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Barrier apparatus

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ABSTRACT

A barrier apparatus (10) is for removably securing a barrier (40) to a barrier frame (82). The apparatus includes a support assembly (12) having upright barrier support members (16) and cross members (18). An engagement component (20, 22) is movable relative to the support member between an operative position in which it abuts the frame to frictionally retain the support member in place, and an inoperative position in which it is free from the support frame. An over centre mechanism (38) is provided for moving the engagement component between the operative and inoperative positions. The apparatus is adapted for supporting or including the barrier.

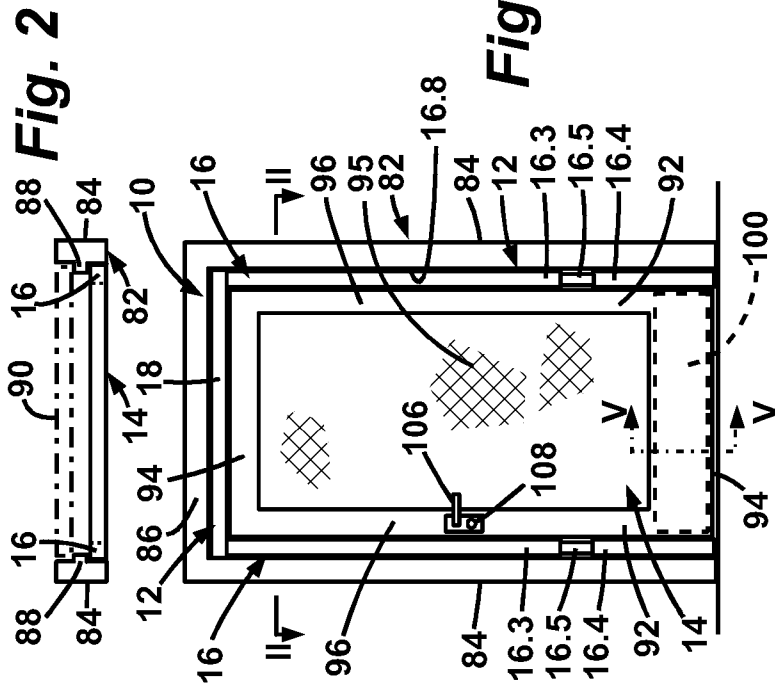


Fig. 1

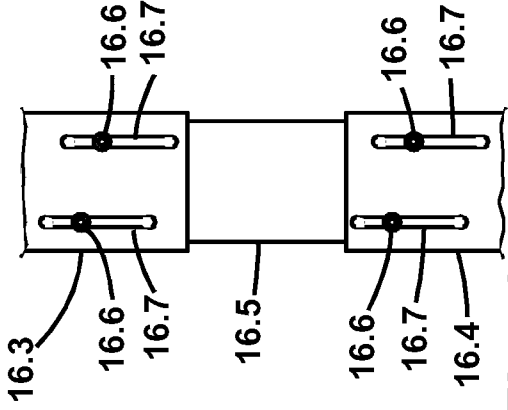


Fig. 2

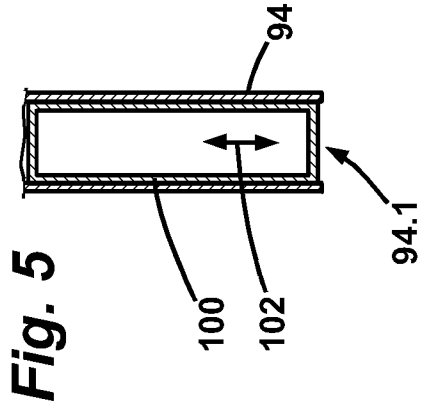


Fig. 3

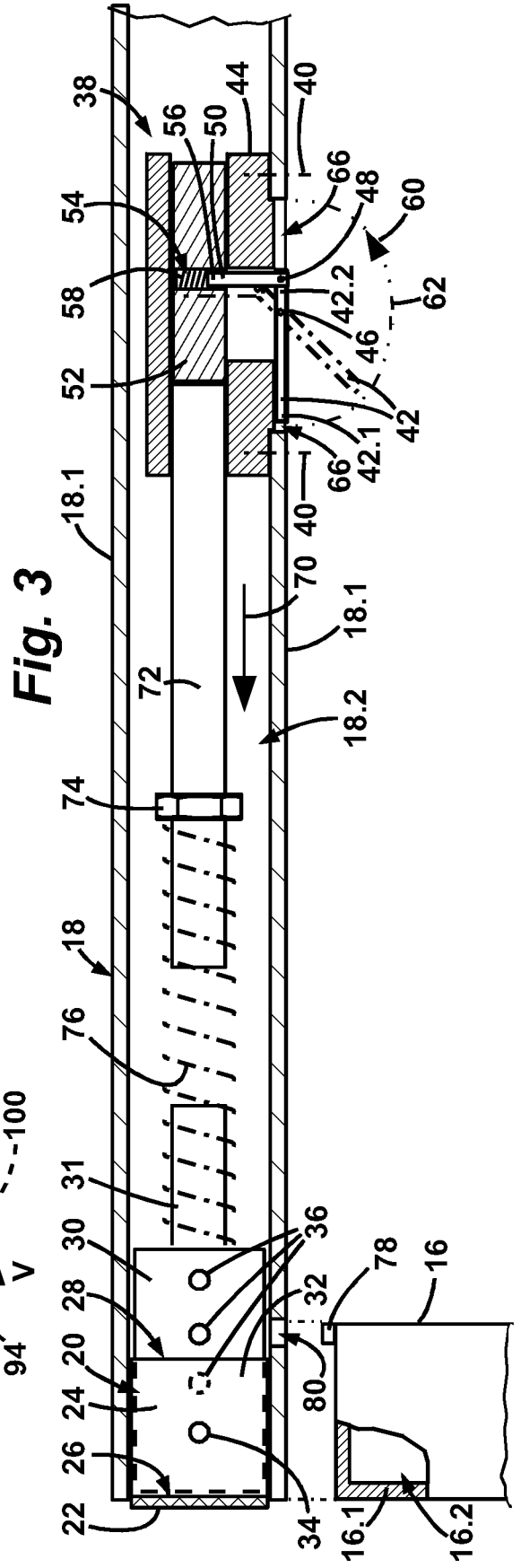


Fig. 4

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COMPLETE SPECIFICATION

Invention Title: Barrier apparatus

The invention is described in the following statement:

FIELD OF THE INVENTION

5 This invention relates to a barrier apparatus for securing a barrier to a barrier frame. According to preferred embodiments, the invention relates to such apparatus for use in providing temporary barriers, such as security doors or gates or window frames, in a building, for instance, in an apartment.

BACKGROUND TO THE INVENTION

10 Many people living or working in rented premises are reluctant to install fixtures which may overly affect the premises, for example by inserting bolts or other anchors into walls, installing security doors or windows, and so on. Indeed, often, the installing of such fixtures is not permitted in terms of the rental agreements for such premises.

15

This can be disadvantageous from a security point of view, in the case of security barriers, or from a comfort or convenience point of view in the case of insect screens.

20 It is an object of the invention to overcome or ameliorate disadvantages of the prior art, or to provide a useful alternative thereto.

SUMMARY OF THE INVENTION

25 According to the invention there is provided a barrier apparatus for removably securing a barrier to a barrier frame, the apparatus including a support assembly having:

at least one elongate barrier support member;

an engagement component attached to the elongate support member

30 and adapted for movement relative to the support member between an operative position in which the engagement component is adapted to abut said frame thereby to retain the support member in place relative to the frame, and an inoperative position in which the engagement component is free from the support frame; and

actuating means for moving the engagement component between the operative and inoperative positions,

wherein the apparatus includes at least one connection means adapted for supporting the barrier.

5

In a preferred embodiment, the engagement component is slidably attached to the barrier support.

10

Preferably, the engagement component is telescopically slidable relative to the barrier support.

15

In a preferred embodiment, the actuating means includes an over centre mechanism adapted to releasably lock the engagement component in the operative position.

20

Preferably, the actuating means includes an urging component for urging the engagement component towards the operative position and a resilient member between the urging component and engagement component, for accommodating movement of the urging component relative to the frame.

25

In a preferred embodiment, the apparatus is adapted to secure the barrier relative to the frame such that the barrier can be moved between an open position and a closed position.

30

Preferably, the over centre mechanism includes an actuation lever positioned at or adjacent to a surface of the support member.

Preferably, when the barrier is in the closed position, it is immediately adjacent to said surface to prevent the lever from being moved sufficiently to move the engagement component from the operative position to the inoperative position.

In a preferred embodiment, the engagement component has a roughened free surface which is adapted to abut the barrier frame when the engagement

component is in the operative position, so as to facilitate frictional engagement with the barrier frame.

5 In a preferred embodiment, the barrier apparatus includes three said assemblies wherein two of the assemblies are adapted for their elongate barrier support members to form upright members of the apparatus and the third assembly is adapted for its elongate barrier support member to form a cross member of the apparatus, wherein the upright members are adapted to engage the cross member at opposite ends thereof.

10 Preferably, the upright members and the cross member are provided with interlocking means for enabling interlocking engagement between each upright member and the cross member.

15 In a preferred embodiment, the apparatus includes the barrier.

Preferably, said at least one connection means includes complementary connection formations on the barrier and at least one of the upright members for enabling connection of the barrier to, and support of the barrier on, the at
20 least one upright member.

Preferably, the connection formations on the barrier and at least one upright member together constitute at least one rotatable connection whereby, when the barrier is connected to the at least one upright member by the connection
25 formations, the barrier is hinged to that member so as to be movable between a barrier open position and a barrier closed position.

Preferably, the barrier includes a pair of elongate upright frame structures and at least one elongate cross frame structure, wherein at least one of the cross
30 frame structure and the pair of upright frame structures is longitudinally extendible.

Preferably, each extendible frame structure includes at least two structure portions which are telescopically slidable relative to each other to effect said extension.

5 Preferably, each extendible frame structure includes locking means for releasably locking the at least two structure portions in relation to each other to prevent relative sliding movement between the at least two structure portions.

10 Preferably, the at least two structure portions include two outer structure portions and an inner structure portion interconnecting the outer structure portions, the inner structure portion being disposed at least partially within, and being telescopically slidable relative to, each outer structure portions.

15 Any discussion of the prior art in this specification is not intended, and is not to be construed, as any statement, implication or admission that that prior art constitutes part of the common general knowledge in Australia or anywhere else.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

Preferred embodiments of the invention will now be described, by way of example only, with reference to the accompanying drawings in which:

25 Figure 1 is a schematic front view of a door frame together with a barrier apparatus according to an embodiment of the invention;

Figure 2 is a plan view of the frame and apparatus of Figure 1;

30 Figure 3 is a partly exploded side view of an elongated cross member of the apparatus of Figure 1 and part of an upright support member, with the cross-member being shown in longitudinal cross-section and the upright support member being shown partly cut-away;

Figure 4 is an enlarged view of a detail of Figure 1;

Figure 5 is an enlarged cross-sectional view along the line V-V in Figure 1;

- 5 Figure 6 is a schematic side view of an over centre mechanism according to a different embodiment to that shown in Figure 3;

Figure 7 is a front view of the over centre mechanism of Figure 6;

- 10 Figure 8 is a side view of a portion of an elongated cross member according to a different embodiment to that shown in Figure 3, shown partly cut-away, with a lever of the cross member being shown in an inoperative position;

- 15 Figure 9 is a side view of the portion of the cross member of Figure 6 shown partly cut away, with the lever being in an operative position;

Figure 10 is a top view of the portion of the cross member of Figure 9;

- 20 Figure 11 is schematic front view of a door frame together with a barrier apparatus according to another embodiment to that shown in Figure 1; and

Figure 12 is an enlarged cross-sectional view along the line XII-XII in Figure 11.

25 **DETAILED DESCRIPTION**

Referring to Figure 1, there is shown a barrier apparatus 10. The apparatus 10 includes a support assembly 12 and a barrier 14.

- 30 The support assembly 12 includes a pair of upright elongate barrier support members 16, and an elongate barrier support cross member 18. Each of the upright support members 16 is essentially hollow, with an outer wall 16.1 of preferably substantially rectangular cross-section enclosing an interior space

16.2. Similarly, the cross member 18 has outer wall 18.1 of preferably substantially rectangular cross-section enclosing an interior space 18.2.

5 Each upright support members 16 includes an upper outer support member portion 16.3, a lower outer support member portion 16.4 and an inner connecting support member portion 16.5 which interconnects the upper and lower support member portions.

10 The connecting support member portion 16.5 is of lesser width than the upper and lower support member portions 16.3, 16.4, and extends partially into each of the those portions. Thus, the connecting support member portion 16.5 can slide telescopically relative to each of the upper and lower support member portions 16.3, 16.4.

15 In order to lock the upper and lower support member portions 16.3, 16.4 and connecting support member portion 16.5 in position relative to each other, removable locking means in the form of grub screws 16.6 are provided (see Figure 4). The grub screws 16.6 extend through slots 16.7 in the upper and lower support member portions 16.3, 16.4, and into corresponding apertures
20 (not shown) in the connecting support member portion 16.5, as illustrated in Figure 4.

More detail of the left hand end of the cross member 18 is shown in Figure 3. The cross member 18 is provided with an engagement component which
25 includes a plunger 20 and a friction pad 22.

The plunger 20 includes a first plunger portion 24 which is substantially hollow, and which has one closed end 26, and an open end 28. The plunger 20 includes a second plunger portion 30 which extends partially into the first
30 plunger portion 24 through the open end 28. Extending from the second plunger portion 30 is short rod 31.

The friction pad 22 is connected to the closed end 26 of the first plunger portion 24.

The first plunger portion 24 has an outer wall 32 with an aperture 34 in the wall, while the second plunger portion 30 has a series of apertures 36.

5 The second plunger portion 30 is telescopically slidable within the first plunger portion 24. As the second plunger portion 30 is slid inwards or outwards relative to the first plunger portion 24, different ones of the apertures 36 of the second plunger portion move into alignment with the aperture 34 in the first plunger portion 24.

10

The position of the second plunger portion 30 relative to the first plunger portion 24 can be locked by aligning one of the apertures 36 in the second plunger portion with the aperture 34 in the first plunger portion, and then extending a locking element (not shown) such as a grub screw, dowel or the like, through the aligned apertures.

15

The cross member 18 also includes actuating means in the form of an over centre mechanism 38. The over centre mechanism 38 is located within the interior space 18.2 of the cross member 18 and is secured to the lowermost wall 18.1 of the cross member as shown in Figure 3, by means of suitable connectors such as screws (not shown) at the positions indicated at 40.

20

The over centre mechanism 38 includes an actuation lever 42 which is rotatably attached to a body 44 of the mechanism by a pivot pin 46. The lever 42 has an outer end 42.1 on one side of the pivot pin 46, and an inner end 42.2 on the other side of that pin.

25

The inner end 42.2 is joined by a rotatable connection 48 to a link 50, also forming part of the over centre mechanism 38. The mechanism 38 further includes a slider 52 which is adapted to slide leftward and rightward relative to the cross member 18, as shown in Figure 3.

30

The slider 52 has a bore 54 in one side, with the link 50 extending partially into the bore 54. Within the bore 54, adjacent to the interior end 56 of the link 50, is a spring 58.

5 The lever 42 is adapted to be rotated about the pivot pin 46 in the direction of the arrow 60, along the arc-shaped path 62, as shown in Figure 3. When in its leftmost, inoperative position as shown in the figure, the outer end 42.1 of the lever 42 is accommodated in a seat space 66 of the over centre mechanism 38. Similarly, when the lever 42 is moved to its rightmost, operative position in
10 relation to the mechanism 38 as shown in the figure, it is also accommodated in the seat space 66 of the mechanism.

As the lever 42 is rotated in this manner, the inner end 42.2 of the lever, as a result of the rotation, moves both upward and leftward relative to the cross
15 member 18 as shown. As the link 50 is connected to the inner end 42.2 of the lever 42, the link is also forced to move in these directions. However, the link 50 is constrained to slide relative to the bore 54 by the walls of the bore, this sliding movement being accommodated by the spring 58. A partial movement of the lever 42 and link 50 is illustrated in phantom lines in Figure 3.

20

As the lever 42 moves in this manner, the link 50 also forces the slider 52 in a leftward direction, as illustrated by the arrow 70.

25 Connected to the slider 52 is a push rod 72. On the push rod 72 is an adjustable nut 74 which can be moved leftward and rightward relative to the push rod as shown in the figure (that is, longitudinally with respect to the push rod) by rotating the nut which causes a screw thread of the nut to travel along a complementary outer thread on the push rod (these threads not being shown).

30

A coil spring 76 is provided, with the leftmost end of the push rod 72 as shown extending partially into the spring. The rightmost end of the spring 76 abuts the adjustable nut 74.

Extending partially into the leftmost end of the coil spring 76 as shown is the short rod 31.

5 Also shown in Figure 3 is a portion of the leftmost upright member 16 as shown in Figure 1. At the upper end of that upright member 16 there is provided a lip 78 which is received in an aperture 80 in the lowermost wall 18.1 of the cross member 18.

10 In the preferred embodiment, each of the lip 78 and aperture 80 is elongate (i.e. extending longitudinally in a direction perpendicular to these components as shown in Figure 3). The aperture 80 has a width which is somewhat oversized relative to that of the lip 78, to allow some lateral movement of the upright member 16 relative to the length of the cross member 18.

15 Although Figure 3 only shows details of the left-hand end of the cross member 18 and a portion of the leftmost upright member 16, it is to be understood that the right-most end of the cross member, and rightmost upright member are essentially a mirror image of what is shown in Figure 3.

20 In addition, although not shown, each upright member 16 has an arrangement including a plunger, over centre mechanism, push rod, adjustment nut and spring similar to that of the cross member 18 as shown in Figure 3. For each such arrangement, the direction corresponding to the direction 70 in Figure 3, vertically downwards.

25 In particular, the corresponding arrangement for the leftmost upright member 16 essentially consists of the arrangement as shown in Figure 3, but rotated counter clockwise substantially through a right angle. The corresponding arrangement in the rightmost upright member 16 is essentially a mirror image
30 of that of the leftmost upright member.

Accordingly the reference numerals for these features as shown in relation to the cross member 18 in Figure 3 also apply to the corresponding components at the right-most end of the cross member and in the upright members 16.

It will therefore be appreciated that, for each such arrangement, the respective lever 42, as well as the screws (at the positions 40) holding each over centre mechanism 38 in place relative to the respective support member, are located
5 on that side of the support member which is immediately adjacent to the barrier 14.

In the preferred embodiment, the support assembly 12 and barrier 14 are adapted for use on an existing barrier frame 82 such as the door frame as
10 shown in Figures 1 and 2. As the frame 82 shown in these figures is a door frame it is referred to as such below.

The door frame 82 includes left and right upright portions 84 and a cross portion 86. As shown in Figure 2, each upright portion 84 includes a doorjamb
15 portion 88 which is adapted to accommodate the barrier 14, and also a door 90, such as an exterior door (which may for example be a front door) of premises, as shown in phantom lines in Figure 2.

Referring to Figure 1, the barrier 14 has a pair of elongate upright frame
20 structures 92 and upper and lower elongate cross frame structures 94. The barrier 14 also includes an inner portion 95 supported by these frame structures 92, 94 which, according to the preferred embodiment, is in the form of a metal mesh in order to prevent the passage of a person between the frame structures. While a mesh is preferable as it allows the passage of air for
25 ventilation and light, the inner portion may be of other suitable types.

The rightmost upright frame structure 92 of the barrier 14 and the rightmost upright member 16 of the barrier assembly 12 as shown in Figure 2 are provided with connection means (not shown) for connecting the barrier 14 to
30 that upright member, for supporting the barrier.

Any suitable form of connection means may be used, as would be understood by a person skilled in the art, for enabling the barrier 14 to be moved between an open and closed position relative to the support assembly 12.

5 According to a preferred embodiment, each connection means includes connection formations on the rightmost upright frame structure 92 and the rightmost upright member 16, these formations being complementary relative to each other such that, when they are connected to each other, they constitute a hinge for allowing the barrier 14 to be opened and closed.

10 For example, the connection means may include one or more short vertical hinge rods attached to the upright frame structure 92, and components having corresponding tubular passages attached to the adjacent upright member 16, which are adapted to accommodate the rods. Such combinations of hinge rods and passages would constitute hinges for allowing the barrier 14 to be rotated between open and closed positions.

15 The lower cross frame structure 94 of the barrier 14 is hollow and open at its bottom edge 94.1 as shown in Figure 5. Located within the lower cross frame structure 94 is an adjustment box piece 100 which is upwardly and downwardly slidable relative to the lower cross frame structure, as indicated by the arrow 102.

20 The box piece 100 is adapted to be fixed in position relative to the lower cross frame structure 94 by an arrangement of grub screws, and slots in the lower cross frame structure (the grub screws and slots not being shown), similar to the grub screws 16.6 and slots 16.7 described above.

25 The barrier apparatus 10 can be used as a temporary security door, for example in rented premises, such as a rented apartment. It is envisaged that the apparatus 10 will be used in conjunction with a normal exterior door of the premises, such as the front door 90 as shown in Figure 2.

30 In order to install the apparatus 10, the cross member 18 is first secured in place. In order to do so, it may be necessary to adjust the lengths of the portions of the two plungers 20 protruding from the two opposite ends of the cross member 18. This can be done by moving each first plunger portion 24

relative to the corresponding second plunger portion 30, and locking these portions to each other using a grub screw, dowel or the like, as described above, by inserting this component into the aligned apertures 34, 36 in these two plunger portions. In this manner, accommodation can be made for door frames 82 having different widths openings.

Ideally, the plunger portions 24, 30 should be adjusted to the greatest degree of extension practicable beyond the two ends of the cross member 18 and within the confines of the door frame 82, such that the cross member together with the various components located in the interior space 18.2 can be accommodated within the door frame, as shown in Figures 1 and 2.

Once these adjustments have been made, the cross member 18 can be held in place at the upper end of the door frame 82, and then the levers 42 of the over centre mechanisms 38 can be actuated.

This may best be described with reference to the cross member 18 as shown in Figure 3. When the lever 42 is moved along the path 62 from its inoperative position to its operative position in the direction of the arrow 60, the outer end 42.1 of the lever moves from its left-most position to its right-most position. As it moves in this manner, the link 50 is forced leftward as described above. The link forces the push rod 72 to the left and the push rod, in turn, forces the plunger 20 to the left, this force being transmitted via the coil spring 76.

As the plunger 20 is forced in this manner, it moves to the left as indicated by the arrow 70, and is thus caused to protrude further from the cross member 18 until the friction pad 22 bears against the adjacent surface of the door frame 82. The plunger 20 may be regarded as being in an inoperative position prior to being extended in this manner (corresponding to the inoperative position of the lever 42), and in an operative position once it is so extended and is bearing on the door frame 82 (corresponding to the operative position of the lever 42). A similar procedure is applied in relation to the other plungers 20 at the right hand end of the cross member 18, and on the upright members 16.

Moving each lever 42 in the opposite direction to its inoperative position moves the plunger 20 to its inoperative position.

- 5 The coil springs 76 can accommodate excessive movement of the push rods 72, to minimise the chance of damage occurring due to excessive force being applied between the plungers 20 and the door frame 82.

10 If the extent of protrusion of the plungers 20 from the relevant support members 16, 18 has been adjusted as described above, and if, as a result, there is insufficient compression of the coil springs 76 such that insufficient force is transmitted from the push rods 72 to the friction pads 22, the compression of the coil spring can be increased (or could otherwise be adjusted) by rotation of the adjustable nut 74.

15

Once the cross member 18 has been secured in this manner, a similar procedure can be employed to secure the upright members 16 in place. This procedure is essentially the same, except that, while the cross member 16 is provided with two plungers 20, over centre mechanisms 38, and associated
20 components, each upright member 16 is only provided with one of each of these, at the lower end of that member. The upper end of each member 16 is secured to the cross member 18 by inserting the respective lip 78 in the corresponding aperture 80 of the cross member.

25 In addition, if major adjustments to the lengths of the upright members 16 are required, which are too great to be accommodated by adjustments to the extensions of the plungers 20, such adjustments can be effected by loosening the grub screws 16.6 and moving the upper and lower support members portions 16.3, 16.4 relative to each other and to the connecting support
30 member portion 16.5 to lengthen or shorten the upright support members, before retightening the grub screws to again lock these components in place relative to one another.

Once the entire support assembly 12 is installed in this manner, the barrier 14 can be installed on the support assembly. This may involve lengthening or shortening of the barrier 14, by moving the box piece 100 upward or downward relative to the lower cross frame structure 94 as described above.

5

Once such adjustments, if required, are made to the length of the barrier 14, it can be supported on the support assembly 12 by the connection means, described above. For example, in the embodiment which includes hinges consisting of hinge rods and tubular passages as described above, the supporting of the barrier 14 simply involves hanging the barrier on the relevant upright member 16 by inserting the hinge rods in the passages.

10

According to the preferred embodiment, the barrier 14 is provided with not only a door handle 106 and associated latch (not shown) for holding the barrier in its closed position, but also a door lock 108 for locking it in that position.

15

It will be appreciated that when the barrier 14 is in its closed position as shown in Figures 1 and 2, the upright frame structures 92 of the barrier are immediately adjacent to the upright members 16 of the support assembly 12, while the upper cross frame structure 94 of the barrier is immediately adjacent to the cross member 18 of support assembly.

20

As the levers 42 of the various over centre mechanisms 38 are located on those surfaces of the various support members 16, 18 which face the adjacent surfaces of these frame structures of the barrier 14, there is insufficient space, when the barrier is in its closed position, to rotate the levers so as to retract the plungers 20 (that is, to move the levers and plungers from their operative to inoperative positions).

25

30

In addition, as each lever 42 is accommodated in the relevant seat space 66 of the respective over centre mechanism 38, the lever is substantially flush with the outer surface of the respective support member 16, 18.

Furthermore, as the screws holding the over centre mechanisms 38 in place relative to the respective support members 16, 18 are also disposed on those surfaces, those screws cannot be accessed when the barrier 14 is in its closed position.

5

As a result of these features, when the barrier 14 is in its closed position relative to the support assembly 12, the over centre mechanisms 38 cannot be actuated to release the support members 16, 18 from the door frame 82, and cannot be removed (which would have the same effect).

10

Similarly, the grub screws (not shown) locking the box piece 100 in place are preferably also located so as to face the adjacent upright member 16 of the support assembly 12. Accordingly, these grub screws also cannot be accessed when the barrier 14 is in its closed position relative to the support assembly 12. This can hinder an attempt to adjust the barrier 14 so as to shorten it to possibly allow an intruder access via a gap that would be created at the bottom of the barrier by such shortening.

15

It will be appreciated that the support assembly 12, and hence the barrier 14, are essentially secured in place relative to the door frame 82 by means of frictional engagement between the friction pads 22 and the surfaces of the door frame. This assists in avoiding, or minimising, damage to the door frame 82.

20

If, for example the friction pads 22 were to cause slight scratching of the surfaces of the door frame 82, such defects could likely be repaired with minimal effort, for example simply by repainting those surfaces. Indeed, this configuration of the barrier apparatus 10 avoids the need for more intrusive and damaging means of installation, such as nuts, bolts and other anchors, that could overly impact the premises.

30

As a result of such less intrusive installation, the barrier apparatus 10 according to the preferred embodiments of the invention may be somewhat less secure than other barriers which are installed by the more intrusive or

damaging means. However, it is considered that the barrier apparatus 10 according to the preferred embodiments of the invention should provide not only a deterrence against intrusion, but also a sufficient obstacle to such intrusion to at least delay a potential intruder, giving time for an occupant of the premises to close and lock the external door 90 of the premises, to call for help, and so on.

Referring to Figures 6 and 7, there is shown an over centre mechanism 110 according to a different embodiment to that shown in Figure 3. The mechanism 110 has an actuation lever 112, which is pivoted to a body 114 of the mechanism at a pivot 116. The lever 112 is connected to a slider (not shown) configured for moving the plunger 20 (also not shown in Figures 6 and 7) in a similar manner to that described above.

The lever 112 is adapted to be rotated along an arc 118 represented by dashed lines in Figure 6, between a first seated operative position - this is the position in which the lever is shown in Figure 6 - and a second seated inoperative position as shown in dashed lines in the figure. When the lever 112 is in its first operative position, the plunger 20 is in its operative position, and when the lever is in its second inoperative position, the plunger is in its inoperative position.

The mechanism 110 is provided with part-circular apertures 120 and the lever 112 is provided with corresponding adjacent recesses 122. Thus, each aperture 120 and adjacent recess 122 together form a substantially circular hole 124 in which a user can insert a finger in order to move and actuate the lever 112. As shown, there are two such apertures 120 and the lever 112 has two such recesses 122 on opposite sides of the lever. Thus, there is such a finger hole 124 when the lever 112 is in each of its first and second (operative and inoperative) positions.

The mechanism 110 is adapted to be secured in place by screws (not shown) passing through screw holes 126 which are counter sunk to allow the screws

to be substantially flush with the outer surface of the mechanism, through which they extend.

5 The mechanism 110 as shown is adapted and orientated to be used in the upright support members 16 as shown in Figure 1. In particular, the mechanism 110 is adapted to be disposed at an edge, such as the edge 16.8 of the left hand upright support member 16 as shown in Figure 2. When the lever 112 is in either of the seated positions, it is substantially flush with the edge 16.8 of the relevant upper support member 16.

10 As will be understood by those skilled in the art, similar over centre mechanisms 110 can be used in the other upright support member 16 and at the two opposite ends of the cross member 18.

15 The support assembly 12 may be provided with an alarm system (not shown), which is, for example, battery operated and which includes a switch which is adapted to be closed when the assembly is moved away from the barrier frame 82. Such an alarm can thus be configured to issue an audible and/or
20 visible warning in the event that the assembly is displaced from the barrier frame 82.

25 Referring to Figures 8 to 10, there is shown an over centre mechanism 130 according to a different embodiment to that shown in Figure 3, and Figures 6 and 7.

The over centre mechanism 130 includes a lever 132 which is pivoted to a body 134 of the mechanism at a pivot 136.

30 The lever 132 is also connected, by a crank pin 138, to a connecting rod 140, which is connected via a connection pin 142 to a pushrod 144.

The pushrod 144 passes through a passage 146 in fixed bushing 148, disposed within the body 134.

As in the case of the adjustable nut 74 shown in Figure 3, the bushing 148 bears against a coil spring 150, which serves a similar purpose to the spring 76.

5

The body 134 has a finger opening 152 which can allow an operator to insert a finger adjacent to the lever 132 when it is in its operative position as shown in Figure 9, to rotate the lever towards its inoperative position as shown in Figure 8, such rotation occurring along the arc 154 in the direction of the arrow 156.

10

This movement causes the crank pin 138 to draw the connecting rod 140, and hence the pushrod 144, in the direction of the arrow 158, thereby to withdraw a plunger (not shown) forming part of the embodiment of Figures 8 to 10. In this embodiment, the arrangement of the plunger and various ancillary and related components is preferably as described with reference to Figure 3.

15

In Figure 11, there is shown a barrier apparatus 160, which is similar to the apparatus 10 of Figure 1. However, in the apparatus 160, the cross member 162 has a construction similar to that of the upright support members 16, by having a first outer cross member portion 162.3, a second outer cross member portions 162.4, and an inner connecting cross member portion 162.5. The inner connecting cross member portion 162.5 interconnects the first and second cross member portions.

20

25

These portions 162.3, 162.4, 162.5 correspond in function to the upper outer support member portion 16.3, the lower outer support member portion 16.4, and the inner connecting support member portion 16.5, respectively, of Figure 1, and are operated in relation to each other in a similar manner (with grub screws and slots which are not shown in this embodiment).

30

In particular, just as those portions in Figure 1 can be used to adjust the length of the respective upright support member 16 in Figure 1, so the corresponding components enable the cross member 162 to be adjusted in

length to match the width of the door frame 164, which corresponds to the door frame 82 of the Figures 1 and 2.

The barrier apparatus 160 has an adjustment box piece 166 disposed in the lower elongate cross frame structure 167, corresponding to the box piece 100 and lower elongate cross frame structures 94, respectively, of Figure 1. However, it also has a further adjustment box piece 168 disposed in the right hand upright barrier support member 169 as shown. Just as the box piece 100 can be adjusted as described above to adjust the height of the barrier 14 of Figures 1 and 2, and barrier 170 of Figure 11, so the adjustment box piece 166 can be used to adjust the width of the barrier 170 to suit the width of the opening in the door frame 164.

In the region where the further box piece 168 intersects with the box piece 166 in Figure 11, its sidewalls can be suitably stepped, as indicated in Figure 12, in order for these two box pieces to accommodate each other.

Although the invention is described above with reference to preferred embodiments, it is not limited to those embodiments, and may be embodied in other forms. For example, while the invention has been described with reference to a barrier in the form of a security door, the invention may be applied to other forms of barrier such as insect screens, window or skylight barriers, and so on.

CLAIMS

1. A barrier apparatus for removably securing a barrier to a barrier frame, the apparatus including a support assembly having:
 - 5 at least one elongate barrier support member;
 - an engagement component attached to the elongate support member and adapted for movement relative to the support member between an operative position in which the engagement component is adapted to abut said frame thereby to retain the support member in place relative to the frame, and an inoperative position in which the engagement component is free from the support frame; and
 - 10 actuating means for moving the engagement component between the operative and inoperative positions,
 - wherein the apparatus includes at least one connection means adapted for supporting the barrier.
2. A barrier apparatus according to claim 1 wherein the engagement component is slidably attached to the barrier support.
- 20 3. A barrier apparatus according to claim 2 wherein the engagement component is telescopically slidable relative to the barrier support.
4. A barrier apparatus according to any one of the preceding claims wherein the actuating means includes an over centre mechanism adapted to 25 releasably lock the engagement component in the operative position.
5. A barrier apparatus according to claim 4 wherein the actuating means includes an urging component for urging the engagement component towards the operative position and a resilient member between the urging component and engagement component, for accommodating movement of the urging component relative to the frame.
- 30 6. A barrier apparatus according to any one of the preceding claims wherein the apparatus is adapted to secure the barrier relative to the frame

such that the barrier can be moved between an open position and a closed position.

5 7. A barrier apparatus according to claim 6 wherein the over centre mechanism includes an actuation lever positioned at or adjacent to a surface of the support member.

10 8. A barrier apparatus according to claim 7 wherein, when the barrier is in the closed position, it is immediately adjacent to said surface to prevent the lever from being moved sufficiently to move the engagement component from the operative position to the inoperative position.

15 9. A barrier apparatus according to any one of the preceding claims wherein the engagement component has a roughened free surface which is adapted to abut the barrier frame when the engagement component is in the operative position, so as to facilitate frictional engagement with the barrier frame.

20 10. A barrier apparatus according to any one of the preceding claims, including three said assemblies wherein two of the assemblies are adapted for their elongate barrier support members to form upright members of the apparatus and the third assembly is adapted for its elongate barrier support member to form a cross member of the apparatus, wherein the upright members are adapted to engage the cross member at opposite ends thereof.

25 11. A barrier apparatus according claim 10, wherein the upright members and the cross member are provided with interlocking means for enabling interlocking engagement between each upright member and the cross member.

30 12. A barrier apparatus according to any one of the preceding claims, wherein the apparatus includes the barrier.

13. A barrier apparatus according to claim 12, wherein said at least one connection means includes complementary connection formations on the barrier and at least one of the upright members for enabling connection of the barrier to, and support of the barrier on, the at least one upright member.

5

14. A barrier apparatus according to claim 13, wherein the connection formations on the barrier and at least one upright member together constitute at least one rotatable connection whereby, when the barrier is connected to the at least one upright member by the connection formations, the barrier is hinged to that member so as to be movable between a barrier open position and a barrier closed position.

10

15. A barrier apparatus according to any one of claims 12 to 14, wherein the barrier includes a pair of elongate upright frame structures and at least one elongate cross frame structure, wherein at least one of the cross frame structure and the pair of upright frame structures is longitudinally extendible.

15

16. A barrier apparatus according to claim 15, wherein each extendible frame structure includes at least two structure portions which are telescopically slidable relative to each other to effect said extension.

20

17. A barrier apparatus according to claim 16, wherein each extendible frame structure includes locking means for releasably locking the at least two structure portions in relation to each other to prevent relative sliding movement between the at least two structure portions.

25

18. A barrier apparatus according to claim 16, wherein the at least two structure portions include two outer structure portions and an inner structure portion interconnecting the outer structure portions, the inner structure portion being disposed at least partially within, and being telescopically slidable relative to, each outer structure portions.

30

Fig. 2

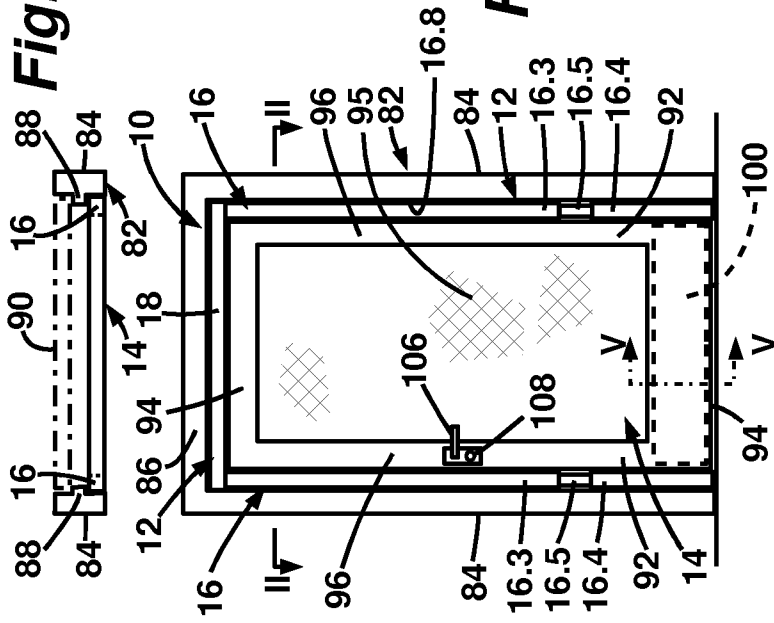


Fig. 1

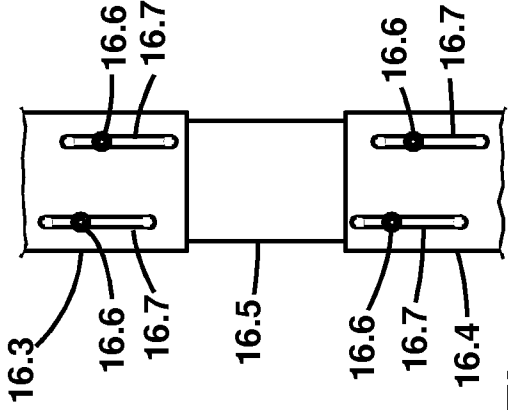


Fig. 4

Fig. 5

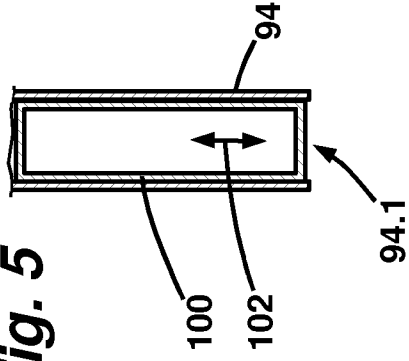
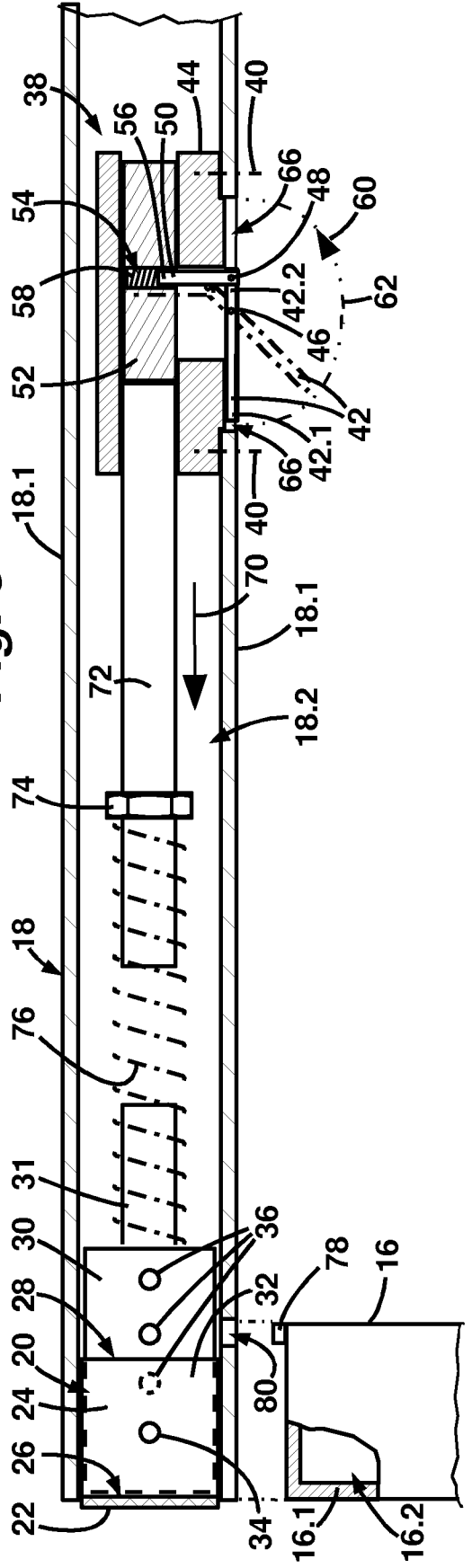


Fig. 3



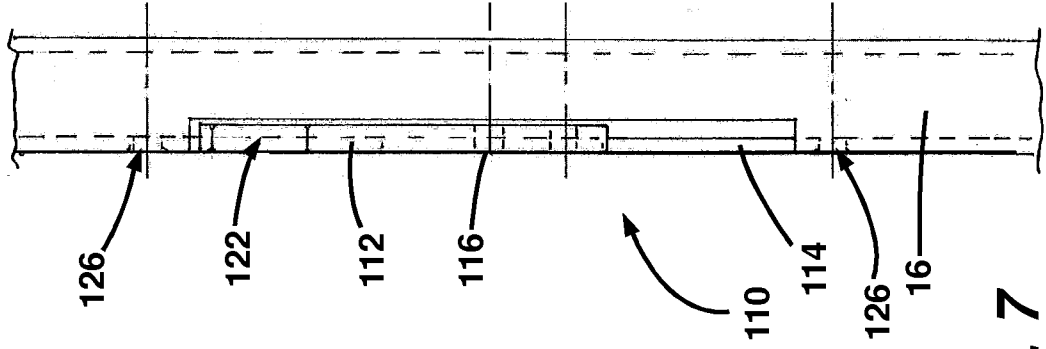


Fig. 7

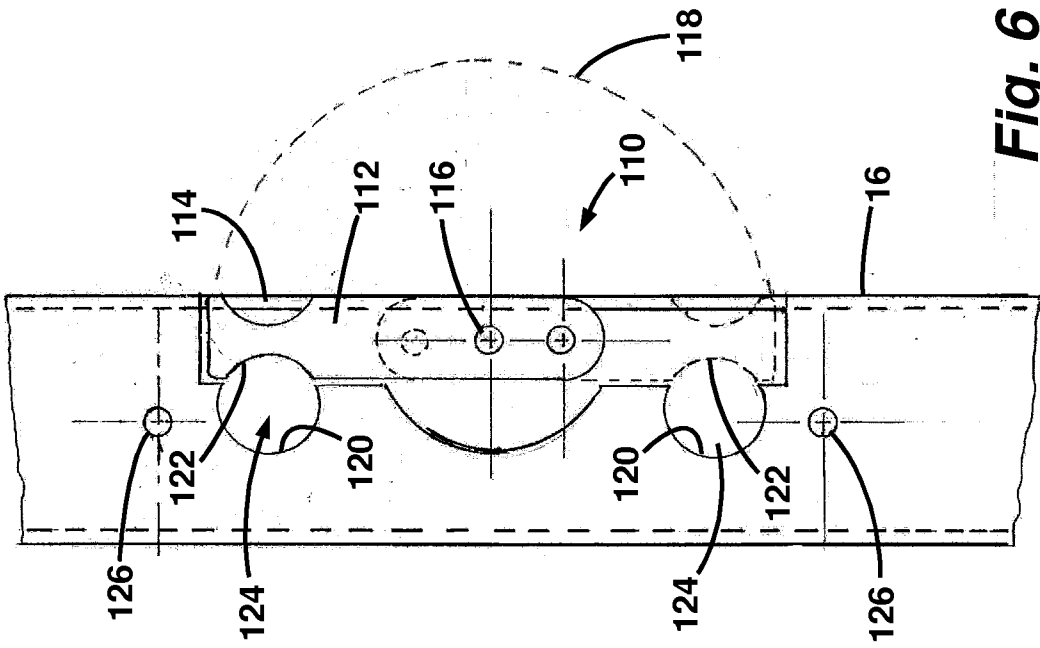


Fig. 6

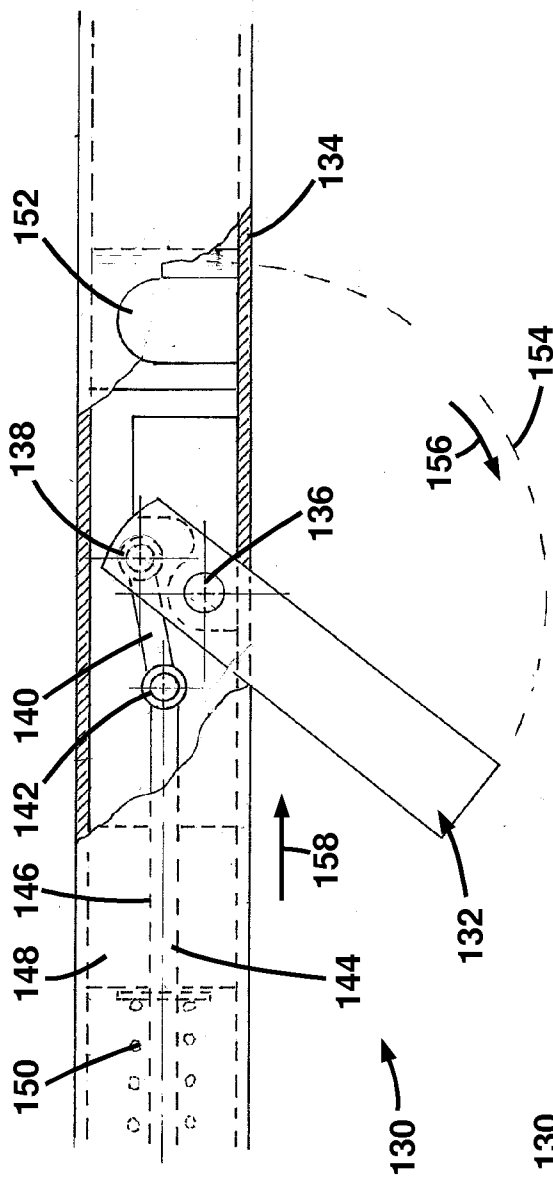


Fig. 8

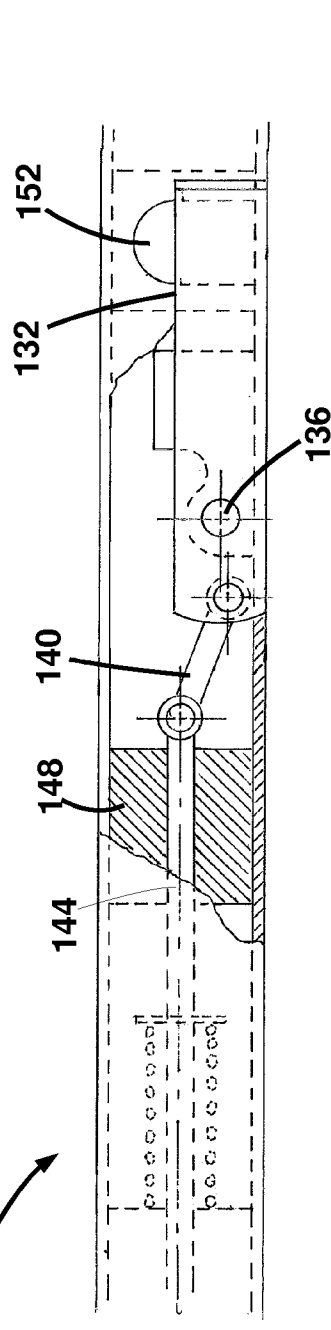


Fig. 9

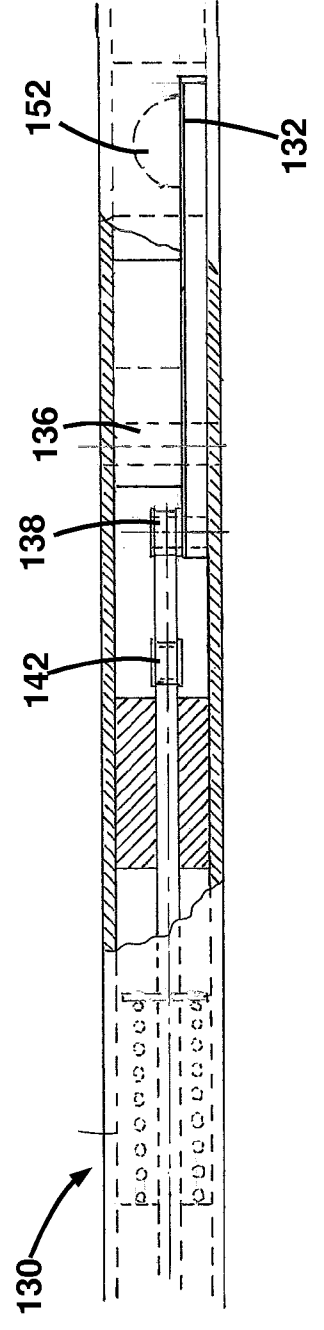


Fig. 10

