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Rising buffer for road barriers.

A buffer or spacer (1) comprising a closed steel strip (7) substantially shaped like a regular or irregular parallelogram, which is welded to two supports (8, 9) in the form of strips (8, 9).

The spacer (1) has the shape of a parallelepiped and is rigidly connected to the wavy blade (6) and to the post (4) by means of bolts or other fixing means.

The support (8) of the blade (6) and the support (9) for the connection to the post (4), are made of a kind of steel having a different resistance with respect to the steel by which the closed strip (7) is formed.

The supports (8, 9) may be provided with recesses or folding lines (12, 13) for a controlled deformation thereof and of the spacer (1), during the collision.

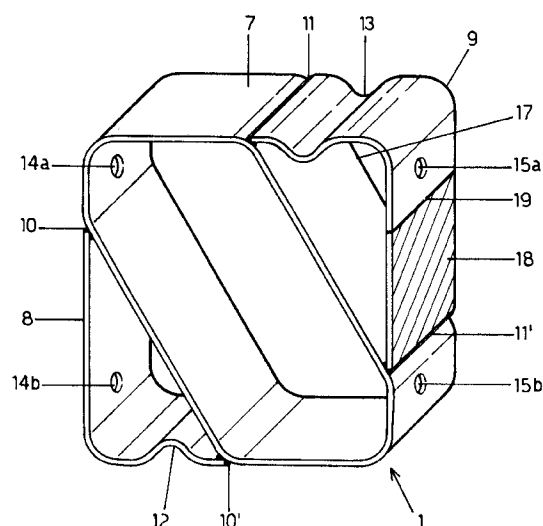


FIG. 3

The present invention relates to metal barriers for roads, preventing the jumping over, or in any case decreasing the risk of jumping over by a vehicle.

In particular, the invention relates to a metal road barrier which includes specific rising spacers or buffers, that is, of a kind which, besides absorbing energy during light collisions, are also used to rise the blade in order to improve the resistance to surmounting by a vehicle in case of more serious collisions.

Spacers or buffers having this function are already known, and they are fixed to the posts of the barrier supporting a triple-wave blade, a double-V blade (W) with opposite W-blades, or a simple W-blade. These spacers are made by steel plates having a central aperture with a substantially quadrilateral shape. One side of the plate is rigidly connected to the upper end of the post, whereas the opposite end is connected to the wavy blade.

The spacer or buffer may also include other apertures, for example circular apertures arranged along a circular arc, for the purpose of obtaining a "controlled" deformation of the buffer (plate), which allows it to fold itself upwardly, causing the blade to "rise".

The barriers which comprise this known kind of spacers or buffers have an excessive lateral extension.

There results that there is less space for the installation of the barrier along the side of the road, and since the embankment has a trapezoidal shape, driving the post in a more external region with respect to the pavement of the road, and using always the same length for the posts, the latter will be driven by a reduced depth into the resistant core; consequently the barrier will be less resistant to collisions.

The object of the present invention is to realize a spacer or buffer of a so-called "rising" type, which overcomes the aforesaid drawbacks, and which is therefore particularly useful on bridges and on traffic dividers (median strips) with modest width, where the extension of the barrier plays a fundamental rôle.

The buffer or spacer of the present invention has a completely different construction with respect to known ones, it occupies less space, and it has exactly the same functions.

The invention will now be described by means of a preferred embodiment thereof, with reference to the annexed drawings, which are given for illustrative and non-limitative purposes, and which show individually:

Fig. 1, a cross-section of a barrier post having at its upper end the spacer or buffer of the present invention;

Fig. 2, the cross-section of the spacer or buffer according to the present invention;

Fig. 3, a perspective view of the spacer or buffer of Fig. 2;

Fig. 4, a sequence of images showing the "controlled" deformation of the spacer or buffer and the rising of the double-W blade during the collision.

sion.

With reference to the drawings, the same parts of the spacer or buffer are indicated by the same reference numbers.

Fig. 1 shows the pavement 2 and the grass-grown embankment 3 into which the post 4 is driven until it has reached a predetermined depth in the resistant core, below said grass-grown embankment, made up of a mixture of sand, gravel, etc. The post 4 may have a variable length according to the requirements, i.e. according to the required height of the barrier which depends upon the traffic type and the locality.

Fig. 1 also shows schematically the spacer or buffer 1 which is fixed by means of bolts 5, 5' to the (triple-wave) blade 6 and to the post 4.

The structure of the spacer 1 is shown in detail in Figs. 2 and 3.

It comprises a "closed" steel strip 7 which is preferably obtained by welding an "open" strip at its opposite ends. Two supporting parts 8, 9 are welded at the points indicated by numerals 10, 10' and 11, 11', to the closed strip 7 having a longitudinal cross-section substantially shaped like a parallelogram. The supporting part 8 supports the triple-wave blade 6, whereas the supporting part 9 makes up that part which holds the spacer or buffer by means of its rigid connection to the post 4.

Both supporting parts 8, 9 are made up by folded strips, as shown in Fig. 2, which have recesses 12, 13. Said recesses 12, 13 are formed for the purpose of causing a deformation of the supporting parts during the collision, prior to the deformation of the closed strip 7. The deformation of the supports 8, 9 causes the rotation of the closed strip 7. The deformation of the supports 8, 9 causes the rotation of the closed strip 7 in the direction of the arrow 7 (Fig. 2).

Therefore it is necessary that the supports 8, 9 are made of a kind of steel which is less resistant than that which makes up the closed strip 7.

In Fig. 4, there is shown the sequence of deformation steps of the barrier. While the supporting parts 8, 9 get deformed, the blade or wave 6 "rises" and the barrier moves back. As shown in Fig. 4, the deformation of the closed strip 7 shaped like a parallelogram takes place only in the last step of the collision.

At the corners of the closed strip 7, the latter may be folded, or it may have cutting lines or reinforcement elements so as to make it more or less deformable, according to the application of the "rising" buffer 1 (barriers for cars, or for goods transporting vehicles, or bivalent).

Fig. 2 shows the through holes 14a, 14b, 15a, 15b for the bolts 5, 5'. It can be seen that the two holes 14a, 15b are obtained on the closed strip 7 shaped like a parallelogram, whereas the holes 14b, 15a are located on the supporting parts 8, 9. Fig. 1 schematically shows two reinforcement elements 16 of the closed strip 7, whereas in Fig. 3 the supporting part 9 has a

reinforcement element 17 (a similar reinforcement element could also be present on the supporting part 8). The rectangular portion 18 of the supporting part 9, which extends itself from the line 19 to the welding line 11', may also be absent, so as to save a greater amount of material.

The present invention has been described according to a preferred embodiment thereof, and obviously the form of the supporting parts 8, 9 and of the closed strip 7 could be varied; the latter may then have a shape which differs from that of a parallelogram, i.e. (substantially) any quadrilateral shape whatever. It is obvious that besides the triple wave 6, a W-shaped wave or a blade with two opposite W's or the like could also be employed.

Moreover, on the same post there could be more than one row of blades, having variable shapes and sizes. Furthermore, the thickness of the supports and of the closed strip can be varied independently, according to the resistance which is required, and therefore according to the application of the barrier.

Claims

1. Rising buffer for metal road barriers, characterized in that it comprises a closed steel strip (7) having a quadrilateral longitudinal section, which is welded to a strip or support (8) of the blade (6) and to a strip or support (9) for the connection to a post (4) of the barrier, said buffer having substantially a parallelepipedal shape, and said supports (8, 9) having recesses (12, 13) realized by drawing in order to allow a controlled deformation of the supports (8, 9); said buffer being further characterized in that in order to postpone the deformation step of the closed strip (7) with respect to the deformation of the supports (8, 9), the latter are obtained from steel having a different resistance with respect to the steel which forms the closed strip (7).
2. Rising buffer according to claim 1, characterized in that said supports (8, 9) and/or said closed strip (7) have reinforcement elements or weakenings in the folded regions or at the corners.
3. Buffer according to claim 1 or 2, characterized in that a portion (18) of the support (9) for the rigid connection to the post (4) is removed in order to reduce the amount of the employed material.
4. Buffer according to claim 1, 2 or 3, characterized in that the thicknesses of the supports (8, 9) and of the closed strip (7), are different.
5. Buffer according to the preceding claims, characterized in that the closed strip (7) has a longitu-

dinal cross-section substantially like a parallelogram.

6. Buffer according to the preceding claims, characterized in that it is fixed to a blade (6) shaped like a triple-wave, a double-wave, or two opposite W's, and in that the form of the support (8) and the kind of bolts used are varied correspondingly.

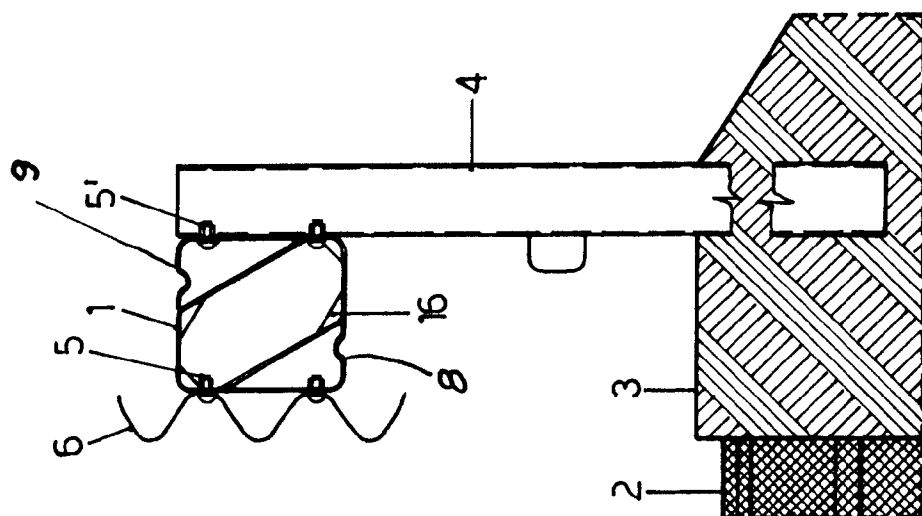


FIG. 1

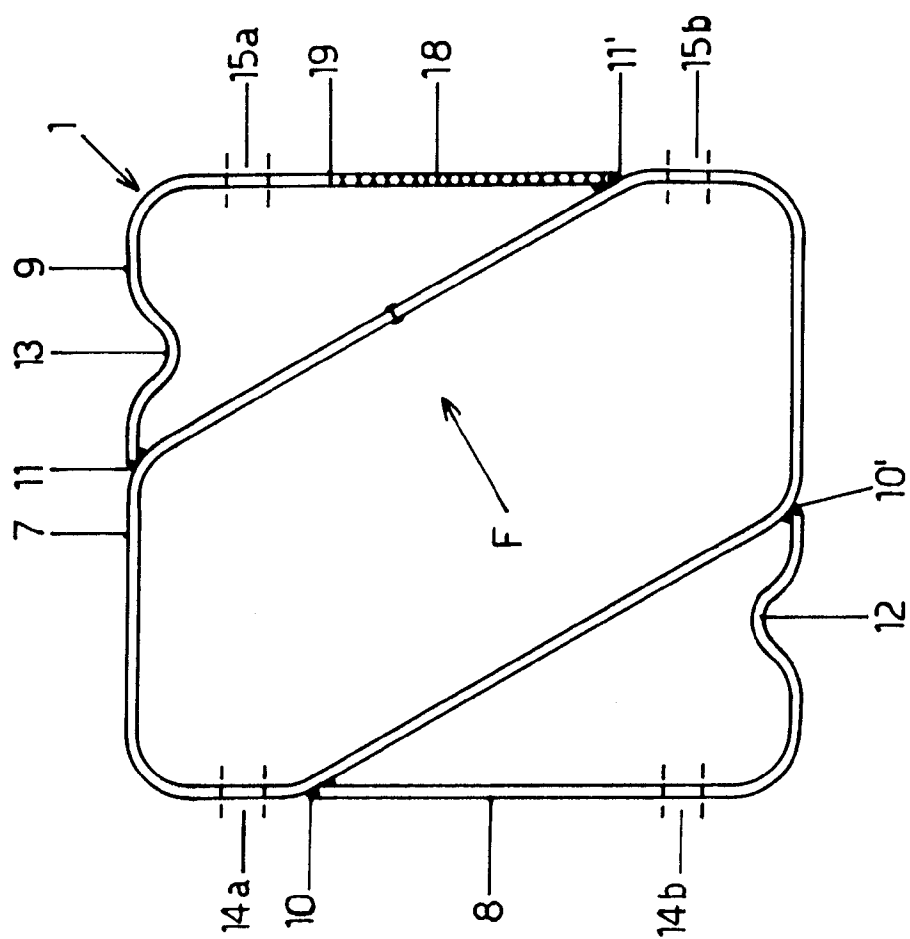


FIG. 2

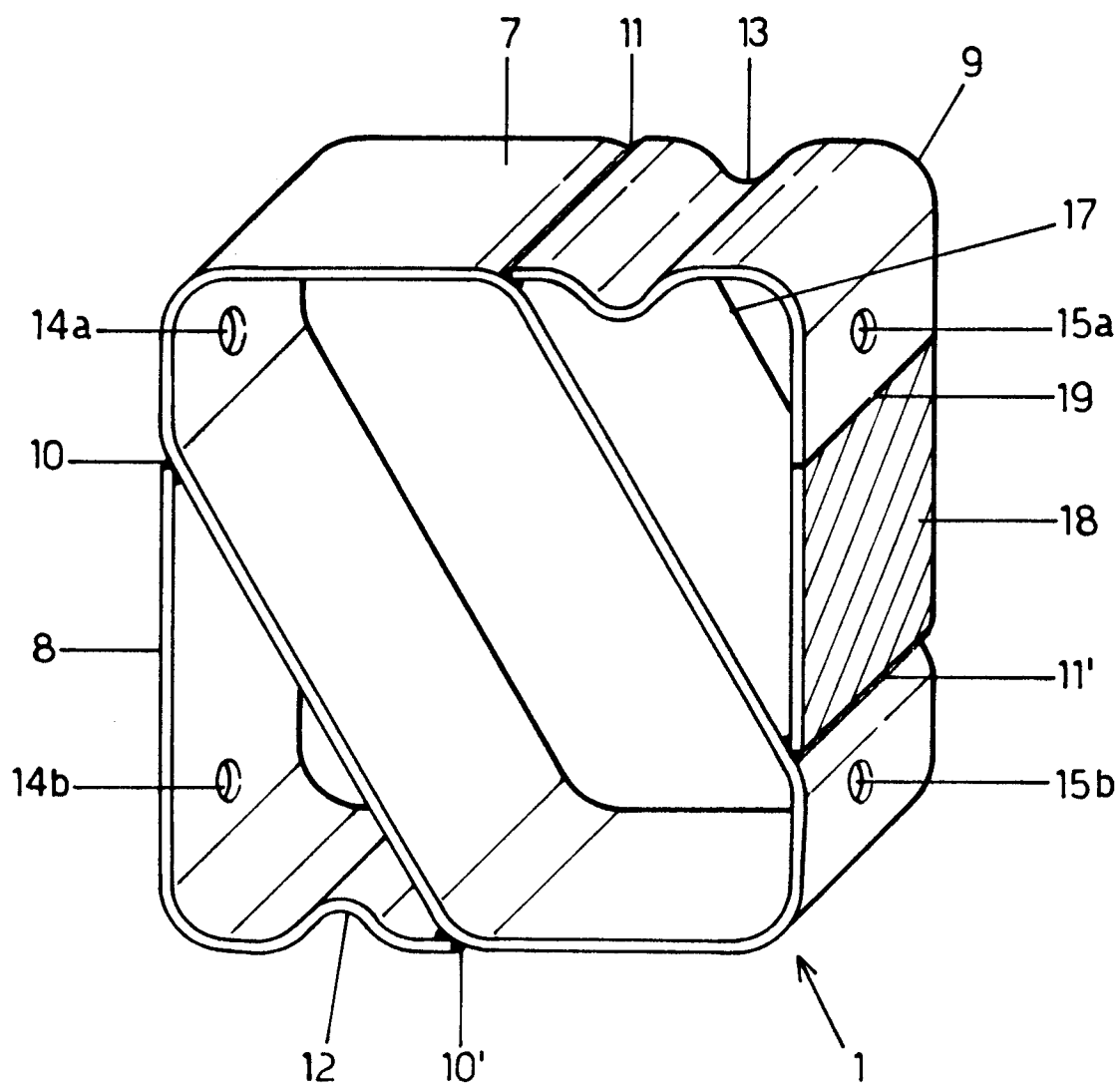


FIG. 3

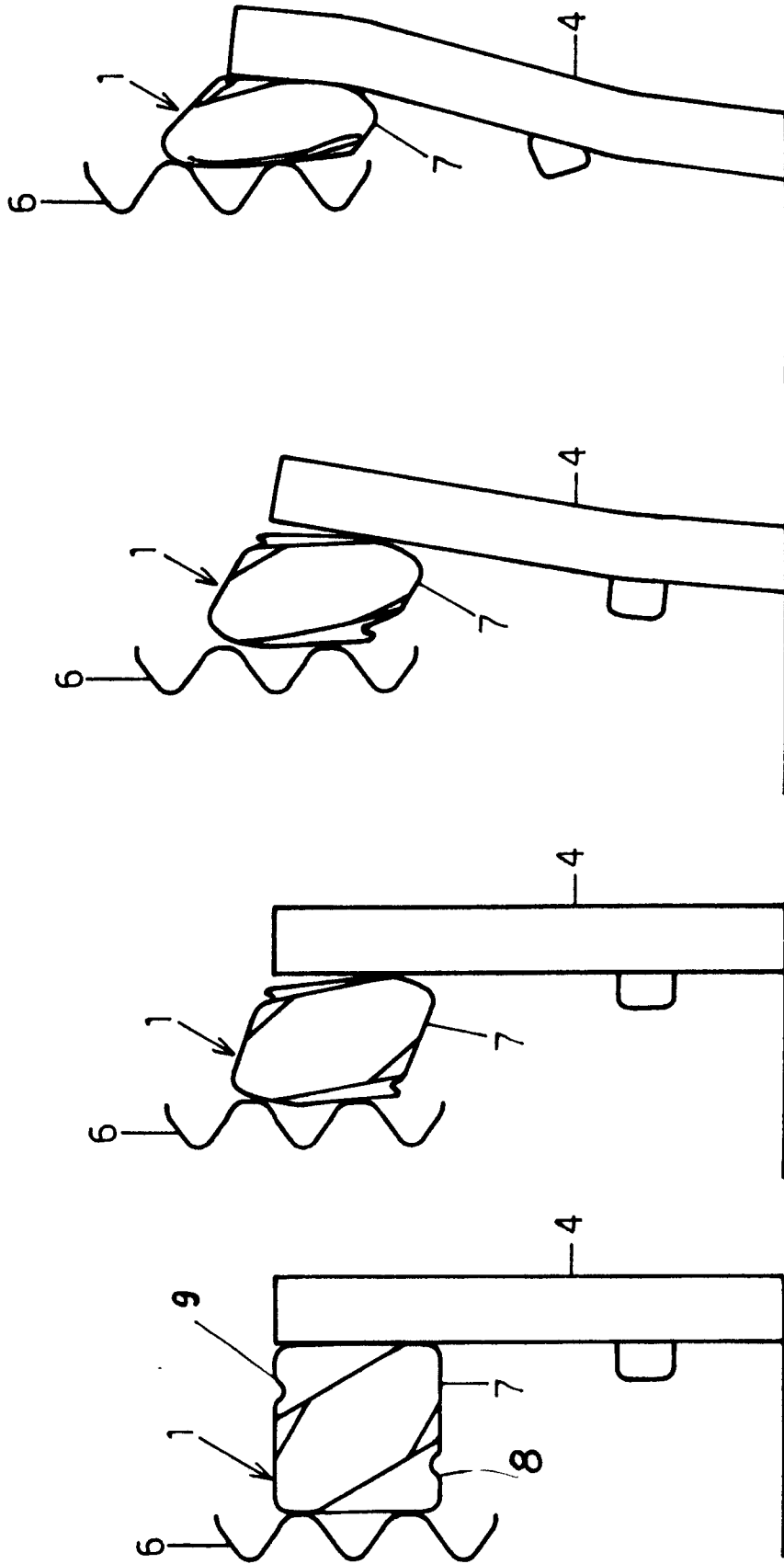


FIG. 4



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 94 83 0404

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
A	FR-A-2 169 997 (E. BAUMANN) * page 14, line 37 - page 15, line 3; figures 70,71 *	1,3,6	E01F15/04
A	DE-A-17 59 575 (R. BERENS) * page 5, line 8 - line 19; figures 3A,3B *	1	
A	BE-A-703 928 (NEHER) * page 3, line 16 - line 22; figure 2 *	1	
A	DE-U-71 06 318 (BERTRAMS) * the whole document *	2	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E01F
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 9 March 1995	Examiner Verveer, D
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