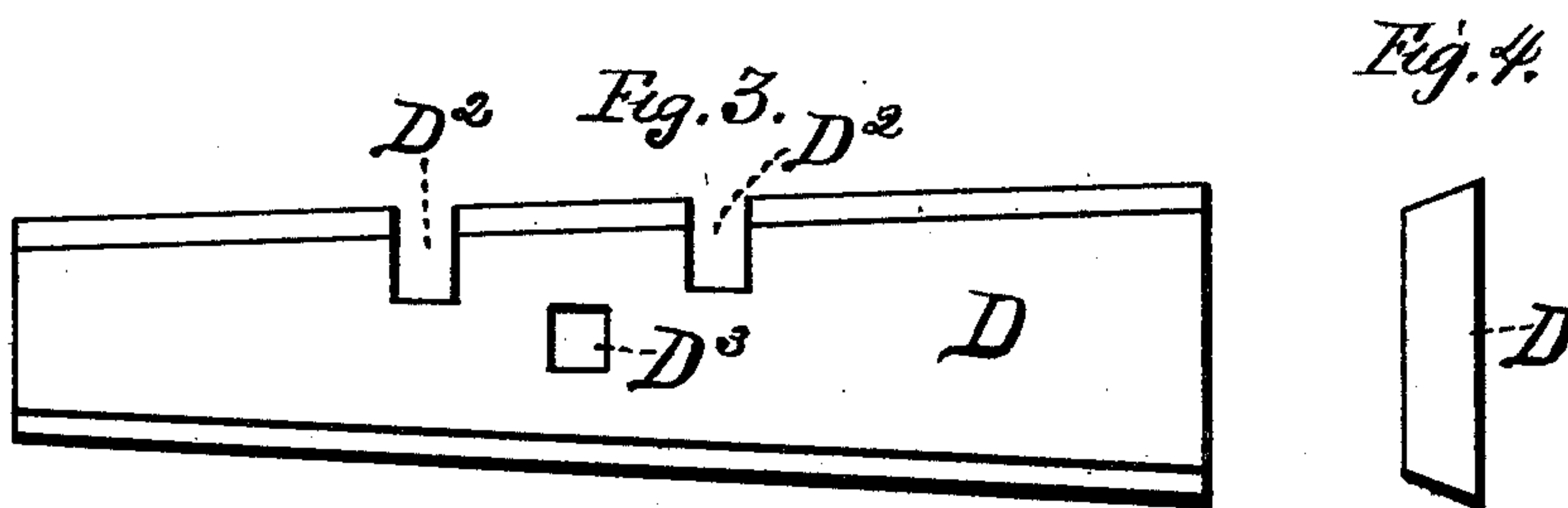
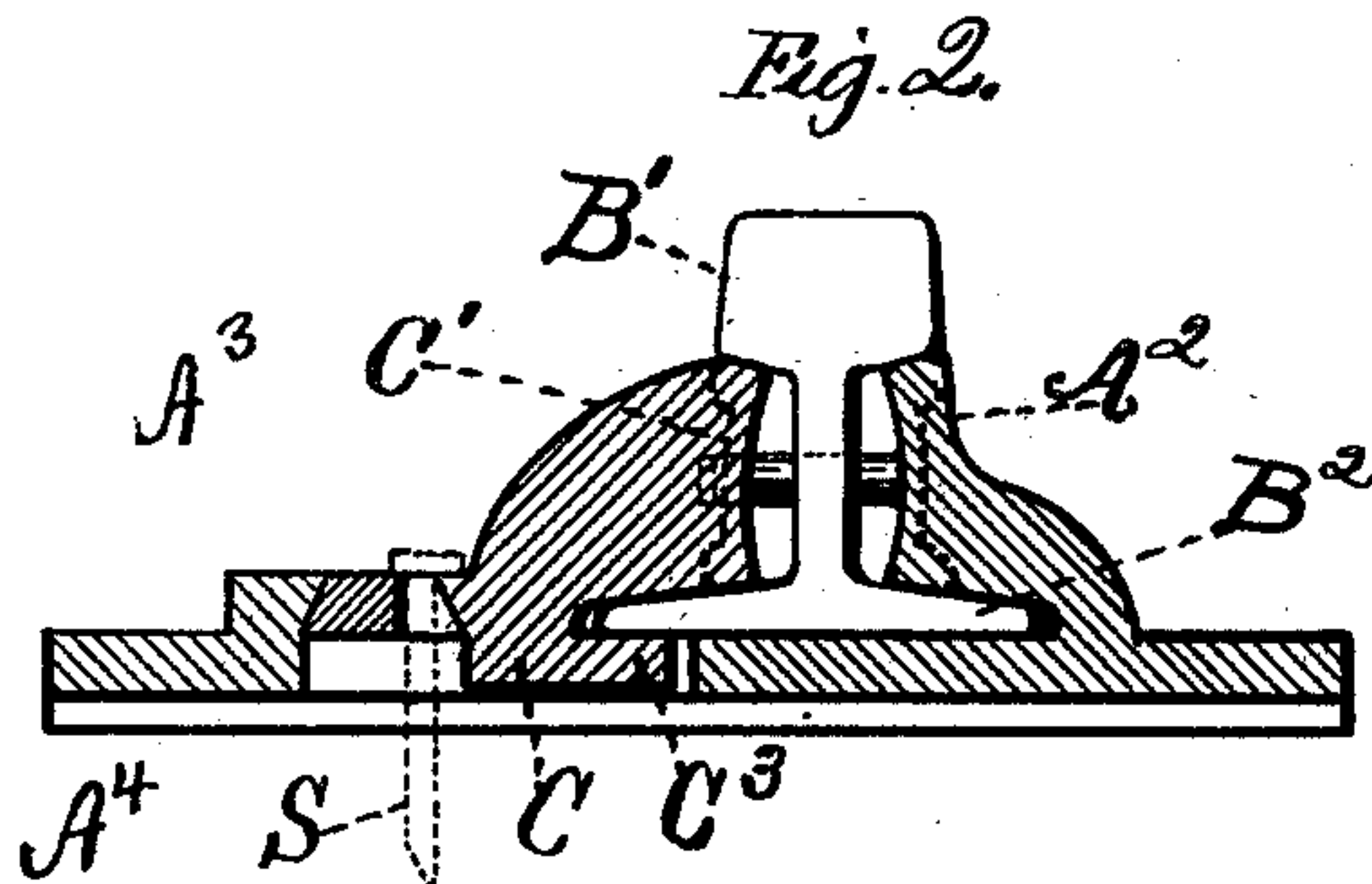
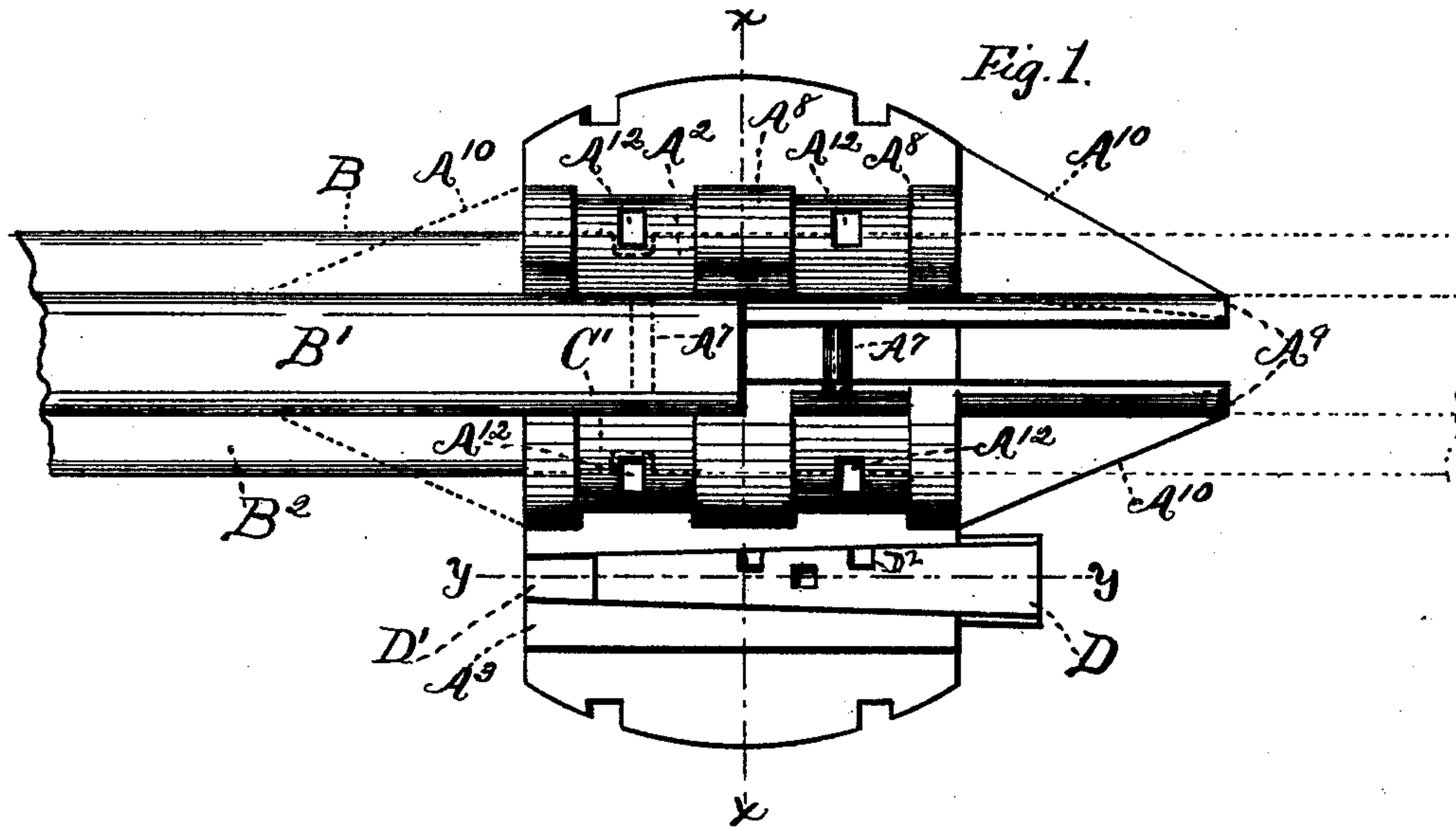


2 Sheets—Sheet 1.

No. 414,348.

Patented Nov. 5, 1889.



Witnesses:  
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(No Model.)

2 Sheets—Sheet 2.

J. W. WALSH.  
RAILWAY RAIL JOINT.

No. 414,348.

Patented Nov. 5, 1889.

Fig. 5.

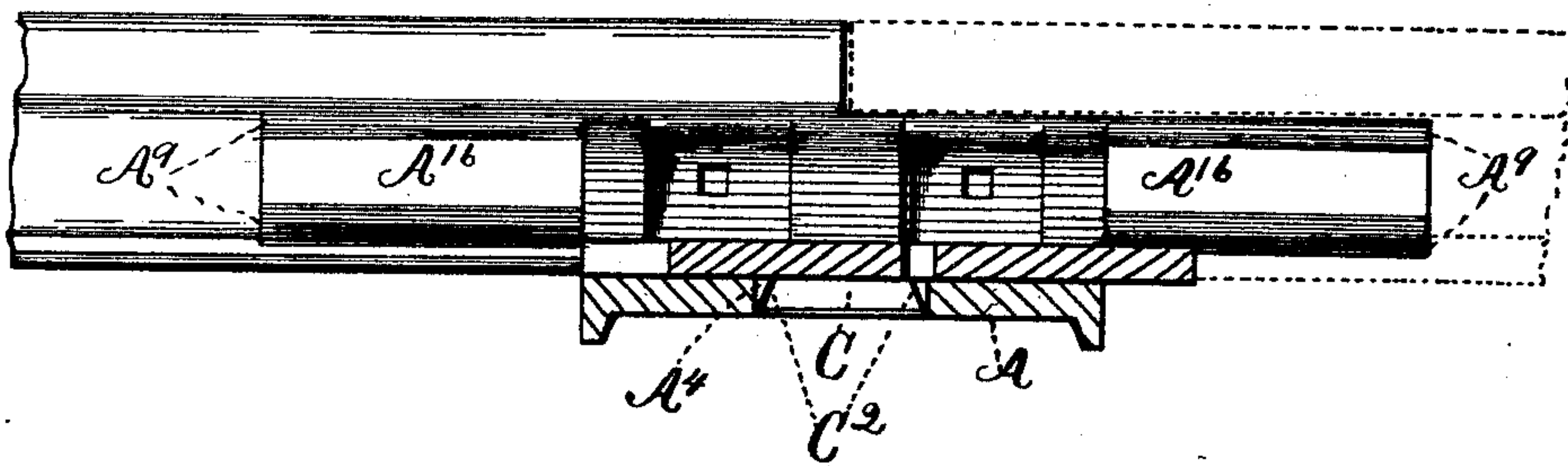
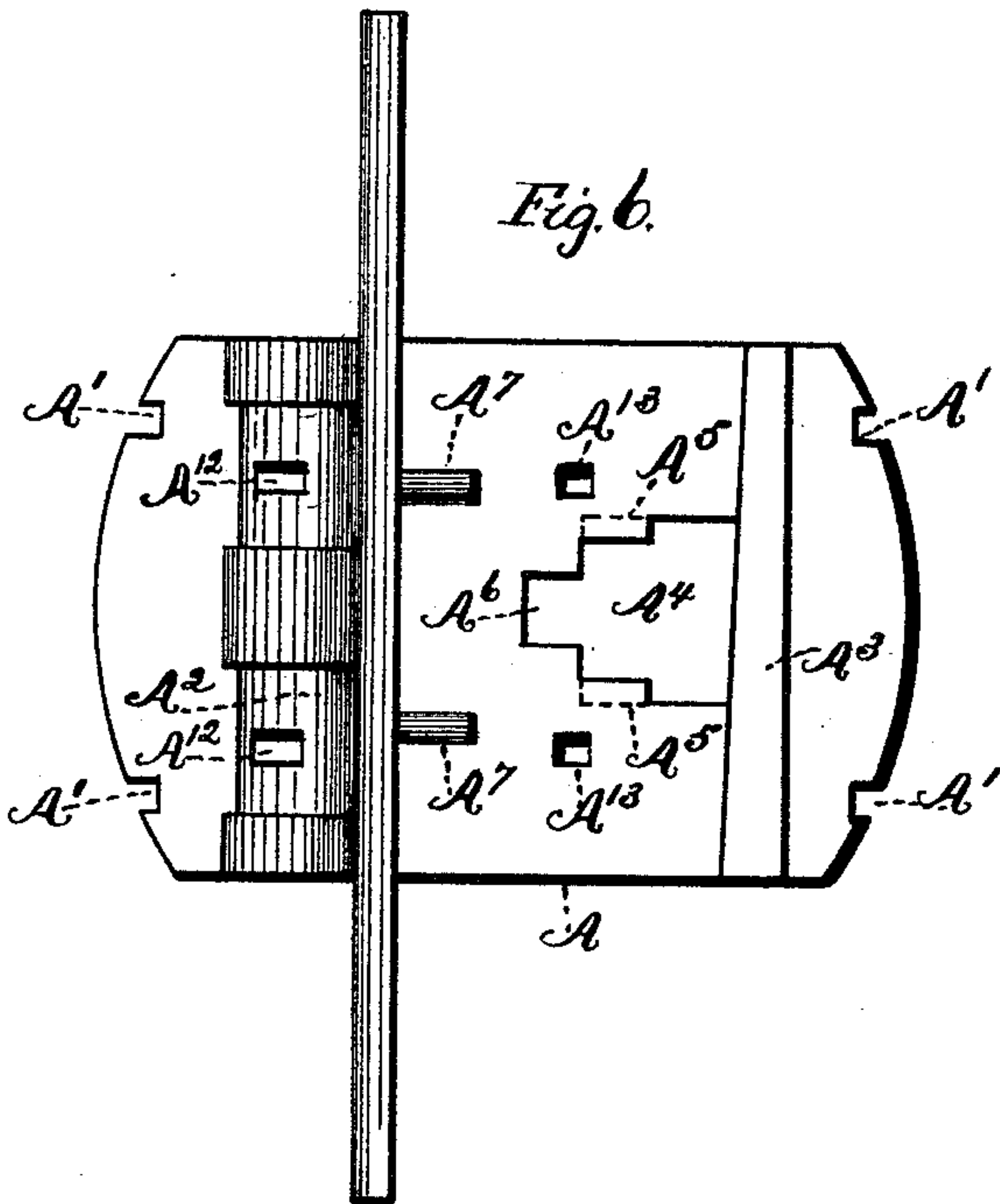
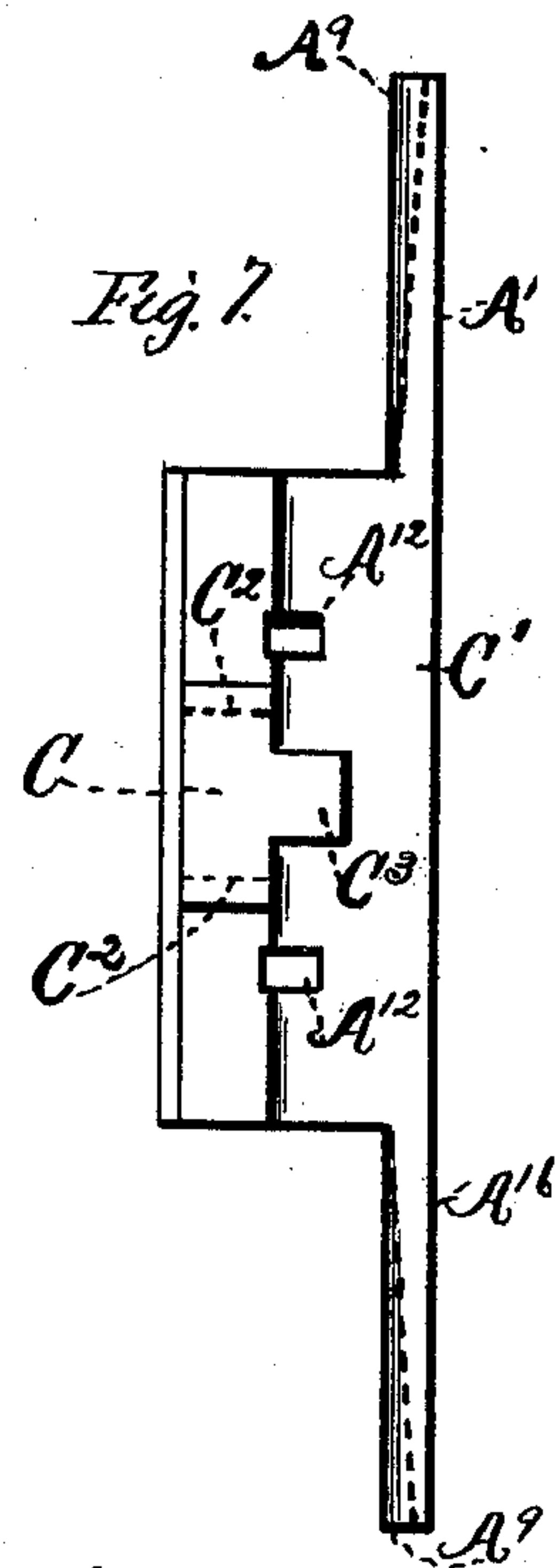


Fig. 6.



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Fig. 7.



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# UNITED STATES PATENT OFFICE.

JOHN W. WALSH, OF TROY, NEW YORK, ASSIGNOR OF PART TO ERASTUS  
H. VAUGHN AND EDWARD F. MURRAY, OF SAME PLACE.

## RAILWAY-RAIL JOINT.

SPECIFICATION forming part of Letters Patent No. 414,348, dated November 5, 1889.

Application filed December 15, 1888. Serial No. 293,744. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN W. WALSH, a resident of Troy, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Railway-Rail Joints; and I do hereby declare that the following is a full, clear, and exact description of the invention, that will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the several figures therein.

My invention relates to improvements in railway-rail joints; and it consists of the novel construction and combination of parts hereinafter described, and pointed out in the claims.

Figure 1 of the drawings is a top plan view of my improved joint, one rail being shown in position by solid lines, and the position of the other rail being indicated by dotted lines. Fig. 2 is a vertical cross-section taken on the broken line *xx* in Fig. 1. Figs. 3 and 4 are respectively plan and end views of the adjusting and locking wedge. Fig. 5 is a longitudinal vertical section of the wedge and adjacent parts, taken on the broken line *yy* in Fig. 1, and showing the rail and rail-sustaining plate in side elevation. Fig. 6 is a top plan view of the flanged chair detached from the other parts. Fig. 7 is a bottom plan view of the rail-sustaining plate and slide-block integral therewith.

A is a metal chair, consisting of a base-plate provided with the slots *A'*, adapted to receive spikes, by which the chair is secured to a cross-tie. (Not shown in the drawings.) The chair is also provided with a rail-sustaining plate or flange *A<sup>2</sup>*, integral therewith; adapted to wedge in between the ball and flange of the rails B, as shown in Fig. 2, *B'* being the ball and *B<sup>2</sup>* the flange of the rail. The chair is also provided with a rib or flange *A<sup>3</sup>*, nearly parallel with the rail-flange, and with an aperture *A<sup>4</sup>*, located between said flanges *A<sup>2</sup>* and *A<sup>3</sup>*, having two of its sides about right-angular to the rail-sustaining flange, and beveled to

form a slideway for a bevel-edged slide-block C, integral with a rail-sustaining plate or flange *C'*, adapted equally with flange *A<sup>2</sup>* to wedge in between the ball and flange of the rails, as shown in Fig. 2. The bevel of the edges is indicated by the dotted lines *A<sup>5</sup>* on the chair, and *C<sup>2</sup>* on the slide-block; also, by the solid lines *C<sup>2</sup>* in Fig. 5.

The slide-block is adapted to be loosely inserted in the aperture *A<sup>4</sup>* until its beveled edges are on the same level with the beveled edges of the chair-plate inclosing the aperture, when it may be slid along toward the flange *A<sup>2</sup>*, the small plate *C<sup>3</sup>*, projecting from the bottom of the slide-block, occupying the space *A<sup>6</sup>*, communicating with the aperture *A<sup>4</sup>*. The flange *A<sup>2</sup>* may also be provided with one or more studs or pins *A<sup>7</sup>*, projecting right-angularly therefrom, and adapted to enter apertures in the web of the rails to prevent too great longitudinal movement of the rails, the holes being sufficiently elongated to permit of contraction and expansion, due to changes in temperature.

The operation of the device is as follows: The chair A is placed upon a cross-tie (not shown) and the contiguous ends of two successive rails in a railway laid thereon, as indicated partly by dotted lines in Figs. 1 and 5, the pins *A<sup>7</sup>* being inserted through the holes in the webs of the rails. The slide-block is then inserted in the aperture *A<sup>4</sup>*, in such a position that the rail-plate *C'* is parallel with the rails. The block and plate are then slid toward the rails to about the position shown in Fig. 1, and the wedge D inserted in the space *D'* between the flanges *A<sup>3</sup>* and the contiguous edges of the slide-block, as shown in Fig. 1. The wedge is then driven farther into the space *D'*, thereby forcing both the rail-sustaining plates or flanges tightly against the rails and wedging the plates in between the ball and flanges of the rails, thereby not only forcing and holding the rails in alignment with each other, but materially assisting the webs of the rails in resisting lateral strains. When the wedge has been driven to produce a sufficiently tight joint, it is secured in position by driving a spike (shown by dotted line *S* in Fig. 2) through one of the



slots  $D^2$  in the wedge and through aperture  $A^4$  into the cross-tie, thus securely locking the wedge and all other parts in the desired position. After railway-rail joints have been in use a short time the wear and strain of passing cars and locomotives will cause a change in position of the parts, which renders them loose and unstable, and consequently of little or no value as an aid to the web of the rail in resisting lateral strains.

To effectually readjust the parts forming my improved joint, it is only necessary to draw the spike  $S$  and with two or three blows of a hammer force the wedge until all the parts are again bound tightly in place, and then insert the spike in the cross-tie through any slot or spike-hole in the wedge which registers with the aperture  $A^4$ . The wedge may have a series of slots  $D^2$  or spike-holes  $D^3$ . The parts will then remain in perfect adjustment and continue to materially support the rails for a long period without further attention or change. There are no bolts or nuts to loosen, and it is impossible for any of the parts to again work loose until the sustaining-plates are actually worn away at their contact-point with the ball and flange of the rails, when the parts may be again tightened, as before, and the life of the joint thereby sustained through a long period of use. It should be observed that the sustaining-plates are made thicker at their longitudinal centers opposite the contiguous ends of the rails and taper toward their ends, the shape and thickness of the ends being indicated by the dotted lines extending from the ball to the flanges of the rail in Fig. 2, to give the greatest sustaining power to the plates with the least amount of metal. For the same reason the plates are provided with the strengthening cross ribs or flanges  $A^8$ , and with the longitudinal top and bottom ribs  $A^9$ , and, when desired, with the horizontal bracing-webs  $A^{10}$ . (Shown in full on one end of the plates and indicated by dotted lines on the other end in Fig. 1 only.)

Instead of the pins  $A^7$  and corresponding holes in the webs of the rails, a modified form of construction for preventing longitudinal displacement of the rails may be employed, consisting of the spike-holes  $A^{12}$ , formed in the sustaining-plates and made to register with corresponding slots in the edges of the rail-flanges, as shown in Fig. 1, and with the spike-holes  $a^{13}$  in the chair, the slots in the rail-flanges being indicated by dotted lines and shown a little wider than the spike-holes in the plates.

As seen in Fig. 2, the small plate  $C^3$ , projecting from the slide-block  $C$ , passes under the flange of the rail and forms an additional safeguard to prevent the slide-block or base of the sustaining-plate from lifting under the influence of the wedge in case the beveled slide-block should by any possibility fail to accomplish the same object. The longitudinal edges of the wedge are made beveled, and

the contiguous edges of the flange  $A^8$  and the base of plate  $C'$  are correspondingly beveled, as shown in Fig. 2, so that the wedge does not depend wholly upon its locking-spike to hold it in position. The tendency of the wedge to lift the base of the plate  $C'$  so beveled is resisted by the beveled slide-block dovetailed upon the base-plate of the chair and by the plate  $C^3$ , hooked upon the flange of the rail, as above explained. By having the spike-holes  $A^{12}$  transversely elongated the plate  $C'$  can be readjusted in position by the wedge without removing the spikes inserted through such elongated slots.

When desired, movable sustaining-plate  $C'$  can be secured in place by means of spikes alone or by any other known appliance, in such case dispensing with the wedge-shaped plate  $D$ . I call the plates  $A^2$  and  $C'$  "rail-sustaining plates," because they assist in supporting the ball of the rail.

By providing the extended ends  $A^{16}$  of the sustaining-plates with longitudinal ribs  $A^9$  very great strength can be obtained with comparatively thin plates.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a railway-rail joint, a rail-supporting chair provided on one side with a rail-sustaining flange or plate and on the opposite side with a wedge-retaining flange and intermediate spike-holes, in combination with a rail-sustaining plate movable to and fro between the side flanges of the chair and provided with transversely-elongated spike-holes  $A^{13}$ , and a wedge-shaped adjusting-plate movable longitudinally of the chair between the movable rail-sustaining plate and the wedge-retaining flange, substantially as described.

2. In a railway-rail joint, a rail-supporting chair provided on one side with a rail-sustaining flange or plate and on the opposite side with a wedge-retaining flange, and an intermediate slideway extending transversely of the chair and having the edge walls of the chair-plate forming the slideway beveled or inclined outward on the lower side, in combination with a rail-sustaining plate movable to and fro between the flanges on the chair and provided with a slide-block interlockably movable in said slideway, and a wedge-shaped adjusting-plate movable longitudinally of the chair between the movable rail-sustaining plate and a wedge-retaining flange, substantially as described.

3. In a railway-rail joint, a rail-supporting chair provided with a rail-sustaining flange or plate gradually diminishing in thickness from the longitudinally-central part toward its ends, in combination with a detachable rail-sustaining plate gradually diminishing in thickness from the longitudinally-central part toward its ends, substantially as described.

4. In a railway-rail joint, a rail-supporting chair provided with a rail-sustaining flange or plate having longitudinally-ribbed ex-



tended ends, in combination with a detachable rail-sustaining plate having longitudinally-ribbed extended ends, substantially as described.

5 5. In a railway-rail joint, an apertured rail-supporting chair provided with a rail-sustaining plate and a wedge-support, in combination with a movable rail-sustaining plate, a wedge-shaped slide-plate provided with a  
10 spike-hole registering with a chair-aperture,

and a locking-spike adapted to enter such spike-hole and aperture, substantially as described.

In testimony whereof I have hereunto set my hand this 13th day of December, 1888.

JOHN W. WALSH.

Witnesses:

W. H. HOLLISTER, Jr.,  
FRANK C. CURTIS.