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(54) **Automatic device for blocking leaves of doors or windows and the like**

(57) Provided herein is an automatic device for blocking leaves (1) of doors or windows and the like (30) that can be positioned in stable equilibrium in an engagement position, in which it is designed to constrain the leaf (30) to a supporting surface (31), and in a disengagement position, in which it is designed to allow movement of the leaf (30), and comprising: a supporting element (2), fixed with respect to the supporting surface (31); a first blocking body (3) and a second blocking body (4), which are designed to constrain the leaf (30) in the blocking position and are constrained to the supporting element (2) respectively by means of a first rotational hinge (5) and a second rotational hinge (6), which are designed to define different paths for said first and second blocking bodies (3,4), in which the latter blocking bodies comprise a slotting system (20) that defines the engagement position. The slotting system is elastically deformable in such a way as to enable manual disengagement thereof.

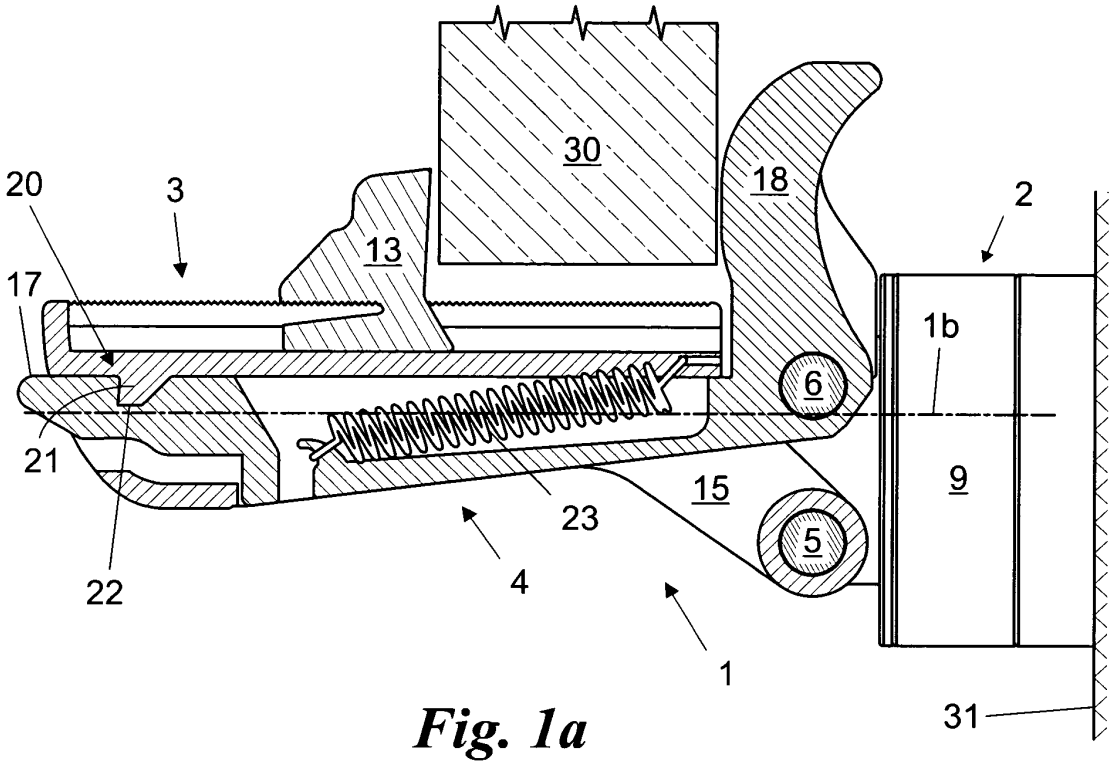

Fig. 1a

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Description

[0001] The subject of the present invention is an automatic device for blocking leaves of doors or windows and the like of the type specified in the preamble of Claim 1.

[0002] Currently known are devices for blocking the leaves of doors or windows and the like, in particular for the leaves of windows.

[0003] As is known, in fact, windows or doors can present external leaves, which, once opened, are set up against the external walls of the building on which they are set.

[0004] Said external leaves are moreover frequently fixed to the external walls of the building by means of purposely provided blocking elements.

[0005] Said blocking elements prevent the leaves from being closed or moved by the wind or by other atmospheric agents, etc.

[0006] In particular, blocking elements are used formed by mechanical hooks of various kinds that constrain the outermost portion of the leaf to the external wall of the building.

[0007] They must be removed for closing or moving the leaf.

[0008] There then exist automatic blocking devices that enable automatic blocking of the leaf when the latter is set up against the wall.

[0009] Blocking is referred to as "automatic" because it is not necessary to intervene manually on the device itself, but it is sufficient to set the leaf against the wall. To unblock the leaf it is instead necessary to intervene manually on the automatic blocking device.

[0010] Automatic blocking devices of this sort are described, for example, in the patent applications Nos. EP-A-0823524 and BE-A-891498.

[0011] The known art referred to above presents some important drawbacks.

[0012] In fact, blocking devices of a known type are subject to failure and malfunctioning and to a high rate of wear.

[0013] The same devices comprise in fact small arrest elements, which are mobile with respect to the remaining portion of the blocking device and are designed to block an appropriate mobile portion of the device itself. Said arrest elements, on account of their reduced dimensions, are then subject to failure, malfunctioning, and wear.

[0014] Furthermore, the blocking devices of a known type generally comprise a fixed portion that is fixed with respect to the wall, extending perpendicular thereto and to the dimension of the leaf.

[0015] The latter constitutes a marked limitation for the movements of the blocking device and is moreover subject to failure on account of involuntary forcing exerted thereon.

[0016] Not the least important drawback is the fact that automatic blocking devices are costly on account of their complexity.

[0017] In the above situation, the technical task underlying the present invention is to devise an automatic device for blocking leaves of doors or windows and the like that is able to overcome substantially the drawbacks referred to above.

[0018] In the framework of said technical task, an important purpose of the invention is to provide an automatic device for blocking leaves of doors or windows and the like that will be simple and resistant to wear and to various stresses.

[0019] Another important purpose of the invention is to obtain an automatic device for blocking leaves of doors or windows and the like that will present an extensive possibility of movement.

[0020] Not the least important purpose of the invention is to devise an automatic device for blocking leaves of doors or windows and the like that will be inexpensive and simple to install.

[0021] The technical task and the purposes specified are achieved by an automatic device for blocking leaves of doors or windows and the like as claimed in the annexed Claim 1.

[0022] Preferred embodiments are specified in the subclaims.

[0023] Further characteristics and the advantages of the invention are clarified hereinafter by the detailed description of a preferred embodiment of the invention, with reference to the attached drawings, in which:

Figure 1a shows a side view of the automatic blocking device according to the invention in the blocking position;

Figure 1b represents a side view of the automatic blocking device according to the invention in the position of release;

Figure 1c illustrates an enlargement of a portion of Figure 1a;

Figure 2 shows an exploded view of Figure 1 a;

Figure 3 illustrates an overall three-dimensional view of the blocking device;

Figure 4 represents a first three-dimensional view of a portion of the blocking device ;

Figure 5 shows a second three-dimensional view of said portion of the blocking device;

Figure 6 represents a first three-dimensional view of a further portion of the blocking device;

Figure 7 represents a second three-dimensional view of said further portion of the blocking device;

Figure 8 represents a three-dimensional view of a third portion of the blocking device;

Figure 9a shows a side view of a second variant of the automatic blocking device according to the invention in the blocking position; and

Figure 9b represents a side view of the automatic blocking device according to the invention of Figure 9a, in the position of release.

[0024] With reference to the above figures, the automatic blocking device according to the invention is des-

ignated as a whole by the number **1.**

[0025] The blocking device is set on leaves **30** of doors or windows and the like. By the term "leaf" 30 is meant any type of element that develops substantially in a plane, designed to close or free an opening, part of a wall, of a piece of furniture, or the like.

[0026] The leaf 10 is preferably mobile by means of rotations about one or more hinges and can be set up against a supporting surface **31,** constituted in particular by the external wall of the building on which the door or window or the like is set.

[0027] The automatic blocking device 1 can be SET in positions of stable equilibrium in an engagement position (Figure 1a), in which it is designed to constrain the leaf 30 to the supporting surface 31, and in a disengagement position (Figure 1 b), in which it is designed to allow movement of the leaf 30.

[0028] The automatic blocking device 1 comprises, roughly speaking, a supporting element **2** and a first blocking body **3** and a second blocking body **4,** which are designed to constrain the leaf 30 temporarily in the blocking position. They are directly constrained to the supporting element 2, by means of a first rotational hinge **5** and a second rotational hinge **6,** respectively, and are able to turn about said hinges.

[0029] The rotational hinges 5 and 6 act preferably in parallel directions, defining a transverse direction **1a** and are aligned parallel to the supporting surface 31. There are then defined different paths for the blocking bodies 3 and 4.

[0030] In detail, the supporting element 2 preferably comprises two flanges 7, designed to support pins that constitute the rotational hinges 5 and 6. The supporting element 2 moreover preferably comprises spacer elements **9,** which adjust the distance between the blocking bodies 3 and 4 and the supporting surface 31.

[0031] The first and second blocking bodies 3 and 4 develop prevalently in a longitudinal direction **1b,** perpendicular to the supporting surface 31 and to the transverse direction 1a.

[0032] In particular, the first blocking body 3 (Figures 4 and 5) is constituted by an approximately parallelepipedal element, provided with an internal recess **10,** which also extends prevalently in a longitudinal direction 1b and is delimited by a top plate **11** and by a bottom plate **12.**

[0033] The first blocking body 3 moreover comprises an arrest element **13,** illustrated in Figure 8, constituted by a wedge or the like designed to constrain the leaf 30 by means of a part **13b** substantially parallel to the external surface of the leaf 30, when the device 1 is in the blocking position.

[0034] The position of the arrest element 13 is then preferably adjustable in the longitudinal direction 1b by means of appropriate adjustment means. In particular the arrest element 13 is provided separable from the first blocking body 3 and comprises an opening **13a** that can be reclosed, by means of a screw, and is provided with a bottom toothing, as illustrated in Figure 2.

[0035] The bottom toothing 13c can be constrained to a toothing set on two rails **14** forming part of the blocking body 3, illustrated in Figures 4 and 5.

[0036] The first blocking body 3 then comprises two arms **15** connected to a bushing defining a seat **16** for the first rotational hinge 5.

[0037] Finally, the first blocking body 3 is preferably made of polymeric material.

[0038] The second blocking body 4 (Figures 6 and 7) is instead constituted by an element having a prevalent development in a longitudinal direction 1b and designed to fit into the recess 10.

[0039] Furthermore, the length of the second blocking body 4 in a longitudinal direction 1b is greater than the length of the first blocking body 3. Consequently, the second blocking body 4 has an end portion **17** that extends beyond the recess 10 and is designed to be pressed with the user's fingers, as specified more clearly hereinafter.

[0040] Furthermore, said end portion 17 can be provided separate from the second blocking body 4 and turnable with respect to the latter, as illustrated in Figures 9a and 9b.

[0041] The second blocking body 4 then comprises a rear lever **18,** designed to constrain the leaf 30, in a direction opposite to the arrest element 13, when the device 1 is in the blocking position. The lever 18 is moreover designed to enable automatic closing of the device 1, as specified more fully hereinafter.

[0042] Finally, the device 1 comprises a seat **19** for the second rotational hinge 6, set in the proximity of the rear lever 18, and is preferably made of polymeric material.

[0043] The first and second blocking bodies 3 and 4 moreover comprise a slotting system **20** defining the engagement position in stable equilibrium (Figure 1a).

[0044] Said blocking bodies 3 and 4 are moreover manually disengageable from the engagement position by means of an elastic deformation of the slotting system 20.

[0045] In particular, the slotting system 20 is constituted by a tooth **21** and a seat **22** for said tooth 21. The latter comprise a position of interference, in which they are in mutual interference, in the proximity of the engagement position.

[0046] The position of interference corresponds to the position in which the path of the tooth 21 and of the seat 22, defined by the rotational hinges 5 and 6, coincide with one another.

[0047] Basically, in order to come out of the engagement position, the slotting system 20 must be forced and undergo deformation. This guarantees the stability of equilibrium of the device 1 in the engagement position. Said forcing is conveniently obtained by acting on the end portion 17.

[0048] In detail, the tooth 21 is preferably fixed on the bottom face of the top plate 11, forming part of the first blocking body 3, whilst the seat 22 is set on the top face of the second blocking body 4.

[0049] The device 1 moreover preferably comprises

an elastic element **23,** appropriately a spring or the like, constrained both to the first blocking body 3 and to the second blocking body 4.

[0050] The latter blocking bodies then comprise purposely provided hooks, respectively a first hook **24** and a second hook **25** for the elastic element 23.

[0051] The elastic element is designed to stabilize the disengagement position (Figure 1b) of the device 1 and increase the stability of the engagement position (Figure 1a).

[0052] Alternatively, said disengagement position can be stable simply on account of gravitational force, as indicated in the example of Figures 9a and 9b.

[0053] Operation of the automatic blocking device 1 described above in a structural sense, is described in what follows.

[0054] In a first situation, the leaf 30 is in a position of gripping of a window or the like. The device 1 is, instead, in the disengagement position (Figure 1b).

[0055] Next, the leaf 30 is opened and set up against the supporting surface 31.

[0056] During opening, the leaf 30 interferes with the rear lever 18, forming part of the second blocking body 4.

[0057] The same leaf 30 then causes rotation of the second blocking body 4 about the second hinge 6 and raises it.

[0058] During rotation, and on account of the thrust of the leaf 30, the slotting system 20 of the device 1 is forced, and the latter is set in the engagement position.

[0059] On account of the presence of the slotting system 20 and of the arrest element 13, the device 1 remains in the engagement position and constrains the leaf 30 even if it is subjected to strong winds and various atmospheric agents. In fact, the latter do not cause a rotation in the direction of disengagement of the second blocking body 4 about the second hinge 6, on account of the shape and direction of the vertical wall 13b.

[0060] When it is necessary to close the leaf 30 again, it is sufficient to press the end portion 17 of the second blocking body 4 in the direction of rotation downwards. The slotting system 20 is then forced by the same pressure in a direction such as to enable release from the position of engagement of the device 1.

[0061] In particular, the tooth 21 and the seat 22 are moved, respectively, according to the paths **21'** and **22',** illustrated in Figure 1 c.

[0062] The second blocking body 4 comes into contact with the bottom plate 12 of the first blocking body 3 and causes rotation also of the latter.

[0063] Rotation is also favoured by the elastic element 23, which causes a force of approach of the two hooks 24 and 25, which are brought closer together into the disengagement position, as illustrated in Figure 1b.

[0064] The device 1 is then set in the disengagement position (Figure 1b) and remains stable in said position also on account of the elastic element 23, until it is again stressed by the leaf 30.

[0065] The invention enables important advantages.

[0066] In fact, the automatic blocking device 1 for leaves of doors or windows and the like has an extensive possibility of movement, since it does not have a fixed portion which extends in a longitudinal direction 1b to which a mobile portion is constrained that extends in a perpendicular direction, but has two portions that are both mobile, the mutual position of which determines stable equilibrium in the engagement position and in the disengagement position.

[0067] The automatic blocking device 1 is moreover inexpensive and simple to install, in particular on account of the presence of the simple and functional engagement system 20.

[0068] The device 1 is moreover particularly advantageous if it is used with leaves 30 of windows, in view of the fact that the latter present problems of blocking and are frequently set in positions that are difficult to reach.

[0069] The invention may undergo variations, all of which fall within the scope of the inventive idea. All the items may be replaced by equivalent elements, and the materials, shapes, and dimensions may be any whatsoever within the scope of Claim 1.

Claims

1. An automatic device (1) for blocking leaves (30) of doors or windows and the like, which can be set in stable equilibrium in an engagement position, in which it is designed to constrain said leaf (30) to a supporting surface (31), and in a disengagement position, in which it is designed to enable movement of said leaf (30), said device comprising: a supporting element (2), fixed with respect to said supporting surface (31), blocking bodies (3, 4), designed to constrain said leaf (30) in said blocking position, said device being **characterized in that**: said first blocking body (3) and said second blocking body (4) are provided, constrained to said supporting element (2) by means of a first rotational hinge (5) and a second rotational hinge (6), respectively, which are designed to define different paths for said first and second blocking bodies (3, 4); said first and second blocking bodies (3, 4) comprise a slotting system (20) defining said engagement position; and said slotting system (20) is elastically deformable in a way designed to enable manual disengagement thereof.

2. The device according to Claim 1, wherein said slotting system comprises a tooth (21) and a seat (22) for said tooth (21), said tooth (21) and said seat (22) presenting a position of interference, in which they are in mutual interference, in the proximity of said engagement position.

3. The device according to one or more of the preceding claims, comprising an elastic element (23), designed to maintain said disengagement position in stable

equilibrium.

4. The device according to Claim 1 or Claim 2, wherein said disengagement position is maintained in stable equilibrium by means of the gravitational force.

5. The device according to one or more of the preceding claims, wherein said first hinge (5) and said second hinge (6) are parallel to said supporting surface (31).

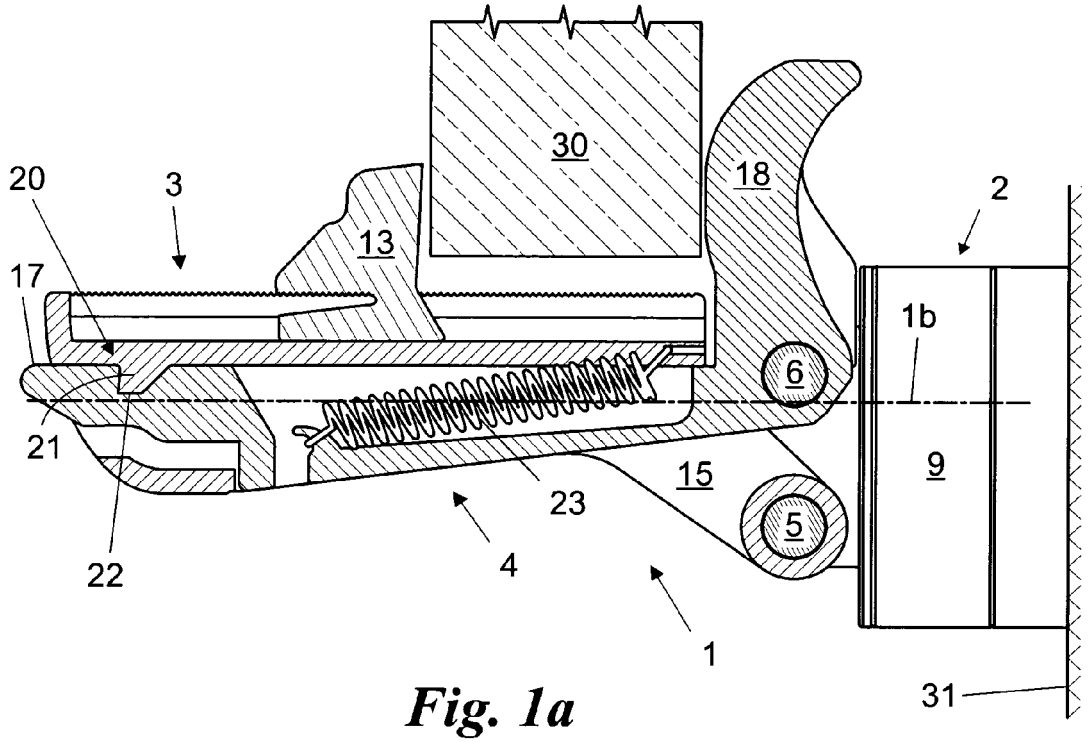
6. The device according to one or more of the preceding claims, wherein said first blocking body (3) is provided with a recess (10), which extends prevalently in a longitudinal direction (1b) transverse to said supporting surface (31), and in which said second blocking body (4) is constituted by an element having a prevalent development in said longitudinal direction (1b), designed to fit into said recess (10).

7. The device according to one or more of the preceding claims, wherein said second blocking body (4) has an end portion (17), which extends in a longitudinal direction (1b) beyond said recess (10) and is designed to be manoeuvred manually to enable exit of said device from said engagement position.

8. The device according to one or more of the preceding claims, wherein said end portion (17) can be turned with respect to said second blocking body (4).

9. The device according to one or more of the preceding claims, wherein said first blocking body (3) comprises an arrest element (13), designed to constrain said leaf (30) in a position corresponding to a face (13b) substantially parallel to the external surface of said leaf (30).

10. A leaf (30) for doors or windows and the like, comprising an automatic blocking device (1) according to one or more of the preceding claims.


30
18
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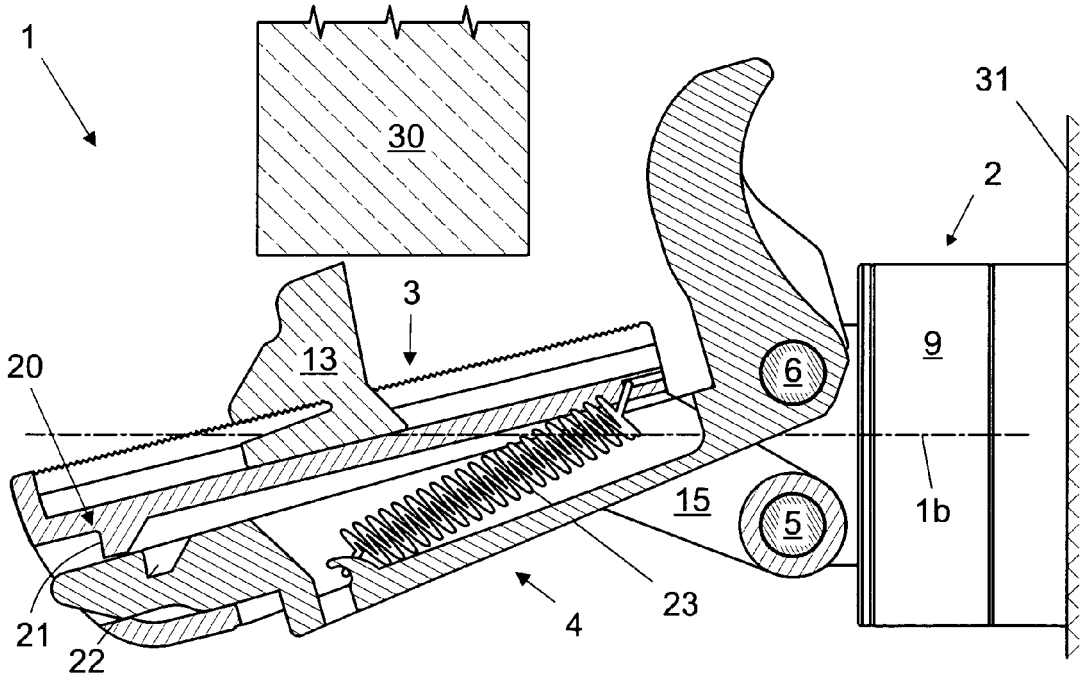
31

Fig. 1a

Fig. 1b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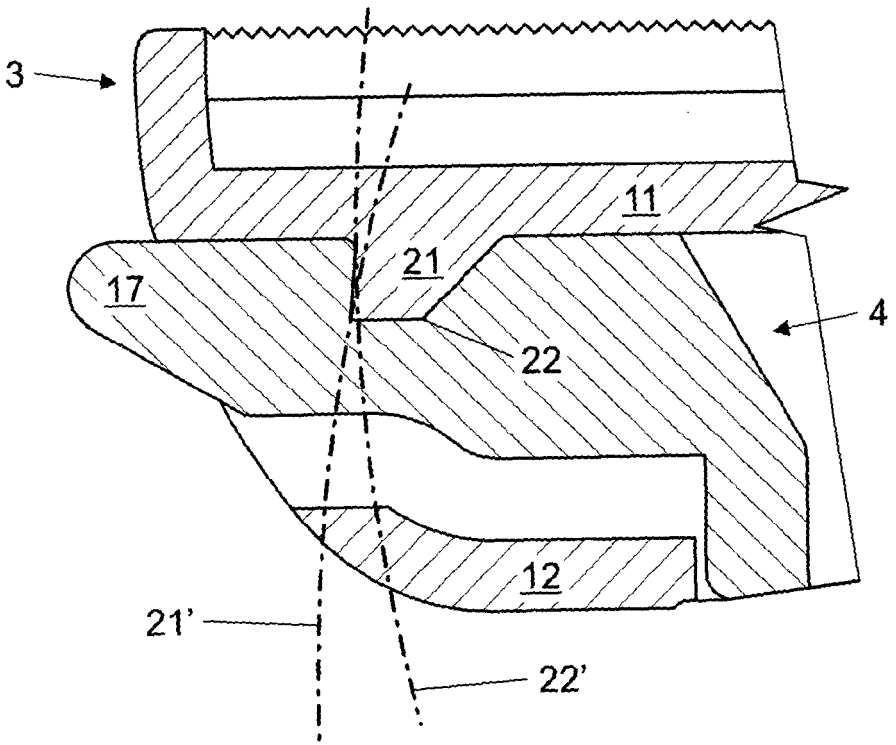
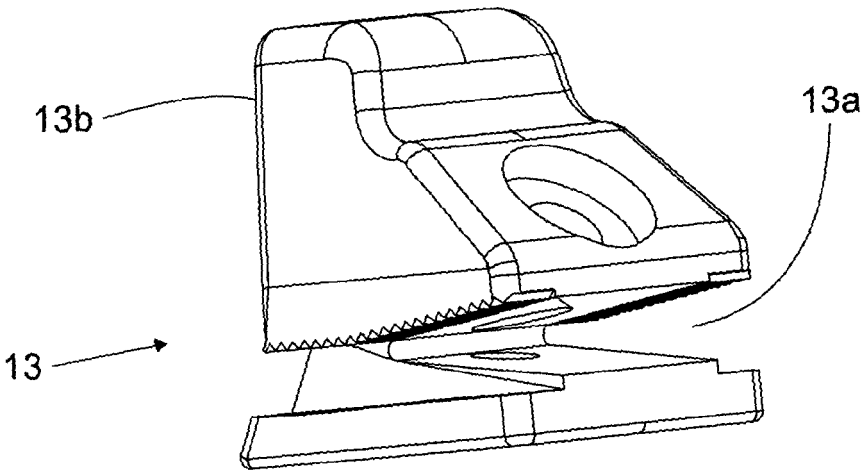


Fig. 1c

Fig. 8



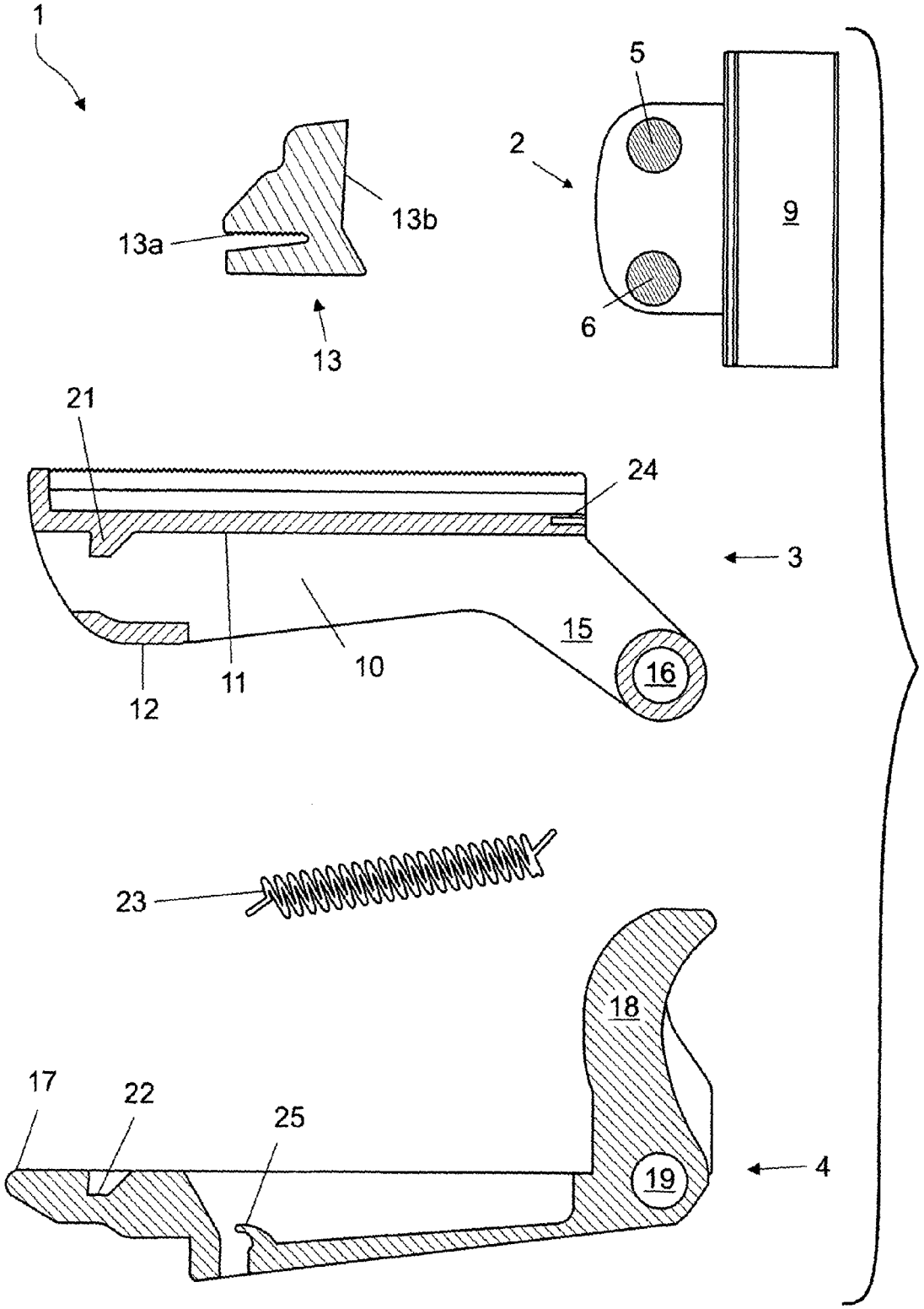


Fig. 2

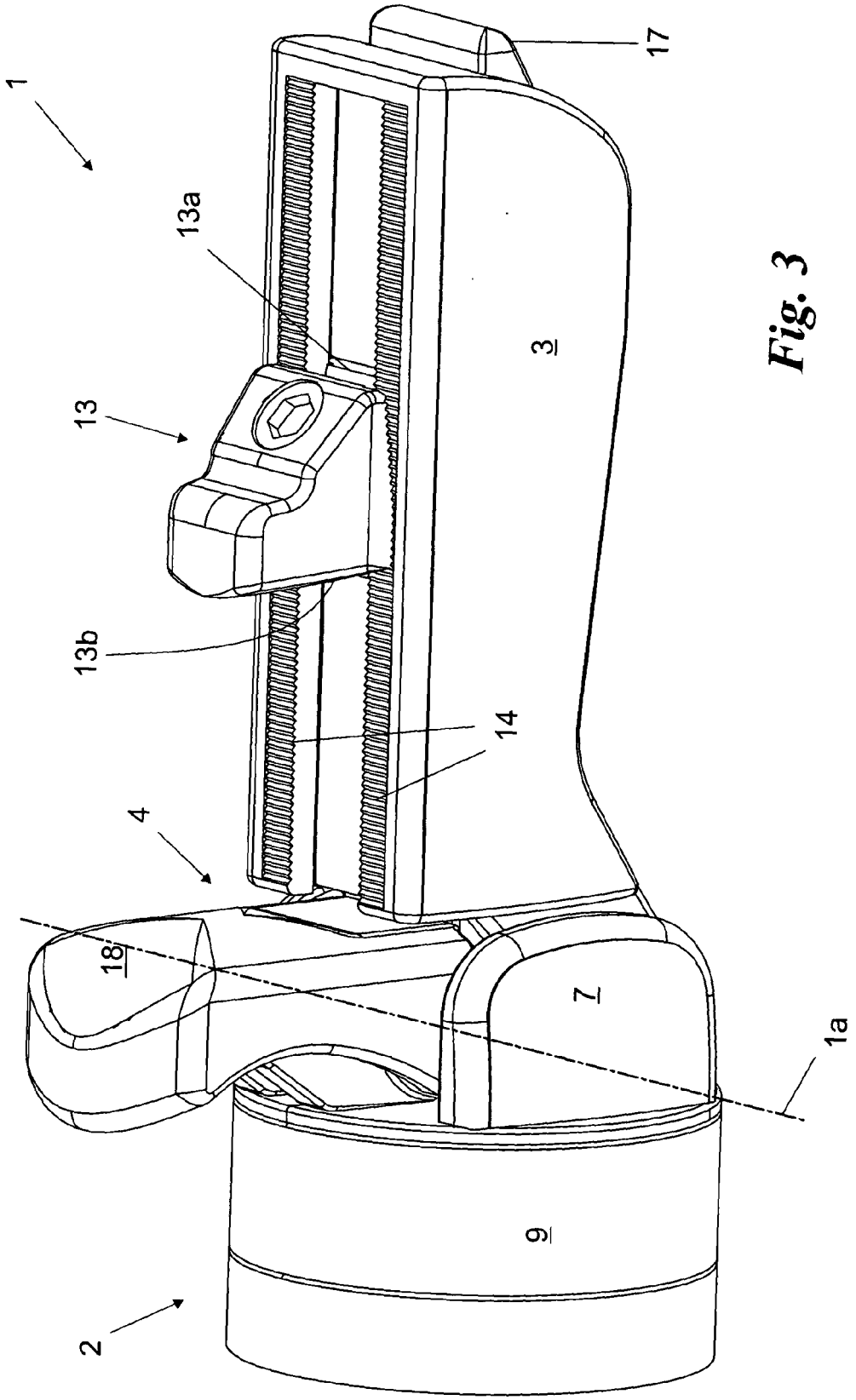


Fig. 3

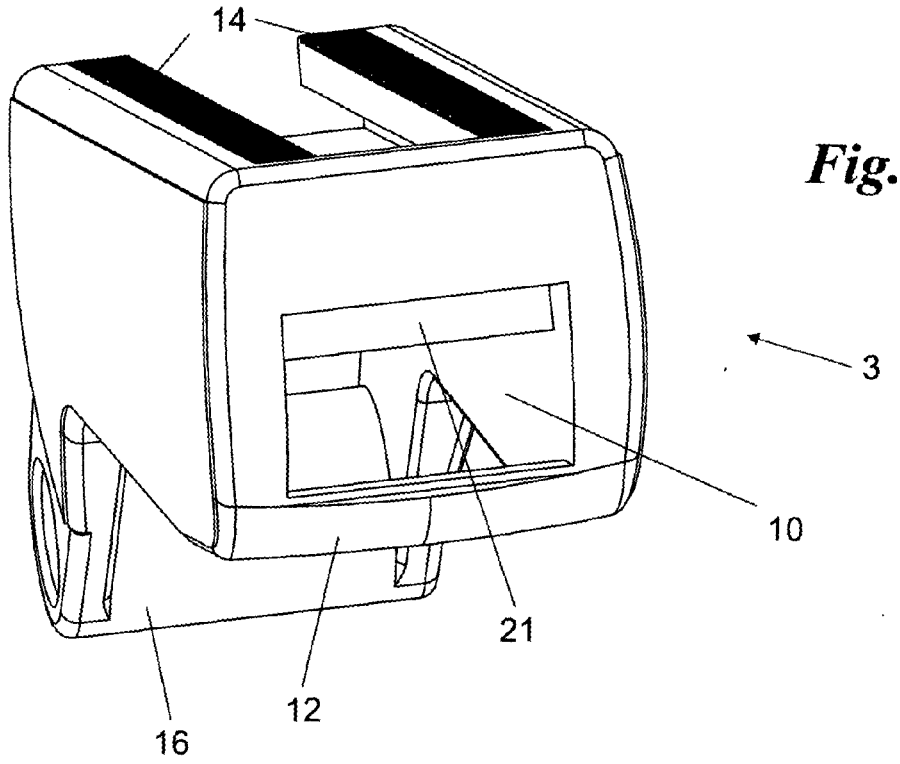
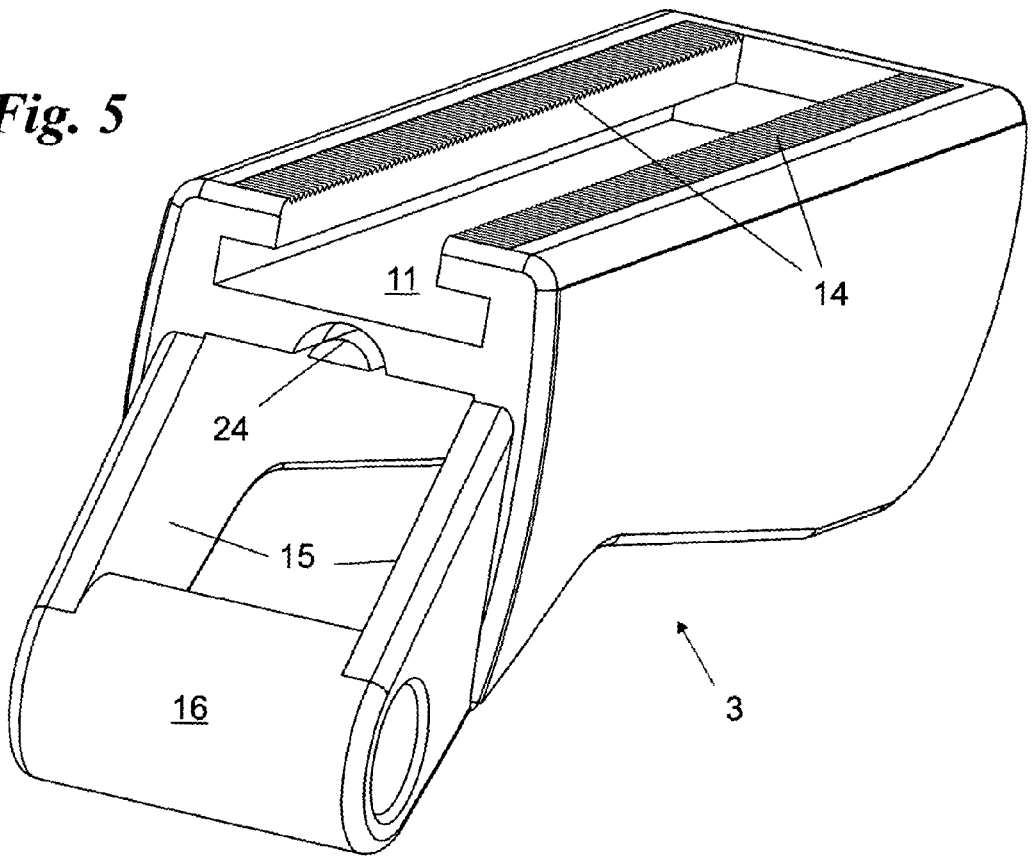


Fig. 4

Fig. 5



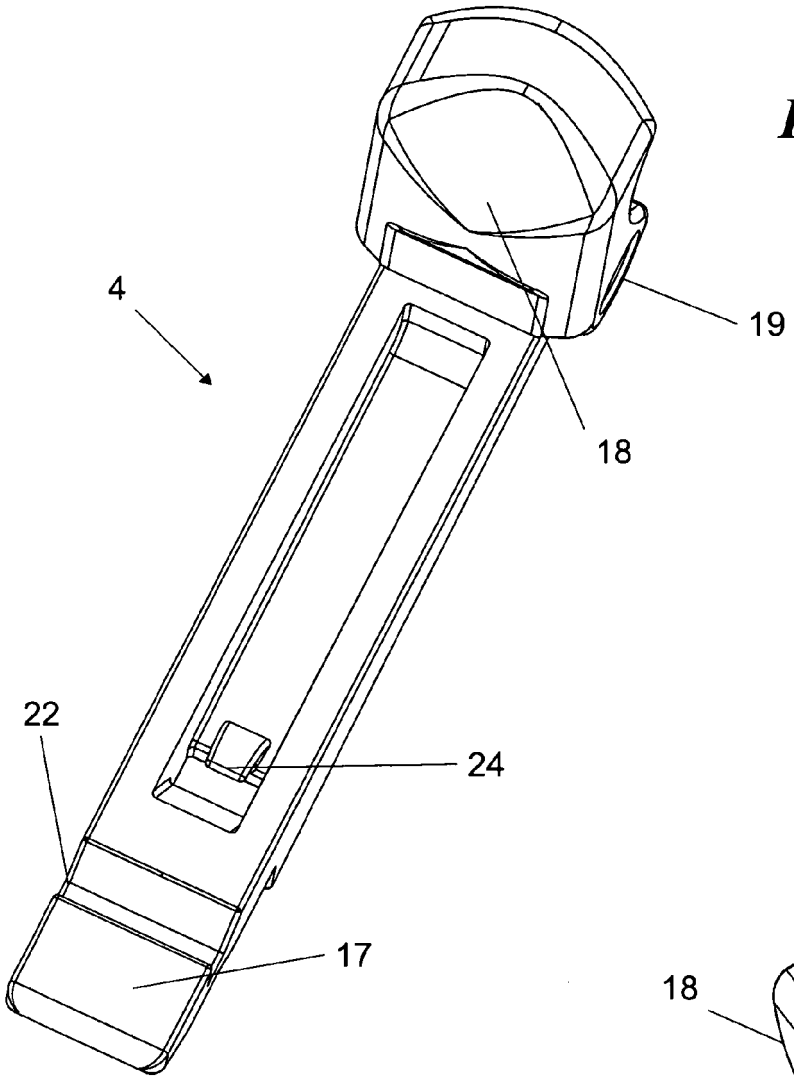


Fig. 6

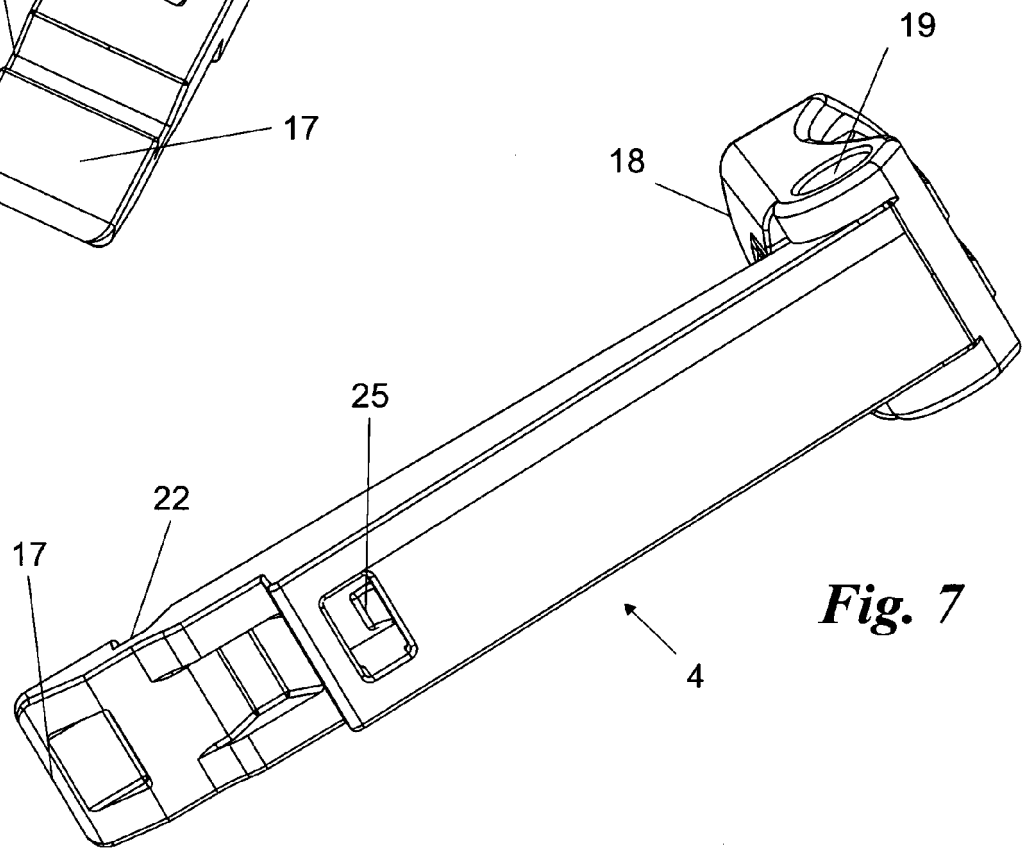


Fig. 7

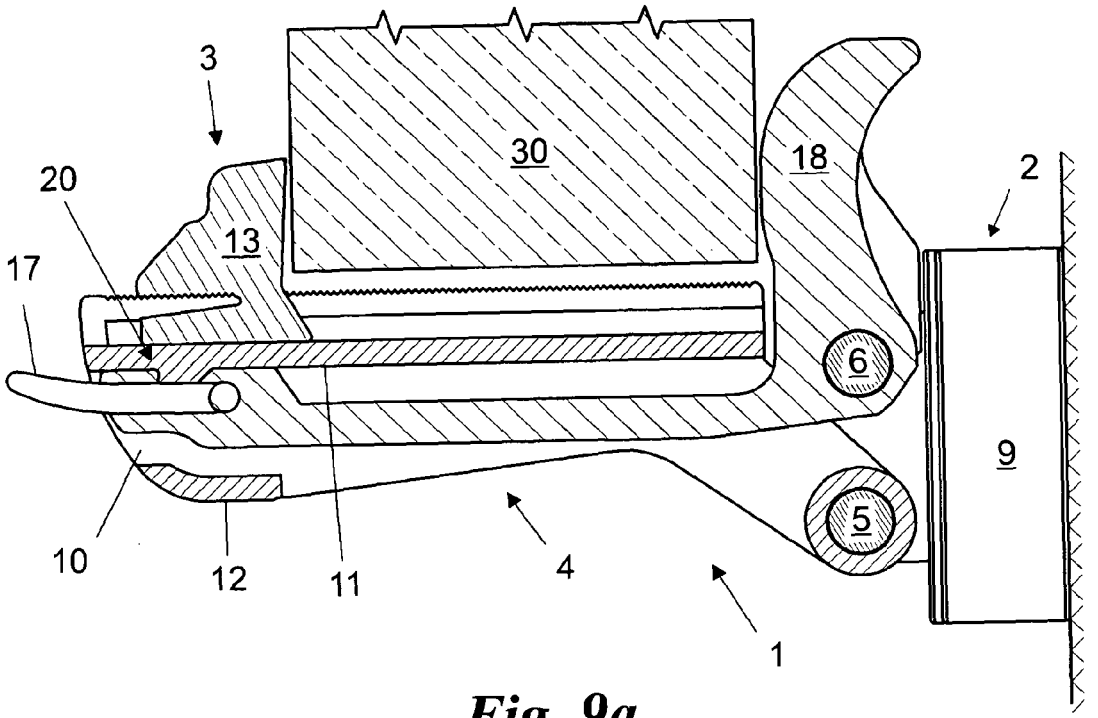
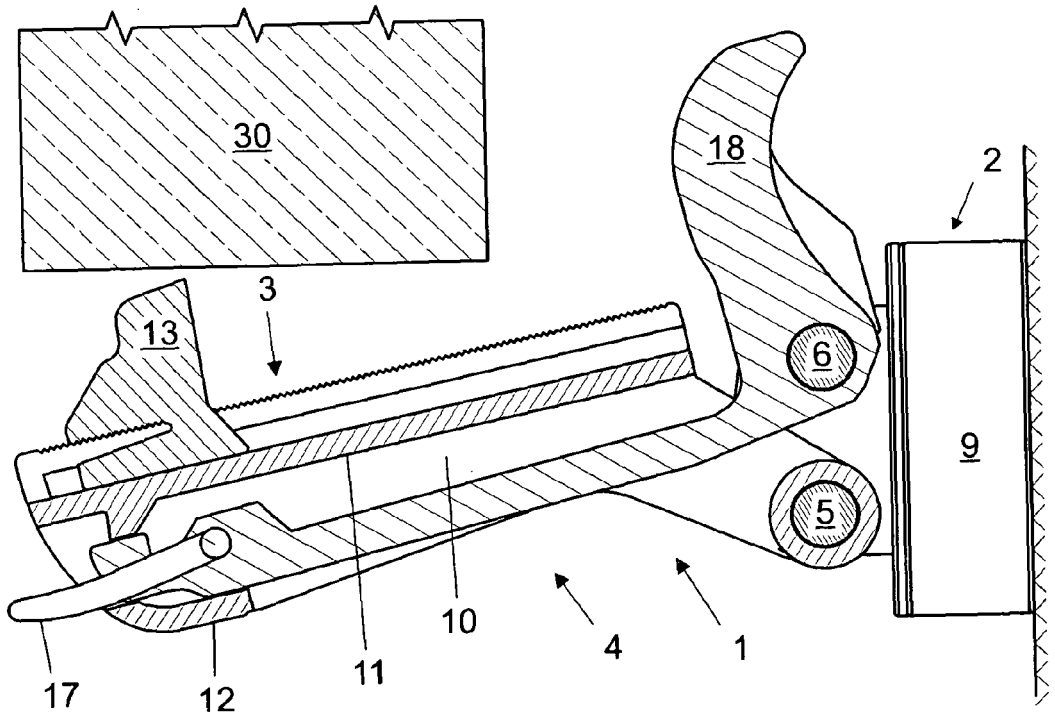


Fig. 9a

Fig. 9b



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EUROPEAN SEARCH REPORT

Application Number
EP 08 42 5648

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
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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	18 March 2009	Wagner, A

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18-03-2009

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