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(54) **Buffer bollard**

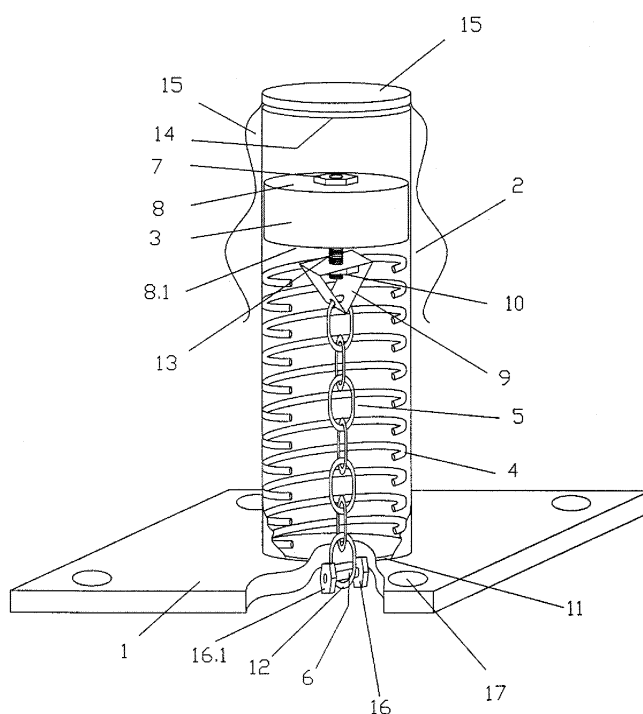
(57) This consists of a bollard strictly speaking which is meant to constitute a separation between vehicle-accessible zones and areas reserved for pedestrians, having as essential nature the fact that this consists of a base for fixing to the ground and a part able to yield to a force with a transversal component. It is fitted with

a spring and a buffer inside it, so that when the bollard is tilted, the pulling force of the spring recovers the verticality of the bollard gently without resilient or violent return movements.

It is usefully fitted with a soft or impact-absorbing casing.

For application in bollard-manufacturing.

Fig. 1



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Description

[0001] The technical field involved in this invention is that of the protection bollards that are located beside pavements or in front of places to restrict vehicle access, or to make certain streets pedestrian areas.

[0002] The problem with said bollards, which overrun the old parts of cities, accesses to monuments or which mark out pavements in areas of conflictive right of way between vehicles and people, is that when a pedestrian or vehicle - even more so if this is a motorcyclist or cyclist - accidentally hits one of these bollards, the mere presence of one of these bollards worsens the consequences of the accident, which would not have taken place had the ground been flat.

Statement of the Prior State of the Art

[0003] The spring is well known. The mere location of a spring under the bollard would mean this was made resilient and returnable.

[0004] But resilience is not always an advantage, as the mere fact of its return capacity is bound to the simple harmonic movement giving rise to the corresponding to and fro motion, meaning that a bollard with resilient base could be used by children at play, for catapulting objects off the same, or for bothering pedestrians, even injuring them.

[0005] ES 1049981 P for a modular item for forming thoroughfare barriers, held by the same applicant as of this patent, consists of a device which allows the mobility of each of the parts of which a protection barrier consists, so as to allow resilient resistance to an impact, but the temporary deformation of the parts of which this is formed goes back to its original position through a resilient anchorage based on a return spring.

[0006] The object of the present invention is a buffer bollard, of the sort that consist of a vertical shaft whose presence identifies the restricted space. This bollard, with its vertical shaft, has the particular characteristic of its being fixed to the ground by means of a securing device which allows it to yield to a transversal thrusting force with the added characteristic of its returning to verticality gently. Its mechanisms activate the return tension and shock absorbing to favour slow movement when a transversal force is applied and so as to return slowly.

[0007] In order to make the following explanation clearer, four sheets of drawings are enclosed, representing the essence of this invention in four figures.

[0008] Figure 1 shows a an open perspective diagrammatic view of the bollard assembly.

[0009] Figure 2 shows a sectional elevation of the assembly.

[0010] Figure 3 shows a sectional elevation of the assembly when a force has been applied to it from the side.

[0011] Figure 4 shows an elevation of a simplified embodiment, with no pressure regulation on the buffer.

[0012] In these figures the following numbers indicate the parts: 1 is the base, 2 the cylinder or body of the bollard, 3 the retaining device or spring made of rubber or similar resilient material with certain rigidity, 3.1 the retaining device or buffer which integrates a coupling to one of the links of the chain for fixing to the ground and to the base, 4 the open spring set inside the cylinder, 5 the securing chain between the base and the buffer, 6 the pin for fixing the chain 5 to the base 1, 7 the nut for regulating the return speed of the buffer, 8 the buffer retention plate, 8.1 the buffer retention plate, 9 the chain support, 10 the retaining nut between the chain support and the buffer 3, 11 the spring support consisting of tabs made in the base of the cylinder 2, 12 the link of the chain which is held and retained by pin 6, 13 the securing bolt between the buffer and the chain, 14 the upper mouth of the bollard, 15 the bollard casing, allowing any arrangement, height or constitution, preferably being a soft, impact-absorbing material, 16 the pin screw or nut, 16.1 the pin nut, 17 the holes for securing the base to the ground.

[0013] Explanation of one form of embodiment.

[0014] This bollard can basically be made in the structure seen in Figure 1, so that its body has a cylindrical shape internally, and externally this can have any configuration, and it has a buffer pulled by a nut 7 which holds a bolt 13 and another nut 10, closed and immobilised in respect of a chain support 9, which as well as immobilising the nut 10, constitutes the securing of the chain whose end is joined to a pin 6 held back by a screw 16 and a nut 16.1. The buffer tends to remain in the position furthest from the base due to a spring 4 whose expansion means it is antagonistic between the buffer 3 and the support 11 of the bollard body and tends to extend between said spring support 11 formed of a support base or a housing for the last spiral inside the cylinder 2. The spring has as much tension as the resistance required for the bollard when being overcome by a transversal force. The buffer 3 has an amount of resistance to return that depends on the pressure exerted between the retention plates 8 and 8.1. This buffering has the basic effect of retaining the return so as to prevent the simple harmonic movement of any resilient body. The retention also has the function of assisting the bollard's resistance to being moved when a transversal force is applied to this.

[0015] The regulation of the force is given by the force of the spring 4, as well as the pressure exerted between plates 8 and 8.1

[0016] A very intense pressure between plates 8 and 8.1 will produce a very slow return, as well as a great resistance to being moved.

[0017] A very powerful pressure of the spring 4 will produce a great retention and resistance of the bollard to being tilted.

[0018] As soon as the bollard receives an impact, it is affected by the effort it has received. Without swinging or violent return the buffer slowly yields until this recov-

ers its vertical position through the effect of the spring.

[0019] One of the great advantages of this type of bollard is that it has unlimited resistance because it clearly yields when subjected to an external force. It yields both farther and more quickly the greater said force. For this reason it can be simply bolted to the ground, as compared with the complex system of rigid bollards which necessarily have to be set in foundations which prove clearly ineffective due to the number of blows that these receive and which shatter the cement and make it ineffective.

[0020] One solution for securing the bollard to the ground may be based on bending the corners of the base 1 if this has a quadrangular shape, so that the points made thereby face downwards. The installation of the item is carried out by being pinned into soft ground surfaces, for example asphalt or unset cement.

[0021] One embodiment essentially implicit in the one described consists of the arrangement of the buffer without a pressure device. If this is formed simply by the cylindrical rubber block and made with a section of chain 3.1, and one or two links inside it, this constitutes sufficient securing. What is more, in this case the operation is carried out with greater bending freedom, since the buffer does not retain the tilting movement so much. Apart from this, the return movement can go back to the vertical more quickly, without constituting a resilient movement.

[0022] In any event this bollard is covered by an external piece, preferably made of non-aggressive material such as rubber or plastic material, which limits any harm that may be done when there is an inevitable conflict between a passer-by and one of these devices. The casing can thus be as high as required and have a design matching the setting in which this is located, and its interior can in all cases be as in any of the embodiments mentioned herein.

[0023] This is for industrial application in the manufacture of bollards.

Claims

1. Buffer bollard, of the sort that are placed in public thoroughfares, marking off pedestrian areas or for similar applications and that are formed of a part that is joined to the ground and rises vertically to a certain height from this, **characterised** because it consists of tension and buffering mechanisms formed of: a base (1), a bollard body (2), an open internal spring (4), a support (11) inside the bollard for the spring, a buffer (3) inside the bollard which is pressed by the spring, a device connected to the buffer and to the base 5, so that a transversal force exerted against the bollard determines a limited resistance of said bollard according to the spring pressure, recovering its position slowly.

2. Buffer bollard, according to claim 1, **characterised in that** the base (1) is formed of a device which, at the opposite end to the bollard strictly speaking, houses a pin (6) which retains the tension device by a chain (5) and spring (4), with means for securing to the ground.

3. Buffer bollard, according to claim 1, **characterised in that** the base (1) consists of a base strictly speaking, with no foundations, and bolted to the ground.

4. Buffer bollard, according to claim 1, **characterised in that** the base (1) is formed of a base strictly speaking formed of a quadrangular plate whose downward-turned corners can be pinned into soft ground surfaces such as asphalt or uncured concrete.

5. Buffer bollard, according to claim 1, **characterised in that** the body of the bollard (2) is formed of a shaft fitted with a hollow interior in which the tension and buffering mechanisms are fitted.

6. Buffer bollard, according to claims 1 and 5, **characterised in that** it has inside the body (2) of the bollard, an open spring (4) preferably set in the internal perimeter of the bollard body (2) which at one end exerts pressure against the internal support (11) of the bollard and at the other end against the buffer (3, 3.1).

7. Buffer bollard, according to claim 1, **characterised in that** the support (11) inside the bollard for the spring consists of an internal rim of the body (2) of the bollard, so that said spring (4) rests on the internal perimeter part antagonistically with the buffer (3, 3.1).

8. Buffer bollard, according to claim 1, **characterised in that** the buffer consists of a cylinder (3, 3.1) made of rubber or resilient material with certain rigidity and dimensions coinciding with the internal diameter of the bollard.

9. Buffer bollard, according to claim 1 and 8, **characterised in that** the buffer (3) consists of a cylinder set between two retaining plates (8, 8.1) able to press on the buffer at both sides so as to regulate the expansion of the sides of said buffer.

10. Buffer bollard, according to claim 1 and 8, **characterised in that** the buffer consists of a rubber cylinder made with at least one link of the chain (5) inside it.

11. Buffer bollard, according to any of the previous claims, **characterised in that** it has an external casing of appropriate size, height or thickness and

preferably of an elastic material.

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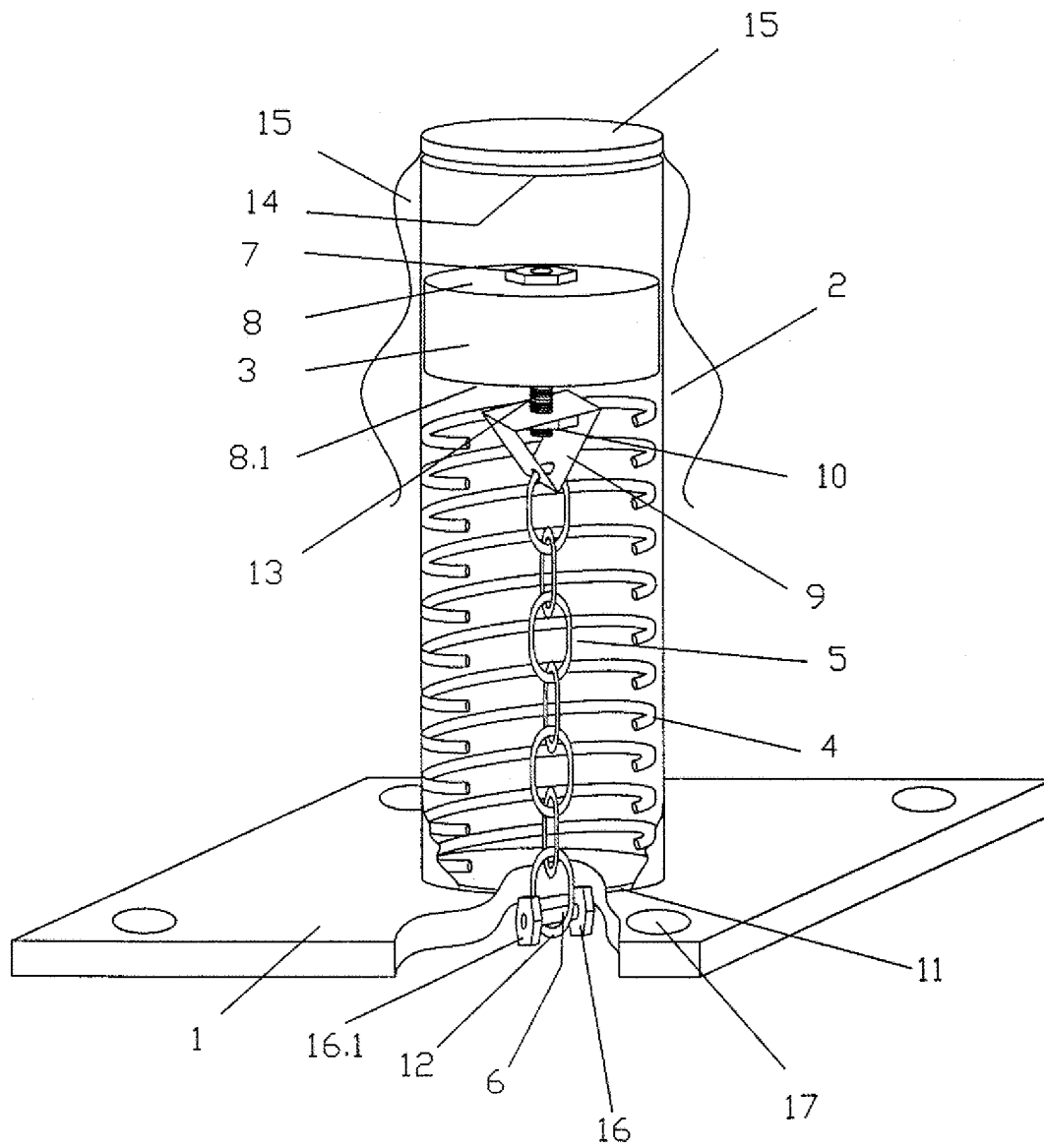
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Fig. 1



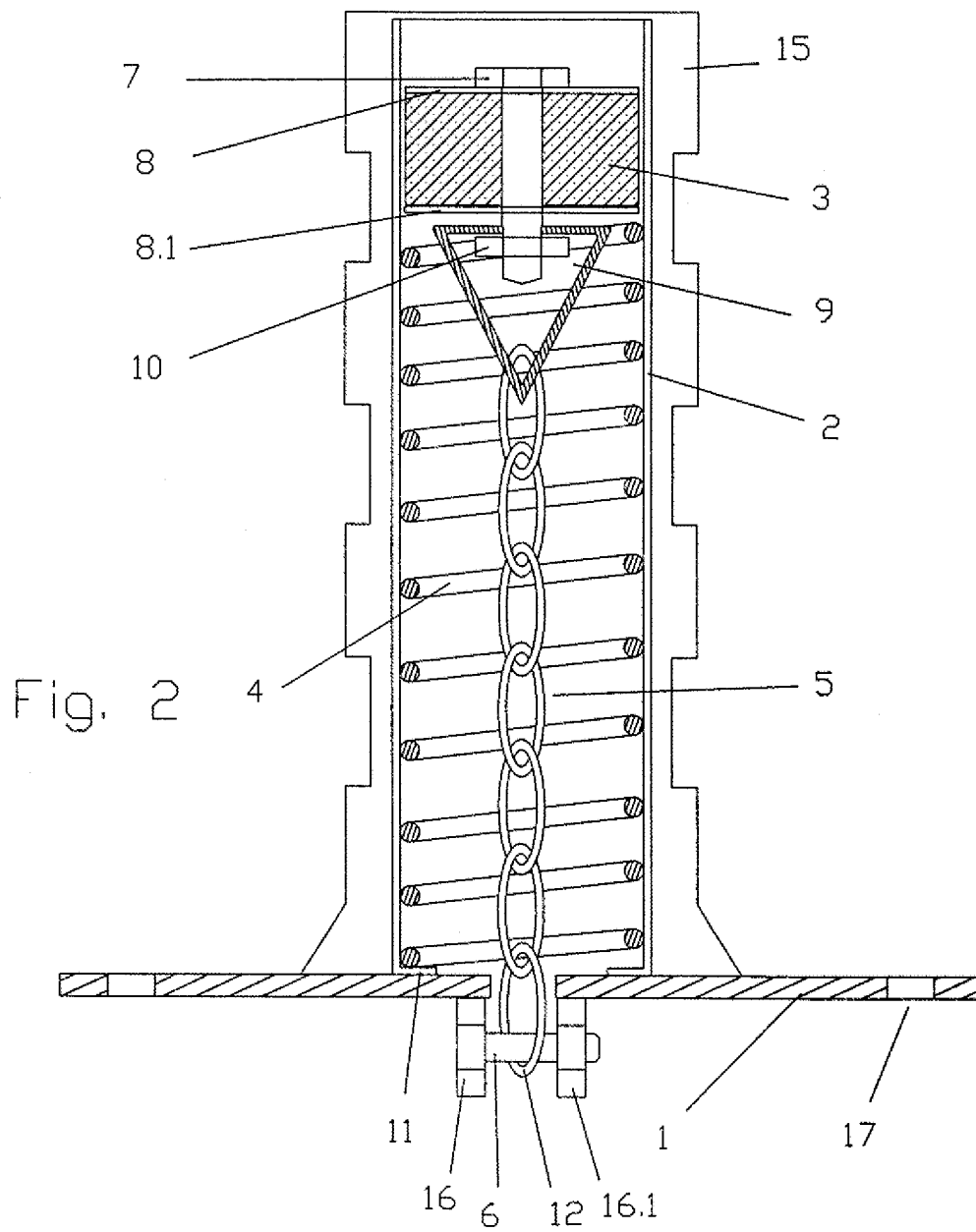
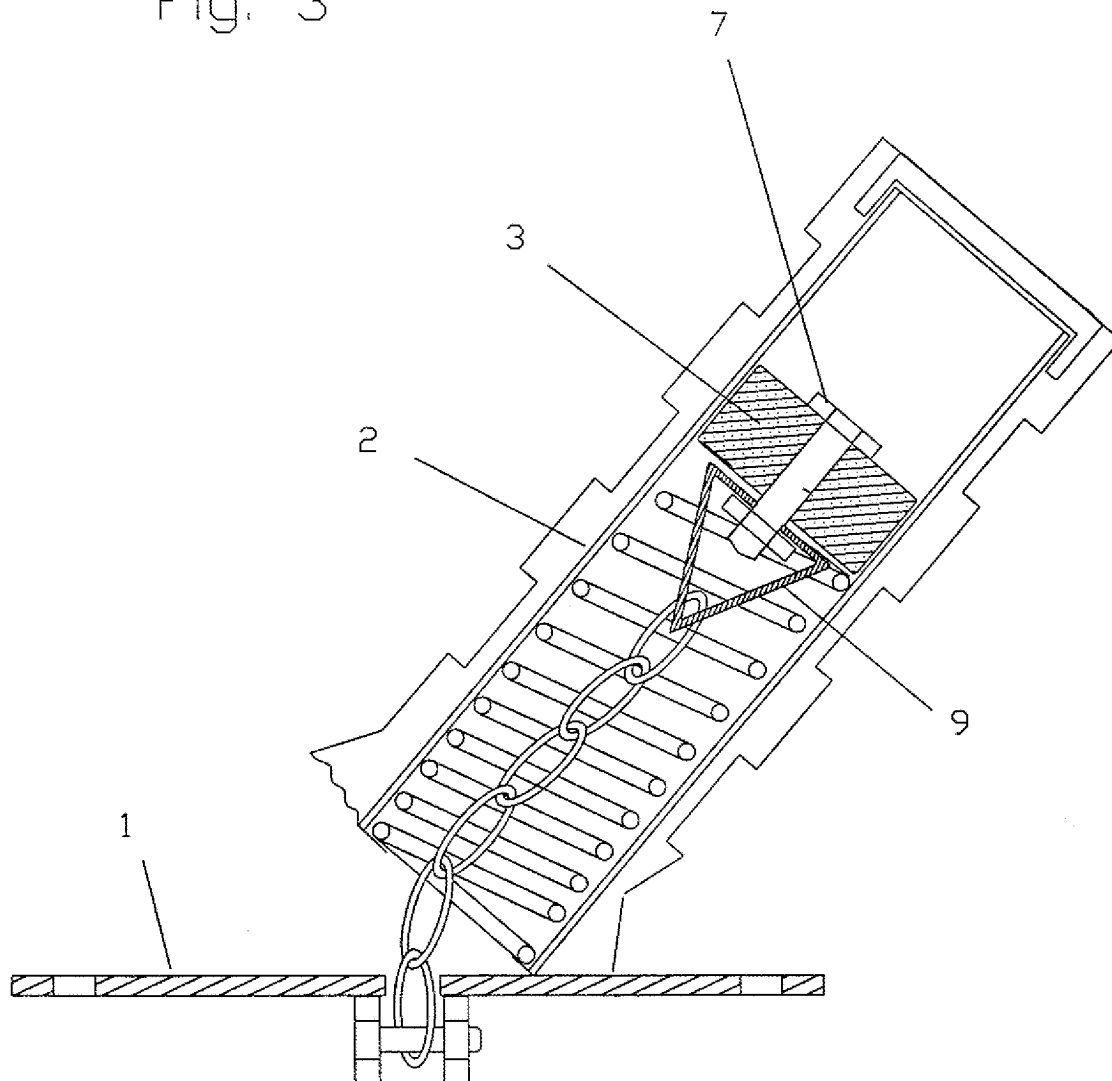


Fig. 3



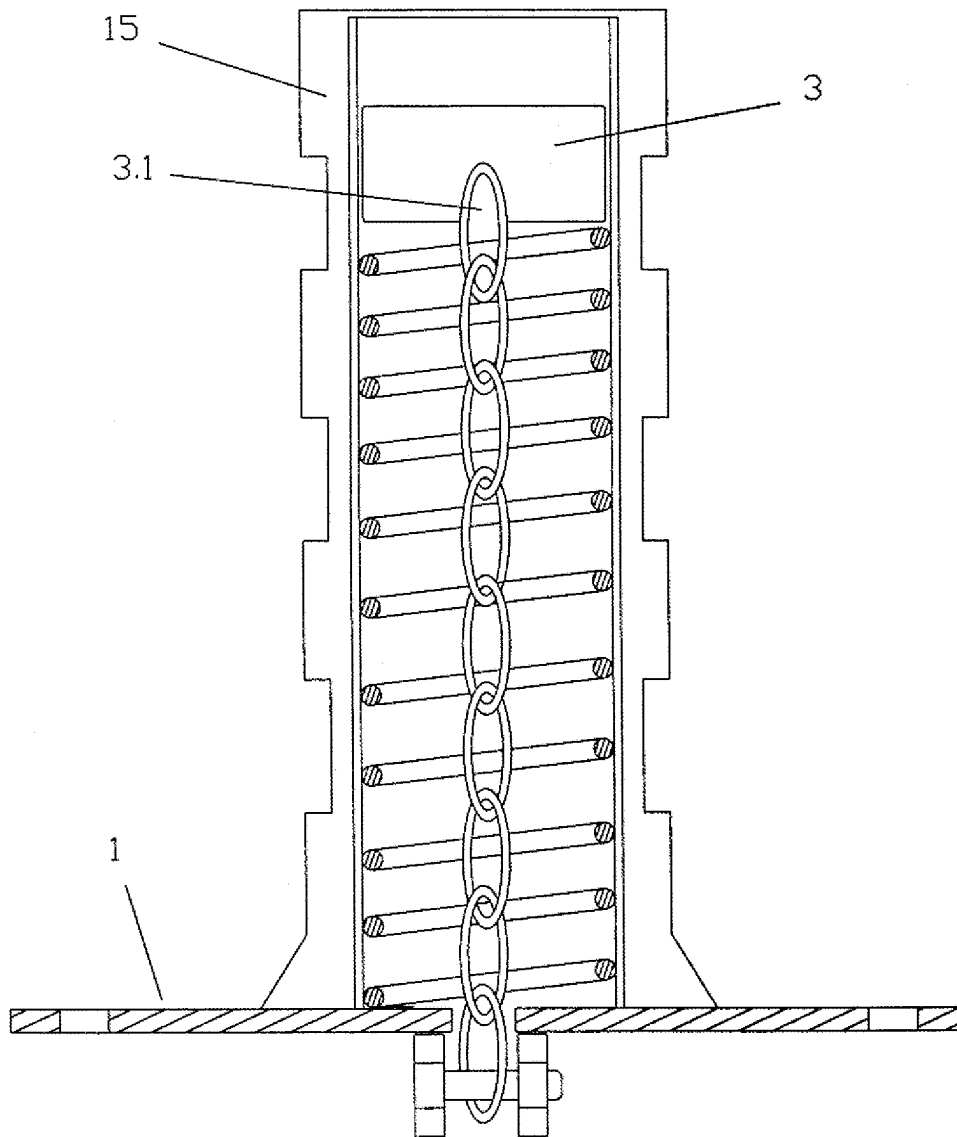


Fig. 4