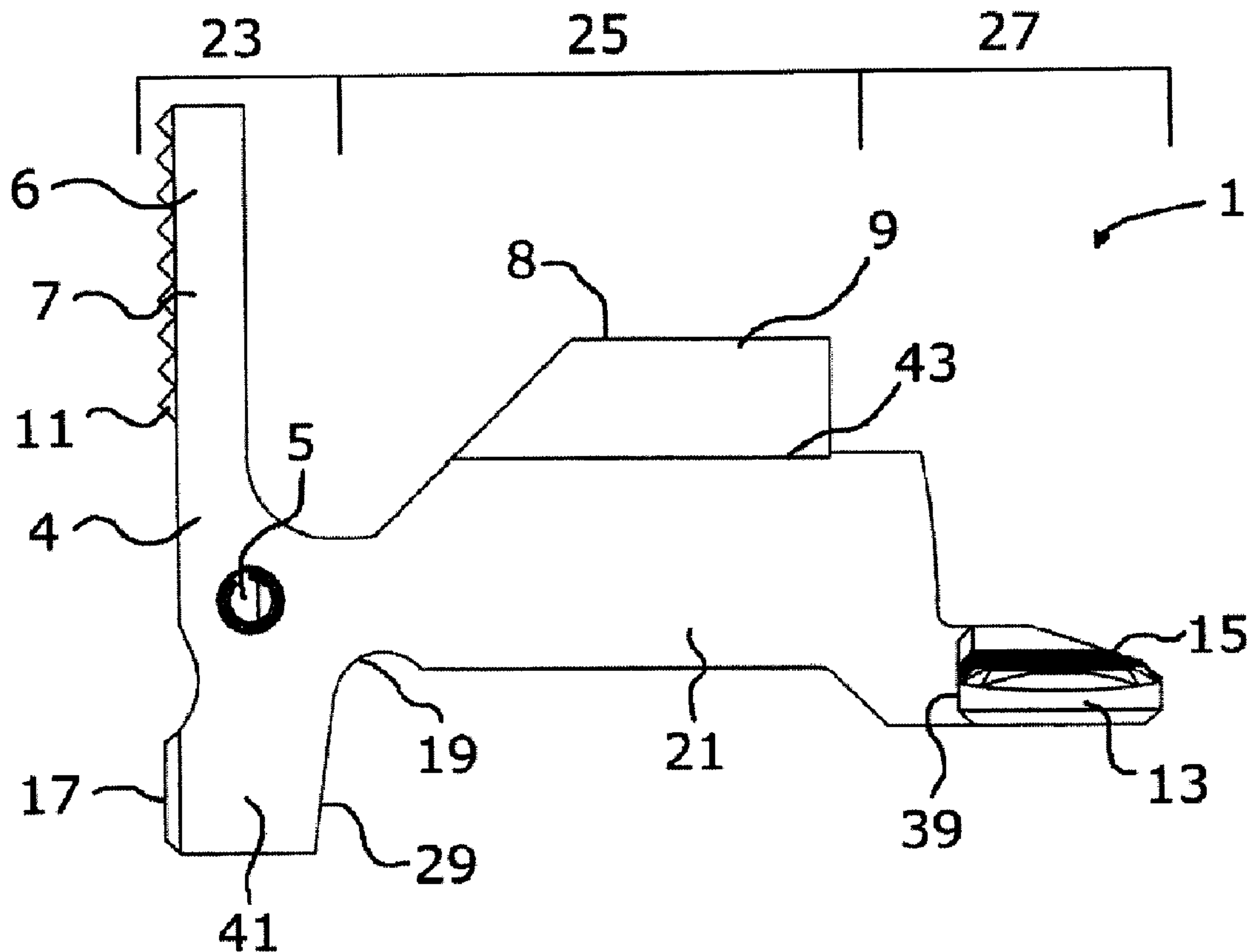




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 LEVIER DE VERROUILLAGE DE CULASSE ET ENVELOPPE D'UNE ARME A FEU**  
 (54) **Title: BOLT CATCH LEVER FOR A FIREARM AND BUTTSTOCK AND WEAPON RECEIVER FOR A FIREARM EQUIPPED  
 THEREWITH**



(57) **Abrégé/Abstract:**

The invention comprises a bolt catch lever (1) for a firearm, which can be operated from both sides of the firearm, and for this purpose has handles (7, 13, 17) protruding from both sides of the firearm, and is designed as an integral part thereof, as well as a buttstock for a firearm, and a receiver, equipped, respectively, with a bolt catch lever (1) of this type.

## Abstract

The invention comprises a bolt catch lever (1) for a firearm, which can be operated from both sides of the firearm, and for this purpose has handles (7, 13, 17) protruding from both sides of the firearm, and is designed as an integral part thereof, as well as a buttstock for a firearm, and a receiver, equipped, respectively, with a bolt catch lever (1) of this type.

## **Bolt Catch Lever for a Firearm and Buttstock and Weapon Receiver for a Firearm Equipped Therewith**

### **Field of the Invention**

The invention relates to a bolt catch lever for a firearm, which can be operated from both sides of the firearm and has protruding handles on both sides of the firearm for this purpose, and has an integrated design, as well as a firearm buttstock and a firearm receiver, in each case equipped therewith.

In these documents, positional indications, such as “up,” “down,” “front,” “back,” etc. always concern weapons held in the normal firing position, in which the bore axis runs horizontally, and the firing of shots occurs toward the front, away from the shooter.

### **Prior Art**

Bolt catch levers are known in various embodiments and function as a means of catching and retaining a bolt, or to release the bolt for firing.

With many weapons, light machine guns, submachine guns and pistols, it has become standard that after firing the last cartridge the bolt is retained in the open position, typically with the aid of a bolt catch lever. For this, after the last shot has been fired, the cartridge loader normally pushes the magazine onto the bolt catch lever and pivots it or pushes it into the movement path of the bolt, i.e. into its so-called catch and retention position. The bolt, which first returns after firing then meets the bolt catch lever when it again moves forward, and the two block each other in a reciprocal manner. After a full magazine has then been inserted, the bolt can again be released through a manual actuation of the bolt catch lever, i.e. the bolt catch lever again ends up

in its so-called released position. The bolt then guides a cartridge into the chamber as it moves forward, and the weapon is again ready for firing.

This automatic catching and retaining of the forward moving bolt when the magazine is empty has, among others, two advantages: firstly, the shooter immediately sees when the magazine is empty, and secondly, he can load a cartridge after inserting a full magazine, by releasing the bolt, without having to work the slide.

Normally, a right-handed shooter actuates the bolt catch lever by means of a handle with his free, left hand, which is not located on the buttstock. Earlier bolt catch levers could only be operated from the left side, such that left-handed shooters had difficulties operating the bolt catch lever.

In the meantime, bolt catch levers that can be operated from both sides have become known. They are all constructed, however, with multiple components, thus resulting in a complex design for the weapon production. Furthermore, these multi-part constructions are prone to damage and malfunction in rough maneuvers or combat situations, due to contamination, for example.

US 7,661,219 B1 describes, for example, a bolt catch lever for a firearm, which can be operated from both sides via an additional multi-part rod construction.

US 2005/0183310 A1 also describes a multi-part bolt catch lever for a firearm that can be operated from both sides. This comprises a rod that extends downward, and can be operated from both sides via a trigger element.

Lastly, US 2010/0275485 A1 also shows a multi-part firearm bolt catch lever that can be operated from both sides, which is extended forward via a yoke and pin assembly. The extension is placed on the remaining part of the bolt catch lever, and attached to the receiver by a pin.



## **Object of the Invention and Solution Thereto**

The object of the invention is to create a bolt catch lever for firearms that can be operated from both sides, but has a simple, and at the same time, functionally reliable construction.

This object is achieved, respectively, by the present invention, which relates to a bolt catch lever, attached to the firearm in an articulated manner such that it can be pivoted about a pivot axis disposed on one side between a release position and its catch/retention position, and by a buttstock or receiver for a firearm equipped with a bolt catch lever of this type.

In a broad aspect, the present invention provides a bolt catch lever 1 for a firearm that can be operated from both sides and for this purpose has handles 7, 13, 17 protruding on both sides of the firearm, and is designed as an integral part thereof, characterized in that it is attached in an articulated manner to a pivot axis 5 disposed on the right or left side of the firearm such that it can pivot between its release position and its catch/retention position on the firearm.

The receiver, as set forth in the present invention, comprises thereby a receiver designed as a one-piece unit, as well as a multi-part receiver consisting, for example, of a receiver upper part and a receiver lower part. The bolt catch lever is provided there at a suitable location. The receiver lower part can be designed as a buttstock module, a buttstock module with a magazine chamber for receiving a magazine, a buttstock module with a receiver for trigger device, a buttstock module with a magazine chamber and a receiver for a trigger device, a buttstock module with a receiver for a trigger device and a shoulder rest, or a buttstock module with a magazine chamber, a receiver for a trigger device, and a shoulder rest.

The bolt catch lever according to the invention thus deviates from multi-part constructions due to its integral construction, has a simple construction and is fail-safe, and increases thereby the reliability of a firearm equipped therewith. The bolt catch lever according to the invention can be manufactured in a cost-effective using known metal casting methods or metal powder injection molding processes, so-called MIM methods (Metal Injection Molding), but also, e.g. using conventional sintering processes.

The pivot axis can be disposed on either the left or right side. This results in short lever paths, and prevents an unintended pivoting of the bolt catch lever.

Furthermore, the bolt catch lever is preferably supported such that it is retained in its release position by an elastic element.

The release position of the bolt catch lever is generally the position in which it allows the bolt to move forward without impediment. The elastic element can be provided as, e.g. a spring, a rubber-like component, or some other suitable component. This retains the bolt catch lever in its release position, in an elastically pre-tensioned manner.

Typically, the bolt catch lever pivots to a catch/retention position after the last cartridge has been fired from the magazine, blocks the forward movement of the bolt, and thus prevents the bolt from moving forward without carrying a cartridge.

Preferably the bolt catch lever has a button, which protrudes therefrom and extends into the magazine chamber, such that the button, together with the cartridge loader, comes into engagement with an empty magazine, and by this means, with the aid of the magazine spring, automatically moves the bolt catch lever from its release position into its catch/retention position.

The button can be designed as a nose or a tooth, in particular having a ramp shape on its front upper surface. This ensures that the bolt, when moving back, cannot catch on the front surface of the bolt catch lever with its back edge. Furthermore, the button only extends into the back upper side of the magazine such that it makes contact with the cartridge loader, but cannot be touched by the cartridge base, thus enabling an unimpeded supplying of the cartridges.

Preferably the cartridge loader exhibits a region that extends beyond the base of the cartridge such that this extended region – but not the cartridge located in the magazine – can be brought into engagement with the button for the bolt catch lever. This extended region of the cartridge

loader transfers the pressure exerted thereon by the magazine spring onto the button, and thus pivots the entire bolt catch lever upward, into its catch/retention position.

The button ensures that the bolt is securely caught and retained in an open bolt position after the last cartridge has been fired. As a result, the shooter can see that the magazine is empty and can replace the magazine.

Preferably the bolt catch lever comprises three handles for the operation thereof, specifically, two on its end in the proximity of its pivot axis, and a further handle on its end further away from its pivot axis.

Preferably the bolt catch lever can be transferred from its catch/retention position to its release position by exerting pressure on its handles.

Preferably the bore for the bolt catch lever pivot axis is provided between the two handles located in the proximity of the pivot axis. For this, the handles can be of the same length or of different lengths. The bolt catch lever can thus be easily operated, and allows for a compact construction.

The shooter can transfer the bolt catch lever from its catch/retention position to its release position in that he pushes the end of the bolt catch lever in the proximity of the pivot axis inward and/or pushes the handle attached to the other end of the bolt catch lever downward.

Normally, the shooter exerts pressure to the bolt catch lever by pushing on one of the handles after exchanging magazines, in order to transfer the bolt catch lever from its catch/retention position to its release position. As a result, the again released bolt can resume its interrupted forward movement, and insert a cartridge from the magazine into the cartridge chamber. In this manner, the shooter can load the weapon after replacing the magazine with his free hand, which is not located on the buttstock or butt of the weapon, using just the one hand. The application of pressure to a handle occurs thereby with the free hand, not located on the buttstock.



Advantageously, it is thus possible to operate the bolt catch lever in an ergonomic manner from both the left side as well as the right, both for right-handed persons as well as left-handed.

Preferably the bolt catch lever exhibits a further handle, which manually pivots the bolt catch lever into the catch/retention position by means of pressure exerted by the shooter.

The shooter can thus, in a simple manner, manually catch the bolt. This is necessary, e.g. during safety checks or when cleaning the weapon. By way of example, the shooter must catch the bolt of the weapon in order for the security staff to be able to check the weapon to ensure it is unloaded.

Preferably the bolt catch lever exhibits a slip-resistant surface on at least one of its handles.

The slip-resistant surface can be generated, for example, by recesses, such as grooves in the surface, or a rubber coating. This enables operation of the bolt catch lever when wearing gloves or in wet conditions, without slipping. By this means, the security of a weapon is increased.

Preferably the bolt catch lever is designed as a retrofitting kit.

As a result of the simple and at the same time space saving construction of the bolt catch lever according to the invention, existing buttstocks or receivers, in particular receiver lower parts can be retrofitted therewith. By way of example, it is possible to simply make a slot in the receiver or the buttstock or the receiver lower part using a milling machine, and insert the bolt catch lever according to the invention therein. As a result, firearms, such as standard rifles like the M16, for example, can be retrofitted with the bolt catch lever according to the invention. It is thus also possible to retrofit older weapons with a bolt catch lever that can be operated from both sides in a cost-effective manner.



With newer weapons, the bolt catch lever according to the invention is preferably a component of the receiver or the receiver lower part from the start. Many weapons are constructed these days from individual assemblies, in order that malfunctioning or defective components can simply be replaced, which applies, in particular, to a buttstock or receiver or receiver lower part having an integrated bolt catch lever according to the invention.

For similar reasons, the bolt catch lever according to the invention is also a component of a receiver or a buttstock, or a receiver lower part.

Preferably the receiver has at least one additional protective projection for at least one of the handles of the bolt catch lever.

The protective projection(s) can already be provided during the manufacturing thereof, in the mold for a receiver, for example, or they can be implemented in the form of an attachment component. The protective projections prevent an unintentional pivoting of the bolt catch lever that could have a negative effect on the functioning of the weapon. In addition, the bolt catch lever is also protected against impact and damage, and thus against bending or breaking as a result thereof.

Preferably one of the bolt catch lever handles extends toward the shooter, and forms an angle to the receiver of  $70^{\circ}$  -  $110^{\circ}$ , in particular, it forms a right angle. The handle can be ergonomically, comfortably and easily located and operated by the shooter in this angular range, but does not protrude so far that it can become caught in the clothing of the shooter, thus increasing the security of the weapon.

## **Description of the Figures**

Embodiment examples of the invention are explained below in greater detail, with reference to the attached, schematic drawings. Shown in the drawings are:

Fig. 1 a view of a bolt catch lever according to the invention from the perspective of a shooter in the direction of firing;

Fig. 2 a view of a bolt catch lever according to the invention inserted in a receiver, in a release position, from the perspective of a shooter in the direction of firing;

Fig. 3 a view of a bolt catch lever according to the invention inserted in a receiver, in a catch/retention position, from the perspective of a shooter in the direction of firing;

Fig. 4 a diagonal view from above of a bolt catch lever according to the invention inserted in a receiver, in a release position;

Fig. 5 a diagonal view from above of a bolt catch lever according to the invention inserted in a receiver, in a catch/retention position; and

Fig. 6 a perspective side view of a bolt catch lever according to the invention inserted in a receiver, in a release position.

The construction of a bolt catch lever 1 shall first be explained based on Figure 1. For a better understanding, it is broken down into three regions 23, 25, 27. A first, left region 23 extends toward the left (seen from the perspective of the shooter in the direction of firing), over a, not shown, receiver, and enables operation thereof from the left side of the weapon. A middle region 25 connects the first region 23 to a right, third region.

The bolt catch lever 1 can be pivoted about a pivot axis 5, between a release position, in which it releases a, not shown, bolt for firing, and a catch/retention position, in which it catches and retains the bolt.

In the first region 23, a first handle 7 and a second handle 17 are provided for the left side operation of the bolt catch lever 1. Both handles 7 and 17 are sections of a two-armed lever 4, which can be pivoted both clockwise and counterclockwise, having an upper lever arm 6 and a lower lever arm 41. The handle 7 has a slip-resistant ribbing 11, which ensures its secure manual manipulation, and in particular, prevents a slipping off of it. In particular, it makes it possible to pivot the bolt catch lever 1 manually from its catch/retention position to its release position. The handle 17 for the lower lever arm 41 can also exhibit a slip-resistant surface. It is possible with this lever to pivot the bolt catch lever 1 manually from its release position to its catch/retention position.

A locking pin, or cotter pin or axle, disposed in a through hole, is retained, for example in the receiver or the receiver lower part 37 (cf. Figs. 2 – 5), and supports the entire bolt catch lever 1, serving as the physical pivot axis 5 for the two-armed lever 4. The bolt catch lever 1 can pivot about the locking pin 5. Alternatively, a circular cotter 35 can be provided on the free end of a pin, which secures the pin and the bolt catch lever 1 from falling out or becoming lost.

A planar surface 29 is located on the right lateral surface of the lower lever arm 41, which transitions upward into a chamfer 19 at the transition to the second region 25. The chamfer 19 facilitates a pivoting of the bolt catch lever 1 about the receiver lower part 37, in that it provides more play for the movement in comparison with a straight edge. In addition, because of the play, there are fewer problems regarding contaminants.

An adjoining carrier 21 in the second, middle region 25 has a planar design, and forms substantially, together with the two-armed lever 4, a horizontal T-shape, wherein the carrier 21 represents the “leg” of the “T” and the lever 4 forms the crossbar thereof. The horizontal carrier 21 continues, however – in differing from a T – upward, toward a catch/retention region 9, which forms a region facing the shooter of a projection 8 on the carrier 21, having an overall ramp-like shape (cf. Figs. 4 – 6).

The catch/retention region 9 serves as a bearing for the bolt (not shown) striking it – in the catch/retention position of the bolt catch lever 1 – during its forward movement. If the catch/retention region 9 and the bolt are engaged with one another, the bolt and the bolt catch lever 1 are mutually blocked, even when the magazine has been removed, until the bolt catch lever 1 is moved to its release position by means of its handle 7 and/or a second handle 13, still to be described, or until the bolt is pulled back when the magazine has been removed, and the bolt catch lever 1 is again pivoted to its release position by the pressure of the spring 33 exerted by the bolt 31.

The overall surface formed by the surface of the carrier 21 facing the shooter and the catch/retention region 9 is planar from the perspective of the shooter, but has an edge 43 in the horizontal direction. The edge 43 rises in that the catch/retention region 9 protrudes with respect to the carrier 21, basically toward the shooter, in the manner of a shoulder. The horizontal edge 43 thus forms a protruding ledge between the surface of the carrier 21 and the surface of the catch/retention region 9 on the projection 8. This projecting horizontal edge 43 forms, together with the surface of the catch/retention region 9 on the projection 8, a stop for a plug (not shown), in case this is blown out by a receiver lower part 37, that is separated from the receiver upper part, in order to protect the housing lower part 37 from damage due to the blown out plug. The projection 8 extends in the direction of firing in the manner of a ramp, such that its ramp surface declines toward the direction of firing, i.e. toward the magazine chamber (44) (cf. Figs. 4 – 6). This extension ends in a transition into a tooth or nose shaped button 45 at its front end, in the direction of firing. The button 45 is designed and configured such that it can engage in the part of the cartridge loader 47 extending toward the back in an empty magazine (not shown) (cf. Figs. 4 – 6).

A third handle 13, having a ribbing 15, is shown in the third, right region 27. The handle 13 runs parallel to the bore axis of the firearm. The handle 13 and its lateral surfaces 39 basically form a right angle to the planar surface of the carrier 21.



Figs. 2 and 4 show, in each case, a bolt catch lever 1 inserted in a receiver lower part 37, in its release position, and Figs. 3 and 5 in its catch/retention position. Seen in the direction of firing, a magazine chamber 44 is located in front of the bolt catch lever 1, and behind this is a recess for a known trigger device that is not shown.

Opposite the planar surface 29 of the lower lever arm 41 a bolt 31 is inserted in a recess or blind hole 34 in the receiver 37. The bolt 31 is rounded at its head lying on the planar surface 29. A spring 33 inserted in the blind hole 34 pre-tensions the bolt 31 against the planar surface 29 and pivots the bolt catch lever 1 into its release position therewith.

In Fig. 5 the bolt catch lever 1 is in its catch/retention position. The cartridge loader 47 of an empty magazine is engaged with the button 45 of the bolt catch lever 1 thereby. A spring, not shown, forces the cartridge loader 47, and thus the button 45, upward. Because the button 45 is an integral component of the bolt catch lever 1, the bolt catch lever 1 also pivots about the pivot axis 5 from its release position into its catch/retention position and forces the bolt 31 with its planar surface 29 against the force of the spring 333 into the blind hole 34.

Alternatively it is possible to push the planar surface 29 against the bolt 31 by manual pressure exerted on the lower handle 17, and to compress the spring 33, in order to pivot the bolt catch lever 1 into its catch/retention position.

In the catch/retention position the catch/retention region 9 of the bolt catch lever 1 extends into the track for the bolt.

After firing a shot, the bolt travels over the ramp surface of the projection 8 of the bolt catch lever 1 during its return, when the magazine is empty, and forces the bolt catch lever 1 back into the release position, counter to the force of the spring (not shown) for the cartridge loader 47. The bolt returns toward the shooter thereby. When the returning bolt has passed by the bolt

catch lever 1, the bolt catch lever pivots into its catch/retention position, as explained above, when the magazine is empty.

The bolt then moves further back against the not shown recoil springs. When the maximum compression of the recoil springs has been obtained, the end of the return of the bolt is reached, and the recoil springs then force the bolt back in the direction of firing. During the forward movement of the bolt in the direction of firing, it strikes against the planar surface of the catch/retention region 9 and is caught there.

When the bolt is caught, the shooter can release the empty magazine via a not shown magazine release mechanism, and remove it from the magazine chamber. The cartridge loader 47 is then disengaged from the button 45. The bolt catch lever 1, however, cannot automatically pivot back to the release position, because the bolt is forced by the recoil springs at its front end against the catch/retention surface 9 recoil springs. The bolt catch lever 1 and the bolt block each other in a reciprocal manner via this force-locking connection. The shooter then insert a fully loaded magazine into the magazine chamber.

The bolt catch lever 1 can then be moved to its release position: for this, the shooter actuates either the left handle 7 toward the receiver or receiver lower part and/or the right handle 13 downward as far as a protective projection 49 (cf. Fig. 6) and thus pivots the bolt catch lever 1 back into its release position. The bolt is thus released, and forced by the spring force of the recoil springs in the direction of firing. When moving forward, a new cartridge is guided out of the replaced magazine into a not shown cartridge chamber. The weapon is then ready for firing.

The spring loaded bolt 31 then retains the bolt catch lever 1 in the release position until the cartridge loader 47 engages with the integral button 45, and furthermore again pivots the bolt catch lever 1 anew, or the bolt catch lever 1 is manually pivoted by actuating the handle 17.

Fig. 6 shows a side view of a bolt catch lever according to the invention inserted in a receiver lower part 37, in its release position. A protective projection 49 is formed on the receiver lower part 37, which basically projects laterally, at a right angle, from the receiver lower part 37. The protective projection 49 can, alternatively, also be placed on the receiver lower part 37, or be attached thereto in a suitable manner. In the release position, the third handle 13 lies in the proximity of the protective projection 49, and is protected against external influences. In the catch/retention position, the handle 13 is pivoted upward, and spaced apart from the protective projection 49.

## Claims

1. A bolt catch lever (1) for a firearm that can operated from both sides and for this purpose has handles (7, 13, 17) protruding on both sides of the firearm, and is designed as an integral part thereof, characterized in that it is attached in an articulated manner to a pivot axis (5) disposed on the right or left side of the firearm such that it can pivot between its release position and its catch/retention position on the firearm.
2. The bolt catch lever (1) according to Claim 1, characterized by its being supported such that it is retained in its release position by an elastic element (33).
3. The bolt catch lever (1) according to Claim 1 or 2, characterized by a button (45) protruding from it, that extends into a magazine chamber (44) such that the button (45) becomes engaged with a cartridge loader (47) of an empty magazine, and by this means, with the aid of a magazine spring, moves the bolt catch lever (1) from its release position into its catch/retention position.
4. The bolt catch lever (1) according to any one of the Claims 1 – 3, characterized in that it has two handles (7, 17) on its end in the proximity of its pivot axis (5), and a third handle (13) on its end further away from its pivot axis (5).
5. The bolt catch lever (1) according to Claim 4, characterized in that it can be moved from its catch/retention position to its release position by exerting pressure on one of its handles (7, 13).
6. The bolt catch lever (1) according to Claim 4, characterized in that it can be moved from its release position to its catch/retention position by actuating one of its handles (13, 17).
7. The bolt catch lever (1) according to any one of Claims 1 – 6, characterized in that at least one of its handles (7, 13, 17) exhibits a slip-resistant surface (11).



8. The bolt catch lever (1) according to any one of Claims 1 – 7, characterized in that it is designed as a retrofitting kit for firearms.
9. A buttstock for a firearm, characterized by a bolt catch lever (1) according to any one of the Claims 1 – 8.
10. A receiver (37) characterized by a bolt catch lever (1) according to any one of the Claims 1 – 8.
11. The receiver (37) according to Claim 10, characterized in that it has at least one protective projection (49) for at least one handle (13, 17) of the bolt catch lever (1).

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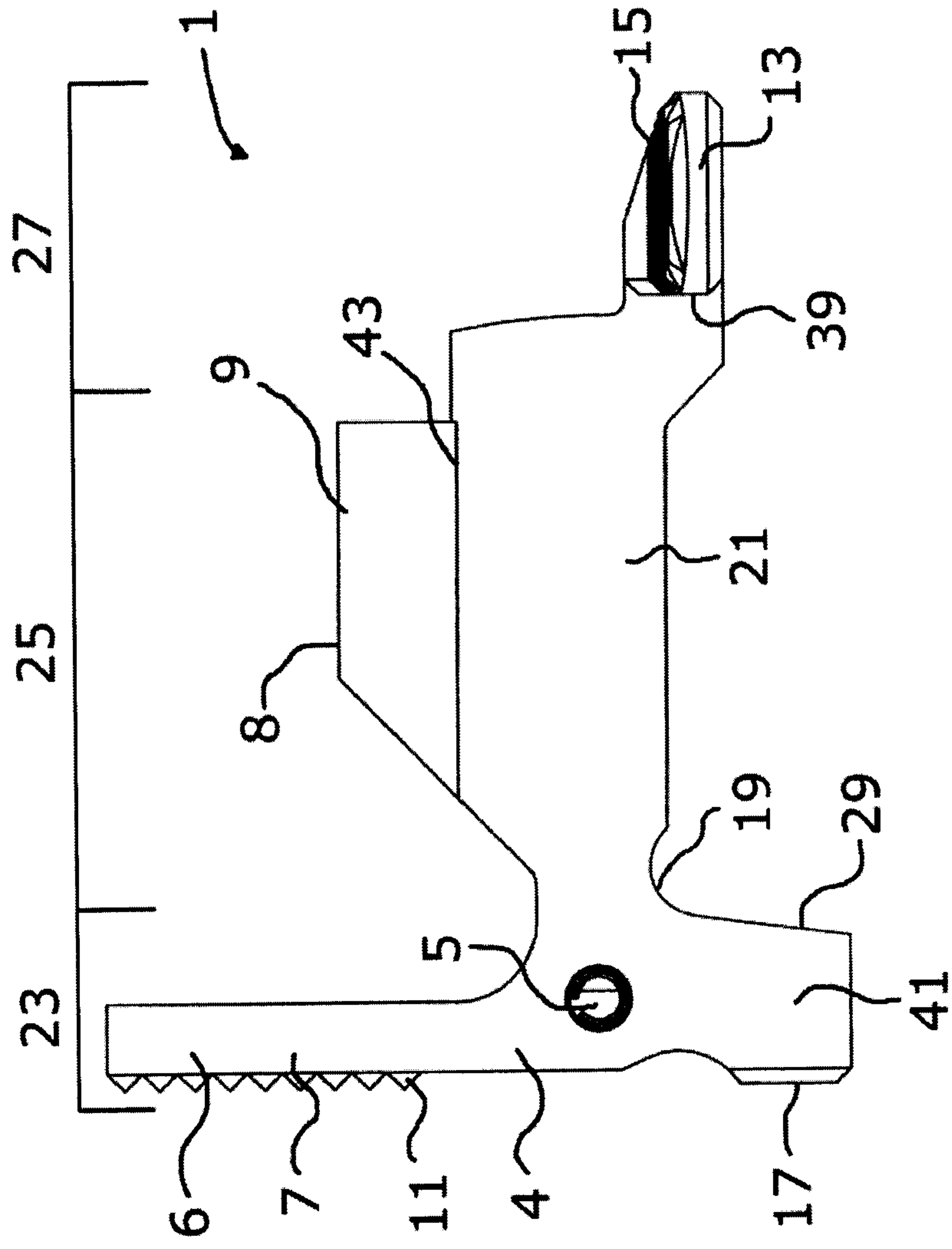


Fig. 1

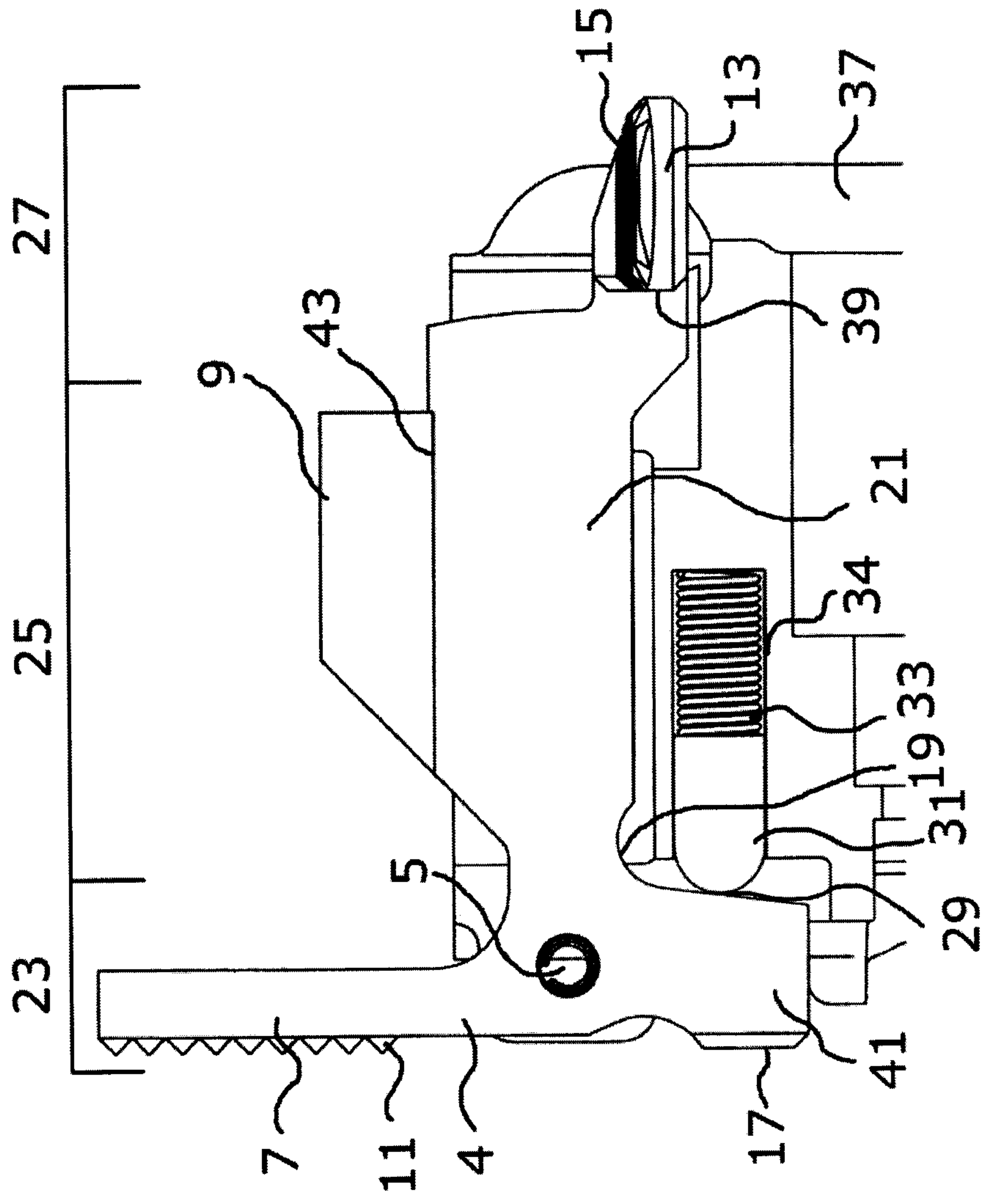


Fig. 2

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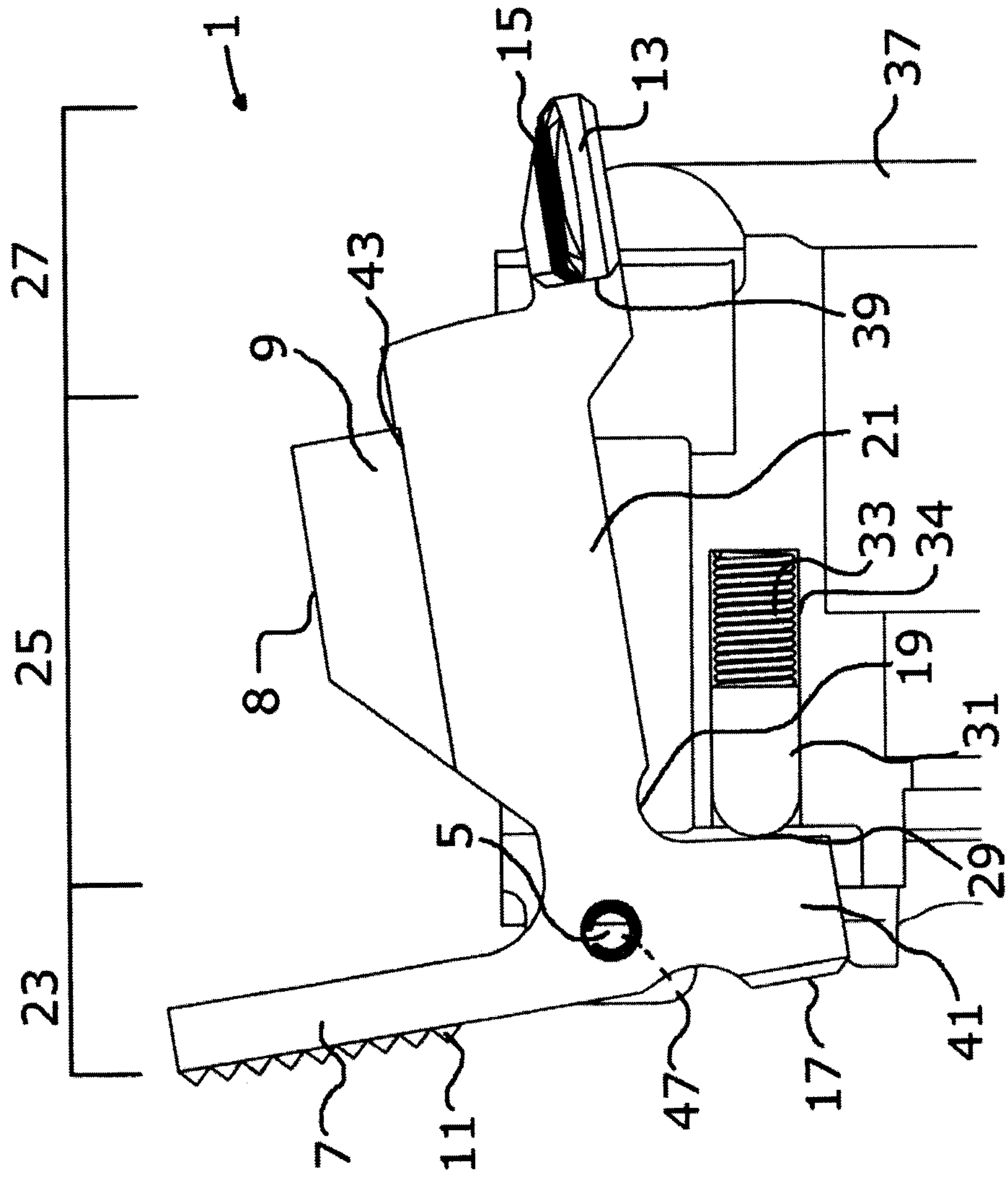


Fig. 3



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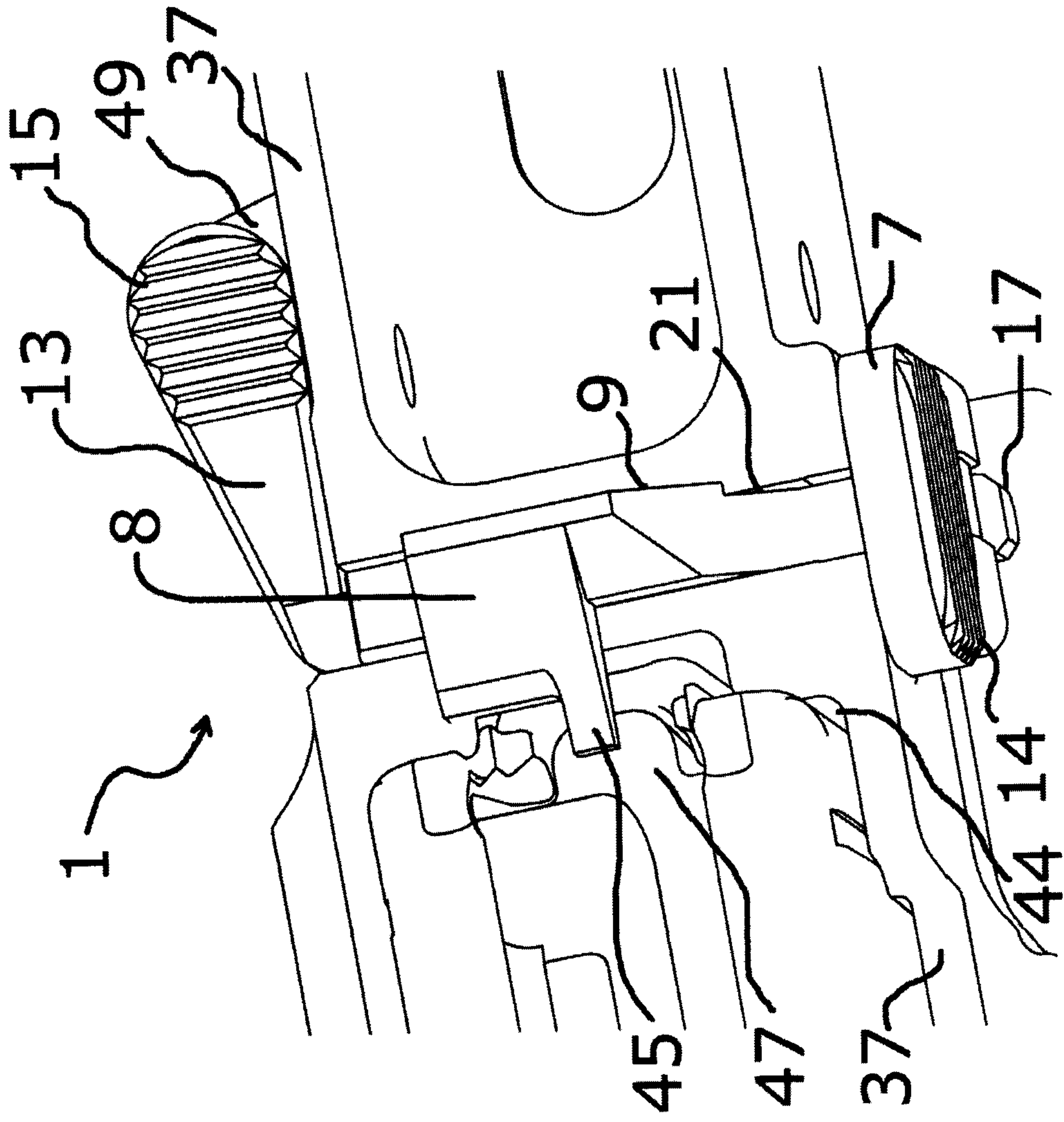


Fig. 4

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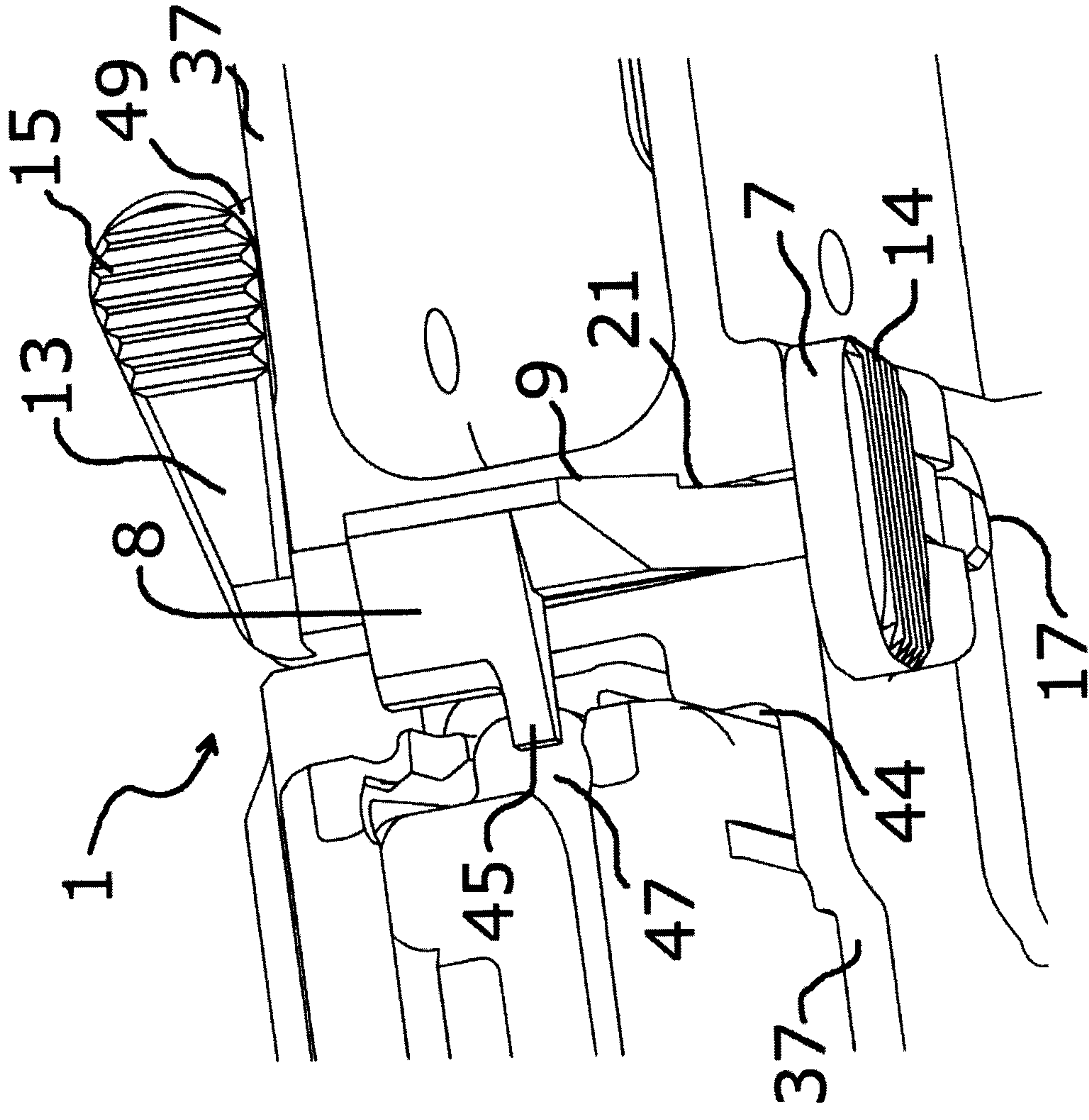


Fig. 5

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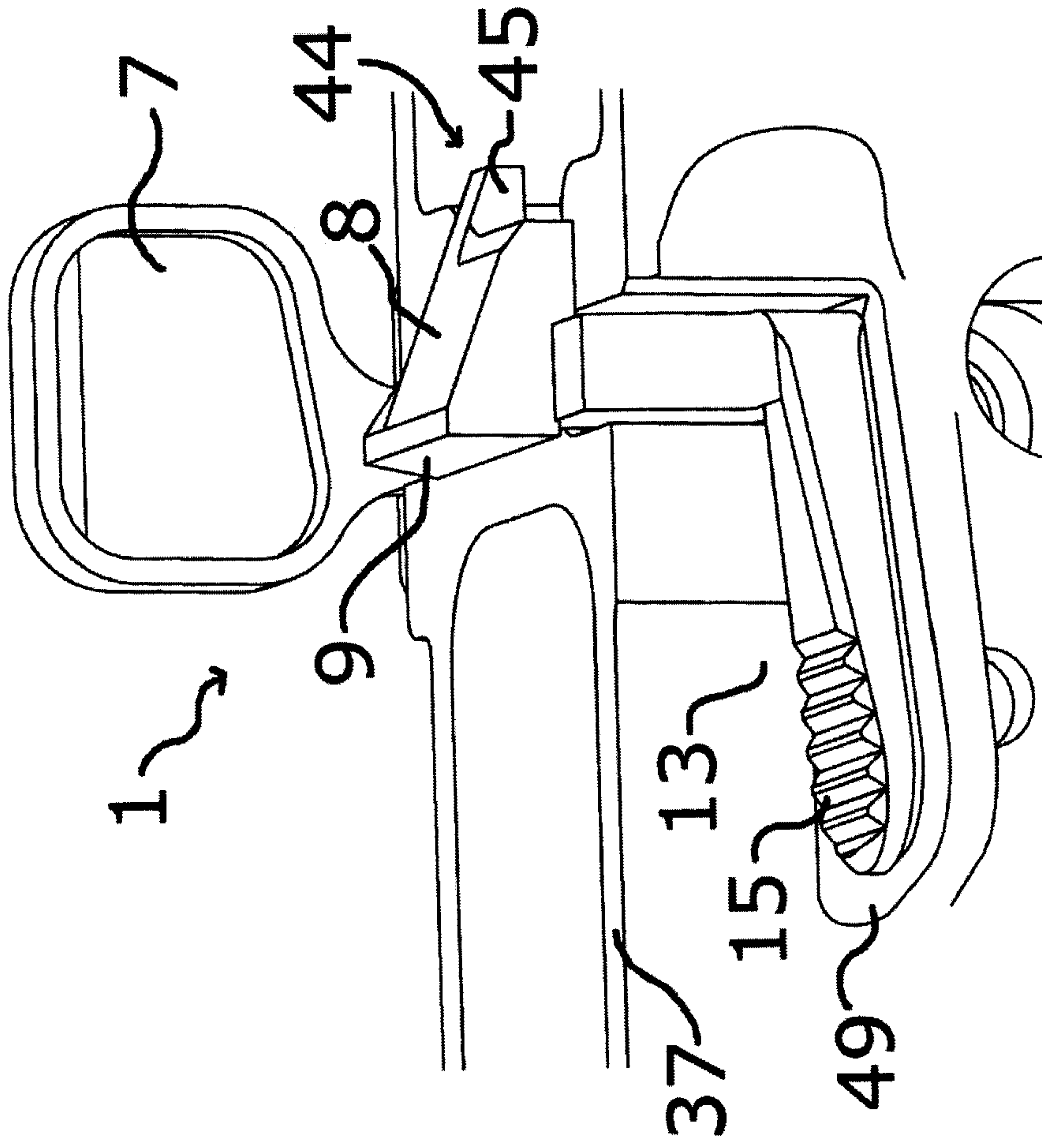


Fig. 6

