June 30, 1942. F. TVRZICKY 2,287,843

CLAMP

Filed Sept. 5, 1939 3 Sheets-Sheet 1

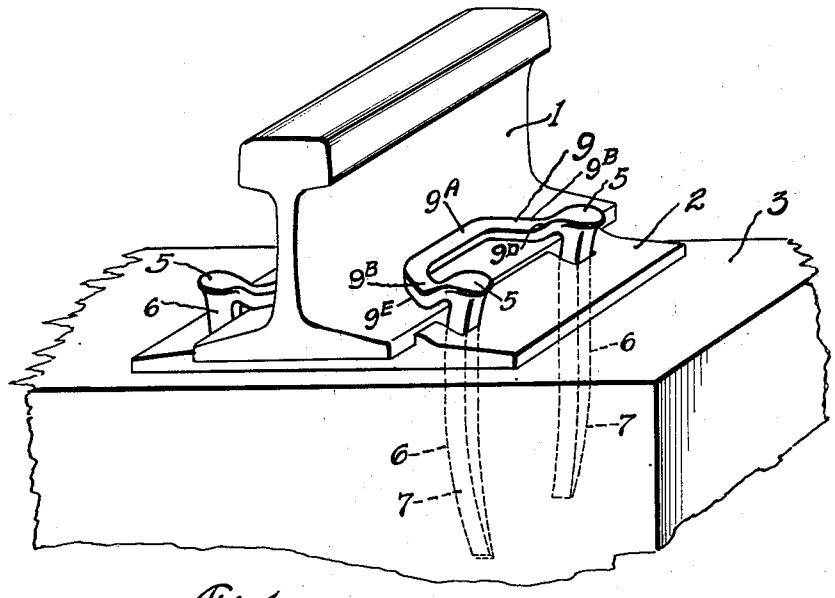


Fig 1

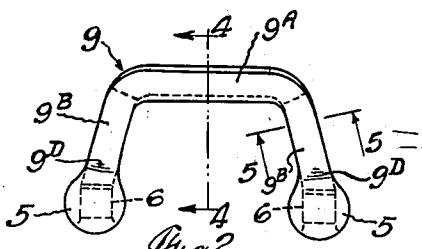


Fig. 2

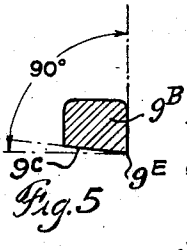


Fig. 5

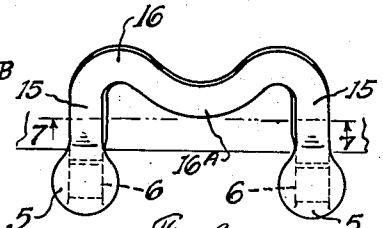


Fig. 6

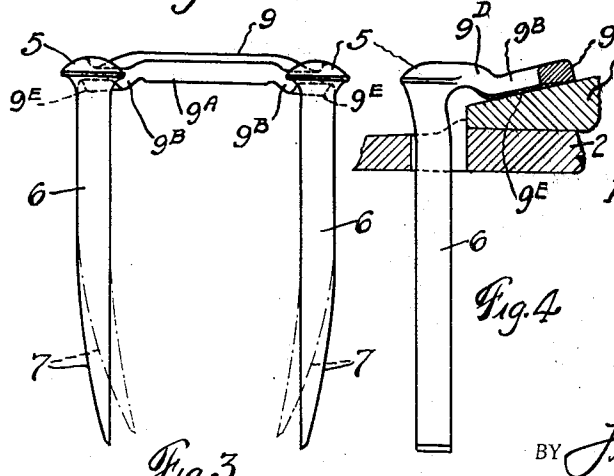


Fig. 3

Fig. 4



Fig. 7

Francis Tvrzicky
INVENTOR.

BY Frank J. Schraeder Jr.

ATTORNEY.

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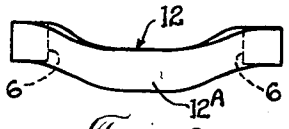


Fig. 8

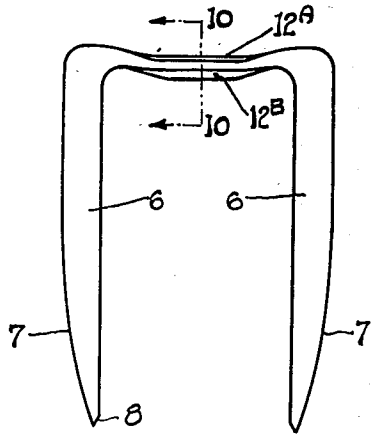


Fig. 9

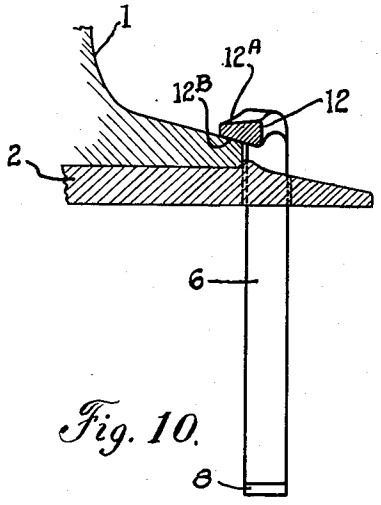


Fig. 10.

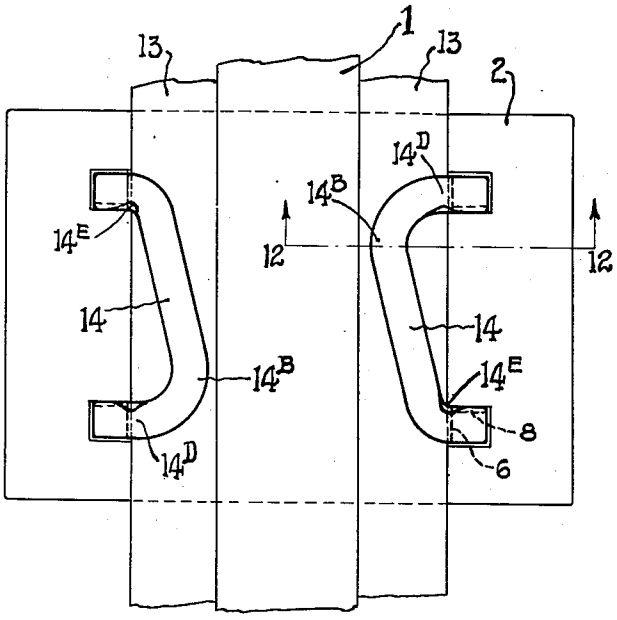


Fig. 11

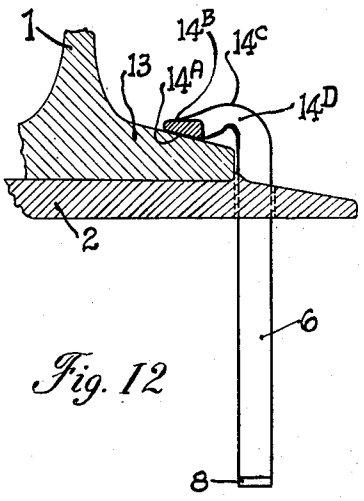


Fig. 12

INVENTOR.
Francis Tvrzicky
BY Frank J. Schraeder Jr.
ATTORNEY.

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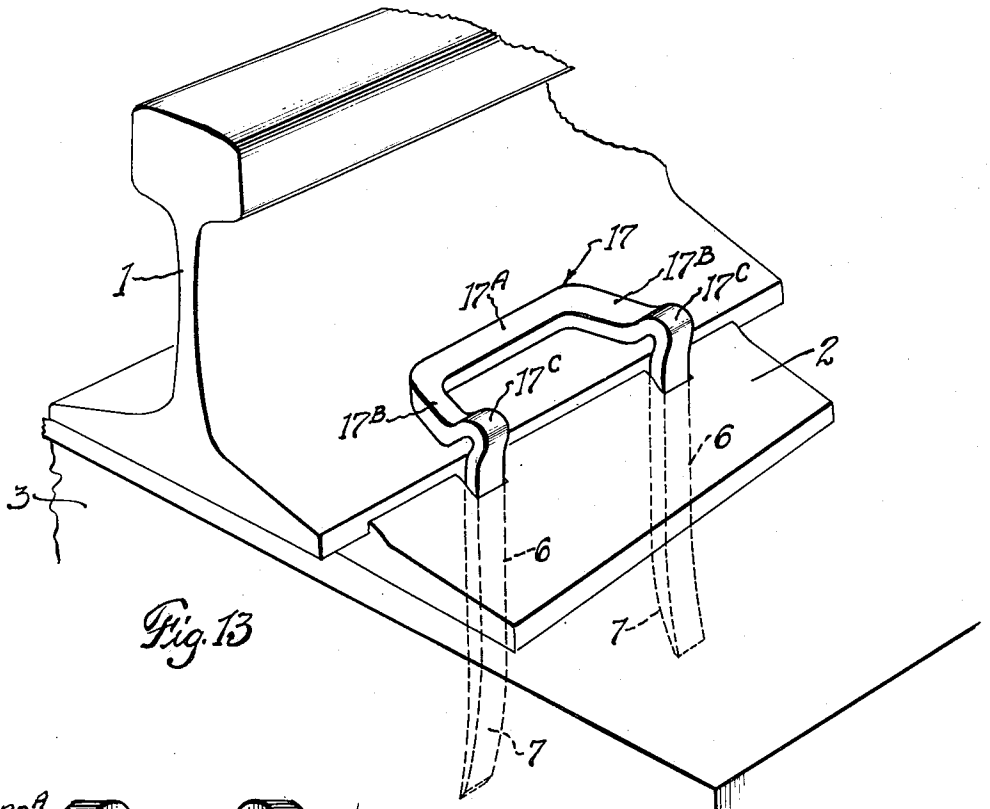


Fig. 13

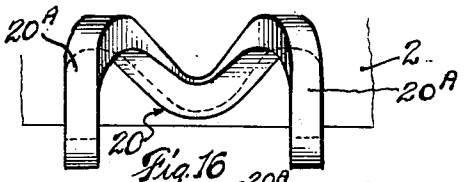


Fig. 16

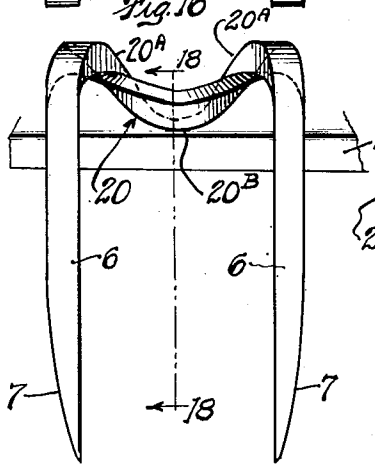


Fig. 17

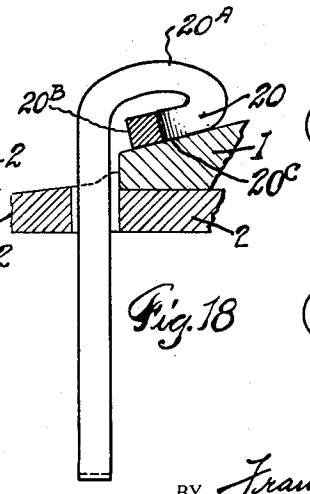


Fig. 18

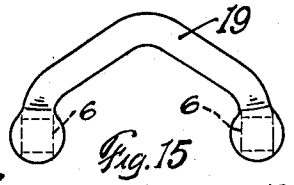


Fig. 15

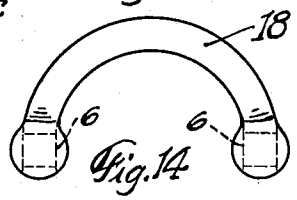


Fig. 14

Francis Tvrzicky
INVENTOR.

BY Frank J. Shraeder Jr.

ATTORNEY.

Patented June 30, 1942 2,287,843

UNITED STATES PATENT OFFICE

2,287,843

CLAMP

Francis Tvrzicky, Chicago, Ill.

Application September 5, 1939, Serial No. 293,485

15 Claims. (Cl. 238—349)

This invention relates generally to clamps and has particular reference to new and useful improvements in railway rail clamps.

The invention has for its object to provide novel means for securely fastening rails to ties against lateral and vertical displacement. The present increased speed of trains necessitates safer equipment and more rugged fastenings of rails. The common practice is to use rail tie plates with four holes to retain two diagonally arranged spikes for securing the rail to the tie.

One of the objects of my invention is to provide a pair of novel securing members for each tie plate, and each securing member comprising two spike portions connected together by a cross bar portion forming a clamp, thus utilizing all four holes in the tie plate which normally would require four individual spikes.

Another object of my invention is to provide a rail clamp affording an elongated surface contact between a pressure-exerting clamp portion and the rail.

Another object of my invention is to provide a clamp having a cross bar integrally connecting the shanks of a pair of spaced spike portions and which cross bar is offset relatively to the side of the flange of the rail base and extends over and onto the inclined top of the rail base.

Another feature of my invention resides in providing each of the spike shank portions with a vertically disposed beveled surface or face, preferably on a radius, whereby the two shanks will be forced to bend oppositely one to the other in slightly inwardly or outwardly directions, depending on which side the bevel is located, when driven into the tie; the bevel on one shank being disposed oppositely to that of the other shank, and thus the relatively opposite bending action of the shanks will cause a more secure gripping within the tie to afford greater resistance to extraction or displacement. To increase the securing power of the spike portions the beveled surfaces extend preferably in about the lower half end of each spike, thus the bent shanks of the spike portions extend a considerable distance into the tie.

Another feature of my invention is to facilitate the installation of such clamps by providing the clamp with enlarged upstanding heads on the cross bar ends directly over the spike portions.

Still another feature of my invention is found in the combination of my improved clamps with a tie plate wherein the openings therein are carefully spaced to provide a bearing against each of the spike portions to thereby resist shifting of the tie plate parallel to the longitudinal axis of the rail.

A further object of my invention is to provide the spike portion with a chisel-pointed end extending parallel to the tie fibers to thereby minimize damage to the tie fibers.

A still further object of my invention is found in constructing the cross bar clamp portion with a beveled or angularly disposed lower face portion.

Still another object of my invention is found in the provision of a rail clamp wherein the cross bar clamp portion has curved spike-connecting portions, which may be of decreased cross section, and wherein the clamp portion is bent or offset onto the rail base thus affording a cross bar clamp portion of comparative narrow width and resilient or pressure-exerting action providing resiliency in both vertical and lateral directions of the cross bar.

With the above and other objects in view, my invention consists of the novel combination, construction and arrangement of the parts and their portions shown in preferred embodiments in the attached drawings, described in the following specifications, and particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a perspective view of a section of a rail, a tie plate and portion of a wooden tie and showing a rail clamp embodying my invention;

Fig. 2 is a plan view of the clamp shown in Fig. 1;

Fig. 3 is a front elevation of the clamp;

Fig. 4 is a section taken on line 4—4 of Fig. 2;

Fig. 5 is a cross section through the clamp taken on line 5—5 of Fig. 2;

Fig. 6 is a plan view of the clamp, similar to Fig. 2, but a modification of the cross bar clamp portion.

Fig. 7 is a cross-section taken on line 7—7 of Fig. 6;

Fig. 8 is a plan of another modified form of my clamp;

Fig. 9 is a front elevation of the clamp shown in Fig. 8;

Fig. 10 is a cross section taken on line 10—10 of Fig. 9;

Fig. 11 is a plan view of still another modification of my invention;

Fig. 12 is a cross-section taken on line 12—12 of Fig. 11;

Fig. 13 is a perspective view of a clamp embodying another modification of my invention;

Figs. 14 and 15 are plan views of modified forms of cross bar; and

Fig. 16 is a plan view of another modification of my clamp invention;

Fig. 17 is a front elevation of the clamp shown in Fig. 16, and;

Fig. 18 is a vertical section taken on line 18—18 of Fig. 17.

In Fig. 1 is shown an arrangement of rail 1, plate 2 and wooden tie 3 securely fastened together with my improved clamp designated generally by numeral 9.

Referring to Figs. 2 to 5 inclusive, my improved double spiked clamp consists of two heads 5, each of a shape similar to that of the head of a standard spike, each formed with a depending integral shank portion 6, preferably rectangular in cross-section and each shank portion having a beveled or preferably curved face 7 extending along substantially its lower half portion. As shown in Figs. 1 and 3, the shank portions are beveled on the opposite outside surfaces in opposite directions and the shank portions 6 and heads 5 are integrally connected together with a clamp cross-bar portion 9^A.

It will be noticed that the transverse end portions 9^B of the cross-bar portion 9^A are provided with oppositely and inwardly upwardly beveled bottom face portions 9^C which extend substantially from the downwardly curved connection portions 9^D up to the horizontal portion 9^A so that the beveled face 9^C is adapted to engage the upper face of the base of the rail by the sharp outside corners 9^E of such end portions 9^B. The lower face of the intermediate portion 9^A has a flat surface contact with the rail flange.

It will also be noted that when the clamp is driven into full clamping position as shown in Figs. 1, and 4, the heads 5 are disposed above the outer part of the flange of the rail base and that through the downwardly bent or curved integral connecting portions 9^D a spring-pressed action will be imparted to the offset clamp portion, that is, a constant pressure will be exerted by the portions 9^A and 9^B upon the rail flange to thereby securely clamp the rail to tie plate 2 and still permit slight movements of the clamped member under intermittently applied loads.

It will also be noted that the enlarged heads 5 extend slightly beyond the square sides of spike portions 6. Such construction not only provides a substantial head above the spike shank portions 6, but also provides clearly visible locations of such spike shank portions for guiding and directing the hammer blow directly over the spike shank portions.

The shank portions 6 of the double spike are manufactured straight, as shown in Figs. 3 and 4, but when penetrating into the tie, the curved beveled surfaces 7 cause the spike shank portions to bend slightly towards each other, following the way of least resistance, as shown in an exaggerated form in Fig. 3 by dot and dash lines, thus forcibly gripping the part of the tie between the shank portions.

The lower half portions of the spike 6 may also be formed with a curved face 7 disposed transversely to the longitudinal axis of the cross-bar 9^A to thereby cause such lower half portions to be bent transversely to the cross-bar 9^A.

In the modification shown in Figs. 6 and 7, the clamp consists of the spike portions 6, enlarged heads 5 having integral parallel extensions 15 of rectangular cross-section. It will be noted that the extensions 15 are twisted or bent oppositely to provide engagement of the corners 15^A with the rail base but that the curved central portion 16^A has a flat surface contact with the top of the rail base.

The modification of my invention shown in Figs. 8, 9 and 10 shows another resilient type of clamp which consists of the spike portions 6 each having a curved face 7, but the integral cross-bar or clamping portion 12, which is substantially of a width equal to that of the spike portions 6, is deformed in the greater portion of its mid-section, or in other words, is laterally offset as at 12^A to afford engagement of the rail base by its angularly disposed lower face 12^B. I also prefer to offset such portion 12^A downwardly in a vertical plane as shown in Figs. 9 and 10. It will now be readily apparent that the clamp construction shown in Figs. 8, 9 and 10 provides resiliency in both lateral and vertical directions and that the mid-section of the cross-bar 12 is substantially of trapezoidal cross-sectional form.

In the modification of my clamp invention shown in Figs. 11 and 12 the resilient clamp consists of the spike portions 6, each of which has an outside face curved inwardly downwardly at the lower half portion of shank 6, similarly as those shown in Fig. 9, terminating in a chisel point 8. The upper ends of the spike shank portions extend above the top of the outer edge of the rail flange or base 13 and are integrally connected by the cross-bar 14 which is provided with a beveled bottom face 14^A and preferably is substantially of a width equal to the width of the spike shank portions.

It will be noted from Figs. 11 and 12 that the cross-bar portion 14^B is offset laterally but eccentrically to the center between the centers of the spike shank portions. The cross-bar portion 14^B extends at one end upwardly in curved formation 14^C into integral junction 14^D with one of the spike shank portions and which integral junction 14^D is preferably of decreased cross-section to afford the desired resiliency between the cross-bar 14 and spikes 6. The other end of the cross-bar 14^B extends into an integral junction 14^E of slightly decreased cross-section formed with the upper portion of the other spike shank portion.

Due to the eccentric deformation of the cross-bar or clamp portion 14^B, the two clamps for each tie plate will be oppositely disposed relatively one to the other to thereby resists relatively opposite movements between rail and clamps. The ends of the cross-bar being curved and of decreased cross-section provide the desired resiliency as well as weakened sections which sections in the event the clamp is engaged by a derailed wheel may fracture and break to thereby save the rail from breaking. These resilient features also resist displacement of the clamp from a tight engagement with the rail, since such resiliency permits accommodation of the clamp to any slight longitudinal movement of the rail, that is, once the cross-bar clamp portion of the clamp is brought into tight engagement with the rail flange, the resiliency of the cross-bar will not only tend to maintain contact with the rail flange even under slight relative movements between the rail and clamp but such resiliency will also tend to resist longitudinal movement of the rail relatively to the tie plate.

In the modification shown in Fig. 13, the clamp consists of the spike portions 6 and an integral clamp portion 17 of the same cross-section as the spike portions 6. The clamp portion 17 con-

sists of the longitudinal portion 17A disposed parallel to the rail 1, integral transverse end portions 17B formed integrally with the upwardly disposed curved portions 17C formed of the upper ends of the spike portions 6. This resilient type of clamp provides flat surface contact on the bottom face of the clamp portions 17A and 17B and these portions are shaped to engage the angularly disposed face of the flange of the rail base.

The modifications of my rail clamp invention shown in Figs. 14 and 15 embody a construction similar to that shown in Fig. 6 except that in the rail clamp shown in Fig. 14 the clamp portion 18, which engages the rail flange, is arcuate in shape, and in the rail clamp shown in Fig. 15, the clamp portion 19, which engages the rail flange, is of V-shape form. In both of these designs the clamp portions 18 and 19 have a flat surface contact with the rail base.

The clamp shown in Figs. 16, 17 and 18 is made of a metal bar of uniform cross-section and consists of the pointed spike portions 6 integrally connected by the curved inverted clamp portion generally indicated by numeral 20. It will be noted that the clamp end portions 20A extend inwardly and then downwardly into an outwardly disposed inverted and reversedly curved medial portion 20B having an arcuate face 20C in contact with the rail flange. In a rail clamp of this design comparatively great resiliency is provided in the large curved spike connecting portions 20A.

Among other features of my invention, which will now be more readily apparent, is the extension of substantially the entire body of the cross-bar clamp portion onto the top of the angular face of the rail base a substantial distance beyond the marginal side of the rail base to afford an angularly disposed contact with the base of the rail; the terminal portions of the cross-bar clamp portion which are formed integrally with the spike portions being preferably of curved form to provide the desired resiliency between the upper portions of the spike portions and the cross-bar clamp portion whereby the cross-bar clamp portion is substantially in constant contact with the base of the rail due to the spring pressure imposed upon the cross-bar clamp portion when the spike portions are forcibly driven into place. Another important feature of my invention is found in the provision of a rail clamp having a line or surface contact, or both, with the flange of the rail.

I claim:

1. A unitary rail clamp comprising a pair of substantially vertically disposed spaced spike portions, and a laterally disposed cross-bar clamp portion having its end portions formed integrally with the upper portions of said spike portions, the rail-engaging section of said clamp portion being bodily laterally offset to extend beyond a horizontal line intersecting the centers of said spike portions, the said end portions of said cross-bar clamp portion extending upwardly into mergence with the upper ends of said spike portions.

2. A unitary clamp as embodied in claim 1 and including enlarged heads formed on the upper ends of said spike portions and said cross-bar end portions formed integrally with said spike heads.

3. A rail clamp comprising a pair of spaced spike portions of substantially square section, and a cross bar clamp portion formed integrally with the upper ends of said spike portions said cross bar clamp portion being of a width substantially equal to the width of said spike portions and having a mid-section offset downwardly toward and then outwardly of the rail relatively to its end portions and the bottom face of said mid-section being disposed angularly for engagement with the angular face of a rail flange.

4. A rail clamp comprising a pair of spaced spike portions of substantially square cross-section, and a cross bar clamp portion formed integrally with the upper ends of said spike portions, said cross bar clamp portion being deformed between its end portions to extend laterally beyond a center line passing through the the centers of the cross-sections of said spike portions and the maximum lateral deformation of said cross bar clamp portion being closer to one of said spike portions but below the upper end portion of such closest spike portions, said cross bar clamp portion having a beveled bottom face adapted to clampingly engage the upper face of the rail flange.

5. A rail clamp as embodied in claim 4 and including the end portions of said cross bar clamp portion formed of a reduced cross-section near their integral formations with the spike portions.

6. The combination with a rail and supporting tie plate having a pair of spike-receiving openings disposed on each side of the rail flange, of a pair of clamps as embodied in claim 4 each having said spike portions disposed in a pair of said openings in said tie plate, said clamps being relatively oppositely disposed one to the other.

7. A unitary rail clamp comprising a pair of spaced spike portions, and a longitudinal clamp portion laterally spaced from said spike portions, the full width of its longitudinal portion being disposed beyond the marginal edge of the rail flange, said clamp portion having transversely and angularly upwardly disposed end portions merging with the upper portions of said spike portions, the outer contiguous face of said clamp portion and portions of its integral transversely disposed end portions having an edge contact with the rail flange.

8. A unitary rail clamp comprising a pair of spaced spike portions of substantially rectangular cross-section, and a longitudinally extending cross-bar clamp portion having transversely disposed end portions formed integrally with the upper ends of said spike portions, said cross-bar clamp portion and its transverse end portions being of substantially the same cross-section as said spike portions and being offset laterally to extend beyond the marginal edge of the rail base, said transverse end portions being curved downwardly to extend beyond the marginal edge of the rail flange into mergence with said longitudinally disposed cross-bar clamp portion.

9. A unitary rail clamp comprising a pair of spaced spike portions having upper extensions curved inwardly toward the rail and integrally connected by an outwardly downwardly curved rail-engaging clamp portion.

10. A unitary rail clamp as embodied in claim 9 and including said spike portions and said rail-engaging clamp portion formed of material of the same cross-section.

11. A unitary rail clamp as embodied in claim 1 and including said cross-bar end portions being curved and constituting bridges each formed

integrally with and disposed between the crossbar end and one of the spike portions, said bridges being spaced from the upper face of the rail flange.

12. In combination with a tie, a tie plate having a rail seat and a pair of spaced openings on one side of the seat, and a rail mounted on the seat, a member having a pair of spaced, interconnected prongs extending through the openings and driven into the tie and also having a flexible generally U-shaped part extending inwardly over the rail base between the prongs and engaging the top of the base to urge the rail against its seat, said inwardly extending part coacting with the rail base to urge said prongs toward the edges of said openings remote from the rail.

13. In combination with a tie, a tie plate having a rail seat and a pair of spaced openings on one side of the seat, and a rail mounted on the seat, a member having a pair of spaced prongs extending through the openings and driven into the tie and also having a generally U-shaped spring arm connecting the prongs and extending inwardly over the rail base and engaging the top of the base to hold the rail yieldingly against its seat.

14. A rail fastening comprising a pair of prongs formed on top with striking heads, and a generally U-shaped flexible part connecting the prongs together intermediate the heads, the arms of the flexible part converging from the prongs.

15. In combination with a tie, a tie-plate having a rail seat and a pair of spaced openings on one side of the seat, and a rail mounted on the seat, a member having a pair of spaced prongs extending through the openings and driven into the tie and also having a spring extending inwardly from each prong over the rail base and a connection between the inner ends of the springs engaging the top of the rail base to urge the rail against its seat, the prongs being joined only by said springs and connection.

FRANCIS TVRZICKY.