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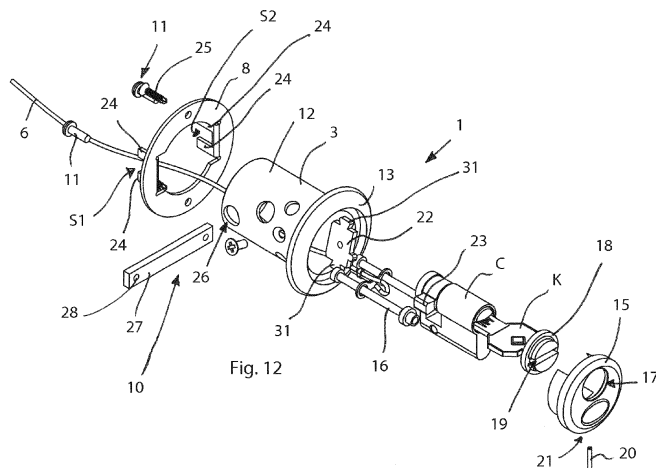
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(54)

RELEASE DEVICE FOR MOTOR-OPERATED DOOR

- (57) A release device for a motor-operated door (2), comprises a housing body (3) suitable for being received and fixed in a seat opening (4) obtained in the motor-operated door (2), a key-operated cylinder unit (5), shaped for being removably received in the housing body (3), and to which a first end (E1) is connected of a cable (6) suitable for being connected, at a second end (E2), to a releasing member (7) of a motor (M) of the motor-operated door (2). The key-operated cylinder unit (5) comprises a European profile cylinder (C) configured for enabling/disabling, by a key (K), extraction of the cylinder unit (5) from the housing body (3); extraction of the cylinder unit (5) enables, with a pulling action transmitted by the cable (6), the releasing member (7) to be acted upon in order to decouple the motor mechanically (M)

from the motor-operated door (2) and thus permit manual movement of the door (2). A fixable positioning element (8) is provided on a rear face (9) of the door (2) and shaped for coupling with, and guiding, the housing body (3) in a correct assembly position (P_M); retaining means (10) configured for coupling with the housing body (3) and for cooperating with the positioning element (8) so as to retain said housing body (3) in the assembly position (P_M) already prior to a subsequent clamping step with screw elements (11). The retaining means (10) prevents disengagement of the housing body (3) from the seat opening (4) and enables an operator to perform conveniently on his or her own clamping of the housing body (3) on the door (2) by the screw elements (11).



Description

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a release device, with a lock, for a motor-operated door such as for example a sectional door.

PRIOR ART

[0002] Using motor-operated doors is known, for example doors of sectional type, provided with an electric motor that, supplied with grid electric current, is arranged for raising and lowering the door without any effort on the part of a user.

[0003] Motor-release devices are known that in the event of a lack of an electric supply (e.g. because of a power cut), or in the event of an electric motor fault, can be driven by the user in order to disengage mechanically the electric motor from the door in order to enable the user to raise or lower the door manually without any resistance being opposed by the electric motor.

[0004] A first type of release device comprises a rotatable lever, connected mechanically to the electric motor, and associated with a lock cylinder, located in a zone near the lever, that enables/prevents rotation thereof. Once an appropriate key is inserted into and rotated in the aforesaid lock, the latter enables rotation of the lever; at this point the lever can be driven to release the aforesaid electric motor.

[0005] This solution accordingly requires both the lever and the lock cylinder to be fitted to the door, which as they have to be applied to mutually distinct zones of the door, require two specific boring or machining tasks to obtain respective housing seats.

[0006] This solution is thus rather complex from the structural point of view, costly and onerous in terms of time and labour required for assembly thereof.

[0007] Further, the reliability and security levels provided by this technical solution are not always considered to be satisfactory.

[0008] Another type of release device comprises a normal lock cylinder, a so-called "round cylinder", which is received, in a releasable manner, in a specific bushing element fixed to the door. A cable is connected to the rear end of the cylinder, the cable being linked to the coupling and release zone that is provided between the electric motor and the door. The aforesaid cylinder, once rotated by the key, can be extracted from the respective bush element that contains the cylinder, and it is possible to thus pull the aforesaid cable so as to intervene on the coupling and release zone, thus disengaging the motor from the door. The bush element is fixed to the door, providing a plate on the front face and a further plate on the rear face of the door; the two plates, thus arranged on the opposite faces of the door, are interconnected by opposite screws. The fixing operation is rather laborious and often requires the continuous presence of two oper-

ators on opposite sides of the door.

[0009] Although this technical solution is very functional and also cheap and easy to construct, it would be desirable to improve both the reliability thereof and the security levels provided thereby.

[0010] There is moreover the need to provide a technical solution that simplifies and significantly accelerates the operations of fitting the release device to a door, ensuring at the same time higher levels of mechanical reliability and of security against break-in attempts.

OBJECTS OF THE INVENTION

[0011] One object of the invention is to improve current release devices for motor-operated doors.

[0012] In particular, one object of the present invention is to provide a release device that is particularly convenient and easy to fit, that is constructionally simple and cheap to make and is provided with higher levels of security against break-ins.

SHORT DESCRIPTION OF THE INVENTION

[0013] The above is achieved by a release device for a motor-operated door, comprising:

- a housing body suitable for being received and fixed in a seat opening obtained on said motor-operated door,
- a key cylinder unit, shaped for being removably received in said housing body, and to which a first end of a cable is connected that is suitable for being connected, at a second end, to a releasing member of a motor of said motor-operated door,
- said key cylinder unit comprising a European profile cylinder configured for enabling/disabling, by a key, extraction of said cylinder unit from said housing body, said extraction permitting, with a pulling action transmitted by said cable, acting on said releasing member in order to decouple mechanically said motor from said motor-operated door and thus permit manual movement of said door,
- a positioning element suitable for being fixed to a rear face of said motor-operated door and shaped for coupling with, and guiding, said housing body in a correct assembly position,
- retaining means configured for coupling with said housing body and for cooperating with said positioning element so as to retain said housing body in said assembly position already prior to a subsequent clamping step with screw elements, said retaining means preventing disengagement of said housing body from said seat opening and enabling an operator to conveniently perform on his or her own clamping of said housing body on said door by said screw elements.

[0014] Owing to the device according to the invention,

the limits associated with prior-art release devices are overcome.

SHORT DESCRIPTION OF THE DRAWINGS

[0015] These and further features according to the present invention, will be clear from the following description with reference to the enclosed drawings, in which:

Figures 1 and 2 are two perspective views, respectively from a front side and from a rear side, of the device according to the present invention;
Figure 3 shows a cylinder unit that is part of the device according to the present invention;
Figure 4 is a perspective view that shows the front side of a motor-operated door on which the device according to the invention is fitted, in which the device is in a stand-by position, i.e. it does not intervene on releasing of the motor of the motor-operated door;

Figure 5 is an enlarged detail of figure 4;

Figure 6 is a perspective view that shows the rear side of a motor-operated door to which the device is fitted in the stand-by position;

Figure 7 is an enlarged detail of figure 6;

Figure 8 is a front perspective view, of the motor-operated door with the device in a release operating position of the motor of the door;

Figure 9 is an enlarged detail of figure 8;

Figure 10 is a rear perspective view of the motor-operated door to which the device is fitted in release operating position of the motor of the door;

Figure 11 is an enlarged detail of figure 10;

Figures 12 and 13 are two exploded views of the device according to the invention;

Figure 14 is a frontal view of the device;

Figure 15 is a section taken along the plane XV-XV in figure 14;

Figure 16 is a section taken along the plane XVI-XVI in figure 14;

Figure 17 is a section taken along the plane XVII-XVII in figure 14;

Figures 18 to 20 are different views of a European profile cylinder included in the device according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0016] The general features of the present invention will be illustrated below through a non-limiting embodiment.

[0017] With reference to the attached drawings, a release device 1 for a motor-operated door 2 is disclosed, in particular, but not in a limiting manner, for a door 2 of the sectional type, driven by a motor M to be raised and lowered.

[0018] The device 1 comprises a housing body 3 suitable

for being received and fixed in a seat opening 4 obtained in the thickness of the aforesaid door 2.

[0019] The housing body 3 comprises a cylindrical portion 12 shaped for being received in the aforesaid seat opening 4 obtained of the door 2, and a frontal abutting portion 13, of annular shape, suitable for abutting on a front face surface 14 of the motor-operated door 2.

[0020] The housing body 3 is made of a highly resistant anti-tear and anti-drilling material to resist drilling attempts with a drill or, in general break-in attempts. A more detailed embodiment will be provided below of material usable for making the housing body 3.

[0021] The release device 1 further comprises a key-operated cylinder unit 5, shaped for being removably received in the aforesaid housing body 3.

[0022] The cylinder unit 5 comprises a cylinder support 15 shaped for supporting, with fixing means 16, a European profile cylinder C. The European profile cylinder C is configured for enabling/disabling, by a key K, extraction of the cylinder unit 5 from the housing body 3. In particular, with reference to figures 18 to 20, a cylinder C of the half-cylinder type is provided, with a total length L_T equal to 41 mm; the distance L_1 of the assembly hole 33 from the front end is equal to 31 mm. Nevertheless, it is possible to provide different dimensions according to specific fitting needs.

[0023] In the device 1, a contrasting plate 22 is provided that is fixed in the housing body 3 and is configured for interacting with a bit element 23 of the aforesaid European profile cylinder C. More precisely, the contrasting plate 22 is provided with wings 31 that engage specific holes 30 provided on the longitudinal wall of the housing body 3. A screw 32 engaging a threaded hole of the contrasting plate 22 secures the latter firmly to the housing body 3.

[0024] In a closed position of the European profile cylinder C, the contrasting plate 22 is an obstacle to the bit element 23 to prevent and disable extraction of the cylinder unit 5 from the housing body 3. Otherwise, in an opening position of the European profile cylinder C, extraction of the cylinder unit 5 from the housing body (3) is enabled.

[0025] A first end E1 of a cable 6 suitable for being connected, at a second end E2 thereof, to a releasing member 7 of the motor M, is connected to the cylinder unit 5.

In the cylinder support 15, a circular opening 17 is obtained that enables the key K to be inserted into the European profile cylinder C. The cylinder support 15 is insertable into and extractable from the housing body 3 from an outer side of the motor-operated door 2, i.e. from the front side 14 of the door 2.

[0026] Extracting the cylinder unit 5 enables, with a pulling action transmitted by the cable 6, acting on the releasing member 7 in order to decouple mechanically the motor M of the motor-operated door 2 and enable manual movement thereof.

[0027] The cylinder unit 5 further comprises a protec-

tive ring nut 18 positioned at the circular opening 17 and arranged for covering the front end of the European profile cylinder C. On the protective ring nut 18, a through slot 19 for inserting the key K is obtained.

[0028] The protective ring nut 18 is coupled in a freely rotatable manner with respect to the cylinder support 15 and to the European profile cylinder C: this makes it extremely difficult, practically impossible, to make a hole with a drill in the ring nut 18, because the ring nut 18 would be rotated integrally with the drill bit, thus frustrating any attempt at abrasion or removal of swarf. Further, the protective ring nut 18, also like the cylinder support 15, are made of a highly tear-resistant material to resist drilling attempts with a drill or, in general, break-in attempts.

[0029] In order to increase further the level of security and the degree of resistance to break-ins, in the cylinder unit 5 a pin element 20 is included made of hardened drill-resistant material, housed along a hole 21 that extends through the cylinder support 15, transversely with respect to the longitudinal axis L of the European profile cylinder C. This pin 20 frustrates any drilling attempt with a drill aimed at reaching the European profile cylinder C.

[0030] The front outer surface of said protective ring nut 18 is substantially flush and coplanar with the front outer surface of the cylinder support 15, and the further front outer surface of the cylinder support 15 does not have substantially step and/or gap zones in the interface perimeter interfacing with the frontal abutting portion 13 of the housing body 3. This configuration enables any grasping and tear attempt aiming at a break-in to be resisted successively, thus contributing to the security and resistance of the device 1.

[0031] The device 1 comprises a positioning element 8, in particular having a washer shape, suitable for being fixed to a rear face 9 of the motor-operated door 2 and shaped for coupling with, and guiding, the housing body 3 in the correct assembly position P_M through the seat opening 4.

[0032] In particular, the positioning element comprises a washer zone 8 of flat shape from which two pairs of lug portions 24 project in a direction parallel to the longitudinal axis L of the housing body 3. During assembly, the lug portions 24 are arranged outside, and on opposite sides, of a rear wall part of the housing body 3. The positioning element 8 is fixable to the rear surface 9 of the motor-operated door 2 by specific screws 25.

[0033] The device 1 further comprises retaining means 10 configured for coupling with the housing body 3 and for cooperating with the washer positioning element 8 so as to retain the housing body 3 in the assembly position P_M already prior to a subsequent clamping step with screw elements 11.

[0034] The retaining means 10 includes through retaining holes 26 obtained on opposite zones of a rear region of the wall of the housing body 3. In particular, the retaining means 10 comprises a rod 27 shaped for being received in the aforesaid retaining holes 26 so as to be

arranged transversely to the longitudinal axis L of the housing body 3.

[0035] On the end zones of the rod 27, threaded holes 28 are obtained that are arranged for engaging screwable screws 11 for abutting and remaining on the positioning element 8.

[0036] During assembly, once the housing body 3 has been inserted into the seat opening 4, from the front face 14 of the door 2, the rod 27 can be inserted into the specific retaining holes 26, crosswise in the housing body 3, as visible for example in figures 2, 16, 17. By engaging the ends of the rod 27 in corresponding seat zones S1, S2 defined by the aforesaid lug portions 24, both rotation and translation of the housing body 3 with respect to the positioning element 8 are inhibited.

[0037] Already in this configuration, thus even before tightening of the device by the screws 11, the device 1 is well constrained, i.e. a disengagement of the housing body 3 from the seat opening 4 is inhibited. The operator, alone, can conveniently and independently clamp, by the screws 11, the housing body 3 on the door 2 by positioning himself or herself near the rear face 9 of the latter, without any risk that the housing body 3 may be expelled from the front.

[0038] The rod 27 and the threaded holes 28 are so configured that the screws 11, once tightened, press on the washer zone 8 of the positioning element 8; in this manner the rod 27 is tensioned to move away from the rear surface of the door and then pulls the housing body 3 at the rear, clamping the frontal abutting portion 13 in an abutting manner against the front surface 14 of the motor-operated door 2.

[0039] As already mentioned, the protection ring nut 18, the cylinder support 15 and the housing body 3 are made of a highly resistant anti-tear and anti-drilling material to resist drilling attempts with a drill or, in general, break-in attempts. This highly resistant anti-tear material, in particular, comprises a steel of type FE37 subjected to deep carbonitriding treatment with 60HRC surface hardness class and 0.5 mm treatment depth.

[0040] By carbonitriding, the resistance to wear and the surface hardness of the aforesaid component are increased significantly.

[0041] During operation, in normal operating conditions of the motor M, the device 1 is in a non-operating stand-by position, as shown in figures 4 to 7. In this case, the European profile cylinder C is in the "closed" position, and cannot be extracted from the housing body 3.

[0042] In the event of a fault of the motor M or power cut, it is sufficient to insert the key K and rotate cylinder C, disengaging the bit element 23 from the contrasting plate 22. At this point, the cylinder unit 5 is released and free to be extracted from the housing body 3. By extracting the cylinder unit 5, it is possible to pull the cable 6 so as to act on the releasing member 7 to decouple the motor M mechanically from the door 2, which at this point can be raised or lowered manually without any resistance being opposed by the motor M.

[0043] From the above it is clear that the release device 1 according to the invention has great versatility and convenience of use, improved break-in resistance features and significant ease of assembly, in addition to a structural configuration that does not require more than one assembly opening to be made on the door 2.

[0044] The device 1 according to the invention is also constructionally simple and cheap to make.

[0045] What has been said and shown with reference to the attached drawings has been provided merely by way of non-limiting example of the general features of the device, and of a preferential embodiment thereof; other modifications and variants are accordingly possible without thereby moving away from the object of the claims. It is possible to configure and scale the device 1 in a desired manner according to the particular applications. Lastly, the materials used can be chosen according to need provided that they are suitable for the specific use for which they are intended.

Claims

1. Release device for a motor-operated door (2), comprising:

- a housing body (3) suitable for being received and fixed in a seat opening (4) obtained on said motor-operated door (2),
- a key-operated cylinder unit (5), shaped for being removably received in said housing body (3), and to which a first end (E1) is connected of a cable (6) suitable for being connected, at a second end (E2), to a releasing member (7) of a motor (M) of said motor-operated door (2),
- said key-operated cylinder unit (5) comprising a European profile cylinder (C) configured for enabling/disabling, by a key (K), an extraction of said cylinder unit (5) from said housing body (3), said extraction permitting, with a pulling action transmitted by said cable (6), acting on said releasing member (7) in order to decouple mechanically said motor (M) from said motor-operated door (2) and thus permit manual movement of said door (2),
- a positioning element (8) suitable for being fixed to a rear face (9) of said motor-operated door (2) and shaped for coupling with, and guiding, said housing body (3) in a correct assembly position (P_M),
- retaining means (10) configured for coupling with said housing body (3) and for cooperating with said positioning element (8) so as to retain said housing body (3) in said assembly position (P_M) already prior to a subsequent clamping step with screw elements (11), said retaining means (10) preventing disengagement of said housing body (3) from said seat opening (4) and

enabling an operator to conveniently perform on his or her own clamping of said housing body (3) on said door (2) by said screw elements (11).

2. Release device according to claim 1, wherein said housing body (3) is made of a highly resistant anti-tear and anti-drilling material to resist drilling attempts with a drill or, in general, break-in attempts, and is provided with:

- a cylindrical portion (12) shaped for being received in said seat opening (4) obtained in said motor-operated door (2), and
- a frontal abutting portion (13) suitable for abutting on a front face surface (14) of said motor-operated door (2).

3. Release device according to claim 1 or 2, wherein said key-operated cylinder unit (5) comprises:

- a cylinder support (15) shaped for supporting, with fixing means (16), said European profile cylinder (C), in said cylinder support (15) a circular opening (17) being obtained for inserting said key (K) in said European profile cylinder (C), said cylinder support (15) being insertable into and extractable from, said housing body (3) from an outer side of the motor-operated door (2), and
- a protective ring nut (18) positioned at said circular opening (17) and arranged for covering the front end of said European profile cylinder (C), on said protective ring nut (18) a through slot (19) being obtained for inserting the key, said protective ring nut (18) being freely rotatable with respect to said cylinder support (15) and said European profile cylinder (C) to prevent drilling thereof with a drill.

4. Release device according to claim 3, wherein said cylinder support (15) and said protective ring nut (18) are made of a highly resistant anti-tear material to resist drilling attempts with a drill or, in general break-in attempts.

5. Device according to claim 3 or 4, wherein said cylinder unit (5) includes a pin element (20) made of hardened drill-resistant material, housed along a hole (21) that extends through said cylinder support (15) transversely with respect to a longitudinal axis (L) of said European profile cylinder (C), said pin element (20) being arranged for increasing further cylinder unit (5) resistance against drilling attempts with a drill.

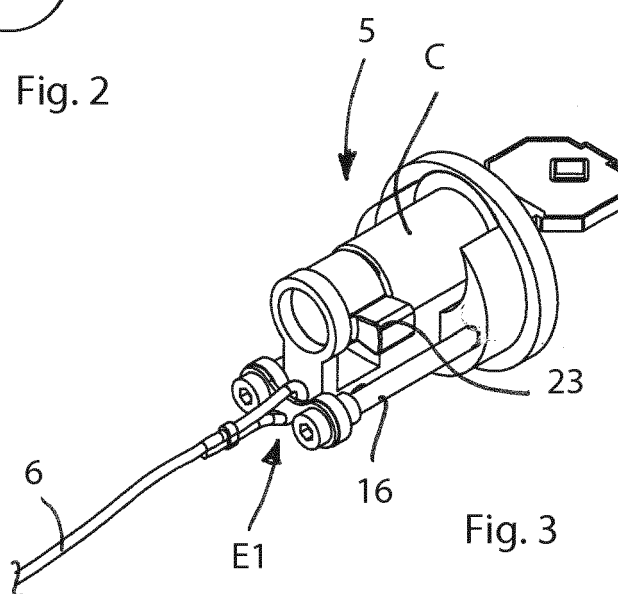
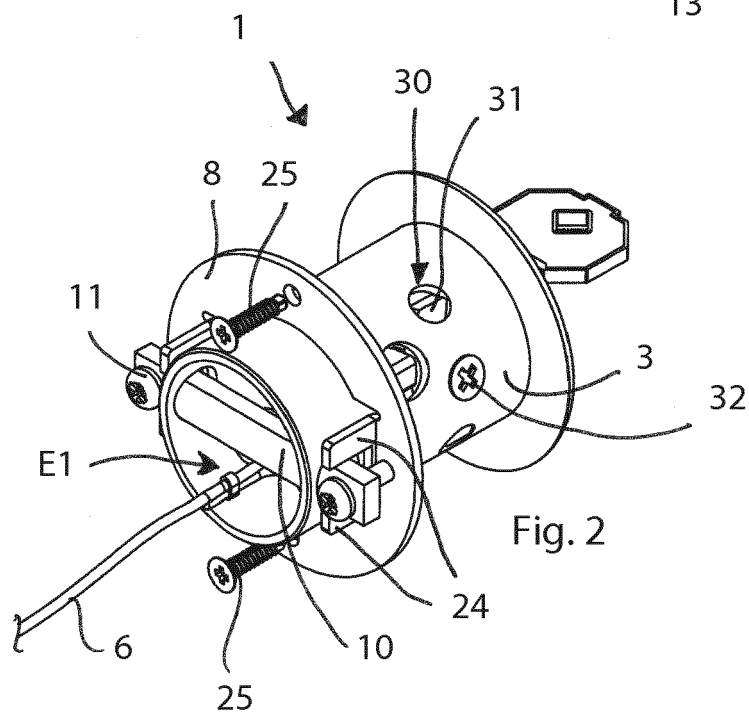
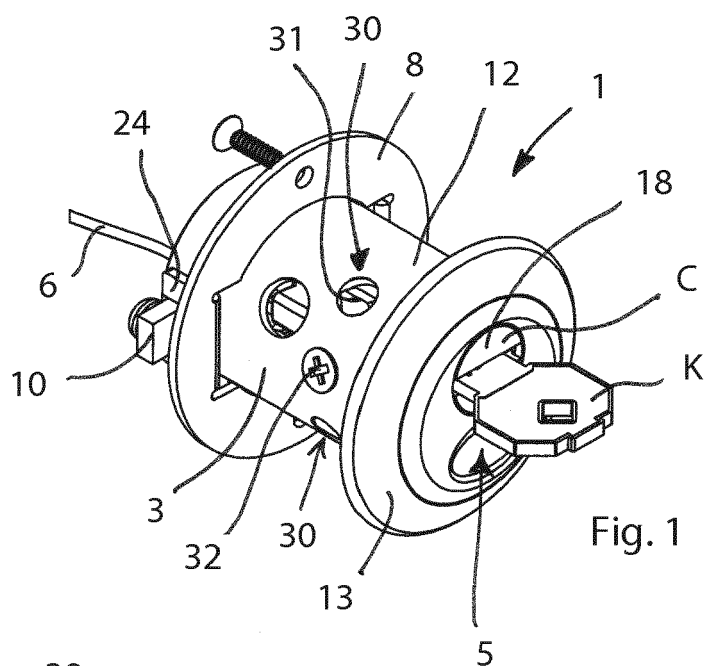
6. Device according to any one of claims 3 to 5, wherein the front outer surface of said protective ring nut (18) is substantially flush and coplanar with the front outer surface of said cylinder support (15), and the further

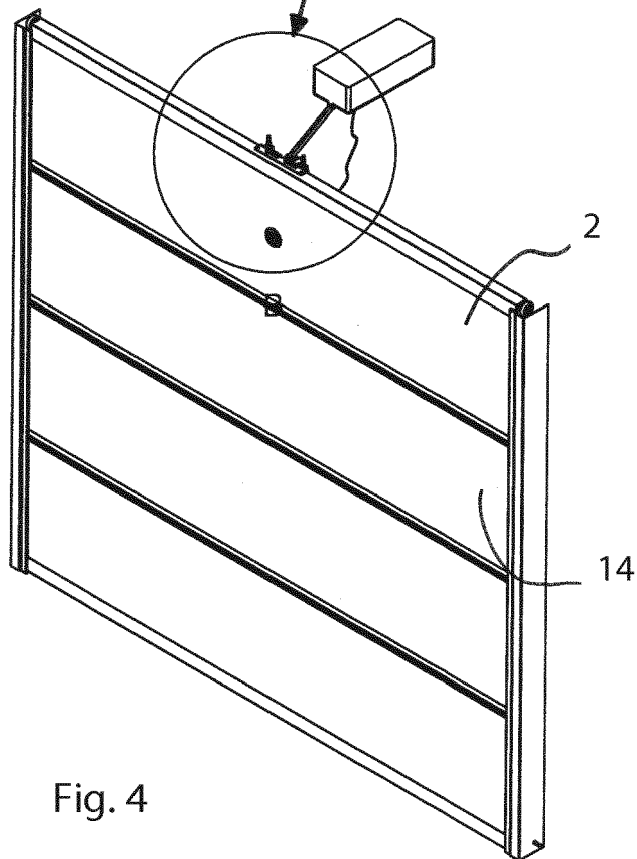
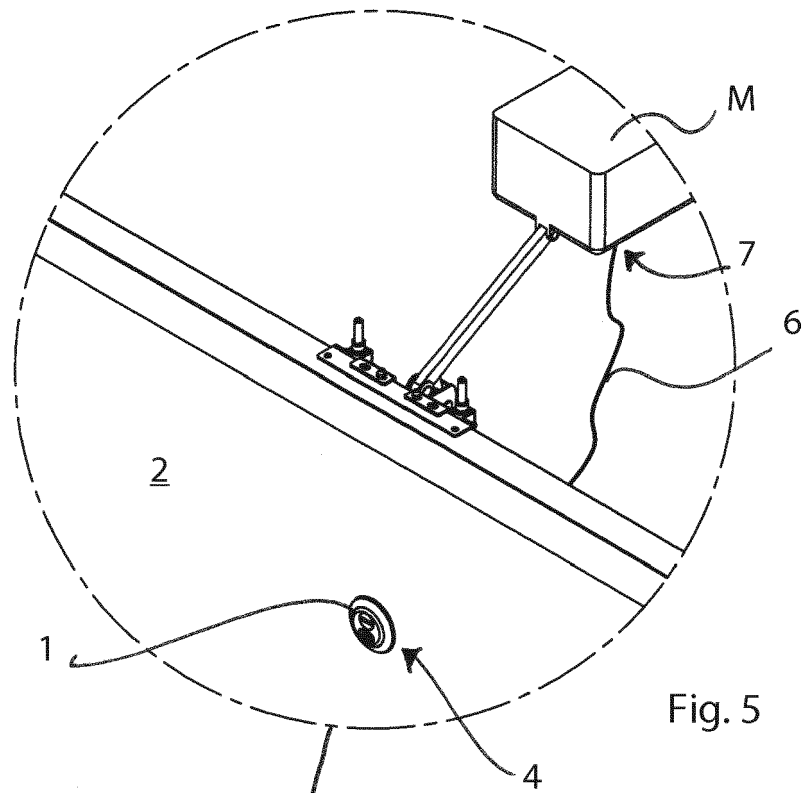
front outer surface of said cylinder support (15) does not have substantially step and gap zones in the interface perimeter interfacing with said frontal abutting portion (13) of said housing body (3), so as to oppose any grasping and tear attempt aiming at a break-in.

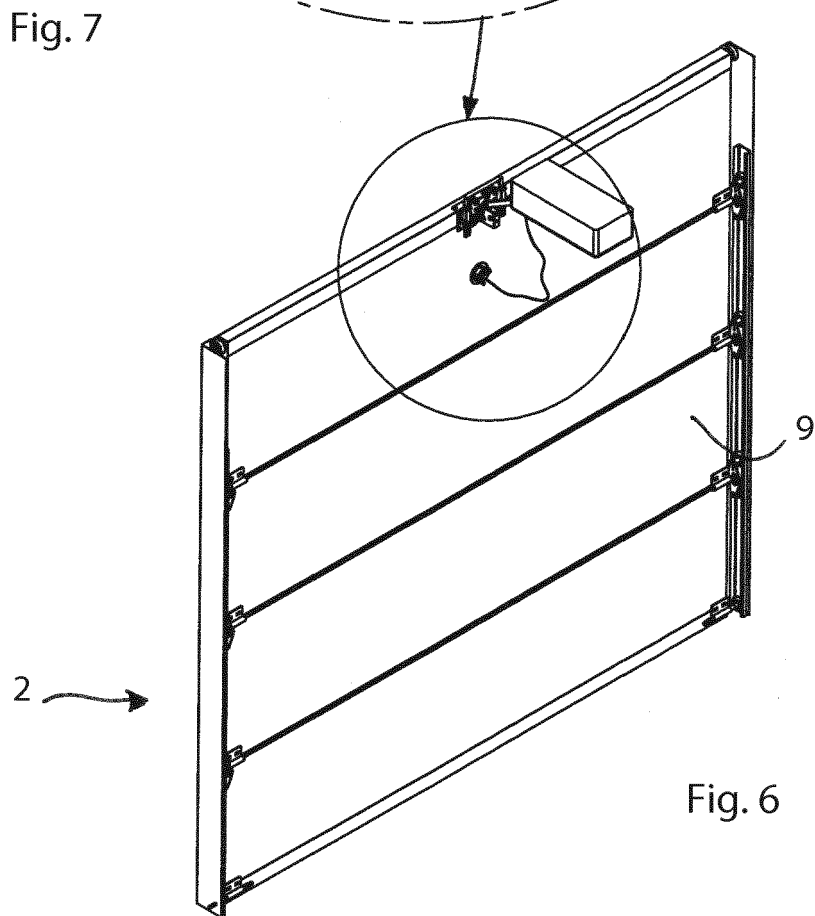
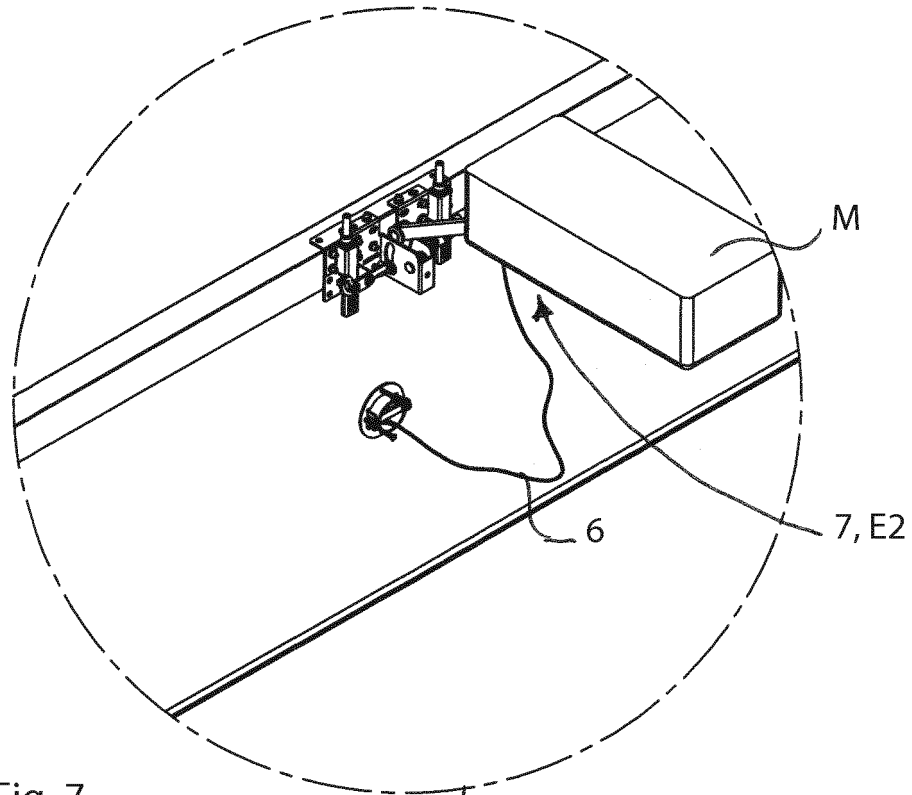
7. Device according to any preceding claims, further comprising a contrasting plate (22) fixed inside said housing body (3) and configured for interacting with a bit element (23) of said European profile cylinder (C), such that in a closed position of the European profile cylinder (C) said contrasting plate (22) is an obstacle to said bit element (23) to prevent and disable the extraction of said cylinder unit (5) from said housing body (3), and in such a manner that in an opening position of the European profile cylinder (C) extraction of said cylinder unit (5) from said housing body (3) is enabled.
8. Device according to any preceding claims, wherein said positioning element comprises a washer zone (8) of flat shape provided with lug portions (24) that protrude to the rear in a direction parallel to the longitudinal axis (L) of said housing body (3) so as to be, during assembly, arranged outside, and on opposite sides, of a rear wall part of said housing body (3), said positioning element (8) being fixable to the rear surface of said motor-operated door (2) by screw means (25).
9. Device according to any preceding claim, wherein said retaining means comprises through retaining holes (26) obtained on opposite zones of a rear wall region of said housing body (3), said retaining means including a rod (27) shaped for being received in said retaining holes (26) so as to be arranged transversely to the longitudinal axis (L) of said housing body (3).
10. Device according to claim 9, wherein the ends of said rod (27) engage corresponding seat zones (S1, S2) defined by respective pairs of lug portions (24), so as to prevent both rotation and translation of said housing body (3) with respect to said positioning element (8).
11. Device according to claim 9 or 10, wherein on the end zones of said rod (27) threaded holes (28) are obtained arranged for engaging said tightenable screw elements (11) for abutting and urging on said positioning element (8).
12. Device according to claim 11, as claim 9 is appended to claim 8, wherein said rod (27) and said threaded holes (28) are so configured that said screw elements (11), once tightened, press on the washer zone (8) of said positioning element (8) and said rod (27) pulls said housing body (3) by tightening said

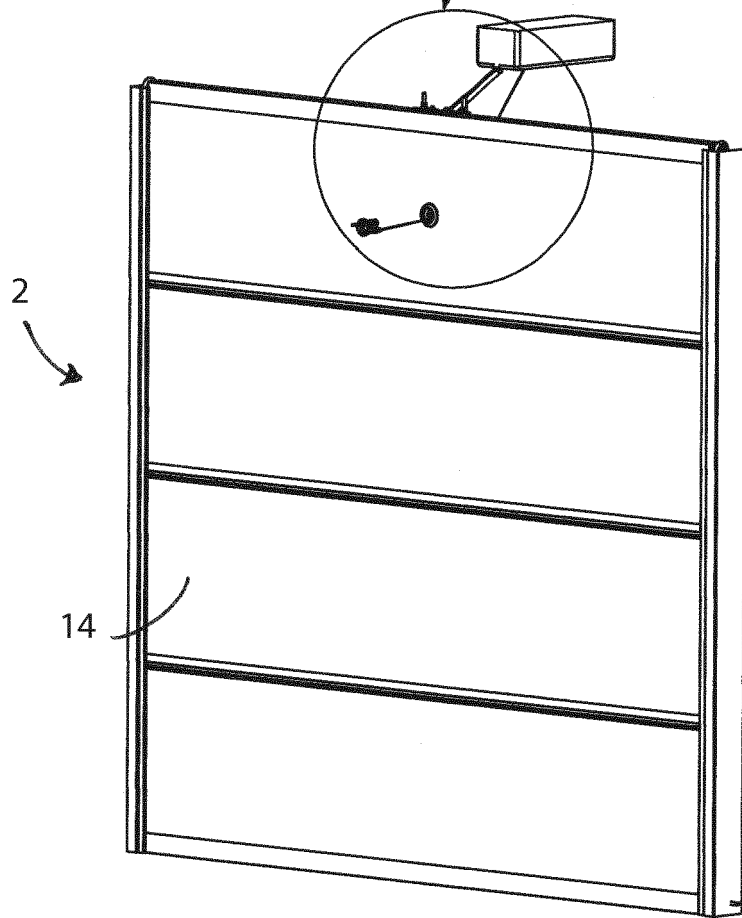
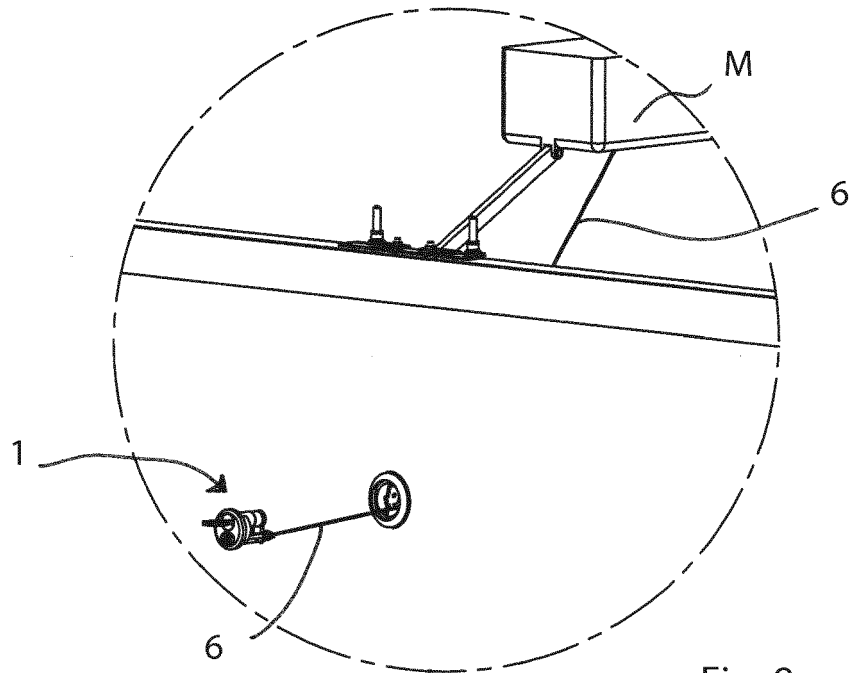
frontal abutting portion (13) in an abutting manner against the front surface (14) of said motor-operated door (2).

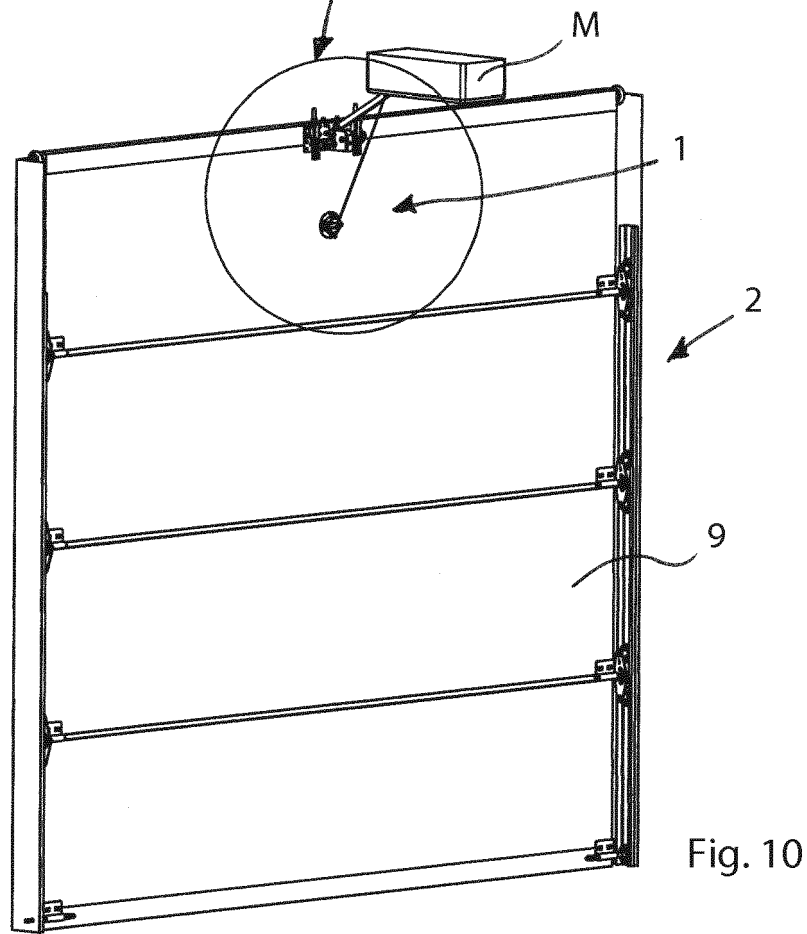
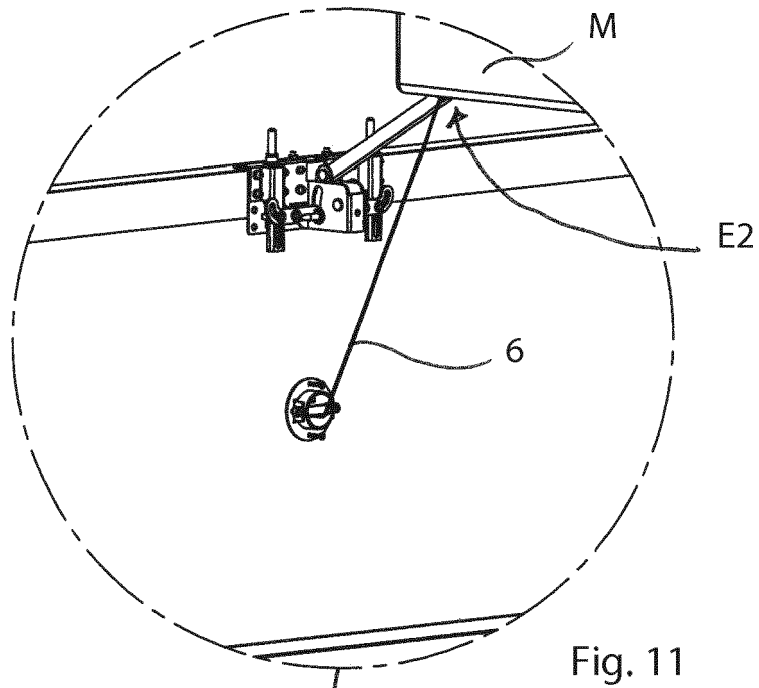
13. Device according to claim 2, or according to any one of claims 3 to 12 as appended to claim 2, wherein said highly resistant anti-tear material comprises a steel of type FE37 subjected to deep carbonitriding treatment with 60HRC surface hardness class and 0.5 mm treatment depth.











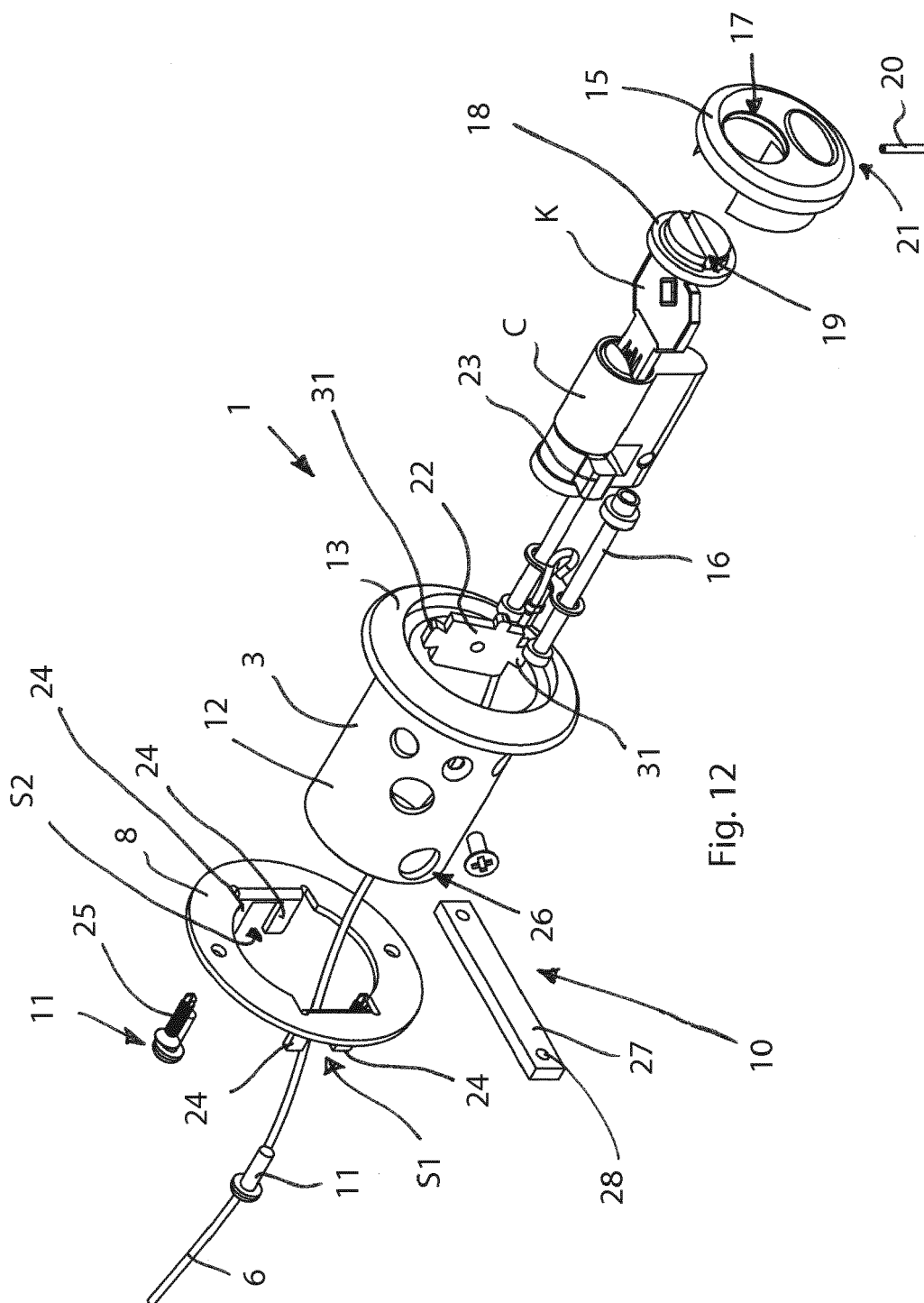
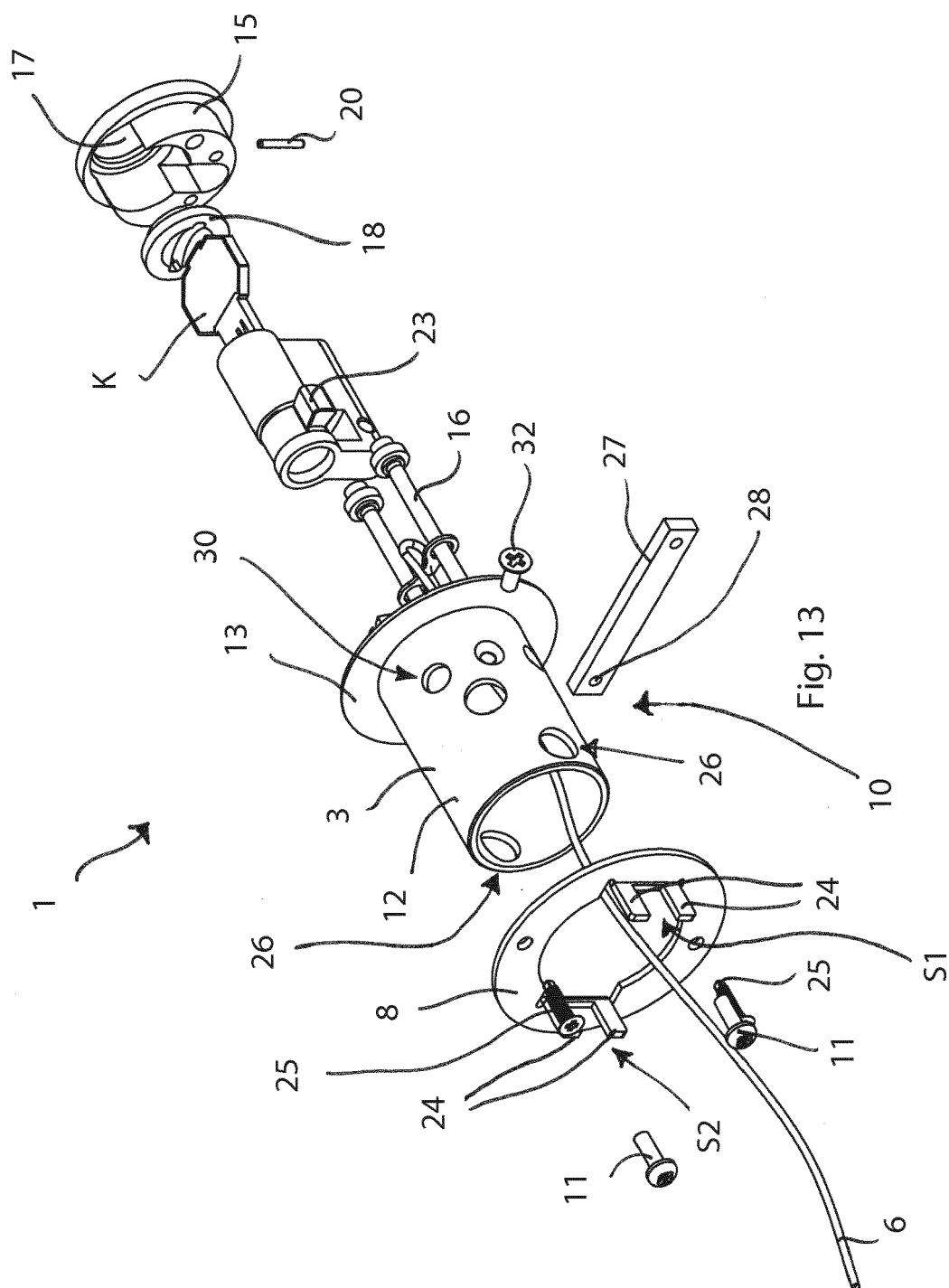


Fig. 12



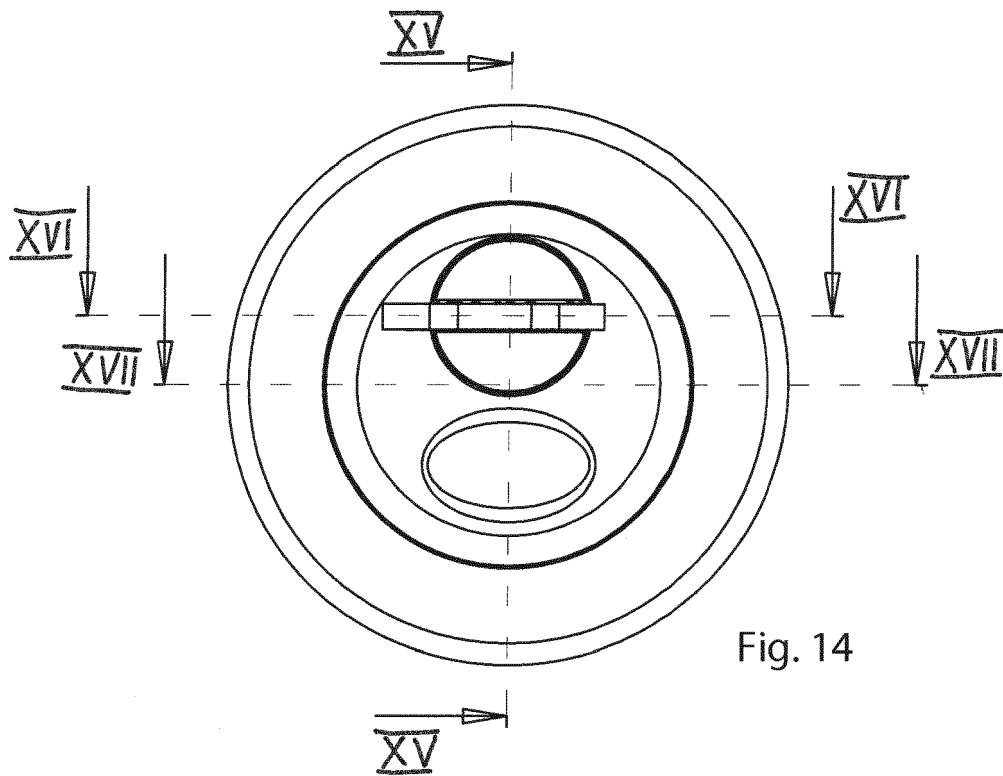


Fig. 14

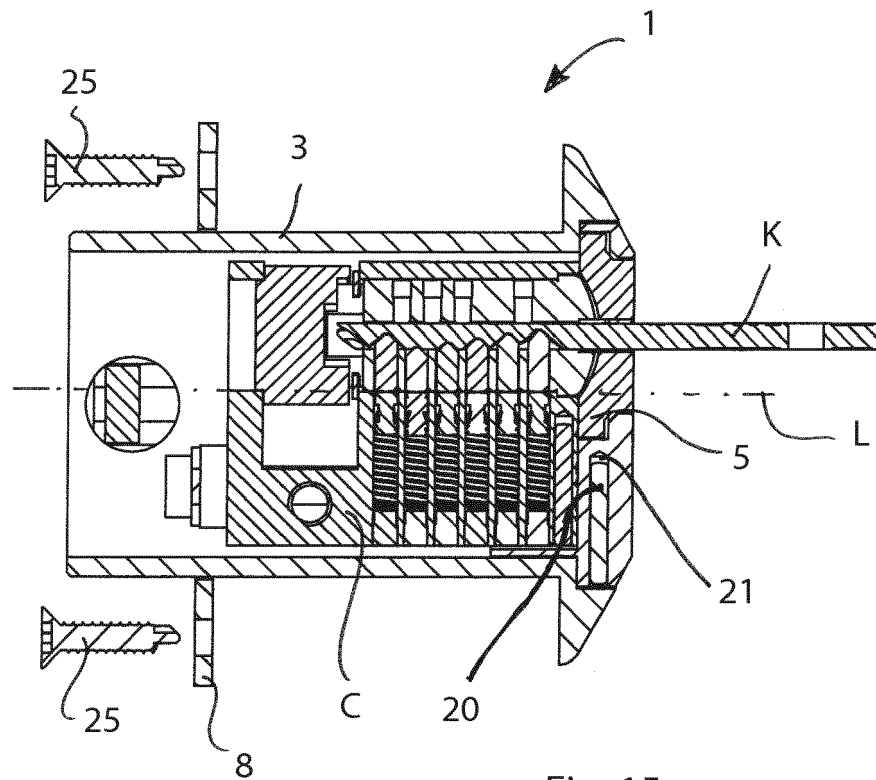
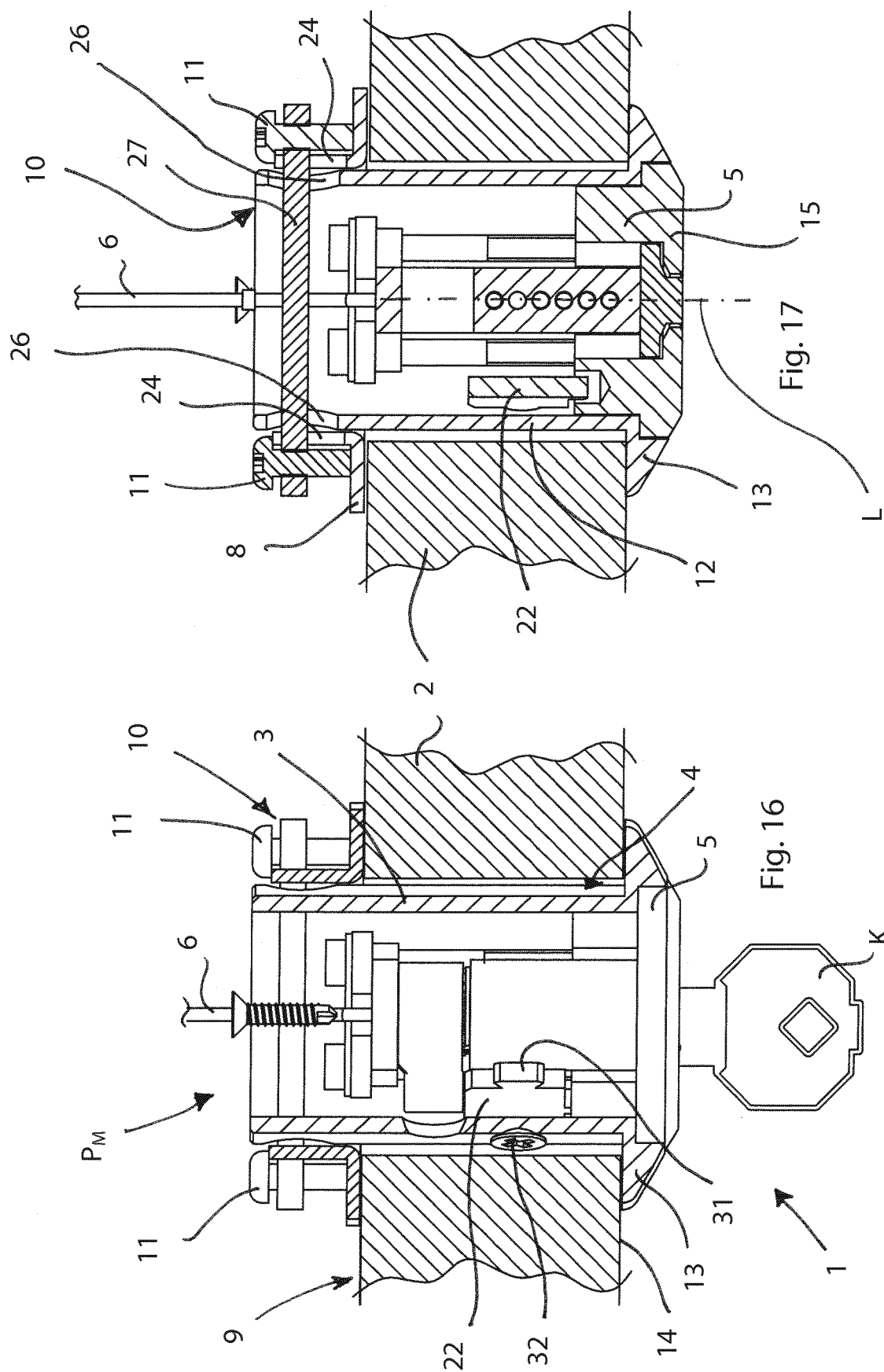
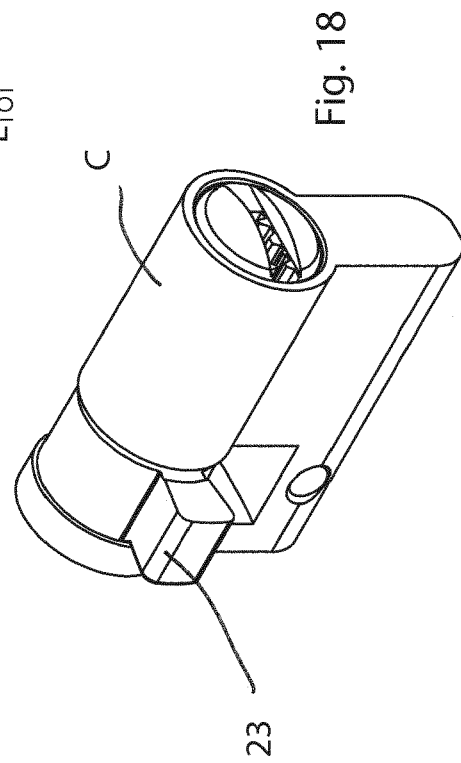
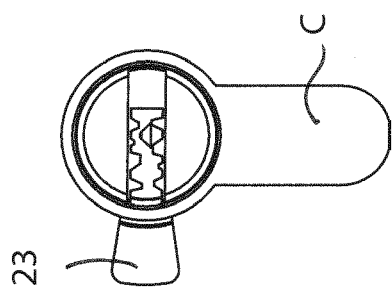
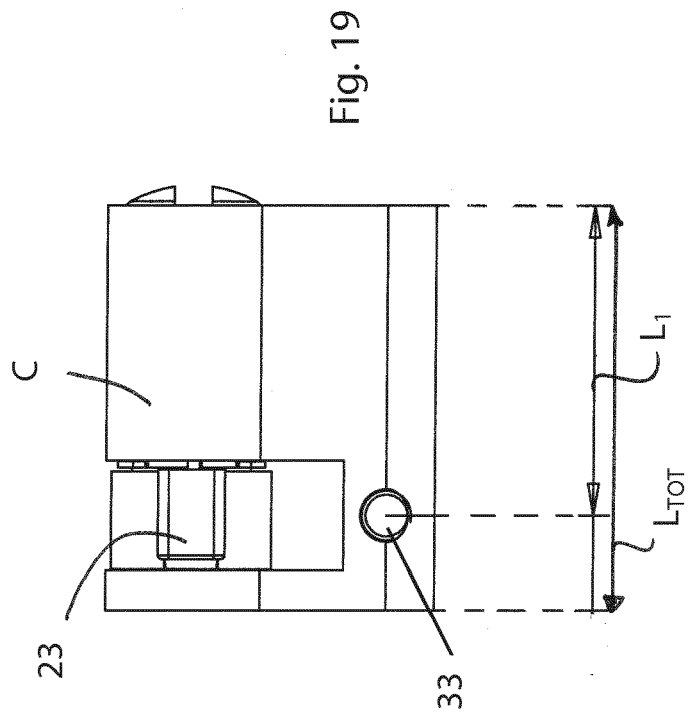


Fig. 15







EUROPEAN SEARCH REPORT

Application Number
EP 19 15 6757

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	DE 202 02 312 U1 (H & K TECKENTRUP KG [DE]) 7 November 2002 (2002-11-07)	1-7,13	INV. E05F15/40 E05F15/668 E05B65/00 E05B9/08 E05B63/00
A	* page 4, paragraph 1 - page 5, paragraph 3; figure *	8-12	
A	EP 3 045 618 A1 (OLIANA PIER LUIGI [IT]) 20 July 2016 (2016-07-20) * paragraphs [0017] - [0026]; figures *	3-6	
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