

March 31, 1931.

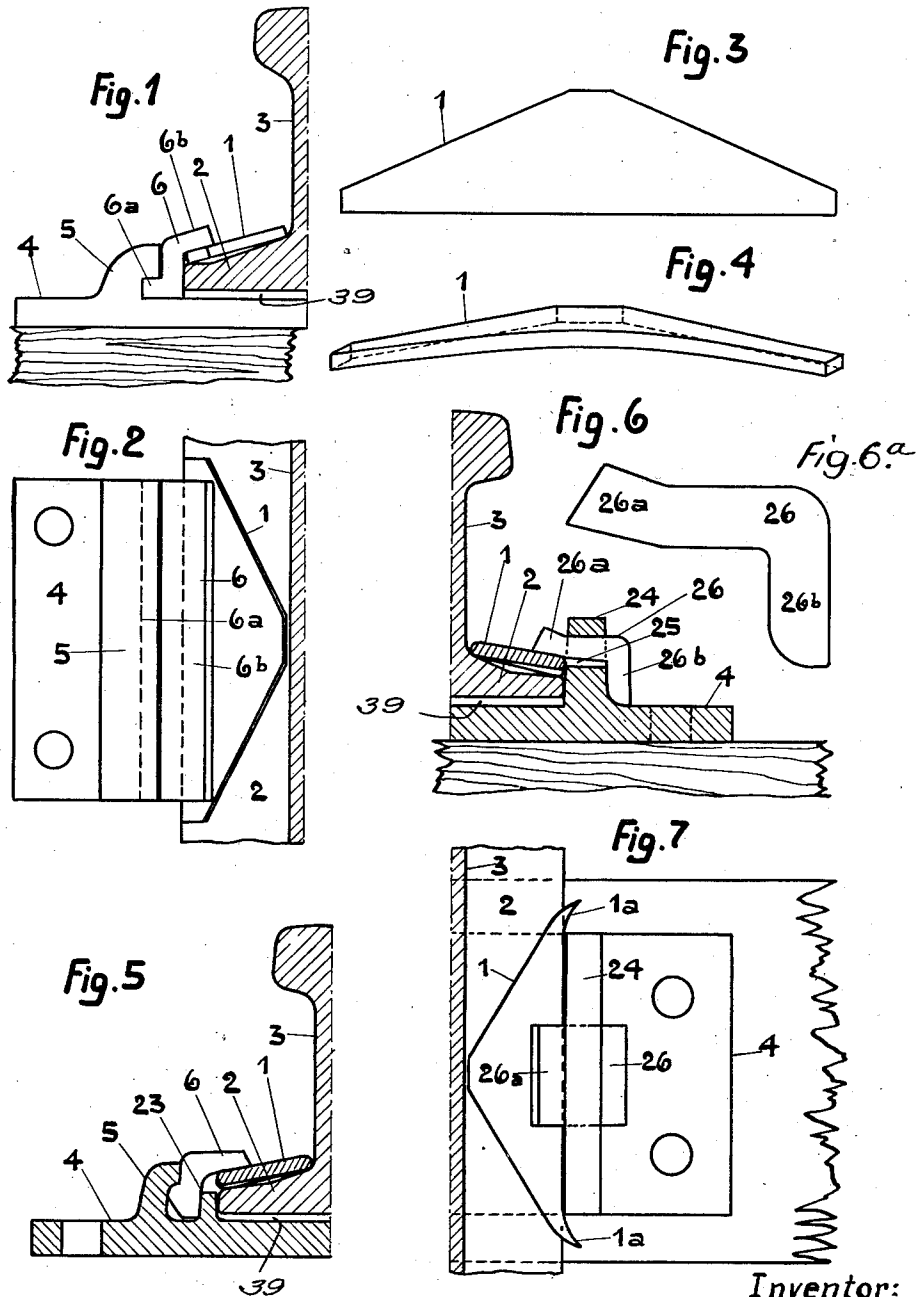
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1,798,357

METHOD OF AND MEANS FOR FASTENING DOWN RAILS

Filed July 25, 1929

3 Sheets-Sheet 1



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METHOD OF AND MEANS FOR FASTENING DOWN RAILS

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3 Sheets-Sheet 2

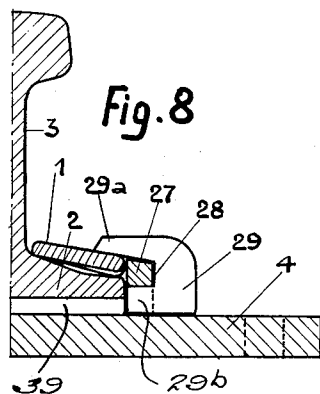


Fig. 8

Fig. 10

Fig. 11

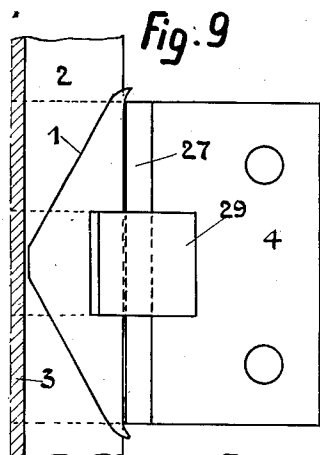
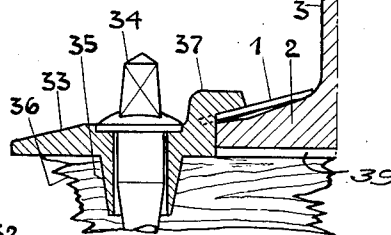
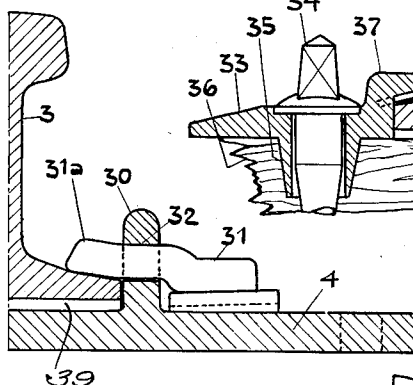


Fig. 9

Fig. 12

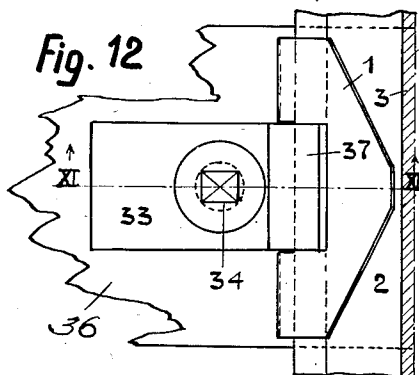
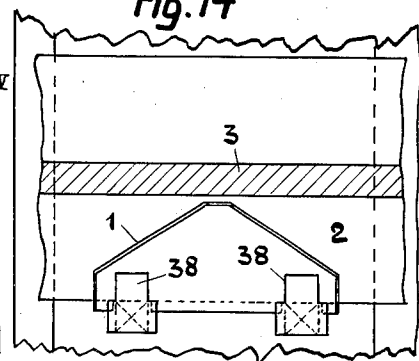
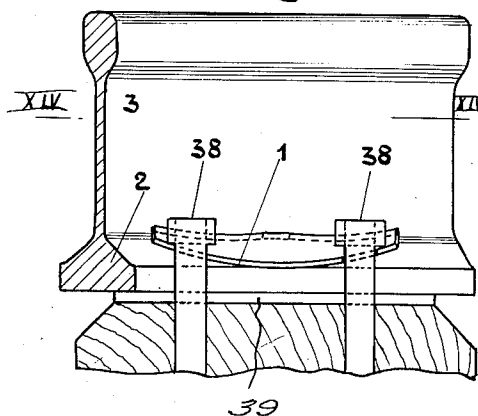


Fig. 13

Fig. 14



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METHOD OF AND MEANS FOR FASTENING DOWN RAILS

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3 Sheets-Sheet 3

Fig. 15

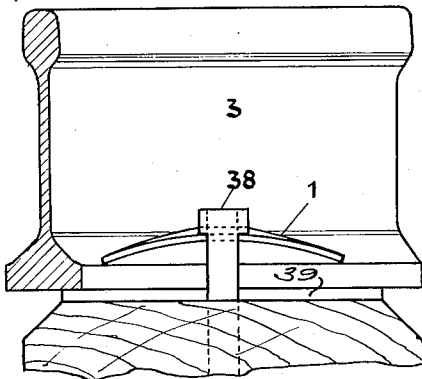


Fig. 16

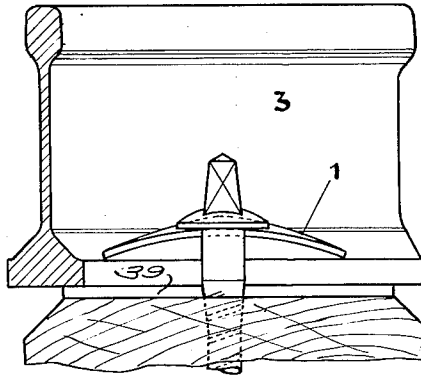


Fig. 17

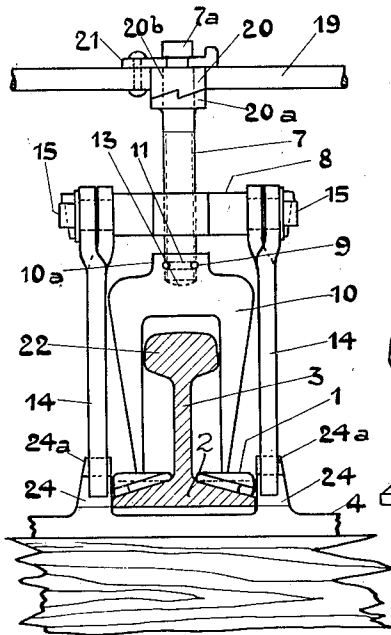
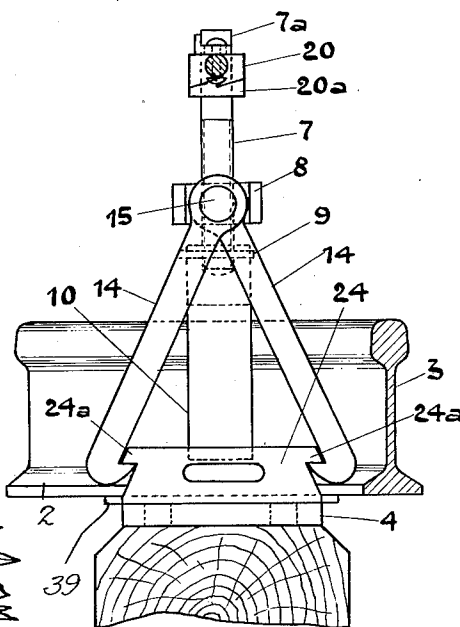


Fig. 18



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UNITED STATES PATENT OFFICE

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METHOD OF AND MEANS FOR FASTENING DOWN RAILS

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The invention relates to a method of and means for fastening rails by means of plate springs which press down upon the foot of the rail.

It is now customary in rail fastenings of this kind to stress the springs by directly or indirectly pressing them down by screws, nails and the like; or the springs are in the form of a wedge and are forced by heavy blows underneath the holders which are secured to the sleeper. These methods have failed to produce a serviceable rail fastening on which reliance could be placed.

The method of the invention differs from the foregoing in that the springs are stressed by a screw-press or other tool independently of the rail fastening itself and they are thus held until the holders are applied or until the springs are in the proper positions relatively to the holders, whereupon the springs are released sufficiently to allow them to press against the holders. The tool is then removed.

Various forms of the rail fastening according to the invention and of the tool employed for stressing the springs, are illustrated in the accompanying drawings, in which:

Figures 1 and 2 are respectively, a cross-sectional elevation and a plan of half of a rail and of one form of rail fastener according to the invention, and

Figures 3 and 4 are respectively, a plan and side view of the plate spring used therewith.

Figure 5 is a cross-sectional elevation of half a rail and of a second form of rail fastener according to the invention.

Figures 6 and 7 are respectively, a cross-sectional elevation and a plan of half a rail and of a third form of rail-fastener according to the invention,

Figure 6a being an end view on a larger scale of the key used therewith.

Figures 8 and 9 are respectively, a cross-sectional elevation and a plan of half a rail and of a fourth form of rail-fastener according to the invention.

Figure 10 is a cross-sectional elevation of half a rail and of a fifth form of rail fastener according to the invention.

Figures 11 and 12 are respectively, a cross-sectional elevation and a plan of half a rail and of a sixth form of rail-fastener according to the invention.

Figure 13 is a side view of a part of a rail and of a seventh form of rail-fastener according to the invention,

Figure 14 being a corresponding plan with the rail in section on XIV—XIV, Figure 13.

Figures 15 and 16 are side views of parts of rails and of two further forms of rail-fastener according to the invention.

Figures 17 and 18 show an end and side elevation illustrating part of a rail in a chair fitted with plate springs and of one form of tool employed for stressing the plate springs, according to the invention.

All forms of the rail fastener illustrated, with the exception of that shown in Figure 10, have plate springs 1 of the triangular form shown in Figures 3 and 4, placed upon the foot 2 of the rail 3, so that the somewhat blunt apex of the triangular spring presses against the web 3 of the rail and the longest edge or the base rests upon the edge of the foot 2 of the rail.

In the forms shown in Figures 1 and 2, the base 4 of the chair or fastener is provided with a hook shaped rib 5. When the triangular spring 1 is not stressed, that is to say, before use, it is bow-shaped as indicated in Figure 4. It is first laid upon the foot of the rail and then stressed by means of a screw-press or tool such as that hereinafter described, that is to say, it is pressed down upon the foot 2 of the rail. A clip 6, which is Z-shaped in cross-section, is then inserted between the hook shaped rib 5 and the foot 2, so that its lower flange 6a engages under the rib 5 and its upper flange 6b engages over the stressed spring 1.

The clip 6 being now in position, the stressed spring is slightly released by the tool hereinafter described so that it presses against the upper flange 6b of the clip 6. Thereupon the tool which has been employed for stressing the spring is removed and the rail fastening is complete. The foot 2 of the rail is now gripped by the spring 1 between the clip 6 and the base 4 of the chair, and

cannot be freed until sufficient pressure is applied to the spring 1 to release the pressure on the clip 6 to enable it to be withdrawn, thus necessitating a tool such as that hereinafter referred to.

The preferred form of tool for stressing the spring 1 illustrated in Figures 17 and 18, comprises a screw threaded spindle 7, which passes through an internally screw threaded boss or nut formed on a cross-head 8 and has its lower end connected to a U-shaped pressure member 10, so that it can rotate relatively to said member, but cannot move axially with respect thereto, for example, by means of a U-shaped locking pin 9 inserted in holes in the boss 10a of the pressure member and into a groove 11 in the end of the spindle 7. The hole 13 in the boss 10a has a spherical bottom and the end of the spindle 7 is correspondingly shaped. Anchoring members or gripper arms 14 are pivoted to the cross-head 8 by the pins 15. An operating lever 19 is mounted freely on the end of the spindle 7 and has a ratchet toothed clutch member 20b for co-operative engagement with a ratchet toothed clutch member 20a on the spindle 7.

The lever 19 is rigidly secured to the upper part 20b with which it can be rotated and is axially movable on the upper cylindrical part of screw spindle 7, so that when this is rotated to the left, the teeth of the clutch members 20a, 20b can move one on the other, the upper part 20b, moving upwards, whereas when rotated to the right, the lower part is taken round by the upper. The upward axial movement is limited by an enlargement 7a.

The operating lever 19 has a key 21, pivoted to it which can be placed in between the upper shoulder 7a of the screw spindle 7, and the upper clutch member 20b, so as to lock the lever to the spindle in order to enable the spindle to be unscrewed to remove the member 10 from the plate springs 1.

The tool is used in the following manner:

The screw spindle 7 is first unscrewed until it has reached its uppermost position, so that the gripper arms 14 are down in their lowermost position. The springs 1 having been laid upon foot 2 of the rail, the U-shaped pressure member 10 is lowered over the head of the rail 22 and the web 3 of the rail, so that the lower ends of the arms of the pressure member 10 reach the springs 1, the lower rounded ends of the arms 14 of the gripper passing over the adjacent portions 24a of the ribs 24 of the chair base plate 4. When they have passed the projections 24a on the ribs, the members 14 fall inwards, so that they engage below the head of the rail. The screw spindle 7 is then rotated by means of the operating lever 19, so that the gripper arms 14 firmly engage with or are anchored by the projections 24a and consequently the pressure member 10 is pressed against the springs

1, so that the latter are stressed or pressed flat against the foot 2 of the rail and thereupon the means for locking the springs, for example, the above described clips 6, are placed in position. The key 21 is then inserted and the screw spindle 7 is unscrewed so that the springs 1 arch until they press against the key. The fastening of the rail is thus completed.

The springs 1 are released in similar manner.

The form illustrated in Figure 5 differs substantially from that illustrated in Figures 1 and 2, in that a rib 23 is provided on the base plate 4 between the clip 6 and the foot 2 of the rail. The rib 23 determines the position of the rail and provides a good grip for the clip 6.

A particularly satisfactory form is that illustrated in Figure 6, wherein ribs 24 are provided on the chair base 4 on both sides of the foot of the rail, against which ribs the foot of the rail as well as the outer edges of the springs 1 can bear.

Each rib 24 is provided with a slot 25. Each spring 1 is pressed down by the tool hereinbefore described, flat upon the foot of the rail, whereupon the upper arm of an angular clip 26 is inserted into the slot 25, the end 26a of the clip 26 being slightly diverted upwardly and thickened. The uppermost point of the spring is then about 3 mm. lower than shown in Figure 6. Immediately the spring is released sufficiently to allow it to press against the clip 26, the diverted end 26a of the clip 26 prevents the latter from retiring through the slot. The downwardly pointing arm 26b of the clip 26 presses against the rib 24 and also upon the base 4 and thus provides a grip for the clip.

As will be seen from Figure 7, the ends 1a of each spring 1 may be turned down so that they curve around the adjacent rib 24. The spring is thus prevented from moving sideways, although there is no such movement in practice because the spring is so firmly held. For the same purpose, namely, to prevent lateral movement, the support for the end of the clip 26 which engages over the spring may be slightly hollow, that is, shaped to conform to and snugly fit the arched upper point of the spring.

In the forms shown in Figures 8 and 9, ribs 27 are provided on the chair base plate 4, near the foot of the rail, and each of these ribs is provided directly above the base with a slot 28. Into this slot is inserted the lower arm 29b of a substantially U-shaped clip 29, the upper arm 29a lying upon the spring 1.

The form shown in Figure 10 is merely to demonstrate that it is possible to dispose the spring directly on the chair base plate, and not on the foot of the rail as in the forms previously described, that is to say, to place it outside the rib 30 of the base 4. The clip

or plate 31, which holds the spring 1 is passed through a slot 32 in the rib 30, so that the outer end of the plate 31 is pressed by the spring 1 upwards, whereas the inner end 31a is pressed downwards upon the foot of the rail.

In the form shown in Figures 11 and 12, a hook-shaped clamping plate or clip 33 is secured to the wooden cross tie or sleeper 36 by means of the screw 34. A tubular extension 35 of the hooked plate or clip 33 penetrates the wood of the sleeper 36 and prevents the plate 33 from moving laterally. The hook 37 of the plate 33 engages over the spring 1. In this form too, the spring 1 is stressed by means of the tool hereinbefore described. The plate 33 having been tightly secured by the screw 34, the spring is released from pressure so as to permit it to press against the hook 37 of the plate 33. However, nails may be used instead of screws.

In the form shown in Figures 13 and 14 after the spring 1, having been stressed by means of the tool hereinbefore described, the nails 38 are driven in and the spring is allowed to press against the heads of the nails and the foot of the rail by loosening the tool. It will be obvious that screws may be employed in place of the nails 38.

In the forms shown in Figures 15 and 16, only one nail or screw 38 is used respectively for each spring 1. Thus, unlike the construction according to Figures 13 and 14, the spring 1 is in each case inserted with the arch upwards.

In all the forms hereinbefore described, a thin layer of wood or packing strip 39 is inserted in the usual manner under the foot of the rail.

I claim:

1. A rail fastener comprising a base provided with ribs for the reception of a rail foot between them, arched plate springs adapted to be laid on the rail foot and to be stressed by a screw press or like tool and clips adapted to be inserted between said ribs and said plate springs while the latter are stressed and to be locked with said ribs when said springs are released by the screw-press, substantially as and for the purpose hereinbefore set forth.

2. A rail fastener comprising a base provided with ribs for the reception of a rail foot between them, arched plate springs to be placed on the rail foot, clips adapted to be placed in interlocking connection with said ribs, while said plate springs are stressed to engage with said clip when said springs are released substantially as and for the purposes hereinbefore set forth.

3. A rail fastener comprising a base provided with ribs for the reception of a rail foot between them, arched plate springs to be laid on said rail foot and to be stressed,

clips adapted to interlock with said ribs and extend over said springs when said springs are stressed; and also to engage with said springs when said springs are released, and means for preventing longitudinal displacement of said springs, substantially as hereinbefore set forth.

4. A rail fastener comprising a base provided with ribs for the reception of a rail foot between them, arched plate springs of substantially triangular shape adapted to be laid on said rail foot with their apices against the rail web and their longer edges against said ribs and clips adapted to interlock with said ribs and to extend over said springs when said springs are stressed and to hold said springs when said springs are released substantially as hereinbefore set forth.

5. Rail fastenings comprising plate springs adapted to lie on the rail foot and holders for the plate springs engaging over the rail foot, said plate spring being preferably arched in the longitudinal direction of the rail and having a width approximately equal to the width of one side of the rail foot.

6. Rail fastening according to claim 5, said plate spring tapering in the longitudinal direction of the rail toward both ends and bearing preferably at its largest cross-section against an abutment.

7. Rail fastening according to claim 5, said spring holders being unadjustable in the direction of the spring action.

8. Rail fastening according to claim 5, including a rail chair, a rib on said rail chair on each side of the rail with said rib serving directly as abutment for the rail foot and for the spring, said rib being provided with a slot, said holder being preferably angularly shaped and provided with an arm engaging with its ends over the springs through said slot.

9. Rail fastening according to claim 5, including a rail chair, a rib on said rail chair on each side of the rail with said rib serving directly as abutment for the rail foot and for the spring, said rib being provided with a slot, said holder being preferably angularly shaped and provided with an arm engaging with its ends over the spring, the end of the holder arm engaging over the spring being bent obliquely upwards and extending through said slot.

10. Rail fastenings according to claim 5, including a rail chair, a rib on said rail chair on each side of the rail with said rib serving directly as abutment for the rail foot and for the spring, said rib being provided with a slot, said holder being preferably angularly shaped and provided with an arm engaging with its ends over the spring, the end of the holder arm engaging over the spring being bent obliquely upwards and extending through said slot, the plate being secured against displacement transversely to the rail

on one side by the rail web and on the other side by said rib on the chair.

11. Method of fastening rails to their support by means of stressed plate springs which
5 lie on the rail foot and are stressed by a special stressing tool by depressing said springs on the rail foot and are held in this stressed condition by spring holders engaging over the rail foot, said stressing tool exerting the pressure over the rail foot on the
10 plate springs when stressing the springs.

12. Rail fastenings comprising plate springs adapted to lie on the rail foot and holders for the plate springs engaging over
15 the rail foot, an abutment, said plate spring tapering in the longitudinal direction of the rail toward both ends and bearing preferably at its largest cross-section against said abutment.

20 13. Rail fastenings comprising plate springs adapted to lie on the rail foot and holders for the plate springs engaging over the rail foot, said spring holders being in-adjustable in the direction of the spring
25 action.

14. Rail fastening according to claim 5, including a rail support, a rib on said rail support on each side of the rail with said rib serving directly as abutment for the rail foot and
30 for the spring, said rib being provided with a slot, said holder being preferably angularly shaped and provided with an arm engaging with its ends over the spring through said slot.

35 15. Rail fastening according to claim 13, including a rail support, a rib on said rail support on each side of the rail with said rib serving directly as abutment for the rail foot, said holder being preferably angularly
40 shaped and provided with an arm engaging with its ends over the spring through said slot.

16. Rail fastening according to claim 5, including a rail support, a rib on said rail support on each side of the rail with said rib serving directly as abutment for the rail foot and
45 for the spring, said rib being provided with a slot, said holder being preferably angularly shaped and provided with an arm engaging with its ends over the spring, the end of the holder arm engaging over the spring and extending through said slot being formed in a manner to prevent the moving back after its insertion.

55 17. Rail fastening according to claim 5, said plate spring tapering in the longitudinal direction of the rail toward both ends and bearing preferably at its largest cross-section against an abutment, the spring being held
60 by a head of a holder fastened directly in the wooden sleeper.

18. Rail fastening according to claim 5, said plate spring tapering in the longitudinal direction of the rail towards both ends and
65 bearing preferably at its largest cross-section

against an abutment, said spring pressing against a Z-shaped clip which is held by suitable means to its support.

19. Rail fastener according to claim 12 in which the clip is provided with a tubular projection extending into the screw hole of the
70 sleeper.

In testimony whereof I affix my signature.

MAX RÜPING.

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