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Marchant

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[54] **RAIL CLIP ASSEMBLY**

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[30] **Foreign Application Priority Data**

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[52] **U.S. Cl.** **238/347;** 238/331; 238/346
[51] **Int. Cl.²** **E01B 9/66**
[58] **Field of Search** 238/282, 310, 331, 333, 238/338, 343, 344, 345, 346, 347, 361

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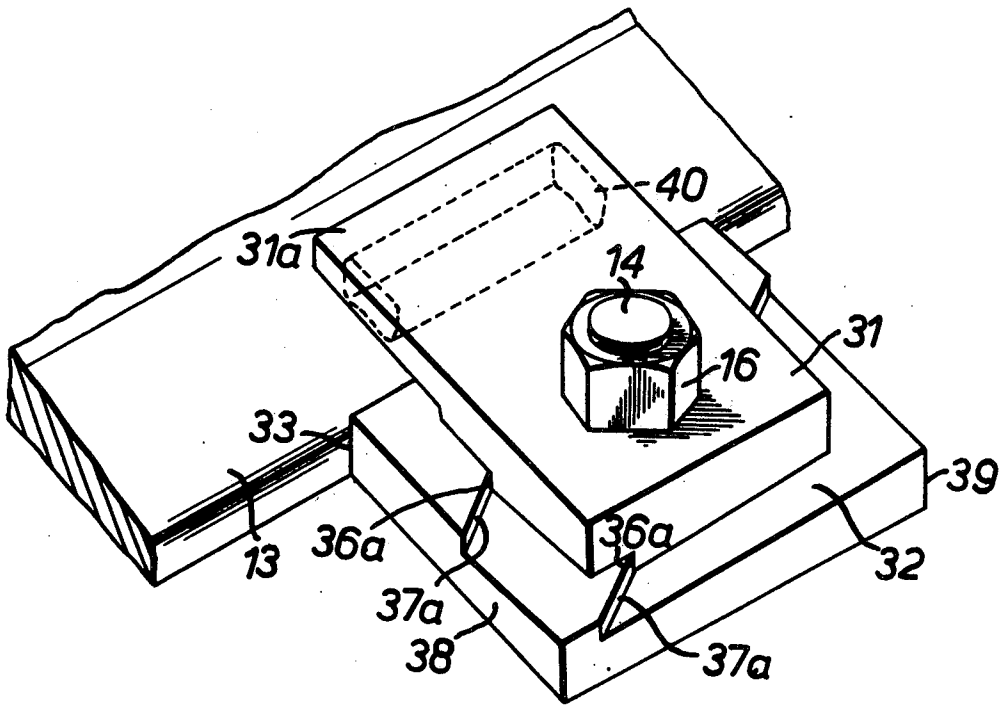
[57] **ABSTRACT**

A rail clip for securing a rail to a rail support composed of two bodies, one of which overlies a portion of the rail and the other of which overlies the rail support and has a lateral face which abuts the rail. Both bodies have registering apertures to receive a connecting member fixed to the support, the aperture in the second body being elongated so as to enable the bodies to assume different relative positions when assembled on the connecting member, the contacting faces of the bodies being shaped to provide positive engagement between them when assembled.

7 Claims, 9 Drawing Figures



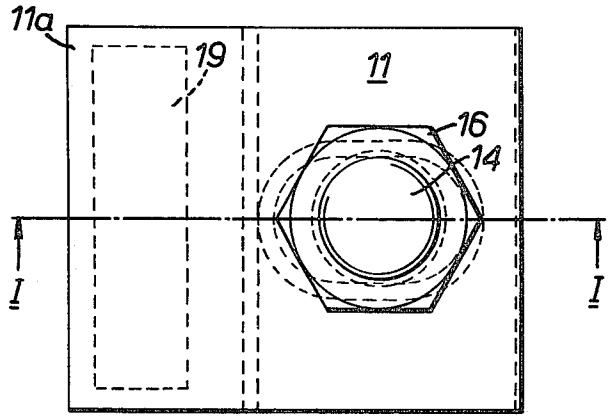


FIG. 1.

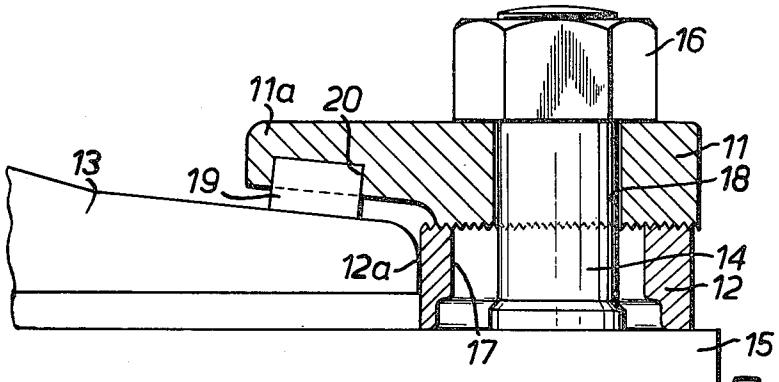


FIG. 2.

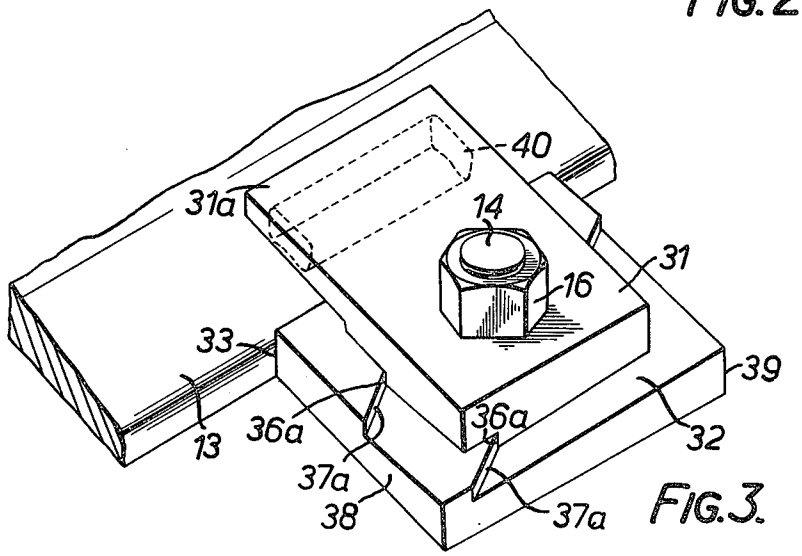


FIG. 3.

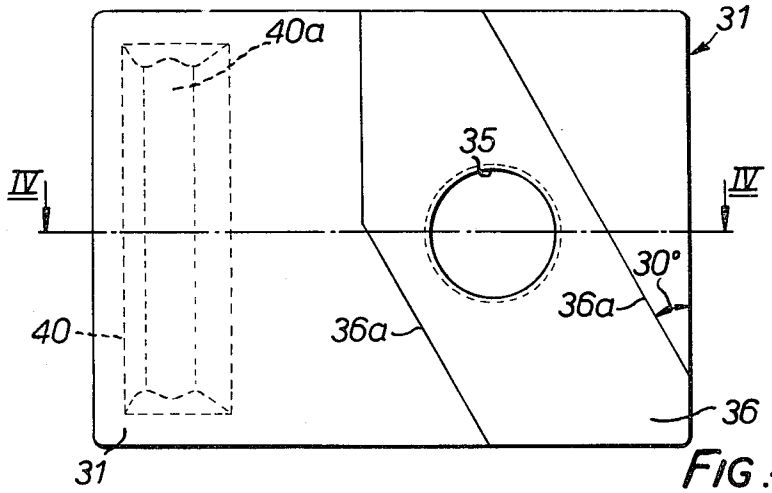
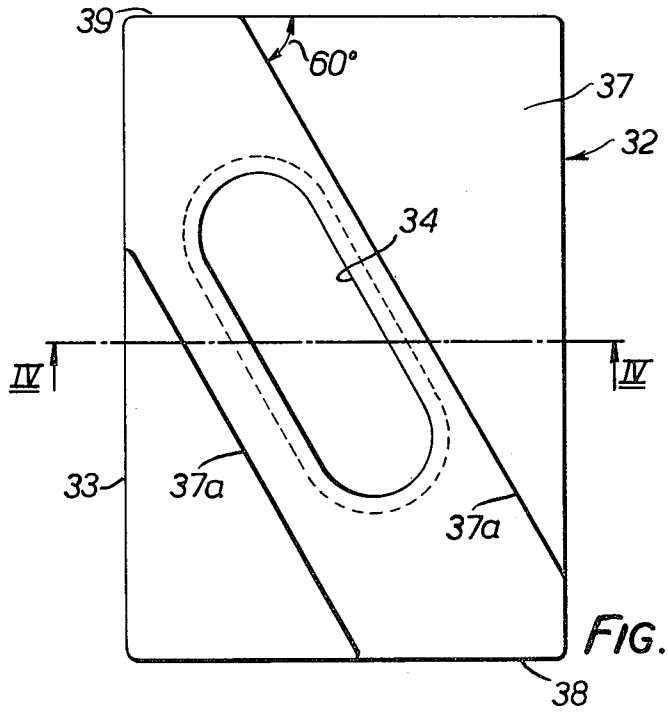


FIG. 4.



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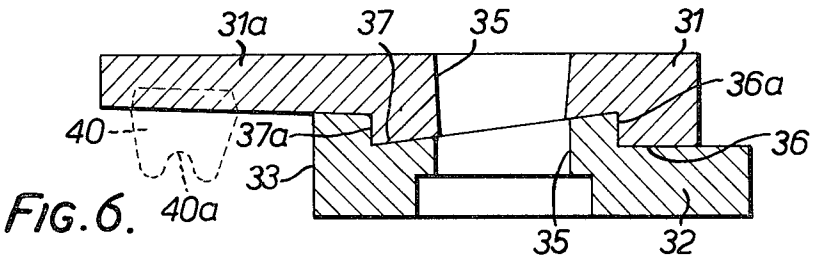
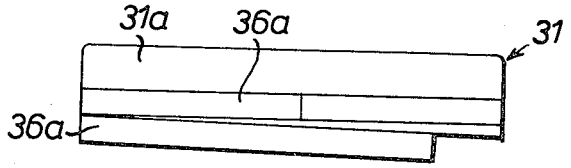


FIG. 6.



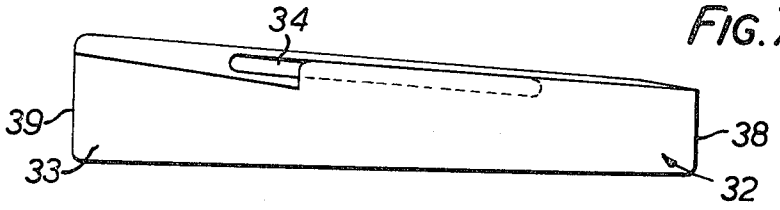


FIG. 7.

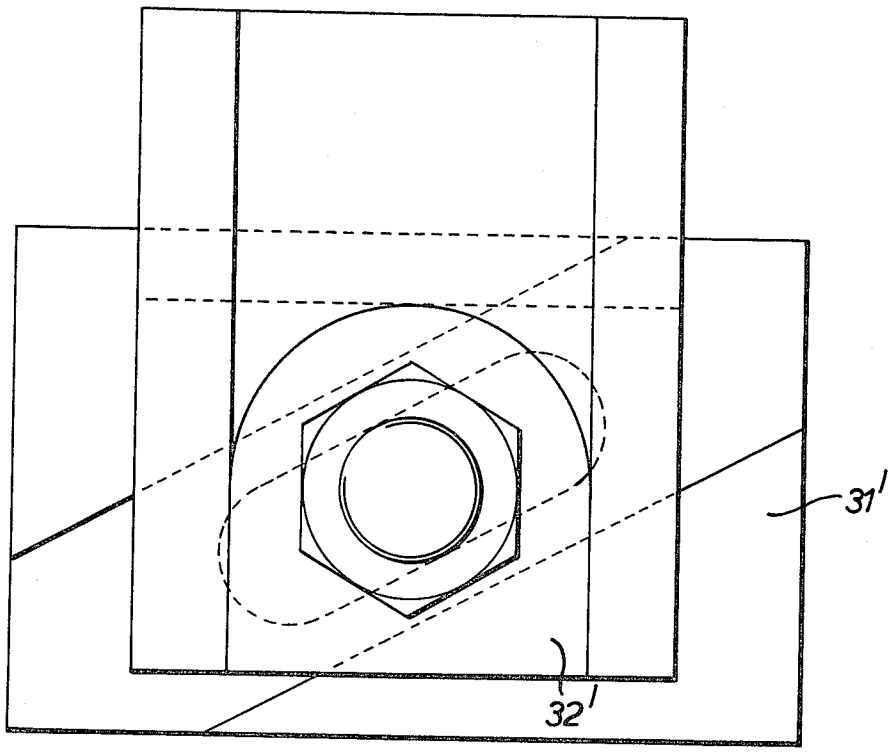


FIG. 8.

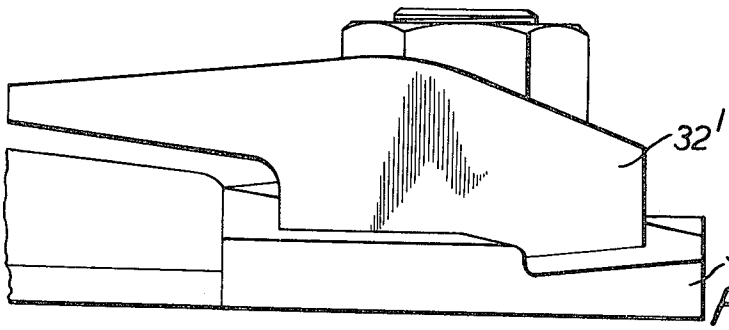


FIG. 9.

RAIL CLIP ASSEMBLY

The present invention relates to rail clip assemblies, and particularly but not exclusively to clip assemblies suitable for securing a rail, such as a crane rail, to a flanged girder.

According to the present invention there is provided a clip assembly for use in securing a rail to rail support means comprising a first portion for overlying a portion of a rail and a second portion for overlying the rail support means and having a lateral face for abutment with a portion of a lateral face of the rail, said portions being provided with apertures therethrough for use in connecting said portions to the said support means and being adapted to be assembled with a face of said first portion contacting a face of said second portion and said apertures in register, wherein said aperture in said second portion is elongate to permit said portions to assume different relative positions when assembled and said contacting faces are shaped to provide positive engagement therebetween while permitting said portions to assume said different relative positions.

Preferably the contacting faces of the portions are shaped to provide abutted surface portions extending from the general plane of the contacting faces, the surface portions extending in said general plane, parallel to inclined to the direction of extent of the rail and parallel or inclined to the direction of length of the elongate aperture in the second portion.

The invention will be better understood from the following description of embodiments thereof, given by way of example only, with reference to the accompanying drawings, in which:

FIG. 1 is a plan view of an embodiment of a clip assembly according to the present invention;

FIG. 2 is a sectional elevation on the line I—I of FIG. 1 showing the clip assembly in use;

FIG. 3 is an isometric view of another embodiment of the invention in use;

FIG. 4 is an underneath plan view of the first portion of the assembly of FIG. 3;

FIG. 5 is a top plan view of the second portion of the assembly of FIG. 3;

FIG. 6 is a section through the portions of FIGS. 4 and 5 when assembled and on the lines IV—IV of FIGS. 4 and 5;

FIG. 7 is an exploded end view of the portions of FIGS. 4 and 5; and

FIGS. 8 and 9 are a plan view and a side elevation respectively of a further embodiment of the invention.

The assembly of FIGS. 1 and 2 includes a first portion 11 and a second portion 12 and is intended to be secured adjacent a rail 13 by a stud or bolt 14 extending therethrough and nut 16, the stud 14 projecting from and being secured to the rail support 15. The second portion 12 is generally rectangular and is positioned on the support 15 with a lateral face 12*a* abutting a lateral face of the rail flange. The portion 12 has an elongate aperture 17 in which stud 14 is received and which permits this portion to be adjusted laterally to ensure that its abuts the rail. Thus variations in the spacing between the stud and the rail can be accommodated, as can a situation in which a rail is re-positioned relative to its studs. In this embodiment, the direction of length of the aperture 17 is generally normal to the length of the rail.

The first portion 11 is also generally rectangular and has a part 11*a* arranged to overlie the rail flange 13 and a part which overlies the portion 12 and has an aperture 18 in which the stud 14 is received.

The first portion 11 may bear on the rail flange 13 through a pad 19 which is located in a recess 20 in part 11*a* of portion 11. This pad is made of an elastomeric material, e.g. natural or synthetic rubber, and may be shaped as shown in FIG. 2, or may be shaped as shown in broken lines in FIG. 6 to be described hereafter.

Alternatively, the pad 19 may be omitted. The clip assembly then acts only to limit excessive upward movement of the rail.

The contacting faces of portions 11 and 12 are complementarily shaped so that, on assembly, they are positively engaged together, the shaping being such that the two portions can be moved relatively to assume different relative positions while being positively engaged together.

In the present embodiment, the shaping is such as to provide opposed corrugations or ridges which interfit or mesh on tightening nut 16. This meshing will prevent lateral movement of the assembly when it is subjected to lateral loading by the rail. As shown, the corrugations are of V-section although it will be appreciated that they could be sinusoidal or sawtooth and that a variety of inter-fitting or meshing arrangements could alternatively be used. The corrugations extend in a direction normal to the direction of length of the aperture 17 so that the variation in the relative positions of the first and second portions is discrete. To provide for fine adjustment the corrugations may be offset so that, for example, a 3 mm pitch will give a 1.5 mm adjustment on turning the portion 12 around. Similarly, the aperture 17 in portion 12 is offset so that a greater range of lateral adjustments can be achieved by turning portion 12 through 180°. It will be appreciated that these corrugations provide opposed abutting surfaces on the two portions which are inclined to the general plane of the contacting faces of the portions 11 and 12.

Installation of the assembly is relatively straightforward and is carried out by first placing the second portion 12 over the stud 14 and abutting it against the lateral face of the rail flange. The first portion 11 then is placed in position on top of the second portion to overlie the rail flange and, if the corrugations do not mesh together, the second portion can be turned through 180° and again positioned against the rail. The corrugations will now mesh and all that remains is to tighten the nut 16 down to the required torque.

The assembly of FIGS. 3 to 7 comprises a first portion 31 and a second portion 32. The second portion 32 is generally rectangular, is intended to be located with one lateral face 33 abutting a lateral face of the rail flange 13 to laterally restrain the rail, and is provided with an elongate aperture 34. The first portion is also generally rectangular and includes a part 31*a* which, in use, overlies the rail flange 13 and a part which overlies the second portion 32 and which is provided with an aperture 35.

The portions are assembled with the apertures 34, 35 in register and are placed on a bolt or stud 14, projecting from and secured to the rail support. The portions are fixed to the support by a nut 16 threaded on to the stud.

As in the above described embodiment, with the portions 31, 32 on the stud 14, the position of the first por-

tion is relatively fixed because the aperture **35** is dimensioned to fit the stud. The aperture **34** in the second portion is elongate so that the second portion can be moved relative to the first portion in the direction of length of the aperture to abut the lateral face **33** of the second portion against a lateral face of the flange **13.** Finally the nut **16** is tightened on the stud **14.**

The contacting faces **36, 37** of the first and second portions are again complementarily shaped and in this embodiment, the shaping is such as to provide at least one pair, and as shown two pairs, of abutting faces **36***a*, 37*a*, which are inclined to the general plane of the faces **36, 37.** As shown the faces **36***a*, 37*a*, are substantially vertical, with the faces **36***a* of the first portion being directed towards the rail and the faces **37***a* of the second portion being directed away from the rail so that movement of the second portion away from the rail, caused by lateral movements of the rail, is resisted by the faces **36***a* of the first portion.

The faces **36***a*, 37*a* extend in the direction of elongation of the slot **34** in the second portion so that they remain in abutment for all relative positions of the first and second portions. The angular inclination of the abutting faces to the direction of extent of the rail can be selected as desired and in dependence on the length and width of the portions and the extent of relative movement required.

The above described arrangement allows for a continuous variation in the relative positions of the first and second portions, in contrast to the stepped variation permitted by the embodiment of FIGS. **1** and **2.**

It will be appreciated that, as the first portion varies in position relative to the second portion, the extent of overlap between the first portion and the rail flange varies. To allow for the increase in thickness of the rail flange laterally of the rail from the edge of the flange, the thickness of the second portion increases in the direction of increasing overlap of the first portion with the rail flange (i.e., the second portion increases in thickness from end **38** to end **39**). This increase in thickness is designed to maintain an approximately constant spacing between the part of the first portion overlying the rail flange and the upper surface of the flange.

As in the preceding embodiment, the part **31***a* may limit upward movement of the rail flange or may bear on the rail flange through a resiliently compressible pad **40.** This pad may be shaped as shown in FIG. **2** or may, as shown, be provided with a central recess **40***a* extending in the direction of length of the pad. This recess is designed so that the pad maintains a substantially constant pressure on the rail with variation in the spacing of the first portion from the rail flange.

In use, the above described clip assembly limits lateral movement of the rail initially because of friction between the clip assembly and the rail support due to pre-tension in the bolt or stud. If the force exerted by the rail on the clip assembly becomes sufficient to overcome this friction, it will cause the second portion to move relatively to the first portion in the direction of length of the aperture **34.** This relative movement has the effect of moving the first portion relative to the second portion in the direction of increase in thickness of the second portion. As a result the bolt or stud tends to be extended increasing the tension in the bolt or stud and increasing the friction between the clip assembly and the rail support. This clip assembly thus has an improved ability to resist lateral movement of the rail.

The above described clip assemblies may be designed for light or medium duty and as such may be compact and particularly suitable for use in securing rails on relatively narrow flanged girders, e.g. having a top flange dimension of **12** inches. However, the assembly may also be designed for heavy duty and such a clip assembly is shown in FIGS. **8** and **9.** As before this clip assembly includes first and second portions **31'**, **32'** the portions being mutually engaged as described with reference to FIGS. **1** and **2** or FIGS. **3** to **7.**

The first and second portions of the above described assemblied may be made of cast steel, malleable cast iron or other similar material such, for example, as aluminium. It will be appreciated that the shapes of the portions are relatively simple and that molds therefore will be relatively inexpensive to form. The rubber pad if provided is preferably bonded into a recess in the first portion although clearly the recess could be shaped to retain a pad of complementary form.

I claim:

1. A clip assembly for use in securing a rail to rail support means comprising:

a first body;

a second body;

said first body being adapted to be assembled with said second body so as to overlie a portion of the rail and to overlie said second body with a surface of said first body contacting a surface of said second body;

said second body defining a lateral face for abutment with a lateral face of the rail;

means defining an aperture through each body, which apertures are arranged to be in register when said bodies are assembled for use in securing said bodies to the rail support means, said aperture in said second body being elongate to permit said bodies to assume different relative positions when assembled; the direction of elongation being inclined at an acute angle to the direction of extent of the rail,

each of said contacting surfaces including a laterally directed portion, which portions are abutted for transmitting forces applied by the rail to said second body to said first body, said laterally directed surface portions extending in the direction of elongation of said aperture in said second body so that said surface portions remain in abutment in said different relative positions fo said bodies;

said second body increasing in thickness in the direction of approach to said inclined laterally directed surface portions to said rail.

2. A clip assembly as claimed in claim **1** wherein said bodies are adapted to be assembled with said first body overlying said second body and said contacting faces extending in a plane generally normal to said lateral face of said second body and, in use, generally parallel to the direction of extent of the rail.

3. A clip assembly as claimed in claim **1** wherein said first body is provided with a resiliently compressible member for bearing on said portion of the rail.

4. A clip assembly as claimed in claim **3** wherein the bearing face of said resiliently compressible member is recessed such that said member will bear on the rail with a substantially constant force irrespective of variations in the compression thereof.

5. A clip assembly as claimed in claim 1 wherein said first and second bodies are generally rectangular in plan.

6. A clip assembly according to claim 1 wherein each said contacting surface includes at least a second laterally directed portion, which second portions are abutted in said different relative positions of said bodies.

7. A clip assembly as claimed in claim 6 wherein said laterally directed surface portions are formed by steps in said contacting surfaces.

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