(No Model.) 2 Sheets—Sheet 1.

B. W. DE COURCY.

CROSS TIE AND FASTENING OF THE RAILS THERETO.

No. 306,139. Patented Oct. 7, 1884.

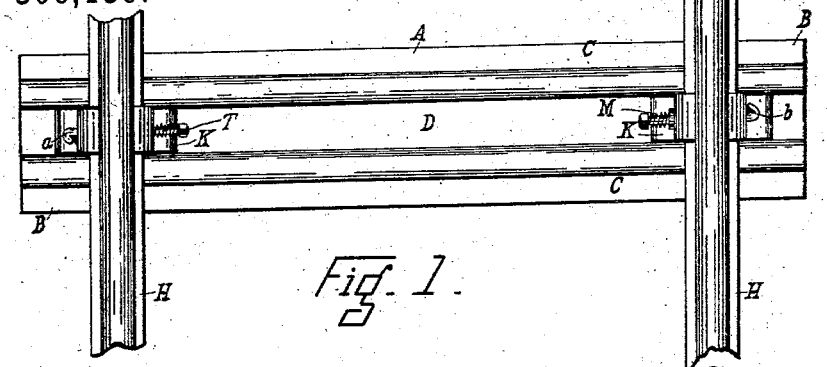

Fig. 1.

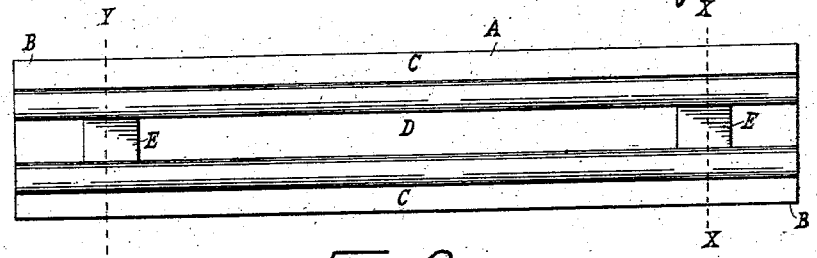

Fig. 2.

Fig. 3.

Fig. 4.

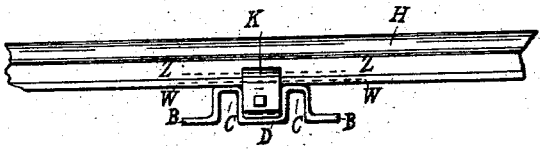

Fig. 5.

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(No Model.) 2 Sheets—Sheet 2.

B. W. DE COURCY.

CROSS TIE AND FASTENING OF THE RAILS THERETO.

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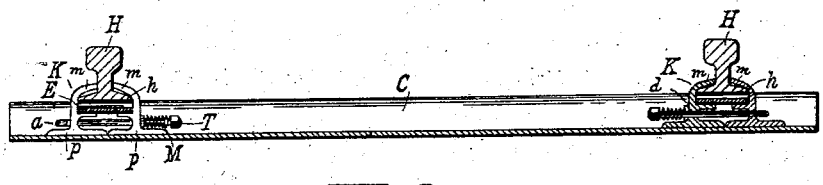

Fig. 6.

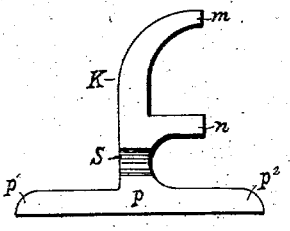

Fig. 7.

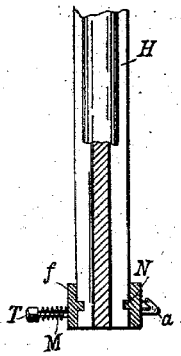

Fig. 8.

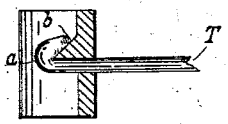

Fig. 9.

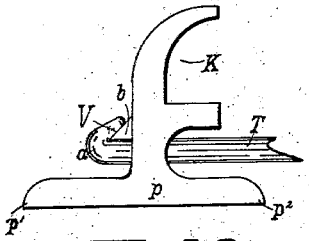

Fig. 10.

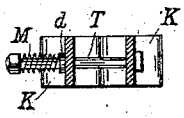

Fig. 11.

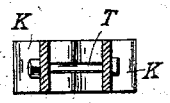

Fig. 12.

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Inventor—
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per Wm. Hubbell Fisher,
Atty

UNITED STATES PATENT OFFICE.

BOLTON W. DE COURCY, OF STARKVILLE, MISSISSIPPI, ASSIGNOR OF TWO-THIRDS TO JOHN G. MANN, OF JACKSON, TENNESSEE, AND JOHN McKECHNEY, OF CHICAGO, ILLINOIS.

CROSS-TIE AND FASTENING OF THE RAILS THERETO.

SPECIFICATION forming part of Letters Patent No. 306,139, dated October 7, 1884.

Application filed December 27, 1883. (No model.)

To all whom it may concern:

Be it known that I, BOLTON W. DE COURCY, a resident of the city of Starkville, in the county of Oktibbeha and State of Mississippi, have invented certain new and useful Improvements in Cross-Ties and Means for Making Connection Between Them and the Rails, of which the following is a specification.

Certain features of my invention have relation to a railroad cross-tie made of metal, and certain features have reference to a novel means for connecting a railroad-rail to a metallic cross-tie.

The several features of my invention and the various advantages resulting from their use conjointly or otherwise will be apparent from the following specification.

In the accompanying drawings, forming part of this specification, Figure 1 is a top view of a metallic cross-tie made according to my invention, portions of the rails being shown in position on the same, and also showing devices for connecting the cross-tie and the rails, these devices also illustrating certain features of my invention. Fig. 2 is a top view of the metallic cross-tie, the rails and the devices for connecting the rail to the tie having been removed. Fig. 3 is an end elevation of the cross-tie. Fig. 4 represents a vertical transverse section of the cross-tie, taken at a plane passing through the dotted line *x x* or *y y* of Fig. 2. Fig. 5 is an elevation of the cross-tie, rail, and their connecting devices shown in Fig. 1, and taken from either end of the rail toward the transverse center of the cross-tie. Fig. 6 represents a vertical section of the tie, rail, and connecting devices shown in Fig. 1, the section being taken through the longitudinal center of the cross-tie. Fig. 7 is an enlarged edge elevation of one of the two members forming a portion of the devices for connecting the rail to the cross-tie, and showing its relation when in working position to the cross piece or brace for enabling the chair or clip pieces to keep the rail to the tie and prevent the rail from slipping laterally. Fig. 8 is a top view of transverse horizontal section of the clip-pieces and rail, taken at the dotted line *z z* of Fig. 5, and showing a mode of securing the rail from slipping longitudinally; the parts above a horizontal plane passed through said dotted lines having been removed. Fig. 9 is a top view of the under portion of a horizontal section taken at the dotted line W W of Fig. 5, and showing the approved mode of connecting the opposing clip-pieces. Fig. 10 shows a modified mode of making the connection illustrated in Fig. 9. Figs. 11 and 12 show other modes of connecting the bolt and the clip-pieces.

A indicates the cross-tie, preferably made of wrought-iron. The tie is provided with two or more longitudinal ribs, C, either solid or hollow. Preferably the ribs are hollow and open below, the tie being thus corrugated above and below. Between adjacent ribs is a gutter or groove, D, opening upward. The cross-tie, excepting the cross-bar, may be readily rolled into shape in one and the same operation.

Various means may be employed for connecting the rail to the cross-tie.

A useful means for enabling the chair or equivalent device to hold the rail in position on the cross-tie consists of a cross bar or piece, E, extending across the groove D, and a desirable mode of connecting it to the ribs consists in forming openings *e* one in the inner side of each rib bordering the groove D, these openings being preferably located a little distance below the top of the rib. One end of the cross-piece E being inserted in one of the openings *e*, the cross-piece is bent so as to shorten it, and its other end being then inserted in the other opening *e*, it is then straightened, and is thus effectually secured or locked in position in the openings *e*. The cross-piece can thus be most readily introduced into the openings by heating it to a red heat, and while thus hot it can be bent, inserted into the openings, and straightened, and then, when allowed to cool, it is well secured in place.

In connection with the cross-tie, cross-piece E, and the rail, any suitable chairs or clips may be employed. A preferred form of such clip or chair pieces of my invention will now be described. The rail H, in so far as its shape in transverse cross-section is concerned,

is made in any of the usual shapes, being provided with a tread and a foot having the usual side extensions or flanges, *h*. The clip has two hook or claw pieces, K K. Each of these pieces K has a claw, *m*, at its upper extremity, adapted to fit over edge *h* of the foot of the rail, and also has a horizontal lug, *n*, adapted to fit closely beneath the cross-piece E of the cross-tie when this piece K is moved toward its opposing companion piece K. Each piece K has a base or plate, *p*, preferably extending to the front and rear of the upright portion or shank of the piece. Although the rear portion of said base—viz., that indicated by p'—may be dispensed with, it is desirable to retain the other or front portion, p^2, that it may meet the corresponding front portion, p^2, of the opposing companion piece K and enable the screw or bolt connecting both to exert its proper leverage, as will be hereinafter specified. When the rail is to be connected to the cross-tie, these pieces K are applied as follows: One clip-piece K is placed on one side of the rail, the bottom portion of the clip-piece being in the groove D and resting on or near the bottom of the latter, and the lug *n* of the piece K being toward cross-piece E. The piece K is then advanced toward the rail, the lug *n* passing under the cross-piece E and the claw *m* passing upon and engaging that part *h* of the foot of the rail which is on the side toward said piece K. The opposing clip-piece K is also placed in the groove D, but on the opposite side of the rail, and with its lug *n* pointing toward the cross-piece E. This clip-piece K is likewise advanced, its lug *n* passing under the cross-piece E, and its claw *m* engaging that portion of the flange *h* of the foot of the rail which is adjacent.

Any suitable means for connecting the chairs together and to the rail and cross-tie may be employed.

A very advantageous mode of my invention is as follows: These clip-pieces K each has a transverse perforation or opening, S, from front to rear. I provide a bolt, T, having a head at one end, and a hook, *a*, at the other end. An elastic substance or piece, preferably a coiled spring, M, is placed on or in connection with the bolt. The hook end of the bolt is now passed through the openings S in the clip-pieces. On the back of the clip-pieces adjacent to the hook end of the bolt is a projection or boss, *b*, adapted to receive the hook. The head of the hook is now advanced and the spring compressed between said head and the outside of said adjacent clip, and the hook *a* is hooked over the projection *b* of the opposing clip. The pressure of the operation on the head of the bolt is now removed, and the elasticity of the spring presses the head away from its adjacent clip, and keeps the hook securely locked over and upon the projection *b*, and the clip-pieces hold the rail between them and down upon the cross-tie with a firm, equal, and elastic pressure. The portion of the projection and the hook may be altered. Thus, for example, the plane of the hook and the projection *a* may be vertical, as shown in Fig. 10.

To the better enable a narrow spring and a not large bolt-head to be employed, a washer, *d*, is preferably present on the bolt between the spring and its adjacent clip-piece, the washer covering the part of opening S not filled by the bolt-rod. The principal advantages of such a spring-bolt and hook connection is that there are no nuts to get loose, and consequently the employés ordinarily required to tighten the bolts can be dispensed with. All rattling is also obviated. When desired, however, a nut can be substituted for the hook, and the spring retained, (see Fig. 11;) or the spring also may be omitted and the head of the bolt be brought close up to its adjacent clip-piece. (See Fig. 12.) When the clip-pieces are drawn together, their flanges or projections p^2 impinge against each other. As the bolt is continued to be tightened, the upper portions of the pieces K will be forced toward each other, and will tightly grasp between them the foot of the rail.

From the sloping or beveled shape of the top and edge of each of the flanges *h* of the rail-foot and the corresponding concave shape of the engaging-claws *m* of the clip-pieces the rail will not only be tightly grasped between the pieces K, but be drawn downward securely upon the cross-tie. It is desirable that the rail be prevented from slipping longitudinally. A device for accomplishing this consists in providing the inner face of the clip-piece with a rib, fin, or other projection, *f*, adapted to fit into the usual recesses, N, now present on the edge of rails for the admission of the rail-spike. These projections thus prevent the rails from sliding in the direction of the length of the track. All of the clip-pieces need not have said projections *f*, but only enough to suitably secure the rail from longitudinal movement. One of the clip-pieces may be bolted or otherwise permanently secured to the cross-tie, and of each pair preferably that clip which is on the outside of the rail is the one to be so secured. The hollows in the ribs admit the ballast of the road-bed, and thus the cross-tie is additionally secured from being moved out of place, the flanges B of the tie at the same time resting on the road-bed.

The preferred form of hook *a* and projections *b* is as shown, each having a bevel, V, making a very tight joint, and one which, if in part displaced, has a tendency, when acted upon by the spring W, to always return to place.

While various features of my invention are preferably employed together, one or more of them may be employed without the remainder.

The groove D may be interrupted and become at each end a recess or pocket for the

reception of the clips, and the tie may be flat and provided with recesses for the reception of the chairs.

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

1. A corrugated metallic cross-tie provided with ribs C, hollow and open beneath and supporting the cross-bar E, substantially as and for the purposes specified.

2. A metallic cross-tie for railways, having an upper recess or groove for the reception of the clip-pieces and under recesses or grooves at each side of the upper groove, the said grooves being open, forming a substantial bearing for the rail, substantially as described.

3. The combination of railroad-rail, a cross-tie provided with recesses or groove D and cross-pieces E and rail-clips K, each having claws *m* and lug *n*, and means for connecting them together, substantially as and for the purposes specified.

4. The improved clip or chair consisting of the pieces K K, each provided with a lug, *n*, claw *m*, base-flange p^2, and united by a bolt, substantially as and for the purposes specified.

5. The improved clip or chair consisting of pieces K, each provided with claw *m*, lug *n*, and projection or rib *f*, substantially as and for the purposes specified.

6. The combination of the rail and cross-tie having lug or cross-piece E, clip consisting of pieces K, each piece having jaw *m*, base p^2, and bolt T, and an elastic or spring piece located between the head of the bolt and the adjacent clip-piece, substantially as and for the purposes specified.

7. The combination of the rail and the cross-tie having groove D, ribs C C, and cross-piece E, supported in the ribs C′ over the groove D, and a clip, whereby the rail is connected to the said cross-piece, substantially as and for the purposes specified.

8. The combination of the rail having openings N, and the clip having pieces K, each piece having lug *n* and projection *f*, and means for uniting the clips, and a metallic rail having a groove, D, and piece E, substantially as and for the purposes specified.

9. The clip having pieces K, each having jaw *m*, and the bolt T, provided with hook *a*, adapted to engage one of the pieces K, and elastic piece or spring located between the head of the bolt and the adjacent clip, substantially as and for the purposes specified.

10. The bolt T, having hook *a*, provided with bevel V, and clip-pieces K, one piece K having a rear projection provided with a bevel, V, and spring located between the head of the bolt and the adjacent clip-piece, substantially as and for the purposes specified.

11. The combination of the hooked bolt, spring W, clip-pieces K, having a rib, F, and base-pieces p^2, and corrugated metallic cross-tie, brace E, and rail having recesses or openings N, substantially as and for the purposes specified.

12. The combination of bolt T, having hook *a*, spring W, washer *d*, clip-pieces, rail having a lug or projection, *b*, and cross-tie, substantially as and for the purposes specified.

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Attest:

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