Dec. 16, 1930. F. L. KLINGENSMITH 1,784,901

RAILWAY TIE

Filed July 11, 1929

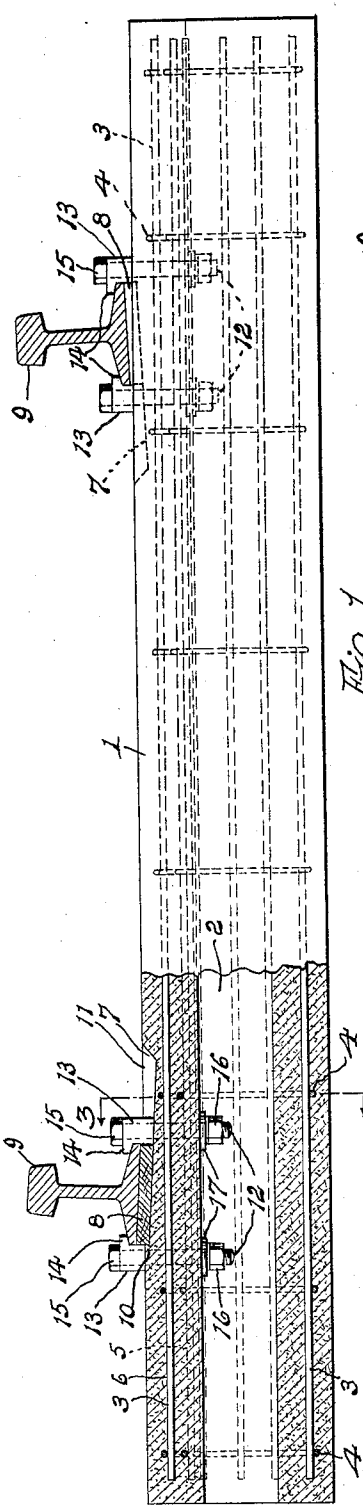


Fig. 1.

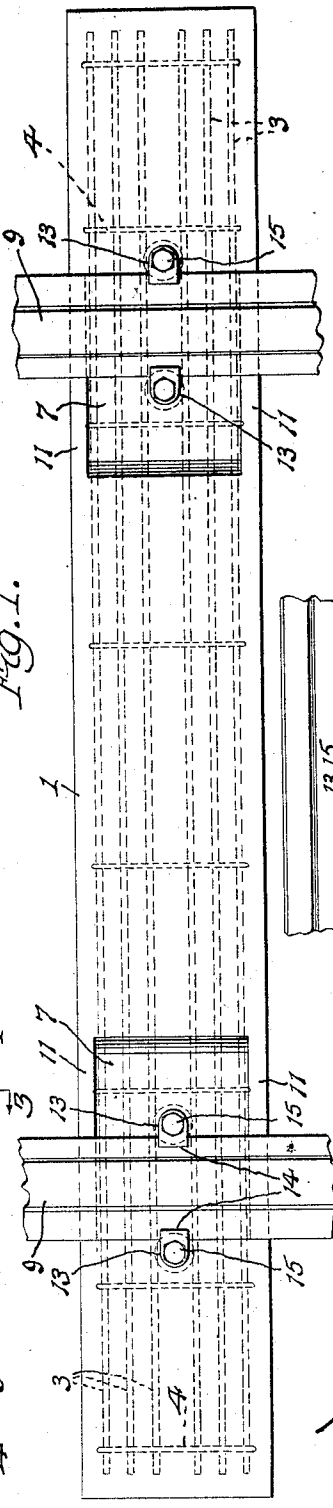


Fig. 2.

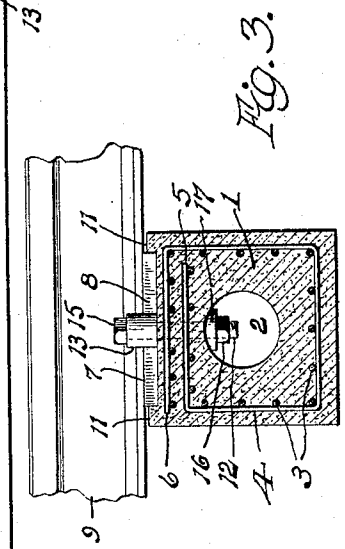


Fig. 3.

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RAILWAY TIE

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In the making of concrete ties it is the usual practice to form such ties in a stationary mold by simply pouring the cement into the mold, permitting it to set and then removing the formed tie from the mold.

It is now proposed to cast a tie centrifugally, that is by providing a suitable mold and support therefor and then rotating the mold at a high rate of speed with the cement mixture in the mold, thus compacting and forming the mixture to conform to the interior of the walls of the mold by centrifugal force. In forming a tie in this manner, a longitudinally extending opening is formed in the tie by the centrifugal action which throws the plastic mixture outwardly from the axis of rotation toward the mold walls, and this opening, in the present method is utilized to assist in anchoring the rails and their seats in place upon the tie by means extending through a wall of the tie with the securing means therefor located within this longitudinal opening in the tie. The tie therefore provides a convenient arrangement of structure whereby the rail seats and rails may be readily and removably secured in place thereon.

A tie formed by the centrifugal method may also be provided with suitable reinforcing means placed within the mold and held in proper relation thereto prior to the introduction of the mixture into the mold. The centrifugal action therefore firmly embeds this reinforcement in the tie, increasing the reinforcing action of such reinforcement and such reinforcement does not in any way interfere with or retard the forming of the tie.

An object of the present invention is to provide a form and construction of tie which may be readily formed and is particularly adapted to be formed by the centrifugal method. A further object is to provide a tie with a longitudinal opening extending inwardly from the ends thereof for the purpose of reducing the weight of the tie and at the same time providing a tie of great strength, the central opening further facilitating the securing to the tie of means for anchoring the rail and its seat to the tie and providing for the ready manipulation thereof in securing the rail in place. It is also an object to provide a construction and arrangement of tie reinforcement which is particularly adapted to the centrifugal method of forming the tie and which reinforcement adds greater strength to the tie due to the fact that it is firmly embedded therein at every point throughout its length, and intimately united with the body of the tie which is compacted with great force around the reinforcement by the centrifugal action in the forming of the tie.

It is also an object to provide a tie having other new and useful features, all as hereinafter more fully set forth.

With the above and other ends in view, the invention consists in the matters set forth in the following specification and illustrated in the accompanying drawing in which—

Figure 1 is a side elevation, partly in longitudinal section, of a tire illustrative of an embodiment of the present invention;

Fig. 2 is a plan view of the same; and

Fig. 3 is a transverse vertical section substantially upon the line 3—3 of Fig. 1.

In the drawing, 1 indicates the body of the tie which is formed of a suitable cementitious material, which body, as shown, is of rectangular form in cross section, but it will be understood that any desired form may be produced embodying the features of the present invention. In order to mold this body a suitable mold (not shown) is provided, said mold having an interior configuration conforming to the desired exterior configuration of the tie to be produced, and this mold is supported in any convenient manner so that it may be rotated in the desired position with comparatively high velocity with the cementitious material within the mold.

As the tie is formed by the centrifugal method, it will have a longitudinally extending axial opening 2, open through the ends of the body, and if found desirable, the body may be reinforced and strengthened by a suitable reinforcement of metal, said reinforcement preferably consisting, as shown, of a series of rods 3 extending longitudinally of the body and of slightly lesser length than the length of the body so that the body will

cover the ends of these rods. These longitudinal rods are connected by a series of transverse tie rods 4 which extend across the rods 3 at right angles thereto and are firmly secured to the rods 3, as by spot welding at each point of intersection. A fabricated metal reinforcement is thus provided with the longitudinal rods forming the main element of reinforcement and the transverse rods serving mainly to hold the longitudinal rods in spaced relation.

The fabricated reinforcement thus provided forms a sheet or layer of considerable width which is preferably bent as shown, into rectangular form with a narrow space between the sides and bottom of the body and this reinforcement. At the top of the body the two end portions of the fabricated reinforcement or the parts 5 and 6 thereof, are overlapped and spaced apart inwardly of the body so that two runs of this reinforcement are embedded within the upper part of the body of the tie where the greatest strength is required.

Because of the particular form of fabricated reinforcement, this reinforcement may be readily set in the mold in which the tie body is formed, prior to the forming of the tie by rapid rotation of the mold, with plastic material therein and the reinforcement held in spaced relation to the interior surfaces of the mold in any suitable manner, so that this plastic material will be forced into every crack and crevice of the reinforcement and solidly against the mold walls. This axial opening 2 thus formed, may be of any desired size in cross section according to the cross sectional size of the tie and said opening will preferably open through the ends of the tie, therefore producing a tie which is hollow at least throughout a large portion of its length.

Preferably the interior surface of the mold will be provided with a projection, which projection will form a notch or notches 7 in one side of the tie body, these notches being provided to receive a suitable seating block 8 for the rail 9. This block 8 may be of wood or other suitable material which is slightly resilient and is firmly held against escaping from beneath the rail by the slight end wall or shoulder 10 of the notch and by the side walls or ribs 11, said ribs preventing the block from moving longitudinally of the rail and the shoulder 10 engaging the outer side of the block. It will be noted that the notch 7 is of greater length in the direction of the length of the tie, than the width of the block so that by loosening the means at the inner side of the rail which holds the rail and block in place, said block may be moved along the notch from beneath the rail and a new block slipped into place without the necessity for removing the entire rail and all fastening means therefor.

Openings are provided in the top wall of the body 1 which open into the bottom of each notch or groove 7, these holes extending through the wall into the longitudinal opening 2 of the body, and these vertical holes are provided to receive bolts 12 for securing suitable clips or rail fasteners 13 to the upper side of the tie in spaced apart relation to receive between them the base of the rail, each clip having a lateral flange 14 to engage over the base flange of the rail and hold the rail in place upon the block 8. The outer or upper ends of these bolts may be provided with the usual heads 15 and their inner ends screw-threaded to receive nuts 16 and washers 17 which are located within the opening 2. The washers 17 may each have a curved base as shown in Fig. 3, to seat against and conform to the curvature of the wall of the opening 2, said wall preventing rotation of the washer due to such curvature of its upper side, when the bolt is turned to firmly clamp the clips 13 upon the tie at each side of the rail.

It is the usual practice to seat the rails 9 at a very slight inward inclination so that they will better take the lateral thrust of the car wheels and have less tendency to spread apart or tilt outwardly, and it will be noted that the bottoms of the notches 7 are inclined slightly, inwardly in the direction of the length of the tie and to its upper surface. Therefore, the cushion blocks 8 which are seated in these notches upon the inclined bottom surfaces thereof, have a like inclination to support the rails in a slightly inwardly inclined position.

Obviously other means than the bolts and clips shown, may be provided for securing the rails to the ties, but usually great difficulty is encountered in providing suitable ways of anchoring the fastening means firmly to cement ties with sufficient security to insure them against working loose under the jar and strains to which they are subjected in use, but where the tie is formed as in the present structure, with an axial opening 2, this opening will always provide means whereby the securing means may be rigidly anchored to the tie and made readily accessible for its application to or removal therefrom. It is also obvious that reinforcing means may or may not be employed and that other forms of reinforcement than the one shown may be used if found desirable. It is further obvious that the notches in the upper side of the tie to receive the seating blocks for the rails may also be omitted and the blocks held in place between the devices provided for securing the rails to the tie. These several changes and modifications are contemplated, and all such as fall within the scope of the appended claims may be made without departing from the spirit of the invention.

Having thus fully described my invention, what I claim is:—

1. A railway tie including a body formed

of cementitious material with a longitudinal opening formed by rapidly rotating the body while the material is in a plastic state, said opening being open through the ends of the body, a metal reinforcement in said body firmly embedded therein during said centrifugal formation of said body and means for securing rails and blocks in place upon the body, said means including members extending through the wall of the body and reinforcement with their inner ends within the longitudinal opening in the body.

2. A railway tie formed of a cementitious material by a spinning method to provide an opening in the interior thereof, and a fabricated metal reinforcement embedded in said tie around the opening therein during rotation in centrifugally forming the tie, said reinforcement comprising longitudinal and transverse rods forming a sheet or layer bent longitudinally into rectangular form in cross section, said reinforcement being spaced from the bottom and sides of the mold in which the tie is formed, with the ends of the sheet in overlapping and spaced relation at the top of the mold to provide inwardly spaced apart layers of reinforcement within the upper side of the tie.

3. A railway tie having a hollow body formed of cementitious material by a spinning method with longitudinally extending depressions in the upper surface of the body, the bottoms of said depressions being inclined longitudinally of said body, and a fabricated metal reinforcement embedded in said tie during centrifugal formation thereof, blocks forming rail seats seated in said depressions and held therein by marginal portions around said depressions, said depressions being of greater length longitudinally of the body, than the width of said blocks, bolts passing through openings in the upper wall of the body into the hollow interior thereof and at the opposite sides of said blocks, clips on the upper ends of said bolts having lips to engage over a rail flange, and nuts on the inner ends of said bolts within the interior of said body, said nuts being accessible through the open ends of the body.

In testimony whereof I affix my signature.

FRANK L. KLINGENSMITH.