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J. R. SNYDER
METHOD AND MEANS FOR RECLAIMING
SPIKE HOLES FOR RAIL FASTENINGS

2,690,878

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2 Sheets-Sheet 1

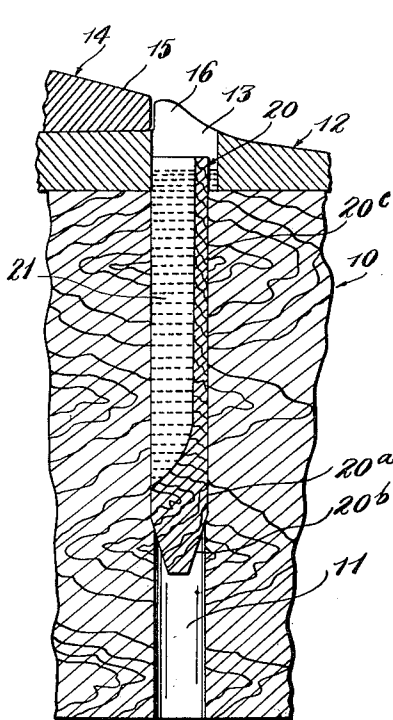


FIG. 2

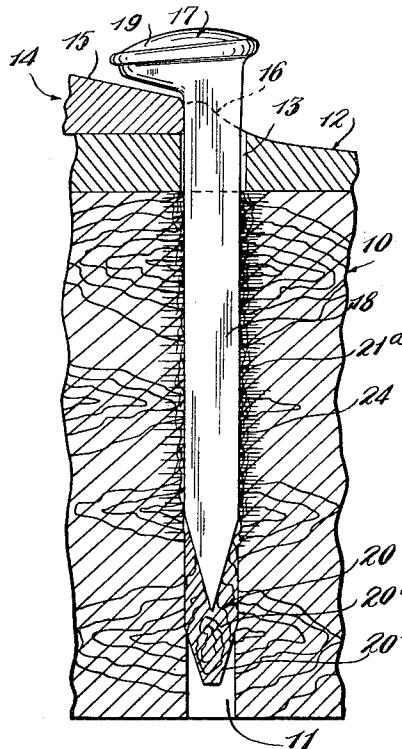


FIG. 1

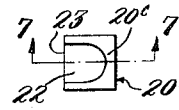


FIG. 5

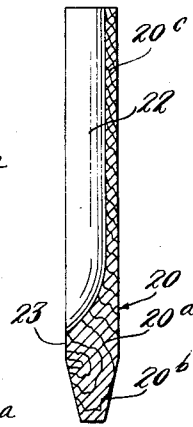


FIG. 7

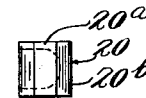


FIG. 6

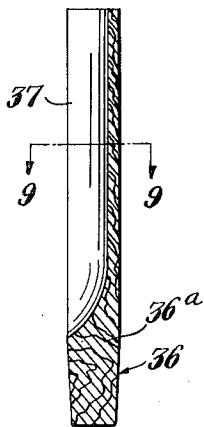


FIG. 8

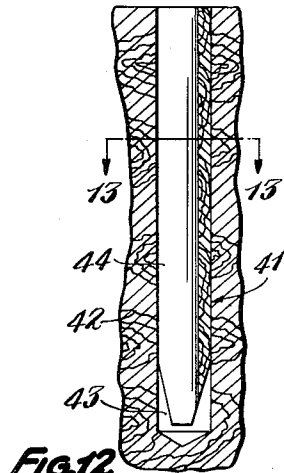


FIG. 12

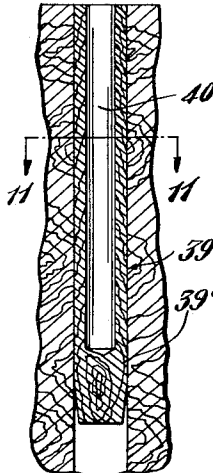


FIG. 10

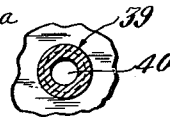


FIG. 11

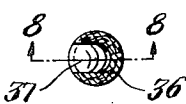


FIG. 9

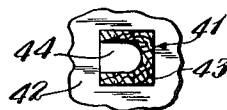


FIG. 13

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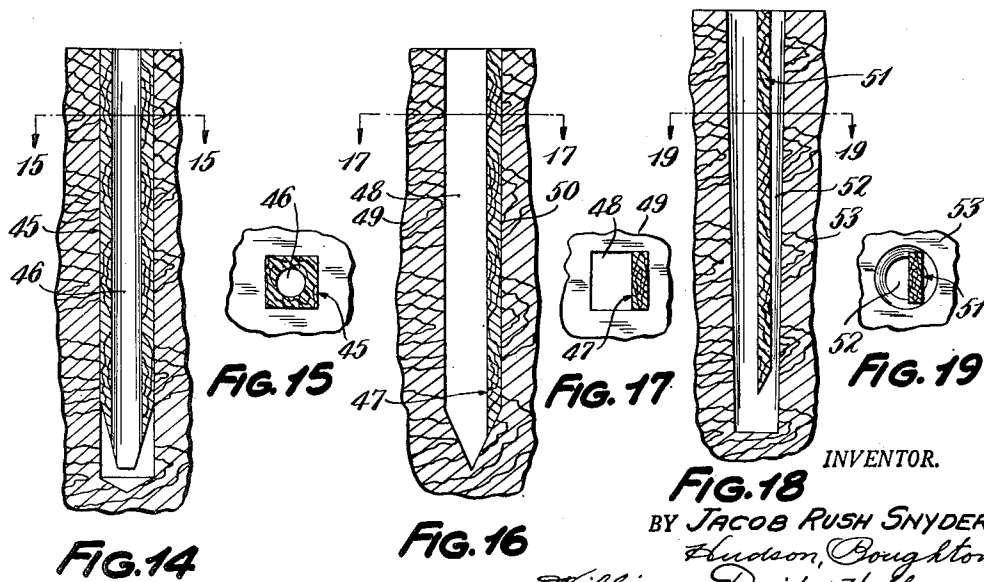
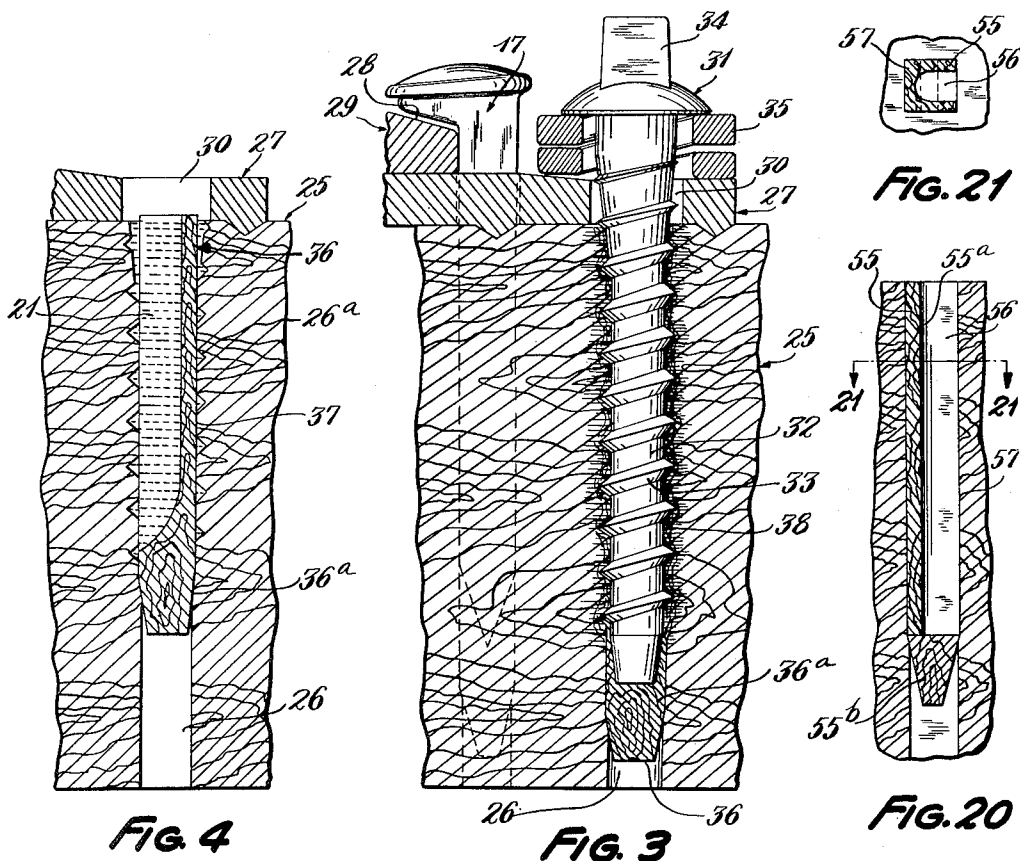
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UNITED STATES PATENT OFFICE

2,690,878

METHOD AND MEANS FOR RECLAIMING
SPIKE HOLES FOR RAIL FASTENINGS

Jacob Rush Snyder, Cleveland, Ohio

Application May 27, 1950, Serial No. 164,744

12 Claims. (Cl. 238—370)

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This invention relates to rail fastenings of the kind employing wood ties having spike holes into which fastening spikes are driven and, more particularly, to a method and means for using oversize spike holes and for reclaiming spike holes for re-use after they have become worn.

After wood railroad ties have been in use for a period of time, the spike holes thereof become worn, frayed and enlarged as the result of forces transmitted by the rails to the spikes engaged in such openings and, when this condition has occurred, the spikes have reduced holding power in the ties and are prone to work loose. To correct this condition it is usually necessary to pull out the spikes and drive them into the ties in newly formed spike holes. Attempts have been made to plug up the old spike holes with solid wood pegs so as to exclude rain and brine and thus prevent rotting of the ties. Such pegs have not been effective in satisfactorily closing the old spike holes and rain and brine seeping into such old holes has caused rapid decay of the ties internally thereof.

The present invention provides, as one of its objects, a novel method and means by which these worn spike holes can be readily restored to usefulness such that they can be re-used immediately and will produce rail fastenings in which the spikes will have a holding power in the ties of equal or greater strength than the spikes initially used in such holes.

Another object of this invention is to provide a novel method and means for the purpose mentioned in which a wood peg driven into such a previously used spike hole serves as a filler and spike tightening means, and in which a wood-hardening and preservative chemical material, preferably a thermosetting or potentially thermosetting material, introduced into the spike hole is forced into the peg and into portions of the tie surrounding the spike hole by the driving of the spike and enables the spike to form with the peg and surrounding tie portions a fastening of increased holding power and durability.

This invention also provides a novel method and means for re-using old spike holes in which the chemical material also has the characteristics of a glue and forms an adhesive bond between the spike, peg and surrounding tie portions.

A further object is to provide a novel method and means of the character mentioned in which the peg has an axial passage or recess therein into which the spike is driven after the peg has been introduced into the spike hole.

Still another object is to provide a novel method and means of the character referred to above, in which the lower end of the peg is imperforate and adapted to form a plug in the spike hole and the axial passage extends into the peg from the upper end thereof.

Yet another object of this invention is to provide a wood tie spike hole filler peg of a novel form which can be used to advantage in carrying

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out the method herein disclosed for reclaiming worn spike holes.

Other objects and advantages of this invention will be apparent in the following detailed description and in the accompanying sheets of drawings in which,

Fig. 1 is a vertical section taken through a rail fastening employing a cut spike and in which an oversize or previously used spike hole has been reclaimed according to the present invention;

Fig. 2 is a similar vertical section taken through the tie and spike hole after the peg and chemical material have been introduced thereinto but prior to the driving of the spike;

Fig. 3 is a vertical section similar to Fig. 1, but taken through a rail fastening which employs a screw spike and a somewhat different form of peg;

Fig. 4 is a vertical section taken through the tie and spike hole of Fig. 3 after the peg and chemical material have been introduced thereinto but prior to the driving of the screw spike;

Fig. 5 is a top end view of the peg used in the rail fastening construction illustrated in Figs. 1 and 2;

Fig. 6 is a bottom end view of the peg;

Fig. 7 is a vertical or longitudinal section through the peg taken as indicated by section line 7—7 of Fig. 5;

Fig. 8 is a vertical or longitudinal section taken through a peg of the form employed in the fastening construction illustrated in Figs. 3 and 4, the view being taken substantially as indicated by section line 8—8 of Fig. 9;

Fig. 9 is a transverse section taken through the peg of Fig. 8, as indicated by section line 9—9 hereof;

Figs. 10 and 11 are longitudinal and transverse sections, respectively, showing another form of peg which may be used in the fastening construction illustrated in Figs. 3 and 4, the transverse section of Fig. 11 being taken on the section line 11—11 of Fig. 10;

Figs. 12 and 13 are longitudinal and transverse sections, respectively, taken through another form of peg which may be used in fastening construction of the type illustrated in Figs. 1 and 2, but which is intended for a spike hole which does not extend entirely through the tie, the transverse section of Fig. 13 being taken on section line 13—13 of Fig. 12;

Figs. 14 and 15 are longitudinal and transverse sections, respectively, showing another form of peg which may be used in fastening construction of the type illustrated in Figs. 3 and 4, but which is intended for a spike hole which does not extend entirely through the tie, the transverse section of Fig. 15 being taken on section line 15—15 of Fig. 14;

Figs. 16 and 17 are longitudinal and transverse sections, respectively, showing still another form of peg which may be used in a spike hole which does not extend entirely through the tie,

the transverse section of Fig. 17 being taken on section line 17—17 of Fig. 16;

Figs. 18 and 19 are longitudinal and transverse sections, respectively, showing an additional form of peg which may be used in a round spike hole which does not extend entirely through the tie, the transverse section of Fig. 19 being taken on section line 19—19 of Fig. 18; and

Figs. 20 and 21 are longitudinal and transverse sections, respectively, showing a two-piece peg as another modification for use in a spike hole which does not extend entirely through the tie, the transverse section of Fig. 21 being taken on section line 21—21 of Fig. 20.

As one example of rail fastening construction utilizing the present invention, Figs. 1 and 2 show a wood railway tie 10 having a spike hole 11 therein and extending transversely of the grain of the wood. A conventional tie plate 12 is supported on the tie and has a spike hole opening 13 therein which overlies the spike hole 11 of the tie. The tie plate 12 forms a seat for a rail 14 having a base flange 15 and includes an upstanding rail-gauging shoulder 16 adjacent the edge of the base flange. A spike 17, in this instance a so-called cut spike, has a plain stem 18 of a quadrangular or square cross-section driven into the spike hole 11 of the tie and extending through the tie plate opening 13. The spike 17 also includes a head 19 having a portion thereof extending into overhanging relation to the base flange 15 of the rail.

The spike hole 11 of the tie 10 is always an oversize hole and is usually, though not necessarily, a previously used spike hole which has become somewhat worn and enlarged. The spike hole 11 may be one which was initially bored into the tie 10 and, in this instance, extends entirely through the tie although, as explained herein-after, the invention is also applicable to spike holes which do not extend entirely through the tie and which can be referred to as "blind" spike holes as distinguished from "through" spike holes. The spike hole 11 here shown is also a hole having a quadrangular or square cross-sectional shape.

In accordance with the present invention the rail fastening construction illustrated in Figs. 1 and 2 also includes a peg 20 which is driven into the spike hole 11 prior to the driving of the spike 17 therein and which forms a filler or tightening means for the spike in the spike hole. As another important feature of the present invention the rail fastening construction illustrated in Figs. 1 and 2 also includes a wood-hardening and preservative chemical material 21 which is also introduced into the spike hole 11 prior to the driving of the spike 17 therein. In addition to being a wood-hardening and preservative substance, the chemical material 21 is preferably also a form of glue which will provide an adhesive bond between the spike stem 18, the peg 20 and the portions of the tie 10 immediately surrounding the spike hole.

The peg 20 is a wood peg which, as shown in Fig. 7, may be of a length comparable with the length of the stem 18 of the spike 17. This peg, as used in the quadrangular or square spike hole 11, is also of a quadrangular or square cross-sectional shape as shown in Figs. 5 and 6, but is preferably somewhat larger in its plan dimensions than the plan dimensions of the spike hole 11 so that when the peg is driven into the spike hole it will have a tight fit therein and will also have a strong face-to-face engagement with

the surrounding tie portions forming the sides of the spike hole. An important feature of the peg 20 is that it has an axial or longitudinal passage or recess 22 extending thereto from its upper end. The passage 22 is here shown as being a substantially U-shaped groove which is open along one side face of the peg, in this instance the side face 23.

The axial passage 22 of the peg 20 is an important characteristic and performs two novel functions. When the peg is provided with such an axial passage, it will only partially fill the cross-sectional shape of the spike hole 11, thus leaving a substantial portion of the spike hole volume to permit the driving of the spike 17 into the spike hole. The longitudinal passage 22 also provides a space into which the chemical material 21 can be introduced after the peg has been driven into the spike hole 11. Fig. 2 of the drawings shows the peg 20 as having been driven into the spike hole 11 of the tie 10 and the chemical material 21 as having been introduced into the peg passage 22, preparatory to the driving of the spike 17. The peg 20 can be inserted into the spike hole 11 through the opening 13 of the tie plate 12 and can be forced into the spike hole by any suitable pounding implement or pressure applying device.

In connection with the peg 20 it is also important to explain at this point that when the peg is used in a through spike hole, as shown in Figs. 1 and 2, it has an imperforate or solid lower end 20a which is substantially rigid and will maintain its shape and will have tight engagement with the walls of the spike hole while the peg is being driven thereto. This solid lower end of the peg also forms a closure or plug for the lower end of the spike hole 11 which will cause the chemical material 21 to be retained in the portion of the spike hole extending above this plug. To facilitate the starting of the peg 20 in the spike hole 11 and to insure a smooth and straight downward movement of the peg during the driving thereof, it is also preferably provided with a converging taper 20b at the lower end thereof.

For an important purpose the peg 20 is driven into the spike hole 11 with the face 23, containing the axial passage 22, disposed nearest the rail 14. When the peg is disposed in this position it will be seen that the passage 22 will be located in a somewhat off-center relation with respect to the axis of the spike hole 11 and the upright solid portion 20c of the peg will lie alongside the wall of the spike hole 11 which is the more remote from the rail 14. The advantage of the peg construction above described and of having the axial passage 22 disposed in this offset relation is that when the spike 17 is driven into the spike hole 11, it will enter the passage 22 of the peg and the offset location of this passage and the presence of the solid wall portion 20c along the outside wall of the spike hole will cause the spike to be pushed laterally toward the rail 14 so as to compensate for any enlargement of the spike hole which may previously have taken place in an outward direction, that is in a direction away from the rail 14. The relation of the peg portions in the spike hole 11, as just described, will thus insure a location of the spike 17 in the fastening being formed which will bring the spike head 19 and the adjacent portion of the spike stem 18 in a proper holding relation to the rail flange 15.

As indicated above, the chemical material 21 is a wood-hardening and preservative material

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and is preferably also a form of glue. As this chemical material, this invention contemplates the use of any suitable substance which will accomplish these desired results, such as a cold-setting glue which is water-insoluble in its set condition, preferably a synthetic resin glue which is potentially thermosetting and which will assume a set condition at ordinary temperatures. Synthetic resin materials suitable for this purpose are urea formaldehyde, resorcinol formaldehyde, phenol formaldehyde, melamine formaldehyde and the like, and various other materials having comparable properties and characteristics. Usually a so-called catalyst, such as formaldehyde, is mixed with the resin in suitable amount at the time of use to render the same actually thermosetting. The chemical material 21 may, in some cases, comprise a mixture of one of the synthetic resin glues just mentioned and a plasticizing agent which will prevent the glue from becoming excessively brittle in its set condition. A vinyl resin, such as vinyl acetate or vinyl butyral, can be used in admixture in suitable proportion with urea formaldehyde or other synthetic resin material as this plasticizing agent. The chemical material 21 is introduced into the spike hole 11 and the passage 22 of the peg 20 in a fluid condition and for this purpose any suitable pouring or injecting means can be used.

It is also an important feature of the present invention that when the spike 17 is driven into the spike hole 11 and the passage 22 containing this fluid chemical material, the material is pressurized by the driving of the spike causing the material to be forced into the pores or interstices of the wood peg 20 and into the pores or interstices of the portions of the wood tie immediately surrounding the spike hole. The impregnation of the surrounding tie portion with the chemical material is indicated in Fig. 1 by the reference character 21a. This impregnation of the peg and the surrounding tie portions is important because when the chemical material becomes set therein it hardens and preserves the wood so as to enable the spike 17 to have strong holding power in the reconditioned spike hole. The adhesive bond which is also formed between the peg, spike and tie by the chemical material will also increase the holding power of the spike in its driven condition.

During the driving of the spike 17 into the spike hole 11 and the passage 22 of the peg 20, it is expected that the peg will become broken, splintered or shattered with respect to the portions thereof which are coextensive with the passage 22. Such breaking of the upper portion of the peg is usually necessary to enable the stem 18 of the spike to move downwardly into the spike hole and during such breaking, portions of the peg will become distributed along the stem of the spike and will act as a filler or tightening means between the spike and the side wall of the spike hole 11. The broken portions of the peg will also become partially embedded in the wood of the surrounding tie portions, as has been indicated at 24 in Fig. 1, and will be bonded thereto by the chemical material 21.

It will accordingly be seen that in a rail fastening constructed according to the method above described and utilizing the peg 20 and the chemical material 21, the spike will have a strong holding power in the tie 10 and that the fastening will have a strength and durability comparable to or greater than that of a fastening formed by the driving of a similar spike into a new tie. It will

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also be seen that the peg 20 and the chemical material 21 provide for a simple and practical way of reclaiming previously used spike holes so as to provide strong and durable rail fastenings without need for forming new holes in the ties.

Figs. 3 and 4 of the drawings show a rail fastening generally similar to that described above in connection with Figs. 1 and 2 and which is formed in a similar way and provides the same improved results and advantages. In the rail fastening construction illustrated in Figs. 3 and 4, however, the tie 25 has a round spike hole 26 therein and is a spike hole from which a previously driven screw spike has been removed. As shown in Fig. 4, the spike hole 26 may include a helical groove 26a in the surrounding portion of the tie 25 and which was formed by the thread of the previously driven screw spike.

The rail fastening shown in Fig. 3 includes a conventional tie plate 27 forming a seat for the base flange 28 of a rail 29 and having a spike hole opening 30 overlying the spike hole 26 of the tie 25. This rail fastening also includes a screw spike 31 having a stem 32 driven into the spike hole 26 and carrying a helical thread 33. The spike 31 is provided at its upper end with a head having a non-circular portion 34 to which a suitable tool can be applied.

In this instance the screw spike 31 serves only to hold the tie plate 27 against the tie 25 and the hole 30 of the tie plate is therefore located in laterally spaced relation to the rail flange 28. A compression spring 35 disposed around the stem of the spike 31 and located between the head of the spike and the tie plate 27 exerts a yielding pressure against the latter for holding the tie plate against the tie. The rail fastening here shown may also include a line spike located adjacent the rail flange 28, and which line spike is here shown as being one of the cut spikes 17 described above.

According to the present invention the rail fastening construction illustrated in Figs. 3 and 4 also utilizes a wood peg 36 and the chemical material 21 in the spike hole 26 in the same manner as has been explained above in connection with the fastening construction of Figs. 1 and 2. The peg 36, however, differs somewhat from the peg 20 and is of the form shown in Figs. 8 and 9. The peg 36 embodies the same principal features as the peg 20, that is to say, it includes an axial passage 37 and has a tapered solid or imperforate lower end 36a, but is of a substantially round cross-sectional shape so as to be better suited for use in the round spike hole 26.

The operations performed in the rail fastening construction illustrated in Figs. 3 and 4 are substantially the same as have been described above in connection with the rail fastening construction of Figs. 1 and 2, and it will be understood that the driving of the screw spike 31 into the spike hole 26 and into the passage 37 of the peg 36 subjects the chemical material 21 to pressure for causing this material to be impregnated into the peg and into the portions of the wood tie 25 surrounding the spike hole.

During the driving of the spike 32 the peg 36 will be broken or splintered in the spike hole 26 and portions of the peg will be distributed along the spike hole and pressed into the wood of the tie, as indicated by the reference character 38, so as to constitute a filler for tightening the spike in the spike hole.

Instead of using the peg 36 in connection with the screw spike 31, a peg 39 of a somewhat dif-

ferent form may be used with this screw spike. As shown in Figs. 10 and 11, the modified peg 39 has the axial passage 40 therein in the form of a central bore extending into the peg from the upper end thereof and terminating at the solid or imperforate lower end 39a.

Figs. 12 and 13 show another modified peg 41 which is similar to the peg 20, but which can be somewhat more easily constructed and is suitable for use in a tie 42 having a blind spike hole 43, that is to say, a spike hole which does not extend entirely through the tie. The peg 41 has an axial passage 44 therein in the form of a U-shaped groove which extends for the full length of the peg. The modified peg 41 is used in the same way as the peg 20 except that the pressurization of the chemical 21 does not depend upon the peg including any solid portion at its lower end inasmuch as the chemical material is trapped in the blind spike hole 43.

Figs. 14 and 15 show another modified peg 45 which is used in the same way and serves substantially the same purpose as the modified peg 41, but in which the axial passage 46 is a central bore extending through the peg.

Figs. 16 and 17 show still another modified form of peg 47 which is in the form of a flat strip adapted to be inserted into the square spike hole 48 of a tie 49 so as to lie along and against the side face 50 of the spike hole which is farthest from the rail. The peg 47 is of a width corresponding substantially with the width of the spike hole so that its edges will have a substantially tight fit therein, as shown in Fig. 17. The peg 47 forms a tightening means for a cut spike when such a spike is driven into the spike hole 48.

Figs. 18 and 19 show a modified construction in which a peg 51 of a strip form similar to the peg 47 has been driven into a round spike hole 52 of a tie 53 preparatory to the driving of a screw spike (not shown) into this spike hole. It will be understood that the pegs 47 and 51 of Figs. 16 and 18 are used in combination with the chemical material 21 which is trapped and pressurized in the blind spike holes 48 and 52 by the driving of the spikes thereinto.

As a form of wood peg which is very economical to produce, Figs. 20 and 21 show a peg 55 of a square or quadrangular cross-sectional shape and which comprises two complementary upper and lower peg pieces 55a and 55b. The upper peg member 55a is a relatively long straight wood piece having a longitudinal groove 56 in one face and extending for the full length of this member. The lower peg member 55b is a tapered end piece which is inserted into the square spike hole 57 ahead of the long peg member 55a and forms a closure for the lower end of the groove 56. It will be understood that the two-piece peg of Figs. 20 and 21 is used in combination with the chemical material 21 which will be trapped and pressurized in the blind spike hole 57 by the driving of a cut spike thereinto.

All of the pegs 20, 36, 39, 41, 45, 47, 51 and 55 disclosed herein are made of wood and, hence, the chemical material 21 will be effective thereon for hardening and preserving the same and for forming the above-mentioned adhesive bond. These pegs can be made from any suitable kind of wood and are preferably cut from solid pieces of wood although, if desired, all of these pegs can be made from a wood composition such as a mixture of wood particles, for example sawdust or wood flour, and a suitable binder such as a synthetic resin glue. When the pegs are made of

such a wood composition they can be rapidly and economically produced by a suitable molding operation.

It should be understood also that the pegs herein disclosed can all be used as tightening fillers in spike holes without employing the chemical material 21 and, in that case, the pegs need not be made of wood but could be made of any suitable material.

From the foregoing description and the accompanying drawings it will now be readily understood that this invention provides a method and means for conditioning oversize spike holes and for reclaiming the previously used spike holes of wood railway ties, such that rail fastenings using such spike holes can be easily and reliably produced and will have a strength and durability comparable with or greater than those of rail fastenings formed with spikes driven into new ties.

Although the spike hole reclaiming method and means of the present invention has been illustrated and described herein to a somewhat detailed extent it will be understood, of course, that the invention is not to be regarded as being limited correspondingly in scope but includes all changes and modifications coming within the terms of the claims hereof.

Having thus described my invention, I claim:

1. In a rail fastening, a wood tie having a pre-formed spike hole therein, a one-piece wood peg engaged in said spike hole, said peg having a longitudinal groove in one side thereof and being disposed in said spike hole with the groove on the rail side of the peg, and a spike driven into said spike hole and into the groove of said peg, portions of said peg forming a filler along the side of the spike hole which is most remote from the rail for tightening said spike in said spike hole.

2. In a rail fastening, a wood tie having a pre-formed spike hole extending therethrough, a peg inserted into said spike hole from the upper end thereof, said peg having a longitudinal groove therein extending from its upper end and along one side thereof for a portion of its length and said peg also having an imperforate lower end, and a spike driven into said spike hole and into the groove of said peg, portions of said peg forming a filler for tightening said spike in said spike hole and said imperforate lower end forming a plug in the lower portion of the spike hole.

3. In a rail fastening, a wood tie having a previously used spike hole therein, a one-piece wood peg engaged in said spike hole, said peg having a passage of substantially U-shaped cross-section extending longitudinally along the side thereof nearest said rail, and a spike driven into said spike hole and into the passage of said peg, portions of said peg forming a filler for tightening said spike in said spike hole.

4. In a rail fastening, a wood tie having a previously used spike hole therein, a wood peg engaged in said spike hole, said peg having a passage of substantially U-shaped cross-section extending longitudinally therein from its upper end and along the side thereof nearest said rail and also having an imperforate lower end, and a spike driven into said spike hole and into the passage of said peg, portions of said peg forming a filler for tightening said spike in said spike hole and said imperforate lower end forming a plug in the lower portion of said spike hole.

5. In a rail fastening, a wood tie having a previously used spike hole extending therethrough, a one-piece wood peg inserted into said spike hole

from the upper end thereof, said peg having a passage extending longitudinally therein from its upper end and also having an imperforate lower end forming a plug in the lower portion of said spike hole, and a spike driven into said spike hole and into the passage of said peg, portions of said peg forming a filler for tightening said spike in said spike hole, said peg and portions of said tie surrounding said spike hole being impregnated with and hardened by a thermosetting wood-hardening and preservative material and enabling said spike to form with said tie and said peg a connection of increased holding power and durability, said material being initially contained in the spike hole and peg passage in a fluid condition and being forced into said peg and into the surrounding portions of said tie by the driving of said spike.

6. In a rail fastening, a wood tie having a previously used spike hole therein, a one-piece wood peg engaged in said spike hole, said peg having a passage of substantially U-shaped cross-section extending longitudinally along the side thereof nearest said rail, and a spike driven into said spike hole and into the passage of said peg, portions of said peg forming a filler for tightening said spike in said spike hole, said peg and portions of said tie surrounding said spike hole being impregnated with and hardened by a thermosetting wood-hardening and preservative material and enabling said spike to form with said tie and said peg a connection of increased holding power and durability, said material being initially contained in the spike hole and peg passage in a fluid condition and being forced into said peg and into the surrounding portions of said tie by the driving of said spike.

7. In a rail fastening, a wood tie having a previously used spike hole therein, a wood peg engaged in said spike hole, said peg having a passage of substantially U-shaped cross-section extending longitudinally therein from its upper end and along the side thereof nearest said rail and also having an imperforate lower end, and a spike driven into said spike hole and into the passage of said peg, portions of said peg forming a filler for tightening said spike in said spike hole and said imperforate lower end forming a plug in the lower portion of said spike hole, said peg and portions of said tie surrounding said spike hole being impregnated with and hardened by a thermosetting wood-hardening and preservative material and enabling said spike to form with said tie and said peg a connection of increased holding power and durability, said material being initially contained in the spike hole and peg passage in a fluid condition and being forced into said peg and into the surrounding portions of said tie by the driving of said spike.

8. A filler for use in reclaiming previously used spike holes of one-piece wood railway ties comprising, an elongated wood peg adapted to be driven into such a spike hole and being of a cross-sectional size and shape to engage tightly in said spike hole, said peg having an imperforate lower end adapted to form a plug in said spike hole and also having a longitudinal groove therein extending from its upper end and along one side thereof but terminating at a point above said imperforate lower end such that when the peg is driven into said spike hole it will only partially fill the portion of the spike hole above said plug.

9. As an article of manufacture, a wood tie spike hole filler peg as defined in claim 8 but in

which the peg is a performed rigid molded article and is formed of wood particles and a binder.

10. The method of reclaiming previously used spike holes of wood railway ties which comprises, introducing into such a spike hole a one-piece filler peg of a substantially quadrangular cross-sectional shape and having a longitudinal groove in one side thereof, introducing a settable wood-hardening glue in fluid form into said spike hole and longitudinal groove, and then driving a spike into said spike hole and longitudinal groove and pressurizing said glue by the driving of the spike for forcing some of the glue into the peg and into the portions of the tie immediately adjacent said spike hole.

11. In a rail fastening, a wood tie having a preformed spike hole extending thereinto crosswise of the grain thereof, a one-piece wood peg having a longitudinal grain and engaged in said spike hole, said peg having a longitudinal groove in one side thereof and being disposed in said spike hole with the groove defining a passage in the spike hole along one side of the latter and exposing the cross grain of the tie, and a spike driven into said spike hole and said passage and a portion of said spike being in direct engagement with the exposed cross grain of the tie, portions of said peg forming a filler along the opposite side of the spike hole for tightening said spike in said spike hole and wedging the spike against said exposed cross grain of the tie.

12. In a rail fastening, a wood tie having a preformed spike hole extending thereinto crosswise of the grain thereof, a one-piece wood peg having a longitudinal grain and engaged in said spike hole, said peg having a longitudinal groove in one side thereof and being disposed in said spike hole with the groove defining a passage in the spike hole along one side of the latter and exposing the cross grain of the tie, and a spike driven into said spike hole and said passage and a portion of said spike being in direct engagement with the exposed cross grain of the tie, portions of said peg forming a filler along the opposite side of the spike hole for tightening said spike in said spike hole and wedging the spike against said exposed cross grain of the tie, portions of said peg and portions of said tie immediately adjacent said spike hole being impregnated with and hardened by a wood-hardening and preservative glue and enabling said spike to form with said tie and said peg a connection of increased holding power and durability, said glue being initially contained in said spike hole and said passage in a fluid but settable condition and being forced into said peg and into said immediately adjacent portions of the tie by the driving of said spike.

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