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Description

This invention relates to deadbolt assemblies of the kind used to releasably secure a door, for example, in a closed position by moving a deadbolt in a direction substantially parallel to an adjacent edge of the door.

The deadbolt can be slidably mounted in a housing having two vertically spaced recesses for receiving respective parts of a strike. The deadbolt has two parts each of which is arranged to extend across a respective one of the housing recesses when the deadbolt is in its operative position. In the inoperative position, said parts of the deadbolt are withdrawn into the housing to leave the housing recesses clear for movement of said parts of the strike into and out of the housing recesses. Each of said parts of the strike has an aperture which is able to receive a respective one of said parts of the deadbolt when the strike parts are properly located in the housing recesses.

A deadbolt assembly usually includes inside and outside actuators. The outside actuator is typically a key operated lock, whereas the inside actuator can be either a manually operable turn knob or a key operated cylinder. If a turn knob is employed the deadbolt assembly may also include a security feature which is selectively operable to hold the turn knob against rotation or otherwise render it ineffective for operation of the deadbolt from the inside of the door.

A mechanism through which the actuators drive the deadbolt between its operative and inoperative positions is known from FR-A 2 286 933, which is acknowledged by the preamble of the present independent claim, and which discloses inter alia a deadbolt having a notch along one side forming a non-circular opening having two co-operating edges with which a drive pin can engage to cause linear movement of the deadbolt, but the drive pin escapes from the notch when the deadbolt is in the operative and inoperative positions and thus does not remain in engagement with either of said two co-operating edges of the notch.

It is an object of the present invention to provide an assembly of the foregoing kind in which the mechanism is more positive in operation than prior mechanism of the same kind and is less complex and therefore relatively inexpensive.

In accordance with the present invention, a deadbolt assembly comprises a housing, a deadbolt mounted on said housing for linear movement relative thereto between operative and inoperative positions, an actuator mounted on said housing, a drive plate rotatably mounted on said housing and being connected to said actuator so as to rotate in response to operation of said actuator, and a drive pin fixed to said drive plate so as to move therewith and being located radially outwards from the axis of said plate rotation, said deadbolt having a non-circular opening and said drive pin engaging against a respective one of two co-operating edges of said opening to cause said linear movement of said deadbolt in each of two opposite directions as said drive plate is rotated in opposite directions, character-

ised in that said opening is surrounded by said deadbolt and is substantially triangular having one edge which extends substantially in the direction of said linear movement and two further edges which converge away from said one edge with said converging edges forming said co-operating edges, a junction being provided between each adjacent two of said edges, the junction between each said converging edge and said one edge being arranged to provide a seating surface for said drive pin when said deadbolt is in said operative position and said inoperative position so as to resist movement of said drive pin out of the respective junction, at least in one direction.

Assuming the inside actuator is a turn knob, it may be connected to the drive plate in the manner described in our copending EP-A 0 229 514.

An embodiment of the invention is described in detail in the following passages of the specification which refer to the accompanying drawings in which:

Fig. 1 is a perspective view showing a typical deadbolt assembly to which the invention is applicable,

Fig. 2 is an exploded perspective view of one embodiment of the invention,

Fig. 3 is a view of critical components of the deadbolt mechanism as shown in Fig. 2, and showing the deadbolt in the inoperative position,

Fig. 4 is a view similar to Fig. 3 but showing the deadbolt moving towards the operative position,

Fig. 5 is a view similar to Fig. 3 but showing the deadbolt in the operative position,

Fig. 6 is a view of a blank for forming a strike as shown in Fig. 1,

Fig. 7 is a perspective view of an alternative form of strike.

The invention is applicable to deadbolt assemblies of various kinds, and Fig. 1 shows one such assembly. The arrangement of Fig. 1 includes a deadbolt housing 1 which is secured to a door 2 and a strike 3 which is secured to the door jamb 4. Two recesses 5 and 6 are provided in a projecting end 7 of the housing 1 and each is adapted to receive a respective one of the bars 8 and 9 of the strike 3. The deadbolt 10 (Fig. 2) has two parts 11 and 12, each of which extends across a respective one of the recesses 5 and 6 when the deadbolt 10 is in its operative position.

An assembly of the foregoing kind includes an inside actuator 13 and an outside actuator 14, both of which are shown in Fig. 2. The outside actuator 14 of the arrangement shown is a key operated lock, whereas the inside actuator 13 is in the form of a manually operable turn knob. The turn knob 13 is connected to the deadbolt 10 through a drive connection which includes a rotatable plate 15 and a drive pin 16 fixed to the plate 15 so as to move therewith and being located radially outwards from the axis of rotation of the plate 15.

In the arrangement shown, the drive plate 15 is in the form of a disc and a hole 17 is formed through the centre of the plate 15. That hole 17 enables a connection to be effected between the outside actu-

ator 14 and another key operated lock 18 which, in the construction shown, is mounted in the turn knob 13 to enable the deadbolt to be locked from the inside of the door.

It is preferred that the rotational movement of the plate 15 is guided by a guide plate 19 which is fixed to the housing 1. That plate 19 may have an arcuate slot 20 formed therein as shown, and the drive plate 15 and guide plate 19 are arranged in face to face relationship with the pin 16 extending through the guide slot 20. An end portion 21 of the pin 16 projects beyond the guide plate 19 for engagement with the deadbolt 10 or a member secured thereto. The arcuate slot 20 is preferably arranged so that its opposite ends 22 and 23 are located on a line extending substantially parallel to the path of movement of the deadbolt 10, and that line may substantially intersect with the axis of rotation of the plate 15.

The deadbolt 10 shown includes two cylindrical parts 11 and 12 arranged substantially coaxial and arranged in axially spaced relationship. As shown, those parts 11 and 12 are interconnected through a carrier plate 24 which is located at the side of the guide plate 19 remote from the drive plate 15. In the preferred form shown, the carrier plate 24 is pressed or stamped from a metal plate such as steel, and each deadbolt part 11 and 12 may be also formed from steel or a similar hard metal. Such deadbolt parts and their carriers have traditionally been cast from zinc, for example, and consequently have been relatively weak and susceptible to breakage in the event of attempted forced actuation. A steel or similar hard metal arrangement as provided in the present construction is much more resistant to damage and is therefore more secure than prior constructions.

According to the particular construction shown, the main body of the carrier plate 24 is in substantially face to face relationship with the guide plate 19 and cooperates with that plate 19 or the housing 1 in such a way as to be held to a line of movement which extends substantially parallel to the axis of the deadbolt parts 11 and 12. That may be achieved by means of two guide pins 25 secured to the carrier plate 24 and slidably located in respective guide slots 26 formed through the guide plate 19. The guide pins 25 extend outwards from a face of the carrier plate 24 and are located in spaced relationship along a line extending substantially parallel to the axis of the deadbolt parts 11 and 12. Each of the cooperating slots 26 of the guide plate 19 extends in substantially the same direction as that line.

Each deadbolt part 11 and 12 is preferably secured to a respective arm 27 projecting laterally outwardly from an end of the body of the carrier plate 24. Those arms 27 are preferably integral with the body of the plate 24 and in the arrangement shown are bent from upper and lower ends respectively of a backwardly turned flange 28 of the carrier plate 24. Each arm 27 may be strengthened against deflection by being pressed, stamped or otherwise formed to have a longitudinally extending rib 29 therealong. The deadbolt parts 11 and 12 may be secured to their respective arms 27 by riveting or other appropriate procedure.

The drive pin 16 engages with the carrier plate 24 in such a way that the plate 24 moves as required in response to rotation of the drive plate 15. In the preferred arrangement shown, that engagement is achieved by having the pin 16 located within a cam opening 30 which is formed through the carrier plate 24. That opening 30 may be of triangular shape as shown, having an edge 31 extending upwards in the direction of the guide slots 26 and the other two edges 32 and 33 converge away from the upright edge 31 generally in a direction towards the deadbolt parts 11 and 12.

When the deadbolt 10 is in the inoperative position as shown in Figures 1 and 3, the drive pin 16 is located at the bottom end 23 of the arcuate slot 20 of the guide plate 19 and also at the lower end 34 of the upright edge 31 of the cam opening 30. If the plate 15 is then rotated to move the pin 16 along the arcuate slot 20, the pin 16 will also naturally travel towards the apex 35 of the converging edges 32 and 33 of the cam opening 30. At some stage (Figure 4) in that movement the pin 16 engages the upper edge 33 of the cam opening 30 and thereafter pushes the carrier plate 24 upwards. Such upward movement of the carrier plate 24 moves the deadbolt parts 11 and 12 towards the operative position (Figure 5) and that position is reached at or near the time when the pin 16 reaches the upper end 22 of the arcuate guide slot 20. At that time, the pin 16 will also be at the upper end 36 of the upright edge 31 of the cam opening 30.

As will be seen from Figures 2 to 5, the junction between each of the edges 31, 32 and 33 are preferably of arcuate form. It is further preferred that those junctions 34, 35 and 36 are arranged so that each provides a seating surface for the pin 16 such that movement of the pin 16 out of any one of the junctions 34, 35 and 36 is resisted. That is, each junction 34, 35 and 36 in effect forms a shallow recess in which the pin 16 seats or nests to an extent such that a force must be applied to overcome the restraining influence against movement of the pin 16 out of that recess.

The foregoing arrangement has the particular advantage that the pin 16 is positively located in the position at which the deadbolt 10 is operative. Also, the arrangement is such that the pin 16 positively holds the carrier plate 24 against forced movement into the inoperative position of the deadbolt 10. In particular, such movement of the carrier plate 24 can only be initiated by rotation of the plate 15 and that cannot be effected by applying a downward force to the deadbolt parts 11 and 12 or the arms 27 on which those parts 11 and 12 are mounted.

If desired, a spring 37 may act between the pin 16 and the carrier plate 24 so as to urge the pin 16 towards the upright edge 31 of the cam opening 30 and thereby ensure that the pin 16 normally locates in one of its extreme positions.

A further advantage of the improved deadlocking mechanism as described is that it permits the housing 1 to be fixed to a door 2 in a more secure manner than was previously possible. In the preferred arrangement shown, a mounting plate 38 of steel or other suitable metal is secured in any appro-

priate manner in face to face relationship with the inside surface of a door 2. An outwardly projecting flange 39 and 45 respectively is provided at each of the upright sides of that plate 38 and at least one fixing screw hole 40 is provided through the flange 39. Preferably, there are two such holes 40 in the flange 39 and they are spaced vertically apart. It is further preferred that the holes 40 in the flange 39 are screw threaded holes to cooperate with the thread of the fixing screws 41.

The mounting plate 38 is dimensioned so as to fit within the open back of the hollow housing 1 (Figure 2) and in the assembled condition the front flange 39 preferably abuts against or lies close to the inner surface of an outer side wall 42 of the housing 1. That outer side wall 42 is the wall closest to the front edge of the door 2 and is provided with a pair of holes 43 which align with the holes 40 of the front flange 39. It is preferred that the rear flange 45 locates against or close to the inner side wall 44 of the housing 1.

It is preferred that the flange 45 is provided with two slots 46 which are adapted to receive respective lugs 47 provided on an edge of the guide plate 19. The plate 19 is fixed to the housing 1 by fastening screws 48 and consequently interaction between the lugs 47 and the slots 46 serve to assist in the firm retention of the housing 1 on the mounting plate 38.

The foregoing arrangement is such that the housing 1 is firmly secured to the door 2 and in such a manner that the fixing screws 41 are concealed from view and tampering while the door 2 is in a closed position.

The security of the assembly can be further improved by forming the strike 3 of sheet metal such as steel rather than die cast zinc as in the past. In the arrangement shown, the strike 3 is formed from a rectangular section of metal plate (Figure 6) having a rectangular opening 49 therethrough so as to form two laterally spaced bars 8 and 9 which extend in the longitudinal direction of the plate section. As shown, the width of those bars 8 and 9 is reduced by removing an adjacent edge portion of the plate. Each of the opposite end portions 50 and 51 of the plate section can have a plurality of holes 52 therethrough for receiving fastening screws.

A plate section as described can be formed into an effective strike by bending that section intermediate the length of the bars 8 and 9 so that each bar 8 and 9 adopts a substantially U shape as shown in Figures 1 and 7. At least one end portion 50 of the plate section is bent along a line extending transverse to the bars 8 and 9 so as to form a mounting flange 53 which is disposed in opposed relationship to the base of the U-shaped bars 8 and 9. The other end portion 51 may be similarly bent in which event the two flanges 53 and 54 overlie one another as shown in Figure 1. Alternatively, as shown in Figure 7, the end portion 51 may be left to form a mounting flange 54 which is arranged substantially at right angles to the flange 53.

In a variation of the construction last described, sections of plate (not shown) between and outside of the bars 8 and 9 may project at right angles to the

flange 54 so as to overlie the flange 53. Such an arrangement improves the security of the strike 3 because fastening screws can be passed through those plate sections and the underlying flange 53.

The strike 3 described above can be secured to a door jamb 4 by means of the mounting flanges 53 and 54 and in a position such that the U-shaped bars 8 and 9 are able to enter into respective front end recesses 5 and 6 of the deadbolt housing 1. The space 55 enclosed by each bar 8 and 9 thus forms an opening for receiving a respective part 11 and 12 of the deadbolt 10.

It will be appreciated that a strike 3 as described has substantially greater strength than prior die cast strikes and is therefore much more resistant to breakage. That feature when combined with other features as previously described in this specification results in an exceptionally secure deadbolt assembly.

Claims

1. A deadbolt assembly comprising a housing (1), a deadbolt (10) mounted on said housing for linear movement relative thereto between operative and inoperative positions, an actuator (14) mounted on said housing, a drive plate (15) rotatably mounted on said housing and being connected to said actuator (14) so as to rotate in response to operation of said actuator, and a drive pin (16) fixed to said drive plate (15) so as to move therewith and being located radially outwards from the axis of said plate rotation, said deadbolt (10) having a non-circular opening (30) and said drive pin (16) engaging against a respective one of two co-operating edges (32, 33) of said opening to cause said linear movement of said deadbolt in each of two opposite directions as said drive plate is rotated in opposite directions, characterised in that said opening (30) is surrounded by said deadbolt and is substantially triangular having one edge (31) which extends substantially in the direction of said linear movement and two further edges (32, 33) which converge away from said one edge (31) with said converging edges forming said co-operating edges, a junction being provided between each adjacent two of said edges, the junction between each said converging edge (32, 33) and said one edge (31) being arranged to provide a seating surface (34, 36) for said drive pin (16) when said deadbolt (10) is in said operative position and said inoperative position so as to resist movement of said drive pin (16) out of the respective junction, at least in one direction.

2. A deadbolt assembly according to claim 1, characterised in that the junction between each adjacent two of said edges is formed as an arcuate junction (34, 35, 36).

3. A deadbolt assembly according to claim 1 or claim 2, characterised in that said drive pin (16) travels through an arc during movement of said deadbolt (10) between said operative and inoperative positions thereof, and the extremities of said arcuate travel are located on a straight line which is

substantially parallel to the path of said linear movement.

4. A deadbolt assembly according to claim 3, characterised in that said straight line substantially passes through said axis of rotation.

5. A deadbolt assembly according to any preceding claim, characterised in that a guide plate (19) is fixed to said housing, an arcuate slot (20) is formed through said guide plate, and said drive pin (16) is slidably located within said slot (20) and is guided by said slot during said drive plate rotation.

6. A deadbolt assembly according to any preceding claim, characterised in that said deadbolt includes a carrier plate (24) and two cylindrical parts (11, 12) which are secured to said carrier plate so as to be substantially coaxial and arranged in axially spaced relationship, the axis of each said cylindrical part being substantially parallel to the direction of said linear movement.

7. A deadbolt assembly according to any preceding claim, characterised in that guide means (25, 26) functions to guide said deadbolt in said linear movement.

8. A deadbolt assembly according to claims 5, 6 and 7, characterised in that said guide means includes said guide plate (19), at least one guide slot (26) in said guide plate which extends in the direction of said linear movement, and two guide pins (25) secured to said carrier plate (24) and each slidably located in said guide slot (26).

9. A deadbolt assembly according to claim 6 or claim 8, characterised in that said carrier plate (24) is formed of metal plate, and said cylindrical parts (11, 12) are formed separately from said carrier plate and are secured to said carrier plate.

10. A deadbolt assembly according to claim 9, characterised in that said carrier plate (24) includes two laterally projecting arms (27) which extend substantially transverse to the direction of said linear movement and are spaced apart in that direction, and each said cylindrical part is secured to a respective said arm.

11. A deadbolt assembly according to claim 10, characterised in that each said arm (27) has a longitudinal strengthening rib (29) formed thereon.

12. A deadbolt assembly according to any preceding claim, characterised in that said housing (1) is hollow, a mounting plate (38) is located within an open back of said housing, and at least one fastening screw (41) extends through a side wall (42) of said housing and engages with said mounting plate (38) to secure the housing to the mounting plate.

13. A deadbolt assembly according to any preceding claim when combined with a strike (3) formed of metal plate, said strike including a mounting flange (53) for securing the strike to a support, and a pair of bars (8, 9) formed integral with said flange, each said bar being of substantially U-shape and being arranged so that the base of the respective U is in opposed relationship to said mounting flange, and a respective part (11, 12) of said deadbolt is receivable in the space (55) between said mounting flange and each said bar.

14. A combination according to claim 13, characterised in that each said bar has one end attached

to a side edge of said mounting flange (53) and the opposite end is attached to a further said mounting flange (54).

15. A combination according to claim 14, characterised in that said further mounting flange (54) overlies the first said mounting flange (53) in face to face relationship.

16. A combination according to claim 14, characterised in that said further mounting flange (54) is arranged substantially at right angles to the first said mounting flange (53) and extends beyond the face of the first said mounting flange which is opposite to said bars.

Patentansprüche

1. Schließriegelanordnung, mit einem Gehäuse (1), einem Schließriegel (10), der auf dem Gehäuse für eine lineare Relativbewegung zu diesem zwischen einer Arbeits- und einer Ruhestellung gelagert ist, mit einem Betätigungselement (14), das auf dem Gehäuse gelagert ist, mit einer Antriebsplatte (15), die drehbeweglich auf dem Gehäuse gelagert ist und mit dem Betätigungselement (14) derart verbunden ist, daß sie in Abhängigkeit von der Betätigung des Betätigungselements dreht, und mit einem Antriebsstift (16), der an der Antriebsplatte (15) derart befestigt ist, daß er sich mit dieser bewegt und radial außerhalb der Achse der Drehung der Antriebsplatte angeordnet ist, wobei der Schließriegel (10) eine nicht-kreisförmige Öffnung (30) aufweist und der Antriebsstift (16) an der jeweiligen von zwei zusammenwirkenden Kanten (32, 33) der Öffnung anliegt, um die lineare Bewegung des Schließriegels in jeder der beiden gegenüberliegenden Richtungen zu bewirken, wenn die Antriebsplatte in entgegengesetzte Richtungen gedreht wird, dadurch gekennzeichnet, daß die Öffnung (30) von dem Schließriegel umgeben ist und im wesentlichen dreieckförmig ist und eine Kante (31) aufweist, die sich im wesentlichen in der Richtung der linearen Bewegung erstreckt, und zwei weitere Kanten (32, 33) aufweist, die von der einen Kante (31) weg konvergieren, wobei die konvergierenden Kanten die miteinander zusammenwirkenden Kanten bilden, daß eine Verbindung zwischen allen aneinander angrenzenden zwei Kanten vorgesehen ist, wobei die Verbindung zwischen jeder konvergierenden Kante (32, 33) und der einen Kante (31) so angeordnet ist, daß sie eine Sitzfläche (34, 36) für den Antriebsstift (16) erzeugt, wenn der Schließriegel (10) in der Arbeitsstellung und in der Ruhestellung ist, um der Bewegung des Antriebsstifts (16) aus der betreffenden Verbindung zu widerstehen, mindestens in einer Richtung.

2. Schließriegelanordnung nach Anspruch 1, dadurch gekennzeichnet, daß die Verbindung zwischen allen angrenzenden beiden Kanten als eine Bogenverbindung (34, 35, 36) ausgebildet ist.

3. Schließriegelanordnung nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß der Antriebsstift (16) während der Bewegung des Schließriegels (10) zwischen dessen Arbeits- und Ruhestellung eine bogenförmige Bahn durchläuft und die äußersten Punkte der bogenförmigen Bahn auf einer geraden

Linie angeordnet sind, die im wesentlichen parallel zu der Bahn der geraden Bewegung ist.

4. Schließriegelanordnung nach Anspruch 3, dadurch gekennzeichnet, daß die gerade Linie im wesentlichen durch die Rotationsachse verläuft.

5. Schließriegelanordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß eine Führungsplatte (19) an dem Gehäuse befestigt ist, daß ein bogenförmiger Schlitz (20) durch die Führungsplatte gebildet ist und daß der Antriebsstift (16) gleitbeweglich in dem Schlitz (20) angeordnet und während der Antriebsplattendrehung durch den Schlitz geführt ist.

6. Schließriegelanordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß der Schließriegel eine Trägerplatte (24) und zwei zylindrische Teile (11, 12) aufweist, die an der Trägerplatte derart befestigt sind, daß sie im wesentlichen koaxial sind und in einem axial beabstandeten Verhältnis angeordnet sind, wobei die Achse jedes der zylindrischen Teile im wesentlichen parallel zur Richtung der linearen Bewegung ist.

7. Schließriegelanordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß eine Führungseinrichtung (25, 26) den Schließriegel bei der linearen Bewegung führt.

8. Schließriegelanordnung nach einem der Ansprüche 5, 6 oder 7, dadurch gekennzeichnet, daß die Führungseinrichtung die Führungsplatte (19), mindestens einen Führungsschlitz (26) in der Führungsplatte, der sich in Richtung der linearen Bewegung erstreckt, und zwei Führungsstifte (25) aufweist, die an der Trägerplatte (24) befestigt und je gleitbeweglich in dem Führungsschlitz (26) angeordnet sind.

9. Schließriegelanordnung nach Anspruch 6 oder 8, dadurch gekennzeichnet, daß die Trägerplatte (24) als Metallplatte ausgebildet ist und daß die zylindrischen Teile (11, 12) getrennt von der Trägerplatte ausgebildet und an der Trägerplatte befestigt sind.

10. Schließriegelanordnung nach Anspruch 9, dadurch gekennzeichnet, daß die Trägerplatte (24) zwei seitlich vorragende Arme (27) einschließt, die sich im wesentlichen quer zur Richtung der linearen Bewegung erstrecken und in dieser Richtung beabstandet sind, und daß jeder zylindrische Teil je an einem Arm befestigt ist.

11. Schließriegelanordnung nach Anspruch 10, dadurch gekennzeichnet, daß jeder Arm (27) eine darauf ausgebildete Längsverstärkungsrippe (29) aufweist.

12. Schließriegelanordnung nach einem der vorhergehenden Ansprüche, dadurch gekennzeichnet, daß das Gehäuse (1) hohl ist, daß eine Lagerplatte (38) in einer offenen Rückseite des Gehäuses angeordnet ist und daß mindestens eine Befestigungsschraube (41) sich durch eine Seitenwand (42) des Gehäuses erstreckt und mit der Lagerplatte (38) in Eingriff steht, um das Gehäuse an der Lagerplatte zu befestigen.

13. Schließriegelanordnung nach einem der vorhergehenden Ansprüche, in Kombination mit einer Schloßfalle (3), die aus einer Metallplatte ausgebildet ist, wobei die Schloßfalle einen Befestigungs-

flansch (53) für die Befestigung der Schloßfalle an einer Abstützung und ein Paar Riegel (8, 9) aufweist, die einstückig mit dem Flansch ausgebildet sind, wobei jeder Riegel im wesentlichen U-förmig ist und so angeordnet ist, daß die Basis des betreffenden U sich dem Befestigungsflansch gegenüberliegend befindet, und wobei je ein Teil (11, 12) des Schließriegels in dem Raum (55) zwischen dem Befestigungsflansch und jedem Riegel aufnehmbar ist.

14. Kombination nach Anspruch 13, dadurch gekennzeichnet, daß ein Ende jedes Riegels an einer Seitenkante des Befestigungsflanschs (53) befestigt ist und daß das gegenüberliegende Ende an einem weiteren Befestigungsflansch (54) befestigt ist.

15. Kombination nach Anspruch 14, dadurch gekennzeichnet, daß der weitere Befestigungsflansch (54) dem ersten Befestigungsflansch (53) von diesen beabstandet gegenüberliegt.

16. Kombination nach Anspruch 14, dadurch gekennzeichnet, daß der weitere Befestigungsflansch (54) im wesentlichen rechtwinklig zu dem ersten Befestigungsflansch (53) angeordnet ist und sich über die Stirnfläche des ersten Befestigungsflansches, die den Riegeln gegenüberliegt, hinaus erstreckt.

Revendications

1. Système avec pêne de sécurité comprenant un boîtier (1), un pêne (10) monté sur le boîtier afin qu'il se déplace linéairement par rapport à lui entre des positions de travail et de repos, un organe de manœuvre (14) monté sur le boîtier, une plaque d'entraînement (15) montée sur le boîtier afin qu'elle puisse tourner et raccordée à l'organe de manœuvre (14) afin qu'elle tourne lors de la commande de l'organe de manœuvre, et un axe d'entraînement (16) fixé à la plaque d'entraînement (15) afin qu'il se déplace avec elle et disposé radialement vers l'extérieur par rapport à l'axe de rotation de la plaque, le pêne (10) ayant une ouverture non circulaire (30) et l'axe d'entraînement (16) étant au contact de l'un de deux bords coopérants (32, 33) de l'ouverture afin qu'il provoque un déplacement linéaire du pêne dans chacun des deux sens opposés lorsque la plaque d'entraînement est tournée en sens opposés, caractérisé en ce que ladite ouverture (30) est entourée par le pêne et a une forme sensiblement triangulaire, ayant un bord (31) disposé pratiquement dans la direction du déplacement linéaire, et deux bords supplémentaires (32, 33) qui convergent en s'écartant du premier bord (31), les bords convergents constituant lesdits bords coopérants, une jonction étant placée entre les bords de chaque paire de bords adjacents, la jonction formée entre un bord convergent (32, 33) et le premier bord (31) étant réalisée avec une surface de siège (34, 36) destinée à coopérer avec l'axe d'entraînement (16) lorsque le pêne (10) est dans la position de travail et lorsqu'il est dans la position de repos, si bien qu'il présente une résistance au déplacement de l'axe d'entraînement (16) en dehors de la jonction respective, au moins dans un sens.

2. Système avec pêne de sécurité selon la revendication 1, caractérisé en ce que la jonction formée

entre deux bords d'une paire de bords adjacents est sous forme d'une jonction courbe (34, 35, 36).

3. Système avec pêne de sécurité selon la revendication 1 ou 2, caractérisé en ce que l'axe d'entraînement (16) se déplace en arc de cercle pendant le déplacement du pêne (10) entre les positions de travail et de repos, et les extrémités du déplacement courbe sont placées sur une droite qui est sensiblement parallèle au trajet de déplacement linéaire.

4. Système avec pêne de sécurité selon la revendication 3, caractérisé en ce que ladite ligne droite passe pratiquement par l'axe de rotation.

5. Système avec pêne de sécurité selon l'une quelconque des revendications précédentes, caractérisé en ce qu'une plaque de guidage (19) est fixée au boîtier, une fente courbe (20) est formée dans la plaque de guidage, et l'axe d'entraînement (16) est positionné dans la fente (20) afin qu'il puisse coulisser et est guidé par la fente pendant la rotation de la plaque d'entraînement.

6. Système avec pêne de sécurité selon l'une quelconque des revendications précédentes, caractérisé en ce que le pêne comporte une plaque de support (24) et deux parties cylindriques (11, 12) qui sont fixées à la plaque de support afin qu'elles soient sensiblement coaxiales et distantes axialement, l'axe de chaque partie cylindrique étant pratiquement parallèle à la direction dudit déplacement linéaire.

7. Système avec pêne de sécurité selon l'une quelconque des revendications précédentes, caractérisé en ce que le dispositif de guidage (25, 26) assure le guidage du pêne dans ledit déplacement linéaire.

8. Système avec pêne de sécurité selon les revendications 5, 6 et 7, caractérisé en ce que le dispositif de guidage comporte la plaque (19) de guidage, au moins une fente de guidage (26) formée dans la plaque de guidage et qui est orientée dans la direction dudit déplacement linéaire, et deux ergots de guidage (25) fixés à la plaque de support (24) et positionnés chacun dans la fente de guidage (26) afin qu'il puisse coulisser.

9. Système avec pêne de sécurité selon la revendication 6 ou 8, caractérisé en ce que la plaque de support (24) est une plaque métallique, et les parties cylindriques (11, 12) sont formées séparément de la plaque de support et sont fixées à cette plaque de support.

10. Système avec pêne de sécurité selon la revendication 9, caractérisé en ce que la plaque de support (24) comporte deux bras (27) qui dépassent latéralement, qui ont une orientation sensiblement transversale à la direction dudit déplacement linéaire, et qui sont espacés dans cette direction, et chaque partie cylindrique est fixée à un bras respectif.

11. Système avec pêne de sécurité selon la revendication 10, caractérisé en ce que chacun des bras (27) a une nervure longitudinale de renforcement (29) qui y est formée.

12. Système avec pêne de sécurité selon l'une quelconque des revendications précédentes, caractérisé en ce que le boîtier (1) est creux, une plaque de montage (38) est positionnée dans une partie arrière ouverte du boîtier, et au moins une vis de

fixation (41) traverse une paroi latérale (42) du boîtier et est au contact de la plaque de montage (38) afin que le boîtier soit fixé à la plaque de montage.

13. Système avec pêne de sécurité selon l'une quelconque des revendications précédentes, combiné à une ferrure (3) formée d'une plaque métallique, la ferrure ayant un flasque de montage (53) destiné à la fixation de la ferrure sur un support, et deux barres (8, 9) formées afin qu'elles soient solitaires du flasque, chacune des barres ayant une forme pratiquement en U et étant disposée de manière que la base du U respectif soit placée du côté opposé au flasque de montage, et une partie respective (11, 12) du pêne est destinée à se loger dans l'espace (55) formé entre le flasque de montage et chacune des barres.

14. Combinaison selon la revendication 13, caractérisée en ce que chacune des barres a une première extrémité fixée à un bord latéral du flasque de montage (53) et l'extrémité opposée est fixée à un flasque de montage supplémentaire (54).

15. Combinaison selon la revendication 14, caractérisée en ce que le flasque supplémentaire de montage (54) est disposé sur le premier flasque de montage (53), afin qu'ils soient face à face.

16. Combinaison selon la revendication 14, caractérisée en ce que le flasque supplémentaire de montage (54) est disposé en direction sensiblement perpendiculaire à celle du premier flasque de montage (53) et il dépasse de la face du premier flasque de montage qui est opposée aux barres.

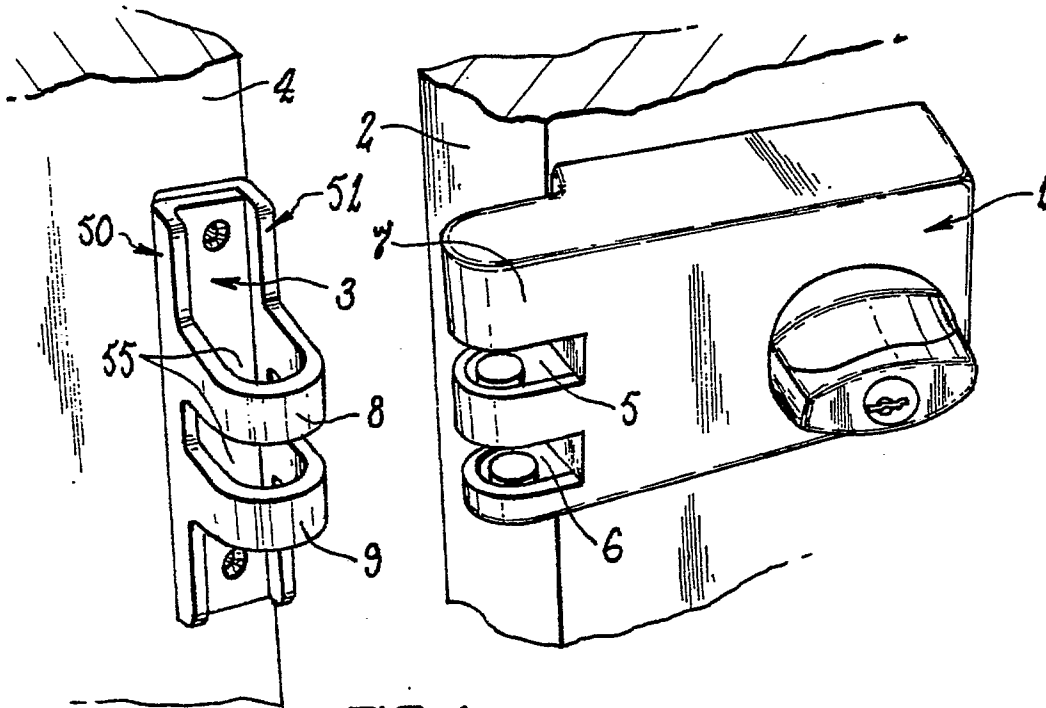


FIG 1

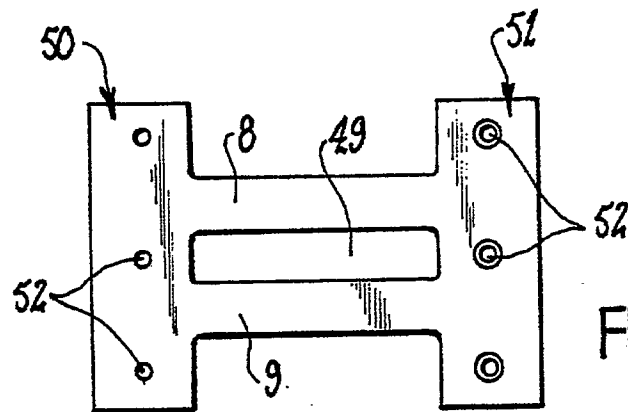


FIG 6

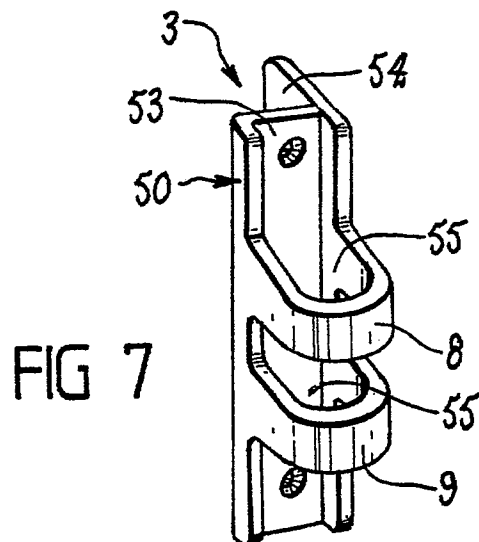


FIG 7

FIG 2

