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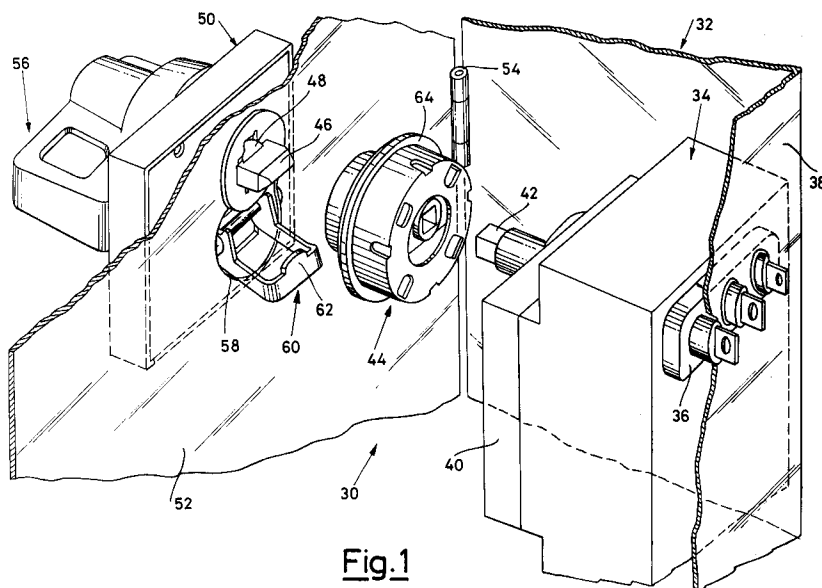
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I- 20122 Milano (IT)(54) **Device for mechanical control of electric circuit breakers and similar appliances, provided with latching, blocking and signalling means.**

(57) Device (30) for the control of circuit breakers (34), or the like, essentially comprised of a rotary handle (56), mounted on a transmission and blocking gear (50) fastened to a door (52), from which protrudes inside the door (52) a selfcentering transmission member (44) connecting the handle (56) with a mechanism (40) translating a rotation movement in a linear one, the device (30) allowing to block the door (52) both in the case of closed circuit breaker and in

the case of open circuit breaker with padlocked device, further preventing the circuit breaker closure in case of open door (52). Further the rotary handle (56) keeps a memory of the position taken before door opening and the selfcentering transmission member (44) allows to compensate misalignments between the rotary handle (56) and the mechanism (40) translating the control movement of the circuit breaker.

**Fig.1****EP 0 540 073 A2**

The present invention relates to a device for the mechanical control of electric circuit breakers, and similar appliances, mounted in a board or protecting cabinet, contemporaneously meeting the basic control requirements, for both remote and direct controls, included all the required interlocks, where it needs to be assured the highest safety for operating people, being said device both highly strong and simple in manufacture.

For obtaining the required features, it is to resort to a device having some specific features. Particularly, the device must have "positive actuation", that is it must give a univocal indication of correspondence between contact position of the appliance and the position of the control handle and allow the lock of the handle in "open" position only with contacts in open position (as already disclosed, for example in EP-A-0 450 699 filed on March 23, 1991 at the name of the present applicant). Further, the device must be able to transmit, in efficient and inexpensive way, high forces or torques and to provide a coupling of the control handle mounted on a door or a cover of the possible container, even with strong off-set between the handle itself and the corresponding devices directly applied on the circuit breaker. It is an object of the present device to meet, among other, the herebelow indicated requirements:

1) - Door block.

It must be impossible to open the control board if the circuit breaker is in "closed" position (control handle in "I" position).

Said block can be bypassed just by specifically informed operators provided with a specific tool, with clearly intentional drive (as provided by safety regulations).

2) - Block, with padlock or lock, in open position.

It must be possible to block, through padlock or lock, the control handle only if said handle is in "open" position (O), and only if the circuit breaker contacts are open (to completely understand this function see the above mentioned EP-A-0 450 699)(positive padlocking). Further, it must be impossible to open the door while the handle is blocked.

3) - Circuit breaker block in case of open door.

The device must prevent, through blocks, to close the circuit breaker in case of open door, both through direct control and remote control. The corresponding blocks must be bypassable.

4) - Memory of the control handle.

In both versions of remote control and direct control, the handle must remain in the position having when the door has been open and it must be impossible, as the door is open, to take it to any other position. It must be possible to bypass also this condition.

5) - Handle selfalignment.

The transmission members are provided with selfalignment means allowing the handle mounted on the door to be inserted on the transmission members themselves also in case of a substantial alignment error.

The above mentioned requirements are met by a control device as defined in claim 1.

The features and the advantages of the present invention will appear clearer from the following detailed description of embodiments thereof, given for exemplifying and not limiting purposes, provided with the enclosed drawings, in which:

- Figure 1 is a schematic partial view, partially broken, of a control board cabinet or housing of so deep kind that a circuit breaker in insertable embodiment, mounted on the bottom of the cabinet, has its remote control in a handle externally secured to a door on a transmission and block gear according to the present invention, following said handle the opening and closing movements of said door;
- Figure 2 is a lateral view of a rotary handle assemblable on a block gear, in turn assemblable on a door, according to the present invention;
- Figure 3 is a rear view partially disassembled, of the same handle of Figure 2;
- Figure 4 is a rear view completely assembled of the same handle of Figure 2;
- Figure 5 is a partial exploded view of padlocking components, allowing the above mentioned positive padlocking, and of block enable provided in the handle depicted in the preceding figures 2 to 4;
- Figure 6 is a perspective exploded view of a handle and blocking gear assembly door mounted according to the present invention;
- Figure 7 is a rear view of the same block gear particularly depicted in Figure 6;
- Figure 8 is a cross-section view along the line 8-8 of Figure 7;
- Figure 9 is a cross-section view along the line 9-9 of Figure 7;
- Figure 10 is a cross-section view along the line 10-10 of Figure 7;
- Figure 11 is a perspective exploded view of a movement transmission member of self

centering kind between door handle and movement translation mechanism, being the whole assembly according to the present invention, allowing to compensate also substantial misalignments between handle and movement translating mechanism;

- Figures 12 to 15 are cross-section views of the selfcentering member of Figure 11 showing how are compensated the alignment errors along two each other perpendicular directions, between a handle shaft and a shaft of a movement translation mechanism,.
- Figure 16 is partial, partially broken view of an alternate control board cabinet according to the invention, so little deep that a there mounted circuit breaker in insertable embodiment protrudes with its mechanism translating the rotary movement in linear movement, provided with block and enable means, through an opening provided in the openable door of the control board itself;
- Figure 17 is a partial cross-section view, in lateral elevation of the door, having behind the circuit breaker in insertable embodiment, depicting block and enable means and an external frame or seal against intake of extraneous objects;
- Figure 18 is a perspective exploded view of an assembly, according to the invention, of a handle with a block gear and a movement translating mechanism directly assembled on the circuit breaker;
- Figure 19 is a rear view of the block gear and movement translating mechanism particularly depicted in figure 18, shown in the state in which opens the circuit breaker contacts;
- Figure 20 is a cross-section view of the same gear and mechanism taken along the line 20-20 of figure 19;
- Figure 21 is a cross-section view of the same gear and mechanism taken along the line 21-21 of figure 19; and
- Figure 22 is a rear view of the same gear and mechanism of figure 18 depicted in the state in which closes the contacts of the circuit breaker.

Referring at first to figure 1, it is seen that a control device 30, according to the invention, comprises a control board cabinet 32 containing a circuit breaker 34 in insertable embodiment mounted by means of insertion sockets, such as the sockets 36, on the rear wall 38 of the cabinet 32. This circuit breaker 34 is provided with a mechanism 40 translating a rotary movement in linear movement to allow the control thereof by means of rotary handles, such as those depicted in the above mentioned EP -A- 0 450 699. From said mechanism 40 protrudes a rotary shaft 42 on

which is fastened a selfcentering transmission member 44 which, in turn, houses an engagement expansion 46 provided on a shaft 48 protruding from a transmission and block gear 50 fastened to a door 52 mounted by means of hinges 54 to the control board cabinet 32, said transmission and block gear 50 being at last provided with a rotary handle 56 allowing an external control of the circuit breaker 34 itself.

From the rear of said block gear 50 protrudes through a suitable opening 58 in the door 52 a U-shaped block member 60, engageable, by means of a tooth 62 thereof, with a protruding edge 64 of the selfcentering transmission member 44 to allow a latching of the member 60 to the member 44 and prevent, as a consequence, opening of the door 52 against preset conditions connected with the objects of the present invention, which will be later specified in detail.

For a complete understanding of the control method and device according to a first embodiment of the invention, reference will be made to figure 1 as well as to figures 2 through 10.

From a first inspection of the Figures 2 to 5, it is seen that a rotary handle 56, usable in the present invention, comprises a central hub 70, from which protrudes an actuating lever 72, provided with a window 74 which can be occupied by a latch 76 longitudinally slidable in an internal recess 78 of the lever 72. Said latch 76 specifically consists (see Figure 5) of a body 80, occupying the internal recess 78 of the lever 72 and housing inside a spring 82, provided with a first axial finger 84, a second transversal finger 86 and an engagement notch 88, the fingers 84 and 86 and the notch 88 having respectively the duty of driving the latch 76 sliding, to drive further latching mechanisms connected to padlocking and to enable the movement of latch 76 for starting a padlocking. The handle 56 is underneath closed by a shaped plate 90 fastened by a pair of tapping screws 92 and 94 to the body of the central hub 70 of the handle and having in the center a square shaft 96 mounted axially fixed but able to rotate with respect to the shaped plate 90 along an angle set by two first fingers 98 and 100 descending from a flange 102 having fixed in the center said square shaft 96 and engaged in respective openings 104 and 106, having transversal size wider than that of the corresponding fingers, in the shaped plate 90, in order to enable the so called positive padlocking, already mentioned in the background of the present application. Said flange 102 is further provided with a third descending finger 108, having the here below depicted task of enabling a proper assembly of the rotary handle 56 with respect to a rotary shaft contained in the block device 50, and with a fourth finger 110, arranged in opposed direction, to be

engaged by a spring 112 housed in a slot 114 of the same central hub 70 of the rotary handle 56.

Reference is now made to figures 6 through 10 for understanding the features and the structure of the block gear 50 and the selfcentering transmission member 44.

Looking in particular at figure 6, in which are depicted in exploded perspective view the rotary handle 56 and the block gear 50, it is seen that said block gear 50 consists of an external hollow box 120 rearward closed by a shaped cover 122 which will be interposed between the box 120 and the external side of the door 52 (Figure 1).

Within said box 120 are housed the components of the block gear which are, in detail, a rotary member 124 comprising, starting from the bottom 126 of the box 120, a first cam 128, a second cam 130, a support expansion 132, slidable on a semi-circular basis 133 of the bottom 126, a cylindric shaft 48, surrounded by a coil spring 136, and an expansion 46, already depicted in Figure 1, having the purpose to be engaged in the selfcentering transmission member 44 specifically depicted in Figure 11. Further, the rotary member itself 124 comes out from the box 120 with a cylindric hub 125, provided with a square recess 127 to house the square shaft 96 of the handle 56, being said cylindric hub 125 housed within a corresponding recess of a cylindric bushing 129 surrounded by a protruding circular relief 131 against which leans the lower edge of the hub 70 of the rotary handle 56. Between the external circular relief 131 and the internal bushing 129 are provided a first opening 133 for the entrance of a tool providing to release the square shaft 96 of the handle 56 from the square recess 127 of the hub 125 and a second opening 135 to allow the sliding transversal finger 86 of the latch 80 and the consequent movement of the protrusion 190 of the actuating member 176 for the positive padlocking latch. In fact, as visible in Figure 6, the cam 130 is provided with a step 137 which in case of contact welding, as the hub 125 cannot completely rotate because of the clearances between the fingers 98 and 100 and their corresponding recesses 104 and 106 in the plate 90 of the handle 56, remains in front of the opening 135, so preventing the sliding of the latch 76 and the padlocking of the handle itself (positive padlocking).

A slider member 140 for transmitting linear movement is provided with a shaped window 142, interacting, by means of reliefs 143, with the second cam 130, for moving said member 140 in two different positions corresponding to the closure and opening positions of the contacts of the circuit breaker 34 (Figure 1), the lower position corresponding to the closure of the contacts and the upper position corresponding to the contact open-

ing. Said slider member 140 further comprises a lower finger 144 inside provided with a post 146 having wound thereon a coil spring 148 ending with two linear portions 150 and 152 engaged around a relief 154 integral with said lower finger 144. The lower finger 144 of the slider member 140 is surrounded along the sides 156 and 158 by two respective fingers 160 and 162 arranged to extend two lateral legs 164 and 166 of the U-shaped block member 60 beyond a columnar pin 168 provided to have the respective ends housed in recesses 170 and 172 of reliefs joined to the bottom 126 of the box 120. The finger 162 is inserted between the linear portions 150 and 152 of the spring 148 for the purpose, here below better explained, to allow wanted operations of block by-passing or release on the member 60, while the finger 160 occupies a space on which can act in two opposed directions two respective actuating members 174 and 176 enabling the first the wanted disengagement of the block 60 from the selfcentering member 44 and thus the block of the door 52 in case of padlocking of the handle 56 which can occur just for a handle in open position without obstacles due to contact weldings of the circuit breaker 34 (positive padlocking). From said actuating members, the first one 174 operates against the lower face 160 of the block member 60 through a lower tooth 178 when pushed by a tool operating through a hole 180 in a lateral wall of the box 50 on a lower tooth 182. The member 60 can be rotated in a disengaged position because, when the member 174 upside pushes the finger 160 of the leg 164, the finger 162 of the other leg 166 pushes away the rectilinear portion 150 of the spring 148, enabling the disengagement of the member 60.

The second actuating member 176 operates by means of a finger 184 against the upper face of the same finger 160 to allow a not bypassable block of the member 44, and thus of the door 52, in the case of enabled padlocking of the handle 56.

This member 176 is normally held in the position shown in figure 7 by the operation of a spring 186 on a square projection 188, while is moved by the operation of the transversal finger 86 of the padlocking latch 76 of the rotary handle 56 acting on a protrusion 190 thereof passing through an opening 192 of the bottom 126 and through the opening 135 between the external circular relief 131 and the cylindric bushing 129, producing a clockwise rotation of the member 176 itself around a pin post 194 inserted in a hole 196 thereof. In this case the padlocking of the rotary handle 56 compels the block member 60 to engage the edge 64 of the selfcentering member 44, preventing the unlock of the door 52, because the finger 184 rests against the finger 160 of the member 60, raising it in latching position.

This block position is not deletable or bypassable, because the stiffness of the finger 184 prevents to move the finger 160 under the push of the member 174. Of course, it is sufficient to take away the padlock from the window 74 of the rotary handle 56 to allow the release of the door 52.

Still referring to figure 6, it is seen that the shaped cover 122 is crossed by a circular opening 198 provided with reentering substantially rectangular notches 200, 202 and 204 through which can pass fingers 206 or 208 descending from a disk 210 and expected to be inserted in recesses 207 and 209 of the hub 125, being said disk provided with a central opening 211 for allowing the engagement expansion 46 to pass and usually resting against the coil spring 136 wound around the cylindric shaft 48. Said disk 210, with its fingers 206 and 208, at the opening of the door 52 is raised by said coil spring 136, engaging the reentering notches 200-204 of the opening 198 on the plate 122, to keep memory of the position of the rotary handle 56.

The shaped cover 122 is further provided with a rectangular window 212 to let pass the block member 60 and make visible the position of the lower finger 144 of the slider member 140, and of loop bends 214, 216 and 218 of which the first two are expected to provide housing and constraints to the ends of the shaft 168, preventing it to come out from the recesses 170 and 172 inside the box 120. The cover 122 is further provided with holes 220, 222 and 224 for bolts, such as the bolt 226, providing to fasten the box 120 to the door 52.

The selfcentering transmission member 44 is depicted in perspective in Figure 11 and in section in the Figures 12 to 15 to fully understand the function thereof.

Said member 44 comprises a hollow external shell 230 housing, as an inside slider, an end plug 232 comprised of an external bushing 234 having fitted an internal bushing 236 provided with threaded holes 238 and 240 housing screws 242 and 244 providing to fasten a cylinder 246 provided with a rectangular recess 248 suitable to house a coupling block 252 and one or more holes 254 for blocking the rotary shaft 42 of the mechanism 40 translating the circuit breaker movement, being able said block to laterally slide in a recess 256 on a face of the cylinder 246 faced to the extreme plug 232 according to a first direction.

The bushing 234 ends outside with an extended opening 258, directed according to a direction substantially perpendicular to said first direction, into which is inserted the engagement expansion 46 of the shaft 48, provided with two bevellings 260 and 262 which, engaging against bevelled faces 46a and 46b of the engagement expansion 46, move the whole member 44 in a first

or in a second opposed direction to promote a centering, in said first direction, between the shaft 42 of the mechanism 40 and the shaft 48 of the blocking gear 50. The centering of the shaft 48 itself in the direction perpendicular to the first one is provided by the extension difference between the opening 258 and the expansion 46, as it is particularly depicted in Figures 12 and 13.

From what above depicted it results obvious that, within some limits, it is not to worry about alignment lacks between the shaft 48 of the block gear 50 and the shaft 42 of the mechanism 40 because the selfcentering member 44 compensate said lacks in two each other perpendicular directions and thus on a planar area around the shaft 42. In a typical embodiment of the present invention it is possible to compensate misalignments of 5 mm on opposed sides of two perpendicular directions, so assuring a compensation area having extension of 10 mm x 10 mm about the shaft 42 itself.

Reference is now made to the alternate embodiment of the invention depicted in Figures 16 to 22.

Referring at first to Figure 16, it is seen that an alternate control device 330, according to the invention, comprises a control board cabinet 332 containing a circuit breaker 334 in insertable embodiment mounted by means of insertable plugs, such as the plugs 336, visible on the bottom wall 338 of the control board 332 itself. This circuit breaker 334 is provided with a mechanism 340 translating a movement from rotary to linear, provided with block and latching means, to allow the control thereof by means of rotary handles, as for example those depicted in the above mentioned EP-A- 0450 699. A handle which could fully meet the required function could be the here depicted handle 356 which is similar to the handle 56 shown in the first embodiment of the present invention.

Said mechanism 340 protrudes, through an opening 358, with its whole forward portion from a door 352 mounted by means of hinges 354 to the control board cabinet 332.

As particularly visible in figure 17, the opening 358 in the door 352 is externally provided with a continuous frame or seal 360 having the task to prevent the intake between door and circuit breaker of extraneous materials which could affect the operation of the device itself.

From the upper and lower sides of said mechanism 340 come out a latching tooth 362 and one or more confirming fingers 364, respectively, engaging the first in a protrusion 366 of a latching member 368 however fastened behind said door 352 and the second against a support member 369 usually manufactured integral and as an extension

of the latching member 368 itself.

For a full comprehension of the control method and device according to the alternate embodiment of the invention, reference is made, together Figures 16 and 17, also to Figures 18 to 22.

Thus, considering all the above mentioned figures, it is seen that the movement translating mechanism 340, provided with block means, is driven by a rotary handle 356, completely similar to the rotary handle 56 of the first embodiment, essentially consisting of a hub 370, from which protrudes an actuating lever 372, provided with a window 374 which can be occupied by a latch 376 slidable in a recess 378 of the lever 372 itself, from which protrudes with a finger 386 to the external face of the mechanism 340.

The rotary handle 356 is manufactured with means similar to those of the handle 56 of the first embodiment to allow the same functions of said first embodiment and specifically the so called positive padlocking. To this purpose, said handle 356 is also provided with a shaped bottom plate 390, fastened by means of screws 392 and 394 to the body of the hub 370 and having protruding and free to rotate a square shaft 369 connected in a way completely similar to what happens for the square shaft 96 of the first embodiment, to fingers 398, 400 and 408, having the same functions of the corresponding fingers 98, 100 and 108. As the rotary handle 356 can be identical to the handle 56, depicted in detail in the Figures 2 to 5, for the structural and operating details thereof, reference is made to said preceding embodiment.

Continuing now to consider the figures 18 to 22, it is seen that the movement translating and latching mechanism 340 comprises a containing box 420, fastenable to the circuit breaker 334 and bottom closed by a shaped cover 422. Within said box 420, is contained an assembly translating the movement from rotatory to linear, essentially consisting by a first crank member 424 connected by an articulated joint to a connecting rod 426, in turn connected by articulated joint to a second crank member 428. In particular, the first crank member 424 comprises a first outside faced cylindric hub 425, a second inside faced cylindric hub 427 engaged in a circular hole 429 through the shaped cover 422 and a lever 430 connecting the two hubs 425 and 427 to the articulated joint for actuating the connecting rod 426.

Further, said first crank member 424 comprises, connected to the hub 425, a first cam expansion 432, having the task to aid in the well known positive padlocking function and sliding into a slot 434 of the bottom 436 of the box 420, and a second cam expansion on an opposite side of said hub 425 sliding into an opposed slot 438 of the bottom 436 itself having the task to interfere with a

corner of a first confirmation member 440 provided to be negated in the support member 369 (see Figure 17) to allow movements of the mechanism 340 just when the door 352 is closed. The second crank member 428 comprises two rotation pins 442 and 444 respectively engaged in a seat 446 integrally manufactured with the bottom 436 of the box 420 and in a circular hole 448, present in the shaped cover 422, and a lever 450 connecting the two pins 442 and 444 with the articulated joint of the rod member 426 for transmitting movement to the second crank member 428. In the body of said lever 450 is pierced a window 452 provided with two opposed curved convex walls having the task of actuating a linearly moving control lever of a circuit breaker and around the pin 442 is provided a partially open slot 454 housing a spring 456 which engages by means of both ends a pin 458 coming out from a block gear 460 which with its teeth 362 can protrude from two slots 462 and 464, present in a wall of the box 420, to engage a protrusion 366 of a latch member 368 fastened behind the door 352, as visible in figure 17. The block gear 460 must be bypassable on purpose by some skilled operator and for that is provided in the box 420 an opening 465, such as a slot window, within which it is possible to insert a suitable tool for depressing the gear 460 itself, even with closed circuit breaker, overcoming the drive of the spring 456.

As the first embodiment, also this second embodiment provides latching of the door 352 when the circuit breaker 334 is open with the handle 356 padlocked and, to this purpose, is used an actuating member 466 for padlocking consisting of a slider 468, located by a spring 470, provided with a square protrusion 472 and a bevel 474, the square protrusion 472 being moved by the tooth 386 of the latch 376, when the handle 356 is padlocked, and the bevel 474 moving a corresponding protrusion present in the block gear 460 to bring the teeth 362 out of the slots 462 and 464 in order to provide the door latch in case of padlocked handle 356. As in the first embodiment, this kind of latch is not bypassable because the bevel 474 of the slider 468 is not plyable and thus it is not possible to depress the blocking gear 460 operating by means of the suitable tool through the opening 465.

Once the door 352 is open, the rotary handle 356 cannot any more change in position if the door is not closed, so keeping position memory for said control handle. To that will provide the confirmation fingers 364, protruding from the containment box 420, of which the upper one is the top of the confirmation member 440 which, when the door 352 is open and thus the finger 364 does not lean any more against the support member 369, is pushed out of the box 420 by a spring 476, caus-

ing a corner 478 to interfere with a member of the hub 425, so preventing any rotation of the first crank member 424. Likewise, the lower confirmation finger is at the bottom of a confirmation member 480 which with a bevelled edge 482 thereof operates against a first square protrusion 484 of a slider 486, driven by means of a slot 488 thereof by a protrusion 490 of the bottom 436 of the box 420 and ending with a second square protrusion 492 suitable for interfere with a protrusion 493 of the articulated joint between the crank member 428 and the rod member 426 to prevent any rotation of the second crank member 428. In fact, when the door 356 is open, as, lacking the support of the supporting member 369, a spring 494 wound around a pin 496 pushes to the right the protrusion 484 and thus the slider 486, the second protrusion 492 interferes with the above mentioned articulated protrusion 493.

This memory function of handle position can be simply bypassed by pushing the confirmation fingers 364 for having them reentering flush in the containment box 420 in order to release the movement of the movement translating mechanism 340.

The first cylindric hub 425 is provided with a square recess 500 for housing the square shaft 396 and is inserted in a recess 502 of cylindric bushing surrounded by a circular protruding relief 504 determining a groove 506, covered by the hub 370 of the handle 356, for letting pass in the interruptions thereof, such as the interruption 508 visible in the figures 18, 19 and 22, members cooperating to the door block, such as the square protrusion 472.

What has been here above disclosed depicts two embodiments of the present invention given just as examples. Obvious and equivalent provisions which could come in mind to a person skilled in this particular art from a reading of the above description must be deemed all here covered. For example, between the selfcentering member 44 and the rotary shaft 42 of the mechanism 40 translating the movement can be interposed an extending member which at a first end is fastened to the shaft 42 and at the second one is fastened in the coupling hole 252 of the member 44 to use the latching possibility of the door 52 also in so deep control boards that the selfcentering member cannot be directly mounted on the shaft 42 of the mechanism 40.

Claims

1. Device for controlling a circuit breaker (34, 334), or the like, mounted in a control board or protecting cabinet (32, 332) using a block gear (50, 340) to prevent the opening of said door (52, 352), when a rotary handle (56, 356) outside from said control board or cabinet (32,

332) is in position corresponding to closed circuit breaker, characterized in that said block gear (50, 340) is provided with tooht means (62, 362) securing them to clamping means (64, 368) at their ends, preventing the opening of the door (52, 352) when the rotary handle (56, 356) is in the closure position of the circuit breaker, and with enabling means (210, 364) allowing to move the rotary handle just when the door (52, 352) is closed.

2. Device for controlling a circuit breaker, as in claim 1, characterized in that the block gear (50, 340) is further provided with bypassing means for the block, actuable by means of a suitable tool inserted in an opening (180, 465) present in a box (120, 420) of the block gear (50, 340) itself, providing to release said tooth means (62, 362) from said latching means (64, 368).
3. Device for controlling a circuit breaker as in claims 1 and 2, characterized in that said means enabling the movement of the handle (56) are comprised of a disk (210), mounted on a shaft (48) coming out from the block gear (50), which, when the door is open, engages with fingers thereof (206, 208) recesses (200, 202, 204) of a rear cover (122) of said block gear (50), preventing the movement of the handle (56), and, when the door is closed, descends disengaging said recesses, enabling the movement of the handle (56) itself, being the disk (210) depressable, also by hand, to enable the movement of the handle (56) also in case of closed door.
4. Device for controlling a circuit breaker, as in claim 3, characterized in that said block gear (50) contains a U-shaped member (60), provided with a tooth (62) engaging in a protruding edge (64) of a selfcentering transmission member (44) interposed between said block gear (50) and said mechanism (40), translating a rotary movement in a linear movement, moved in respective block and release positions with respect to said transmission member (44) by a slider member (140) driven by a cam (130), present on said shaft (48), which acts in a shaped window (142) of said slider member (140) for having it arranged in two different positions corresponding to block and release of said door (52), respectively.
5. Device for controlling a circuit breaker, as in claim 4, characterized in that the U-shaped block member (60) is provided with two lateral legs (164, 166) ending with two respective

fingers (160, 162) of which the first one (160) can be actuated in a first direction by a first actuating member (174), driven by a suitable tool inserted through an opening (180), for determining a bypass of the latch provided by the member (60), because of a push of said first actuating member (174) against said first finger (160) and consequent movement of the second finger (162) against two spring ends (150, 152) and can be actuated in a second opposed direction by a second actuating member (176), also pushing said first finger (160), for determining a block of the door (52) when the rotary handle (56) of the device is in the open position and has been padlocked through insertion of a padlock member in a window (74) of a lever (72) of said handle (56), the actuation in this second direction not being bypassable because of the stiffness of the second actuating member (176).

position and is padlocked by insertion of a padlock member in a window (374) of a lever (370) of the handle (356) itself, the block due to padlocking not being anyway bypassable because of the stiffness of the slider (468).

6. Device for controlling a circuit breaker, as in claims 1 and 2, characterized in that said means enabling the movement of the handle (356) are comprised of confirmation fingers (364), protruding from a box (420) of the block (340) and engaging support members (369), which when the door is closed remain therein inserted, enabling the movements of its internal movements, and when the door is open come out from the box (420) of the block gear (340) preventing any movement of internal mechanisms of the block gear (340), being possible to reinsert by hand said confirmation fingers (364) for bypassing the block of the gear (340).
7. Device for controlling a circuit breaker, as in claim 6, characterized in that the block gear (340) is provided with one or more latching teeth (362) coming out from the gear (340) itself when the rotary handle (356) is moved to the closure position, preventing the opening of the door (352), and come in the gear (340) when the rotary handle (356) is moved in the opening position, being able to cause the coming in of the teeth (362), even with the handle (356) in closed position, by action on a block gear (460), provided with the latch teeth (362), of a suitable tool through an opening (465), such as a slot window.
8. Device for the control of a circuit breaker, as in claim 7, characterized in that on said latch gear (460) acts a slider (468) of an actuating padlock member (466) causing the coming out of the latching teeth (362) from the gear (340) when the handle (356) is rotated in the closure

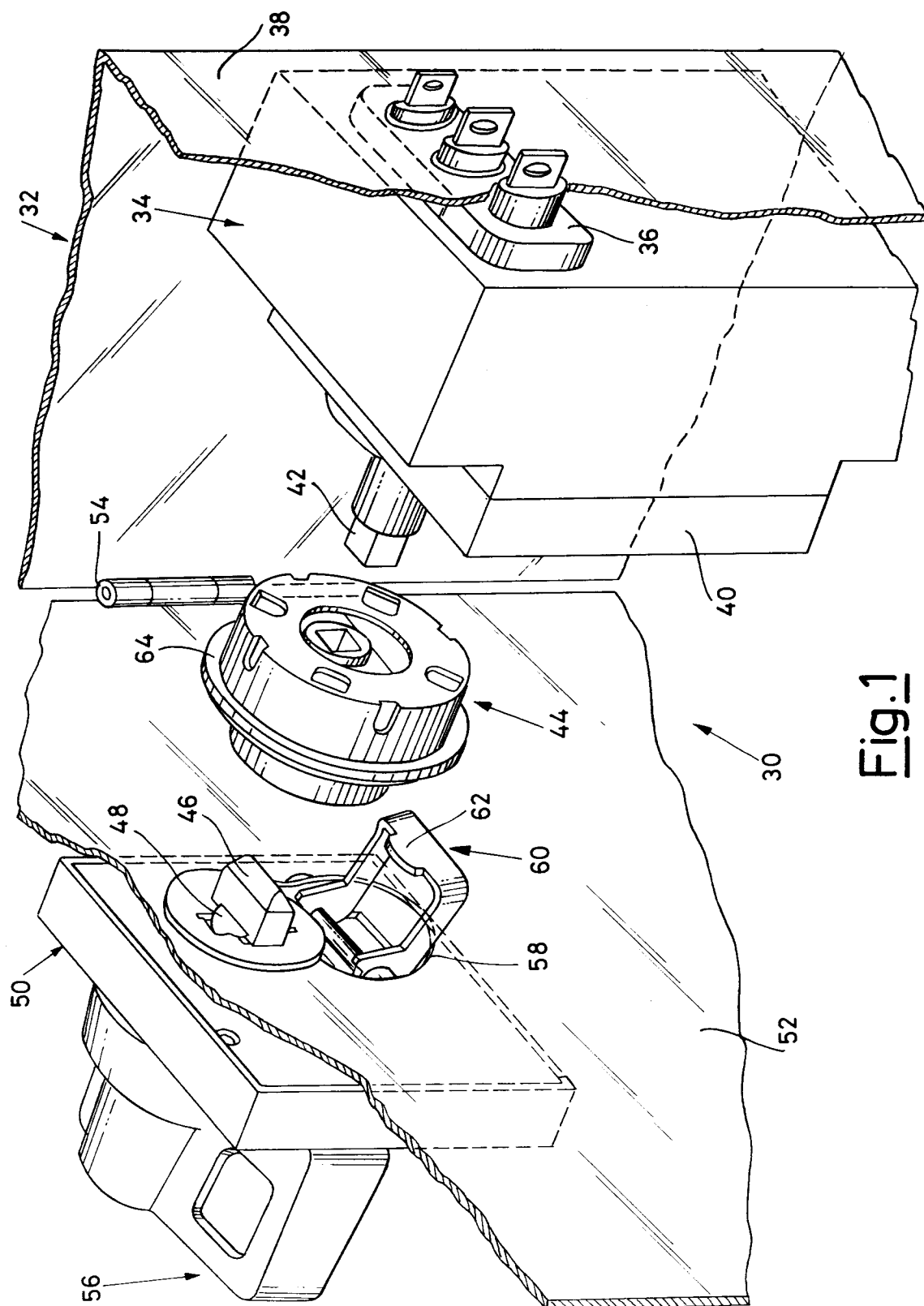


Fig.1

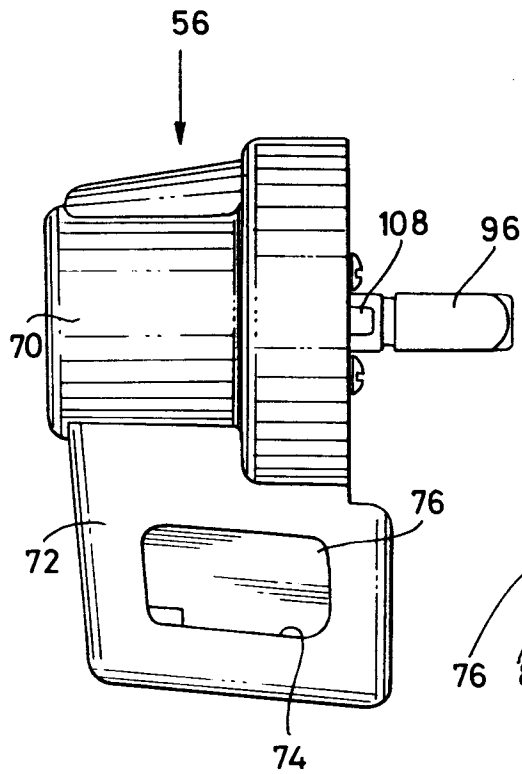


Fig.2

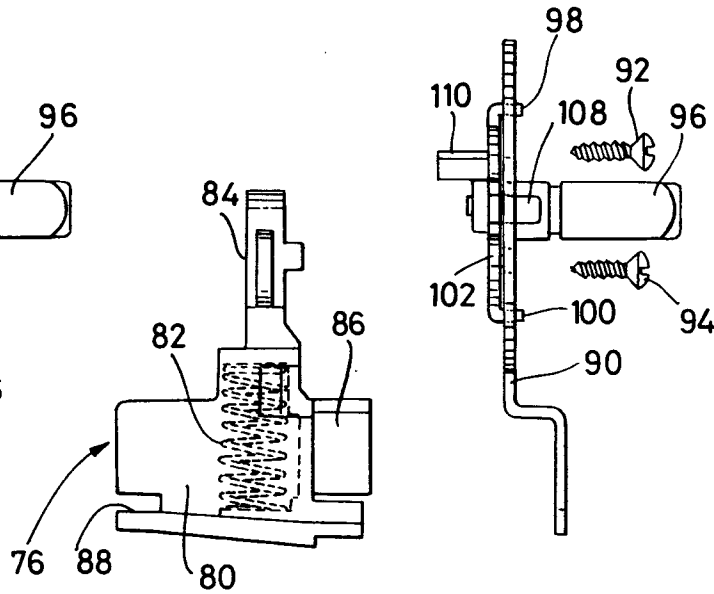


Fig.5

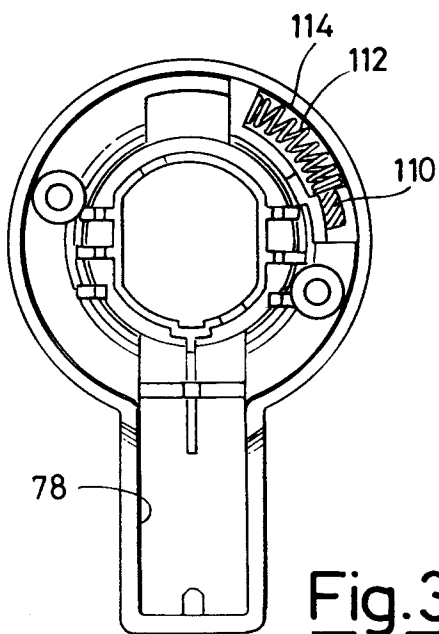


Fig.3

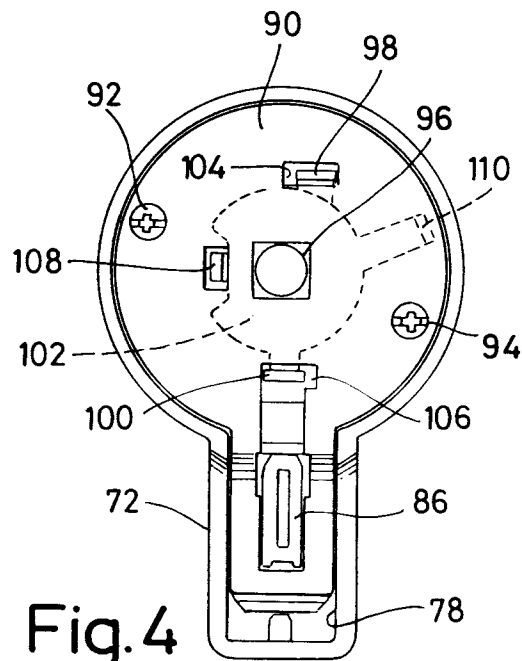


Fig.4

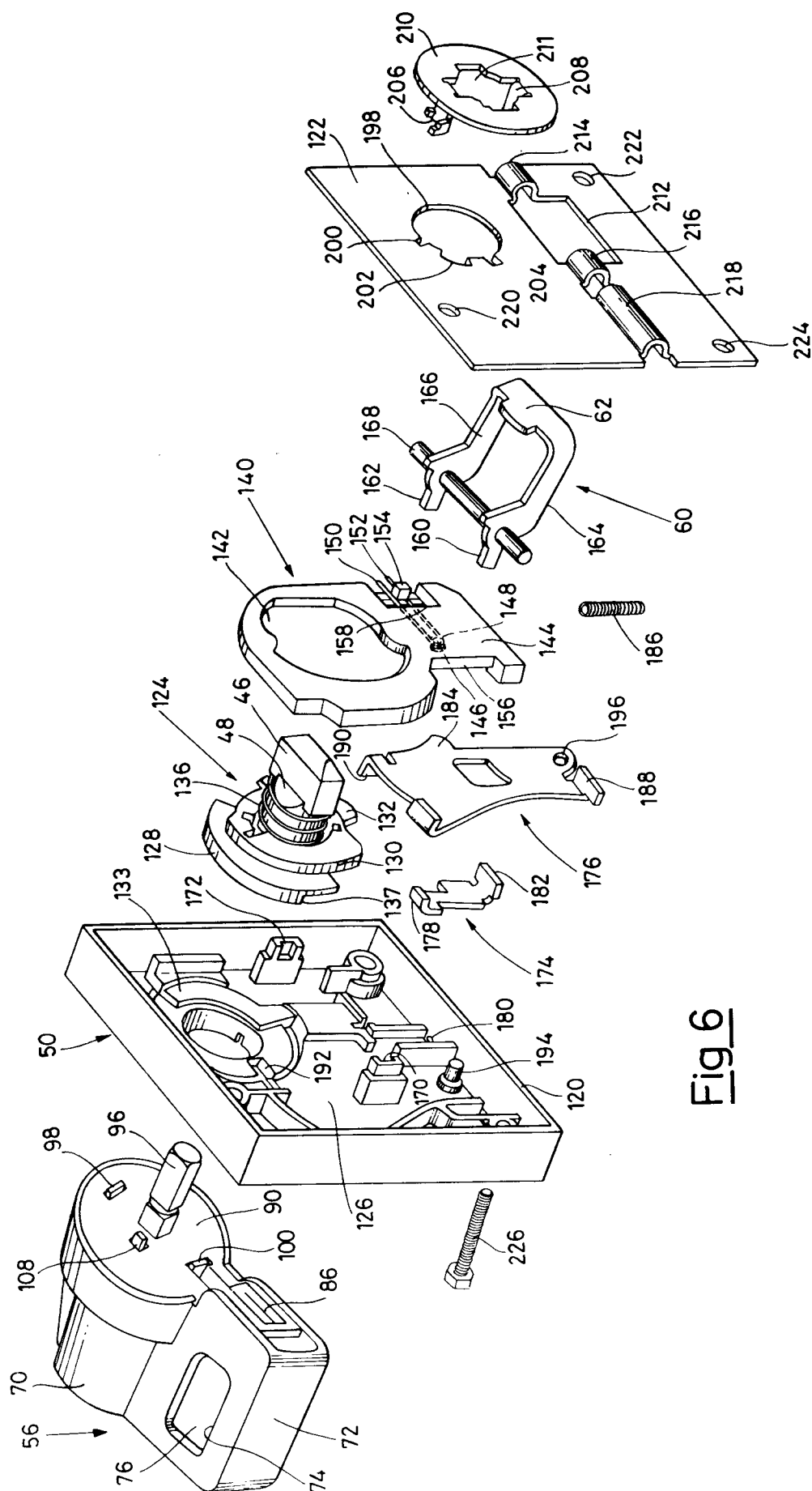
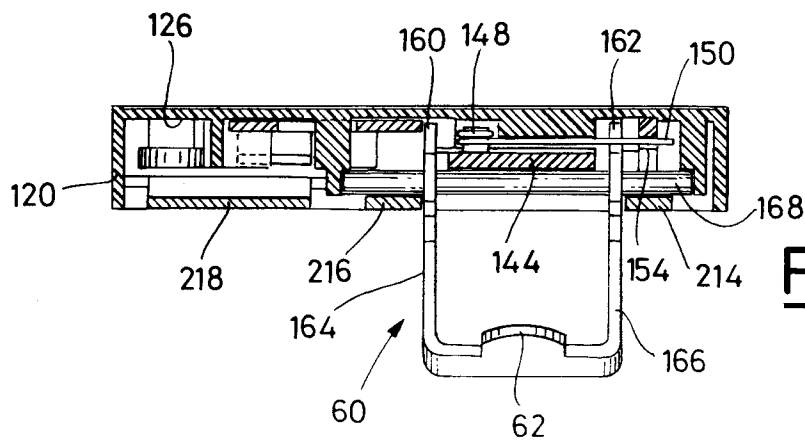
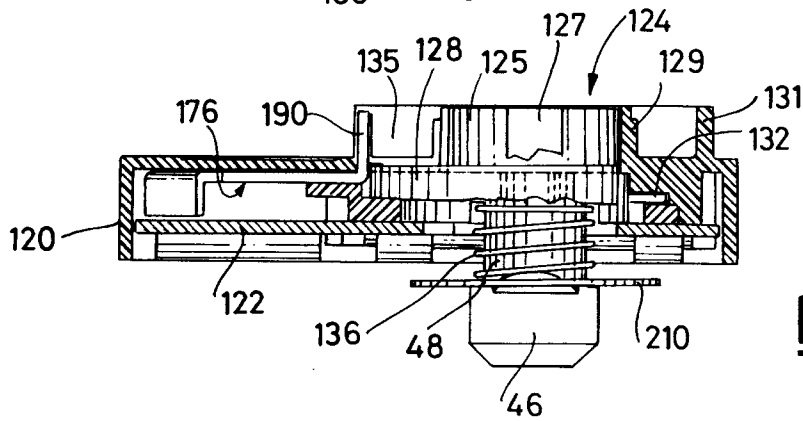
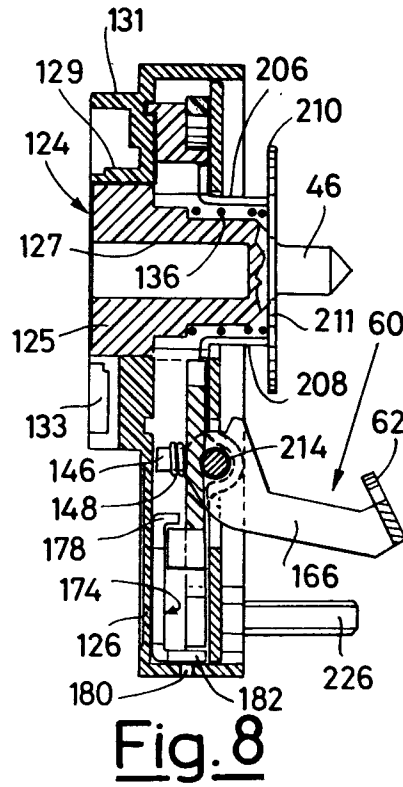
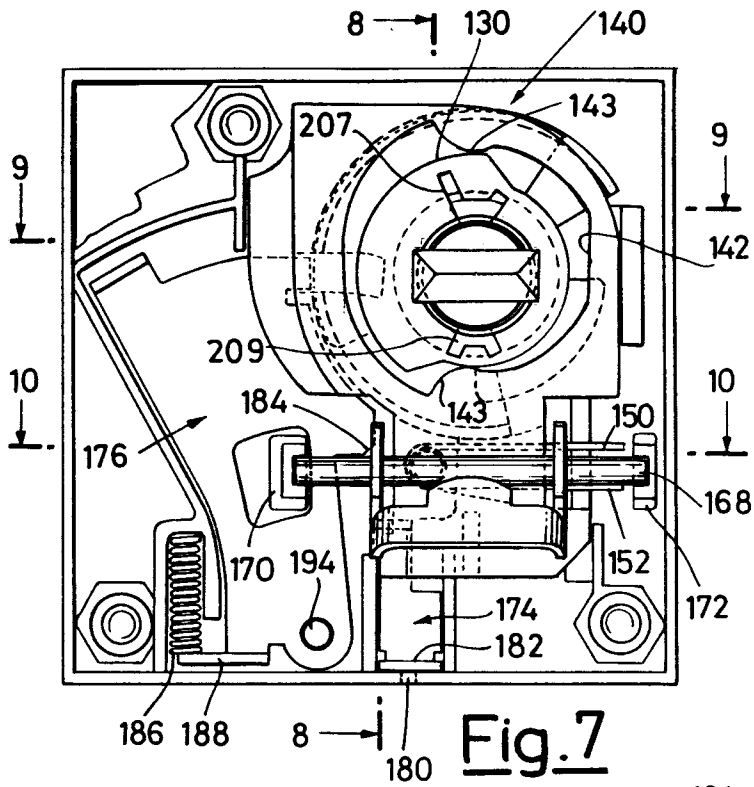


Fig. 6



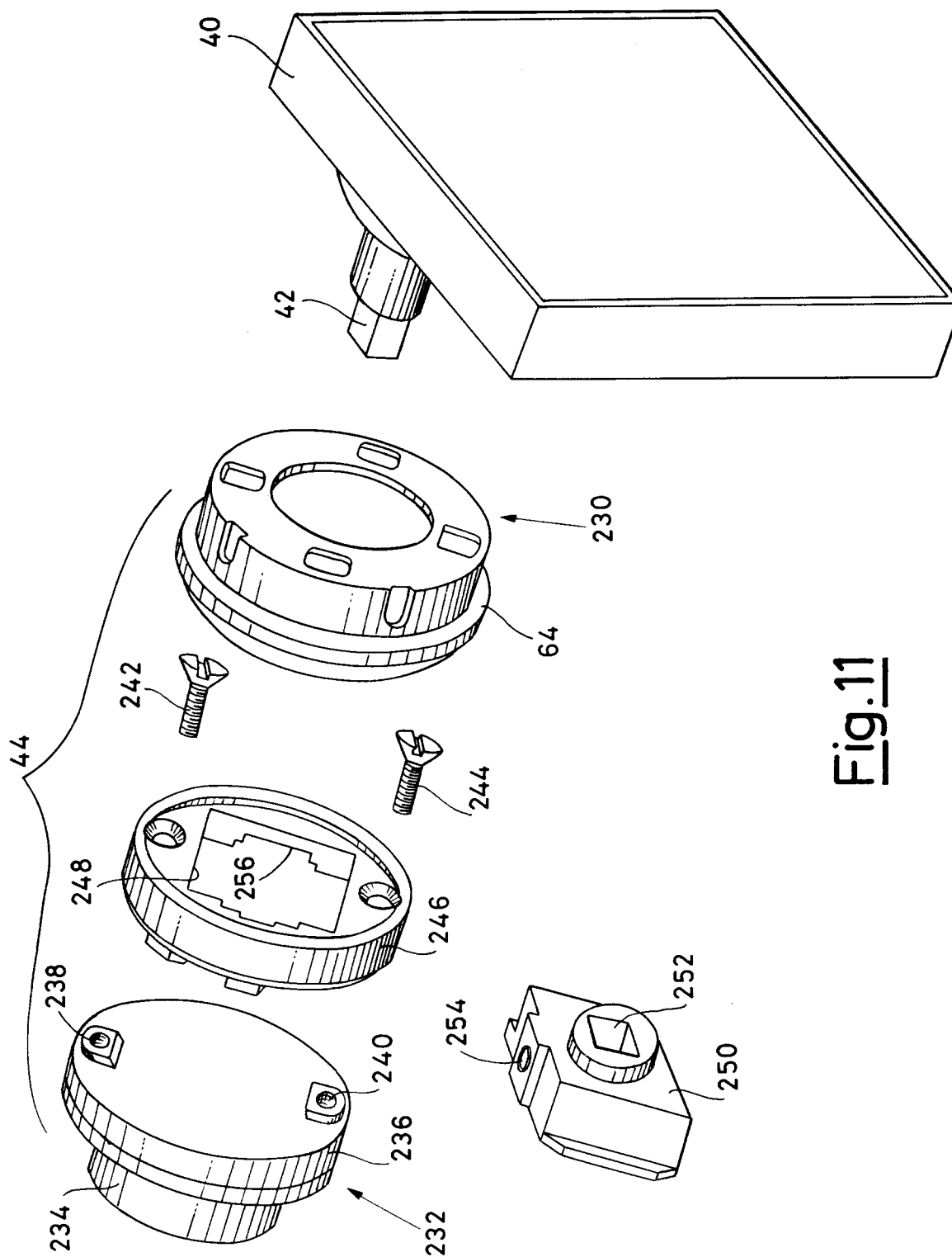


Fig. 11

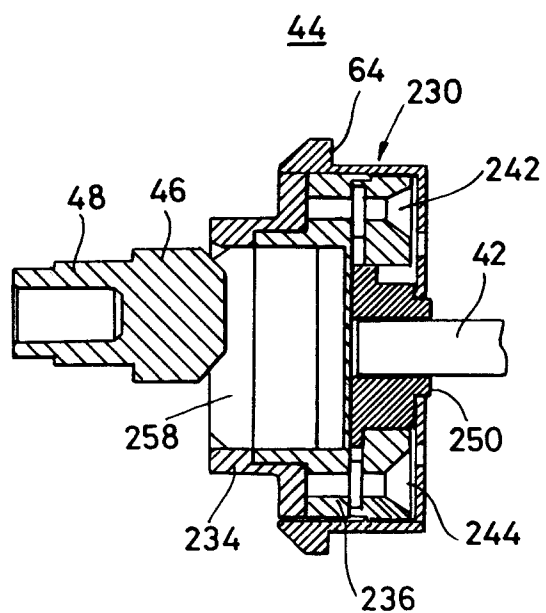


Fig.12

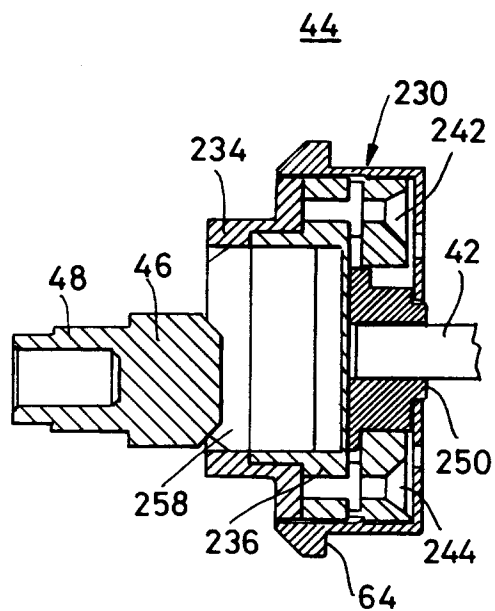


Fig.13

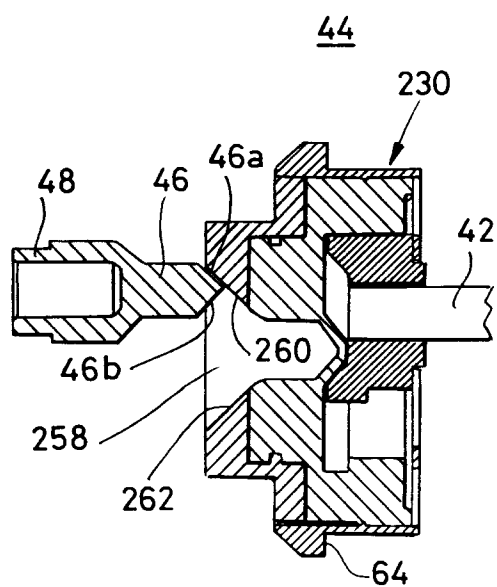


Fig.14

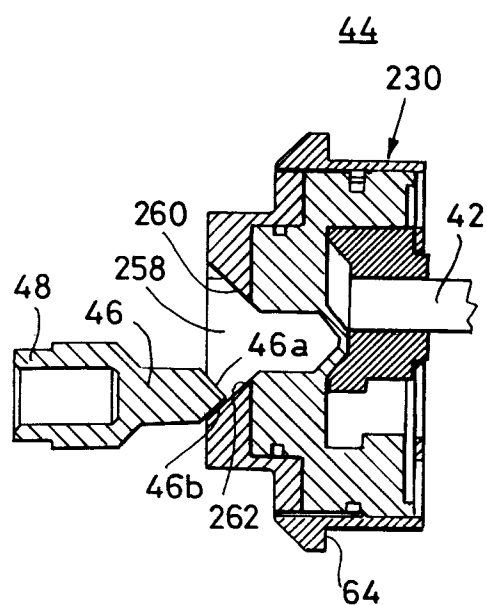
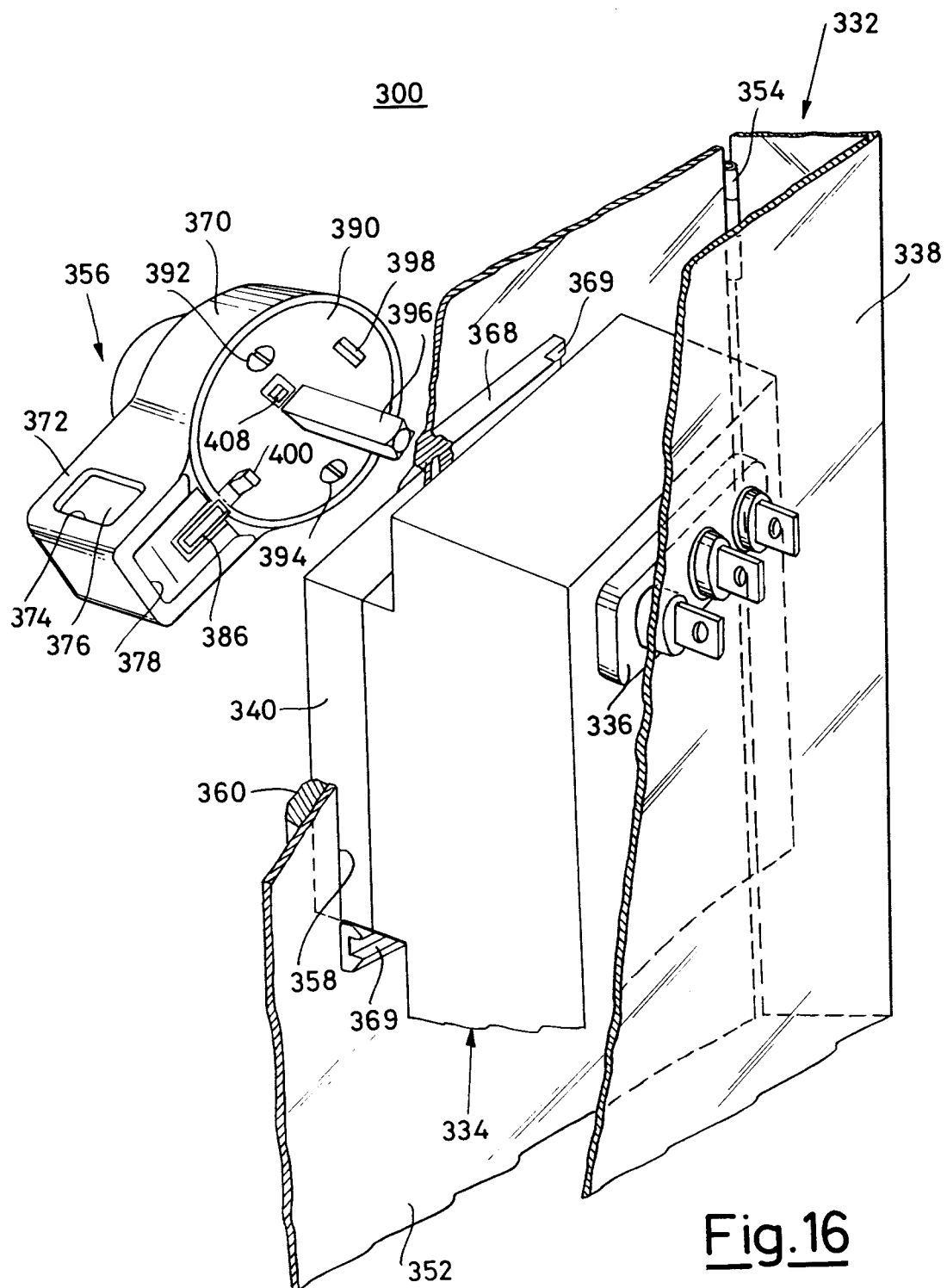
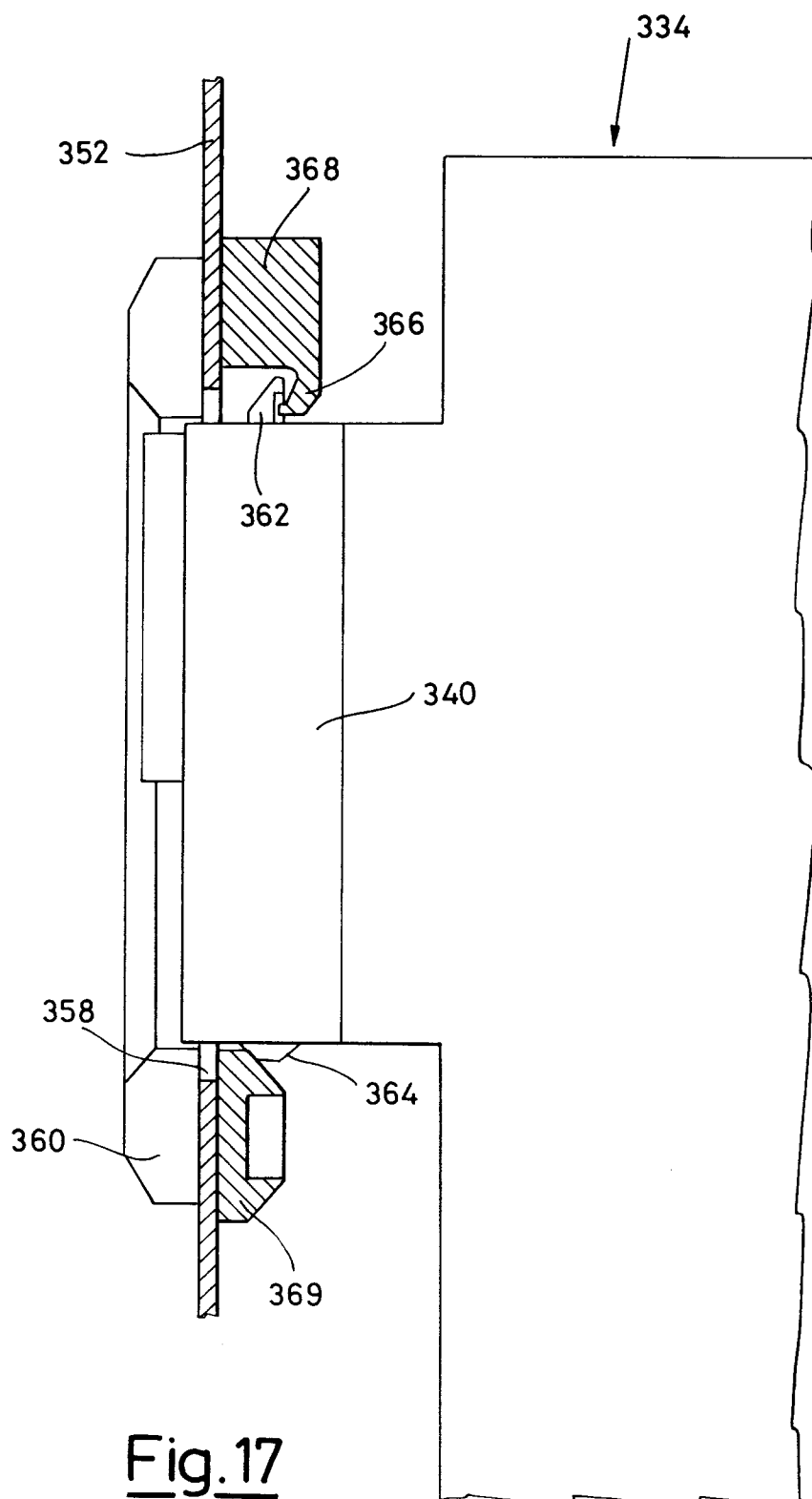


Fig.15





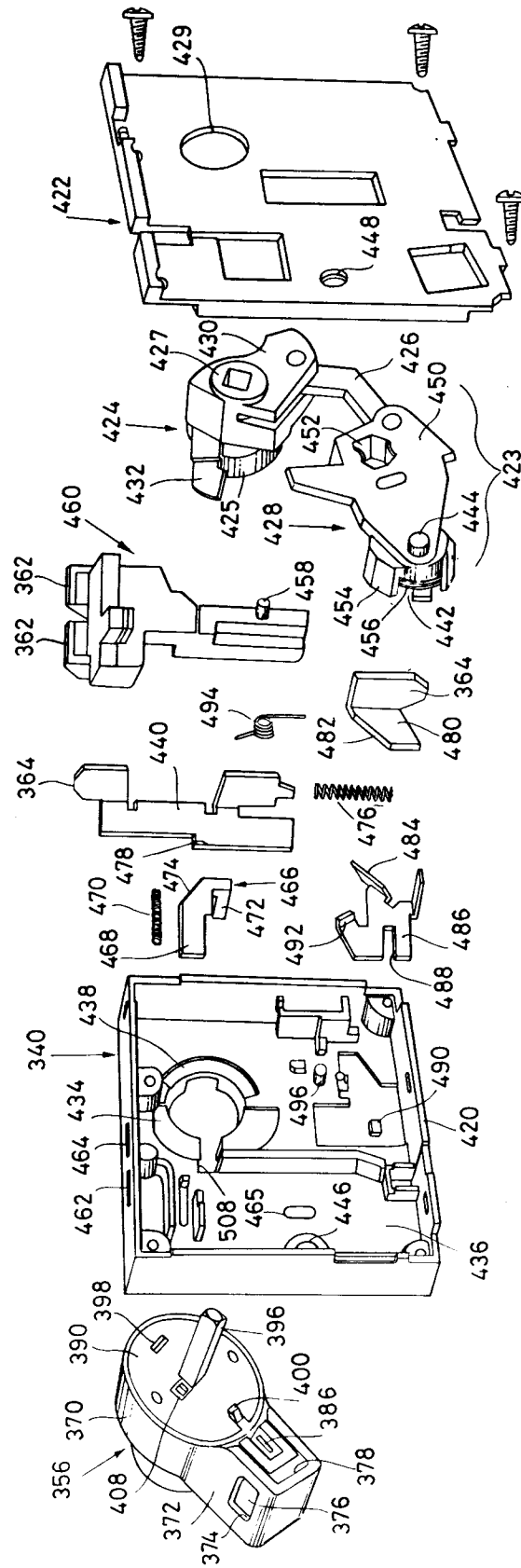


Fig.18

