

(19)



(11)

EP 1 950 347 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
05.03.2014 Bulletin 2014/10

(51) Int Cl.:
E01B 9/38 (2006.01) E01B 9/68 (2006.01)

(21) Application number: **08380021.9**

(22) Date of filing: **28.01.2008**

(54) Support plate for flexible fastenings of railway rails

Stützplatte für flexible Befestigungen von Eisenbahnschienen

Plaque support pour fixations flexibles de rails de chemin de fer

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

(30) Priority: **26.01.2007 ES 200700170**

(43) Date of publication of application:
30.07.2008 Bulletin 2008/31

(73) Proprietor: **Railtech Sufetra, S.A.
08901 L'Hospitalet de Llobregat, Barcelona (ES)**

(72) Inventor: **Vives Clavel, Juan
46550 Albuixech (Valencia) (ES)**

(74) Representative: **Carpintero Lopez, Francisco et al
Herrero & Asociados, S.L.
Alcalá 35
28014 Madrid (ES)**

(56) References cited:
**WO-A1-03/012204 ES-U- 285 328
US-A- 2 380 991 US-A- 3 439 874**

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

EP 1 950 347 B1

Description

OBJECT OF THE INVENTION

[0001] The present invention relates to a support plate for flexible fastening of railway rails that applies to the railway industry field, allowing an elastic and flexible fastening for the absorption of deformations produced in the rail, by means of a single piece, with the resulting savings in the production costs and simplicity of installation.

BACKGROUND OF THE INVENTION

[0002] Presently there are different means used for the securing and fastening of the rails that comprise the railways tracks in their service position. In each fastening point, these means comprise different elements, among which is found at least one guide plate that guides the rail, a rail splice, also referred to as elastic fastening clip or band, a grounding insulating plate that is situated under the rail, at least one rail screw and in some cases a bearing plate.

[0003] Presently, each one of these elements is an independent piece, which requires a linking or joining therebetween, each one of them having a specific function.

[0004] The elastic character of this type of fastener, wherein a means of sliding or elastic securing is required, i.e. which secures, but does not immobilize, the rail at its vertical axis, is determined with the object of allowing an absorption of the deformations produced in the rail, for example, as a consequence of the stress that is produced during the circulation of the machines and wagons and prevents the thermal expansions, at the same time that it fulfils its fastening function.

[0005] Spanish patent no. ES 285 328 and in European patent no. EP 0295685 disclose devices for the securing of railway rails on the railway track, which comprise, for each fastening point of a rail, two guide plates that are situated on both sides of the rail, each one of which is secured to the bearing area or rail-bearer by means of an elastic rail splice that treads on the rail and that is fastened by a rail screw, an insulating plate being situated under the rail.

[0006] The drawback presented by these devices is that they do not have a support plate, but instead only have guide plates that are situated in contact with the side of the flange or rail base, on each side thereof, for the securing of the elastic rail splice. The mandatory incline that the rail has to have must be achieved by means of an inclined surface on a track that must be performed during the manufacture of the corresponding precast concrete rail-bearer, with the resulting increase in cost.

[0007] In these devices the guide plate is configured to house the external part of the rail splice and make contact in the lateral area of the rail flange. The preform of the rail-bearer must also have the track or negative corresponding to the guide plate, with the object that the guide plate remains immobile in its service position, these

being the drawbacks entailed by not having a bearing plate, which serves to achieve the incline of the rail and allows the installation of the rail on any surface.

[0008] Additionally, there are devices that comprise metal bearing plates, such as those disclosed in different technical standards, such as, for example, in the American standard corresponding to the AREMA organization, *American Railway Engineering and Maintenance-of-Way Association*, and in the Brazilian standard. These bearing plates have a specific incline, which can be seen in a variation of thickness of the plate, wherein the lower bearing area is situated in contact with a rail-bearer, remaining in horizontal position while the upper surface of the bearing plate has a specific angle with the lower surface, i.e. both surfaces or sides of the plate are not parallel, with the object of guiding the loads towards the rail, or rather towards the rail gage or middle area of the railway.

[0009] The main drawback that the means of fastening that these bearing plates comprise is that they require guides parallel to the rail, which are achieved by means of studs and slots in the piece with the object of guiding the rail. In other words, the problem that these bearing plates have is that they do not provide for the inclusion of a guide plate, which means that they require said studs and slots for the guiding of the rail.

[0010] Additionally, United States patent no. US 3,439,874 discloses a layout for the securing of rails which, besides the elements disclosed in the previously mentioned patents, comprises bearing plates, preferably of a laminated metal material. Said bearing plate consists of a flat piece that comprises two ridges parallel to the rail that are configured to make contact with the rail and position it, at the same time serving as support and position limiter for the elastic rail splice.

[0011] One drawback that this securing presents is that the bearing plate does not have an inclined surface provided for the rail to have the mandatory incline. Additionally, said bearing plate does not have adequate means for the containment and elastic fastening of the rail splice in its working position, which could even pop out of its position. This bearing plate is a completely flat piece with parallel upper and undersides, comprising two ridges, an outer ridge for the rail splice and an inner ridge for the rail, with respect to the axis of the rail screw, which makes the contact with the rail splice precise, not adapting to an optimal fastening thereof. Additionally, the bearing area of the plate is flat and does not allow the housing of foreign elements, such as, for example, a stone, during its installation, which produces undesired alterations in the horizontal position or even the breakage of the bearing plate, above all when it is in a load situation, for example during the passing of a train, i.e. when it has a usage load.

[0012] Additionally, devices for the elastic fastening of rails exist wherein each fastening point comprises a guide plate, such as, for example, those disclosed in Spanish patent no. ES 2 160 529 and in European patent no. 0767274. The main drawback of these fastenings is

that they do not have a bearing plate. These devices comprise a flexed guide plate configured to be housed in rail shoes that must have a complementary space on the upper surface of the pre-fabricated rail-bearers, said guide plate remaining adjacent to the rail flange, with the object of immobilizing it in its position and absorbing the lateral thrust of the train wheels on their passage along the track, as well as the deformations previously mentioned.

[0013] On the other hand, the international patent application WO03/012204 A1 discloses a rail vibration isolator for improving efficiency of vibration isolation, laying the rail conveniently, and wherein the replacement of a vibration isolating pad is simple and the maintenance of the railroad line is convenient.

DESCRIPTION OF THE INVENTION

[0014] This invention relates to a support plate for flexible fastenings of railway rails which has a single-piece configuration and comprises means to guide and support a rail on a bearing area, said support piece comprising a plurality of contact slits and rail shoes configured to house and fasten an attaching flange of said rail.

[0015] The support plate proposed by the invention allows an elastic and flexible fastening, by means of a sliding securing, i.e. which secures but does not immobilize the rail at its vertical axis, with the object of allowing an absorption of the deformations produced in the rail, for example as a consequence of the thermal expansions or lateral thrust of the train wheels on their passage along the track, all of this without failing in its fastening function.

[0016] The invention relates to a support plate, which serves as a means of elastic fastening of railway rails, being configured to attach to any bearing area, i.e. to smooth cement or concrete surfaces, such as wooden and concrete rail-bearers.

[0017] The support plate has a symmetric single-piece configuration with respect to a half-imaginary axis perpendicular to the rail. The support plate comprises means of guiding a rail, a function that was done by the guide plate in the fastening devices used until now, at the same time comprising means of supporting, i.e. serve as support for said rail, a function that until now was done by means of another different piece, which was the bearing plate.

[0018] The support plate comprises at least two rail shoes on each side of the central span, which are two slots configured to house and receive, serving as support, curved areas that has the rail splice in an area opposite the contact area of said rail splice with the rail flange.

[0019] With the support plate proposed by the invention, it is possible to dispense with the guide plates currently used, which have a lower protuberance for the housing and support of the rail splice, requiring that the bearing area or the bearing plate to be used have a shape operatively adapted to receive the settlement of said low-

er protuberance.

[0020] Likewise, the elasticity to the fastening of the rail is increased which results in an increase in the feeling of comfort perceived by the passenger, the fastening providing a greater degree of cushioning, which results in a greater protection of the railway, considering its use in continuous tracks, unlike the bearing plates used until now, which did not allow for their installation in any span.

[0021] The possibility is considered that the support plate comprises, with the object of guiding a flat, central and lowered span along the rail, an upper part, which is configured to be in contact and support a rail flange, said central span having an appropriate incline for the seating of said rail.

[0022] On the other hand, the possibility is considered that the support plate comprises at least two through-holes, such as two cylindrical slits, one through-hole and one cylindrical slit situated on each side of the central span between the contact slits. Each cylindrical slit is aligned according to a perpendicular direction to the rail with at least one through-hole, each one of said holes being configured to house a rail screw to secure the support plate to the rail splice or elastic clip.

[0023] Each cylindrical slit is flanked, according to a direction parallel to the rail, preferably by two contact slits, configured to be in contact with a rail splice or elastic clip, which at the same time is configured to make contact with the rail flange and immobilize it, which means that the contact slits have the shape of the rail splice in said contact area.

[0024] The possibility is considered that the support plate, in an underside, where the through-holes comprise a polygonal area, preferably hexagonal, is configured to house the hexagonal head of the rail screw, allowing for an optimal immobilization thereof.

[0025] Likewise, the possibility is considered that the support plate comprises a plurality of securing holes, preferably six spaced out evenly in each outer area, i.e. in the areas furthest from the central span, said securing holes being configured to allow an operator to secure the support plate to any span, in accordance with the type of bearing area wherein it is intended to be secured, allowing for the avoidance of deformations when the support plate is fitted, for example, to a wooden bearing area. Preferably, the securing holes are aligned according to a direction parallel to the rail.

[0026] The possibility is considered that the central span is configured to house an elastic insulating base plate configured, at the same time, to be in contact with the rail flange, with the object of avoiding breakages of the support plate.

[0027] Likewise, the central span can comprise, at ends perpendicular to the rail, two cross-sectional studs configured to immobilize the insulating base plate in its position on the central span, allowing for the resistance of the stress produced in the direction of the rail, above all at the points of braking and start-up of a train, avoiding that the insulating base plate is blown out of its service

position.

[0028] The possibility is considered that the underside of the support plate comprises a plurality of ridges, preferably perpendicular and covering the whole surface of said underside, with the object of lightening the piece, conserving its mechanical resistance, allowing for the housing of any foreign object between said ridges, like for example stones, which could be found on the bearing area at the time of installation of the support plates.

[0029] On the other hand, the bearing area can comprise a plurality of stubs, situated on the upper side and preferably two to each side of the central span, which are configured to allow for the stacking of the support plates, with the resulting saving of time and space during the operations of transport and storage thereof.

[0030] The possibility is considered that the support plate comprises, on each side of the central span, at least two rail splice alignment ridges on the upper side, which flank the contact slits according to an alignment thereof, i.e. according to a direction parallel to the rail. Each alignment ridge is bearing area a complementary ridge, configured to be used in the subassembly, the complementary ridges remaining on the outer side of each alignment ridge, with respect to the central span of the support plate, the rail splice or elastic clip remaining immobilized in an optimal position.

[0031] Preferably, the support plate of the invention is made of a plastic material, with the resulting savings in its manufacture by injection, being lighter and easier to transport and store. Specifically, the support plate is made of polyamide with fibre-glass, even being able to be self-extinguishing VO.

[0032] Therefore, in accordance with the invention disclosed, the support plate for flexible fastening of railway rails that the invention proposes constitutes an advance in the fastenings used until now, and resolves the problem previously stated in a completely satisfactory way, in the line of allowing an elastic and efficient fastening in only one piece, with the resulting economic savings and installation advantages.

DESCRIPTION OF THE DRAWINGS

[0033] To complete the description being made and with the object of helping towards a better understanding of the invention's characteristics, in accordance with a preferred practical embodiment example thereof, a set of illustrative and non-limitative drawings are included as an integral part of said description, which represents the following:

Figure 1. Shows a perspective view of the support plate proposed by the invention, wherein its upper side can be observed, configured to be in contact with the rail flange.

Figure 2. Shows a perspective view of the support plate in its service position, wherein a fastened rail with the support plate of the inven-

tion can be observed.

Figure 3. Shows a cross-section of the view shown in figure 2, according to a plan perpendicular to the rail.

5 Figure 4. Shows a perspective view of the support plate proposed by the invention, wherein its underside, configured to be in contact with a bearing area, can be observed.

10 PREFERRED EMBODIMENT OF THE INVENTION

[0034] In view of the figures shown, it can be observed how one of the possible embodiments of the invention relates to a support plate (1) for flexible fastenings of railway rails that has a symmetric single-piece configuration with respect to a half-imaginary axis perpendicular to the rail (21), said support plate (1) comprising means of guiding and supporting a rail (21) on a bearing area (18), which can be a smooth cement or concrete surface, such as wooden and concrete rail-bearers, said support plate (1) comprising two contact slits (5) and two rail shoes (9) on each side of the central span (12), which are two slots configured to house and receive curved areas (10) that has a rail splice (6) in an area opposite that of contact of said rail splice (6) with a rail (21) flange (22).

[0035] With the object of guiding the rail (21), an upper part of the support plate (1) comprises a flat and lowered central span (12) that is configured to be in contact and support the rail (21) flange (22), said central span (12) having an appropriate incline for the seat of said rail (21).

[0036] On the other hand, the support plate (1) comprises two through-holes (3) and two cylindrical slits (2), one through-hole (3) and one cylindrical slit (2) situated on each side of the central span (12) between two contact slits (5). Each cylindrical slit (2) is aligned according to a direction perpendicular to the rail (21) with the through-hole (3), said through-holes (3) being configured to house a rail screw (4) to secure the support plate (1) to a rail splice (6) or elastic clip.

[0037] Each cylindrical slit (2) is flanked, according to a direction parallel to the rail (21), by two contact slits (5), configured to be in contact with a rail splice (6) or elastic clip, which at the same time is configured to make contact with the rail (21) flange (22) and immobilize it, for which reason the contact slits (5) have the shape of the rail splice (6) in said contact area.

An underside (15) of the support plate (1) comprises a polygonal area (19), specifically of hexagonal configuration, in the through-holes (3), configured to house the head of a rail screw (4).

[0038] On the other hand, the support plate (1) comprises six securing holes (11), spaced out evenly in each outer area (20) and aligned according to a direction parallel to the rail (21), said securing holes (11) being configured to allow the securing of the support plate (1) to any type of bearing area (18).

[0039] Furthermore, the central span (12) is configured

to house an elastic insulating base plate configured at the same time to be in contact with the rail (21) flange (22), with the object of avoiding breakages of the support plate (1). Likewise, the central span (12) comprises, at perpendicular ends of the rail (21), two cross-sectional studs (14) configured to immobilize said insulating base plate (13) in its position on the central span (12).

[0040] The underside (15) of the support plate (1) comprises a plurality of ridges (16) that cover the entire surface of said lower part (15), as can be observed in figure 4.

[0041] Likewise, the support plate (1) comprises four stubs (17), situated on the upper side, two being on each side of the central span (12), which are configured to allow for a stacking of the support plates (1).

[0042] The support plate (1) comprises, on each side of the central span (12), two alignment ridges (7) of the rail splice (6) on the upper side, which flank the contact slits (5). Each alignment ridge (7) is bearing area a complementary ridge (8), configured to be used in the sub-assembly, the complementary ridges (8) remaining on the outer side of each alignment ridge (7), respect to the central span (12) of the support plate (1), the rail splice (6) remaining immobilized in an optimal position.

[0043] Preferably, the support plate (1) of the invention is made of polyamide with self-extinguishing VO fibre-glass.

[0044] In view of this description and set of figures, the person skilled in the art will be able to understand that the embodiments of the invention described can be combined in multiple ways within the object of the invention. The invention has been described according to preferred embodiments thereof, but for the person skilled in the art it will be evident that multiple variations can be implemented in said preferred embodiments without exceeding the object of the claimed invention.

Claims

1. A support plate with a rail splice for flexible fastening of a railway rail (21), said support plate (1) comprising:

a unitary construction comprising a top surface;
a plurality of receiving members raised from the top surface;

a plurality of railway shoes (9), each railway shoe (9) comprising a slot made in the top surface; and

wherein the rail splice (6) comprises a plurality of first portions and a plurality of second portions having a curved area (10), the first portions being spaced from the second portions, each railway shoe (9) receiving a respective one of the second portions of the rail splice (6) and the plurality of receiving members receiving a respective one of the first portions,

characterised in that the support plate (1) fur-

ther comprises a plurality of alignment ridges (7) for the rail splice (6) on the top surface, each alignment ridge (7) comprising a bearing area and a complementary ridge (8), and wherein the unitary construction is manufactured by injection and made of polyamide with fiberglass.

2. Support plate with a rail splice according to claim 1, wherein the support plate (1) has an upper part that comprises a flat and lowered central span (12) that is configured to be in contact with and support a rail (21) flange (22), said central span (12) having an incline for the seat of said rail (21).

3. Support plate with a rail splice according to any of the previous claims, wherein the support plate comprises at least two through-holes (3), one through-hole (3) situated on each side of the central span (12) between the receiving members (5), each one of said through-holes (3) configured to house a rail screw (4) to secure the support plate to the rail splice (6).

4. Support plate with a rail splice according to claim 3, wherein the support plate comprises an underside (15), where the through-holes (3) comprise a polygonal area (19) configured to house a head of a rail screw (4).

5. Support plate with a rail splice according to any of the previous claims, wherein the support plate comprises a plurality of securing holes (11) in each outer area (20), configured to secure the support plate to a bearing area (18).

6. Support plate with a rail splice according to any of claims 2 to 5, wherein the central span (12) is configured to house an elastic insulating base plate (13) configured to be in contact with the rail (21) flange (22).

7. Support plate with a rail splice according to claim 6, wherein the central span (12) comprises two cross-sectional studs (14) configured to immobilize the elastic insulating base plate (13).

8. Support plate with a rail splice according to any of claims 4 to 7, wherein the underside (15) comprises a plurality of ridges (16).

9. Support plate with a rail splice according to any of claims 2 to 8, wherein the support plate comprises a plurality of stubs (17) configured to stack the support plates.

10. Support plate with a rail splice according to claim 1, wherein each receiving member comprises an indentation for cooperatively receiving the respective

one of the first portions of the rail splice.

Patentansprüche

1. Stützplatte mit einer Schienenlasche für die flexible Befestigung von Eisenbahnschienen (21), wobei die Stützplatte (1) umfasst:

eine einteilige Konstruktion, umfassend eine obere Fläche;
eine Vielzahl von Aufnahmeelementen, die sich von der oberen Fläche erheben;
eine Vielzahl von Schienenschuhen (9), wobei jeder Schienenschuh (9) eine Nut aufweist, die in der Oberfläche ausgebildet ist; und
wobei die Schienenlasche (6) eine Vielzahl von ersten Abschnitten und eine Vielzahl von zweiten Abschnitten umfasst, die einen gebogenen Bereich (10) aufweisen, wobei die ersten Abschnitte die zweiten Abschnitte beabstanden, jeder Schienenschuh (9) jeweils ein Ende der zweiten Abschnitte der Schienenlasche (6) aufnimmt und die Vielzahl der Aufnahmeelemente jeweils einen der ersten Abschnitte aufnehmen, **dadurch gekennzeichnet, dass** die Stützplatte (1) des Weiteren eine Vielzahl von Ausrichtungserhöhungen (7) für die Schienenlasche (6) an der oberen Fläche umfassen, wobei jede Ausrichtungserhöhung (7) eine Auflagefläche und eine Komplementärerhöhung (8) umfasst und wobei die einteilige Konstruktion durch Spritzguss gefertigt wird und aus Polyamid mit Glasfaser besteht.

2. Stützplatte mit einer Schienenlasche nach Anspruch 1, wobei die Stützplatte (1) einen oberen Teil aufweist, der einen flachen und abgesenkten Mittelbereich (12) umfasst, der dazu eingerichtet ist, mit dem Flansch (22) einer Schiene (21) in Kontakt zu stehen und diesen zu stützen, wobei dieser Mittelbereich (12) eine Neigung für den Sitz der Schiene (21) aufweist.
3. Stützplatte mit einer Schienenlasche nach einem der vorhergehenden Ansprüche, wobei die Stützplatte mindestens zwei Durchgangsbohrungen (3) aufweist, jeweils eine Durchgangsbohrung (3) auf jeder Seite des Mittelbereichs (12) zwischen den Aufnahmeelementen (5) angeordnet ist, die Durchgangsbohrungen (3) jeweils dazu eingerichtet sind, eine Schienenschraube (4) aufzunehmen, damit die Stützplatte an der Schienenlasche (6) befestigt werden kann.
4. Stützplatte mit einer Schienenlasche nach Anspruch 3, wobei die Stützplatte eine Unterseite (15) umfasst, und die Durchgangsbohrungen (3) einen polygona-

len Bereich (19) umfassen, der zum Aufnehmen eines Kopfes einer Schienenschraube (4) ausgebildet ist.

5. Stützplatte mit einer Schienenlasche nach einem der vorhergehenden Ansprüche, wobei die Stützplatte in jedem Außenbereich (20) eine Vielzahl von Befestigungsbohrungen (11) aufweisen, die dazu eingerichtet sind, die Stützplatte an einer Auflagefläche (18) zu befestigen.
6. Stützplatte mit einer Schienenlasche nach einem der Ansprüche 2 bis 5, wobei der Mittelbereich (12) zur Aufnahme einer elastischen, dämpfenden Grundplatte (13) eingerichtet ist, die dafür ausgelegt ist, mit dem Flansch (22) der Schiene (21) in Kontakt zu stehen.
7. Stützplatte mit einer Schienenlasche nach Anspruch 6, wobei der Mittelbereich (12) zwei quer verlaufende Riegel (14) umfasst, die dazu eingerichtet sind, die elastische, dämpfende Grundplatte (13) zu immobilisieren.
8. Stützplatte mit einer Schienenlasche nach einem der Ansprüche 4 bis 7, wobei die Unterseite (15) eine Vielzahl von Rippen (16) umfasst.
9. Stützplatte mit einer Schienenlasche nach einem der Ansprüche 2 bis 8, wobei die Stützplatte eine Vielzahl von Stützen (17) umfasst, die zum Stapeln der Stützplatten eingerichtet sind.
10. Stützplatte mit einer Schienenlasche nach Anspruch 1, wobei jedes Aufnahmeelement eine Vertiefung umfasst, um zusammenwirkend den entsprechenden ersten Abschnitt der Schienenlasche aufzunehmen.

Revendications

1. Plaque support dotée d'une plaque d'assemblage de rail pour la fixation flexible d'un rail de chemin de fer (21), ladite plaque support (1) comprenant :

une construction monobloc comprenant une surface de dessus ;
une pluralité d'organes de réception rehaussés par rapport à la surface de dessus ;
une pluralité de butées de chemin de fer (9), chaque butée de chemin de fer (9) comprenant une encoche réalisée dans la surface de dessus ; et
dans laquelle la plaque d'assemblage de rail (6) comprend une pluralité de premières portions et une pluralité de secondes portions ayant une zone incurvée (10), les premières portions étant

espacées des secondes portions, chaque butée de chemin de fer (9) recevant une portion respective des secondes portions de la plaque d'assemblage de rail (6) et la pluralité d'organes de réception recevant une portion respective des premières portions,

caractérisée en ce que la plaque support (1) comprend en outre une pluralité de crêtes d'alignement (7) pour la plaque d'assemblage de rail (6) sur la surface de dessus, chaque crête d'alignement (7) comprenant une zone d'appui et une crête complémentaire (8), et dans laquelle la construction monobloc est fabriquée par injection et constituée de poly(amide) avec de la fibre de verre.

2. Plaque support dotée d'une plaque d'assemblage de rail selon la revendication 1, dans laquelle la plaque support (1) comporte une partie supérieure qui comprend une travée centrale plate et abaissée (12) qui est configurée pour être en contact avec et supporter un patin (22) de rail (21), ladite travée centrale (12) comportant une pente pour l'assise dudit rail (21).

3. Plaque support dotée d'une plaque d'assemblage de rail selon l'une quelconque des revendications précédentes, dans laquelle la plaque support comprend au moins deux trous traversants (3), un trou traversant (3) étant situé de chaque côté de la travée centrale (12) entre les organes de réception (5), chacun desdits trous traversants (3) étant configuré pour loger une vis de rail (4) afin d'arrimer la plaque support à la plaque d'assemblage de rail (6).

4. Plaque support dotée d'une plaque d'assemblage de rail selon la revendication 3, dans laquelle la plaque support comprend une sous-face (15), où les trous traversants (3) comprennent une zone polygonale (19) configurée pour loger une tête d'une vis de rail (4).

5. Plaque support dotée d'une plaque d'assemblage de rail selon l'une quelconque des revendications précédentes, dans laquelle la plaque support comprend une pluralité de trous d'arrimage (11) dans chaque zone externe (20), configurés pour arrimer la plaque support à une zone d'appui (18).

6. Plaque support dotée d'une plaque d'assemblage de rail selon l'une quelconque des revendications 2 à 5, dans laquelle la travée centrale (12) est configurée pour loger une plaque de base isolante élastique (13) configurée pour être en contact avec le patin (22) de rail (21).

7. Plaque support dotée d'une plaque d'assemblage de rail selon la revendication 6, dans laquelle la tra-

vée centrale (12) comprend deux montants en coupe (14) configurés pour immobiliser la plaque de base isolante élastique (13).

8. Plaque support dotée d'une plaque d'assemblage de rail selon l'une quelconque des revendications 4 à 7, dans laquelle la sous-face (15) comprend une pluralité de crêtes (16).

9. Plaque support dotée d'une plaque d'assemblage de rail selon l'une quelconque des revendications 2 à 8, dans laquelle la plaque support comprend une pluralité d'ergots (17) configurés pour empiler les plaques supports.

10. Plaque support dotée d'une plaque d'assemblage de rail selon la revendication 1, dans laquelle chaque organe de réception comprend une indentation pour recevoir coopérativement la portion respective des premières portions de la plaque d'assemblage de rail.

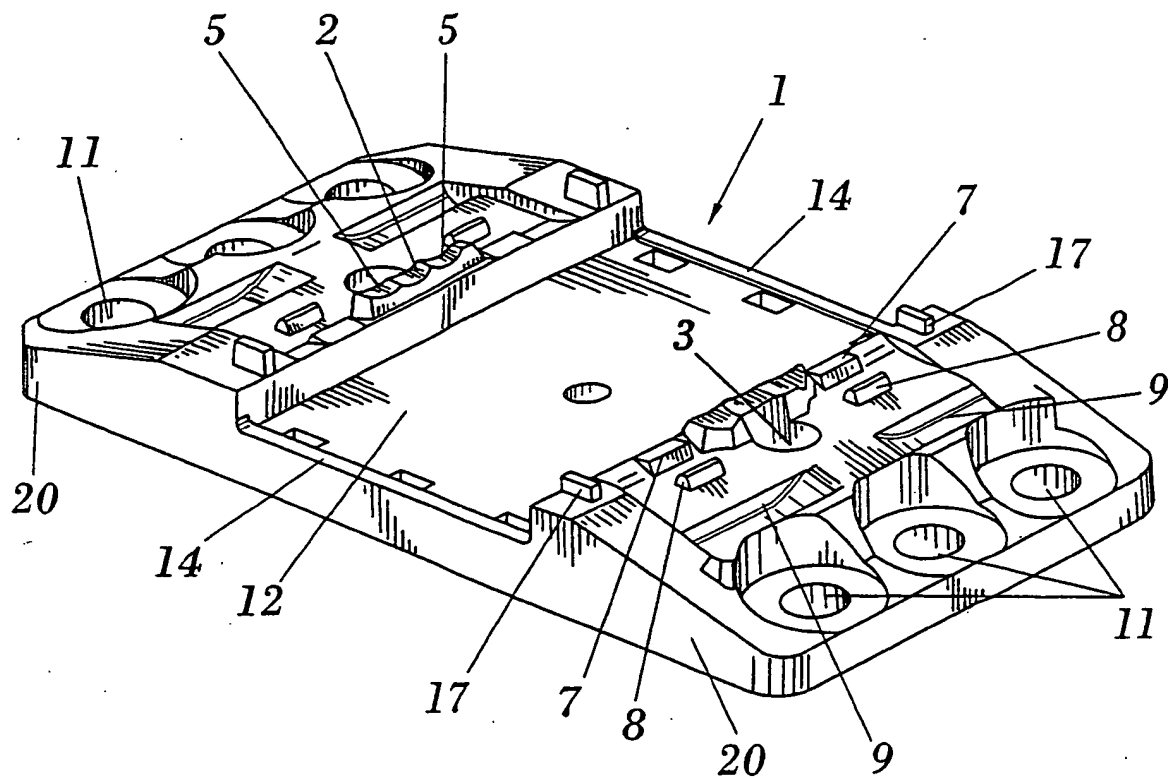


FIG. 1

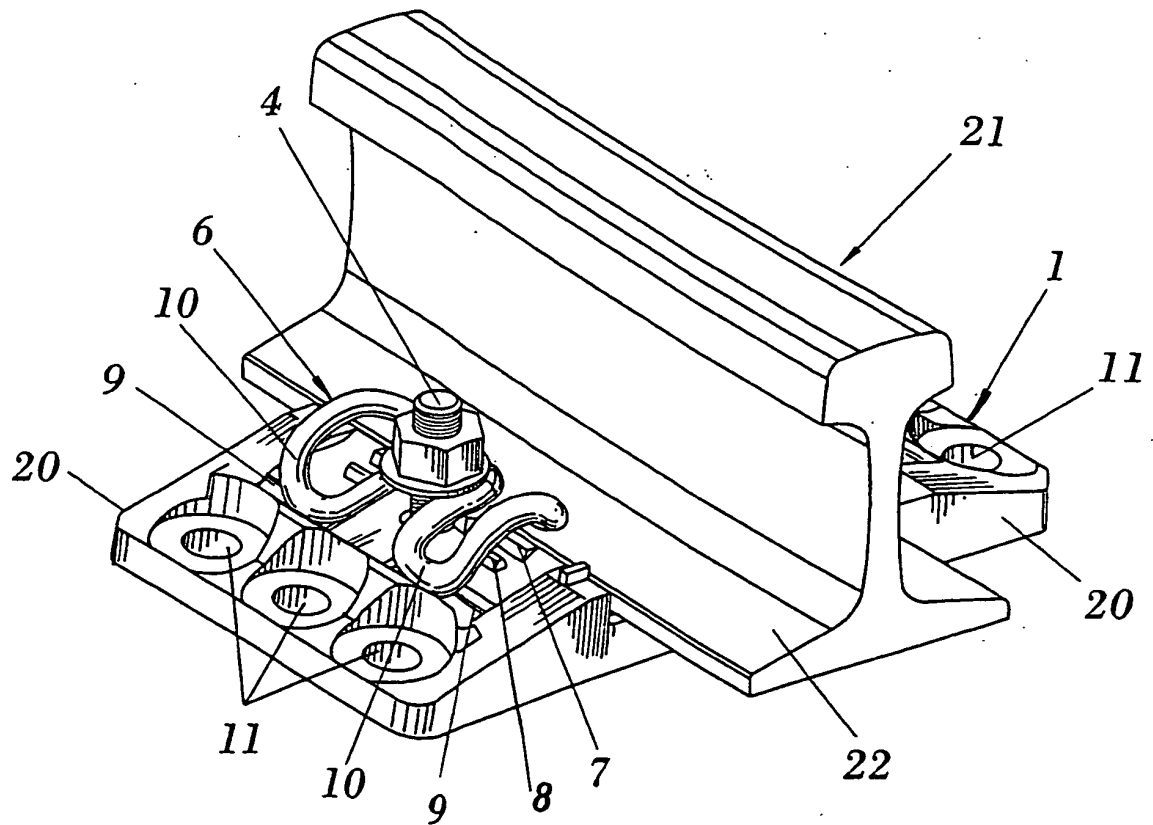
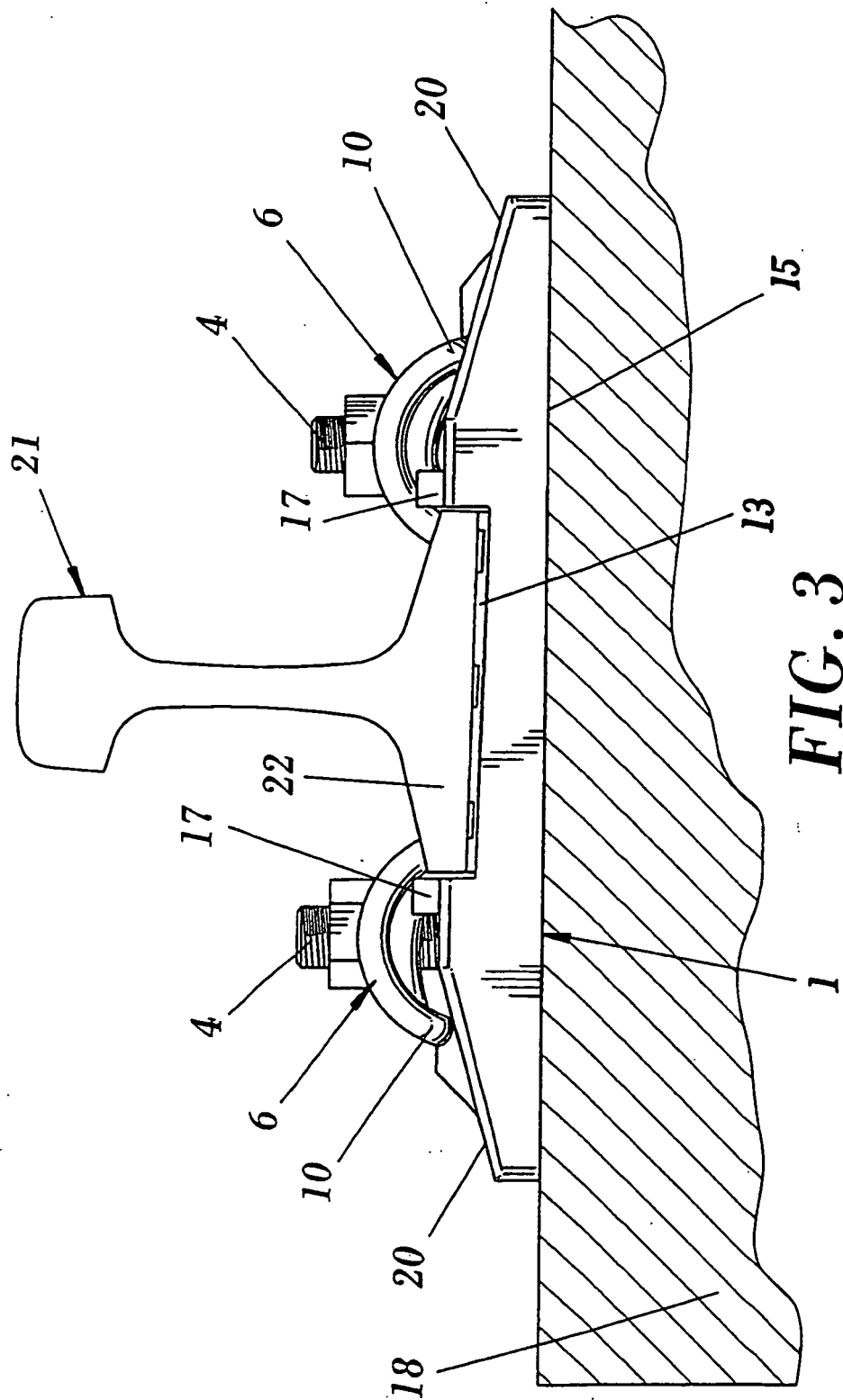


FIG. 2



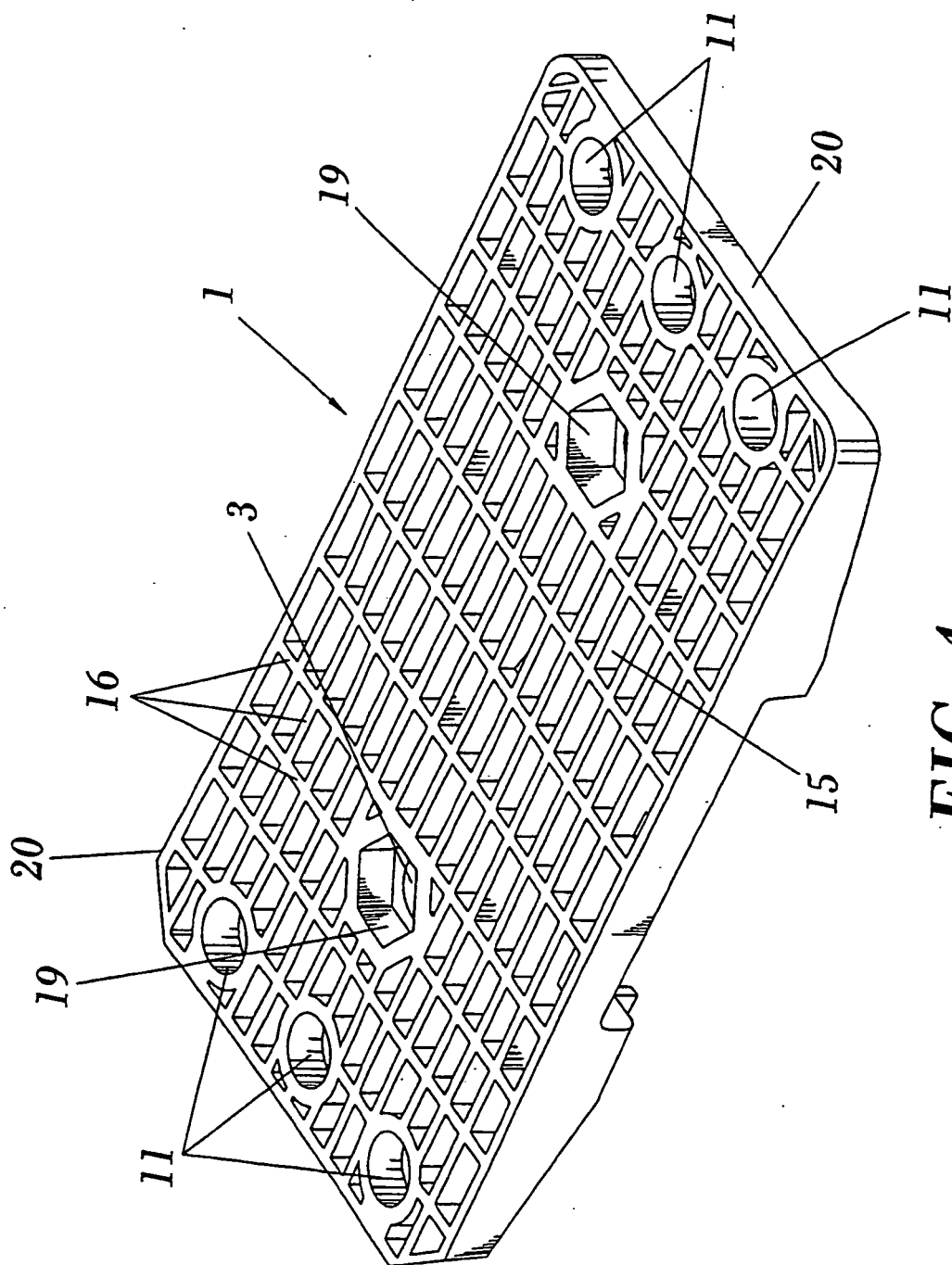


FIG. 4

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- ES 285328 [0005]
- EP 0295685 A [0005]
- US 3439874 A [0010]
- ES 2160529 [0012]
- EP 0767274 A [0012]
- WO 03012204 A1 [0013]