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Senior et al.

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[54] **RAIL FASTENING DEVICES**

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[52] **U.S. Cl.** **238/349**

[51] **Int. Cl.** **E01b 21/04**

[58] **Field of Search** 238/349, 350, 351, 341, 238/282

[56] **References Cited**

UNITED STATES PATENTS

2,207,262	7/1940	Loutrel	238/349
2,772,835	12/1956	Prot	238/349
3,309,023	3/1967	Burwell	238/349

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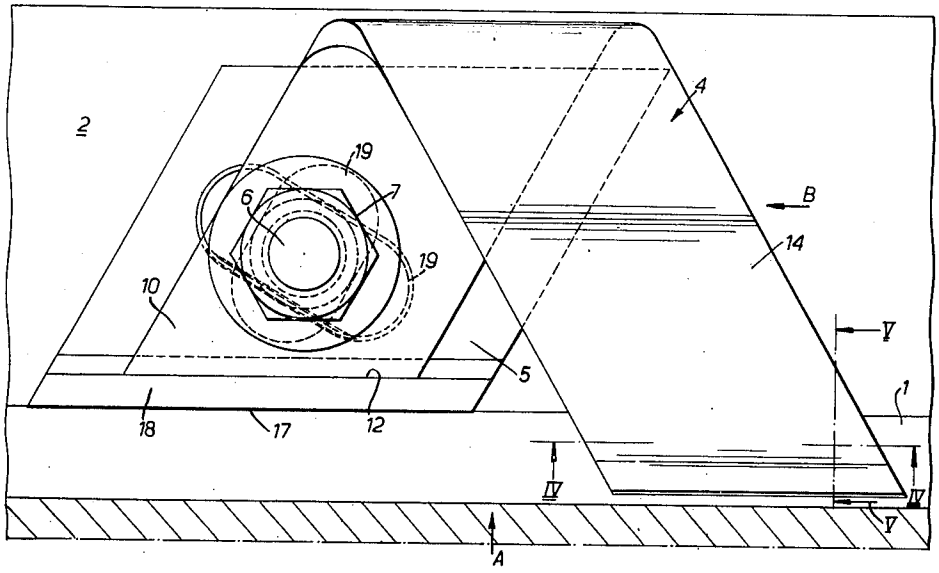
[57] **ABSTRACT**

A rail fastening assembly including a resilient clip mountable upon a block and securable by a stud or the like received in apertures in the clip and block, the clip including a base in which is the clip aperture, a return part extending up from the base, toward the rail and being angled to provide access to the aperture in the base part and a toe to engage the rail flange.

9 Claims, 5 Drawing Figures



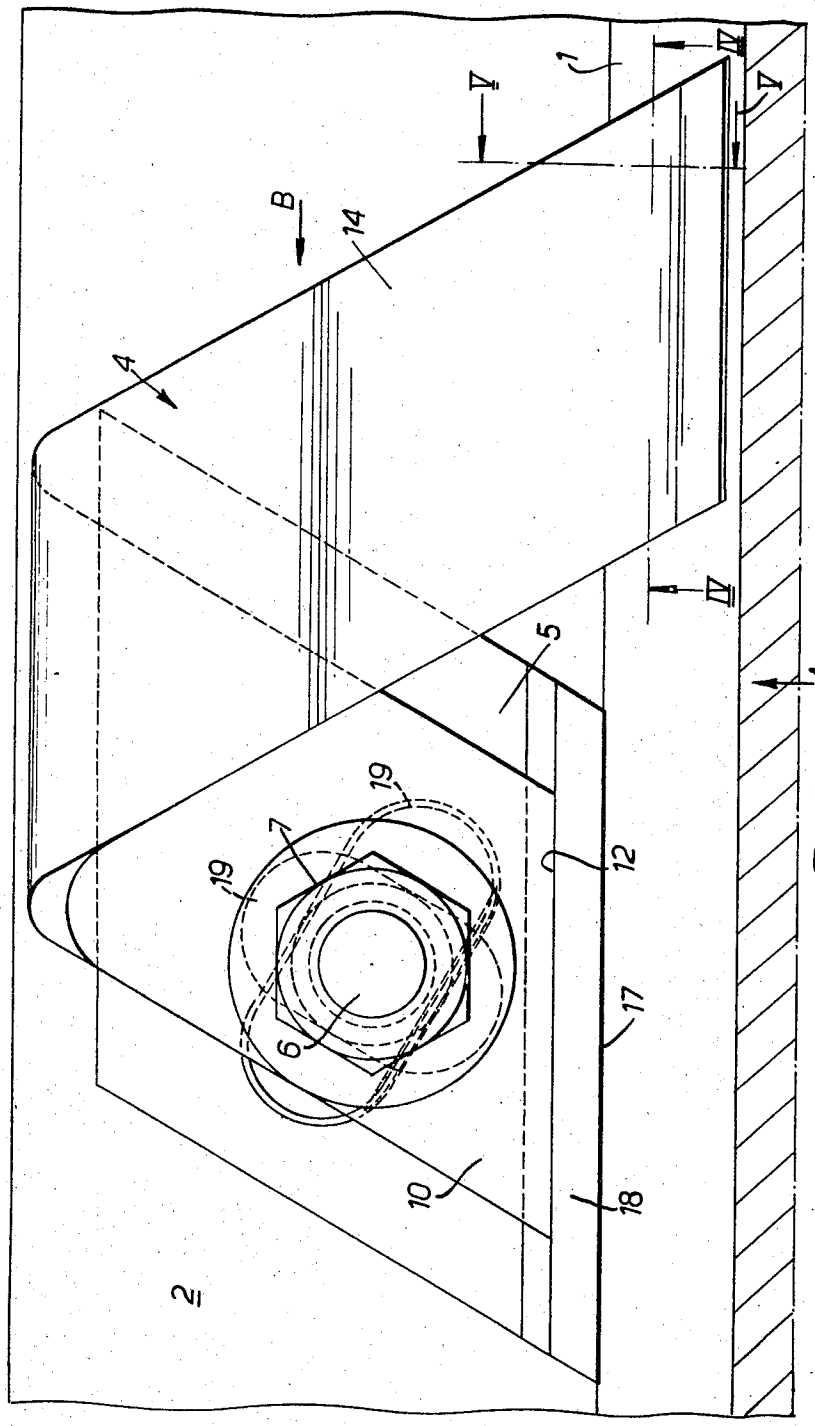


FIG. 1.

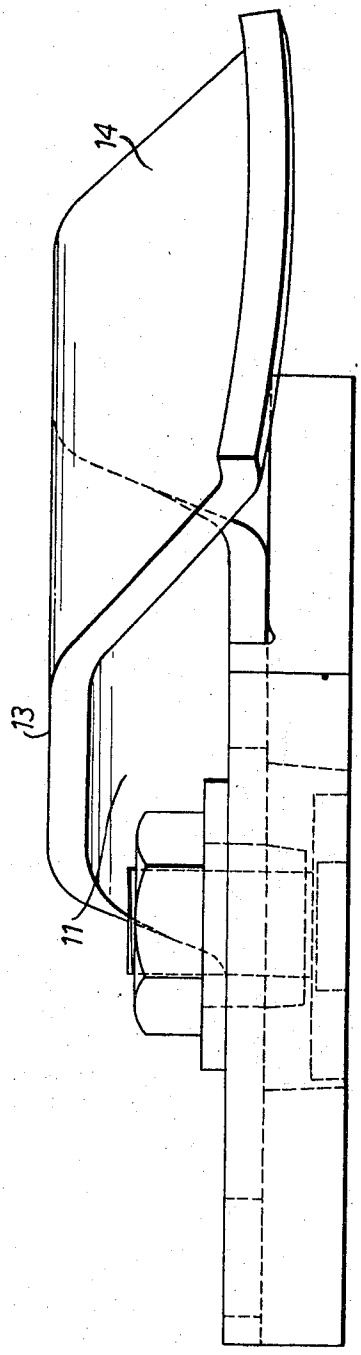


FIG. 2.

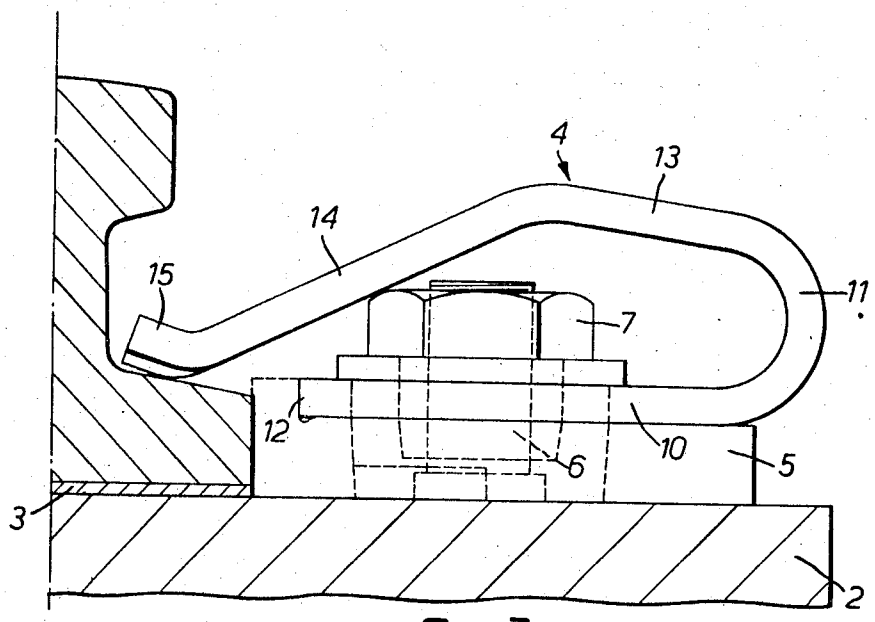


FIG. 3.

FIG. 4.

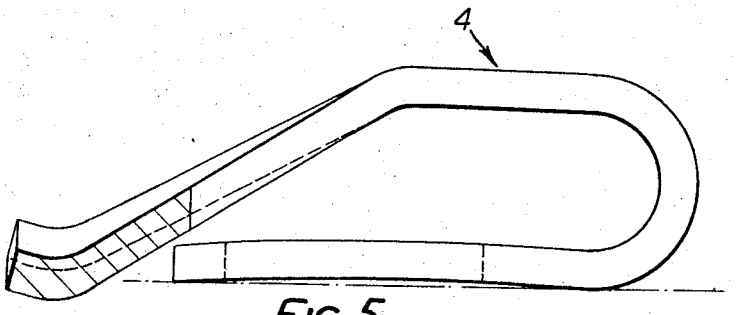


FIG. 5.

RAIL FASTENING DEVICES

This invention relates to a fastening assembly by which a rail may be fastened to a supporting structure such as a girder or gantry, and to a rail clip for such an assembly.

In general, rails are fastened to their supporting structure by a number of devices mounted on the support structure on both sides of each rail and at intervals therealong. Low cost devices for this purpose usually are formed from strip spring steel of about the same sectional dimensions as automotive leaf springs, but their design normally involves penetration of the strip in such a way that the devices can fail relatively easily by fatigue.

Among known devices is a spring clip which has a base part, a return part which extends upwardly and centrally over the base part, the return part being prolonged in the form of a toe which bears on and digs into a rail flange.

According to the present invention there is provided a fastening assembly for securing a rail to a support, the assembly comprising a resilient clip which is deformed to define a base part for attachment to the support, a return part extending upwardly from the base part and over the base part toward the rail and a toe to engage the rail flange, and a block on which the base part is positionable, the base part and block each having an aperture for reaceiving a common fastening member and the return part being angled relative to the base part to provide direct access to a fastening member when received by the apertures.

According to the invention there is further provided a rail fastening clip comprising a resilient strip deformed to define a base part for attachment to the support, a return part extending upwardly from the base part and extending over the base part and a toe to engage the upper surface of a rail flange, the return part being angled relative to the base part to provide access to an aperture in the base part.

Embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings, in which:

FIG. **1** is a plan view of one embodiment of the present invention;

FIG. **2** is an end elevation of the device of FIG. **1** viewed in the direction of arrows A of FIG. **1**;

FIG. **3** is a side elevation of the device of FIG. **1** viewed in the direction of arrow B of FIG. **1**;

FIG. **4** is a section on the line IV—IV of FIG. **1**; and

FIG. **5** is a section on the line V—V of FIG. **1**.

Referring to FIGS. **1** and **3** there is shown a rail **1** seated on a support structure, such as a girder **2** with a resilient pad **3** interposed between the rail and the girder. The rail is fastened by a clip **4** located on a block **5** and held fast by a bolt or stud **6** fixed to the girder and a nut **7**.

The clip **4** is made from a strip of suitable spring steel for example 80 mm wide and 8 mm thick. The strip is sheared along parallel lines which are oblique to the longitudinal edges, suitably at **60°**. The strip is deformed from the flat to provide a base part **10**, a curved return part **11**, the axes of curvature being generally parallel to the free edge **12** of the base part, and a generally planar return part **13**. This latter is prolonged at an angle by a toe part **14** which blends with the return part along a line parallel with free edge **12** and the axis of curvature of the return part **11**. The side edges of the

toe part **14** make different angles with the planar return part as seen in FIG. **5**, and in the region of the margin of the toe part adjacent the free end, the toe part is concave (as shown in FIG. **4**) in a plane parallel to free edge **12** and is upturned at **15**. As examples of dimensions, the radius of curvature of the curved return part **11** is 14.5 mm, of concavity of the toe part is 330 mm, and the angle of upturn 10° to the horizontal. The base part may be concave in a direction normal to the free edge **12** of the base part, and the underface of the toe at **15** is preferably 3 mm below the general plane of the underface of the base part.

The block **5** is in plan view a parallelogram, one edge **17** of which has an upstanding stop lip **18**. The base part **10** and the block **5** have elongate bolt holes **19** whose major axes intersect (FIG. **1**). Thereby, a lateral force exerted by the rail normal to the edge **17** will be resisted by a wedging action due to the divergent movement of the block and clip.

To mount the rail the pad **3** is laid on the support structure, the rail is laid on the pad, the block is located on the bolt and abutted against the rail, the clip is positioned on the block and bolt, and the nut is applied. The bolt being exposed is readily accessible for application of and tightening of the nut and as the nut is tightened the toe is applied against the rail flange. Due to the different angular displacement of the toe sides, as the nut tightens the toe will roll on the rail until the principal clamping effort is between the rounded underface of the toe at **15** and the flange at the region of the toe midway between the sides of the toe. This will allow some displacement of the rail without shear forces being set up at a mechanical interlock between the rail and the clip.

Instead of providing an elongate aperture in the clip and the block only one may have such an aperture, the other aperture being circular to receive the stud in the usual way.

We claim:

1. A rail fastening clip comprisisng a resilient parallelsided strip deformed to define a base part for attachment to a support with an edge extending between the said sides and adapted to extend towards a rail flange, an outer part extending upwardly from the base part and terminating in a toe engageable with a rail flange, the toe having an edge extending between said parallel sides, and the clamping part being angled relative to the base part to diverge from the base part in the direction of the toe to provide direct access to a fastening member when received by an aperture in the base part.

2. A rail fastening clip according to claim **1** in which the toe part adjacent the free edge is curved to present a convex clamping surface to a rail flange.

3. A clip as claimed in claim **2** in which the underface of margin of the toe adjacent the free edge is convex in a plane parallel with the direction of the rail.

4. A clip as claimed in claim **3** in which, when the base part is horizontal the lowest point on the convex surface is adjacent that side of the toe remote from the base part whereby upon bolting the clip down with a rail flange beneath the toe part, the toe part will be angularly displaced to progressively advance the region of clamping toward the side means, the base part.

5. A clip as claimed in claim **4** in which the free edge of the toe part is upturned to provide a rounded region displaced from the free edge of the toe to bear upon the flange.

6. A fastening assembly for securing a rail to a support, the assembly comprising a parallel-sided resilient strip which is deformed to define a base part for attachment to the support with an edge extending between said sides directed toward the rail flange, an outer part extending upwardly from the base part and a clamping part extending from the outer part toward the rail and terminating in a toe part for engaging the rail flange, the toe part having an edge extending between said parallel sides, and a block on which the base part is positionable, openings in the base part and the block for receiving a fastening member for fastening the base part and the block together, and the clamping part being angled relative to the base part to diverge from the base part in the direction of the toe to provide direct access to a fastening member when received by the aperture.

7. An assembly as claimed in claim 6 in which an edge of the block will abut the rail and the free edge of the base part will abut a stop on the block parallel with the edge of the block which will abut the rail.

8. A fastening assembly according to claim 6 in which said openings comprise apertures in the block and base part at least one of which is elongated.

9. A fastening assembly according to claim 8 in which both apertures are elongated and have their major axes positionable in intersecting planes which will intersect the plane of the rail whereby with a fastening member fast with a structure supporting the rail received by the apertures at the intersection of the axes forces exerted by the rail on the assembly will result in a wedging action of the member in the apertures.

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