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(54) **Locking handle.**

(57) A locking handle for a door or window comprises a fixing plate (1), a handle (11) which is pivotally mounted on the fixing plate for movement between open and closed positions, and a catch (19) which automatically engages when the handle is moved into the closed position to prevent subsequent movement of the handle to an open position until the catch is released. The catch comprises a push button (21) which is pivotally mounted at (24) on the handle and is resiliently biased by spring means (25) to urge a first portion (29a) of the button into engagement with a first recess (10) of the fixing plate (1) when the handle is in the closed position, said engagement preventing turning of the handle, and the arrangement is such that depression of the push button (21) releases the catch by rocking the button against its resilient bias to move the first portion (29a) of the button out of the first recess (10) in a direction which is substantially at right angles to the direction in which the button is depressed.

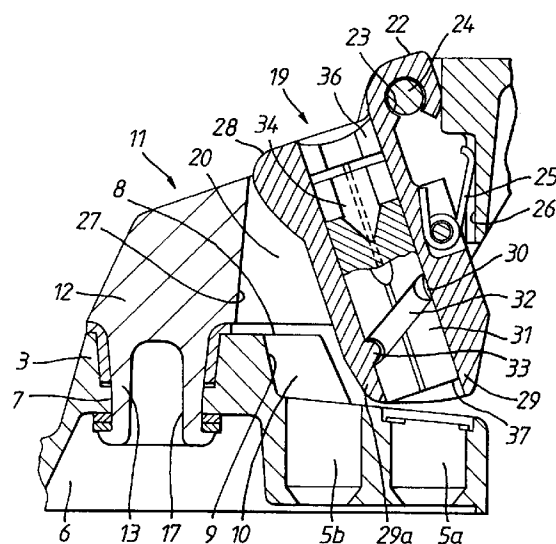


Fig.2.

The invention relates to a locking handle for a door or window, the locking handle being of the kind comprising a fixing plate, a handle which is pivotally mounted on the fixing plate for movement between open and closed positions, and a catch which automatically engages when the handle is moved into the closed position to prevent subsequent movement of the handle to an open position until the catch is released.

Locking handles of this general type are well known, and may be of the cockspur type in which the handle has a nose arranged to engage with a striker or keep plate, or of the espagnolette type in which the handle carries a drive spindle which is rotated by turning the handle in order to operate an espagnolette locking mechanism.

According to the invention the catch of a locking handle of the kind described comprises a push button which is pivotally mounted on the handle and is resiliently biased to urge a first portion of the button into engagement with a first recess of the fixing plate when the handle is in the closed position, said engagement preventing turning of the handle, and the arrangement is such that depression of the push button releases the catch by rocking the button against its resilient bias to move the first portion of the button out of the first recess in a direction which is substantially at right angles to the direction in which the button is depressed.

When the catch has been released, the handle can be turned to its open position so that the door or window can be opened, and the push button can be released as soon as the handle has been turned sufficiently for the button to be moved out of alignment with the first recess of the fixing plate. When the door or window is closed and the handle is turned to its closed position, the button comes into engagement with a portion of the fixing plate and is caused by a camming action to rock against the resilient bias so as to allow the handle to be moved to the closed position, whereupon the button is realigned with the first recess and is caused by the resilient bias to move into the first recess to lock the handle in the closed position.

Preferably the push button is arranged to be depressed in a direction which is substantially parallel to the pivot axis of the handle, and the push button is resiliently biased by means of a suitable spring, such as a torsion spring or a compression spring, acting between the button and a portion of the handle.

Preferably the push button is pivotally mounted on the handle by means of a fixed pivot pin carried by the handle and a channel shaped socket which is carried by the push button and is a snap-fit onto the pivot pin so that the pin is received captively by the socket and the socket can rotate about the pin. This arrangement facilitates manufacture and assembly of the locking handle, especially if the push button comprises

a moulded plastics body and the socket is formed integrally with the body. In this case manufacture and assembly of the locking handle may be further simplified if the resilient bias acting on the push button is provided by a leaf spring which is formed integrally with the body of the push button and bears against a portion of the handle.

If additional security is required, the push button may be provided with a key operated locking plunger which is movable between a retracted position within the button and a locking position in which it projects from the button, operation of the key to move the plunger to its locking position when the first portion of the button is in engagement with the first recess causing the plunger to engage in a second recess of the fixing plate to prevent depression of the button to release the catch. Thus, operation of the key to move the plunger to its locking position when the handle is closed and the catch engaged acts to lock positively the handle in this position. The catch cannot then be released to allow the handle to be turned to the open position until the key has been used to retract the locking plunger from the second recess.

Two embodiments of a locking handle in accordance with the invention will now be described, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a cross-section through part of a first embodiment showing the handle in the closed position and the catch engaged and locked;

Figure 2 is a view similar to that of Figure 1 but showing the catch unlocked and released to allow the handle to be turned to the open position;

Figure 3 is a cross-section through part of the second embodiment showing the handle in the closed position and the catch engaged and locked;

Figure 4 is a view similar to that of Figure 3, but showing the catch unlocked and released to allow the handle to be turned to the open position;

Figure 5 is a section through the catch taken on the line V-V in Figure 3; and,

Figure 6 is a view similar to that of Figure 5 but showing the locking plunger of the catch in its retracted position.

The locking handle shown in Figures 1 and 2 comprises a fixing plate 1 of elongate, substantially rectangular shape, the plate having a substantially flat undersurface 2 and an upper surface provided with a raised central portion 3 between opposite end portions 4 and 5 each of which has two recessed, countersunk screw holes 4a,4b and 5a,5b centred on the longitudinal axis of the fixing plate. The underside of the fixing plate is provided with a recess 6 beneath the raised central portion 3, and the raised portion 3 is provided with an aperture 7 communicating with the recess 6, the axis of the aperture 7 being parallel to the axes of the recessed screw holes 4a,4b, 5a,5b

and perpendicular to the plane of the flat undersurface 2. At its end adjacent the end 5 of the fixing plate 1, the central portion 3 has a pair of side walls 8 (only one of which is shown) extending parallel to the longitudinal axis of the fixing plate 1 towards the end 5 on opposite sides of the screw hole recess 5b, the outer sides of the walls 8 being flush with the sides of the fixing plate 1, and the inner sides of the walls 8 defining, together with the end wall 9 of the portion 3, a recess 10 which is open at the top and its end remote from the central portion 3.

The locking handle also comprises a handle 11 which is pivotally mounted on the fixing plate 1, the handle 11 having a body portion 12 provided with a boss 13 projecting from the underside of the body portion and received rotatably in the aperture 7 of the raised central portion 3 of the fixing plate so that the handle 11 can turn relative to the fixing plate about a pivot axis coincident with the axis of the aperture 7. A bearing sleeve 14 is provided between the boss 13 and part of the aperture 7, and the free end 15 of the boss 13 is swaged radially outwardly over bearing washers 16 to prevent removal of the handle from the fixing plate, although any other suitable retention method may be adopted if preferred. The boss 13 is provided with a bore 17 which is open at the free end 15 for receiving a conventional square sectioned spindle (not shown) for driving an espagnolette mechanism, although as mentioned earlier the handle may alternatively be of the cockspur type.

The handle 11 also has a hand grip portion 18 which extends from the upper end of the body portion 12 in a direction substantially perpendicular to the pivot axis of the handle and parallel to the plane of the undersurface 2 of the fixing plate. In addition, the handle 11 has a locking catch 19 housed in a passage 20 of substantially rectangular section provided in the body portion 12 between the boss 13 and the hand grip portion 18, the passage 20 extending in a direction substantially parallel to the pivot axis of the handle and being open at both the upper and lower surfaces of the body portion 12.

The locking catch 19 comprises a moulded plastics push button 21 of substantially rectangular section having a width slightly less than the width of the passage 20 so that the button 21 fits closely between the side walls of the passage 20. At its upper end edge nearest the hand grip portion 18 of the handle, the push button 21 is formed with an integral mounting portion 22 defining a transversely oriented channel shaped socket 23 which encloses a 270° arc and is a snap-fit over a fixed pivot pin 24 extending transversely between the side walls of the passage 20 near the upper end of the passage adjacent the hand grip portion 18 so that the push button 21 is pivotally mounted on the pivot pin 24 for rocking movement in the longitudinal plane of the handle 11. A spring 25 is mounted to act between the push button 21 and the

hand grip end 26 of the passage 20 in order to bias the button to pivot about the pin 24 in a direction towards the opposite end 27 of the passage 20, i.e. towards the pivot axis of the handle. In this embodiment, the spring 25 comprises a torsion spring which is mounted on the push button 21 so that opposite ends of the spring act on the hand grip end 26 of the passage 20 and the facing end of the button 21 to press them apart. As mentioned earlier, however, the spring 25 may take any suitable alternative form.

As shown in Figure 1, the upper end 28 of the push button 21 projects from the passage 20 at the upper surface of the handle, and the lower end 29 of the button projects from the passage at the undersurface of the handle. When the handle 11 is in its closed position shown in Figure 1, i.e. with the longitudinal axis of the handle 11 parallel to the longitudinal axis of the fixing plate 1, a part 29a of the lower end of the push button 21 is received in the recess 10 between the side walls 8 projecting from the raised central portion 3 of the fixing plate, the button 21 being held in this position with the end portion 29a engaging the end wall 9 of the recess 10 under the action of the spring 25. In this position the catch 19 is engaged and prevents the handle 11 from being turned to an open position.

It will be further noted that in this position of the handle 11 and the catch 19, a longitudinal bore 30 extending through the push button 21 is substantially co-axially aligned with the screw recess 5b which opens in the upper surface of the fixing plate 1 between the side walls 8 of the recess 10. Rotatably mounted within the bore 30 is a cylindrical locking plunger 31 having a part helical cam slot 32 provided in its external surface, this slot receiving and cooperating with a lug 33 fixed to the inner wall of the bore 30. At its upper end, the locking plunger 31 is provided with a keyway 34 for receiving the lower end of an operating key 35 which is insertable into the bore 30 through a slotted entrance guide 36 mounted in the upper end of the bore 30. Following insertion of the key 35 into engagement with the locking plunger 31, rotation of the key in one direction will rotate the locking plunger 31 so that interaction of the lug 33 and the slot 32 causes the locking plunger to move axially from a retracted position within the bore 30 to a locking position in which the lower end 37 of the plunger 31 projects from the lower end 29 of the push button 21 into the recess 5b. This prevents the push button 21 from being rocked about its pivot pin 24, and hence locks the catch 19 in engagement with the recess 10. Turning the key 35 back in the opposite direction unlocks the catch by withdrawing the locking plunger 31 from the recess 5b back to its retracted position within the bore 30.

With the locking plunger 31 retracted, the catch 19 can be disengaged from the recess 10 to allow the handle 11 to be turned to its open position. Disen-

gement of the catch 19 is caused by depressing the upper end portion 28 of the push button 21 towards the fixing plate 1, i.e. in a direction substantially parallel to the pivot axis of the handle, thus causing the push button 21 to pivot about the pin 24 so that the lower end 29 of the push button moves away from the raised central portion 3 of the fixing plate to a position in which the portion 29a of the lower end of the button has moved clear of the recess 10 as shown in Figure 2. The handle 11 can then be turned to the open position, and the push button 21 can be released to allow the spring 25 to return it to its rest position.

When the handle is moved back to the closed position, the lower end portion 29a of the button 21 comes into engagement with the outer surface of the nearer side wall 8 of the recess 10, and the button 21 is thereby caused to rock about the pivot pin 24 against the action of the spring 25 as the handle moves further towards the closed position, the wall 8 and the lower end portion of the button being shaped to facilitate this camming action. In this way the push button 21 is gradually deflected to enable it to move past the wall 8 as the handle is moved to the closed position, and when the handle reaches the fully closed position the push button 21 becomes aligned with the recess 10 and the bias exerted by the spring 25 acts to move the lower end 29 of the button into engagement with the recess 10 to hold the handle in the closed position. If desired, the handle can then be locked in this position by inserting and turning the key 35 to advance the locking plunger 31 into the recess 5b.

The embodiment illustrated in Figures 3 to 6 is identical to that just described with reference to Figures 1 and 2 except with regard to the construction and arrangement of the central bore 30' through the push button 21' and the locking plunger 31' which is mounted within the bore 30'. In the second embodiment, the locking plunger 31' comprises two parts, a first part 40 which receives the key (not shown) and is rotatable but axially fixed relative to the button 21', and a second part 41 which is connected to the first part 40 so that it is rotatable with the first part and is axially movable relative thereto, the outer surface of the second part 41 having a part helical slot 32' which receives and cooperates with a lug 33' provided on the internal surface of the bore 30'.

This arrangement enables the handle to be deadlocked in the closed position, the first part 40 of the locking plunger 31' comprising a deadlocking cylinder which cannot be rotated without insertion of the correct key. This part 40 has an annular peripheral groove 42 which receives a lug 43 provided on the internal surface of the bore 30' in order to prevent axial movement of the part 40 within the bore 30' while permitting rotation thereof, and at its lower end the part 40 has an axially offset leg 44 projecting in an axial direction, the leg 44 having a radially inwardly di-

rected foot 45 at its free end. The leg 44 and its foot 45 are received in an axially extending slot 46 in the second part 41, the part 41 having a shoulder 47 at the upper end of the slot 46 which is cooperable with the foot 45 to prevent the two parts from becoming axially separated. The interengagement of the leg 44 and foot 45 in the slot 46 locks the two parts 40 and 41 together rotationally, but allows the part 41 to move axially relative to the part 40 between a retracted position as shown in Figures 4 and 6 and a locking position in which it projects from the lower end of the push button 21' as shown in Figures 3 and 5. Thus, insertion and rotation of the operating key in the first part 40 will cause the lower part 41 to rotate with the first part 40 and simultaneously to move axially relative thereto as a result of the interengagement of the lug 33' and the part helical slot 32' in the outer surface of the part 41. Rotation in one direction causes the part 41 to move from the retracted position to the locking position in which, when the handle 11 is closed and the catch 19' engaged as shown in Figure 3, the part 41 projects into the recess 5b in the fixing plate 1. Rotation in the opposite direction will move the part 41 back to its retracted position to allow the catch 19' to be released and the handle to be opened.

In both embodiments described above, the lug 33,33' is mounted on the inside surface of the bore 30,30' of the push button, and the part helical slot 32,32' with which it cooperates is provided in the outer surface of the locking plunger 31,31'. It will of course be appreciated, however, that the position of these parts may be reversed, so that the slot is provided in the internal surface of the bore 30,31' and the lug is provided on the outer surface of the locking plunger.

Claims

1. A locking handle for a door or window comprising a fixing plate (1), a handle (11) which is pivotally mounted on the fixing plate for movement between open and closed positions, and a catch (19) which automatically engages when the handle is moved into the closed position to prevent subsequent movement of the handle to an open position until the catch is released, characterised in that the catch (19) comprises a push button (21) which is pivotally mounted on the handle (11) and is resiliently biased to urge a first portion (29a) of the button into engagement with a first recess (10) of the fixing plate (1) when the handle is in the closed position, said engagement preventing turning of the handle, and the arrangement is such that depression of the push button (21) releases the catch (19) by rocking the button against its resilient bias to move the first portion (29a) of the button out of the first recess (10) in

a direction which is substantially at right angles to the direction in which the button is depressed.

2. A locking handle according to claim 1, in which the push button (21) is depressed in a direction which is substantially parallel to the pivot axis of the handle (11). 5
3. A locking handle according to claim 1 or claim 2, in which the push button (21) is pivotally mounted on the handle (11) by means of a fixed pivot pin (24) carried by the handle and a channel-shaped socket (23) which is carried by the push button and is a snap-fit onto the pivot pin so that the pin is received captively by the socket and the socket can rotate about the pin. 10 15
4. A locking handle according to claim 3, in which the push button (21) comprises a moulded plastics body and the socket (23) is formed integrally with the body. 20
5. A locking handle according to claim 4, in which the push button (21) is resiliently biased by means of a leaf spring which is formed integrally with the body and bears against a portion (26) of the handle (11). 25
6. A locking handle according to any one of claims 1 to 4, in which the push button (21) is resiliently biased by means of a torsion spring (25) or a compression spring acting between the button and a portion (26) of the handle. 30
7. A locking handle according to any one of the preceding claims, in which the push button (21) is provided with a key operated locking plunger (31) which is movable between a retracted position within the button and a locking position in which it projects from the button, operation of the key (35) to move the plunger (31) to its locking position when the first portion (29a) of the button is in engagement with the first recess (10) causing the plunger to engage in a second recess (5b) of the fixing plate (1) to prevent depression of the button to release the catch. 35 40 45
8. A locking handle according to claim 7, in which the locking plunger (31) is mounted to rotate about its own axis in response to insertion and turning of the key (35), rotation of the plunger causing it to move axially between its retracted and locking positions as a result of engagement of a follower member (33) carried by the push button (21) or the plunger (31) in a helical slot (32) provided in the plunger or the push button respectively. 50 55

9. A locking handle according to claim 7, in which the locking plunger (31') is in two parts, a first part (40) which receives the key and is rotatable but axially fixed relative to the push button (21') when the key is turned, and a second part (41) which is connected to the first part (40) so that it is rotatable with the first part and is axially movable relative thereto, the second part (41) having the follower member (33') or the helical slot (32').

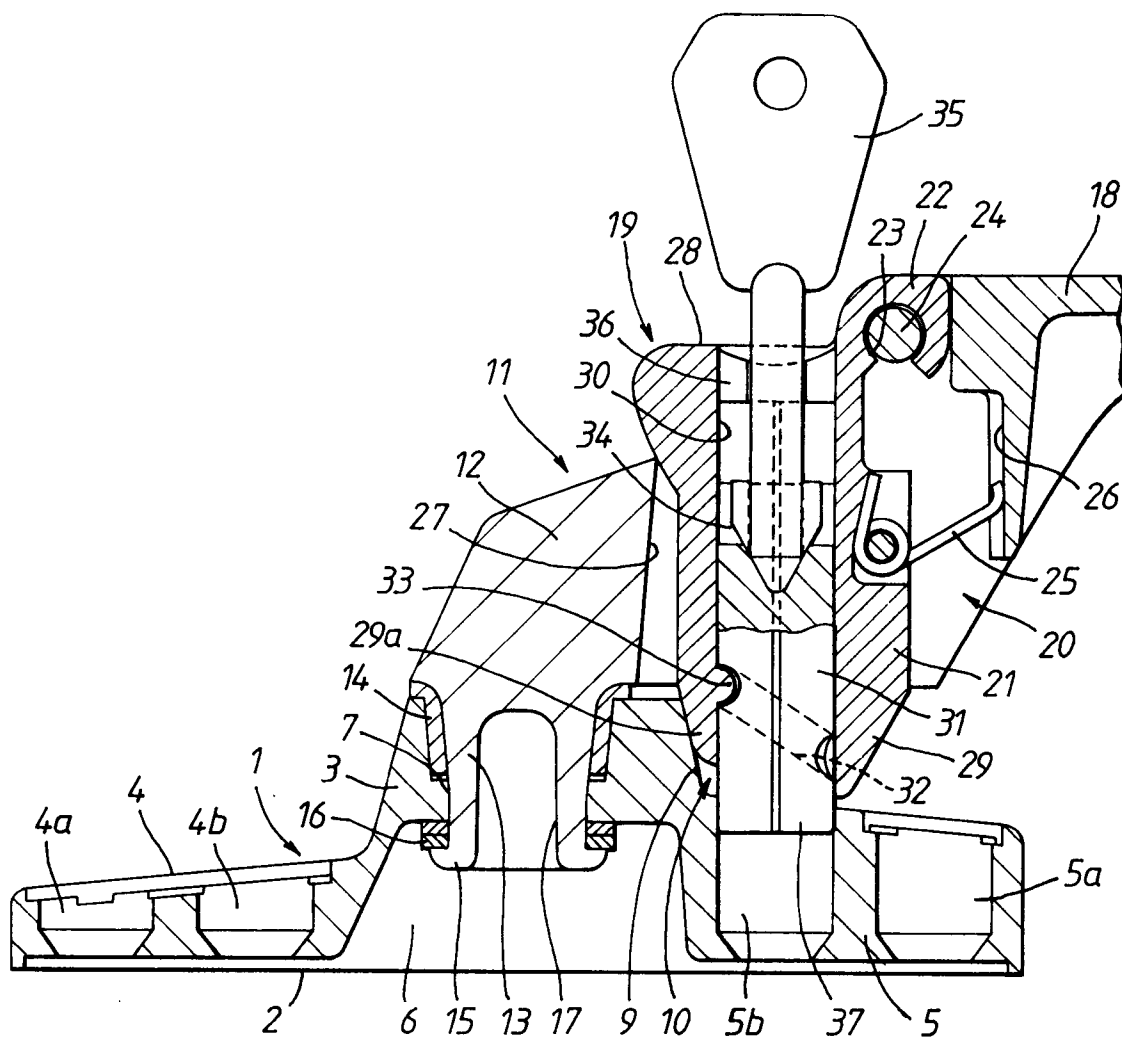


Fig.1.

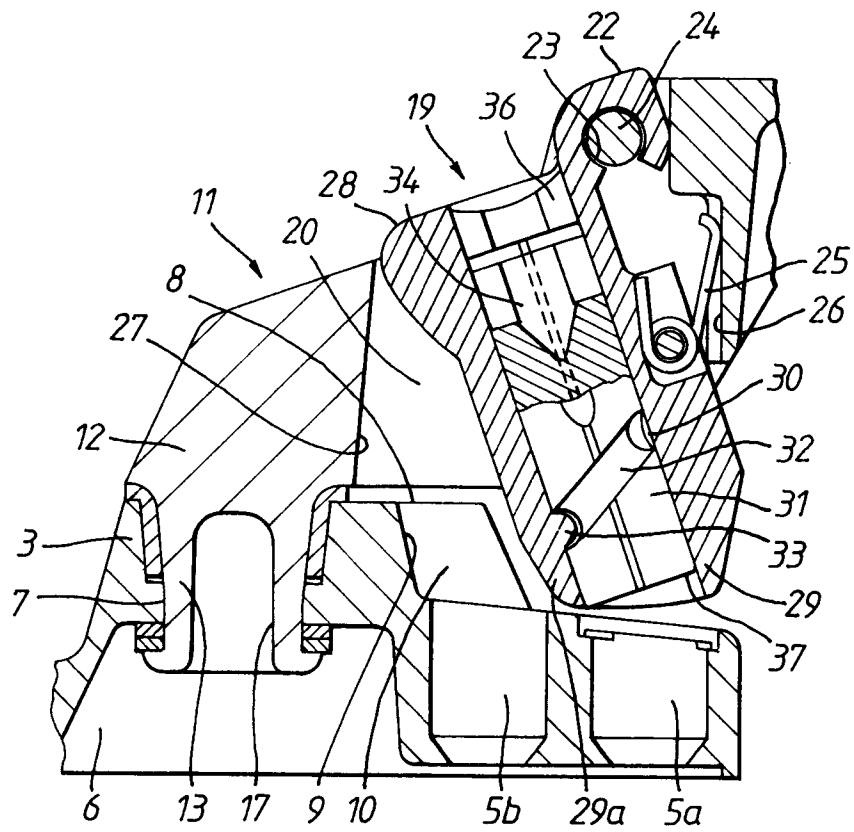


Fig. 2.

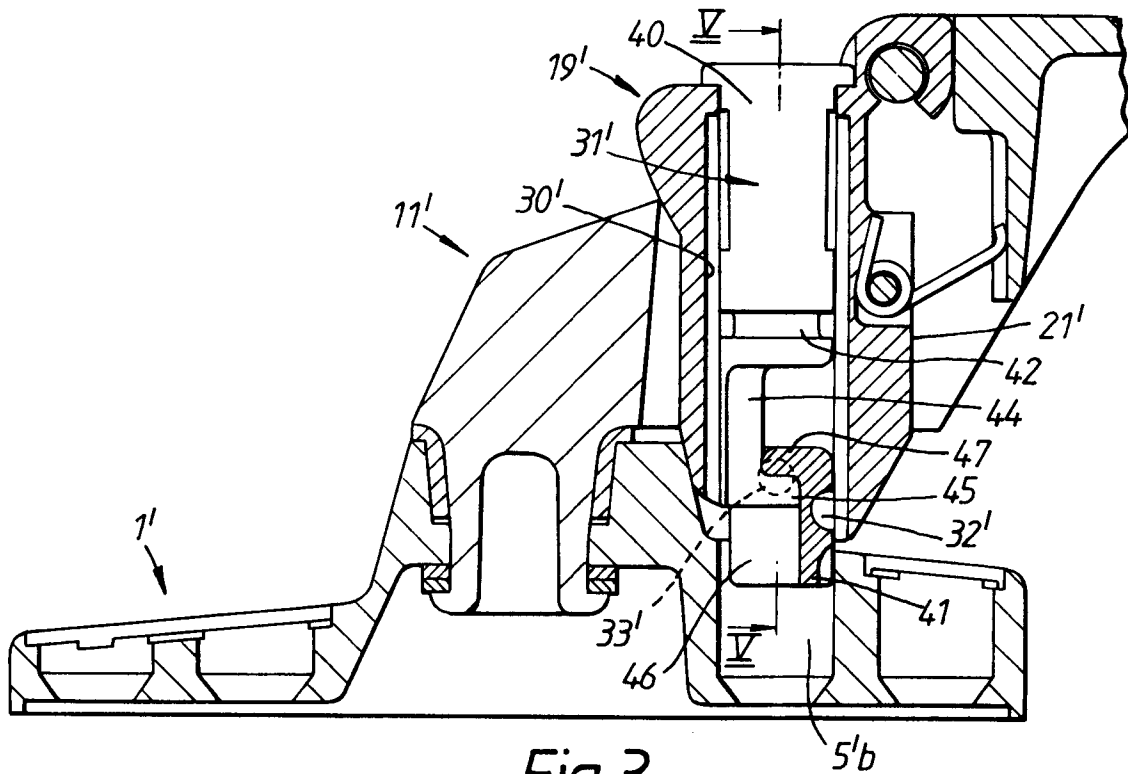


Fig. 3.

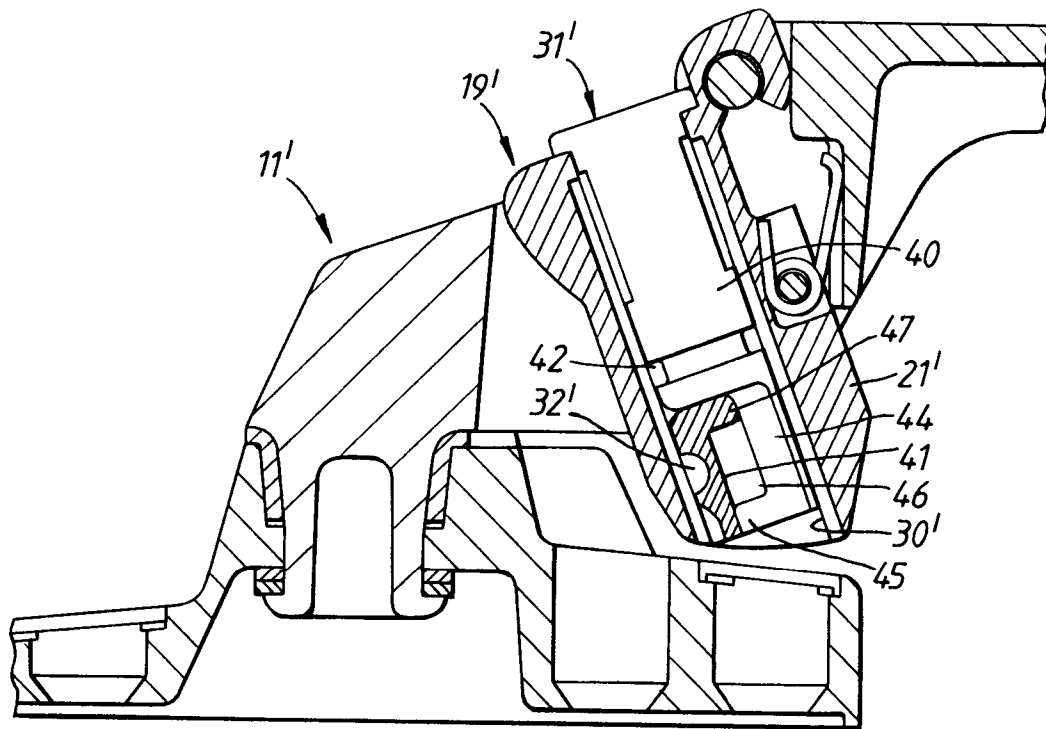


Fig. 4.

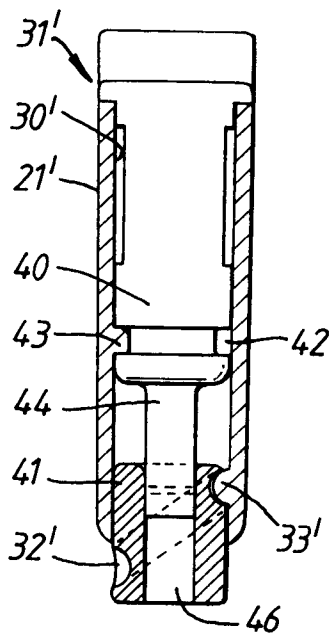


Fig. 5.

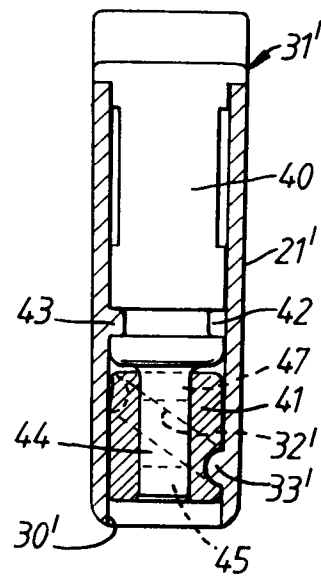


Fig. 6.



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number

DOCUMENTS CONSIDERED TO BE RELEVANT			EP 93300217.2
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB - A - 2 233 702 (McKECHNIE METALS LTD.) * Fig. 1-5; claims 1-6 *	1,3,5 7,8,9	E 05 B 1/00
X	GB - A - 2 204 909 (McKECHNIE METALS LTD.) * Fig. 1-13; claim 15 *	1,3,6 7,8	
X	EP - A - 0 260 517 (HOPPE GMBH + CO.KG) * Fig. 1-4; claims 1-18 *	1,2,3 5,6,7	
X	GB - A - 2 203 481 (SCHLEGEL HOLDINGS LTD.) * Fig. 1-2; claims 1-9 *	1,2,3 4,5,7 9	
X	GB - A - 2 076 455 (TITON HARDWARE LTD.) * Fig. 1-2; claims 1-9 *	1,2,3 5,6	
X	GB - A - 2 188 671 (REGENT LOCK COMPANY LTD.) * Fig. 1-12; claims 1-12 *	1,2,3 5,6	TECHNICAL FIELDS SEARCHED (Int. Cl.5)
X	DE - A - 3 943 290 (WEHAG LEICHTMETALL GMBH) * Fig. 1-24; claims 1-13 *	1,3,5 6,7	E 05 B E 05 C
X	AT - B - 387 822 (MELCHERT BESCHLÄGE GMBH & CO.KG) * Fig. 1-8; claims 1-4 *	1,2,3 5,6,7 9	
The present search report has been drawn up for all claims			
Place of search VIENNA		Date of completion of the search 19-04-1993	Examiner CZASTKA
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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