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(71) Applicant: **Lin, Jui-Chang**
No. 297, Bor-Ay Road
Kaohsiung City(TW)

Applicant: **Liu, Yin-Chic**
No. 96, Section 1 Chih Yu Road
Taipei(TW)

Applicant: **Lee, Jiunn-Kuen**
2F, No. 22, Sublane 13 Lane 512, Min Tzu East Road
Taipei(TW)

(72) Inventor: **Lin, Jui-Chang**
No. 297, Bor-ay Road
Kaohsiung City(TW)

(74) Representative: **LOUIS, PÖHLAU, LOHRENTZ & SEGETH**
Kesslerplatz 1 Postfach 3055
D-8500 Nürnberg-1(DE)

(54) A latch control structure and a latch for electronic locks.

(57) A latch control structure and a latch for an electronic lock, wherein an outside (11) or an inside (23) knob can pull in the dead bolts, the upper (66) and the lower (65), when said button (24) is not turned being kept vertical. But when said button (24) is turned to become horizontal, a blocking tip (451) can block a notch (493) in a rail (49) and a cross bar of a moving base (44) cannot enter said rail for engaging with the grooves of a square shaft (13) of the outside knob (11) so that the outside knob can only turn idle, impossible to open the door without using a correct coded key card, which has to be inserted in a sensor (15) to start a magnetic coil (16) for sucking up said blocking tip so as to pull in the dead bolts by turning the outside knob.

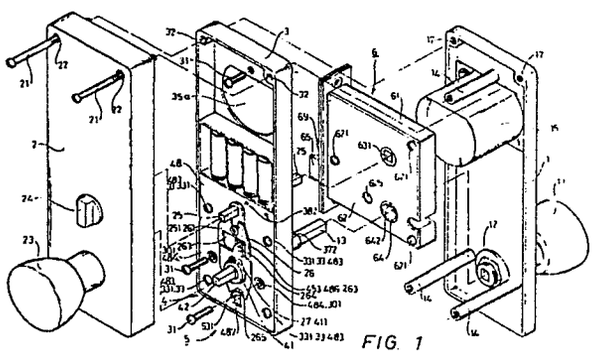

FIG. 1

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A LATCH CONTROL STRUCTURE AND A LATCH FOR ELECTRONIC LOCKS

BACKGROUND OF THE INVENTION

This applicant filed an application entitled " A structure for controlling the dead bolt used in electronic locks " for an American patent with the United States Serial No. 079,418 on July 30, 1987.

The application provides a structure that enables an electronic lock to function not only as an electronic lock necessary to use a coded key card but also as a common lock with the electronic part temporarily kept invalid.

The basic function of the structure is as follows.

1. When the pin of the control plate is moved to the position of "closed", turning the inside knob can open this lock without a coded key card, but turning the outside knob cannot open this lock without the coded key card.

2. When the pin of the control plate is moved to the position of "open", turning either the inside knob or the outside one can open this lock freely and repeatedly without the coded key card.

The main feature of the structure is the function described in Item 2, and it means this lock can function as a common lock with the electronic part temporarily stopped.

The structure includes only one dead bolt, so it has a rather weak protective security against burglary because unlawful thieves can break the lock by sawing the dead bolt or prying open the gap between the door and the door frame with a hard spanner. Therefore, this applicant has newly devised a new latch control structure and a latch for electronic locks in order to reinforce its security against burglary.

SUMMARY OF THE INVENTION

This invention, a latch control structure and a latch for an electronic lock, comprises an outside cover 1 and an outside knob 11, said outside knob 11 turning a square shaft 13. The front end of said square shaft 13 is fixed with an engaging disc 131. Said outside cover 1 is provided with a sensor 15 which gives out a signal to a magnetic coil 16 to work only when a correct coded key card is inserted in; when said magnetic coil works, a blocking plate 45 is to be freed of its control over a moving base 44 so that said base 44 can engage with said engaging disc 131 of said square shaft 13. Then said outside knob 11 can be turned to pull in the dead bolts 65, 66 of a latch 6.

This invention also comprises an inside cover 2 and an inside knob 23, said knob 23 turning a square shaft 42. Said square shaft 42 can directly turn an engaging base 46, which then turns a moving tube 37. Then said moving tube 37 can pull in the dead bolts 65, 66. Said inside cover 2 is provided with a turning button 24, whose turning movement can make the upper dead bolt 66 of the latch 6 automatically extend out for reinforcing the preventing function of this lock against burglary.

BRIEF DESCRIPTION OF THE DRAWINGS

An embodiment of the invention will now be described by way of example and with reference to the accompanying drawings, in which:-

Figure 1 is an exploded perspective of the latch control structure and the latch for electronic locks in accordance with the present invention;

Figures 2-1, 2-2 are detailed explosive views of the latch control structure and the latch for electronic locks in accordance with the present invention;

Figure 3 is a front view of the rail in the latch control structure and the latch for electronic locks in accordance with the present invention;

Figure 4 is a side view of the rail in the latch control structure and the latch for electronic locks in accordance with the present invention;

Figure 5 is a bottom view of the rail in the latch control structure and the latch for electronic locks in accordance with the present invention;

Figure 6 is a front view of the plate in the latch control structure and the latch for electronic locks in accordance with the present invention;

Figure 7 is a side view of the plate in the latch control structure and the latch for electronic locks in accordance with the present invention;

Figure 8 is a cross-sectional view taken along line 8-8 of Figure 9;

Figure 9 is a cross-sectional view taken along line 9-9 of Figure 8;

Figure 10 is a cross-sectional view taken along line 10-10 of Figure 11;

Figure 11 is a cross-sectional view taken along line 11-11 of Figure 10;

Figure 12 is an exploded perspective of the latch for electronic locks in accordance with the present invention;

Figure 13 is a cross-sectional view of the latch for electronic locks set on a door being in the freely openable position in accordance with the present invention;

Figure 14 is a cross-sectional view of the latch for electronic locks set on a door being in the closed position in accordance with the present invention;

Figure 15 is a cross-sectional view of the latch for electronic locks set on a door with the turning button turned in accordance with the present invention;

Figure 16 is a cross-sectional view of the latch for electronic locks set on a door with the turning button turned and the door closed in accordance with the present invention;

Figure 17 is a cross-sectional view of the latch for electronic locks set on a door with the inside or the outside knob being turned to open the door when the door is closed in accordance with the present invention;

Figure 18 is a structural view of the second example of the control wheel in the latch for electronic locks in accordance with the present invention;

Figure 19 is a cross-sectional view of the latch with the second example of the control wheel in the latch for electronic locks set on a door being in the position with the turning button turned and the door closed in accordance with the present invention;

Figure 20 is a cross-sectional view of the latch with the second example of the control wheel in the latch for electronic locks being in the position with the inside or the outside knob being turned to open the door in accordance with the present invention.

DETAILED DESCRIPTION OF THE INVENTION

This new latch control structure and the latch for electronic locks comprises an outside cover 1, an inside cover 2, a basic plate 3, moving parts 4, a security means 5, a latch 6 as its main parts as shown in Figure 1.

The outside cover 1 shown in Figures 1 and 2-2 includes a turnable outside knob 11 provided with a square shaft hole 12 for combining with and moving a square shaft 13. Said square shaft 13 is provided with an engaging disc 131 at one end; said engaging disc 131 is provide with four grooves 132 for a cross bar 441 to engage therein. The outside cover 1 is also provided with three shaft posts 14 for fixing said cover 1 and the basic plate 3 separately on both sides of a door with screws 31 screwing through said plate 3 and in said posts 14. A sensor 15 is provided in the outside cover 1 for identifying a coded key card to start a magnetic coil to make a sucking movement in case of the correct key card discerned. Besides, screw holes 17 are also provided in said cover 1 for combining said cover 1 with the inside cover 2 and the basic plate 3 together with screws 21 inserting through the holes 22, the round holes 32 and said holes 17.

The inside cover 2 to be fixed on the inside surface of the door as shown in Figures 1 and 2-1, is to be assembled together with the outside cover 1 and the basic plate 3 as described above by means of the screws 21. A turnable inside knob 23 is fixed with said cover 2, provided with a square shaft hole 231 for combining and moving a square shaft 42 and with a turning button 24 which has a square shaft hole 241 for the square shaft of a turning plate 25 to engage with so that said plate 25 can be revolved by the turning of said button 24. The square shaft on the other side of said plate 25 penetrates through a shaft hole of a control wheel 631 in the latch 6, so the turning of said button 24 can revolve the control wheel 631. A protruding post 251 in the turning plate 25 sticks in a notch 261 of a plate 26. Said plate 26 shown in Figures 6 and 7 set at the neck of a positioning ring 41 by means of a round hole 262 and a C-shaped ring 27 engaging in a ring groove 411 of said ring 41; so the plate 26 can never fall off its position and swings along the round hole 262. The plate 26 is also provided with an oblong hole 263 and a mountain-shaped protrusion 264 protruding up in said hole 263, said protrusion 264 having sloping edges at both sides and said hole 263 being stuck in by a pin 453 of a blocking plate 45 so that the swinging of said plate 26 can force the pin 453 to move up and down along the two sloping edges of the protrusion 264. A swallowtailed notch 265 is also provided at the bottom of the plate 26, pushing against a curve-faced bar 531 of a replacing plate 53 so that the swinging of the plate 26 forces the bar 531 to go down along the two sloping edges of the notch 265.

The basic plate 3 shown in Figures 1 and 2-2 to be set on the inside surface of the door is provided with four posts 33 to fix a lid 48 on said plate 3 with screws 331 and contains the moving parts 4 inside covered by the lid 48. Said plate 3 is also provided with a round hole 35a for the sensor 15 to extend out, a round hole 35b for the square shaft of the turning plate 25 to penetrate through, a round hole 35c for a positioning ring 36 to engage in as shown in Figure 2-1, said positioning ring 36 also engaging with the engaging base 46 at its inner circular edge so that base 46 can revolve inside said ring 36, round holes 35d for the feet of the magnetic coil 16 to stick in, and round holes

35e for screws 52 to screw in screw holes 511 of a base 51.

A moving tube 37 is provided with four protrusions 371 around its outer edge to engage in the engaging notches 461 of the engaging base 46, two slots 372 for protrusions 642 in the latch 6 to stick in so that the dead bolts of the latch 6 may be moved in case of the turning of the engaging base 46, and the inner circular edge for the square shaft 13 to insert in and to revolve idle therein.

A replacing ring 38 is provided with four protrusions 381 at the inner edge to engage in the engaging notches 461 of the engaging base 46 so that said base 46 can turn said ring 38, four feet 382 for a replacing spring 39 to rest in around said feet 382. Said spring 39 has two ends protruding up and sticking at the both side of a protrusion 34 provided in the basic plate 3; said spring 39 can be compressed with one end moved in case of the turning of the replacing ring 38; said spring 39 can resiliently extend to move said ring 38 back if the force moving said ring 38 disappears and the moving tube 37 and the engaging base 46 are to be moved back by said ring 38 accordingly.

The moving parts 4 shown in Figures 2-1 and 2-2 includes a positioning ring 41, a square shaft 42, a spring 43, a moving base 44, a blocking plate 45, an engaging base 46, a lid 48 and a rail 49.

The positioning ring 41 engages with a round hole 481 of the lid 48 with its neck, and is provided with a ring groove 411 for a C-shaped ring 27 to stick in, and the inside hole for the square shaft 42 to penetrate through and revolve therein. Said square shaft 42 engages with a square shaft hole 231 of the inside knob 23 and is provided with an inside round hole for the spring 43 and the moving base 44 to insert in and a round disc 421 having four slots 422 to engage with four petals 462 of the engaging base 46; then said base 46 can be revolved through the square shaft 42 by turning the inside knob 23.

The spring 43 and the moving base 44 are set between the notches 422 of the square shaft 42 and the petals 462 of the engaging base 46, said moving base 44 being always pressed by the spring 43 such that the cross bar 441 of the moving base 44 always engage with the engaging grooves 463 of the engaging base 46. The upper and the lower parts of the cross bar 441 extend out of the diameter of the engaging base 46 and in addition, the upper part of said bar 441 blocked by a blocking tip 451 of the blocking plate 45 hampers the moving base 44 from reaching the bottom of the engaging grooves 463 of said base 46. The top face of the upper part of said bar 441 is inclined and this inclined face can either move along the slopes 494 of the rail 49 or touch with the inclined face of the blocking tip 451 of the blocking plate 45.

The blocking plate 45 shown in Figure 2-2 is sustained at a post 30 of the basic plate 3 by means of a hole 452 inserted by said post 30, and provided with a blocking tip 451 which can enter a notch 493 of the rail 49. The blocking tip 451 shaped like a reverse triangle can either touch with the inclined face of the upper part of said bar 441 at its inclined face or with either of the two vertical back faces of the upper part of said bar 441. Besides, the blocking plate 45 is provided with a horizontally protruding pin 453 to stick in the hole 263 of the plate 26 so that said pin 453 can be raised up along the two inclined edges of the protrusion 264 so as to move the blocking tip 451 off the notch 493 of the rail 49. Moreover, the blocking plate 45 is made of iron so as to be sucked up by the magnetic coil 16 if said coil 16 gets electricity, and therefore the blocking tip 451 can be moved off the notch 493, too.

The engaging base 46 is provided at one end with four petals 462 to engage with the slots 422 of the square shaft 42, and at the other end with the engaging grooves 461 for the protrusions 371 of the moving tube 37 and the protrusions 381 of the replacing ring 38 to engage with.

The lid 48 is provided with four holes 483 for screws 331 to insert in and in the posts 33 combining said lid 48 with the basic plate 3, a round hole 481 bored corresponding to a round hole 35c in the basic plate 3, two small round holes 482 bored corresponding to the two holes 35d in the basic plate 3, said holes 482, 35d being for fixing the base of the magnetic coil 16, two holes 484 for screws 31 to insert in and through a post 301 of the basic plate 3 and to screw in the shaft post 14 of the outside cover 1, a hole 485 for the square shaft of the turning plate 25 to extend out, a window 486 for the pin 453 of the blocking plate to extend out and a window 487 for a bar 531 of the security means 5 to extend out.

The rail 49 shown in Figures 2-1, 3, 4, and 5 is provided with two round holes 491 to be suspended by two posts 301 of the basic plate 3 and also to be pressed by two springs 492 against said plate 3, and a notch 493 for the upper part of the cross bar 441 of the moving base 44 to pass through, passing of said bar 441 being controlled by the blocking tip 451 of the blocking plate 45. The rail 49 is also provided with a slope 494 separately extending rightward and leftward from the notch 493. When the blocking tip 451 does not occupy the notch 493, the moving base 44 is pressed forward by the spring 43, the cross bar 441 engaging with the grooves 132 of the engaging disc 131; then the inclined face of the upper part of the cross bar 441 enters the notch 493, and said inclined face can slide down along the inside of the

slope 494 and gets off at the cut 495 of the slope 494 if the outside knob 11 or the inside knob 23 is turned. During the moving process of the cross bar 441, the rail 49 gradually presses the spring 492 because of the inclination of the slope 494. When the inclined face of the cross bar 441 gets off the cut 495, the rail 49 moves back minutely pressed by the springs 492, and then said inclined face of said bar 441 moves outside the rail 49. If said knob 11 or 23 is released, the moving base 44 is to be moved back by the engaging base 46, and then said inclined face of said bar 441 is to climb up along the outside of the slope 494 and to enter the notch 493 again, but it can not really enter there, because the blocking tip has already entered there.

The security means 5 shown in Figure 2-2 includes a base 51, a bolt 52 and a replacing plate 53.

The base 51 is provided with two holes 511 for being combined with the basic plate 3 by a screw 52 inserting in the round hole 35e, and two holes 512 for being combined with the replacing plate 53 by a bolt 54 and a nut 55.

The replacing plate 53 is provided with a hole 533 to be penetrated through by a bolt 54 which also penetrates through a spring 56, and said spring 56 pushes against the base 51 at one end and against the bar 531 of the replacing plate 53 at the other. Said bar 531 sticks at the notch 265 of the plate 26, extending through the window in the lid 48. Besides, the replacing plate 53 is also provided with an standing-up arm 532 which leans against the basic plate 3 because of the pressing of the spring 56 and is fitted between the lower part of the cross bar 441 of the moving base 44 and the basic plate 3. Therefore, when the turning button 24 is turned and said plate 53 is also turned, the bar 531 of said plate 53 is to be moved by the notch 265, the arm 532 moving forward to push the moving base 44, the inclined face of the upper part of the cross bar 441 touching and forcing the inclined face of the blocking tip 451 of the blocking plate 45 so that said plate 45 is to be raised up letting the cross bar 441 to move back to the outside of the notch 493 of the rail 49.

The latch 6 shown in Figure 12 comprises a frame plate 61, a lid 62, a turning wheel 63, a moving tube 64, a lower dead bolt 65, an upper dead bolt 66, a moving plate 67, a base 68 and a middle dead bolt 69.

The frame plate 61 shaped square is provided with a sub-faceplate 611 and a face plate 612 at one side. Said sub-faceplate 611 and faceplate 612 are provided with round holes 6111, 6121 for fixing the frame plate 61 on the door with screws, upper dead bolt holes 6112, 6122, lower dead bolt holes 6113, 6123 and middle dead bolt holes 6114, 6124 respectively for the upper, the lower and the middle dead bolts 66, 65, 69 to extend out. The frame plate 61 is also provided with a round hole 613 for the turning wheel 63 to engage with and to revolve therein, a round hole 614 for the moving tube 64 to engage with and to revolve therein, round holes 615 at both sides of the hole 614 for the shaft posts 14 of the electronic lock to penetrate through, a restricting post 6161 to restrict the moving direction of the moving plate 67, a small round hole 617 to fix the base 68, a limiting slot 618 for a pin 633 of the turning wheel 63 to move along, said slot 618 having one end inclining down and its bottom recessed. Besides, said frame plate 61 is also provided with a plate 619 which has a round hole 6191 for a shaft 691 of the middle dead bolt 69 to penetrate through so that said middle dead bolt 69 can move straight according to the middle dead bolt holes 6114, 6124, and the hole 6191, a post 6163 for a hook 635 to hang on and to revolve therein, a post 6164 for one end of a spring 661 to hook at, three posts 6165 for screws 621 to screw in to fix the lid 62, and a post 6166 inserting in the slot 664 in the upper dead bolt 66 and a shaft hole 6361 of a sticking plate 636.

The lid 62 is combined with the frame plate 61 by means of screws 621, holes 622 and posts 6165. The lid 62 is provided with holes 623, 624, 625 corresponding to those in the frame plate 61, said hole 623 corresponding to the hole 613 for supporting the turning wheel 63, said hole 624 corresponding to the hole 614 for supporting the moving tube 64, and said holes 625 corresponding to the holes 615 for the shaft post 14 of the lock to penetrate through. One more hole 626 also provided in the lid 62 is for the base 68 to extend out.

The turning wheel 63 is turnably fitted in the round hole 613 of the frame plate 61 with its outer circular edge, and in its inner circular hole is fitted a control wheel 631 provided with an oval hole 6301 to be inserted by a pin 633 which is also stick in a pin hole 6321 of a connecting plate 632, and a protruding edge 6302 to touch with an arm 671 of the moving plate 67.

The control wheel 631 is fitted in the inner circular hole of the turning wheel 63 with its outer circular edge, but only turns idle in relation to the turning wheel 63 without mutual movement. The control wheel 631 is provided with a square shaft hole to be moved by the turning button 24 of the lock, and a control plate 6311 shaped oval at the lower end and as an eccentrical fan at the upper end and having a stopping edge 6312 at one end of the fan to touch the arm 671 of the moving plate 67.

The connecting plate 632 is provided with two pin holes 6321, 6322, said pin hole 6321 being inserted by a pin 633 which also sticks in an oval hole 6301 of the turning wheel 63, and said pin

hole 6322 being inserted by a pin 634 which also sticks in a pin hole 662 of the upper dead bolt 66.

The pin 633 is provided with a protruding circular edge 6331 at the middle, combining with the connecting plate 632 at one end and penetrating through the oval hole 6301 of the turning wheel 63 at the other end, and also sticking in the limiting slot 618 of the frame plate 61. The pin 633 can move along the limiting slot 618 and go to the recess at the downward inclined end when the turning wheel 63 revolves.

The pin 634 penetrating the connecting plate 632 is riveted at the pin hole 662 of the upper dead bolt 66, but still able to revolve in relation to said plate 632 and said bolt 66.

The hook 635 can pivotally turn with the shaft hole 6351 inserted by a post 6163 and is pressed by one end of a coiled spring 6352, said spring 6352 having the other end pressing the inner wall of the frame plate 61. As Figure 12 shows, the hook 635 can revolve clockwise, and is provided with a stopping tooth 6353 which rests on the inner wall of the frame plate 61 to position the hook 635, and a pointed tooth 6354 set opposite to said tooth 6353 for hooking with a lower notch 663 of the upper dead bolt 66.

The sticking plate 636 sticks on a post 6166 with a shaft hole 6361 so that said plate 636 can pivotally revolve with said post 6166 as a pivot. Said plate 636 is provided at the bottom with a notch 6362 for being stuck by a protruding-up wall 693 of an U-shaped base 692 of the middle dead bolt 69. The movement of said bolt 69, can cause said plate 636 to revolve. Said plate 636 is provided with a protrusion 6363 for sticking in an upper notch 665 of the upper dead bolt 66, an arm 6364 having its free end inclined downward and inward, upper to lower, and a protruding post 6365 to touch the fan-shaped part of the control plate 6311 of the control wheel 631, said inclined face of said arm 6364 resting on the outside of the pointed tooth 6354 of the hook 635.

The turning hook 637 hangs on a post 6162 of the frame plate 61 with a shaft hole, a coiled spring 6372 inserted in by said post 6162 with one end pressing the inner wall of the frame plate 61 and with the other pressing said hook 637. Then, as Figure 12 shows, said hook 637 is always under pressure to turn counter-clockwise, and provided with a notch 6373 either stuck in by the arm 6364 restricting the sticking plate 636 or separating from said arm 6364 so that said sticking plate 636 can revolve.

The moving tube 64 is pivotally fitted at one end in the round hole 614 of the frame plate 61 and also fitted at the other end in the round hole 624 of the lid 62. The circular end of said tube 64 is fitted with the inner circular hole of the positioning ring 641 and nearing the lid 62, the outer circular edge of said ring 641 rests inside the two feet 51 of the lower dead bolt 65. The moving tube 64 is provided with a protrusion 642 on the inner hole surface to engage with the moving tube 37 of the lock so that the turning of the inside or the outside knob can turn said moving tube 64. Said tube 64 is also provided with a fan-shaped plate 643, which has the both ends stuck at the hooks 652 of the feet 651 of the lower dead bolt 65. So no matter clockwise or counter-clockwise said tube 64 may turn, it can pull said bolt 65. In addition, an oval plate 644 is provided in said tube 64, having a long upper straight edge touching the bottom edge 674 of the moving plate 67 so that the turning of said tube 64 can cause said plate 67 to move upward.

The lower dead bolt 65 can extend out of a lower dead bolt holes 6113, 6123, provided with two feet 651 which extend to the both sides of the outer edge of the positioning ring 641 and have a hook at each end separately sticking at each end of the fan-shaped plate 643. A base 68 set between said feet 651 is pressed by one end of a spring 681, the other end of said spring 681 pressing a protrusion 653 of the lower dead bolt 65 so that said bolt 65 is always under pressure to extend out of the lower dead bolt holes 6113, 6123.

The upper dead bolt 66 can extend out of the upper dead bolt holes 6112, 6122, provided with a slot 664 being inserted by the post 6166 so that said bolt 66 may move straight along said slot 664, a hole 666 for one end of a spring 661 to hook at, the other end of said spring 661 hooking at the post 6164 of the frame plate 61 for enabling said bolt 66 to extend out of the upper dead bolt holes 6112, 6122, and a lower notch 663 to be hooked by the pointed tooth 6354 of the hook 635 and an upper notch 665 to be stuck at by the protrusion 6363 of the sticking plate 636 for preventing said bolt 66 from extending out of said holes 6112, 6122. Said bolt 66 extended out cannot be pulled back until the turning wheel 63 is revolved, and is provided with a hole 662 to be linked with the connecting plate 632 by riveting the pin 634 therein.

The moving plate 67 is provided with a slot 672 for the post 6161 to insert, a slot 673 for the post 6162 to insert, said slots 672, 673 having a large hole at the top end so as to fit around the larger part of said posts 6161, 6162. Said plate 67 is also provided with a bottom edge 674 touching the long upper straight edge of the oval plate 644 of the moving tube 64, and an arm 671 touching the stopping edge 6312 of the control wheel 631 so that said plate 67 can cause the turning wheel 63 and the control wheel 631 to revolve by means of its arm 671 in case said plate 67 is moved up by

the turning of said moving tube 64.

The base 68 is fixed on the frame plate 61 by means of a post 682 riveted in the hole 617, extending in between the two feet 651 of the lower dead bolt 65, and provided with a protrusion 683 for one end of the spring 683 to push, the other end of said spring 683 pressing the protrusion 653 of the said bolt 65 so as to put said bolt 65 always under pressure to extend out.

The middle dead bolt 69 can extend out of the middle dead bolt holes 6114, 6124, and is provided with a shaft 691. An U-shaped base 692 set on said shaft 691 such that said base 692 can move thereon, the free end of said shaft 691 penetrating the hole 6191 in the plate 619, the U-shaped base 692 provided with a standing-up wall 693 sticking at the notch 6362 of the sticking plate 636, said shaft 691 provided with a positioning pin 694 and two springs 695, 696 such that said U-shaped base 692 can only move between said bolt 69 and said pin 694, said spring 695 resiliently pressing between said bolt 69 and said base 692, and said spring 696 resiliently pressing between said pin 694 and said plate 619.

Next, the movement of the latch 6 is going to be described.

At first, as shown in Figures 12 and 13, suppose the latch 6 is already set properly on the door, the moving tube 64 penetrated by the moving tube 37, and the turning wheel 63 assembled with the square shaft of the turning plate 25. The door is opened as shown in Figure 13, the turning button 24 not turning the turning wheel 63 yet, and the inside upper edge of the notch 6373 of the said wheel 63 is hooking at the arm 6364 of the sticking plate 636. Under this position, if the knob 11 or 23 does not turn the moving tube 64, the lower dead bolt 65 is extending out of the lower dead bolt holes 6113, 6123 pressed by the spring 681, the middle dead bolt 69 is extending out of the middle dead bolt 69 is extending out of the middle dead bolt holes 6114, 6124, and the sticking plate 636 is receiving the leftward pushing force from the wall 693 of the U-shaped base 692 as the arrow shows so that the protrusion 6363 of said plate 636 goes down to stick in the upper notch 665 of the upper dead bolt 66. Said bolt 66 is hiding inside the upper dead bolt hole 6121, unable to extend out, and the outer inclined edge of the pointed tooth 6354 of the hook 635 keeps touching the arm 6364 and the bottom inclined edge of the end of said bolt 66.

Figures 12 and 14 show this latch is already set on the door, and the door is closed. The lower dead bolt 65 is sticking in the door frame, at first pressed and then pushed by the spring 681 extending out of the lower dead bolt holes 6113, 6123, and in other words, sticking in the lower dead bolt hole 6103 of the restricting board of the door frame. But the middle dead bolt 69 is hiding in the frame plate 61, as there is no hole for said bolt 69 to extend out in the restricting board. Said bolt 69 at first compresses the spring 695 to the largest limit pushing the U-shaped base 692 back, said base 692 pushing the sticking plate 636 to revolve with the post 6166 as a pivot by means of the wall 693. But the arm 6364 of said plate 636 is still hooked by the notch 6373 of the turning hook 637 so that the upward movement of said plate 636 is not enough to separate the protrusion 6363 from the upper notch 665 of the upper dead bolt 66, and said bolt 66 is still impossible to extend out. However, under this position, if the turning button 24 inside the door is revolved to turn the control wheel 631 as shown in Figure 16, the control plate 6311 of the control wheel 631 pushes the turning hook 637 to move nearer to the side wall of the frame plate 61. The turning direction is shown by an arrow on said inner cover 2. Then the turning hook 637 becomes free separated from the sticking plate 636 (at this moment, the stopping edge 6312 of the control wheel 631 touches the arm 671), the sticking plate 636 revolves once more pushed by the spring 695 so that the upper dead bolt 66 can extend out of said bolt holes 6112, 6122 pulled by the spring 661, the protrusion 6363 moving off the upper notch 665. So said bolt 66 becomes sticking in the upper dead bolt hole 6102 of the limiting board 610 of the door frame, and this is an reinforced locking function available for a person inside the door.

Referring to Figures 1 and 13, suppose this latch 6 is already set on the door and the door is opened. Then the turning button 24 inside the door is going to be turned to make the control plate 6311 of the control wheel 631 push the turning hook 637 as shown in Figure 15. At this moment, said hook 637 no longer restricts the arm 6364 of the sticking plate 636, the lower dead bolt 65 and the middle dead bolt 69 still extending out of the holes 6113, 6123, 6114, 6124. And the arm 6364 of the sticking plate 636 still keeps horizontal as the U-shaped base 692 of said bolt 69 is pressed by the spring 696, the protrusion 6363 still sticking in the upper notch 665 of said bolt 66 so that said bolt 66 is impossible to extend out of the holes 6112, 6122.

Then, if the middle dead bolt 69 is pressed back or the door is closed, the backward movement of said bolt 69 compresses at first the spring 695 to delay the U-shaped base 692 in pressing the sticking plate 636 so that the turning movement of said plate 636 takes place later than said bolt 66 touches the restricting board 610 or when said bolt 66 has entered the hole 6102 of said board 610. The turning of said plate 636 separates the protru-

sion 6363 from the upper notch 665 of said bolt 66, said bolt 66, receiving no hampering force, extending out of said holes 6112, 6122 pulled by the spring 661. So to speak, said bolt 66 sticks in the hole 6102 of said board 610, and this is an automatic reinforced locking function available in going out of the door. When said bolt 66 extends out, it pulls outward simultaneously the connecting plate 632 which in order forces the turning wheel 63 to revolve, and then the edge 6302 of said wheel 63 comes to touch the arm 671 of the moving plate 67. But when said bolts 65 and 66 both are extending out as shown in Figure 16 and any knob 23 or 11 is turned, the moving tube 37 can force the moving tube 64 to revolve as shown in Figure 17. Then one end edge of the fan-shaped plate 643 of said tube 64 can press the hook 652 of said bolt 65 so that said bolt 65 is to be pulled inside the frame plate 61. Meanwhile, the long upper straight edge of the oval plate 644 presses the bottom edge 674 of the moving plate 67 at the same time so that said plate 67 moves upward, the arm 671 touching the edge 6302 of the turning wheel 63 and the stopping edge 6312 of the control wheel 631. Therefore, the upward movement of said plate 67 makes said wheel 63 and said wheel 631 both revolve back to their original non-revolving positions; the revolving of said wheel 63 can pull said bolt 66 into the frame plate 61 and that of said wheel 631 can free the turning hook 637 from the pressure of the control plate 6311 of said wheel 631. Then the turning hook 637 moves nearer to the control plate 6311 already returned to its original position, pushed by the spring 6372. At this moment, the door is still closed and the turned knob 11 or 23 is not released yet, so the upper, the middle and the lower dead bolts 66, 69, 65 are all still in the frame plate 61, impossible to extend out. Then the turning force of the knob 11 or 23 enables the upper dead bolt 66 to be pulled inward slightly, and it may be understood by comparing Figure 17 with Figure 13. And the bottom edge of the end of said bolt 66 surpasses the hook 635, which makes the pointed tooth 6354 stick in the lower notch 663 of said bolt 66 by the replacing force of the spring 6352. But when the force turning the knob 11 or 23 disappears and the door is opened as shown in Figure 13, said bolt 65 can automatically extend out of the holes 6113, 6123 by the resilient force of the spring 681, and said bolt 69 can also automatically extend out of the holes 6114, 6124 by means of the spring 695, 696. Besides, the U-shaped base 692 also acquires an outward pushing force to push the sticking plate 636 back to the position shown in Figure 13 and the end slope of the arm 6364 of the sticking plate 636 can push the turning hook 637 to revolve a bit and then to return again so that the arm 6364 can enter the notch 6373 of said hook 637. Then the protrusion 6363 sticks at the upper notch 665 of said bolt 66, said arm 6364 goes down and simultaneously pushes slightly the hook 635 freeing said hook 635 from the lower notch 663 so that said bolt 66 extends out a little further back to the position shown in Figure 13.

Next, various movements and using principles are to be described.

A. Referring to Figures 1, 8 and 9, the turning button 24 is turned vertical. Under this position, the plate 26 becomes also vertical guided by the turning plate 25, the pin 453 stuck in the notch 263 of the plate 26 passing over the protrusion 264, the blocking tip 451 of the blocking plate 45 going up and not hampering the notch 493 of the rail 49, the moving base 44 entering the rail 49 pushed by the spring 43, the cross bar 441 sticking in the engaging grooves 463 and the notches 132 of the square shaft 13. Then this lock is totally unlocked. Under this position,

1. if the inside knob 23 is turned, it turns the engaging base 46 through the square shaft 42, said base 46 turning the moving tube 37, the slot 372 engaging with the protrusion 642 of the moving tube 64. So the lower dead bolt 65 is to be pulled in, and the door is to be opened.

2. if the outside knob 11 is turned, it turns the square shaft 13, which in order revolves the moving base 44 and the engaging base 46 at the same time because of the engaging disc 131 engaging with the cross bar 441. Then said base 46 revolves the moving tube 37, which pulls in the lower dead bolt 65 by means of the slot 372 and the protrusion 642. Then the door is to be opened.

The two kinds of movements just mentioned above show that in case the turning button 24 is not turned the inside knob 23 or the outside knob 11 can open this lock without any limitation.

B. Referring to Figures 1, 10 and 11, suppose the turning button 24 is turned horizontal. Then the plate 26 becomes inclined to a certain angle guided by the turning plate 25, and the pin 453 stuck in the hole 263 falls down to the lowest point of the hole 263. Accordingly, the blocking top 451 of the blocking plate 45 goes down to occupy the notch 493 of the rail 49, and as the turning button 24 turns the plate 26, the notch 265 of the plate 26 pushes down the bar 531 of the replacing plate 53 so that the arm 532 becomes inclined forward pushing outward the cross bar 441. Then the moving base 44 retreats engaging no more with the notches 132 of the square shaft 13, the vertical back of the cross bar 441 and the vertical back of the blocking tip 451 leaning against each other, the moving base 44 becoming unable to enter the rail 49. At this time, the upper and the lower dead bolts

both extends out sticking in the holes of the restricting board 610 of the door frame, making up an reinforced locking function. As for the upper dead bolt 66, it automatical ly extends out only when the door is closed and the middle dead bolt 69 is pressed in. Under this condition,

1. if the inside knob 23 is turned, it turns the engaging base 46 directly through the square shaft 42, said base 46 turning the moving shaft tube 37 which turns pulling in said bolts 66, 65, as mentioned above at the same time. Then the door is to be opened.

2. if the outside knob 11 is turned, it cannot pull in both said bolts 66, 65, because the square shaft 13 does not engage with the cross bar 441 and the engaging base 46 cannot be turned although said shaft 13 is turned by said knob 11. Then the door can not be opened.

3. if a correct coded key card is inserted in the sensor 15 and said sensor 15 identifies the code as satisfactory, electricity is to be supplied to the magnetic coil 16 to suck up the blocking plate 45 for a certain period of time previously set so that the blocking tip 451 can be raised up getting away from the notch 493 of the rail 49 to let the moving base 44 pass through the notch 493 and enter the inside of the rail 49 pushed by the spring 43. Then the cross bar 441 becomes engaging in the notches 132 of the engaging disc 131. Then if the outside knob 11 is turned under this condition, the square shaft 13 turns the moving base 44 by means of the engaging disc 131 and the cross bar 441, said base 44 turning the engaging base 46, said base 46 turning the moving tube 37, said tube 37 causing said bolts 65 and 66 to move in. Then the door is to be opened.

The acting time of the magnetic coil 16 should be be limited, and electricity to said coil 16 must be cut off if that time is up. Then the blocking tip 451 can fall down to occupy the notch 493. Therefore, if the lock is not opened in the limited period of time after the key card is inserted, the action of inserting the card should be repeated to open the lock.

After the outside knob 11 is turned and the limited time is over for electricity to said coil 16, the blocking tip 451 goes down to block the notch 493. Then the moving base 44 has already moved by the knob 11, the upper part of the cross bar 441 slides down along the inside of the slope 494 of the rail 49 and gets off at the cut 495, and climbs up along the outside of the slope 494. (The moving base 44 itself is turned back to the original position by the engaging base 46.) Consequently the cross bar 441 can return to the original position. The latch 6 possesses the function of automatically replacing the turning button 24 to the original position after the knob 11 or 23 is turned. In other words, said button 24 is at the position unlocked again, the lock being free to open as a common cylinder lock.

Figure 18 shows the structure of the second example of a control wheel 631, wherein the stopping edge 6312 in the first example, i.e. that is already described above, is cut off and provided with a slope 6313 instead. When the latch 6 using the second example of a control wheel 631 is set on the door shown in Figure 19 and said control wheel 631 is already turned by the turning button 24, the slope 6313 is situated off the straight moving line of the arm 671 of the moving plate 67; so if the outside knob 11 is turned, the moving tube 64 is moved to pull in the lower dead bolt 65. Besides, although the oval plate 644 of the moving tube 64 can push up the moving plate 67 so that the upper dead bolt 66 can be pulled in by means of the turning wheel 63 moved to return to the original position by the arm 671 of the moving plate 67, said control wheel 631 cannot be revolved and consequently the turning button 24 does not have the function of returning to the original position.

As can be understood in the description, if the first example of a control wheel 631 is used in this latch and the door is opened by turning the knob 11 or 23, the turning button 24 can return to the original position, so the lock is in the unlocked condition, the door being possible to be opened by the outside knob 11 or the inside knob 23.

But if the second example of a control wheel 631 is used in this lock, the turning button 24 cannot be made to return to the original position by the turning of said knob 11 or 23. Therefore, while the said button 24 has not returned to the original position, the plate 26 does not move as shown in Figure 10. Then after the door is closed, the upper dead bolt 66 automatically extends out, and a correct coded key card has to be inserted in the sensor 15 to open the door from the outside, followed by the turning of the knob 11.

This invention comprises, as just described, two kinds of structure for the latch, selectable by a user, and either one is devised to enable both dead bolts, the upper and the lower to extend out so that the lock can be equipped with a reinforced security against burglary.

Claims

1. A latch control structure for an electronic lock comprising;
an outside cover 1 provided with a turnable knob 11, said knob 11 provided with an square shaft hole 12 for a square shaft 13 to combine with for mutual movement, said shaft 13 provided with an

engaging disc 131 to be contained in an engaging base 46, said base 46 being able to be turned by the turning of said knob 11, and cover 1 also provided with a sensor 15 to identify a correct coded key card and to furnish electricity to a megnetic coil 16 for sucking;

an inside cover 2 provided with a turnable knob 23, said knob 23 provided with an square shaft hole 231 for a square shaft 42 of the moving parts 4 to combine with for mutual movement, said cover 2 also provided with a turning button 24 which has an square shaft hole 241 for revolving a turning plate 25, said plate 25 provided with a post 251 to move a plate 26, said plate 26 provided with a hole 263 which is set with a mountain-shaped protrusion 264, said hole 263 being for a pin 453 of a blocking plate 45 to insert in, and said plate 26 provided with a swallowtailed notch 265 for a bar 531 of a replacing plate 53 to stick in;

a basic plate 3 provided with a round hole 35c for a square shaft 13 to penetrate and to combine with a square shaft 42, a moving base 44, an engaging base 46, a moving tube 37 and a replacing ring 38, said hole 35c corresponding to the square shaft holes 231, 12 of the knobs 23, 11 said plate 3 also provided with posts 301 for fixing a rail 49, said rail 49 provided with a notch 493 which is able to be blocked by blocking tip 451 of a blocking plate 45, said blocking plate 45 being able to be sucked up by a magnetic coil 16;

moving parts 4 comprising a positioning ring 41, a square shaft 42, a spring 43, a moving base 44, a blocking plate 45, an engaging base 46, a lid 48 and a rail 49;

a security means 5 provided with a base 51 fixed on the basic plate 3 with screws 52, said base 51 provided with a replacing plate 53 which has a bar 531 to stick at the notch 265 of the plate 26 and an arm 532 extending between the basic plate 3 and the lower part of the cross bar 441 of the moving base 44;

a latch 6 provided with a moving tube 64, said tube 64 provided with an inside protrusion 641 sticking in a slot 372 of the moving tube 37 for mutual turning so as to pull in a lower dead bolt 65; and

features that when the turning button 24 is not turned, the plate 26 is kept vertical, the pin 453 of the blocking plate 45 sticking in the top of the protrusion 264 of the plate 26, the blocking tip 451 of the blocking plate 45 not blocking the notch 493 of the rail 49 so that the moving base 44 can enter the rail 49 to engage with the notches 132 of the square shaft 13 of the outside knob 11, and if the inside knob 23 or the outside knob 11 is turned then, the engaging base 46 and the moving tube 37 are revolved, said tube 37 revolving to pull in the lower dead bolt 65 of the latch 6, and that when the turning button 24 is turned the outside knob 11 can only turn idle, impossible to revolve the engaging base 46, because the pin 453 of the blocking plate 451 goes down to the lowest point of the hole 263 by the turning of the plate 26, the blocking tip 451 blocking the notch 493 of the rail 49, and the moving base 44 unable to enter the rail 49 for engaging with the notches 132 of the square shaft 13.

2. The latch control structure for an electronic lock as claimed in Claim 1, wherein the plate 26 to be moved by the turning button 24 is provided with a swallowtailed notch 265 for the bar 531 of the replacing plate 53 of the security means 5 to stick at, and with two sides inclined inward and downward such that if the plate 26 revolves and the notch 265 or the two inclined sides pushes the bar 531, the replacing plate 53 can be inclined forward to push the moving base 44 to the outside of the rail 49, said plate 53 having an arm 532 extending behind the lower part of the cross bar 441 of the moving base 44.

3. The latch control structure for an electronic lock as claimed in Claim 1, wherein the plate 26 is provided with a hole 263 which has a mountain-shaped protrusion 264, said hole 263 being for a pin 453 of the blocking plate 45 to stick in so that if the plate 26 revolves the two inclined edges of the protrusion 264 can push the pin 453 of the blocking plate 45.

4. The latch control structure for an electronic lock as claimed in Claim 1, wherein the moving parts 4 comprise;

a positioning ring 41 fitting in a round hole 481 of a lid 48 with its outer circular edge and containing the engaging base 46 turnable in its inner hole;

a square shaft 42 fitting in the square shaft hole 231 of the inside knob 23 with its square outer edge and containing a spring 43 and the moving base 44 in its round inner hole, and provided with a round disc 421 having slots 422 for the petals 462 of the engaging base 46 to engage in;

a spring 43 being placed in the round inner hole of the square shaft 42 for always pushing outward the moving base 44;

a moving base 44 provided with a round bar to insert in the round inner hole of the square shaft 42, a cross bar 441 always engaging with the engaging grooves 463 of the engaging base 46, the upper part of said cross bar 441 being longer than the diameter of the engaging base 46 and protruding up and provided with an inclined face for touching with the inclined face of the blocking tip 451 of the blocking plate 45;

an engaging base 46 shaped as a round cylinder and provided with four engaging grooves 461 at the right side and four engaging grooves 463 at the left side, said grooves 461 being for combining the tube 37, the replacing ring 38 and a positioning

spring 39, and said grooves 463 being for the cross bar 441 of the moving base 44 to engage with;

a moving tube 37 provided with protrusions 371 to engage with the engaging grooves 461 and a slot 372 for a protrusion 641 of the moving tube 64 to insert in so as to pull the lower dead bolt 65;

a replacing ring 38 provided with protrusions 381 to engage with the engaging grooves 461 of the engaging base 46 and feet 382 for placing a positioning spring 39 inside around, one of said feet 382 being hooked by one foot of the spring 39;

a positioning spring 39 having two ends sticking separately in two groove 341 of a protrusion 34, one foot being able to be moved by a foot 382 of the replacing ring 38 which can be turned to tighten the spring 39 and be moved to regain its original position by automatic straightening of the spring 39;

a square shaft 13 set in the square shaft hole 12 of the outside knob 11, and provided with an engaging disc 131 at its front end, said engaging disc 131 being contained in the engaging base 46 and provided with engaging grooves 132 for the cross bar 441 to stick in, and said grooves 132 corresponding to the engaging grooves 463 of the engaging base 46;

a lid 48 being fixed on the basic plate 3 with screws 331;

a rail 49 provided with a round hole 491 at each end, a notch 493 at the middle and a cut 495 at both sides, fixed on the post 301 of the basic plate 3 and pressed against said plate 3 by means of springs 492;

a blocking plate 45 provided with a blocking tip tip 451, a pin 453 and a hole 452 for being set pivotally on a post 30 of the base plate 3; and

features that when the inside knob 23 is turned, it can orderly revolves the square shaft 42, the moving base 44 and the engaging base 46, that the upper part of the cross bar 441 of the moving base 44 can be hampered by the blocking tip 451 of the blocking plate 45 so that the cross bar 441 is impossible to engage with the engaging disc 131, and the outside knob 11 can only turn idle together with said disc 131, and that when the upper part of said bar 441 is not hampered by the blocking tip 451, said cross bar 441 can enter the notch 493 of the rail 49 and engages with the engaging grooves 132 of said disc 131, and therefore, if the outside knob 11 is turned, it can revolve in order said disc 131, the moving base 44, the upper part of the cross bar 441 moving along the inside of the slope 494, the rail 49 moving forward compressing the springs 492, siaid springs 492 recovering to push said rail 49 back when said cross bar 441 comes to the cut 495 at the end of the slope 494, no longer pressing said rail 49, said cross bar 441 moving to the outside of the slope 494, and said moving base 44 revolving in reverse and moving along the outside of the slope 494 and coming to the notch 493 by the recovering force of the knob 23 or 11.

5. The latch control structure for an electronic lock as claimed in Claim 1, wherein the blocking plate 45 is provided with a blocking tip 451 extending downward and a pin 453, said tip 451 provided with an inclined face to correspond with the inclined face of the upper part of the cross bar 441 of the moving base 44, both said inclined faces touching each other when said tip 451 and said bar 441 hook each other and both the vertical backs touching each other when said tip 451 and the said bar 441 separate from each other, said pin 453 sticking in the hole 263 of the plate 27.

6. A latch comprising;

a frame plate 61 provided with a face-plate 612 and a sub-faceplate 611 bored with upper dead bolt holes 6122, 6112, middle dead bolt holes 6124, 6114 and lower dead bolt holes 6123, 6113 respectively for an upper, a middle and a lower dead bolt to extend in or out;

a lower dead bolt 65 provided with two feet 651, said feet 651 having a hook 652 at their free ends for a fan-shaped plate 643 of a moving tube 64 to pull, said tube 64 turning and pushing at the same time a bottom edge 674 of a moving plate 67 with the upper long straight edge of an oval plate 644 so that said plate 67 can move straight up, said plate 67 provided with an arm 671 which can touch an edge 6302 of a turning wheel 63 and a stopping edge 6312 of a control wheel 631 so that said wheel 63 and said wheel 631 may revolve, said wheel 631 being turnably fitted in the inner hole of said wheel 63 without mutual movement, said wheel 631 provided with a control plate 6311 which can push a turning hook 637 in case of the turning of said wheel 631, said hook 637 provided with a notch 6373 for an arm 6364 of a sticking plate 636 to pass through, said notch 6373 being separated from said arm 6364 in case said plate 6311 pushes revolving said hook 737, said hook 737 recovering its position pushed by a coiled spring 6372 and said notch 6373 confining said arm 6364 again in case said wheel 631 is revolved back to its position, said sticking plate 636 provided with a hole 6361 to be supported by a post 6166 of the frame plate 61 and with a notch 6362 at the bottom for a wall 693 of an U-shaped base 692 to stick at and with a protrusion 6363 to stick at an upper notch 665 of the upper dead bolt 66, said frame plate 61 provided with a hook 635 attached with a coiled spring 6352, and said hook 635 provided with a pointed tooth 6354 either pushing said arm 6364 or sticking in a lower notch 663 of the upper dead bolt 66;

an upper dead bolt 66 provided with a slot 664, a

hole 662 and a coiled spring 661, said slot 664 inserted and confined by a post 6166 of the frame plate 61 so that said bolt 66 can only move straight horizontally, said hole 662 hooked at by one end of said spring 661 which has its other end hooked at a post 6164 of the frame plate 61 so as to give said bolt 66 a force to extend out;
a middle dead bolt 69 provided with a long shaft 691, an U-shaped base 692, a positioning pin 694 and two coiled springs 695, 696, said shaft 691 penetrating through a round hole 6191 of a plate 619 set on the frame plate 61, said U-shaped base 692 and said pin 694 set on said shaft 661, said spring 695 set between said base 692 and said bolt 69, said spring 696 set between said pin 694 and said plate 619, said bolt 69 always extending out of said frame plate 61 when it is not hampered and said sticking plate 636 being pushed to revolve by a wall 693 of said U-shaped base 692 when said bolt 69 is pulled in.

7. The latch as claimed in Claim 6, wherein the moving tube 64 is provided with a fan-shaped plate 643 for pushing in the lower dead bolt 65 by means of two end edges of said plate 643, and with an oval plate 644 whose upper straight edge touches the bottom edge 674 of the moving plate 67, and said tube 64 can push the moving plate 67 to move upward while it revolves.

8. The latch as claimed in Claim 6, wherein the moving plate 67 is provided with an arm 671 which can touch the edge 6302 of the turning wheel 63 and the stopping edge 6312 of the control wheel 631 so that the upward movement of said plate 67 can push said turning wheel 63 and control wheel 631 to revolve.

9. The latch as claimed in Claim 6, wherein the middle dead bolt 69 is provided with a long shaft 691, an U-shaped base 692 and a positioning pin 694, said shaft 691 penetrating through a hole 6191 of a plate 619, a spring 695 being set between said U-shaped base 692 and said bolt 69 and a spring 696 set between said pin 694 and the plate 619.

10. The latch as claimed in Claim 6, wherein the sticking plate 636 is provided with a hole 6361, a notch 6362, a protrusion 6363 and an arm 6364, said hole 6361 being for being supported on a post 6166 of the frame plate 61 such that said plate 636 can pivotally turn with the post 6166 as a pivot, said notch 6362 being for a wall edge of the U-shaped base 692 to stick in such that the movement of said middle dead bolt 69 can turn said plate 636, said protrusion 6363 being able to stick in the upper notch 665 of the upper dead bolt 66, said arm 6364 having a downward and inward inclined face at its end for pressing the turning hook 637 in case of the down movement of said plate 636 such that the arm 6364 can enter the notch 6373 of the turning hook 637 and the inclined face of the arm 6364 can press back the pointed tooth 6354 of the hook 635 such that siaid tooth 6354 retreats out of the moving scope of the lower notch 663 of the upper dead bolt 66.

11. The latch as claimed in Claim 6, wherein the turning wheel 63 is provided with an inner circular edge for combining a control wheel 631 without mutual movement, said control wheel 631 being able to be revolved by the turning button 24 of an electronic lock so that the control plate 6311 of said control wheel 631 can push the turning hook 637 to revolve and the notch 6373 of said hook 637 can be separated from the arm 6364 of the sticking plate 636 accordingly.

12. The latch as claimed in Claim 6, wherein the upper dead bolt 66 is provided with a slot 664, a hole 666, an upper notch 665 and a lower notch 663, said slot 664 being movably inserted in by a post 6166, said hole 666 being for one end of a spring 661 to hook at, said spring 661 having the other end hooking at a post 6164 of the frame plate 61 so that said bolt 66 always has a force to extend out, said upper notch 665 being for a protrusion 6363 of the sticking plate 636 to stick in or said lower dead bolt 65 being for a pointed tooth 6354 of the hook 635 to hook at so as to prevent said upper dead bolt 66 from extending out.

13. The latch as claimed in Claim 6, wherein the upper dead bolt 66 is provided with an inclined face at the end bottom, said inclined face can push down the pointed tooth 6354 of the hook 635 when said bolt 66 is pulled in by said wheel 63 so that said tooth 6354 can enter the lower notch 663 of said bolt 66.

14. The latch as claimed in Claim 6, wherein the control wheel 631 is provided with a slope 6313 which is kept at the position outside the straight moving line of the arm 671 of the moving plate 67 when said wheel 631 is turned by the turning button 24 so that the upward movement of said plate 67 cannot push back said wheel 631 to its original position.

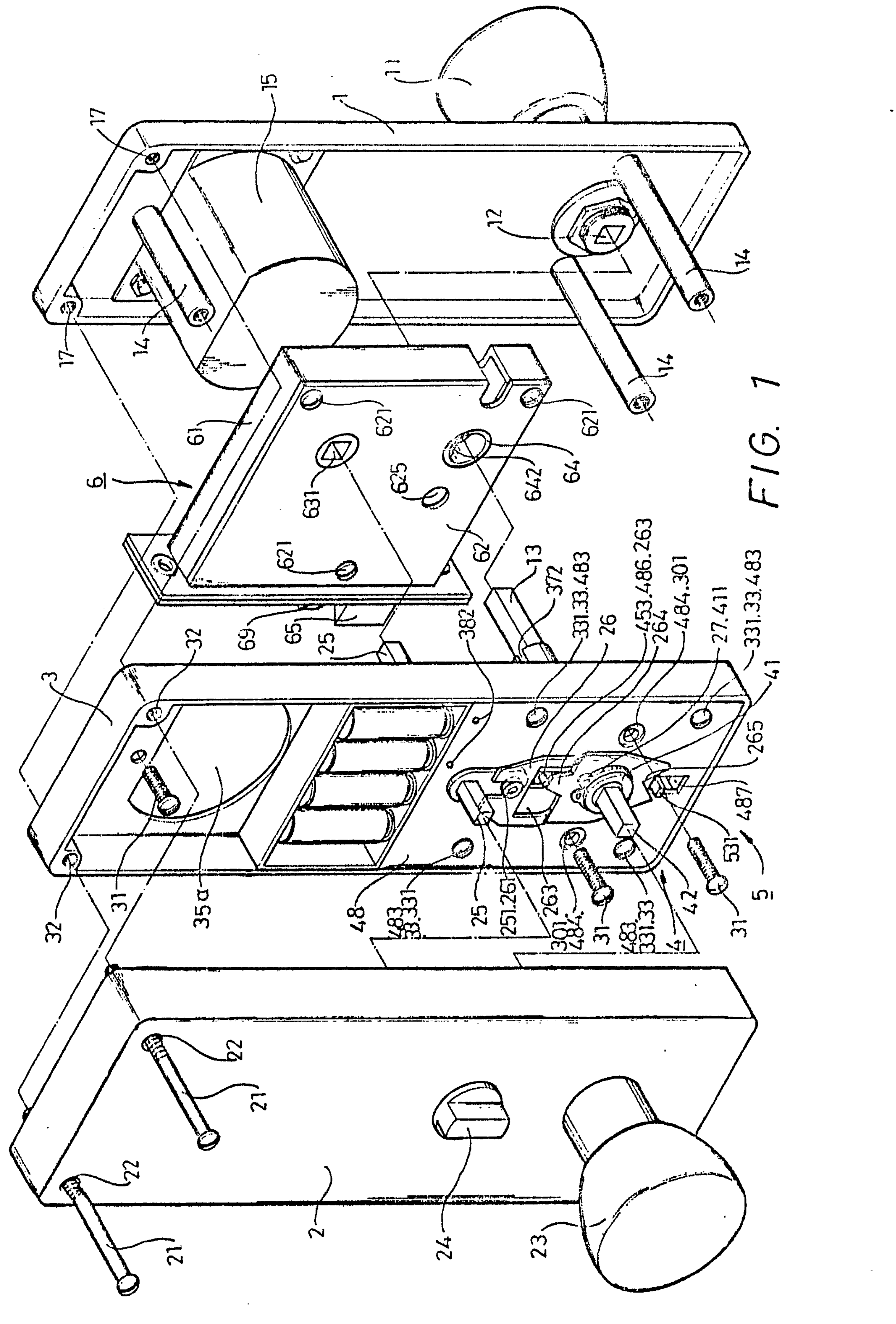
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FIG. 1

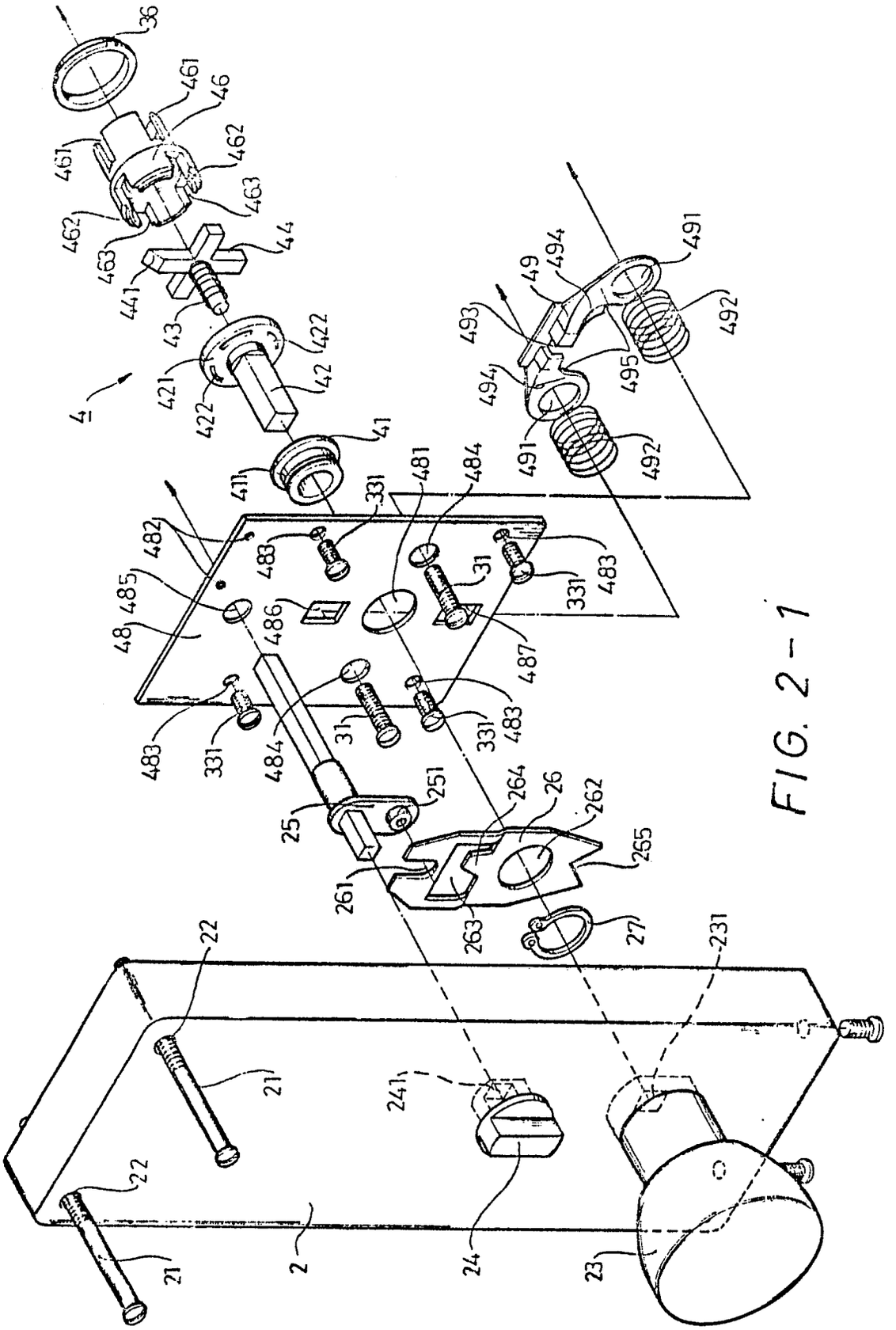
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FIG. 2-1

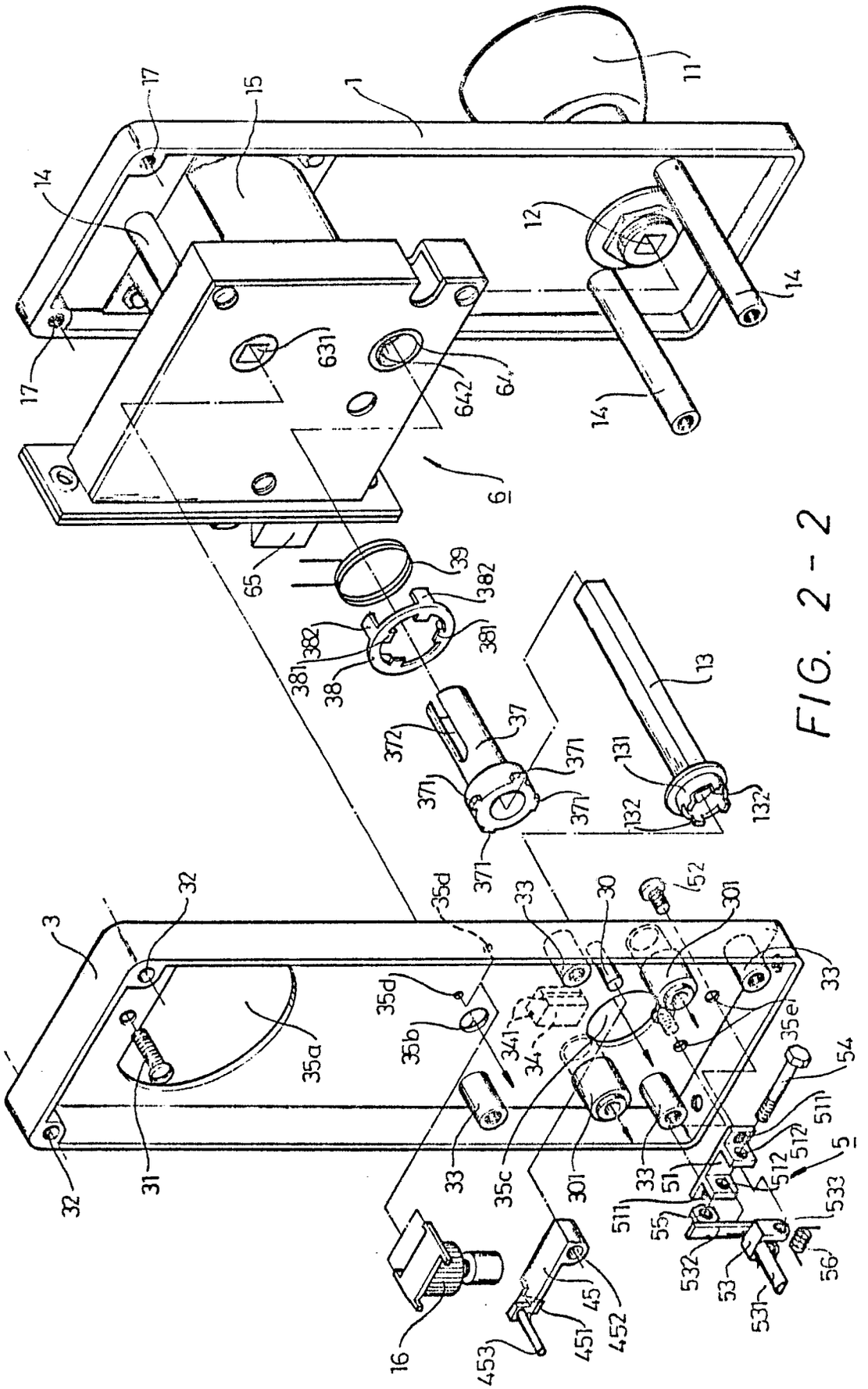
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FIG. 2 - 2

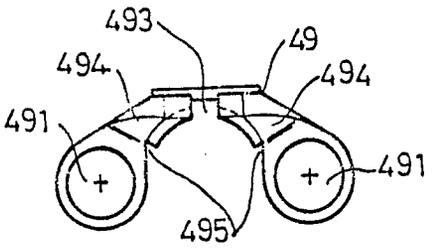

FIG. 3

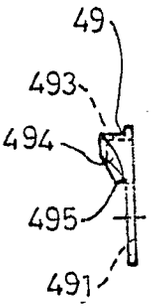

FIG. 4

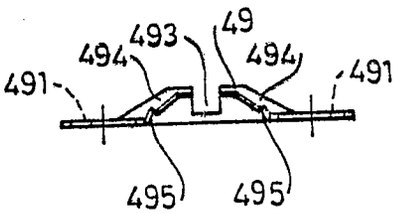

FIG. 5

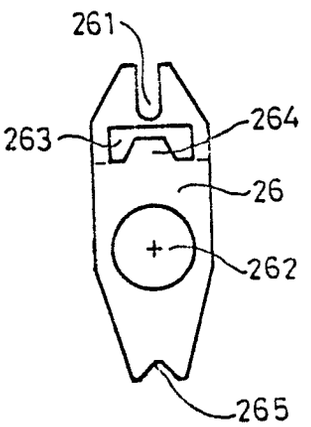

FIG. 6

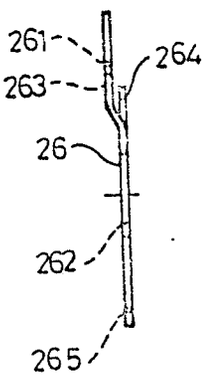

FIG. 7

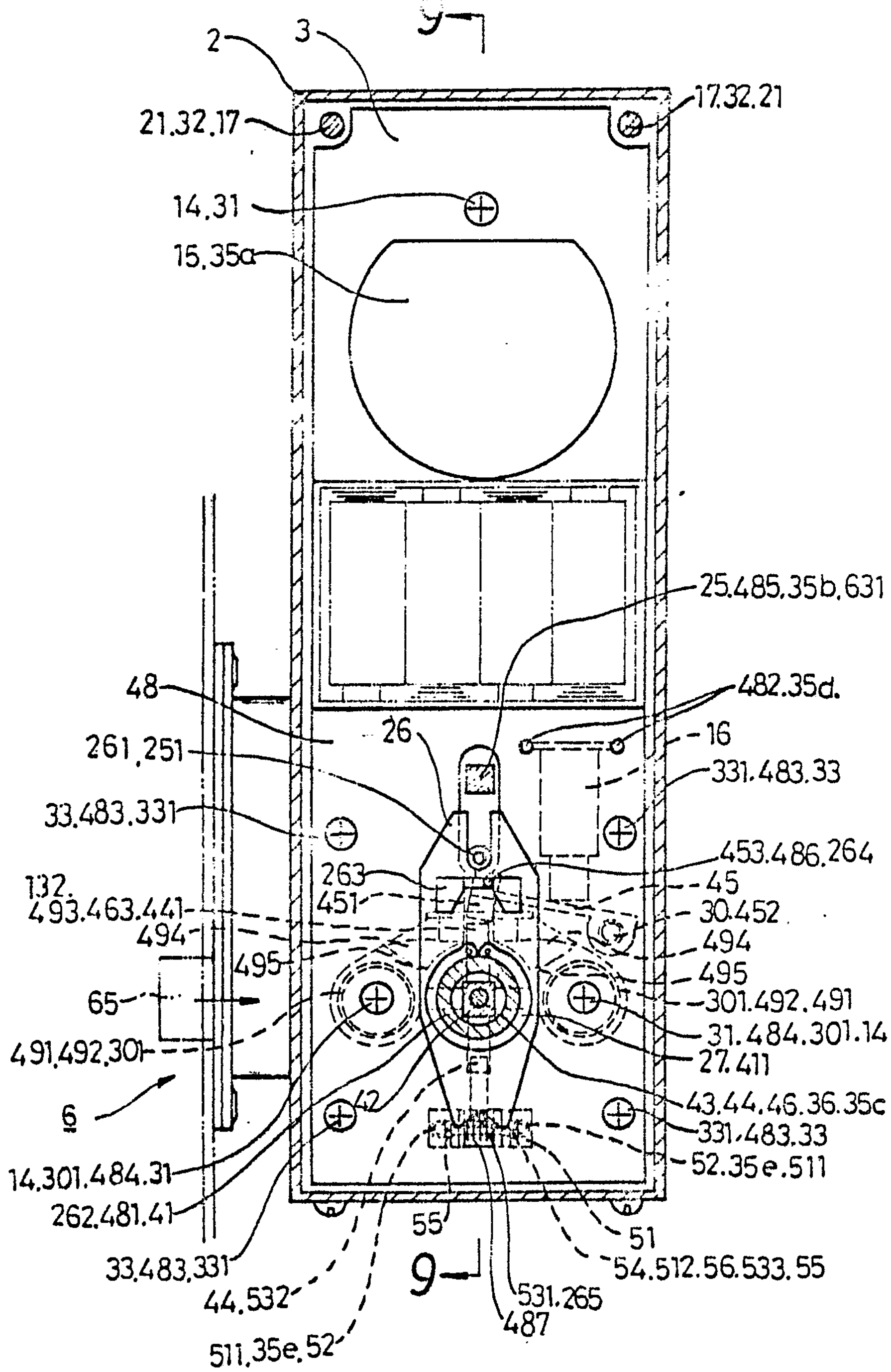
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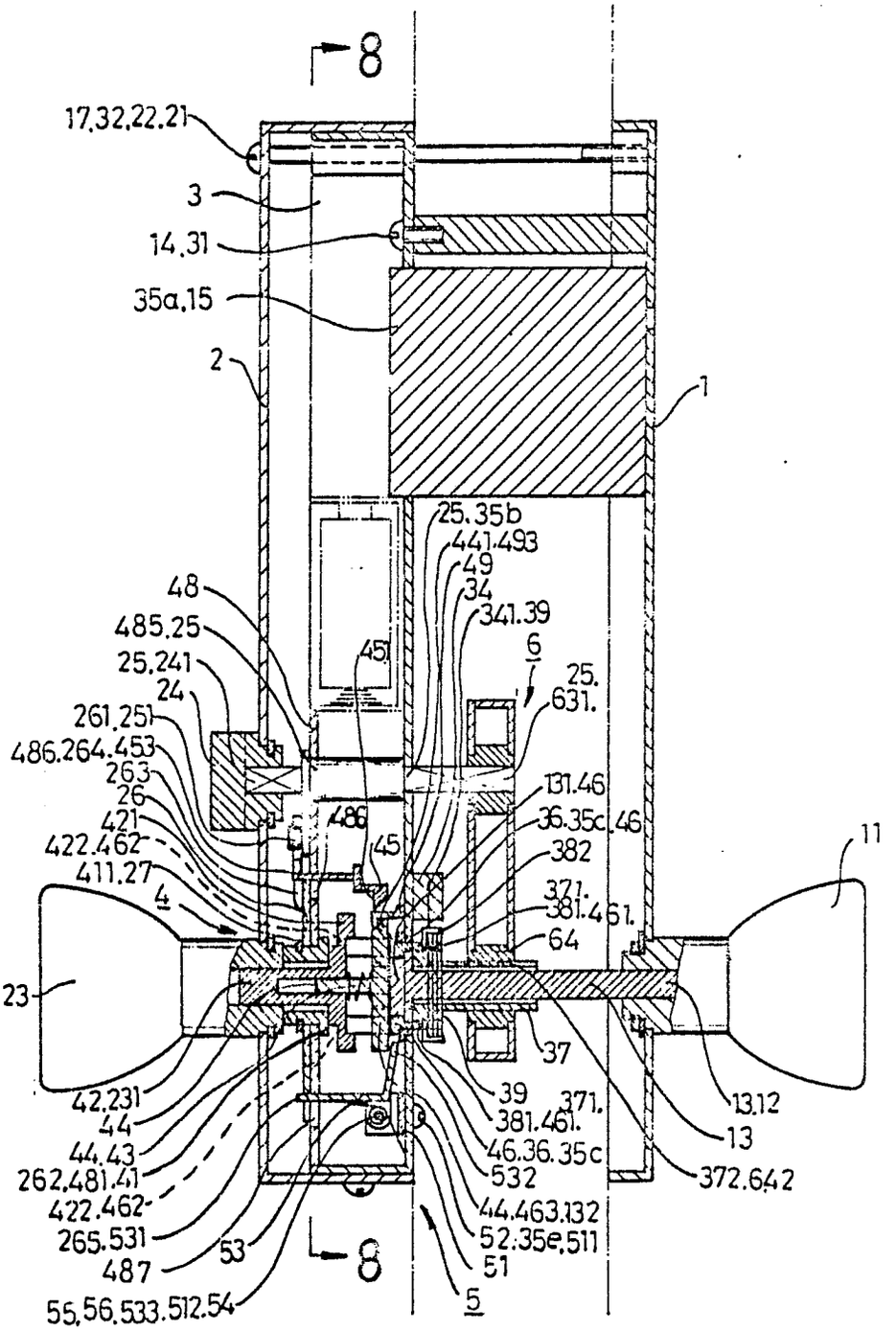
FIG. 8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48
485,25
25,241
24
261,251
486,264,453
263
26
421
422,462
411,27
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451
486
45
131,46
36,35c,46
382
371,
381,461,
64
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23
37
42,231
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44,43
262,481,41
422,462
265,531
487
55,56,533,512,54
53
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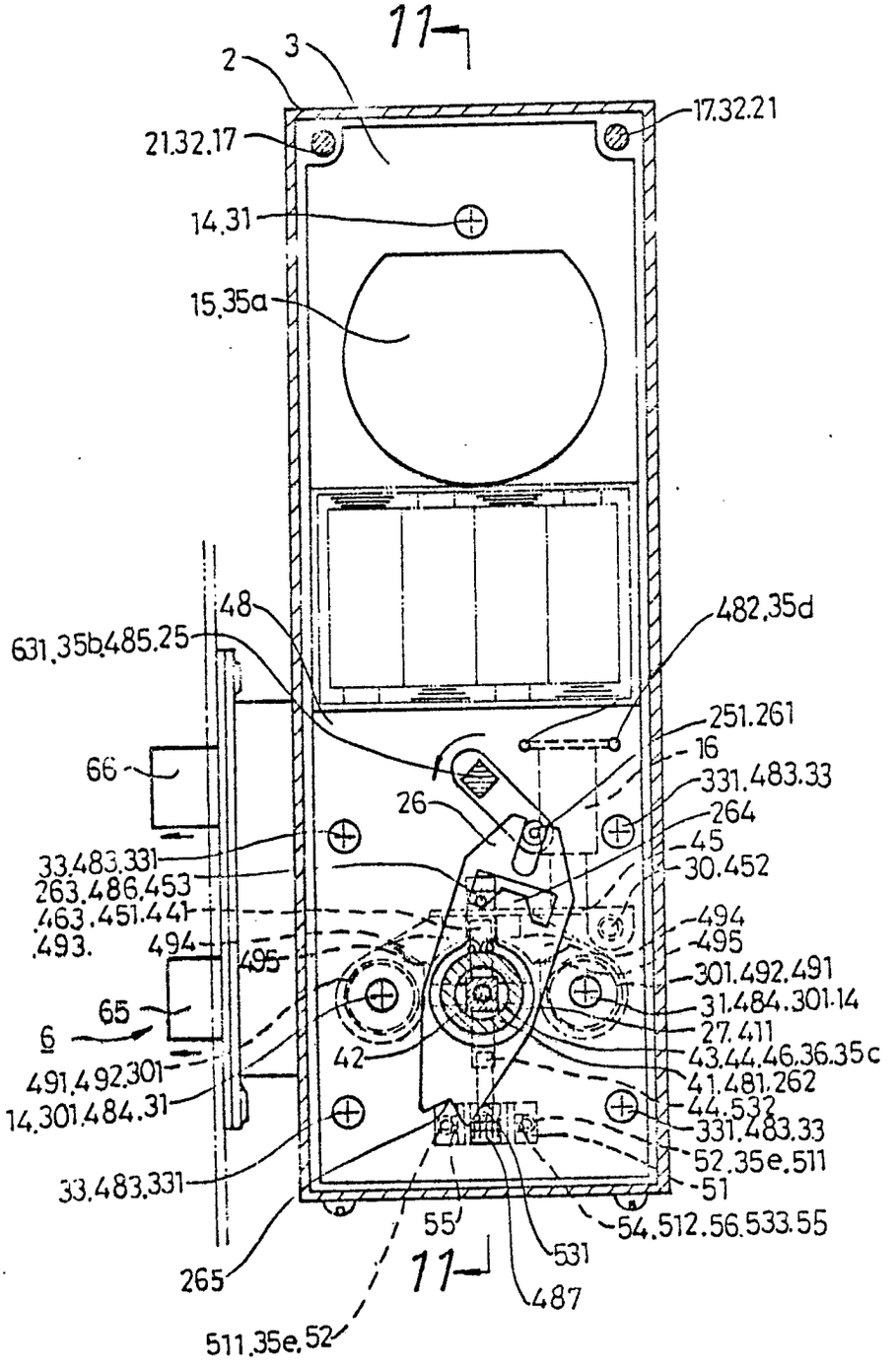
372,642

FIG. 9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264
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30.452
66
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263.486.453
463.451.441
493.
494
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301.492.491
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27.411
43.44.46.36.35c
41.481.262
44.532
331.483.33
52.35e.511
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54.512.56.533.55
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14.301.484.31
33.483.331
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511.35e.52
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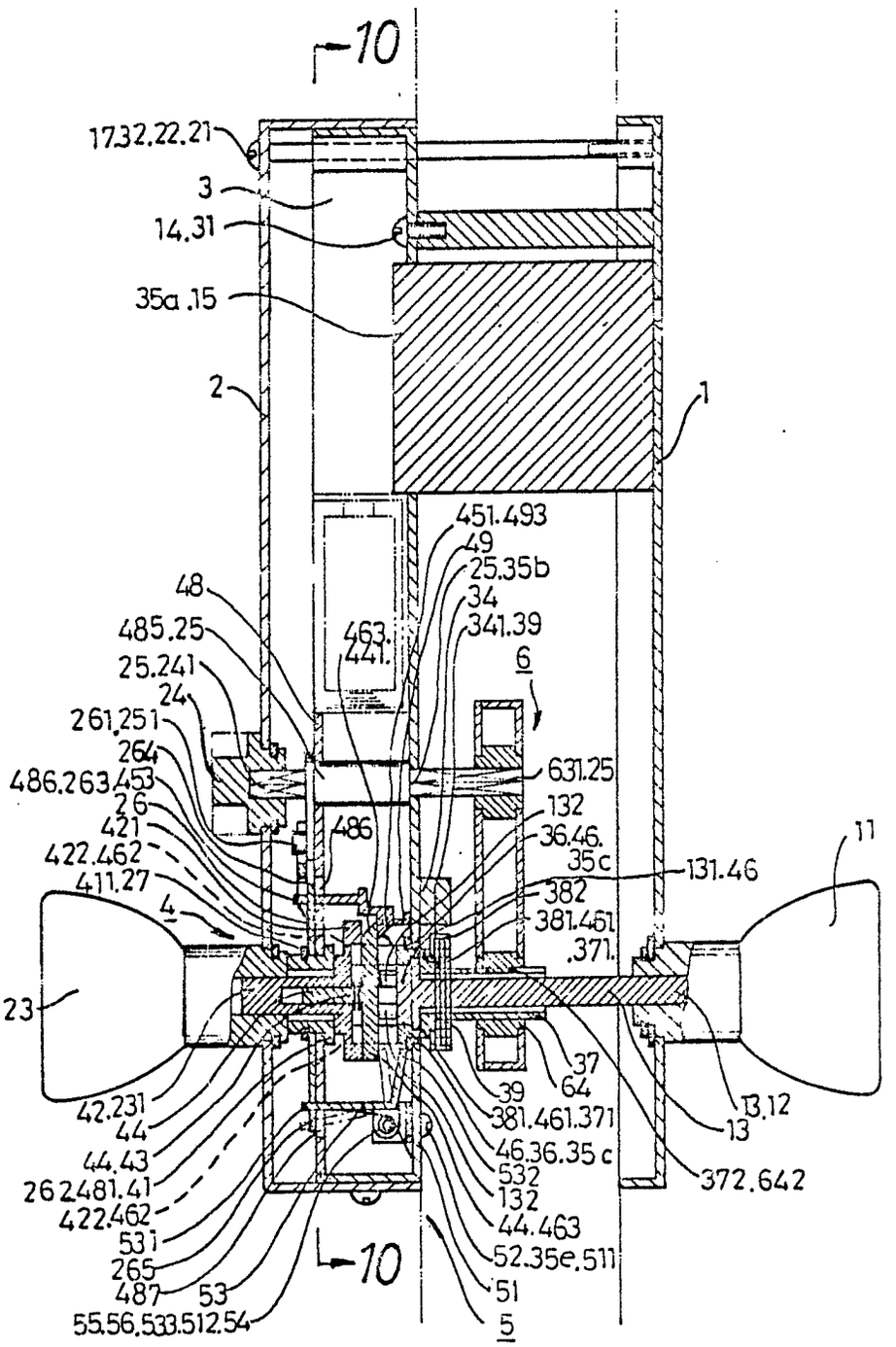
FIG. 10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485.25
463.
441.
25.241
24
261.251
264
486.263.453
26
421
422.462
411.27
4
631.25
132
36.46.
35c
131.46
11
382
381.461
.371.
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381.461.371
13.12
13
46.36.35c
372.642
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52.35e.511
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FIG. 11

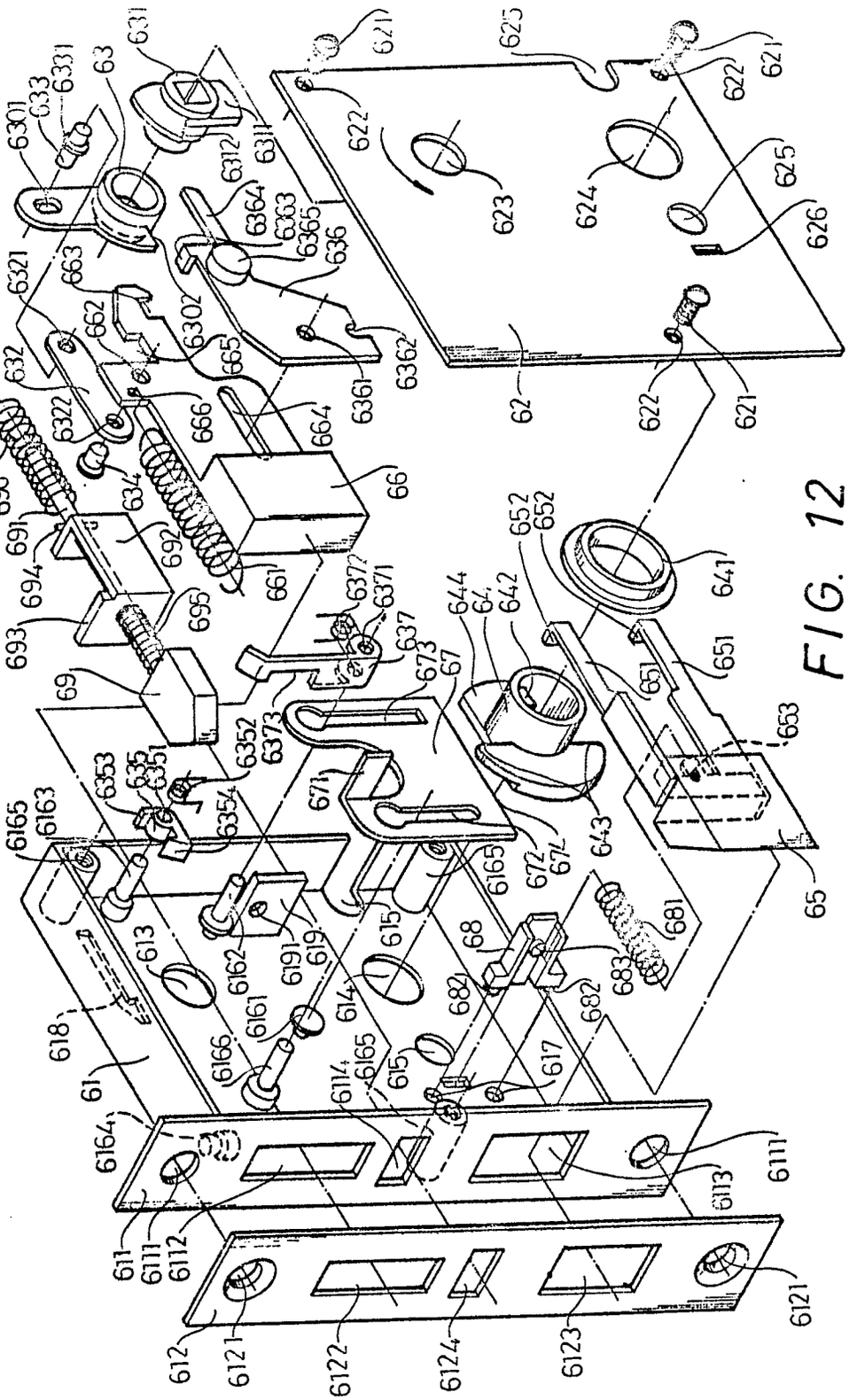

FIG. 12

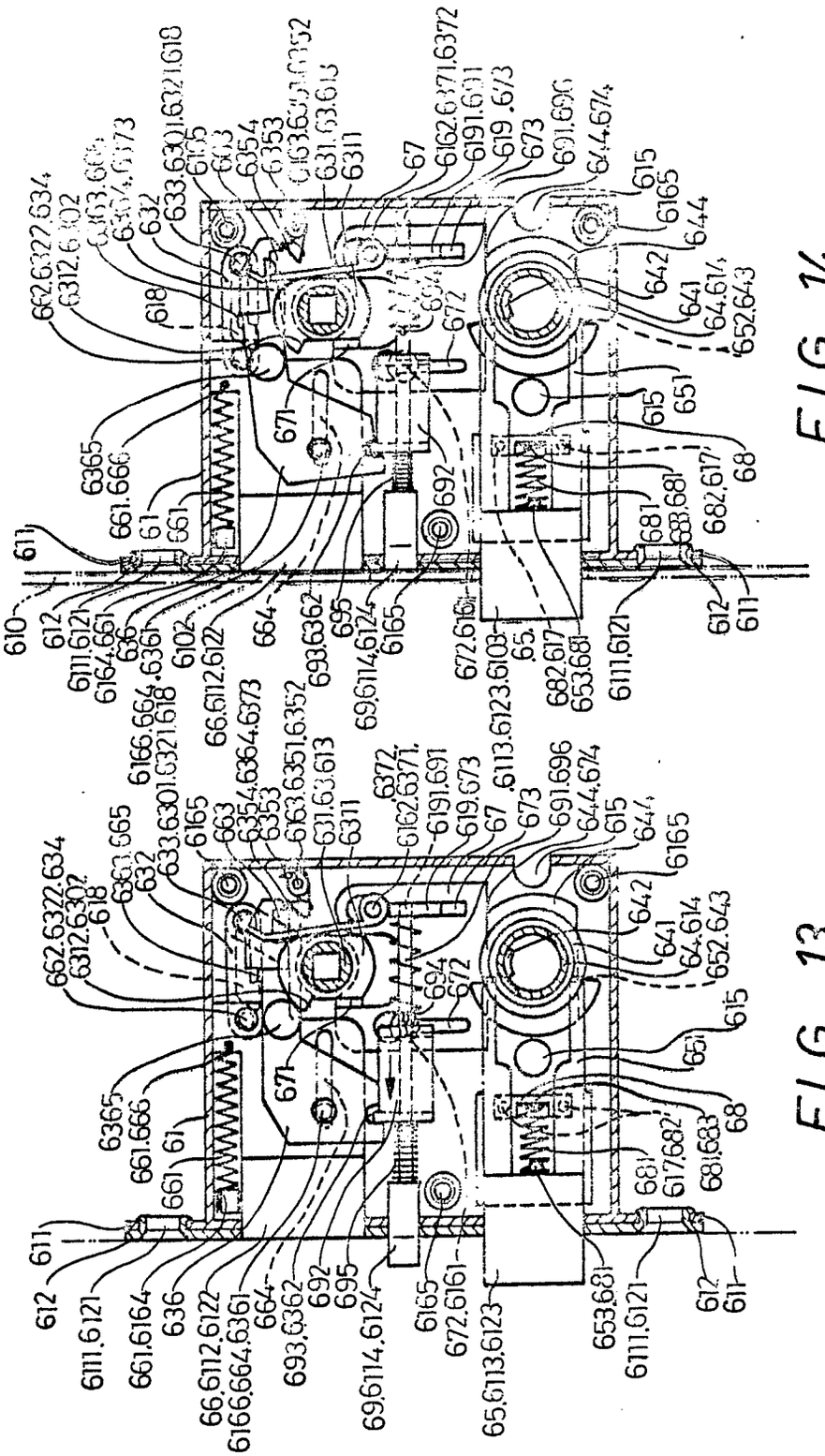

FIG. 13

FIG. 14

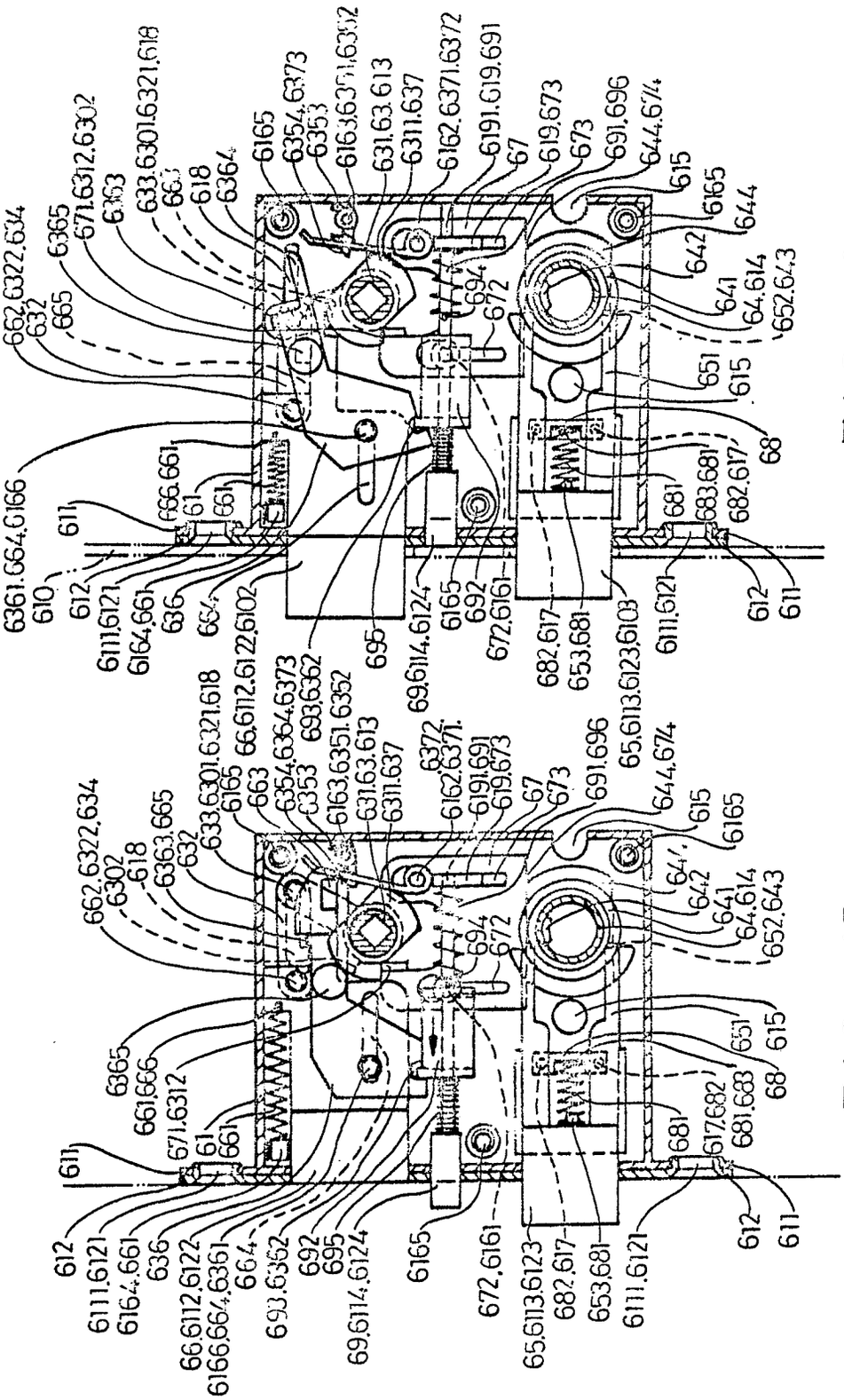

FIG. 15

FIG. 16

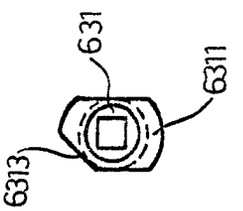
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FIG. 18

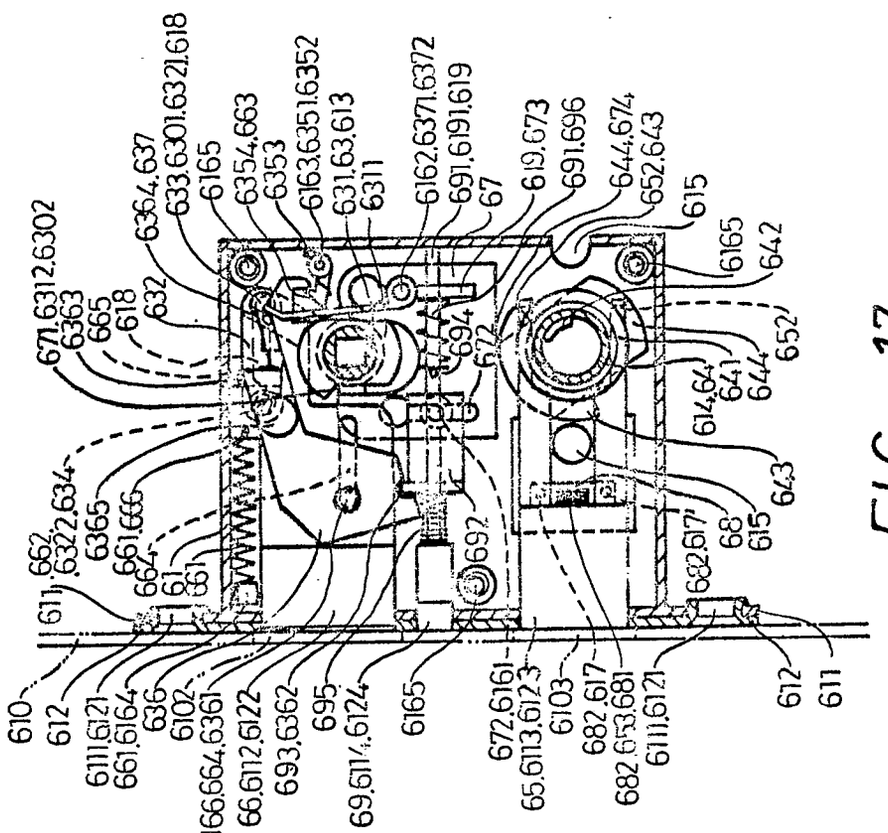
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FIG. 17

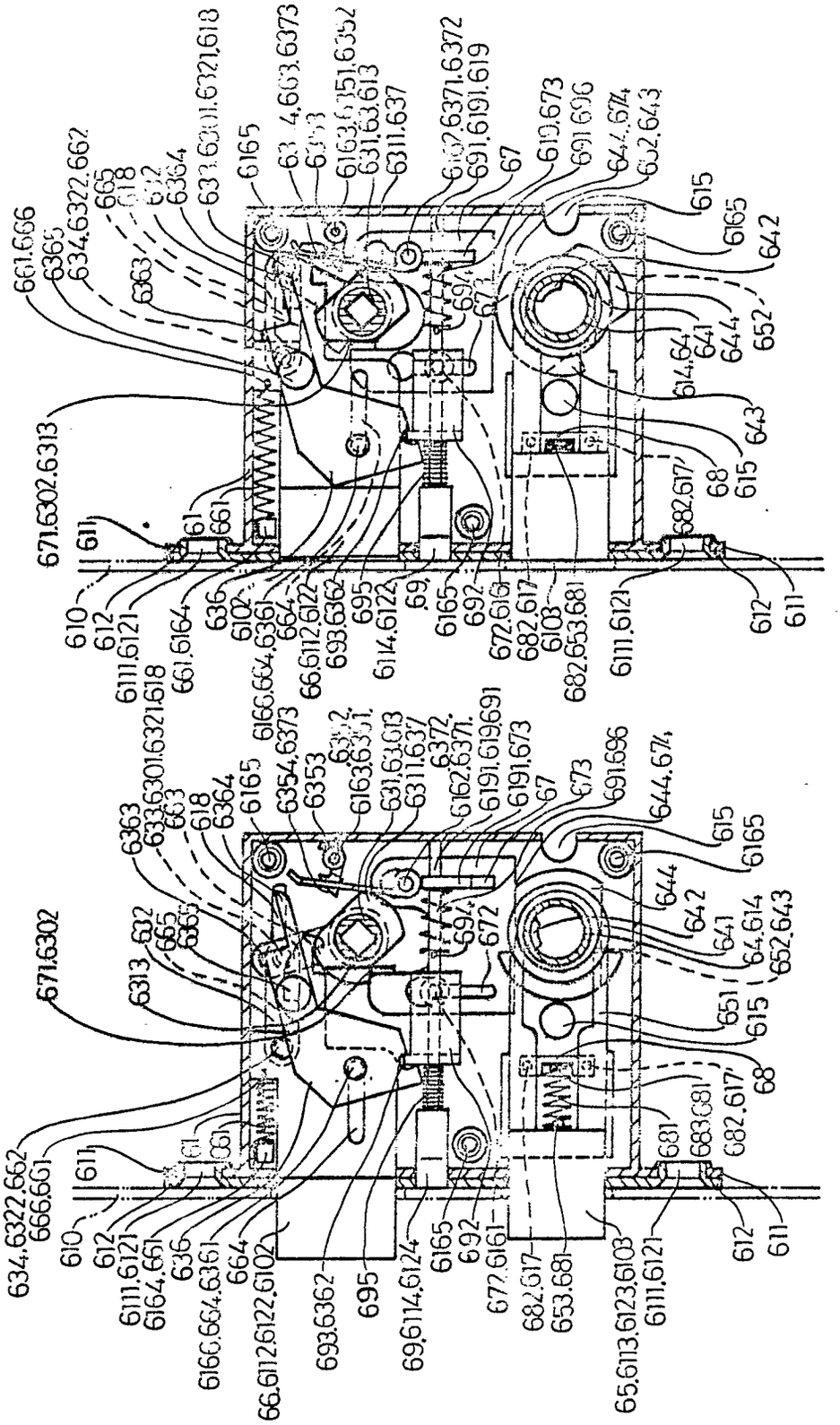

FIG. 19

FIG. 20

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 88 10 9188

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.4)
A	EP-A-0 241 323 (EISERMANN) * Figures 1-4; column 3, line 16 - column 6, line 57 *	1,4,5	E 05 B 47/06
A	BE-A- 673 186 (FISH)	1	
A	US-A-4 633 687 (FAME)	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.4)

E 05 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	06-02-1989	HERBELET J.C.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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E : earlier patent document, but published on, or after the filing date
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L : document cited for other reasons

& : member of the same patent family, corresponding document

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