No. 751,967. PATENTED FEB. 9, 1904.

B. WOLHAUPTER.

TIE PLATE.

APPLICATION FILED JUNE 22, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig 1

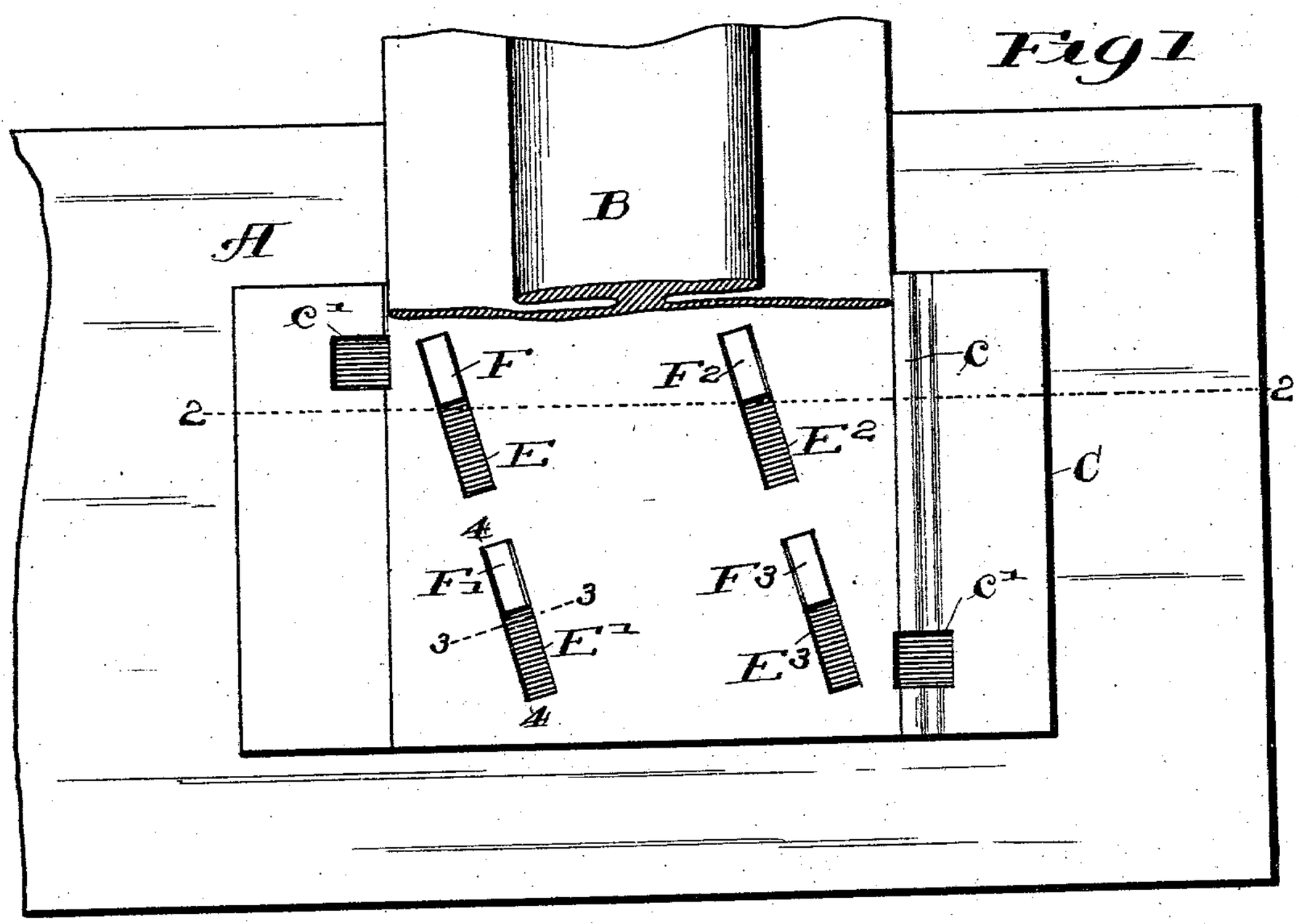


Fig 2

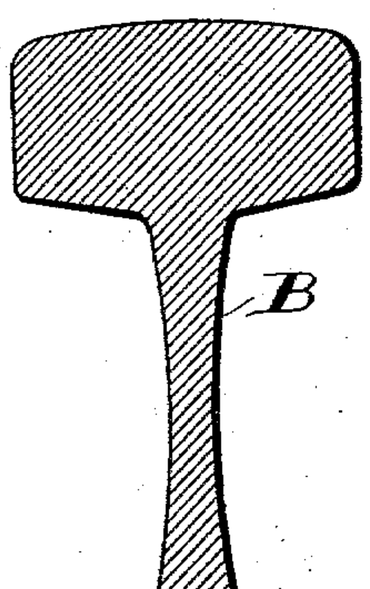
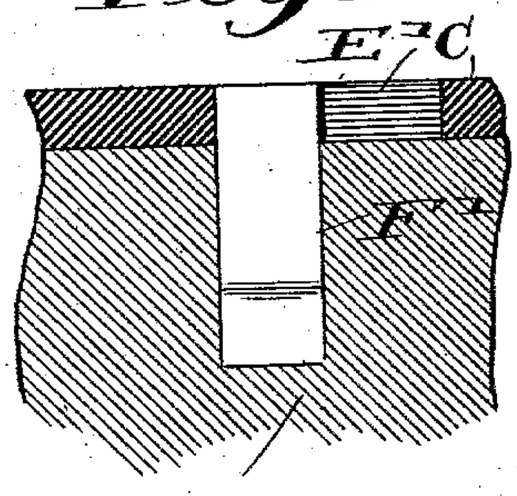
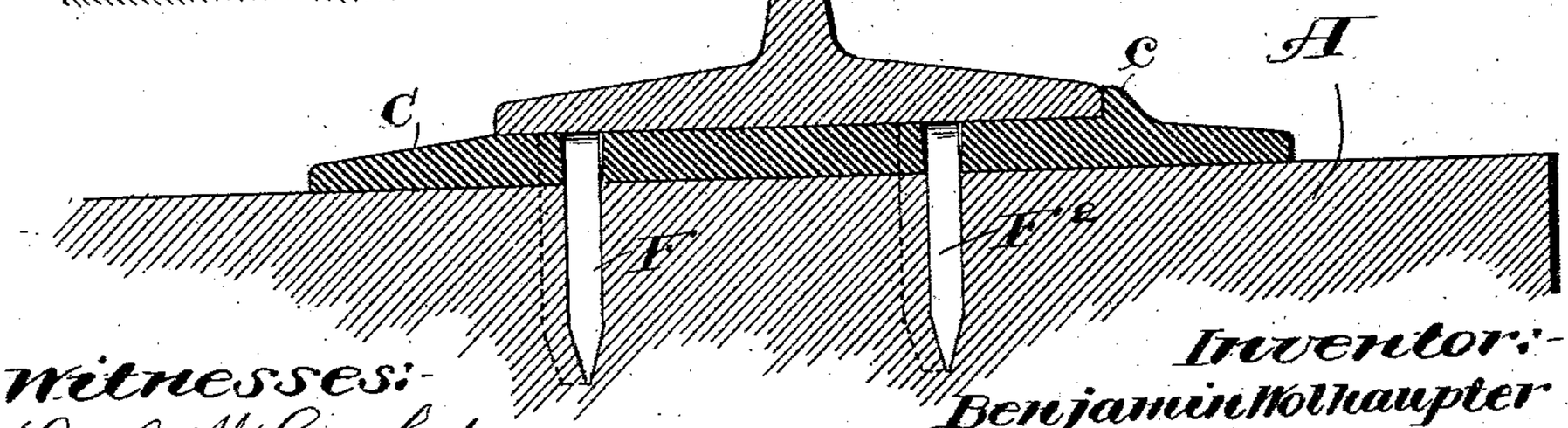


Fig 3

Fig 4





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Benjamin Wolhaupter
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his Attorneys

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NO MODEL. 2 SHEETS—SHEET 2.

Fig 5

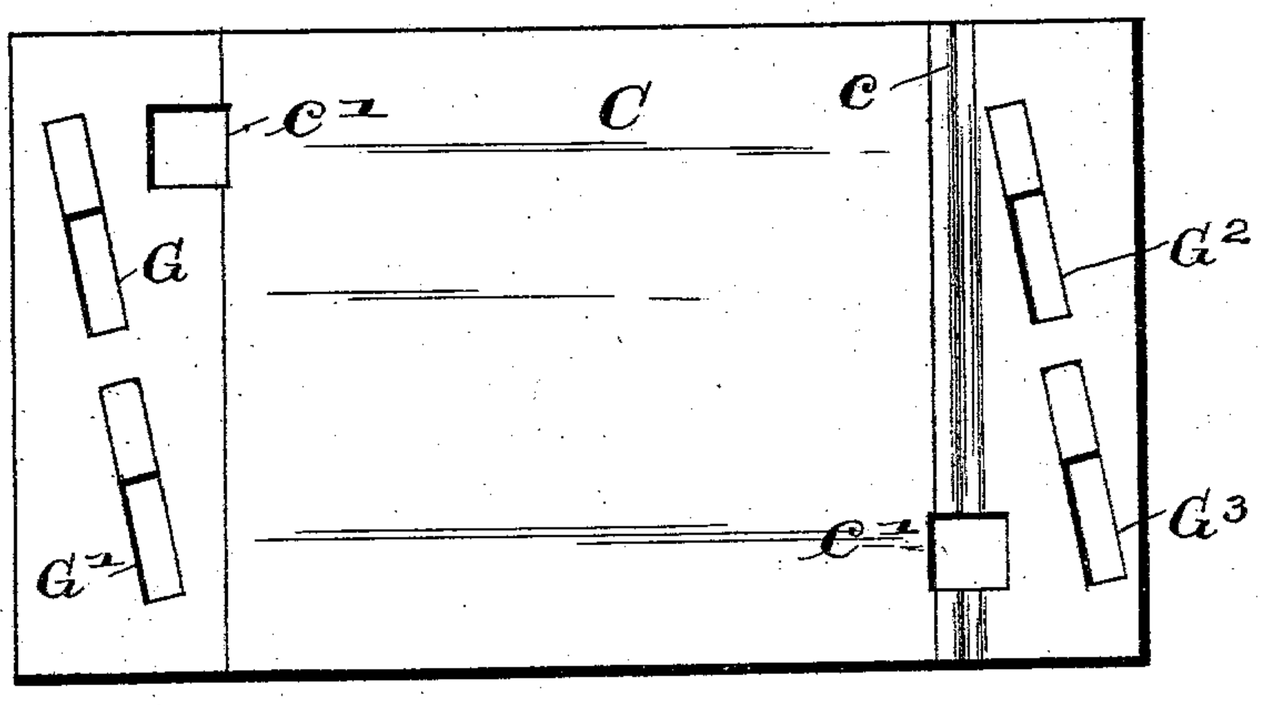
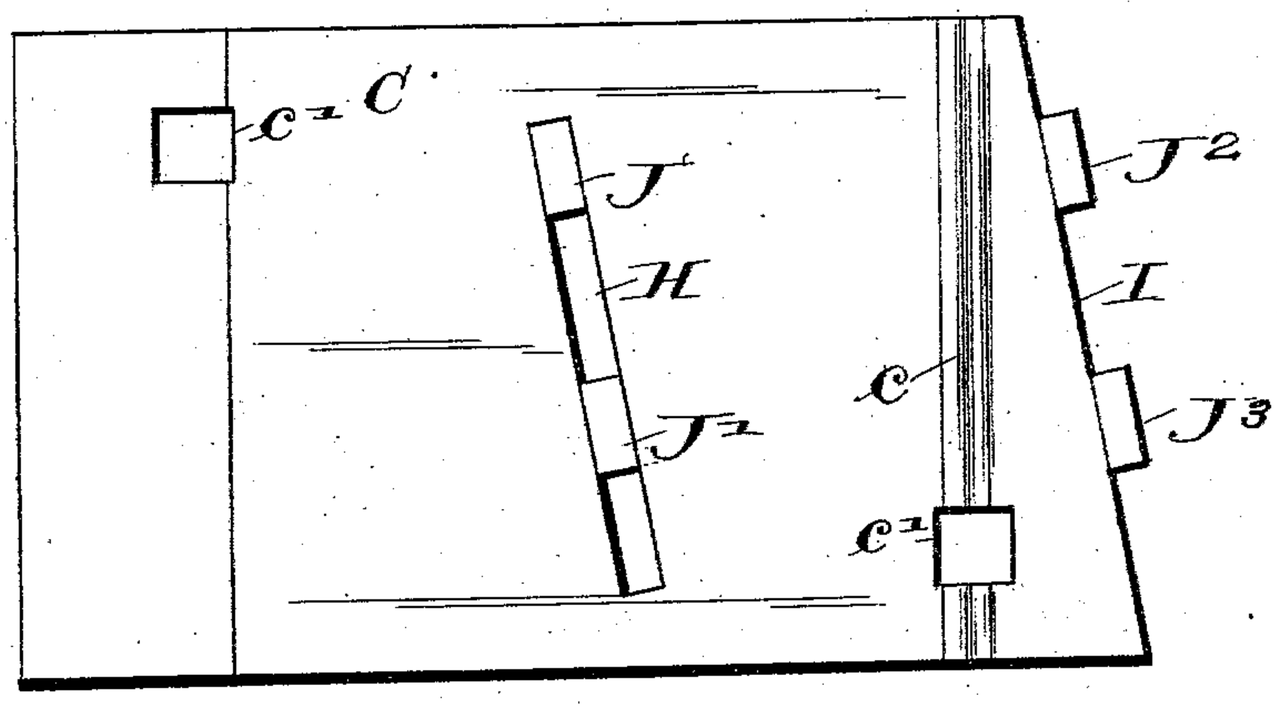


Fig 6



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No. 751,967. Patented February 9, 1904.

UNITED STATES PATENT OFFICE.

BENJAMIN WOLHAUPTER, OF CHICAGO, ILLINOIS.

TIE-PLATE.

SPECIFICATION forming part of Letters Patent No. 751,967, dated February 9, 1904.

Application filed June 22, 1903. Serial No. 162,504. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN WOLHAUPTER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tie-Plates; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to an improvement in railway-tie plates or plates which rest upon a wooden railway-tie beneath the rail and serve to afford a rigid bearing-surface for the rail and to prevent the wearing away of the tie through contact of the rail therewith, and more specifically to means for adjustably securing such tie-plates to the ties.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the accompanying drawings, illustrating my invention, Figure 1 is a plan view of a part of a rail and a tie-plate, together with a portion of a tie upon which the tie-plate rest. Fig. 2 is a cross-section of the rail and tie-plate, taken upon line 2 2 of Fig. 1. Fig. 3 is a detail cross-section taken upon line 3 3 of Fig. 1. Fig. 4 is a detail section taken on line 4 4 of Fig. 1. Fig. 5 is a plan view of a tie-plate generally like that shown in Figs. 1 and 2, but differing somewhat therefrom in details of construction. Fig. 6 is a plan view of a form of tie-plate differing somewhat from that shown in the preceding figures.

As illustrated in said drawings, A designates a wooden railway-tie, B a rail, and C a tie-plate which rests upon the tie beneath the rail and on which the rail rests. Said tie-plate is flat in its general form and is provided with generally parallel top and bottom surfaces. The tie-plate is, moreover, provided at the outer margin of its rail-bearing surface or rail-seat with an elevated rib *c*, which extends across the plate parallel with the ends thereof and forms a shoulder adapted for contact with the base-flange of the rail. Said flange is located at the outer side of the rail base or flange, so as to resist the outward pressure of the wheel-flanges on the rail or prevent the rail from shifting or moving outward under the side thrust of the vehicle-wheels. The tie-plate is, moreover, provided at opposite sides of the rail-seat with two or more spike-holes *c'*, through which are inserted the spikes D', by which the rail is secured to the tie.

One of the principal features of my invention is embraced in a construction of a tie-plate by which a tie-plate provided with a shoulder, against which the outer edge of the rail-base bears, is provided also with a bearing or contact surface which faces laterally and outwardly with respect to the rail and which is arranged obliquely or with its ends at unequal distances from the said shoulder and is adapted for contact or engagement with a stud which is driven into the tie and projects at its upper end above the same in position for engagement with said bearing-surface. Said oblique bearing or contact surface by its engagement with the said stud serves to hold the tie-plate from shifting endwise or laterally with respect to the rail and by reason of its obliquity or inclination is adapted when the tie-plate is shifted both endwise or laterally with respect to the rail or is moved in an oblique path corresponding with the inclination of the said surface to remain in engagement or contact with the said stud. This provision of an oblique laterally-facing bearing-surface is designed to enable the tie-plate to be adjusted and shifted on the tie both endwise and laterally with respect to the rail, so that when it becomes necessary to shift the position of the rail to compensate for wear on the inner side of the rail-head or to correct the alinement of the rail the tie-plate may be shifted in the manner described to bring another part of the said oblique surface in engagement with the holding-stud without any shifting or disturbing of the stud itself, thereby insuring the holding of the tie-plate rigidly from outward movement under the outward pressure of the rail on the rail-engaging shoulder of the tie-plate under the outward pressure brought on the rail by the car-wheels.

When the rail is shifted inwardly to compensate for wear on the inner edge of its head or to correct the alinement of the track, the tie-plate made as described may be so shifted obliquely until the rail-engaging shoulder is in contact with the outer edge of the rail-base and after it is shifted will be positively held by the engagement of the holding-stud with its said inclined surface from outward movement without depending on the rail-holding spikes for this purpose. The inclination of the said laterally-facing oblique bearing-surface with respect to the side edges of the rail will not be so great that the pressure of said oblique surface on the stud will have any appreciable tendency to move or shift the plate in a direction endwise of the rail, it being of course understood that the rail-holding spikes by their engagement with the plate will serve to partially hold the plate from any such movement endwise of the rail.

Referring to the illustration of the features of the tie-plate referred to as contained in the drawings, Figs. 1 to 4, the oblique bearing or engaging surfaces of the tie-plate and the holding-studs communicating or coöperating therewith are made as follows: In the body portion of the tie-plate which forms the rail-seat are formed four stud receiving or engaging slots E E′ E^2 E^3, the lateral margins of which constitute the laterally-facing bearing-surfaces. These slots are arranged obliquely in two sets or pairs, the slots E and E′ constituting one pair and being arranged near one end of the tie-plate and in line with each other and the slots E^2 and E^3, constituting the other pair, being arranged near the opposite or outer margin of the tie-plate and also in a line with each other. By reason of the oblique position or arrangement of the said slots the opposite ends thereof are at unequal distances from the side margin of the rail-base when the rail rests upon the tie-plate or, in other words, at unequal distances from the rib *c* of the tie-plate. In connection with the obliquely-arranged slots described I employ four holding-studs F F′ F^2 F^3, which are driven into the tie and the upper ends of which project into said slots, one of said studs being arranged with each of said slots. Ordinarily the adjustment required in the rail and tie-plate will be inwardly or toward the center of the track by reason of the fact that lateral adjustment of the rail is most often required by reason of the wearing away of the inner face of the rail-head, as indicated in dotted lines in Fig. 2. Such inner adjustment of the rail and tie-plate may also be required by reason of the studs being slightly moved or shifted outwardly by the yielding or giving of the wood of the tie in which they are driven under continued outward pressure upon their upper end. The holding-studs will therefore in the first instance be rigidly secured in position to engage the ends of the holding-slots nearest the track at the inner edge of the rail, this being the position of the holding-studs. (Shown in Fig. 1 of the drawings.) In first laying the track, therefore, the tie-plate will usually be placed on the tie beneath the rail, with its rib *c* bearing against the outer edge of the rail-base, and the four holding-studs will then be driven through the slots at the ends thereof remote from the said rib *c* and when so driven serve to hold the tie-plate firmly and rigidly in position without depending upon the rail-spikes for this purpose. If adjustment of the rail and tie-plate is later required, the rail-spikes will be withdrawn to release the rail and tie-plate and the tie-plate then shifted or driven endwise of the rail in a direction to carry the studs toward the opposite ends of the slots from those in which they were first driven until the rail has been shifted inwardly a desired distance by the action of the rib *c* therein or until said rib *c* is brought closely into contact with the rail-base if the rail is first shifted to its new position. The rail-spikes will then be again driven to fasten the rail to the tie, it being usual to plug the original spike-holes in the tie in order that the spikes will firmly hold when redriven.

The holding-studs E may be made of any suitable shape adapting them to be driven and to be engaged at their upper ends with the slots in the tie-plate. As shown in Figs. 1, 2, 3, and 4, said studs E are made wide and thin, of rectangular form in cross-section, tapered at their flat sides at their driving ends or points and slightly enlarged at their upper ends where they engage the slots in the tie-plate. The making of the studs of wide and thin shape has the advantage of making them better adapted to enter the wood of the tie with a minimum effect in breaking up or rupturing the grain of the wood and also of making them better adapted to hold in the tie against the lateral pressure thereon. Such slots will usually be slightly tapered upwardly or from their lower or inner to their outer or upper ends, this being the shape that will usually be given to the said slots when made by a punching operation by punches acting on the bottom or under side of the tie-plate, and when the slots are so formed the studs will preferably be enlarged at their upper ends, as described, so that they will more closely or accurately fit the side faces of the slots.

The tie-plate shown in Fig. 5 is generally similar to that before described; but in this instance the said plate is provided with oblique slots G G′ G^2 G^3, arranged in pairs and having the same relation to each other as the pairs of slots shown in Fig. 1, but located near the end margins of the tie-plate outside of the rail-seat.

In the further modification of the tie-plate

illustrated in Fig. 6 the same is provided with a single oblique slot H, located in the rail-seat, and with an oblique marginal bearing-surface I, formed on the outer end margin of the tie-plate outside of the rib *c*, said bearing-surface I being parallel with the slot H. In connection with the said slot H and bearing-surface I are employed four holding-studs J J′ J² J³, which are arranged and operate in connection with said slot H and bearing-surface I in the same manner as do the holding-studs described in connection with Figs. 1 to 4. The employment of two or four holding-studs in connection with each plate is preferred, because the engagement of two studs at laterally-separated points on the plate prevents liability of the plate becoming twisted or being thrown out of its parallel relation to the rail through the outward pressure of the latter.

Ordinarily the extent of adjustment required in the tie-plate will not exceed that afforded by the length of the oblique slots E E′ E² E³ of Fig. 1; but if in any case a greater extent of adjustment is required the tie-plate may be moved or shifted, so as to bring the studs F and F², which first engage the slots E and E², into engagement with the slots E′ and E³, and other studs will then be driven in position to engage the slots E′ and E³. The same is true of the construction shown in Figs. 5 and 6; but the construction shown in Fig. 6 permits a greater range of movement in the tie-plate for the purpose of adjustment than that shown in the other figures without the driving of additional holding-studs.

An important advantage of the construction described is that this construction affords a means for holding the tie-plate from outward movement without dependence on the rail-holding spikes, while at the same time it avoids the necessity of the withdrawal from the tie and the reinsertion therein of the tie-engaging studs when the tie-plate is shifted in effecting its adjustment. In that form of tie-plate heretofore commonly used, wherein the tie-plate is provided on its bottom surface with downwardly-projecting integral prongs, it becomes necessary to withdraw the prongs or claws from the tie and to reinsert them whenever the tie-plate is shifted. Such withdrawal and reinsertion of the prongs or claws is objectionable, because when the tie-plate is shifted only a short distance the prongs or claws are not easily driven into the tie in their new position, but tend to return to the holes originally made in the first driving of the prongs, and also because the withdrawal and reinsertion of the prongs has the objection of greatly injuring the tie because breaking the grain thereof in a number of places and leaving a number of holes which will be liable to retain water or moisture, and thus lead to the rapid rotting of the tie and the weakening of the surface of the tie which is subjected to the pressure of the load coming upon the rail and tie-plate. In the use of the tie-plate constructed as herein set forth these objections are entirely avoided, because for the ordinary range of adjustment required in the tie-plate the holding-studs remain in their original positions in the tie and require no shifting, and if it becomes necessary to move the tie-plate a greater distance than is afforded by the length of the oblique slots therein and other studs are inserted, as hereinbefore described, the plate will be shifted so far that the studs originally engaged with the slots E′ and E³ will come outside of the margin of the tie-plate and may remain in the tie, or if the two unused studs be removed from the tie they will leave only two holes located at such distance from the remaining studs as to be unobjectionable, and as the tie-plate will have been shifted away from said holes they will not be left in the part of the tie on which the tie-plate rests, so that their presence will not lead to the injury or weakening of the part of the tie on which the pressure of the tie-plate comes or by which the tie-plate is immediately supported.

I claim as my invention—

1. A tie-plate which is movable on the tie endwise of the rail and is provided with an oblique bearing-surface which faces laterally with respect to the rail and is separate from any bearing-surface of the plate which is engaged by a rail-holding spike, said oblique bearing-surface being adapted for engagement with the upper end of a holding-stud driven into the tie.

2. A tie-plate which is movable on the tie endwise of the rail and is provided with a shoulder adapted for engagement with the outer edge of the rail-base, and with an oblique bearing-surface which faces laterally with respect to the rail and is separate from any bearing-surface of the plate which is engaged by a rail-holding spike, said oblique bearing-surface being adapted for engagement with a holding-stud driven into the tie.

3. A tie-plate provided with an oblique slot, one margin of which forms a bearing-surface which faces laterally with respect to the rail and is separate from any bearing-surface of the plate which is engaged by a rail-holding spike, said slot being adapted for engagement with the upper end of a stud driven into the tie.

4. A tie-plate provided with a shoulder adapted for engagement with the outer edge of the rail-base, and having an oblique slot, one margin of which forms a bearing-surface which faces laterally with respect to the rail and is separate from any bearing-surface of the plate which is engaged by a rail-holding spike, said slot being adapted for engagement with the upper end of a stud driven into the tie.

5. The combination with a tie-plate provided

with an oblique bearing-surface which faces laterally with respect to the rail and which is separate from any bearing-surface of the plate which is engaged by a rail-holding spike, and a holding-stud adapted to be driven into the tie and to be engaged at its upper end with said laterally-facing oblique surface.

6. The combination with a tie-plate provided with a shoulder adapted for engagement with the outer edge of the rail-base and having an oblique bearing-surface which faces laterally with respect to the rail and is separate from any bearing-surface of the plate which is engaged by a rail-holding spike, of a holding-stud adapted to be driven into the tie, with its upper end in engagement with the said laterally-facing oblique bearing-surface.

7. A tie-plate which is movable on the tie endwise of the rail and is provided in its rail-seat with a plurality of oblique slots, one side margin of each of which constitutes a bearing-surface which faces laterally with respect to the rail and is separate from any bearing-surface of the plate which is engaged by a rail-holding spike, said oblique slots being adapted for engagement with the upper ends of holding-studs driven into the tie.

8. A tie-plate provided at the outer margin of its rail-seat with a shoulder adapted for engagement with the outer margin of the rail-base and with a plurality of oblique slots located at opposite sides of the transverse center line of the plate and adapted for engagement with the upper ends of studs driven into the tie.

9. A tie-plate provided with two oblique slots arranged in alinement with each other and adapted for engagement with studs driven into the tie.

10. The combination with a tie-plate provided with a shoulder adapted for engagement with the outer edge of the rail-base and with a bearing-surface which faces laterally with respect to the rail, of one or more flat, thin studs adapted to be driven into the tie in contact with said bearing-surface of the plate, to hold the plate against lateral movement on the tie.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two witnesses, this 13th day of May, A. D. 1903.

BENJAMIN WOLHAUPTER.

Witnesses:

C. CLARENCE POOLE,

GERTRUDE BRYCE.