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Description

[0001] The present invention relates to improvements in or relating to locks, and is more particularly, although not exclusively, concerned with locks for garden gates.

[0002] Self-latching devices for fastening a hinged closure member, such as, a door or a gate, are known. One such self-latching device is described in EP-B-1657383. The latching device comprises a latch bolt mounted on a frame of the gate and which cooperates with a striker element mounted on a fixed post or another gate. The striker element provides an elongate cavity into which the latch bolt is received when the gate is closed. An operating knob for the latching device is mounted on top of the frame of the gate. A latch bolt operating mechanism is provided between the knob and the latch bolt which is located within the frame of the gate and allows the latch bolt to move between a latching position, where it extends from the frame and into the striker element, and a retracted position, within the frame itself. A bushing is provided that can be mounted over the latch bolt and screwed into the frame to be substantially flush with the surface thereof. The bushing forms an additional guide for the latch bolt so that it slides more easily within the latching device as the gate is closed.

[0003] The use of bushings to provide additional guides for latch bolts and/or dead bolts is also described in EP-B-0963498 and EP-B-1367198. In EP-B-0963498, the bushings extend a short distance from the surface of the frame in which the associated latching device is mounted and cannot house the entire length of the latch bolt with which they are associated. In EP-B-1367198, screw threaded tubular elements are attached to a frame of the lock to provide additional support for the latch bolt, particularly when the frame to which the lock has to be attached has a reduced wall thickness. In addition, these tubular elements provide guidance for latch bolts and guide bolts.

[0004] For additional security, it is desired that the latching device is such that it is not possible to retract the latch bolt once located within the striker element when a handle or knob is locked and cannot operate the latch bolt other than by using a key associated with the handle or knob. Such a system is provided in the lock disclosed in EP-B-1657383 wherein the knob can be locked by means of a key operated locking mechanism.

[0005] Further additional security can be provided by door jamb anti-separation devices as described for example in US-A-5129693. In this door jamb anti-separation device a bolt head, protruding from a door jamb plate, engages with a slotted groove formed in a retaining plate. Similar arrangements are also described in NL-A-8800761, GB-A-2189836 and FR-A-1484779.

[0006] In EP-B-1600584, a latching device is described that includes a security element forming part of a lock mounted on a gate that engages with a substantially C-shaped profile forming part of a striker element mounted in a post to which the gate is to be latched.

When the gate is closed, the security element is located within the C-shaped profile of the keeper and it is not possible to force apart the latching device holding the gate and post in a latched and locked position. In addition, the security element can be applied over a latch or a dead bolt with the latch or dead bolt extending through the security element. However, the application of the security element over the latch bolt increases the space needed between the gate and the post as the latch bolt has to extend a further distance, through the security element, in order to be able to engage with the keeper. Moreover, the keeper also extends a larger distance from the post thus limiting the free entrance space when the gate is open and increasing the risk of people hurting themselves against this projecting keeper.

[0007] Whilst it is relatively easy to mount such security devices in locations where there are no space constraints, it becomes a problem when space is limited, particularly between a frame element of a hinged closure member and post (or other hinged closure member) to which the hinged closure member is to be latched and locked in position.

[0008] EP 1 818 483 discloses a compact lock and striker arrangement that can be used in small spaces and can be mounted within frames having relatively small dimensions. The lock is mounted in the post whilst the keeper or striker is mounted onto the gate. The security element is applied in this lock over the latch bolt. It forms a latch bolt guiding element that includes a latch bolt guiding portion and a latch bolt stop portion. In this lock the keeper doesn't have to extend over a larger distance from the gate since rotation of the gate is stopped by contact between the latch bolt guiding element and the keeper.

[0009] A drawback of this lock is that the latch bolt can always be retracted from both sides of the gate, even in its closed position, so that, as this lock doesn't comprise a dead bolt, it doesn't allow to lock the gate.

[0010] It is an object of the present invention to provide a lock and striker arrangement in which portions of the lock and striker are such that they only extend minimal distances from the surfaces to which they are mounted.

[0011] It is a further object of the present invention to provide a lock and striker arrangement which enables to securely lock the closure member without having to provide a dead bolt in the lock.

[0012] In accordance with the present invention, there is provided a lock for latching and locking a first closure element to a second closure element, at least one of the closure elements having a hollow frame member, the lock comprising:-

a first assembly mountable on the hollow frame member of one of the closure elements, the first assembly including:-

a lock body mountable within the hollow frame member;
a latch bolt extending from the lock body and

being biased in an extended position and moveable to a retracted position, the retracted position being at least partially within the lock body; a latch bolt guiding element fixed to the lock body and including a latch bolt guiding portion and a latch bolt stop portion, the latch bolt extending through both the latch bolt guiding portion and the latch bolt stop portion; and

a second assembly mountable on the other of the closure elements, the second assembly including:-

a latching element having a first cavity formed therein for receiving at least the latch bolt, which latching element includes a second cavity for receiving the latch bolt stop portion, the second cavity being defined by at least a wall portion that limits the movement of the latch bolt stop portion within the latching element in two orthogonal directions by contact of the latch bolt guiding element and the wall portion; and a striker surface for retracting the latch bolt prior to it being retained within the first cavity of the latching element;

characterised in that the lock further comprises:-

a first handle;

a second handle; and

a first locking element (265) associated with the first handle (130) and operable to lock both the first and second handles (130, 135) in a fixed position.

[0013] By having a single latch bolt and associated latch bolt guiding element, a more compact and less complicated lock assembly can be obtained with added security. Moreover, since the closing movement of the door or gate is stopped by the latch bolt guiding element, no keeper plate engaging the frame of the door or gate is required to stop the closing movement of the door or gate. When the lock is mounted in a tubular member of the frame, as in the present invention, and the handles are mounted on this tubular member, an important advantage is that the keeper plate can be omitted so that there is no risk of hurting his fingers when opening or closing the gate (by contact with the keeper plate which is very close to the handles, especially when the tubular frame member onto which they are mounted have a relatively small width, in particular a width of 6 cm or less or even a width of 4 cm or less).

[0014] The lock comprises at least a first handle, a first locking element associated with the first handle for locking at least the first handle in the fixed position and a second handle. The first locking element is operable to lock both the first and second handles in a fixed position. The latch bolt stop portion of the latch bolt guiding element thus provides the security as it fits within the second cavity of the latching element and prevents access to the latch bolt located in the first cavity, neither the latch bolt

stop portion nor the latch bolt being removable from their respective cavities until the handle is unlocked.

[0015] Additionally, a second locking element may be associated with the second handle and the second locking element may also be operable to lock both the first and second handles in the fixed position.

[0016] The latching element may further include a latching element guiding portion that forms part of the wall portion.

[0017] Advantageously, the latching element guiding portion comprises a recess for receiving the latch bolt guiding portion, the recess being spaced from the striker. It is desired that the recess is dimensioned to accommodate closely the latch bolt guiding portion. This close dimensioning provides very little or no access to the first cavity of the latching element in which the latch bolt is located once it is latched within the latching element.

[0018] It is preferred that the first and second handles are coupled to one another by an actuating portion and the locking element operates to move a locking plate into engagement with a locking slot formed in the actuating portion in which each of the first and second handles are mounted to lock both handles in the fixed position.

[0019] In addition, the striker surface and the recess of the latching element are spaced so as to accommodate closely the latch bolt stop portion as the latch bolt moves over the striker surface and into the first cavity. The first cavity is dimensioned to accommodate closely the extended latch bolt and the second cavity of the latching element may also be dimensioned to accommodate closely the latch bolt stop portion. Both of these features, either alone or in combination, operate to limit the access to the latch bolt once it is within the cavity of the latching element thereby adding to the security of the lock once the handles are locked in the fixed position and cannot be operated to retract the latch bolt and allow its removal from the latching element.

[0020] In an advantageous embodiment of the lock according to the invention, the only contact between the first and second closure elements in their closed position is the contact between the latch bolt and the latching element and the contact between the latch bolt guiding element and said wall portion of the second cavity.

[0021] This embodiment also has the advantage that it is safe as it is not possible to trap fingers between the gate and the keeper as the latch bolt becomes latched or unlatched.

[0022] An adjustable hinge member may be associated with one of the first and second closure elements, the adjustable hinge member being adjusted to minimise the space between the first assembly and the second assembly.

[0023] Ideally, at least one of the first and second closure elements comprises a hinged closure element which may comprise a gate.

[0024] For a better understanding of the present invention, reference will now be made, by way of example only, to the accompanying drawings in which:-

Figure 1 illustrates a lock assembly mounted in a tubular frame of a gate in accordance with the present invention;

Figure 2 illustrates an exploded view of the lock assembly and post as shown in Figure 1;

Figure 3 illustrates an exploded view of the lock assembly shown in Figures 1 and 2 without the post;

Figures 4 to 6 illustrate perspective views of a locking handle assembly for the lock assembly shown in Figures 1 to 3;

Figure 7 illustrates the lock assembly of the present invention together with a keeper assembly mounted on a post;

Figure 8 illustrates a side view of the lock assembly of the present invention with the front plate removed; Figure 9 is similar to Figure 8 but showing the latch bolt retracted;

Figure 10 is similar to Figure 8 but showing the latch bolt in an extended position with the key in an intermediate position;

Figure 11 is similar to Figure 8 but showing the latch bolt an extended position with the key in a locked position;

Figure 12 is similar to Figure 8 but showing the latch bolt in an extended position with the key in a double-locked position;

Figure 13 illustrates a perspective view that is similar to Figure 8 but with showing the latch bolt in an extended and locked position;

Figure 14 illustrates a perspective view of the keeper assembly of Figure 7 in more detail;

Figure 15 illustrates a perspective view of a hinge that can be used with the lock of the present invention;

Figure 16 illustrates a perspective view of the hinge from another side;

Figure 17 illustrates a sectioned view through the hinge shown in Figures 15 and 16 with the hinge bolt in a first position;

Figure 18 is similar to Figure 17 with the hinge bolt in a second position; and

Figure 19 illustrates a top perspective view of the hinge as shown in Figures 15 to 18.

[0025] The present invention will be described with respect to particular embodiments and with reference to certain drawings but the invention is not limited thereto. The drawings described are only schematic and are non-limiting.

[0026] It will be understood that the terms "vertical" and "horizontal" are used herein refer to particular orientations of the Figures and these terms are not limitations to the specific embodiments described herein.

[0027] Components that are the same in each of the Figures bear the same reference numerals.

[0028] Referring initially to Figures 1 and 2, a lock assembly 100 is shown mounted on a tubular frame 10 that forms part of a gate (not shown). The tubular frame 10

typically comprises a substantially square cross-section and has a front surface 15 to which the lock assembly 105 is mounted.

[0029] The lock assembly 100 comprises a lock body 105 that fits within a recess 20 formed in the front surface 15 of the frame 10. The lock body 105 is fixed within the recess 20 by means of a mounting plate 110 that is screwed or bolted to the front surface 15 of the frame 10 by means of two screws or bolts 115 that co-operate with holes 25, 30 formed in the front surface 15 as shown. Extending from the lock body 105 and through the mounting plate 110 is a latch bolt 120. Latch bolt 120 extends through a security member 125 that is also mounted on the mounting plate 110. Two handles 130, 135 are mounted on either side of the frame 10 with respective spindle assemblies 140, 145 extending through apertures 35, 40 formed in the frame 10 in surfaces that are substantially perpendicular to the front surface 15. Two screws or bolts 150 are used to retain each handle 130, 135 in place on the frame 10 by means of holes 45, 50, 55, 60, only screws or bolts for handle 130 being visible in Figures 1 and 2. Screws or bolts 150 also retain handle 135 in place on the frame 10 and in relation to handle 130 as will be described in detail below.

[0030] In Figure 3, an exploded view of the lock body 105 is shown. The lock body 105 comprises a front and a back angled portions 155, 160 that surround a frame portion 165, an actuating portion 170, a locking plate 175, and spindle operators 180, 185 when assembled. Springs 190, 195 are arranged in an upper portion of the frame portion 165 for biasing the actuating portion 170 as will be described in more detail below. The actuating portion 170 retains the spindle operators 180, 185 in place within recesses 200, 205 formed within the frame portion 165 when the lock body 105 is assembled. Only recess 200 can clearly be seen in Figure 3. Each spindle operator 180, 185 has a projection 210, 215 that engages with the locking plate 175. Cut-outs 220, 225 formed on either side of the locking plate 175 provide the means for engagement of the projections 210, 215 with the locking plate 175 when the lock is to be operated as described in more detail below.

[0031] The actuating portion 170 includes two boss portions 230, 235 that protrude outwards from the actuating portion and away from the frame portion 165. The boss portions 230, 235 are hexagonally-shaped and engage correspondingly shaped hexagonal surface portions 240, 245 formed on respective ones of the spindle assemblies 140, 145 of the handles 130, 135. The hexagonal shape of the boss portions 230, 235 and the surface portion 240, 245 provides a positive location so that only desired elements of the spindle assemblies 140, 145 can rotate with respect to the actuating portion 170.

[0032] As shown, spindle assembly 140 comprises a hexagonally-shaped spindle housing 250 with a cylindrical aperture 255 having a substantially circular cross-section that is sized to receive a substantially square cross-sectioned spindle 260 attached to locking element

265 (which is a cylinder lock, in particular a Euro-cylinder) and to allow the spindle 260 to rotate freely within the aperture 255. A mounting plate 270 and disc element 275 are also provided. Screws 280 hold the disc element 275 in place within handle 130. The disc element 275 has a hexagonal aperture 285 formed in its centre. The hexagonally-shaped spindle housing 250 extends through the hexagonal aperture 285 so that the hexagonal surface portion 240 of spindle housing 250 engages with the hexagonally-shaped aperture 285 and the spindle 260 engages with the spindle operator 180.

[0033] Handle 130 has a body 290 within which the locking element 265 is located, the spindle 260 being moveable between a first position and a second position as shown in Figure 6. A cover 295 is provided for the body 290 as shown in Figure 3. Screws 280 extend through the disc element 275 and into the body 290 to retain the locking element 265 within the body 290 of the handle 130.

[0034] Spindle assembly 145 is identical to spindle assembly 140 and is rotatable by means of handle 135. It has a disc element and mounting plate assembly, shown generally as 305, that is similar to that disc element 275 and mounting plate 270, when assembled, of handle 130. Although not shown, screws 280 also extend through the disc element and into the body of the handle 135. Again, the screws 280 retain another locking element (not shown), that is identical to locking element 265, within the body of the handle 135.

[0035] As described above, each spindle 260, 300 engages with a correspondingly shaped square hole 310, 315 formed in each of the spindle operators 180, 185. Spindle housing 250 also includes a portion 320 that abuts the end of the locking member 265 to retain it within the body 290 of the handle 130. Similarly, handle 135 also includes a spindle housing (not shown) that includes a portion that abuts the end of the other locking element (not shown) within the body of handle 135.

[0036] The lock body 105 is assembled by locating the springs 190, 195 in respective recesses 325, 330 formed in the upper portion of the frame portion 165. Spring 190 is retained in position at its end remote from the frame portion 165 by means of a retainer plate 335 which forms the backing for the latch bolt 120 and associated security member 125. The retainer plate 335 has two portions 337, 339 formed on either side which engage with and is guided by engagement of the two portions 337, 339 with slots 157, 162 formed in respective ones of the front and back angled portions 155, 160. The security member 125 is passed through aperture 355 in the mounting plate 110 and fixed in position within the aperture 355 so that it is fixed relative to the mounting plate 110. The latch bolt 120 is inserted into aperture 360 formed in the security member 125 and connected to the retainer plate 335 by means of a washer 340 and screw 345.

[0037] The spindle operators 180, 185 are located in respective recesses 200, 205 before the actuating portion 170 is mounted on the frame portion 165. The locking

plate 175 is mounted with respect to the frame portion 165. A spring clip 365 is located to provide an upper and a lower stop position for the locking plate 175. The front and back angled portions 155, 160 are fixed together surrounding the frame portion 165 and the components assembled thereon as described above using screws 370.

[0038] As is shown more clearly in Figure 2, the assembled lock body 105 is inserted into recess 20 in the frame 10 with the mounting plate 110 against front surface 15 of the frame 10. The mounting plate 110 is retained in place against the front surface 15 by means of screws 115 that engage respective holes 25, 30. The handle 130 is assembled by attaching the spacer 275 to the mounting plate 270 using screws 280, mounting the spindle housing 250 on the spindle 260 of the locking element 265 and inserting the spindle housing 250 and locking element 265 into the body 290 of the handle 130. Screws 280 also extend through the mounting plate 270 and into the body 290 of the handle 130 (not shown). Cover 295 is placed over the end of the body 290 of the handle 130. Although not shown, handle 135 is assembled in a similar way to that of handle 130 with the screws 280.

[0039] The assembled handle 130 is inserted through aperture 40 in the frame 10 so that the spindle 260 engages with the square hole 310 formed in the spindle operator 180 retained in the lock body 105. Similarly, handle 135 is inserted through aperture 35 so that the spindle 300 engages with square hole 315 in the spindle operator 185. Screws or bolts 150 are used fix both handles 130, 135 to the frame 10 as they pass through holes 45, 50, 55, 60 formed in the frame 10 and into nut members 375, 380 formed on inner surface of mounting plate 305. Tightening of the screws or bolts 150 with respect to nut members 375, 380 holds the lock body 105 in position within the frame 10.

[0040] To prevent the lock from being demounted in its locked position, the first handle 130 has such a shape that in its locked or fixed position, it covers the head of at least one of the screws or bolts 150. When rotating the handle 130 to retract the latch bolt, the head of this screw or bolt 150 is uncovered so that the lock can be demounted.

[0041] The latch bolt 120 comprises a cylindrical body 385 having an angled end that forms a latch surface 390 as shown more clearly in Figure 2. The latch surface 390 engages with a keeper assembly 420 (Figures 7 and 14) that is mounted on a post 65 with respect to which the gate (not shown) which is to be closed. As the latch bolt 120 is biased to extend from the lock body 105 and the security member 125, as the gate to which the lock assembly 100 has been fitted is closed, the latch surface 390 engages the keeper assembly 420 and is pushed in a horizontal direction towards the lock body 105 against the biasing force of the spring 190. The latch bolt 120 returns to its extended position, due to the biasing force of the spring 190, when the latch bolt 120 is within a first

cavity 427 in the keeper assembly 420.

[0042] The security member 125 is shaped to have a substantially annular stop portion 395 that is connected to a cylindrical tubular portion 400. As described above, the latch bolt 120 extends through aperture 360 formed in the security member 125. The operation of the security member 125 will be described in more detail below.

[0043] Turning now to Figures 4 to 6, the handle 130 is shown assembled and connected to its mounting plate 270. In Figure 4, a perspective view is shown where the handle body 290 is in its normal position with respect to the mounting plate 270. Figure 5 illustrates the reverse perspective view and clearly shows the spindle 260, the spindle housing 250 and its hexagonal surface 240. Figure 6 is a similar perspective view to that of Figure 5 but illustrates rotational movement of a key 405 inserted into the locking element 265 and the relative movement of the spindle 260. As the key 405 is rotated as indicated by arrow 410, the spindle 260 rotates within the spindle housing 250 as indicated by arrow 415. It will be appreciated that Figures 4 to 6 are equally applicable to handle 135.

[0044] Figure 7 shows a closed position where the frame 10 of the gate (not shown) is aligned with a post 65. The post 65 has a keeper assembly 420 mounted on it that engages with the lock assembly 100. The keeper assembly 420 is also shown in isolation in Figure 14.

[0045] Referring to Figure 14, the keeper assembly 420 comprises a latching element 422 and a striker surface 425. As shown, the striker surface 425 is located adjacent the first cavity 427 in which the latch bolt 120 is retained when the gate is closed. The annular portion 395 of the security member 125 is retained within a second cavity 430 that is located above the first cavity 427. The second cavity 430 is formed by top wall portion 435, bottom wall portion 440, side wall portion 442, surface 444 adjacent the first cavity 427 and front wall portion 445. A lip 447 is formed by the front wall portion 445.

[0046] Additionally, a hole 429 is formed in the first cavity 427 through which a bolt (not shown) can be inserted to fix the keeper assembly 420 to the post 65. The front wall portion 445 is shaped to provide a recess 450 into which the tubular portion 400 of the security member 125 can be located.

[0047] As the frame 10 is moved to the position shown in Figure 7, the latch surface 390 of the latch bolt 120 engages the striker surface 425 and the latch bolt 120 is pushed towards the lock body 105 against the biasing force of the spring 190. As the latch bolt 120 is pushed towards the lock body 105, the slots 157, 162 formed in the front and back angled portions 155, 160 guide the movement of the retainer plate 335 relative to the lock body 105. Once the latch surface 390 clears the striker surface 425, the latch bolt 120 is extended by the spring 190 so that it is located within the latching element 422, and in particular, within the first cavity 427. At the same time as the latch surface 390 moves over the striker surface 425, the tubular portion 400 of the security member

125 moves into recess 450 with the annular stop portion 395 inside the second cavity 430. Release of the latch bolt 120 from the striker surface 425 coincides the latch bolt 120 being located within the first cavity 427 with the annular stop portion 395 of the security member 125 being retained within the cavity 430 against the side wall portion 442 that extends between the top and bottom wall portions 435, 440. The tubular portion 400 of the security member 125 remains within the recess 450. In this position, the gate of which the frame 10 forms a part is closed with respect to the post 65. A key, for example key 405 shown in Figures 4 to 6, can then be turned to lock the handle 130 with the latch bolt 120 in its extended position within the first cavity 427 of the keeper assembly 420. This locking operation is described in more detail below with reference to Figures 8 to 13.

[0048] The recess 450 is sized to closely accommodate the tubular portion 400 of the security member 125 and the front wall portion 445 in which the recess 450 is formed is spaced from the striker surface 435 to prevent the annular stop portion 395 from being moved within the cavity 430 when the handles 130, 135 are in the locked position. As described above, the annular stop portion 395 abuts the side wall of the keeper assembly 442 that extends between the top and bottom wall portions 435, 440. In addition, the lip portion 447 formed by the front wall portion 445 is engaged by, or is situated on a small distance from, a surface 397 of the annular stop portion 395. The first and second cavities 427, 430 are sized to closely accommodate the latch bolt 120 and the security member 125 and the security member 125 also encloses the latch bolt 120 and prevents lateral access thereto so that it is not possible to retract the latch bolt 120 when the handles 130, 135 are locked.

[0049] Figure 8 is a part cut-away view of the lock assembly in accordance with the present invention when the gate to which it is attached is in an open or a closed position. The latch bolt 120 extends through the security member 125 and into the lock body 105 and is connected to retainer plate 335. Referring also to Figure 3, the spring 190 is held in position between the recess 325 in the frame portion 165 and the retainer plate 335. The retainer plate 335 abuts an engagement surface 455 of the actuating portion 170. Spring 195 is held in position between recess 330 in the frame portion 165 and an upper end 460 of the actuating portion 170. The locking plate 175 has a locking portion 465 that is positioned so as not to engage with locking slot 470 of the actuating portion 170.

[0050] In Figure 9, rotation of the handle 130 (Figures 1 to 7) in a clockwise direction causes the actuating portion 170 to rotate in a clockwise direction as shown due to the engagement of the hexagonal surface 240 of the spindle housing 250 with the hexagonal boss 230 of the actuating portion 170. In this position, upper end 460 of actuating portion 170 compresses spring 195 and engagement surface 455 acting through retainer plate 335 compresses spring 190 as shown. A slot 480 is formed in the actuating portion 170 for providing clearance for

one of the screws or bolts 150 extending through the assembled lock body 105 and holding the handles 130, 135 and the lock assembly 100 in place. The locking portion 465 of locking plate 175 is still not engaged with locking slot 470 of actuating portion 170.

[0051] Figure 10 is similar to Figure 8 but with a portion of the actuating portion 170 removed so that the spindle operator 180 and its associated projection 210 are visible and with the spindle 260 in a rotated position. In this position, the key has been rotated and with it the spindle 260 and the spindle operator 180.

[0052] Figure 11 illustrates further rotation of the key that moves the projection 210 of the spindle operator 180 to a position where it is engaged with cut-out 220 in the locking plate 175 (Figure 3). This engagement with the cut-out 220 in the locking plate 175 and further rotation of the key causes the locking plate 175 to move upwards in the direction of arrow 490 so that the locking portion 465 of the locking plate 175 engages with the locking slot 470 of the actuating portion 170. This is shown in Figure 12 and more clearly in the inset thereof.

[0053] In Figure 13, a perspective view of the lock body 105 is shown. In this Figure, the key has been rotated further within the locking element 265 and the projection 210 of spindle operator 180 is no longer engaged with the cut-out 220 in the locking plate 175. The locking portion 465 of the locking plate 175 remains engaged with the locking slot 470 of the actuating portion 170.

[0054] Regardless of the position of the locking portion 465 of the locking plate 175 with respect to the locking slot 470 of the actuating portion 170, the latch bolt 120 is always free to move in the direction indicated by arrow 475 (Figure 8) against the biasing force of the spring 190. However, such movement is only possible by rotation of one of the handles 130, 135.

[0055] In the positions shown in Figures 12 and 13, the handles 130, 135 are locked in a substantially horizontal position as shown in the Figures and cannot move relative to the lock body 105.

[0056] To unlock, the key 405 is rotated so that the projection 210 of the spindle operator 180 re-engages with cut-out 220. Further rotation of the key 405 pushes the locking plate 175 in the opposite direction to arrow 490 so that locking portion 465 of locking plate 175 is disengaged from locking slot 470 of actuating portion 170. When fully unlocked, the handles 130, 135 are free for operation and the gate to which the lock assembly 100 is attached can be opened by operation of handle 130 or handle 135 to retract the latch bolt 120 from the further cavity formed in the keeper assembly 430.

[0057] Similarly, if the key is operated in a locking element associated with handle 135 to lock and unlock the handles 130, 135, the projection 215 of the spindle operator 185 will engage and re-engage respectively with cut-out 225 formed in the locking plate 175 to move the locking portion 465 of locking plate 175 into and out of engagement with the locking slot 470 formed in the actuating portion 170.

[0058] Figures 15 to 19 illustrate a hinge mechanism 500 that can be used with the lock assembly 100 and keeper assembly 420 of the present invention. The hinge mechanism 500 comprises a hinge housing 510 that includes a hinge post 520 that is mounted to a post 70 on which the gate or other closure member is to be mounted. As shown more clearly in Figures 16 and 17, the hinge housing 510 includes an externally threaded bolt portion 530 that extends through a hole (not shown) formed in the post 70. A nut member 535 engages the free end of the threaded bolt portion 530 to secure the hinge mechanism 500 to the post 70.

[0059] Within the hinge housing 510, a rack element 540 is provided on which the hinge post 520 is located. As shown, the position of the hinge post 520 can be adjusted along the length of the rack element 540 in the direction indicated by arrow 550. Once in the correct position, the hinge post 520 can be locked in position by means of a screw 525 that clamps a plate 560 onto the rack element 540 and engages with the hinge post 520 itself. This adjustment of the hinge post 520 with respect to the post 70 provides gate adjustment so that the positioning of the lock assembly 100 and the keeper assembly 420 can be optimised so that any gaps surrounding the security member 125 when in the cavity 430 and the latch bolt 120 when in the further cavity can be minimised to prevent access to the latch bolt 120 when the handles 130, 135 are locked.

[0060] The security member 125 of the present invention has been described as having an annular stop portion. It will be appreciated that the security member may have any other suitable shape that allows a portion thereof to be located under lip 447 formed by the front wall portion 445 and provided that shape can be reliably aligned when assembled on the mounting plate 110.

[0061] Euro cylinder locks may be used as the locking element 265. For the particular application, it may be necessary to modify the locks. If two locks are used, one in each handle, it is preferred that a single key can operate both locks and also locks of other doors such as a front door of the house or a garage door or gate.

[0062] Although the present invention has been described with reference to a gate, it will be appreciated that it can be used on any other hinged closure that has a frame that is capable of accommodating the lock body 105, for example, a door. It will also be readily understood that the post 65 could be another hinged closure, for example, for double gates or doors.

[0063] It will be appreciated that the terms "bolts" and "screws" are interchangeable and other fastening means may be provided for mounting the mounting plate 110 to the frame 10 and for securing the handles 130, 135 to the frame 10.

Claims

1. A lock (100, 420) for latching and locking a first clo-

sure element to a second closure element, at least one of the closure elements having a hollow frame member (10), the lock (100, 420) comprising:-

a first assembly (100) mountable on the hollow frame member (10) of one of the closure elements, the first assembly (100) including:-

a lock body (105) mountable within the hollow frame member (10);
a latch bolt (120) extending from the lock body (105) and being biased in an extended position and moveable to a retracted position, the retracted position being at least partially within the lock body (105);
a latch bolt guiding element (125) fixed to the lock body (105) and including a latch bolt guiding portion (400) and a latch bolt stop portion (395), the latch bolt (120) extending through both the latch bolt guiding portion (400) and the latch bolt stop portion (395); and

a second assembly (420) mountable on the other of the closure elements, the second assembly (420) including:-

a latching element (422) having a first cavity (427) formed therein for receiving at least the latch bolt (120), which latching element (422) includes a second cavity (430) for receiving the latch bolt stop portion (395), the second cavity (430) being defined by at least a wall portion (442, 445) that limits the movement of the latch bolt stop portion (395) within the latching element (422) in two orthogonal directions by contact of the latch bolt guiding element (125) and the wall portion (442, 445); and
a striker surface (425) for retracting the latch bolt (120) prior to it being retained within the first cavity (427) of the latching element (422);

characterised in that the lock further comprises:-

a first handle (130);
a second handle (135); and
a first locking element (265) associated with the first handle (130) and operable to lock both the first and second handles (130, 135) in a fixed position.

2. A lock according to claim 1, wherein the latching element (422) further includes a latching element guiding portion (450) that forms a part of the wall portion (445).

3. A lock according to claim 2, wherein the latching element guiding portion (450) comprises a recess for receiving the latch bolt guiding portion (400), the recess being spaced from the striker surface (425).

4. A lock according to claim 3, wherein the striker surface (425) and the recess (450) of the latching element (422) are spaced so as to accommodate closely the latch bolt stop portion (395) as the latch bolt (120) moves over the striker surface (425) and into the first cavity (427).

5. A lock according to claim 3, wherein the recess (450) is dimensioned to accommodate closely the latch bolt guiding portion (400).

6. A lock according to any one of the previous claims, further comprising a second locking element associated with the second handle (135), the second locking element being operable to lock both the first and second handles (130, 135) in the fixed position.

7. A lock according to claim 6, wherein the first and second handles (130, 135) are coupled to one another by an actuating portion (170) and the first locking element (265) operates to move a locking plate (175) into engagement with a locking slot (470) formed in the actuating portion (170) in which each of the first and second handles (130, 135) are mounted to lock both handles (130, 135) in the fixed position.

8. A lock according to any one of the previous claims, wherein the lock body (105) is mountable within the hollow frame member (10) by means of at least one bolt (150) screwed through a mounting plate (270) wherein the first handle (130) is mounted, the first handle (130) covering said bolt (150) when being locked in its fixed position and uncovering said bolt (150) when operated to retract the latch bolt (120).

9. A lock according to claim 8, wherein said bolt (150) is screwed in a further mounting plate (305) wherein the second handle (135) is mounted.

10. A lock according to any one of the preceding claims, further comprising an adjustable hinge member (500) associated with one of the first and second closure elements, the adjustable hinge member being adjusted to minimise the space between the first assembly (100) and the second assembly (420).

11. A lock according to any one of the preceding claims, wherein at least one of the first and second closure elements comprises a hinged closure element.

12. A lock according to claim 11, wherein the hinged closure element

comprises a gate.

13. A lock according to any one of the preceding claims, wherein the latch bolt (120) moves from its extended to its retracted position in a first direction and when closing the first and second closure elements either said first or said second closure element moves in a second direction, and wherein said two orthogonal directions correspond to said first and second directions. 5 10
14. A lock according to any one of the preceding claims, wherein the only contact between the first and second closure elements in their closed position is the contact between the latch bolt (120) and the latching element (422) and the contact between the latch bolt guiding element (125) and said wall portion (442, 445) of the second cavity (430). 15 20

Patentansprüche

1. Ein Schloss (100, 420) zum Einklinken und Verriegeln eines ersten Schließelements an ein zweites Schließelement, wobei zumindest eines der Schließelemente ein hohles Rahmenglied (10) hat, wobei das Schloss (100, 420) Folgendes umfasst:- 25 30
- eine erste Anordnung (100), montierbar auf dem hohlen Rahmenglied (10) eines der Schließelemente, wobei die erste Anordnung (100) Folgendes umfasst:- 35
- einen Schlossaufbau (105), montierbar im hohlen Rahmenelement (10);
einen Fallriegel (120), der sich vom Schlossaufbau (105) ausdehnt und in einer ausgefahrenen Position vorgespannt ist und in eine zurückgezogene Position beweglich ist, wobei sich die zurückgezogene Position zumindest teilweise im Schlossaufbau (105) befindet; 40
ein Leitelement (125) des Fallriegels, befestigt am Schlossaufbau (105) und einen Leitabschnitt (400) des Fallriegels und einen Stoppabschnitt (395) des Fallriegels umfassend, wobei sich der Fallriegel (120) sowohl durch den Leitabschnitt (400) als auch den Stoppabschnitt (395) des Fallriegels ausdehnt; und 45 50
- eine zweite Anordnung (420), montierbar am anderen Schließelement, wobei die zweite Anordnung (420) Folgendes umfasst:- 55
- ein Einklinkelement (422) mit einem ersten Hohlraum (427), darin gebildet, um zumin-

dest den Fallriegel (120) aufzunehmen, wobei das Einklinkelement (422) einen zweiten Hohlraum (430) zum Aufnehmen des Stoppabschnitts (395) des Fallriegels umfasst, wobei der zweite Hohlraum (430) durch zumindest einen Wandabschnitt (442, 445) definiert wird, der die Bewegung des Stoppabschnitts (395) des Fallriegels im Einklinkelement (422) in zwei orthogonale Richtungen durch Kontakt des Leitelements (125) des Fallriegels und des Wandabschnitts (442, 445) begrenzt; und eine Schließteiffläche (425) zum Zurückziehen des Fallriegels (120), bevor er im ersten Hohlraum (427) des Einklinkelements (422) aufgenommen wird;

dadurch gekennzeichnet, dass das Schloss ferner umfasst:

einen ersten Handgriff (130);
einen zweiten Handgriff (130); und
ein erstes Verriegelungselement (265) in Verbindung mit dem ersten Handgriff (130) und betätigbar, um sowohl den ersten als auch den zweiten Handgriff (130, 135) in einer fixierten Position zu verriegeln.

2. Ein Schloss nach Anspruch 1, wobei das Einklinkelement (422) ferner einen Leitabschnitt (450) des Einklinkelements umfasst, das einen Teil des Wandabschnitts (445) formt.
3. Ein Schloss nach Anspruch 2, wobei der Leitabschnitt (450) des Einklinkelements eine Aussparung zum Aufnehmen des Leitabschnitts (400) des Fallriegels umfasst, wobei sich die Aussparung in einem Abstand von der Schließteiffläche (425) befindet.
4. Ein Schloss nach Anspruch 3, wobei die Schließteiffläche (425) und die Aussparung (450) des Einklinkelements (422) in einem solchen Abstand angeordnet sind, dass der Stoppabschnitt (395) des Fallriegels genau aufgenommen wird, wenn sich der Fallriegel (120) über die Schließteiffläche (425) und in den ersten Hohlraum (427) bewegt.
5. Ein Schloss nach Anspruch 3, wobei die Aussparung (450) so bemessen ist, dass der Leitabschnitt (400) des Fallriegels genau aufgenommen wird.
6. Ein Schloss nach irgendeinem der vorigen Ansprüche, das ferner ein zweites Verriegelungselement in Verbindung mit dem zweiten Handgriff (135) umfasst, wobei das zweite Verriegelungselement betätigbar ist, um sowohl den ersten als auch den zweiten Handgriff (130, 135) in der fixierten Position zu verriegeln.

7. Ein Schloss nach Anspruch 6, wobei der erste und der zweite Handgriff (130, 135) durch einen Betätigungsabschnitt (170) miteinander verbunden sind, und das erste Verriegelungselement (265) betätigt wird, um eine Verriegelungsplatte (175) in einen Verriegelungsschlitz (470) im Betätigungsabschnitt (170) eingreifen zu lassen, in dem der erste und der zweite Handgriff (130, 135) montiert sind, um beide Handgriffe (130, 135) in der fixierten Position zu verriegeln. 5
8. Ein Schloss nach irgendeinem der vorigen Ansprüche, wobei der Schlossaufbau (105) im hohlen Rahmenglied (10) mittels zumindest eines Bolzen (150) montierbar ist, welcher durch eine Montageplatte (270) geschraubt wird, in der der erste Handgriff (130) montiert ist, wobei der erste Handgriff (130) den erwähnten Bolzen (150) bedeckt, wenn er in seiner fixierten Position verriegelt wird, und den erwähnten Bolzen (150) freigibt, wenn er betätigt wird, um den Fallriegel (120) zurückzuziehen. 10 15 20
9. Ein Schloss nach Anspruch 8, wobei der erwähnte Bolzen (150) in eine weitere Montageplatte (305) geschraubt wird, in der der zweite Handgriff (135) montiert ist. 25
10. Ein Schloss nach irgendeinem der vorigen Ansprüche, welches ferner ein verstellbares Scharnierglied (500) umfasst, welches mit dem ersten oder zweiten Schließelement verbunden ist, wobei das verstellbare Scharnierglied eingestellt ist, um den Raum zwischen der ersten Anordnung (100) und der zweiten Anordnung (420) zu minimieren. 30 35
11. Ein Schloss nach irgendeinem der vorigen Ansprüche, wobei zumindest das erste oder das zweite Schließelement ein Scharnierschließelement umfasst. 40
12. Ein Schloss nach Anspruch 11, wobei das Scharnierschließelement ein Tor umfasst. 45
13. Ein Schloss nach irgendeinem der vorigen Ansprüche, wobei sich der Fallriegel (120) von seiner ausgefahrenen in seine zurückgezogene Position in einer ersten Richtung bewegt, und wobei sich, wenn das erste und zweite Schließelement geschlossen werden, entweder das erwähnte erste oder das erwähnte zweite Schließelement in eine zweite Richtung bewegt, und wobei die erwähnten zwei orthogonalen Richtungen der erwähnten ersten und zweiten Richtung entsprechen. 50
14. Ein Schloss nach irgendeinem der vorigen Ansprüche, wobei der einzige Kontakt zwischen dem ersten und dem zweiten Schließelement in ihrer geschlossenen Position der Kontakt zwischen dem Fallriegel

(120) und dem Einklinkelement (422) und der Kontakt zwischen dem Leitelement (125) des Fallriegels und dem erwähnten Wandabschnitt (442, 445) des zweiten Hohlraums (430) ist.

Revendications

1. Serrure (100, 420) pour enclencher et verrouiller un premier élément de fermeture à un deuxième élément de fermeture, au moins un des éléments de fermeture ayant un membre de cadre creux (10), la serrure (100, 420) comprenant:

un premier ensemble (100) pouvant être monté sur le membre de cadre creux (10) d'un des éléments de fermeture, le premier ensemble (100) comprenant :

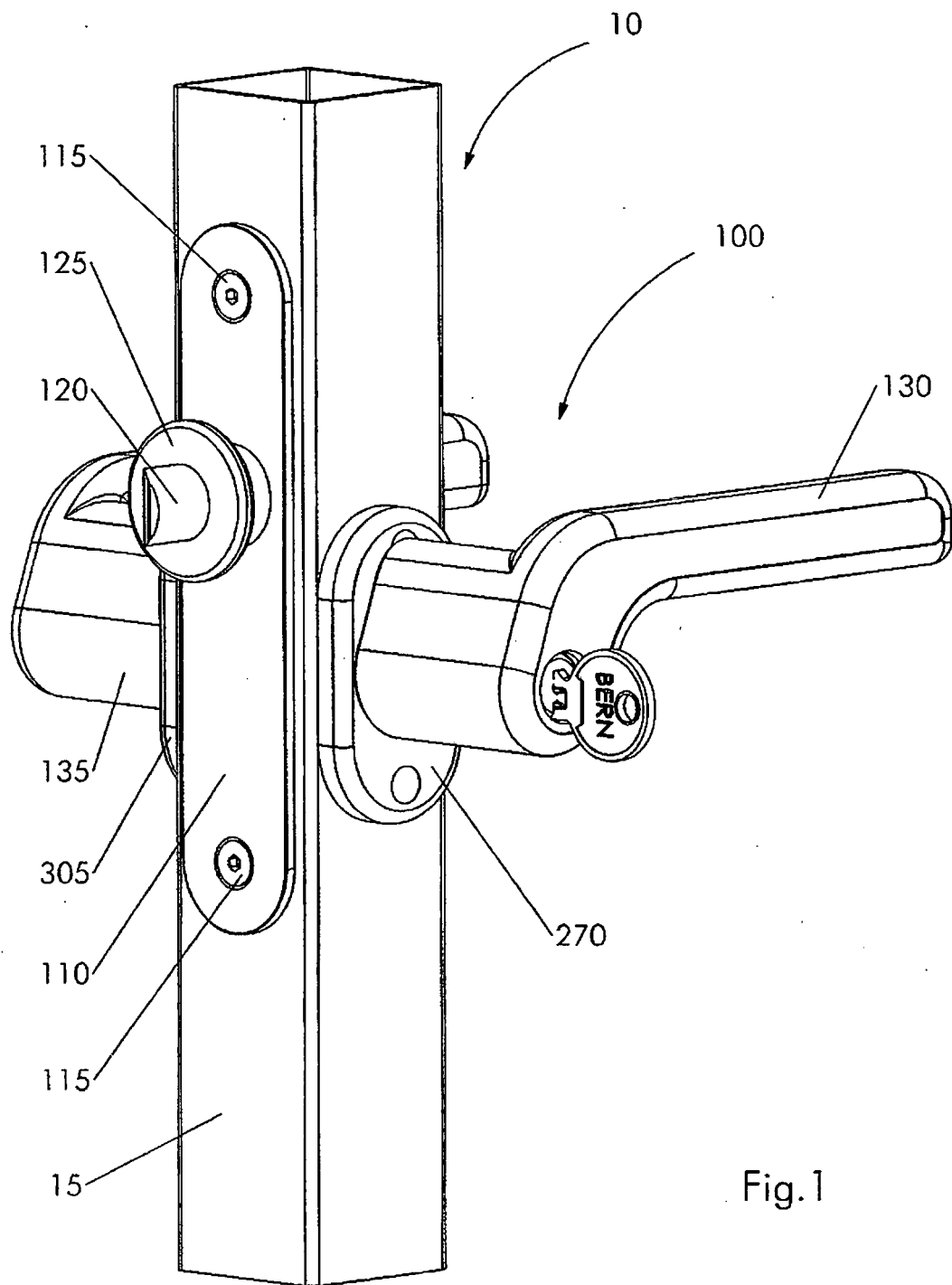
un corps (105) de serrure pouvant être monté dans le membre de cadre creux (10) ;
un pêne demi-tour (120) s'étendant à partir du corps (105) de serrure et étant poussé dans une position étendue et pouvant être mu dans une position rétractée, la position rétractée étant au moins en partie à l'intérieur du corps (105) de serrure ;
un élément de guidage (125) de pêne demi-tour fixé au corps (105) de serrure et comprenant une partie de guidage (400) de pêne demi-tour et une partie d'arrêt (395) de pêne demi-tour, le pêne demi-tour (120) s'étendant à travers la partie de guidage (400) de pêne demi-tour et la partie d'arrêt (395) de pêne demi-tour ; et

un deuxième ensemble (420) pouvant être monté sur l'autre des éléments de fermeture, le deuxième ensemble (420) comprenant :

un élément d'enclenchement (422) dans lequel est formée une première cavité (427) destinée à recevoir le pêne demi-tour (120), lequel élément d'enclenchement (422) comprend une deuxième cavité (430) destinée à recevoir la partie d'arrêt (395) de pêne demi-tour, la deuxième cavité étant définie par au moins une portion de paroi (442, 445) qui limite le mouvement de la partie d'arrêt (395) de pêne demi-tour à l'intérieur de l'élément d'enclenchement (422) dans deux directions orthogonales par contact de l'élément de guidage (125) de pêne demi-tour et de la portion de paroi (442, 445) ; et une surface de gâche (425) pour rétracter le pêne demi-tour (120) avant qu'il ne soit retenu à l'intérieur de la première cavité (427) de l'élément d'enclenchement (422) ;

caractérisé en ce que la serrure comprend en outre :

- une première poignée (130) ;
 - une deuxième poignée (135) ; et
 - un premier élément de verrouillage (265) associé à la première poignée (130) et pouvant être actionné pour verrouiller les première et deuxième poignées (130, 135) dans une position fixe.
- 2. Serrure selon la revendication 1, dans laquelle l'élément d'enclenchement (422) comprend en outre une partie de guidage (450) d'élément d'enclenchement qui forme une partie de la portion de paroi (445).
- 3. Serrure selon la revendication 2, dans laquelle la partie de guidage (450) d'élément d'enclenchement comprend un évidement destiné à recevoir la partie de guidage (400) de pêne demi-tour, l'évidement étant espacé de la surface de gâche (425).
- 4. Serrure selon la revendication 3, dans laquelle la surface de gâche (425) et l'évidement (450) de l'élément d'enclenchement (422) sont espacés de manière à loger étroitement la partie d'arrêt (395) de pêne demi-tour quand le pêne demi-tour (120) se meut sur la surface de gâche (425) et entre dans la cavité (427).
- 5. Serrure selon la revendication 3, dans laquelle l'évidement (450) est dimensionné pour loger étroitement la partie de guidage (400) de pêne demi-tour.
- 6. Serrure selon l'une quelconque des revendications précédentes, comprenant en outre un deuxième élément de verrouillage associé à la deuxième poignée (135), le deuxième élément de verrouillage pouvant être actionné pour verrouiller les première et deuxième poignées (130, 135) dans la position fixe.
- 7. Serrure selon la revendication 6, dans laquelle les première et deuxième poignées (130, 135) sont accouplées l'une à l'autre par une partie d'actionnement (170) et le premier élément de verrouillage (265) agit pour mettre en prise une plaque de verrouillage (175) avec une fente de verrouillage (470) formée dans la partie d'actionnement (170) dans laquelle chacune des première et deuxième poignées (130, 135) sont montées pour verrouiller les deux poignées (130, 135) dans la position fixe.
- 8. Serrure selon l'une quelconque des revendications précédentes, dans laquelle le corps (105) de serrure peut être monté à l'intérieur du membre de cadre creux (10) au moyen d'au moins un boulon (150) vissé à travers une plaque de montage (270) dans laquelle la première poignée (130) est montée, la première poignée (130) couvrant ledit boulon (150) quand elle est verrouillée dans sa position fixe et découvrant ledit boulon (150) quand elle est actionnée pour rétracter le pêne demi-tour (120).
- 9. Serrure selon la revendication 8, dans laquelle ledit boulon (150) est vissé dans une autre plaque de montage (305) dans laquelle la deuxième poignée (135) est montée.
- 10. Serrure selon l'une quelconque des revendications précédentes, comprenant en outre un membre de charnière ajustable (500) associé à l'un des premier et deuxième éléments de fermeture, le membre de charnière ajustable étant ajusté pour réduire au minimum l'espace entre le premier ensemble (100) et le deuxième ensemble (420).
- 11. Serrure selon l'une quelconque des revendications précédentes, dans laquelle au moins un des premier et deuxième éléments de fermeture comprend un élément de fermeture à charnière.
- 12. Serrure selon la revendication 11, dans laquelle l'élément de fermeture à charnière comprend une barrière.
- 13. Serrure selon l'une quelconque des revendications précédentes, dans laquelle le pêne demi-tour (120) se meut de sa position étendue dans sa position rétractée dans une première direction et quand on ferme les premier et deuxième éléments de fermeture soit ledit premier soit ledit deuxième élément de fermeture se meut dans une deuxième direction, et dans laquelle lesdites deux directions orthogonales correspondent auxdites première et deuxième directions.
- 14. Serrure selon l'une quelconque des revendications précédentes, dans laquelle le seul contact entre les premier et deuxième éléments de fermeture dans leur position fermée est le contact entre le pêne demi-tour (120) et l'élément d'enclenchement (422) et le contact entre l'élément de guidage (125) de pêne demi-tour et ladite portion de paroi (442, 445) de la deuxième cavité (430).



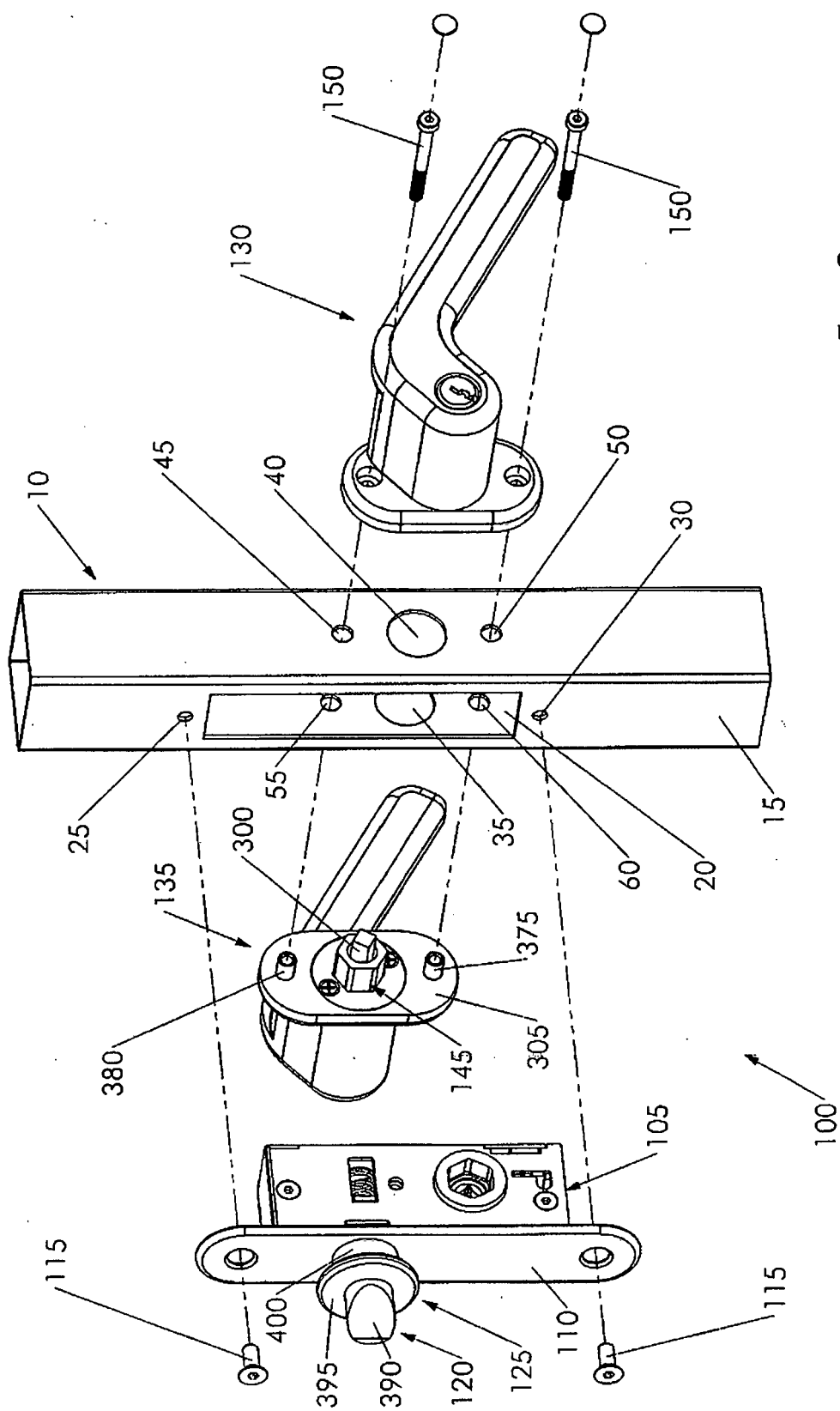


Fig. 2

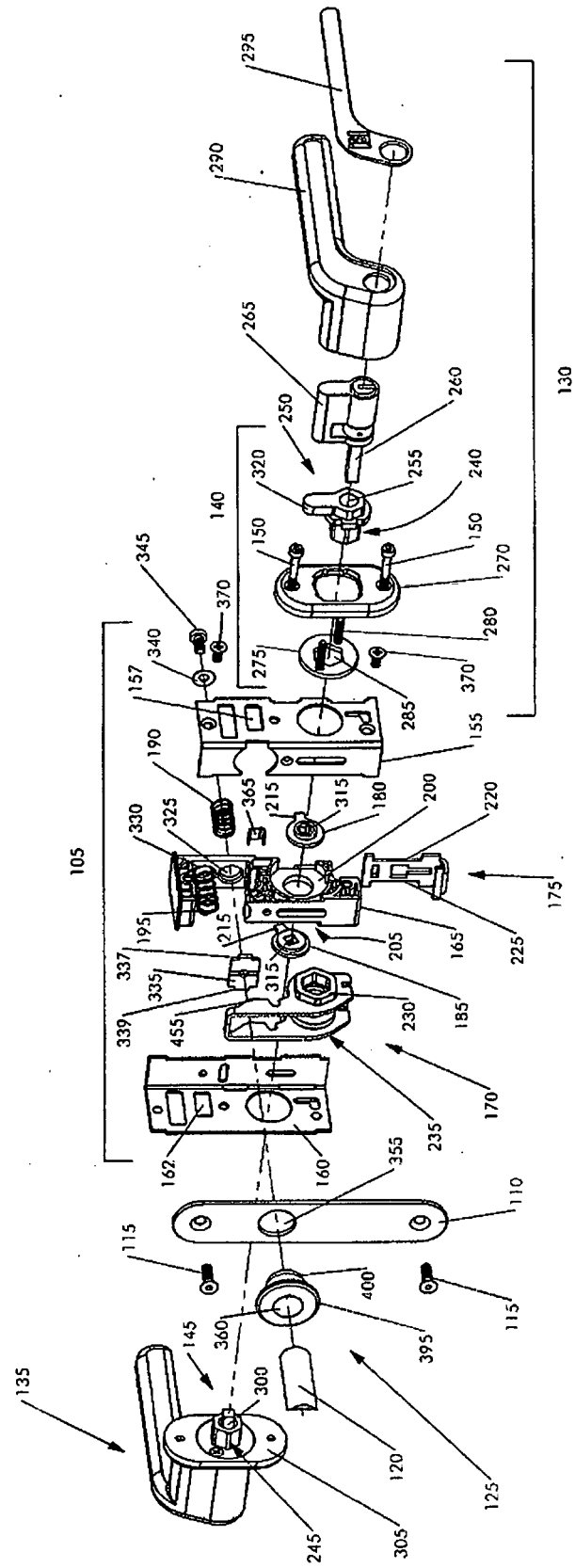


Fig. 3

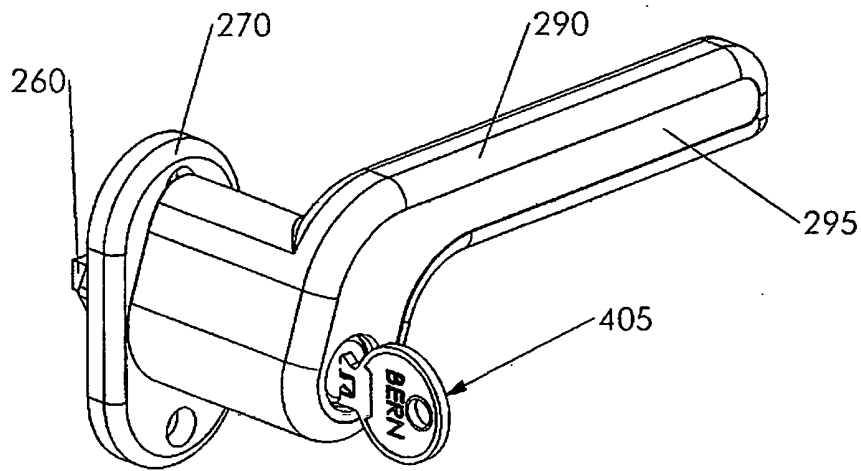


Fig. 4

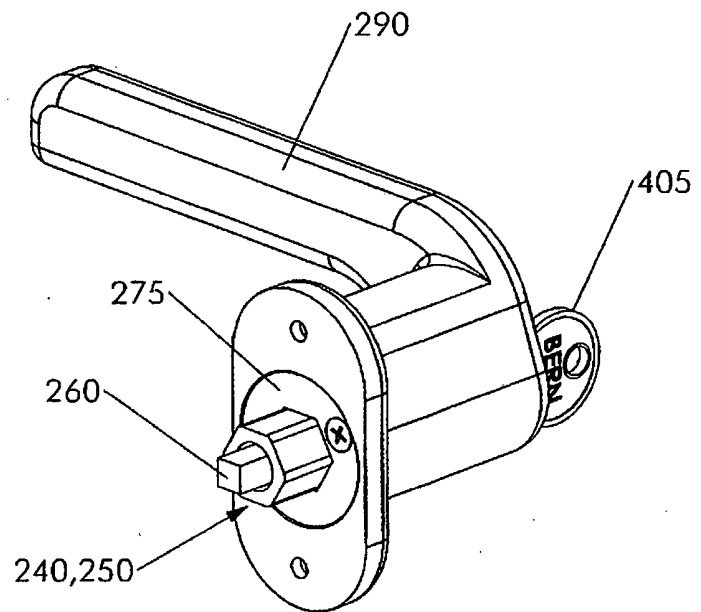


Fig. 5

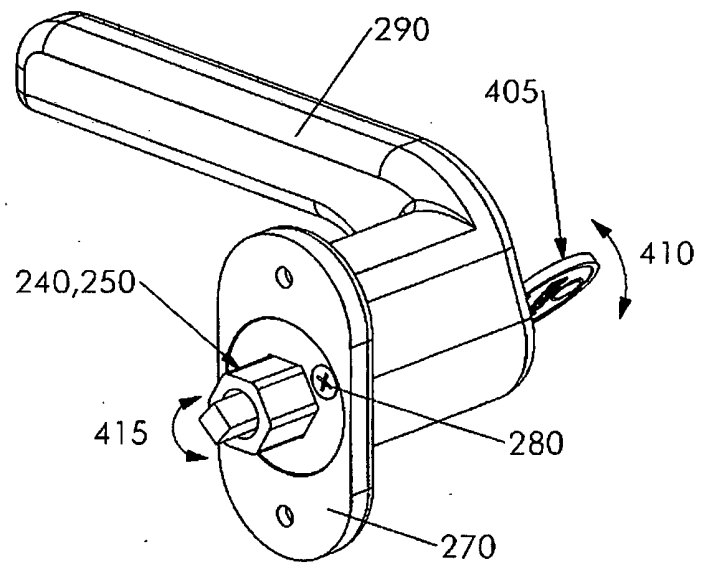


Fig. 6

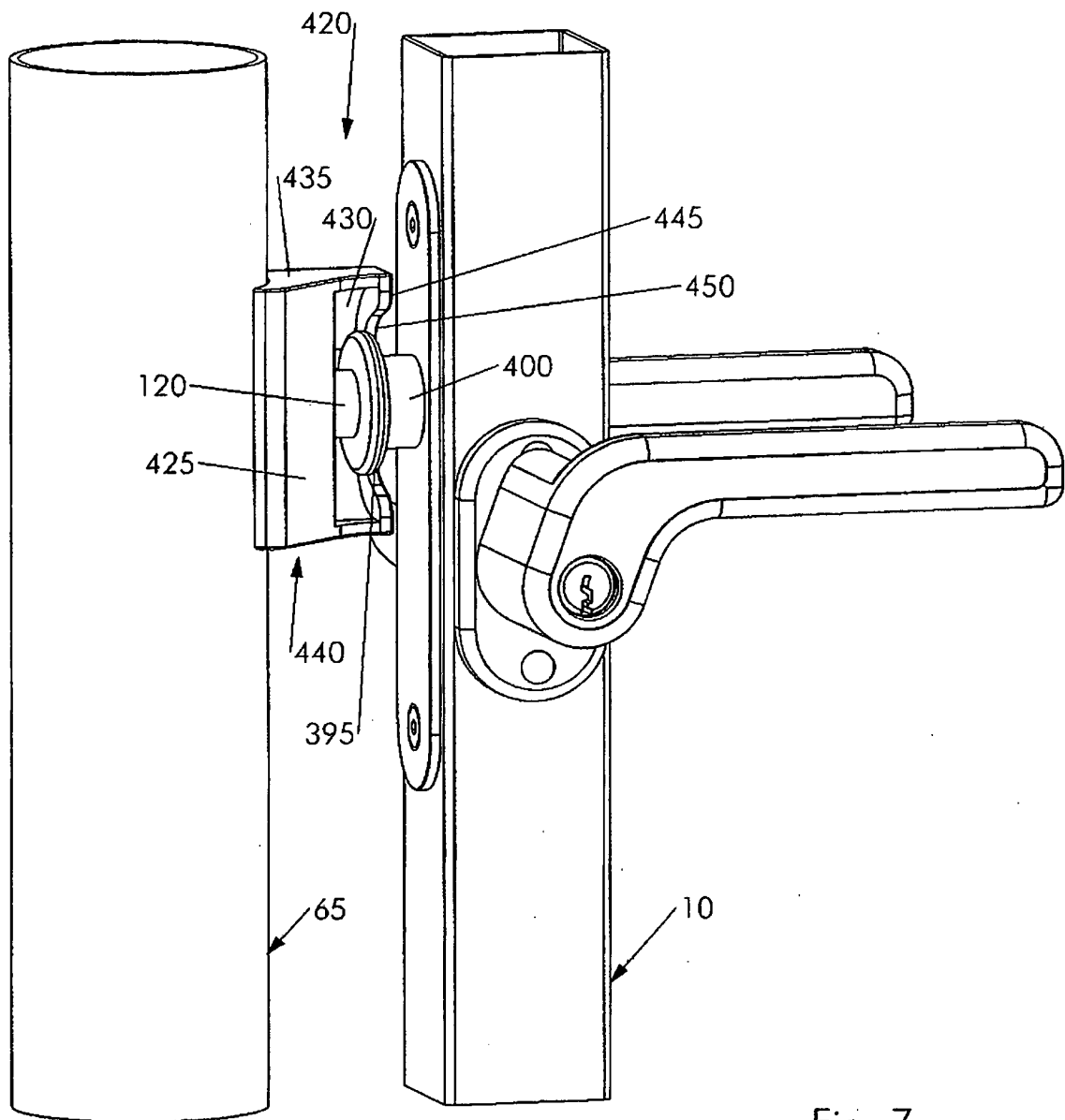
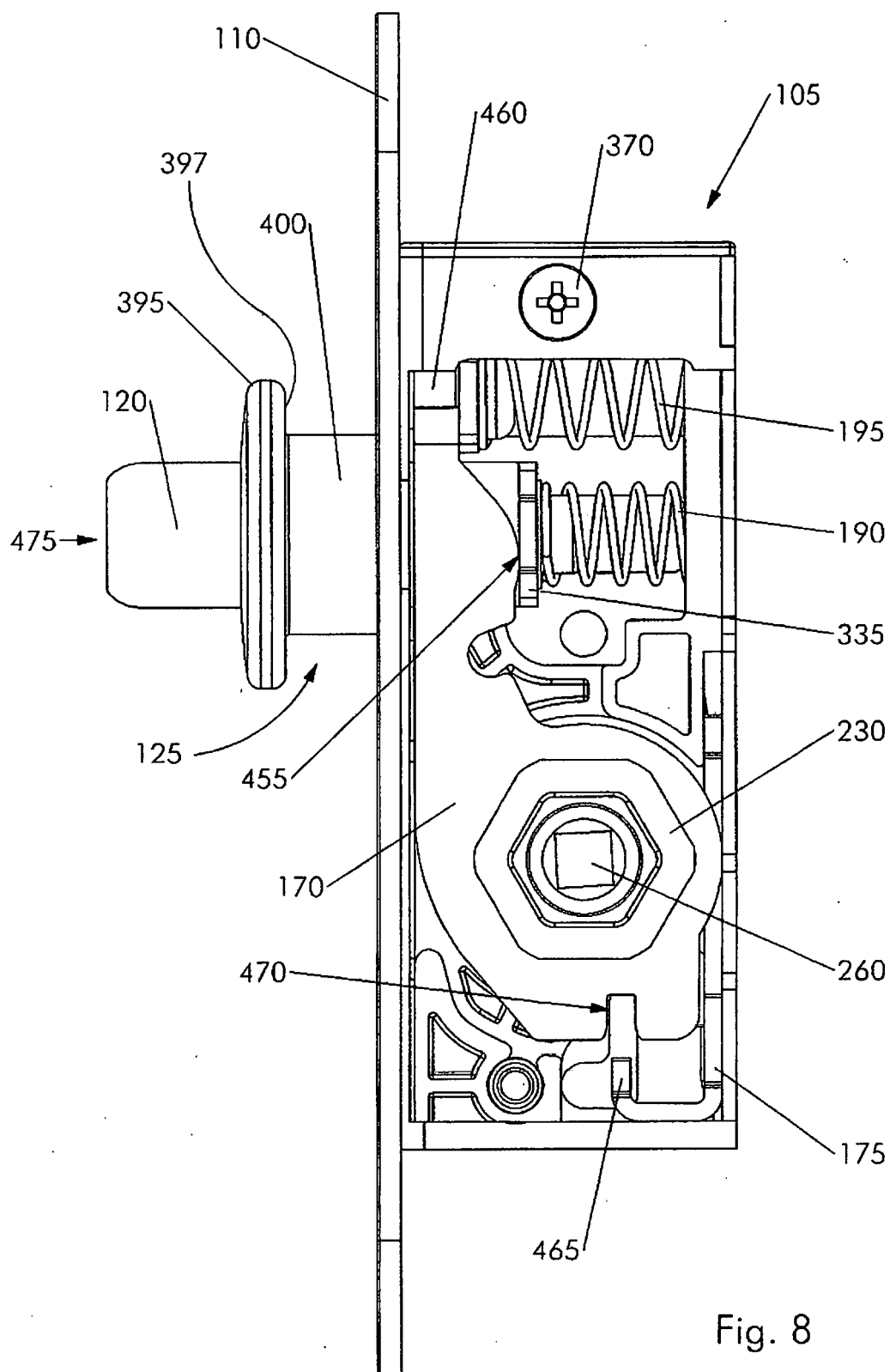
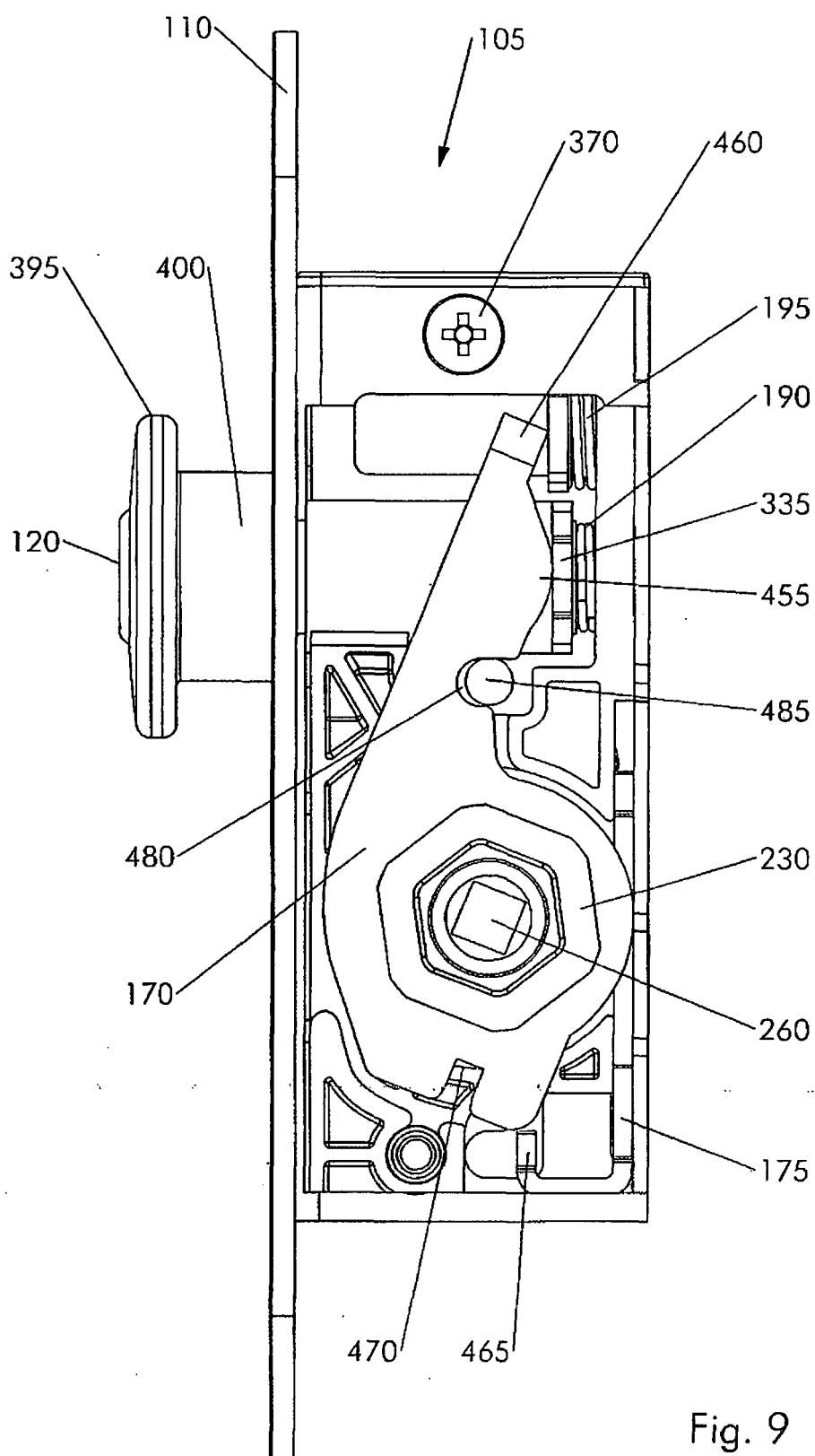


Fig. 7





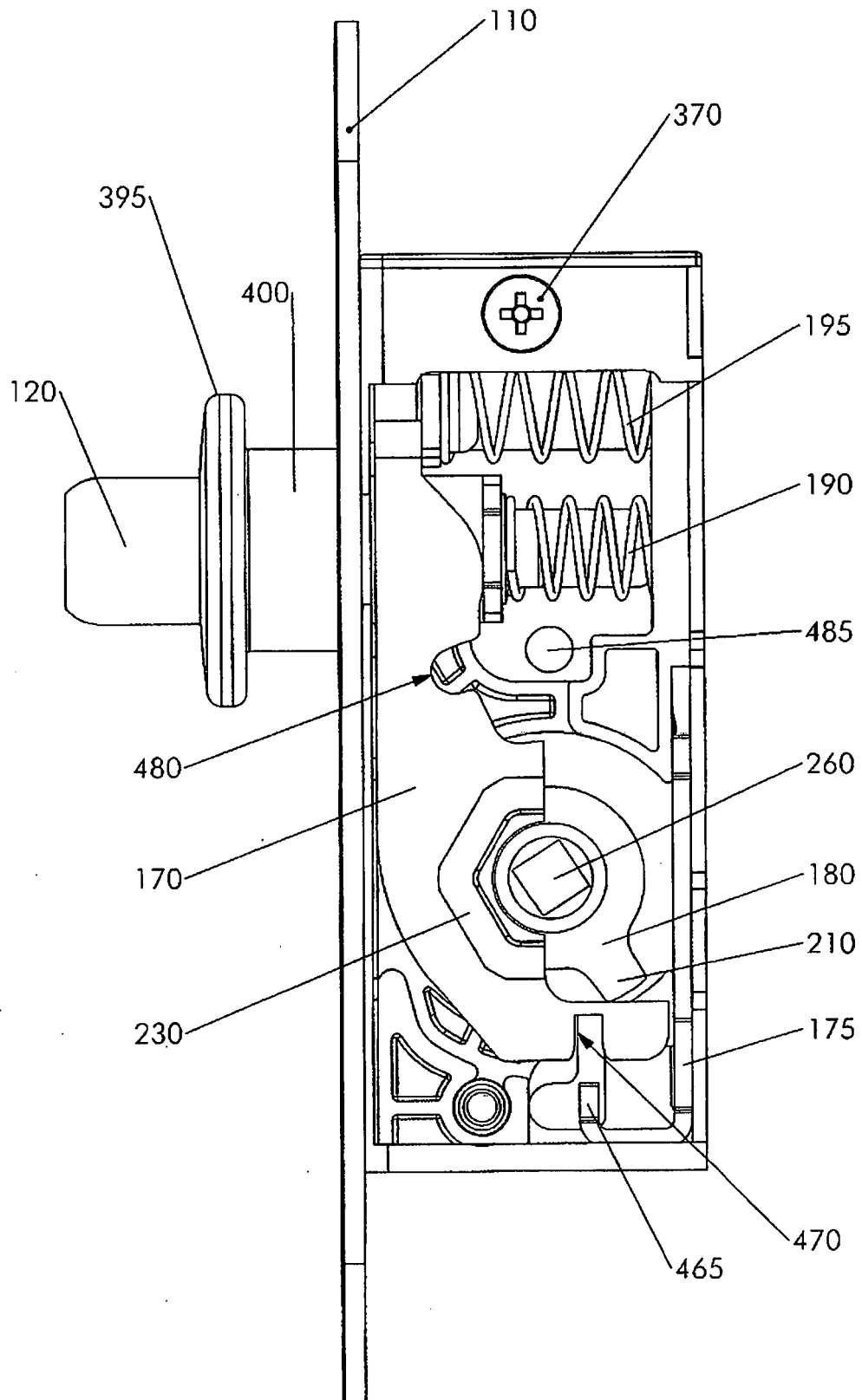
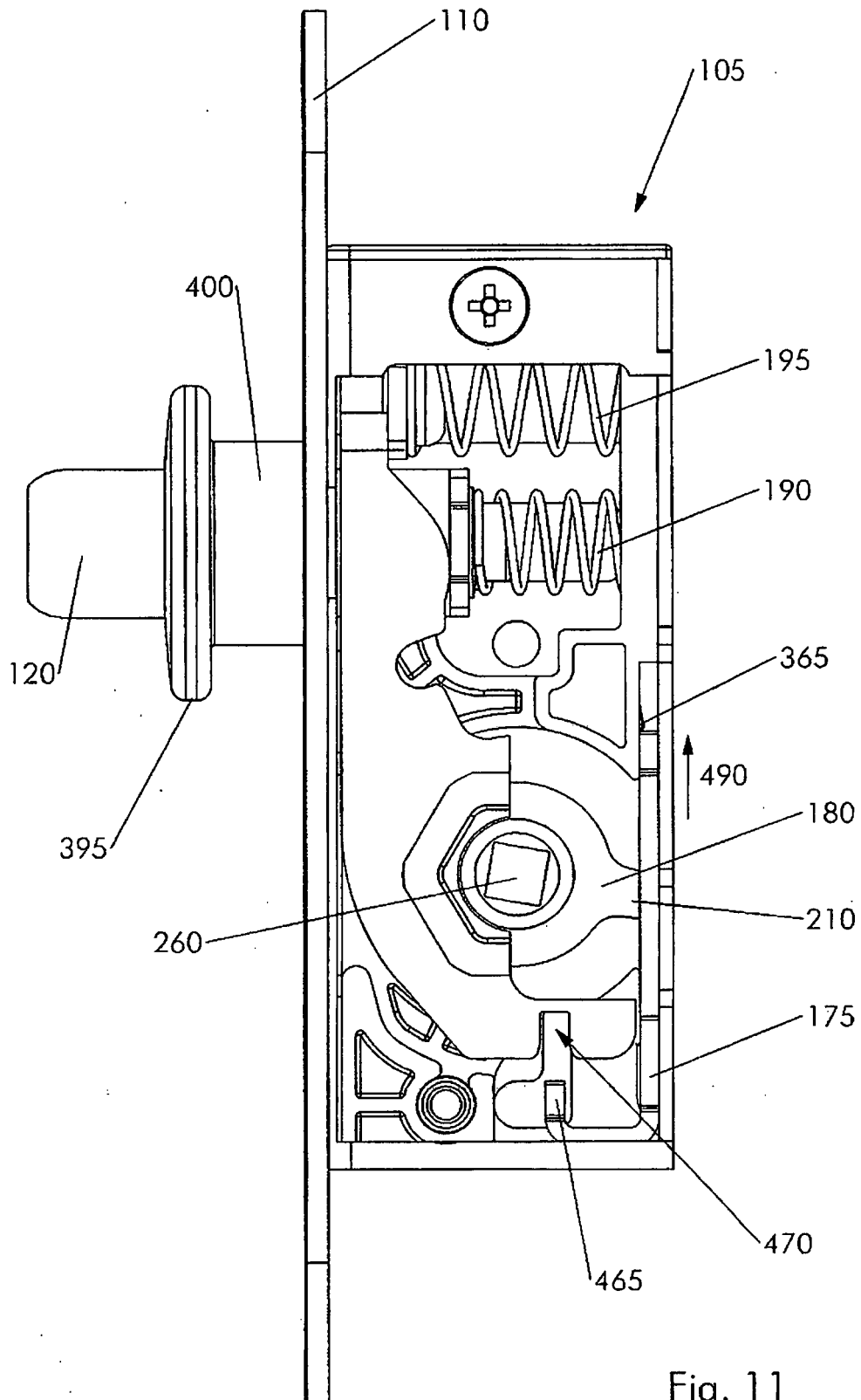


Fig. 10



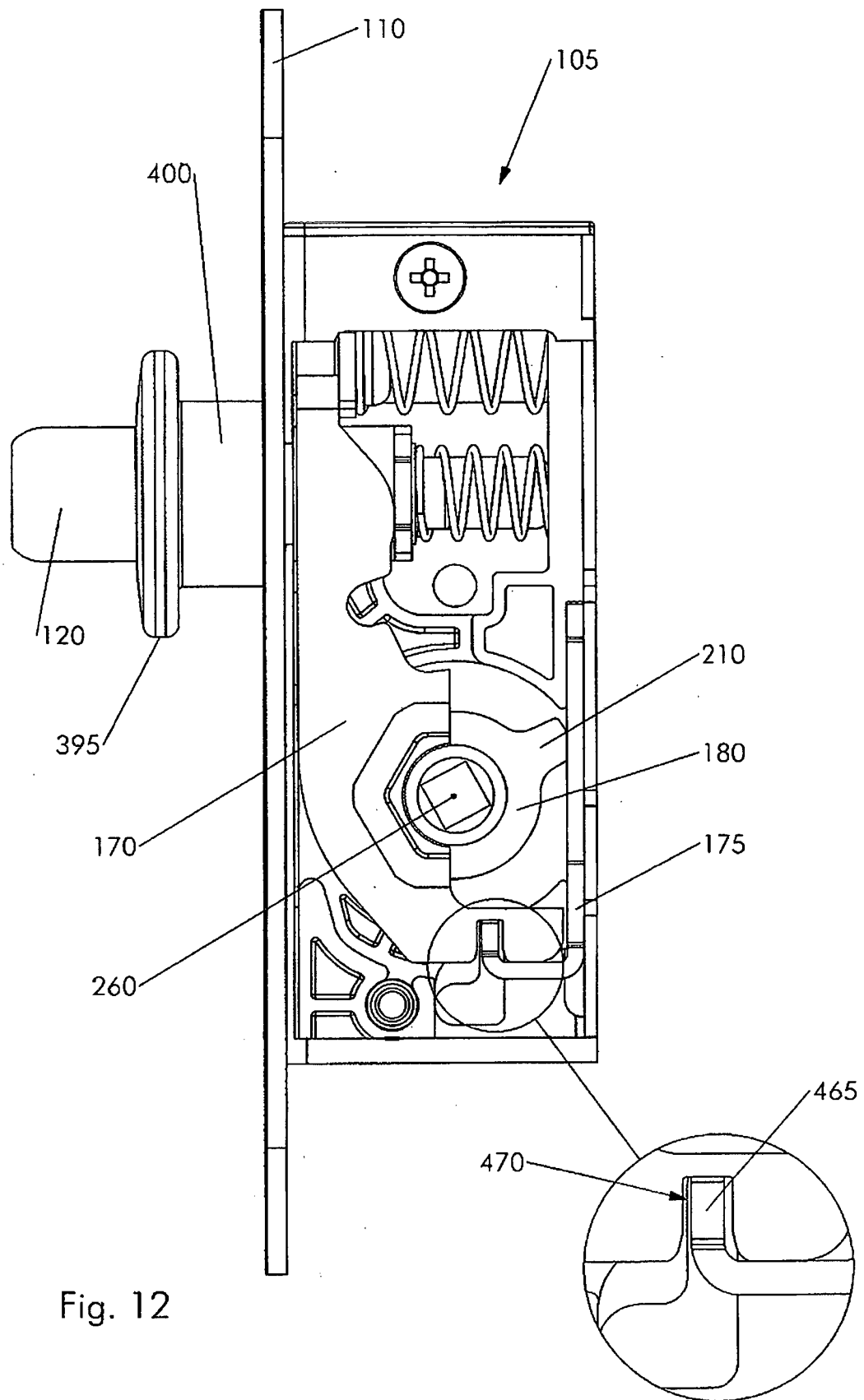
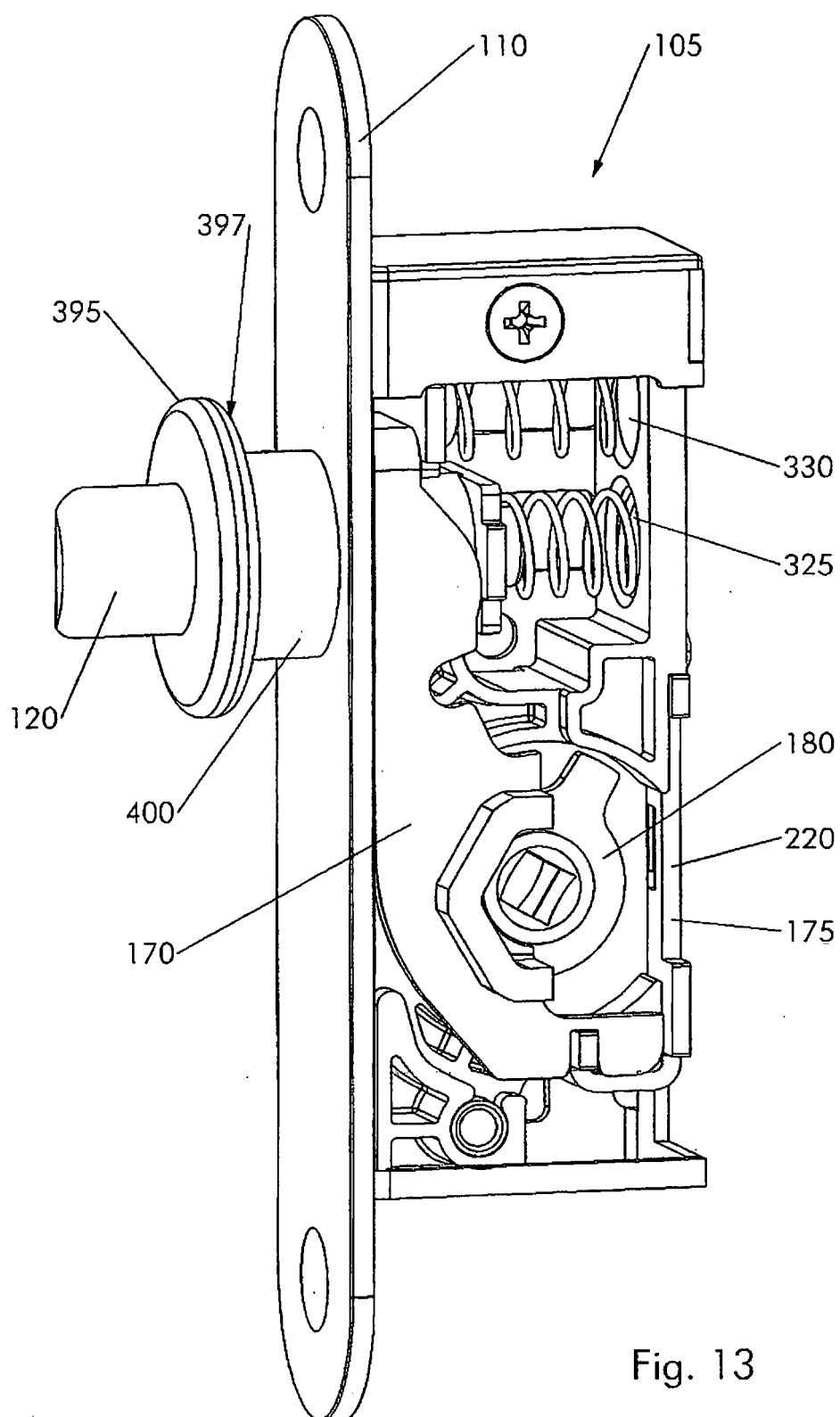


Fig. 12



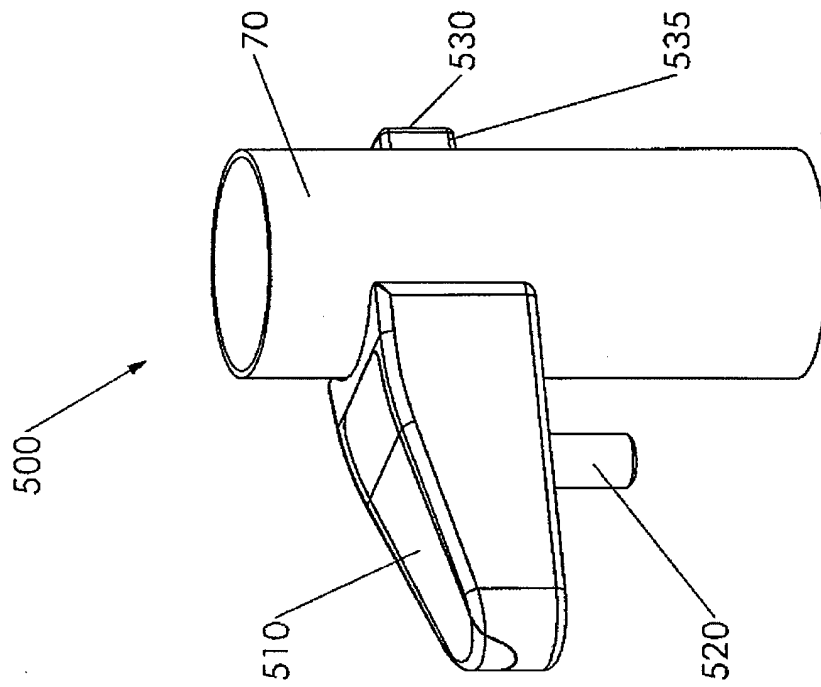


Fig. 15

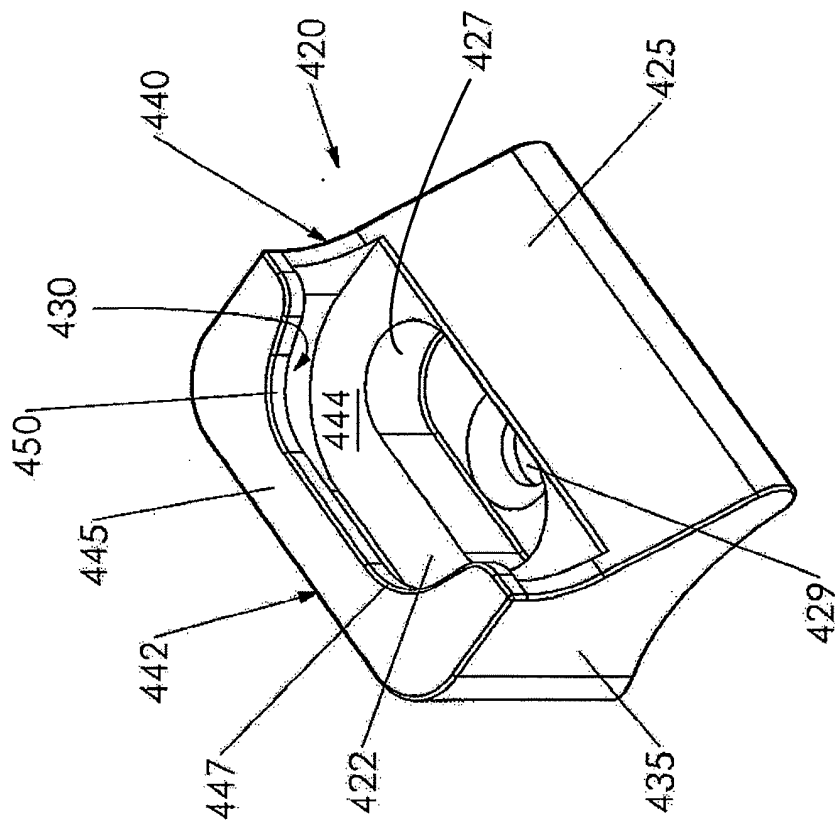


Fig. 14

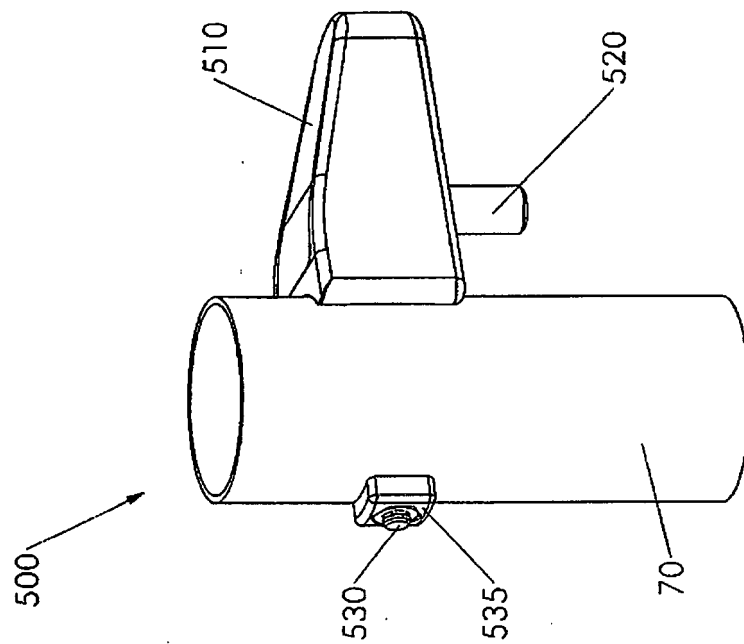


Fig. 16

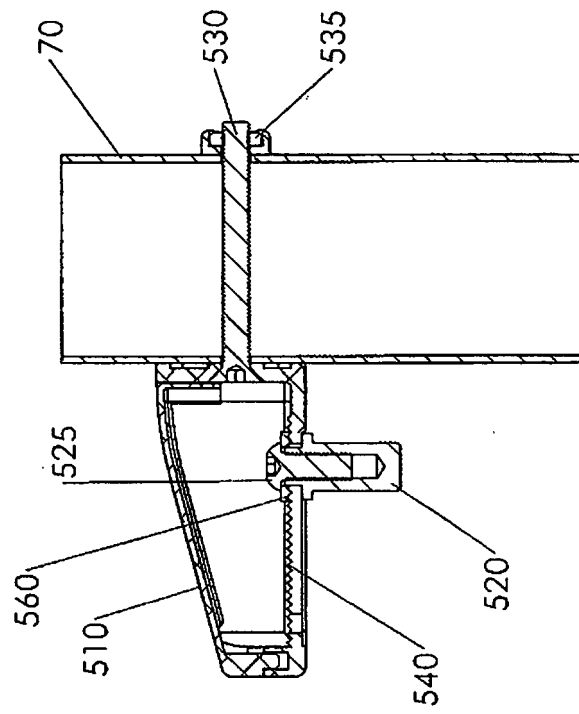


Fig. 17

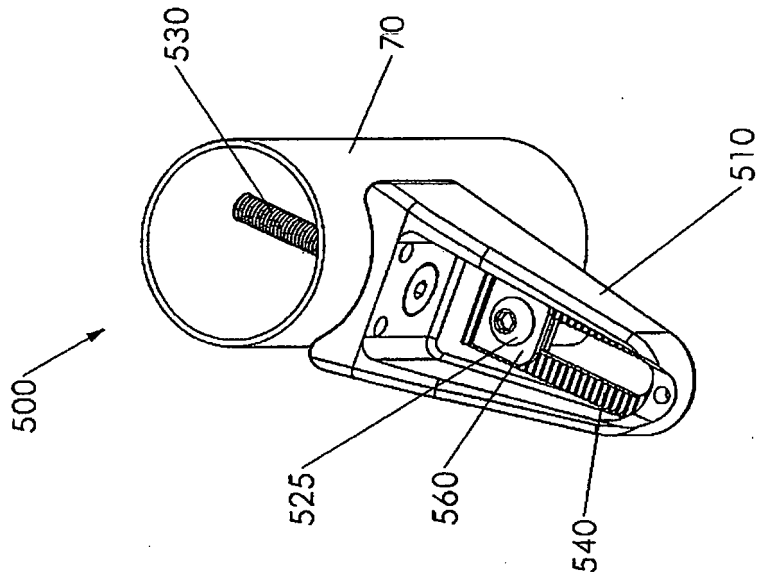


Fig. 19

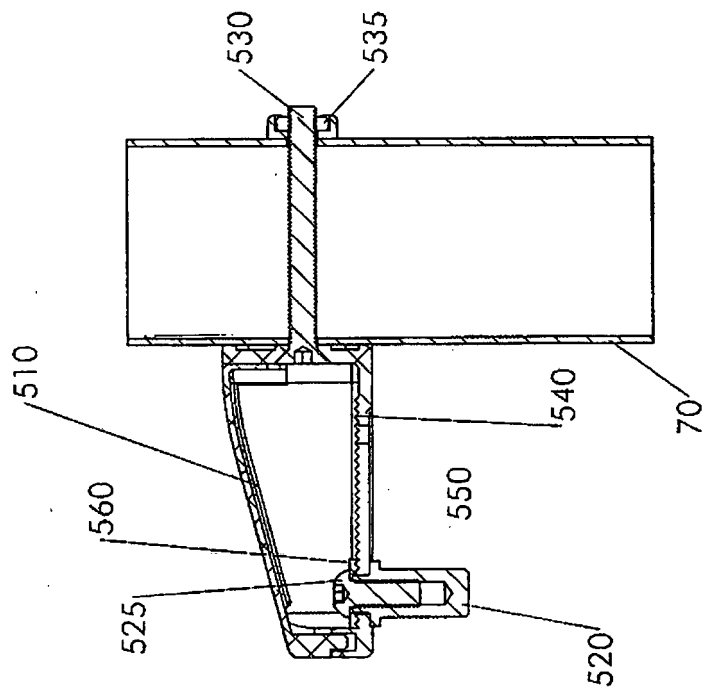


Fig. 18

REFERENCES CITED IN THE DESCRIPTION

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