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Patented June 6, 1899.

S. HAZARD.

METALLIC CROSS TIE FOR RAILWAY TRACKS.

(Application filed Oct. 13, 1898.)

(No Model.)

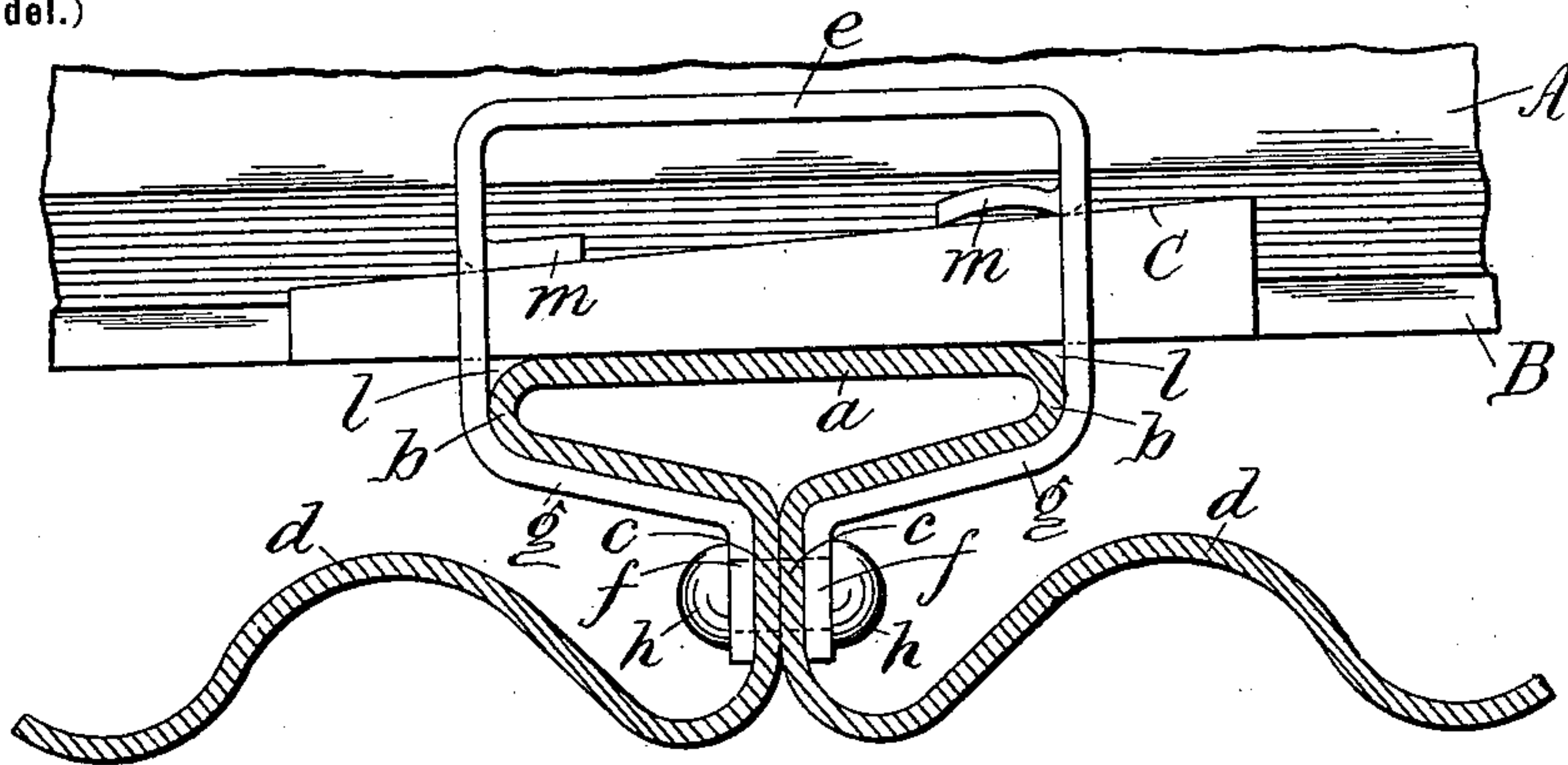


Fig. 1.

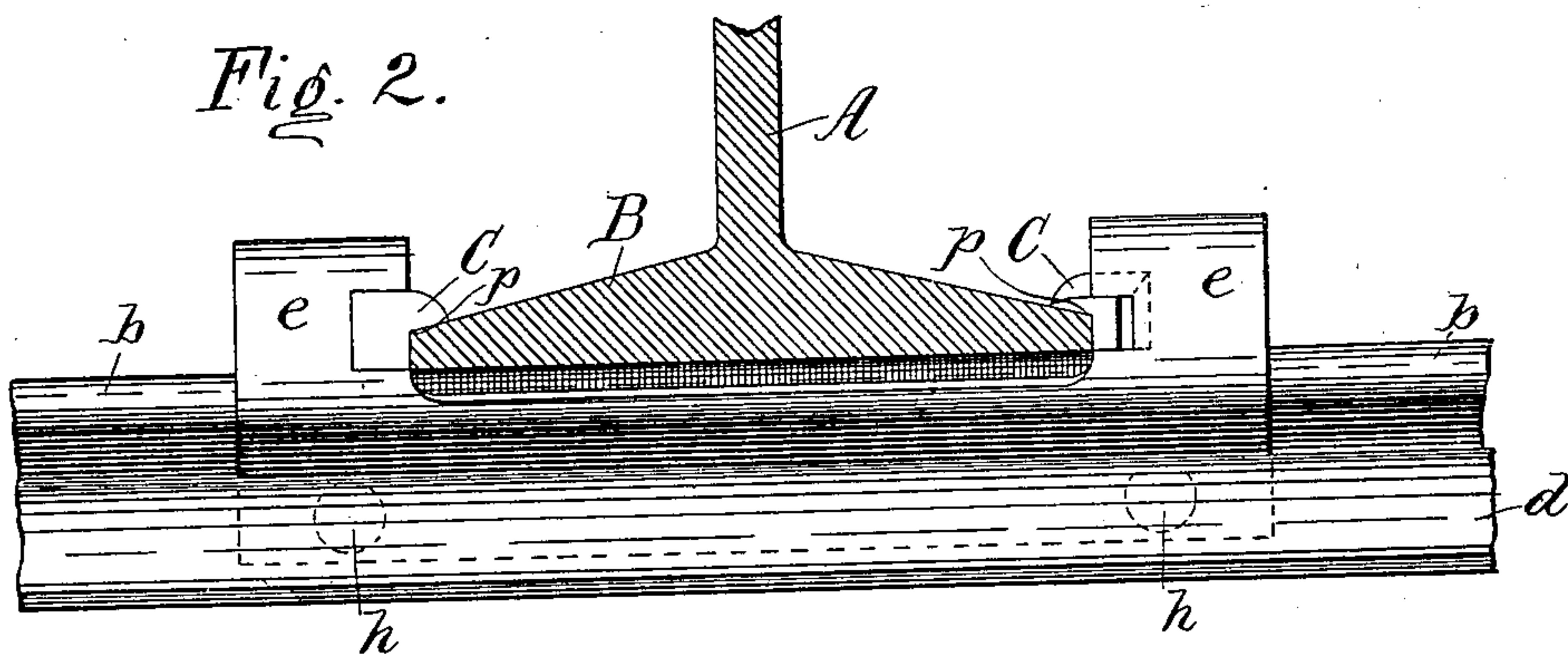


Fig. 2.

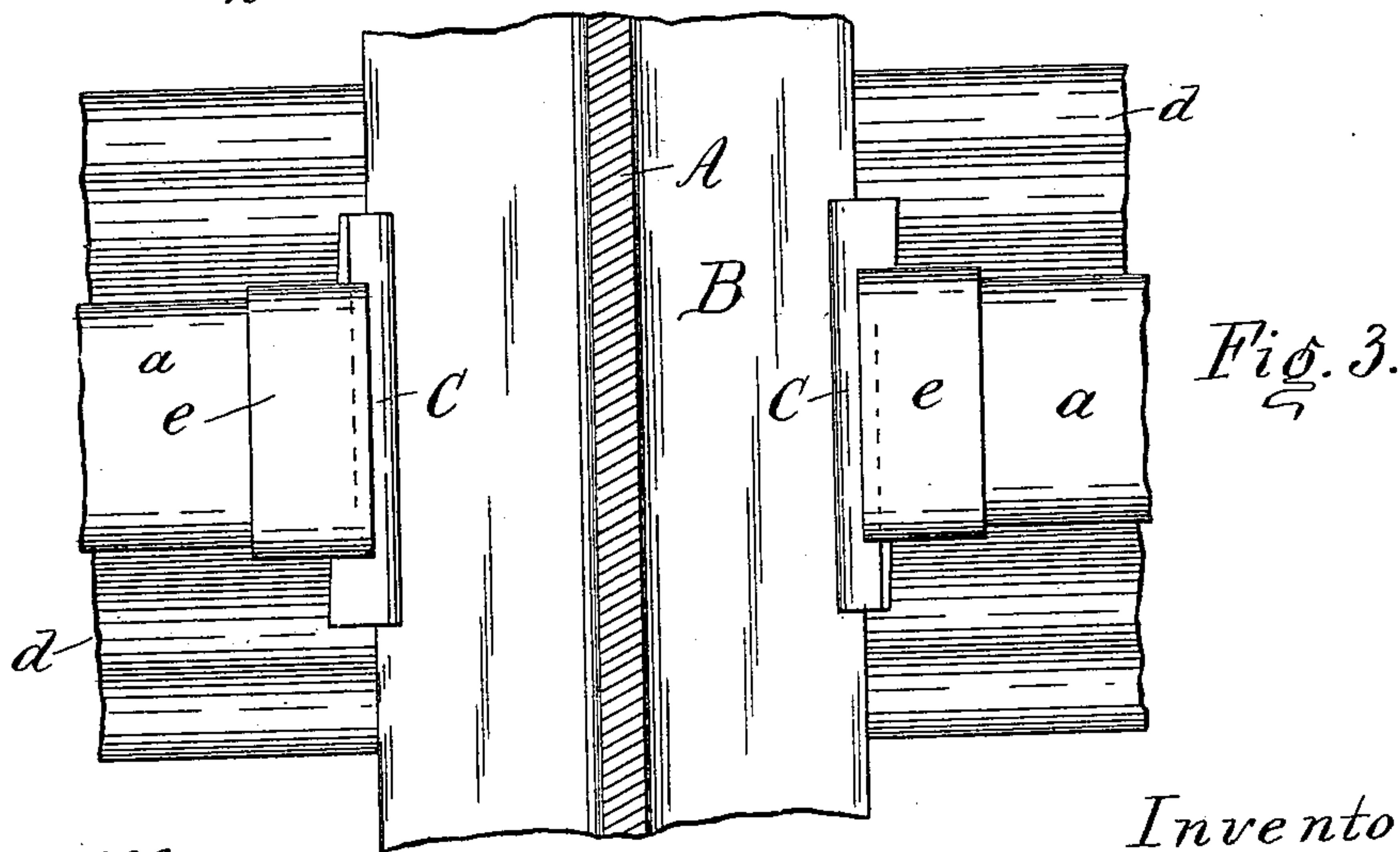


Fig. 3.

Witnesses.

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# UNITED STATES PATENT OFFICE.

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## METALLIC CROSS-TIE FOR RAILWAY-TRACKS.

SPECIFICATION forming part of Letters Patent No. 626,612, dated June 6, 1899.

Application filed October 13, 1898. Serial No. 693,373. (No model.)

*To all whom it may concern:*

Be it known that I, SCHUYLER HAZARD, a citizen of the United States, residing at Fern Bank, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Metallic Cross-Ties for Railway-Tracks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to metal cross-ties for use in supporting rails for railways and which are intended to be employed as a substitute for the wooden ties more commonly in use, and it has more particular relation to such metal ties when employed for street-railroad work, in which the ties are usually embedded in concrete and the surface of the street is paved or finished to the top of the rails. It is evident that for such street-railway purposes the shallower the cross-ties the less concrete will have to be disturbed and restored in tearing up the streetway for the laying of the track. Every inch of thickness of concrete saved in laying the track represents, of course, a large saving in the completed roadway. Heretofore six inches has been the minimum thickness of cross-ties in use for street-railroad work, and it is the purpose of my invention to reduce this thickness of tie to a very large extent, while at the same time maintaining a structure fully as rigid and serviceable as any construction of tie now in use. This I accomplish by a certain novel construction of metallic tie, to be hereinafter particularly pointed out and claimed.

Other features of my invention consist of the construction of clamp for securing the rails to the cross-ties, whereby any weakening of the top surface of the tie is avoided in attaching the clamp and the number of separate parts in making up the structure is reduced to a minimum.

When the ordinary wood cross-ties are used, the loose and separate parts merely consist of spikes to secure the rails to the ties, and it is my aim in the substitution of metal for wood to so arrange the clamp that the same may be permanently attached to the tie during its manufacture and the rails attached to the clamp by keys or wedges, which will thus

avoid the necessity of any loose bolts and nuts and render the laying of the track as simple and expeditious as with ordinary wooden ties. Furthermore, my clamps are so arranged that the gage of the track can be readily lessened or widened at curves and other places where necessary, which cannot be accomplished by metal ties, in which holes are punched in the tie for the reception of retaining-bolts, without furnishing special ties for such purpose.

In the drawings, Figure 1 is a cross-section of my improved tie and clamp. Fig. 2 is a cross-section of the rail, taken between the ties. Fig. 3 is a horizontal section of the rail-web, taken just above the tie and clamp.

My improved cross-tie is manufactured out of rolled-steel plate of the proper length, bent by suitable machinery into the shape shown in Fig. 1, in which *a* is the top face of the tie, *b b* the extended side flanges, *c c* the vertical web portion, and *d d* the base of the tie. The steel plate is of any desired thickness; but probably the best results can be obtained from a thickness of about an eighth of an inch.

The base of the tie is bent, as shown, into an ogee curve as the preferable shape, although, if desired, a single reversed curve can be employed, leaving the outer edge of the base flat. The base, however, should be substantially much wider than the top surface of the tie, and it is preferable to make the base practically three times the width of the top. With this shape of tie in cross-section it is possible to contract the depth of the tie very materially, so that a perfectly substantial and serviceable tie can be constructed not over two inches in depth.

As has already been said, my cross-tie is especially adapted for street-railway work, and in laying the tie the concrete is tamped under the full curves and the outer edges to give a substantial solid support for the tie. The broad base thus furnishes ample bonding-surface to rigidly secure the tie in place when the concrete has been filled in over the tie, and the upwardly-extending surface of the curves of the base effectually takes up the strain of the surface load on the rails and prevents the vertical web of the tie from spreading out or separating. To give additional bonding facilities, I also cut openings in the



broadly-extending base of the tie, through which the cement can set, so that the tie becomes practically a part of the concrete.

The clamp for securing the rails to the tie consists of a sheet of steel plate *e*, cut away at the center to receive the base of the rail and bent over, with its side edges *f f* approaching each other, so as to form a shell which can be slipped over the end of the tie, leaving the lower ends to embrace the vertical web *c c* of the cross-tie and the base of the clamp-shell *g g* embracing the tie underneath the side flanges *b b* thereof. The clamp-shells are secured at the proper point on the ties by rivets *h*, this operation being performed before the base portion of the tie is bent to shape. Instead of rivets slotted bolts with wedge-shaped cotter-pins can also be employed for the same purpose, the central portion of the clamp-shell being cut away of the width of the base *B* of the rail *A*. The rail is placed to rest on the cross-tie between the remaining outside upper portions of the clamp-shell. In order, however, to wedge the rail to the clamp, openings *l l*, adjacent to and just above the rail-base, are cut in each side of the clamp-shell by slitting and bending inward the metal *m m* at those points, the amount of metal detached being larger both in width and breadth at one side at each opening thus left than at the other. In this way a wedge-shaped passage-way is left narrower both vertically and laterally at one end than at the other, the two passage-ways being reversed, so that the keys for locking the rail are inserted from opposite sides for each clamp. These keys *C C* are wedge-shaped, with a groove *p* to fit over the outer edge of the base of the rail, and at the narrow end are preferably split, so as to be opened out to lock the key, and in addition to this the edge of one of the bent pieces *m* is curved over, so as to form a seat for the key.

As I have already stated, the clamps are riveted to the cross-tie at the proper places during the process of manufacture of the tie, so that the ties are furnished ready for the rails with no extra pieces. The keys are furnished in quantities and are applied as readily and easily as the ordinary spikes for the wooden ties, while for variations in the width of the gage at curves and elsewhere extra sets of keys are used, larger or smaller than

the ordinary ones, to allow a change in gage without disturbing the clamps, an arrangement obviously impossible where bolts are to be used through openings previously punched in the tie.

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

1. In a cross-tie, a metallic shell provided with a vertical web, flattened top surface, expanded side flanges, and a broadly-extended base having a reverse curve rising up nearly to a level with the top portion of the vertical web, substantially as shown and described.

2. In a cross-tie, a metallic shell provided with a vertical web, flattened top surface, expanded side flanges, and a broadly-extended base of an ogee curve in cross-section with the portion of the curve adjacent to the vertical web rising up nearly to a level with the top portion thereof, substantially as shown and described.

3. In a metallic cross-tie, provided with expanded side flanges, the combination therewith, of clamps consisting of a metallic shell, longitudinally embracing the side flanges, with means for securing same to the side of the tie, said clamp-shells extending above the surface of the tie and being cut away at the top for the reception of the rail-base and keys for securing the rails to the clamps, substantially as shown and described.

4. In a metallic cross-tie, provided with expanded side flanges, the combination therewith, of clamps consisting of a metallic shell longitudinally embracing the side flanges with means for securing same to the sides of the tie, said clamp-shells extending above the surface of the tie, cut away at the top for the reception of the rail-base and provided with longitudinal openings at the sides with keys to be inserted therein, said openings being wedge-shaped both sidewise and lengthwise, to draw down and wedge in the rail in the clamp, substantially as shown and described.

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Witnesses:

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