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(54) Anti ram crash device comprising an anti ram crash post

(57) An anti ram-raid device (1) has an anti ram-raid bollard (3) and an anchoring device (7) with which the anti ram-raid bollard (3) is anchored in the ground. The anchoring device (7) has two energy-absorbing elements (9), which are elastic cables made of plastic.

The anchoring device (7) has a tube (11), which is situated below ground level (5) and in which the anti ram-raid bollard (3) is situated, as well as an anchoring element (13), also below ground level, which is fastened to the tube (11). The anchoring element (13) has a plate (15), which has a horizontal part (17), to which the tube (11) is fastened, and an upright part (19) that slopes upwards. The anchoring element (13), furthermore, has stiffening ribs (21), which are attached to both parts (17,19) of the plate (15), and an additional plate (23), which is attached to the upright part (19) of the plate (15) sloping upwards as well as to the stiffening ribs (21).

The energy-absorbing element (9) is attached at one end (9a) to the additional plate (23). The energy-absorbing element (9) is attached at the other end (9b) to the tube (11) just below ground level (5).

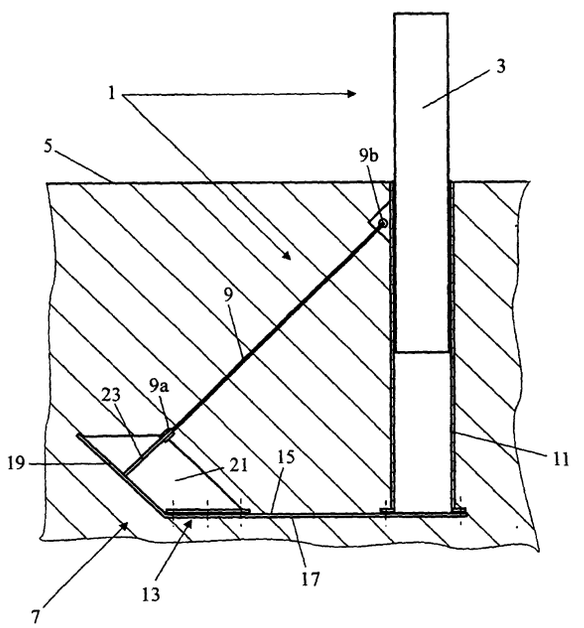

FIG. 1

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Description

BACKGROUND OF THE INVENTION:

Field of the invention

[0001] The invention relates to an anti ram-raid device comprising an anti ram-raid bollard, which can or cannot sink into the ground, and when in use is partially in the ground below ground level and partially out of the ground above ground level, as well as an anchoring device for anchoring the anti ram-raid bollard in the ground.

[0002] Anti ram-raid devices are used, among other things, by shops, such as jewellers, cash dispensers and bank buildings, to prevent thieves from ramming the building's facade with a vehicle and in that way gain access to the building. There are anti ram-raid devices known in which the anti ram-raid bollard is fixed in the ground and also those in which the anti ram-raid bollard can sink into the ground, for example, in order not to be an obstacle for the public during the building's opening hours.

[0003] By an anti ram-raid device is meant here not only the above mentioned device, but every device the purpose of which is to form an obstacle, such as blocking passage in a street.

Prior art

[0004] Such an anti ram-raid device is generally known. In order to offer adequate resistance against ramming, anti ram-raid devices must be sufficiently strong. With the known anti ram-raid devices this is achieved by making the bollard adequately strong, for example, by means of thick walls or a solid bollard, and by making the anchoring device sufficiently heavy and robust, for example, by a cast concrete block in which the anti ram-raid bollard is fixed. Placing the known anti ram-raid device is labour-intensive. First of all, a large hole has to be dug and poured full of concrete, after which the heavy bollard is placed in it. In addition, the known anti ram-raid device is heavy and expensive due to the

Summary of the invention

[0005] An objective of the invention is to provide an anti ram-raid device of the type described in the preamble that is lighter, less expensive and easier to place than the known anti ram-raid device, but still offers sufficient resistance to ramming. To this end, the anti ram-raid device according to the invention is characterized in that the anchoring device comprises at least one energy-absorbing element, one end of which is connected to the anti ram-raid bollard near and below ground level, and that the other end is attached to an anchoring element situated below ground level. The anchoring element is held down by the soil on top of it as a result of which a relatively light anchoring device can suffice. Because the element between the anchoring device and the anti ram-raid bollard absorbs energy when the bollard is rammed, the anti ram-raid bollard as well as the anchoring element will be less heavily loaded, as a result of which they can be executed in a lighter form than that of the known anti ram-raid device. The energy-absorbing element lengthens the braking distance of a ramming vehicle with the result that when being rammed less energy has to be absorbed by the bollard and the anchoring element.

[0006] The energy-absorbing element is preferably an element that can absorb ramming energy when the bollard is being rammed by means of elastic deformation. After being rammed the element will spring back as a result of which the bollard will return to its original position. The anti ram-raid device according to the invention is, therefore, as effective after being rammed as before. This is in contrast to the known anti ram-raid device where the anti ram-raid bollard will be deformed to a lesser or greater degree after one ramming, as a result of which, after being successively rammed a number of times the anti ram-raid bollard will be so deformed that it will no longer be able to block passage adequately.

[0007] The anchoring device preferably comprises a tube, which is situated below ground level and in which there is the anti ram-raid bollard.

[0008] An embodiment of the anti ram-raid device according to the invention is characterized in that the anchoring element comprises a receptacle in which the anti ram-raid bollard is situated. In this embodiment, the energy-absorbing element is preferably attached to the inside of the receptacle at one end and is connected to the anti ram-raid bollard at its other end. Preferably, the energy-absorbing element is situated at an angle that is not equal to 90° with respect to the anti ram-raid bollard, as a result of which the element's length will be great enough to be able to absorb the energy from a collision by deforming.

[0009] The anchoring element preferably comprises a plate on which there is much soil, therefore, keeping it firmly in place. Preferably, the plate is attached to the tube.

[0010] In order to increase the strength of the anchoring element, the plate preferably has a horizontal part, which is attached to the tube, as well as an upright sloping part on it, to which the energy-absorbing element is connected. Furthermore, the anchoring element preferably comprises stiffening ribs, which are attached to both parts of the plate. Additional strengthening is obtained by an embodiment in which the anchoring element comprises an additional plate that is attached at a right angle to the upright part of the plate sloping upwards as well as to the stiffening ribs, and to which the energy-absorbing element is attached.

[0011] The energy-absorbing element is preferably an elongated element of a highly elastic material, such as a spring or a plastic cable.

[0012] The invention also relates to an anchoring device that is applicable in an anti ram-raid device according to the invention.

Brief description of the drawings

[0013] The invention will be elucidated more fully below on the basis of drawings in which embodiments of the anti ram-raid device according to the invention are shown. In these drawings:

Figure 1 is a cross-section of a first embodiment of the anti ram-raid device according to the invention situated in the ground;
Figure 2 is a view from above of the anti ram-raid device shown in figure 1;
Figure 3 is a cross-section of a second embodiment of the anti ram-raid device according to the invention situated in the ground;
Figure 4 is a view from above of the anti ram-raid device shown in figure 3; according to the invention situated in the ground;
Figure 6 is a view from above of the anti ram-raid device shown in figure 5.

Detailed description of the drawings

[0014] In figures 1 and 2 a first embodiment of the anti ram-raid device according to the invention is shown in a cross-section when situated in the ground and in'a view from above respectively. The anti ram-raid device 1 has an anti ram-raid bollard 3, which is situated partially in the ground below ground level 5 and partially out of the ground above ground level. The anti ram-raid device 1, furthermore, has an anchoring device 7 with which the anti ram-raid bollard 3 is anchored in the ground. The anchoring device 7 has two energy-absorbing elements 9, which are elastic plastic cables.

[0015] The anchoring device 7 has a tube 11, which is situated below ground level 5 and in which the anti ram-raid bollard 3 can slide in and out, as well as an anchoring element 13 situated below ground level 5, which is attached to the tube 11. The mechanism for sliding the anti ram-raid bollard in and out of the tube is not shown for the sake of clarity. The anchoring element 13 has a plate 15, which has a horizontal part 17, to which the tube 11 is attached, and a part 19 that slopes upwards. Furthermore, the anchoring element 13 has stiffening ribs 21, which are attached to both parts 17, 19 of the plate 15, and an additional plate 23, which is perpendicular to the upright part 19 of the plate 15 that slopes upward and is attached to the stiffening ribs 21.

[0016] The energy-absorbing element 9 is attached at one end 9a to this additional plate 23. The energy-absorbing element 9 is attached to the tube 11 just below ground level 5 at its other end 9b.

[0017] In figures 3 and 4 a second embodiment of the anti ram-raid device according to the invention is shown in a cross-section when situated in the ground and in a view from above respectively. The elements of this second embodiment that are the same as those of the first embodiment are indicated by the same reference numbers. With this anti ram-raid device 25, the anti ram-raid bollard 27 cannot move vertically but is fixed to the plate 15 of the anchoring element 13. Furthermore, in this embodiment, the end of the energy-absorbing element is not coupled to the anti ram-raid bollard by means of an eye, but the energy-absorbing element 29 is wrapped round the anti ram-raid bollard 27. The energy-absorbing element 29 here is a double cable, which is attached to the anchoring element 13 at one end 29a and wrapped round the anti ram-raid bollard 27 at the other end 29b, just below ground level 5.

[0018] In figures 5 and 6 a third embodiment of the anti ram-raid device according to the invention is shown in a cross-section when situated in the ground and in a view from above respectively. The elements of this third embodiment that are the same as those of the first embodiment are again indicated by the same reference numbers. With this anti ram-raid device 31, the anchoring element is a rectangular steel receptacle 33, which is situated in the ground and in which the anti ram-raid bollard 3 is situated. The energy-absorbing elements 9 are elastic plastic cables, which extend at an angle with respect to the anti ram-raid bollard 3 and with respect to the walls of the receptacle 33. The receptacle 33 is open at the top and is closed off by a plate 35. This plate is not shown in figure 6 for the sake of clarity.

[0019] Although in the above the invention is explained on the basis of the drawings, it should be noted that the invention is in no way limited to the embodiments shown in the drawings. The invention also extends to all embodiments deviating from the embodiments shown in the drawings within the context defined by the claims.

Claims

1. Anti ram-raid device comprising an anti ram-raid bollard, which can or cannot sink into the ground, and when in use is partially in the ground below ground level and partially out of the ground above ground level, as well as an anchoring device for anchoring the anti ram-raid bollard in the ground, **characterized in that** the anchoring device comprises at least one energy-absorbing element, one end of which is connected to the anti ram-raid bollard near and below ground level, and that the other end is attached to an anchoring element situated below ground level.

2. Anti ram-raid device according to claim 1, **characterized in that** the energy-absorbing element is an element that can absorb the ramming energy through elastic deformation when the bollard is

rammed.

3. Anti ram-raid device according to claim 1 or 2, **characterized in that** the anchoring device comprises a tube that is situated below ground level in which the anti ram-raid bollard is situated.

4. Anti ram-raid device according to claim 1,2 or 3, **characterized in that** the anchoring element comprises a receptacle in which the anti ram-raid bollard is situated.

5. Anti ram-raid device according to claim 1, 2 or 3, **characterized in that** the anchoring element comprises a plate.

6. Anti ram-raid device according to claims 3 and 5, **characterized in that** the plate is attached to the tube.

7. Anti ram-raid device according to claim 5 or 6, **characterized in that** the plate comprises a horizontal part, which is attached to the tube, as well as an upright sloping part on it, to which the energy-absorbing element is connected.

8. Anti ram-raid device according to claim 7, **characterized in that** the anchoring element comprises stiffening ribs, which are attached to both parts of the plate.

9. Anti ram-raid device according to claim 7 or 8, **characterized in that** the anchoring element comprises an additional plate that is attached at a right angle to the upright part of the plate that slopes upwards as well as to the stiffening ribs, and to which the energy-absorbing element is attached.

10. Anti ram-raid device according to one of the preceding claims, **characterized in that** the energy-absorbing element is an elongated element made of a highly elastic material, for example, a spring or a plastic cable.

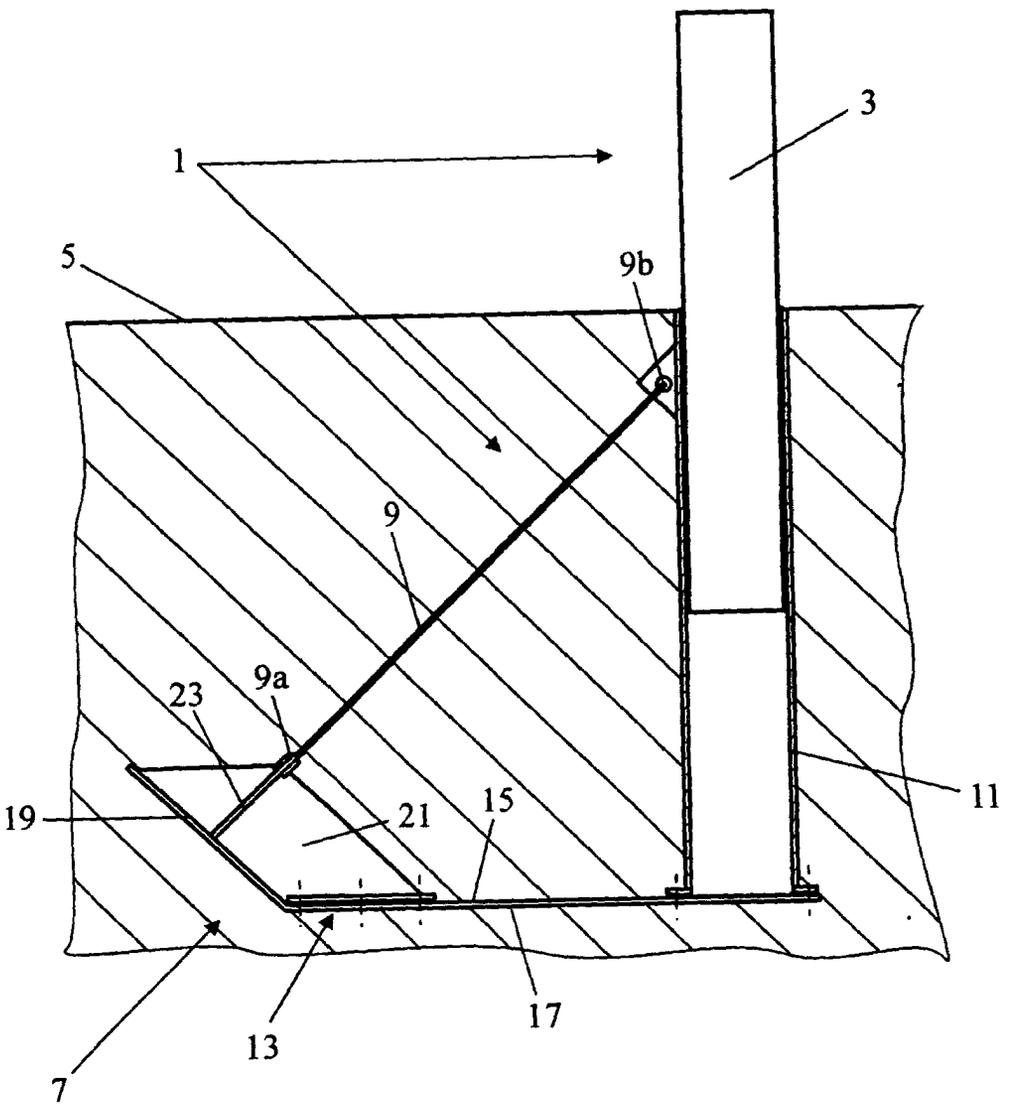

FIG. 1

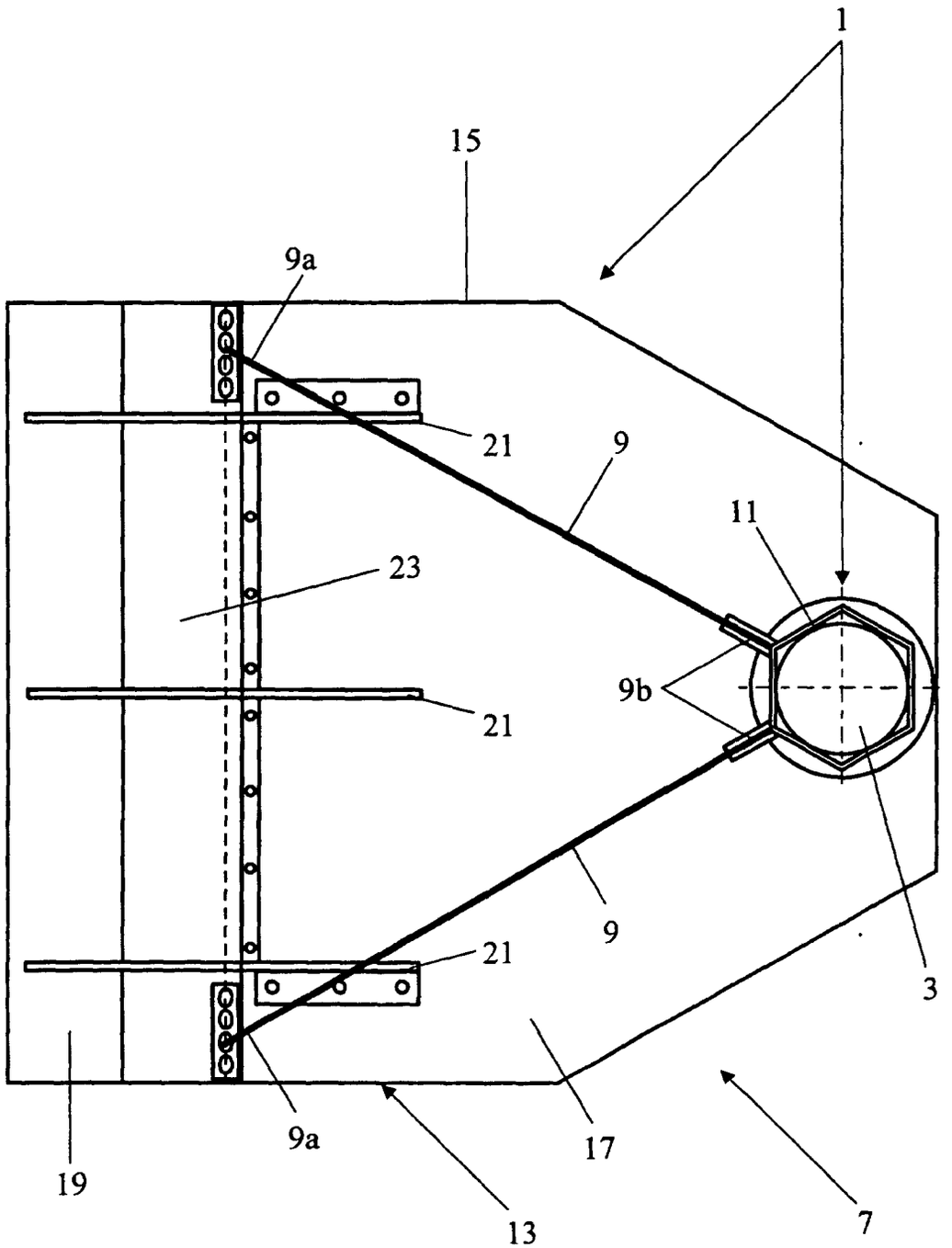

FIG. 2

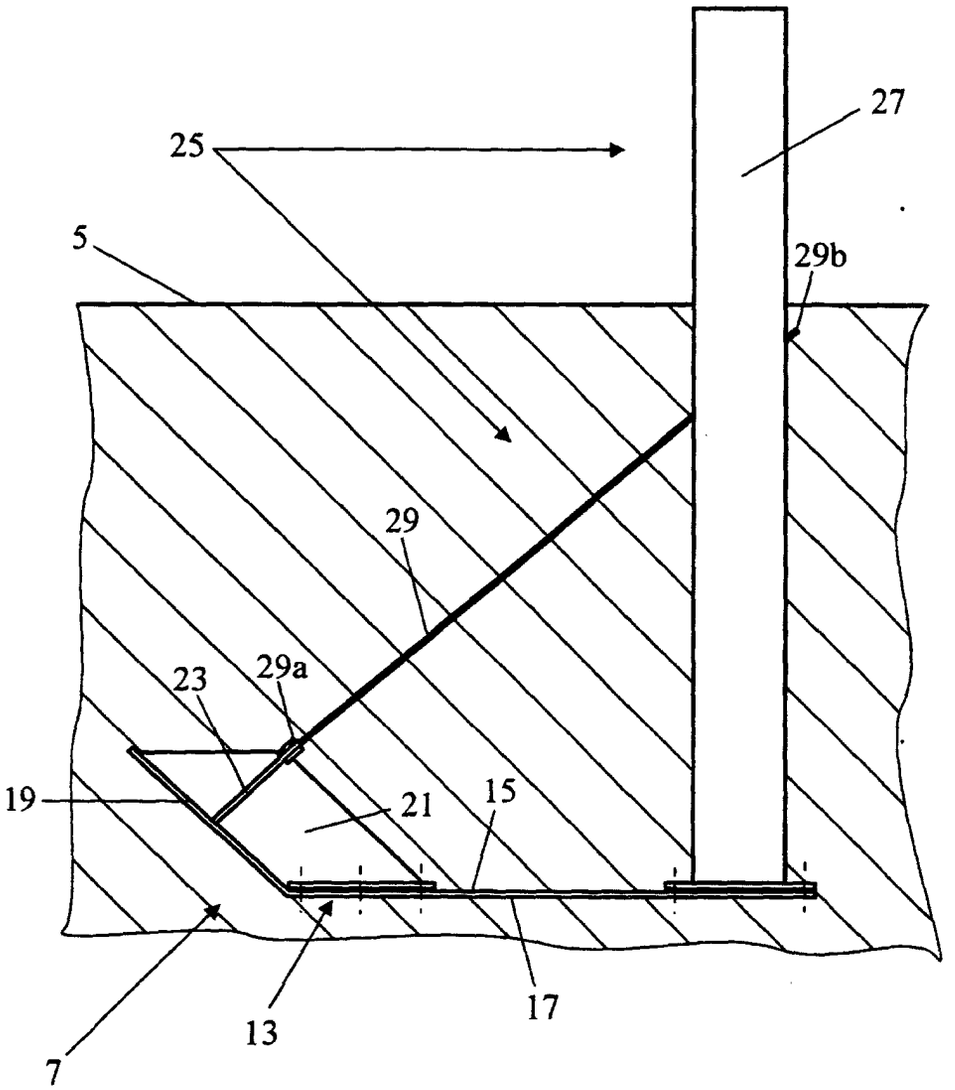

FIG. 3

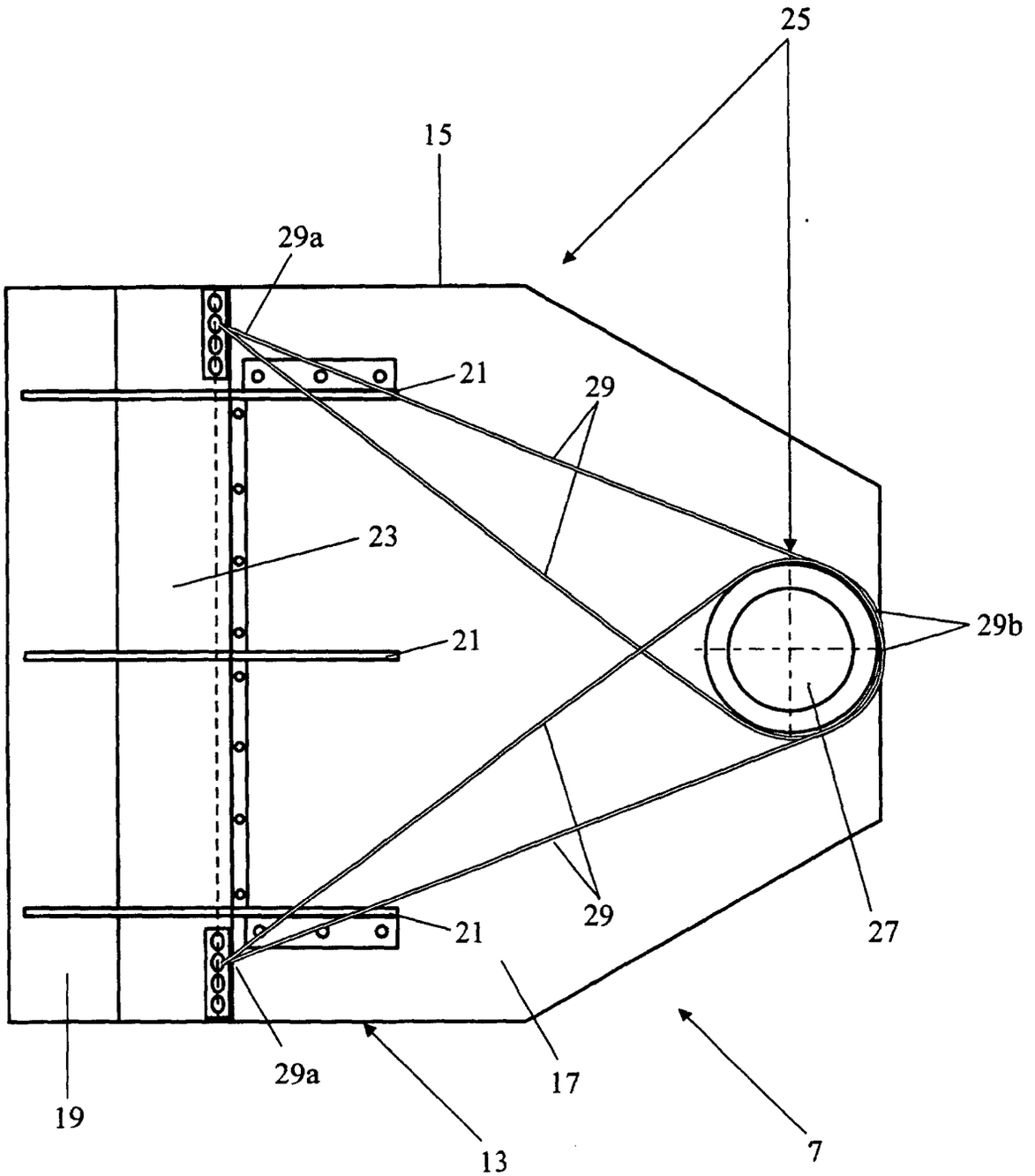

FIG. 4

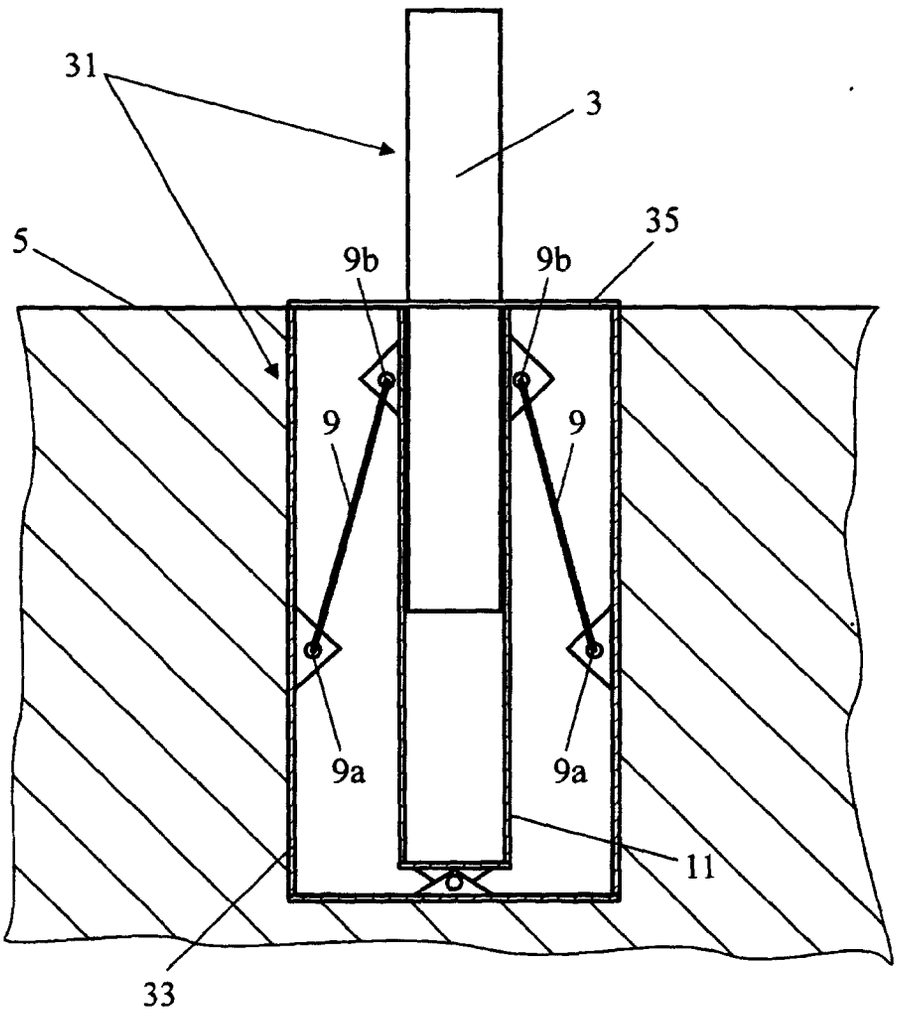

FIG. 5

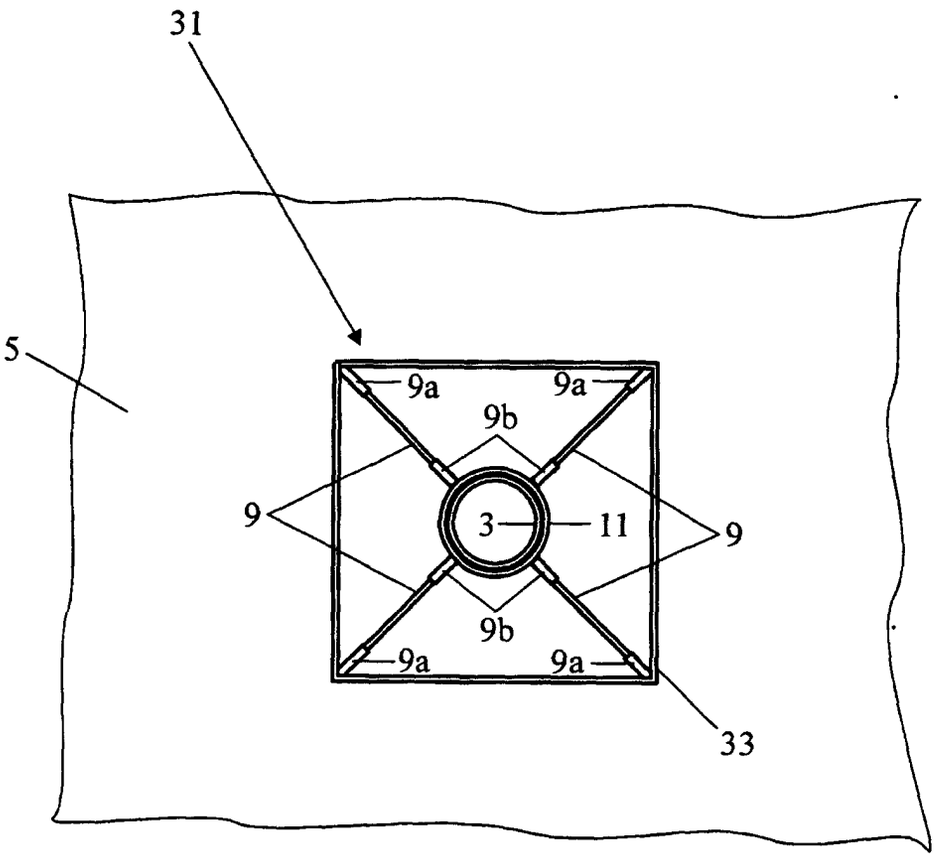

FIG. 6

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EUROPEAN SEARCH REPORT

Application Number
EP 04 07 8306

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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
Munich	3 March 2005	Flores Hokkanen, P

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03-03-2005

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