(No Model.) 3 Sheets—Sheet 1.

S. F. ADAMS.

METALLIC RAILWAY TIE.

No. 567,632. Patented Sept. 15, 1896.

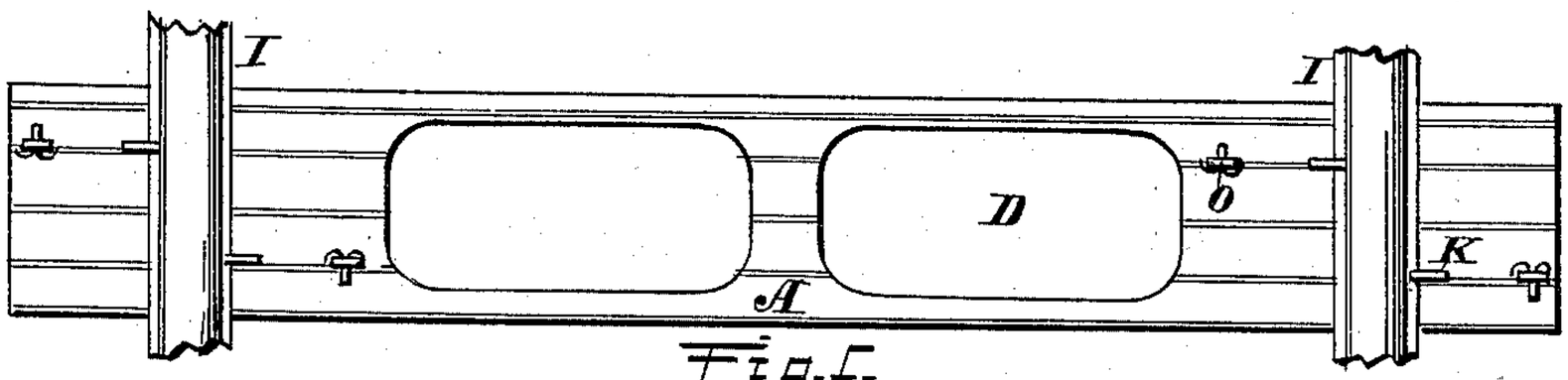

Fig. 1.

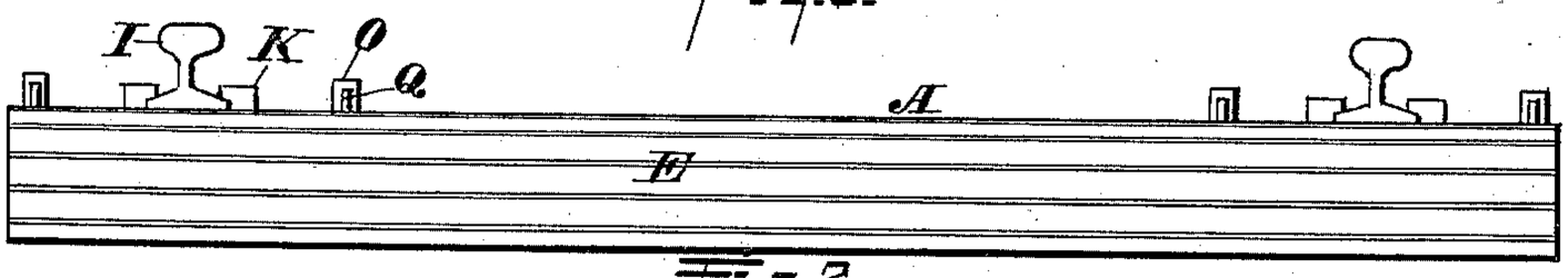

Fig. 2.

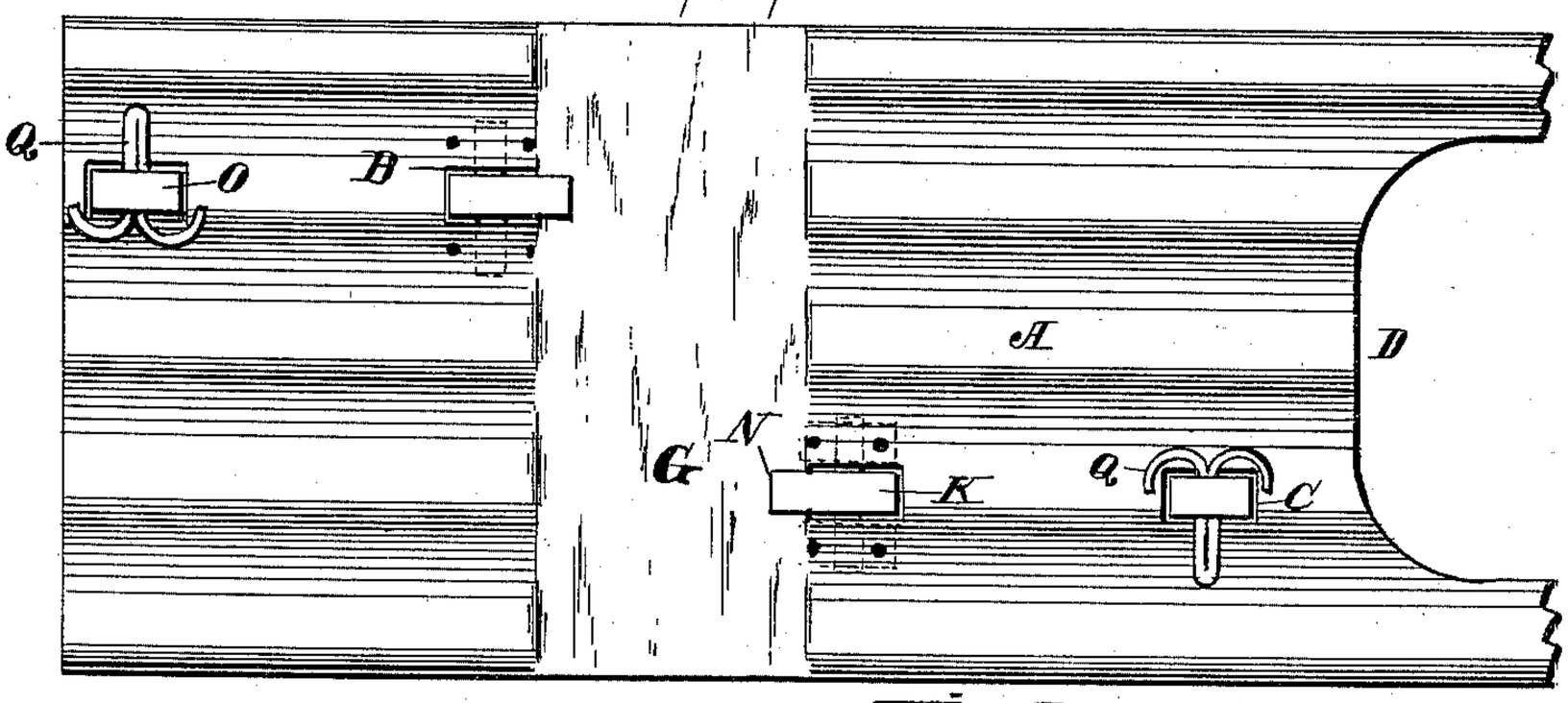

Fig. 3.

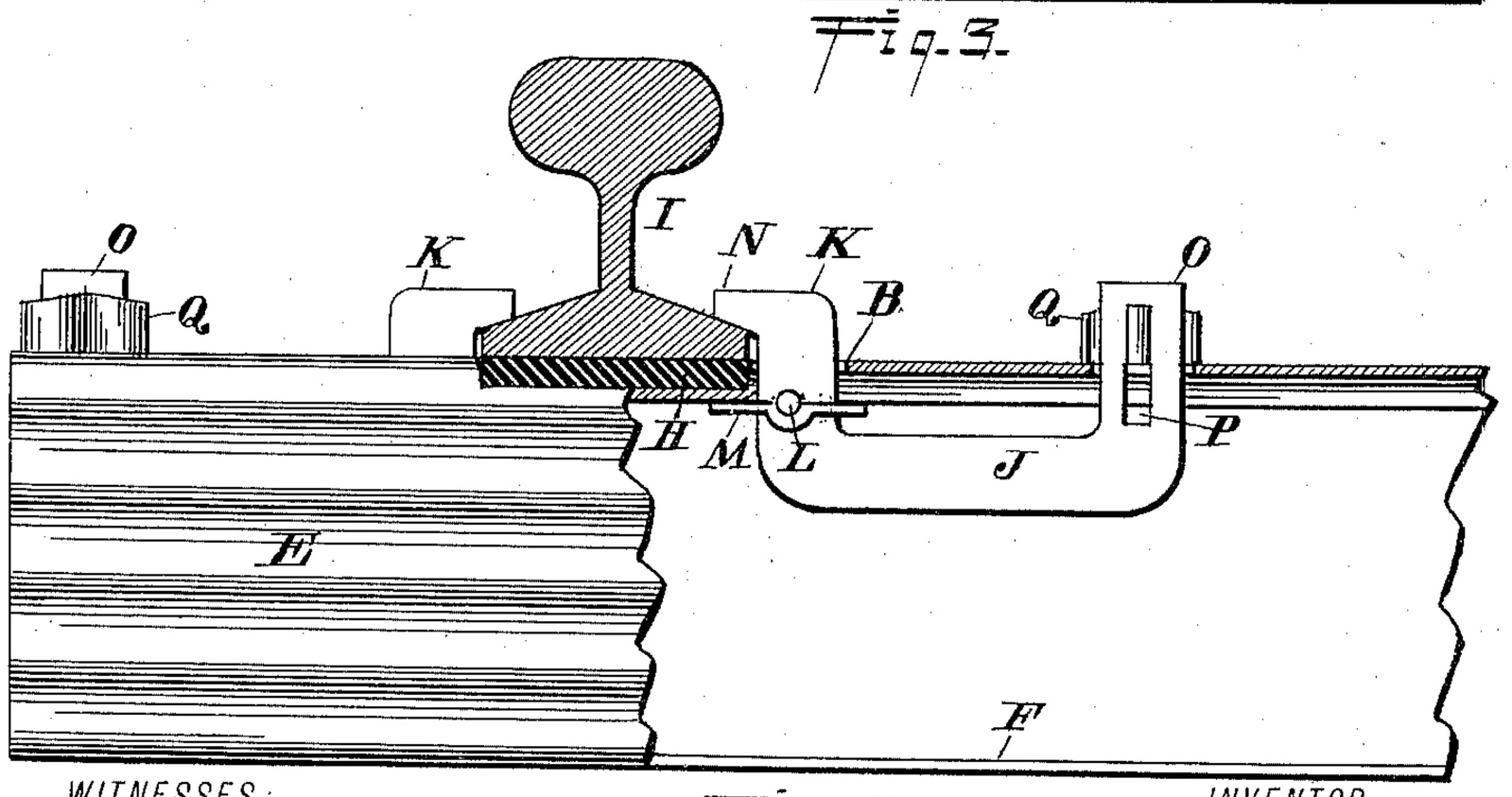

Fig. 4.

WITNESSES:

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(No Model.) 3 Sheets—Sheet 2.

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METALLIC RAILWAY TIE.

No. 567,632. Patented Sept. 15, 1896.

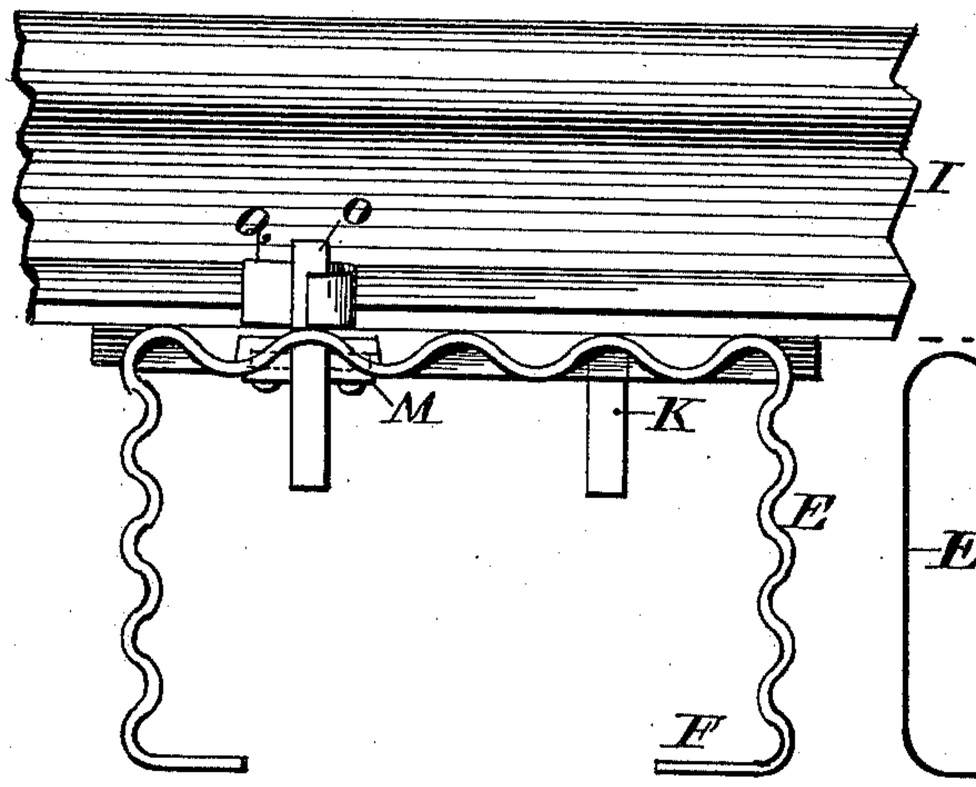

Fig. 5.

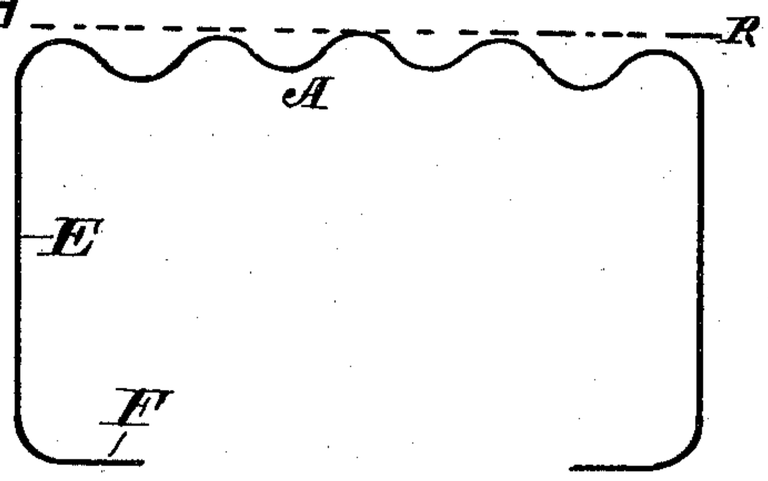

Fig. 6.

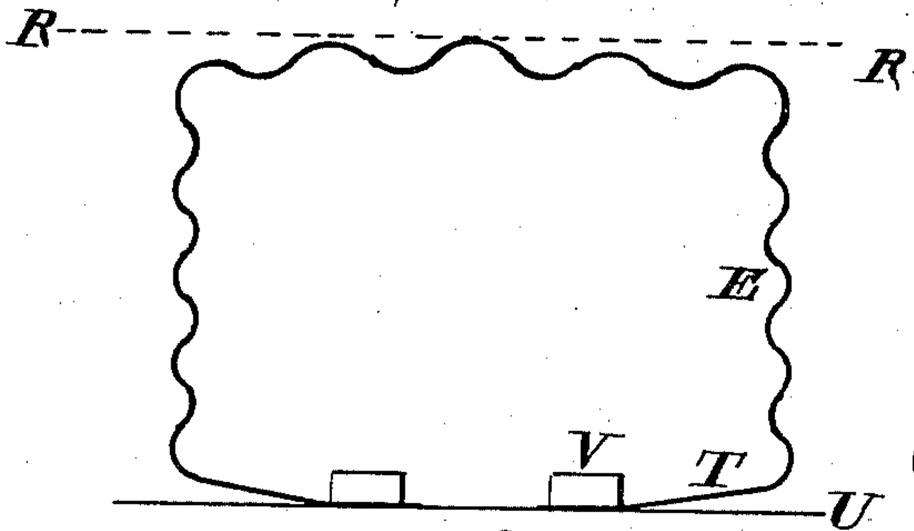

Fig. 7.

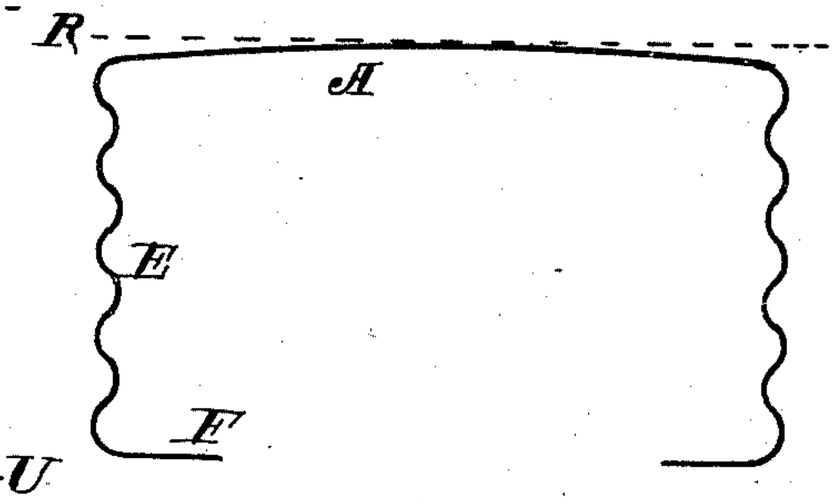

Fig. 8.

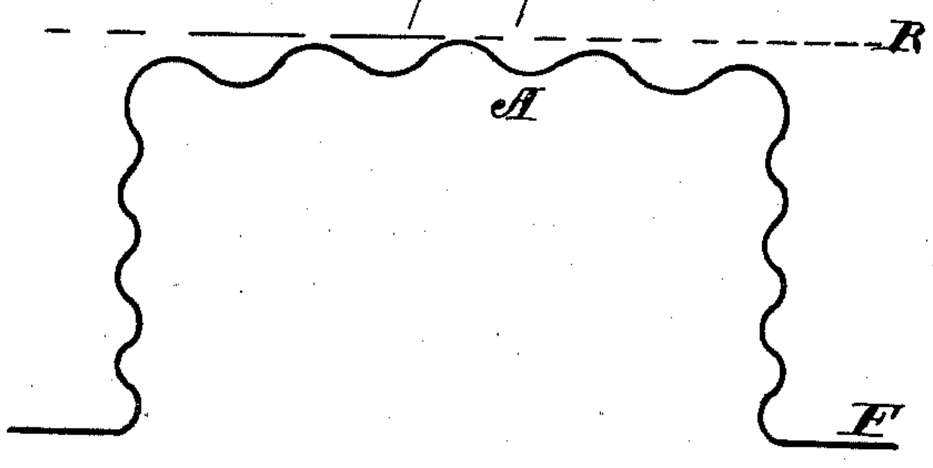

Fig. 9.

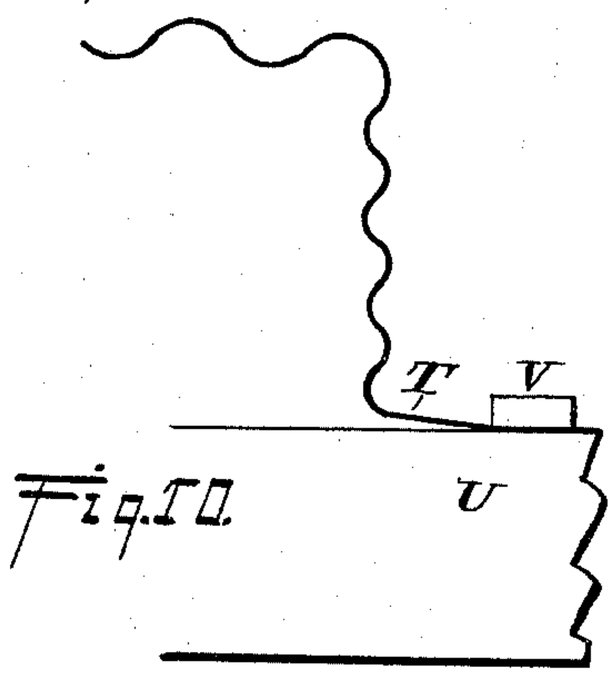

Fig. 10.

WITNESSES:

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(No Model.) 3 Sheets—Sheet 3.

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METALLIC RAILWAY TIE.

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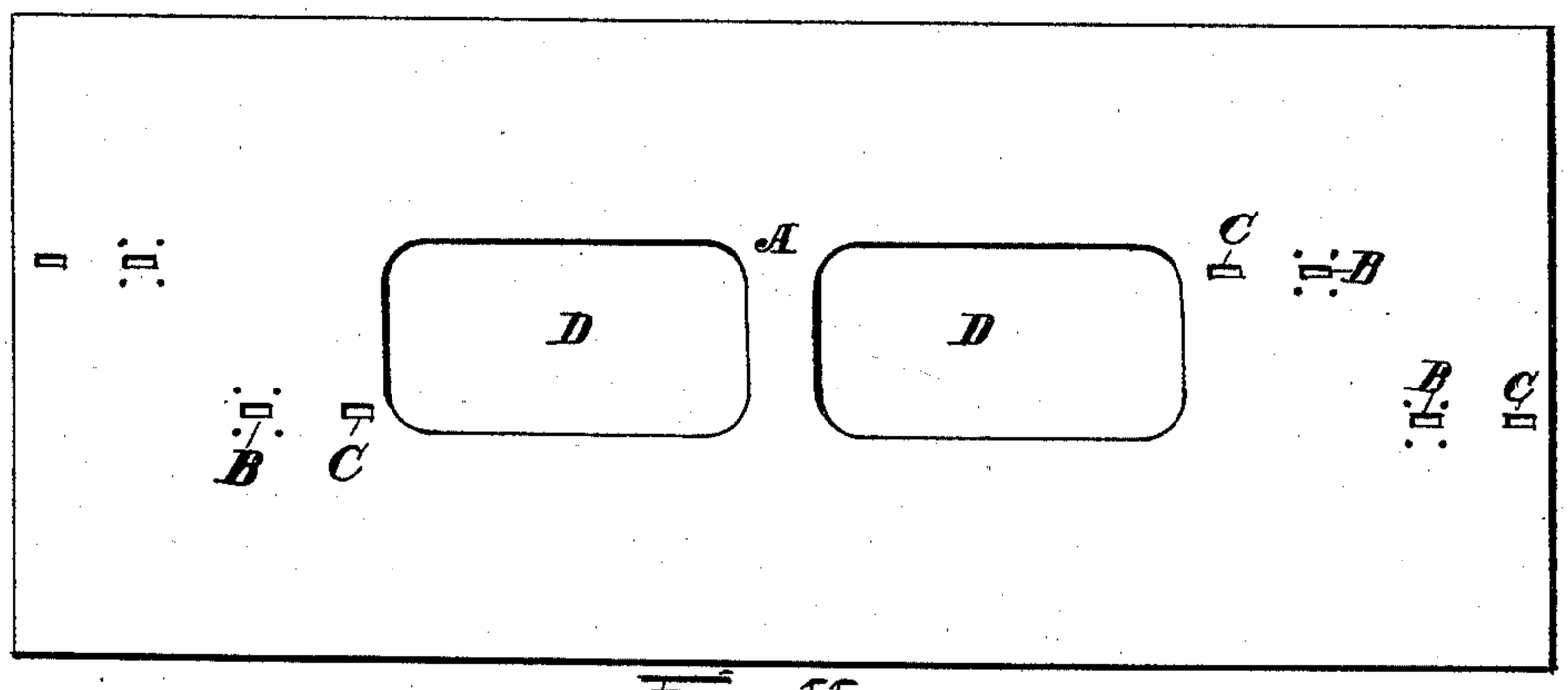

Fig. 11.

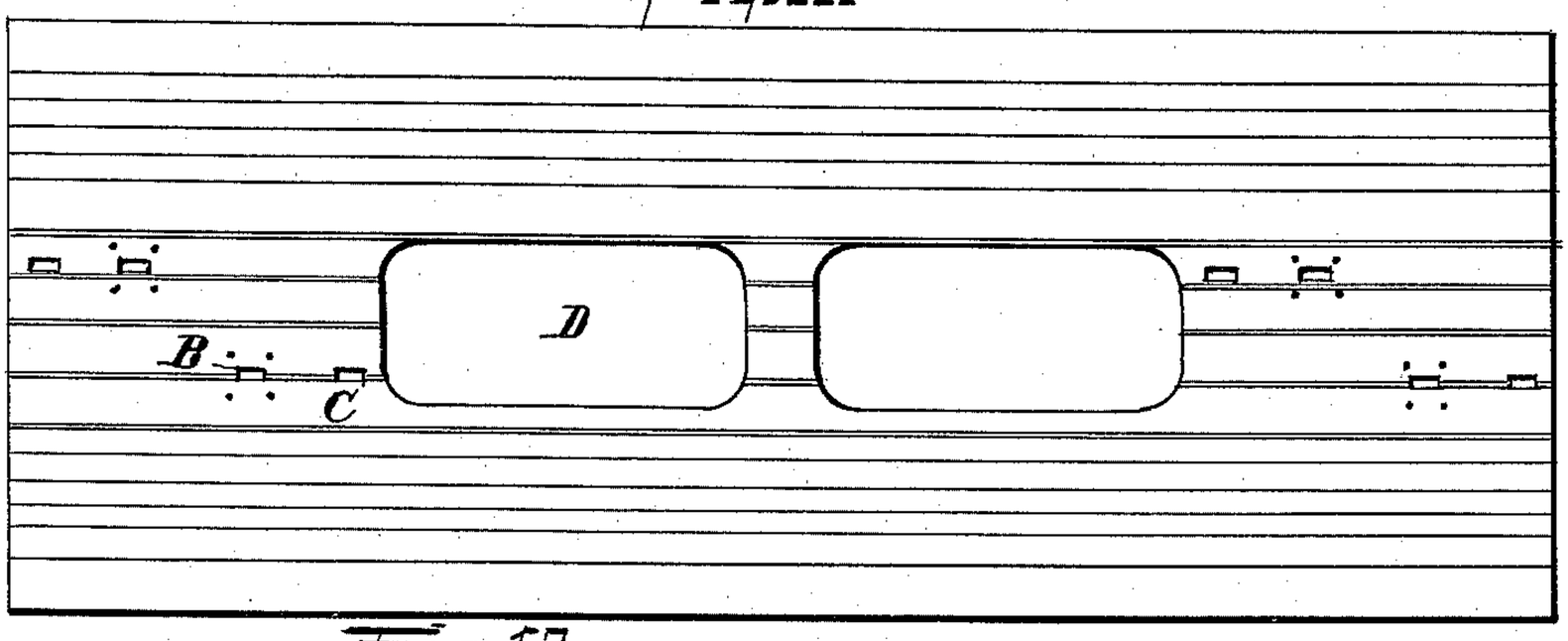

Fig. 12.

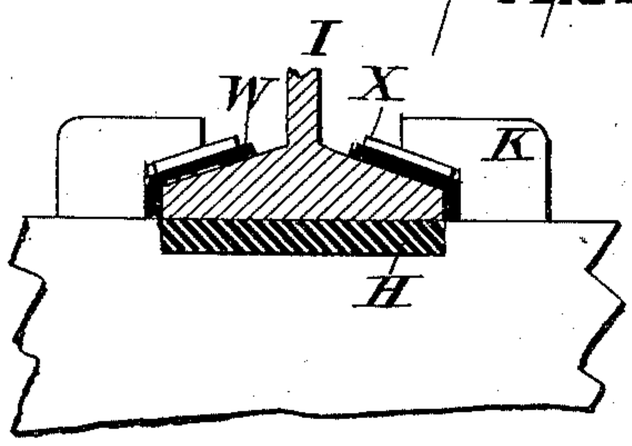

Fig. 13.

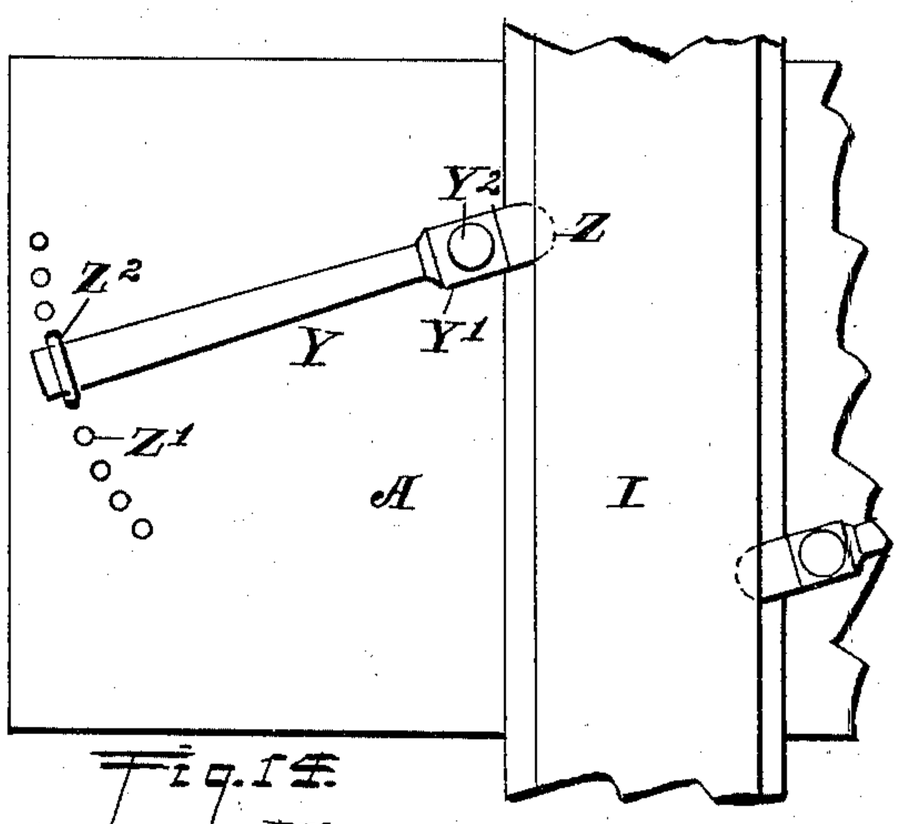

Fig. 14.

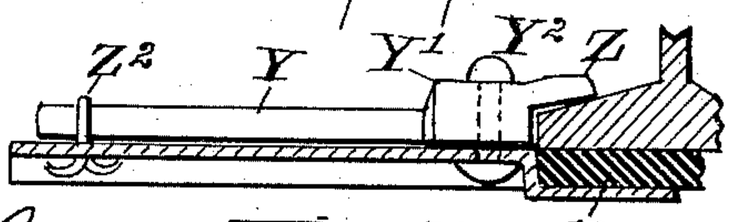

Fig. 15.

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UNITED STATES PATENT OFFICE.

SAMUEL F. ADAMS, OF BROOKLYN, NEW YORK.

METALLIC RAILWAY-TIE.

SPECIFICATION forming part of Letters Patent No. 567,632, dated September 15, 1896.

Application filed January 3, 1896. Serial No. 574,247. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL F. ADAMS, a citizen of the United States and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Metallic Railway-Ties, of which the following is a specification.

The object of this invention is to construct a metallic railway-tie which will be thoroughly elastic and at the same time can be held rigidly in place, which will be cheap in construction, easily placed in position or removed, and will not require bolts or nuts to hold the rail rigidly to the tie; and it consists of a rectangular piece of sheet steel or other suitable metal provided with longitudinal corrugations over the entire body, and in having the two sides bent downwardly at right angles and the edges inturned to form a base. Near the ends, where the rails rest on the tie, transverse channels are pressed in the corrugations, having slight upward curves so as to form a flat resting place, and on each side of this transverse channel are two slotted openings in line with each other, adapted to receive therein a bell-crank lever, so as to hold the rail securely, and insulating-strips in the channel beneath the rail and between the rail-flange and lever, all of which will now be set forth in detail.

In the accompanying drawings, Figure 1 is a general top view of my improved railway-tie with the rails secured thereto; Fig. 2, side view of the tie, showing end view of the rails; Fig. 3, enlarged top view of one end of my improved tie; Fig. 4, side view of same, partly in section, showing end view of rail and manner of securing same in position; Fig. 5, end view of tie, showing side view of rail and construction of fastening device on the bell-crank lever; Fig. 6, end view showing modified form of bending the tie; Fig. 7, inturned form of base, showing its adaptability for being attached to a rigid base, bridge, viaduct, or like structure; Fig. 8, modified form of the upper surface of the tie; Fig. 9 showing manner of turning the base outwardly for certain uses; Fig. 10, modification of the outwardly-bent base; Fig. 11, view of the blank from which the tie is made, showing the cut-out portions, the openings for the fastenings, and rivet-holes; Fig. 12, same corrugated preparatory to bending into shape; Fig. 13, cross-section of rail and fasteners, showing the construction of the insulating-strips; Fig. 14, plan view of modified form of securing-lever, and Fig. 15, cross-section of rail and side view of fastening-lever.

In constructing my invention I do not confine myself to the use of sheet metal, as it is obvious that any metal or material best adapted may be employed, but as steel appears to be the best known material at this time I shall refer to its use in this connection. Any suitable thickness of metal may be employed, and as its use is dependent on the class and character of work, I do not limit myself to thickness, but it may be well to say that for all railway work where ballast is required, or where the ties are placed under ground, the metal can be much thinner than where the tie is attached to a frame, bridge, viaduct, or other rigid structure, because in the former case a large portion of the weight of the tracks will be sustained by the top or upper wall of the tie and only a comparatively small portion by the sides and the inturned base of the tie. Hence thickness is not so essential.

I will first describe the tie designed for surface roads (shown in end view of Fig. 5) as an illustration, the form in cross-section.

The entire tie is constructed of one piece of sheet metal A, rectangular in shape, as shown in Fig. 11, into which I punch the eight longitudinal openings B C, of the size best adapted for the purpose, these openings being on opposite sides of the location of the rail, and are designed to receive the fastening-lever. Centrally the sheet or blank is cut away, as shown at D D, for the purpose of lightening the tie-body, and also to enable the workingmen to readily pack the interior with ballast when the tie is put down, or to remove the ballast when it is desired to remove the tie. The tie is then provided with longitudinal corrugations, as shown in Fig. 12, and afterward the sides E are bent down at right angles to the main body and the edges F inturned, as shown. The tie thus grooved constitutes a body which is light, possesses immense strength, and has the quality of elasticity, which is a necessary element in an article for this purpose. In order now

to prepare it for the rails, I press a flat transverse channel or way G across each end, and as it is desirable both to provide a cushion and an insulation for the rail, I place a strip H, of vulcanized fiber or other suitable material, in this channel and mount the rail I thereon. The rail-fastening is one of the most important elements in work of this character, for the reason that bolts and nuts are impracticable, and the fastener as a whole should be so made that it will not deteriorate by contact with the earth, and it should be capable at all times of ready and speedy removal without destroying the parts. In order to accomplish this, I construct a lever J with an upturned, right-angled limb at each end. The forward limb K, which projects upwardly through the slotted opening B, has a pin L projecting out on both sides at a point below the shell of the tie, where it is held in place by means of a clip M, riveted to the body of the tie. The upper end of the limb K has a forwardly-projecting dog N, which rests on the flange of the rail. The other limb O, which projects up through the other slotted opening C, has a slot P, into which is driven a wedge-shaped split key Q, the ends of which are bent around the limb to hold it in position. The action of this lever is twofold: It not only clamps the rail tightly to its seat, but it serves to hold the rail from lateral displacement. As the flange of the rail rests against the limb K, and as the key Q is on the upper side of the tie, it can be readily reached by the trackman and tightened up when required. At the same time the body of the lever itself is below the tie, and therefore not in the way to form an obstruction. It may also be observed that as both limbs K O pass through the slotted openings they form a more rigid bearing for the lateral movement of the rail than would be the case if only a single limb should be used.

In practice the upper surface of the tie should be slightly curved or convexed, as shown at R, Figs. 6, 7, and 8, by the dotted lines. The object of this is to add as much elasticity to the body as possible. However, the corrugated structure of the body accomplishes this in a great measure and also serves other useful purposes, particularly in the fact that the corrugated sides when placed in ballast has much better frictional contact than if made with plain sides, as shown in Fig. 6. Again, as is well known, structures of this character, where great weight or stress is required, will retain their shape and afford resistance much better than if made straight or flat. I find, however, that the corrugated sides are of great advantage where the tie is employed on rigid structures, as, for instance, bridges, viaducts, &c., because the elasticity is imparted to the convolutions, and the impact of the downward blow is distributed to the base in a less destructive manner. To that end I may construct the horizontal portion of the tie flat, as shown in Fig. 8, and have only the sides corrugated, thus cheapening the structure materially.

My preferred forms for rigid structures are shown in Figs. 7 and 10. In the former the inturned wings T are formed at an angle to the surface of the stringer U, and a narrow strip near the edge is made so that it will rest flat on the stringer to receive the lag screws or bolts. In Fig. 10 this wing extends outwardly, having the same detail of construction where it is secured to the stringer. This construction affords not only an elastic area on the upper surface of the tie, but also on the sides and base, which particularly adapt it for use on overhead railways in cities where it is important to overcome the noise of passing trains.

Fig. 9 shows the base-wings turned outwardly resting solidly on the stringer.

As it is important in electrical work to insulate the rail from the tie, I show a preferred form of doing this in Fig. 13. It will be seen that I employ the base-strip H, of vulcanized fiber or other material, in the channel under the rail, and insert an L-shaped insulator W under the end of the dog N, and over this I place a metal plate X to receive the pressure of the dog, thus making a positive insulation between the tie and rail, at least.

While it is obvious that various methods may be employed to secure the rail to the tie, the preferred form, for the reasons stated, is shown in Fig. 4, but numerous modifications may be made, and one form is illustrated in Figs. 14 and 15. In this case I employ a lever Y, which has an enlarged head Y′, through which is placed a rivet Y^2, in order to secure it to the tie. A nose Z projects forward from this head and overlaps the flange of the rail. At the outer end, and within range of the sweep of this lever, is a series of holes Z′, formed through the shell of the tie, and when the lever is turned so as to bring the nose Z tightly in contact with the flange a staple Z^2 is placed astride the lever Y and the lower projecting ends bent, as shown in Fig. 15, to hold the same, thus accomplishing the purpose of securing the rail to the tie without using bolts or nuts.

What I claim as new is—

1. As a new article of manufacture, a tie composed of sheet metal longitudinally corrugated, provided with downturned sides also longitudinally corrugated, each side having an inturned base, a transverse, flattened channel across the upper face near each end to receive the rails, and slotted openings in the body of the tie on each side of said channels, substantially as set forth.

2. A railway-tie constructed of sheet metal, its entire body being longitudinally corrugated, the sides formed by downturned portions and the base by inturned wings, the upper surface having depressed and flattened transverse channels, and slotted openings on each side of said channels, in combination with a rail, U-shaped levers in said slotted

openings, engaging with the flanges of said rail, and keys for securing same, substantially as set forth.

3. A railway-tie composed of sheet metal, longitudinally corrugated, and having downturned sides and inturned base, the upper surface having near each end a transverse flattened channel, said channel being slightly curved from end to end, so that the initial pressure or load will rest centrally on said tie, substantially as set forth.

4. A railway-tie having its entire body composed of longitudinally-corrugated sheet metal with downturned sides and inturned base, the upper surface being slightly convex, and the base elastic, substantially as set forth.

5. A railway-tie composed of sheet metal, having on its upper side near each end a flattened transverse channel provided with an upward curve, in combination with a rail, an insulating-strip in the transverse channel beneath the rail, and a U-shaped fastening-lever on each side of the rail, with insulating material interposed between the rail and levers and clamped by said U-shaped levers, substantially as set forth.

6. A fastening for railway-ties composed of a lever with two upturned right-angled ends one end being hinged to the tie adjacent to the rail and having a dog which projects over and binds the rail-flange, and the other upturned end having a slot to receive a key, in combination with a metal tie and rail substantially as set forth.

7. The combination with a metal tie having at each end a transverse channel and a railway-rail of a rail-fastener, composed of a lever with two upturned right-angled ends which pass through slots in the tie, one end being hinged to the tie adjacent to the rail, and having a dog which projects over and binds the rail-flange, and the other upturned end having a slot and a key for fastening the same, and insulating material in said transverse channel substantially as set forth.

Signed at Brooklyn, in the county of Kings and State of New York, this 27th day of December, A. D. 1895.

SAMUEL F. ADAMS.

Witnesses:
HUGH MOORE,
A. J. ZERK.