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(54) **Lock apparatus**

(57) The invention relates to lock apparatus 1 for a closure which has a handle 100 both interiorly and exteriorly, comprising a key means operable lock device 2

and a dead-lock device 3, the arrangement being such that the apparatus is unlockable both by the key means and by the handle of the closure.

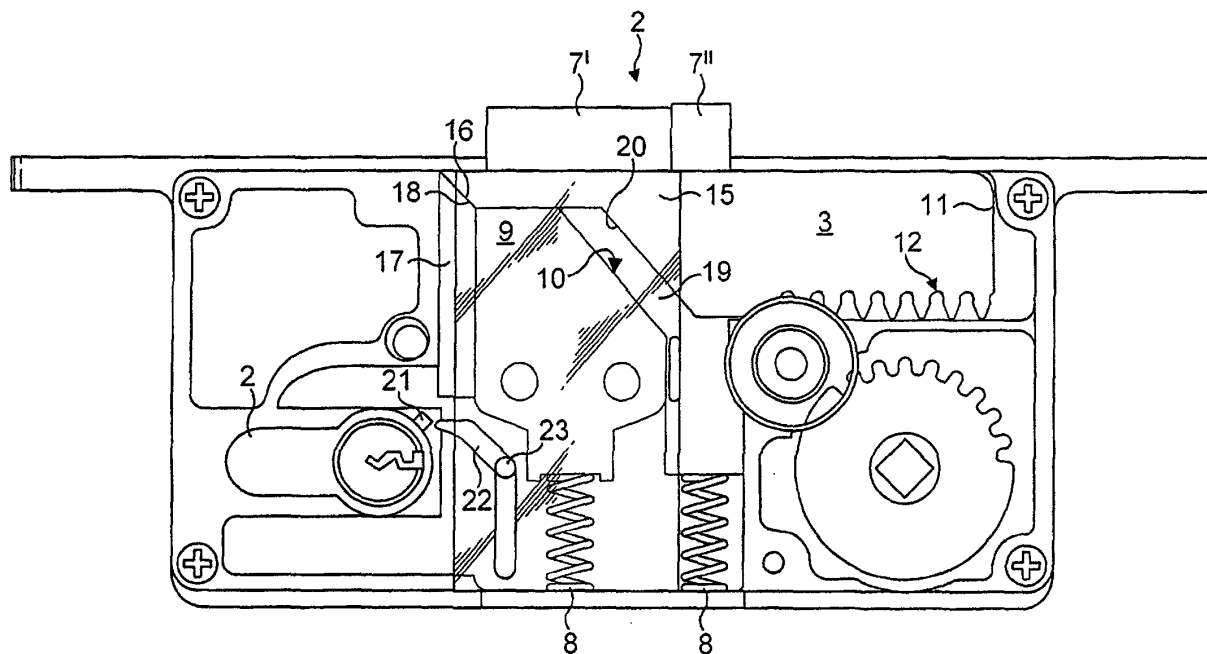


FIG. 7

Description

[0001] The invention relates to lock apparatus, particularly to such apparatus as can be used in a multi-tenancy situation.

[0002] In a multi-tenancy situation such as premises which could be a hotel, a block of flats, apartments, student accommodation and the like, it is often necessary to be able to provide a dead-lock situation for security. However, prior apparatus is complicated, and hence expensive to be manufactured.

[0003] It is an object of the invention to seek to mitigate this disadvantage.

[0004] According to a first aspect, the invention provides lock apparatus for a closure with a handle comprising a key means operable lock device and a dead-lock device, the arrangement being such that the apparatus is unlockable both by a key means and by the handle of the closure.

[0005] Using the invention it is possible to allow for multiple locks to be installed in a multi-tenancy situation, such as a hotel, hostel, apartment block or the like.

[0006] It will be understood that the term "key means" used herein includes both a separate, traditional, kind of key, and a thumb or finger turn-key which is part of a back plate of the lock apparatus, as considered interiorly of a door on which the apparatus is mounted.

[0007] The dead-lock device may comprise a member which is reciprocable in a direction substantially at 90° to the direction of movement of a latch of the apparatus. This provides for relative ease of dead-locking.

[0008] The member may comprise a rack member operable by a gear arrangement. This is a relatively simple yet reliable construction.

[0009] The rack member may have an extension which is adapted to cooperate with an abutment whereby to obviate operation of the latch.

[0010] This provides for positive dead-locking.

[0011] The latch may have a relieved part for allowing movement of the rack member to a dead-locking position. Thus there may be a gap which provides for dead-locking by allowing movement of the member to close the gap and effect dead-locking.

[0012] The extension of the rack member and the abutment may have interengageable complementary surfaces for providing dead-locking. This again provides for positive dead-locking, particularly when the surfaces may be mutually inclined surfaces.

[0013] The latch may be operable to unlock the closure in use by a member rotatably mounted thereon and operable by the key operable lock device.

[0014] This provides a particularly simple yet efficient construction, particularly when there is an extension of a pivot of the member to the exterior of the apparatus whereby the apparatus can be operable from the outside of the closure.

[0015] It will be understood that the invention extends to a closure fitted with a lock apparatus as hereinbefore

defined, and/or a building including at least one such closure as hereinbefore defined.

[0016] Lock apparatus embodying the invention is hereinbefore described with reference to the accompanying drawings.

Fig. 1 is a schematic perspective view of one embodiment of a multi-point lock system incorporating apparatus according to the invention;

Fig. 2 is a schematic perspective view of a second embodiment of a multi-point lock system incorporating apparatus according to the invention;

Figs. 3 to 6 show schematically to a reduced stage use of a lock apparatus according to the invention;

Fig. 7 is a schematic view to a larger scale of the interior of one embodiment of lock apparatus according to the invention with a back plate removed, for ease of viewing; and

Fig. 8 is a schematic front view of the lock apparatus of Fig. 1 with a key operable lock device removed.

[0017] Referring to the drawings, there is shown in Figs. 1 and 2 respectively, schematic perspective views of quick-release multi point lock systems A, B incorporating lock apparatus 1. The system A includes a bolt and hook locking arrangement C, the system B a bolt only locking arrangement D, there being a front plate P by which the respective system is secured to a nose or free front edge of a closure such as a door (not shown) by screws passing through holes H.

[0018] The systems A, B are normally operable by usual means to lock and unlock the closure. In order to provide quick-release the lock apparatus 1 for a closure has a handle 100, such as a hotel door, comprising a key means operable lock device 2 and a dead-lock device 3, the arrangement being such that the apparatus 1 is unlockable both by a key means 101, and by the handle 100 of the closure.

[0019] The lock apparatus 1 has a casing or body 4 which has a front plate 5 with a key-hole shaped recess 6 in which the lock device 2 in the form of a cylinder or barrel lock, is mounted.

[0020] Interiorly of the body 4 there is a reciprocable two part latch device 7, each part 7' 7" being mounted for reciprocation to open and close the door under pressure of resilient means in the form of respective coil springs 8 which normally act to extend the latch 7 into a latching/locking position behind a keeper (not shown) fitted in a door jamb or surround (also not shown).

[0021] The latch part 7' has a body comprising a main part, laminated therewith, there being plate 9 with a relieved section in the form of an inclined surface 10.

[0022] The plate 9 lies in the same plane as the dead-lock device which is in the form of a reciprocable ele-

ment 11 having a rack 12 which is operable by a gear arrangement 13 which is actuated on turning a handle, not shown, stepped in a seating 14 in the body 4.

[0023] Operation of these gear arrangements 13 results in bodily reciprocation of the rack 11, 12, depending on the rotational direction of the gears of the gear arrangement, so that an extension 15 of the rack 11, 12 is also reciprocated, to left or right as viewed in Fig. 7. A free end of the extension 15 has an inclined surface 16, complementary in inclination to an angle of inclination of free end 18 of a dead-locking device or abutment 17 in the form of a reciprocable bar or rod which is mounted in the body 4 alongside the latch part 7'.

[0024] In a non-dead-lock condition of the apparatus 1, there is a gap 19 between the relieved surface 10 of the plate 9 and a parallel inclined relieved surface 20 of the rack 11, 12.

[0025] In operation, in a non-dead-locked condition, the latch 7 is retractable to open the door by inserting the key in the key operable device 2 and turning it. This in turn rotates the barrel of the lock so that a lateral extension 21 thereof is turned to bear on an adjacent part 22 of a pivotable member in the form of a swan neck pivot connected to the latch 7.

[0026] This withdraws the latch and the door can be opened.

[0027] In order to dead-lock the door, the handle is turned to slide the rack 11, 12 to the left as viewed, so that the gap 19 between the surfaces 10, 29 is closed and those surfaces come into direct engagement. This leftwards bodily shifting of the rack 11, 12 brings the inclined free end or nose 16 of the extension 15 into engagement with the similarly complementary inclined free end 18 of the abutment 17. To accommodate this engagement of the extension 15 and the abutment 17, the inclined surface 16 of the extension 15 engages and slides over the inclined surface 18 of the abutment 17, forcing it downwardly as viewed.

[0028] This movement results in the body of the abutment 17 at its lower end as viewed being interposed between the lateral extension 21 of the barrel of the lock and the part 22 of the swan neck pivot. This pivot cannot then be operated by the key operable lock device 2, and the lock apparatus is dead-locked.

[0029] It can only be reverted to a non-dead-locked position by counter-rotation of the handle to withdraw the rack 11, 12, and hence the extension 15 thereof, to the right, so enabling the abutment 17 to move out of the way of the lateral extension 21 of the lock 2. This is achieved in that a cam surface on the free end of the lateral extension 21 engages the lower end of the abutment 17 on rotation of the cylinder of the lock free-sliding mounting of the abutment 17 allowing it to rise sufficiently under this action of the cam surface for the extension 21 to engage the swan neck pivot at 22 for rotation to withdraw the latch 7 from locking engagement with its keeper. An extension of the pivot 23 of the swan neck pivot to the exterior of the case or body 4 of the lock

apparatus 1 indicates from the exterior of the closure whether the lock apparatus is dead-locked or not.

[0030] In use, in normal operation, to lock the door handle H is lifted to its fullest extent, arrow 'X'. The key is then turned one revolution towards the frame of the closure, for example a door in an opening defined by the frame and in which the door is mounted for opening and closing. This is shown by arrow 'Y'. The door is now locked and cannot be opened from outside without using the key. To unlock the door from the outside the key is turned one revolution away from the door frame (arrow 'R'). The handle 100 is then pushed down (arrow 'S'). The key is turned once again to withdraw the latch and open the door. To open or unlock the door from inside, the same sequence of operations as shown in Figs. 5 and 6 is followed, there being a handle, and key position, on the inside.

[0031] In order to open the door in an emergency, the handle 100 is snatched down, i.e. in direction of arrow 'S'.

[0032] The extension of the pivot 23 acts as an override device in the form of an auxiliary locking point above the handle and is used to dead-lock the apparatus from the outside when the building or premises using this apparatus have been vacated. When this auxiliary locking point is used, the ability to open the door by snatching the handle 100 down is over-ridden, and is not used when persons are on the premises.

[0033] It will be understood that a lock apparatus embodying the invention can be retro-filled to any door and with a multi-point lock system and also can be integrated into door production without modification to door preparation.

[0034] It will be understood that the lock apparatus described herein with reference to the drawings allows simple exit from premises under conditions of emergency. The lock apparatus in normal operation works in the same way as any multi-point split spindle lock as will be apparent to those skilled in the art. When rapid evacuation of the premises is required all the locking points of the lock can be withdrawn by depressing the internal handle lever 100.

[0035] Operation of the internal handle lever 100 withdraws the centre dead bolt, latch and any additional compression bolts or hooks allowing the door to be opened without the use of a key.

[0036] When fitted the auxiliary lock point dead locks the apparatus from outside and negates panic operation of the lock. This is an auxiliary locking option for use when the premises have been completely vacated.

[0037] Thus using the invention, the lock apparatus 1 described herein with reference to the drawings can be operated both by a key, and by a handle.

Claims

1. Lock apparatus for a closure with a handle compris-

ing a key operable lock device and dead-lock device, **characterised by** the apparatus being unlockable both by a key means and by the handle of the closure.

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2. Apparatus according to Claim 1, **characterised by** the dead-lock device comprising a member which is reciprocable in a direction substantially at 90° to the direction of movement of a latch of the apparatus. 10
3. Apparatus according to Claim 2, **characterised by** the member comprising a rack member operable by a gear arrangement. 15
4. Apparatus according to Claim 3, **characterised by** the rack member having an extension which is adapted to cooperate with an abutment whereby to obviate operation of the latch. 20
5. Apparatus according to Claim 4, **characterised by** the latch having a relieved part for allowing movement of the rack member to a dead-locking position.
6. Apparatus according to Claim 5, **characterised by** the rack extension of the rack member and the abutment having interengageable complementary surfaces for providing dead-locking. 25
7. Apparatus according to Claim 6, **characterised by** the surfaces being mutually inclined surfaces. 30
8. Apparatus according to any of Claims 2 to 7, **characterised by** the latch being operable to unlock the closure in use by a member rotatably mounted thereon and operable by the key operable lock device. 35
9. Apparatus according to Claim 8, **characterised by** comprising an extension of a pivot of the member to the exterior of the apparatus whereby the apparatus can be operable from the outside of the closure. 40
10. Apparatus according to any preceding claim, **characterised by** the extension comprising an override device adapted to dead lock the apparatus from the outside. 45
11. A closure, **characterised by** being fitted with lock apparatus according to any preceding claim. 50

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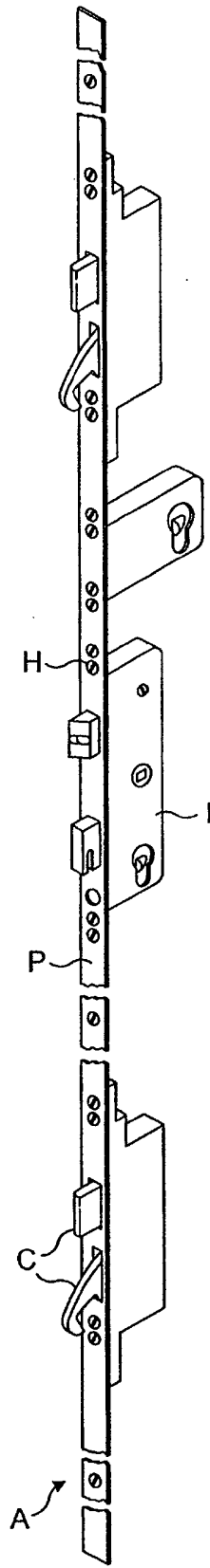


FIG. 1

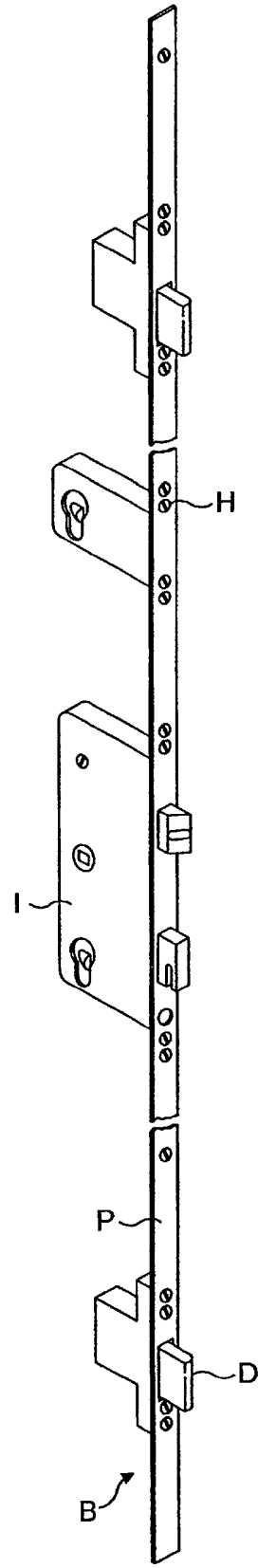


FIG. 2

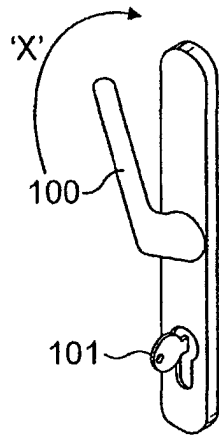


FIG. 3

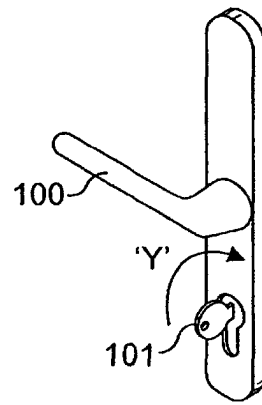


FIG. 4

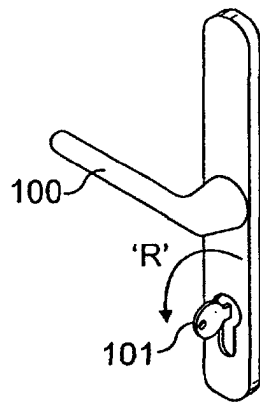


FIG. 5

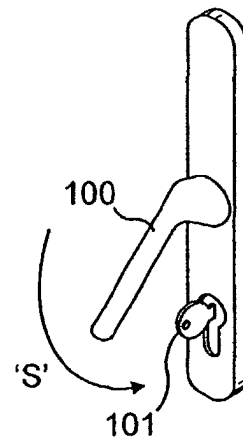


FIG. 6

