Aug. 16, 1938. R. T. SCHOLES 2,127,430

RAIL FASTENING

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Fig. 1

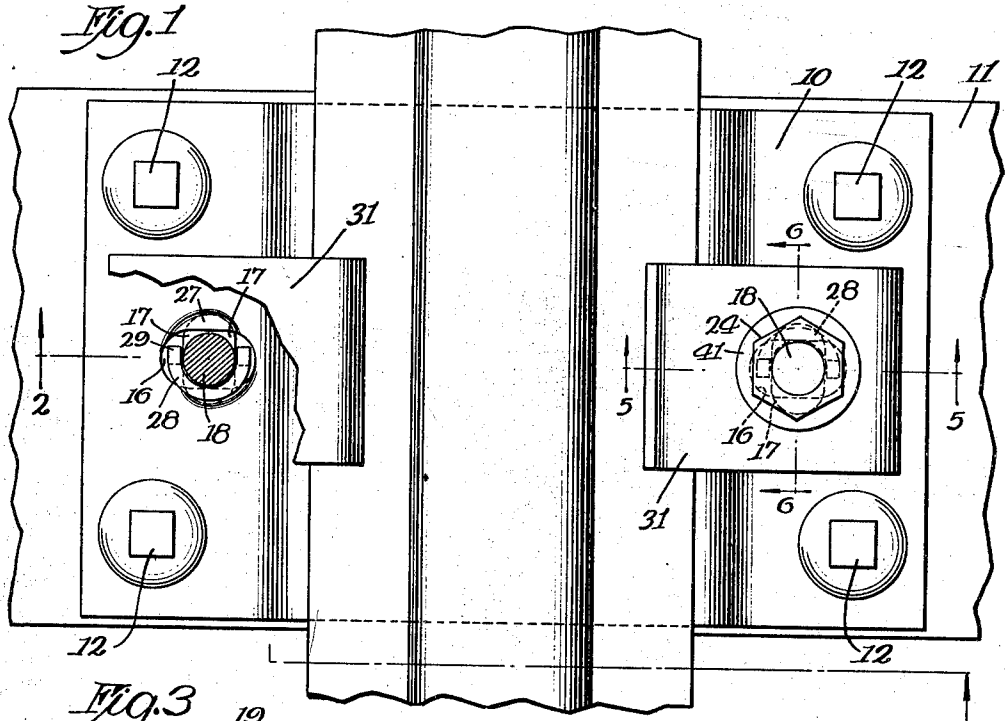


Fig. 3

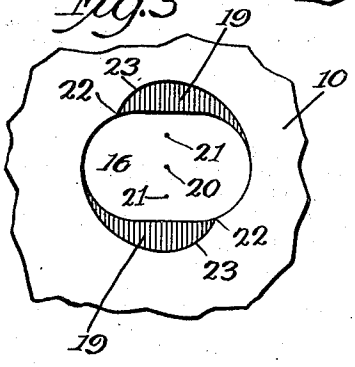


Fig. 2

Fig. 4

Inventor:
Richard T. Scholes
By Fillson Mann & Cox,
Attys.

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Fig. 5

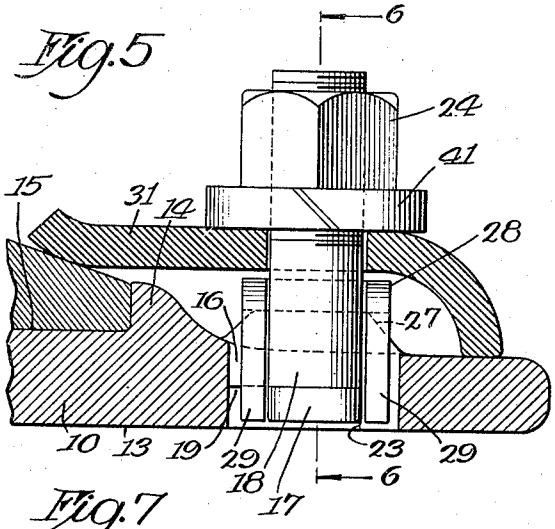


Fig. 6

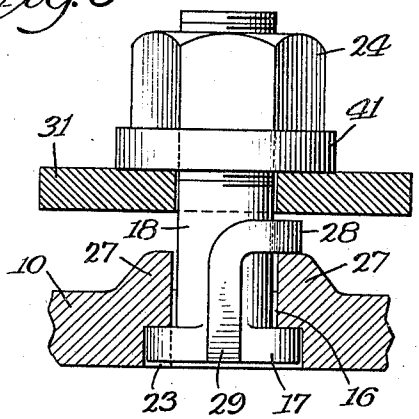


Fig. 7

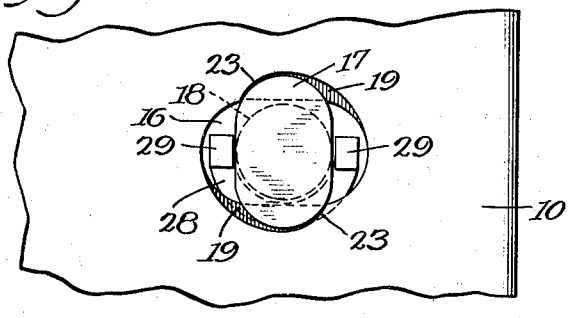


Fig. 8

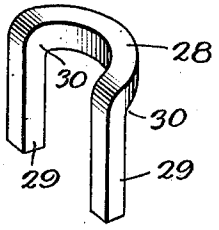


Fig. 9

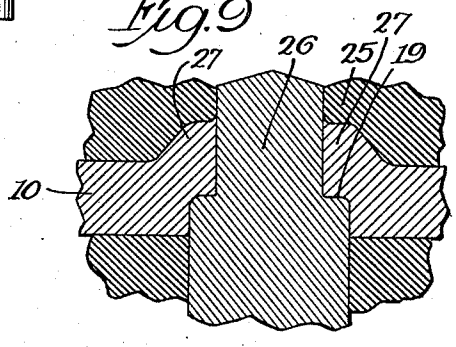
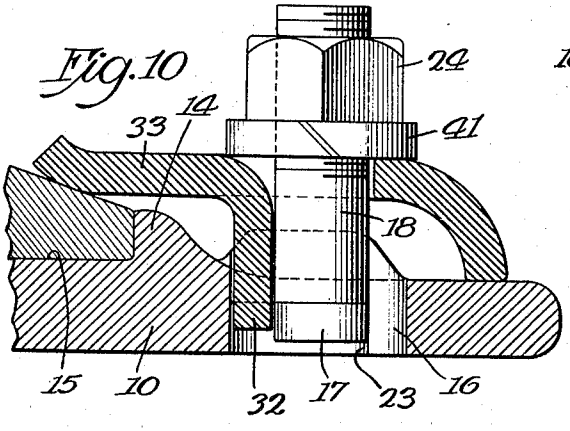


Fig. 10



Inventor
Richard T. Scholes
By Wilson, Mann & Co.
Attys.

Aug. 16, 1938. R. T. SCHOLES 2,127,430

RAIL FASTENING

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Fig. 11

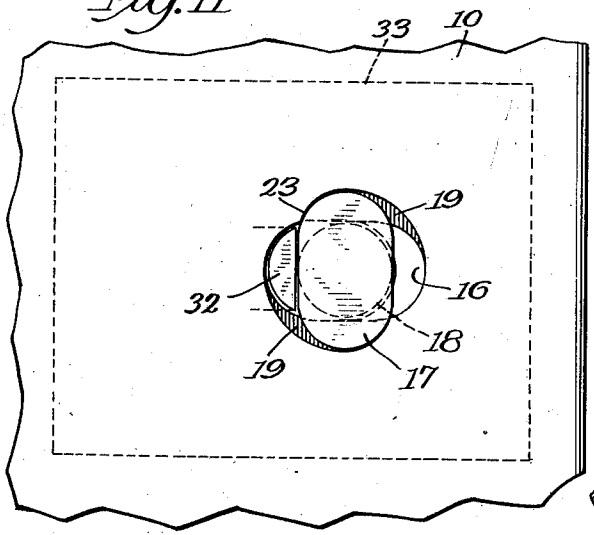
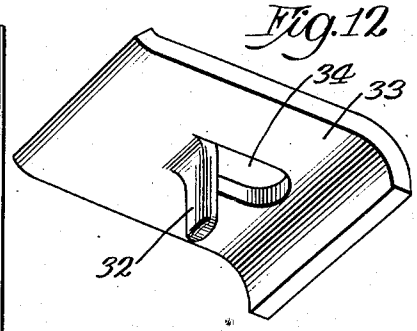


Fig. 12



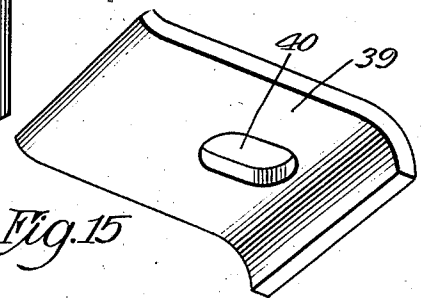


Fig. 15

Fig. 13

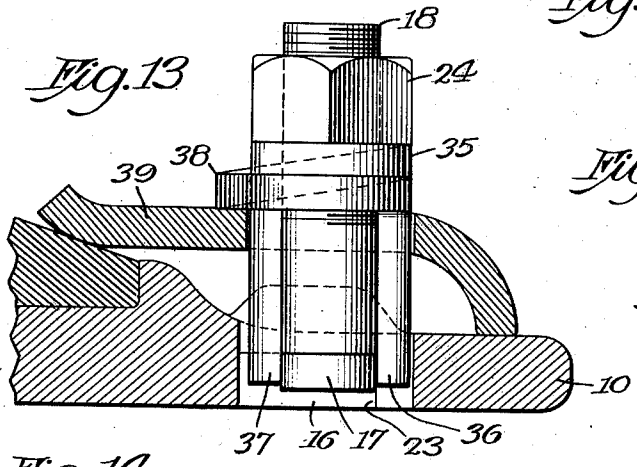


Fig. 16

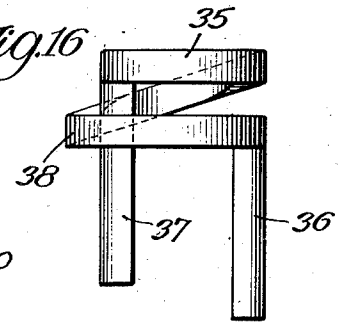


Fig. 14

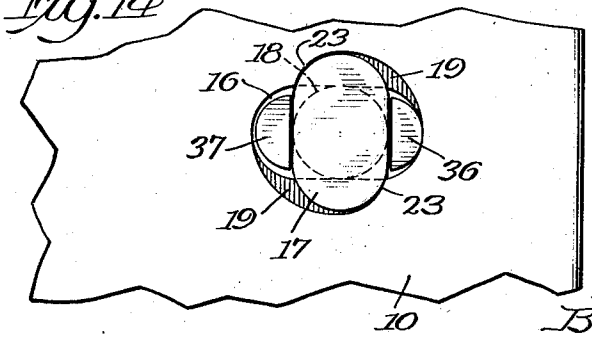
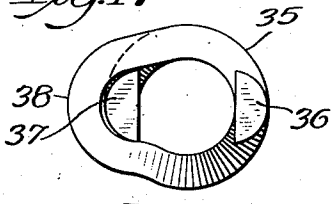


Fig. 17



Inventor.
Richard T. Scholes
By Wilson, Mann & Cox,
Attys

Patented Aug. 16, 1938 2,127,430

UNITED STATES PATENT OFFICE

2,127,430

RAIL FASTENING

Richard T. Scholes, Hinsdale, Ill.

Application February 17, 1937, Serial No. 126,126

6 Claims. (Cl. 238—338)

It is desirable to spike tie plates on railroad ties to gauge at a shop or other place equipped with jigs and tools for the purpose and to ship the ties thus prepared with the necessary rail clips and bolts to the place where they are to be put in the track, leaving the track man the simplest possible job in fastening the rails to the ties.

For obvious reasons it is not desirable to insert the bolts before spiking the plates to the ties and it is very objectionable to make holes in the ties for the bolt heads because that not only requires an additional operation but makes pockets for water to collect and promote rotting.

A great many expedients have been offered to meet the situation. For examples, slots have been made through the plates or the shoulders or bore into which the bolts were to be inserted and some have made the walls of the slots inclined and the bolt heads to correspond.

In many instances the slots have required a milling or other expensive machine operation that made the cost prohibitive. In others the bolt heads were not securely fixed and the unavoidable movement of the tracks under trains made the fastening unreliable. What with one defect or another, the needs of the service have not been met.

The principal object of this invention is to provide a construction that can be had at low cost and will make a reliable rail fastening under modern high speed trains.

In the accompanying drawings—

Fig. 1 is a plan view of the preferred embodiment of the invention, part of one of the rail clips being broken away to show the arrangement beneath;

Fig. 2 is a transverse section on the line 2—2 of Fig. 1;

Fig. 3 is an inverted plan view of a portion of the plate showing the elongated hole and the countersunk seats for the bolt head;

Fig. 4 is a perspective view of one of the fastening bolts;

Figs. 5 and 6 are transverse and longitudinal sections respectively, on the lines 5—5 and 6—6 of Fig. 1;

Fig. 7 is an inverted plan view of Fig. 5, showing how the bolt head is locked in the plate;

Fig. 8 is a perspective view of one form of bolt lock;

Fig. 9 is a diagrammatic sectional view indicating the manner in which the punching dies form the holes in the tie plate;

Fig. 10 is a transverse sectional view similar to Fig. 5, showing an alternative form of bolt lock;

Fig. 11 is an inverted plan view of Fig. 10, showing how the bolt head is locked in the plate;

Fig. 12 is a perspective view of the rail clip shown in Fig. 10 with the bolt lock forming a part thereof;

Fig. 13 is a transverse section corresponding to Figs. 5 and 10, but showing still another form of bolt lock;

Fig. 14 is an inverted plan view showing how the bolt lock of Fig. 13 coacts with the bolt head in the tie plate;

Fig. 15 is a perspective view of the rail clip shown in Fig. 13, and

Figs. 16 and 17 are side elevation and inverted plan view, respectively, of the bolt lock shown in Figs. 13 and 14.

But these specific illustrations and the corresponding description are used for the purpose of disclosure only and it is realized that the substance of the invention may be put in other forms.

In the drawings the tie plate 10 is shown fixed to a wooden tie 11 by four screw spikes 12. Preferably the bottom 13 of the plate is plain and free from projections sometimes used to bite into the wooden tie. On the top of the plate there are spaced shoulders 14 defining a rail seat 15 between them which is also preferably plain and flat to avoid concentrating stresses on the rail.

At each side of the rail seat and preferably beyond the shoulders 14 elongated bolts holes 16 are provided which extend entirely through the plate to permit the heads 17 of bolts 18 to be inserted from the top after the plate has been spiked to the tie.

As shown in Figs. 3 and 7, which are inverted plan views, the tie plate is countersunk on the bottom at 19 to provide seats for the bolt head 17 into which it can be turned by approximately one-quarter of a revolution.

The countersinks 19 extend from each end of the elongated hole 16 at one side only and stop short of the other end of the hole.

In this particular embodiment the walls of the countersunk portion lie on an arc struck from the center 20 for somewhat less than one-quarter of a revolution. From there the countersunk portion is struck on a shorter radius from the center 21 to the intersection with the elongated opening at 22.

This construction permits the bolt head to be inserted through the elongated hole 16 and then rotated to a position at right angles to the

major axis of that hole when it is stopped by shoulders 23. Naturally the shoulders 23 are so placed as to hold the bolt against rotation as the nut 24 is screwed on and set up.

The elongated opening 16 and the countersunk portions 19 are preferably formed by a punching operation, diagrammatically illustrated in Fig. 9, where a portion of the plate 10 is shown between the male and female dies 25 and 26 which have just formed the elongated holes 16 and the countersunk portions, displacing metal corresponding to the countersunk portions and forming flanges 27, constituting an integral protuberance, at the upper side of the tie plate and thereby preserving approximately the entire thickness of metal above the countersunk seat for the bolt head 17.

In order to insure that the bolts will not work loose and unfasten under the movement of trains, it is desirable to lock the bolt heads 17 against rotation from the countersunk seats 19.

In the preferred form this is accomplished by a forked lock 28 having fingers 29 adapted to be received within the elongated opening 16 at each side of the bolt and thus lie in the path of the reverse rotation of the bolt head, as best appears in Figs. 5, 6 and 7.

The upper portion of the lock is bent over at 30 to lie alongside the bolt and under the rail clip 31, as shown in Figs. 2 and 5. Obviously, as long as the nut 24 is on the bolt the clip will remain in place and the lock will remain in position to prevent rotation of the bolt head 17.

In an alternative form shown in Figs. 10, 11 and 12, the lock is formed as a depending finger 32 on the rail clip 33 and is curved on one side to fit and practically fill the elongated opening 16 by the side of the bolt head 17, as best appears in Figs. 10 and 11. In this form the lock can be made by a punching operation that first forms the hole 34 in the rail clip and then shapes the lock substantially as shown.

In the alternative form shown in Figs. 13 to 17, the lock is formed as part of a spring lock washer 35, depending arms 36 and 37 being practically continuations of the ends of the lock washer, which is given a somewhat pear shape, as best seen in Fig. 17. This form has the advantage that a single part performs the function of locking the nut and locking the bolt, and saves handling. In order to bring the arm 37 within the compass of the elongated hole 16 in the tie plate, the lock washer 35 is given a little excess of curvature at 38 (Figs. 16 and 17). Naturally, the rail clip 39 for use with this form of lock is provided with an elongated opening 40.

With the bolt lock shown in Figs. 1 to 12, the bolt is equipped with a familiar form of lock washer 41.

The construction of tie plates shown permits the bolt hole and countersinking to be done by a single punching operation at very low cost. The displacement of the metal by which the countersunk seats are made retains the full strength of the plate for cooperation with the head of the bolt. In addition, the flanges on the upper side assist in locating the rail clips.

I claim:

1. In a rail fastening, a bolt having an elongated head, a tie plate having a bottom surface adapted to engage a tie and having an upper surface adapted to support the rail, said plate having an elongated opening extending entirely through it to admit the bolt head from the top and oppositely countersunk from the bottom to permit the bolt head to be rotated in the countersunk portion about one-quarter of a turn only to an unwithdrawable position within the plate crosswise to the elongated opening, a rail clip having spaced portions bearing on the plate and on the rail and an intermediate portion spaced above the plate and having an opening aligned with the plate opening and receiving the bolt, locking means in the plate opening having a portion adjacent to a side of the bolt head and cooperating therewith and with the plate opening for preventing reverse rotation of the bolt and having another portion extending above the plate opening and beneath the intermediate portion of the clip, and a nut on the bolt holding the clip and locking means on the plate.

2. In a rail fastening, a bolt having an elongated head, a tie plate having a bottom surface adapted to engage a tie and having an upper surface adapted to support the rail, said plate having an elongated opening extending entirely through it to admit the bolt head from the top and oppositely countersunk from the bottom to permit the bolt head to be rotated in the countersunk portion about one-quarter of a turn only to an unwithdrawable position within the plate crosswise to the elongated opening, a rail clip having spaced portions bearing on the plate and on the rail and an intermediate portion spaced above the plate and having an opening aligned with the plate opening and receiving the bolt, independent locking means having fingers inserted into the plate opening, resting on the tie and straddling the bolt head and cooperating therewith and with the plate opening for preventing reverse rotation of the bolt, the upper ends of said fingers extending above the tie plate and beneath the intermediate portion of the clip, and a nut on the bolt holding the clip and locking means on the plate.

3. In a rail fastening, a bolt having an elongated head, a tie plate having a bottom surface adapted to engage a tie and having an upper surface adapted to support the rail, said plate having an elongated opening extending entirely through it to admit the bolt head from the top and oppositely countersunk from the bottom to permit the bolt head to be rotated in the countersunk portion about one-quarter of a turn only to an unwithdrawable position within the plate crosswise to the elongated opening, a rail clip having spaced portions bearing on the plate and on the rail and an intermediate portion spaced above the plate and having an opening aligned with the plate opening and receiving the bolt, independent locking means having fingers inserted into the plate opening, resting on the tie and straddling the bolt head and cooperating therewith and with the plate opening for preventing reverse rotation of the bolt, an integral connection for the upper ends of said fingers above the tie plate and beneath the intermediate portion of the clip, and a nut on the bolt holding the clip and locking means on the plate.

4. In a rail fastening, a bolt having an elongated head, a metal tie plate having an elongated opening extending entirely through it to admit the bolt head from the top and oppositely countersunk from the bottom to permit the bolt head to be rotated in the countersunk portion about one-quarter of a turn only to an unwithdrawable position within the plate crosswise to the elongated opening, an integral protuberance elevated above the surrounding area of the plate opposite said countersunk portion whereby the metal of

the plate is of substantially uniform thickness at and adjacent to the countersunk portion, a clip having spaced portions bearing on the plate and on the rail and having an intermediate portion spaced above the plate accommodating said protuberance and provided with an opening receiving the bolt, and a nut on the bolt holding the clip on the plate.

5. In a rail fastening, a bolt having an elongated head, a tie plate having a bottom surface adapted to engage a tie and having an upper surface adapted to support the rail, said plate having an elongated opening extending entirely through it to admit the bolt head from the top and oppositely countersunk from the bottom to permit the bolt head to be rotated in the countersunk portion about one-quarter of a turn only to an unwithdrawable position within the plate crosswise to the elongated opening, a rail clip having spaced portions bearing on the plate and on the rail and an intermediate portion spaced above the plate and having an opening aligned with the plate opening and receiving the bolt, a lock washer on the bolt having a finger extending through the clip and into the plate opening adjacent a side of the bolt head and cooperating therewith and with the plate opening for preventing reverse rotation of the bolt, and a nut on the bolt holding the clip and lock washer on the plate.

6. In a rail fastening, a bolt having an elongated head, a tie plate having a bottom surface adapted to engage a tie and having an upper surface adapted to support the rail, said plate having an elongated opening extending entirely through it to admit the bolt head from the top and oppositely countersunk from the bottom to permit the bolt head to be rotated in the countersunk portion about one-quarter of a turn only to an unwithdrawable position within the plate crosswise to the elongated opening, a rail clip having an opening aligned with the plate opening and receiving the bolt, a locking finger integral with the clip depending therefrom into the plate opening and having a portion adjacent to a side of the bolt head and cooperating therewith and with the plate opening for preventing reverse rotation of the bolt, and a nut on the bolt holding the clip on the plate.

RICHARD T. SCHOLES.