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(54) **Device for manual emergency release of automatic systems for the movement of doors, gates and the like**

(57) A device (1) for manual emergency release of automatic systems for moving doors, gates and the like, comprising means (2) for the manual actuation of a bolt (3) that is interposed between at least one wing (4) of doors, gates and the like and at least one automatic system for the movement of the wing (4) for the passage of the bolt (3) from at least one locking configuration, in which the wing (4) is jointly associated for rotation with an output shaft (5) of the automatic system, to at least one release configuration, in which the wing (4) and the automatic system are mutually disengaged, and lock means (6) for retaining in position the bolt (3) at least in the locking configuration and/or in the release configuration.

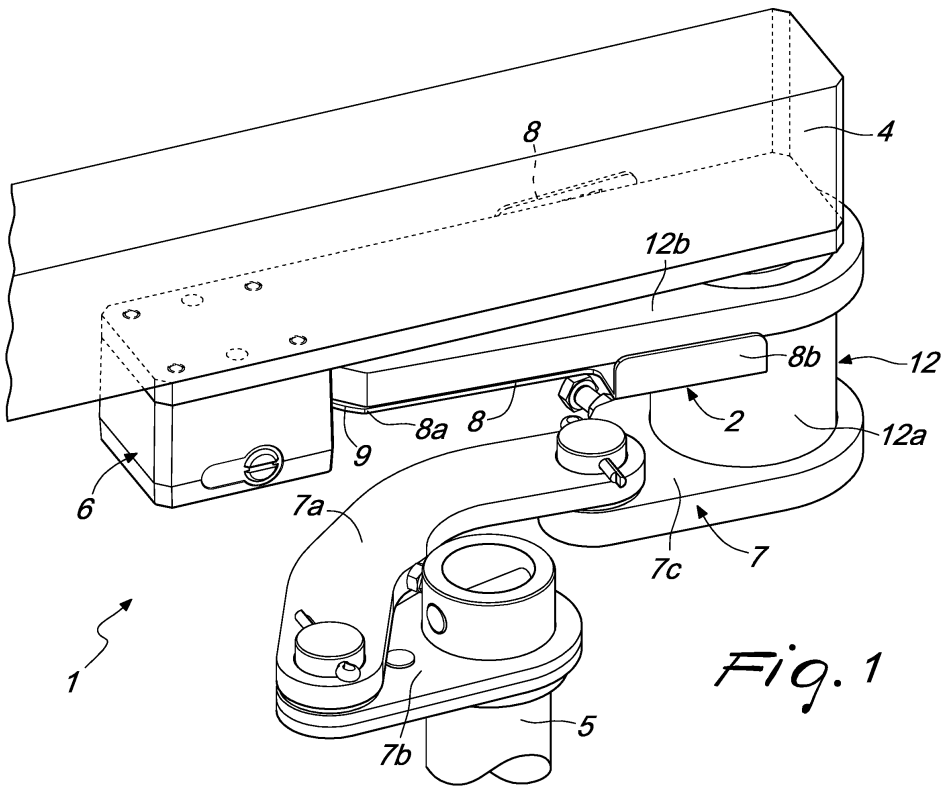

Fig. 1

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Description

[0001] The present invention relates to a device for manual emergency release of automatic systems for the movement of doors, gates and the like.

[0002] In particular, the present invention relates to automatic doors, gates and the like that are actuated to open/close by means of remote controls or remote buttons.

[0003] These opening and closing systems generally provide for the use of a motor provided with a reduction unit, the output shaft of which is connected, for example, by means of actuation mechanisms, to each wing to be opened and closed.

[0004] The rotation of the output shaft is in fact controlled angularly in the two travel directions so that the wing sweeps a specific angle.

[0005] Each wing is alternately movable between a configuration for closing the door or gate, in which it blocks passage through such door or gate, and an open configuration, in which vice versa the jambs of the door or gate are arranged so as to allow passage through the door or gate.

[0006] The motor is generally of the type of an electric motor operated by an electromagnetic wave receiver, which in turn is activated by a transmitter that is arranged in the remote control with which the user is equipped. In case of emergency, as in an electric power failure due for example to a temporary blackout or others, it would be impossible to operate the motor and therefore actuate the door or gate connected thereto for closing and opening.

[0007] According to the applicable statutory provisions regarding installations of automatic devices, it is necessary, in order to prevent lack of electric power, to provide the door, gate and the like with a manual release device that allows manual opening and closing of the door, gate and the like in case of emergency.

[0008] These release devices are of two different types: the first type acts on the mechanical connection between the output shaft and the wing and the second one acts upstream of the output shaft in the connection between the output shaft and the motor, placing such output shaft in neutral.

[0009] As regards the first described type, known devices generally have a first plate, which is associated with the output shaft of the motor, and a second plate, which is associated directly with the wing of the door, of the gate, to be opened/closed.

[0010] The first and second plates are mutually pivoted, and in normal operating conditions the first and second plates are mutually jointly connected by way of locking means.

[0011] In case of electric power failure or emergency, in which it becomes necessary to open the door or gate manually, the deactivation of the locking device is performed. In particular, such device has a pivot that is adapted to perform a translational motion from a locking configuration, in which the pivot is interposed directly between the first and second plates, keeping them mutually jointly connected, to a release configuration, in which the pivot is disengaged from either the first plate or the second plate, allowing the mutual rotation of such plates.

[0012] Generally, the translational motion of the pivot is provided by means of the rotation of a work tool, such as for example a screwdriver or a key or the like, which is adapted to enter an appropriately provided slot formed directly on a drum for pushing such pivot.

[0013] These known types of device are not free from drawbacks, which include the fact that the rotation to be imparted to the work tool is not always easy, since it is necessary to overcome the contrast forces of the frictions to which such pivot is subjected, especially in conditions of poor lubrication due to wear or deposits due to occasional use of the device. It is in fact observed that such work tool, especially when it is a key, is prone to frequent breakages due to the torsional stress to which it is subjected in order to push the pivot from the locking configuration to the release configuration and vice versa.

[0014] A consequence of this drawback is the fact that breakage of the key inside the lock renders the device unusable and therefore requires its replacement.

[0015] The aim of the present invention is to eliminate the above-mentioned drawbacks of the background art, by providing a device for manual emergency release of automatic systems for moving doors or gates and the like that allows to facilitate the release/locking operations of the door or gate.

[0016] Within this aim, an object of the present invention is to provide a structure that is simple, relatively easy to provide in practice, safe in use, effective in operation, and of relatively low cost.

[0017] Another object of the invention is to preserve from wear the work tool, especially if it is necessary to use a key for it.

[0018] Further, another object of the invention is to make the release operation faster and to ensure that the mechanical elements involved are affected by low stresses and that therefore they have a longer lifespan.

[0019] This aim and these and other objects, which will become better apparent hereinafter, are achieved by the present device for manual emergency release of automatic systems for moving doors, gates and the like, characterized in that it comprises means for the manual actuation of a bolt that is interposed between at least one wing of doors, gates and the like and at least one automatic system for the movement of said wing for the passage of said bolt from at least one locking configuration, in which said wing is jointly associated for rotation with the output shaft of said automatic system, to at least one release configuration, in which said wing and said automatic system are mutually disengaged, and lock means for retaining in position said bolt in at least said locking configuration and/or said release configuration.

[0020] Further characteristics and advantages of the present invention will become better apparent from the

following detailed description of a preferred but not exclusive embodiment of a device for manual emergency release of automatic systems for moving doors, gates and the like, illustrated by way of non-limiting example in the accompanying drawings, wherein:

Figure 1 is a perspective view of the device according to the invention in the locking configuration;
Figure 2 is a partially sectional side view of Figure 1;
Figure 3 is an exploded view of the device of Figure 1;
Figure 4 is a bottom view of Figure 1;
Figure 5 is an exploded view of the lock means of the device of Figure 1;
Figure 6 is a perspective view of the actuation means of the device according to the invention.

[0021] With reference to the figures, the reference numeral 1 generally designates a device for manual emergency release of automatic systems for moving doors, gates and the like.

[0022] The device 1 comprises means 2 for the manual actuation of a bolt 3 that is interposed between at least one wing 4 of doors, gates and the like and at least one automatic system for the movement of the wing 4.

[0023] In particular, the actuation means 2 are suitable for the passage of the bolt 3 from at least one locking configuration, in which the wing 4 is jointly rotationally associated with an output shaft 5 of the automatic system, to at least one release configuration, in which the wing 4 and such automatic system are mutually disengaged.

[0024] Further, the device 1 comprises lock means 6 for retaining in position the bolt 3 at least in the locking configuration and/or in the release configuration.

[0025] As is known, means 7 for transmitting motion between the output shaft 5 and the wing 4 are interposed between the output shaft 5 of the automatic system and the wing 4, and are detachably associated with the wing 4 by means of the device 1. The actuation means 2 comprise at least one lever 8 for actuating the bolt 3.

[0026] In particular, the lever 8 comprises at least one cam 9, which is provided at a first end 8a of the lever 8, which can engage a base 10 of the bolt 3.

[0027] In particular, the base 10 in turn is engaged, in the locking configuration, in a seat 11 that is associated with a body 12 for transmitting motion from the output shaft 5 to the wing 4, in particular from the transmission means 7 to the wing 4.

[0028] In the preferred embodiment shown in the figures, the transmission means 7 in fact comprise a linkage 7a, the ends of which are respectively pivoted to at least one first eccentric element 7b, which is jointly associated with the output shaft 5, and to a second eccentric element 7c, which is jointly associated with the transmission body 12, for rotational actuation of the transmission body 12 in accordance with the rotation of the output shaft 5.

[0029] In particular, the transmission body 12 is rotatably associated with the wing 4 and comprises an internally hollow tubular portion 12a, for accommodating a pivot 13 that is associated with the wing 4. The wing 4 is free to rotate with respect to the transmission body 12 when the bolt 3 is in the release configuration and vice versa is jointly associated for rotation with the transmission body 12 and thus with the output shaft 5 when the bolt 3 is in the locking configuration.

[0030] The second eccentric element 7c is jointly associated with the lower end of the tubular portion 12a, and a plate 12b, provided for example monolithically on the tubular portion 12a, is jointly associated with the upper end of the tubular portion 12a.

[0031] The plate 12b, in the preferred embodiment, has a longitudinal axis that is substantially parallel to the central plane of arrangement of the wing 4.

[0032] In particular, the seat 11 is provided at the end of the plate 12b that is distal with respect to the tubular portion 12a.

[0033] A second end 8b of the lever 8 in particular can be gripped, for example manually, for rotary actuation in contrast with means 14 for elastic return of the lever 8.

[0034] The lever 8 is in fact advantageously pivoted, at a central point 8c thereof, to the plate 12b of the transmission body 12.

[0035] The elastic return means 14 are interposed directly between a point of the lever 8, which in turn is interposed between the central point 8c and the second end 8b, and a region of the plate 12b proximate to the tubular portion 12a.

[0036] The cam 9 is advantageously suitable for the translational actuation of the bolt 3 in contrast with elastic means 15 interposed between the wing 4 and the bolt 3, for the passage of the bolt 3 from the locking configuration to the release configuration.

[0037] In particular, the elastic means 15 are interposed directly between a face 16 of the bolt 3 that lies opposite the base 10 and a first abutment 17a that is jointly associated with the wing 4, for example inside the box-like body of the lock means 6.

[0038] The first abutment 17a is adapted to stop the stroke of the bolt 3 from the locking configuration to the release configuration; the device 1 further comprises a second abutment 17b of the stroke of the bolt 3 from the release configuration to the locking configuration.

[0039] In the preferred embodiment shown in the figures, the device 1 comprises a pair of levers 8, which are arranged on the opposite side with respect to the central plane of arrangement of the wing 4 and can be actuated alternately depending on the position assumed by the wing 4, in its rotary actuation motion, with respect to the operator.

[0040] The lock means 6 comprise an element 18 for retaining the bolt 3 at least in the locking configuration and in the release configuration.

[0041] The bolt 3 in fact comprises at least one first recess 19 and one second recess 20, each of which can be engaged alternately with the retention element 18 respectively in the locking configuration and in the release configuration of the bolt 3.

[0042] In particular, the rotation of the key inside the lock means 6 is adapted to insert the retention element 18 of the rotating member of the lock means 6 in the first or second recesses, respectively 19 or 20, to retain the bolt 3 with respect to the wing 4.

[0043] The retention element 18 can be inserted alternately in the first recess 19, when the bolt 3 is in the locking configuration, and in the second recess 20 when the bolt 3 is in the release configuration.

[0044] The operation of the device according to the invention is as follows.

[0045] In case of an emergency, in which it is necessary to operate manually the door, gate and the like for opening/closing, it is sufficient to insert the key in the lock means 6 and turn the retention element 18 so as to disengage the first recess 19.

[0046] Once the bolt 3 has been released, it is possible to turn the lever 8 arranged on the side of the wing 4 that remains accessible to the operator depending on the position of the wing 4.

[0047] The lever 8 that is actuated, by means of the cam 9, actuates the translational motion of the bolt 3 in contrast with the elastic means 15. In particular, the base 10 of the bolt 3 thus disengages the seat 11 associated with the plate 12b, rotationally disengaging the transmission body 12 with respect to the wing 4, which thus remains manually operatable.

[0048] In order to keep the device 1 in the release configuration it is sufficient to operate the lock means 6 in order to lock the bolt 3 in the retracted position, so that the retention element 18 engages the second recess 20.

[0049] If the user wants to re-establish the mechanical connection between the automatic system and the wing 4, and in particular between the plate 12b of the transmission body 12 and the wing 4, the operation is as follows: by operating the lock means 6, the engagement of the second recess 20 by the retention element 18 is released, at the same time leaving the bolt 3 free to perform a translational motion in accordance with the elastic means 15.

[0050] Once the seat 11 and the base 10 face each other, the bolt 3, and in particular the base 10, resumes engaging the seat 11, and in this position the actuation of the lock means 6 to stop the bolt 3 in the locking configuration is performed.

[0051] In practice it has been found that the described invention achieves the proposed aim and objects, and in particular the fact is stressed that it allows to facilitate the operations for releasing/locking the door or gate, and further it allows to preserve from wear the work instrument, especially if it is necessary to use a key for it.

[0052] Further, the invention as conceived allows to make the release operation faster and to ensure that the mechanical elements involved are affected by low stresses and therefore have a longer lifespan.

[0053] Finally, the device according to the invention has a structure that is simple, relatively easy to provide in practice, safe in use, effective in operation, and of relatively low costs.

[0054] The invention thus conceived is susceptible of numerous modifications and variations, all of which are within the scope of the appended claims.

[0055] All the details may further be replaced with other technically equivalent elements.

[0056] In practice, the materials used, as well as the contingent shapes and dimensions, may be any according to requirements without thereby abandoning the scope of the protection of the appended claims.

[0057] The disclosures in Italian Patent Application No. MO2008A000001 from which this application claims priority are incorporated herein by reference.

[0058] Where technical features mentioned in any claim are followed by reference signs, those reference signs have been included for the sole purpose of increasing the intelligibility of the claims and accordingly, such reference signs do not have any limiting effect on the interpretation of each element identified by way of example by such reference signs.

Claims

1. A device (1) for manual emergency release of automatic systems for moving doors, gates and the like, **characterized in that** it comprises means (2) for the manual actuation of a bolt (3) that is interposed between at least one wing (4) of doors, gates and the like and at least one automatic system for the movement of said wing (4) for the passage of said bolt (3) from at least one locking configuration, in which said wing (4) is jointly associated for rotation with the output shaft (5) of said automatic system, to at least one release configuration, in which said wing (4) and said automatic system are mutually disengaged, and lock means (6) for retaining in position said bolt (3) in at least said locking configuration and/or said release configuration.

2. The device according to claim 1, **characterized in that** said actuation means (2) comprise at least one lever (8) for the actuation of said bolt (3).

3. The device according to one or more of the preceding claims, **characterized in that** said lever (8) comprises at least one cam (9), which is provided at a first end (8a) of said lever (8) and can engage on a base (10) of said bolt (3) that is engaged in a seat (11) that is associated with a body (12) for transmitting motion from said output shaft (5) to said wing; said cam (9) being suitable for the translational actuation of said bolt (3) in contrast with elastic means (15) interposed between said wing (4) and said bolt (3), for the passage of said bolt (3) from said locking configuration to said release configuration, the second end (8b) of said lever (8) being engageable in order to turn said lever (8).

4. The device according to one or more of the preceding claims, **characterized in that** it comprises means (14) for the elastic return of said lever (8) which are interposed between said lever (8) and said transmission body (12).

5. The device according to one or more of the preceding claims,
characterized in that it comprises a pair of said levers (8) which have a mutually substantially symmetrical arrangement with respect to the central plane of arrangement of said wing (4) for the translational actuation of said bolt (3) respectively on opposite sides with respect to said central plane.

6. The device according to one or more of the preceding claims, **characterized in that** said lock means (6) comprise an element (18) for retaining said bolt (3) at least in said locking configuration and in said release configuration.

7. The device according to one or more of the preceding claims, **characterized in that** said bolt (3) comprises at least one first recess (19) and one second recess (20), each of which can engage alternately said retention element (18) respectively in said locking configuration and in said release configuration.

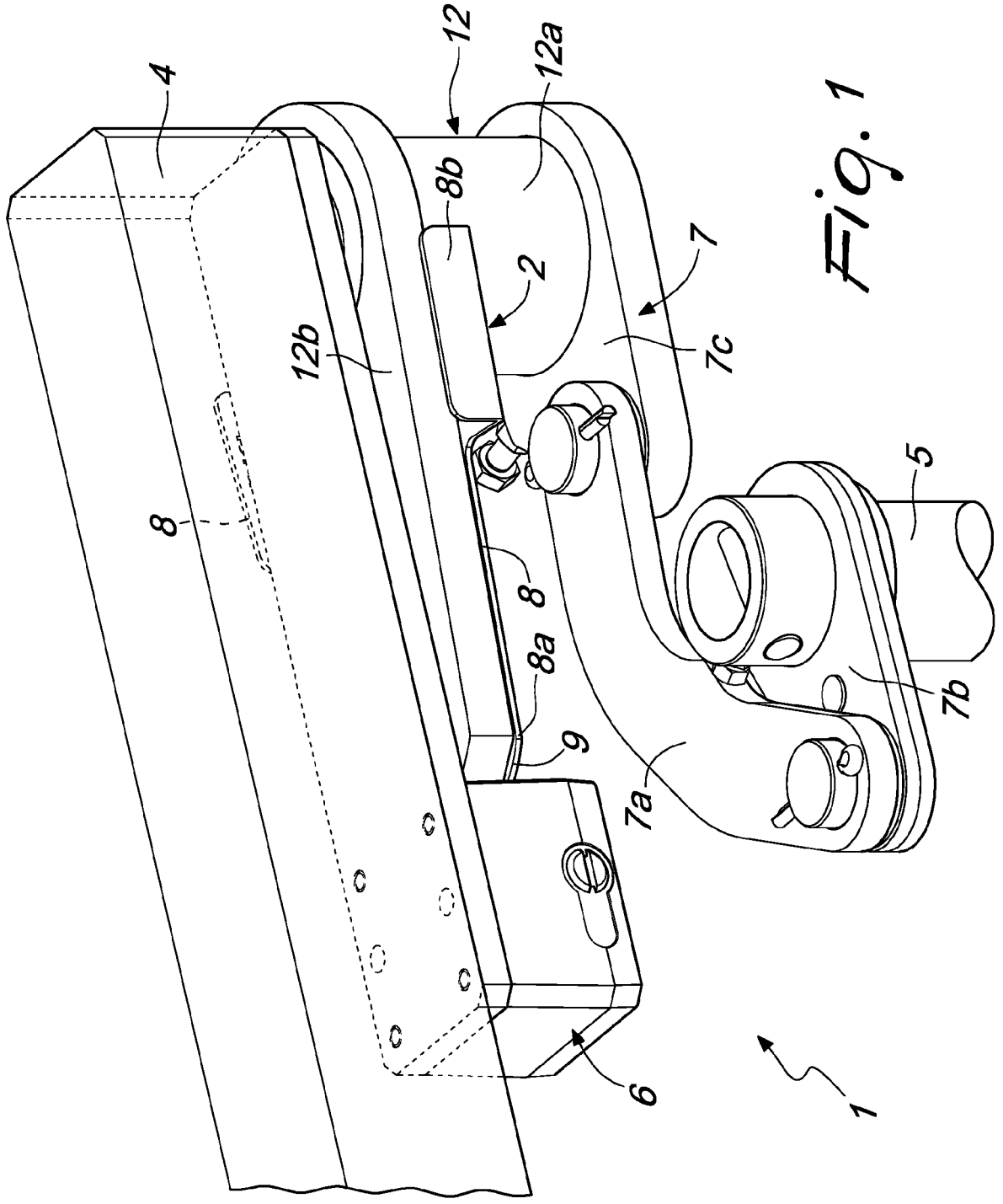
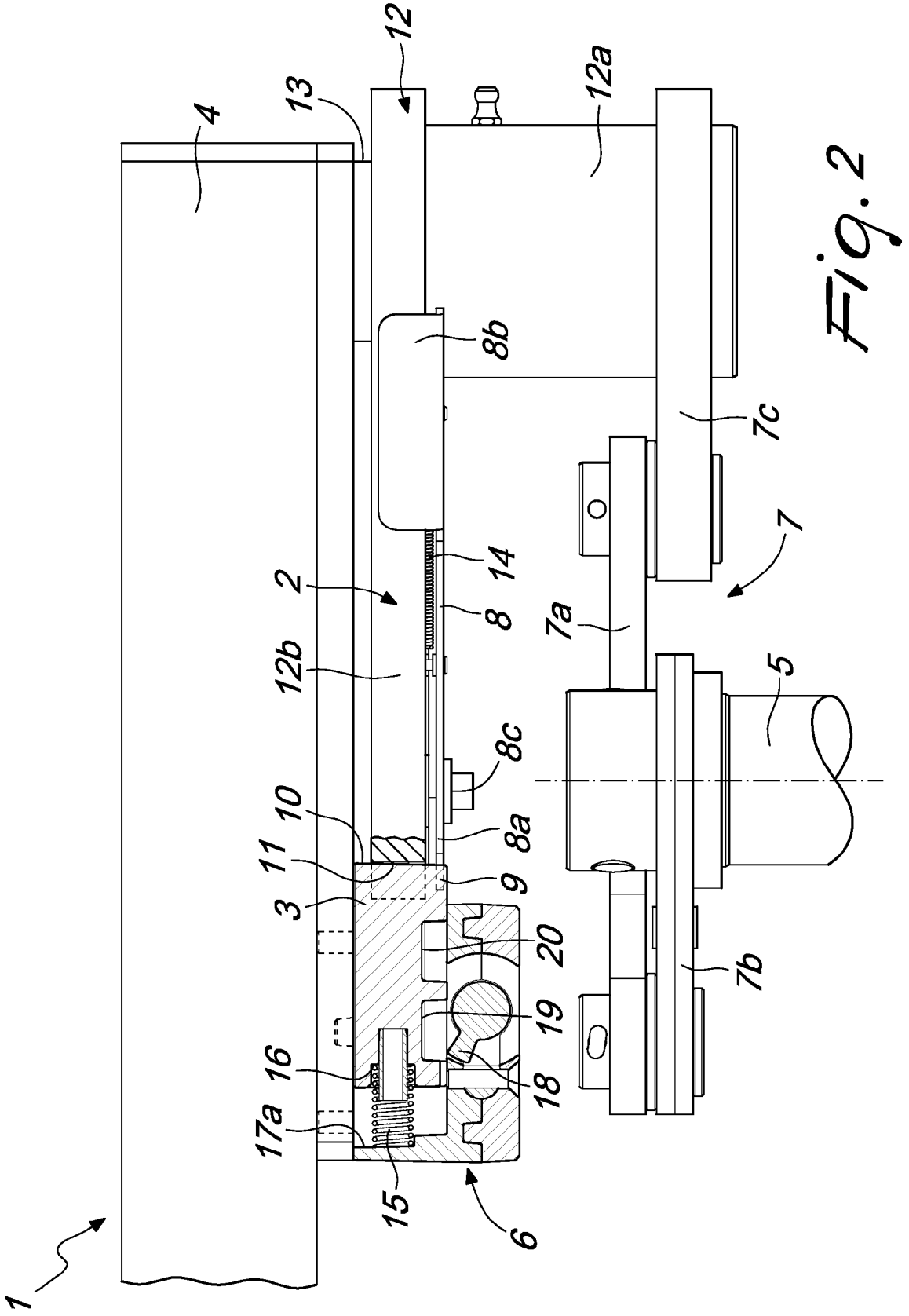


Fig. 1


12
13
12a
4
8b
7c
7
14
2
8
7a
12b
5
8c
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8a
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9
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20
7b
19
16
18
17a
15
6
1

Fig. 2

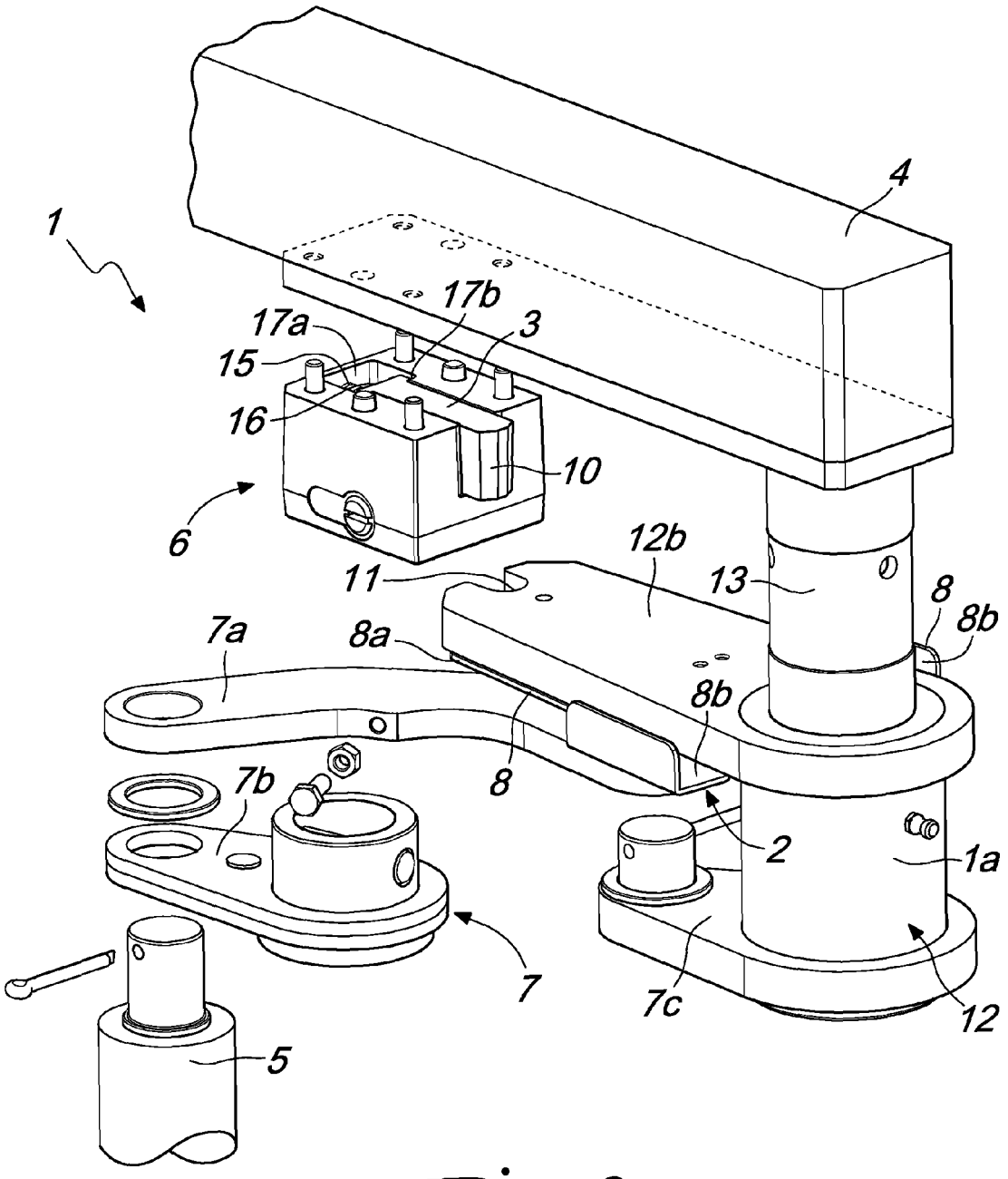

Fig. 3

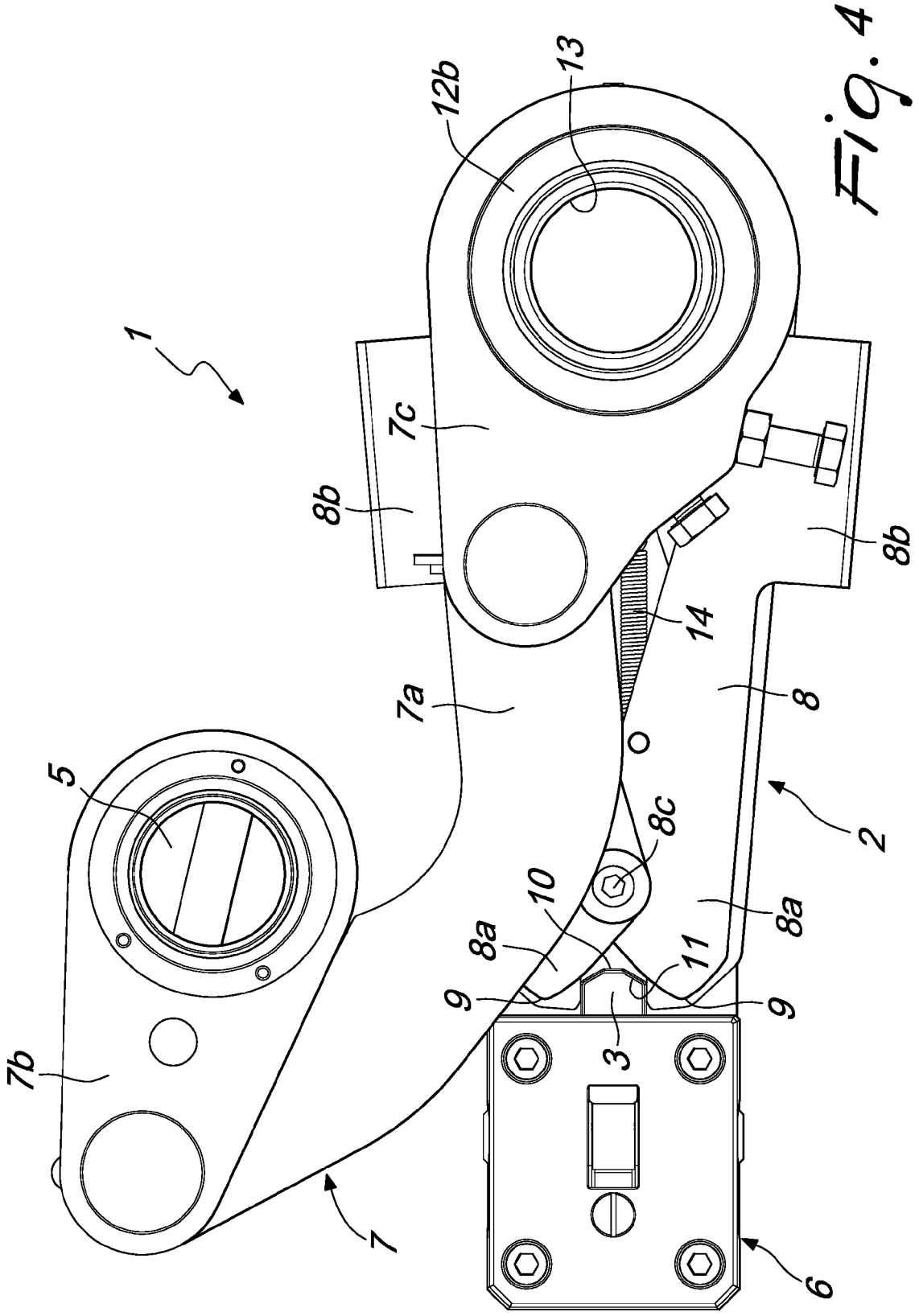

Fig. 4

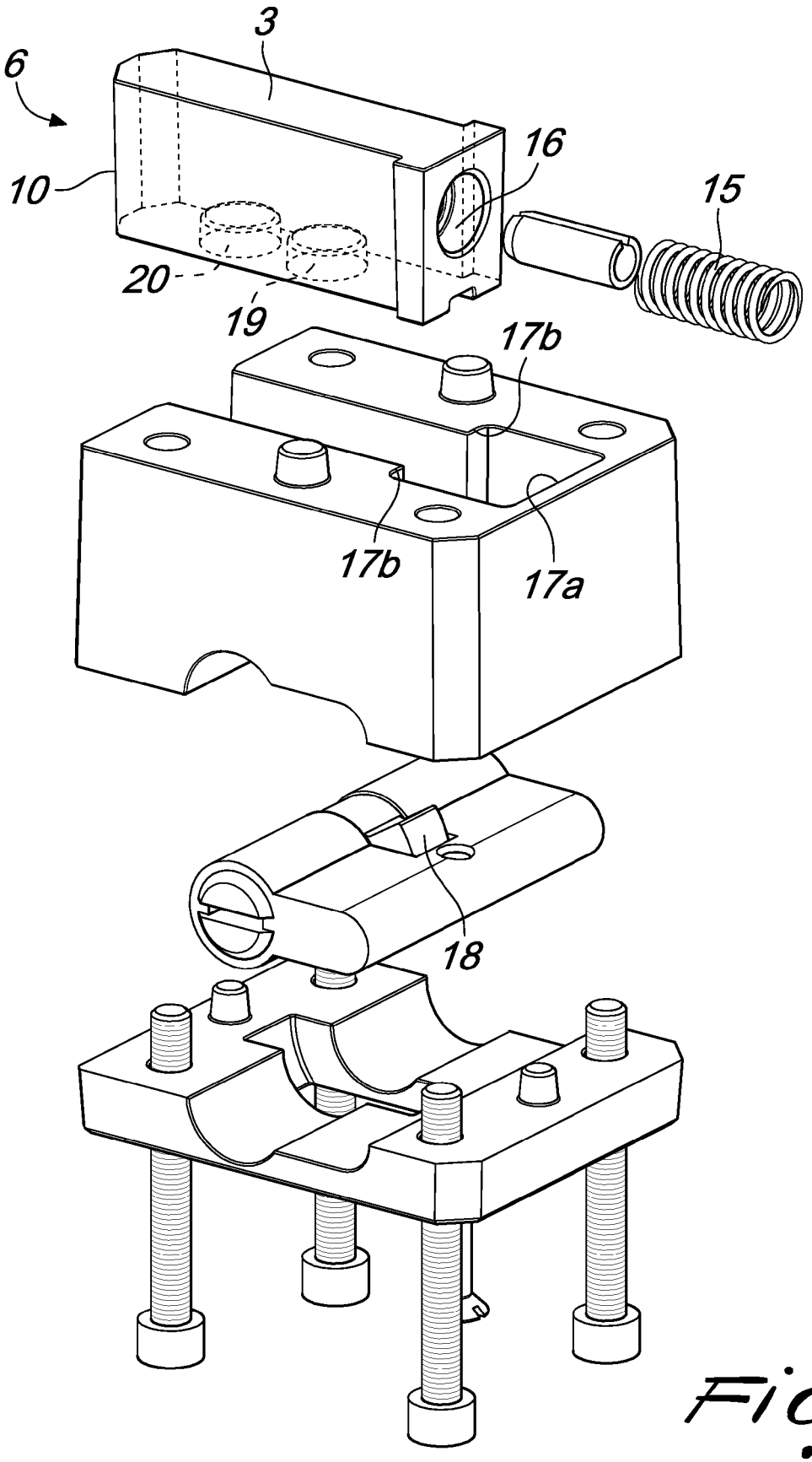

Fig. 5

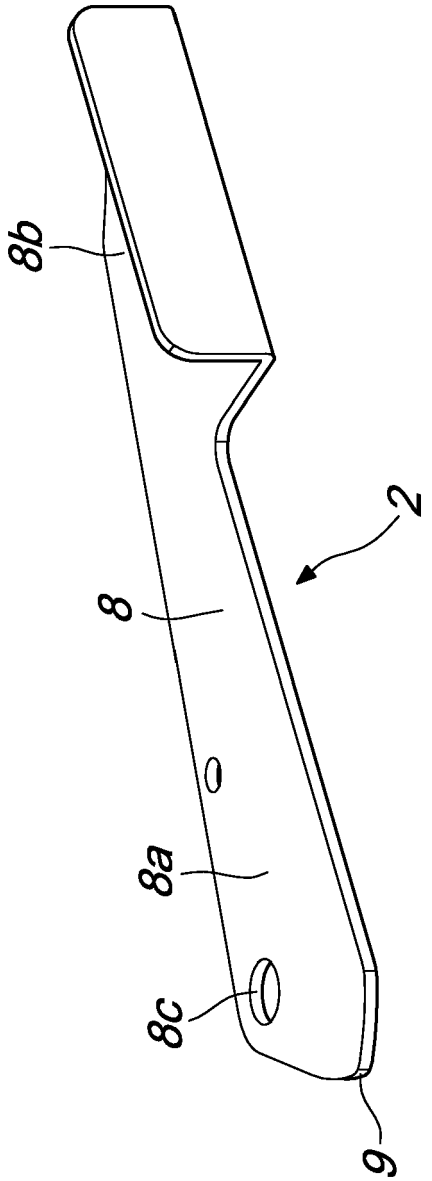

Fig. 6

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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