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(54) **Mechanical deadlock**

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EP 0 665 352 B2

Description

[0001] The present invention relates to a lock which has a mechanical deadlock facility, and in particular, but not exclusively, to a lock for use in an automobile door.

[0002] A conventional automobile door locking system includes a key operated lock, and a latch device which is disposed at a free edge of the door. The latch device is linked to the lock through a link rod attached between the latch and a lever portion of the lock. The latch and lock are also connected by means of mechanical linkages to a cill button provided within the vehicle, located adjacent the internal edge of the window cill, which is raised to unlock the door, and lowered to lock the door. The linkages to the cill button and lock are usually connected at opposite ends of a lever device in the latch. Also connected to the latch through further linkages are an exterior handle release, and interior release. When the lock is in an unlocked condition, achieved through either unlocking of the lock by the key, or raising of the cill button, the latch can be opened by operating either the interior or exterior releases. Such a door locking system is known from DE-A-4 312 573.

[0003] The lock itself conventionally comprises a central rotatable lock barrel having a keyway therein disposed within a housing, with an arrangement of tumblers adjacent the keyway which become appropriately aligned on insertion of the key to allow rotation of the barrel within the lock housing. A lever arrangement is driven by the barrel, with a mechanical linkage attached between the lever and the latch so that as the barrel is rotated in an unlocking or locking action the lever is raised or lowered, effecting locking or unlocking of the latch device. More specifically, the lock is arranged so that the key can only be inserted or retracted into the barrel when the barrel is at a particular orientation in the lock (a "neutral" position). Locking or unlocking requires the operator to rotate the key from this position so as to move the lever, and subsequently return the key to its neutral position to allow its retraction from the lock. To prevent the lever from following the key and barrel as they are rotated back to the neutral position in this action a degree of free play between the barrel and the lever is necessary. This is discussed in further detail in the specific description.

[0004] The existence of this free play compromises the security of the lock system. With such a system, if a thief breaks the window, he or she can simply raise the cill button, allowing operation of the external handle release, or interior release, to open the door. Such a locking system can also be overcome without breaking the window by a thief on insertion of a suitable implement into the door panel, usually via the external window seal. On sliding a suitably adapted instrument it is possible to engage and manipulate one or other of the linkages from the cill button or the lock to the lever in the latch. The free play which exists at the lock allows the lever to be moved to an unlocked position in which the door can

then be opened by the exterior handle release or interior release.

[0005] It has been proposed to provide electrical locking devices which deadlock the internal linkages; however, these systems employ switches, electrical actuators, wiring and connectors which render the locking system expensive, and potentially unreliable due to the sensitive nature of these components.

[0006] The present invention seeks to provide a simple mechanical lock which can be readily incorporated into an otherwise conventional mechanical locking system, and which has a deadlock effect. When so incorporated even if access to the internal linkages within the door can be gained, the latch cannot be opened.

[0007] According to the present invention there is provided a lock for attachment to a latch device comprising a housing, a generally cylindrical barrel arranged therein having a keyway, the barrel being rotatable within the housing on insertion of a key, and a lever rotatable between a first position which represents a locked position and a second position angularly spaced from the first position which represents an unlocked position, characterised in that a cam is fixed to the barrel for rotation therewith; the lever is adapted to be rotated by the cam with free play provided between the lever and cam, said free play allowing the cam and barrel to be returned to a neutral position after locking and after unlocking without driving the lever therewith and allowing said lever to be moved independently of the barrel in said second position; and engagement means are provided between the lever and housing, said engagement means being adapted to prevent rotation of the lever when in the first position with the barrel in the neutral position.

[0008] This arrangement ensures that the locking lever cannot be moved when locked, providing a deadlock effect. The necessary free play, which conventionally is provided between the barrel and lever, is instead provided between the lever and the cam. When connected to a door latch through a mechanical linkage the latch becomes deadlocked so that the latch cannot be opened even if access to the linkages is gained by a thief.

[0009] In a preferred embodiment, the engagement means comprise a locking element constrained to move with the lever on the rotation thereof, a first housing recess of the housing, at least a part of the locking element being received in said recess when the lever is in the first position with the barrel in the neutral position, whereby rotation of the lever is prevented and the lock is deadlocked. The cam may comprise a generally circular plate an edge portion of which lies adjacent the locking element to prevent movement thereof from the first housing recess when the lock is deadlocked and having a first radial cam recess disposed so that it is angularly beyond the locking element in the direction of locking when the lock is deadlocked. A portion of the housing defining an edge of the first housing recess which lies in the unlocking direction may be shaped to urge said locking el-

ement radially inwardly as the lever is urged in the unlocking direction, whereby on rotation of the barrel in the unlocking direction the first cam recess becomes aligned with locking element which is received therein, allowing the lever to be rotated. Moreover, the housing and cam are provided with second respective recesses angularly spaced from the first recesses in the unlocking direction, into which second housing recess said locking element is urged as the barrel is returned to the neutral position after movement of the lever to the unlocked position, and into which second cam recess the locking element is urged on rotation of the cam and lever in the locking direction from an unlocked position. Moreover, the second housing recess permits limited rotation of the lever to a sufficient degree to allow conventional locking by means of a cill button without engaging the deadlock facility.

[0010] This provides an extremely effective deadlock with simple mechanical components, thereby allowing an inexpensive and reliable lock with a deadlocking facility to be provided by means of key operation, whilst still retaining a conventional non-deadlocked slam locking facility.

[0011] Preferably, the locking element is disposed at an outer edge of the lever, between a pair of upstanding lugs, one of which is abutted by a drive surface of the cam during rotation thereof on locking, and the other of which is abutted by an oppositely directed drive surface of the cam during rotation thereof during unlocking, said drive surfaces being angularly spaced to provide the free play between the cam and the lever. These lugs thereby serve both to receive drive, and to constrain the locking element further simplifying the lock.

[0012] The lever preferably comprises a plate-like member having a portion which overlies an end of the housing which is provided with an aperture therethrough through which a portion of the barrel extends, and an elongate portion extending radially therefrom, with said upstanding lugs provided at a side of the lever which is opposite to the elongate portion. The cam is preferably a plate-like member which overlies the lever, and is keyed to the barrel for rotation therewith. The lock can be formed of a very similar overall size to a conventional lock, so that a conventional lock can be readily replaced by a lock in accordance with the invention without modification of the vehicle door.

[0013] The locking element may comprise a cylindrical roller, or alternatively a lever element pivoted at one end to an upstanding lug of the lever and having at its free end an enlarged head portion.

[0014] The invention also resides in a door lock as described above in combination with a door latch, with a mechanical linkage provided between the lever of the lock and the latch.

[0015] Embodiments of the present invention are described, by way of example only, with reference to the following drawings in which:

Figure 1 illustrates a conventional door locking system;

Figure 2 is an exploded view of a lock in accordance with a first embodiment of the invention;

Figure 3(a) shows the lock in accordance with the first embodiment of the present invention in a condition where a lever is in an unlocked position with a barrel in a neutral position;

Figure 3(b) shows the lock as the barrel is being turned by a key in order to engage the lock;

Figure 3(c) shows the lock in a condition with the key and barrel fully turned in the lock in a locking direction;

Figure 3(d) shows the lock with the lever in the locked position and barrel in the neutral position, with the deadlock engaged;

Figure 3(e) shows the lock as unlocking has just commenced;

Figure 3(f) shows the lock at the full extent of rotation of the barrel in the unlocking direction, with the deadlock disengaged; and

Figure 4 is an enlarged view of an alternative embodiment of the lock according to the invention.

[0016] In the drawings, like reference numerals indicate like parts.

[0017] Turning to the drawings, Figure 1 shows a locking system for a vehicle door which is conventional in its construction. Although the precise arrangement illustrated is employed with a sliding door, the principles as they relate to the invention apply equally to conventional pivoting door arrangements, as is discussed in further detail below.

[0018] The system, generally designated 2, comprises a latch device 4 illustrated part-schematically, which is disposed at a free edge of a door (not shown). The latch device 4 comprises a pivoted latch member 7 having a latch claw 5. When the door is closed it is slid in the direction of the arrow A so that the latch claw 5 engages over a striker bar 6 attached to the door frame of the vehicle. The latch claw 5 is cammed over the striker bar 6 in a clockwise sense and against the action of spring 9 to engage over the striker bar 6. At its opposite end the latch member 7 abuts a blocking bar 8 which is pivoted about its lower end. The blocking bar 8 itself is biased by spring 9a in a clockwise sense to engage under the latch member 7, preventing rotation of the latch member. A rocker lever 10 is acted on at opposite sides of its pivot by a lock 11 having a lever 12, through linkage 13, and by a cill button 14 disposed adjacent a window

of the vehicle, through linkage 15. Connected to the blocking bar 8 are an internal door release 16, through a linkage 17, and external door handle release 18, through linkage 19. In Figure 1 the latch is shown in a locked condition in which the latch member 7 is prevented from movement by the blocking bar 8 and lock 11 is locked with the lever 12 of the lock in the "up" locked position, and with the cill button 14 in the "down" locked position. The rocker lever 10 is moved to an unlocked position in which the end thereof adjacent the blocking bar 8 is lowered, either by lifting the cill button 14, or unlocking the lock 11 which moves the lever 12 to its "down" position. With the rocker lever pivoted so that its end adjacent the blocking bar 8 is lowered, the blocking bar 8 can be moved towards the rocker lever 10 by the internal 16 or external 18 door releases, with the end of the rocker lever 10 being received in a cutout 20 of the blocking bar 8. The latch member 7 is then able to pivot past the end of the blocking bar 8 to release the claw 5 from the striker bar 6, allowing the vehicle door to be opened.

[0019] In a conventional hinged door the locking arrangement is generally similar, although here the latch claw takes a different form comprising a claw mounted on a shaft which rotates to engage over a striker bar fixed to the car door frame, as is well known in the art. There is still an arrangement of blocking bar and rocker lever or equivalent which prevents movement of the latch claw when in a locked condition. Moreover, when the lock is in the unlocked condition, movement of the cill button or internal release allows the latch claw to move over the bar.

[0020] In this system, in the locked condition which is illustrated in Figure 1, the lock lever 12 is free to pivot downwardly to a degree in a clockwise sense, owing to the freeplay which is provided between the lock barrel and the lever 12, which freeplay is provided to enable the key to be retracted from the barrel after locking, as discussed above. This freeplay means that a thief who obtains access to the rocker lever 10 or linkages 13 or 15 is able to move the rocker lever 10 to an unlocked position in which the door can be opened by operating the internal or external door releases 16, 18. Also, if a thief breaks the vehicle window he can simply raise the cill button 14 to unlock the door.

[0021] The lock in accordance with the present invention eliminates the need for this freeplay, and can be incorporated into the arrangement of Figure 1 to replace the conventional lock 11. A first embodiment of a lock in accordance with the present invention is illustrated in an exploded view in Figure 2, and in end views illustrating the locking and unlocking sequences, in Figures 3(a) to (f).

[0022] The lock 11' comprises a generally cylindrical lock housing 21 in which a conventional lock barrel 22 is seated. The lock barrel 22 has a keyway therein of which the keyhole 24 is visible, and internally a plurality of tumblers (not visible) so that on insertion of the ap-

propriate key, the tumblers are appropriately positioned in order to allow rotation of the barrel 22 within the housing 21, in the conventional manner. In use, the lock housing 21 is mounted in the door panel. Disposed at an end of the lock barrel in the axial direction is a lever 26 in the form of a flat generally plate-like body. The lever 26 comprises a generally circular portion which overlies the housing 21 and an elongate portion extending therefrom to which is attached a link rod 13 (not shown in Figure 2) which at its opposite end is coupled to the latch device 4, as shown in Figure 1. The lever 26 carries a cylindrical roller 40 which constitutes a locking element. This roller 40 is carried between opposed lugs 44, 45 which up-stand from a face of the lever 26. The roller 40 is however free to move radially between the lugs. The lever 26 is itself overlain by a rotary cam 30 in the form of a generally circular plate which is keyed to the lock barrel 22 for rotation therewith.

[0023] An axially protruding lip-like edge region of the housing 21 defines a first housing recess 34 and second housing recess 32 separated by a housing land 36. The housing land 36 is defined between curved inclined surfaces which serve to force the roller 40 inwardly between the lugs 44 as the lever 26 carries the roller 40 thereover. The cam 30 includes an arcuate cut-out region 46 on a side thereof, which cut-out region comprises end stops 48, 50 and curved first and second cam recesses 54, 52 spaced from the respective end stops 50, 48 with a cam land 53 therebetween. A cover portion upstanding from the cam 30 overlies the cut-out region to prevent exposure of this region of the lock 11'. This portion is, however, omitted from Figures 2, 3 and 4 for reasons of clarity.

[0024] Element 56 is a retaining element in the form of a springy metal clip which serves to hold the cam 30 and lever 26 on the barrel 22.

[0025] The operation of the lock is now described. Figure 3(a) shows the lock in its unlocked position, with the barrel 22 and cam 30 (which are fixed for rotation to each other) in a "neutral" position in which a key can be inserted or retracted. In order to engage the deadlock a key is inserted into the keyhole 24 and rotated in an anticlockwise sense as indicated in Figure 3(b). During this rotation, the end stop 48 of the cam 30 which faces the direction of rotation bears against the upstanding lug 44 so that the lever 26 is also driven in the anticlockwise direction. The lugs 44, 45 carry the roller 40 past the land 36, whose shape urges the roller radially inwards between the lugs 44, 45 as it passes the housing land 36, and into the second cam recess 52. As the anticlockwise rotation is continued the roller 40 is carried beyond the housing land 36 to face the first housing recess 34 until the position of Figure 3(c) is reached. From the position of Figure 3(c) the cam 30 and barrel 22 are returned to the neutral position by a clockwise rotation to the position shown in Figure 3(d). During this clockwise rotation, the cam 30 and in particular the cam land 53 between the cam recesses 52 and 54 urges the roller

40 out into the first housing recess 34. In the position of Figure 3(d) the lock is deadlocked: rotation of the lever 30 out of the locked "up" position is prevented because the roller 40 is prevented from clockwise rotation by the housing land 36 and the presence of the cam 30 and in particular the cam land 53 which stops the roller 40 from moving inwardly between the lugs 44,45.

[0026] When employed in a locking arrangement of the type illustrated in Figure 1, with the lever of the lock in this locked "up" position the rocker lever 10 connected thereto through linkage 13 will be locked in the position illustrated in Figure 1, preventing the blocking bar 8 from being moved into a position where the latch claw 5 can be released. The door latch cannot be opened by means of the interior release 16, exterior handle release 18, or cill button 14 (which will be locked in the "down" position), so that even if one gains access to the internal door linkages within the door panel or cill button, or internal door release the latch cannot be opened.

[0027] To unlock the lock, the key is inserted into the keyhole 24 and rotated in a clockwise sense from the position of Figure 3(d), through the position of Figure 3 (e) (which shows the end stop 50 of the cam 30 having just engaged the lug 45) to the position shown in Figure 3 (f). In the position of Figure 3(e) the first cam recess 54 faces the roller 40. As the cam 30 is further rotated from the position of Figure 3(e) the roller 40 is urged into the first cam recess 54, past the housing land 36, and into the second housing recess 32, with the lever 26 now in the unlocked "down" position. From the end position of Figure 3(f) the barrel 22 and cam 30 are rotated in an anticlockwise direction, back to the neutral position shown in Figure 3(a), with the lever staying fixed and the cam 30 moving relative to the lever 26 so that the second cam recess 52 faces the roller 40, and the end stop 48 of the cam abuts the lug 44. With the lever 26 in this unlocked "down" position, in the locking arrangement of Figure 1 the rocker lever 10 is in the position opposite the cutout 20 of the blocking bar 8, whereby operation of the internal 16 or external handle release 18 operates the latch claw 5. In this condition it is also still possible to effect a conventional slam-locking operation without the key, by opening the door through operation of the internal or external handle releases 16,18 depressing the cill button 14, and slamming the door closed. Alternatively, the door can be locked from the inside by depressing the cill button. In this case, depression of the cill button 14 moves the lever 26 (without moving the cam 30) into a position in which the roller 40 abuts the land 36, which provides sufficient travel so that the latch device is locked. Although the latch device is locked, the lock 11' is not in a deadlocked condition, which means that the door can be unlocked from the inside through simply raising the cill button 14 and using the internal door release. It is an important safety feature that people cannot be deadlocked inside the vehicle by slam-locking, because people inside can still normally lock and unlock the latch device by the cill button.

[0028] In an alternative embodiment illustrated in Figure 4, the lock 11" is identical to that of the above-described embodiment, except that the roller 40 is replaced by a locking element in the form of a lever 60 pivotably mounted at 62 to upstanding lug 44, and having a cylindrical or spherical actuating end portion which is moved in the same manner as the roller 40 in or out of the recesses of the housing and cam as the lock is operated. Thus, the position of Figure 4(a) corresponds to the neutral, unlocked position of Figure 3 (a), whilst the position of Figure 4(b) corresponds to the intermediate position of Figure 3(c) in which the lock is part-way through the locking sequence.

Claims

1. A lock for attachment to a latch device, comprising a housing (21), a generally cylindrical barrel (22) arranged therein having a keyway, the barrel (22) being rotatable within the housing (21) on insertion of a key, and a lever (26) rotatable between a first position which represents a locked position and a second position angularly spaced from the first position which represents an unlocked position, **characterised in that:-**

a cam (30) is fixed to the barrel (22) for rotation therewith;

the lever (26) is adapted to be rotated by the cam with free play provided between the lever (26) and cam (30), said free play allowing the cam and barrel to be returned to a neutral position after locking and after unlocking without driving the lever (26) therewith and allowing said lever to be moved independently of the barrel in said second position; and engagement means (40) are provided between the lever and housing, said engagement means (40) being adapted to prevent rotation of the lever (26) when in the first position with the barrel (22) in the neutral position.

2. A lock according to claim 1 wherein the engagement means comprise a locking element (40) constrained to move with the lever (26) on the rotation thereof, and a first housing recess (34) of the housing (21), at least part of the locking element (40) being located in said recess when the lever (26) is in the first position with the barrel in the neutral position, whereby rotation of the lever is prevented and the lock is deadlocked.
3. A lock according to claim 2 wherein the cam (30) comprises a generally circular plate having an edge portion (46) adjacent the locking element (40) to prevent movement from the first housing recess (34) when the lock is deadlocked, and having a first

radial cam recess (54) disposed so that it is angularly beyond the locking element (40) in the direction of locking when the lock is deadlocked.

4. A lock according to claim 3 wherein a portion of the housing (21) defining an edge of the first housing recess (34) which lies in the unlocking direction is shaped to urge said locking element (40) radially inwardly as the lever (26) is urged in the unlocking direction, whereby on rotation of the barrel (22) in the unlocking direction the first cam recess (54) becomes aligned with the locking element (40) which is received therein, allowing the lever (26) to be rotated.

5. A lock according to claim 3 or 4 wherein both the housing (21) and cam (30) are provided with second respective recesses (32,52) angularly spaced from the first recesses (34,54) in the unlocking direction, into which second housing recess (32) said locking element (40) is urged as the barrel (22) is returned to the neutral position after movement of the lever (26) to the unlocked position, and into which second cam recess (54) the locking element (40) is urged on rotation of the cam (30) and lever (26) in the locking direction from an unlocked position.

6. A lock according to any one of claims 2 to 5 wherein the locking element (40) is disposed at an outer edge of the lever (26), between a pair of upstanding lugs (44,45), one of which is abutted by a drive surface (48) of the cam (30) during rotation thereof on locking, and the other of which is abutted by an oppositely directed drive surface (50) of the cam (30) during rotation thereof during unlocking, said drive surfaces being angularly spaced to provide the free play between the cam (30) and the lever (26).

7. A lock according to claim 6 wherein the lever (26) comprises a plate-like member having a portion which overlies an end of the housing which is provided with an aperture therethrough through which a central portion of the barrel (22) extends, and an elongate portion extending radially therefrom, with said upstanding lugs (44,45) provided at a side of the lever which is opposite to the elongate portion.

8. A lock according to any preceding claim wherein the cam (30) is a plate-like member which overlies the lever (26), and is keyed to the barrel (22) for rotation therewith.

9. A lock according to any preceding claim wherein the housing (22) is provided with a generally part-circular axially upstanding lip at a side thereof generally opposite the lever, which defines the first and second housing recesses (34,32).

10. A lock according to any one of claims 2 to 9 wherein the locking element is a cylindrical roller (40) disposed between the lugs of the lever.

11. A lock according to any one of claims 2 to 9 wherein the locking element is a lever element (60) pivoted at one end to a lug (62) of the lever, and having at its free end an enlarged head portion.

12. A lock according to any preceding claim in combination with an automobile door latch (4), wherein a mechanical linkage (13) is provided between the lever of the lock and the door latch.

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Patentansprüche

1. Schloß zur Verbindung mit einer Fallenvorrichtung, das ein Gehäuse (21), einen darin angeordneten, im wesentlichen zylindrischen Schließzylinder (22), der eine Schlüsselführung aufweist und nach Einführung eines Schlüssels in dem Gehäuse (21) drehbar ist, sowie einen Hebel (26) umfaßt, der sich zwischen einer ersten, verriegelten Stellung und einer zweiten, von dieser ersten Stellung winkelfversetzten, entriegelten Stellung drehen läßt, **dadurch gekennzeichnet, daß**

- an dem Schließzylinder (22) ein Mitnehmerglied (30) so befestigt ist, daß es sich mit dem Schließzylinder dreht;
- der Hebel (26) durch das Mitnehmerglied gedreht werden kann, wobei zwischen dem Hebel (26) und dem Mitnehmerglied (30) ein Spiel vorhanden ist, welches es möglich macht, daß sich das Mitnehmerglied und der Schließzylinder nach dem Verriegeln sowie nach dem Entriegeln jeweils in eine neutrale Position zurückstellen lassen, ohne daß dabei der Hebel (26) mitbewegt wird, und welches es möglich macht, daß der genannte Hebel unabhängig vom Schließzylinder in die genannte zweite Stellung bewegt werden kann;
- zwischen dem Hebel und dem Gehäuse Eingriffsmittel (40) vorgesehen sind, die eine Drehung des Hebels (26) in der ersten Stellung verhindern, wenn sich der Schließzylinder (22) in der neutralen Position befindet.

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2. Schloß gemäß Anspruch 1, wobei die Eingriffsmittel ein Sperrelement (40), das sich bei Drehung des Hebels (26) mit diesem mitdrehen muß, und zudem eine erste Gehäuseaussparung (34) in dem Gehäuse (21) umfassen, wobei sich zumindest ein Teil des Sperrelements (40) in der genannten Aussparung befindet, wenn sich der Hebel (26) in der ersten Stellung und der Schließzylinder in seiner neutralen Position befinden, wodurch eine Drehung des He-

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bels verhindert wird und das Schloß blockiert ist.

3. Schloß gemäß Anspruch 2, wobei das Mitnehmerglied (30) eine im wesentlichen kreisförmige Platte umfaßt, die mit einem Kantenteil (46) am Sperrelement (40) anliegt, um die Herausbewegung aus der ersten Gehäuseaussparung (34) zu verhindern, wenn das Schloß blockiert ist, und die eine erste radiale Mitnehmeraussparung (54) hat, die so angeordnet ist, daß sie sich in Schließrichtung winkelfersetzt unterhalb des Sperrelements (40) befindet, wenn das Schloß blockiert ist. 5
4. Schloß gemäß Anspruch 3, wobei ein Teil des Gehäuses (21); das einen Rand der in Entriegelungsrichtung liegenden ersten Gehäuseaussparung (34) bildet, so geformt ist, daß das genannte Sperrelement (40) radial nach innen gedrückt wird, wenn der Hebel (26) in Entriegelungsrichtung bewegt wird, so daß bei Drehung des Schließzylinders (22) in Entriegelungsrichtung die erste Mitnehmeraussparung (54) in eine fluchtende Stellung zu dem Sperrelement (40) gebracht wird und das Sperrelement von der ersten Mitnehmeraussparung aufgenommen wird, so daß sich der Hebel (26) drehen läßt. 10 15 20 25
5. Schloß gemäß Anspruch 3 oder 4, wobei sowohl das Gehäuse (21) als auch das Mitnehmerglied (30) jeweils zweite Aussparungen (32,52) aufweisen, die gegenüber den ersten Aussparungen (34,54) in Entriegelungsrichtung winkelfersetzt sind, wobei das genannte Sperrelement (40) in die zweite Gehäuseaussparung (32) gedrückt wird, wenn der Schließzylinder (22) in seine neutrale Position zurückgestellt wird, nachdem der Hebel (26) in die entriegelte Stellung bewegt wurde, und wobei das Sperrelement (40) in die zweite Mitnehmeraussparung (54) gedrückt wird, wenn das Mitnehmerglied (30) und der Hebel (26) aus einer entriegelten Stellung in die Verriegelungsrichtung bewegt werden. 30 35 40
6. Schloß gemäß einem der Ansprüche 2-5, wobei das Sperrelement (40) an einem äußeren Rand des Hebels (26) zwischen einem Paar aufragender Fortsätze (44,45) angeordnet ist und sich an einen dieser Fortsätze eine Antriebsfläche (48) des Mitnehmerglieds (30) anlegt, wenn sich letzteres beim Verriegeln des Schlosses dreht, und sich an den anderen dieser Fortsätze eine in Gegenrichtung weisende Antriebsfläche (50) des Mitnehmerglieds (30) anlegt, wenn sich letzteres beim Entriegeln des Schlosses dreht, wobei diese Antriebsflächen so winkelfersetzt sind, daß sie das Spiel zwischen Mitnehmerglied (30) und Hebel (26) gewährleisten. 45 50 55
7. Schloß gemäß Anspruch 6, wobei der Hebel (26) ein plattenförmiges Glied umfaßt, das ein Teil hat,

welches auf einem Ende des Gehäuses aufliegt und eine durchgehende Öffnung aufweist, durch die ein Mittelteil des Schließzylinders (22) hindurchgeführt ist, und das ein hiervon radial vorstehendes langgestrecktes Teil hat, wobei die genannten aufragenden Fortsätze (44,45) auf einer Seite des Hebels angeordnet sind, die dem langgestreckten Teil gegenüberliegt.

8. Schloß gemäß einem der vorstehenden Ansprüche, wobei das Mitnehmerglied (30) als plattenförmiges Element ausgeführt ist, das auf dem Hebel (26) aufliegt, und über eine Keilverbindung so mit dem Schließzylinder (22) verbunden ist, daß es sich mit diesem dreht. 10 15
9. Schloß gemäß einem der vorstehenden Ansprüche, wobei das Gehäuse (22) an einer Seite, die dem Hebel im wesentlichen gegenüberliegt, ein im wesentlichen teilkreisförmiges, axial vorstehendes Randstück aufweist, in dem die ersten und zweiten Gehäuseaussparungen (34,32) ausgebildet sind. 20
10. Schloß gemäß einem der Ansprüche 2-9, wobei es sich bei dem Sperrelement um eine zylindrische Rolle (40) handelt, die zwischen den Fortsätzen des Hebels angeordnet ist. 25
11. Schloß gemäß einem der Ansprüche 2-9, wobei es sich bei dem Sperrelement um ein Hebelelement (60) handelt, das einseitig schwenkbar an einem Fortsatz (62) des Hebels angelenkt ist und an seinem freien Ende ein vergrößertes Kopfteil aufweist. 30
12. Schloß gemäß einem der vorstehenden Ansprüche in Verbindung mit einer Türfallenvorrichtung (4) eines Kraftfahrzeugs, wobei zwischen dem Hebel des Schlosses und der Türfallenvorrichtung eine mechanische Betätigungsverbindung (13) besteht. 35 40

Revendications

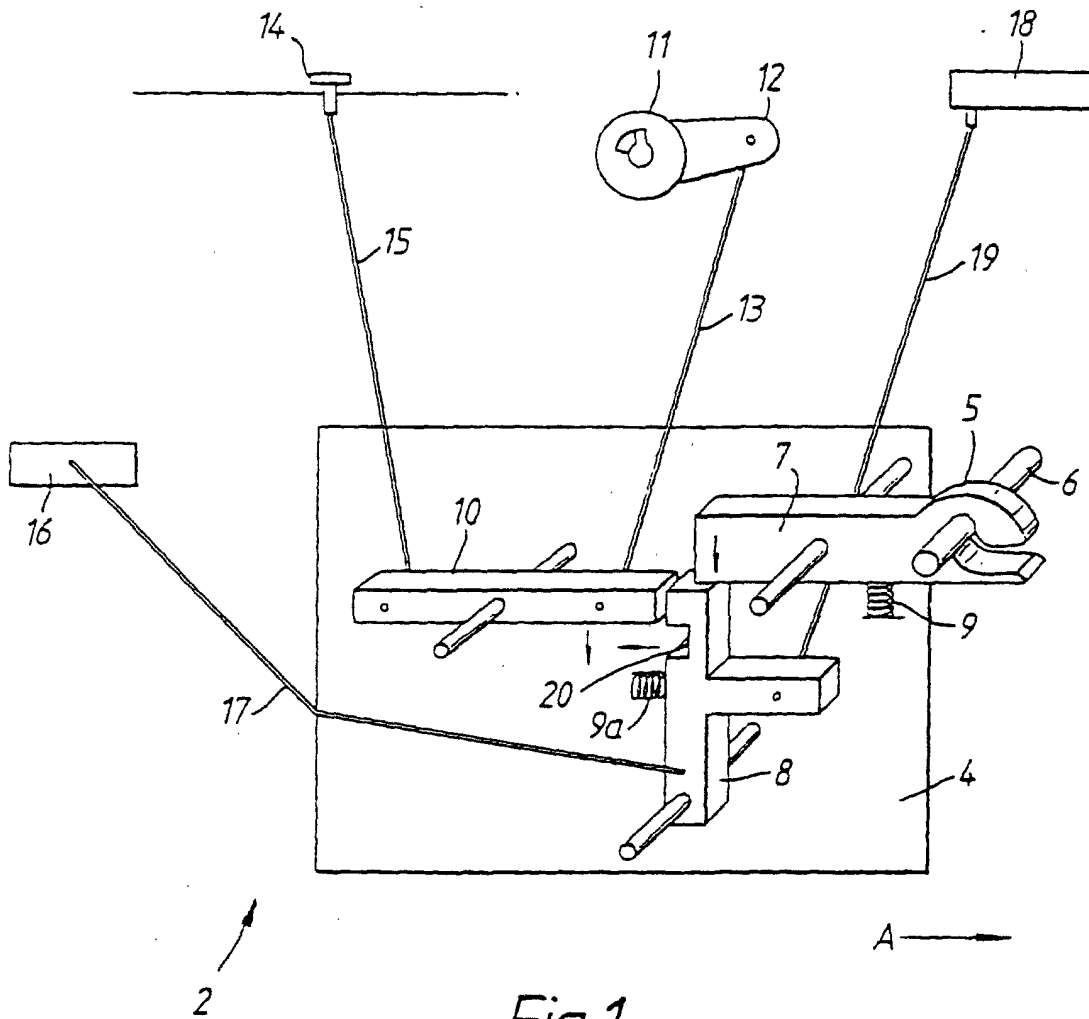
1. Serrure destinée à être attachée à un dispositif de fermeture, comprenant un corps (21), un barillet de manière générale cylindrique (22) placé dans celui-ci et ayant un chemin de clé, le barillet (22) pouvant être tourné dans le corps (12) après introduction d'une clé, et un levier (26) pouvant tourner entre une première position qui représente une position verrouillée et une deuxième position espacée angulairement de la première qui représente une position déverrouillée, **caractérisée par le fait que :** 45 50 55
 une came (30) est fixée au barillet (22) pour tourner avec celui-ci ;
 le levier (26) est propre à être tourné par la came avec un libre jeu prévu entre le levier (26)

et la came (30) pour que la came et le barillet puissent être ramenés à une position neutre après verrouillage et après déverrouillage sans entraîner le levier (26) avec eux et permettant audit levier d'être déplacé dans ladite seconde position indépendamment du barillet ; et des moyens de mise en prise (40) sont prévus entre le levier et le corps, lesdits moyens de mise en prise (40) étant propres à empêcher la rotation du levier (26) lorsqu'il est dans la première position avec le barillet (22) dans la position neutre.

2. Serrure selon la revendication 1, dans laquelle les moyens de mise en prise comprennent un élément de verrouillage (40) contraint de se mouvoir avec le levier (26) lors de la rotation de celui-ci, et un premier creux de corps (34) du corps (21), au moins une partie de l'élément de verrouillage (40) étant située dans ledit creux lorsque le levier (26) est dans la première position avec le barillet dans la position neutre, de sorte que la rotation du levier est empêchée et la serrure est condamnée. 15
3. Serrure selon la revendication 2, dans laquelle la came (30) comprend une plaque de manière générale circulaire ayant une partie de bord (46) voisine de l'élément de verrouillage (40) pour empêcher un mouvement hors du premier creux de corps (34) lorsque la serrure est condamnée, et ayant un premier creux de came radial (54) placé de façon à être angulairement au-delà de l'élément de verrouillage (40) dans le sens de verrouillage lorsque la serrure est condamnée. 25 30
4. Serrure selon la revendication 3, dans laquelle une partie du corps (21) formant un bord du premier creux de corps (34) qui est situé dans le sens de verrouillage est formée de façon à pousser l'élément de verrouillage (40) radialement vers l'intérieur lorsque le levier (26) est poussé dans le sens de déverrouillage, de sorte que lors de la rotation du barillet (22) dans le sens de déverrouillage, le premier creux de came (54) s'aligne avec l'élément de verrouillage (40) qui y est reçu, ce qui permet de tourner le levier (26). 35 40 45
5. Serrure selon l'une des revendications 3 et 4, dans laquelle le corps (21) et la came (30) sont pourvus chacun d'un deuxième creux (32, 52) espacé angulairement du premier creux (34, 54) dans le sens de déverrouillage, l'élément de verrouillage (40) est poussé dans le deuxième creux de corps (32) lorsque le barillet (22) est ramené en position neutre après le mouvement du levier (26) jusqu'à la position déverrouillée, et l'élément de verrouillage (40) est poussé dans le deuxième creux de came (54) lors de la rotation de la came (30) et du levier (26) 50 55

dans le sens de verrouillage à partir d'une position déverrouillée.

6. Serrure selon l'une des revendications 2 à 5, dans laquelle l'élément de verrouillage (40) est placé sur un bord extérieur du levier (26) entre deux ergots saillants (44, 45) contre l'un desquels s'appuie une surface d'entraînement (48) de la came (30) pendant la rotation de celle-ci lors du verrouillage, et contre l'autre desquels s'appuie une surface d'entraînement (50) de la came (30), dirigée à l'opposé, pendant la rotation de celle-ci lors du déverrouillage, les surfaces d'entraînement étant espacées angulairement pour produire le libre jeu entre la came (30) et le levier (26). 10
7. Serrure selon la revendication 6, dans laquelle le levier (26) comprend un élément du genre plaque ayant une partie qui couvre une extrémité du corps qui est pourvue d'une ouverture par laquelle passe une partie centrale du barillet (22), et une partie allongée s'étendant radialement à partir de la précédente, lesdits ergots saillants (44, 45) étant prévus sur un côté du levier qui est opposé à la partie allongée. 15
8. Serrure selon l'une des revendications précédentes, dans laquelle la came (30) est un élément du genre plaque qui couvre le levier (26) et est claveté au barillet (22) pour tourner avec celui-ci. 20
9. Serrure selon l'une des revendications précédentes, dans laquelle le corps (22) est pourvu, sur un côté de celui-ci de manière générale opposé au levier, d'une lèvre saillant axialement de manière générale en partie circulaire qui définit les premier et deuxième creux (34, 32) du corps. 25
10. Serrure selon l'une des revendications 2 à 9, dans laquelle l'élément de verrouillage (40) est un rouleau cylindrique (40) placé entre les ergots du levier. 30
11. Serrure selon l'une des revendications 2 à 9, dans laquelle l'élément de verrouillage est un élément de levier (60) monté pivotant à une extrémité sur un ergot (62) du levier et ayant à son extrémité libre une partie de tête élargie. 35
12. Serrure selon l'une des revendications précédentes en combinaison avec un dispositif de fermeture de porte d'automobile (4), une tringlerie (13) étant prévue entre le levier de la serrure et le dispositif de fermeture de porte. 40 45 50 55



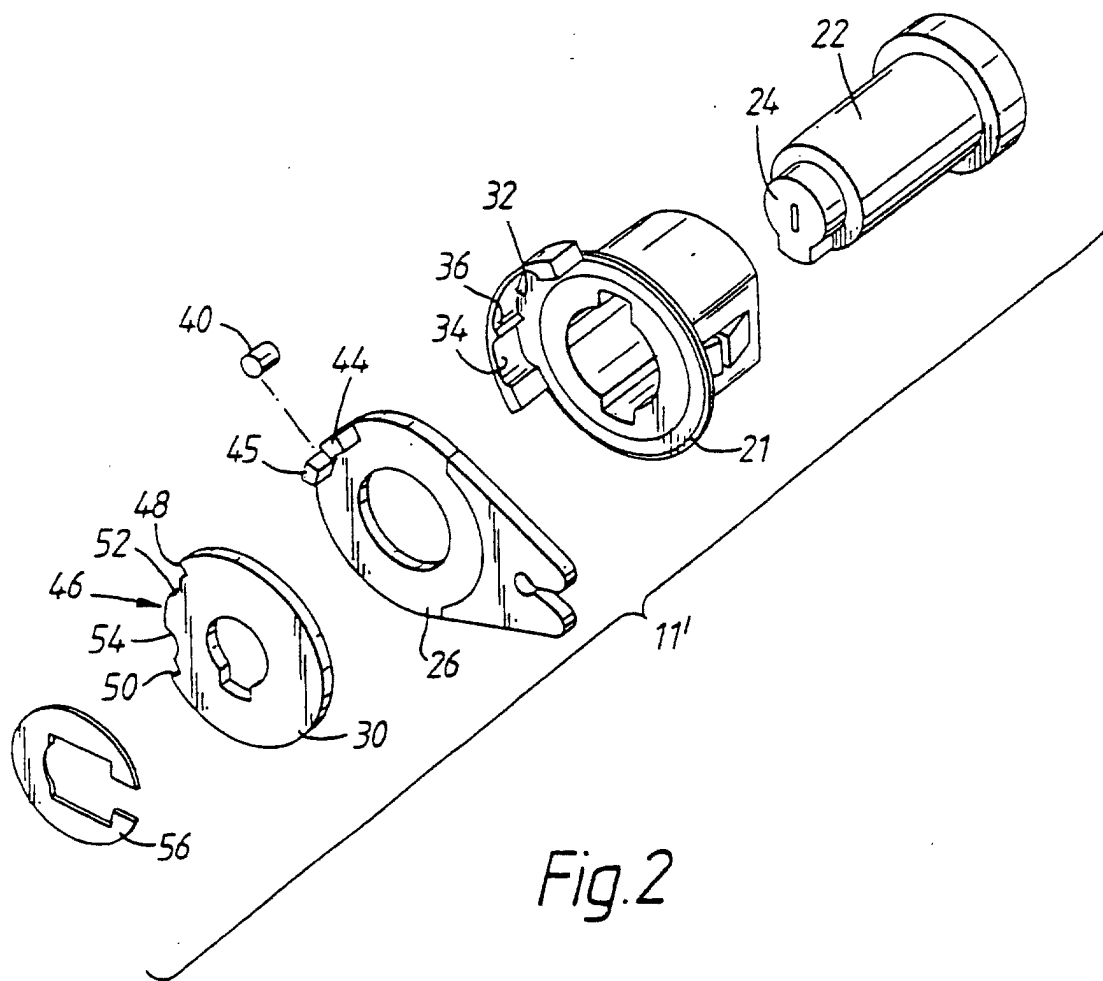


Fig.2

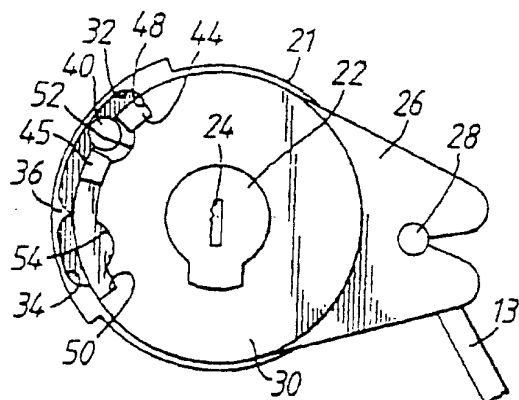


Fig.3(a)

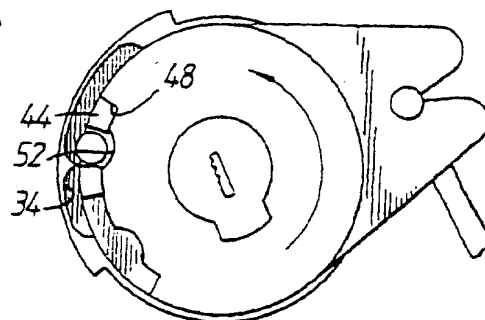


Fig.3(b)

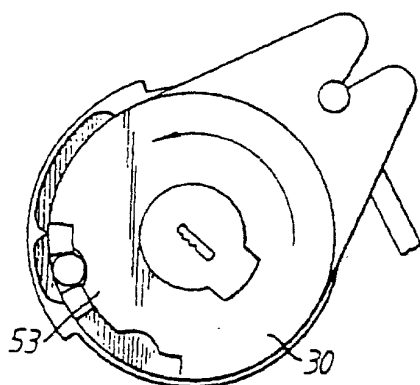


Fig.3(c)

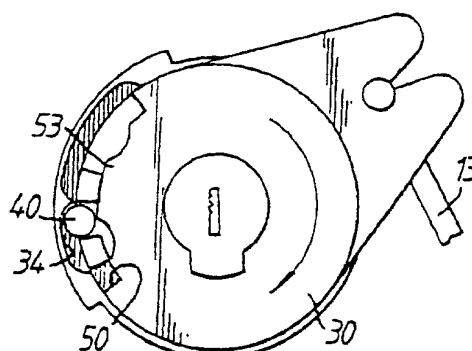


Fig.3(d)

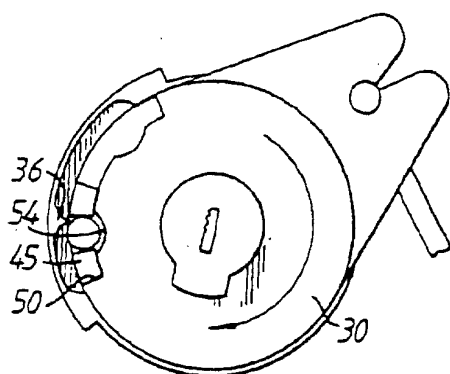


Fig.3(e)

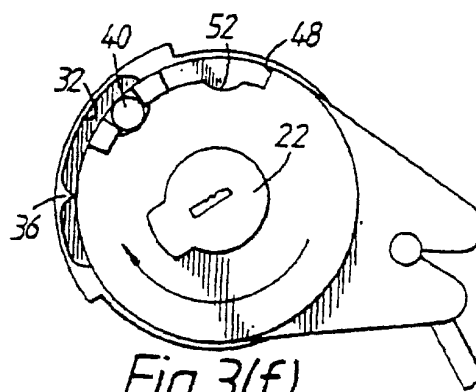


Fig.3(f)

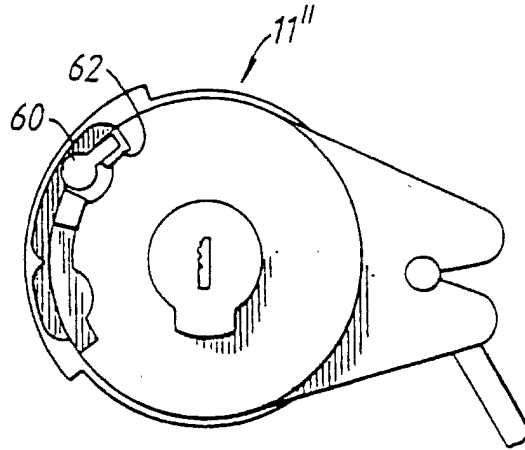


Fig.4(a)

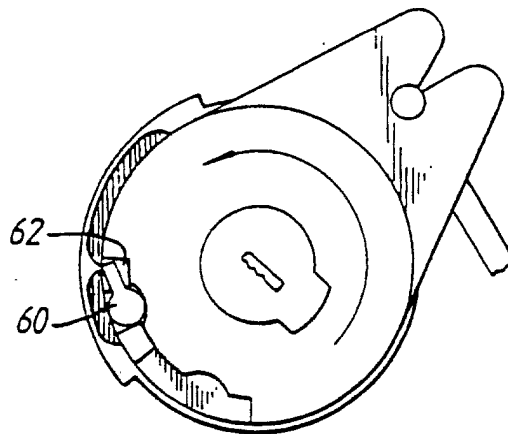


Fig.4(b)