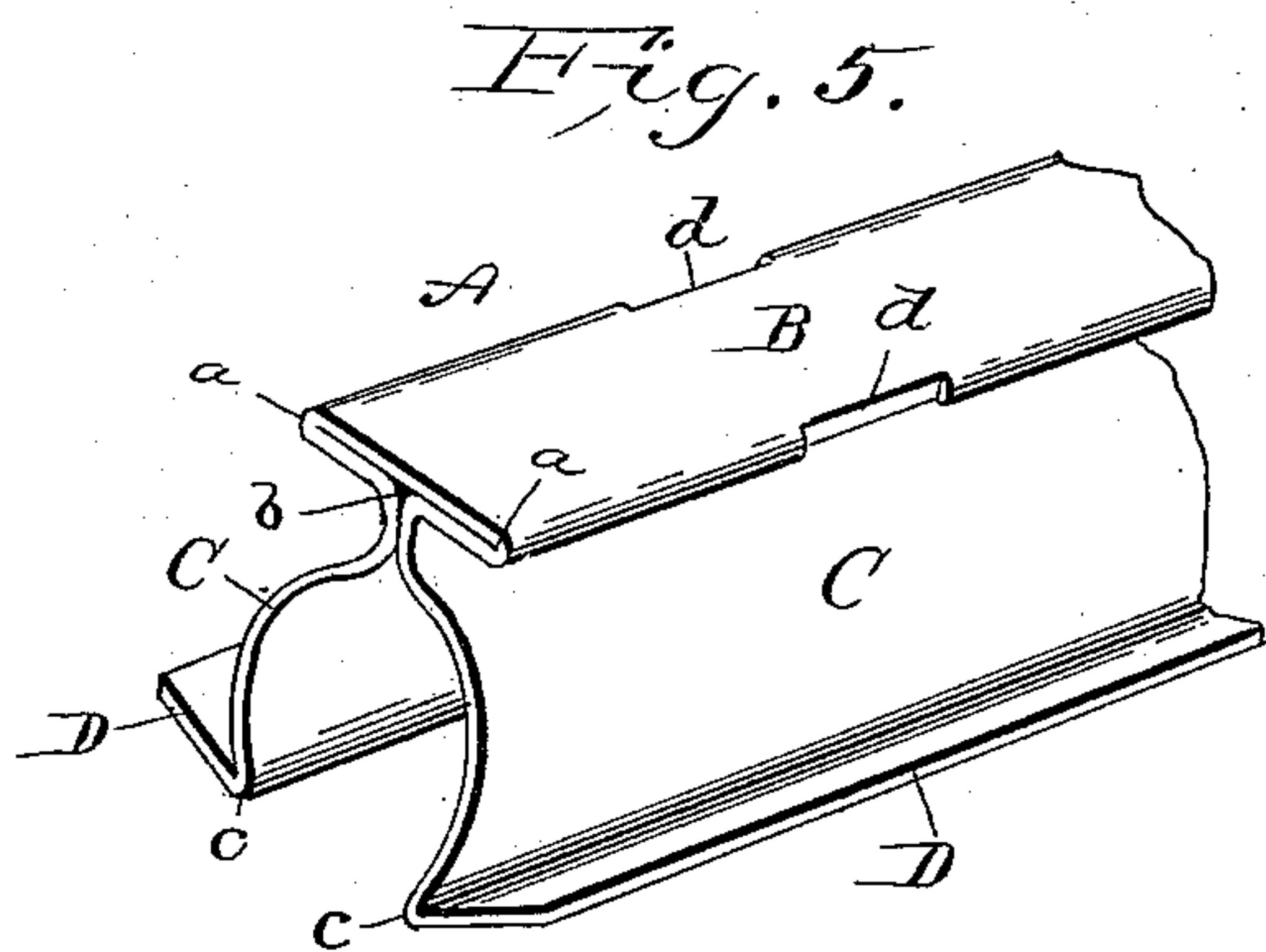
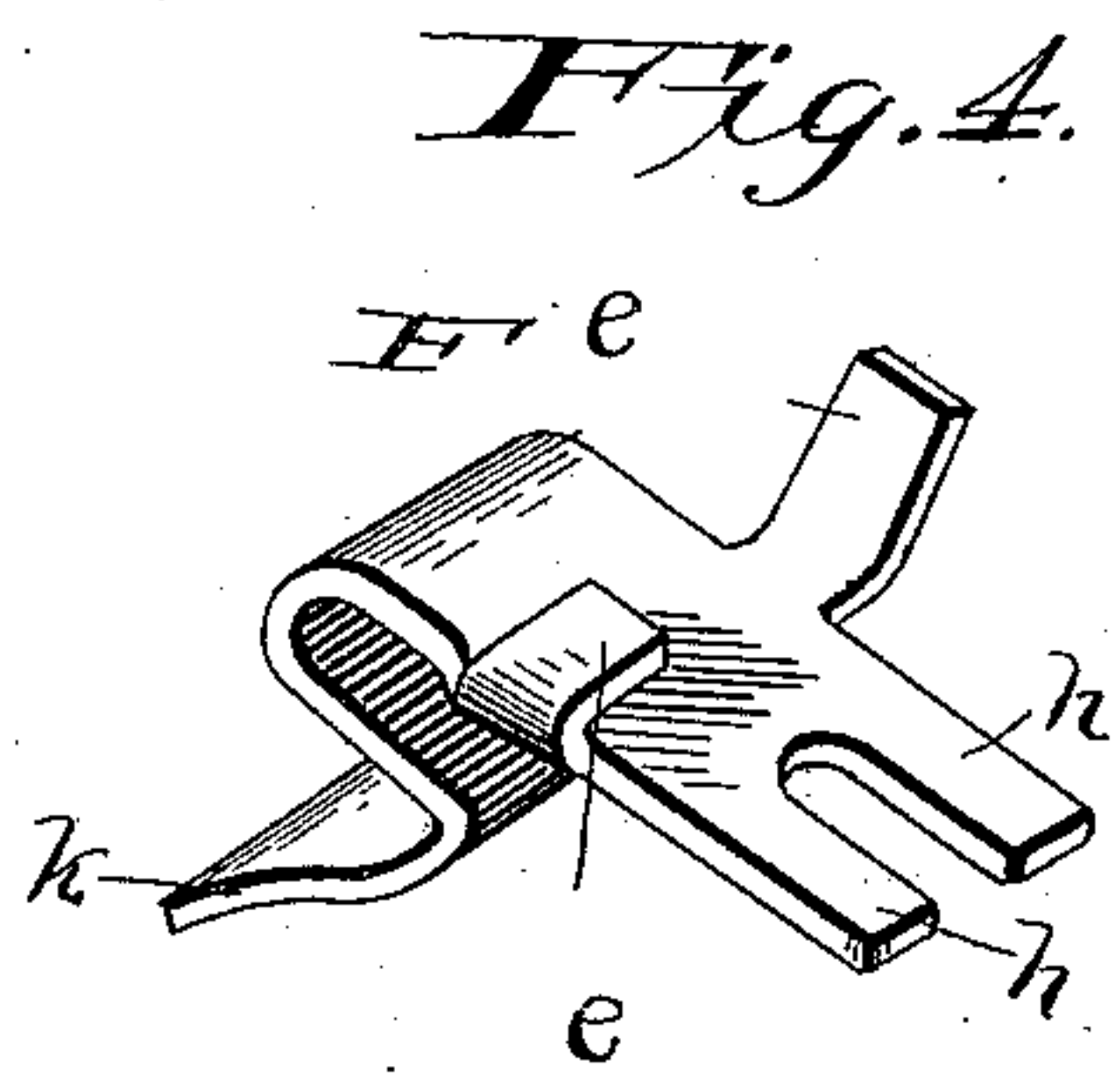
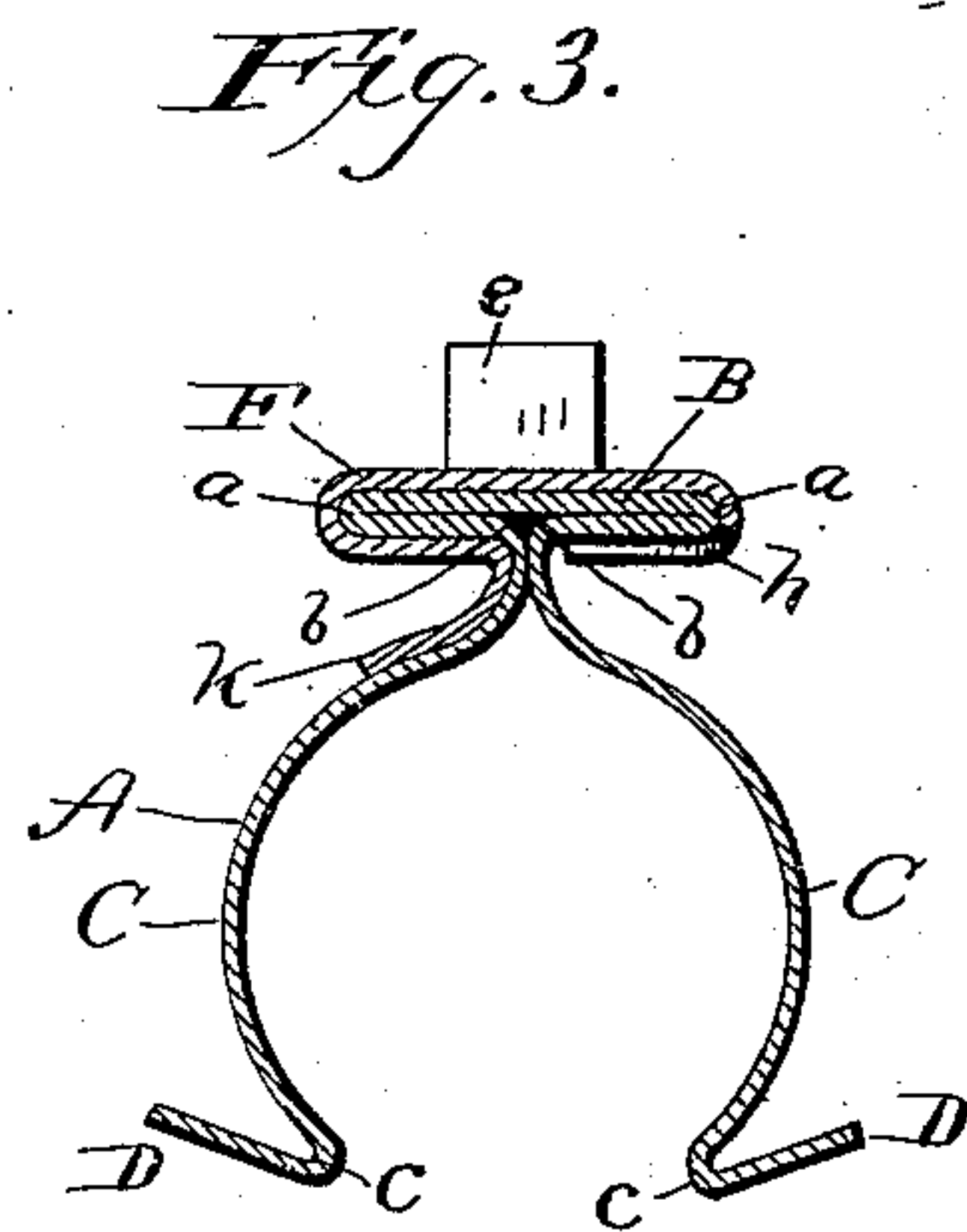
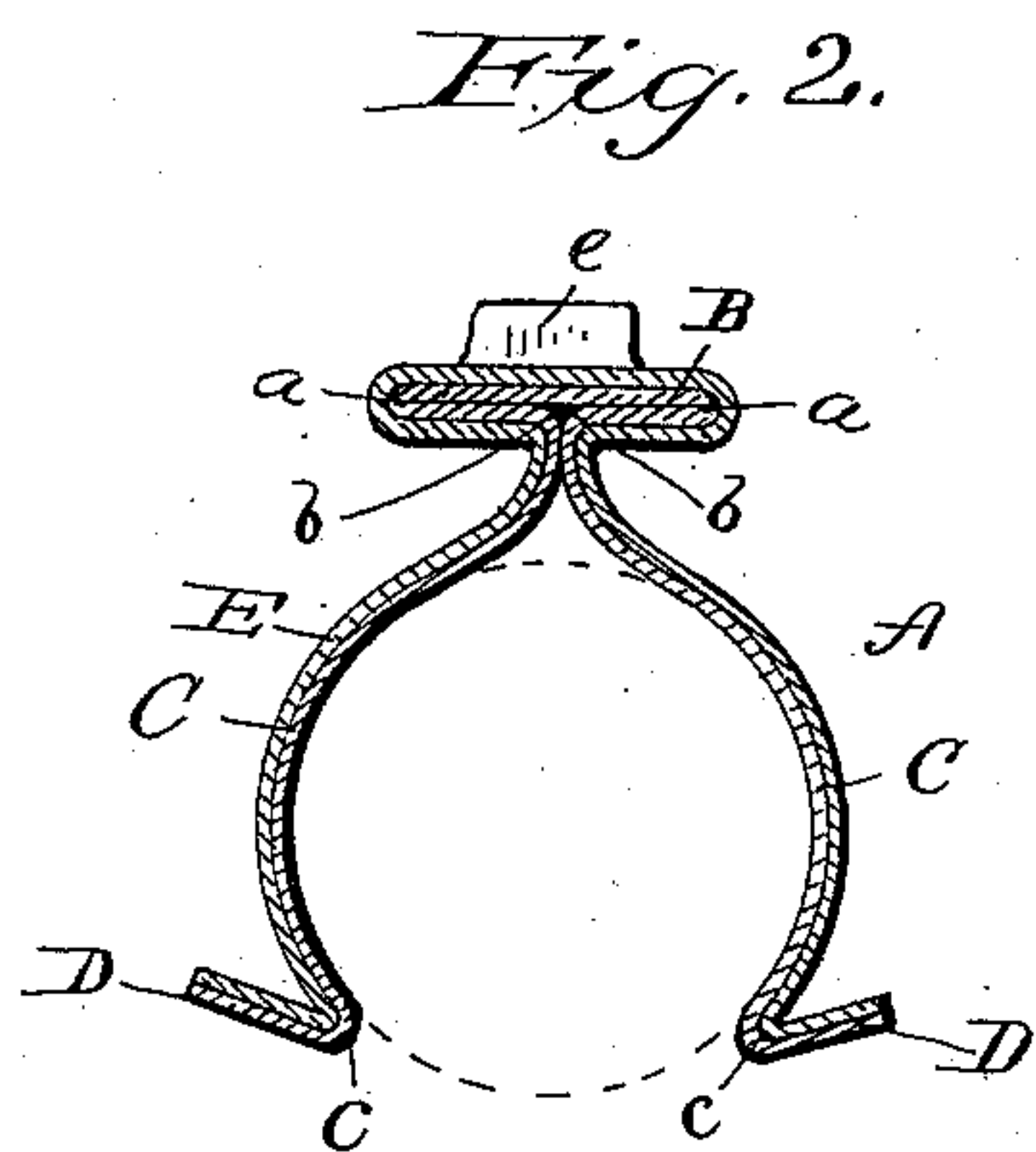
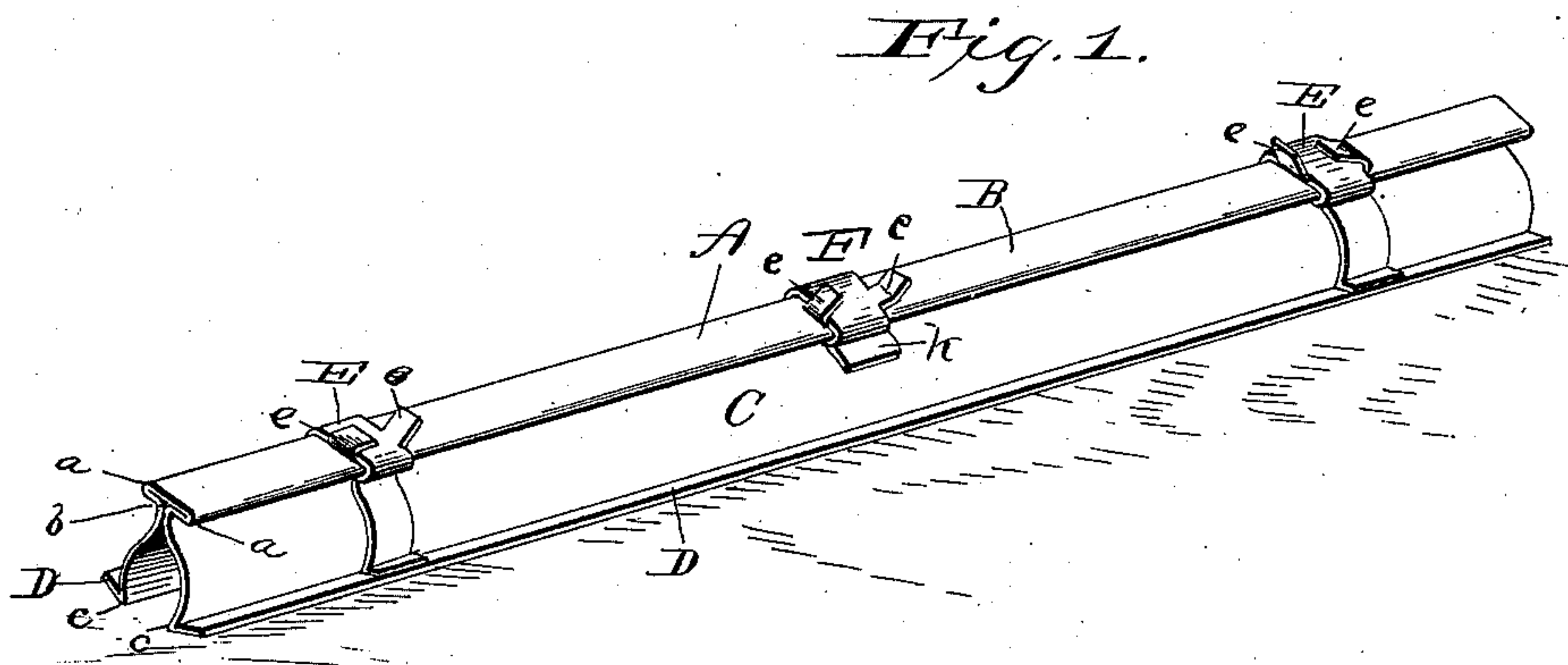


(No Model.)

W. P. HALL.  
RAILWAY TIE.

No. 375,996.

Patented Jan. 3, 1888.



Witnesses:

John S. Finch Jr.  
C. H. Davis

Inventor:

W. P. Hall

By his Attorney

C. M. Alexander



# UNITED STATES PATENT OFFICE.

WILLIAM P. HALL, OF PIQUA, OHIO.

## RAILWAY-TIE.

SPECIFICATION forming part of Letters Patent No. 375,996, dated January 3, 1888.

Application filed September 27, 1887. Serial No. 250,837. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM P. HALL, a citizen of the United States, residing at Piqua, in the county of Miami and State of Ohio, have invented certain new and useful Improvements in Railway-Ties, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention has relation to certain new and useful improvements in railway cross-ties, it having particular reference to that class or character of ties which consist, essentially, of a single strip or sheet of metal bent or formed into shape while hot by means of suitable tools and appliances, as will fully hereinafter appear.

The invention also relates to novel improvements in rail-chairs to be attached to the tie to hold and clamp the rails securely thereon.

The principal objects of the invention are to produce an extremely light and durable cross-tie at a minimum cost, which will at the same time possess sufficient strength and firmness to support the great weight transported over the railway; also, to provide a tie that will possess and retain the requisite amount of elasticity to prevent injury to the rolling-stock; also, to provide a tie which will present a bearing surface that will possess the necessary superficial area for the adequate support of the rails; also, to provide a tie whose sides or limbs will not spread while in use, but will retain their original shape and elasticity for a comparatively long time; also, to provide a bearing-surface for the rails which will afford a sure and ready means of attachment for the rail chairs or fastenings; and, also, to provide for attachment to the improved tie a rail-chair of simple and inexpensive construction that may be readily applied to the tie, and which will, when so applied, preserve the alignment of the rails and at the same time serve to assist in preventing spreading of the tie and add materially to its elasticity and strength, as will be more fully hereinafter specified.

That others skilled in the art may use and construct my invention, I will now proceed to describe it, reference being had to the accompanying drawings, in which—

Figure 1 represents a perspective view of the tie with the rail-chairs attached thereto;

Fig. 2, a vertical transverse sectional view of the same taken through one of the rail-chairs; Fig. 3, a vertical transverse sectional view of the tie taken through the switch-rail chair; Fig. 4, a perspective view of the switch-rail chair before it is applied to the tie; and Fig. 5, a perspective view of one end of the improved tie, showing the slight notches or indentations in the edges of the T-shaped bearing surfaces for the reception and retention of the rail-chairs.

My improved tie A is constructed of a single sheet of metal formed or rolled into shape by means of suitable appliances. The broad bearing-surface B is formed by making two bends or folds, *a*, longitudinally through the sheet of metal at equal distances from a central line drawn through the sheet and folding or bending the two outer portions of the sheet close under the center portion, preferably until they meet midway thereof, where they are again bent or folded at *b* and turned downwardly, the contiguous faces of these folded portions being pressed into close contact. The two outer portions of the sheet are separated a short distance below the bearing surface B, and carried downward and curved outwardly to form the convex elastic sides C, the lower extremities of which are slightly turned inward toward the vertical center line of the tie to prevent them spreading and afford the desired amount of elasticity. The sides, when thus bent, form, approximately, arcs of the same circle, and their lower longitudinal edges are bent outwardly at *c* and turned up, so as to form flanges D, which set at an acute angle to the sides C, as shown, to assist in preventing spreading of the same.

It will be readily seen that by folding the metal upon itself, in the manner described, I have a broad and ample bearing-surface for the rails, that will be very strong in proportion to its weight, and will also afford means whereby the rail-chairs may be rigidly secured to the tie to resist spreading of the rails when in place. The sides C, as constructed, are not only prevented from spreading, but also add strength and elasticity to the tie.

In the projecting longitudinal edges *a* of the bearing-surface of the tie, at the proper distance apart, I form indentations, notches, or



depressions *d*, for the reception and retention of the rail chairs or clamps *E*, these notches serving to hold the rails in perfect alignment and obviating the necessity of using bolts or rivets or shoulders in the tie for that purpose.

The rail-chairs are each formed of a single strip of metal cut to a proper length, and provided about midway its length with ears *e*, which are adapted to be bent over to clamp the flanges of the rail when in place upon the tie. The strip is bent to a shape similar to the tie, and is slipped over its end while hot, and it is then shrunk and forced into the notches *d* and under the projecting flanges of the bearing-surface, the ends of the strip being carried down to the side of the tie, and turned up at their ends to rest upon the flanges *D*. The chair thus formed will closely embrace and strengthen the tie, and all possibility of lateral movement upon the tie is obviated by means of the notches *d*, in which the chairs are forced or shrunk. The chairs are so formed and secured to the tie that the ears for clamping the rails will be on top of the rail-bearing surface of the tie, as shown. By thus forcing or bending the limbs of the chair up under the flanges of the bearing-surface I not only strengthen the same, but the chair is rigidly and permanently attached to the tie, so that it will not work loose from the continual jarring of the trains passing over the road; and by continuing the limbs of the chair downwardly, as shown, and bending them so as to closely embrace the curved sides *C* and rest upon the upturned flange *D*, I greatly strengthen the sides and render them more elastic, and also assist them in retaining their original curvature. The switch-rail or guard-rail chairs *F* are also formed of a single strip of sheet metal, and are adapted to be clamped upon any desired portion of the T-shaped bearing-surface of the tie. The strip is provided at a proper point in its length with ears *e* for clamping the rail-flanges, and at one of its ends is bifurcated so as to form two tongues, *h*, for clamping the flanges of the bearing-surface of the tie. The strip is first bent into the shape shown by Fig. 4—that is, one end of it is bent and curved so as to closely embrace the flange of the bearing-surface and extend a short distance down upon the convex elastic side *C*, as shown at *k*, and one of the ears *e* is turned up to the proper position to clamp the rail-flange. The chair is then applied to the tie and forced or pressed into the slight notches *d* in the edges thereof, as shown clearly in Fig. 3, the tongue *h* being bent around closely under the flange of the bearing-surface to clamp the chair securely thereto.

The object in extending the end *k* of the strip of the chair *F* down upon the side of the tie is to assist in securely and permanently attaching it to the tie, as the tendency of a heavy weight upon the chair will be to clamp the side of the bearing-surface upon which the extension is placed, as is evident.

It will be evident from the foregoing that

the essential features of my present invention are the broad, firm, and very strong bearing-surface for the rails, so constructed as to afford a ready and secure means of attachment for the rail-chairs, the elastic sides so constructed as not to spread or lose their shape, and the rail-chairs adapted to embrace the T-shaped bearing surface and the elastic sides of the tie in such a manner as to be permanently attached thereto and strengthen and render them more elastic.

I wish it understood that I do not confine myself to the exact construction of parts shown and described, for it is evident that any person skilled in the art might vary some of the parts without departing from the spirit of the invention.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A railway cross-tie constructed of a single sheet of metal folded through its center, so as to form a broad firm T-shaped bearing-surface, and the depending elastic sides *C*, spread apart and flanged, substantially as described.

2. A railway cross-tie constructed of a single sheet of metal folded and bent throughout its center, so as to form the broad T-shaped bearing-surface for the rails, and the depending outwardly-curved elastic sides *C*, provided with flanges at their lower edges, substantially as described.

3. A railway cross-tie constructed of a single sheet of metal bent and folded upon itself throughout its length, forming the broad and strong T-shaped bearing-surface for the rails, and the depending convex elastic sides *C*, having their lower edges bent or turned in toward the center line of the tie and provided with flanges *D*, substantially as described.

4. A railway cross-tie constructed with the T-shaped bearing surface, and the convex elastic sides *C*, flanged at their lower longitudinal edges, in combination with the rail-chair constructed of a single strip of metal provided with clamping-ears and bent around and shrunk upon the tie thus constructed, so as to embrace it closely, the lower ends of the said strip being bent so as to rest upon the lower flanges of the sides *C* of the tie, substantially as described.

5. The combination, with the tie constructed with a T-shaped bearing-surface, and elastic depending flanged sides *C*, the projecting flanges of the said bearing-surface being provided with notches or indentations, of the rail-chair provided with clamping-ears and bent so as to closely embrace the tie, and forced and shrunk into the notches or indentations in the bearing-surface, substantially as described.

6. The combination, with a metallic railway-tie constructed with a broad T-shaped bearing-surface, and convex elastic sides depending from the center of the lower side of the bearing-surface, the edges of the said bearing-surface being provided with slight notches



or indentations, of the switch-rail chair F, constructed of a strip of metal provided with clamping-ears, the said strip being bent so as to closely embrace the said bearing-surface and rest in the notches in the same, and provided with a continuation, *k*, which extends down upon one of the convex sides of the tie, all arranged as and for the purpose described.

7. The combination, with a metallic rail-way-tie constructed with a broad T-shaped bearing-surface and elastic depending sides, the edges of the bearing-surface being pro-

vided with slight notches *d*, of the switch-rail chair F, constructed of a strip of metal provided with clamping-ears *e*, the strip being bent so as to closely embrace the bearing surface of the tie and rest in the notches *d* in the opposite edges thereof.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM P. HALL.

Witnesses:

I. S. MORRIS,

WALTER D. JONES.