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(54) Title: GATE BARRICADE THAT RELEASES AGAINST EXTERNAL IMPACT

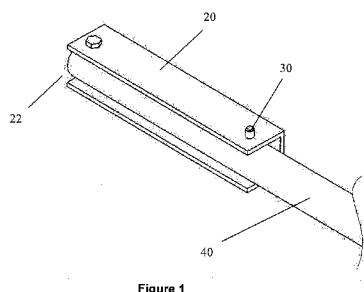


Figure 1

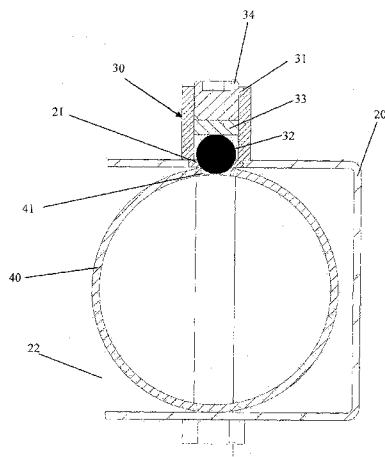


Figure 2

(57) Abstract: The present invention relates to a gate barricade that releases against external impact, characterized by: an elongated barrier member (40) having a depression (41); a beam (20) is fitted and hinged to the elongated barrier member (40); an adjustable ball detent (30) including a ball detent housing (31) to receive a ball (32), an elastic member (33) adjacent to the ball (32), and a fastening means (34) for securing the elastic member (33) and the ball (32) within the ball detent housing (31), wherein said ball (32) is engaged with the depression (41) for fastening retaining the elongated barrier member (40) in the beam; wherein the elongated barrier member (40) swings away from the beam (20) if an external force (42) greater than the compression force of the elastic member (33) is applied on the elongated barrier member (40).

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GATE BARRICADE THAT RELEASES AGAINST EXTERNAL IMPACT

Background of the Invention

Field of the Invention

- 5 This invention relates to a gate barricade that releases against external impact, and more particularly to an elongated barrier member which is released from a beam when a certain external force is applied to the elongated barrier member to prevent damage to the elongated barrier member and its motorized system.

10 Description of Related Arts

- Gate barrier is a common machine to control traffic anywhere in the world. The gate barrier is usually regulating the traffic at places such as parking lots, tolls ways, and commercial areas. For example in parking lots, the gate barrier controls the traffic and at the same time giving, collecting parking tokens or tickets from the drivers. Typically, the gate barrier arm is horizontally elongated across the barrier point to regulate the traffic. The gate is usually electromechanically operated whereby a mechanical mechanism operates by receiving an electrical signal from other sources such as the gate operator and automatic ticket station. The gate barrier is activated when pre-authorized vehicle is approaching. The gate barrier is then lowered so that the barrier arm after the vehicle is cleared from the barrier point. In the event of high volume traffic, it is common that the barrier arm is lowered onto the middle of intervening vehicles. Heavy traffic might also cause the gate to malfunction and prematurely lowers the barrier arm before the vehicle manages to clear from the barrier point. This entire scenario might damage the vehicle and the gate barrier itself.

- US Patent No. 4227344** disclosed an automatic parking lot gate with four-way flex connector. The parking lot gate includes a flexible connector between the elongated gate arm to prevent breakage of the gate arm or the drive mechanism. The special flexible connector includes first and second connection plates which

connected to the gate arm and the arm drive means, and first and second coil spring which are connected between the first and second connection plates. The first and second spring are positioned essentially parallel to each other in vertical manner to combine strength to hold the arm gate in horizontal position. The design
5 of the cited patent has particularly effective in reducing damage to the parking gate arm and the arm drive mechanism. However, the parking gate arm requires excessive force which is fixed and not adjustable, before it release said excessive force. This will cause difficulty in the event of emergency or power failure, when the parking gate arm cannot be operated, there must be an external force to push
10 or pull and hold the arm must be exist to allow traffic to pass through the parking gate.

US Patent No. 6460292 B1 disclosed barrier gate arm assembly and method for use thereof. The barrier gate includes an automatic vehicle gate operating
15 mechanism connected a barrier arm assembly. The barrier arm comprises of a bracket assembly with a hinge assembly attached to the bracket assembly. The hinged assembly having a pivot axis transverse to the bracket assembly permitting pivotally joins the bracket assembly to a plate assembly permitting pivotal movement of the plate assembly away from the bracket assembly. The plate
20 assembly is adjointly aligned with the bracket assembly during a closed and normal operational position. A magnet is provided on the bracket assembly in alignment with the plate assembly in to firmly hold the metallic plate assembly. If a vehicle hits the barrier arm with a force more than the magnetic force and the metallic plate, the barrier arm will swing away from the bracket to prevent damage
25 to the vehicle and the barrier gate. It is a disadvantage for the cited patent whereby the force of the magnet and the metallic plate is not easily adjustable. Furthermore, it is not practical to use the barrier gate in extreme climate such as very hot environment due the weakness of the magnet which will lost it magnetic power during high temperature environment.

US Patent No. 4364200 disclosed an automatic operable automotive vehicle gate apparatus provided with self-protection and automotive protection. The gate apparatus also include structure which permits the gate member to move to an open position when opening forces are applied thereto, without operation of the operational mechanism. Therefore, the gate apparatus and the vehicle are protected against damage. The gate apparatus also include mechanism which permits gate operation mechanism to move from open position to a close position while the gate member remains in opened position. Thus, if an automotive vehicle should be within the gateway when closing action of the gate operation mechanism occurs, the automotive vehicle is protected against damage. However, the design from the actuator to the barrier arm of the gate is permanent. The force required to move the gate member away if a vehicle hits the gate member is already fixed and is dependent on the gate member weight. The only way to adjust the force to enable gate member swing away is by adjusting the gate member weight. The heavier the gate member is, the more force is required to enable the gate to swing away.

US Patent No. 7814706 B2 disclosed a safety system, for use with boom gate. The boom gate includes a boom and a boom operator for moving the boom between a down and up position. The safety system also has a boom deflection detector for detecting deflection of the boom, such as deflection caused by collision of the boom with a vehicle. A control system is provided for actuating the boom operator to move the boom to the up position whenever deflection is detected. A combination hinged is used to permit the boom to deflect in both horizontal and vertical direction. The combination hinge includes a horizontal pivot joint and a vertical pivot join. The combination hinged is spring biased to retain the boom in a normal, undeflected position. The spring also acts to return the boom to the normal, undeflected position after the boom has been deflected. However, this design is complex as the hinges are already in the spring biased state in the manufacturing stage, thus it is practically hard to maintain the mechanism regularly and even harder to repair if said spring needs to be replaced.

Furthermore, the spring force is not adjustable to the force required before the boom is swing away if a vehicle collides with the boom.

Summary of Invention

5 It is an objective of the present invention to provide a gate barricade that releases against external impact.

It is also an objective of the present invention to provide an adjustable compression force before the elongated barricade member is released from the
10 beam.

Accordingly, these objectives may be achieved by following the teachings of the present invention. The present invention relates to a gate barricade that releases against external impact, characterized by: an elongated barrier member having a
15 depression; a beam fitted and hinged to the elongated barrier member; an adjustable ball detent including a ball detent housing to receive a ball, an elastic member adjacent to the ball, and a fastening means for securing the elastic member and the ball within the ball detent housing, wherein said ball is engaged with the depression for fastening retaining the elongated barrier member in the
20 beam; wherein the elongated barrier member swings away from the beam if an external force greater than the compression force of the elastic member is applied on the elongated barrier member.

Brief Description of the Drawings

25 The features of the invention will be more readily understood and appreciated from the following detailed description when read in conjunction with the accompanying drawings of the preferred embodiment of the present invention, in which:

Figure 1 is an isometric view of a gate barricade that releases against external
30 impact.

Figure 2 is a cross-section view of a gate barricade that releases against external impact.

Figure 3 is a drawing showing an adjustable ball detent.

Figure 4 is a cross sectional view of the adjustable ball detent.

Figure 5a is drawing showing top view of the gate barricade comprises an elongated barrier member at initial position and a cross sectional view taken from line C-C.

Figure 5b is drawing showing top view of the gate barricade comprises an elongated barrier member swing away from the initial position and a cross sectional view taken from line D-D.

10 Detailed Description of the Invention

As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention, which may be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting but merely as a basis for claims. It should be understood that the drawings and detailed description thereto are not intended to limit the invention to the particular form disclosed, but on the contrary, the invention is to cover all modification, equivalents and alternatives falling within the spirit and scope of the present invention as defined by the appended claims. As used throughout this application, the word "may" is used in a permissive sense (i.e., meaning having the potential to), rather than the mandatory sense (i.e., meaning must). Similarly, the words "include," "including," and "includes" mean including, but not limited to. Further, the words "a" or "an" mean "at least one" and the word "plurality" means one or more, unless otherwise mentioned. Where the abbreviations of technical terms are used, these indicate the commonly accepted meanings as known in the technical field. For ease of reference, common reference numerals will be used throughout the figures when referring to the same or similar features common to the figures. The present invention will now be described with reference to Figs. 1-5b.

The present invention relates to a gate barricade that releases against external impact, comprising:

an elongated barrier member (40) having a depression (41);
a beam (20) is fitted and hinged to the elongated barrier member
5 (40);

an adjustable ball detent (30) including a ball detent housing (31) to receive a ball (32), an elastic member (33) adjacent to the ball (32), and a fastening means (34) for securing the elastic member (33) and the ball (32) within the ball detent housing (31), wherein said ball (32) is engaged with the depression
10 (41) for fastening retaining the elongated barrier member (40) in the beam;

wherein the elongated barrier member (40) swings away from the beam (20) if an external force (42) greater than the compression force of the elastic member (33) is applied on the elongated barrier member (40).

15 In a preferred embodiment of the gate barricade that releases against external impact, the beam (20) is a C-shaped beam (20).

In a preferred embodiment of the gate barricade that releases against external impact, the compression force between the elastic member (33) and the ball (32)
20 is adjustable by adjusting the insertion depth of the fastening means (34).

The C-shaped beam (20) forms a bracket with an opened side (22). The elongated barrier member (40) is fitted into the C-shaped beam (20). The open side (22) is positioned in the same direction of the external force (42) applied to the elongated
25 barrier member (40), in order to enable the elongated barrier member (40) to swing away from the C-shaped beam (20). One end of the beam is hinged to the elongated barrier member (40). At an opposite end of the beam (20), there is an aperture (21) positioned coaxial with the depression (41). The adjustable ball detent (30) coaxially is mounted over the aperture (21) the ball detent housing (31)
30 is fixed to the beam (20), whereby the ball (32) is partially protrudes out from the aperture (21) to engage with the depression (41) for retaining the elongated barrier member (40) within the beam (20).

Said gate barricade can support a various amount of external force (42) applied to the elongated barrier member (40) for the elongated barrier member (40) to swing away from the C-shaped beam (20), by adjusting the insertion depth of the fastening (34). As the fastening means (34) is inserted deeper into the ball detent housing (31), a greater compression force is exerted within the elastic member (33) and therefore, the greater force from the elastic member (33) pushes the ball (32) into the depression (41). Thus, more force is required to enable elongated barrier member (40) to swing away from the C-shaped beam (20).

10

Although the present invention has been described with reference to specific embodiments, also shown in the appended figures, it will be apparent for those skilled in the art that many variations and modifications can be done within the scope of the invention as described in the specification and defined in the following claims.

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Description of the reference numerals used in the accompanying drawings according to the present invention:

Reference Numerals	Description
20	Beam / C-Shaped beam
21	Aperture
22	Open side
30	Ball detent
31	Ball detent housing
32	Ball
33	Elastic member
34	Fastening means
40	Elongated barrier member
41	Depression
42	External force

Claims

I/We claim:

1. A gate barricade that releases against external impact, characterized by:
 - 5 an elongated barrier member (40) having a depression (41);
 - a beam (20) fitted and hinged to the elongated barrier member (40);
 - an adjustable ball detent (30) including a ball detent housing (31) to receive a ball (32), an elastic member (33) adjacent to the ball (32), and a fastening means (34) for securing the elastic member (33) and the ball (32)
 - 10 within the ball detent housing (31), wherein said ball (32) is engaged with the depression (41) for fastening retaining the elongated barrier member (40) in the beam;
 - wherein the elongated barrier member (40) swings away from the beam (20) if an external force (42) greater than the compression force of
 - 15 the elastic member (33) is applied on the elongated barrier member (40).
2. A gate barricade that releases against external impact in claim 1, wherein the beam (20) is a C-shaped beam (20).
- 20 3. A gate barricade that releases against external impact in claim 1, wherein the compression force between the elastic member (33) and the ball (32) is adjustable by adjusting the insertion depth of the fastening means (34).

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GATE BARRICADE THAT RELEASES AGAINST EXTERNAL IMPACT**Abstract**

The present invention relates to a gate barricade that releases against external
5 impact, characterized by: an elongated barrier member (40) having a depression
(41); a beam (20) is fitted and hinged to the elongated barrier member (40); an
adjustable ball detent (30) including a ball detent housing (31) to receive a ball (32),
an elastic member (33) adjacent to the ball (32), and a fastening means (34) for
securing the elastic member (33) and the ball (32) within the ball detent housing
10 (31), wherein said ball (32) is engaged with the depression (41) for fastening
retaining the elongated barrier member (40) in the beam; wherein the elongated
barrier member (40) swings away from the beam (20) if an external force (42)
greater than the compression force of the elastic member (33) is applied on the
elongated barrier member (40).

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Drawing accompanying abstract: Figure 1 and Figure 2.

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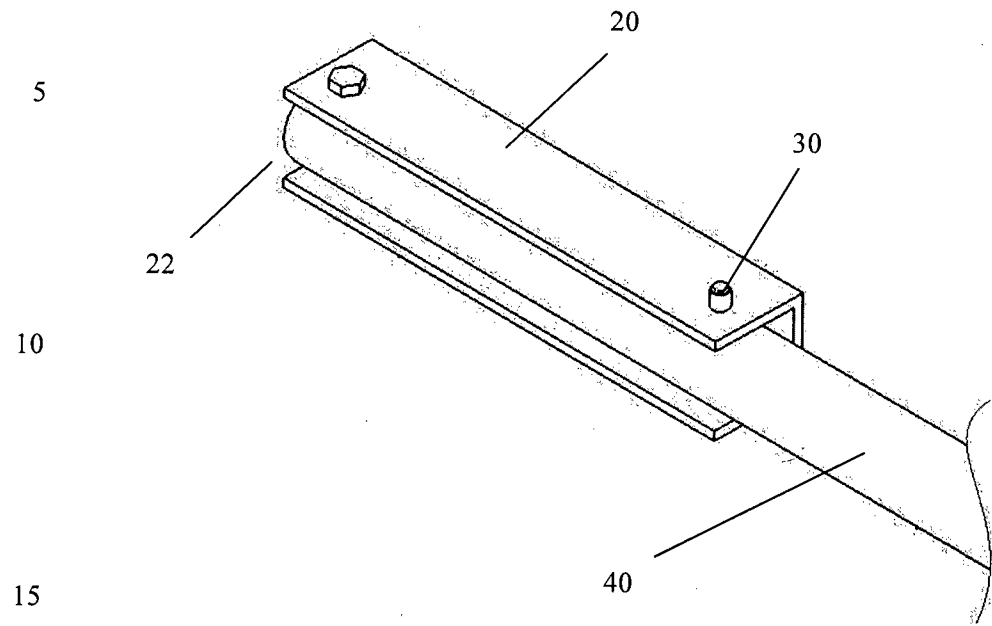


Figure 1

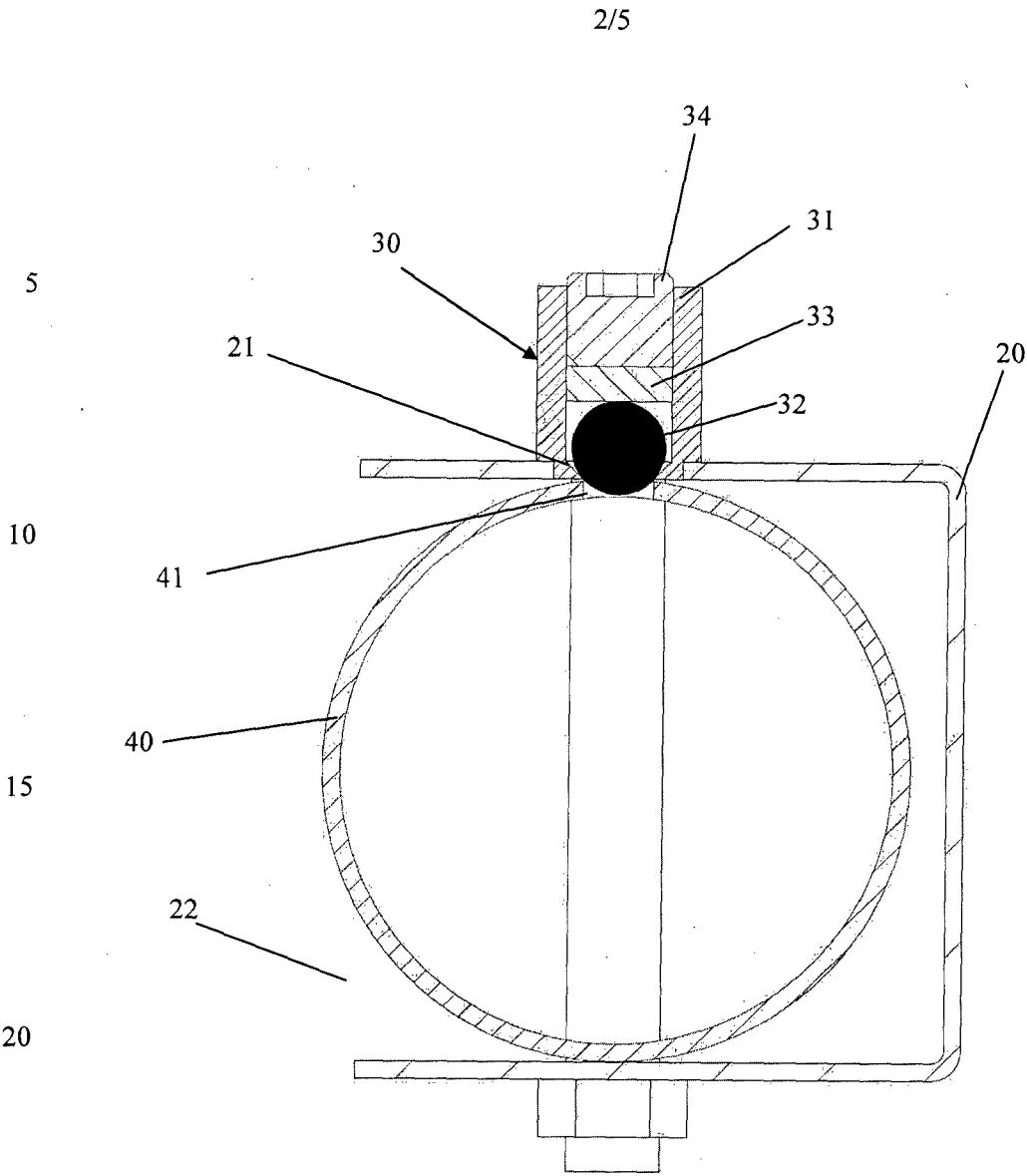


Figure 2

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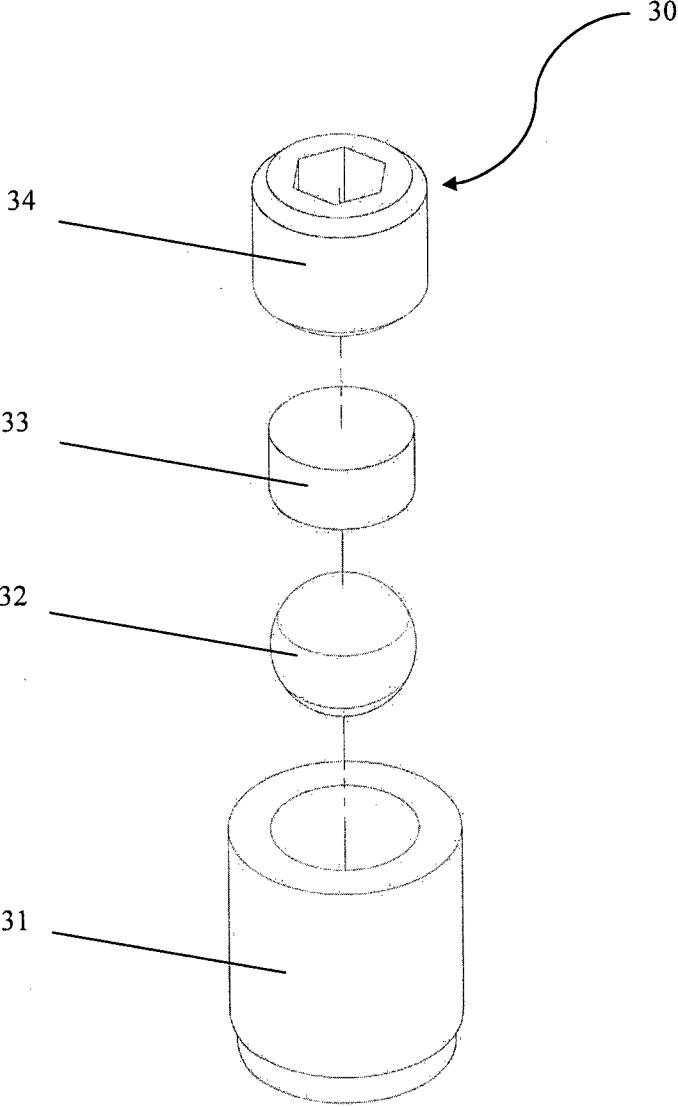


Figure 3

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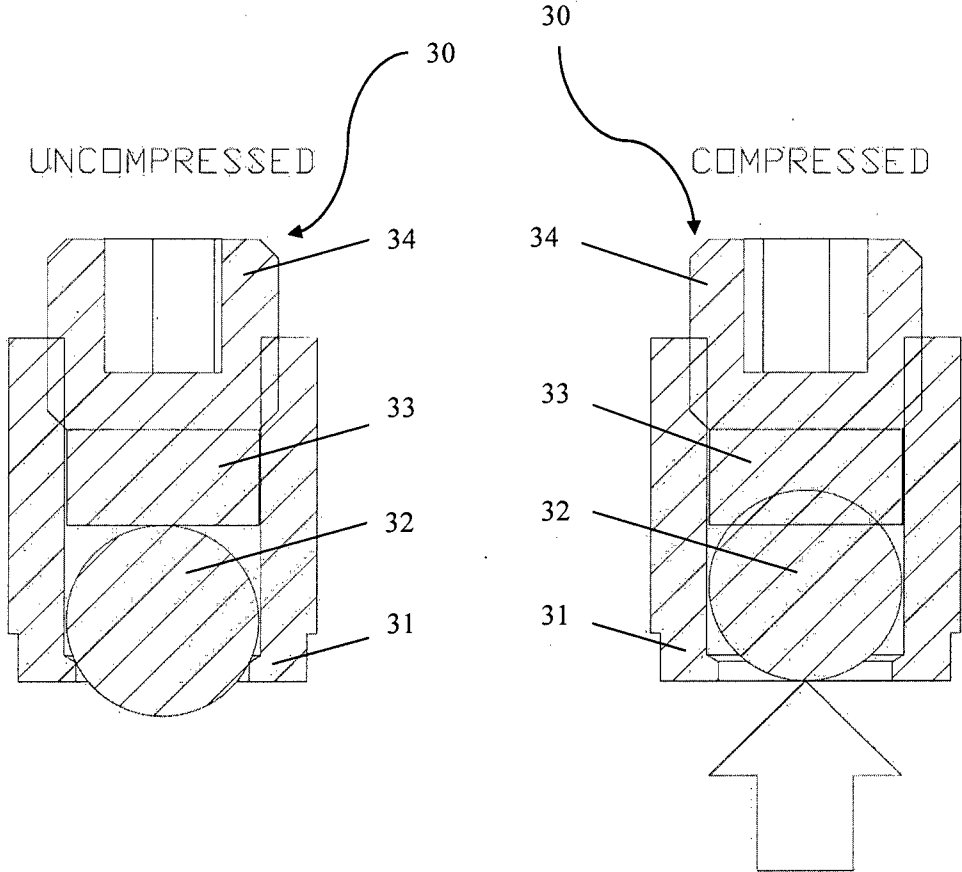


Figure 4

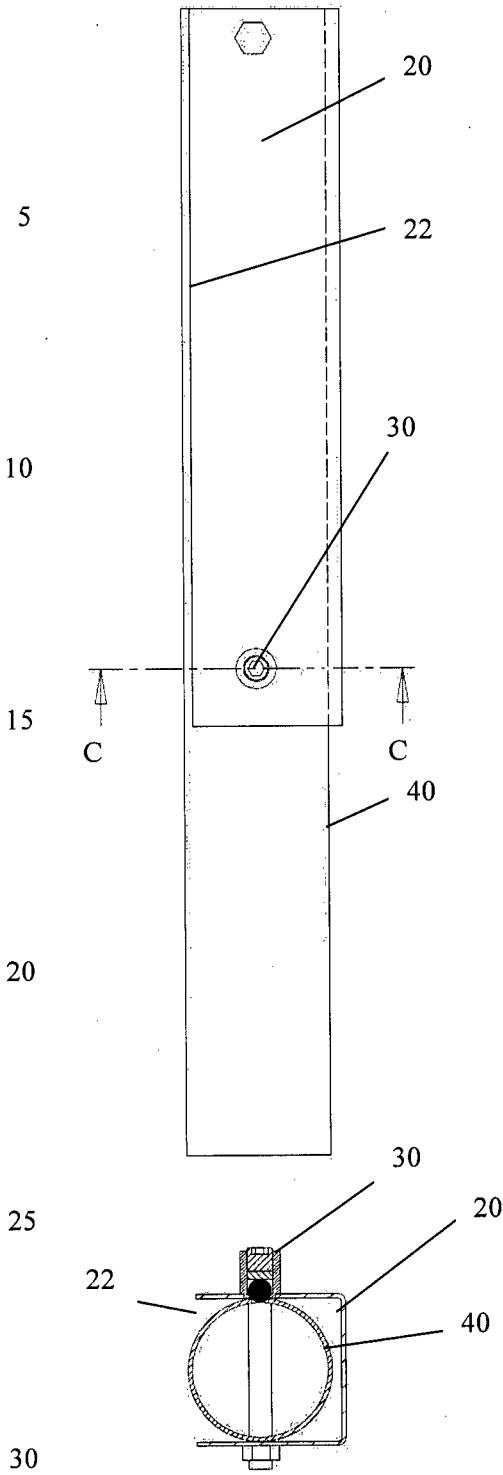


Figure 5a

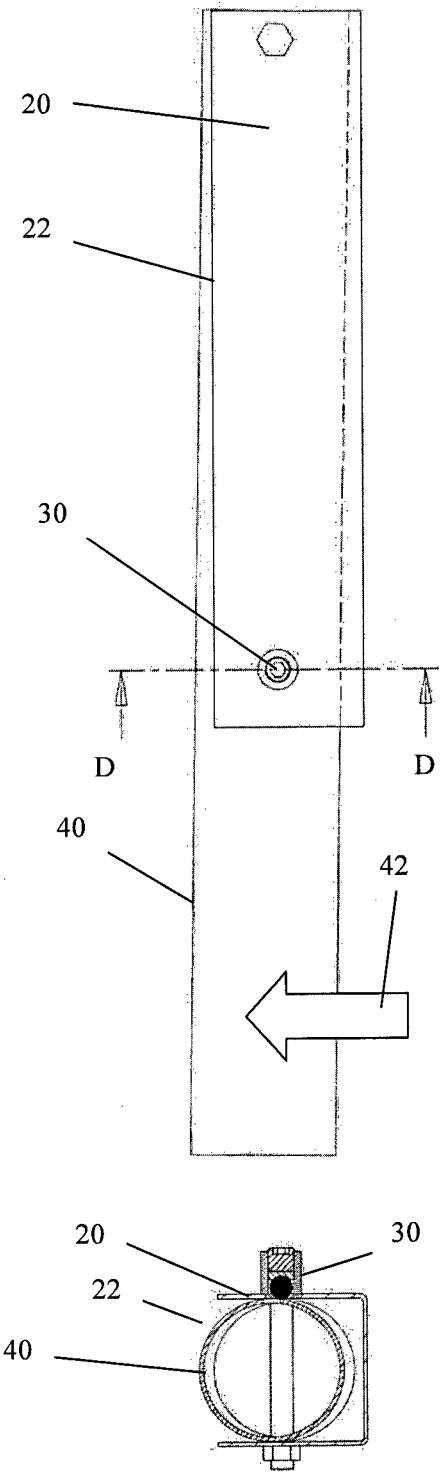


Figure 5b