

(12) UK Patent Application (19) GB (11) 2 147 347 A

(19) **GB** (11)

(43) Application published 9 May 1985

(21) Application No 8324739

(22) Date of filing 15 Sep 1983

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(51) INT CL⁴
E05B 65/10

(52) Domestic classification
E2A 100 106 115 160 171 420 553 PD
U1S 1714 E2A

(56) Documents cited

(58) Field of search
E2A

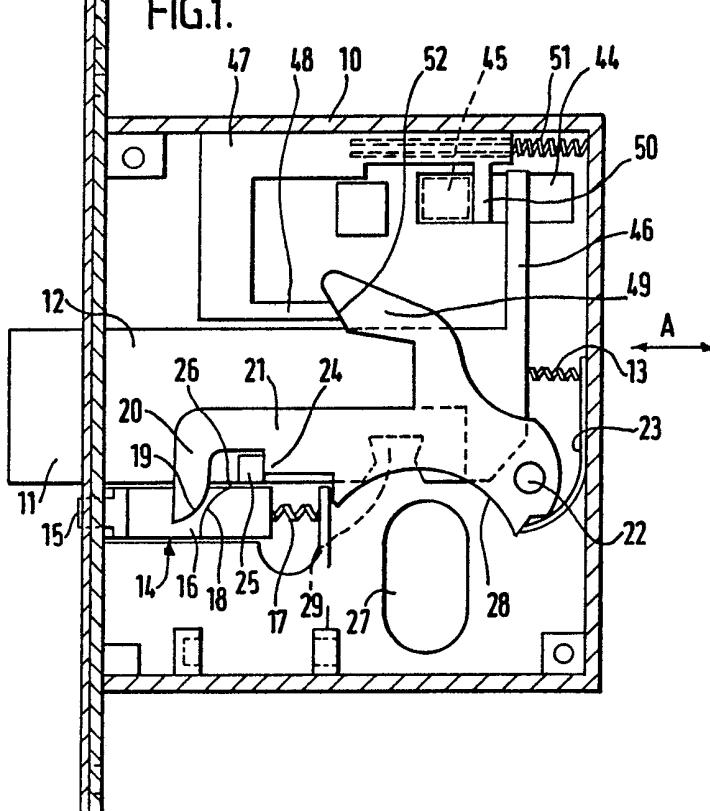
(54) Locks

(57) A lock includes a latching member 11 and a bullet catch 14. In the position shown the member 11 is in a locking position and extends within a catchplate of a door frame (not shown) and the bullet catch is held in a retracted position by engagement with the door frame. A tumbler lever 21 includes a downwardly projecting detent 24 which abuts a lug 25 on the carrier plate of the latching member 11 and prevents the latching member from moving to the unlocking position.

The latching member may be moved to an unlocking position by a cylinder lock mechanism (not shown) mounted in a slot 27 or by an emergency mechanism including a peg 45. Both of these means for moving the latching member to the unlocking position first cause the detent 24 on the tumbler lever to be swung clear of the lug 25 before moving the latching member to the unlocking position.

When the door is in the open position both the latching member and the bullet catch extend from the lock. Closure of the door causes both of these members to be pushed in before the latching member is pushed out into the catchplate of the door and the detent 24 of the tumbler lever swings down into the position shown.

FIG.1.



The drawing(s) originally filed was/were informal and the print here reproduced is taken from a later filed formal copy. The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1982.

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FIG.1.

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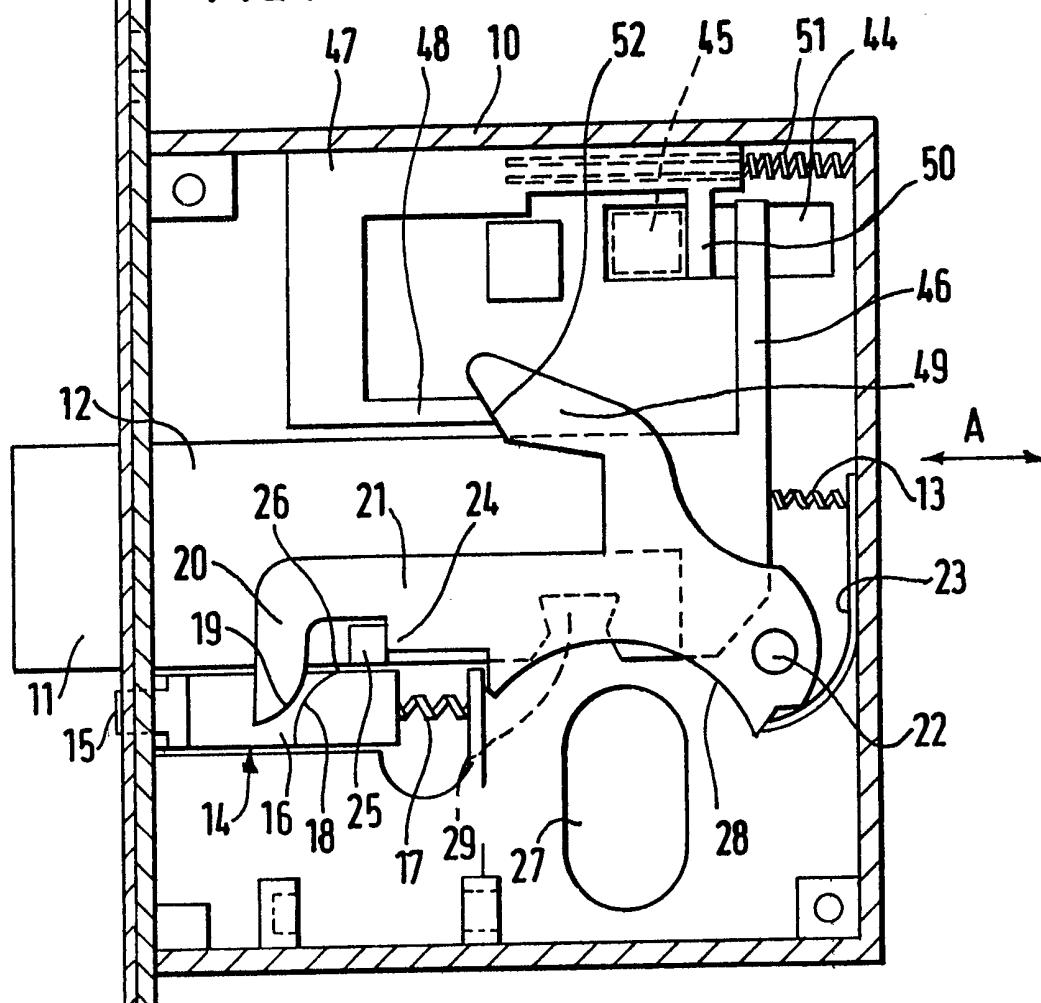
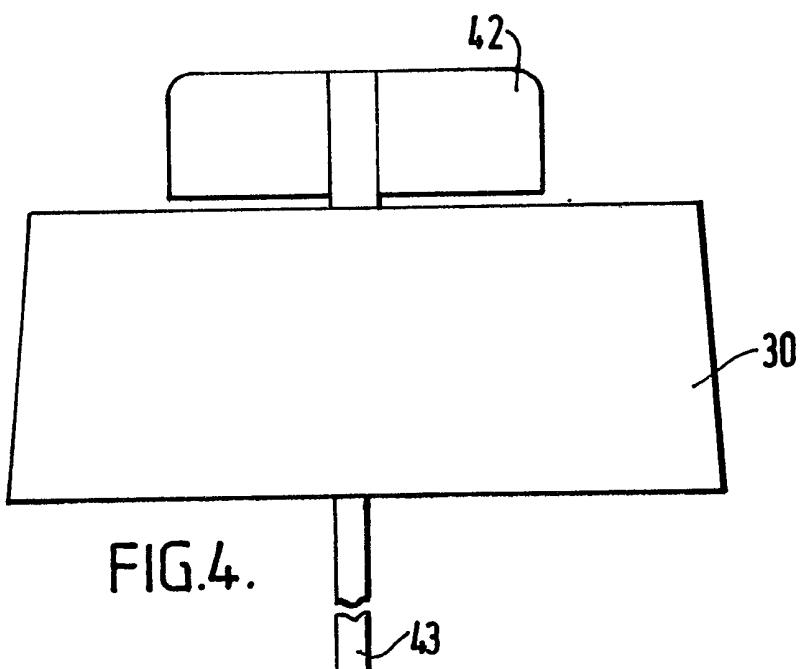
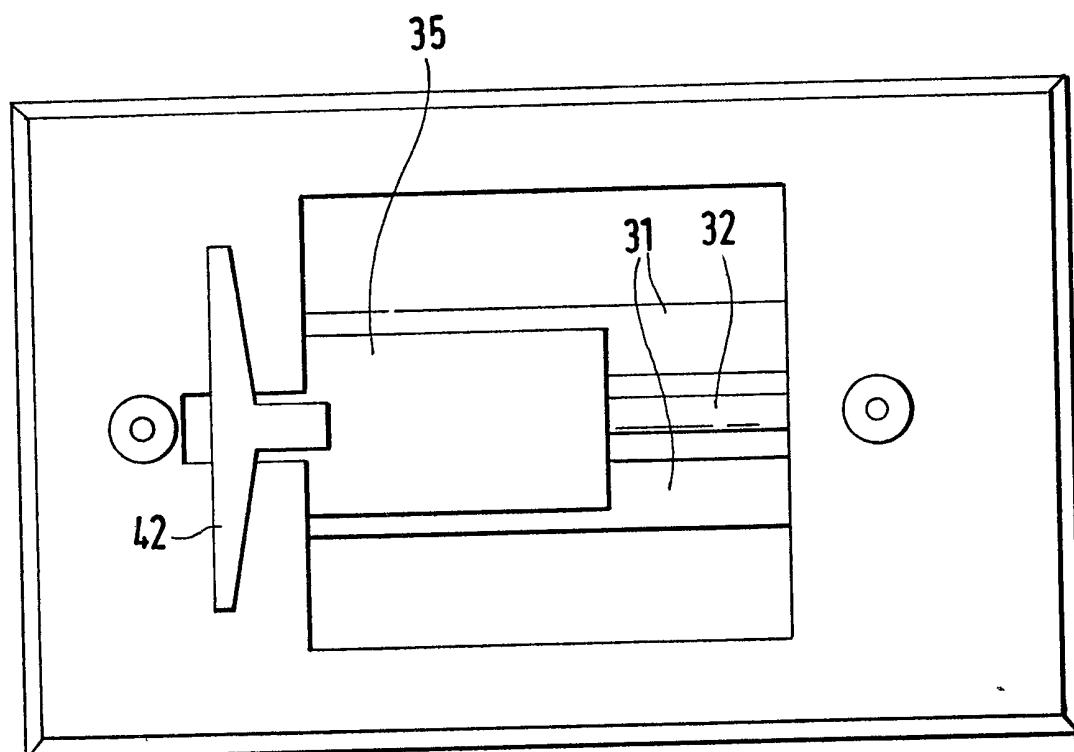
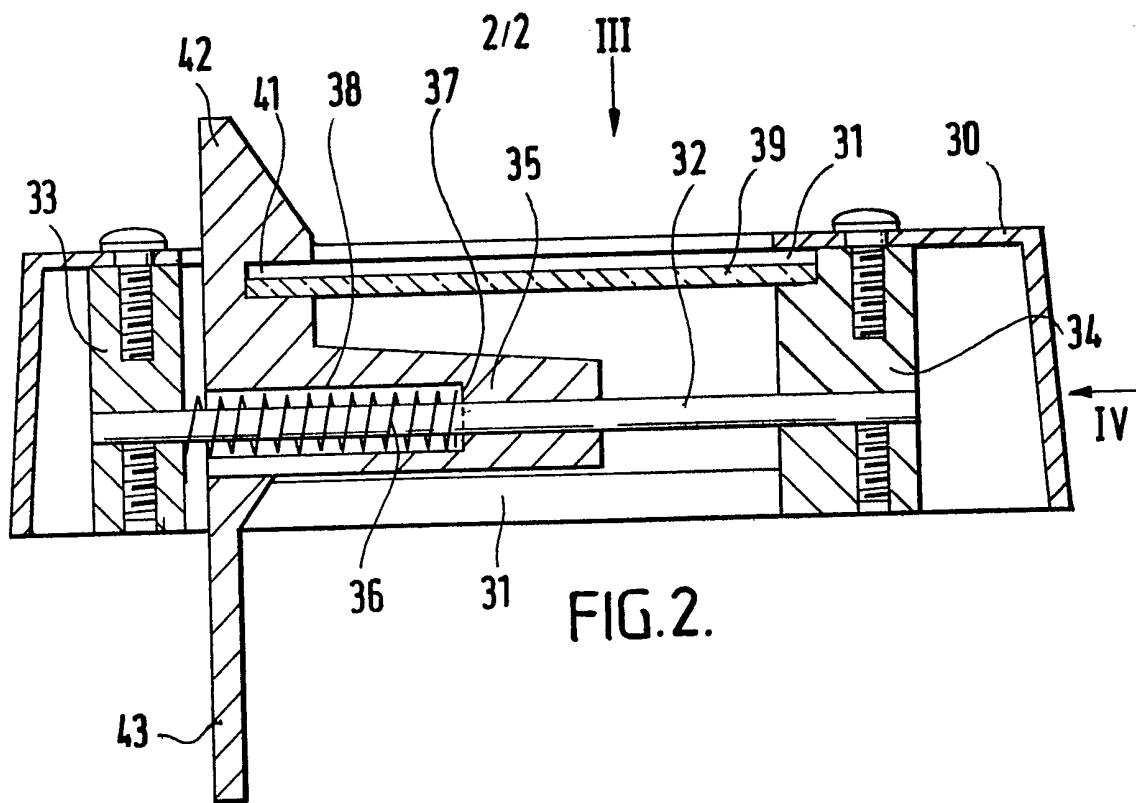


FIG.4.



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SPECIFICATION

Locks

5 This invention relates to locks, and in particular to locks of the kind in which a latch member is moveable by an authorised person (e.g. the holder of a key for a lock which is key operated) from a locking position in which

10 the latch member protrudes from a housing (e.g. for engagement with a catchplate on a door frame) to an unlocking position in which the locking member is retracted against the force of resilient biasing means.

15 In a prior proposal for such a lock with a latch member, the lock has included control means which can be operated in an emergency by smashing a sheet of glass to cause the direction in which the resilient biasing

20 means acts on the latch member to be reversed, thus moving the latch member to the unlocking position. When the latch member engages a catchplate on the frame of a door (in the locking position), the smashing of the

25 glass causes the latch member to move to the unlocking position to permit the door to be opened. One of the disadvantages of this prior proposal is that the mechanism for reversing the direction in which the resilient biasing

30 means acts is complicated and thus expensive to manufacture and prone to failure. A further disadvantage of this known latch member is that it has a bevelled edge which protrudes from the housing in the locking position,

35 which bevelled edge may be engaged by a sheet member inserted by an unauthorised person between the door and the door frame to cause the latch member to be moved to the unlocking position and allow the door to be

40 opened.

According to one aspect of the present invention, a lock comprises a housing, a latch member urged by resilient biasing means towards a locking position in which the latch

45 member protrudes from the housing, the latch member being capable of moving an unlocking position in which the latch member is retracted against the force of the resilient biasing means, first control means including a

50 control member which is urged by further resilient biasing means towards an extended position in which the control member protrudes from the housing, the control member being capable of moving to a retracted position, against the force of the further resilient biasing means, in which the control member is retracted, the first control means holding the latch member in the locking position when the control member is in the retracted position,

60 second control means operable by an authorised person to move the latch member from the locking position to the unlocking position and third control means operable by anyone in an emergency to move the latch

65 member from the locking position to the un-

locking position, the second and third control means overriding the holding of the latch member in the locking position provided when the control member of the first control means

70 is in the retracted position. Such a lock provides a latch which, when mounted on a door for instance, enables the door to close with the latch operating in a conventional way, the latch being able to be locked in the catchplate

75 of the door frame whereby the latch can not be opened by insertion of a sheet member to engage the latch member, but the door being able to be opened by withdrawal of the latch member from the catchplate either by an

80 authorised person or by anyone in an emergency.

The lock may include a holding member arranged to co-operate with the latch member whereby, when the control member of the

85 first control means is in the retracted position, and the latch member is in the locking position, the latch member may occupy a holding position in which the latch member is held against moving to the unlocking position by

90 co-operating portions of the latch member and the holding member abutting one another, movement of the control member to the extended position causing the holding member to move from the holding position to a release

95 position in which the latch member may move to the unlocking position without the co-operating portions of the latch member and the holding member abutting one another, operation of the second or third control means also

100 causing the holding member to move to the release position. The holding member may be a flat plate which may enable the holding member to be stamped, or cut out of a blank of sheet material. The provision of a single

105 holding member to hold the latch member in the locking position, the holding member being able to move with any of the control means provides a simple mechanism which may be cheap to produce and easy to assemble and service. The holding member preferably includes resilient biasing means arranged to urge the holding member to the holding position, and the resilient biasing means may comprise a resilient strip of material held away

110 from the position which it would tend to occupy under its natural flexure. The holding member may be pivotally mounted on the lock.

Either or both of the second and third

120 control means may be arranged, upon operation of those control means, to move the holding member from the holding position towards the release position prior to commencing movement of the latch member from

125 the locking position towards the unlocking position.

The lock provides a secure means of controlling access, for instance through a door. The lock may include a strong housing which

130 may be arranged to extend between the com-

ponents of the lock and at least one side of the door. What is meant by a strong housing is one such as can resist heavy blows, for instance from a sledge hammer. A strong 5 housing may include metal walls which are at least 3 mm thick in places and may include portions which are 11 mm or more thick.

The invention may be carried into practice in various ways, but one embodiment will 10 now be described with reference to the accompanying drawings, in which:

Figure 1 is a cross-section through a lock showing the latch member and the location of three control means; 15 Figure 2 is a transverse cross-section through one of the control means for the lock shown in Figure 1; Figure 3 is a view in the direction of arrow III of Figure 2; and 20 Figure 4 is a view in the direction of arrow IV of Figure 2.

The part of the lock shown in Figure 1 comprises a generally rectangular housing 10 which can be secured in the edge of a door 25 frame in a conventional manner. The lock has a latching member 11, rigidly secured to a carrier plate 12. The carrier plate 12 is slidably mounted for movement in the direction of arrows A of Figure 1 so that the latching 30 member 11 can be moved between a locking position, in which it projects from the housing as shown in Figure 1, and an unlocking position in which the member 11 is retracted into the housing. The latch member 11 is 35 urged into the locked position shown by a compression spring 13 acting between the housing and the carrier plate 12.

Located immediately below the latch member 11 is a bullet catch 14 comprising an 40 angled flange 15 rigidly secured to a carrier block 16. The bullet catch 14 is shown in a retracted position in which substantially all of the flange 15 lies within the housing. A compression spring 17 acts on one end of the 45 carrier block to urge the flange to the left, as seen in Figure 1, so that it protrudes beyond the housing. The bullet catch is moved into, and held in the retracted position shown by closing the door causing the angled flange to 50 bear against the door jamb and be pushed into the housing, where it remains, trapped by the jamb.

The carrier block 15 of the bullet catch 55 includes a sloping surface 18 which is arranged to co-operate with a corresponding sloping surface 19 present on a downwardly extending limb 20 of a tumbler lever 21 pivotally mounted at 22. With the bullet catch 14 in the retracted position shown, the sloping surface 18 is out of contact with the 60 sloping surface 19 and the tumbler lever 21 is permitted to lie in the position shown, under the resilient force of a leaf return spring 23 acting between the housing and the lever, 65 in the region of the pivotal mounting 22, the

resilient force biasing the lever in an anti-clock wise direction. The tumbler lever 21 has a downwardly projecting detent 24 which lies inwards of a lug 25 on the carrier plate, when

70 the bullet catch is in the retracted position shown. Abutment of the lug 25 on the carrier plate with the detent 24 of the tumbler lever prevents the latching member from being moved from the locking position to the unlocking position.

When the door is opened, the angled flange 15 moves away from the door jamb and the bullet catch is then free to move, under the bias of the spring 17, to an extended position 80 in which the angled flange extends beyond the housing. When the bullet catch is in the extended position, the downwardly extending limb 20 of the tumbler lever 21 is limited in its extent of downwards movement by engagement with an upper edge 26 of the carrier block 16. In the lowermost position of the downwardly extending limb 20, the detent 24 lies above the lug 25 so that, when the bullet catch is in the extended position, the 85 latching member is always free to move from the locking position to the unlocking position, with the lug 25 moving past the detent 24.

In use, a cylinder lock mechanism (not shown) including a cam is mounted in a slot 95 27 in the housing 10. The cylinder lock mechanism, in use, is only used when it is desired to open the door from its initial closed position when the bullet catch is in the retracted position. The cam can be rotated by 100 means of a key being inserted into the lock mechanism. Rotation of the key in a clockwise direction causes the cam firstly to engage a curved surface 28 on the tumbler lever and raise the lever against the action of the leaf return spring 23. This causes the detent 24 to 105 rise clear of the lug 25. Further rotation of the cam causes the cam to enter a recess 29 in the carrier plate and move the carrier plate to the right, as viewed in Figure 1, thus moving 110 the latching member 11 into the unlocking position. The resilient force exerted by the respective springs on the carrier plate and the tumbler lever and the cam causes the lock to return, in an anticlockwise direction, to the 115 locking position when the turning force on the key is removed.

If it is desired to move the latching member from the locking position to the unlocking position, when the bullet catch is in the 120 retracted position, without the use of a key, for instance in an emergency such as a fire, the additional control means shown in Figures 2 to 4 may be fitted to the surface of one side of the door.

125 The control means comprises a box-like casting 30 to which is rigidly secured a support frame 31. A guide bar 32 extends between the ends 33 and 34 of the frame 31 and the control member 35 slidably mounted 130 on the guide bar 32. The control member 35

is urged to the right as viewed in Figure 2 by a spring 36 which is compressed between the end 33 of the frame 31 and the end 37 of a bore 38 housed within the control member

5 35. In normal use the control member 35 is maintained in the position shown in Figure 2, against the action of the spring 36, by a glass plate 30, one edge of which engages in a slot 40 in the end 34 of frame 31, and the other 10 opposite end of which engages in a slot 41 in the member 35.

The control member 35 also has a first projecting part in the form of a handle 42 and a second projecting part in the form of a peg 15 43.

The plate of glass 39 which is normally opaque and marked with some such wording as "Break glass for emergency exit" has not been shown in Figure 3 for the sake of clarity, 20 but it will be understood that it is normally essential for the glass plate to be present for the member 35 to be maintained in the position shown in Figure 3 against the action of the spring.

25 In use a horizontally extending slot is cut in the side of the door to expose horizontally extending slot 44 (see Figure 1) in the housing 10 of the main lock assembly. The box-like section 30 is screwed to the door with the 30 peg 43 projecting into the slot 44 in the position shown in dotted lines 45 in Figure 1.

The carrier plate 12 has an upwardly extending arm 46 which extends into the region of the slot as shown in Figure 1.

35 The housing 10 also contains a release member 47 mounted for sliding movement in the direction of arrows A. The release member 47 has a horizontally extending arm 48 which abuts against a tongue 49 of the tumbler 40 lever 21 and the member 47 also has a downwardly extending arm 50 which extends into the region of the slot 44. The arms 46 and 50 are spaced slightly apart in the horizontal direction as shown in Figure 1.

45 As long as the peg 43 remains in the position shown by dotted lines in Figure 1 at 45, the lock operates normally, and the release member 47 is maintained in the position shown in Figure 1 by means of a compression

50 spring 51. Should it be desired to unlock the door in the event of an emergency however, the plate of glass 52 can be smashed. This causes the member 35 to spring to the right as viewed in the Figures, carrying the peg 43 55 with it. If the member 35 shows any tendency to jam, a sharp blow can be delivered to the projecting handle 32, to move the member 35 to the right.

This movement causes the peg 43 firstly to 60 engage the arm 50, moving the release member 47 to the right slightly. The arm 48 of the release member 47 presses against a sloping face 52 of the arm 49 of the tumbler 21, lifting the tumbler until the detent 24 moves 65 clear of the lug 25. Further movement of the

peg 43 causes the arm 50 to engage the arm 46 and move the carrier plate 12 to the right, moving the latching member 11 into the unlocking position.

70 The key operated mechanism can thus be overridden in the event of an emergency.

CLAIMS

1. A lock comprising a housing, a latch member urged by resilient biasing means towards a locking position in which the latch member protrudes from the housing, the latch member being capable of moving to an unlocking position in which the latch member is retracted against the force of the resilient biasing means, first control means including a control member which is urged by further resilient biasing means towards an extended position in which the control member protrudes from the housing, the control member being capable of moving to a retracted position, against the force of the further resilient biasing means, the first control means preventing the latch member moving from the locking position to the unlocking position when the control member is in the retracted position, second control means operable by an authorised person to move the latch member from the locking position to the unlocking position and third control means operable by anyone in an emergency to move the latch member from the locking position to the unlocking position, the second and third control means overriding the effect of the first control means on the latch member in which the latch member is prevented from moving from the locking position to the unlocking position when the control member of the first control means is in the retracted position.
- 105 2. A lock as claimed in Claim 1 including a holding member arranged to co-operate with the latch member whereby, when the control member of the first control means is in an extended position, the latch member may move between the locking and unlocking positions, and when the control member of the first control means is in a retracted position and the latch member is in the locking position, the holding member may occupy a position in which co-operating portions of the latch member and the holding member abut one another to prevent the latch member moving from the locking position to the unlocking position, operation of the second or third control means being arranged to move the holding member to a position in which the latch member may move from the locking position to the unlocking position.
- 110 3. A lock as claimed in Claim 2 in which, when the control member of the first control means is in the retracted position, the latch member may move from the unlocking position to the locking position.
- 115 125 4. A lock as claimed in Claim 2 or 3 in which the holding member comprises a flat

plate.

5. A lock as claimed in any of Claims 2 to 4 including resilient biasing means arranged to urge the holding member into a position in

5 which it prevents movement of the latch member from the locking position to the unlocking position.

6. A lock as claimed in Claim 5 in which the resilient biasing means comprises a resilient strip of material.

10 7. A lock as claimed in any of Claims 2 to 6 in which the holding member is mounted for pivotal movement on the lock.

15 8. A lock as claimed in any of Claims 2 to 7 in which, when the holding member is in a position in which it prevents movement of the latch member from the locking position to the unlocking position, operation of the second control means is arranged to move the holding member to a position in which the latching member is permitted to move to the unlocking position prior to commencing movement of the latching member towards the unlocking position.

20 25 9. A lock as claimed in any of Claims 2 to 8 in which, when the holding member is in a position in which it prevents movement of the latch member from the locking position to the unlocking position, operation of the third control means is arranged to move the holding member to a position in which the latching member is permitted to move to the unlocking position prior to commencing movement of the latching member towards the unlocking

30 35 position.

10. A lock as claimed in any preceding claim including a strong housing.

11. A lock as claimed in Claim 10 in which the housing is at least 3 mm thick in places.

40 45 12. A lock as claimed in Claim 11 in which the housing includes portions which are 11 mm or more thick.

13. A lock substantially as herein described with reference to, and as shown in the accompanying drawings.

50 55 14. A door including a lock as claimed in any preceding claim arranged to co-operate with a door frame in which the latch member may extend into the frame when in the locking position, with the control member of the first control means being held in the retracted position by the door frame, the latching member and the control member being moved towards the unlocking position and the retracted position respectively by engagement with the door frame upon movement of the door towards a closed position prior to the latching member moving to the locking position when the door is closed.