

Description

The present invention relates to a rail clip assembly, particularly but not exclusively for securing a crane rail to a flanged girder.

Document FR-A 2 388 078 discloses a rail clip assembly comprising a body member (1) which has a base portion (1b) for connection to a rail support surface (3) and a lip portion (1a) which can, in use, overlie an edge of a rail (2), the body member having a first surface (5) which, in use, extends parallel to the rail and abuts a lateral face of the rail, a second surface facing away from the first surface and an elongate slot (6) for receiving a connector (7) for connecting the body member to the rail support surface, the slot extending in a direction which is generally inclined with respect to the said first surface, the assembly further comprising an upper member (9) which includes an aperture (10) for registration with the slot and for receiving the connector, said upper member having a surface which contacts the said second surface of the body member, said second surface being at an angle to the plane of the rail surface, whereby lateral forces applied by the rail are transmitted to the body, to the upper member, to the said connector, and to the rail support.

According to the present invention there is provided a rail clip assembly comprising a body member which has a base portion for contact with a rail support surface and a lip portion which can, in use, overlie an edge of a rail the body member having a first surface which in use, extends parallel to the rail, and abuts a lateral face of the rail, a second surface facing away the first surface and an elongate slot which extends in a direction which is generally inclined with respect to the said first surface, the assembly further comprising an adjusting member which includes an aperture for registration with the slot, a surface which contacts the said second surface of the body member, said second surface being at an angle to the plane of the rail surface, and the slot and the aperture in use receiving a connector for connecting the body member and the adjusting member to the rail support surface, whereby lateral forces applied by the rail, are transmitted to the body member, to the adjusting member, to the said connector and to the rail support, the assembly being characterised in that the adjusting member is a pivoting member which pivots about a point located on the body member.

Preferably, the slot is curved and the pivoting member hinges about a point located substantially at the centre of curvature of the slot, for example on a cylindrical lug. Alternatively, if the slot is straight, the pivoting member can itself have a slot in which a cylindrical lug can travel as the aperture of the pivoting member travels along the slot of the body member.

The pivot point is preferably located on the opposite side of the slot to the said first surface.

Advantageously, the body member is wedge-shaped and thickens towards to the first surface, the sloping upper surface of the body member producing the said second surface. Preferably, the

pivoting member is complementarily wedge-shaped, so that its lower surface and the upper surface of the body member are in intimate contact with one another and so that its upper surface and the lower surface of the body member remain substantially parallel, as the member is pivoted.

Most preferably, the second surface is of helical form generated by rotation of a generator line rotated about the axis of the pivot point.

Alternatively, the second surface may be substantially perpendicular to the rail support surface and, in use, be abutted by an edge of the pivoting member.

Embodiments of the invention are described in detail below, by example only, with reference to the accompanying drawings, wherein:

Fig. 1 is a sectional view of a rail clip assembly in accordance with the present invention.

Fig. 2 is a plan view of the assembly of fig. 1, without the pivoting member being shown;

Fig. 3 is an orthogonal view of the clip of figs. 1 and 2;

Fig. 4 shows a member of pivoting members being formed from a strip;

Fig. 5 is a sectional view of a pivoting member of fig. 4; and

Fig. 6 is a plan view of another embodiment of the invention.

The rail assembly of figs. 1, 2 and 3 comprises a body member 1 having a base 2 which can be connected to a flat rail support surface 3. The body 1 has a lip 4 which, in use, overlies a portion of a rail 5, for example a crane rail, which is supported on the rail support 3. Thus, the body 1 has, in cross-section, a generally Z-shaped configuration with the lip 4 over the rail 5 and the base 2 on the rail support 3. The body 1 has a first surface 6 which extends upwards from the lower surface 7 of the base 2 towards the lip 4. The first surface 6 is, in use, arranged parallel to and in contact with the edge of the rail 5 and extends in a plane substantially perpendicular to the plane of the rail support surface 3.

The base 2 has a second, upper surface 8, facing away from the first surface 6. The surface 8 extends at an inclined angle to the rail support surface 3, i.e. the base 2 is generally wedge-shaped, thickening towards the first surface 6. In the illustrated embodiment, the upper, second surface 8 of the base 2 is in fact of a helical form generated by the rotation of a generator line about an axis through the pivot 12, discussed below.

As most clearly seen in fig. 2, the body 1 has an elongate slot 9 for receiving a connector 10 for connecting the body 1 to the rail support 3. The elongate slot allows for lateral adjustment of the lip relative to the connector 10, which may be a threaded stud welded to the rail support 3, and having a nut 20.

The slot 9 extends in a direction away from the first surface 6, a first right-hand end 9a being nearest to that surface and a second, left-hand end 9b being furthest away, so that any forces which in use tend to rotate the nut 20 will tighten it rather than slacken it.

In this embodiment, the slot 9 is curved with the outside of the curve facing the first surface 6. The edge of the above-mentioned second surface 8 follows the curve of the slot 9 and a step 8a is formed along this edge. The lip 4 connects to the top of the step 8a via inclined surfaces 11. At the centre of curvature of the slot 9 there is a cylindrical lug 12 on which is pivotally mounted a pivoting member 13. The member 13 includes an aperture 14 which registers with the slot 9 and through which the connector 10 fits. Member 13 further includes a lower surface 13a which rests on surface 8 of the body 1.

As mentioned above, the base 2 of the body 1 is substantially wedge-shaped and thickens towards the first surface 6. The member 13 is correspondingly wedge-shaped so that the upper surface 15 of the member 13 and the bottom surface 7 of the base 1 remain substantially parallel in all positions of the member 13 and so that the member 13 intimately contacts the body 1.

It should be noted, however, that all the upper surface of the base 2 need not be inclined. As shown in fig. 3, there is a horizontal portion 16 adjacent the lug 12, this portion connecting to the upper, inclined surface via a step 17 which follows the curve of the slot 9.

In use, the body 1 and the pivoting member 13 are loosely assembled on the connector 10. The body is then moved relative to the stud and the rail, until it is located with its first surface 6 abutting the edge of the rail 5. During adjustment of the body 1, the pivoting member 13 automatically adjusts its position relative to the body.

The nut 20 is then threaded onto the stud and is tightened to fix the rail relative to the rail support 3.

Now, in use, any force applied laterally to the rail 5 will be transmitted via surfaces 8 and 13a to the pivoting member 13. In other words, the provision of the pivoting member 13 prevents the lateral forces from being applied directly to the stud. If the frictional forces between the abutting surfaces of the pivoting member 13 and body 1 and between the bottom surface of the body 1 and the rail support surface 3 are overcome, then the body 1 will move relative to the lug 12 and the pivoting member 13. Such movement results in increased tension in the stud 10 because the member 13 moves along the slot towards the first surface 6 and adopts a position where the wedge-shaped base is thicker. Thus, the above mentioned frictional forces are even greater and further lateral movement of the body is resisted.

In the embodiment described above, the interacting surfaces of the body 1 and the member 13 have been described as surfaces 8 and 13a. However, if the surface of the step 8a of the body 1 and the edge 13b of the member 13 are designed to each other then these can also operate as the interactive surfaces. Thus, in this case, it is not essential that the body 1 has an inclined upper surface.

If the body 1 has an inclined upper surface 13a and if the edge 13b does abut the step 8a, then both of these pairs of surfaces are in fact acting to transfer forces from the body 1 to the member 12.

It should also be noted that pivot point of the pivoting member 13 may, if desired, be located on the same side of the slot 9 as the first surface 6.

Fig. 4 shows a portion of a metal strip 21 from which the pivoting members 13 may be pressed. The strip 21 has, in cross-section, a flat base and an upper surface formed of an inclined, curved surface 22 and a flat surface 23 along one edge of the strip 21. The members 13 are pressed from the strip so that a line connecting their apertures 14 and pivots is at an angle α of 45° to the longitudinal direction of the strip. Thus the member 13 thickens in a direction along that line and in a direction perpendicular to it.

Fig. 5 shows a section through a pivoting member 13 punched from a metal strip as shown in fig. 4. It will be seen that a plug 24 is only partly punched from the strip so that the user is obliged to locate the member 13 on the lug 12 of the body member the right way up.

Turning now to the embodiment shown in fig. 6 it will be seen that in this case the slot 9 is straight rather than curved. The pivoting member 13 pivots on a lug 12 located along a line substantially perpendicular to the direction of the slot and running from the end 9a of the slot. However, the lug 12 could alternatively be located in other positions, for example at the apex of a triangle having the slot as its base.

The pivoting member 13 itself has a slot 17 which, in the position illustrated, extends in a direction approximately perpendicular to that of the slot 9. Slot 17 is provided to accommodate the travel of the lug 12 as aperture 14 of the pivoting member 13 travels along the slot 9 in which the connector 10 is fitted.

In other respects, the assembly of fig. 6 corresponds substantially to that of figs. 1 to 3.

In the above described embodiments, a pad 18 of elastomeric material may be provided in a recess along the underside of the lip 4. Such a resilient pad will, in use, bear on the upper side of the rail 5. Alternatively, the lip may be spaced from the rail so as to provide an upper limit to the possible movement of the rail.

The body member and pivoting member of the above embodiment may be made of cast steel, malleable cast iron or other similar material. The slot 9 may extend at an angle of approximately 30° to the surface 6 of the body, the direction of the slot being measured along a line connecting its two ends, to take into account the fact that the slot may be curved. The inclination of the upper surface of the body member may be 8°, for example, the lower surface of the pivoting member having a corresponding inclination relative to its upper surface.

Claims

1. A rail clip assembly comprising a body member (1) which has a base portion (2) for contact with a rail support surface (3) and a lip portion (4) which can, in use, overlap an edge of a rail (5), the body member (1) having a first surface (6) which, in use, extends parallel to the rail (5) and abuts a lateral face of the rail, a second surface (8, 8a) facing

In this embodiment, the slot 9 is curved with the outside of the curve facing the first surface 6. The edge of the above-mentioned second surface 8 follows the curve of the slot 9 and a step 8a is formed along this edge. The lip 4 connects to the top of the step 8a via inclined surfaces 11. At the centre of curvature of the slot 9 there is a cylindrical lug 12 on which is pivotally mounted a pivoting member 13. The member 13 includes an aperture 14 which registers with the slot 9 and through which the connector 10 fits. Member 13 further includes a lower surface 13a which rests on surface 8 of the body 1.

As mentioned above, the base 2 of the body 1 is substantially wedge-shaped and thickens towards the first surface 6. The member 13 is correspondingly wedge-shaped so that the upper surface 15 of the member 13 and the bottom surface 7 of the base 1 remain substantially parallel in all positions of the member 13 and so that the member 13 intimately contacts the body 1.

It should be noted, however, that all the upper surface of the base 2 need not be inclined. As shown in fig. 3, there is a horizontal portion 16 adjacent the lug 12, this portion connecting to the upper, inclined surface via a step 17 which follows the curve of the slot 9.

In use, the body 1 and the pivoting member 13 are loosely assembled on the connector 10. The body is then moved relative to the stud and the rail, until it is located with its first surface 6 abutting the edge of the rail 5. During adjustment of the body 1, the pivoting member 13 automatically adjusts its position relative to the body.

The nut 20 is then threaded onto the stud and is tightened to fix the rail relative to the rail support 3.

Now, in use, any force applied laterally to the rail 5 will be transmitted via surfaces 8 and 13a to the pivoting member 13. In other words, the provision of the pivoting member 13 prevents the lateral forces from being applied directly to the stud. If the frictional forces between the abutting surfaces of the pivoting member 13 and body 1 and between the bottom surface of the body 1 and the rail support surface 3 are overcome, then the body 1 will move relative to the lug 12 and the pivoting member 13. Such movement results in increased tension in the stud 10 because the member 13 moves along the slot towards the first surface 6 and adopts a position where the wedge-shaped base is thicker. Thus, the above mentioned frictional forces are even greater and further lateral movement of the body is resisted.

In the embodiment described above, the interacting surfaces of the body 1 and the member 13 have been described as surfaces 8 and 13a. However, if the surface of the step 8a of the body 1 and the edge 13b of the member 13 are designed to each other then these can also operate as the interactive surfaces. Thus, in this case, it is not essential that the body 1 has an inclined upper surface.

If the body 1 has an inclined upper surface 13a and if the edge 13b does abut the step 8a, then both of these pairs of surfaces are in fact acting to transfer forces from the body 1 to the member 12.

It should also be noted that pivot point of the pivoting member 13 may, if desired, be located on the same side of the slot 9 as the first surface 6.

Fig. 4 shows a portion of a metal strip 21 from which the pivoting members 13 may be pressed. The strip 21 has, in cross-section, a flat base and an upper surface formed of an inclined, curved surface 22 and a flat surface 23 along one edge of the strip 21. The members 13 are pressed from the strip so that a line connecting their apertures 14 and pivots is at an angle α of 45° to the longitudinal direction of the strip. Thus the member 13 thickens in a direction along that line and in a direction perpendicular to it.

Fig. 5 shows a section through a pivoting member 13 punched from a metal strip as shown in fig. 4. It will be seen that a plug 24 is only partly punched from the strip so that the user is obliged to locate the member 13 on the lug 12 of the body member the right way up.

Turning now to the embodiment shown in fig. 6 it will be seen that in this case the slot 9 is straight rather than curved. The pivoting member 13 pivots on a lug 12 located along a line substantially perpendicular to the direction of the slot and running from the end 9a of the slot. However, the lug 12 could alternatively be located in other positions, for example at the apex of a triangle having the slot as its base.

The pivoting member 13 itself has a slot 17 which, in the position illustrated, extends in a direction approximately perpendicular to that of the slot 9. Slot 17 is provided to accommodate the travel of the lug 12 as aperture 14 of the pivoting member 13 travels along the slot 9 in which the connector 10 is fitted.

In other respects, the assembly of fig. 6 corresponds substantially to that of figs. 1 to 3.

In the above described embodiments, a pad 18 of elastomeric material may be provided in a recess along the underside of the lip 4. Such a resilient pad will, in use, bear on the upper side of the rail 5. Alternatively, the lip may be spaced from the rail so as to provide an upper limit to the possible movement of the rail.

The body member and pivoting member of the above embodiment may be made of cast steel, malleable cast iron or other similar material. The slot 9 may extend at an angle of approximately 30° to the surface 6 of the body, the direction of the slot being measured along a line connecting its two ends, to take into account the fact that the slot may be curved. The inclination of the upper surface of the body member may be 8° , for example, the lower surface of the pivoting member having a corresponding inclination relative to its upper surface.

Claims

1. A rail clip assembly comprising a body member (1) which has a base portion (2) for contact with a rail support surface (3) and a lip portion (4) which can, in use, overlap an edge of a rail (5), the body member (1) having a first surface (6) which, in use, extends parallel to the rail (5) and abuts a lateral face of the rail, a second surface (8, 8a) facing



away from the first surface (6) and an elongate slot (9) which extends in a direction which is generally inclined with respect to the said first surface (6), the assembly further comprising an adjusting member (13) which includes an aperture (14) for registration with the slot (9), a surface (13a, 13b) which contacts the said second surface (8, 8a) of the body member (1), said second surface (8, 8a) being at an angle to the plane of the rail surface (3) and the slot (9) and the aperture (14) in use receiving a connector (10) for connecting the body member (1) and the adjusting member (13) to the rail support surface (3), whereby lateral forces applied by the rail (5) are transmitted to the body member (1), to the adjusting member (13), to the said connector (10) and to the rail support, the assembly being characterised in that the adjusting member (13) is a pivoting member which pivots about a point (12) located on the body member (1).

2. An assembly according to claim 1, wherein the slot (9) is curved and the pivoting member hinges about a point located substantially at the centre of curvature of the slot (9).

3. An assembly according to claim 1, wherein the slot (9) is straight and the pivoting member has a slot (7) in which a lug on the body member (1) can travel as the aperture (14) of the pivoting member (13) travels along the slot (9) of the body member (1).

4. An assembly according to any preceding claim, wherein the pivot point (12) is located on the opposite side of the slot (9) to the said first surface (6).

5. An assembly according to any preceding claim, wherein the body member (1) is wedge-shaped and thickens towards the first surface (6), the sloping upper surface of the body member forming the said second surface (8).

6. An assembly according to claim 5, wherein the pivoting member (13) is complementarily wedge-shaped, so that its lower surface (13a) and the upper surface (8) of the body member (1) are in intimate contact with one another and so that its upper surface (15) and the lower surface of the body member (1) remain substantially parallel as the member is pivoted.

7. An assembly according to any preceding claim, wherein the second surface is of helical form generated by rotation of a generator line about the axis of the pivot point (12).

8. An assembly according to any of claims 1 to 4, wherein the second surface (8a) is substantially perpendicular to the rail support surface and, in use, is abutted by an edge (13b) of the pivoting member (13).

Patentansprüche

1. Eine Schienenbefestigungsvorrichtung mit einem Körper (1), der einen Basisabschnitt (2) zum Kontakt mit einer Schienentragefläche und einen Ansatzabschnitt (4) aufweist, der im Gebrauch eine Kante einer Schiene (5) übergreifen kann, wobei der Körper (1) eine erste Fläche (6), die im Gebrauch sich parallel zu der Schiene (5) erstreckt und an einer Seitenfläche der Schiene anliegt, eine zweite Fläche (8, 8a), die von der ersten Fläche (6)

hinwegweist und einen langgestreckten Schlitz (9) aufweist, der sich in einer Richtung erstreckt, die in Beziehung zu der ersten Fläche (6) generell geneigt ist, wobei die Vorrichtung ferner ein Einstellteil (13) enthält, das eine Öffnung (14) zum In-Übereinstimmung-Bringen mit dem Schlitz (9) enthält, mit einer Fläche (13a, 13b), die die zweite Fläche (8, 8a) des Körpers (1) berührt, wobei die zweite Fläche (8, 8a) in einem Winkel zur Ebene der Schienenfläche (3) und des Schlitzes (9) und der Öffnung (14) steht, die im Gebrauch einen Verbinder (10) zur Verbindung des Körpers (1) und des Einstellteils (13) mit der Schienentragefläche (3) aufnimmt, wodurch seitliche auf die Schiene (5) aufgebrachte Kräfte auf den Körper (1), auf den Einstellteil (13), auf den Verbinder (10) und auf den Schienenträger übertragen werden, wobei die Vorrichtung dadurch gekennzeichnet ist, daß der Einstellteil (13) ein schwenkbarer Teil ist, der um einen Punkt (12), der auf dem Körper (1) liegt, schwenkbar ist.

2. Eine Vorrichtung nach Anspruch 1, bei der der Schlitz (9) gekrümmt ist und der Schwenkteil um einen Punkt gelenkig ist, der im wesentlichen im Zentrum der Krümmung des Schlitzes (9) liegt.

3. Eine Vorrichtung nach Anspruch 1, bei der der Schlitz (9) gerade ist und der schwenkbare Teil einen Schlitz (7) hat, in dem ein Vorsprung auf dem Körper (1) sich bewegen kann, wenn die Öffnung (14) des schwenkbaren Teils (13) sich längs des Schlitzes (9) des Körpers (1) bewegt.

4. Eine Vorrichtung nach einem der vorhergehenden Ansprüche, bei der der Schwenkpunkt (12) auf der der ersten Fläche (6) entgegengesetzten Seite des Schlitzes (9) liegt.

5. Eine Vorrichtung nach einem der vorhergehenden Ansprüche, bei der der Körper (1) keilförmig ist und sich zur ersten Fläche (6) hin verdickt, wobei die geneigte obere Fläche des Körpers die zweite Fläche (8) bildet.

6. Eine Vorrichtung nach Anspruch 5, bei der der schwenkbare Teil (13) komplementär keilförmig ist, so daß seine untere Fläche (13a) und die obere Fläche (8) des Körpers (1) in innigem Kontakt miteinander sind und so daß seine obere Fläche (15) und die untere Fläche des Bodenteils (1) im wesentlichen parallel bleiben, wenn der Teil geschwenkt wird.

7. Eine Vorrichtung nach einem der vorhergehenden Ansprüche, bei der die zweite Fläche eine Schraubenform hat, die durch die Drehung einer erzeugenden Linie um die Achse des Schwenkpunktes (12) erzeugt ist.

8. Eine Vorrichtung nach einem der Ansprüche 1 bis 4, bei der die zweite Fläche (8a) im wesentlichen senkrecht zu der Schienentragefläche ist und im Gebrauch von einer Kante (13b) des schwenkbaren Teils (13) berührt ist.

Revendications

1. Ensemble formant crapaud de rail comportant un corps (1) qui présente une portion de base (2) pour venir en contact avec une surface (3) de support de rail et une portion de rebord (4) qui, en service peut surmonter un bord du rail (5), le corps (1) présentant une première surface (6) qui, en servi-



ce, s'étend parallèlement au rail (5) et bute contre une face latérale du rail, une seconde surface (8, 8a) fait face du côté opposé à la première surface (6), et une lumière de forme allongée (9) qui s'étend selon une direction qui, de façon générale, est inclinée par rapport à ladite première surface (6), l'ensemble comportant en outre un élément de réglage (13) qui présente une ouverture (14) à aligner avec la lumière (9), une surface (13a, 13b) qui vient en contact avec ladite seconde surface (8, 8a) du corps (1), ladite seconde surface (8, 8a) faisant un angle avec la plan de la surface (3) de support du rail, et la lumière (9) de l'ouverture (14) recevant, en service, un connecteur (10) pour relier le corps (1) et l'élément de réglage (13) à la surface (3) de support du rail, ce par quoi les forces latérales appliquées par le rail (5) sont transmises au corps (1), à l'élément de réglage (13), audit connecteur (10) et au support du rail, l'ensemble étant caractérisé en ce que l'élément de réglage (13) est un élément pivotant qui pivote autour d'un point (12) situé sur le corps (1).

2. Ensemble selon la revendication 1, dans lequel la lumière (9) est courbe, et dans lequel l'élément pivotant fait charnière autour d'un point situé sensiblement au centre de courbure de la lumière (9).

3. Ensemble selon la revendication 1, dans lequel la lumière (9) est rectiligne, et dans lequel l'élément pivotant présente une lumière (7) dans laquelle un téton prévu sur le corps (1) peut se déplacer lorsque l'ouverture (14) de l'élément pivotant (13) se déplace le long de la lumière (9) du corps (1).

4. Ensemble selon l'une quelconque des revendications précédentes, dans lequel le point de pivotement (12) est situé du côté de la lumière (9) opposé à ladite première surface (6).

5. Ensemble selon l'une quelconque des revendications précédentes, dans lequel le corps (1) a la forme d'un coin et va en s'épaississant en direction de la première surface (6), la surface supérieure, en pente, du corps formant ladite seconde surface (8).

6. Ensemble selon la revendication 5, dans lequel l'élément pivotant (13) a la forme d'un coin complémentaire, de sorte que sa surface inférieure (13a) et la surface supérieure (8) du corps (1) sont en contact intime l'une avec l'autre, et de sorte que sa surface supérieure (15) et la surface inférieure du corps (1) restent sensiblement parallèles lorsque l'élément pivote.

7. Ensemble selon l'une quelconque des revendications précédentes, dans lequel la seconde surface a une forme hélicoïdale générée par la rotation d'une génératrice autour de l'axe du point de pivotement (12).

8. Ensemble selon l'une quelconque des revendications 1 à 4, dans lequel la seconde surface (8a) est sensiblement perpendiculaire à la surface support du rail et dans lequel, en service, un bord (13b) de l'élément pivotant (13) bute contre cette seconde surface.

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