EUROPEAN PATENT SPECIFICATION

SAFETY LOCK WITH ADJUSTABLE-LENGTH BOLT
SICHERHEITSSCHLOSS MIT LÄNGENVERSTELLBAREM RIEGEL
SERRURE DE SURETE COMPRENANT UN PENE A LONGUEUR REGLABLE

Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SI SK TR

Designated Extension States:
RO

Priority:
22.02.2002 WO2002/00107
22.02.2002 WO2002/00108

Date of publication of application:
17.11.2004 Bulletin 2004/47

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References cited:
WO-A-98/37295
DE-C- 418 353
DE-C- 485 632

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Description

[0001] The present invention relates to a safety lock with an adjustable-length bolt.

[0002] More particularly, the lock in question is intended to be advantageously mounted on doors, main entrances, gates or the like so as to perform closing thereof against a fixed frame of a casing.

[0003] These locks are generally composed, as is known, of a box-shaped body normally made of metallic material and intended to form the structure for supporting and containing the locks, inside which the bolt movement mechanisms are housed. The latter can normally be operated from the outside on one side or both sides of the door by means of a key performing one or more turns.

[0004] The box-shaped body is fixed in a seat provided inside a special recess in the door, normally by means of screws, and has a front plate provided with a through-hole for receiving the bolt.

[0005] In greater detail, the bolt is able to slide inside the through-hole between a retracted position, where it is partially (or totally) housed inside the box-shaped body, and a projecting position, where it extends outside the front plate so as to engage inside a corresponding seat provided inside the upright.

[0006] As is known, it is possible to envisage that the bolt may extend from the front plate with its extending portion by a variable amount depending on the specific applicational requirements. The latter may include the need to ensure a greater or smaller penetration of the bolt into the seat of the frame or may depend on the specific constructional forms of the door or gate on which the lock must be mounted, which, as is known, in certain cases may require the use of longer or shorter bolts.

[0007] In any case, it is clearly of use, in the sector concerned, to be able to vary the length of the bolt depending on specific applicational requirements.

[0008] In order to meet this need, locks provided with adjustment means able to vary the length of the bolt portion which extends outside the housing box have been developed.

[0009] These solutions, however, have proved to be impractical in that the box-shaped body must first be opened in order to operate the adjustment means and therefore vary the length of the projecting portion by the desired amount.

[0010] Moreover, numerous systems able to vary the projecting portion of a latch mounted inside the said box-shaped body and mechanically connected to a handle and/or to the said bolt movement mechanisms are already known.

[0011] These systems may very often be operated directly from the outside and are therefore particularly convenient. It must however be pointed out that the possibility of performing an adjustment of the projecting portion of the latch is facilitated by the fact that the actuating mechanism to which the latch is connected is simpler and different compared to that to which the bolt is connected.

[0012] Some solutions involving latches which can be adjusted from the outside of the box-shaped body are described and illustrated for example in the patents of industrial invention FR 2,783,271, EP 712987 and EP 963498.

[0013] The main object of the present invention is therefore that of overcoming the drawbacks of the solutions of the known type mentioned above, by providing a safety lock with an adjustable-length bolt which is constructionally simple and inexpensive to manufacture and operationally entirely reliable.

[0014] A further object of the present invention is that of providing a lock which allows the adjustment of the projecting portion of the bolt without having to extract the lock from its housing and by exclusively operating on the outside of the box-shaped body containing the lock.

[0015] A further object of the present invention is that of providing a lock, the components of which are easy to manufacture by means of simple mechanical machining processes.

[0016] These objects, together with others, are all achieved by the safety lock according to the present invention, which comprises: a box-shaped body defined as is known, of a box-shaped body normally made of metallic material and intended to form the structure for support- and containing the locks, insidewhichtheboltmovement mechanisms are housed. The latter can normally be operated from the outside on one side or both sides of the door by means of a key performing one or more turns.

[0017] According to the invention, the lock is characterized in that it comprises adjustment means which are accessible from the outside of the box-shaped body and are able to actuate the movable element producing a displacement thereof having at least one rotary component so as to engage/disengage the engaging means in/from the seats.

[0018] The technical features of the invention, in accordance with the abovementioned objects, may be determined from the contents of the claims reproduced below and the advantages thereof will emerge more clearly from the following detailed description, with reference to the accompanying drawings, which show some purely exemplary and non-limiting embodiments, wherein:

- Figure 1 shows schematically an overall perspective view of an example of a lock according to the invention;
- Figure 2 shows a further example of a lock according to the invention with some parts removed so that other parts may be seen more clearly;
- Figure 3 shows a front view of the lock according to Fig. 2 with key-type actuating means inserted;
In accordance with the embodiment shown in detail in the accompanying figures 2 and 3, the said box-shaped body 2 is intended to support also a handle, arranged on one side or on both sides of the box-shaped body 2, or also a latch which can be actuated preferably by means of the said handle.

The lock 1 also comprises a bolt 5 mounted slidably on the box-shaped body 2 by means of a support guide 6 and a shaped hole 7 formed on the front plate 4.

During use, the bolt 5 is displaced by means of actuating means 8 between one or more operating positions including generally one or more projecting positions 9 (depending on the number of turns imparted by the actuating means) and a retracted position 10. In this way, it is engaged with and disengaged from a corresponding matching seat formed in the fixed frame, so as to perform the secure closure of a door or a gate against the said frame or so as to release the said door or the said gate, allowing opening thereof.

As will be clarified below, according to the present invention, the bolt may vary its position also as a result of a different adjustment which will cause it to extend from the front plate 4 with a longer or shorter portion 5a.

When the bolt 5 is arranged in the retracted position 10, it may nevertheless advantageously extend outside the front plate 4 with a projecting portion 5a, as indicated in particular in the example according to Figure 2.

Alternatively, in accordance with a possible embodiment not shown in detail, the bolt 5 may disappear completely inside the box-shaped body 2 when it is located in the retracted position 10 and during a particular adjustment condition.

The abovementioned actuating means 8 are of a type conventional per se and are for example formed in accordance with the example contained in the accompanying drawings, 1 denotes overall the lock according to the present invention.
The pin 19 forms, in accordance with the example illustrated in the accompanying figures, one piece with the box-shaped body 2 and is provided on a plinth 24 which projects upwards from the support base 3 in the vicinity of the front plate 4, as can be clearly seen in Figure 5.

Alternatively, in accordance with a further embodiment not shown in detail in the accompanying figures, it is possible to envisage instead that the pin 19 is instead integral with the movable plate 15 and extends perpendicularly from its second side s' so as to engage in a corresponding hole formed in the box-shaped body 2.

In any case, as a result of this mode of constraint, the plate 15 is substantially free to rotate on the box-shaped body 2, as indicated by the arrow F in Figure 3 and not to slide thereon. This rotation is however opposed by the compressive action exerted by the leaf 16, which tends to bias the movable plate 15 against the bolt 5, so that the engaging means 17 are constrained inside the seats 14.

In accordance with a different embodiment of the present invention, the movable plate 15 may perform rotary/translational movements or more generally have at least one rotary component and one component of displacement. For this purpose, the abovementioned hole may assume a cam-like configuration.

During operation, the actuating means 8, by means of the projection 12, in addition to engaging with the teeth 13 so as to displace the bolt 5 in the direction of its axis x, at the same release the said bolt 5 from engagement with the movable plate 15 so as to allow displacement thereof.

In fact, the projection 12, during its rotation produced by the key, interferes with the bottom profile 53 of the movable plate and, overcoming the opposing action of the leaf 16, is able to cause rotation of the movable plate 15 about the pin 19 and therefore raising of the engaging teeth 17 from the seats 14.

According to a main characteristic feature of the present invention, the lock 1 comprises adjustment means 20 which are accessible from the outside of the box-shaped body 2 and act on the movable plate 15, imparting to it a rotation so as to engage/disengage the engaging element in/from the seats 14.

During operation, by operating the adjustment means 20, it is possible to overcome the resilient opposing action of the leaf 16 and cause rotation of the movable plate 15 by the amount needed to free the bolt 5 from engagement therewith. The latter, once freed, is able to slide in the longitudinal direction of its axis X so as to allow it to be positioned with the projecting portion 5a extending from the front plate 4 by the desired length, which, as mentioned, will generally depend on specific applicational requirements.

The adjustment means may in general impart to the movable plate 15 displacements having at least one rotary component.

In accordance with the example shown in Figure 6, three different adjustment positions are possible.

The adjustment means 20 may be preferably formed by an adjusting screw 21 inserted inside a threaded through-hole 22 formed on the front plate 4 of the box-shaped body 2 and intended to bear against a shaped portion 23 of the movable plate 15.

In the case of the example shown in Figure 7, the shaped portion 23 is formed by a lug extending perpendicularly from the second side S' of the movable plate 15.

As a result of the invention in question it is possible to adjust in a simple and practical manner the length of the portion 5a of the bolt 5 which extends outside of the front plate 4 of the lock 1.

In fact, in order to perform the abovementioned adjustment, it is sufficient for a user to operate the screw 21, for example simply using a screw driver, causing the screw 21 itself to advance in its screwing direction until it bears first against the shaped portion 23 of the movable plate 15 and then until the movable plate 15 is rotated, disengaging the bolt 5.

At this point, the user may cause sliding of the bolt 5 inside the guides 6, 7 until the desired position is reached, with the projecting portion 5a extending by a desired amount.

Finally, the user operates the screw 21 again, unscrewing it until the movable plate 15 is made to engage again in the seats 14 of the bolt 5.

A further advantage of the present invention relates to the particular arrangement assumed by the movable plate 15, on the outside of the bolt 5, which allows simplified assembly of the lock 1 and easier maintenance.

Owing to the rotational instead of the sliding movement performed by the plate 15, it is possible to provide a particularly simple operating mechanism which results in a considerable saving in the costs of production of the lock.

Claims

1. Safety lock with adjustable-length bolt, in particular for doors, gates or the like, comprising:
   - a box-shaped body (2) defined by at least one support base (3) and by a front plate (4);
   - at least one bolt (5) mounted slidably on said box-shaped body (2) in the direction of its longitudinal axis (X);
   - actuating means (8) able to move said bolt (5) in said longitudinal direction (X) between different operating positions;
   - at least one movable element (15) provided with engaging means (17) intended to engage in seats (14) provided along said bolt (5) so as
to retain the latter in said operating positions;

characterized in that it comprises adjustment means (20) which are accessible from the outside of said box-shaped body (2) and able to actuate said movable element (15) producing a displacement thereof having at least one rotary component so as to engage and respectively disengage said engaging means (17) in and respectively from said seats (14).

2. Safety lock according to Claim 1, characterized in that said movable element is rotatably connected to said box-shaped body (2) about an axis of rotation (Z) with respect to which it is able to rotate as a result of the action of said adjustment means (20).

3. Safety lock according to Claim 1, characterized in that said adjustment means (20) comprise at least one adjusting screw (21) inserted in a through-hole (22) formed in said box-shaped body (2), accessible from the outside of said box-shaped body (2) and able to bear against said movable element (15).

4. Safety lock according to Claim 3, characterized in that said through-hole (22) is formed on said front plate (4).

5. Safety lock according to Claim 3, characterized in that said through-hole (22) is threaded.

6. Safety lock according to Claim 1, characterized in that said movable element (15) is substantially arranged on the outside of said bolt (5) with respect to the support base (3) of said box-shaped body (2).

7. Safety lock according to Claim 1, characterized in that said movable element (15) is mechanically connected to said box-shaped body (2) by means of a pin (19) defining an axis of rotation (2).

8. Safety lock according to Claim 7, characterized in that said pin (19) is provided on a plinth (24) which projects upwards from the support base (3) of said box-shaped body (2) in the vicinity of said front plate (4) and engages in a hole (18) formed in said movable element (15).

9. Safety lock according to Claim 7, characterized in that said pin (19) forms one piece with said box-shaped body (2).

10. Safety lock according to Claim 7, characterized in that said pin is provided projecting on said movable element and engages in a hole formed in said box-shaped body (2).

11. Safety lock according to Claim 1, characterized in that said front plate (4) is provided with a shaped hole (7) for receiving in a guided manner said bolt (5).

12. Safety lock according to Claim 1, characterized in that it comprises resiliently yielding means (16) able to push said movable element (15) against said bolt (5) in order to keep said engaging means (17) normally engaged in said seats (14).

13. Safety lock according to Claim 12, characterized in that said resiliently yielding means (16) comprise at least one flexible leaf which is secured at one of its ends to said box-shaped body (2) and bears, under compression, substantially with its other end against said movable element (15).

14. Safety lock according to Claim 1, characterized in that said engaging means (17) consist of a tooth extending perpendicularly with respect to the plane of lie of said movable element (15).

15. Safety lock according to Claim 1, characterized in that said movable element (15) is provided with a shaped portion (23) intended to receive, in engagement, said adjustment means (20).

16. Safety lock according to Claim 1, characterized in that said seats (14) are formed by a plurality of incisions aligned along the longitudinal axis (X) of said bolt (5).

Patentansprüche

1. Sicherheitsschloss mit längenverstellbarem Riegel, besonders für Türen, Tore und Ähnliches, umfassend:

- einen kastenförmigen Körper (2), definiert durch mindestens eine Stützbasis (3) und durch eine Frontplatte (4);
- mindestens einen Riegel (5), auf besagtem kastenförmigem Körper (2) in Richtung seiner Längsachse (X) gleitfähig montiert;
- Betätigungsvorrichtung (8), die in der Lage ist, besagten Riegel (5) in der besagten Längsrichtung (X) zwischen verschiedenen Betriebsstellungen zu bewegen;
- mindestens ein bewegliches Element (15), versehen mit Eingriffsvorrichtung (17) zum Ein greifen in Sitze (14), die längs des besagten Riegel (5) angeordnet sind, um Letzteren in den besagten Betriebsstellungen zu halten;

dadurch gekennzeichnet, dass es eine Verstellvmodification (20) umfasst, die von außerhalb des besagten kastenförmigen Körpers (2) zugänglich und
in der Lage ist, besagtes bewegliches Element (15) zu betätigen, was eine Verschiebung desselben herbeiführt, mit mindestens einem drehbaren Be-
standteil, um besagte Eingriffsvorrichtung (17) in Eingriff mit besagten Sitzen (14) zu bringen bzw. aus dem Eingriff mit besagten Sitzen (14) zu lösen.

2. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass besagtes bewegliches Element mit besagtem kastenförmigem Körper (2) um eine Drehachse (Z) drehbar verbunden ist, um die es sich infolge der Aktion besagter Verstellvorrichtung (20) drehen kann.

3. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass besagte Verstellvorrichtung (20) mindestens eine Verstellschraube (21) umfasst, die in ein im besagten kastenförmigen Körper (2) hergestelltes Durchgangsloch (22) eingesetzt wird, die von außerhalb des besagten kastenförmigen Körpers (2) zugänglich ist und in der Lage ist, an dem besagten beweglichen Element (15) anzuliegen.

4. Sicherheitsschloss nach Anspruch 3, **dadurch gekennzeichnet**, dass das Durchgangsloch (22) in besagter Frontplatte (4) hergestellt wird.

5. Sicherheitsschloss nach Anspruch 3, **dadurch gekennzeichnet**, dass besagtes Durchgangsloch (22) mit einem Gewinde versehen ist.

6. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass besagtes bewegliches Element (15) im Wesentlichen auf der Außenseite des besagten Riegels (5) in Bezug auf die Stützbasis (3) des besagten kastenförmigen Körpers (2) angeordnet ist.

7. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass besagtes bewegliches Element (15) mit dem besagten kastenförmigen Körper (2) mittels eines Stiftes (19), der eine Drehachse (Z) definiert, mechanisch verbunden ist.

8. Sicherheitsschloss nach Anspruch 7, **dadurch gekennzeichnet**, dass besagter Stift (19) auf einem Sockel (24) angeordnet ist, der aus der Stützbasis (3) des besagten kastenförmigen Körpers (2) in der Nachbarschaft besagter Frontplatte (4) aufwärts ragt und in ein im besagten beweglichen Element (15) hergestelltes Loch (18) greift.

9. Sicherheitsschloss nach Anspruch 7, **dadurch gekennzeichnet**, dass besagter Stift (19) ein Stück mit besagtem kastenförmigem Körper (2) bildet.

10. Sicherheitsschloss nach Anspruch 7, **dadurch gekennzeichnet**, dass besagter Stift auf besagtem beweglichem Element herausragend angeordnet ist und in ein in besagtem kastenförmigem Körper (2) hergestelltes Loch greift.

11. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass besagte Frontplatte (4) mit einem geformten Loch (7) zum geführten Aufnehmen des besagten Riegels (5) versehen ist.

12. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass es eine elastisch nachgebende Vorrichtung (16) umfasst, die in der Lage ist, besagtes bewegliches Element (15) gegen besagten Riegel (5) zu schieben, um besagte Eingriffsvorrichtung (17) normalerweise im Eingriff mit besagten Sitzen (14) zu halten.

13. Sicherheitsschloss nach Anspruch 12, **dadurch gekennzeichnet**, dass besagte elastisch nachgebende Vorrichtung (16) mindestens ein flexibles Blatt umfasst, das mit einem seiner Enden an besagtem kastenförmigem Körper (2) befestigt ist und unter Druck im Wesentlichen mit seinem anderen Ende an besagtem beweglichem Element (15) anliegt.

14. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass besagte Eingriffsvorrichtung (17) aus einem Zahn besteht, der sich senkrecht zur Lageebene des besagten beweglichen Elements (15) erstreckt.

15. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass besagtes bewegliches Element (15) mit einem geformten Anteil (23), der im Eingriff besagte Verstellvorrichtung (20) aufnehmen soll, versehen ist.

16. Sicherheitsschloss nach Anspruch 1, **dadurch gekennzeichnet**, dass besagte Sitze (14) durch eine Vielheit von entlang der Längsachse (X) des besagten Riegels (5) ausgerichteten Einschnitten gebildet werden.

**Revendications**

1. Serrure de sûreté avec un pêne de longueur réglable, en particulier pour des portes, des grilles ou analogues comprenant :
   - un corps en forme de boîtier (2) défini par au moins une base de support (3) et par une plaque frontale (4) ;
   - au moins un pêne (5) monté de façon coulissante sur ledit corps en forme de boîtier (2) dans la direction de son axe longitudinal (X) ;
- des moyens d'actionnement (8) aptes à dépla-
cer ledit pêne (5) dans ladite direction longitudi-
nale (X) entre différentes positions de fonctionnement ;
- au moins un élément mobile (15) muni de
moyens d'engagement (17) destinés à s'enga-
ger dans des sièges (14) prévus le long dudit
pêne (5) de façon à retenir ce dernier dans les-
dites positions de fonctionnement ;

caractérisée en ce qu'elle comprend des moyens
de réglage (20) qui sont accessibles depuis l'exté-
rieur dudit corps en forme de boîtier (2) et capables
da'actionsner ledit élément mobile (15) en produisant
un déplacement de celui-ci ayant au moins une
composante rotative de façon à engager ledits
moyens d'engagement (17) dans ledits sièges (14)
et respectivement à désengager ledits moyens
d'engagement (17) desdits sièges (14).

2. Serrure de sûreté selon la revendication 1,
caractérisée en ce que ledit élément mobile est
rélié de façon rotative audit corps en forme de boî-
tier (2) autour d'un axe de rotation (Z) par rapport
auquel il est capable de tourner à la suite de l'action
desdits moyens de réglage (20).

3. Serrure de sûreté selon la revendication 1,
caractérisée en ce que lesdits moyens de réglage
(20) comprennent au moins une vis de réglage (21)
introduite dans un trou traversant (22) réalisé dans
dudit corps en forme de boîtier (2) et capable de s'appliquer contre ledit élément mo-
bile (15).

4. Serrure de sûreté selon la revendication 3,
caractérisée en ce que ledit trou traversant (22)
est réalisé sur ladite plaque frontale (4).

5. Serrure de sûreté selon la revendication 3,
caractérisée en ce que ledit trou traversant (22)
est taradoù.

6. Serrure de sûreté selon la revendication 1,
caractérisée en ce que ledit élément mobile (15)
est sensiblement agencé sur l'extérieur dudit pêne
(5) par rapport à la base de support (3) dudit corps
en forme de boîtier (2).

7. Serrure de sûreté selon la revendication 1,
caractérisée en ce que ledit élément mobile (15)
est mécaniquement relié audit corps en forme de
boîtier (2) par l'intermédiaire d'une broche (19) dé-
finissant-un axe de rotation (Z).

8. Serrure de sûreté selon la revendication 7,
caractérisée en ce que ladite broche (19) est pré-
vue sur une base (24) qui fait saillie vers le haut à
partir de la base de support (3) dudit corps en forme
de boîtier (2) à proximité de ladite plaque frontale
(4) et s'engage dans un trou (18) réalisé dans ledit
élément mobile (15).

9. Serrure de sûreté selon la revendication 7,
caractérisée en ce que ladite broche (19) forme
une pièce avec ledit corps en forme de boîtier (2).

10. Serrure de sûreté selon la revendication 7,
caractérisée en ce que ladite broche est prévue
en faisant saillie sur ledit élément mobile et s'engag-
e dans un trou réalisé dans ledit corps en forme
de boîtier (2).

11. Serrure de sûreté selon la revendication 1,
caractérisée en ce que lesdits moyens d'engagement
(17) normalement engagés dans lesdits sièges
(14) sont formés par une pluralité d'incisions alignées le long de
l'axe longitudinal (X) dudit pêne (5).
Fig. 1