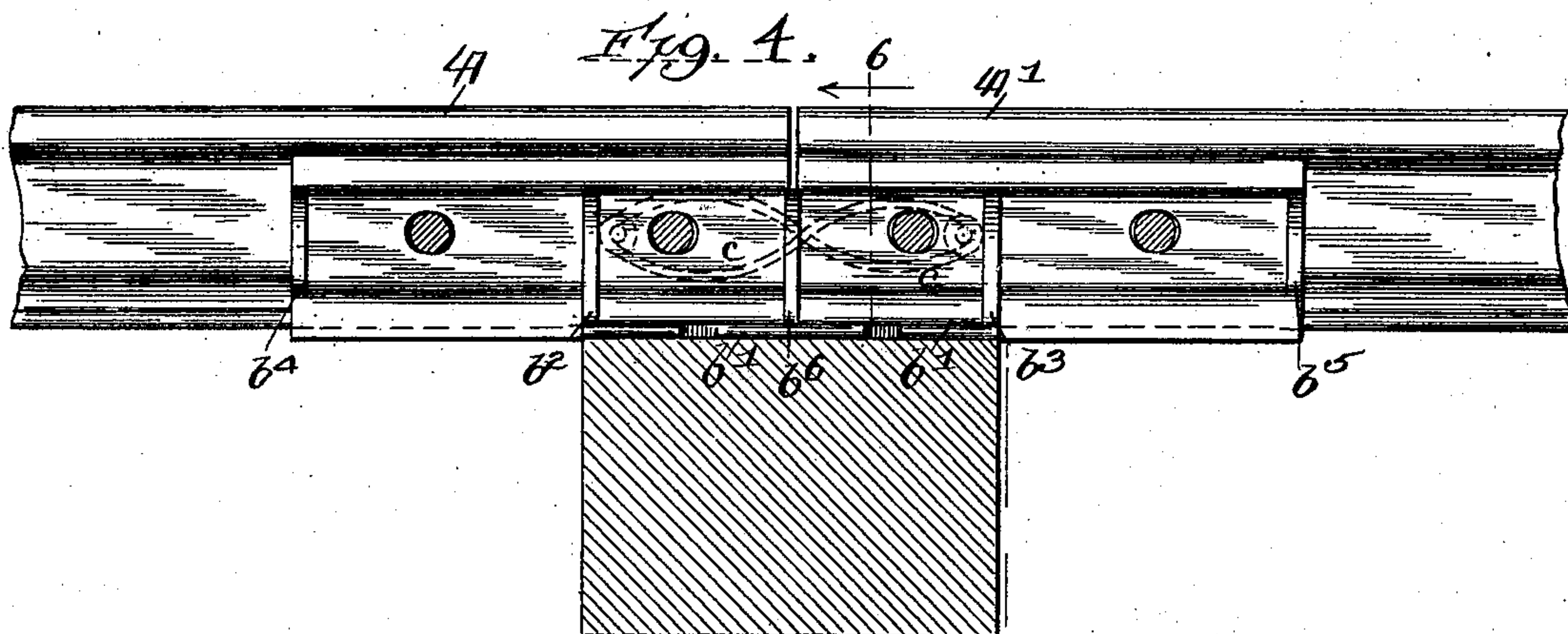
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2 Sheets—Sheet 2.



Witnesses:

Harry B. White.
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Inventor:

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UNITED STATES PATENT OFFICE.

FORÉE BAIN, OF CHICAGO, ILLINOIS, ASSIGNOR TO JAMES G. McMICHAEL,
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RAILWAY-RAIL JOINT.

SPECIFICATION forming part of Letters Patent No. 690,823, dated January 7, 1902.

Application filed September 12, 1901. Serial No. 75,119. (No model.)

To all whom it may concern:

Be it known that I, FORÉE BAIN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Railway-Rail Joints; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in railway-rail joints.

The object of my invention is to provide a rail-joint by means of which the abutting ends of the adjacent rails in a railway-track will be firmly and intimately held together, so as to provide a result that for all intents and purposes is equal in effect to that of a continuous unbroken rail.

By means of my joint the heads of the adjacent rails are supported in a vertical position and the rails are bodily supported against the lateral outwardly-extended strain of the passing train. The mobility of the ends of the rails with reference to each other is avoided when supported by my joint, while sufficient elasticity and strength are afforded by providing an unbroken metal support under the base of the ends of the rails through the entire length of the joint, and a vertical relative displacement of the rails is thereby prevented. The arched outwardly-curved vertical portion contained between the under side of the head and the flange of the rail is strengthened by webs or braces in a plane where the rails meet, which adds great strength to withstand the transverse, vertical, and lateral stress and shock to which the joint is in practice subjected. The economical distribution of metal in the general form and construction of my joint provides one of the highest realizations of strength, rigidity, and elasticity for the purpose for which it is designed.

The drawings show the embodiment of my invention, in which—

Figure 1 is a side elevation of my joint, showing the tie-plate midway between the ends thereof. Fig. 2 is a plan view of the same, showing the manner in which it rests upon the tie. Fig. 3 is a transverse section through lines 3 3 of Fig. 1. Fig. 4 is a side elevation of my joint, showing one section only used in connection with an ordinary fish-

plate or angle-bar, the one section of my improved joint being placed, preferably, on the outside of the track. Fig. 5 is a plan view of the same. Fig. 6 is a transverse section showing the ordinary angle-bar in dotted lines.

In all of the views the same letters of reference indicate similar parts.

My completed joint is composed of two like sections, which are designated *b* and *b'* and which are shown in Figs. 1, 2, and 3 and are designed to be placed on opposite sides of the rails and bolted together by means of bolts passing through the vertical web of the rail and also by means of other bolts passing under the base of the rail and located on either side of the cross-tie.

In the joint shown in Fig. 3 only one section or member of my joint is necessary. It is used in connection with the ordinary angle-bar or fish-plate. In this event I extend the rail base-plate entirely under the rail and have it project slightly beyond the base of the rail, so as to provide a means for spiking the base-plate and the angle-bar to the cross-tie.

a and *a'* and *b* and *b'* are lateral extensions of the rail-base support of each section of the joint. They are located in the center of the section and support the joint upon the tie.

c and *c'* are the vertical arched outwardly-curved sections, which have bearings and form supports between the top surface of the base and the under surface of the head of the rail.

The sections are perforated with holes for the admission of bolts for holding the said sections in contact with the rails.

I provide bolts *a*¹¹ and *a*¹² to be placed in perforated bosses located under the rail. They are designed to pass through the joint, which is extended below the rail for that purpose. Between these bolts I have located the tie-plate, which is adapted to rest upon a tie, immediately above which the abutting ends of the adjacent rails meet. Bolts *a*⁹ are adapted to pass through the upper part of the sections and through the vertical webs of the rails. I join the section *c* with the plate *b* at a point in a plane through the meeting-point of the rails by means of a brace *a*⁶ and *b*⁶. They extend from a point near the top of the vertical outwardly-curved or arched portion *c* to the bottom of the base portions *a* and *b*. They increase the cross-section through the

plane where the two rails meet and add greatly to the rigidity and strength of the joint at the point subjected to the greatest strain.

5 a^8 and b^8 are perforated bosses which are provided on the lower part of the rail beyond the tie-plate or on either side thereof, through which the bolts a^{11} and a^{12} are designed to pass and by means of which the lower parts
10 of the joint are forced into contact with the sides of the rail.

The joint consists, essentially, of a base-plate placed in the center of the joint, which is designed to rest upon the tie, a vertical out-
15 wardly-curved or arched portion, and a folded-over portion, which joins the base-plate with the said curved portion, these parts being reinforced or strengthened by thin ribs or braces properly disposed.

20 The ribs a^2 and a^3 and b^2 and b^3 extend from points near the top of the vertical curved portion c to the top of the laterally-extended extremities a and b of the base-plate, which pass also under the rails A and A' . These ribs form
25 rigid braces or webs for supporting the curved arched portion in a vertical position and for holding the base-plate in the proper relation thereto.

The laterally-extending base-plates afford
30 a large surface in contact with the top of the tie upon which the rail rests, so that the weight which comes upon the rails by the passing of the train will not cause the structure to be embedded in the ties on account of the
35 larger surface over which the pressure is distributed.

There is sufficient space between the inner surface of the vertical outwardly-curved or arched section and the vertical web of the
40 rails for containing the electric bonds that are generally used for electrically joining the abutting ends of the rails, so that the rails may be bonded together by the usual method and the bonds covered by the joint, and thus
45 protect it from accident or intended injury.

When the joint-sections are drawn together by means of the various bolts, the vertical curved portion having correspondingly-angled engaging surfaces, is wedged in tightly
50 between the under surface of the rail and the top surface of the flange and does not come in contact with the vertical web of the rails.

When a single section of my joint is used, as shown in Figs. 4, 5, and 6, an ordinary fish-
55 plate or angle-bar, as shown in dotted lines in Fig. 6, may be used in connection therewith. In that event the base-plate a is extended under the rail and beyond the limit of the said fish-plate, so that a spike may be
60 inserted through the openings a^{14} and a^{15} .

By the construction which I have shown and described the head of the rail is directly supported by the arched outwardly-curved section. A portion of the vertical stress comes
65 directly through the rail-head and angle-bar and is distributed over the larger surface, which bears directly upon the tie. By means

of the arrangement of the parts—the curved portion, rail-bases, braces, and tie-plates—the rail is sustained in a vertical position against
70 lateral thrusts and strains.

All of the parts of my rail-joint are made of a thin but uniform cross-section, so that when the joint is made of malleable iron the annealing process will affect the entire mass
75 of material of which the joint is composed and penetrate sufficiently to render all of the metal malleable, tough, and strong.

All of the webs and braces of my joint are distributed so as to afford the greatest
80 strength and elasticity, and the webs which connect the folded portion with the outwardly-curved portion provide a means for adding great strength to the said sections without proportionately increasing the weight
85 thereof.

Having described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

1. In a rail-joint for securing the ends of
90 rails together, the combination of two like vertical sections curved outwardly from the web of the rail, each adapted to fit the rail along its entire length between the under surface of the head and the flange thereof, a rail
95 base-plate under the base-surface of the rail, extending longitudinally the entire length of the joint, and extending laterally from the middle thereof, forming the tie-plates, an intermediate folded portion between said base-
100 plate and said vertical curved portion, vertical webs connecting said vertical portion, folded portion and tie-plates, and other vertical webs connecting said vertical, out-
105 wardly-curved portion and said folded portion at points between said tie-plate and the ends of said section, substantially as set forth.

2. In a rail-joint for securing the ends of rails together, the combination with an ordinary angle-bar, or fish-plate, of a vertical,
110 outwardly-curved section adapted to fit the rail along its entire length between the under surface of the head and the flange thereof, a continuous-rail base-plate under and beyond the base-surface of the rail, extend-
115 ing uninterruptedly and longitudinally the entire length of the joint-section, and extending laterally to form a central tie-plate, an intermediate, folded portion between said base-plate and said vertical, curved portion,
120 vertical webs connecting said vertical portion, folded portion and central tie-plate, other vertical webs connecting said vertical portion and bolts for securing the said angle-bar and said section to the rails, and said
125 folded portion, substantially as set forth.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

FORÉE BAIN.

In presence of—

M. F. ALLEN,

HARRY R. L. WHITE.