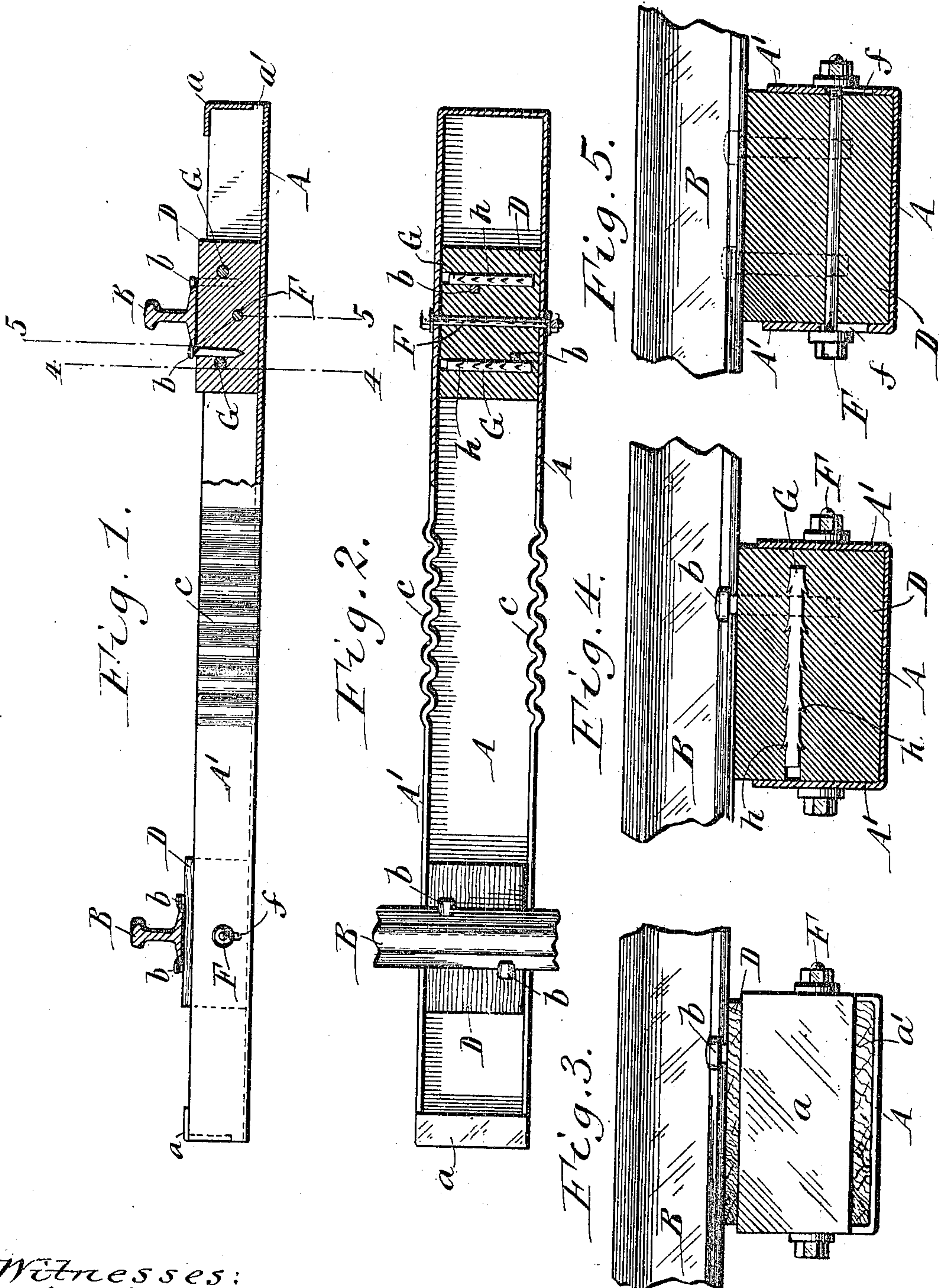


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RAILWAY TIE.

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# UNITED STATES PATENT OFFICE.

AUGUST HEINE, OF SILVER CREEK, NEW YORK.

## RAILWAY-TIE.

No. 831,787.

Specification of Letters Patent.

Patented Sept. 25, 1906.

Application filed April 28, 1906. Serial No. 314,250.

*To all whom it may concern:*

Be it known that I, AUGUST HEINE, a citizen of the United States, residing at Silver Creek, in the county of Chautauqua and State of New York, have invented a new and useful Improvement in Railway - Ties, of which the following is a specification.

This invention relates more particularly to that class of railway-ties having metal bodies and wooden blocks or sleepers to which the rails are secured for the purpose of cushioning the load placed upon the rails and also insulating the same, so that the same may be used as part of the electrical signaling mechanism.

The object of my invention is to provide a tie of this character which is not liable to become center-bound, which permits of reliably securing the rails to the cushioning blocks or sleepers by means of spikes without liability of loosening the same, and which is provided with simple and effective means whereby the sleepers are prevented from becoming checked or cracked.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of a railway-tie constructed in accordance with my invention. Fig. 2 is a top plan view thereof, partly in section. Fig. 3 is an end elevation thereof, on an enlarged scale. Figs. 4 and 5 are vertical cross-sections thereof, on an enlarged scale, in lines 4 4 and 5 5, Fig. 1, respectively.

Similar letters of reference indicate corresponding parts throughout the several views.

The body of the tie is constructed of metal, preferably rolled steel, in the form of a trough which is open at the top and consists, essentially, of a horizontal bottom A and two upright longitudinal side walls A' A', projecting upwardly at opposite longitudinal edges of the bottom. At each end of the tie-body its side walls are connected by a cross piece or bar a, extending from the upper edge of said walls downwardly to within a short distance of the bottom, leaving an opening a' between this bar and the bottom to permit any moisture on the inner side of the tie to drain to the outer side thereof.

It sometimes happens that the road-bed under the central part of the tie-body is more firm than under its ends, and when the tie becomes thus center-bound the body when subjected to the pressure of the load running over the rails B B is depressed unevenly, rendering the railway unsafe. This

occurs most frequently when the road-bed is tamped harder under the center of the tie than at the ends. As is the case in the spring after a severe winter, the center of the tie is frost or center bound, while at its outer ends and under the rails on account of the greater sun exposure of this part of the road-bed the ground is free from frost, and consequently more yielding. It is therefore desirable that the tie should have a yielding quality with sufficient resilience to restore it to its normal form when relieved from pressure. When the tie does not have this yielding quality, the passing of the train over it will produce a pounding action on the rolling-stock, rail, and ties, resulting in more or less injury to all. It is the rigidity of the metal tie so far in use that is the cause of objections to them, which is overcome in the present construction.

In order to provide the requisite flexibility in the body of the tie to enable the same to be thus bent when center-bound, the central part of its side walls are each provided with one or more transverse or vertical corrugations c, while its end portions remain uncorrugated. The bottom of the tie-body is uncorrugated or straight throughout its length, as shown in Figs. 1 and 2. When the tie-body of this construction becomes center-bound, the depression of its ends under the load on the rails merely causes the corrugations to be drawn out or flattened more or less, while the central part of the bottom bends the required extent, and when the load leaves the ends of the tie-body the resilience of the corrugations again restores the ends of the tie-body to their normal elevated position. It will thus be observed that the body of the tie is springy and yielding even though it be frost or center bound or unevenly tamped and embodies in a metallic tie all of the yielding or spring qualities of the wood tie.

D represents the cushioning blocks or sleepers, which are interposed between the tie-body and the rails. Each of these blocks is preferably constructed of wood, so as to fit against the bottom and side walls of the tie, and projects with its upper end a short distance above the walls, so that the rail while resting on the upper side of the block is held out of metallic contact with the tie-body. By this means the rails are insulated from the tie-body, permitting the rails to be used as conductors of the electric current when it is desired to equip the railway with an electrical



signaling mechanism. The cushioning-blocks are made comparatively short and extend but a short distance beyond opposite sides of the rails, and the same are so cut that the grain of the wood runs lengthwise of the tie-body. The rails are secured to the upper sides of these blocks by means of spikes *b*, driven vertically into the blocks. The latter are held in place in the tie-body by horizontal coupling-bolts *F* passing transversely through the blocks and the side walls of the tie-body. In the drawings only one of such coupling-bolts is employed for each cushioning-block, the same passing through the central part of the block; but, if desired, more than one of such bolts may be employed for holding each cushioning-block in place.

It has been found by experience that the reaction or rebound following the downward movement produced by the weight of the train passing over the blocks and also the shifting of the weight from one tie to another has a tendency to spring up the rail over the tie just released and produce an upward strain on the head of the spikes on the latter.

If the cushioning-blocks were rigidly secured to the ties, the upward pull, which is exerted by the rails after the load leaves the same, would come principally on the heads of the spikes which fasten the rails to the cushioning-blocks and soon pull these spikes out of the blocks, thereby causing the rails to become loose and unsafe. In order to avoid undue pulling on the spikes, each of the cushioning-blocks is so connected with the tie-body that it is free to rise with its rails to a limited extent independently of its tie-body. This is preferably effected by passing the coupling-bolts *F* through vertically-elongated openings or vertical slots *f* in the side walls of the tie-body, as shown in Figs. 1 and 5. As the cushioning-blocks are compressed under the load the coupling-bolts move downwardly in the slots *f*, and after the load leaves the rail the bolts are free to rise in the slots, together with the cushioning-blocks, under the upward pull on the same by the rails. The strain of the rails on the spikes, which otherwise would be exerted almost wholly against the same during the retraction or relaxation of the rails, is thus relieved, thereby causing the rails to be always firmly secured to the blocks by the spikes and increasing the safety of the railway accordingly.

In order to prevent the wood cushioning-blocks from being split when the spikes are driven into the same and also to enable the spikes to obtain a better hold on the wood, the end portions of the cushioning-blocks outside of the spikes are reinforced or tied together, so as to resist horizontal spreading or checking of the fibers of the wood at the ends of the wood blocks. The preferred means for this purpose (shown in the drawings) consist of horizontal reinforcing or locking rods

or pins *G*, which are placed transversely in the end portions by the cushioning-block outside of the spikes. When the cushioning-blocks are made out of soft wood, these locking or reinforcing rods may be driven directly into the wood; but if the blocks are made out of comparatively hard wood it is preferable to bore an opening of somewhat smaller diameter than the locking-rod, into which the rod may be driven more readily. The surface of each locking-rod is preferably provided with a plurality of barbs or spurs *h*, which embed themselves in the wood and form anchors, which firmly interlock the reinforcing-rod with the wood and prevent the ends of the blocks from spreading, cracking, or checking when the rail-holding spikes are driven into the same. By this means the spikes are not only able to maintain a firm grip on the wood block, but it also permits the blocks to be made much shorter than would otherwise be possible, thereby economizing in the use of the wood and reducing the cost in the same measure. For the purpose of increasing the grip on the spikes the locking-rods are preferably so located that the spikes upon being driven into the blocks will engage on their outer sides with the inner sides of the locking-rods, as shown in Figs. 1 and 2. It is not necessary, however, for the spikes to actually engage the locking-rods, because substantially the same effect is produced if the spikes are driven close to the locking-rods, owing to the condensation or compactness of the wood fibers immediately around the locking-rods.

When the rails are used as a part of the electrical signaling system, the locking-rods are constructed of a length less than the internal width of the tie-body and the same are driven into the cushioning-blocks, so that the opposite ends of the locking-rods are arranged at a distance from or stop short of the sides or exterior of the cushioning-blocks, as shown in Fig. 4, thereby preventing metallic connection between the locking-rods and the tie-body which otherwise would interfere with the electric circuits.

In practice the space within the tie-body is filled with ballast even with the road-bed.

My improved railway-tie is comparatively simple and inexpensive in construction, the same can be installed at low cost by the same class of labor which is now commonly employed for this purpose and owing to its superior durability reduces the cost of a railway materially.

I claim as my invention—

1. A railway-tie comprising a trough-shaped body having its central part corrugated transversely while its end portions are uncorrugated, substantially as set forth.

2. A railway-tie comprising a trough-shaped body having a horizontal bottom and upright sides, the central parts of said up-



right sides being corrugated vertically while its end portions are uncorrugated, substantially as set forth.

3. A railway-tie comprising a trough-shaped body having a horizontal bottom and upright sides, the central parts of said upright sides being corrugated vertically while the end portions thereof are uncorrugated and said bottom being uncorrugated throughout its length, substantially as set forth.

4. A railway-tie comprising a hollow body, a cushioning-block seated in said body and adapted to have a rail secured thereto, and means for loosely connecting said body and block, substantially as set forth.

5. A railway-tie comprising a hollow body, a cushioning-block seated in said body and adapted to have a rail secured thereto, and means for loosely connecting said body and block, consisting of a coupling-bolt passing transversely through said block and vertical slots in the sides of said body, substantially as set forth.

6. A railway-tie comprising a metal body of trough form having a flat bottom and upright side walls, a cushioning-block of wood seated on the bottom of the body and engaging with the side walls thereof and adapted to have spikes driven vertically therein for securing a rail to the upper side thereof, and a horizontal coupling-bolt extending transversely through the cushioning-block and through vertical slots in the side walls of the body, substantially as set forth.

7. A railway-tie comprising a hollow body, a cushioning-block of wood seated in said body and adapted to have spikes driven into the same for securing a rail thereto, and a reinforcing-rod arranged transversely in the end portions of said block but disconnected from the body, substantially as set forth.

8. A railway-tie comprising a hollow body, a cushioning-block of wood seated in said body and adapted to have spikes driven into the same for securing a rail thereto, and a reinforcing-rod arranged transversely in the end portions of said block and having anchoring-barbs which are embedded in the cushioning-blocks, substantially as set forth.

9. A railway-tie comprising a hollow body, a cushioning-block of wood seated in said body and adapted to have spikes driven into the same for securing a rail thereto, and a reinforcing-rod arranged transversely in the end portions of said block and having its ends arranged at a distance from the outer side of the cushioning-block, substantially as set forth.

10. A railway-tie comprising a hollow metal body, a wood cushioning-block arranged in said body and having its grain running lengthwise, reinforcing-rods arranged transversely in the end portions of said block but disconnected from the body, and spikes driven vertically into the block on the inner side of said rods and adapted to secure a rail to the block, substantially as set forth.

11. A railway-tie comprising a hollow metal body, a wood cushioning-block arranged in said body and having its grain running lengthwise, reinforcing-rods arranged transversely in the end portions of said block but disconnected from the body, and spikes driven vertically into the block and into engagement with the inner side of said rods and adapted to secure a rail to said block, substantially as set forth.

12. A railway-tie comprising a trough-shaped metal body having a horizontal bottom and upright side walls, a cushioning-block of wood arranged in said body and having its grain running lengthwise, a coupling-bolt passing transversely through said block and through vertical slots in the side walls of the body, reinforcing-rods arranged transversely in the end portions of said block and stopping short of the sides thereof and having anchoring-barbs on its surface, and spikes driven vertically into the block and into engagement with the inner sides of said rods and adapted to secure a rail upon said block, substantially as set forth.

Witness my hand this 27th day of April, 1906.

AUGUST HEINE.

Witnesses:

THEO. L. POPP,  
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