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(56) Documents Cited
GB 2276190 A WO 87/07670 A1 US 4824151 A
US 4597599 A US 4547006 A US 3918752 A

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(54) Abstract Title

Lock arrangement for uprights having male locking member(s) engagable by a latch plate and cam means to move the plate between a locked and unlocked position

(57) The arrangement comprises first and second uprights 2,3, wherein one of the uprights is movable towards and away from the other upright. The first upright 2 is provided with a male locking member(s) 4 while the second upright is provided with a latch plate 8. The plate receives and co-operates with the male locking member(s) via apertures 12 to lock the uprights together. The latch plate is movable between locking and unlocking positions and is spring biased into the locking position. A key operated cam 15,16 is provided to lift the latch plate from the locking to the unlocking position. The arrangement may be used as part of a door, shutter, gate or a security grille.

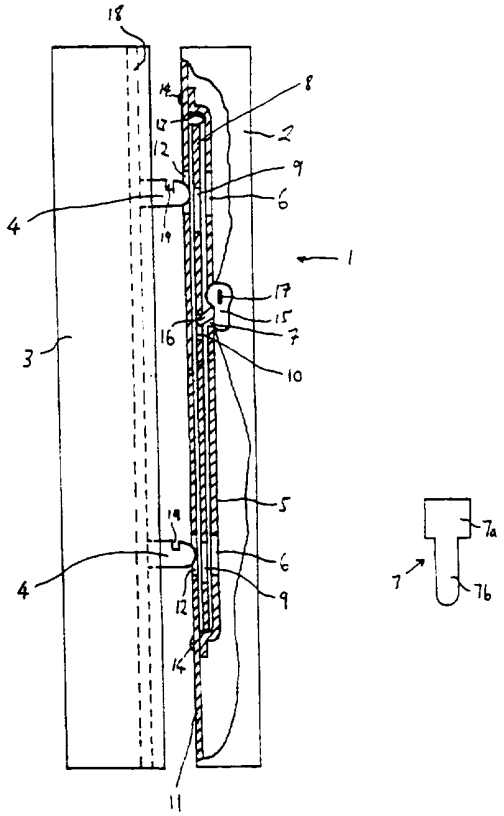

Fig 1

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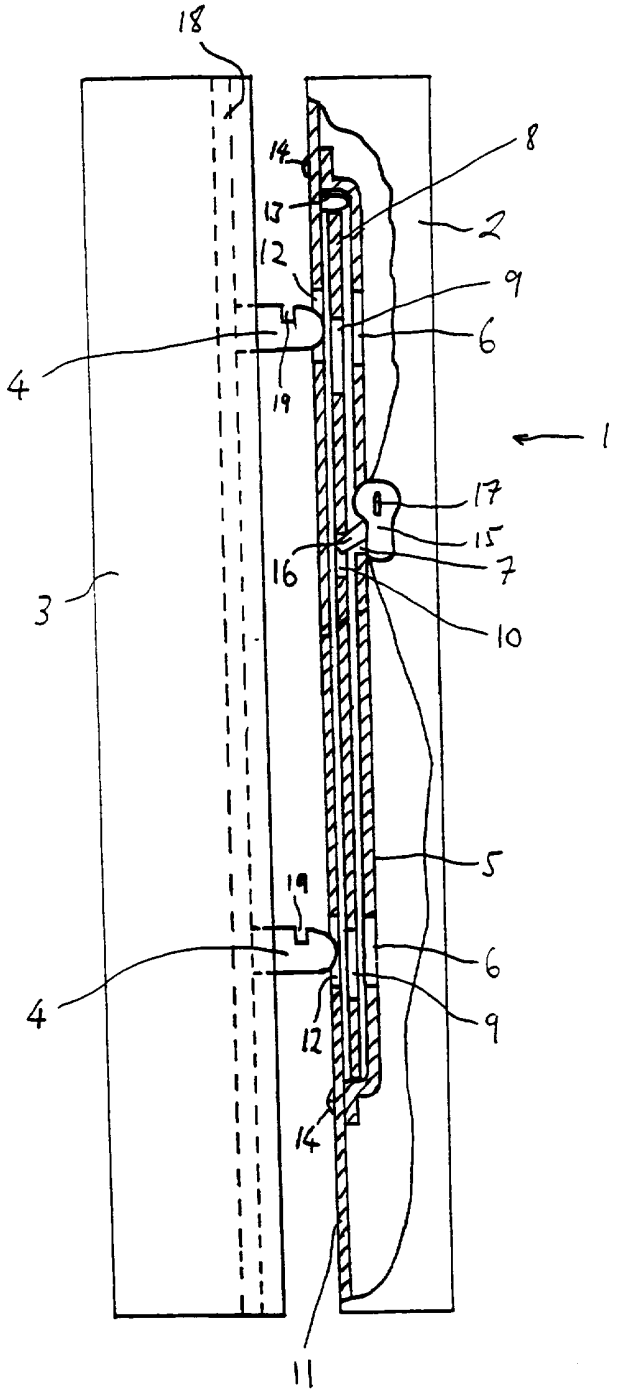


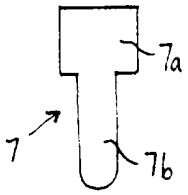
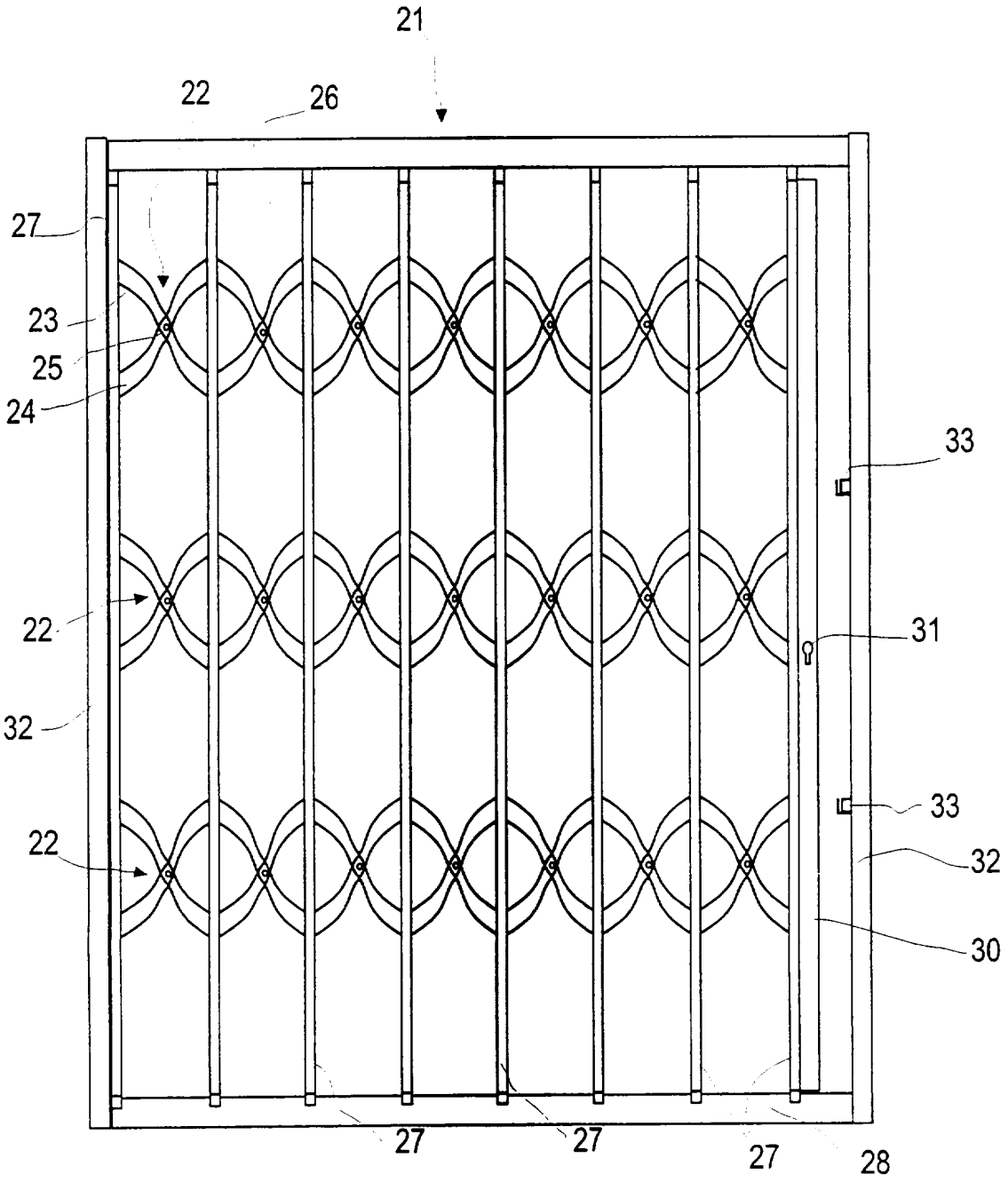


Fig 1

Fig. 2



LOCKING ARRANGEMENT

Field of the Invention

This invention relates to locking arrangements, and in particular to a locking arrangement for use with a sliding gate, door, shutter, or security grille.

Background to the invention

As the number of burglaries increases, there is a requirement to make properties more secure. Many buildings are provided with sliding gates, doors, shutters, or security grilles. All of these require locks, which are themselves points of weakness. This invention relates to an improved locking arrangement that is particularly suitable for use with collapsible security grilles, and sliding gates and doors.

Known locking arrangements comprise numerous components, are complex to assemble and to operate. It would therefore be desirable to provide a locking arrangement which does not suffer from these disadvantages.

Summary of the Invention

According to the invention there is provided a locking arrangement comprising first and second members wherein at least one of the said members is moveable towards and away from the other member, and wherein the first member is provided with at least one male locking member and the second member is provided with a latch member to receive and co-operate with the or each male locking member to lock the first and second members together, the latch member being moveable between locking and releasing positions and is biased into the said locking position, and wherein the arrangement further comprises means to move the latch member from the locking to the unlocking position.

Preferably, the latch member is provided with apertures, which may be slots, through which respective male locking members may pass, and advantageously, one or more of the said at least one male locking member is provided with a slot, the latch member being engagable with said slot to lock the first and second members together. Advantageously, the leading edge of the male locking member is curved or chamferred.

Preferably, the latch member is held in place by a latch casing.

The second member may comprise a hollow elongate member, and the latch casing may be attached to the inside thereof. The latch casing may be releasably attachable to the second member. The hollow elongate member is suitably provided with at least one aperture through which a male locking member may pass. Advantageously, the latch casing is provided with means to receive at least one male locking member, and the said means may comprise an indent or an aperture, preferably in the form of a slot.

The said means to move the latch member may comprise a cam, and preferably, the cam is part of a key actuated cylinder cam. The latch member suitably comprises a slot, indent or protrusion with which the cam may engage, thereby enabling rotary motion of the cam to lift the latch member.

The cam cylinder may be fastened to the latch casing, and the latch casing may be provided with an aperture through which the said cam may pass.

The arrangement may further comprise biasing means to bias the latch member into the locking position. The biasing means may comprise a spring, which may be a leaf spring or a coil spring for instance. Where the biasing means is a coil spring one end thereof may be attached to the latch casing or the hollow elongate member, whilst the other end may be attached to the latch member.

The first member may be slidable towards the second member, the second member may be slidable towards the first member, or the first and second members may be slidable towards and away from each other.

Preferably, at least one of the first an/or second members form part of one of the group comprising a door, a shutter, a gate, and a security grille.

The locking arrangement of the invention has few components and moving parts, and is simple to manufacture and operate.

Brief Description of the Drawings

In the drawings which illustrate a preferred embodiment of the invention:

Figure 1 is a partial cross-section of a locking arrangement according to the invention; and

Figure 2 is a side view of a collapsible security gate having a locking arrangement according to the invention.

Detailed Description of the Preferred Embodiment

A locking arrangement 1 is shown in Figure 1. The locking arrangement 1 comprises two upright members 2, 3. The upright members 2, 3 could be attached to the ends of sliding doors, or the uprights 2, 3 may form part of a collapsible grille as shown in Figure 2 and the locking arrangement therefor.

The upright 3 comprises a channel-shaped aluminium extrusion having a steel plate 18 with a pair of male locking members 4 welded to the front face thereof. The steel plate 18 is screwed to the aluminium extrusion. The screws (not shown) pass through slots in the plate so that fine adjustment of the plate's position in the extrusion can be made. The plate 18 is set back in the aluminium extrusion so that the point where the opposite faces of upright members 2, 3 abut when locked together is overlapped. This prevents insertion of a lever, such as a jemmy bar between the upright members 2, 3. The extrusion may be provided with slots, the plate being slidably mounted therein.

Upright 2 comprises an aluminium extrusion having a pair of apertures 12 in the front face 11 thereof through which male locking members 4 may pass. A latch casing 5 is fixed to the inside of the aluminium extrusion by means of screws 14. The latch casing has three apertures therein. The two outermost apertures 6 are opposite the apertures 12 in the front face 11 of the aluminium extrusion so that each aperture 6 may receive the end of one of the male locking members 4. The third aperture 7 comprises a substantially rectangular upper portion 7a and a downwardly extending slot 7b.

A key operated cylinder cam 15, commonly known as a "Europrofilecylinder", comprising a cam 16 and a keyhole 17 is mounted in the aluminium extrusion 2. One side of the cylinder cam 15 fits into the substantially rectangular portion 7a of aperture 7, whilst the cam can be rotated clockwise through the slot 7b. A screw or bolt (not shown) passes through the aluminium extrusion of upright 2, and into the casing of the cylinder cam 15, thereby securing the cylinder cam to the said aluminium extrusion.

A latch plate 8 is slidably mounted between the latch casing 5 and the aluminium extrusion. A leaf spring 13 is mounted between the top of the latch plate 8 and the latch casing 5 to bias the latch plate 8 into the position shown in Figure 1. The latch plate 8 is provided with three apertures. The outermost apertures 9 are arranged to receive the male locking members 4, whilst the central aperture 10 receives the cam 16 of cylinder cam 15. Upon clockwise rotation of the cam 16, latch plate 8 is caused to move upwards.

To lock the uprights 2 and 3 one to another, they are simply pushed together. As the male locking members enter the upright 2 through apertures 12. As the uprights 2, 3 are further pushed together the leading edge of each male member 4 engages with the upper edge of a respective aperture 9. Due to the leading edge of each male locking member 4 being curved, the latch plate 8 is lifted as the uprights 2, 3 are further pushed together, until the latch plate 8 falls into slots 19 in the male locking members 4.

To unlock the uprights 2, 3 a key is inserted into the keyhole 17 of the cam cylinder 15, and the key is rotated clockwise. This rotates cam 16 in a clockwise direction which in turn lifts the latch plate 8 out of slots 19, against the force of the leaf spring 13. The upright members 2, 3 can then be moved apart. As the male locking members are withdrawn, the latch plate 8 returns to the position shown in Figure 1 due to its own weight and the force exerted by the leaf spring 13 on the said latch plate.

In Figure 2 there is shown a collapsible security grille in the form of a collapsible gate 21, comprising a plurality of pairs of elongate members 29, adjacent pairs of elongate members being connected one to another by connecting members 22. Each connecting member 22 comprises a pair of levers 23, 24 joined at their centres by a pin 25.

The levers 23, 24 of the grill function in the same manner as known security grilles, and therefore this will not be described in detail. However, to explain briefly, it will be understood by one skilled in the art that one end of each lever 23, 24 must be pivotally mounted in a pair of elongate members 27, whereas the other end of each lever 23, 24 must be pivotally and slidably mounted in an adjacent pair of elongate

members 27. This is so as to provide for the grill 21 to open and close in concertina fashion.

Where the levers 23, 24 are pivotally, but not slidably, attached to a pair of elongate members 27 a fastening means secures the elongate members of the pair together and mounts the said levers. The ends of the levers 23, 24 which slide in the pair of elongate members are each provided with a pin that slides in the elongate members of a pair.

In order to lock the grille in a closed position, a locking arrangement as shown in Figure 1 is provided on the right hand side of the gate 21, the upright 32 being provided with male locking members 33 to engage with the upright 30. The uprights 32, together with upper and lower rails 26, 28 may be attached to a building so as to secure a window or doorway for instance.

CLAIMS

1. A locking arrangement comprising first and second members, wherein at least one of the said members is movable towards and away from the other member, and wherein the first member is provided with at least one male locking member and the second member is provided with a latch member to receive and co-operate with the or each male locking member to lock the first and second members together, the latch member being movable between locking and releasing positions and is biased into the said locking position, and wherein the arrangement further comprises actuating means to move the latch member from the locking to the unlocking position.

2. A locking arrangement according to Claim 1, wherein the latch member is provided with apertures through which respective male locking members may pass.

3. A locking arrangement according to Claim 2, wherein one or more of the said at least one male locking member is provided with a slot, the latch member being engageable with said slot to lock the first and second members together.

4. A locking arrangement according to Claim 1, 2 or 3, wherein the leading edge of the male locking member is curved or chamfered.

5. A locking arrangement according to any preceding claim, wherein the latch member is held in place by a latch casing.

6. A locking arrangement according to Claim 5, wherein the second member comprises a hollow elongate member, and the latch casing is attached to the inside thereof.

7. A locking arrangement according to Claim 6, wherein the latch casing is releasably attachable to the second member.

8. A locking arrangement according to Claim 6 or 7, wherein the hollow elongate member is provided with at least one aperture through which a male locking member may pass.

9. A locking arrangement according to Claim 5, wherein the latch casing is provided with means to receive at least one male locking member, said means comprising an indent or an aperture.

10. A locking arrangement according to any preceding claim, wherein the actuating means comprises a cam.

11. A locking arrangement according to Claim 10, wherein the cam is part of a key actuated cylinder cam.

12. A locking arrangement according to Claim 11, wherein the cam cylinder is fastened to the latch casing, and the latch casing is provided with an aperture through which the cam may pass.

13. A locking arrangement according to Claim 10, 11 or 12, wherein the latch member comprises a slot, indent or protrusion with which the cam may engage, thereby enabling rotary motion of the cam to lift the latch member.

14. A locking arrangement according to any preceding claim, further comprising biasing means to bias the latch member into the locking position.

15. A locking arrangement according to Claim 14, wherein the biasing means comprises a spring.

16. A locking arrangement according to Claim 15, wherein the biasing means is a coil spring, one end of which is attached to the latch casing or the hollow elongate member, whilst the other end is attached to the latch member.

17. A locking arrangement according to any preceding claim, wherein the first member is slidable towards the second member, the second member is slidable towards the first member, or the first and second members are slidable towards and away from each other.

18. A locking arrangement according to any preceding claim, wherein at least one of the first and/or second members forms part of a door, a shutter, a gate, or a security grille.

19. A locking arrangement, substantially as described with reference to, or as shown in, the drawings.

Application No: GB 9800949.1
Claims searched: 1-19

Examiner: Gary Williams
Date of search: 5 August 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.Q): E2A: ACAK,ACAP

Int Cl (Ed.6): E05C: 1/10

Other:

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
X	GB 2276190 A	(PRETORIUS) See Fig.3, page 6 line 21 - page 7 line 7	1-4,6,8,10, 11,13-15, 17,18
X	WO 87/07670 A1	(KING) See Fig.4, page 10 line 1 - page 11 line 17	1-9,14,15, 17,18
X	US 4824151	(TAYLOR) See Figs.7&8, col.7 line 44 - col.9 line 7	1,4,10,11, 13-15, 17,18
X	US 4597599	(SOUTHCO) See Figs.1-3, col.3 line 37 - col.4 line 22	1-4,14, 15,17,18
X	US 4547006	(SUPERIOR) See Figs.1&2, col.3 lines 36-68	1,5,14,15
X	US 3918752	(LEONE) See Figs.1&2, col.2 line 39 - col.3 line 28	1,3,5,6,8, 9,14-18

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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