



(12)

EUROPEAN PATENT APPLICATION

(21) Application number : **92830539.0**

(51) Int. Cl.⁵ : **E05C 1/06**

(22) Date of filing : **30.09.92**

(30) Priority : **01.10.91 IT F1910239**

(43) Date of publication of application :
14.04.93 Bulletin 93/15

(84) Designated Contracting States :
BE CH DE ES FR GR LI NL

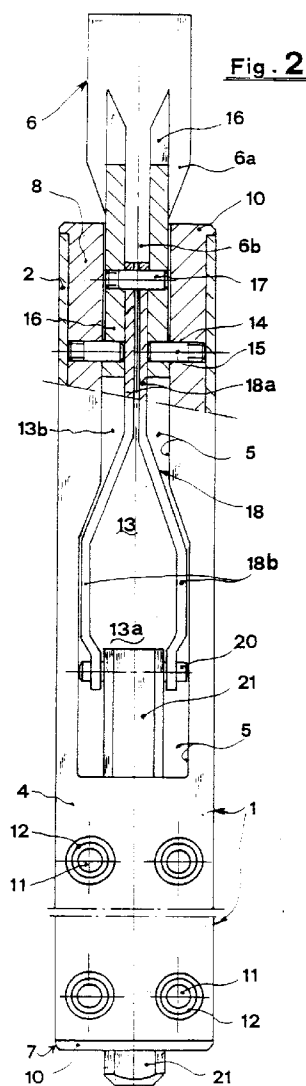
(71) Applicant : **F.A.P.I.M. FABBRICA ACCESSORI
PER INFISSI METALLICI S.R.L.
Via Sibolla, Località Cerbaia
I-55011 Altopascio (Lucca) (IT)**

(72) Inventor : **Pacini, Sergio
97, Via San Giuseppe
I-55015 Montecarlo (Lucca) (IT)**

(74) Representative : **Bardini, Marco Luigi et al
c/o Società Italiana Brevetti S.p.A. Corso dei
Tintori, 25
I-50122 Firenze (IT)**

(54) **Improved sliding bolt of the externally mounted type for doors, windows and the like.**

(57) An improved sliding bolt of the externally mounted type for doors, windows and the like, in particular in metallic sections comprising a latch (21) moved by a lever (6) swinging between two positions corresponding to the locking and unlocking of a door. The sliding bolt comprises a box-type elongated body (1), wherein there are housed a block (7) and a support (8) in which sliding guides (22, 23) are made for the latch (21) itself. The movement of the latch (21) is allowed by the lever (6) which rotates around two pins (15) and drags a fork-shaped arm (18) which, at its divergent end, is hinged to the latch (21). A user can therefore introduce a finger into the space (13a) comprised in the divergent area of the forked arm (18) and easily grip the lever (6) making it swing between the two positions of locking and unlocking of the latch (21) into and from the corresponding housings made in the doorposts (FIG. 2).



The present invention generally relates to the field of accessories for frames, such as doors, and more precisely it relates to an improved sliding bolt of the externally supported type for doors, windows and the like.

Sliding bolts, or bars, are commonly used to lock doors and wings of doors or windows to the doorposts to which they are hinged. They are positioned vertically and have a latch which fits into a blocking housing made on the upper and lower lintel or directly on the threshold or ceiling. In most cases the sliding bolts are mounted in an upper and a lower position on the wing of the door or window to be locked and when the door is in a closed position they remain comprised in the usually very small interspace existing between the two adjacent wings.

For this reason the sliding bolts are often embedded in the frames and the latches slide inside the frames protruding from the latter only in correspondence to the locking housings. This solution, even though aesthetically very valid, makes their assembly very burdensome, and in the case of frames in metallic sections, the embedding requires the cutting of the section reducing significantly its strength.

Sliding bolts of reduced thickness also exist which do not require to be embedded and which are externally supported. However they have the disadvantage of having grips for their operation which are very small and therefore difficult to use. Furthermore they often lack a snap-fitted locking in open and closed positions and have limited strength since they have a thin and flat latch. In other known sliding bolts exist of the externally supported type and reduced thickness there is provided a lever which can be turned over assuring a good grip for its operation and snap-fitted locking in open and closed positions. Nevertheless, to conciliate the characteristics of reduced thickness and of having the lever which can be turned over with a good grip, said sliding bolts are designed in two separate portions to be assembled at the time of mounting on the frame, an operation which requires time for, the alignment of said portions and which is not always well carried out thus generating unwanted forcings.

The technical problem of the construction of a sliding bolt which is contemporaneously strong, of minimum thickness so it can be mounted on a frame in the interspace comprised between two adjacent wings and is quickly and easily mounted is strongly felt in the field of accessories for window and door frames.

The general object of the present invention is to provide a sliding bolt which works out contemporaneously said problems and is able to accomplish the principal function of operation of the latch in a simple and practical way.

A particular object of the present invention is to provide a sliding bolt which is provided with a space

sufficient to allow a good grip on the operating lever and which contemporaneously is made in a single, easily mountable unit of a thickness and width in the limits compatible with the maximum interspace allowable between the wings of the frame.

These objects are achieved by the improved sliding bolt according to the present invention of the externally supported type for doors, windows and the like, which comprises a latch moved by a lever swinging between two opposite positions corresponding to the locking and unlocking of the door. Its novel feature is that it comprises an elongated box-type body wherein a block and a support are located in which sliding housings for the latch are formed. The support comprises a cavity in which the swinging lever engages. The latter is rotatably connected to the support, and to one end of an arm which is slidably housed in the cavity of the support, the other end being hinged to the latch. Said arm has a space in correspondence with the gripping end of the lever in order to make easier its operation. Preferably said space is derived from the substantially forked shape of the arm which has one convergent end connected to the lever and divergent ends connected to the latch.

Further characteristics and advantages of the improved sliding bolt according to the present invention will be made apparent in the following description of one of its possible embodiments given as an example, but not limitative, with reference to the attached drawings, in which:

- Figure 1 is a longitudinal sectional view of a sliding bolt according to the present invention in an unlocked position;
- Figure 2 is a partially sectioned front view of the sliding bolt of figure 1;
- Figure 3 shows in a perspective view a pair of sliding bolts according to the present invention of different lengths mounted on the upper and lower portions of a window or door frame in metallic sections;
- Figure 4 is a longitudinal sectional view of the sliding bolt of figure 1 in a locked position;
- Figure 5 is a partially sectioned front view of the sliding bolt according to the present invention in the same position as figure 4;
- Figures 6, 7, 8 and 9 are cross sectional views of the sliding bolt according to the invention carried out according to arrows respectively VI-VI, VII-VII, VIII-VIII, and IX-IX of figure 5.

With reference to figures 1 and 2, a sliding bolt according to the present invention comprises a box-type body 1 substantially in the shape of a U within the side portions 2 of which dovetailed guides 3 are made. On the platband 4 a symmetrical longitudinal opening 5 is provided for the manoeuvre of a swinging lever 6, described further on. Inside the body 1, a block 7 and an elongated support 8 are housed respectively in the lower and upper portions. Longitu-

dinally, both have dovetailed side protrusions 9 (see Figures 6-9) which fit in the guides 3 of the body 1 as well as at one end in the longitudinal direction they have blocking ledge 10 which abuts against one end of the body 1. The block 7 and the elongated support 8 have transversal through holes 11 with flared ends corresponding to flarings 12 formed in the platband of the body 1 for their mounting on the window or door frame by means of screws. The elongated support 8 also has a central cavity 13 composed of a larger space 13a and a narrower space 13b, the latter being located on the same side of the blocking ledge 10. In the support 8, two opposite transversal holes 14 are also formed which face the space 13b and house two pins 15. Pins 15 protrude by about half-way from the holes 14 and engage rotatively with the central portion of two parallel ribs 16 formed on one side of the lever 6. The lever 6 has a shape similar to that of the cavity 13 with one end 6a wider and the other end 6b more narrow. At the end 6b, a pivot 17 is provided for, parallel to pins 15, engaging in housings formed in the ribs 16, and rotatively connected to a forked arm 18 formed by two oppositely bent thin plates. More precisely, as shown also- in the cross sections of figures 6, 7 and 8, the arm 18 is connected to lever 6 by pivot 17 at the convergent side 18a, whereas at the divergent side 18b it is rotatively connected to a latch 21 by means of a pivot 20. Latch 21 has a round section with flattened opposite faces (as shown in figure 9) and slides in seats 22 and 23 formed respectively in the block 7 and in the support 8. In correspondence with the end 6b of the lever 6, a spring 24, facing an opening 25 formed on the hollow support 8, abuts against the ribs 16.

With reference to figure 3, two sliding bolts according to the present invention are shown mounted on a frame 26, the body 1 of them having a different length. In particular the upper sliding bolt has a body 1 longer than the lower sliding bolt in order to bring the lever 6 to a lower, more easily accessible height. The whole block, of which the box-type body 1 is made, gives the sliding bolt according to the invention a compactness which makes practical and simple its mounting by means of the screws 27.

The sliding bolt is fit to be mounted both on frames made in metallic sections and on frames made in wood, etc.. The block 7 and the support 8 are provided for as separate elements rather than a whole one so that they are modular components of the sliding bolt and are adaptable to the different lengths of the body 1 and to possible different embodiments.

With reference to the above-mentioned figures, to disengage or engage the latch 21 from or by a locking seat not shown, it is necessary to operate the swinging lever 6. More precisely, with reference to figures 4 and 5, to unlock the latch it is necessary to insert a finger in the space 13a and make the lever 6 rotate by 180° about pins 15 bringing it to the position

shown in figures 1 and 2. During said movement the pivot 17 is also forced to make a rotation about the pins 15 dragging the forked arm 18 which makes latch 21 slide inside seats 22 and 23 of block 7 and support 8 respectively. In correspondence to the end 6a of the lever 6 ribs 16 abuts resiliently against spring 24 originating snap-fitted action between the locking and unlocking positions of the latch 21. With reference to figures 2 and 5, the forked shape of arm 18 assures at the same time the transmission of the locking/unlocking movement to latch 21 operated by lever 6 as well as an easy grip on the lever 6 itself to start the manoeuvre of unlocking, since a finger is allowed to enter the space 13a to grip lever 6 itself. The convergent portion 18a of arm 18, when the sliding bolt is in a locked position (as shown in figures 4, 5, 6, 7) inserts itself between ribs 16 of the lever 6 reducing the thickness to a minimum. The compact structure of the sliding bolt is allowed also by the shape of the latch 21 having a round cross section with flattened opposed faces of limited thickness and increased strength. Pins 15 and pivot 17 are preferably screw-threaded or knurled at one end so that they can be locked in the housings formed respectively in ribs 16 and in arm 18.

In conclusion, the sliding bolt according to the present invention proves particularly compact and therefore easily mountable, strong and contemporaneously thin and not very wide so that it can be externally mounted on a window or door frame in the interspace comprised between two adjacent wings. Finally, it is easy to be manoeuvred.

Claims

1. Improved sliding bolt of the externally supported type for doors, windows and the like, comprising a latch (21) moved by a lever (6) swinging between two opposite positions corresponding to the locking and unlocking of the door, characterized in that it comprises an elongated box-type body (1) wherein a block (7) and a support (8) are located in which sliding housings (22,23) for said latch (21) are formed, said support (8) comprising a cavity (13) in which said lever (6) engages, the latter being rotatively connected to said support (8) and to the end (18a) of an arm (18) slidably housed in said cavity (13) of said support (8), the other end (18b) of said arm being hinged (20) to said latch (21), said arm (18) having a space (13a) in correspondence to the gripping end (6b) of said lever (6) whereby its manoeuvre is made easier.
2. Sliding bolt according to claim 1, wherein said arm (18) is substantially fork-shaped with convergent end (18a) connected to said lever (6) and

divergent ends (18b) connected to said latch (21) and delimitating said space (13a).

3. Sliding bolt according to claims 1 and 2, wherein the rotational connection between said lever (6) and said support (8) comprises two coaxial and spaced pins (15) extending from two parallel ribs (16) formed on a face of said lever (6) and engaging in said support (8) from opposite sides inside said cavity (13), between said ribs (16) engaging the convergent portion (18a) of said arm (18).
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4. Sliding bolt according to the previous claims, wherein said block (7) and said support (8) engage with said box-type body (1) by means of a dovetailed connection (3,9), at one end of said block (7) and of said support (8) blocking ledges (10) abutting against the ends of the box-type body (1) being provided for.
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5. Sliding bolt according to the previous claims, wherein the cavity (13) formed in said support has a restricted portion (13b) in which there are engaged said two pins (15), the ribs (16) of said lever (6), the convergent ends (18a) of said arm (18), and a widened portion (13a) in which the divergent portion (18b) of said arm (18) and the gripping end (6a) of said lever (6) are housed when the latter is in a locking position.
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6. Sliding bolt according to the previous claims, wherein said ribs (16) of said lever (6) abut against a spring (24) facing an opening (25) formed in said support (8).
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7. Sliding bolt according to the previous claims, wherein said latch (21) is a round rod with two flattened opposed faces.
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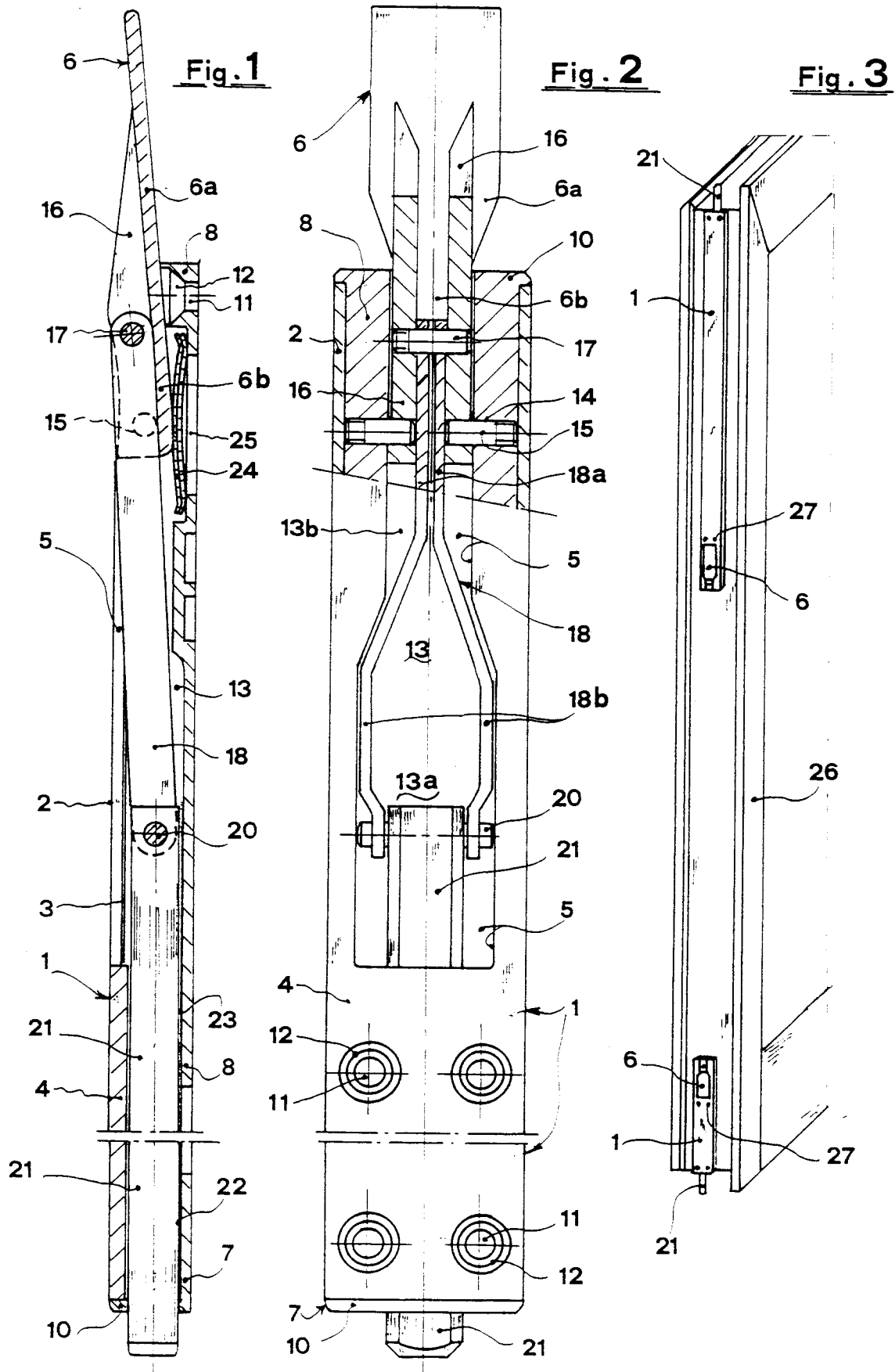


Fig. 4

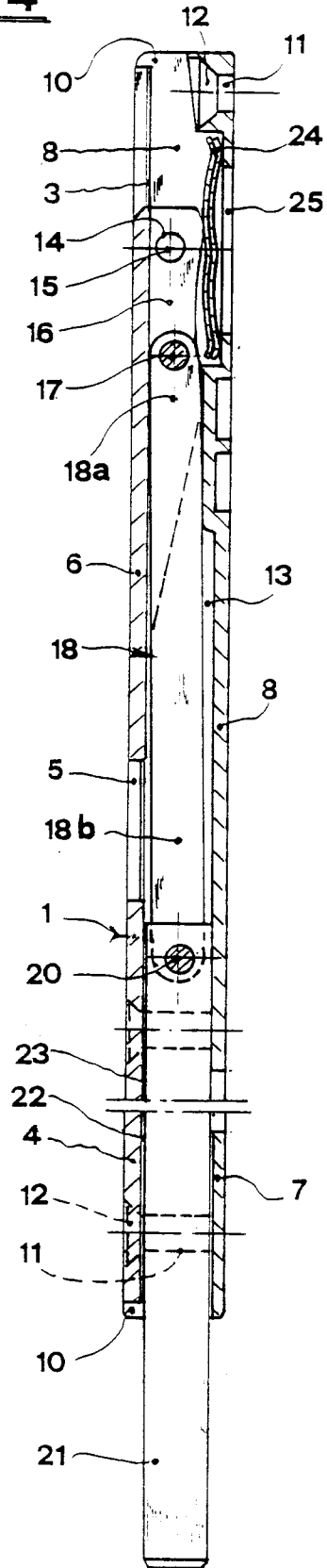
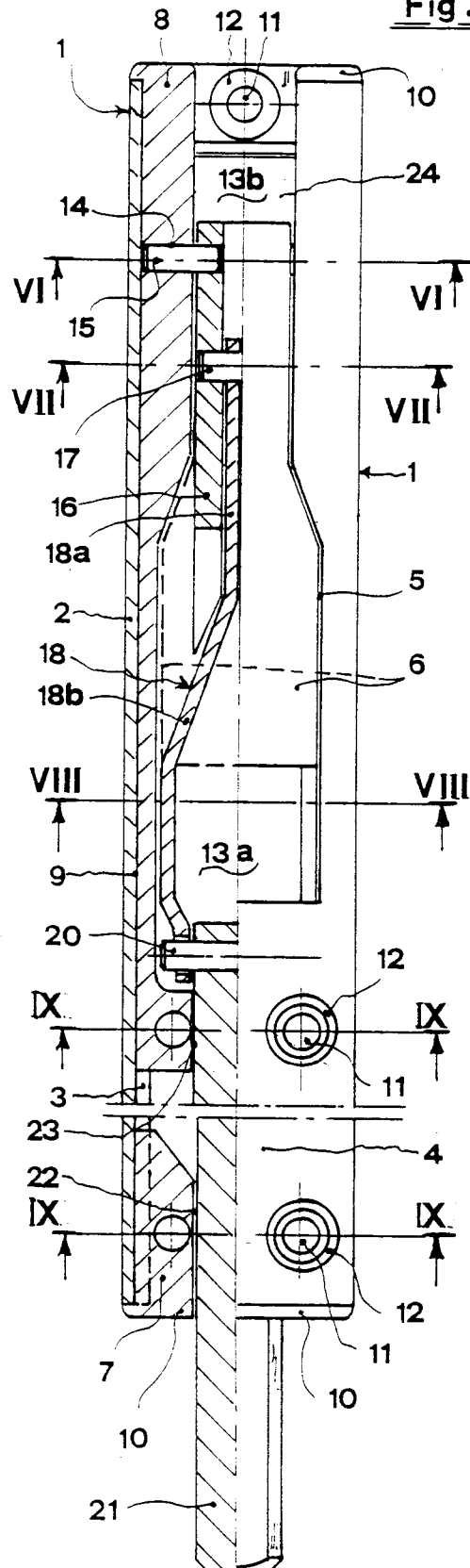


Fig. 5



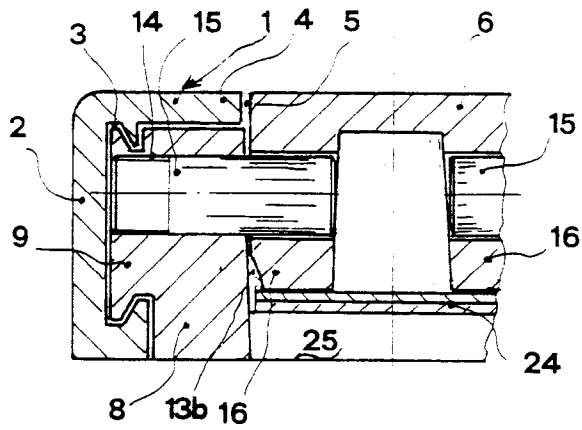


Fig. 6

Fig. 7

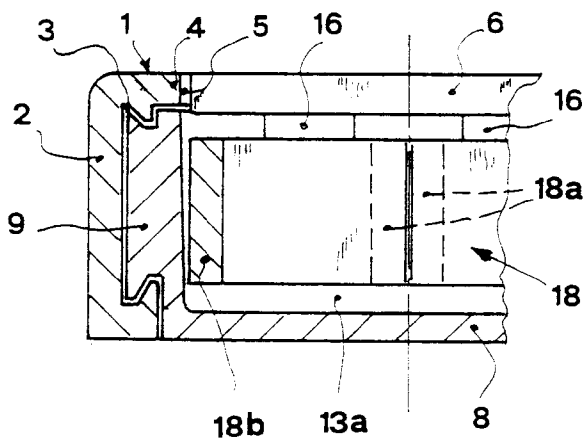
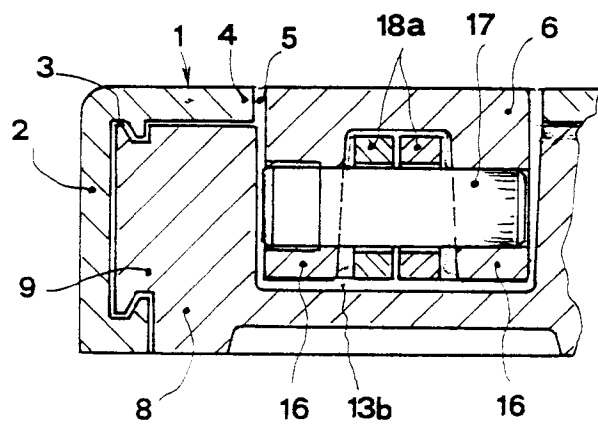
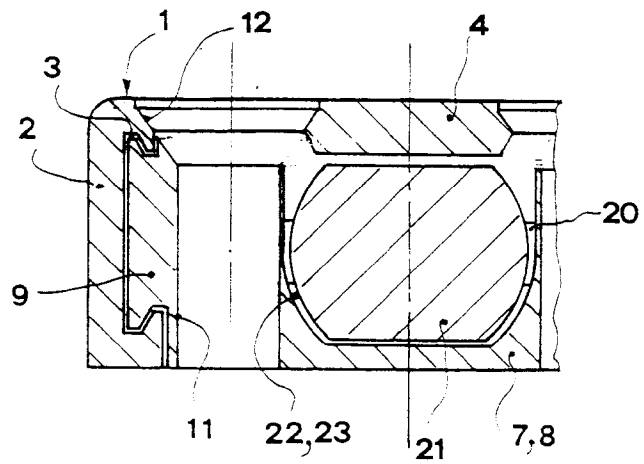


Fig. 8

Fig. 9





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EUROPEAN SEARCH REPORT

Application Number

EP 92 83 0539

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.5)
A	FR-A-1 275 033 (FAGES & VENE PAQUET) * page 2, left column, paragraph 3 -paragraph 4; figures 1-3 * ---	1	E05C1/06
A	FR-A-2 098 048 (AMERICAN METAL CLIMAX, INC) * the whole document * ---	1	
A	EP-A-0 066 297 (F. HESTERBERG & SÖHNE GMBH & CO. KG) * page 5, paragraph 2; figures 1,2 * ---	1	
A	GB-A-748 188 (E. HOLDEN & CO. LIMITED) * the whole document * ---	1	
A	DE-C-869 610 (FA. ERICH LEICHT) * the whole document * ---	1	
A	GB-A-441 508 (WILLIAM NEWMAN AND SONS LIMITED) * the whole document * -----	1	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			E05C
Place of search THE HAGUE		Date of completion of the search 22 JANUARY 1993	Examiner VESTIN 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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