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(54) **Safety barrier for guard rails**

(57) It is of the type that is installed by securing to a post (1), the upper part of which comprises a barrier (2) that is perpendicular with respect to said post (1) and projects out with respect to the roadway (7) or verge (9), characterised in that it comprises: at least one flexible barrier (3), underneath and parallel to the barrier (2), pro-

jecting out with respect to the roadway (7), with two lateral fins with longitudinal tabs (4) and located at their ends, bent towards the post (1) and at least one bow (5) fixed at its centre to said post (1) underneath the barrier (2), the ends (6) of which are inserted inside the lateral fins with tab (4) in a sliding fashion, adopting a convex configuration with respect to the mentioned post (1).

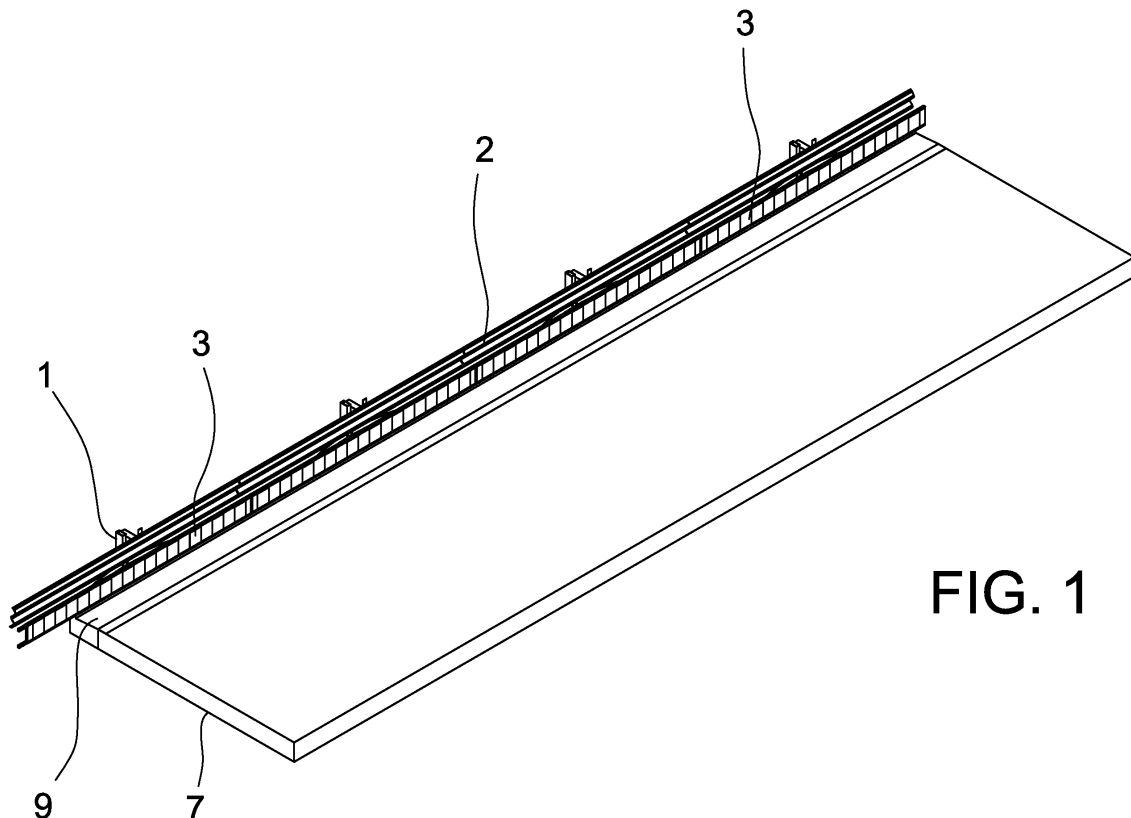
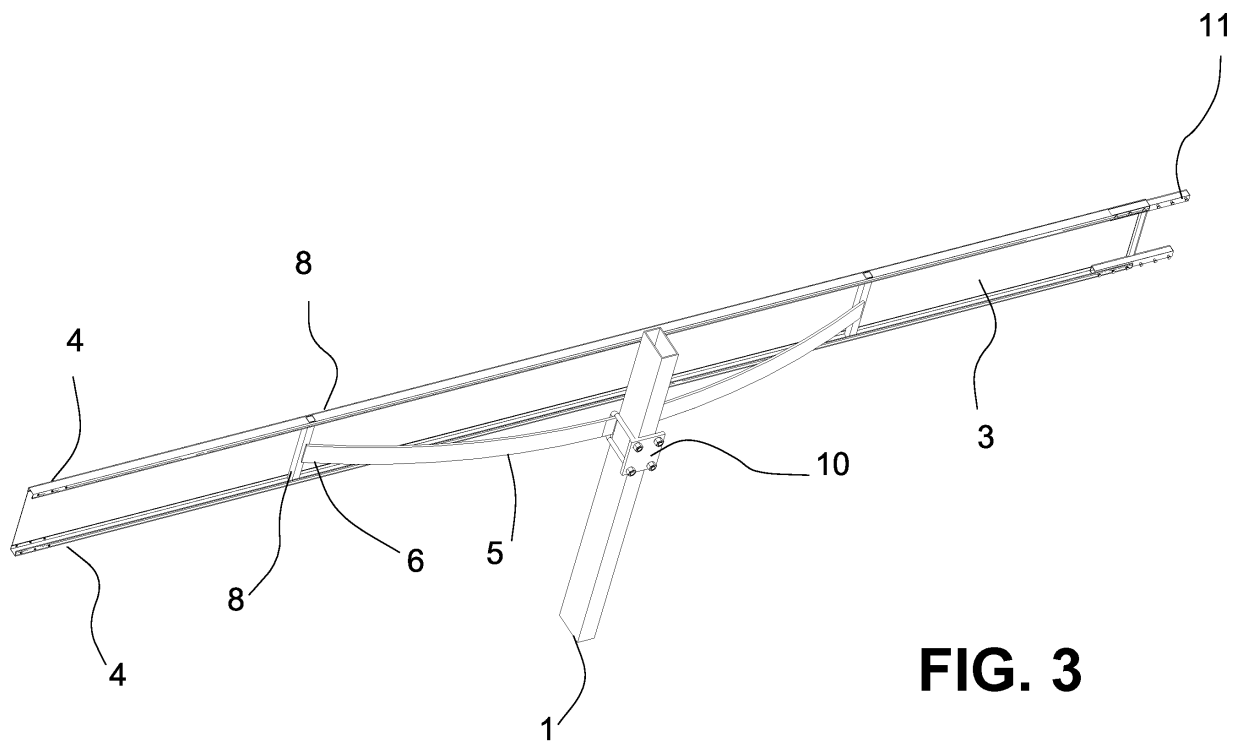


FIG. 1

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Description

[0001] A safety barrier for guard rails, of the type that is installed by securing to a post, the upper part of which comprises a barrier that is perpendicular with respect to said post and projects out with respect to the road way or verge, characterised in that it comprises at least one flexible barrier, underneath and parallel to the barrier, projecting out with respect to the roadway, with two lateral fins with longitudinal tabs and located at their ends, bent towards the post, together with at least one bow fixed at its centre to said post underneath the barrier, the ends of which are inserted inside the lateral fins with tab in a sliding fashion, adopting a convex configuration with respect to the mentioned post.

BACKGROUND OF THE INVENTION

[0002] Various types of guard rail protectors are known in the technical field. Some affect post protection, others on protection of the metal barrier and third group introduce one or more lower barriers to prevent motorcyclists sliding underneath.

[0003] Thus, Spanish patent No 200500537 (ES2288061) is known, in the name of Mr Carlos RAYÓN MARTÍN, from the year 2005, which refers to an elastic system for protecting motorcyclists in road containment systems. It is a device that is installed at the sides of roads and designed to improve motorcyclist safety in relation to safety barriers or railings in use. It consist of a continuous band of elastic material, eventually reinforced with longitudinal fibres or elements made of rubber, in general from used tyres, which are secured to the safety barrier posts and can acquire an initial installation tension which permits recovery after impacts. An elastic grille is fixed to this continuous longitudinal band in order to guarantee that no part of the motorcyclist can pass the system position during a collision. This is a more economic alternative to metal solutions because it makes use of recycled material.

[0004] Utility Model No 200701994 (ES1066189U) is also known, in the name of AMATEX, S.A., from the year 2007, which refers to a continuous system that can be installed on road barriers for motorcyclist safety, characterised in that it comprises lower screens securely fixed to the road barrier and/or its fixing posts by means of shock absorbers; with each lower screen structured into groups of boards and straps backed together in pairs and mounted on said shock absorbers, thus forming an angle of convergence with each shock absorber structured on an arm and a connecting part, the geometry and layout of which condition the cited angle of convergence of the lower screens.

[0005] European Patent No 1184515, also belongs to the technical field, in the name of SEC ENVEL, S.R.L., from the year 2001, which refers to a safety barrier to be installed along the length of vehicle roads, which includes at least one horizontal rails, secured to vertical supports

and also includes a lower screen described as "for protection" which presents two edges, respectively upper and lower, and designed to prevent a two-wheeled vehicle involved in an accident, sliding along the road and/or its driver who has fallen to the ground from passing underneath the rail, characterised in that the lower protection screen is suspended by means of arms that extend above the upper edge of the lower screen and fixed to the single rail or that rail which is closest to the ground, with the lower screen freely extending without any other means of securing other than the arms, in a substantially vertical average plane that is clearly located under the vertical supports with respect to an observer located on the road, with these arms being made of a material and having dimensions so that they form functional barrier elements, calibrated to flex non-elastically and allow the lower screen to pivot with resistance due to the effect of a significant impact received by said screen in case of a traffic accident.

DISCLOSURE OF THE INVENTION

[0006] The present invention is an improvement in the sector of inventions to protect motorcyclists against the dreaded guard rails.

[0007] The guard rail configuration comprises a post, usually H-shaped, which includes cutting edges and a rigid upper metal barrier arranged transversally with respect to said post which occasionally also includes cutting elements.

[0008] When a motorcyclist has an accident, falls from the motorbike and slides along the asphalt on reaching the guard rail, because this is projecting and elevated with respect to the roadway or verge, does not meet any resistance and passes underneath without any braking whatsoever.

[0009] If this person has the misfortune to strike the post, said post could cut off a member or even cause death.

[0010] The previously indicated solutions tend to prevent such injuries. Even so, in those cases in which the post is protected, the motorcyclist can still pass underneath without any control and could, for example, continue on over a precipice.

[0011] If it is protected with a lower protector, such as the object of this invention, the inventions belonging to the technical field are either economically unfeasible or do not produce the desired effect of reducing the impact.

[0012] The present invention is a great advance in the sector because, on the one hand, it prevents the motorcyclist from losing a member and, on the other, avoids the person from sliding uncontrollably underneath the metal barrier, it is simple and easy to install and lastly, reduces the impact so that the motorcyclist is not injured by the striking against the guard rail.

[0013] It essentially comprises an elastic barrier that is positioned below the metal barrier and secured to a post by a flexible bow, which is firmly fixed to the post

and the arms of which open more or less, depending on the pressure exerted on said elastic barrier when the motorcyclist strikes the elastic band.

[0014] Similarly, the use of a bow allows at least two points to exist to absorb the impact of the striking the flexible barrier, with these two points not being fixed as in the examples in the background, but can move instead. This provides the advantage that even when the motorcyclist impact happens near the previously cited point, the bow operates correctly with all its absorption capability.

[0015] Once installed, the bow adopts a convex configuration with respect to the post. This convex configuration provides longitudinal tension to each of the sections that make up the elastic barrier, thus permitting shock absorption and recovery after the impact.

[0016] Lastly, the inventor has included non-return safety mechanisms so that, in the assumption of an unexpected return of the elastic barrier towards its original position this is blocked by the guide stubs or tubes.

[0017] One objective of this invention is a safety barrier for guard rails, of the type that is installed by being fixed to a post which, at the top comprises a barrier perpendicular with respect to said post and project out with respect to the roadway or verge, characterised in that it comprises at least one flexible barrier, under and parallel to the barrier and projecting with respect to the roadway, with two lateral fins with longitudinal tabs and located at its ends, bend towards the post and at least one bow, fixed at its centre to the referred post, under the barrier, the ends of which are inserted into the side fins with tabs in a sliding fashion, adopting a convex configuration with respect to the mentioned post.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] In order to facilitate the description, this report is accompanied by three sheets of drawings that present a practical exemplary embodiment that is cited as for guideline purposes only and does not limit the scope of this present invention:

- Figure 1 is a perspective view of a barrier module and the roadway.
- Figure 2 is a perspective view of the objective of the invention, without the roadway or barrier,
- Figure 3 is a perspective rear view of Figure 2,
- Figure 4 shows details of the operation of the safety mechanism with a drill hole and
- Figure 5 shows details of the operation of the safety mechanism with a toothed billet.

SPECIFIC EXEMPLARY EMBODIMENT OF THE PATENT APPLICATION

[0019] Figure 1 illustrates a post 1, a barrier 2, flexible barriers 3 and a roadway 7 with its verge 9.

[0020] Figure 2 shows the post 1, the flexible barrier

3, a bow 5, connection means 11 and securing means 10 for the bow to the post.

[0021] Figure 3 includes the post 1, the flexible barrier 3, lateral fins with tabs 4, the bow 5, ends 6 of the bow, guide stubs 8, connection means 11 and securing means 10.

[0022] Figure 4 shows the tabs 4 the guide stubs 8 or tubes, an internal spring 22 and a drill hole 20.

[0023] Figure 5 illustrates the tabs 4, the guide stubs 8 or tubes, the internal spring 22 and a toothed billet 21 with its teeth 23.

[0024] Thus, in a specific exemplary embodiment, when an accident occurs in which the motorcyclist is sent sliding along the asphalt 7, the moment the guard rail is reached, the first thing encountered is the flexible barrier 3 which, in this embodiment is more advanced than the barrier 2 (metal), because the distance between the post 1 and the flexible barrier 3 is greater than the distance between the post 1 and the barrier 2.

[0025] Since barrier 3 is flexible, it absorbs the impact that could be received by the motorcyclist and, at the same time, its longitudinal configuration covers the post 1, so that it prevents problems of losing members that was described in the DISCLOSURE OF THE INVENTION and lastly, the motorcyclist is prevented from sliding uncontrollably under the barrier 2 of the guard rail.

[0026] The sequence is as follows: when the motorcyclist's body makes contact with the flexible barrier 3 it moves to inwards. This means that to maintain bow 5 arm integrity, the guide stubs 8 located at the ends of the bow 6 and positioned inside the lateral fins with tabs 4, enable the bow and flexible barrier to function like a slider and both move in opposite directions, with the guide stubs 8 moving in direction of the ends of the flexible barrier 3, and thus absorbing the impact.

[0027] Once the pressure caused by the motorcyclist against the flexible barrier 3 disappears, the flexible barrier 3 returns to its original position, producing the opposite movement to that described in the previous paragraph.

[0028] Various flexible barrier 3 sections can be joined by securing means 11, which could be connection pipes and rubber seals for enhanced protection and finish. This option could be highly beneficial because when the motorcyclist impact is produced against the flexible barrier 3 and the bow deforms absorbing part of the impact energy, the connection of the various flexible barriers 3 allows "collaboration" between them in absorbing said energy.

[0029] Similarly, the inventor has thought of the possibility that the first and last ends of the flexible barrier 3 where a module (a continuous series of flexible barriers) terminates, are curved, to avoid sharp elements.

[0030] Lastly, in order to increase safety still further, if this is possible, the inventor has developed a non-return safety mechanism based on the guide stubs 8 or tubes. At first, the inventor thought of the two that are shown, although more could be developed, all within the scope

of the present invention.

[0031] Thus, as can be seen, both in Figure 4 and in Figure 5, the mentioned guide stubs 8 or tubes comprise an internal spring 22 that partially covers the guide stubs 8 or tubes when these are inside the tabs 4.

[0032] The first of the proposed solutions (Figure. 4) would consist of the tabs 4 comprising at least one drill hole 20, with sufficient diameter for the guide stubs 8 or tubes to fit inside when they pass over said drill hole 20.

[0033] This means when, as a result of the impact, bow 5 deforms and the guide stubs 8 or tubes circulate inside the tabs 4, on returning, when said guide stub 8 or tube passes over the drill hole 20, the action of the internal spring 22 will push said guide stub 8 or tube towards the outside, causing it to pass through the drill hole 20, securing it and blocking the return of the flexible barrier 3.

[0034] In the second solution, shown in Figure 5 it comes from the installation of at least one toothed billet 21, which is fixed inside the tabs 4, the teeth 23 of which block the guide stubs 8 or tubes when they pass over said toothed billet 21. Wedge-shaped notches have been made at the ends of the guide stubs 8 or tubes, in order to facilitate the fitting of the teeth 23.

[0035] Thus, when an impact is produced against the flexible barrier 3, the guide stubs 8 or tubes move and overcome the resistance of the first tooth 23 on the toothed billet 21, depending on the impact, said guide stubs 8 or tubes move forward more teeth. In all cases, when the flexible barrier 3 tries to return, it is blocked by the anchoring between one tooth 23, which is pushed by the internal spring 22 and the guide stub 8 or tubes in the shape of a wedge.

[0036] The present invention describes a new safety barrier for guard rails. The examples described here do not limit the present invention, for which reason it may have various applications and/or adaptations, all within the scope of the following claims.

Claims

1. A safety barrier for guard rails, of the type that is installed by securing to a post (1), the upper part of which comprises a barrier (2) that is perpendicular with respect to said post (1) and projects out with respect to the roadway (7) or verge (9), **characterised in that** it comprises:

- at least one flexible barrier (3), underneath and parallel to the barrier (2), projecting out with respect to the roadway (7), with two lateral fins with longitudinal tabs (4) and located at their ends, bent towards the post (1) and
- at least one bow (5) fixed at its centre to said post (1) underneath the barrier (2), the ends (6) of which are inserted inside the lateral fins with tab (4) in a sliding fashion, adopting a convex configuration with respect to the mentioned post

(1).

2. A barrier, in accordance with claim 1, **characterised in that** the ends (6) of the bow comprise guide stubs (8) or tubes that are positioned inside the lateral fins with tabs (4).

3. A barrier, in accordance with claim 1, **characterised in that** the distance between the post (1) and the flexible barrier (3) is greater than the distance between the post (1) and the barrier (2).

4. A barrier, in accordance with claim 1, **characterised in that** because there are connection means (11) between barriers at the ends of the flexible barrier (3).

5. A barrier, in accordance with claim 1, **characterised in that** the first and last ends of the flexible barrier (3) where a module terminates, are curved.

6. A barrier, in accordance with claim 2, **characterised in that** it comprises a non-return mechanism for the bow (5) based on the guide stubs (8) or tubes.

7. A barrier, in accordance with claim 6, **characterised in that:**

- the guide stubs (8) or tubes comprise an internal spring (22) that partially covers the guide stubs (8) or tubes when these are inside the tabs (4), and
- the tabs (4) comprising at least one drill hole (20), with sufficient diameter for the guide stubs (8) or tubes to fit inside when they pass over said drill hole (20).

8. A barrier, in accordance with claim 6, **characterised in that:**

- the guide stubs (8) or tubes end in a wedge and comprise an internal spring (22) that partially covers said guide stubs (8) or tubes when these are inside the tabs (4), and
- at least one toothed billet (21), which is fixed inside the tabs (4), the teeth (22) of which block the guide stubs (8) or tubes when they pass over said toothed billet (21).

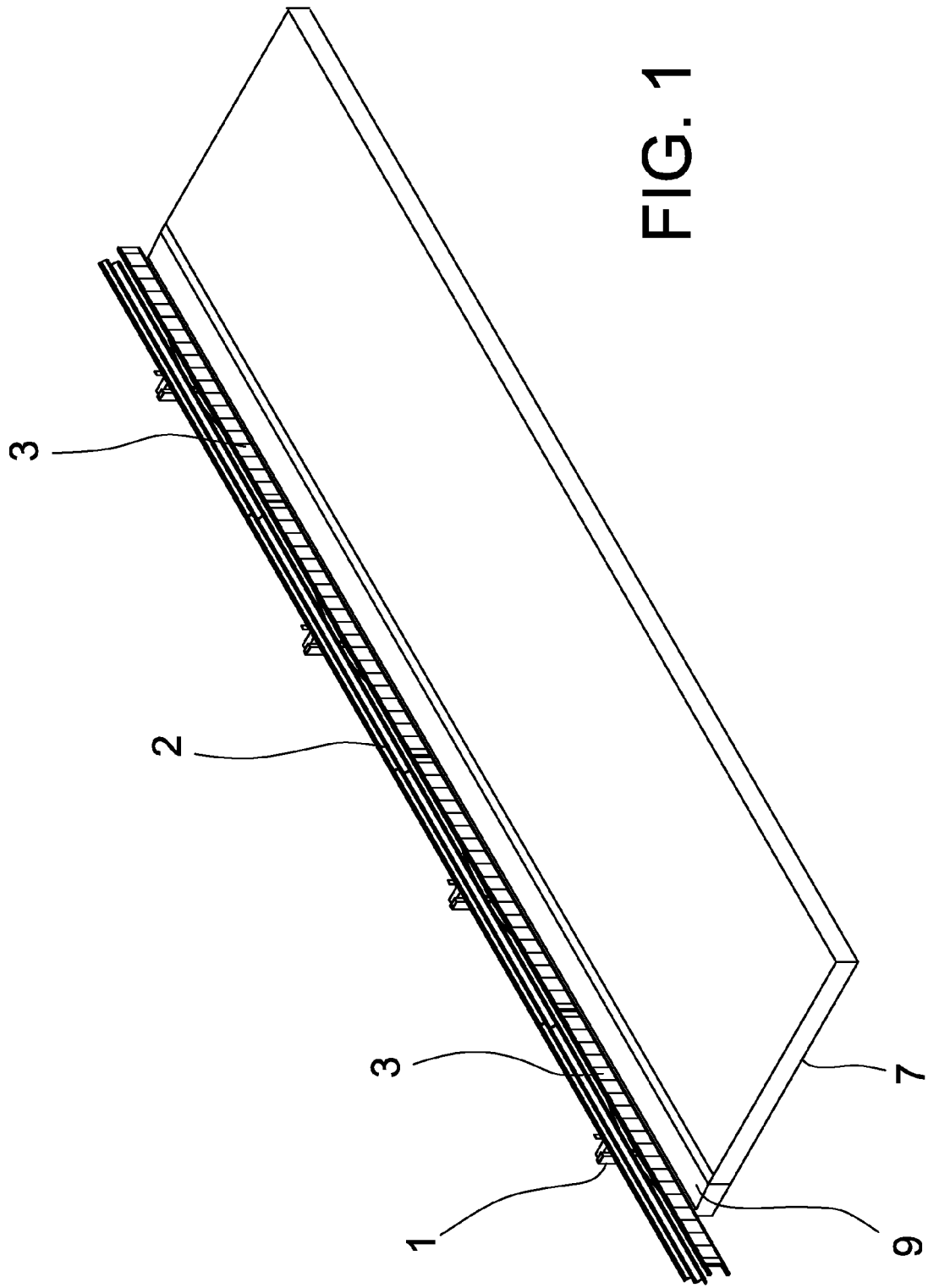


FIG. 1

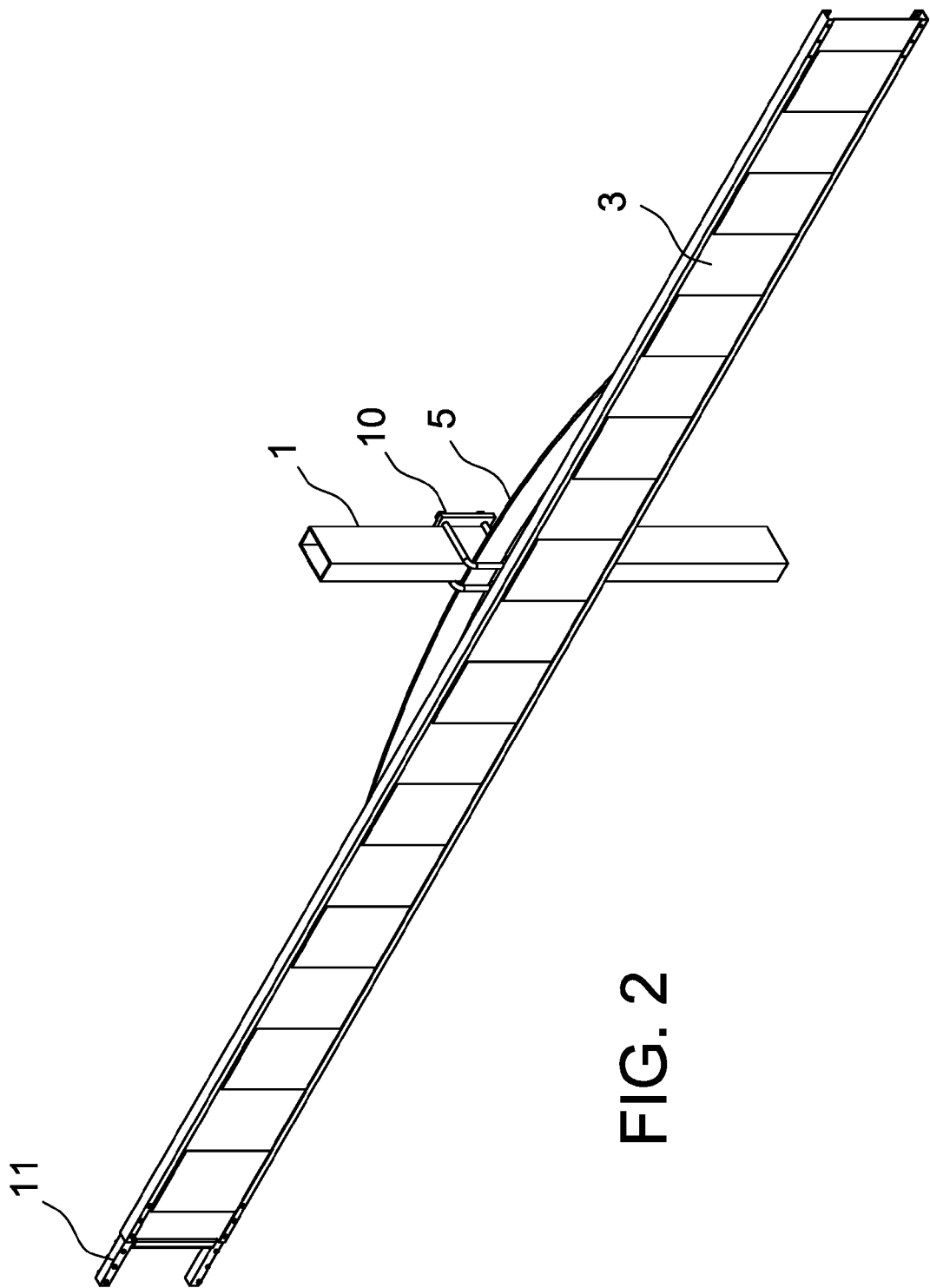


FIG. 2

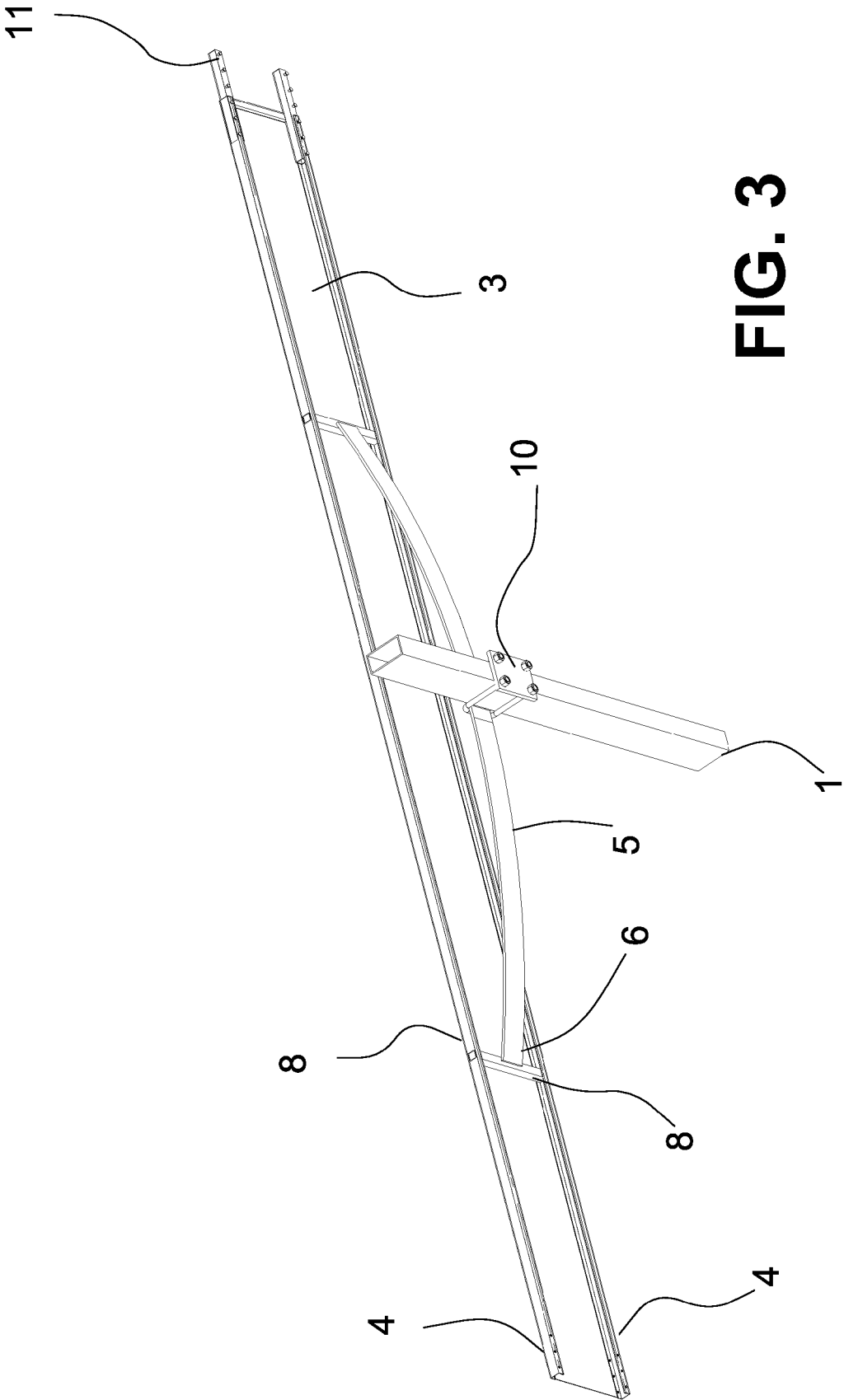


FIG. 3

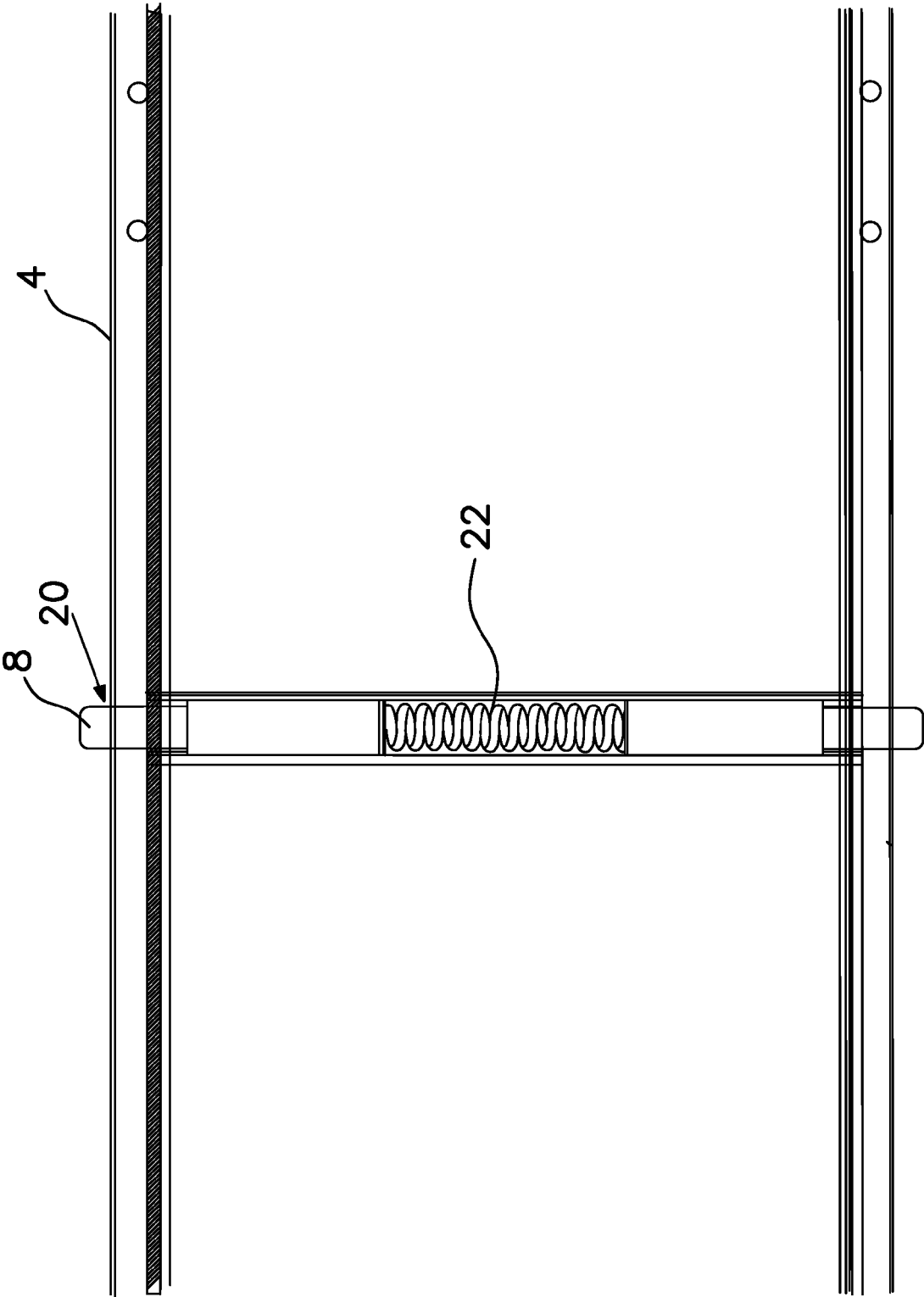


FIG. 4

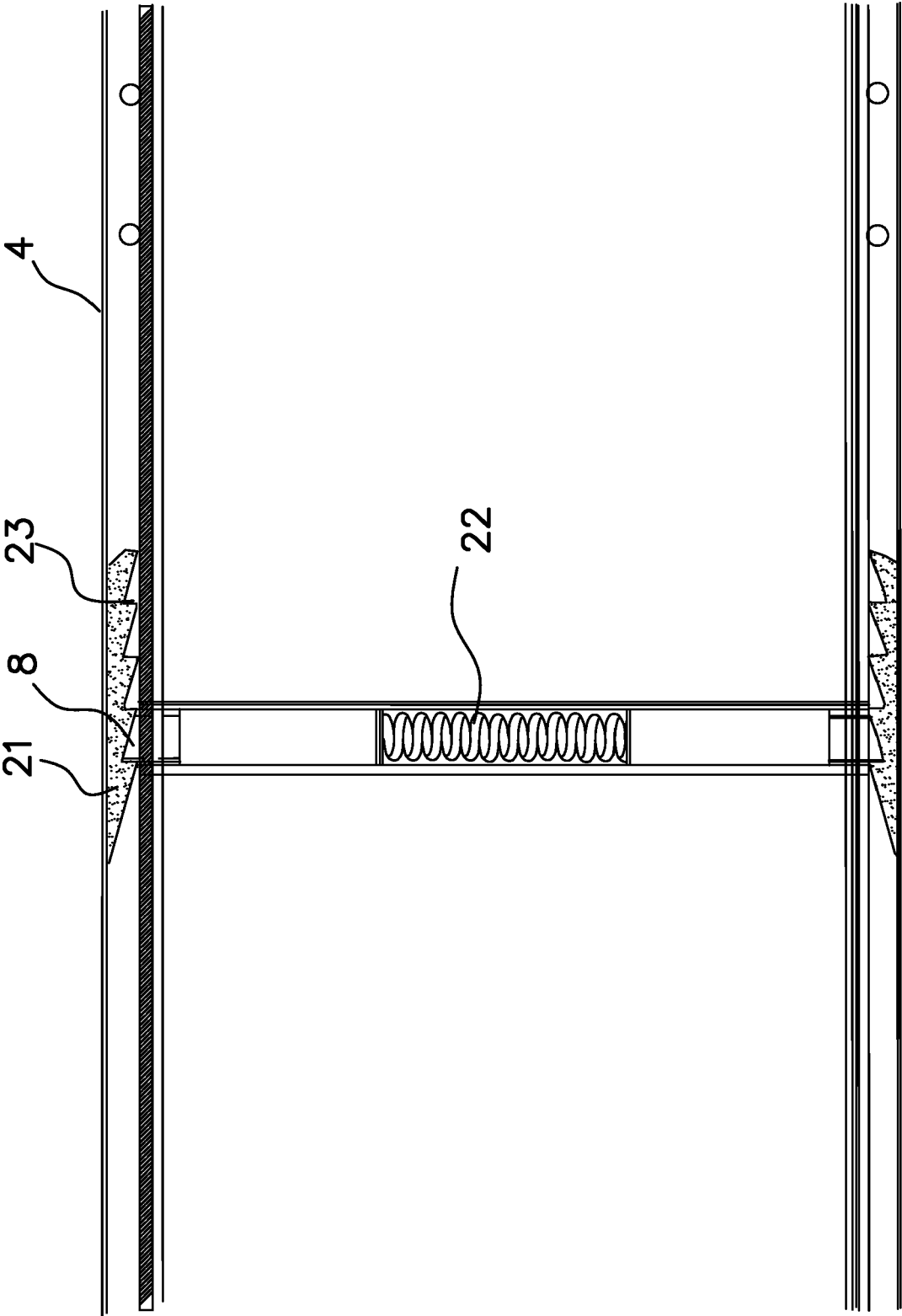


FIG. 5



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 08 38 2005

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A	----- DE 23 27 139 A1 (ROESSNER HANS DIPL ING) 19 December 1974 (1974-12-19) * page 2, lines 11-15; figures 1,3-6 *	6	
			TECHNICAL FIELDS SEARCHED (IPC)
			E01F
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 11 June 2008	Examiner Flores Hokkanen, P
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**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 08 38 2005

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11-06-2008

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