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

(11) Publication number: **0 342 164**
A2

(12) # EUROPEAN PATENT APPLICATION

(21) Application number: **89830182.5**

(51) Int. Cl.[4]: **E 05 B 65/08**

(22) Date of filing: **02.05.89**

(30) Priority: **09.05.88 IT 5312488**

(43) Date of publication of application:
15.11.89 Bulletin 89/46

(84) Designated Contracting States:
AT BE CH DE ES FR GB GR IT LI LU NL SE

(71) Applicant: **Nicoletti, Maria**
Corso Regina Margherita, 210
I-10144 Torino (IT)

(72) Inventor: **Nicoletti, Francesco**
Corso Regina Margherita, 210
I-10144 Torino (IT)

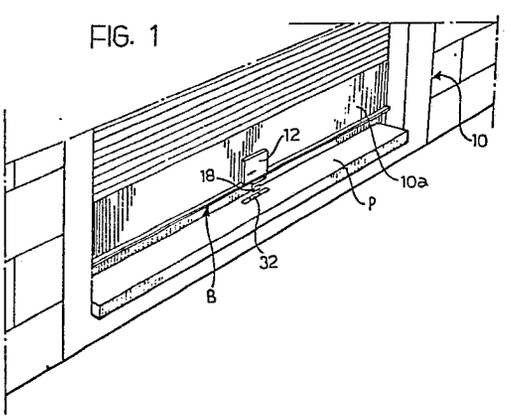
Pitzus, Mauro
Via Bianzé, 33
I-10143 Torino (IT)

(74) Representative: **Rambelli, Paolo et al**
Jacobacci-Casetta & Perani S.p.A. Via Alfieri 17
I-10121 Torino (IT)

(54) **Device for closing shutters and the like.**

(57) A closure device for shutters comprises a lock (12) which is fixed to the bottom of the shutter (10) and is provided with a movable, hook-shaped locking element (18) which projects downwards and is adapted to cooperate with a seat (32) formed in the sill (P).

FIG. 1



EP 0 342 164 A2

Description

A closure device for shutters and the like

The present invention relates to a closure device for windows and doors, particularly shutters, including a lock connected to a lower portion of the window or door.

Closure devices produced hitherto for shutters or for metal doorways with doors which pivot about intermediate horizontal axes include a lock fixed to the bottom of the door and adapted to drive a pair of horizontal slidable rods engageable in suitable seats formed in the frame to lock the door in the closed position.

Such known devices do not often afford an effective safeguard against attempts to force an entry by the levering apart of the lower edge of the window or door and the sill.

The object of the present invention is to provide a closure device of the type specified at the beginning of the description which has a considerably improved ability to resist any attempts to force the window or door open.

According to the invention, this object is achieved by virtue of the fact that the lock drives a hook-like locking element which projects vertically from the lower portion of the window or door, the locking element being movable between a first position for its insertion in a fixed seat which faces the lower portion of the window or door and a second position in which the locking element engages an abutment of the seat in order to prevent the opening of the window or door.

In the case of a shutter, the insertion of the locking element is achieved by the closure of the shutter itself, whilst in the case of a door which pivots about an intermediate horizontal axis (commonly known as "pivoting door") manual operating means are provided to make the locking element project (vertical movement) whereafter it is moved horizontally by the lock.

By virtue of the above characteristics, as well as being restrained laterally in correspondence with the horizontal rods, the window or door is restrained frontally by virtue of the presence of the hook-like locking element, so that any attempt to force an entry is made more difficult.

If the lock is fixed to the lower portion of a shutter, the fixed seat preferably comprises a cavity in the sill of the shutter with an aperture at the level of the sill for the insertion, by the downward movement of the shutter, of both the locking element and a security portion of the lock which projects vertically from the shutter.

The security portion thus cooperates with the locking element to prevent it from coming out of the seat laterally and therefore increases the security of the device.

Further characteristics and advantages according to the invention will become clear from the detailed description which follows with reference to the appended drawings, provided by way of non-limiting example, in which:

Figure 1 is a perspective view of a shutter provided with a device according to the invention,

Figure 2 is a partially-sectioned schematic front view of the device of Figure 1 in a first configuration,

Figure 3 is a view similar to Figure 2 and shows the device in a second configuration,

Figure 4 is a partially-sectioned, schematic front view of a second embodiment of the device in an inoperative configuration,

Figure 5 is a view similar to Figure 4 and shows the device in an operative configuration,

Figure 6 is an exploded perspective view of the device of Figure 4,

Figure 7 is a section taken on the line VII-VII of Figure 4,

Figure 8 is a partially-sectioned, schematic front view of a third embodiment of the device in a first configuration, and

Figure 9 is a view similar to Figure 8 and shows the device in a second configuration.

With reference to Figures 1-3, a shutter or roller shutter is generally indicated 10 and is provided with a lower portion 10a to which is fixed a lock 12, for example of the lever type, which, in known manner, drives two horizontal rods 14 adapted to engage suitable lateral seats (not shown) provided in correspondence with the jambs of the shutter.

The lock 12 includes a bolt 16 to which is fixed a locking element 18 provided with guide slots 20 for enabling it to slide transversely relative to pins 22 fixed to the lock 12.

The locking element 18 is in the form of an L-shaped hook and has a vertical rod-like portion 18a and an end portion 18b which is at 90° to the rod-shaped portion 18a.

The lock 12 has a tubular appendage 13 of quadrangular cross-section which projects below the edge B of the shutter 10 and within which the rod-shaped portion 18a of the locking element 18 can slide transversely. The dimensions of the tubular appendage 13 and the rod 18a are such as to enable the locking element 18 to be guided in its sideways movement, as will become clear from the following description.

Below the shutter 10, there is a sill P which faces the edge B of the shutter and defines a seat 26 for housing and retaining a hollow metal body 28 with an upper wall 28a which is substantially flush with the sill P. The hollow body 28 is provided with triangular lateral appendages 30 which cooperate with the material C of the sill P, (for example cast concrete) in order to prevent the hollow body 28 from coming out of the sill P.

The upper wall 28a of the hollow body 28 has a rectangular aperture 32 whose shape corresponds substantially to that of the tubular appendage 13 of the lock 12.

In the configuration shown in Figure 1, the lock 12 is open, with the locking element 18 and the tubular appendage 13 projecting frontally from the edge B of

the lower portion 10a of the shutter. When the shutter 10 is lowered (Figure 2), the tubular appendage 13 and the locking element 18 enter the aperture 32 of the hollow body 28 which is fixed to the sill P (Figure 2). After this insertion, the operation of the lock 12 by means of a suitable key (not illustrated) causes both the sliding of the rods 14 in opposite directions and the transverse sliding of the locking element 18 which is attached to or integral with the bolt 16 (Figure 3). This transverse movement causes the end portion 18b of the locking element 18 to be inserted in the undercut beneath the upper wall 28a of the hollow body 28, preventing the raising of the shutter 10. Since it is engaged in the aperture 32, the tubular portion 13 of the lock 12 prevents any movements of the shutter due to an attempt to force it open by trying to move the lower portion 10a of the shutter 10 sideways to release the hooked end 18b of the locking element 18 from its engagement with the upper wall 28a of the hollow body 28. When the shutter is in the locked configuration shown in Figure 3, two lateral notches 15 and 17 of the locking element 18 cooperate with fixing pins F of the lock 12 to increase the security of the lock against a forced entry.

In order to prevent foreign bodies or dirt from entering the hollow body 28 through the aperture 32 when the shutter 10 is open, the hollow body 28 has a shaped closure plate 36 which is slidable within the body and has a raised portion 36a whose shape corresponds to that of the rectangular aperture 32. The plate 36 is urged upwards by a helical spring 38 interposed between the plate and a bottom wall 40 of the hollow body 28. It is clear that, when the locking element 18 is inserted in the aperture 32, the shaped plate 36 is pushed downwards against the action of the helical spring 38.

Figures 4-7 show a second embodiment of the device according to the invention, in which elements similar to those shown in Figures 1-3 are indicated by the same reference numerals.

This embodiment of the device is particularly suitable for use with doors which pivot about intermediate horizontal axes. The lower portion of such a door is indicated 40 and, in the closed configuration, its lower edge B faces the sill P. The lock 12, which is fixed at the bottom of the door 40, differs from that previously described in that it has no tubular appendage projecting from the edge B of the door and is provided with manual operating means 41 for enabling the locking element 18 to slide vertically in a guide 42 of the bolt 16. The levers of the lock, which are of known type, are indicated 43.

The means 41 for causing the vertical sliding of the locking element 18 comprise a sprocket 45 which is mounted in the lock for rotation about an axis X-X perpendicular to the direction of sliding of the bolt 16, and is adapted to cooperate with a set of teeth 47 provided on the side of the locking element 18.

A retaining member 48 is interposed between the pin 45a of the sprocket 45 and the lock and comprises a ball 48a which is acted upon by a compression spring 48b and is adapted to cooperate with a hemispherical seat 49 formed in the pin 45a so as resiliently to keep the locking element 18 in a raised position. The pin 45a of the sprocket 45 also has a central hole of polygonal cross-section for enabling the insertion of an end 50 of a releasable control lever 51.

In order to enable the correct engagement of the sprocket 45 and the set of teeth 47, as well as the correct vertical sliding of the locking element 18 in the guide 42, a spring 53 is interposed between the guide 42 and the locking element 18 for urging the locking element 18 resiliently towards a side wall of the guide 42 adjacent the sprocket 45.

In the configuration shown in Figure 4, in which the locking element 18 is in the raised position, the door 40 can be pivoted without any danger of interference between the end portion 18b of the locking element 18 and sill P. When the door 40 is in the vertical configuration, the user rotates the operating lever 51 to make the locking element 18 descend. This configuration, which is intermediate the configurations shown in Figures 4 and 5, corresponds to the configuration shown in Figure 2 with reference to the first embodiment, and enables the subsequent sideways movement of the locking element 18 by the sliding of the bolt 16. In the locked configuration shown in Figure 5, the locking element 18 is fast with the lock 12 both by virtue of the engagement between the end of a recess 55 of the locking element and a corresponding pin 56 of the bolt 16, and because of the engagement of the notches 15 and 17 of the locking element 18 with the fixing pins F of the lock 12.

The embodiment shown in Figures 8-9 is a variant of the first embodiment (Figures 1-3), in which the tubular appendage 13 of the lock 12, which projects below the edge B of the shutter 12, has been replaced by a vertical pin 24 which projects below the lower edge B of the shutter and is adapted to cooperate with a circular hole 34 formed beside the rectangular aperture 32 of the hollow body 28.

The advantages of the device of the invention relating essentially to its greater security against attempts to force an entry are clear from the above description. With particular reference to the embodiment shown in Figures 4-7, it is important to note that any attempts to force the levers 43 of the lock 12 do not affect the security of the device.

Moreover, the solution relating to this embodiment may be used to advantage for normal shutters and for doors which pivot about horizontal axes, with the advantage that there are no elements projecting from the lower edge of the shutter and greater security against forced entry is ensured.

Claims

1. A closure device for windows and doors, particularly shutters, including a lock connected to a lower portion of the window or door, characterised in that the lock (12) drives a hook-like locking element (18) which projects vertically from the lower portion (10a, 40) of the window or door (10, 40), the locking element (18) being movable between a first position for its insertion in a fixed seat (28, 32) which faces

the lower portion (B) of the window or door (10, 40) and a second position in which the locking element (18) engages an abutment (28a) of the seat (28) in order to prevent the opening of the window or door (10, 40).

2. A device according to Claim 1, in which the lock is fixed to the lower portion of a shutter (10), characterised in that the fixed seat comprises a cavity (28) in the sill (P,C) of the shutter (10) which has an aperture (32) at the level of the sill (P) for the insertion, by the downward movement of the shutter (10), of both the locking element (18) and a security portion (13, 24) of the lock (12) which projects vertically from the shutter (10).

3. A device according to Claim 1, characterised in that the locking element (18) is connected to the bolt (16) of the lock (12).

4. A device according to Claim 2, characterised in that the locking element (18) has a rod-like portion (18a) and an end portion (18b) bent at 90° to the rod-like portion (18a) and having dimensions which correspond substantially to those of the aperture (32) of the seat (28).

5. A device according to Claim 4, characterised in that the security portion (13) of the lock is in the form of a tube within which the rod-like portion (18a) of the locking element (18) can move horizontally.

6. A device according to Claim 1, particularly for the closure of a door (40) which pivots about a horizontal axis, characterised in that the locking element (18) can also move vertically between an inoperative position in which it does not project beneath the door (40) and an extended position which corresponds to the said first position.

7. A device according to Claim 6, characterised in that the locking element (18) is mounted for transverse sliding relative to the bolt (16) of the lock, manual operating means (41, 51) being interposed between the lock and the locking element (18) for causing the locking element (18) to move vertically when the latch is in a retracted configuration.

8. A device according to Claim 7, characterised in that the operating means comprise a sprocket (45) which is rotatable relative to the lock (12) and is adapted to cooperate with a set of fixed teeth (47) at the side of the locking element (18).

9. A device according to Claim 3, characterised in that the locking element (18) is integral with the bolt (16) of the lock (12).

10. A device according to Claim 1, characterised in that a vertical pin (24) is connected to the lower portion (10a) of the shutter (10) and corresponds to an auxiliary seat (34) which faces the lower portion (10a) of the shutter (10), the pin (24) being adapted to be inserted in the auxiliary seat (34) by the downward movement of the shutter (10) to restrain the shutter (10) laterally.

FIG. 1

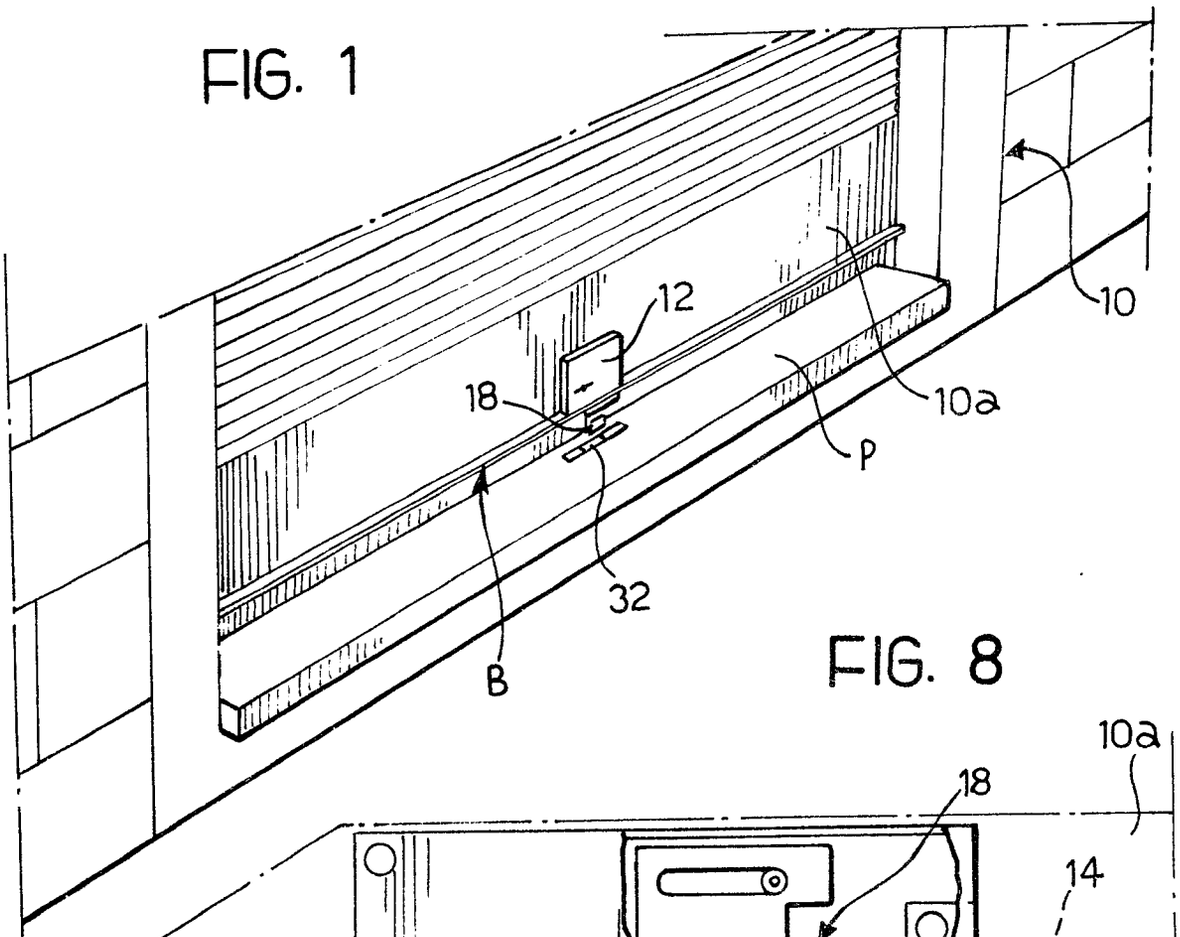

12
10
18
10a
P
32
B

FIG. 8

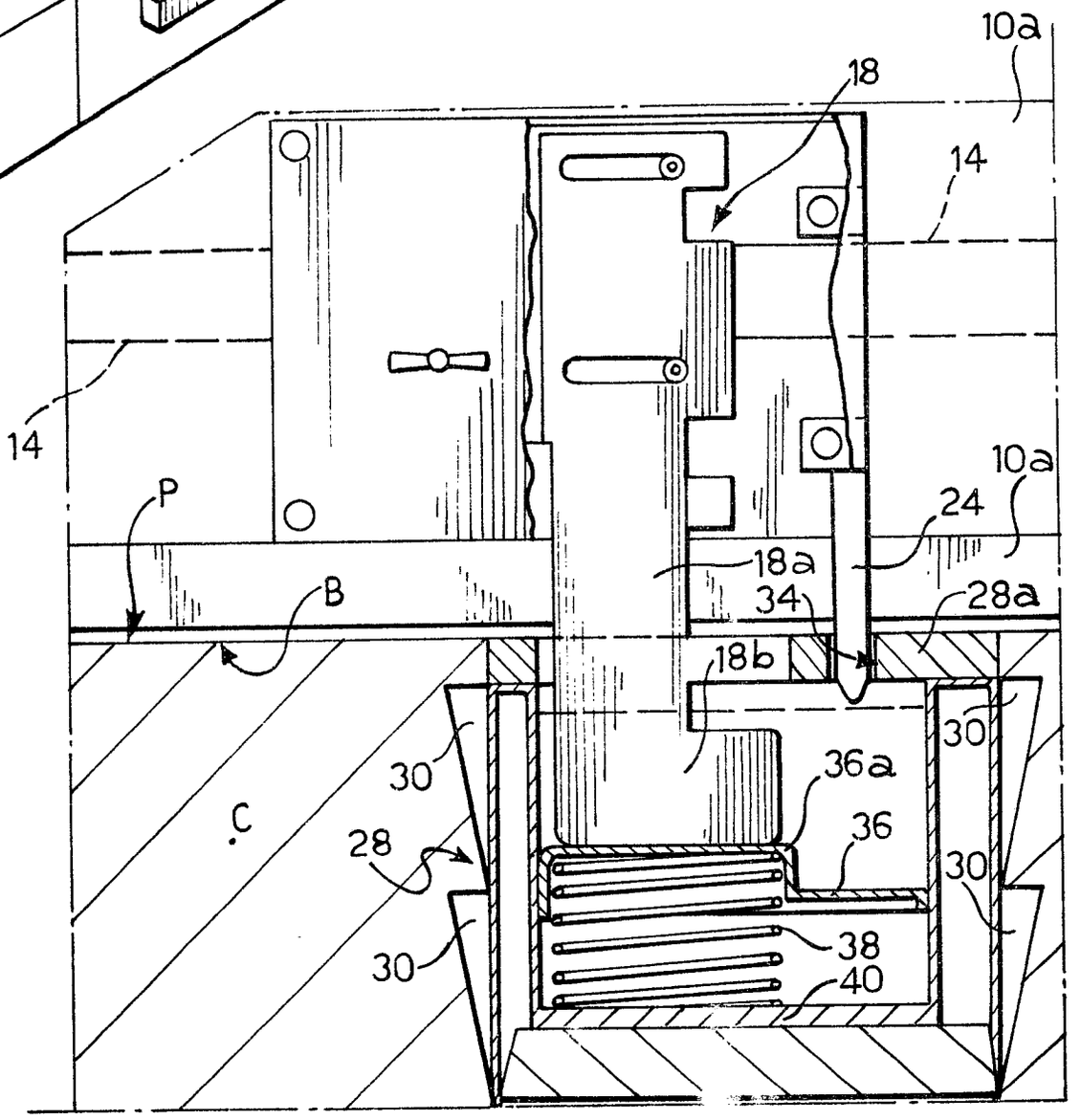

10a
18
14
14
P
10a
24
18a
B
34
28a
18b
30
30
36a
C
36
28
30
38
40

FIG. 3

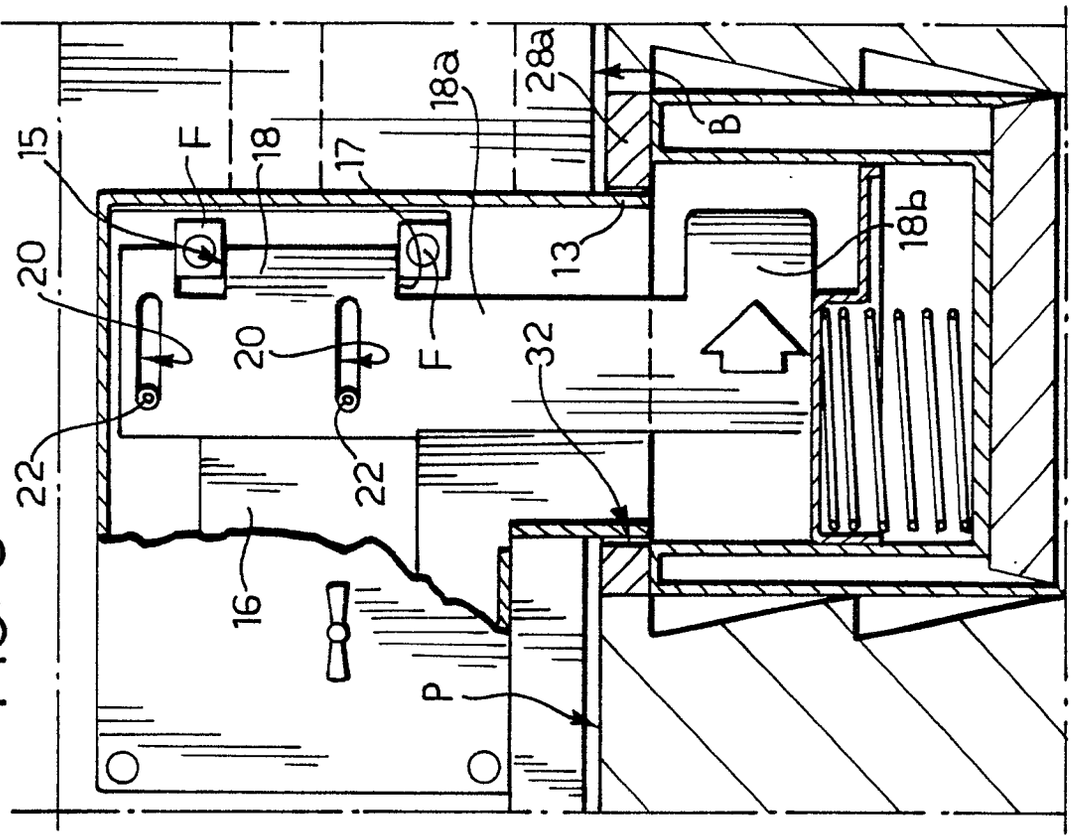
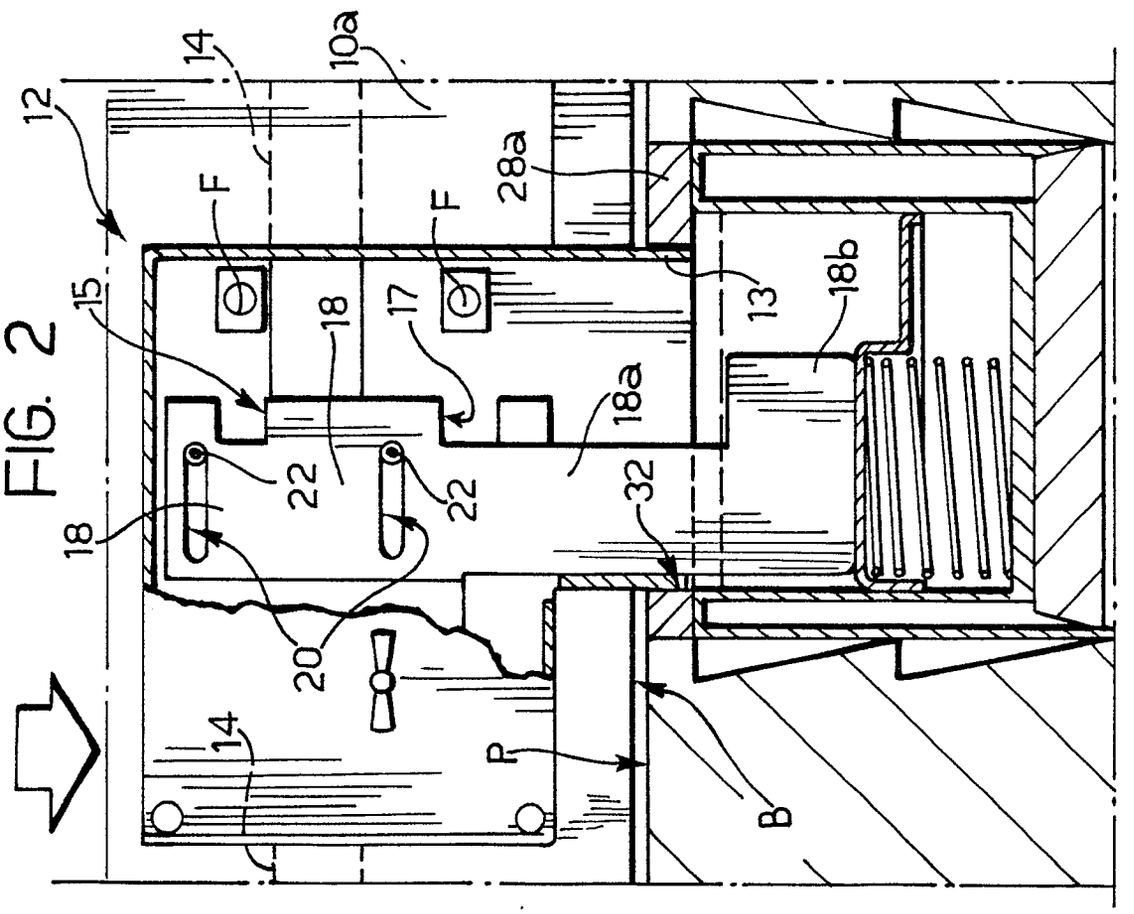

15
F
18
17
18a
28a
B
20
13
18b
20
F
32
22
22
16
P

FIG. 2


12
14
10a
F
F
28a
15
18
17
13
18b
18a
22
22
32
18
20
14
R
B

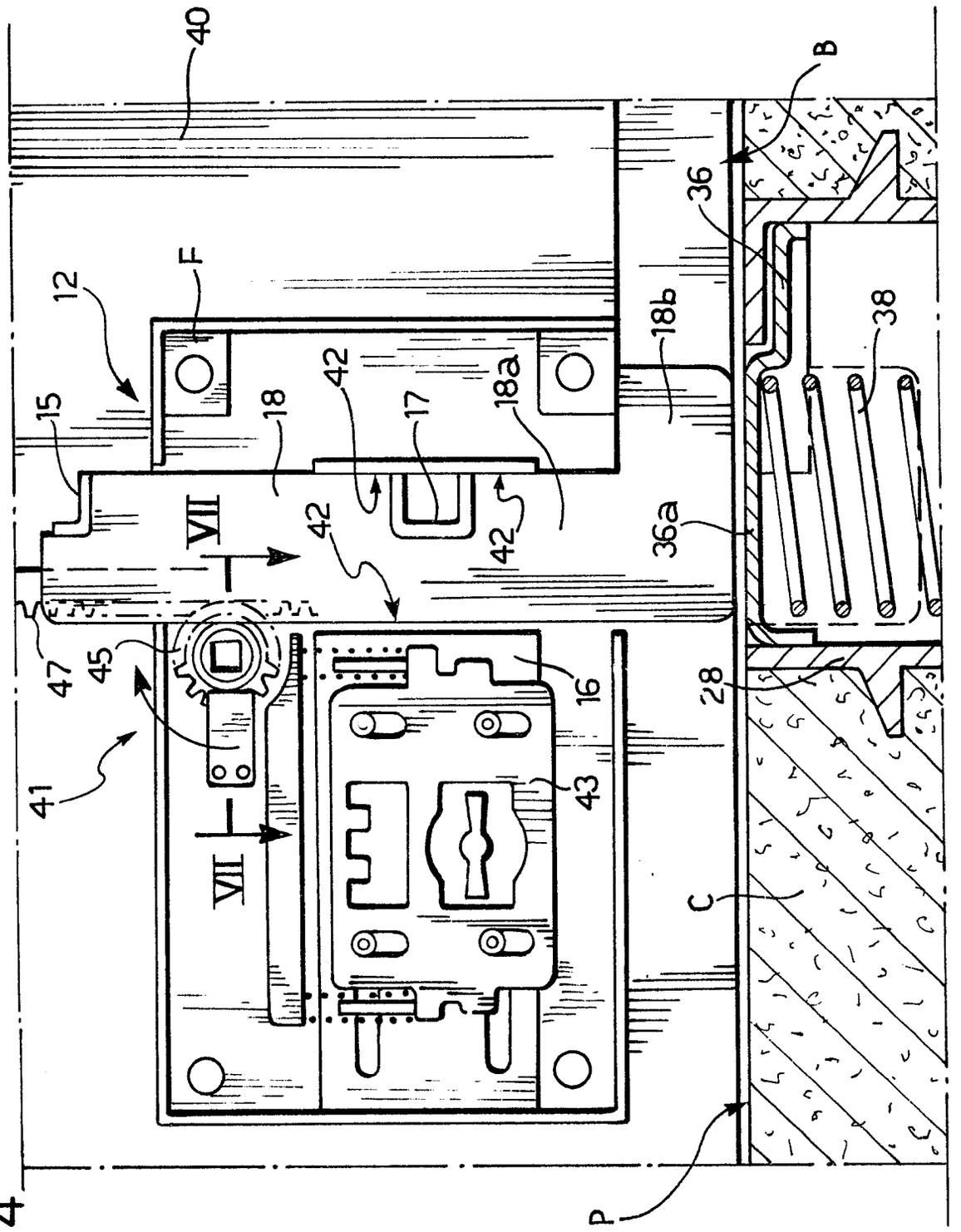

40
B
36
F
12
18b
38
15
18
42
17
18a
VII
42
42
36a
47
45
16
28
41
43
VII
C
P

FIG. 4

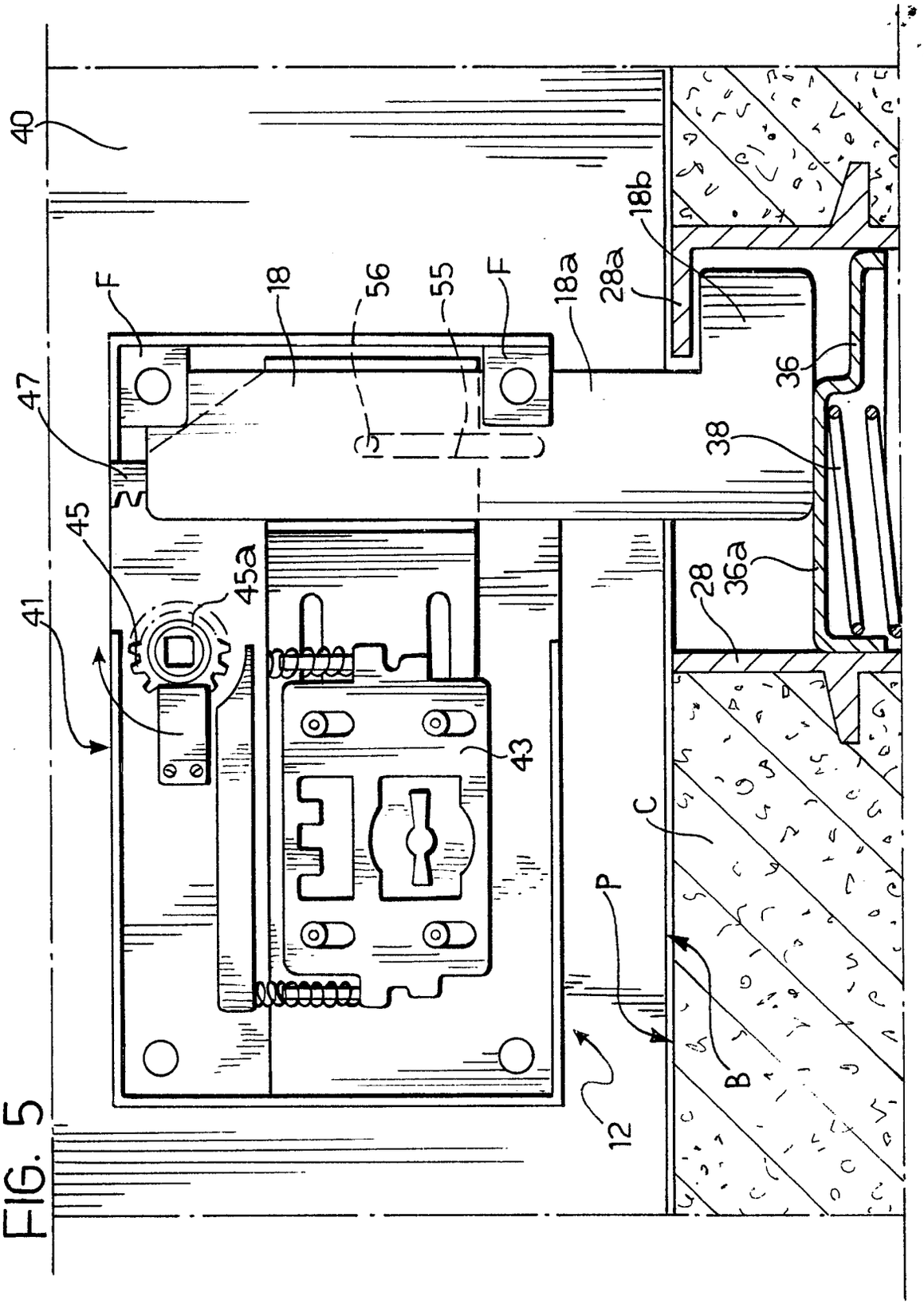


FIG. 5

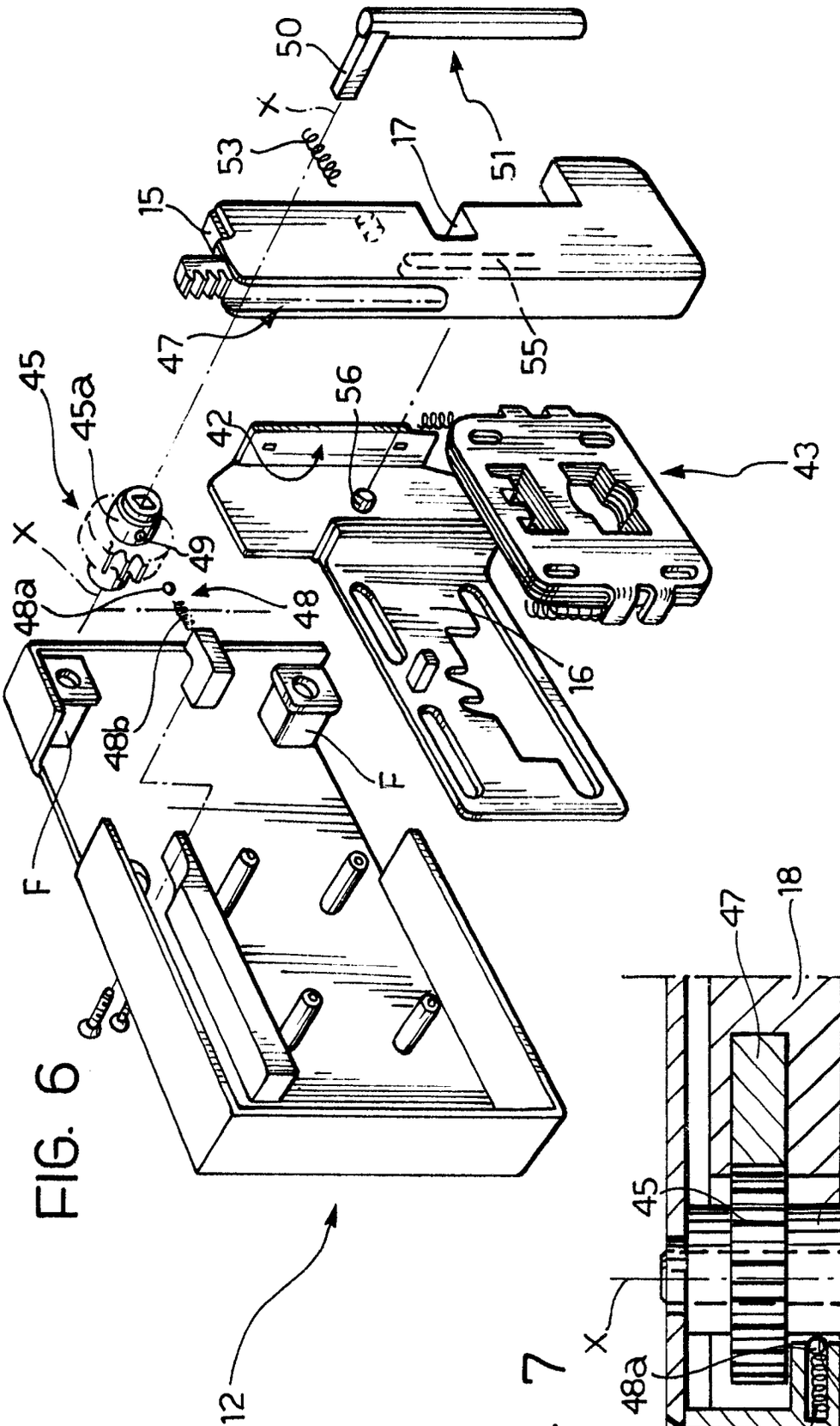

50
X
53
17
51
15
47
55
45
45a
56
42
43
X
49
48a
48
16
48b
F
F
12

FIG. 6

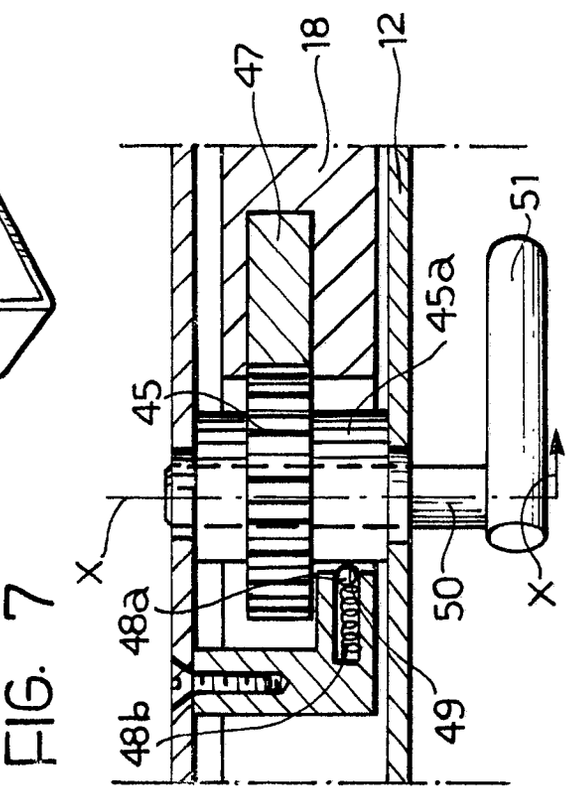
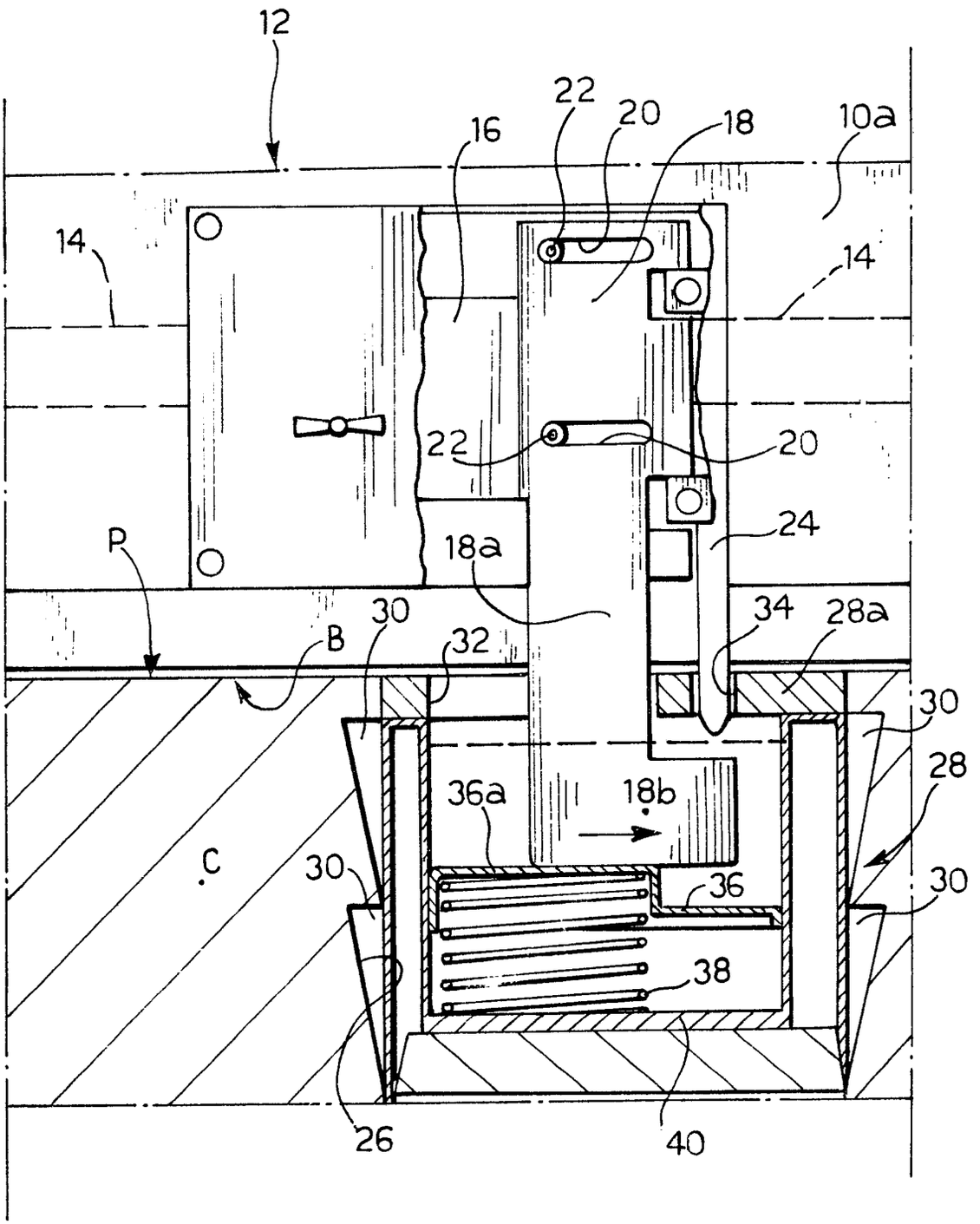

47
18
12
51
45a
45
X
48a
48b
50
X
49

FIG. 7

FIG. 9


12
16
22
20
18
10a
14
14
22
20
24
18a
P
B
30
32
34
28a
30
28
36a
18b
C
30
36
38
30
26
40