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(54) **ESPAGNOLETTE FASTENING FOR WINDOW OR DOOR**

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Description

This invention relates to an espagnolette fastening for a window or door, and which comprises a pinion housing which can be mounted in a closing face of the window or door, an elongate slidable member movable longitudinally between fastening and release positions, a pinion rotatably mounted in said housing and adapted to receive the spindle of an actuating handle which can rotate the pinion between release and fastening positions, and a mechanism interconnecting the pinion and the slidable member and operable to convert rotary motion of the pinion into linear movement of the slidable member.

Espagnolette type fastenings are well known in the art for fastening windows and doors, and need not be described in detail herein. Usually, the slidable member, often referred to as an espagnolette rod, is provided with one or more locking elements, which may comprise so-called "mushroom cams", such locking elements being movable between release and fastening positions with respect to corresponding keeper elements, upon linear movement of the espagnolette rod. One widely used type of mechanism for transferring rotary movement of the pinion into linear movement of the slidable member comprises a rack provided on the slidable member and which engages the teeth of the pinion as the latter rotates. However, other types of mechanism may be used, and a rack and pinion type of mechanism is not essential to the present invention. Furthermore, while some known espagnolette fastenings have a single espagnolette rod which moves to and fro to move between the release and fastening positions, there are other known designs in which a pair of espagnolette rods are provided, which move in relatively opposite directions i.e. towards or away from each other as they move between the release and the fastening positions. Such an arrangement is also within the scope of the present invention.

In espagnolette type fastenings for doors and windows, and when so-called "mushroom cams" are used as the locking elements, these cams slide into locking engagement with suitably designed keeper elements mounted in the fixed frame in which the door or window is hingedly mounted, and the cams have a cylindrical shank which is received in a slot defined by the respective keeper element, and which resists opening movement of the door or window i.e. in a direction perpendicular to the axis of the shank. Therefore, with a fastening system in which the actuating handle is located internally only, once the handle has been moved to the locking position, the door or window is locked against forced-opening movement (which would otherwise take place by pivoting about its hinges), by reason of the interfitting between the shanks of the cams and the edges of the slots in the keeper elements in which they are received. However, to provide further resistance against forced entry, which may be attempted by use of a jemmy or the

like introduced between the closing face of the door or window and the fixed frame, each mushroom cam has a flange or dome shaped head at the end of each shank, and which fits within each keeper slot, and resists axial separation between the shank and the keeper. Therefore, the flanged or dome shaped heads provide axial restraint against possible forced separation between the closing face of the door or window and the fixed frame, and in the general plane of the door or window.

However, existing designs of mushroom cam are not sufficiently strongly designed to resist a serious attempt at forced entry, and the purpose of the present invention is to provide an additional locking feature, as a component part of the espagnolette fastening, to provide additional resistance to any attempt at forced relative separation of the fixed frame and the hinged frame in which the door or window is mounted.

According to the invention there is provided an espagnolette fastening for fastening an openable window or door member to a fixed frame in which it is mounted, said fastening comprising:

a pinion housing which can be mounted in a closing face of said window or door member;

a pinion rotatably mounted in said housing and adapted to be rotated by a spindle of an actuating handle between release and fastening positions;

an elongate member slidable longitudinally and having a fastening element which is movable with the elongate member between release and fastening positions with respect to a keeper element in the fixed frame;

a mechanism arranged within said housing and interconnecting said pinion and said elongate member, said mechanism being operative to convert rotary movement of the pinion into linear movement of said elongate member; and

a locking element mounted on said pinion and rotatable therewith, said locking element being movable between a retracted position in which it is accommodated at least partly within said housing when the pinion is in the release position, and an extended position in which it is capable of making locking engagement with a respective keeper on the fixed frame in order to resist forced relative separation of the keeper and said closing face in the general plane of the window or door when the pinion is in its fastening position.

Therefore, by provision of the locking element which is mounted on the pinion, an additional security feature is provided by relatively simple means, and which is moved automatically between locking and retracted position as the pinion is rotated by the actuating handle between the fastening and released positions respectively.

The locking element may comprise a claw which can be received at least partly within the housing, when

in the retracted position, so that it does not project from the overall device to any appreciable extent, but which can make reliable and robust locking engagement with its keeper when in the locking position.

The keeper may comprise a specially designed keeper plate mounted in the fixed frame. Therefore, in a preferred embodiment, by relatively simple means additional security is provided by mounting the claw type locking element on the pinion (in which the pinion may be of standard or well known design), and by providing a suitable keeper plate mounted in the fixed frame.

Preferably, a single slidable espagnolette rod forms said slidable elongate member, and which has a rack engageable by the teeth of the pinion in order to be driven linearly upon rotation of the pinion. However, more complex designs may be provided, within the scope of this invention, including provision of double espagnolette rods movable in opposite directions, and with any suitable drive mechanism to transfer rotary motion from the pinion into opposite linear movements of the rods.

The rod(s) may be provided with mushroom cam(s) or other similar fastening elements.

A preferred embodiment of espagnolette fastening according to the invention will now be described in detail, by way of example only, with reference to the accompanying drawings, in which:

Figure 1 is a side view of the fastening mechanism; and

Figure 2 is a perspective view of the mechanism.

Referring now to the drawings, an espagnolette fastening according to the invention is designated generally by reference 10, and is adapted to fasten an openable window or door (not shown) to a fixed frame in which it is mounted, the fastening 10 comprising a pinion housing 11 which can be mounted in a suitable recess formed in a closing face of the window or door member. Housing 11 may be of standard design.

A pinion 12 is rotatably mounted in housing 11 and is adapted to be rotated by a spindle of an actuating handle (not shown) between release and fastening positions in well known manner. Pinion 12 has peripheral teeth, of which one is shown by reference 13, and which are capable of meshing with a rack (not shown in detail) mounted on an elongate member, in the form of espagnolette rod 14, which is slidable longitudinally between release and fastening positions with respect to a keeper element (not shown) mounted in the fixed frame. The rod 14 has one or more locking cams 15 which may comprise well known "mushroom cams".

Rotation of pinion 12 effects longitudinal movement of espagnolette rod 14 so as to move cams 15 between release and fastening positions in accordance with the direction of rotation of pinion 12. A mechanism is arranged within housing 11 and interconnects pinion 12 and rod 14, which is operative to convert rotary movement of the pinion into linear movement of the rod 14,

and which, as described above, takes the form of rack and pinion interconnection between pinion 12 and rod 14. However, other types of mechanism may be provided in order to convert the rotary movement of the pinion into linear movement of the rod 14.

A locking element in the form of claw 16 is mounted on pinion 12 and is shown in full lines in a retracted position in which it is accommodated at least partly within housing 11, and which position it takes-up when the pinion 12 is in the release position. As can be seen from the drawing, the claw 16 does not project from the housing 11 by any greater extent than the cams 15, and therefore the overall depth of fastening 10, when in the release position, is kept to a minimum.

However, claw 16 can be rotated to a locking position, as shown in dashed outline, when the pinion 12 is rotated by the spindle of the actuating handle to the fastening position, and when claw 16 is in this position it is capable of making locking engagement with a respective keeper in the form of centre keep plate 17 mounted on the fixed frame, in order to resist forced relative separation between the keeper plate 17 and the closing face of the window or door in which fastening 10 is mounted. A slot 16a in claw 16 engages around a strengthened securing bar or rod 17a incorporated in keep plate 17. This resistance to relative separation prevents, or at least resists strongly any forced separation e.g. by use of a jemmy, tending to move the fixed frame and the closing face of the window or door apart in the general plane of the window or door.

As shown in the drawing, only a single espagnolette rod 14 is provided, but more complex designs may be provided, within the scope of the invention, including provision of double espagnolette rods movable in opposite directions, and with provision of any suitable drive mechanism to transfer the rotary motion of the pinion 12 into opposite linear movement of the rods.

The rod or rods are provided with mushroom cams, or other similar fastening elements.

Therefore, the preferred embodiment illustrated in the drawing provides the following technical advantages over existing designs of espagnolette fastenings:

1. Higher security than standard fastenings, with only a small increase in cost;
2. May be designed to be dimensionally similar to standard espagnolette rods, so as to fit the same sections as standard espagnolette rods, while still giving greater security;
3. The security claw (16) is substantially built-into the housing or gearbox, so that no loose parts are needed for fitting, and can be installed the same as a standard espagnolette fastening;
4. In the closed position, the claw can locate around a security bar provided in the keep plate 17, and protrudes into reinforced part of the fixed frame section;
5. When closed, the claw hooking action onto the

keep plate gives added security against forced levering apart of the sash and frame;

6. In the closed position, this gives extra security against forced opening of the sash because the claw slots into a reinforced chamber which may be specially designed; and,

7. As the gearbox pinion is turned by the window handle, the pinion moves a rack of an espagnolette rod(s) to which the mushroom cams are attached, and these move into standard keeper elements, while at the same time, the claw, which is an integral part of the pinion, moves around and locates in a purpose made keep which is attached to the frame. In the fully closed position, the claw hooks round a bar on the keep preventing the sash and frame being levered apart.

Claims

1. An espagnolette fastening for fastening an openable window or door member to a fixed frame in which it is mounted, said fastening comprising:

a pinion housing which can be mounted in a closing face of said window or door member; a pinion rotatably mounted in said housing and adapted to be rotated by a spindle of an actuating handle between release and fastening positions;

an elongate member slidable longitudinally and having a fastening element which is movable with the elongate member between release and fastening positions with respect to a keeper element in the fixed frame;

a mechanism arranged within said housing and interconnecting said pinion and said elongate member, said mechanism being operative to convert rotary movement of the pinion into linear movement of said elongate member; and a locking element mounted on said pinion and rotatable therewith, said locking element being movable between a retracted position in which it is accommodated at least partly within said housing when the pinion is in the release position, and an extended position in which it is capable of making locking engagement with a respective keeper on the fixed frame in order to resist forced relative separation of the keeper and said closing face in the general plane of the window or door when the pinion is in its fastening position.

2. An espagnolette fastening according to claim 1, in which the locking element comprises a claw which can be received at least partly within said housing, when in the retracted position, so that it does not project from the overall device to any appreciable

extent.

3. An espagnolette fastening according to claim 1 or 2, and in combination with said keeper.
4. An espagnolette fastening according to any one of claims 1 to 3, in which a single slidable espagnolette rod forms said slidable elongate member, and which has a rack engageable by the teeth of the pinion in order to be driven linearly upon rotation of the pinion.
5. An espagnolette mechanism according to any one of claims 1 to 4, in which said rod is provided with mushroom cams or other fastening elements.

Patentansprüche

1. Treibstangenverriegelung zum Arretieren eines zu öffnenden Fenster- oder Türelements an dem befestigten Rahmen, an dem es montiert ist, mit

- einem Ritzelgehäuse, das sich in der Schließseite dieses Fenster- oder Türelements montieren läßt,
- einem Ritzel, das in diesem Gehäuse drehbar montiert ist und sich mit einer Spindel eines Handgriffs zwischen Öffnungs- und Schließstellung hin- und herdrehen läßt,
- einem länglichen Element, das in Längsrichtung verschiebbar ist und ein Verriegelungselement aufweist, das sich zusammen mit dem länglichen Element in bezug auf ein am befestigten Rahmen angebrachtes Eingriffselement zwischen Öffnungs- und Schließstellung hin- und herbewegen läßt,
- einem in dem Gehäuse angeordneten Mechanismus, der das Ritzel und das längliche Element miteinander verbindet und bewirkt, daß eine Drehbewegung des Ritzels in eine Linearbewegung des länglichen Elements umgewandelt wird, sowie
- einem auf dem Ritzel montierten und sich mit diesem mitdrehenden Schließelement, das zwischen einer Einrückstellung, bei der sich das Ritzel in Öffnungsstellung befindet, und einer Ausrückstellung, bei der sich das Ritzel in Schließstellung befindet, hin- und herbewegt werden kann, wobei es in der Einrückstellung zumindest zum Teil vom Gehäuse umgeben ist und in der Ausrückstellung sich mit einem entsprechenden Schließblech, das am befestigten Rahmen angebracht ist, in Eingriff bringen läßt, um einer gewaltsamen Trennung von Schließblech und Schließseite in der Hauptebene des Fensters oder der Tür Widerstand zu leisten.

2. Treibstangenverriegelung nach Anspruch 1, bei der das Schließelement eine Klaue umfaßt, die in Einrückstellung zumindest zum Teil vom Gehäuse umgeben ist, so daß sie nur unwesentlich aus der gesamten Vorrichtung herausragt.
3. Treibstangenverriegelung nach Anspruch 1 oder 2, und in Kombination mit dem Schließblech.
4. Treibstangenverriegelung nach einem der Ansprüche 1 bis 3, bei der nur eine einzige verschiebbare Treibstange mit einer Zahnstange, mit der sich die Zähne des Ritzels in Eingriff bringen lassen, um die Treibstange durch Drehen des Ritzels linear zu bewegen, das verschiebbare längliche Element bildet.
5. Treibstangenmechanismus nach einem der Ansprüche 1 bis 4, bei der die Treibstange mit Pilzkopfnocken oder anderen Verriegelungselementen versehen ist.

Revendications

1. Fixation à crémone destinée à fixer un élément de fenêtre ou de porte ouvrable sur un cadre fixe dans lequel il est monté, cette fixation comprenant :
 - un logement de pignon qui peut être monté dans un battant de l'élément de fenêtre ou de porte ;
 - un pignon monté rotatif dans le logement et conçu pour être tourné par un pivot d'une poignée de manoeuvre, entre des positions de libération ou de fixation ;
 - un élément allongé coulissant longitudinalement et pourvu d'un élément de fixation mobile avec l'élément allongé entre des positions de libération et de fixation, par rapport à une gâche située dans le cadre fixe ;
 - un mécanisme disposé dans le logement et raccordant entre eux le pignon et l'élément allongé, ce mécanisme fonctionnant pour convertir le mouvement rotatif du pignon en mouvement linéaire de l'élément allongé ; et
 - un élément de verrouillage, monté sur le pignon et susceptible de tourner avec celui-ci, cet élément de verrouillage étant mobile entre une position rentrée dans laquelle il est logé au moins partiellement à l'intérieur du logement, lorsque le pignon est dans la position de libération, et une position sortie dans laquelle il est susceptible de venir s'engager en position de verrouillage dans une gâche respective placée dans le cadre fixe de manière à empêcher toute séparation relative forcée de la gâche et du battant, dans le plan général de la fenêtre ou de la porte, lorsque le pignon est dans sa position de

fixation.

2. Fixation à crémone selon la revendication 1, dans laquelle l'élément de verrouillage comprend une griffe qui peut être reçue, au moins partiellement, à l'intérieur du logement, lorsqu'il se trouve en position rentrée, de sorte qu'il ne dépasse pas de l'ensemble du dispositif de manière importante.
3. Fixation à crémone selon la revendication 1 ou 2, et en combinaison avec la gâche.
4. Fixation à crémone selon l'une quelconque des revendications 1 à 3, dans laquelle une seule tringle de crémone coulissante constitue l'élément allongé coulissant, et qui présente une crémaillère susceptible de coopérer avec les dents du pignon afin d'être entraînée linéairement lors de la rotation du pignon.
5. Mécanisme à crémone selon l'une quelconque des revendications 1 à 4, dans lequel la tringle est pourvue de cames bombées ou d'autres éléments de fixation.

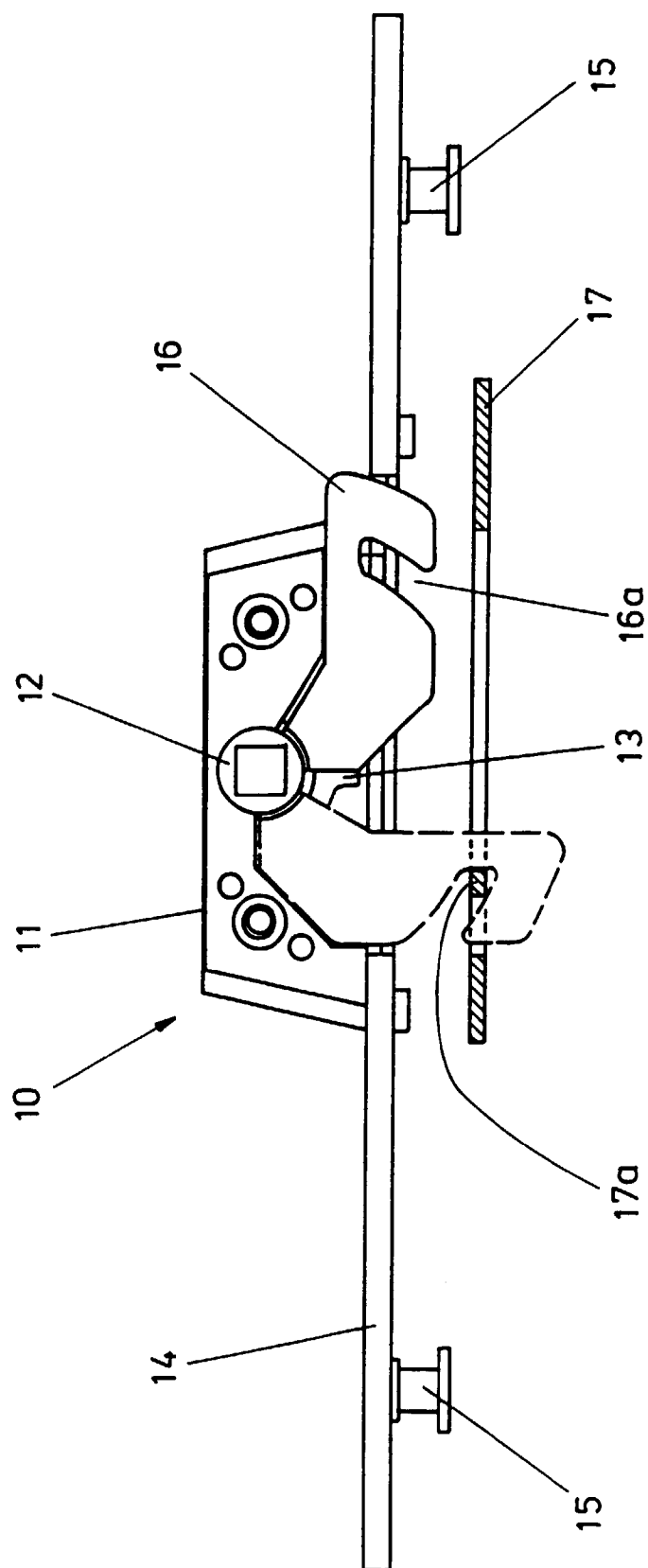


FIG. 1

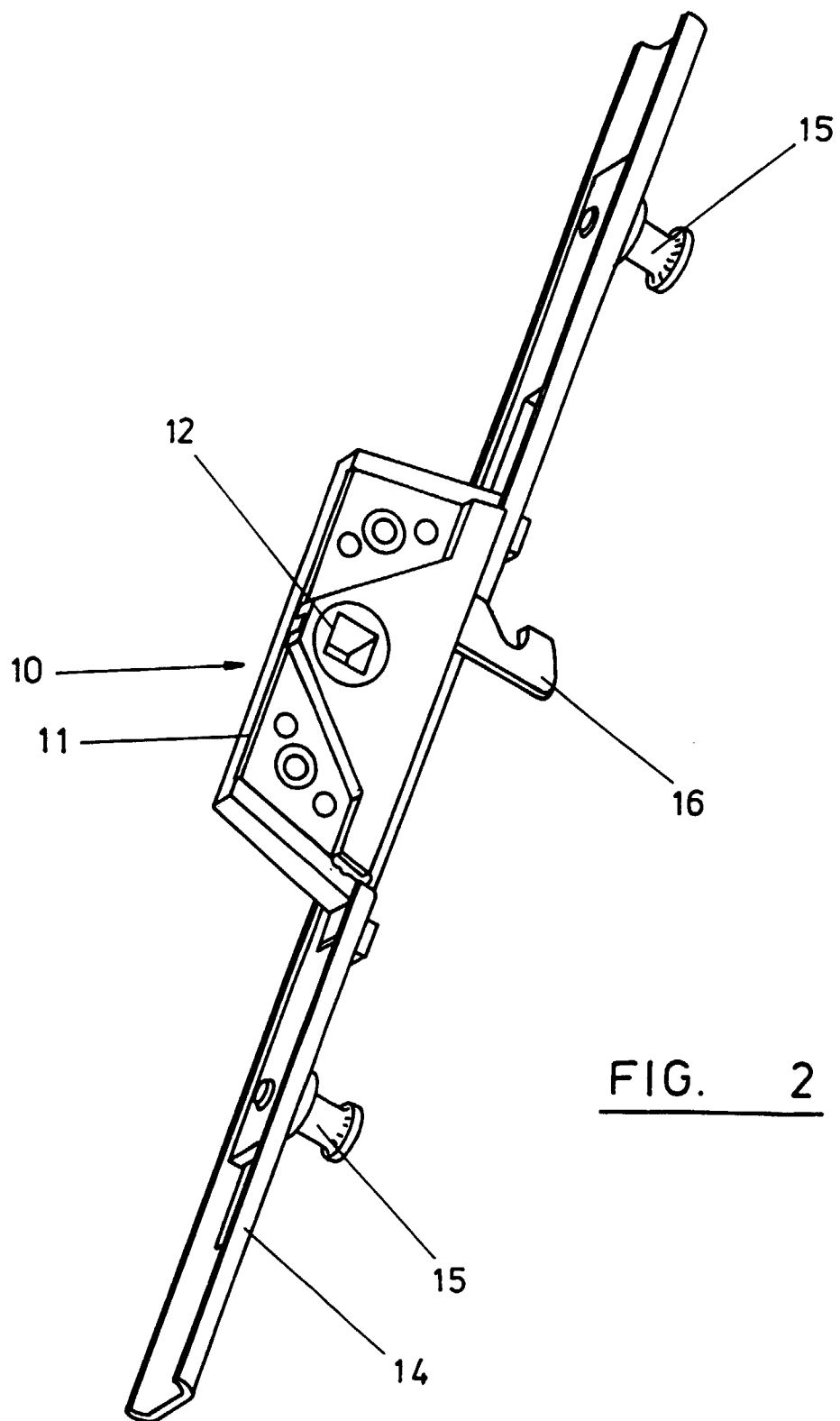


FIG. 2