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(54) **Reinforced roadside barrier**

(57) The barrier comprises an impact-resistant beam (20) supported on a row of upright posts (12) and having a lateral, impact surface (20a). Two tight ropes (32, 34) extend along the side of impact-resistant beam (20) facing away from the impact surface (20a) and are anchored to the impact-resistant beam with a mutual arrangement such that the rope (32, 34) is subjected to tensile stress in the event of a lateral impact against the impact-resistant beam (20).

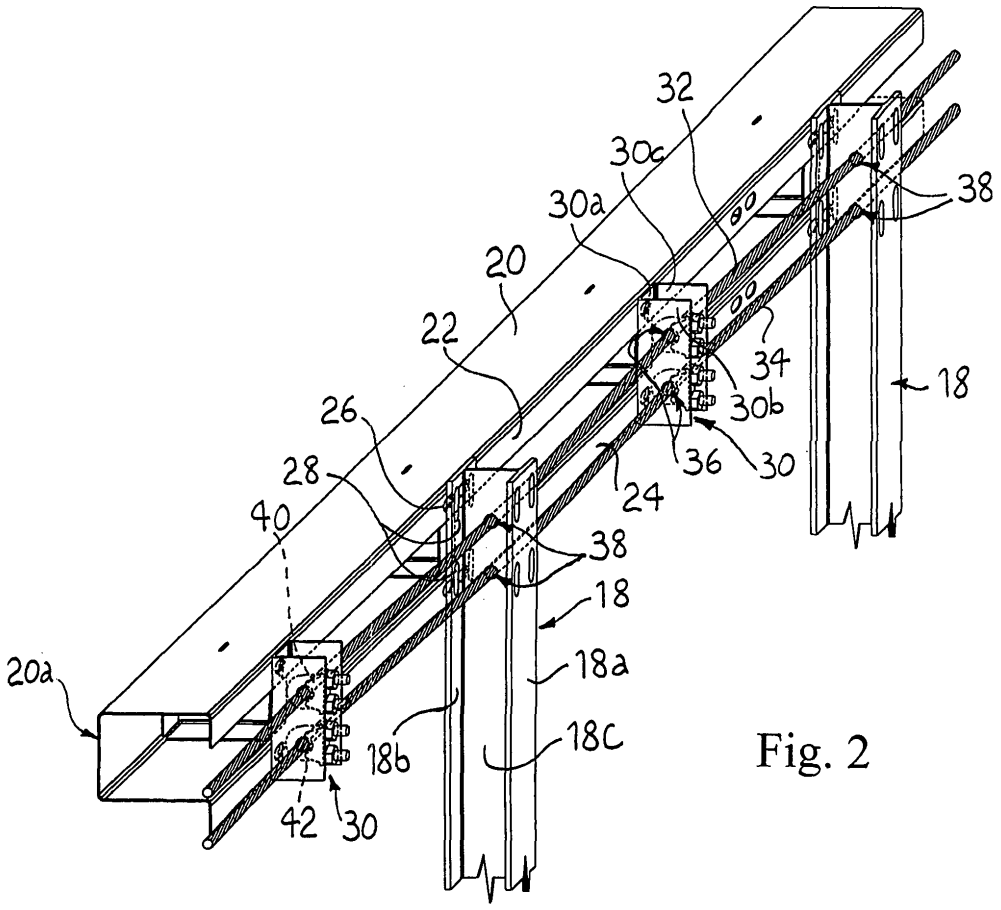

Fig. 2

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Description

[0001] The present invention relates to a roadside barrier for use along the edge of roads or bridges, traffic dividers, and the like.

[0002] As known, steel roadside barriers usually comprise posts which are stuck in the ground or anchored to structures and support impact-resistant longitudinal beams having the scope of resisting the impact of vehicles and directing them back on the roadway. The dimensions and/or the geometry of the beams are designed such to have a predetermined resistance to bending stress, which allows the barrier to resist the impact without any part of it to break and prevents the vehicle from jumping over the barrier or overturning.

[0003] A main object of the present invention is now to provide a roadside barrier reinforced with a versatile and low-cost system which enhances the resistance of the barrier particularly in relation to lateral impacts.

[0004] It is another object of the invention to provide a reinforcing system as above which can also be incorporated in conventional roadside barriers by making only a few changes in the barrier.

[0005] The above objects and other advantages, which will better appear below, are achieved by th reinforcing system for roadside barriers having the features recited in claim 1, while the other claims state other advantageous features of the invention.

[0006] The invention will be now described in more detail with reference to a few preferred, non-exclusive embodiments, shown by way of non limiting example in the attached drawings, wherein:

Fig. 1 is a view in transverse, cross-section of a road flanked by a guardrail-type roadside barrier according to the prior art;

Fig. 2 is a perspective view of a portion of a roadside barrier according to a first embodiment of the invention;

Fig. 3 is a side elevation view of another portion of the roadside barrier of Fig. 2;

Fig. 4 is a perspective view of a portion of a roadside barrier according to a second embodiment of the invention;

Fig. 5 is a perspective view of a portion of a roadside barrier according to a third embodiment of the invention.

[0007] In Fig. 1, a paved roadway 10 is flanked by a conventional roadside barrier comprising upright posts such as 12 rising from the bare ground 14 and supporting a metal channel 16. The size of the channel is designed such to have a predetermined resistance to torsional and bending stress, such as required by the specific application.

[0008] Fig. 2 shows a roadside barrier similar to the barrier of Fig. 1 but provided with a reinforcing system according to the invention.

[0009] The barrier of Fig. 2 comprises upright posts 18 each consisting of a metal H beam having two parallel flanges 18a, 18b interconnected by a middle wall 18c. The posts are to be stuck in the ground with their middle walls 18c arranged at right angles to the edge of the road, and support a impact-resistant beam 20 consisting of a channel whose back wall 20a forms the impact surface for the barrier. The opposite, longitudinal edges 22, 24 of channel C are bent downwards at right angles and are perforated with respective horizontal slots such as 26 in order to be bolted to the upper ends of flanges 18b of posts 18, which are also perforated with vertical slots 28. For better clarity of illustration, the bolts are not shown in the Figures.

[0010] Brackets 30 are fastened to impact-resistant beam 20 in intermediate positions between the posts. Each bracket consists of a vertical channel having its back wall 30a bolted to longitudinal edges 22, 24. A pair of steel ropes 32, 34 extend along the barrier. The ropes pass through holes such as 36 bored in side walls 30b, 30c of brackets 30 and holes such as 38 bored in middle walls 18a of posts 18. Ropes 32, 34 are axially maintained in a tight condition by clamps 40, 42, which are gripped on ropes 32, 34 between side walls 30b, 30c of brackets 30 and abut against the inner side of one of side walls 30b, 30c.

[0011] As shown in Fig. 3, each of the opposite ends of ropes 32, 34 is folded into an eyelet 44, 45 and is anchored to a respective post by means of a clamp 46, 47 that is used to close the eyelet.

[0012] In use, ropes 32, 34 are maintained tight by clamps 40, 42 and their arrangement is such that, as the person skilled in the art will immediately understand, they will be tensioned in the event of a lateral impact against the barrier. Therefore, in case of impact, the buckling of impact-resistant beam 20 is opposed by the high resistance to tensile stress of steel ropes 32, 34, which laterally apply their reaction force upon impact-resistant beam 20 via posts 18 and brackets 30, which act as spacers or struts against the lateral deformation of the beam.

[0013] An alternative embodiment of the roadside barrier according to the invention is shown in Fig. 4, wherein spacer members 150 are arranged between impact-resistant beam 120 and each post 118 which allow the overhang of the impact-resistant beam to be adjusted with respect to post 118. Each spacer member 1 SO consists of a portion of a H beam arranged with its middle wall 150a at right angles to the impact-resistant beam. In the embodiment of Fig. 4, steel ropes 132, 134 still pass through holes 136 bored in lateral walls 130b, 130c of brackets 130 in a way similar to the previous embodiment, but, instead of passing through the posts, they pass through holes 152 bored the middle walls 150a of spacer members 150. Therefore, with this embodiment, middle

walls 118c of posts 118 could be not perforated.

[0014] A further alternative embodiment of the barrier according to the invention is shown in Fig. 5 wherein, in a way similar to the embodiment of Fig. 4, spacer members 250, each consisting of a portion of a H beam, are arranged between impact-resistant beam 220 and posts 218. However, in the embodiment of Fig. 5, lateral walls 230b, 230c of brackets 230 are wider and steel ropes 232, 234, which still pass through holes 236 in lateral walls 230b, 230c of brackets 230, do not pass through holes in the spacer members but through holes 238 that are bored into middle walls 218a of posts 218, in a way similar to the embodiment of Figs. 2, 3. Therefore, with this embodiment, middle walls 250a of spacer members 250 could be not perforated.

[0015] With all the above embodiments, the impact-resistant beam may whether be used directly as a barrier or as a mounting spacer for an impact-resistant, undulated metal band, in a way known per se.

[0016] Of course, a rope-based, reinforcing system as above may be incorporated in conventional roadside barriers, by drilling the posts or the spacer members for inserting the ropes, and by welding the brackets to the inner side of the impact-resistant beam. As the person skilled in the art will appreciate, these operations can be carried out in an inexpensive way with low costs of material.

[0017] A few preferred embodiments have been described herein, but of course many changes may be made by a person skilled in the art within the scope of the inventive concept. In particular, the number of ropes may be varied with respect to what illustrated, depending on the specific application. Moreover, although in the above examples the clamps which maintain the ropes tight are arranged between the lateral walls of the brackets, the ropes could also be left free to slide with respect to the brackets and could be anchored to the posts, with the clamps abutting against the middle walls of the posts. Furthermore, as the person skilled in the art will immediately understand, it is not necessary for the ropes to be axially anchored to all the brackets and/or posts. In some cases, the ropes could even be anchored only at their ends and could be left free to slide with respect to the brackets and to the posts. Nevertheless, the use of H beams for the posts and the use of channels for the brackets are to be intended as preferred but not essential, different profiles being possible, e.g., box-type beams. Moreover, the elements which connect the ropes to the impact-resistant beam, i.e., the brackets, the posts and/or the spacer members, could function as spacers or struts even if the ropes do not pass through them. For example, the rope could be passed trough the holes bored in the posts and then behind the brackets, which brackets, being interposed between the ropes and the logitudinal beam, would function all the same as spacers or struts in the event of an impact against the barrier.

Claims

1. A roadside barrier comprising an impact-resistant beam (20) supported on a row of upright posts (12) and having a lateral, impact surface (20a), **characterized in that** it comprises at least one tight rope (32, 34) extending along the side of impact-resistant beam (20) facing away from the impact surface (20a), and anchored to the impact-resistant beam with a mutual arrangement such that the rope (32, 34) is tensioned in the event of a lateral impact against the impact-resistant beam (20).

2. The roadside barrier of claim 1, **characterized in that** it comprises a plurality of spacers (30) interposed between the impact-resistant beam (20) and the rope (32, 34) and acting as struts subjected to the lateral reaction force opposed by the rope (32, 34) in the event of an impact against the barrier.

3. The roadside barrier of claim 2, **characterized in that** said spacers (30) are provided with respective holes (36) through which the rope (32, 34) is passed.

4. The roadside barrier of claim 2 or 3, **characterized in that** said rope is axially anchored (40, 42) in a tight condition to at least one of said spacers (30) by anchor means (40, 42).

5. The roadside barrier of claim 4, **characterized in that** said anchor means comprise clamps (40, 42) gripped on the rope and abutted against the spacer (30).

6. The roadside barrier of any of claims 1-5, **characterized in that** said posts (18) have respective holes (38) through which the rope (32, 34) is passed.

7. The roadside barrier of any of claims 1 to 6, **characterized in that** said rope is axially anchored in a tight condition to at least one of said posts (18) by anchor means.

8. The roadside barrier of claim 7, **characterized in that** said anchor means comprise clamps gripped on the rope and abutted against the post.

9. The roadside barrier of any of claims 1 to 5, **characterized in that** spacers (150) are interposed between said impact-resistant beam (120) and the posts (118) and are provided with respective holes (152) through which said rope (132, 134) is passed.

10. The roadside barrier of any of claims 2-10, **characterized in that** each of said spacers consists of a vertical channel attached to the back of the impact-resistant beam (20) and provided with perforated side walls (30b, 30c) through which the rope (32, 34) is passed.

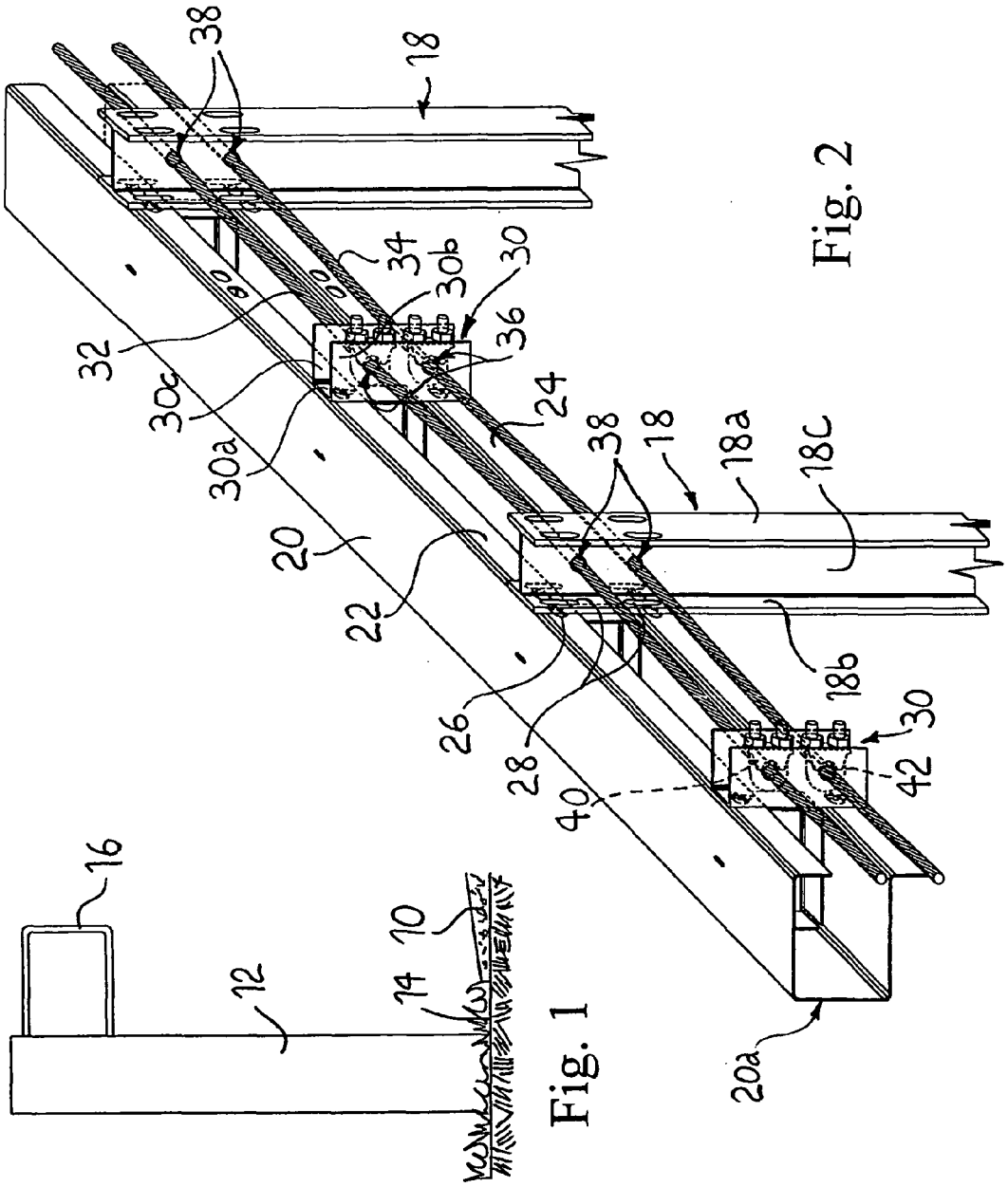
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Fig. 1

Fig. 2

Fig. 3

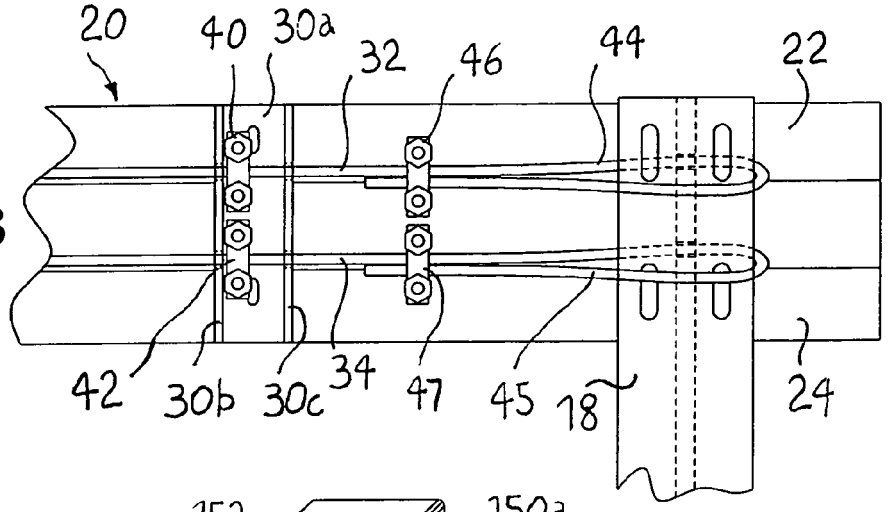


Fig. 4

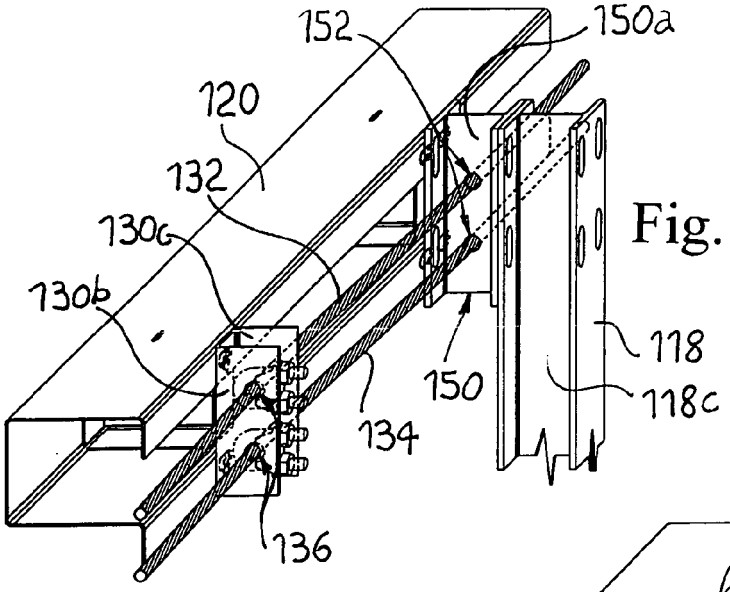
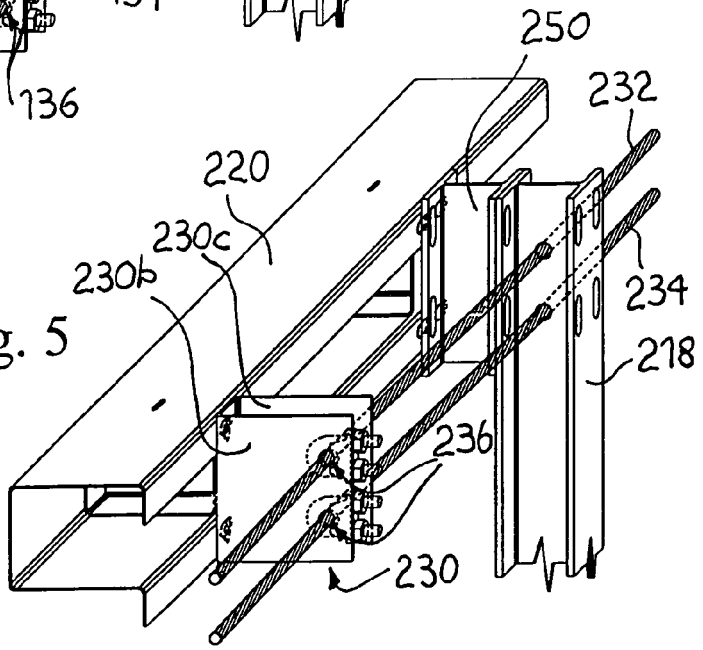


Fig. 5



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EUROPEAN SEARCH REPORT

Application Number
EP 06 42 5157

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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X	US 2 085 058 A (WOOD HENRY ALLYN) 29 June 1937 (1937-06-29) * the whole document *	1	
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The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	11 August 2006	Geivaerts, D

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This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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