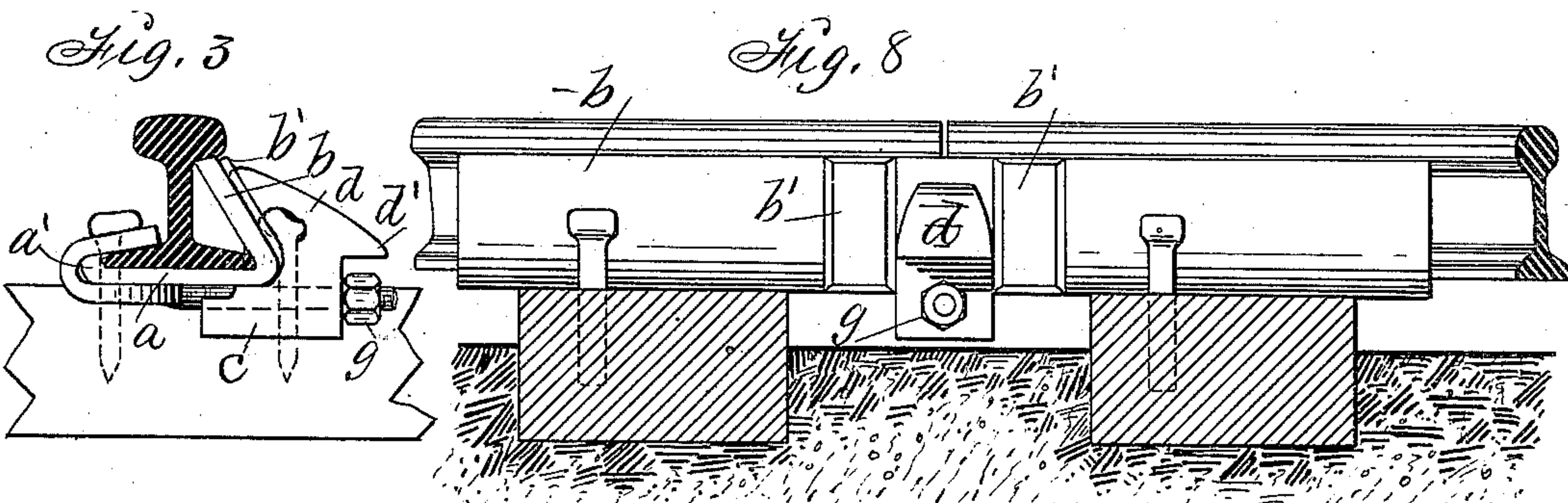
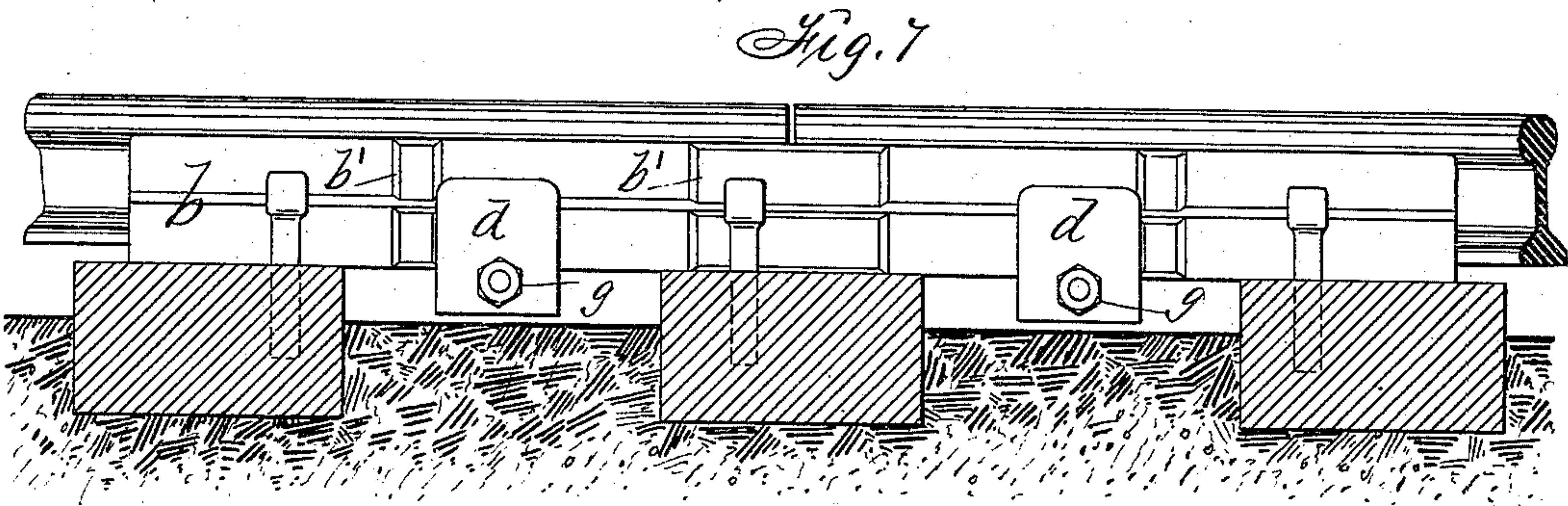
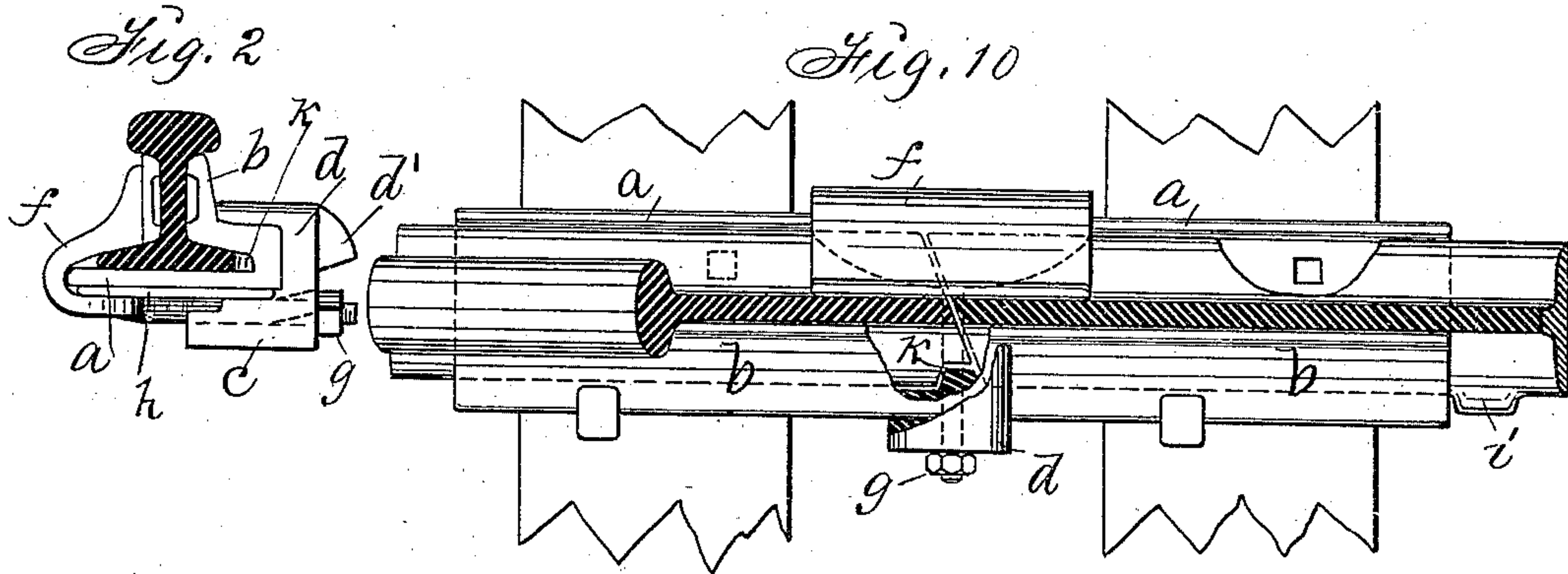
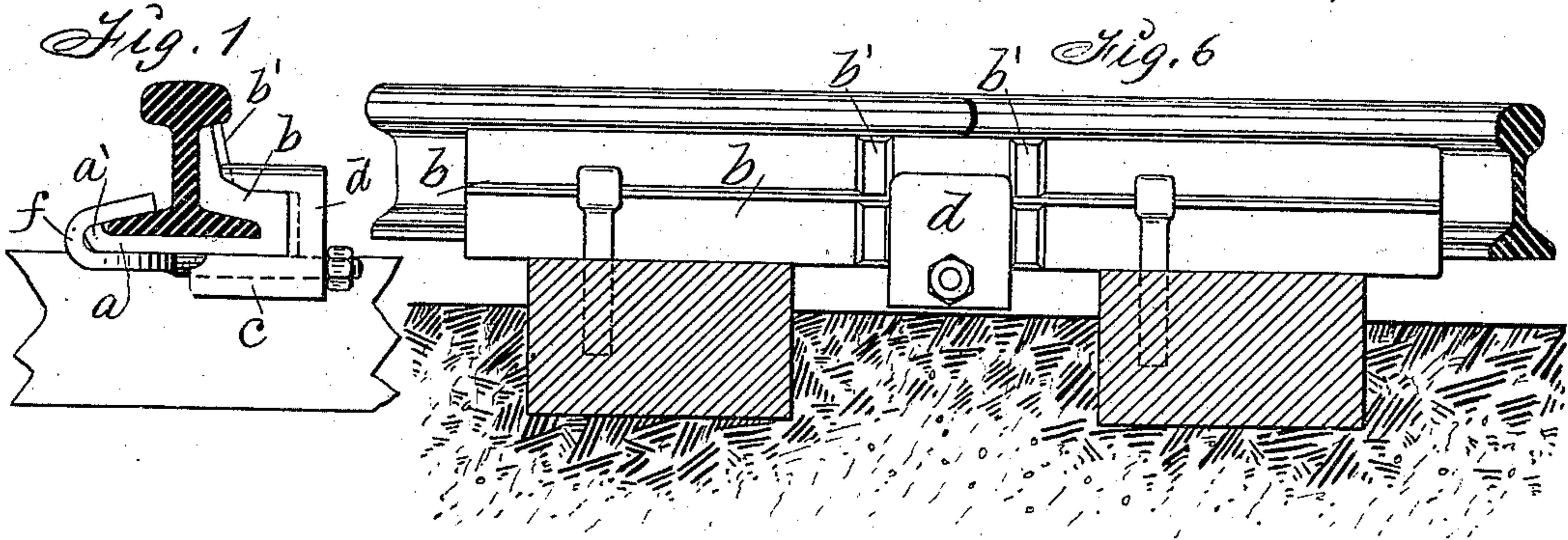


W. F. GOULD.

RAILWAY RAIL JOINT, CHAIR, AND SPLICE.

No. 310,581.

Patented Jan. 13, 1885.



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(No Model.)

2 Sheets—Sheet 2.

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Fig. 9

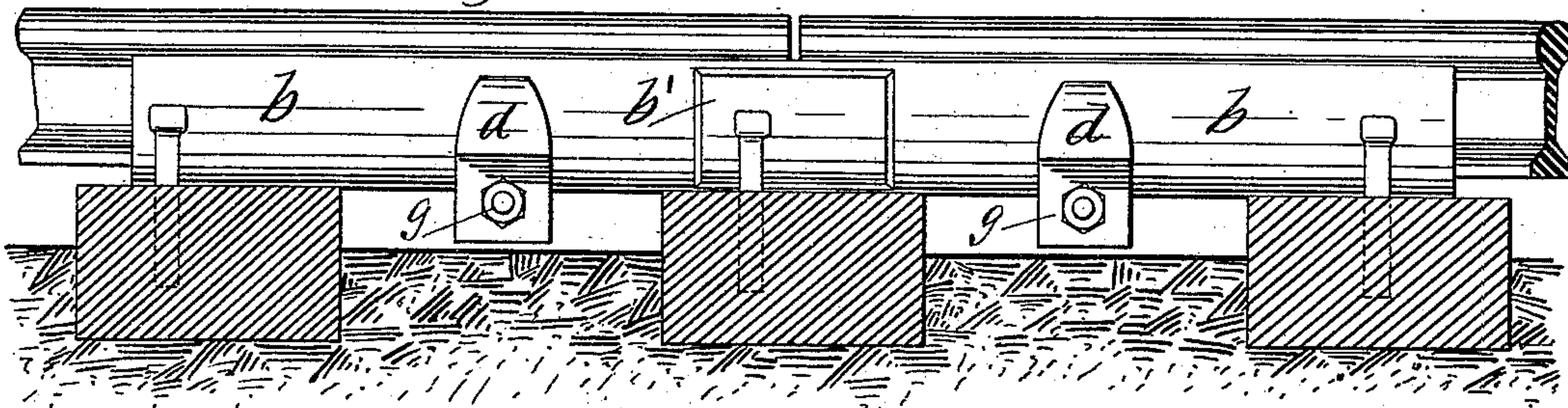


Fig. 11

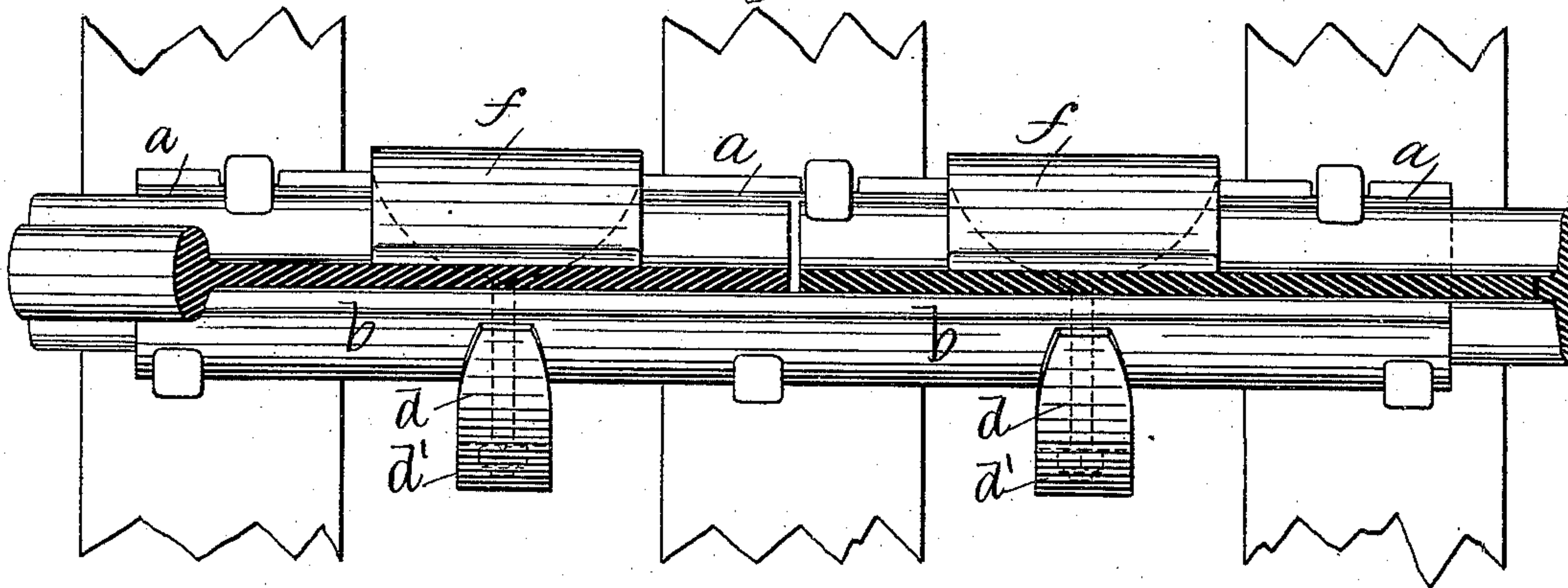


Fig. 4

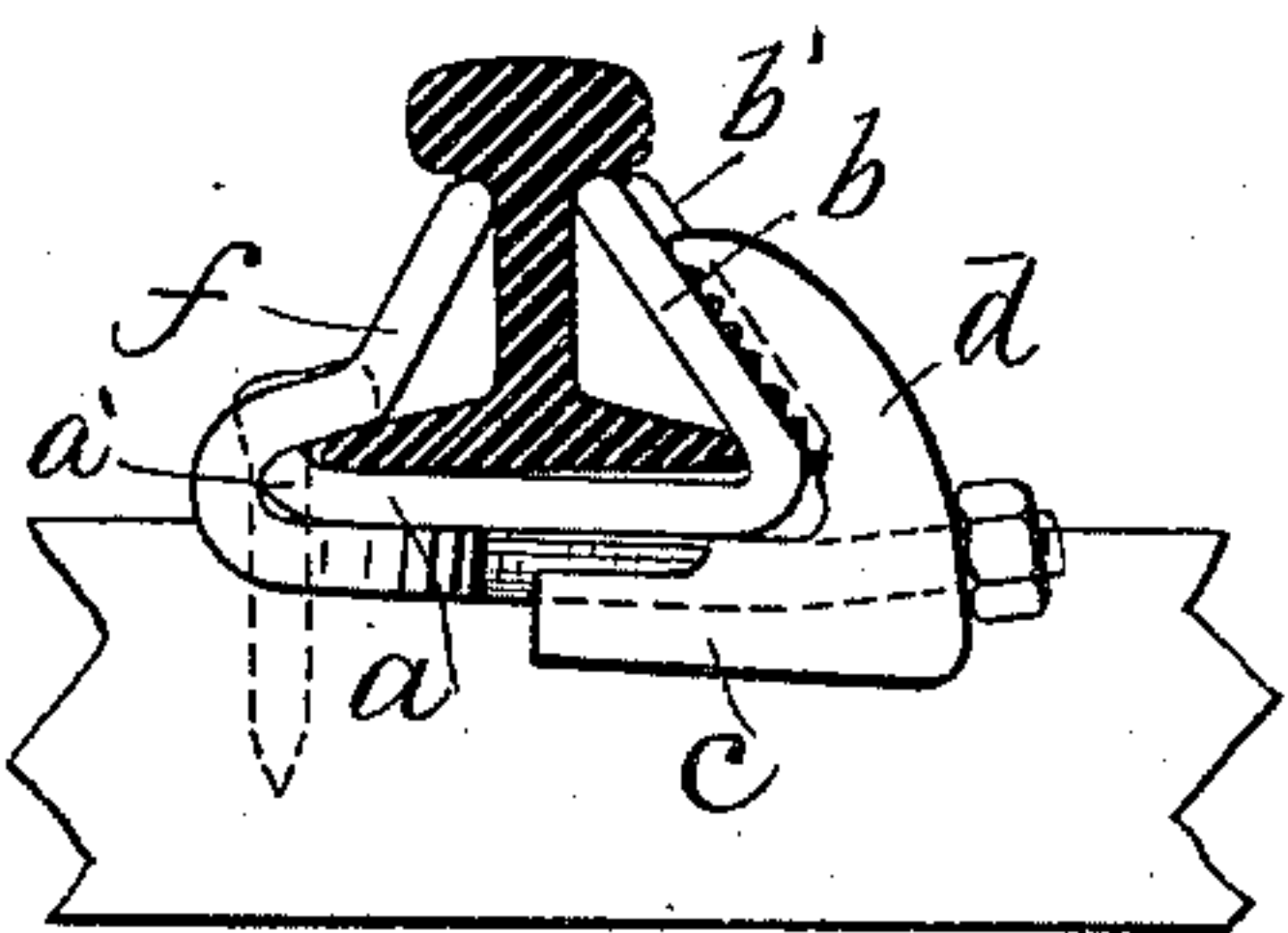


Fig. 5

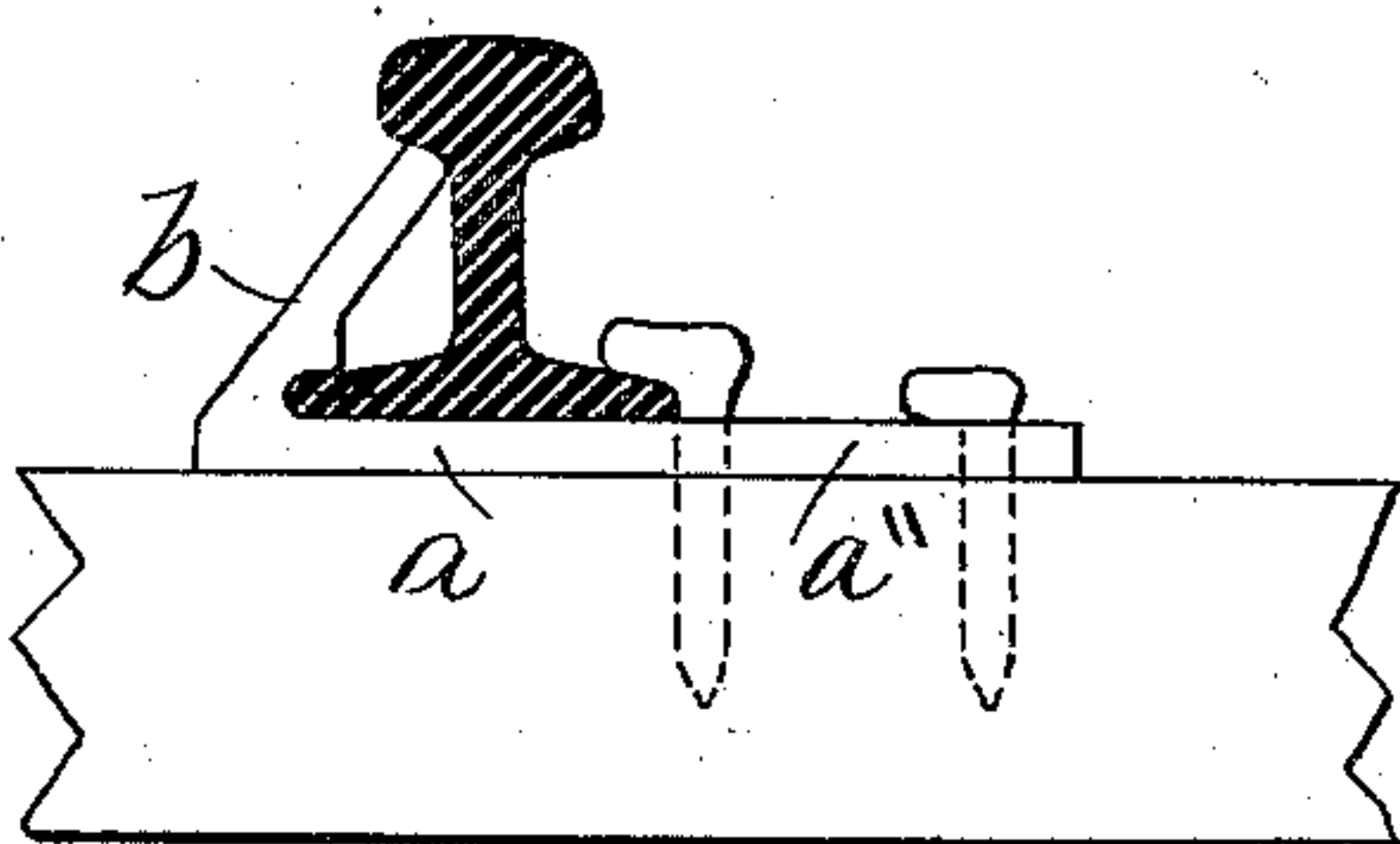


Fig. 9

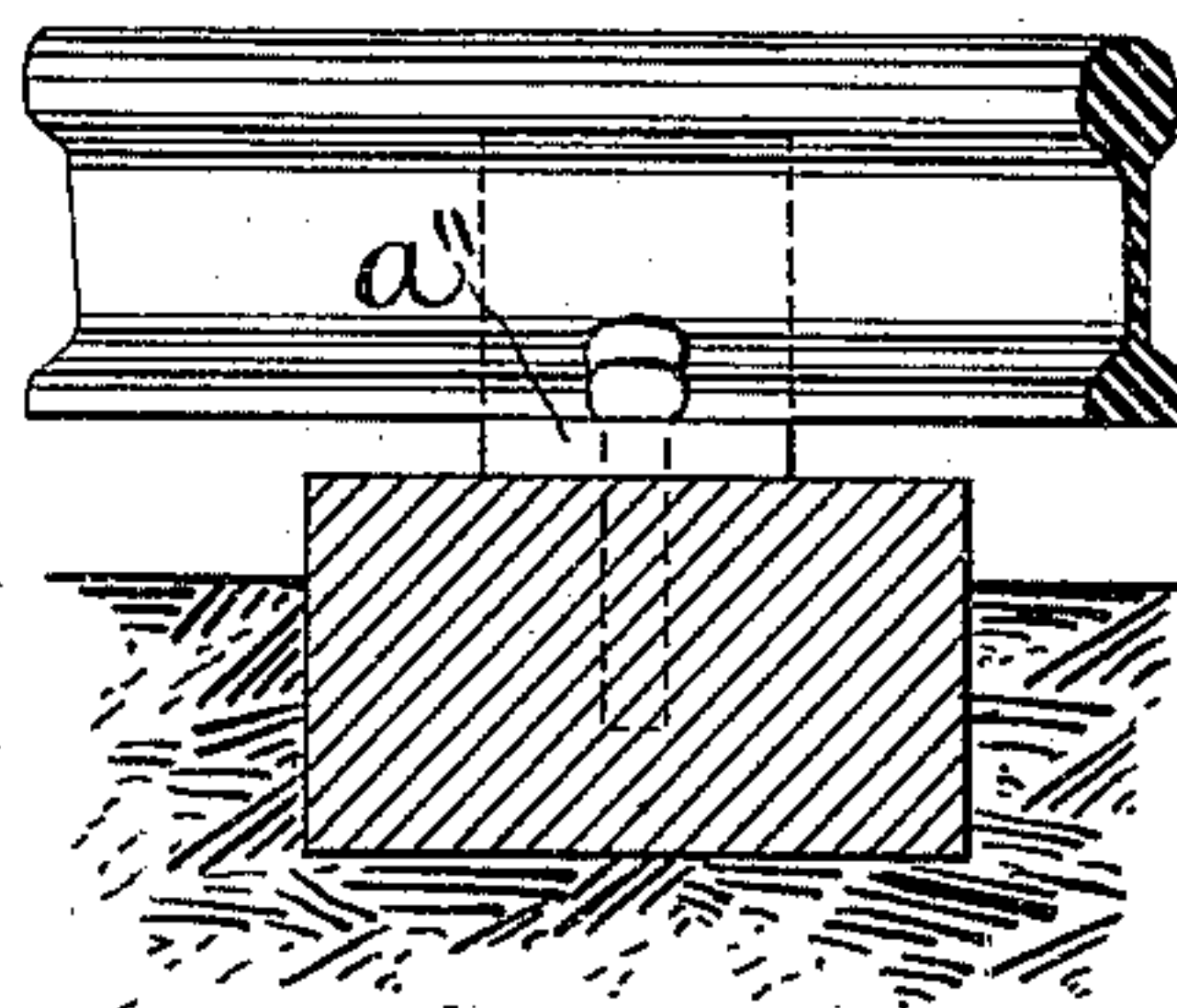


Fig. 12

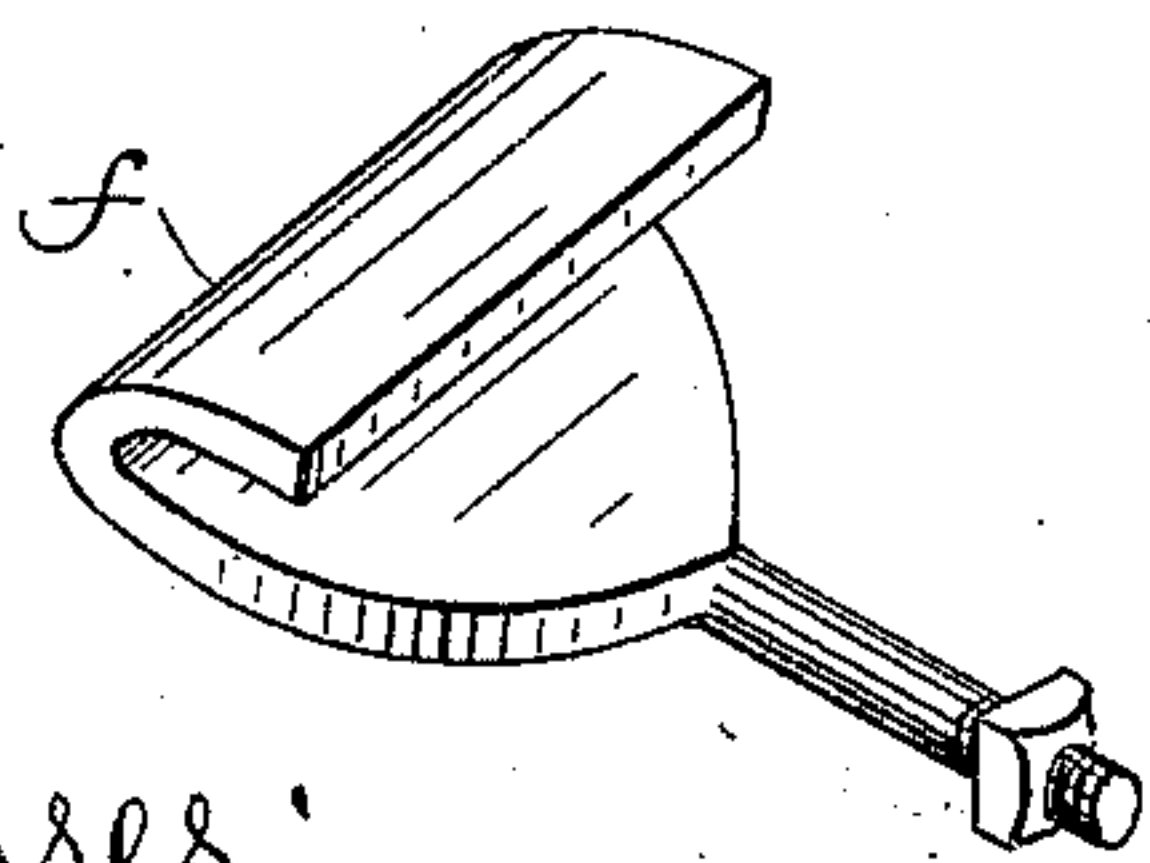
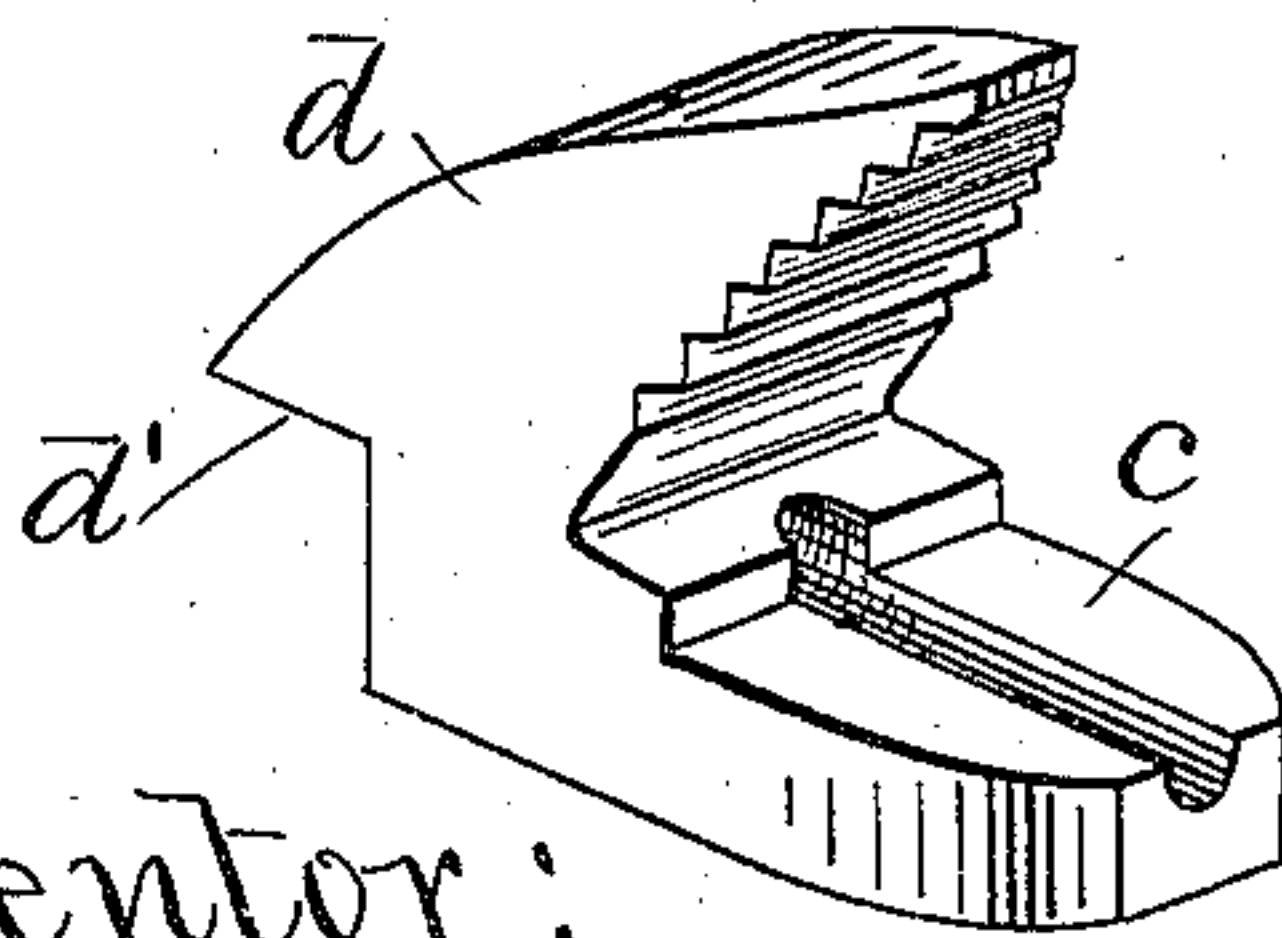


Fig. 13



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# UNITED STATES PATENT OFFICE.

WILLIAM F. GOULD, OF DES MOINES, IOWA.

## RAILWAY-RAIL JOINT, CHAIR, AND SPLICE.

SPECIFICATION forming part of Letters Patent No. 310,581, dated January 13, 1885.

Application filed August 11, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM F. GOULD, of Des Moines, in the county of Polk and State of Iowa, have invented an Improved Railway-Rail, Railway-Chair, and Railway Joint or Splice, of which the following is a specification.

My object is to facilitate forming a railway-joint or the splicing of a broken rail at any time and place, in building and operating a railway; to relieve the rails from the torsional strain to which they are subjected at curves and whenever and wherever a track is uneven and the weight of a locomotive and passing train not evenly balanced on the parallel track-rails; to save the time, labor, and expense of drilling holes; and also to avoid impairing the strength of rails by making bolt-holes therein, and to prevent the creeping of tracks incident to joints in which bolts are passed through rails.

My invention consists in the construction and combination of a chair adapted to perform the function of a truss in supporting the abutting ends of two rails, and a clamping-jaw adapted to engage the chair and to protect a drawing-nut with a screw-clamp, cross-ties, and rails, as hereinafter fully set forth.

Figures 1, 2, 3, 4, and 5 are transverse sections of my improved track and joint. Figs. 6, 7, 8, and 9 are side views, and Figs. 10 and 11 top views, of the same. Fig. 12 is a perspective view of a common screw-clamp, and Fig. 13 of my clamping-jaw used in combination with the screw-clamp to produce parallel jaws in a joint.

Jointly considered these figures clearly illustrate the construction and combination of the different elements and the novelty and utility of my complete invention.

$a$  is the horizontal portion of my chair adapted to rest flat upon one or more ties.  $b$  is the vertical portion adapted to engage the under side of the ball or T-head of the rail at its top and the flange of the rail at its junction with the horizontal portion  $a$ .

In Figs. 1 and 2 the vertical portion is made to overlap the flange of the rail, and also to engage the web of the rail, and to produce this result the chair must be formed from wrought metal by means of roller-dies or cast in a mold.

The vertical part  $b$  thus produced from flat plate metal will not come in contact with the web of a rail, and hence is adapted to be applied to rails of various shapes and height, and to connect the abutting ends of rails that differ in form and height. The balls of the rails will rest upon the top edge of the part  $b$ , and their top surfaces will be thereby kept even with each other, as required to produce a continuous smooth track, while the flat bottoms of the rails may be retained at different points of elevation and at different angles relative to each other and the base or horizontal portion of the chair by the contact of the chair with the edges of the flanges on the opposite sides of the rails, as clearly shown in Figs. 3 and 4. When made, as shown in Figs. 3 and 4, to engage the under side of the T-head of the rail and the edge of the flange only, and not the web of the rail, it can be readily made by bending plate metal in a machine adapted to double plates together.

In Figs. 2 and 4 the edge  $a'$  of the horizontal portion  $a$  is turned up to engage the flange of the rail, to aid in preventing any lateral movement of the rail relative to the chair. This turned-up part  $a'$  does not prevent the complete chair from being put in place under the ends of two rails or a broken rail by sliding laterally, and aids in retaining the rails in place, while the opposite vertical part,  $b$ , engages the ball of the rail in such a manner that pressure communicated to the chair at the top of the part  $b$  will be resisted at the point  $a'$ , and the intermediate part of the complete chair utilized as a spring to relieve the cars and the track from concussion.

In Figs. 5 and 9 my truss-form chair is provided with an extension,  $a''$ , of the horizontal portion, to adapt it to be spiked fast upon a tie at the central portion of a rail, for the purpose of preventing any lateral motion of the rail relative to the tie or the tread of a wheel passing over it.

$b'$  are vertical ribs or swells formed integral with the vertical portion  $b$  of the chair, to stiffen and strengthen the chair and complete joint.

Heretofore a railway-chair has had vertical extensions on its opposite sides that would engage the ball of a rail when the end of a rail



was inserted between the two vertical extensions. A chair has also been made in two parts, so that the ends of the rails could be clamped by vertical extensions on the two separate pieces; but the complete chair could not be placed in position to engage the under side of the ball of the rail, as contemplated by my chair, which is adapted to be slipped under a rail, or the abutting ends of two rails, from the side, and to engage the flat bottom, the flange, and the under side of the ball of the rail, to increase the bearing-surface of the narrow top edge of the chair, for the purpose of supporting the balls of the abutting ends of two rails or a broken rail more efficiently.

*c* is the base of my clamping-jaw, adapted to extend partially under the horizontal portion *a* of the chair.

*d* is the vertical portion, adapted in form on its rear side to engage the outside surface of the vertical portion *b* of the chair. A bolt-hole through the base portion *c* adapts it to be combined with a common screw-clamp, *f*, by passing the screw-threaded end of the clamp through it and then placing a nut on the screw-threaded end, as clearly shown in Figs 1, 2, 3, and 4.

*d'* (shown in Fig. 2) is a lateral and outward projection from the vertical portion *d* of the jaw that covers and protects the screw end of the clamp *f* and the nut *g* thereon from the car-wheels when they accidentally get off the top of the rail.

In Fig. 4 the vertical portion of the clamp *f* has an angular bend that overlaps the flanges of the rails in such a manner that the flanges of the rails will act as wedges in forcing the top edge of the clamp against the balls of the rails as the nut on the end of the clamp is drawn. By means of this angular bend in the vertical portion of the clamp the top edge of the clamp and the top edge of the chair on the opposite side of the rails are simultaneously operated by means of the nut to compensate for the wear that occurs between the balls of the rails and their supports. The inwardly-turned portion of the clamp also overlaps and engages the turned-up part *a'* of the chair, and the chair and the clamp mutually support each other and coact when the nut is drawn in pressing up against the balls of the rails as required to maintain a joint firm and secure and the track-surface even.

To increase the bite of the jaw portion *d* upon the outside surface of the part *b* of the chair, I simply serrate the inside surface of the vertical part *d* of the jaw, as shown in Figs. 4 and 13.

*h* (shown in Fig. 2) represents a metal plate or elastic packing-plate placed under the horizontal portion *a* of the chair, and between the parallel jaws *c*, *d*, and *f*, to aid in keeping the joint tight and to prevent wear and noise.

In Figs. 6, 8, and 10 a joint or splice is shown formed between two ties by means of my chair, one of my clamping-jaws, and

a screw-clamp, by simply placing the chair under the abutting ends of two rails, to rest upon two parallel ties, and then clamping the chair to the rails by passing the screw-threaded end of the clamp *f* across under the chair and through the base *c* of the clamping-jaw, and then putting a nut, *g*, on its end, and thereby drawing the two parallel jaws, *f* and *d*, toward each other; and to fasten the chair and connected rails to the ties I drive spikes through perforations in the horizontal portion of the chair, as shown in Figs. 3 and 10, and at its side, as shown in Figs. 6, 7, 8, and 10.

In Figs. 7, 9, and 11 the abutting ends of two rails are immediately over a tie, and the chair rests upon three parallel ties, and two parallel jaws and clamping devices are applied between the ties and at two different portions of the chair.

In Figs. 6, 8, and 10 the rails meet between two ties, and only one pair of jaws is applied.

In Figs. 2 and 4 the jaw portion *f* of the screw-clamp is extended upward to engage the under side of the T-head of the rail, to aid in holding the ends of the rails rigid and in maintaining a continuous solid track. By thus clamping fast and detachably connecting my chair with the ends of two rails to form a joint, or at the dividing-point of a broken rail to form a splice, the top edge of the vertical portion of the chair will engage the under side of the T-head of the rail, to support it and to prevent it from twisting or breaking down under the tread of the wheels of heavy trains, and the flange of the rail or its edge will be engaged at the junction of the vertical and horizontal portions of the same chair to prevent any vertical motion or bending of either of the abutting ends of the rails, and the chair supported upon the ties thus becomes a truss to relieve the T-head and web of the rail from undue pressure and to support them in a vertical position, while it aids in binding them together as required to produce a continuous track.

By forming lateral projections *i* on the flanges of the rails, as shown in Fig. 10, the projections will engage the ends of the chairs or spikes fixed in the ties, and prevent the rails from creeping relative to the chairs they engage; and when they creep away from the end of a chair each rail in the track must act independently, and cannot draw the complete track in the manner incident to the creeping of tracks when joints are formed by bolting plates to the sides of the rails.

*k* (shown in Figs. 2 and 10) is a projection or stop formed on or fixed to the longitudinal center of the chair and in the angle formed by the junction of the horizontal portion *a* and the vertical portion *b* to enter a corresponding notch formed in the edge of the flange of the rail to prevent any longitudinal movement of the chair relative to the rails.

I am aware that a railway-chair has been formed in two parts in such a manner that the



pieces could be applied on the opposite sides of the rails and their horizontal portions slipped under the ends of the rails by lateral movements; but my manner of forming a chair complete in one piece and slipping it in place by a lateral movement to form a joint upon a tie or between two, as required in repairing a broken rail in a track, is novel and greatly advantageous.

By notching only one end of each rail to admit the projection  $k$ , and allowing the other end of the same rail to remain whole, one end of each rail will be free to move longitudinally, while its opposite end will be locked to the chair by means of the projection  $k$  and a notch in the flange of the rail near its end.

I am aware that notches have been formed in rails and projections on chairs to enter the notches, and that the end of a rail has been secured to one end of a chair by means of a projection and notch to prevent any longitudinal movement of the rail relative to the chair, while the abutting end of another rail was clamped to the same chair by means of a revolving clamp attached to the tie in such a manner that it could move longitudinally relative to the chair and tie; but my combination of a chair having a projection with one notched rail and one not notched is novel and advantageous.

I claim as my invention—

1. A railway chair and truss consisting of the horizontal portion  $a$ , having a turned-up edge,  $a'$ , that is adapted to engage the under side of the edge of the flange of a rail, but not the upper side of the same edge, and the vertical extension  $b$ , that is adapted to engage the edge of the flange of the rail, and the under side of the ball of the rail without coming in contact with the web of the rail, and adapted as a complete device to be moved laterally and placed under the abutting ends of two rails, or a broken rail, to connect and maintain the balls of the two rails even while the flat bottoms of the same ends may be uneven, as and for the purposes stated.

2. In a railway-joint, the jaw  $c$   $d$ , having a

projection,  $d'$ , in combination with a screw clamp and nut,  $g$ , substantially as and for the purposes set forth.

3. A railway-chair adapted to slide laterally under the abutting ends of rails to engage their flat bottoms, and also their balls on one side, a jaw adapted to extend under the horizontal portion of the chair, and also partly over the vertical part of the chair, and a clamp adapted to extend through the jaw and under the chair, and to overlap the flanges of the rails without extending vertically to the balls of the rails, arranged and combined in a railway-track as illustrated in Figs. 1 and 3, for the purposes specified.

4. A railway-chair adapted to slide laterally under the abutting ends of rails to engage their flat bottoms, and also their balls on one side, a jaw adapted to extend under the horizontal portion of the chair, and also partly over the vertical part of the chair, and a clamp adapted to extend through the jaw at its horizontal end, and to the ball of the rail at its vertical end, arranged and combined in a railway-track as illustrated in Figs. 2 and 4, for the purpose specified.

5. The improved railway joint and track composed of a chair formed complete in one piece, having a vertical portion adapted to engage the under sides of the T-heads of two abutting rails and also the top edges of their flanges, a screw-clamp,  $f$ , a jaw,  $c$   $d$ , and one or more cross-ties, substantially as shown and described.

6. In a railway-joint, the combination of a railway-chair,  $a$   $b$ , adapted to slide laterally under the abutting ends of two rails, and having a single projection,  $k$ , in its angle, a rail having a notch in its flange to admit the projection  $k$ , and a second rail abutting against the first within the chair, substantially as shown and described, to operate in the manner set forth, for the purposes specified.

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Witnesses:

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C. S. SMART.