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(54) Espagnolette bolting systems

(57) An espagnolette bolting system for a door, window or like opening structure comprises a first bolt movable between an operative position and an inoperative position, a second bolt movable between an operative position and an inoperative position, a first rack member (4) arranged to move the first bolt between said operative and inoperative positions and vice versa, a second rack member (14) arranged to move the second bolt between said operative and inoperative positions and vice versa, a toothed quadrant (3) rotatably mounted in a case and arranged to engage with a first toothed rack (5) on the first rack member (4), a spindle (12) extending through the quadrant (3) and projecting from at least one side of the case, a handle or lever (16) mounted on a or the projecting end of the spindle (12) and a pinion (13) rotatably mounted in the case. Each of the rack members (4, 14) is provided with a slot and a toothed rack (7, 15) is provided on one side of each slot. The pinion (13) is located in the slots and is arranged to engage with the toothed racks (7, 15).

When the spindle (12) is turned by the handle or lever (16), the quadrant (3) is rotated and, by virtue of its engagement with the rack (5), is effective to move the first rack member (4) which thus moves the first bolt. At the same time, movement of the first rack member (4) is effective cause the pinion (13) to rotate which in turn is effective to move the second rack member (14) which thus moves the second bolt.

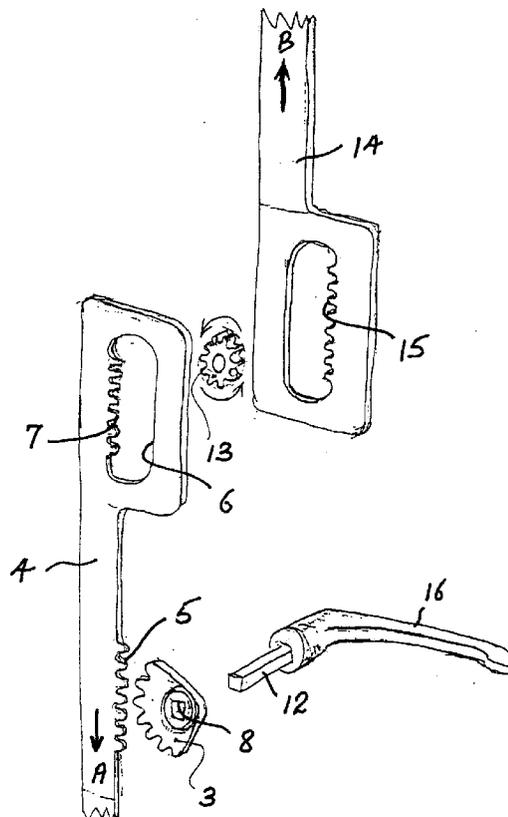


Fig. 3

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Description

This invention relates to bolts and is particularly concerned with espagnolette bolts for doors, windows and like opening structures.

In a known espagnolette bolting system, bolts are provided at the top and bottom of a door and are operated by a single central driving cog. The cog is arranged to be operated by a door handle or lever and engages racks which drive the bolts. The racks engage the cog on opposite sides which means that at least one of the bolts has to be heavily cranked. The disadvantage with this is that if force is applied, flexing of the bolts can occur so that the bolts are deformed and the racks can jump out of engagement with the cog so that the door cannot then be bolted.

The present invention aims to provide an espagnolette bolting system which avoids the above-mentioned disadvantage and which ensures reliable operation.

According to the invention, there is provided an espagnolette bolting system for a door, window or like opening structure; said system comprising a first bolt movable between an operative position and an inoperative position, a second bolt movable between an operative position and an inoperative position, a first rack member arranged to move the first bolt between said operative and inoperative positions and vice versa, a second rack member arranged to move the second bolt between said operative and inoperative positions and vice versa, a first toothed member rotatably mounted in a case and arranged to engage with a first toothed rack, on said first rack member, a spindle extending through the first toothed member and projecting from at least one side of the case and a handle or lever being mounted on a or the projecting end of the spindle; and a second toothed member rotatably mounted in the case and arranged to be engaged by a second toothed rack on the first rack member and to engage with a toothed rack on the second rack member, the arrangement being such that turning of the spindle by means of the handle or lever is effective to cause the first toothed member to rotate to drive the first rack member which in turn is effective to rotate the second toothed member to drive the second rack member whereby the bolts can be moved from the operative to the inoperative position or vice versa.

Preferably, the first toothed member takes the form of a toothed quadrant and the second toothed member comprises a pinion.

The provision of the second toothed member in the form of a pinion enables both the rack members and bolts to be located adjacent to the foreend of the case in which they are located and avoids the necessity for either of the bolts to be cranked thereby ensuring reliable operation.

Preferably, the spindle projects from only one side of the case but it may for some applications project from both sides of the case if desired.

According to a preferred embodiment of the invention, the first rack member is provided with a slot which accommodates the pinion, the second toothed rack on said member extending along one of the sides of the slot.

The invention will now be further described, by way of example, with reference to the drawings, in which:-

Fig. 1 is a side elevation of the centre unit of one embodiment of an espagnolette bolting system according to the invention with the casing lid of the unit removed to show the internal components;

Fig. 2 is a section taken on the line II-II in Fig. 1 in the direction of the arrows but showing the casing lid in position on the casing; and

Fig. 3 is an exploded perspective view of parts of the mechanism illustrated in Figs. 1 and 2.

Referring to the drawings, the centre unit of an espagnolette bolting system according to the invention comprises a casing 1 which is adapted to receive and co-operate with a casing lid 2, both components being designed to be received and fitted in a recess in the opening edge of a door, window or like opening member (not shown) to abut against a foreend plate 10. A toothed quadrant 3 is rotatably mounted in the casing, the quadrant having a series of teeth over only part of its periphery. A first rack member 4 is slidably mounted in the casing, said member having a first toothed rack 5 the teeth of which are arranged to engage with the teeth of the quadrant 3 whereby the rack can be driven by the inter-engaging teeth when the quadrant 3 is rotated. The quadrant is provided, for this purpose, with a square-sectioned bore 8 which is adapted to receive a spindle 12 of corresponding section, one end of the spindle being arranged to project from the casing or the casing lid and to be engaged by a handle 16 whereby turning of the handle is effective to rotate the spindle and hence the quadrant 3.

The upper end of the rack member 4 extends past the quadrant 3 and is provided with a slot 6 in which a pinion 13 is located. A second toothed rack 7 is provided along one of the sides of the slot 6 and the teeth of the rack 7 are arranged to mesh with a series of teeth provided on the pinion 13. This pinion is rotatably mounted in the casing 1 on a pin 18. A second rack member 14 is slidably mounted in the casing 1, in a similar manner to the rack member 4, and is provided with a toothed rack 15 the teeth of which are arranged to be engaged by the teeth of the pinion 13. As can be seen from Fig. 2 of the drawings, the two rack members 4 and 14 are laterally offset from one another whereby relative movement between the two rack members can take place without interference.

The casing 1 is further provided with circular apertures each of which is adapted to receive a respective threaded bush 9. The casing lid 2 is provided with corresponding apertures which can be aligned with the re-

spective bushes 9 in order accurately to locate the casing lid 2 on the casing 1. Screws (not shown) can be inserted in the apertures in the casing lid to engage with the screw-threads of the bushes 9 in order to secure the lid on the casing. The casing is further provided with an apertured lug 11 by means of which the casing can be secured by screws or like fixing means to a door or window or like opening structure.

Respective drive bars (not shown) are secured to the rack members 4 and 14 and extend from the centre unit of the bolting system adjacent to the lower and upper edges respectively of the structure to which the system is secured. The drive bars are connected to respective bolts (likewise not shown).

The drawings show the bolting system in the unbolted condition. In order to throw the bolts into the bolted condition of the system, the quadrant 3 must be turned, by means of the handle 16 on the spindle 12, through 90° in an anticlockwise direction as viewed in Fig. 1. Rotation of the quadrant 3 is effective to move the rack member 4, by virtue of the engagement of the toothed rack 5 with the quadrant 3, downwardly from the withdrawn position shown in Fig. 1 towards the opposite end of the casing 1 in the direction of the arrow A. At the same time, the pinion 13 is also rotated in an anti-clockwise direction as viewed in Fig. 1 by virtue of its engagement with the toothed rack 7 on the rack member 4. Rotation of the pinion 13 in this manner is effective to move the rack member 14 in the direction of the arrow B by virtue of the engagement of the pinion 13 with the toothed rack 15. This movement causes the respective drive bars to move away from each other and to move the associated bolts to the thrown or bolted position. In this fashion, the structure can be effectively bolted.

The bolts can be withdrawn by rotating the pinion 3, by means of the spindle and handle, in the opposite direction, i.e. in a clockwise direction as viewed in Fig. 1 of the drawings.

Further bolts may be provided to extend from the outer edge of the door, window or like structure and arranged to be operated by the drive bars which are secured to the rack members 4 and 14.

The invention is not restricted to the above-described embodiments but modifications and variations may be made without departing from the scope of the invention. For example, the system according to the invention may also be provided with a centre bolt or latch which is adapted to be operated directly by the spindle and pivoted into or out of the latched or bolted position by turning of the handle on the spindle.

Claims

1. An espagnolette bolting system for a door, window or like opening structure; said system comprising a first bolt movable between an operative position and an inoperative position and a second bolt mov-

able between an operative position and an inoperative position, characterized in that a first rack member (4) is arranged to move the first bolt between said operative and inoperative positions and vice versa, a second rack member (14) is arranged to move the second bolt between said operative and inoperative positions and vice versa, a first toothed member (3) is rotatably mounted in a case (1) and is arranged to engage with a first toothed rack (5) on said first rack member (4), a spindle (12) extends through the first toothed member (3) and projects from at least one side of the case (1) and a handle or lever (16) is mounted on a or the projecting end of the spindle (12); and a second toothed member (13) is rotatably mounted in the case (1) and is arranged to be engaged by a second toothed rack (7) on the first rack member (4) and to engage with a toothed rack (15) on the second rack member (14), the arrangement being such that turning of the spindle (12) by means of the handle or lever (16) is effective to cause the first toothed member (3) to rotate to drive the first rack member (4) which in turn is effective to rotate the second toothed member (13) to drive the second rack member (14) whereby the bolts can be moved from the operative to the inoperative position and vice versa.

2. An espagnolette bolting system according to claim 1, characterized in that the first toothed member takes the form of a toothed quadrant and the second toothed member comprises a pinion (13).
3. An espagnolette bolting system according to claim 2, characterized in that the first rack member (4) is provided with a slot (6) which accommodates the pinion (13), the second toothed rack (7) on said member extending along one of the sides of the slot (6).
4. An espagnolette bolting system according to claim 3, characterized in that the second rack member (14) is provided with a slot which also accommodates the pinion (13), the toothed rack (15) on said member extending along one of the sides of the slot.
5. An espagnolette bolting system according to claim 4, characterized in that the toothed rack (15) on the second rack member (14) is provided on the opposite side of the slot from the side of the slot (6) on which the second toothed rack (7) is provided on the first rack member (4).
6. An espagnolette bolting system according to any one of the preceding claims, characterized in that the rack members (4, 14) are connected to the respective bolts by respective drive bars.

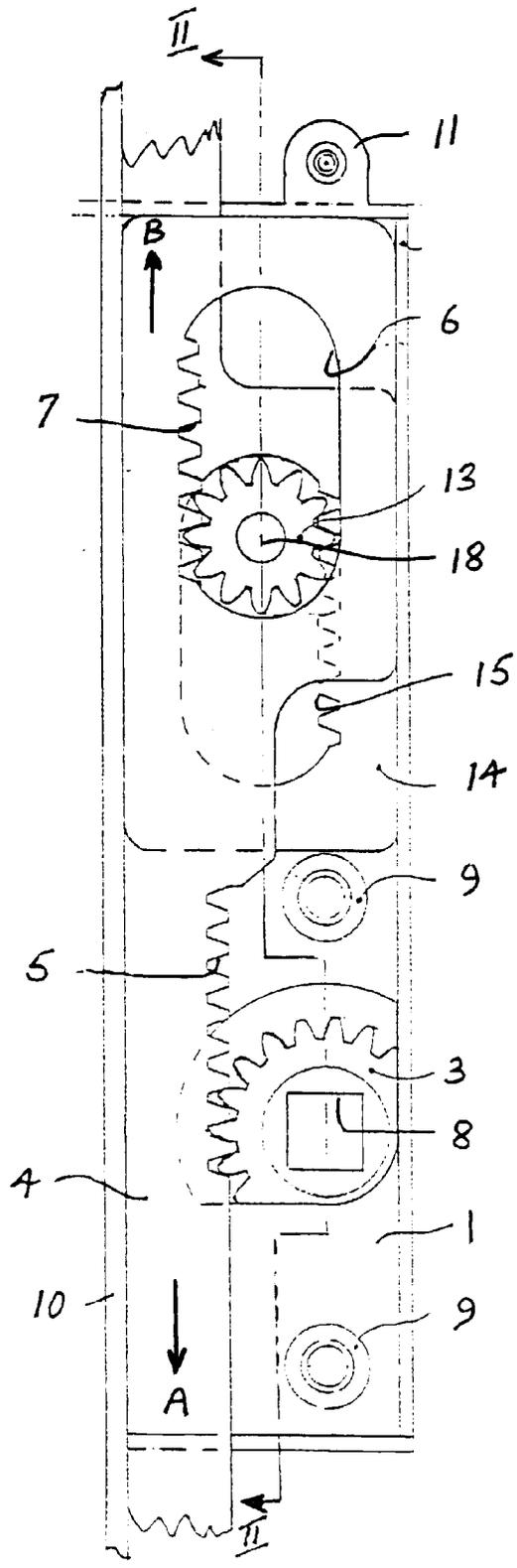


Fig. 1

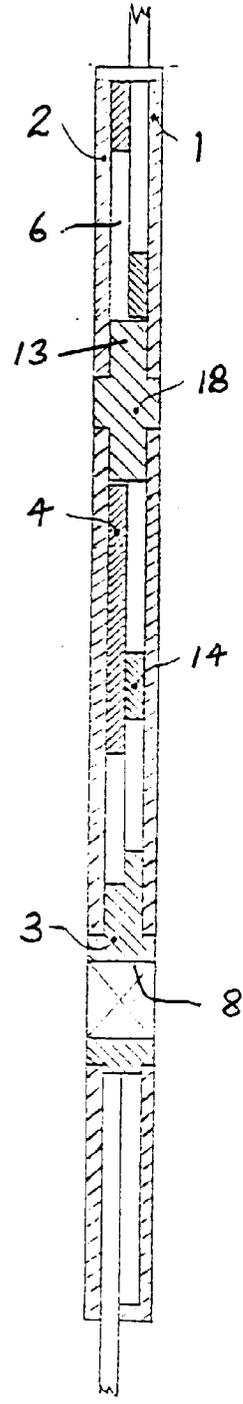


Fig. 2

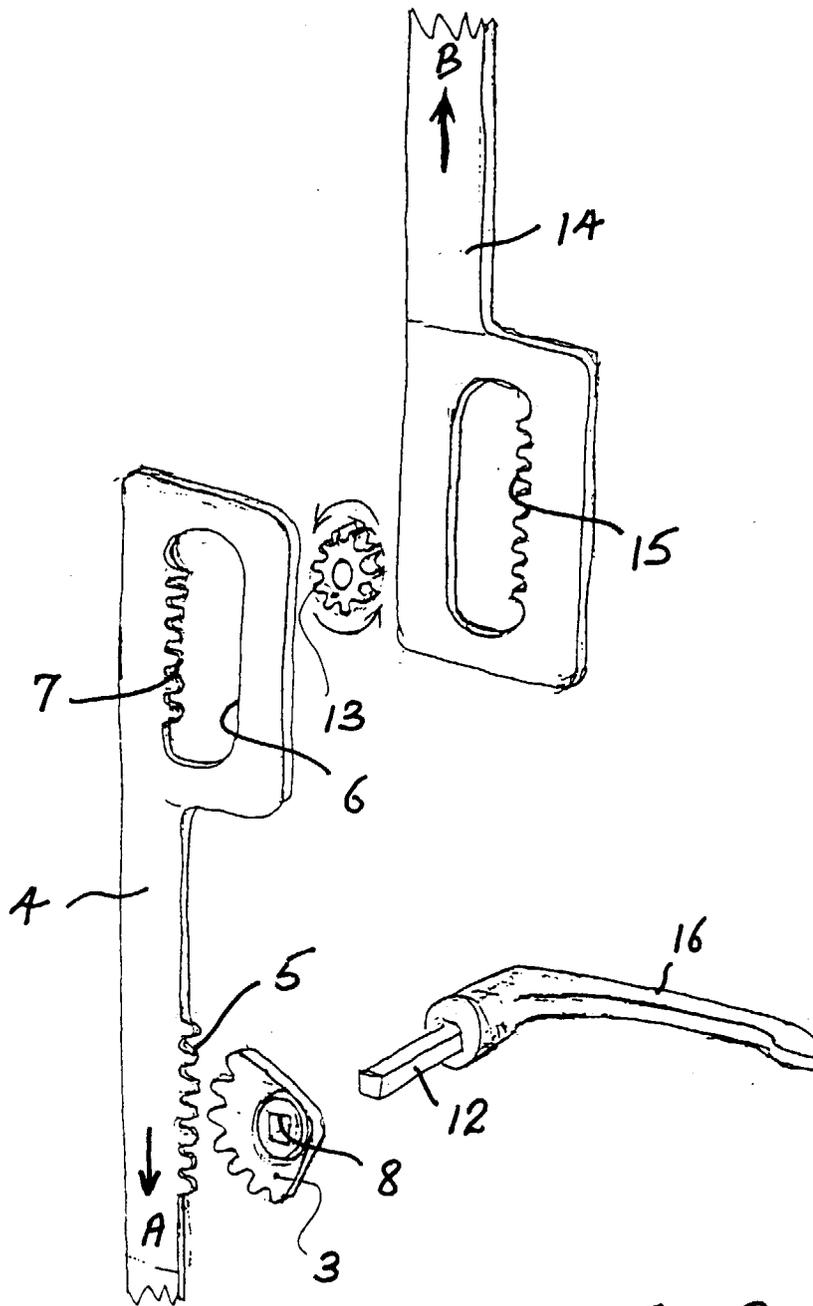


Fig. 3



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EUROPEAN SEARCH REPORT

Application Number
EP 98 30 1100

DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)	
X	GB 2 264 529 A (CEGO LTD) 1 September 1993	1,2,6	E05C9/04	
Y	* the whole document *	3-5		
Y	FR 2 583 452 A (ETABLISSEMENTS JEAN MASSARD) 19 December 1986 * page 2, line 15 - line 19; figures 1,2 *	3-5		
X	FR 717 401 A (GISIE FRERES S.A.R.L.) 6 January 1931 * the whole document *	1,2,6		
X	CH 178 162 A (KIEFER) * the whole document *	1,2,6		
X	DE 929 710 C (FELCO SCHLOSS- UND BESHLAGFABRIK G.M.B.H.) * the whole document *	1,2,6		
X	GB 2 257 745 A (WOOD) 20 January 1993 * the whole document *	1,2,6		
X	DE 90 01 279 U (FERCO INTERNATIONAL USINE DE FERRURES DE BATIMENT) 6 June 1991 * the whole document *	1,2,6		TECHNICAL FIELDS SEARCHED (Int.Cl.6)
X	FR 2 570 744 A (SA CROISEES ET PROFILS) 28 March 1986 * the whole document *	1,2,6		E05C
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A	FR 1 452 272 A (SERVANT) 14 December 1966 * figures 1-4 *	1,3-5		
A	EP 0 248 142 A (ISEO SERRATURE SPA) 9 December 1987 * the whole document *	1,3-5		
The present search report has been drawn up for all claims				
Place of search		Date of completion of the search	Examiner	
THE HAGUE		27 May 1998	Westin, K	
CATEGORY OF CITED DOCUMENTS				
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document		T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document		

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