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(54) ROAD BARRIER WITH MOTORCYCLISTS PROTECTION

(57) Road barrier (1) comprising: a series of supporting posts (2), which are adapted to be fixed firmly to the ground (P) in a substantially vertical position, one spaced side by side the other along the lateral edge of the carriageway; a series of first oblong cross-beams (3), which are fixed firmly to the supporting posts (2) in a substantially horizontal position and one following the other, so as to form a first longitudinal retaining band (4), which extends along the lateral edge of the carriageway at a predetermined height above the ground (P); and a longitudinal motorcyclist-protection structure (10) comprising a second longitudinal retaining band (13), separate and distinct from said first longitudinal retaining band (4), which extends spaced apart beneath said first longitudinal retaining band (4) and is directly and substantially exclusively supported by said first longitudinal retaining band (4).

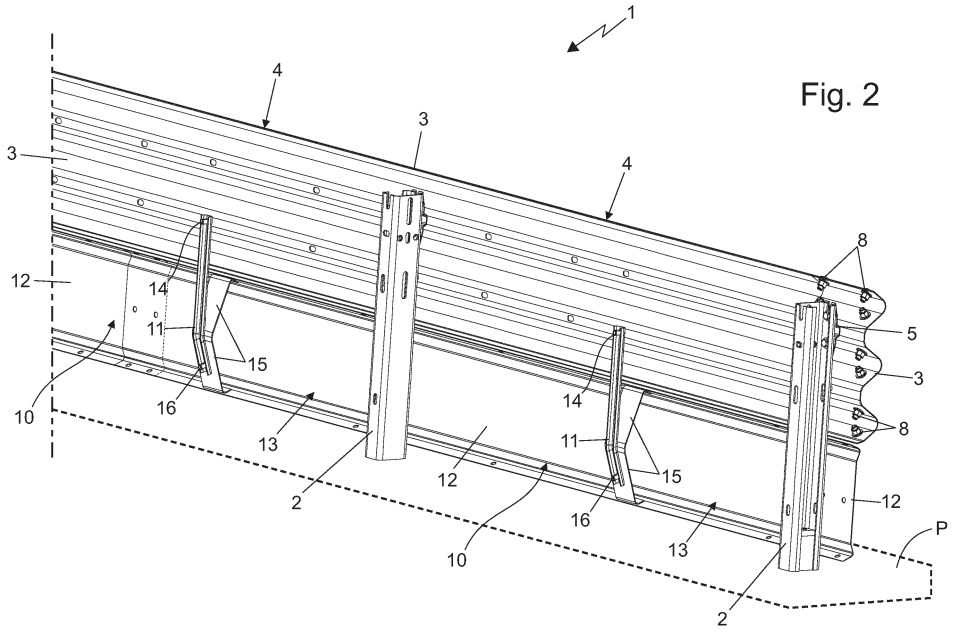

Fig. 2

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Description

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

[0001] This application claims priority over Italian Patent Application No. 102023000024426 filed on 17 November 2023, the contents of which are incorporated herein by reference.

TECHNICAL FIELD

[0002] The present invention relates to a road barrier with motorcyclists protection.

[0003] More specifically, the present invention relates to a programmed-deformation, discontinuous road barrier with motorcyclists protection. Use to which the following disclosure will make explicit reference without thereby losing generality.

STATE OF THE ART

[0004] As is known, road barriers are fixed structures that are placed along the lateral edge of the carriageway and are adapted to hold, within the carriageway, a car or other vehicle for transporting goods and/or persons of medium to large dimensions, which should accidentally impact against the same road barrier.

[0005] Among the most popular road barriers on the market there are the discontinuous, programmed-deformation road barriers.

[0006] These road barriers, traditionally called "guard-rails", are basically made up of a series of supporting posts, which are made of metal and are driven into the ground in a substantially vertical position, one spaced side by side the other along the lateral edge of the carriageway; and of a series of ribbonlike cross-beams with a double- or triple-wave profile, which are made of metal, are fixed to the supporting posts in a horizontal position and one after the other, at a predetermined height above the ground, and are butt-fixed one to the other via special through bolts, so as to form a longitudinal retaining band, which extends seamlessly along the lateral edge of the carriageway.

[0007] More specifically, the ribbonlike cross-beams with double- or triple- wave profiles are fastened to the supporting posts so that the longitudinal retaining band is roughly at the same height as the bumpers of cars and other vehicles for transporting goods and/or persons that travel on the roads.

[0008] Clearly, the supporting posts and ribbonlike cross-beams with a double- or triple- wave profile are specifically structured and dimensioned to retain, within the carriageway, a car or other vehicle for transporting goods and/or persons of medium to large dimensions, which might accidentally impact against the road barrier in the event of an accident.

[0009] Unfortunately, while fulfilling its purpose very well, the structure of discontinuous-type road barriers, with supporting posts and ribbonlike cross-beams with a doubleor triple- wave profile, can be an extremely dangerous obstacle for motorcyclists that, in case of fall-off, accidentally crash into the road barrier.

[0010] In fact, it happens very often that the motorcyclist, following the fall-off, continues his ride, sliding on the road surface until he hits one of the supporting posts of the road barrier located on the side of the road, resulting in particularly serious traumatic injuries, even in case of a low-speed impact.

[0011] In addition, supporting posts and/or double- or triple-wave ribbonlike cross-beams sometimes have sharp edges that unfortunately can be lethal for the motorcyclist impacting at high speed.

[0012] To overcome this problem, some manufacturers of road barrier have developed discontinuous road barriers provided with an additional protective structure, which prevents the motorcyclist from impacting on the supporting posts of the road barrier.

[0013] In patent application EP1455020 A1, for example, there is described a road barrier with cyclists protection, which comprises, in addition to the traditional horizontal ribbonlike cross-beams with a double- or triple-wave profile, also a series of horizontal ribbonlike cross-beams with a fretted profile, which are arranged horizontally, spaced beneath the longitudinal containment band formed by the horizontal ribbonlike cross-beams with double- or triple-wave profile, and are fastened to the supporting posts of the road barrier by means of spacers with programmed-deformation structure, which deform in the event of impact by the motorcyclist.

[0014] In the patent application EP2088247 A2, on the other hand, there is describes a road barrier comprising, in addition to the traditional horizontal ribbonlike cross-beams with a double- or triple- wave profile, a series of straight metal section-bars with omega profile, which are arranged horizontally and one after the other, spaced beneath the longitudinal containment band formed by the horizontal ribbonlike cross-beams with a double- or triple-wave profile, and are fixed directly to the supporting posts of the road barrier by means of metal strips.

[0015] Unfortunately, several experimental tests have shown that the motorcyclist that impacts on the road barriers described above often suffers anyway fairly high decelerations , with all the physical problems this entails.

SCOPE OF THE INVENTION

[0016] Aim of the present invention is to realise a discontinuous-type road barrier, which offers better protection to motorcyclists in the event of an accident and which is, at the same time, easy and cheap to install.

[0017] In accordance with these aims, according to the present invention there is provided a road barrier with motorcyclists protection as defined in Claim 1 and preferably, though not necessarily, in any one of the claims dependent thereon.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] The present invention will now be described with reference to the accompanying drawings, which show a nonlimiting embodiment thereof, wherein:

- Figure 1 is a perspective view of the front part of a road barrier realized according to the teachings of the present invention, with parts removed for clarity's sake;
- Figure 2 is a perspective view of the rear part of the road barrier shown in figure 1, with parts removed for clarity's sake;
- Figure 3 is a side view of the road barrier shown in Figures 1 and 2, with parts in section and parts removed for clarity's sake; whereas
- Figure 4 is a side view of a variation of the road barrier shown in Figures 1 and 2, with parts in section and parts removed for clarity's sake.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0019] With reference to Figures 1, 2 and 3, number 1 denotes, as a whole, a road barrier adapted to be installed long the lateral edge of the carriageway, with the function of holding, within the carriageway, a car or other vehicle for transporting goods and/or persons of medium to large dimensions, which should accidentally impact against the same road barrier 1.

[0020] The road barrier 1 is adapted to be firmly anchored to the ground P along the lateral edge of the carriageway, and comprises: a series of supporting posts 2 preferably made of metallic material, which are fixed/adapted to be firmly fixed to the ground P in a substantially vertical position, one spaced side by side the other along the lateral edge of the carriageway; and a series of oblong cross-beams 3 preferably made of metallic material, which are firmly fixed to the supporting posts 2 in a substantially horizontal position and one after the other, at a predetermined height above the ground, so as to form a longitudinal containment band 4 that extends along the lateral edge of the carriageway roughly parallel to the ground P.

[0021] More specifically, supporting posts 2 are preferably substantially straight and are preferably structured to be driven into the ground in a substantially vertical position.

[0022] Clearly, the road barrier 1 could also be a bridge-side road barrier or similar. In this case, the supporting posts 2 could be fixed directly to the reinforced concrete, advantageously by means of anchor plates and/or anchor bolts placed at the lower ends of the supporting posts 2.

[0023] The oblong cross-beams 3, on the other hand, are preferably substantially rectilinear and are preferably fixed rigidly to the lateral side of the supporting posts 2 preferably via the interposition of special connecting brackets 5 advantageously made of metallic material, which are preferably structured so as to keep the oblong cross-beams 3 roughly grazing the supporting posts 2.

[0024] More specifically, the connecting brackets 5 are preferably structured so as to keep the oblong cross-beams 3 at a nominal distance d_1 from the supporting posts 2 less than or equal to 3-4 cm (centimetres).

[0025] In other words, the connection brackets 5 are preferably fixed cantilevered on the lateral side of the supporting posts 2 at a predetermined height above the ground, advantageously by means of one and more pass-through anchoring bolts 6, and the oblong cross-beams 3 are fixed directly to the connection brackets 5 advantageously by means of one and more pass-through anchoring bolts 7.

[0026] In addition, the oblong cross-beams 3 are preferably butt-fixed to one another so as to form a longitudinal retaining band 4, which extends seamlessly along the lateral edge of the carriageway.

[0027] More specifically, the oblong cross-beams 3 preferably have ribbonlike structure.

[0028] In addition, the oblong and ribbonlike cross-beams 3 preferably overlap to one another at their respective ends, and are preferably rigidly fixed to one another by means of at least one or, more conveniently, a plurality of pass-through connecting bolts 8, which are adapted to tighten, one against the other, the ends of two consecutive oblong cross-beams 3.

[0029] With reference to Figures 1, 2 and 3, in the example shown, in particular, the supporting posts 2 preferably have an overall length ranging between 1 and 2 m (metres) and/or are preferably made of steel.

[0030] More in detail, the supporting posts 2 preferably consist of straight metal section-bars advantageously with a substantially U- or C- shaped cross-section. Clearly, these straight metal section-bars may also have an IPE, HE, sigma, etc. profile.

[0031] Preferably, the supporting posts 2 are moreover driven into the ground so that the protruding section has an overall length ranging between 80 and 130 cm (centimetres), and more conveniently equal to about 100 cm.

[0032] Oblong cross-beams 3, on the other hand, have an overall length preferably ranging between 4 and 6 m (metres) and more conveniently equal to about 5 m (metres), and are preferably made of steel.

[0033] More in detail, the oblong cross-beams 3 preferably consist of ribbonlike straight metal section-bars advantageously with a double- or triple- wave profile.

[0034] The longitudinal containment band 4, therefore, preferably has a double- or triple- wave profile.

[0035] Preferably, the nominal thickness of the metal sheet forming these straight and ribbonlike metal section-bars with a double or triple-wave profile moreover ranges between 2 and 6 mm and is advantageously equal to about 3 mm (millimetres).

[0036] Preferably oblong cross-beams 3 furthermore have a nominal width ranging between 45 and 55 cm (centimetres) and more conveniently equal to about 50 cm.

[0037] With reference to Figure 3, in addition, the oblong cross-beams 3 are preferably placed at a minimum height h from ground advantageously ranging between 40 and 50 cm (centimetres), and more conveniently equal to about 45 cm.

[0038] As a consequence, the longitudinal retaining band 4 is located at a minimum height h from ground preferably ranging between 40 and 50 cm (centimetres), and more conveniently equal to about 45 cm.

[0039] If envisaged, the connecting brackets 5, on the other hand, preferably consist of ribbonlike metal slats which are bent substantially in the shape of a Ω (omega) and are advantageously arranged with the two ends abutting on the side of the supporting post 2. Preferably also the ribbonlike slats are moreover made of steel.

[0040] With reference to Figures 1, 2 and 3, the road barrier 1 is furthermore provided with a longitudinal motorcyclists-protection structure 10, which extends roughly parallel to the ground P beneath the longitudinal retaining band 4, and is adapted to prevent the motorcyclist, in event of a fall-off and subsequent sliding on the road surface, to accidentally go beyond the longitudinal retaining band 4 passing beneath the latter and possibly also to violently impacting against one or more supporting posts 2.

[0041] This longitudinal motorcyclist-protection structure 10 in particular is provided with a second longitudinal containment band, separate and distinct from the longitudinal containment band 4, which extends more or less parallel to the ground P spaced beneath the main longitudinal containment band 4, and is supported directly by the longitudinal containment band 4. Preferably this second longitudinal containment band is moreover spaced from the supporting posts 2.

[0042] More specifically, the longitudinal containment band of the longitudinal motorcyclists-protection structure 10 is rigidly fixed/attached to the longitudinal containment band 4 above.

[0043] In other words, the longitudinal containment band of the longitudinal motorcyclists-protection structure 10 hangs rigidly below the main longitudinal containment band 4.

[0044] In addition, the longitudinal containment band of the longitudinal motorcyclists-protection structure 10 is preferably also supported substantially exclusively by the longitudinal containment band 4.

[0045] In more detail, the longitudinal containment band of the longitudinal motorcyclists-protection structure 10 extends roughly parallel to the main longitudinal containment band 4 and/or to the ground P, while remaining at a distance d_2 from the main longitudinal containment band 4 preferably greater than or equal to 1 cm (centimetres) and/or lower than or equal to 20 cm (centimetres).

[0046] Preferably, the longitudinal containment band of the longitudinal motorcyclists-protection structure 10 moreover extends roughly parallel to the main longitudinal containment band 4 and/or the ground P, while remaining at a maximum distance d_3 from the ground P preferably greater than or equal to 2 cm (centimetres) and/or lower than or equal to 15 cm (centimetres).

[0047] With reference to Figures 1, 2 and 3, the longitudinal motorcyclist-protection structure 10 preferably comprises: a series of supporting arms 11 preferably made of metallic material, which are firmly fixed to the longitudinal containment band 4, or rather to the oblong cross-beams 3, and extend cantilevered downwards one parallel to and spaced apart from the other, up to arrive at predetermined distance from the ground P below advantageously ranging between 4 and 10 cm (centimetres); and a second series of oblong cross-beams 12 preferably made of metallic material, which are firmly fixed on the supporting arms 11 in a substantially horizontal position and one following the other at a predetermined height above the ground, so as to form a second longitudinal containment band 13, which extends more or less parallel to the ground P, roughly beneath the longitudinal containment band 4.

[0048] Preferably the width and/or the stiffness of the longitudinal retaining band 13 is/are moreover lower than that of the longitudinal retaining band 4.

[0049] More in detail, the supporting arms 11 are preferably substantially rectilinear and preferably extend cantilevered from the main longitudinal retaining band 4, or rather from the oblong cross-beams 3, in a substantially vertical direction.

[0050] In addition, the upper end of the supporting arms 11 is preferably structured in so as to be rigidly fastened to the longitudinal retaining band 4, or rather to the oblong cross-beams 3, by means of at least one pass-through anchoring bolt 14.

[0051] Preferably the lower end of the supporting arms 11 is bent towards the carriageway, i.e. it is bent towards the side opposite to the supporting posts 2.

[0052] More specifically, the lower end of the supporting arms 11 is inclined with respect to the vertical by an angle preferably ranging between 15° and 25°.

[0053] With reference to Figures 1, 2 and 3, the oblong cross-beams 12, on the other hand, are preferably substantially straight, and are preferably rigidly fixed to the lower ends of the various supporting arms 11.

[0054] More in detail, the oblong cross-beams 12 are preferably located beside the lower ends of the various supporting arms 11, and are preferably fixed in rigid manner to the various supporting arms 11 via the interposition of special connecting brackets 15 advantageously made of metallic material, which preferably have a programmed-deformation structure and are preferably structured so as to keep the oblong cross-beams 12 suspended almost grazing the ground P.

[0055] In other words, the connecting brackets 15 are preferably fixed in rigid manner to the lower ends of the supporting arms 11 advantageously via at least one pass-through anchoring bolt 16, and the oblong cross-beams 12 are fixed directly to the connecting brackets 15 advantageously by means of one and more pass-through

anchoring bolts 17.

[0056] In addition, similarly to the oblong cross-beams 3, the oblong cross-beams 12 are preferably butt-fixed one to the other so as to form a longitudinal retaining band 13, which extends seamlessly along the lateral edge of the carriageway.

[0057] More in detail, even the oblong cross-beams 12 preferably have a ribbonlike structure.

[0058] In addition, the oblong and ribbonlike cross-beams 12 preferably overlap ton one another at their respective ends, and are preferably fixed in rigid manner to one another via at least one or, more conveniently, a plurality of pass-through connecting bolts 20, which are adapted to tighten one against the other the ends of two consecutive oblong cross-beams 12.

[0059] Preferably, the nominal width w of oblong and ribbonlike cross-beams 12 is moreover smaller than that of the oblong cross-beams 3.

[0060] With reference to Figures 1, 2 and 3, in the example shown, in particular, the supporting arms 11 preferably have an overall length ranging between 40 and 60 cm (centimetres) and/or are preferably made of steel.

[0061] More in detail, the supporting arms 11 preferably consist of straight metal section-bars, advantageously with a substantially U- or C-shaped cross-section.

[0062] The oblong cross-beams 12, on the other hand, have an overall length preferably shorter than that of oblong cross-beams 3 and advantageously ranging between 2 and 4 m (metres) and more conveniently equal to about 3,5 m (metres), and/or are preferably made of steel.

[0063] Preferably, the oblong cross-beams 12 are moreover arranged spaced beneath the oblong cross-beams 3, or rather beneath the main longitudinal retaining band 4, at a distance d_2 from the latters advantageously ranging between 2 and 4 cm (centimetres).

[0064] More specifically, in the example shown, the oblong cross-beams 12 preferably consist of straight and ribbonlike metal section-bars, advantageously with C-bent or C-curved lateral edges in order to give the correct stiffness/ flexibility to the element and to protect the motorcyclist's upper limbs from cuts.

[0065] In other words, the oblong cross-beams 12 preferably have a substantially flat central band and two side bands, which flank the central band on opposite sides of the latter, and are bent or curved towards the supporting posts 2 behind.

[0066] Preferably, the nominal thickness of the metal sheet forming said metal ribbonlike section-bars with the later edges C-bent or C-curved is moreover lower than the nominal thickness of the metal ribbonlike section-bars with a doubleor triple- wave profile that form the oblong cross-beams 3.

[0067] More specifically, the nominal thickness of the metal sheet forming said metal ribbonlike section-bars with curved later edges preferably ranges between 2 and 4 mm, and is advantageously equal to about 3 mm (millimetres).

[0068] Preferably oblong cross-beams 12 moreover have a width w ranging between 35 and 45 cm (centimetres) and more conveniently equal to about 40 cm.

[0069] Preferably, the oblong cross-beams 12 are moreover fixed to the supporting arms 11 advantageously via the interposition of connecting brackets 15, so as to extend substantially parallel to the ground P, at a distance d_2 from the oblong cross-beams 3 advantageously equal to about 3 cm (centimetres) and/or at a distance from the ground P advantageously equal to about 2 cm.

[0070] As a consequence, the second longitudinal containment band 13 extends more or less parallel to the ground P, at a distance from the longitudinal containment band 4 advantageously equal to about 3 cm (centimetres) and/or at a distance from the ground P advantageously equal to about 2 cm (centimetres).

[0071] With reference to Figures 2 and 3, on the other hand, the connecting brackets 15 preferably consist of ribbonlike metal slats, which are substantially V-bent, have their two ends rigidly fixed to the oblong cross-beam 12 preferably by means of a pair of pass-through bolts 17, and are finally fixed in rigid manner to the lower end of the supporting arms 11 near the central elbow preferably via the pass-through bolts 16.

[0072] More specifically, each V-bent ribbonlike metal slat is preferably arranged substantially coplanar to the corresponding supporting arm 11, and its two ends are fixed to the oblong cross-beam 12 one at the upper longitudinal edge and the other at the lower longitudinal edge of the oblong cross-beam 12.

[0073] In other words, the connecting brackets 15 are preferably structured so as to connect the related supporting arm 11 simultaneously to both major longitudinal edges of the oblong cross-beam 12.

[0074] Operation of road barrier 1 is easily inferable from the above.

[0075] The longitudinal retaining band 13 formed by the oblong cross-beams 12 is at a height from ground such that it is hit by the motorcyclist that, as a result of a fall-off, slides on the road surface up to impact against the road barrier 1.

[0076] The supporting arms 11, the oblong cross-beams 12 and the connecting brackets 15 of the longitudinal motorcyclist-protection structure 10 are suitably shaped/dimensioned so as to plastically deform on impact of the motorcyclist against the longitudinal containment band 13.

[0077] Since it is released from the supporting posts 2 that concur in forming the more rigid part of the road barrier 1, the longitudinal motorcyclist-protection structure 10 has a greater capacity to deform following the impact of the motorcyclist, thus more progressively absorbing the motorcyclist's kinetic energy.

[0078] In the event of a collision, in fact, the kinetic energy of the motorcyclist is substantially entirely ab-

sorbed by the oblong cross-beams 12, the connecting brackets 15 and the supporting arms 11, which bend/deform substantially without involving the other (more rigid) metal parts of the road barrier 1.

[0079] The advantages connected to the particular structure of the lower longitudinal retaining band 13 of the bar road barrier 1 are remarkable.

[0080] Experimental tests according to the UNI CENT TS 17342 standard have shown that, in event of impact with the lower longitudinal retaining band 13, the motorcyclist undergoes significantly less deceleration than in the event of impact against traditional road barriers, with the resulting lower physical damage.

[0081] In addition, the longitudinal motorcyclists-protection structure 10 is made up of components that are relatively cheap to produce, with the savings this entails.

[0082] Last but not least, the longitudinal motorcyclists-protection structure 10 is moreover suited for installation on traditional "guard-rail" type road barriers (i.e. having a longitudinal containment band advantageously with a double- or triple- wave profile) already installed along the carriageway, because it requires only minor structural modifications (the holes for the pass-through anchoring bolts 14) to the longitudinal containment band of the road barrier.

[0083] Finally, it is clear that modifications and variations may be made to the road barrier 1 described above 1 without however departing from the scope of the present invention.

[0084] For example, with reference to figure 4, in a more sophisticated embodiment, the oblong cross-beams 3 are fixed in rigid manner to the lateral side of the supporting posts 2 by the interposition of special spacer elements 105 advantageously made of metal material, which are structured so as to keep the oblong cross-beams 3 at a nominal distance d_1 from the supporting posts 2 greater than 5-6 cm (centimetres) and advantageously also lower than 80 cm (centimetres).

[0085] In other words, the spacer elements 105 are preferably fixed cantilevered on the lateral side of the supporting posts 2 at a given height from ground, advantageously by means of at least one and more conveniently a plurality of pass-through connecting bolts 6, and the horizontal cross-beams 3 are fixed directly to the spacer elements 105 advantageously by means of at least one and more conveniently a plurality of pass-through connecting bolts 7.

[0086] Preferably the spacer elements 105 moreover have a programmed-deformation structure.

[0087] More specifically, in the example shown, the spacer elements 105 are preferably dimensioned so as to keep the oblong cross-beams 3 at a nominal distance d_1 ranging between 8 and 12 cm (centimetres) and more conveniently equal to about 9-10 cm (centimetres).

[0088] Clearly, the spacer elements 105 could also be dimensioned so as to keep the oblong cross-beams 3 at a nominal distance d_1 from the supporting posts 2 greater than 12 cm (centimetres) and more conveniently equal to approximately 45-50 cm (centimetres).

[0089] In the example shown, moreover, the spacer elements 105 preferably basically consist of rectilinear metal section-bars of given length and advantageously with a substantially U- or C-shaped cross-section, which are arranged in abutment on the lateral side of the supporting posts 2 preferably with their longitudinal axis substantially parallel to the longitudinal axis of the supporting post 2.

[0090] The spacer elements 105 allow to arrange the longitudinal retaining band 13 at a greater distance from the supporting posts 2, thus increasing the deformation space of the longitudinal motorcyclist-protection structure 10.

[0091] Finally, in a not-shown alternative embodiment, the upper ends of the supporting posts 2 could be connected to one another by horizontal stringers preferably made of metal material.

Claims

1. A road barrier (1) with motorcyclists protection comprising: a series of supporting posts (2), which are adapted to be firmly fixed to the ground (P) in a substantially vertical position, one spaced side by side the other along the lateral edge of the carriageway; a series of first oblong cross-beams (3), which are firmly fixed to the supporting posts (2) in a substantially horizontal position and one after the other, so as to form a first longitudinal containment band (4) that extends along the lateral edge of the carriageway at a predefined height from the ground (P); and a longitudinal motorcyclists-protection structure (10) arranged beneath said first longitudinal containment band (4) ;
the road barrier (1) being **characterized in that** said longitudinal motorcyclists-protection structure (10) comprises a second longitudinal containment band (13), separate and distinct from said first longitudinal containment band (4), which extends spaced beneath the first longitudinal containment band (4) and is directly supported by said first longitudinal containment band (4).

2. The road barrier according to Claim 1, wherein said second longitudinal containment band (13) is connected in rigid manner to said first longitudinal containment band (4) .

3. The road barrier according to Claim 1 or 2, wherein the width (w) and/or the stiffness of the second longitudinal containment band (13) is/are less than those of the first longitudinal containment band (4).

4. The road barrier according to any one of the preceding claims, wherein the longitudinal motorcyclists-protection structure (10) comprises: a series of sup-

porting arms (11), which are firmly fixed to the first longitudinal containment band (4) and extend cantilevered downwards, parallel and spaced beside to one another, up to arrive at a predefined distance from the ground (P) beneath; and a series of second oblong cross-beams (12), which are firmly fixed to said supporting arms (11) in a substantially horizontal position and one after the other, so as to form said second longitudinal containment band (13).

5. The road barrier according to Claim 4, wherein the second oblong cross-beams (12) have a ribbonlike structure.

6. The road barrier according to Claim 4 or 5, wherein the second oblong cross-beams (12) are butt-fixed to one another so as to form a second longitudinal containment band (13) that seamlessly extends along the lateral edge of the carriageway.

7. The road barrier according to claim 4, 5 or 6, wherein the second oblong cross-beams (12) are located beside the lower ends of the supporting arms (11).

8. The road barrier according to Claim 4, 5, 6 or 7, wherein the second oblong cross-beams (12) are fixed to the supporting arms (11) via the interposition of first connection brackets (15) with programmed-deformation structure.

9. The road barrier according to Claim 8, wherein the second oblong cross-beams (12) have a ribbonlike structure, and the first connection brackets (15) are structured so as to connect the respective supporting arm (11) simultaneously to both the major longitudinal edges of the facing second oblong cross-beam (12).

10. The road barrier according to any one of the preceding claims, wherein the second longitudinal containment band (13) extends roughly parallel to the first longitudinal containment band (4), at a distance (d_2) from the latter greater than or equal to 1 cm and/or less than or equal to 20 cm.

11. The road barrier according to any one of the preceding claims, wherein the second longitudinal containment band (13) extends roughly parallel to the ground (P), at a distance (d_3) from the latter greater than or equal to 2 cm and/or less than or equal to 15 cm.

12. The road barrier according to any one of the preceding claims, wherein the second longitudinal containment band (13) is supported substantially exclusively by said first longitudinal containment band (4).

13. The road barrier according to any one of the preceding claims, wherein the first oblong cross-beams (3) have a ribbonlike structure with double- or triple-wave profile.

14. The road barrier according to any one of the preceding claims, wherein the first oblong cross-beams (3) are butt-fixed to one another so as to form a first longitudinal containment band (4) that extends seamlessly along the lateral edge of the carriageway.

15. The road barrier according to any one of the preceding claims, wherein the first oblong cross-beams (3) are fixed to the lateral sides of the supporting posts (2) via the interposition of spacer elements (105) with programmed-deformation structure.

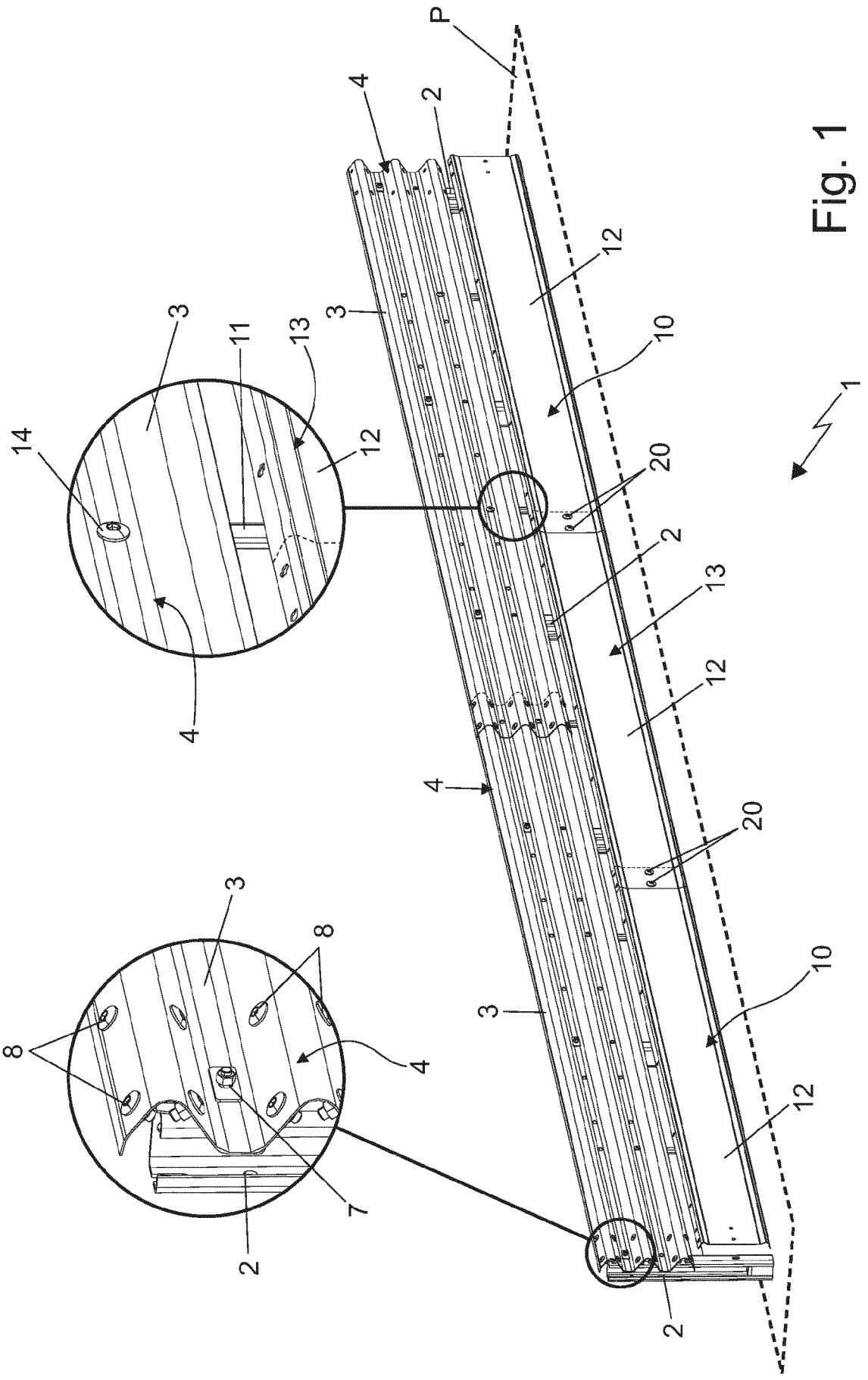
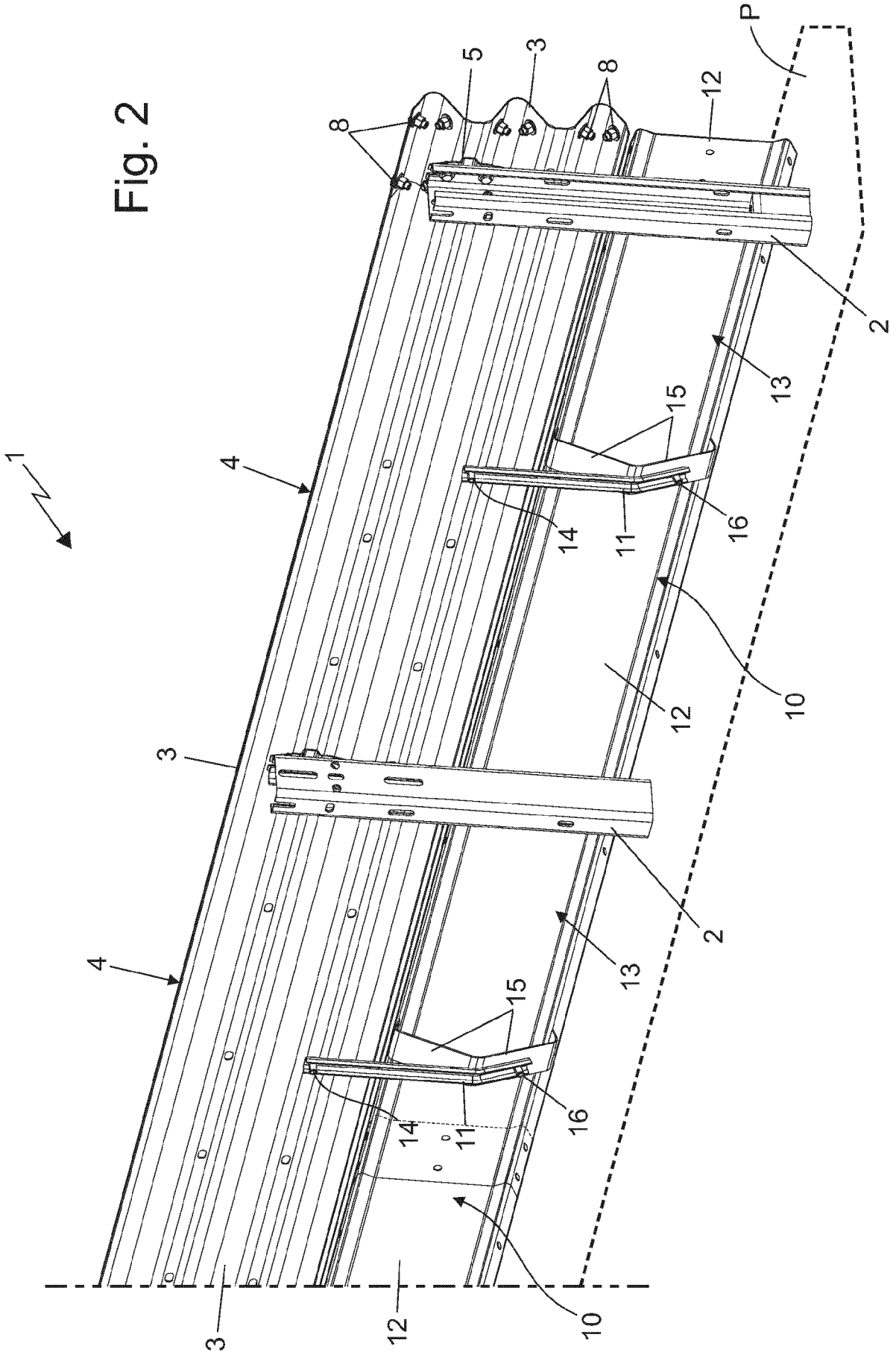


Fig. 1

Fig. 2



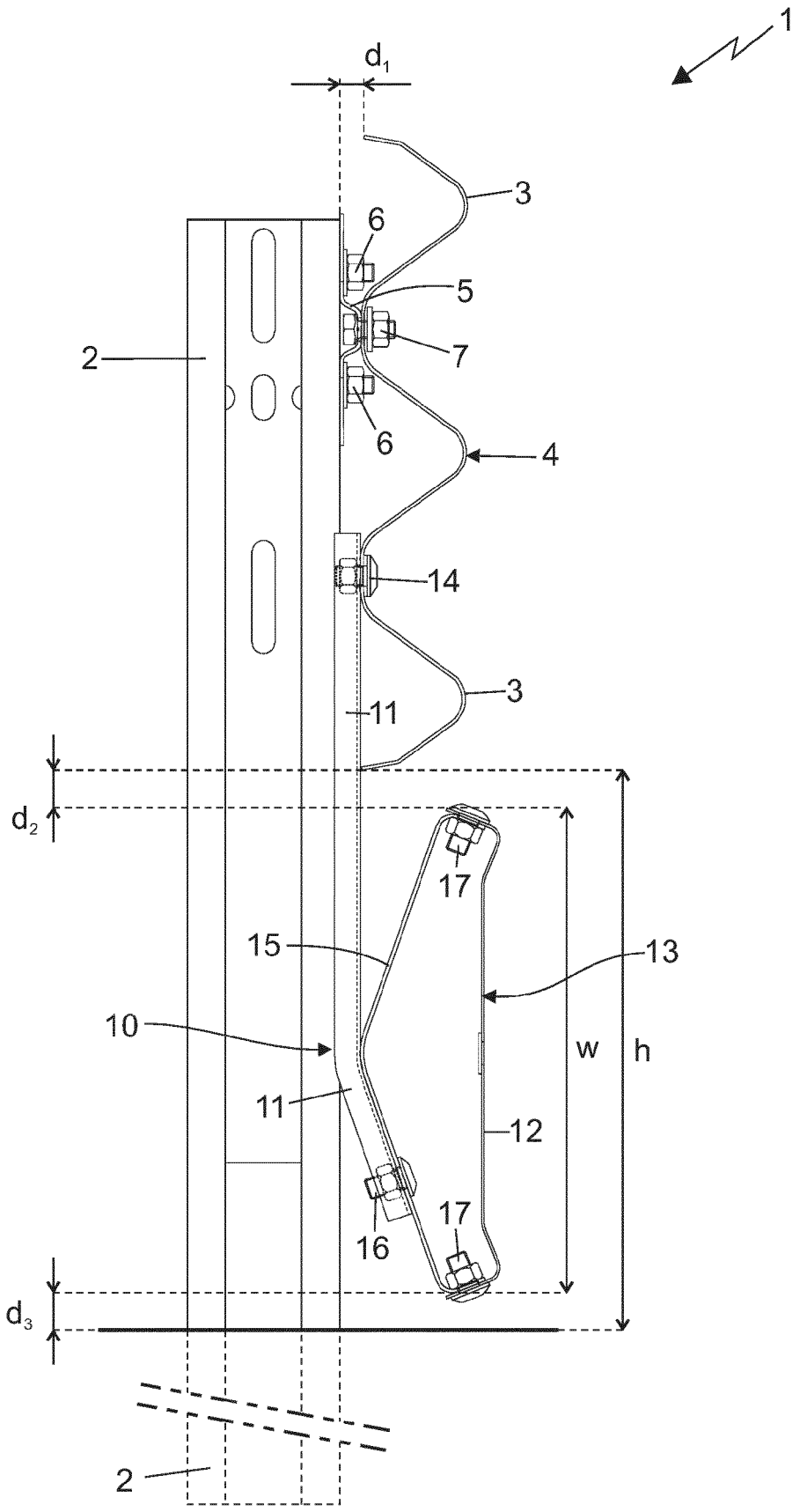


Fig. 3

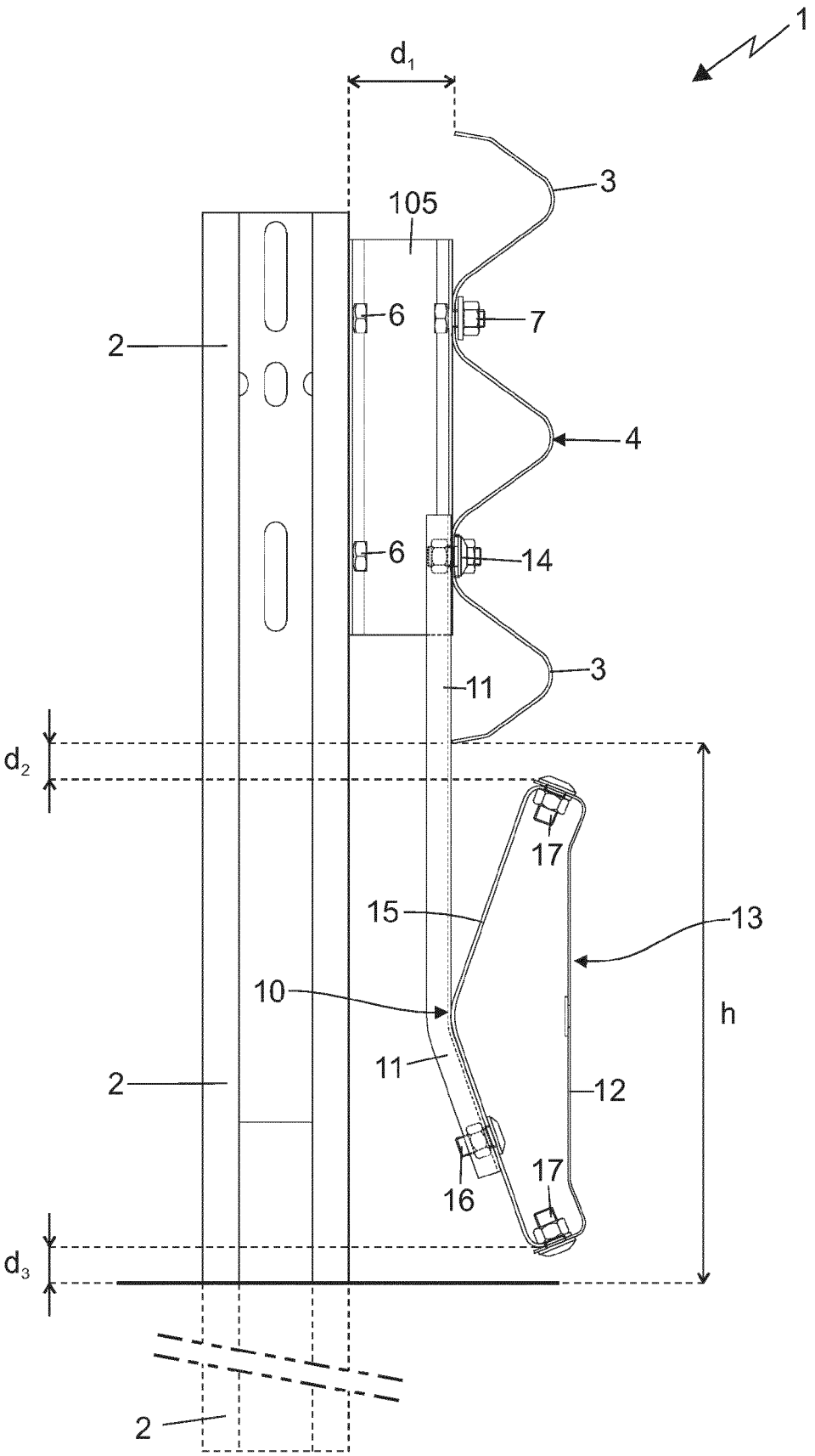


Fig. 4

Europäisches Patentamt
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EUROPEAN SEARCH REPORT

Application Number
EP 24 21 2965

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X A	EP 2 400 061 A2 (SENALIZACIONES VILLAR S A [ES]) 28 December 2011 (2011-12-28) * the whole document *	1-8 9-15	INV. E01F15/04
X	WO 2021/048453 A1 (ARROYO FERNANDEZ JOSE LUIS [ES]; GONZALEZ PINERA ANTONIO [ES] ET AL.) 18 March 2021 (2021-03-18) * page 9, line 8 - page 14, line 18; figures 1A-9B *	1-8	
X	DE 20 2005 009943 U1 (SGGT STRASENAUSSTATTUNGEN GMBH [DE]) 1 September 2005 (2005-09-01) * paragraphs [0020] - [0027]; figures 1-9 *	1-7	

TECHNICAL FIELDS SEARCHED (IPC)
E01F

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	18 March 2025	Flores Hokkanen, P

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 21 2965

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18-03-2025

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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