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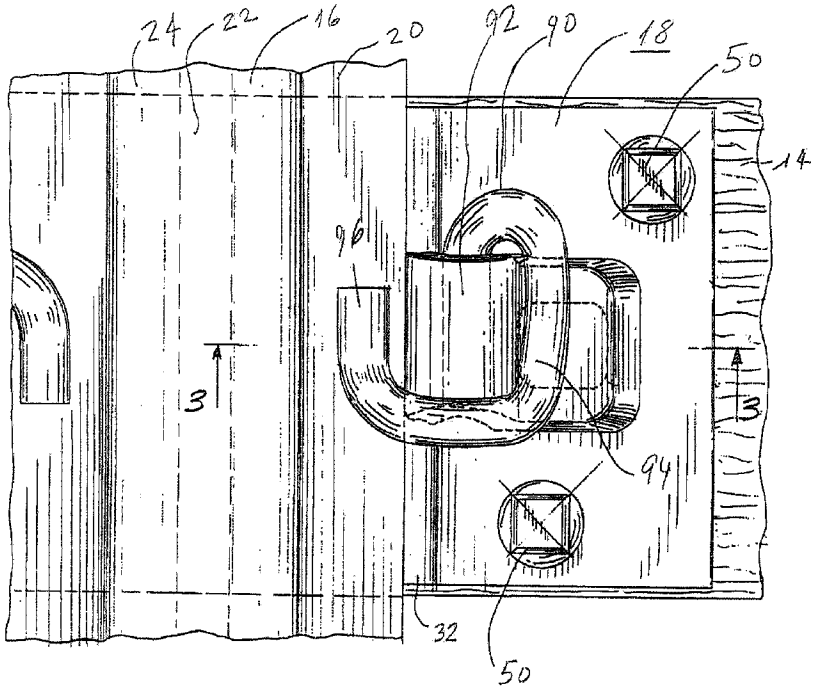
(54) Title: RAIL SUPPORT ASSEMBLY WITH IMPROVED SHOULDER



(57) Abrégé/Abstract:
A rail support assembly for mounting and supporting the rail of a railroad system, the assembly including a plate disposed under the rail and including a shoulder hole, a shoulder arranged and constructed to fit in said shoulder hole without rotation with respect to the plate, and a clip having an end received by said shoulder and arranged to bias the rail toward the plate.

ABSTRACT

A rail support assembly for mounting and supporting the rail of a railroad system, the assembly including a plate disposed under the rail and including a shoulder hole, a shoulder arranged and constructed to fit in said shoulder hole without rotation with respect to the plate, and a clip having an end received by said shoulder and arranged to bias the rail toward the plate.

RAIL SUPPORT ASSEMBLY WITH IMPROVED SHOULDER

FIELD OF INVENTION

This invention pertains to a rail support assembly including a shoulder and a clip engaging the shoulder and arranged to hold a rail in place, the shoulder being shaped to prevent it from rotating with respect to a supporting plate.

DESCRIPTION OF THE PRIOR ART

Trains running on rails are the most efficient way of transporting all industrial, agricultural as well as consumer products. Typically rails are supported on ties by support assemblies including a bottom plate disposed on ties, a pair of shoulders disposed on top of the plate on either side of a rail and clips made of a steel bar formed into a predetermined shape and arranged to secure the rail. One end of each clip engages a respective shoulder and the rest of the clip rests on top of a rail flange and biases the flange (and therefore the rail) downward toward the plate.

This assembly has been found to be working reasonably well, however one problem with it is that typically railroad cars are extremely heavy and apply tremendous pressure and torsional forces on the rails, especially when rails curve. As a result, sometimes whole sections of rails separate from the ties because the support assemblies are not able to resist these effects.

The present invention provides a solution to this problem.

SUMMARY OF THE INVENTION

A rail support assembly for supporting a rail of a railroad track constructed in accordance with this invention includes a plate having a shoulder hole, a shoulder having a boss sized and shaped to fit through said shoulder hole, the boss and shoulder having matching non-rotational shapes selected to prevent the shoulder to rotate with respect to said plate, the plate having a clip receiving member; and an elastic clip having a first end received in the clip receiving member and a rail retaining portion, the elastic clip being positioned by the shoulder to retain the rail on the plate.

In one aspect of the invention, the railroad track includes a tie and The plate includes a mounting member mounting the plate on the tie.

In one aspect of the invention, the plate includes spike holes receiving spikes to attach said plate to said tie.

In one aspect of the invention, the boss and the shoulder hole have a generally square shape with rounded corners.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows an isometric view of a section of a rail and its supports;

Fig. 2 shows a top view of a rail support assembly constructed in accordance with this invention;

Fig. 3 shows a side sectional view of the rail support assembly; and

Fug, 4 shows an exploded view of the rail support assembly.

DETAILED DESCRIPTION

Referring first to Fig.1, a railroad track 10 includes a track bed 12 with a plurality ties 14. Ties 14 are typically made of treated wood, or concrete. A rail 16 is supported on the ties 14 by a support assembly 18. The rail 16 includes a bottom flange 20, a vertical web 22 and a top 24. A second rail identical to rail 16 extends in parallel thereto but has been omitted for the sake of clarity.

As shown more clearly in Figs. 2-4, rail support assembly 18 includes a plate 30. Plate 30 is generally rectangular having a width substantially equal to the width of tie 14 and extending along the top surface of the tie 14. The plate 30 is formed with two transversal ridges 32A 32B. Each ridge includes a vertical wall 36A, 36B and a sloping wall 38A, 38B. The distance between the two vertical walls 36A, 36B is equal to the width W of the flange 20 of rail 16. Therefore the rail 16 can be seated solidly on top of the plate 30 with the flange 20 firmly seated between the ridges 32A, 32B.

Optionally, a pad (not shown) may be provided between the rail 16 and the plate 30.

The plate 30 has two segments 34A, 34B disposed between the ridges 32A, 32B and the short edges of the plate 30, as shown. Segment 34A is formed with two smaller holes 40, 42 and a large hole 44. Importantly, large hole 44 has a generally square shape with rounded corners, as at 46.

Referring back to Fig. 2, four conventional spikes 50 pass through holes 44 and secure the assembly 18 to the tie 14.

Attached to plate 30 is a shoulder 52. This shoulder 52 includes a base 54 having a somewhat square configuration with sloping sides, as at 56. The base 54

also has a flat bottom surface 58 with a boss 60 extending downwardly from the surface 58. The boss 60 has the same shape and size as hole 44. The boss 60 has an outer surface with a circumferential groove 64.

The shoulder 52 further includes a clamping wall 70 having a somewhat cylindrical outer surface 72 terminating in a sloping edge 74. The clamping wall 70 is sized and shaped so that when the shoulder 52 is attached to the plate 30, the slopping edge 74 abuts an upper portion of sloping wall 38A on the plate. The clamping wall 70 also includes an inner surface 76. This inner surface 76 has a partial cylindrical shape and forms with wall 38A a horizontal hole 78.

In one embodiment, the clamping wall 70 is provided with an end portion 80 on the inner surface 76. The end portion 80 is formed with a semicircular cutout 82. This cutout forms an opening 84 for hole 78.

In an alternate embodiment, shoulder 52A (also shown in Fig. 4, end portion 80A extends across inner surface 76A so when the shoulder is attached to the plate, there is no opening into the hole 78.

Assembly 18 further includes a clip 90. The clip 90 has one end 92 that is straight, an intermediate portion 94 and another straight portion 96. The clip 90 preferably has a constant cross section. Its first end 90 is sized and shaped to fit into the hole 78 as shown. In this position, the rest of the clip is positioned so that its other end 94 biases the flange 20 downwardly towards the plate 30. The clip 90 is made of steel or other high strength, somewhat flexible material to insure that the rail is firmly attached to the tie 12 through assembly 18. The flexibility of the clip 90 allows the rail to move up and down slightly as a car goes by on the rail 16. In the embodiment on the

right side of Fig. 3 rocks or other undesirable objects trapped in hole 78 are pushed out through opening 84.

The shoulder 52 is preassembled with the plate 30, for example by press-fitting the boss 62 through hole 44. During this operation, pressure is also applied to the bottom portion of the plate 30 causing some of the material of the plate 30 to enter into and even fill slot 64, as shown at 66 in Fig. 3. As a result, the shoulder 52 is firmly mounted and secured to plate 30 and cannot be dislodged easily. Moreover, because the boss 60 and hole 44 are both non-circular, the boss does not rotate with respect to plate 30 but remains firmly attached to it even while the assembly is subjected to extremely high pressures and torsional forces due to a train of several wheels passes by. Since the shoulder is securely mounted, the clip 90 is secured and remains secured to the plate 30 and will not rotate even under strong forces thereby permanently engaging clip 90, and therefore the rail 16.

Numerous modifications maybe made to the invention without departing from its scope as defined in the appended claims.

0THE EMBODIMENTS FOR WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A rail support assembly for supporting a rail of a railroad track, the rail support assembly comprising:

a plate having two ridges that are spaced from each other to define a region in which the rail is arrangeable and a first hole that is located between one of the ridges and an outer periphery of the plate;

a shoulder having a base with a top surface and a bottom surface, a clamping wall extending in a curved manner from the base and being delimited at an outer edge located above the bottom surface and a boss extending from the bottom surface of the base and being sized and shaped to fit into the first hole, said boss and said first hole having matching non-rotational shapes to prevent said shoulder from rotating with respect to said plate when arranged therein, and one of said ridges of said plate and said outer edge of said shoulder cooperating with one of the ridges of the plate when said boss is arranged in said first hole to define a clip receiving region; and

a clip having a first end configured to be arranged in said clip receiving region and a rail retaining portion configured to retain the rail on said plate.

2. The assembly of claim 1, wherein the railroad track includes a tie and said plate includes a mounting member mounting said plate on the tie.

3. The assembly of claim 2, wherein said plate includes a plurality of second holes configured to receive spikes to attach said plate to said tie.

4. The assembly of claim 1, wherein said boss and said first hole each have a generally square shape with rounded corners.

5. A shoulder configured to retain a rail on a plate in a railroad transportation system by a clip arranged to abut and bias the rail against the plate, said plate having a top surface and a bottom surface and a first hole having a non-rotational cross-sectional shape extending between said top surface and bottom surface, said shoulder comprising:

a base having a top surface and a bottom surface,

a clamping wall extending in a curved manner from the base and being delimited at an outer edge that is located above the base;

a boss extending directly from the bottom surface of the base and having a cross-sectional shape matching the shape of the first hole of the plate; and

a clip, in an assembled state, having a first end arranged between a lower surface of the clamping wall and the plate and a second end arranged to bias the rail against the plate.

6. The shoulder of claim 5, wherein said boss has an outer surface and a groove formed at least partially around said outer surface, said groove being sized and shaped to receive material from the plate when the shoulder is press fit into the first hole.

7. The shoulder of claim 5, wherein said clip cooperates with the plate to define a clip receiving opening in which the first end of the clip is arranged in an assembled state.

8. The shoulder of claim 5, wherein the plate includes at least one ridge with a sloping wall and, in an assembled state, the clamping wall cooperates with the sloping wall to form the clip receiving opening.

9. The shoulder of claim 8, wherein said clamping wall includes a member defining an exit hole from said clip receiving opening.

10. The assembly of claim 1, wherein said boss is press fit into said first hole.

11. The assembly of claim 1, wherein said boss has a peripheral surface with a groove and said boss is press fit into said first hole with a portion of said plate extending into said groove to permanently capture said boss.

12. The assembly of claim 1, wherein said plate has a plate thickness and said boss has a length shorter than said plate thickness.

13. The assembly of claim 1, wherein said shoulder and plate are permanently attached.

14. A railroad support assembly supporting a continuous rail on a railroad tie, the railroad support assembly comprising:

a plate including two ridges that are spaced from each other to define a region in which the rail is arrangeable and a first hole spaced between one of the ridges and an outer periphery of the plate;

a clip having an end configured to bias the rail against the plate; and

at least one shoulder including a first end, a second end and a boss that is spaced from the first end and adjacent to the second end, the boss configured to be arranged within the first hole,

the plate and first end of the shoulder cooperating to form a clip receiving space to receive the clip end,

the boss and first hole having matching non-rotational shapes to prevent the shoulder from rotating with respect to the plate,

the boss and the first hole of the plate cooperating to fix the boss within the first hole,

the plate having a thickness around the first hole and the boss having a longitudinal length that is less than said thickness of the plate so that when the boss is inserted into the shoulder hole, the boss does not extend out of the shoulder hole.

15. The assembly of claim 14, wherein said first hole and the boss have the same sized square cross-sections.

16. The assembly of claim 14, wherein said first hole and the boss have the same sized square cross-sections with rounded corners.

17. The assembly of claim 14, wherein the boss is press fit into the first hole.

18. The assembly of claim 14, wherein the boss has a circumferential wall that includes a groove with material from the plate extending into the groove to capture the shoulder.

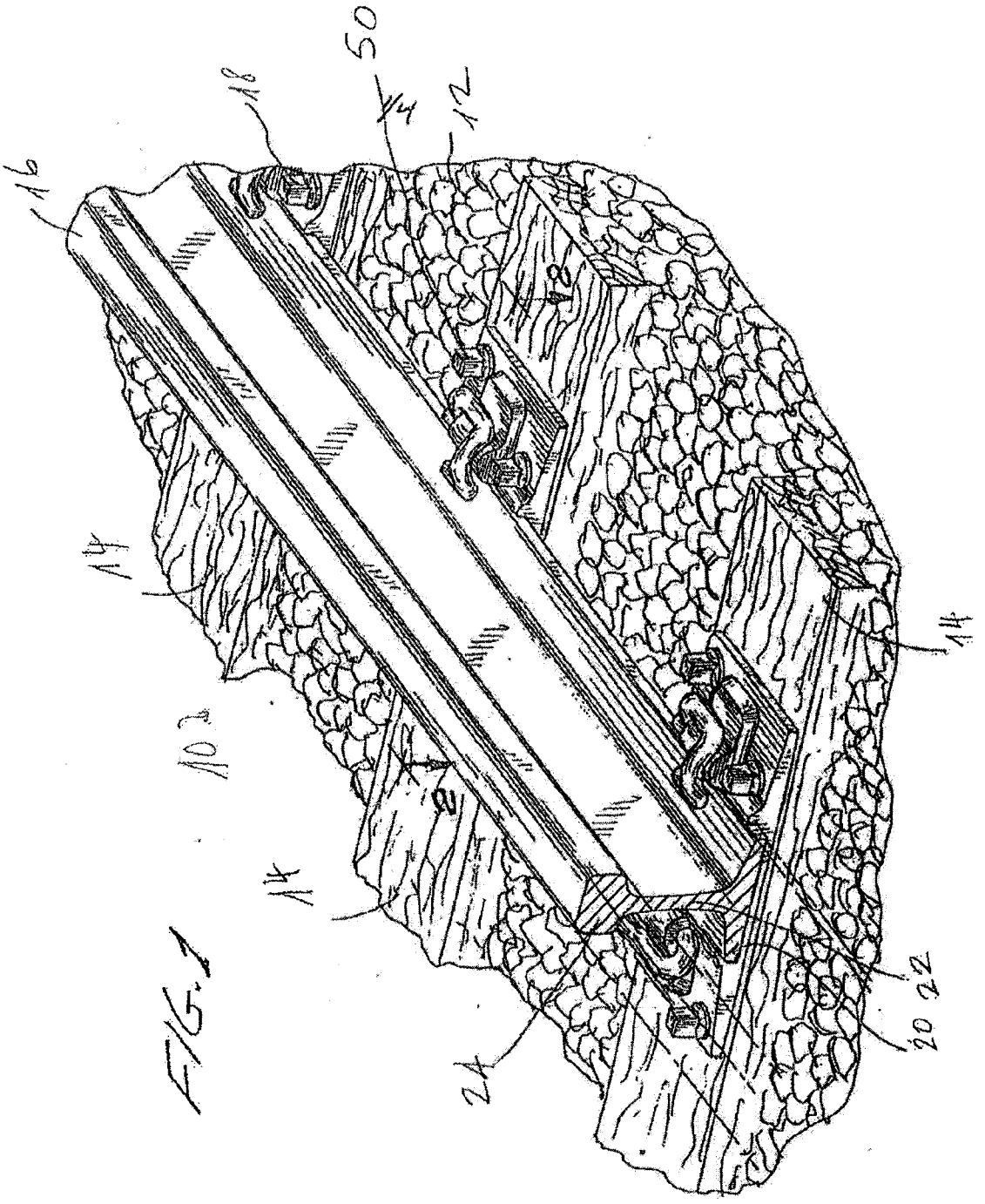


FIG. 1

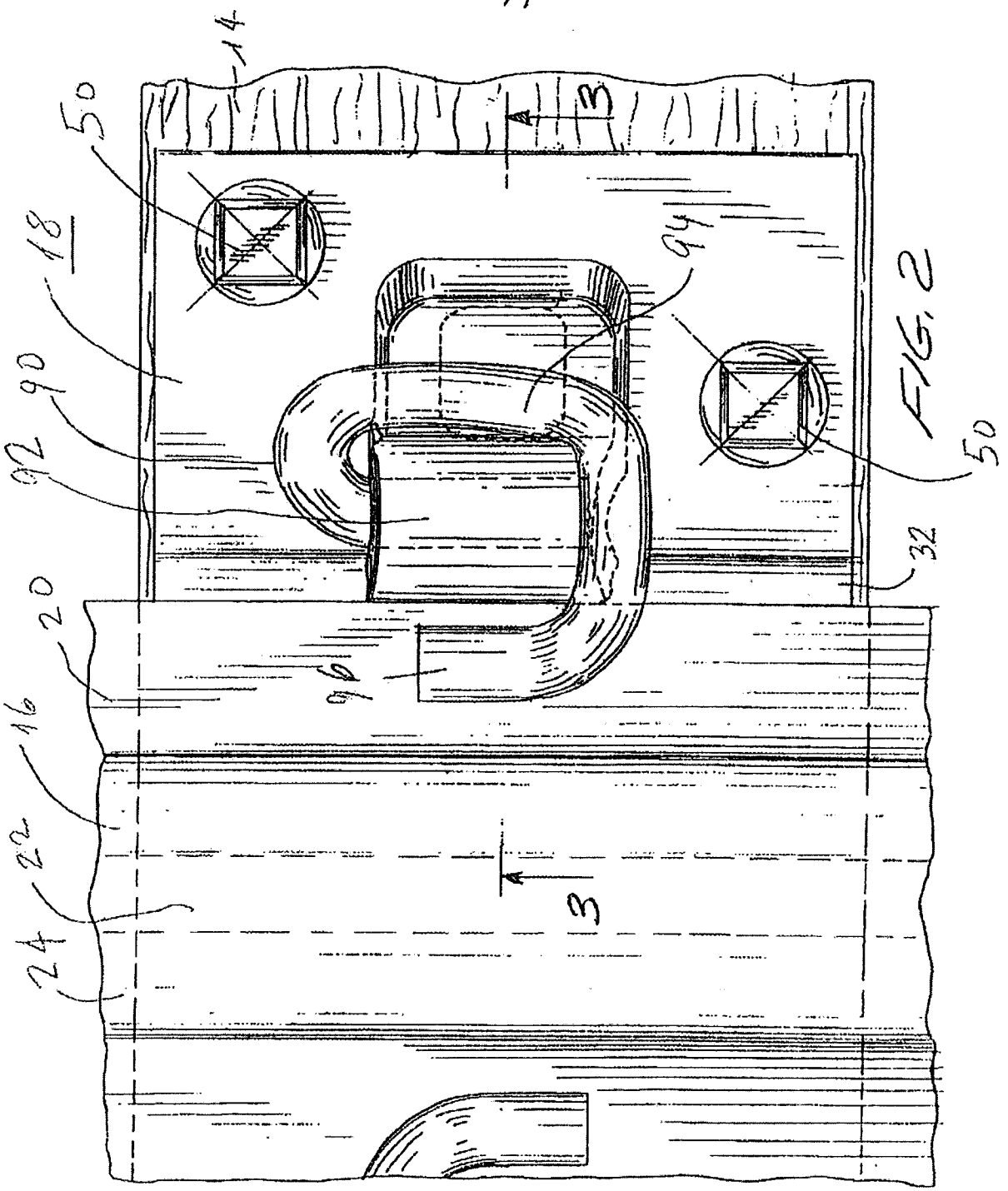
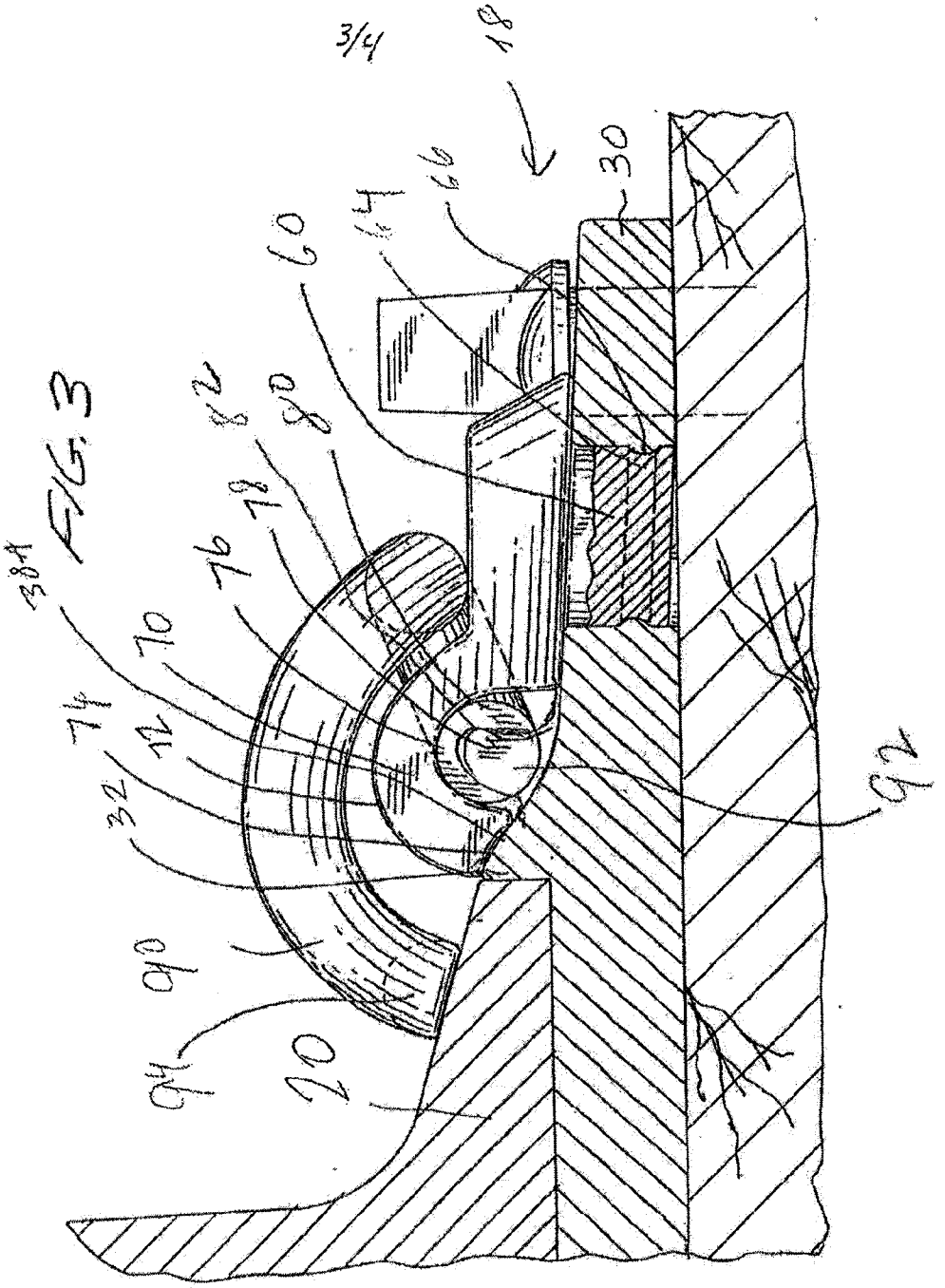


FIG. 2

FIG. 3



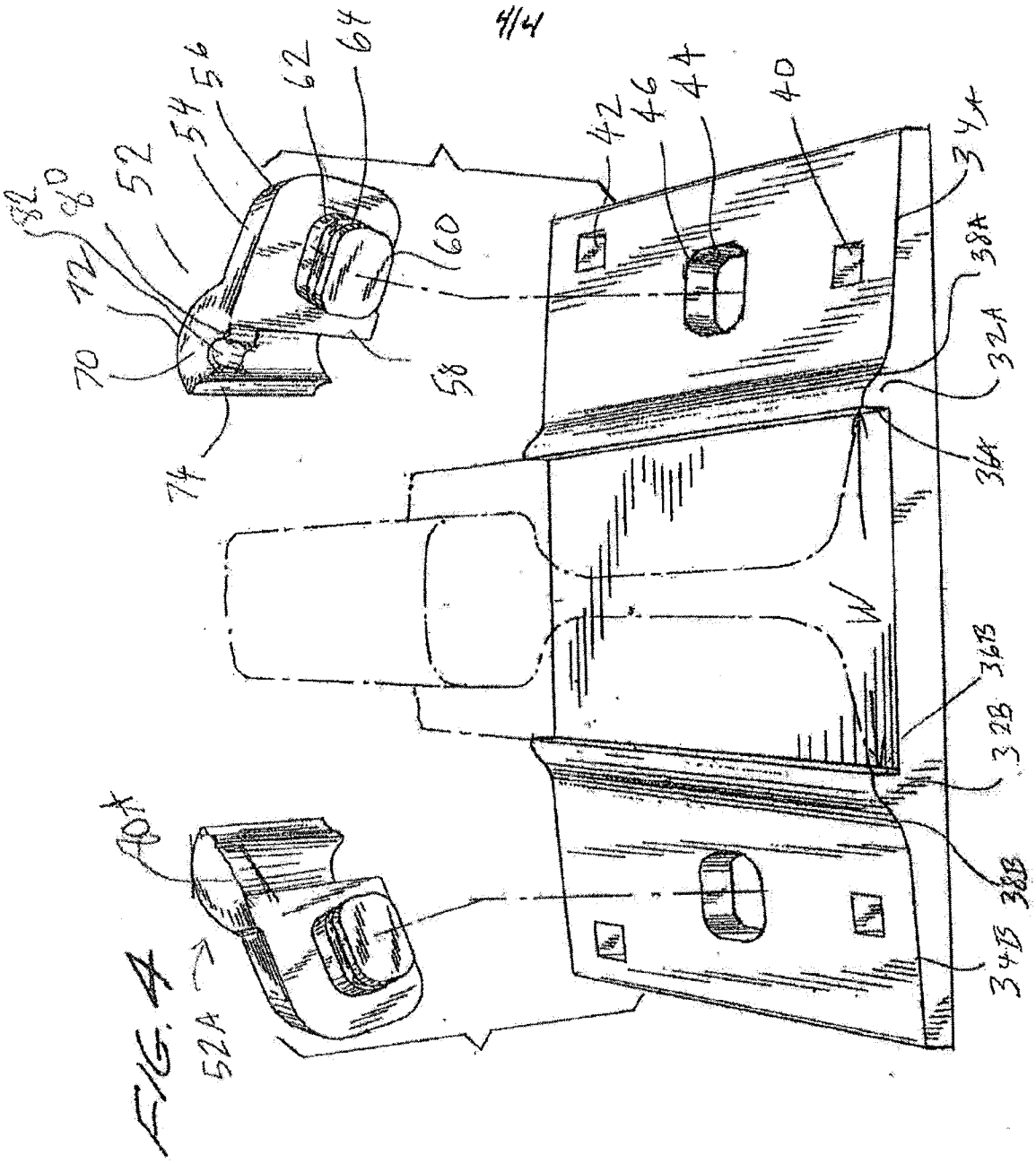

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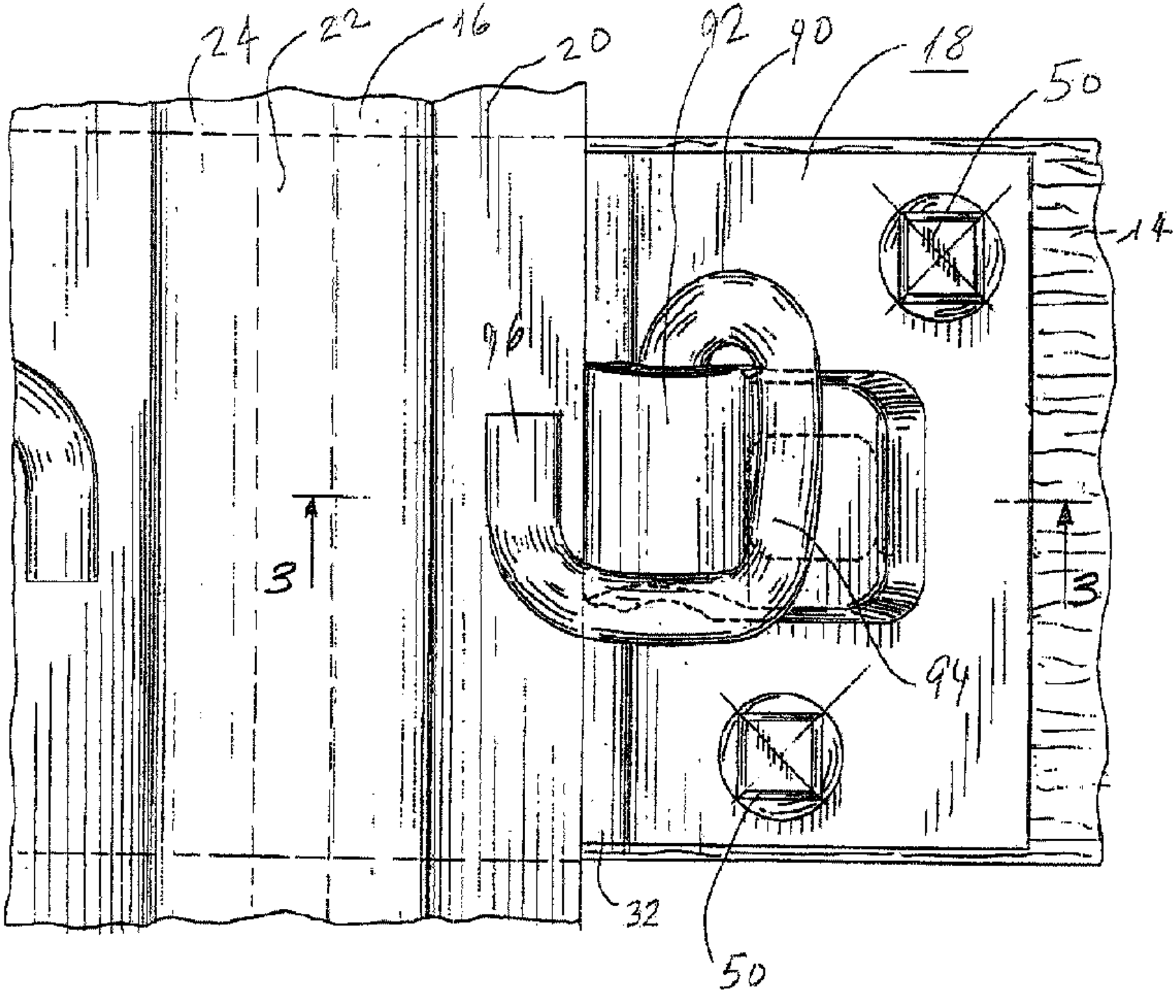
FIG. 4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