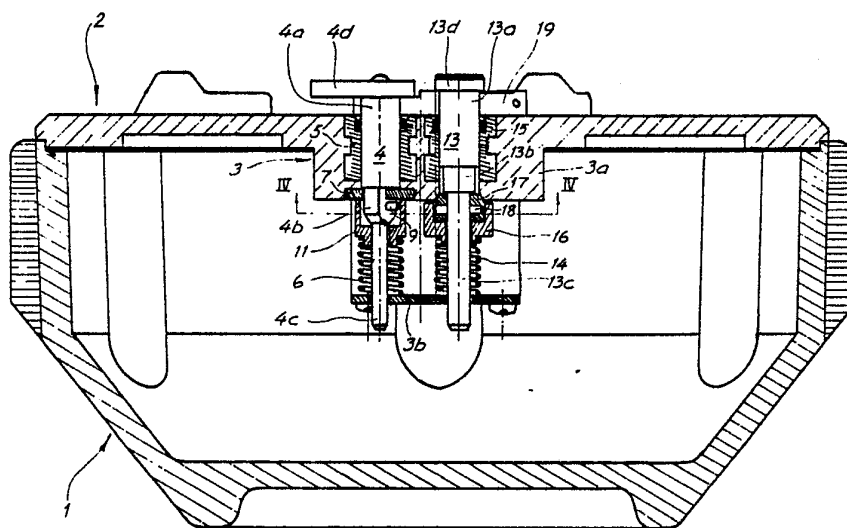




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁴ : F42B 23/22	A1	(11) International Publication Number: WO 87/ 07710 (43) International Publication Date: 17 December 1987 (17.12.87)
(21) International Application Number: PCT/SE87/00259 (22) International Filing Date: 25 May 1987 (25.05.87) (31) Priority Application Number: 8602480-9 (32) Priority Date: 2 June 1986 (02.06.86) (33) Priority Country: SE (71) Applicant (for all designated States except US): AFFÄRSVERKET FFV [SE/SE]; S-631 87 Eskilstuna (SE). (72) Inventors; and (75) Inventors/Applicants (for US only): OLOFSSON, Göran [SE/SE]; Post Box 2014A, S-635 06 Eskilstuna (SE). ANDERSSON, Tord [SE/SE]; Årbygatan 1B, S-633 45 Eskilstuna (SE). (74) Agent: NYDELL, Peder; Nydells Patentbyrå, Storgatan 57, S-392 31 Kalmar (SE).		(81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), LU (European patent), NL (European patent), SE (European patent), US. Published <i>With international search report.</i>

(54) Title: A MECHANISM FOR PRACTICE MINES**(57) Abstract**

A mechanism assembly for a practice mine, comprising a mine body (1) being mounted thereon a housing (3) which incorporates an axially movable and axially rotatable arming plunger (4) which can be manually depressed from outside the mine in a manner to produce an arming movement which simulates a desired arming function of the mine. The mechanism assembly incorporates a release plunger (13) which can be depressed manually from outside the mine and which is arranged for operative co-action via a catch plate (7) and a locking device (16) with the arming plunger in a manner to influence the arming movement of the arming plunger.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	FR	France	ML	Mali
AU	Australia	GA	Gabon	MR	Mauritania
BB	Barbados	GB	United Kingdom	MW	Malawi
BE	Belgium	HU	Hungary	NL	Netherlands
BG	Bulgaria	IT	Italy	NO	Norway
BJ	Benin	JP	Japan	RO	Romania
BR	Brazil	KP	Democratic People's Republic of Korea	SD	Sudan
CF	Central African Republic	KR	Republic of Korea	SE	Sweden
CG	Congo	LI	Liechtenstein	SN	Senegal
CH	Switzerland	LK	Sri Lanka	SU	Soviet Union
CM	Cameroon	LU	Luxembourg	TD	Chad
DE	Germany, Federal Republic of	MC	Monaco	TG	Togo
DK	Denmark	MG	Madagascar	US	United States of America
FI	Finland				

A Mechanism for Practice Mines

TECHNICAL FIELD

The present invention relates to a mechanism assembly intended for practice mines of the kind which are intended to simulate a live mine and which comprise a mine body, the mechanism assembly comprising a mechanism housing mounted on the mine body and incorporating an axially movable and axially rotatable arming plunger which can be depressed manually from outside the mine, to obtain there-
with an arming movement which simulates a desired arming function of the mine, and which further incorporates an axially movable release piston which can be depressed from outside of the mine and which is arranged to co-act oper-
atively with the arming plunger in the depressed position thereof, in a manner to influence the arming movement of the plunger.

PRIOR ART

With practice or training mines of this kind the torque prevailing at the terminal positions of the axially rotatable arming plunger is taken up by a cylindrical locking pin that passes through a hole extending radially through the arming plunger. It has been found, however, that repeated arming and disarming of the mechanism is liable to result in wear on the hole, such that the pin will not be held firmly therein, due to the resultant clearance between the pin and the hole-defining surfaces, with the accompanying risk that the pin may loosen and fall away.

Another drawback with known practice mines of this kind is that the provision of the grooves required in the mechanism housing to accommodate and guide the terminal positions of the pin is both difficult and extensive.

DISCLOSURE OF THE INVENTION

The object of the invention is therefore to provide a mechanism of the aforesaid kind which will function more reliably than the known mechanism, even after being repeatedly armed and disarmed, and which can be manufactured more readily than the aforesaid known mechanism. This object is achieved with a mechanism of the aforesaid kind that has the characterizing features set forth in Claim 1.

Further features of the invention are set forth in the depending claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention will now be described in more detail with reference to the accompanying drawings, which illustrate a preferred embodiment of the inventive mechanism assembly.

Figure 1 is a cross-sectional view of a practice mine fitted with the inventive mechanism assembly.

Figure 2 is a side view of an arming plunger incorporated in the mechanism assembly illustrated in Figure 1.

Figure 3 is a plan view of a catch plate incorporated in the mechanism illustrated in Figure 1.

Figure 4 is a cross-sectional view taken on the line IV-IV in Figure 1 and turned through 45° , and illustrates the arming plunger in a disarming or safe position.

Figure 5 is a cross-sectional view similar to that of Figure 4 but with the arming plunger shown in its arming position.

35

DESCRIPTION OF A PREFERRED EMBODIMENT

Figure 1 illustrates a substantially hemi-spherical, empty metallic mine body 1 of the kind which is conventionally found with anti-tank mines and which, in accordance with the invention, forms the mine body of a practice mine which is intended preferably to be laid in a horizontal position. The outwardly facing circular orifice of the mine body is covered with a conventional metal cover member 2, the centrally located part of which, however, is modified in accordance with the invention to form a housing 3 which accommodates the inventive mechanism. An axially rotatable metallic arming plunger 4 is mounted for axial movement in a bush 5 located in an outer wall 3a of the housing 3, and can be depressed into the housing against the action of a first thrust or compression spring 6.

As will be seen more clearly from Figure 2, the arming plunger 4 consists of an elongated member having a first, cylindrical end-part 4a, which is mounted for axial movement in the bush 5, and intermediate part 4b, which has a rectangular shape in cross-section and which tapers at one end thereof remote from said first end-part 4a into a cylindrical second end-part 4c of smaller diameter of the first mentioned end-part 4a.

A metal catch plate 7 (c.f. also Figure 3) is non-rotatably connected with the intermediate part 4b of the plunger 4 and extends transversely in relation thereto. In the case of the illustrated embodiment (c.f. in particular Figures 1 and 3) the non-rotatable connection is achieved through the combination of a non-round aperture provided in the catch plate 7, in the illustrated embodiment an essentially elongated rectangular aperture 8, and an intermediate plunger-part 4b which is of corresponding non-round shape and passes freely through said aperture. The catch plate 7 is held axially in place

on the intermediate part 4b of the plunger 4 through the abutment of its one, upper side with the bottom surface of the end-part 4a, which therewith forms a supporting shoulder, and through the supporting action of a locking
5 pin 9 which is passed through a hole 10 located in the intermediate part, on the under side of the catch plate.

The second end-part 4c of the arming plunger 4 is displaceable axially through a hole located in an inner wall
10 3b of the housing 3. The spring 6 therewith encircles the second end-part 4c of the plunger, with the lower end of the spring supported against the radially inner wall 3b of the housing. The upper end of the spring 6 bears forcibly against one end of a bearing sleeve 11 which fits over the
15 second end-part 4c of the plunger and is movable axially therealong. The other end of the sleeve abuts the under-surface of the catch plate 7. The uppersurface of the catch plate 7 is engaged in a horizontally positioned catch plate groove or channel 12 (c.f. Figure 4) provided
20 in the inwardly facing surface of the radially outer wall 3a of the housing 3 (Figure 1), the spring 6 thus striving to hold the catch plates 7 firmly in the groove 12.

As illustrated, the groove 12 is inclined at an angle γ of
25 about 45° towards a metallic release plunger 13, for reasons hereinafter made apparent. The release plunger 13 extends parallel with the arming plunger 4 and is mounted for axial movement in the outer wall 3a of the housing 3, depression of the release plunger into the housing being
30 effected against the action of a second thrust or compression spring 14.

Similar to the arming plunger 4, the release plunger 13 consists of an elongated member having a first cylindrical
35 upper end-part 13a, which is mounted for axial movement in a bush 15 provided in the outer wall 3a of the housing 3, a cylindrical intermediate part 13b of smaller diameter

than the end-part 13a, and a second cylindrical end-part 13c, a lower end-part, whose diameter is smaller than the diameter of the intermediate part 13b.

5 The second end-part 13c of the release plunger 13 is mounted for axial movement in a hole provided in the inner wall 3b of the housing 3. The spring 14 thus encircles the second end-part 13c of said release plunger and is held with the lower end of the spring in abutment with the
10 inner wall 3b of the housing and with the upper end of the spring bearing forcibly against the adjacent end of a first latching device, in the form of a locking sleeve 16 which is fitted over the second end-part 13c and is axially movable therealong.

15 The locking sleeve 16 accommodates a second latching device, in the form of a latching sleeve 17 having a conically bevelled upper end which abuts the outer wall 3a of the housing 3. The latching sleeve 17 is held in
20 position on the end-part 13c of the release plunger, by means of a locking pin 18 which is inserted through respective holes located in the end-part 13c and the latching sleeve 17, so as to extend transversely to the longitudinal centres thereof.

25 Unintentional or accidental depression of the arming plunger 4 and the release plunger 13 is prevented by a rod-shaped safety device 19 which when it is in its safe, transportation position lies between the upper surface of
30 the outer wall 3a of the housing 3 and the under surface of an arming device 4d, such as an arming lever, located on the arming plunger 4, and the under surface of a circular head 13d on the release plunger 13. The arming device 4d and the release head 13d thus constitute
35 actuating means by means of which the mine can be activated manually from outside the mine, so as to obtain the desired simulated arming function.

The mechanism operates in the following manner.

When the arming plunger 4 is depressed, by activating the arming lever 4d, the catch plate 7 is automatically moved
5 out of the catch-plate groove 12 located in the wall 3a of the housing 3. It is still not possible, however, to turn the lever 4d, due to the fact that in this position the catch plate is still in abutment with an edge part of the locking sleeve 16 on the release plunger 13, as a result
10 of the inclination of the groove 12. This latching action is clearly shown in Figure 4. However, by depressing the release head 13d, and therewith also the release piston 13, the release plunger is moved axially downwards so that the catch plate becomes free from the locking sleeve 16
15 and so that the bevelled surface on the latching sleeve 17 is located centrally opposite the catch plate 7 instead. The arming lever 4d can now be turned until the catch plate 7 has been rotated through about 90-95°, wherewith the catch plate is brought into contact with the bevelled
20 part of the latching sleeve 17. When the pressure on the release head 13d is removed, the spring 14 effects a wedging action which holds the catch plate 7 firmly against the bevelled part of the latching sleeve 17, as illustrated in Figure 5. The mine is now in its simulated
25 armed state.

The catch plate arrangement and the co-action of the catch plate 7 with the release plunger 13 provides a particularly reliable mechanism which can be armed and disarmed
30 repeatedly a great many times without malfunctioning.

In the illustrated embodiment the inventive mechanism forms part of a conventional lid or cover member of a mine body. Although not shown, the mechanism assembly may
35 alternatively form a separate unit which is mounted on the mine body or on the cover member thereof.

Claims

1. A mechanism assembly for a practice mine of the kind which is intended to simulate a live mine, comprising a mine body (1) having mounted thereon a housing (3) which
5 incorporates an axially movable and axially rotatable arming plunger (4) which can be depressed manually from outside the mine in order to obtain an arming movement which simulates a desired arming function of the mine, and which further comprises an axially movable release plunger
10 (13) which can be depressed manually from outside the mine and which is arranged to co-act operatively with the arming plunger in its depressed position in a manner to influence the arming movement of said plunger,
c h a r a c t e r i z e d by a catch plate (7) which is
15 non-rotatably connected to the arming plunger (4) and which is held firmly in latching position in said housing (3a) by means of a spring (6) such as to prevent rotation of the arming plunger to a simulated armed position, and which against the action of said spring can be brought out
20 of said latching position as a result of said depression of the arming plunger; and in that the release plunger (13) presents a locking device (16) which when the release plunger is in its non-depressed position is located in said operative co-action with the catch plate in the
25 depressed position of the arming plunger, so as to prevent axial rotation of said plunger, but which in the depressed position of the release plunger has relinquished its operative co-action with the catch plate, therewith to permit the catch plate to rotate to the simulated armed
30 position.
2. A mechanism assembly according to Claim 1,
c h a r a c t e r i z e d in that the locking device (16)
is held in said operative co-action by means of a second
35 spring (14).

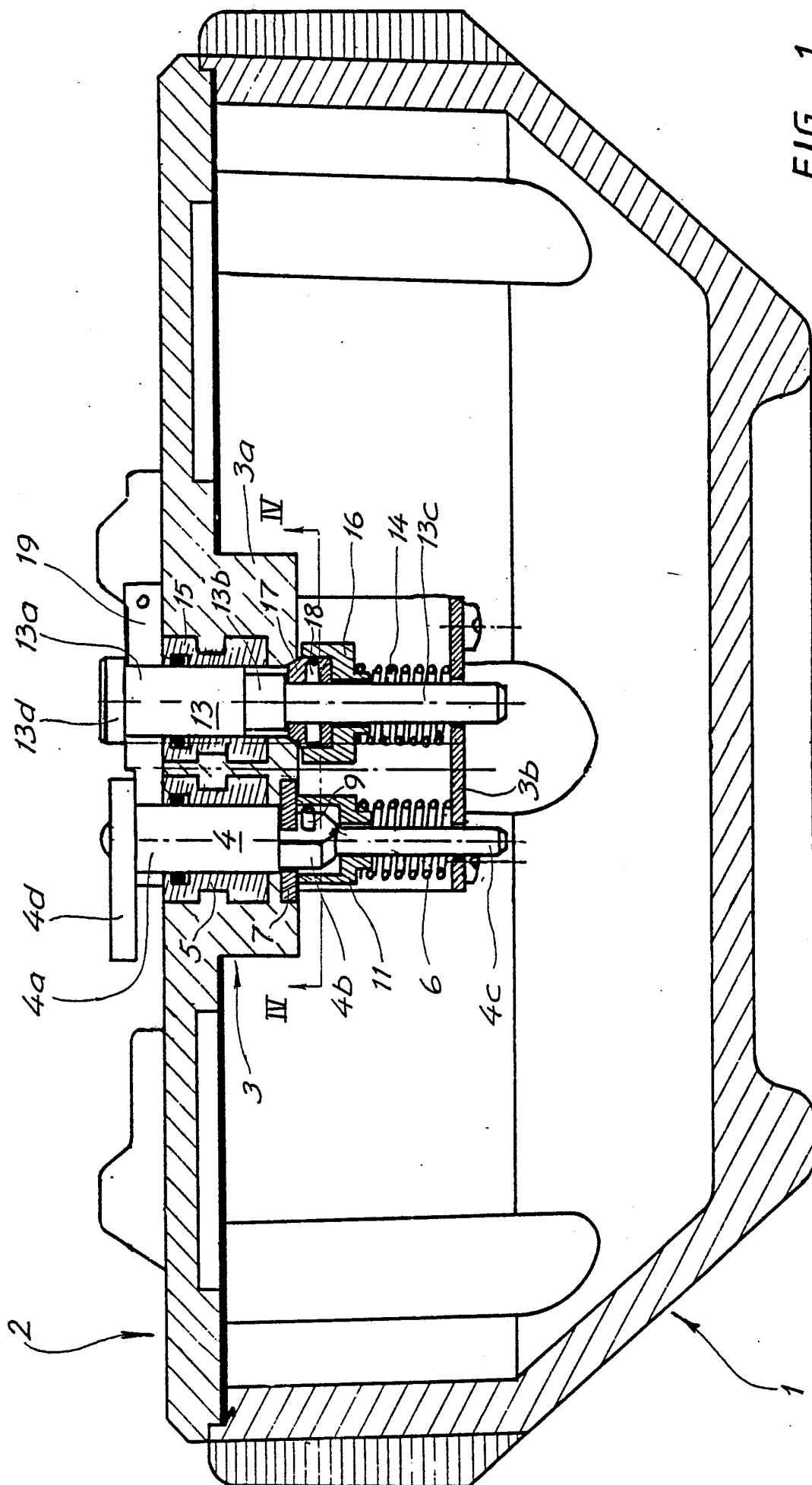
3. A mechanism assembly according to any of the preceding Claims, characterized in that said non-rotatable connection is obtained through the combination of a non-round aperture provided in the catch plate (7), preferably an elongated rectangular hole (8), and an intermediate plunger-part (4b) having a corresponding non-round cross-sectional shape and extending freely through said aperture, the catch plate being held on said intermediate part of the arming plunger by means of a locking pin (9) inserted therethrough.

4. A mechanism assembly according to any of Claims 2-3, characterized in that the release plunger (13) presents a second latching device (17) which endeavors to hold the catch plate (7) in the armed position under the action of the second spring (14).

5. A mechanism assembly according to Claim 4, characterized in that the second latching device consists of a conical part on a cylindrical sleeve (17) extending over the release plunger (13).

6. A mechanism assembly according to Claim 5, characterized in that the sleeve (17) is gripped firmly by the second spring (14) on the release plunger (13c) with the aid of a locking pin (18) extending through said release plunger.

7. A mechanism assembly according to any of the preceding claims, characterized by a transportation safety device (19) operative in preventing depression of the arming and release plungers (4 and 13 respectively).



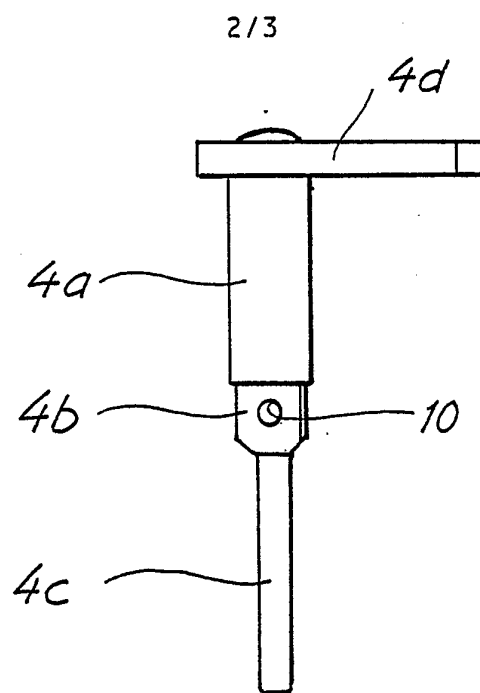


FIG. 2

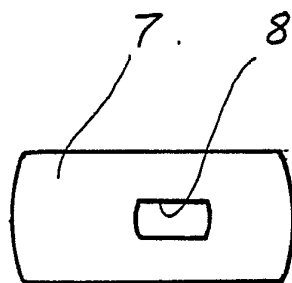
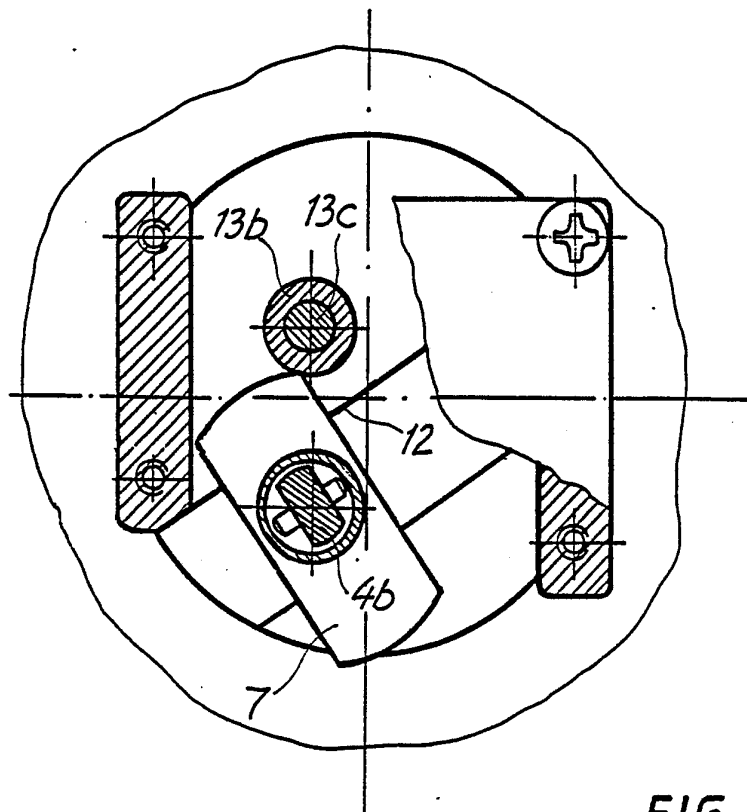
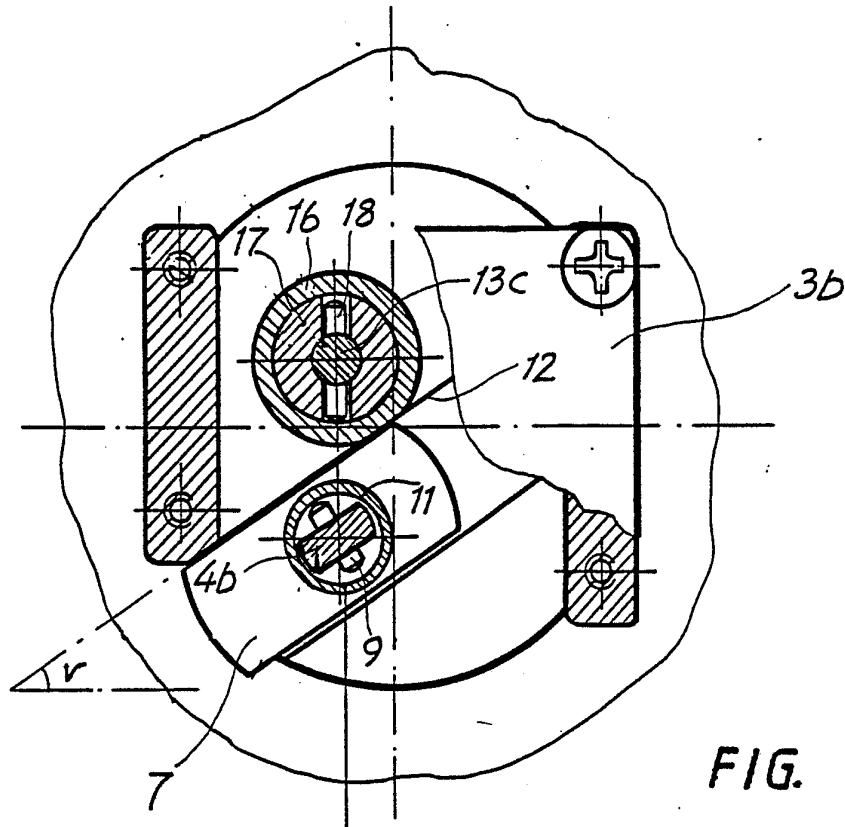
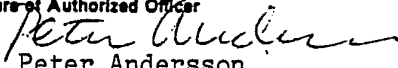


FIG. 3



INTERNATIONAL SEARCH REPORT

International Application No PCT/SE87/00259

I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶		
According to International Patent Classification (IPC) or to both National Classification and IPC ⁴ F 42 B 23/22		
II. FIELDS SEARCHED		
Minimum Documentation Searched ⁷		
Classification System	Classification Symbols	
IPC 4	F 42 B 23/00, /22, /24	
US C1	434: 24; 102: 407	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched ⁸		
SE, NO, DK, FI classes as above		
III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹		
Category ⁹	Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²	Relevant to Claim No. ¹³
A	GB, A, 2 165 928 (HONEYWELL LEAFIELD LTD) 23 April 1986	
A	EP, A1, 0 119 383 (NICO-PYROTECHNIK HANNS-JÜRGEN DIEDERICHs GMBH & CO) 29 September 1984	
¹⁰ Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art. "A" document member of the same patent family		
IV. CERTIFICATION		
Date of the Actual Completion of the International Search		Date of Mailing of this International Search Report
1987-08-14		1987-08-21
International Searching Authority		Signature of Authorized Officer
Swedish Patent Office		 Peter Andersson