(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 840 300 A2

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
03.10.2007 Bulletin 2007/40

(51) Int Cl.:
E05B 9/08 *(2006.01)*

(21) Application number: **07104549.6**

(22) Date of filing: **21.03.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK YU

(30) Priority: **29.03.2006 GB 0606261**

(71) Applicant: **David Brunskill Windows Limited**
Keighley, Yorkshire BD21 5JX (GB)

(72) Inventors:
- **Brunskill, David Edwin**
  Keighley, Yorkshire BD22 0QP (GB)
- **Burnley, Philip James**
  Bingley, Yorkshire BD16 3EP (GB)
- **Haigh, Roger Brian**
  Keighley, Yorkshire BD22 9AB (GB)

(74) Representative: **Waddington, Richard**
Appleyard Lees
15 Clare Road
Halifax, Yorkshire HX1 2HY (GB)

(54) Door Lock

(57) A cylinder door lock assembly comprising a cylinder door lock (2,102) and a securing device (20,120,220), the cylinder door lock (2,102) having a body (4) in which is located a locking cam member (10), an opening (18), and at least one locking aperture (16); the securing device (20,120,220) being adapted to be received in the at least one locking aperture (16) and to extend out of the body (4) of the cylinder door lock (2,102), wherein the securing device (20,120,220) is operable to secure at least a portion of the cylinder door lock (2,102) in a locked position in a part of a door when the body (4) of the cylinder door lock (2,102) is broken.

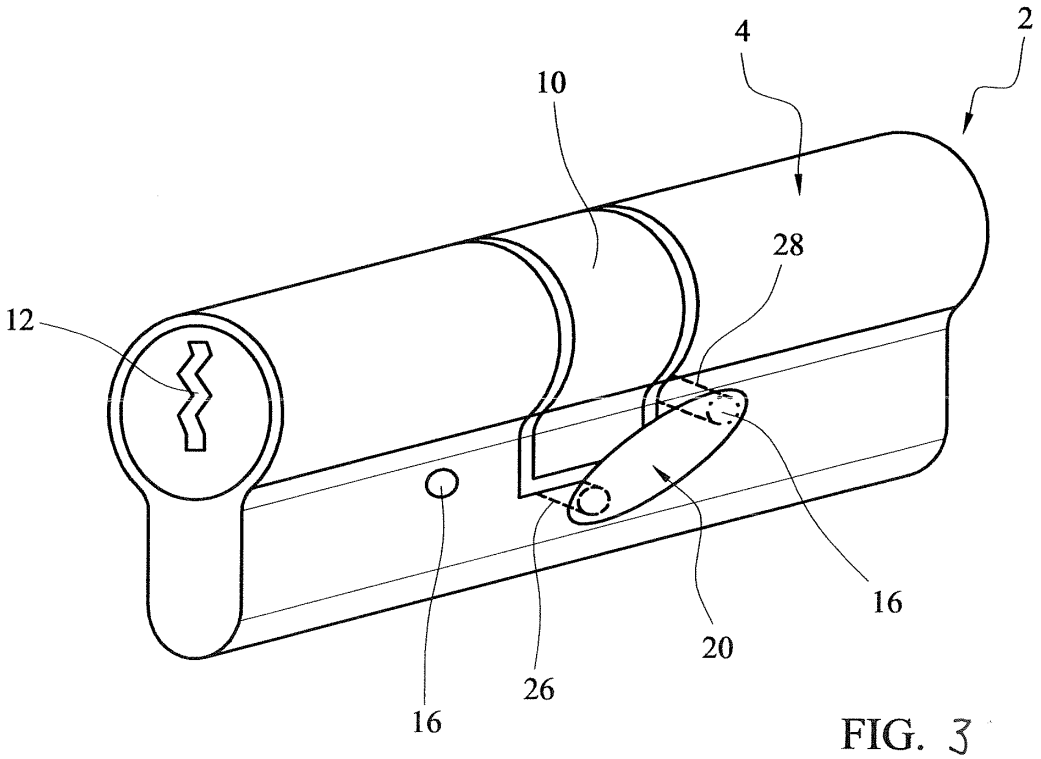

FIG. 3

EP 1 840 300 A2

Description

[0001] The invention relates to a cylinder door lock assembly. Particularly, but not exclusively, the invention relates to a cylinder door lock assembly for a door. The invention further relates to a securing device for a cylinder door lock and a method of installing such a device.

[0002] A typical cylinder door lock comprises a barrel having a rotating locking cam. A screw hole is provided underneath the locking cam to allow fixing of the door lock in the frame of a door. When a key is inserted into the barrel and allowed to turn, the locking cam rotates to lock or unlock the door.

[0003] It is a known problem that cylinder locks used in PVCu doors are susceptible to being snapped and removed by a burglar. This is due to the overall design of these locks which have areas of weakness, particularly around the rotating cam section. This leads them to being easily broken by an applied force, for example a bending and/or pulling force.

[0004] Manufacturers of cylinder locks have attempted to address the problem of breakage of the cylinder lock by reinforcing the body of said lock using metal materials. However, although the body of the lock is strengthened, due to the inherent design faults, these reinforced locks are still susceptible to being readily broken using force.

[0005] It is an object of the present invention to provide a cylinder door lock assembly which minimises the risk of forced entry through a door. It is a further object of the invention to provide a securing device for a cylinder door lock.

[0006] According to the first aspect of the invention, there is provided a cylinder door lock assembly comprising a cylinder door lock and a securing device, the cylinder door lock having a body in which is located a locking cam member, an opening, and at least one locking aperture; the securing device being adapted to be received in the at least one locking aperture and to extend out of the body of the cylinder door lock, wherein the securing device is operable to secure at least a portion of the cylinder door lock in a locked position in a part of a door when the body of the cylinder door lock is broken.

[0007] Preferably, the at least said portion of the cylinder door lock is secured in a locked position in the sash of the door. Preferably, the door is a PVCu type door.

[0008] When a twisting and pulling force is applied to a typical cylinder door lock, the body of the lock is likely to break in the region of the locking cam member and screw hole. The present invention aims to address the problem of at least a part of the cylinder lock being removed from the door sash after said lock is broken. In this manner, advantageously, even when the body of the lock is broken, the securing device remains in place in the lock and the sash. In this way, at least a portion of the cylinder door lock is, in effect, secured to the sash and cannot be pushed out or dislodged. If further force is applied to the portion remaining, the securing device remains in the lock and sash and bends to provide a secondary secured position. The arrangement minimises the likelihood of successful forced entry by tampering with a cylinder door lock using force.

[0009] Preferably, the securing device passes through said locking aperture in a direction perpendicular to a longitudinal axis of the body of the cylinder door lock.

[0010] Preferably, the securing device is adapted to firstly pass through a portion of a sash of the door and then into the cylinder door lock.

[0011] Preferably, the securing device is between substantially 0.5cm and 200cm in length, preferably between substantially 5cm and 10cm, most preferably between substantially 8.0 cm and 9.0cm in length.

[0012] Preferably, the securing device comprises a rod and a cap. Preferably, the cap is attachable to the rod by a screw fitting. Alternatively, the cap may have a push fit attachment on to the rod. Preferably, an abutment member is located at a first end of the rod. Preferably, the cap is fitted to a second end of the rod. Preferably, the cap abuts against a part of the door and preferably attaches to the second end of the rod.

[0013] Alternatively, the securing device comprises a rod and a face. Preferably, the face is integrally moulded to the rod. Preferably, the face extends perpendicularly to the length of the rod. Preferably, the face comprises at least one opening which is preferably dimensioned to receive a fixing screw. Preferably the fixing screw is located in the face so as to extend in a direction parallel to the rod. Preferably, the distance between the fixing screw and the rod is substantially equal to a distance between the screw hole and the at least one locking aperture of the cylinder door lock. In this manner, when the fixing screw is located in the securing device and then threaded through the screw hole in the cylinder door lock, the rod can be threaded through the locking aperture. In this position, the face may extend across a portion of the locking cam member.

[0014] Preferably, the length of the rod of any one of the preferred securing devices does not exceed the width of a sash of a door.

[0015] Preferably, the locking aperture is located adjacent the locking cam member. Preferably, the locking aperture is located substantially 0.5cm from an outer wall of the locking cam member. This distance is taken as a measure to the centre point of the locking aperture. Preferably, the locking aperture has a diameter of substantially 0.5cm. Preferably, two locking apertures are provided in the cylinder door lock. Preferably, each said aperture is located to one side of the locking cam member, preferably, equidistantly spaced apart. Preferably, the or each locking cam member is located substantially 1.5cm from a lowermost edge of the body of the cylinder door lock. Preferably, the or each locking aperture is tapered.

[0016] In the arrangement where two locking apertures are provided, the user may choose which of said apertures to fit the securing device. For example, if the door is an inwards opening door, the user may choose to locate the securing device in the furthermost aperture to

minimise access in the event of the cylinder door lock being broken under force.

[0017] Preferably, the securing device is manufactured from metal material, preferably steel, for example, stainless steel, sprung steel or silver steel. In so doing, the rod has a degree of flexibility and is less likely to snap under an applied force.

[0018] According to a second aspect of the invention, there is provided a securing device for a cylinder door lock, the securing device is adapted to be received in at least one locking aperture in the cylinder door lock, and adapted to extend out of the body of the cylinder door lock, wherein the securing device is operable to secure at least a portion of the cylinder door lock in a locked position in a part of a door when the body of the cylinder door lock is broken.

[0019] Preferably, the securing device comprises a rod which is adapted to be received in the at least one locking aperture. Alternatively, the securing device comprises a chain which is adapted to be received in the at least one locking aperture.

[0020] Preferably, the part of the door is the sash of the door. Preferably, the door is a PVCu type door.

[0021] According to third aspect of the invention, there is provided a method of installing a cylinder door lock assembly, the cylinder door lock assembly comprising a cylinder door lock and a securing device, the cylinder door lock having a body in which is located a locking cam member, an opening, and at least one locking aperture; the securing device being adapted to be received in the at least one locking aperture and to extend out of the body of the cylinder door lock, wherein the method comprises the steps of:

a) positioning a cylinder door lock in a door;
b) locating the securing device in a part of the door such that the securing device passes through the door, into the locking aperture door of the cylinder door lock, and out beyond the body of said lock; and
c) fixing the securing device to a part of the door such that the securing device is operable to secure at least a portion of the cylinder door lock in a locked position in a part of the door when the body of the cylinder door lock is broken.

[0022] Preferably, the securing device is screw threaded into the door. Alternatively, the securing device passes substantially completely through a part of the door and is secured in position by a cap. Preferably, the securing device is fixed to the sash of the door.

[0023] Preferably, the cap or preferably, a face of the securing device abuts against a surface of a sash. Preferably, the cap or the face is coplanar with an edge of the sash. In so doing, the cap or face achieves a flush fitting with the sash of the door. This ensures the door can close in the door frame.

[0024] All of the features described herein may be combined with any of the above aspects, in any combination.

[0025] An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:

Figure 1 shows a schematic perspective view of a cylinder door lock according to the invention;

Figures 2a and 2b show a schematic perspective view and a schematic sectional side view respectively of a locking pin for a cylinder door lock;

Figure 3 shows a schematic perspective view of a cylinder door lock assembly;

Figures 4a and 4b show schematic sectional views of alternative embodiments of a cylinder door lock assembly;

Figure 5 shows an alternative embodiment of a pin for a cylinder door lock assembly; and

Figure 6 shows a further alternative embodiment of a pin for a cylinder door lock assembly.

[0026] Figure 1 shows a cylinder door lock 2 according to the invention. The cylinder door lock 2 comprises a body 4. The body 4 includes an upper portion 6 and a lower portion 8. The upper portion 6 is generally cylindrical in shape and is moulded integrally with the lower portion 8. A rotatable locking cam member 10 is provided centrally to the body 4 and is movable by the action of a key in a key hole 12 located at a first end 14 of the cylinder door lock 2.

[0027] A plurality of holes 16,18 is provided in the lower portion 8. The holes comprise a pair of locking apertures 16 which are located at either side of the locking cam 10, and a screw hole 18 which is located centrally of the lower portion 8 and adjacent the lower end of the locking cam 10. The locking apertures 16 are located approximately 0.5cm from an outermost wall 19 of the lower portion 8 to a centre point of said apertures 16.

[0028] Figure 2a shows a partial schematic view of a securing device or locking pin member 20 for use with the cylinder door lock 2 shown in Figure 1. The locking pin member 20 comprises a face 22 having an opening 24 which is dimensioned to receive a screw 26. A rod 28 extends away from the face 22 in a direction perpendicular to the face 22. The rod 28 is approximately 8cm in length and is dimensioned to be received by one of the locking apertures 16. The opening 24 is of a similar dimension to the screw hole 18 such that, in use, the screw 26 can be threaded through the opening 24 and then into the screw hole 18. Figure 2b is a schematic representation showing the screw 26 threaded through the opening 24 so that the screw 26 extends in a direction parallel to the rod 28.

[0029] Figure 3 shows the locking pin member 20 in

position on the cylinder door lock 2. In this position, the rod 28 is pushed through the aperture 16 and the screw 26 is threaded through the screw hole 18. It will be understood by the reader that the locking pin member 20 could equally be positioned such that the rod 28 passes through the adjacent locking aperture 16. As shown in the figure, the locking pin member 20 is positioned such that the face 22 lies adjacent a section of the lower portion 8 and the locking cam 10.

[0030] Figure 4a shows the locking pin member 20 in position in the cylinder door lock 2 in a door sash 29. In this position, access is gained to the cylinder door lock 2 through the sash 29. The locking pin member 20 is fitted through the sash 29 and into the cylinder door lock 2. The face 22 of the locking pin member 20 abuts against an exterior wall 31 of the sash 29. It can be seen that the rod 28 and the screw 26 extend in substantially the same direction to each other and in parallel to each other. The rod 28 is approximately twice the length of the screw 26. In so doing, the rod 28 extends through the door sash 29, through the cylinder door lock 2 and out into the adjacent wood of the door. The length of the rod 28 may be sufficient to extend substantially the width of the door.

[0031] Figure 4b shows an alternative locking pin member 120 in position in a cylinder door lock 102. The locking pin member 120 is shown in detail in Figure 5. The locking pin member 120 comprises a rod 128 and an abutment member or face 130. The face 130 is generally circular in shape and has a diameter of approximately 1.6cm and a width of approximately 0.2cm. The locking pin member 120 further comprises a cap 132 which is removable from the rod 128. The rod 128 is substantially 8cm in length and comprises a threaded distal end 134. The cap 132 is threaded onto the distal end 134 in use. The cap 132 has a generally circular face 135 having a diameter of approximately 2.0cm and a depth of approximately 0.25cm as indicated by "X" in Figure 5. The body of the cap 132 is approximately 0.9cm in width as indicated by "Y" in Figure 5.

[0032] It can be seen in Figure 4b that the rod 128 passes through the sash 129 of the door such that the face 130 abuts against an exterior wall 131 of the sash 129. The rod 128 fits through the locking aperture of the cylinder door lock 102 and out into the adjacent wood of the sash 129. The cylinder door lock 102 is secured in position by the rod 128 being located in the cap 132 on a furthermost wall 133 of the sash 129.

[0033] Figure 6 shows a further alternative embodiment of the securing device 220. The securing device 220 comprises a rod 228 having a wooded or PVC screw thread 230 and a drill tip 236.

[0034] In use, the locking pin member 20,120 is inserted into the sash 29,129 of the door and fitted through the locking aperture 16,116 of the cylinder door lock 102,102. The rod 28,128,228 extends through the locking aperture 16,116 and exits the lock 2,102, to pass into the wood of the door in a fixed and secure position. When the securing device 20 of Figure 2a is used, the screw 26 may also extend into the wood of the door.

[0035] In the event of the cylinder door lock 2,102 being forcibly snapped, a portion of the cylinder door lock 2,102 will be retained in the door by the locking pin member 20,120,220 which holds said portion in position via the locking aperture. The cylinder door lock 2,102 is fixed to the securing device 20,120,220 and cannot be pushed out because the rod 28,128,228 is held in position in the sash 29,129.

[0036] When the locking pin member 120 of Figure 5 is used, the rod 128 is fitted into the locking aperture 116 and is locked in position by the distal end of the rod 128 passing through the sash 129 and being fixed with the cap 132. It will be understood that the rod 128 may also incorporate an opening 24 for receiving a screw 26 for additional security. When the cap 132 is on the rod 128, the panel or glass of the door can be simply fitted back into the sash 129.

[0037] It will be understood that for increased security, a locking pin member having a pair of rods may be used. Each rod would be located through one of the locking apertures so that the securing device would retain both halves of the cylinder door lock in position in the sash even when the cylinder body was snapped. However, in this arrangement, in the event of the lock being broken, at least the section of the sash having the securing device would need to be replaced.

[0038] The locking pin member 20,120,220 may be manufactured from metal material. For example, such material may comprise silver steel, stainless steel, sprung steel. It is preferred that the metal material used has a degree of flexibility which would have the advantage that the rod 28,128,228 would be less likely to snap under force. The locking pin member 20,120,220 may also be manufactured from glass reinforced nylon or high strength plastics material. Alternatively, the securing device may comprise a chain which is threaded through at least one locking aperture and is secured into the wood of the door.

[0039] Advantageously the cylinder door lock assembly comprising the cylinder door lock 2 and the locking pin member 20, 120,220 prevent access to the door lock even when the body of the cylinder 2 is broken under force. The cylinder door lock 2 is prevented from being knocked out of the door by the rod 28, 128 which remains in a fixed position in the sash 29,129.

[0040] The invention is suited to sash type doors because such doors allow easy access to the cylinder door lock with minimal intrusion to the wood of the door. This limits the damage made to the door by, for example, necessary drilling through the wood. However, the invention is not limited to sash doors and is equally suitable for use in all types of doors. Similarly, the invention is not limited to the type of cylinder lock shown in the figures and is equally suitable for use with an oval type cylinder lock.

[0041] Further advantageously, the locking pin member 20,120,220 may be sold as an individual tool for use with a cylinder door lock 2. In this manner, an existing

cylinder door lock can be modified by having locking apertures 16 drilled therein, and the locking pin member 20,120,220 fitted into said lock. The consumer is provided with an additional security feature to their lock without the expense of having to purchase the entire cylinder door lock assembly.

[0042] The reader's attention is directed to all papers and documents which are filed concurrently with or previous to this specification in connection with this application and which are open to public inspection with this specification, and the contents of all such papers and documents are incorporated herein by reference.

[0043] All of the features disclosed in this specification (including any accompanying claims, abstract and drawings), and/or all of the steps of any method or process so disclosed, may be combined in any combination, except combinations where at least some of such features and/or steps are mutually exclusive.

[0044] Each feature disclosed in this specification (including any accompanying claims, abstract and drawings), may be replaced by alternative features serving the same, equivalent or similar purpose, unless expressly stated otherwise. Thus, unless expressly stated otherwise, each feature disclosed is one example only of a generic series of equivalent or similar features.

[0045] The invention is not restricted to the details of the foregoing embodiment(s). The invention extends to any novel one, or any novel combination, of the features disclosed in this specification (including any accompanying claims, abstract and drawings), or to any novel one, or any novel combination, of the steps of any method or process so disclosed.

Claims

1. A cylinder door lock assembly comprising a cylinder door lock and a securing device, the cylinder door lock having a body in which is located a locking cam member, an opening, and at least one locking aperture; the securing device being adapted to be received in the at least one locking aperture and to extend out of the body of the cylinder door lock, wherein the securing device is operable to secure at least a portion of the cylinder door lock in a locked position in a part of a door when the body of the cylinder door lock is broken.

2. A cylinder door lock assembly as claimed in claim 1, wherein the securing device passes through the locking aperture in a direction perpendicular to a longitudinal axis of the body of the cylinder door lock.

3. A cylinder door lock assembly as claimed in claims 1 or 2, wherein the securing device is adapted to pass through a portion of a sash of the door and then into the cylinder door lock.

4. A cylinder door lock assembly as claimed in any one of the preceding claims, wherein the at least one locking aperture is located adjacent the locking cam member.

5. A cylinder door lock assembly as claimed in any one of the preceding claims, wherein two locking apertures are provided in the cylinder door lock.

6. A securing device for a cylinder door lock, the securing device comprising a rod which is adapted to be received in a locking aperture in the cylinder door lock, and adapted to extend out of the body of the cylinder door lock, wherein the securing device is operable to secure at least a portion of the cylinder door lock in a locked position in a part of a door when the body of the cylinder door lock is broken.

7. A securing device as claimed in any one of the preceding claims, wherein said device is between substantially 0.5cm and 200cm in length.

8. A securing device as claimed in any one of the preceding claims, wherein the securing device comprises a rod and a cap.

9. A securing device as claimed in any one of claims 1 to 7, wherein the securing device comprises a rod and a face.

10. A securing device as claimed in claim 9, wherein the face extends perpendicularly to the length of the rod.

11. A securing device as claimed in claim 9 or 10, wherein the face comprises at least one opening which is preferably dimensioned to receive a fixing screw.

12. A securing device as claimed in claim 11, wherein the fixing screw is located in the face so as to extend in a direction parallel to the rod.

13. A method of installing a cylinder door lock assembly, the cylinder door lock assembly comprising a cylinder door lock and a securing device, the cylinder door lock having a body in which is located a locking cam member, an opening, and at least one locking aperture; the securing device being adapted to be received in the at least one locking aperture and to extend out of the body of the cylinder door lock, wherein the method comprises the steps of:

    a) positioning a cylinder door lock in a door;
    b) locating the securing device in a part of the door such that the securing device passes through the door, into the at least one locking aperture of the cylinder door lock, and out beyond the body of said lock; and
    c) fixing the securing device to a part of the door.

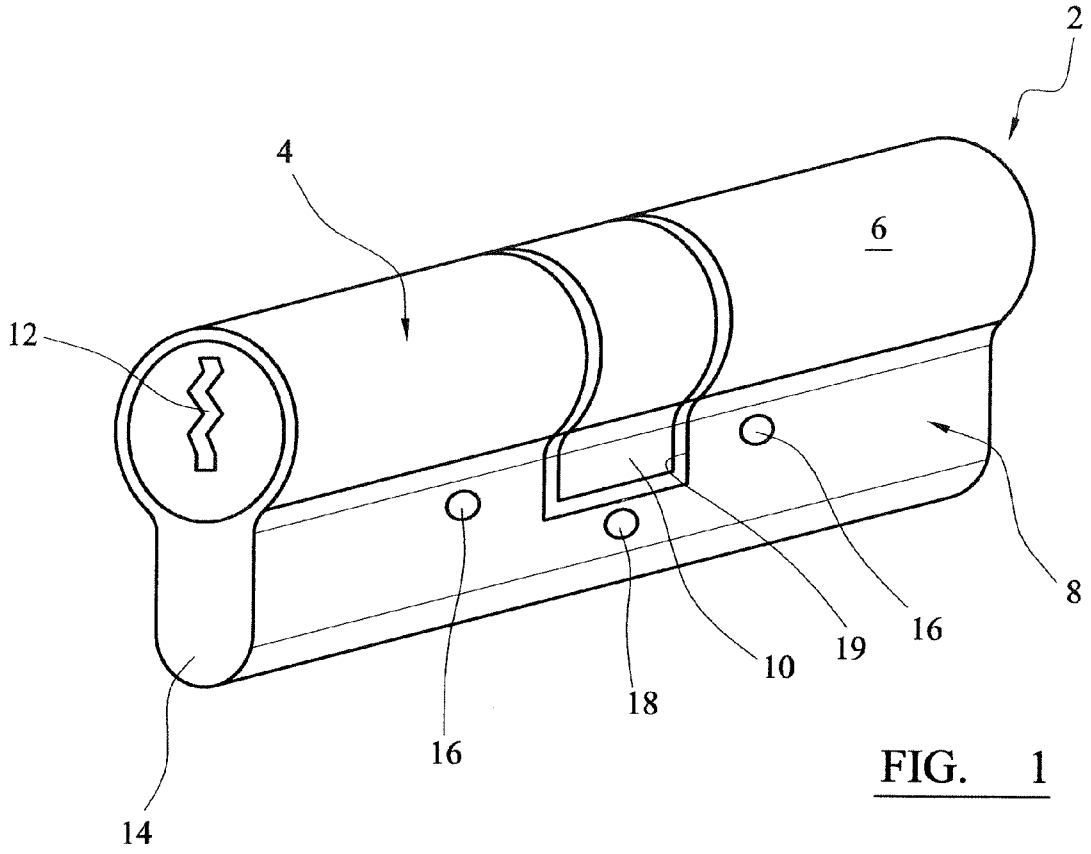

FIG. 1

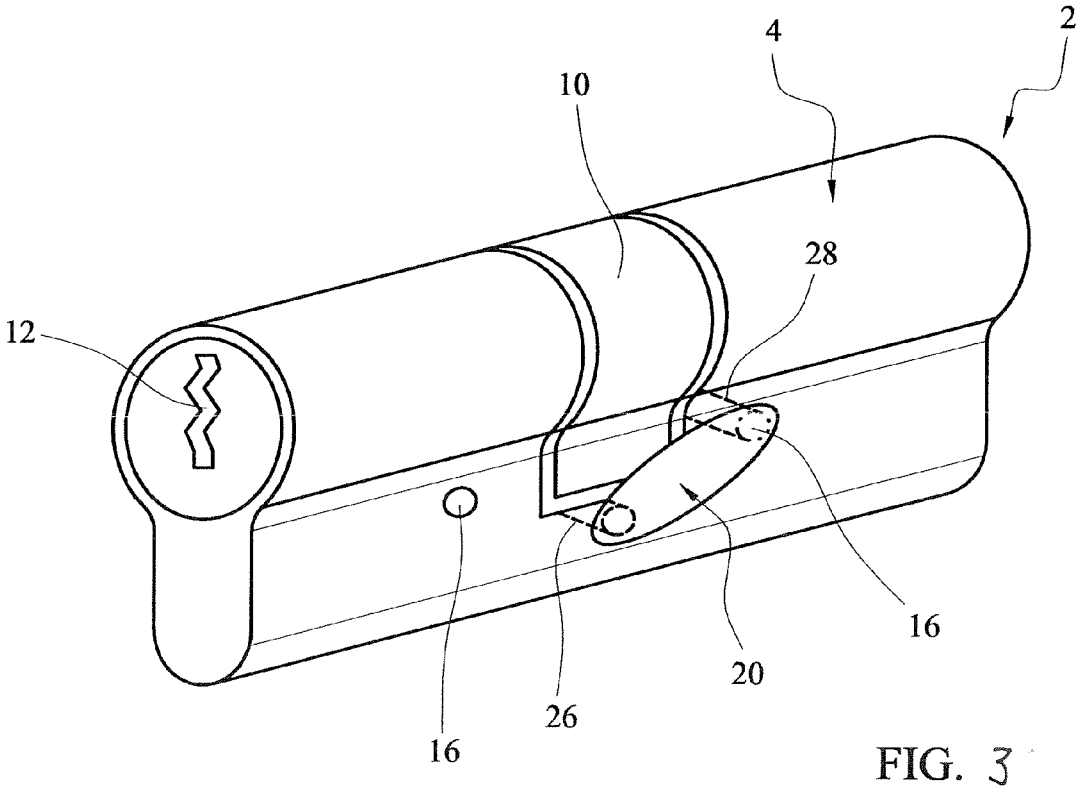

FIG. 3

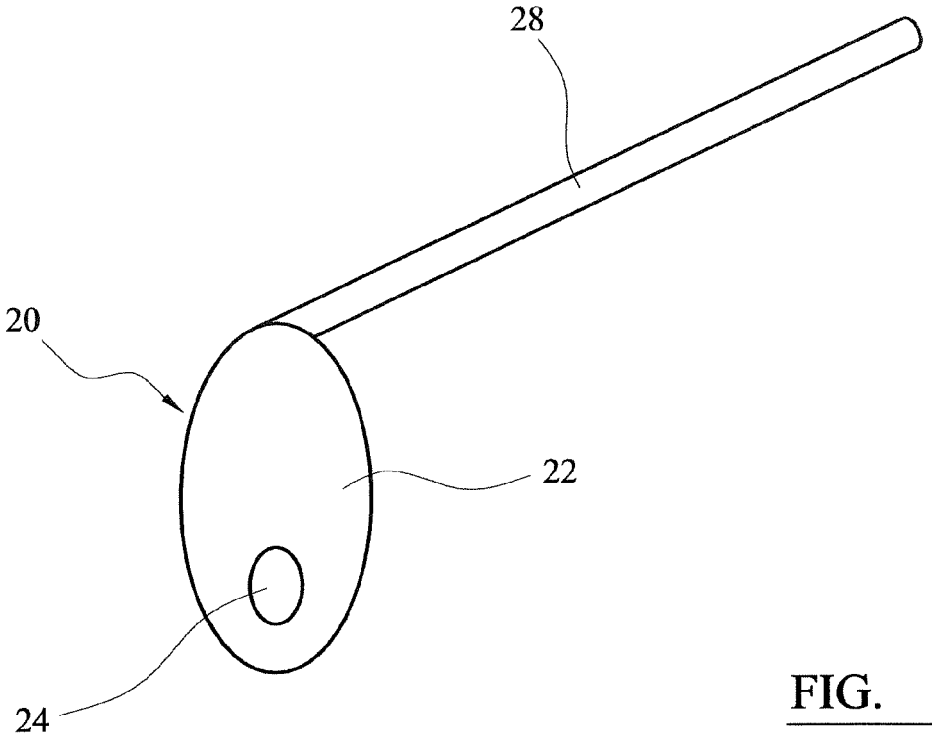

FIG. 2a

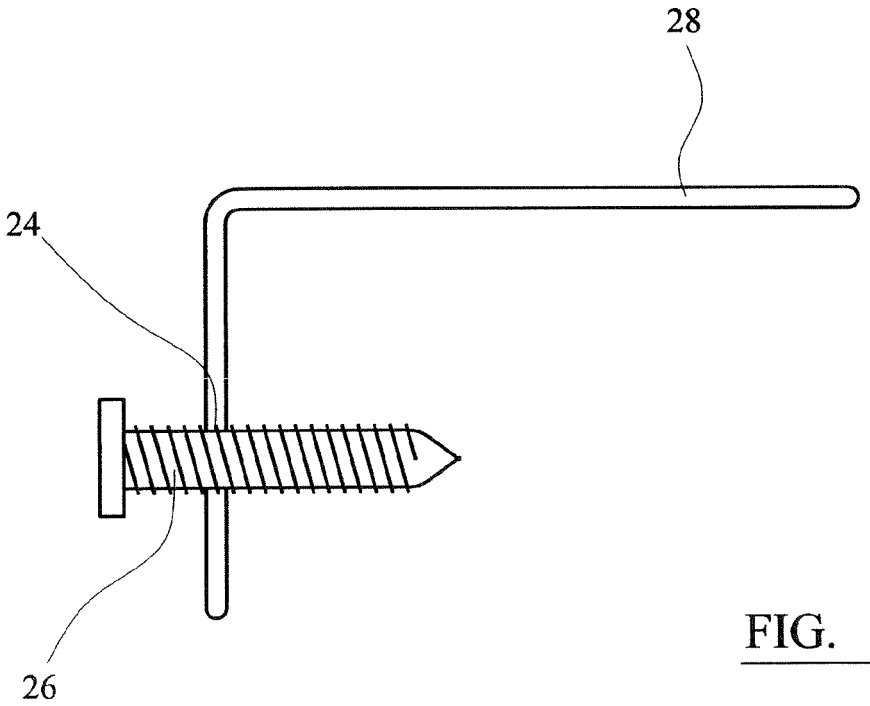

FIG. 2b

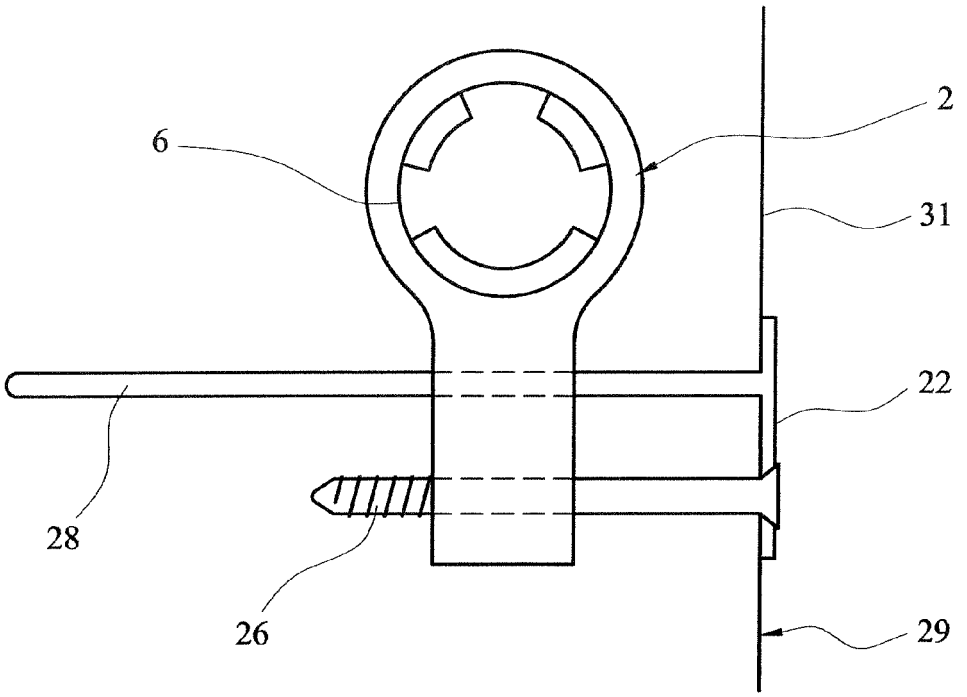

FIG. 4a

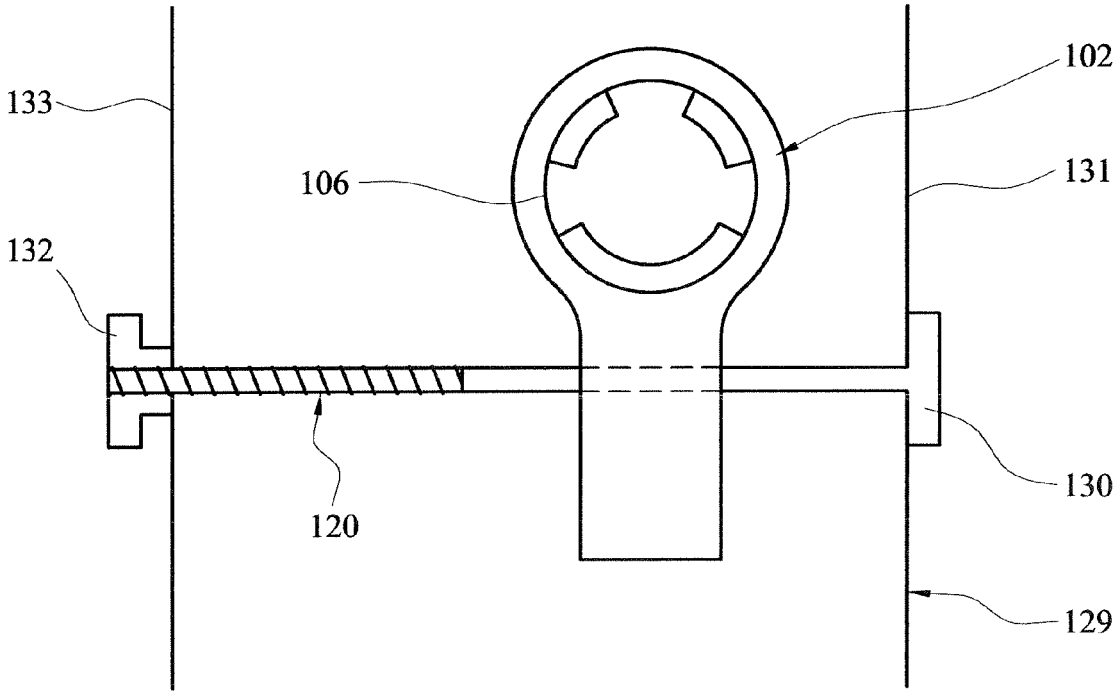

FIG. 4b

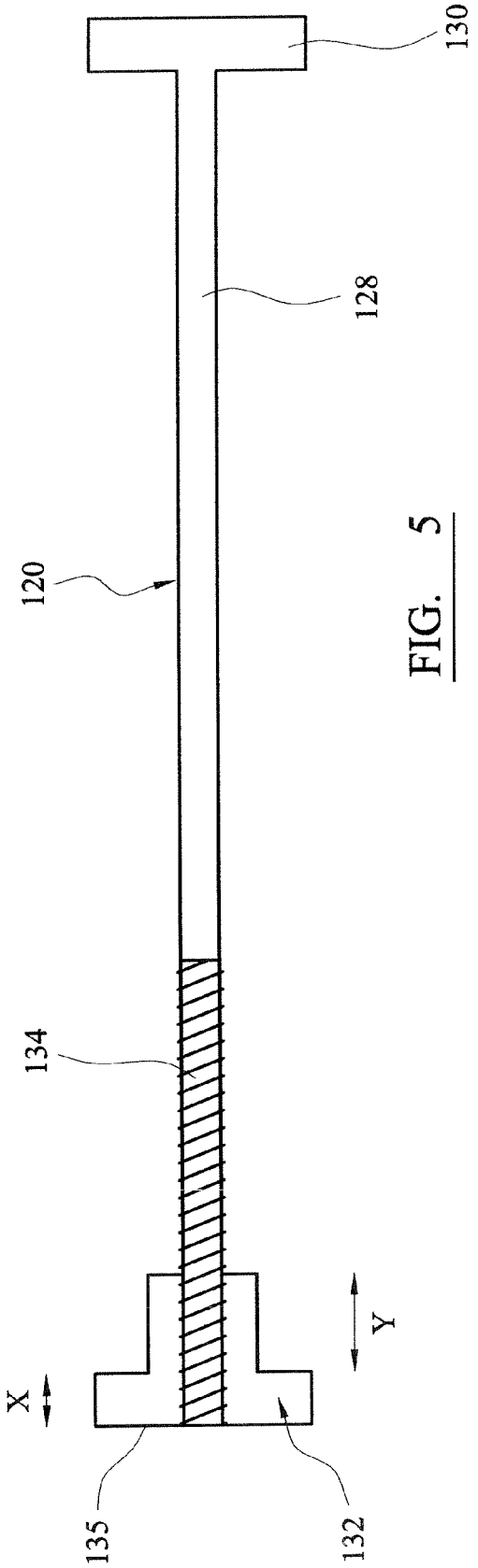

FIG. 5

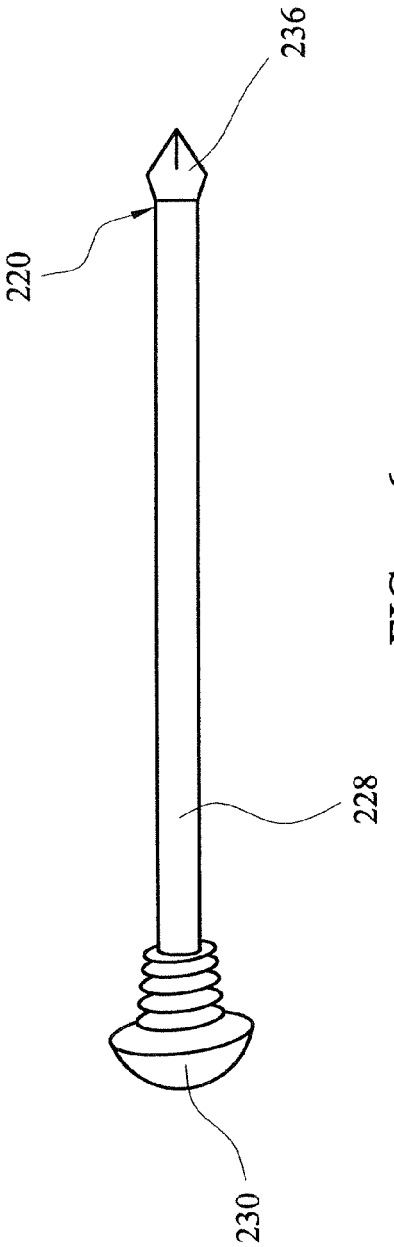

FIG. 6