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54 **Improvements relating to latch mechanisms.**

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Description

This invention is concerned with latch mechanisms such as those which are used on doors.

The conventional door latch mechanism takes many forms and, where security is important the construction can be quite intricate. Thus, the conventional cylinder night-latch or lock mechanism incorporates a large number of parts requiring intricate assembly which cannot readily be mechanised.

It is an object of this invention to provide a latch mechanism which will provide good security and will have the conventional features of this type of door latch whilst providing advantages as to the method of operation and the degree of intricacy of construction.

United States Patent Specification No. 3,765,710 describes a latch mechanism which comprises a casing within which is mounted a bolt which can slide between an extended position whereby it projects through one end of the casing and a retracted position wherein it is at least partially withdrawn into the casing. A drive shaft rotatably operated by a cylinder lock mechanism carries a drive member which may be rotated by the drive shaft to drive the bolt linearly from one position to the other. An operating handle projects from an opposite end of the casing and is linked with the bolt so as to be able to move the bolt from the one position to the other as the handle is moved with respect to the casing.

The invention is distinguished from the device disclosed in the above mentioned United States Patent in that the operating handle is slidably movable with respect to the casing so as to act on a bolt plate carrying the bolt, and wherein the drive member and the operating handle engage independently with the bolt plate for operation of the bolt.

Because the drive member and operating handle act independently upon the bolt, the cylinder lock does not have to drive the handle. The drive member and the operating handle can engage the plate carrying the bolt independently by providing that the drive member is disposed to engage a pin projecting from the bolt plate, whilst the operating handle interengages with the bolt plate by means of a flange.

The bolt plate itself may incorporate a groove which will slide about the drive shaft as the bolt moves between its two positions. Also the bolt is ideally biased, such as by a spring, to the extended position.

In a preferred embodiment the handle is linked with the bolt plate through a handle plate which defines a slot receiving the rotatable drive shaft which is formed, in the region of the slot, with a groove cut in the side of the drive shaft, or a projection from the side of the drive shaft, the slot providing a track extending in the direction of movement of the plate and notches extending generally at right angles to the track such that, when the drive shaft is in one attitude the track

may slide thereabout, the drive shaft being rotatable from that attitude to locate within one of the notches to prevent sliding of the handle plate.

In this latch mechanism two notches will normally be sufficient for holding the bolt in either of its two positions. The rotatable drive shaft can be of circular cross-section and be formed with a semi-circular groove therein, the notches having correspondingly shaped curved and flat faces.

It is preferred that the drive shaft should incorporate lugs which are a releasable snap fit into grooves in the body of the latch mechanism. These grooves will ideally be disposed to hold the drive shaft either in said one attitude or in the condition where it is fully engaged with one of the notches.

A further preferred embodiment of the invention incorporates a deadlatch which can slide between an extended position wherein it projects through the one end of the casing and a retracted position wherein it is at least partially withdrawn into the casing, the deadlatch being carried by a deadlatch plate which forms part of a deadlatch mechanism also incorporating a bolt securing member which is held by the deadlatch plate out of contact with the bolt plate when the deadlatch is in the extended position but which is driven into locking engagement with a part of the bolt plate so as to prevent movement of the bolt to the retracted position when the bolt is extended and the deadlatch is in the retracted position, the drive member being operable to disengage a part of the bolt securing member from the notch in the bolt plate.

Whilst the bolt securing member could be a sliding member, it is preferred that it should take the form of a rotary member carrying first and second pins which can respectively engage with a notch in the bolt plate when the bolt is in the extended position and a notch in the deadlatch plate when the deadlatch is in the retracted position. With such an arrangement the drive member can be positioned to be able to engage one of the pins to drive the first pin out of engagement with the notch of the bolt plate.

Ideally the bolt securing member is biased into the position of locking engagement with the part of the bolt plate, such biasing means comprising a spring arm carried by the bolt securing member. Also the deadlatch itself is preferably biased into the extended position such as by a spring.

Also forming a desirable feature of the latch mechanism of this invention is a latch hold mechanism incorporated in a plate which causes movement of the bolt between its two positions defined by a slot in the plate, the edge of which slot may be engaged by a notch at the end of a hold member, the hold member being biased to raise the notched end thereof free of the slot in the plate when the edge of the slot in the plate is disengaged from the notch, the hold member also incorporating an actuating portion which can be pressed against the bias to allow the notch to engage with the edge of the slot in the plate.

In the preferred embodiment of latch hold

mechanism the hold member is biased by integral spring-like arms thereof acting on part of the casing, and the actuating portion is a button extending through the casing. Retaining means may be included for preventing the hold member from being removed from the casing. This retaining means can comprise projecting resilient flaps on part of the hold member sliding within a sleeve of the casing, the sleeve carrying flanges against which the flaps will abut when the hold member is disengaged and biased away from the plate.

The invention may be performed in various ways and a preferred form of latch mechanism according to the invention will now be described with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view from above of the latch mechanism and staple;

Figure 2 is a perspective view from below of the latch mechanism and staple;

Figure 3 is a cross section on line III—III of Figure 1, and Figures 3A and 3B show parts thereof;

Figure 4 is a cross section on line IV—IV of Figure 3;

Figure 5 is a cross section on line V—V of Figure 3;

Figure 6 is a cross section on line VI—VI of Figure 3;

Figures 7 and 8 illustrate alternative states of a lock mechanism of the apparatus shown in Figures 3 to 6;

Figures 9 to 11 illustrate various conditions of the door bolt and deadlatch of the apparatus shown in Figures 3 to 6; and

Figures 12 to 14 illustrate various conditions of a lock actuator forming part of the apparatus of Figures 3 to 6.

The latch mechanism illustrated in Figures 1 and 2 comprises a body 1 which houses parts for operating a bolt 2 which will be received within an opening 3 in a staple 4 which will be attached to a door frame. The mechanism within the body 1 also operates a deadlatch nose 5. As will be explained hereinafter the bolt 2 may be withdrawn by pulling a handle 6 in a sliding motion in the direction away from the staple 4. The handle 6 may be held in the open condition (fully retracted) by pressing a hold button 7, the operation of which will be described later. The body 1 is attached to a back plate 8 which will be secured to the door and through which will pass a drive shaft 9 provided with a slot 10 to receive a tongue projecting from a cylinder lock which will be secured through the door and may be operated from the outside of the door by a suitable key. A moulded portion 11 projecting from the body 1 will house both the hold button 7 and a key operated mechanism at 12 for locking the handle 6 in either of its two alternative positions (i.e. as shown or fully retracted). The actual construction of the key operated mechanism at 12 is not an essential part of the apparatus and may take many forms. Its purpose is to enable a lock moulding 13 (Figures 3 and 4) to be rotated

between two alternative positions by use of a key only.

The internal mechanism of the latch can be seen from Figures 3 to 6. The bolt nose 2 is fixed to a plate 14 by screws 15 which enter into a limb 16 of the plate 14 located within a slot within the bolt nose 2. The bolt nose can be removed, turned through 180° and secured in the new position so that the latch mechanism can be used with both inwardly and outwardly opening doors. The plate 14 has a generally oblong slot 17 (with an enlargement 17A for receipt of the lock moulding 13 during initial assembly) which will slide about a cylindrical portion of the lock moulding 13 as the bolt nose is moved from the extended position shown to a retracted position within the body 1.

One method of moving the plate 14 is to rotate the drive shaft 9 (by key operation of the cylinder lock within the cylinder body 18 passing through the door 19). This causes an actuating plate 20 (shown in dashed outline in Figure 3) to be carried around with the drive shaft 9 so as to act on a pin 21 projecting from the plate 14 and thus cause the plate 14 to slide about the lock moulding 13. An alternative method of moving the plate 14 is to pull the handle 6 outwardly of the body 1. As can be seen from Figure 4 the handle 6 has, secured thereto, a stepped plate 22 carrying hold plate 23 from which projects a limb 70 (see also Figures 3A and 3B) which is received in a notch 71 in the plate 14. Also deformable lugs 74 mate within openings in the plate 22, whilst a continuous slot is formed in the plate 22 in line with the limb 70 which projects therethrough into the notch 71. The hold plate is kept down by the flange 72 which extends out from the lock moulding 13. Thus when the handle 6 is pulled outwardly the stepped plate 22 carries with it hold plate 23 and the plate 14 so as to withdraw the bolt nose 2 from the staple 4 secured to the door frame 24. In order for this operation to be carried out the lock moulding 13 must be in a condition wherein it does not prevent the sliding movement of the stepped plate 22 and hold plate 23. Figure 3 shows a pair of pins 59 on the body 1 received in slots 60 in the stepped plate 22 which guide the sliding movement of the plate 22.

As can be seen from Figure 4 (and more clearly from Figures 7 and 8) the lock moulding 13 has a slot 25 formed therein leaving a semi-circular portion 26 which can be moved into or out of one of a pair of notches 27, 28 in the hold plate 23. When the lock moulding is in the position illustrated in Figure 8 the stepped plate 22 carrying the hold plate 23 can slide freely backwards and forwards about the portion 26 of the lock moulding 13. When the handle 6 is in the normal condition (into which it is biased by a spring arm 29 acting between a post 30 and the bolt nose 2) the lock moulding 13 can be rotated through 90° into the condition illustrated in Figure 7 so as to locate in a notch 27 in the hold plate 23 whereby the stepped plate 22 is locked against sliding movement. The lock moulding 13 carries a pair of lugs 61 which can snap into notches 62 formed in

part of the body portion 11. Two sets of notches 62 at right angles to one another will be provided so as to hold the lock moulding 13 releasably in either of the two conditions illustrated in Figures 7 and 8. The deformable lugs 74 on the hold plate 23 will bend if undue force is applied to the handle 6 when the plate 22 is locked onto the lock moulding 13 by the hold plate 23 so that the lock itself cannot be forced by pulling the handle 6.

When the handle 6 is pulled out into the retracted position against the bias of the spring 29 the lock moulding 13 may again be rotated through 90° so that the portion 26 locates within the notch 28 thus holding the handle 6 (and the bolt nose 2) in the retracted position. It will however be appreciated that whenever the lock moulding 13 is latched into the notch 27 the plate 14 is still free to move about the lock moulding when the latch mechanism is operated by a key inserted in the cylinder lock 18 to enable the bolt nose 2 to be withdrawn from the staple 4. A post 31 (Figure 3) acts as a stop limiting the movement of the head of the spring 29 and thus of the bolt nose 2. The engagement of the spring arm 29 against the post 31 prevents the deadlatch nose from entering wholly within the body 1 and thus ensures that the bolt nose 2 will not become displaced inside the body 1.

The handle 6 may be held in the retracted position temporarily by means of the hold button 7. As can be seen from Figure 6 the hold button 7 comprises a moulded body of a resilient plastics material formed at its lower end with a notch 32. When the handle 6 has been withdrawn this notch 32 can locate about a reduced portion 33 of the stepped plate 22 as the tip 34 of the hold button 7 passes into an opening 35 due to pressure applied to the face of the button 7. The moulded hold button body incorporates a pair of resilient arms 36 which react against a part of the moulded portion 11 of the body 1 and thus bias the hold button 7 outwardly of the portion 11. Integral flaps 37 which are biased slightly outwardly of the shaft 38 of the hold button 7 locate below steps (not shown) in a sleeve 39 through which the shaft 38 slides. The flaps 37 therefore limit the outward movement of the hold button 7 and will snap into place, during assembly, when the shaft 38 is initially inserted into the sleeve 39. A stop flange 37A limits the inward movement of the hold button 7 (especially during initial assembly). When the handle 6 is held in the retracted position by means of the hold button 7 it can be released by effecting a slight outward movement on the handle 6 whereupon the notch 32 becomes disengaged from the part 33 so that the hold button is moved clear of the part 33 by the action of the spring-like arms 36. Release of the handle 6 then results in the mechanism returning to the normal condition with the bolt nose 2 extended.

The latch mechanism also incorporates a deadlatch comprising the deadlatch nose 5 fixed to a deadlatch plate 40 (as shown in Figures 3 and 5). The deadlatch nose 5 is biased into the extending position shown in Figure 3 by means of a tension

spring 41 mounted between a pillar 42 secured to the plate 40 and a post 43 forming part of the body 1. A slot 44 in the plate 40 allows the plate and deadlatch nose 5 to move between alternative positions about a pin 45. This pin 45 forms part of a deadlatch moulding 46 which carries two further upstanding pins 47 and 48, positioned either side of the plate 40, and a resilient spring-like arm 49 which reacts against a boss 50 on the body 1. The arm 49 therefore biases the deadlatch moulding to rotate about a mounting post 51 on the body 1, in the clockwise direction as viewed in Figure 3.

Operation of the deadlatch mechanism can be understood most clearly from Figures 9 to 14. (Wherein some features of the shape of the plate 14 have been omitted.) When, as shown in Figure 9, the door is open so that the bolt nose 2 and deadlatch nose 5 are fully extended, the deadlatch moulding 46 is held in the same condition as illustrated in Figure 3 because the pin 48 is held against the side of the plate 40. As the door closes both the bolt nose 2 and the deadlatch nose 5 are pushed inwardly by the leading edge of the staple 4 (Figure 10) and, although the pin 48 is now free to move into a notch 52 in the plate 40, it is prevented from doing so because the pin 47 is now held against the side of the plate 14 carrying the bolt nose 2. When the door is pushed fully home the bolt nose 2 enters the opening 3 in the staple 4 so that the plate 14 moves to the condition illustrated in Figure 11. The deadlatch nose 5 will still however be held in that retracted position by the body of the staple 4 so that the deadlatch moulding 46 can now rotate whereupon the pins 48 and 47 move respectively into the notch 52 and a notch 53 in the side of the plate 14 (the plate 22 has the corresponding notch 54 to the notch 53 in the plate 14 which also accommodates the pin 47 in this condition).

Any attempt to force the latch by inserting a knife or similar thin member between the body 1 and the staple 4 to try and push the bolt nose 2 inwardly will meet with failure since the bolt nose 2 will be locked in the extended position by the reaction of the pin 47 on the notched portion 53 of the plate 14. Also the deadlatch nose 5 cannot be forced inwardly any further in an attempt to cause the deadlatch moulding 46 to rotate back to the condition illustrated in Figures 9 and 10 since the pins 45 and 48 will respectively abut the ends of the slot 44 and the notch 52.

When the door is in the closed position as illustrated in Figure 11 the bolt 2 may still be unlatched either by pulling the handle 6 or operating the cylinder lock 18 with a correct key from the outside of the door. Pulling of the handle 6 (assuming that the lock moulding 13 is in the condition shown in Figure 8) has the result that the chamfered edge 55 of the notched portion 54 acts as a cam surface on the pin 47 thus causing the deadlatch moulding 46 to rotate between the conditions illustrated in Figures 7 and 8. The Figure 8 condition of the deadlatch moulding 46 corresponds to that, for instance, of Figure 3 so

that the bolt nose can readily be withdrawn.

If a correct key is inserted into the cylinder lock 18 and rotated this will cause the actuating plate 20 to move firstly from the condition shown in Figure 12 to the condition shown in Figure 13. In the process a face 56 of the actuating plate 20 acts as a cam face on the pin 47 to move the deadlatch moulding into the unlatched position. As the actuating plate 20 rotates further, an arm 57 of the actuating plate 20 reacts against the pin 21, thus carrying the plate 14 to the retracted position, and a curved surface 58 of the actuating plate continues to maintain the deadlatch moulding 46 in the unlatched condition (Figure 14).

The latch mechanism described in connection with the drawings can be seen to incorporate many operative features and advantages with respect to conventional latch mechanisms. The important features of the method of operation of the mechanism will now be discussed briefly. As can be seen from the drawings, when the door is closed the bolt is automatically deadlocked thus providing substantial resistance against tampering. Furthermore, it is possible to prevent the door from being opened from the inside unless a key is used to turn the lock moulding 13 from the locking position wherein the portion 26 is latched into the notch 27. The lock moulding will be operated from the inside by means of the key operated mechanism 12. Furthermore, when the portion 26 is latched into the notch 27 with the door open, the door can still be closed so that the handle 6 is locked against movement. This feature is important for glass panelled doors and the like where an intruder might be tempted to break the panel with a view to unlatching the lock from the inside.

The bolt 2 can be held in the withdrawn position in one of two ways. Firstly, it can be held by the hold button 7 and can be readily released from this condition by pulling slightly on the handle 6 so that the hold button returns to the off position. In order to avoid the possibility of accidental lock-out, the bolt can be locked whilst in the withdrawn position by locating the portion 26 within the notch 28 by actuating the key operated mechanism 12 with the handle 6 held in the pulled out condition. A small indentation can be provided in the staple region which is contacted by the deadlatch nose 5, which will lightly hold the door closed when the bolt 2 is held in the withdrawn position.

As well as being of pleasing appearance the latch mechanism has certain advantages in operation compared with a cylinder night-latch (or rim latch) mechanism where the bolt can only be withdrawn by rotating a knob. The handle 6 provided can readily be grasped by persons with semi-arthritic fingers, or could even be pushed with the flat of the hand or an elbow. Furthermore, the internal construction has been so designed that a minimal number of parts are employed, which parts can generally be formed by moulding or pressing. The method of assembly is relatively simple and thus lends itself

to partial or full mechanisation. The cylinder lock within the cylinder body 18 may take many forms and may indeed be of identical form (for use with the same key) as that which will be employed for the key operated mechanism 12.

Claims

1. A latch mechanism comprising a casing (1) within which is mounted a bolt (2) which can slide between an extended position whereby it projects through one end of the casing (1) and a retracted position wherein it is at least partially withdrawn into the casing (1), a drive shaft (9—13) for rotary operation by a cylinder lock mechanism and carrying a drive member (20) which may be rotated by the drive shaft to drive the bolt (2) linearly from one position to the other, and an operating handle (6) projecting from an opposite end of the casing (1) and linked with the bolt (2) so as to move the bolt (2) from the one position to the other as the handle is moved with respect to the casing (1), characterised in that the operating handle (6) is slidably movable with respect to the casing (1) so as to act on a bolt plate (14) carrying the bolt (2), and wherein the drive member (20) and the operating handle (6) engage independently with the bolt plate (14) for operation of the bolt (2).

2. A latch mechanism as claimed in claim 1, further characterised in that the bolt plate (14) incorporates a groove (17) which will slide about the drive shaft (13) as the bolt (2) moves between its two positions.

3. A latch mechanism according to claim 1 or claim 2, further characterised in that the drive member (20) is disposed to engage a pin (21) projecting from the bolt plate (14).

4. A latch mechanism according to any one of claims 1 to 3, further characterised in that the operating handle (6) interengages with the bolt plate (14) by means of a flange (70).

5. A latch mechanism according to any one of claims 1 to 4, wherein the bolt (2) is biased by a spring (29) to the extended position.

6. A latch mechanism according to any one of claims 1 to 5, further characterised in that the handle (6) is linked with the bolt plate (14) through a handle plate (23) which defines a slot receiving the rotatable drive shaft (13) which is formed, in the region of the slot, with a groove (25) cut in the side of the drive shaft (13), or a projection from the side of the drive shaft (13), the slot providing a track extending in the direction of movement of the handle plate (23) and notches (27, 28) extending generally at right angles to the track such that, when the drive shaft (13) is in one attitude the track may slide thereabout, the drive shaft being rotatable from that attitude to locate within one of the notches (27, 28) to prevent sliding of the handle plate (23).

7. A latch mechanism according to claim 6, further characterised in that two notches (27, 28)

are provided for holding the bolt (2) in either of its two positions.

8. A latch mechanism according to claim 6 or claim 7, further characterised in that the rotatable drive shaft (13) is of circular cross-section and is formed with a semi-circular groove (25) therein, the notches (27, 28) having correspondingly shaped curved and flat faces.

9. A latch mechanism according to any one of claims 6 to 8, further characterised in that the drive shaft (13) incorporates lugs (61) which are releasable snap fit into grooves (62) in the body (11) of the latch mechanism.

10. A latch mechanism according to claim 9, further characterised in that the grooves (62) in the body (11) of the latch mechanism are disposed to hold the drive shaft (13) either in said one attitude or in a condition where it is fully engaged with one of the notches (27, 28).

11. A latch mechanism according to any one of claims 1 to 10, further characterised by a deadlatch (5) which can slide between an extended position wherein it projects through the one end of casing (1) and a retracted position wherein it is at least partially withdrawn into the casing, the deadlatch (5) being carried by a deadlatch plate (40) which forms part of a deadlatch mechanism also incorporating a bolt securing member (46) which is held by the deadlatch plate (40) out of engagement with the bolt plate (14) when the deadlatch (5) is in the extended position, but which is driven into locking engagement with a part of the bolt plate (14) so as to prevent movement of the bolt (2) to the retracted position when the bolt is extended and the deadlatch (5) is in the retracted position, the drive member (20) being operable to disengage a part (47) of the bolt securing member (46) from engagement with the bolt plate (14).

12. A latch mechanism according to claim 11, further characterised in that the bolt securing member (46) is a rotary member carrying a first pin (47) and a second pin (48) which can respectively engage with a notch (53) in the bolt plate (14) when the bolt (2) is in the extended position and a notch (52) in the deadlatch plate (40) when the deadlatch (5) is in the retracted position.

13. A latch mechanism according to claim 12, further characterised in that the drive member (20) is able to engage one of the pins to drive the first pin (47) out of engagement with the notch (53) of the bolt plate (14).

14. A latch mechanism according to any one of claims 11 to 13, further characterised in that the bolt securing member (46) is biased into the position of locking engagement with the part of the bolt plate (14).

15. A deadlatch mechanism according to claim 14, further characterised in that the biasing means is a spring arm (49) carried by the bolt securing member (46).

16. A deadlatch mechanism according to any one of claims 11 to 16, further characterised in that the deadlatch (5) is biased into the extended

position, by a spring (41).

17. A latch mechanism according to any one of claims 1 to 16, further characterised in that a plate (14 or 22) which causes movement of the bolt (2) between its two positions incorporates a slot (35) whose edge may be engaged by a notch (32) at the end of a hold member (38), the hold member (38) being biased to raise the notched end (34) thereof free of the slot (35) in the plate (22) when the edge of the slot (35) in the plate (22) is disengaged from the notch (32), the hold member (38) also incorporating an actuating portion (7) which can be pressed against the bias to allow the notch (32) to engage with the edge of the slot (35) in the plate (22).

18. A latch mechanism according to claim 17 further characterised in that the hold member (7) is biased by integral spring-like arms (36) thereof acting on part of the casing (1).

19. A latch hold mechanism according to claim 17 or claim 18, further characterised in that the actuating portion (7) is a button extending through the casing (1).

20. A latch mechanism according to any one of claims 17 to 19, further characterised by retaining means (37) for preventing the hold member (38) from being removed from the casing (1).

21. A latch mechanism according to claim 20, further characterised in that the retaining means (37) comprises projecting resilient flaps (37) on part of the hold member (38) sliding within a sleeve (39) of the casing (1), the sleeve (39) carrying flanges against which the flaps (37) will abut when the hold member (38) is disengaged and biased away from the plate (22).

Revendications

1. Mécanisme de verrouillage comprenant un boîtier (1) à l'intérieur duquel est monté un pêne (2) qui peut coulisser entre une position d'extension dans laquelle il fait saillie à travers une première extrémité du boîtier (1) et une position de retrait dans laquelle il est au moins partiellement rétracté à l'intérieur du boîtier (1), une tige de commande (9—13) destinée à être actionnée en rotation au moyen d'un mécanisme de verrouillage à cylindre et portant un organe de commande (20) qui peut être tourné au moyen de la tige de commande pour entraîner linéairement le pêne (2) depuis une première position jusqu'à la seconde, et une manette de manoeuvre (6) saillant depuis une extrémité opposée du boîtier (1) et reliée au pêne (2) de manière à déplacer le pêne (2) depuis la première position jusqu'à la seconde lorsque la manette est déplacée par rapport au boîtier (1), caractérisé en ce que la manette de manoeuvre (6) est apte à être déplacée par coulisement par rapport au boîtier (1) de manière à agir sur une plaque de pêne (14) portant le pêne (2), et dans lequel l'organe de commande (20) et la manette de manoeuvre (6) viennent indépendamment en prise avec la plaque de pêne (14) pour l'actionnement du pêne (2).

2. Mécanisme de verrouillage selon la revendication 1, caractérisé en outre en ce que la plaque de pêne (14) comprend une gorge (17) qui est apte à coulisser par rapport à la tige de commande (13) lorsque le pêne (2) se déplace entre ses deux positions.

3. Mécanisme de verrouillage selon la revendication 1 ou la revendication 2, caractérisé en outre en ce que l'organe de commande (20) est disposé de manière à venir en prise avec un ergot (21) saillant de la plaque de pêne (14).

4. Mécanisme de verrouillage selon l'une quelconque des revendications 1 à 3, caractérisé en outre en ce que la manette de manoeuvre (6) vient en prise avec la plaque de pêne (14) au moyen d'une collerette (70).

5. Mécanisme de verrouillage selon l'une quelconque des revendications 1 à 3, dans lequel le pêne (2) est sollicité élastiquement dans la position d'extension par un ressort (29).

6. Mécanisme de verrouillage selon l'une quelconque des revendications 1 à 5, caractérisé en outre en ce que la manette (6) est reliée à la plaque de pêne (14) par l'intermédiaire d'une plaque de manette (23) qui définit un interstice recevant la tige de commande apte à pivoter (13) qui est pourvue, dans la zone de l'interstice, d'une gorge (25) creusée dans le côté de la tige de commande (13), ou d'une saillie dépassant du côté de la tige de commande (13), l'interstice fournissant une piste s'étendant dans le sens du déplacement de la plaque de manette (23), et des encoches (27, 28) s'étendant de façon générale à angle droit par rapport à la piste de telle sorte que, lorsque la tige de commande (13) est dans une première position, la piste puisse coulisser par rapport à elle, la tige de commande étant apte à tourner depuis cette position pour venir se loger dans l'une des encoches (27, 28) afin d'empêcher un coulisement de la plaque de manette (23).

7. Mécanisme de verrouillage selon la revendication 6, caractérisé en outre en ce que deux encoches (27, 28) sont prévues pour retenir le pêne (2) dans l'une ou l'autre de ses deux positions.

8. Mécanisme de verrouillage selon la revendication 6 ou la revendication 7, caractérisé en outre en ce que la tige de commande apte à être tournée (13) présente une section transversale circulaire et est pourvue d'une gorge semi-circulaire (25), les encoches (27, 28) possédant des faces planes et incurvées de forme correspondante.

9. Mécanisme de verrouillage selon l'une quelconque des revendications 6 à 8, caractérisé en outre en ce que la tige de commande (13) comprend des bossages (61) qui constituent un ajustement précis dans des gorges (62) du corps (11) du mécanisme de verrouillage.

10. Mécanisme de verrouillage selon la revendication 9, caractérisé en outre en ce que les gorges (62) ménagées dans le corps (11) du mécanisme de verrouillage sont disposées de manière à maintenir la tige de commande (13) soit dans ladite première position, soit dans une position

dans laquelle elle est totalement en prise avec l'une des encoches (27, 28).

11. Mécanisme de verrouillage selon l'une quelconque des revendications 1 à 10, caractérisé en outre par un pêne dormant (5) qui peut coulisser entre une position d'extension dans laquelle il fait saillie à travers la première extrémité du boîtier (1), et une position de retrait dans laquelle il est au moins partiellement rétracté à l'intérieur du boîtier, le pêne dormant (5) étant porté par une plaque de pêne dormant (40) qui constitue une partie d'un mécanisme de pêne dormant comprenant également un organe de blocage (46) du pêne, qui est maintenu exempt de venue en prise avec la plaque de pêne (14) au moyen de la plaque de pêne dormant (40) lorsque le pêne dormant (5) est dans la position d'extension, mais qui est amené en prise de verrouillage avec une partie de la plaque de pêne (14) de manière à empêcher un déplacement du pêne (2) vers la position de retrait lorsque le pêne est en extension et que le pêne dormant (5) est en position de retrait, l'organe de commande (20) étant apte à être manoeuvré pour libérer une partie (47) de l'organe de blocage (46) du pêne de sa position de prise avec la plaque de pêne (14).

12. Mécanisme de verrouillage selon la revendication 11, caractérisé en outre en ce que l'organe de blocage (46) du pêne est un organe rotatif portant un premier ergot (47) et un second ergot (48) qui peuvent respectivement venir en prise avec une encoche (53) ménagée dans la plaque de pêne (14) lorsque le pêne (2) est dans la position d'extension et avec une encoche (52) ménagée dans la plaque de pêne dormant (40) lorsque le pêne dormant (5) est dans la position de retrait.

13. Mécanisme de verrouillage selon la revendication 12, caractérisé en outre en ce que l'organe de commande (20) est apte à venir en prise avec l'un des ergots pour entraîner le premier ergot (47) hors de sa position de prise avec l'encoche (53) de la plaque de pêne (14).

14. Mécanisme de verrouillage selon l'une quelconque des revendications 11 à 13, caractérisé en outre en ce que l'organe de blocage (46) du pêne est sollicité élastiquement dans la position de verrouillage en prise avec la partie de la plaque de pêne (14).

15. Mécanisme de verrouillage à pêne dormant selon la revendication 14, caractérisé en outre en ce que le moyen de sollicitation élastique est un bras à ressort (49) porté par l'organe de blocage (46) du pêne.

16. Mécanisme de verrouillage à pêne dormant selon l'une quelconque des revendications 11 à 16, caractérisé en outre en ce que le pêne dormant (5) est sollicité élastiquement dans la position d'extension au moyen d'un ressort (41).

17. Mécanisme de verrouillage selon l'une quelconque des revendications 1 à 16, caractérisé en outre en ce qu'une plaque (14 ou 22) qui provoque le déplacement du pêne (2) entre ses deux positions, comprend un interstice (35) dont les arêtes peuvent venir en prise avec une encoche (32) à l'extrémité d'un organe de retenue (38),

l'organe de retenue (38) étant sollicité élastiquement de façon à relever son extrémité (34) pourvue d'une encoche en la dégageant de l'interstice (35) ménagé dans la plaque (22), lorsque l'arête de l'interstice (35) ménagé dans la plaque (22) est libérée de sa position de prise avec l'encoche (32), l'organe de retenue (38) comprenant également une partie d'actionnement (7) qui est apte à être repoussée à l'encontre de la force de sollicitation élastique pour permettre à l'encoche (32) de venir en prise avec l'arête de l'interstice (35) ménagé dans la plaque (22).

18. Mécanisme de verrouillage selon la revendication 17, caractérisé en outre en ce que l'organe de retenue (7) est sollicité élastiquement par des bras (36) équivalents à des ressorts, qui lui sont solidaires et agissent sur une partie du boîtier (1).

19. Mécanisme de verrouillage à blocage selon la revendication 17 ou la revendication 18, caractérisé en outre en ce que la partie d'actionnement (7) est un bouton s'étendant à travers le boîtier (1).

20. Mécanisme de verrouillage selon l'une quelconque des revendications 17 à 19, caractérisé en outre par un moyen de retenue (37) destiné à empêcher l'organe de retenue (38) d'être séparé du boîtier (1).

21. Mécanisme de verrouillage selon la revendication 20, caractérisé en outre en ce que le moyen de retenue (37) est constitué par des languettes élastiques faisant saillie sur la partie de l'organe de retenue (38) coulissant à l'intérieur d'un fourreau (39) du boîtier (1), le fourreau (39) portant des collerettes contre lesquelles les languettes (37) viennent en appui lorsque l'organe de retenue (38) est libéré et sollicité en s'éloignant de la plaque (22).

Patentansprüche

1. Fallen-Mechanismus mit einem Gehäuse (1), in welchem eine Falle (2) angeordnet ist, die zwischen einer äußeren Stellung, in welcher sie aus einem Ende des Gehäuses (1) vorsteht und einer inneren Stellung, in welcher sie zumindest teilweise in das Gehäuse zurückgezogen ist, verschiebbar ist, einer Schließwelle (9—13), die durch einen Zylinderschloß-Mechanismus gedreht werden kann und einen Mitnehmer (20) trägt, der von der Schließwelle gedreht werden kann, um die Falle (2) linear von der einen Stellung in die andere zu bringen, und mit einem Handgriff (6), der sich von einem gegenüberliegenden Ende des Gehäuses erstreckt und mit der Falle (2) derart in Verbindung steht, daß er die Falle (2) von der einen in die andere Stellung bewegt, wenn er in Bezug auf das Gehäuse bewegt wird, dadurch gekennzeichnet, daß der Handgriff (6) in Bezug auf das Gehäuse (1) verschiebbar ist, um auf eine Fallenplatte (14) einzuwirken, welche die Falle (2) trägt, und daß der Mitnehmer (20) und der Handgriff (6) unabhängig voneinander mit der Fallenplatte (14) zwecks Betätigung der Falle (2) zusammenwirken.

2. Fallen-Mechanismus nach Anspruch 1, da-

durch gekennzeichnet, daß die Fallenplatte (14) einen Ausschnitt (17) aufweist, der sich an der Schließwelle (13) vorbei bewegt, wenn die Falle (2) zwischen ihren beiden Stellungen bewegt wird.

3. Fallen-Mechanismus nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der Mitnehmer (20) mit einem Stift (21) in Eingriff bringbar ist, der sich von der Fallenplatte (14) erstreckt.

4. Fallen-Mechanismus nach einem oder mehreren der Ansprüche 1 bis 3, dadurch gekennzeichnet, daß der Handgriff (6) mit der Fallenplatte (14) über einen Flansch (70) zusammenwirkt.

5. Fallen-Mechanismus nach einem der Ansprüche 1 bis 4, dadurch gekennzeichnet, daß die Falle (2) durch eine Feder (29) in ihre äußere Stellung gedrückt ist.

6. Fallen-Mechanismus nach einem der Ansprüche 1 bis 5, dadurch gekennzeichnet, daß der Handgriff (6) mit der Fallenplatte (14) über eine Handgriffplatte (23) verbunden ist, die einen Schlitz zur Aufnahme der drehbaren Schließwelle (13) aufweist, welche im Bereich des Schlitzes mit einer Nut (25) in der Seite der Schließwelle (13) oder mit einem von der Seite der Schließwelle (13) vorstehenden Vorsprung versehen ist, wobei der Schlitz eine in der Bewegungsrichtung der Handgriffplatte (22) sich erstreckende Führung bildet und mit im wesentlichen rechtwinklig zu der Führung sich erstreckenden Aussparungen (27, 28) versehen ist, derart, daß in einer Lage der Schließwelle (13) die Führung zu diesem verschiebbar ist und die Schließwelle aus dieser Lage drehbar ist, um in eine der Aussparungen (27, 28) zu gelangen und eine Verschiebung der Handgriffplatte (23) zu verhindern.

7. Fallen-Mechanismus nach Anspruch 6, dadurch gekennzeichnet, daß zwei Aussparungen (27, 28) vorgesehen sind, um die Falle (2) in der einen oder der anderen seiner zwei Stellungen zu halten.

8. Fallen-Mechanismus nach Anspruch 6 oder 7, dadurch gekennzeichnet, daß die drehbare Schließwelle (13) einen kreisförmigen Querschnitt aufweist und mit einer halbkreisförmigen Nut (25) versehen ist, und daß die Aussparungen (27, 28) entsprechend geformte bogenförmige und gerade Flächen aufweisen.

9. Fallen-Mechanismus nach einem der Ansprüche 6 bis 8, dadurch gekennzeichnet, daß die Schließwelle (13) Ansätze (61) aufweist, die lösbar in Nuten (62) in dem Grundkörper (11) des Fallen-Mechanismus einrastbar sind.

10. Fallen-Mechanismus nach Anspruch 9, dadurch gekennzeichnet, daß die Nuten (62) in dem Grundkörper (11) des Fallen-Mechanismus derart angeordnet sind, daß sie die Schließwelle (13) entweder in der genannten einen Lage oder in einer Stellung halten, in der sie voll in eine der Aussparungen (27, 28) eingreift.

11. Fallen-Mechanismus nach einem der Ansprüche 1 bis 10, gekennzeichnet durch einen Sperriegel (5), der zwischen einer äußeren Stellung, in der er durch ein Ende des Gehäuses (1) vorsteht und einer inneren Stellung, in der er

zumindest teilweise in das Gehäuse zurückgezogen ist, verschiebbar ist und der von einer Riegelplatte (40) getragen ist, die Teil eines Riegelmechanismus bildet, der auch ein Riegelhalteelement (46) aufweist, das von der Riegelplatte (40) außer Eingriff mit der Fallenplatte (14) gehalten ist, wenn sich der Sperrriegel (5) in der äußeren Stellung befindet, das jedoch in einen sperrenden Eingriff mit einem Teil der Fallenplatte (14) bewegt wird, um eine Bewegung der Falle (2) in die zurückgezogene Stellung zu verhindern, wenn diese in ihrer äußeren Stellung ist und der Sperrriegel (5) in der zurückgezogenen Stellung ist, wobei der Mitnehmer (20) betätigbar ist, um einen Teil (47) des Riegelhalteelements (46) außer Eingriff mit der Fallenplatte (14) zu bringen.

12. Fallen-Mechanismus nach Anspruch 11, dadurch gekennzeichnet, daß das Riegelhalteelement (46) ein drehbares Glied ist, das einen ersten Stift (47) und einen zweiten Stift (48) trägt, von denen der erste in eine Kerbe (53) der Fallenplatte (14) eingreift, wenn sich der Riegel (2) in seiner äußeren Stellung befindet, und der zweite in eine Kerbe (52) der Riegelplatte (40) eingreift, wenn sich der Sperrriegel (5) in seiner inneren Stellung befindet.

13. Fallen-Mechanismus nach Anspruch 12, dadurch gekennzeichnet, daß der Mitnehmer (20) mit einem der Stifte zusammenwirken kann, um den ersten Stift (47) außer Eingriff mit der Kerbe (53) der Fallenplatte (14) zu bringen.

14. Fallen-Mechanismus nach einem der Ansprüche 11 bis 13, dadurch gekennzeichnet, daß das Riegelsperrelement (46) in die Stellung, in welcher es im Sperreingriff mit dem Teil der Fallenplatte (14) ist, vorgespannt ist.

15. Fallen-Mechanismus nach Anspruch 14, dadurch gekennzeichnet, daß zur Erzeugung der Vorspannung ein Federarm (49) vorgesehen ist, der von dem Riegelsperrelement (46) getragen ist.

16. Fallen-Mechanismus nach einem der An-

sprüche 11 bis 15, dadurch gekennzeichnet, daß der Sperr-Riegel (5) durch eine Feder (41) in die äußere Stellung gedrückt ist.

5 17. Fallen-Mechanismus nach einem der Ansprüche 1 bis 16, dadurch gekennzeichnet, daß eine Platte (14 oder 22), welche eine Bewegung der Falle (2) zwischen seinen beiden Stellungen bewirkt, einen Schlitz (35) aufweist, dessen Kante in eine Kerbe (32) am Ende eines Halteelements (38) eingreifen kann, das vorgespannt ist, um das mit der Kerbe versehene Ende (34) anzuheben und von dem Schlitz (35) in der Platte (22) freizukommen, wenn die Kante des Schlitzes (35) in der Platte (22) außer Eingriff mit der Kerbe (32) ist, und daß das Halteelement (38) außerdem ein Betätigungselement (7) aufweist, das gegen die Vorspannung eingedrückt werden kann, um zu erreichen, daß die Kerbe (32) mit der Kante des Schlitzes (35) in der Platte (22) zusammenwirkt.

20 18. Fallen-Mechanismus nach Anspruch 17, dadurch gekennzeichnet, daß die Vorspannung des Halteelements (7) von damit einstückigen federnden Armen (36) erzeugt wird, die sich auf einem Teil des Gehäuses (1) abstützen.

25 19. Fallen-Mechanismus nach Anspruch 17 oder 18, dadurch gekennzeichnet, daß das Betätigungselement (7) ein sich durch das Gehäuse (1) erstreckender Druckknopf ist.

30 20. Fallen-Mechanismus nach einem der Ansprüche 17 bis 19, gekennzeichnet durch Haltemittel (37), welche verhindern, daß das Halteelement (38) aus dem Gehäuse (1) entfernt werden kann.

35 21. Fallen-Mechanismus nach Anspruch 20, dadurch gekennzeichnet, daß die Haltemittel (37) vorstehende, federnde Zungen (37) an einem Teil der Halteelements (38) aufweisen, die in einer Hülse (39) des Gehäuses (1) gleiten, wobei die Hülse (39) Flansche trägt, an denen sich die Zungen (37) abstützen, wenn das Halteelement (38) losgelassen und von der Platte (22) weggedrückt ist.

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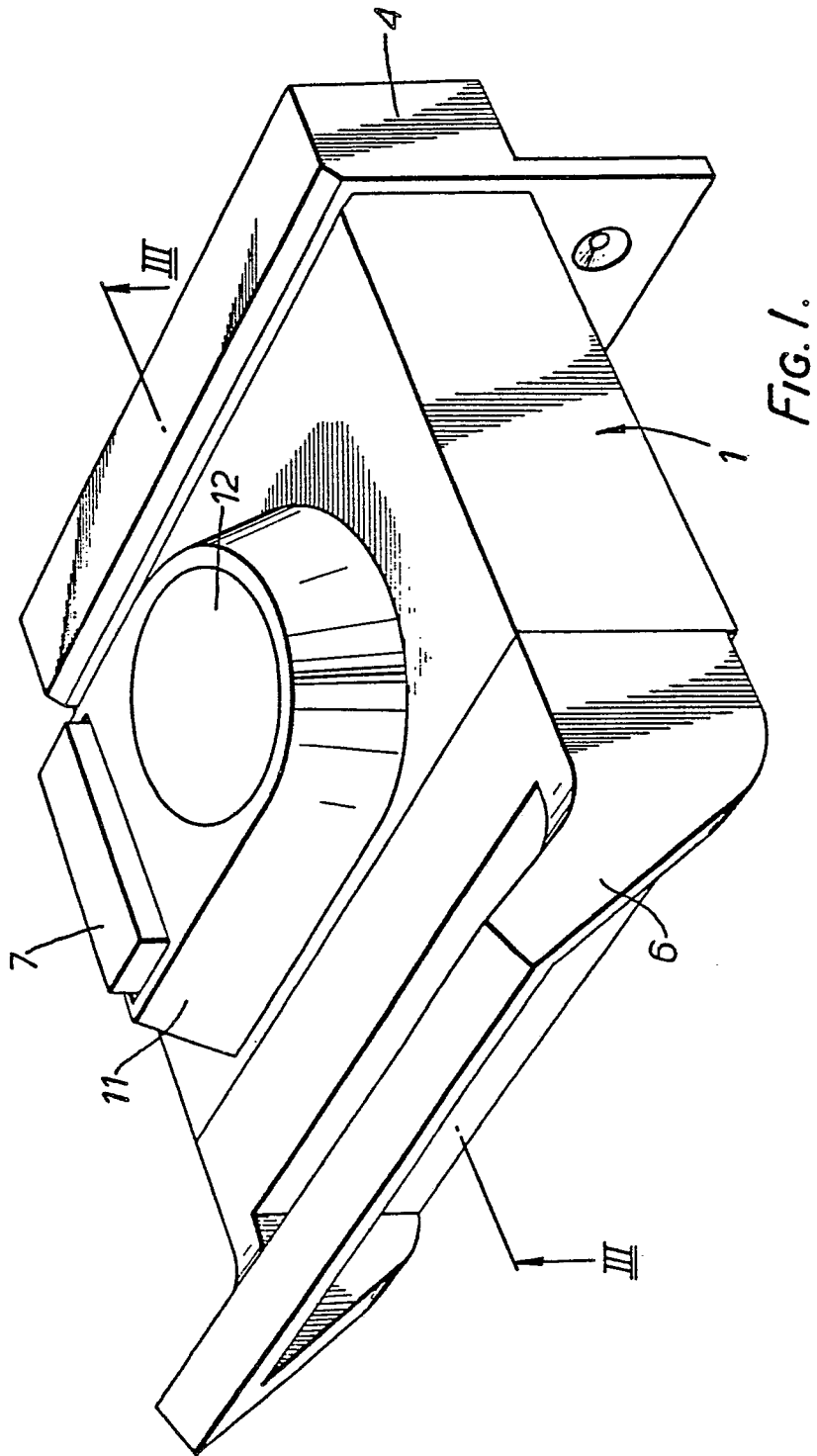
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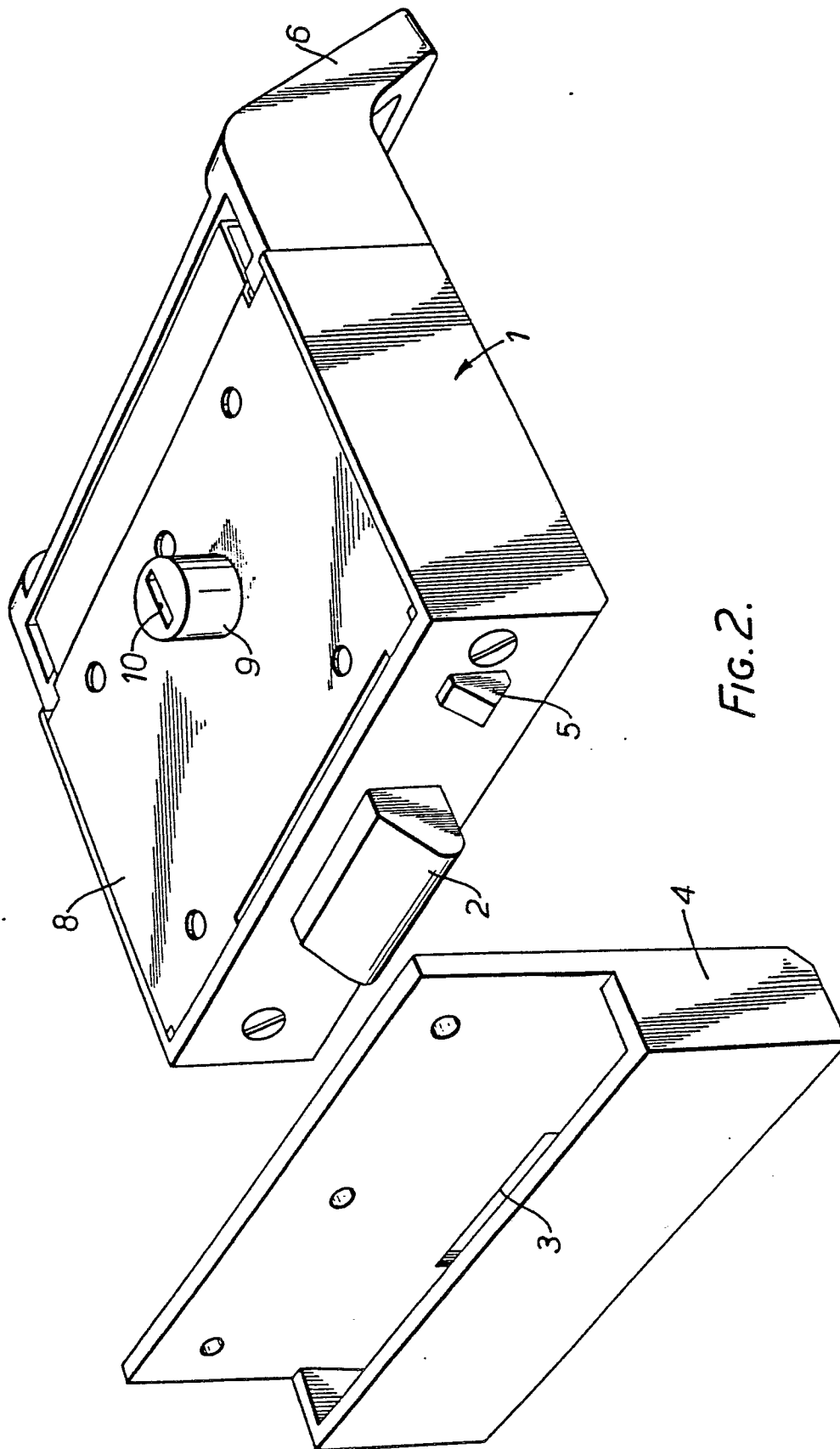


FIG. 2.

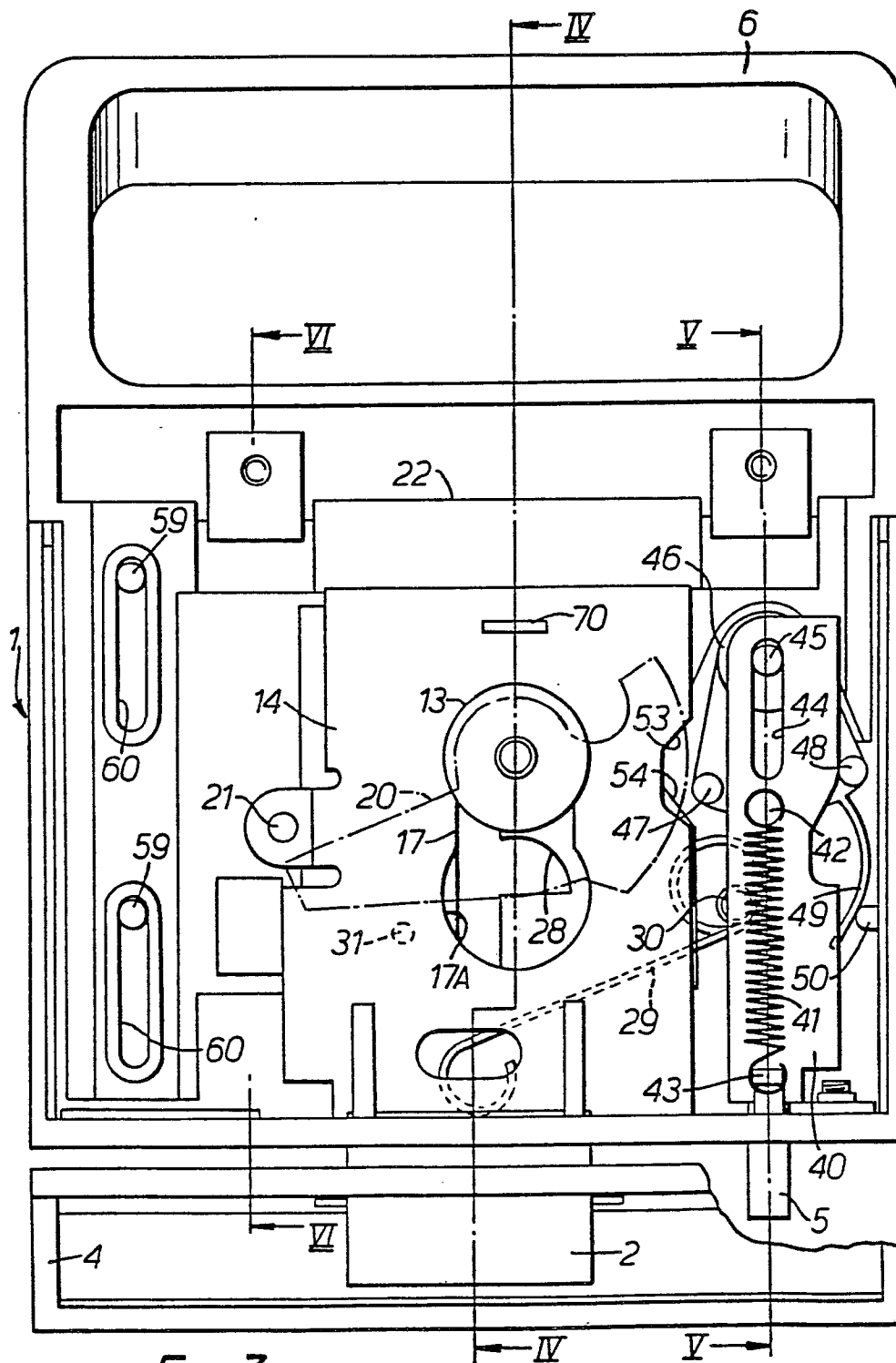
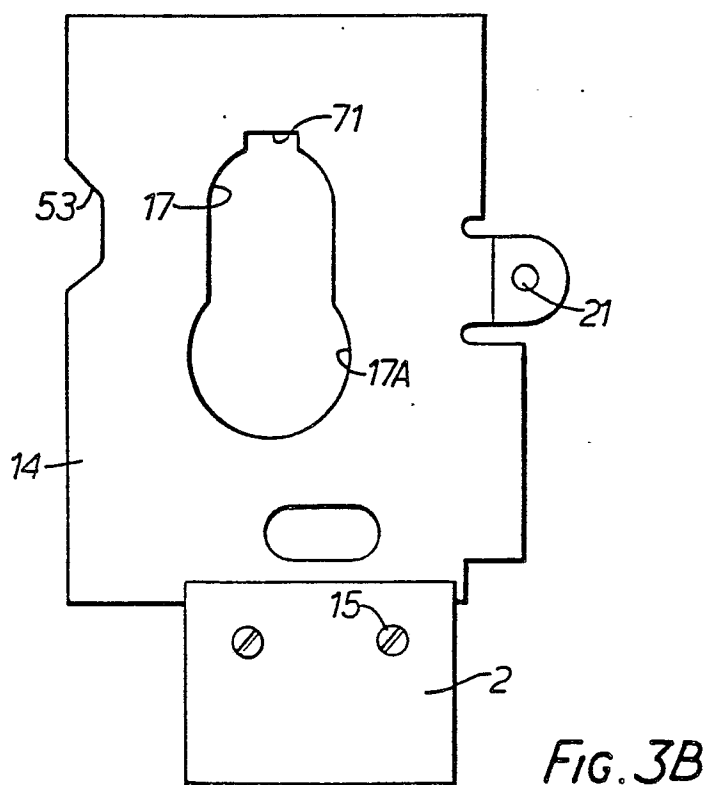
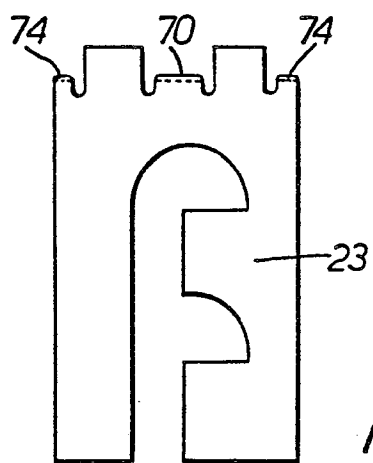


FIG. 3.



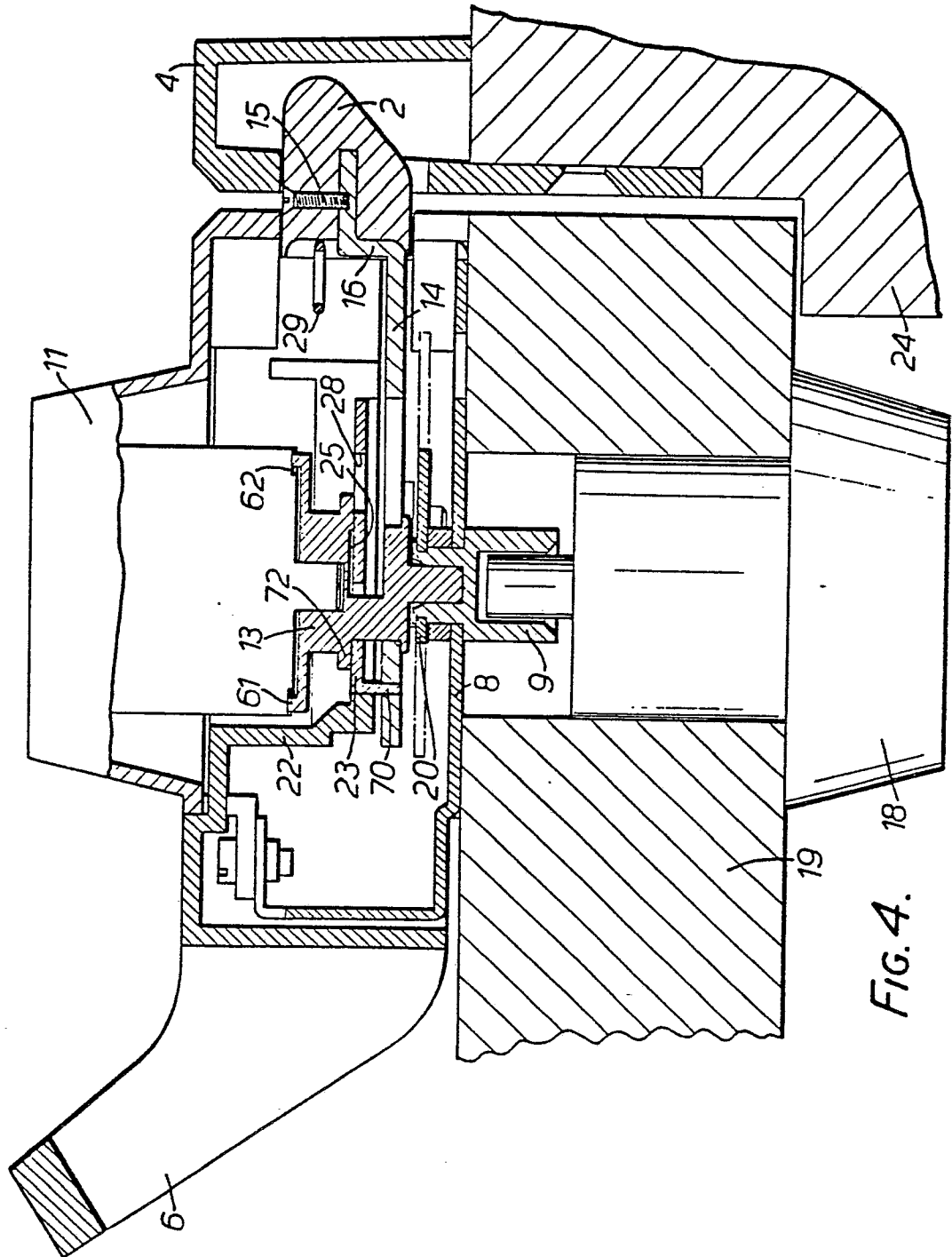


FIG. 4.

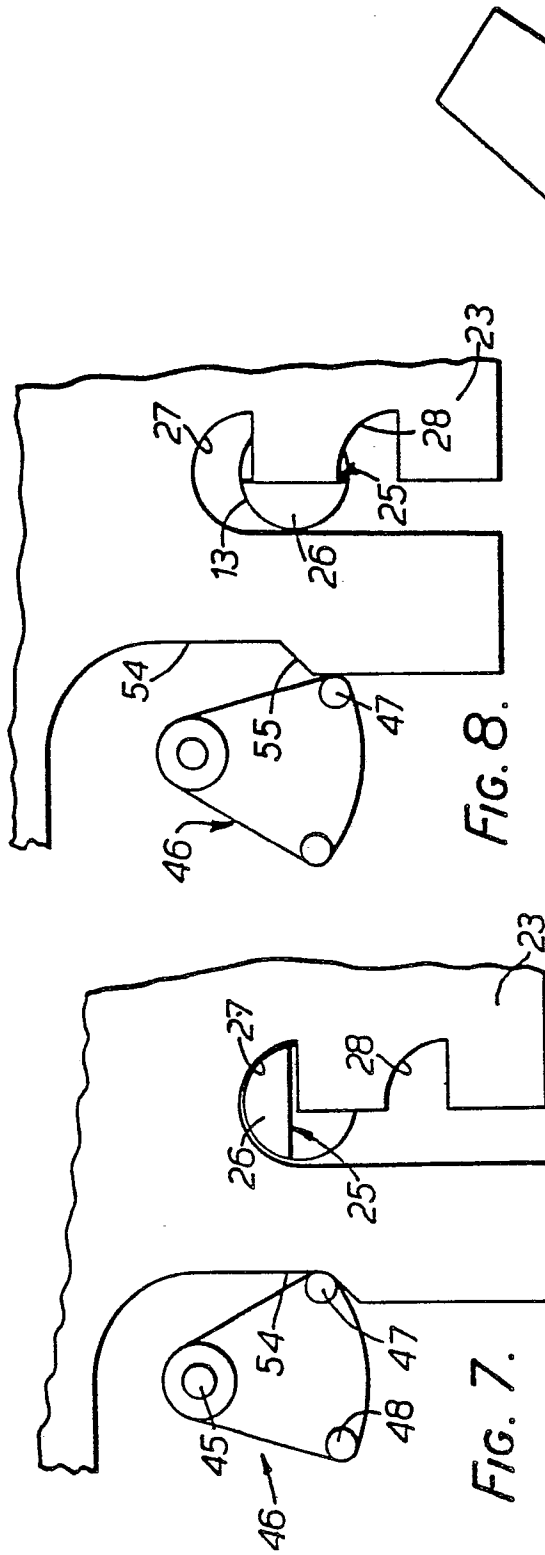


FIG. 8.

FIG. 7.

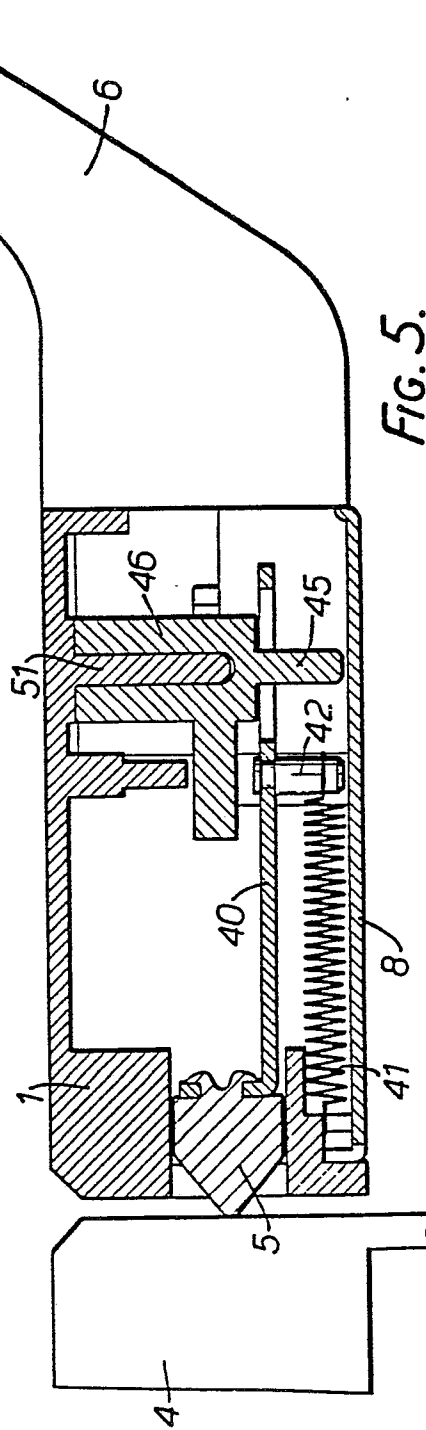


FIG. 5.

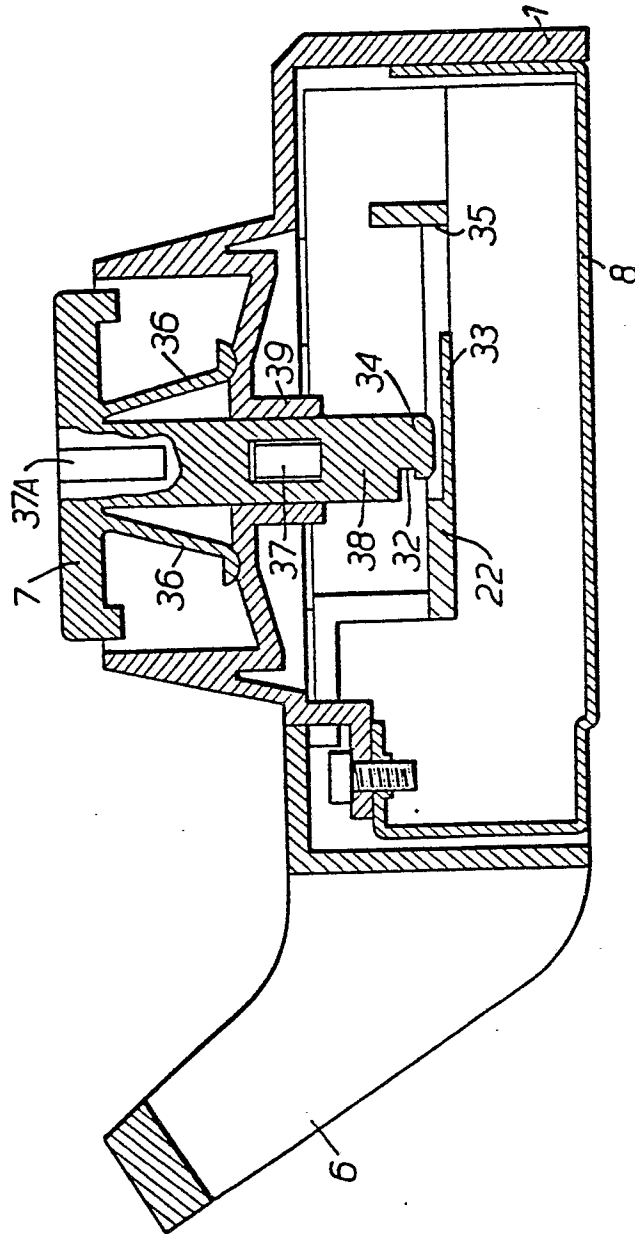
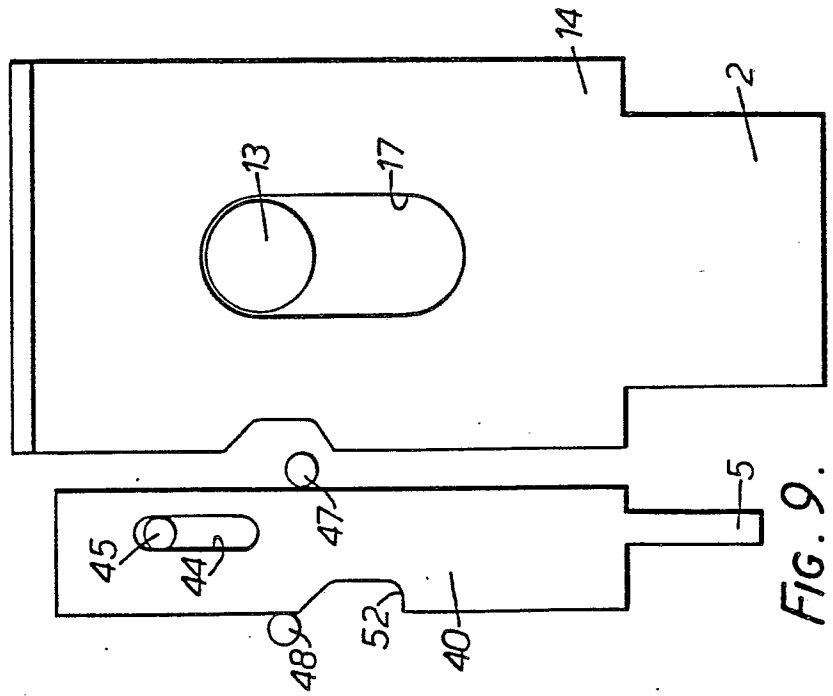
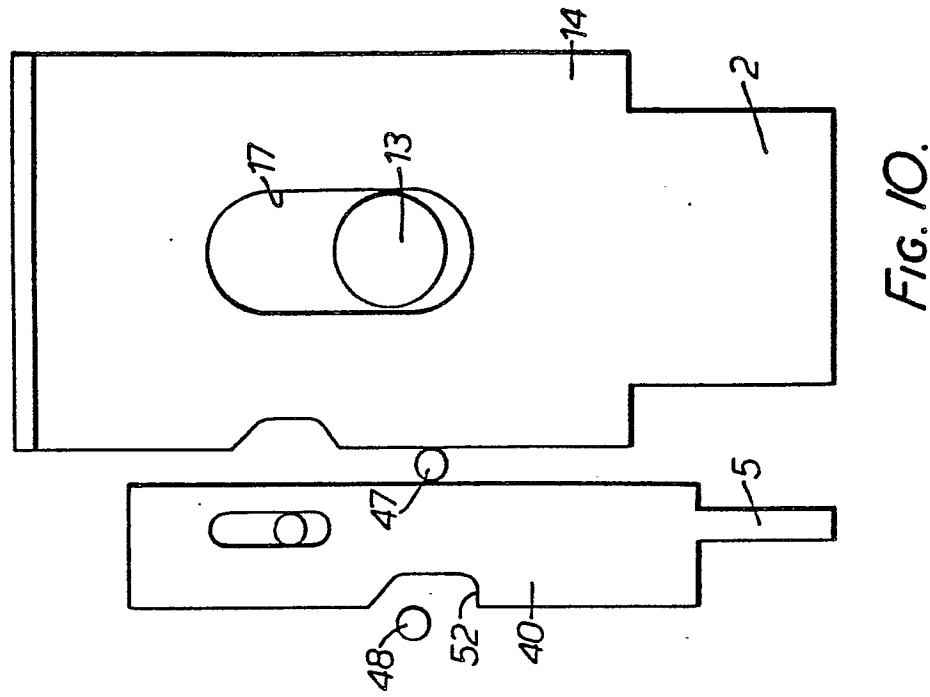
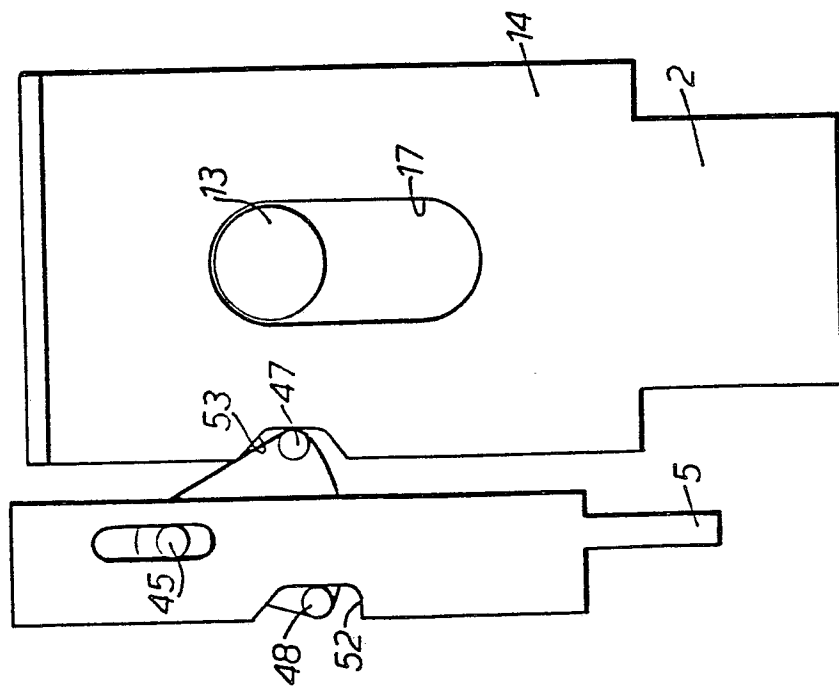
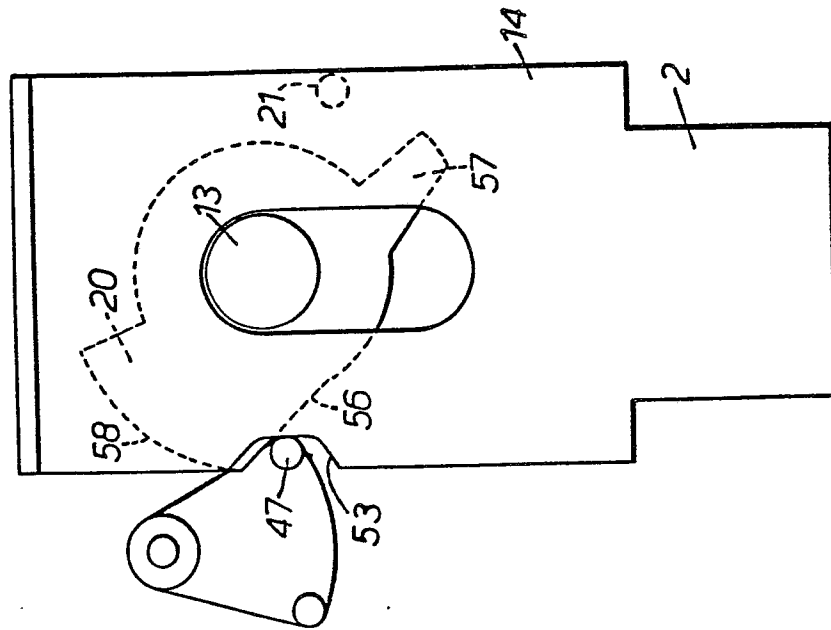


FIG. 6.





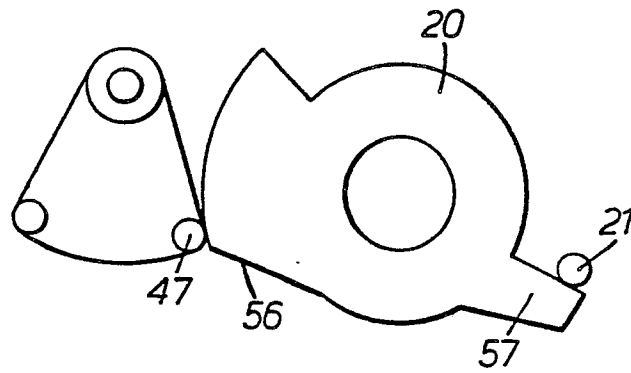


FIG. 13.

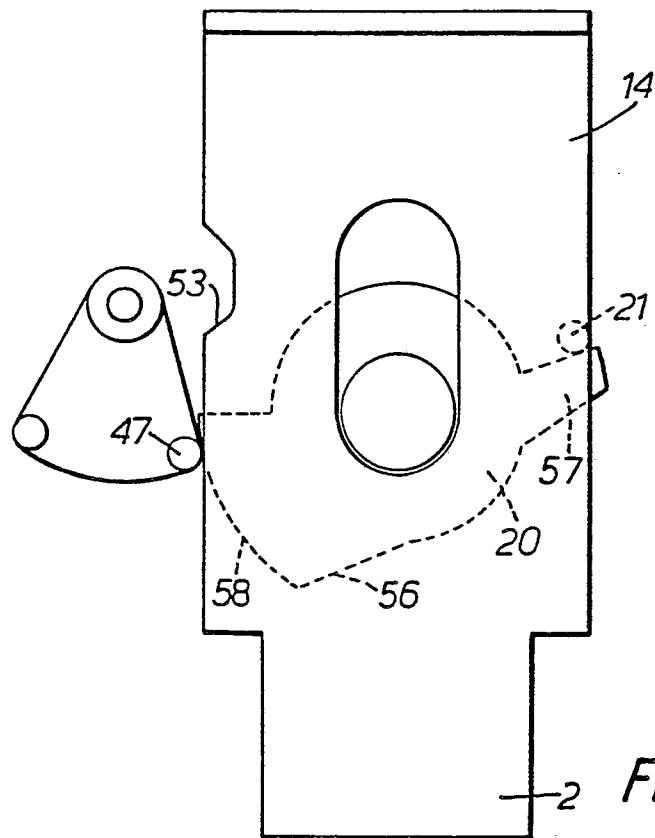


FIG. 14.