



EUROPEAN PATENT APPLICATION

Application number: **93203122.2**

Int. Cl.⁵: **E01F 13/00**

Date of filing: **09.11.93**

Priority: **10.11.92 IT MI920975 U**

Date of publication of application:
18.05.94 Bulletin 94/20

Designated Contracting States:
**AT BE CH DE DK ES FR GB GR IE IT LI LU MC
 NL PT SE**

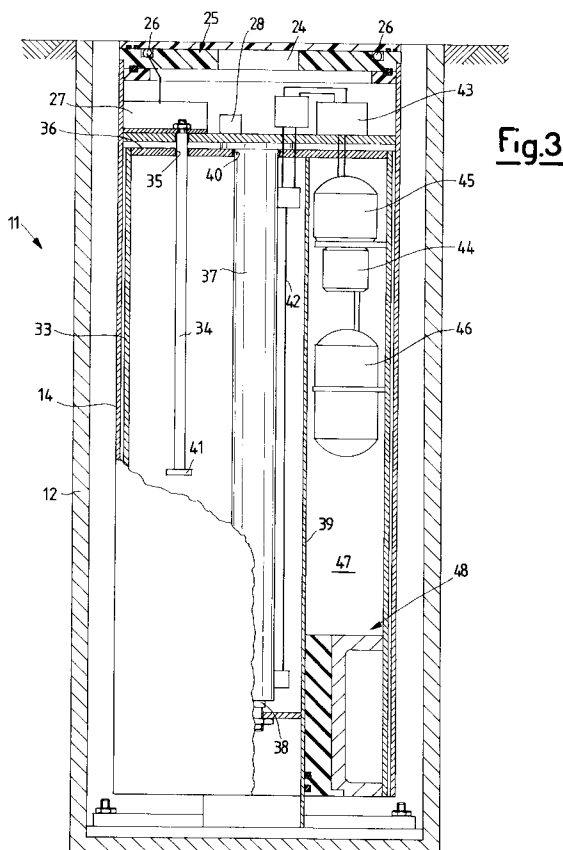
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Disappearing post.

A disappearing post suitable for being housed inside a hole excavated in the ground, comprising an external cylindrical element (14) which acts as the true post, liftable and sinkable by means of a relevant actuator (10, 16-19 and 21; 29; 37; 61; 69), both housed inside an external casing (12) suitable for being installed inside said excavated hole, inside which the actuator (10, 16-19 and 21; 29; 37; 61; 69) is completely contained inside the external cylindrical element (14), with a signalling unit (25) being furthermore provided inside a top cover element (24) for the external cylindrical element (14).



The present invention relates to a disappearing post.

At present, several types of posts are known, which can be used in order to bound parking places for prevent the access to ways and routes, even for temporary purposes only. Inasmuch as, many times such areas have to be closed or bounded only during a determined time period during the day, in order not to be obliged to completely remove the boundary elements ("posts"), the need exists of having available movable posts which can be removed when necessary.

The posts of known type customarely used due to the above reason, of disappearing type, are arranged within holes excavated under the way and in the ground and can be actuated by means of either electrical or mechanical systems.

These types of posts are so installed, as to be liftable inside their suitable seats or sheaths, which are usually made of concrete or steel and are installed inside holes excavated in the ground.

At the desired time during the day, the posts are so lifted as to protrude above the ground or the way, in order to prevent the way or the parking site from being accessed by unauthorized vehicles.

The mechanically or hand actuatable posts display, at their top end, a suitable handle element by means of which said post is lifted and then blocked in such a lifted position, for example by being rotated around its axis. When the post has to be sunk again, the handle element is released and thereafter the post is re-entered into its casing.

One from the drawbacks displayed by this type of posts known from the prior art is due to the fact that central units have to be installed, or separate motor-drive devices have to be provided, which are connected with said posts by means of ducts, when said posts are actuated by means of fluid or pneumatic systems, in order to lift or sink them into the desired position.

Another similar drawback to the preceding one, in the case of posts not provided with actuator means is that such an operation must be carried out manually and requires that the vehicle is stopped and a passanger thereof manually actuates the post.

A general drawback connected with all of the above post types is due to their poor visibility at night time and in the case of bad weather, and even their non-immediate visibility during their lifting or sinking step at prefixed times, in the absence of other signalling devices.

A purpose of the present finding is of providing a disappearing post which overcomes the above disclosed drawbacks.

Another purpose is also of building a simply installed, easily used post.

An important, not least, purpose of providing a post according to the present finding is also of minimizing its total overall dimensions inside the ground or in the site inside which said post is installed, with, however, the posts being made completely independent from each other.

In order to achieve said purposes, a disappearing post was developed, which is suitable for being housed inside a hole excavated in the ground, comprising an external cylindrical element which acts as the true post, liftable and sinkable through a relevant actuator, both said post and said actuator being housed inside an external casing designed to be installed inside said excavated hole, characterized in that said actuator is completely contained inside said external cylindrical element, with a signalling unit being furthermore provided inside a top cover element for the external cylindrical element.

The structural and functional characteristics and the advantages of a device according to the present invention will be better understood from the following exemplifying, non-limitative disclosure in detail, made by referring to the schematic drawings, in which:

Figure 1 is a partially sectional elevation view of a first exemplifying embodiment of post according to the present invention, with mechanical drive means;

Figure 2 is a partially sectional elevation view of a second exemplifying embodiment of post according to the present invention, with oil-dynamic drive means;

Figure 3 is a partially sectional elevation view of a third embodiment of post according to the present invention, of oil-dynamic type;

Figure 4 is a partially sectional elevation view of a fourth exemplifying embodiment of post;

Figure 5 is a partially sectional elevation view of a fifth exemplifying embodiment of post.

With general reference to the figures, five different exemplifying embodiments of a disappearing post according to the present invention, generally indicated with (11), are displayed.

The disappearing post (11) is generally essentially housed inside an external housing (12), partially shown, suitable for being housed inside a hole excavated in the ground.

The post (11), as shown in Figure 1, comprises a central hollow column (13) fastened onto the bottom of the external housing (12), on which an external cylindrical element (14) which acts as the true post, is slidingly guided.

The external element (14) slides along the external surface of the hole column (13) thanks to the presence of bearing-type elements (15) provided at its bottom open region. The motion during such a lifting/sinking movement is supplied by a motor

means (10) interacting, through a first gear means (16) keyed to it, with a second gear means (17) made integral with a screw-threaded shaft, or screw (18) which, by running through a hole (19) provided through a support plate (20) integrally arranged transversely to the external element (14), enters a nut screw (21) fastened to the top end of said hollow column (13).

For a completely compact arrangement of the whole disappearing post (11), the motor means (15) is facing downwards and during the post movement enters between the external cylindrical (14) and the stationary hollow column (13) inside windows (22) and (23) respectively provided through the support plate (20) and the top end wall (9) of the hollow column (13).

Advantageously according to the present invention, inside a top closure portion (24) of this external cylindrical element (14), a signalling unit, indicated with (25), is installed. Such a signalling unit (25) can be made with lighting elements schematically shown in (26), but which can be positioned in a whatever desired way. The same lighting elements (26) can be, e.g., one single flashing lamp, or a plurality of differentiated light signals for signalling that the disappearing post according to the present invention has been lifted, has been lowered, or is stably positioned in its lifted position. The control of the lighting elements (26) is provided by an electrical-electronic central unit (27) which is arranged inside the top closure portion (24).

Inside said top closure portion (24), also sound signal generating elements, such as sound warning elements, schematically shown in (28), can be stably housed, which signal the possible changes in position of post (11).

All the above, of course, on considering that both the motor means (10) which drives the several components, the signalling unit (25), as well as the possibly provided sound signal generating elements or sound warning elements (28), are contained inside the single module which constitutes the post.

Figure 2 displays a second exemplifying embodiment of the disappearing post in which same elements are indicated by means of same reference numerals.

In this further exemplifying embodiment of post, an actuator element of oil-dynamic type (29), such as a cylinder integrally connected with the interior of the external casing (12), at its bottom end, is provided. The free end (30) of the stem of said cylinder is fastened, on the contrary, to the support plate (20), which it moves upwards during its extension or lifting step.

It should be observed that the stem of the cylinder (29) is constituted by two mutually coaxial

portion (31), (32), with the innermost portion (31) having the free end (30) which gets engaged with the support plate (20). The outermost portion (32), coaxially surrounding said first portion (31) on its external side and sliding along it, starts extending outwards once that the first portion has been completely extended outwards.

In this case too, the external hollow cylindrical element is indicated with (14), and one may observe that coaxially with, and inside, it, a second external cylindrical, also hollow, element (33) is provided. Both hollow cylindrical elements (14) and (33) are prevented from rotating relatively to each other by a stud (34) which is fastened onto the support plate (20), and extends downwards running through a bore (35) provided through a top closure plate (36) of the second external cylindrical element (33).

In such a way, actuating the oil-dynamic cylinder (29) promotes, first of all, the extension outwards of the telescopic portion of stem (31), with the external hollow cylindrical element (14) being lifted. Then, when the first portion of stem (31) is completely extended outwards, also said second portion of stem (32) starts to extend. Said second stem portion (32) engages the closure plate (36) and moves upwards also said second external cylindrical element (33).

Also in this exemplifying embodiment of the present invention, inside the top closure portion (24) of the external cylindrical element (14), a signalling unit, indicated with (25), is installed, with lighting elements (26) which, as already said, can be positioned in a whatever way. The control of the lighting elements (26) is supplied by an electrical-electronic central unit (27) arranged inside the top closure portion (24), inside which the above mentioned sound warning elements (28) can be housed.

Figure 3 illustrates a further possible exemplifying embodiment of disappearing post according to the present invention.

Also in this case, same reference numerals are used in order to indicate same elements.

This exemplifying embodiment is a particularly compact one, because it contains all the necessary equipment for disappearing post operations.

In central position, an oil-dynamic actuator (37) is installed in upside down position, i. e., with an end of its stem (38) being constrained to a central support column (39) made integral with the external casing (12).

The base of the cylinder (37) is constrained, on the contrary, to the support plane (20), by running through a central bore (40) provided through the top closure plate (36) of the second external cylindrical element (33).

Also in this case studs (34), e.g. three of them, are provided which, on the one side, are constrained to the support plate (20), and extend downwards running through holes (35) provided through the top closure plate (36) of the second external cylindrical element (33). At their bottom free end, the studs (34) are provided with engagement elements (41) which get engaged with the top closure plate (36), which implies that the second external cylindrical element (33) will be dragged upwards.

The central cylinder (37) is fed by means of suitable ducts (42) controlled by means of solenoid valves (43) and a pump (44) driven by motor means (45). Associated with this system, also a tank (46) is provided. All these elements which constitute the oil-dynamic system are contained inside a chamber (47), or are anyway supported above the support plate (40). The chamber (47) is closed by sealing elements (48) which also cooperate to enable the second external cylindrical element (33) to slide along the central support column (39).

Also according to this further exemplifying embodiment of post according to the present invention, inside the top closure portion (24) of the external cylindrical element (14), a signalling unit is installed which is indicated with (25), which is provided with lighting element (26), which, as already said, can be positioned in any desired way. The lighting elements (26) are controlled by an electrical-electronic central unit (27) installed inside the top closure portion (24), in which the above said sound warning elements (28) can be housed.

This third exemplifying embodiment results to be particularly compact and advantageous as regards the extremely small overall dimensions, and the maintenance thereof, which is only carried out on elements contained inside the post.

Such a structure also results in a particularly advantageous and simple installation once that only external connection wires are provided.

Figure 4 displays a further example of disappearing post in which the external hollow cylindrical element (14) is of increased thickness and is such as to get supported in kerbstone fashion in its retracted resting position, on a base portion (60) having its identical outline. In such a way, a particularly compact and strong structure of column type is obtained in which the external portion supports the load which is transmitted to it by the top closure element (24). The post is constructed in compliance of the applicable European regulations, and in order to support loads of up to 90 tons.

An actuation through a central oil-dynamic cylinder (61) with rotation preventing guide studs (62) is provided. Inside the top closure element (24), of cap type, a central seat (63) is provided for hous-

ing lamps (64), well visible also in the presence of sun light, to which a transparent element (65) is super imposed.

Figure 5 displays a still further exemplifying embodiment of disappearing post in which inside the external hollow cylindrical element (14), an oil-dynamic unit (66) with its relevant tank (67), and an electrical-electronic central unit (68) which pilots the several drive means, are installed.

One single cylinder (69) which extends from a base (70) drives the post lifting/sinking. The structure is particularly compact and strong, of mushroom type, which, inside the top closure element (24), is perimetrically provided, on its side surface, with a seat (72) which houses a transparent ring (71) and inside which a set of lamps (64) are arranged, well visible also in the presence of sun light, and which may be either flashing, or kept continuously lit.

It should be furthermore observed that a post according to the present invention can be provided with electrical power, water, air, telephone taps and power supply lines in general.

Claims

1. Disappearing post suitable for being housed inside a hole excavated in the ground, comprising an external cylindrical element (14) which acts as the true post, liftable and sinkable through a relevant actuator (10, 16-19 and 21; 29; 37; 61; 69), both said post and said actuator being housed inside an external casing (12) designed to be installed inside said excavated hole, characterized in that said actuator (10, 16-19 and 21; 29; 37; 61; 69) is completely contained inside said external cylindrical element (14), with a signalling unit (25) being furthermore provided inside a top cover element (24) for the external cylindrical element (14).
2. Post according to claim 1, characterized in that said signalling unit (25) is realized by means of lighting elements (26, 64) which are well visible also in the presence of sun light.
3. Post according to claim 1 or 2, characterized in that said lighting elements (26, 64) are with one single flashing light.
4. Post according to any preceding claims, characterized in that said lighting elements (26, 64) are a plurality of lamps with different flashing modalities during the lifting, sinking or stably positioned steps.

5. Post according to any preceding claims, characterized in that a central electrical-electronic unit (27, 68) is provided installed inside the top closure portion (24), to act as the control means for said lighting elements (26, 64). 5
6. Post according to any preceding claims, characterized in that in said top portion (24), sound signal generating elements (28) are installed. 10
7. Post according to claim 6, characterized in that said sound signal generating elements are sound warning elements (28).
8. Post according to claim 1, characterized in that it comprises a central hollow column (13) fastened onto the bottom of said external housing (12), on which said external cylindrical element (14) is slidably guided, with said actuator for said lifting/sinking movement being a motor means (10) interacting, through a first gear means (16) keyed to it, with a second gear means (17) made integral with a screw-threaded shaft, or screw, (18) which, by running through a hole (19) provided on a support plate (20) integrally arranged transversely to said external element (14), enters a nut screw (21) fastened onto the end of said hollow column (13). 15
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9. Post according to claim 1, characterized in that said actuator is a cylinder of oil-dynamic type (29) integrally linked with the interior of the external casing (12) at the bottom end thereof, with the free end (30) of its stem being made integral with a support plate (20) provided under a top closure portion (24) of said external cylindrical element (14), with said stem of said cylinder (29) being constituted by two mutually coaxial portions (31, 32), wherein the innermost portion (31) thereof is provided with said free end (30) which gets engaged with said support plate (20), and the outermost portion (32), coaxially surrounding said first portion (31) and sliding on it, and that inside said external hollow cylindrical element (14) there is coaxially provided a second cylindrical element (33), that both said hollow cylindrical elements (14 and 33) are prevented from rotating relatively to each other by a stem (34) and that second stem portion (32) gets engaged with a closure plate (36) of said second external cylindrical element (33). 35
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10. Post according to claim 1, characterized in that said actuator is a cylinder of oil-dynamic type (37) installed in upside down position, with an end of its stem (38) being constrained to a central support column (39) constrained to the external casing (12), with the base of said cylinder (37) being constrained to a support plate (20) provided under a top closure portion (24) of said external cylindrical element (14), with, inside said external hollow cylindrical element (14) a second cylindrical element (33) being coaxially provided, that both hollow cylindrical elements (14 and 33) are prevented from rotating relatively to each other by at least one stud (34), with said cylinder (37) running through a central bore (40) provided through a top closure plate (36) of said second external cylindrical element (33), with said at least one stud (34) being constrained, on one of its ends, to said support plate (20), and extending downwards running through bores (35) provided through said top closure plate (36) and, at its free bottom end, being provided with engagement elements (41) for getting engaged with said top closure plate (36). 55
11. Post according to claim 9 or 10, characterized in that said actuator cylinder (29, 37) is fed by means of relevant ducts (42) controlled by solenoid valves (43) and a motor driven pump (44) driven by a motor means (45), with which a tank (46) for the drive fluid is associated, with all said elements which constitute the feed system for said fluid being contained inside a chamber (47) provided inside said first and/or second external cylindrical elements (14, 33).
12. Post according to claim 1 or 2, characterized in that said lighting elements (64) are installed inside a seat (63) centrally provided inside said top closure portion (24).
13. Post according to claim 1 or 2, characterized in that said lighting elements (64) are installed inside a perimetrical seat (72) provided inside said top closure portion (24).
14. Post according to claim 1, characterized in that said external hollow cylindrical elements (14) comes to rest, in its retracted position, on a base portion (60) having its same identical outline.
15. Post according to claim 1, characterized in that it is equipped with electrical power, water, air, telephone taps and power supply lines in general.

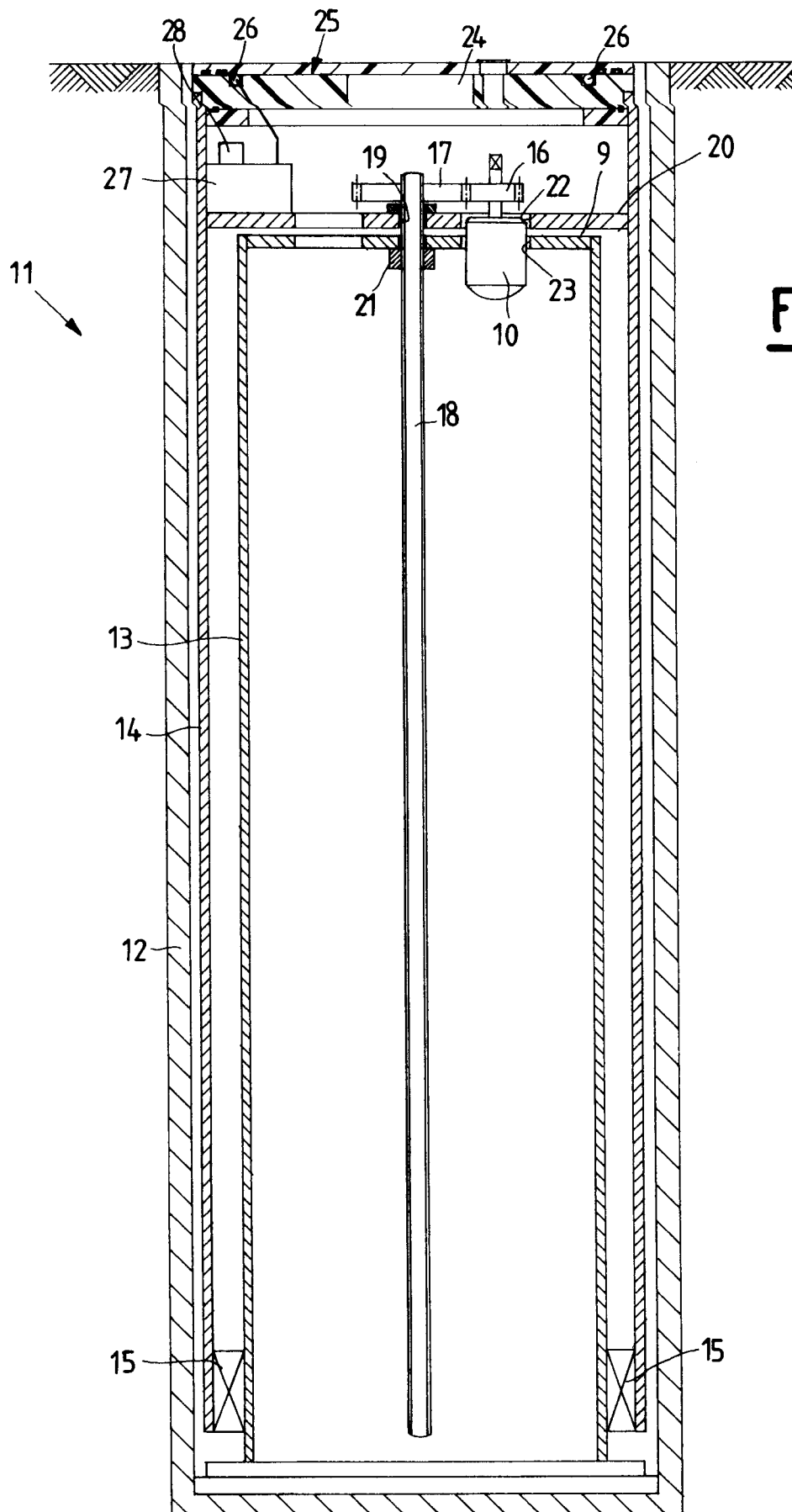
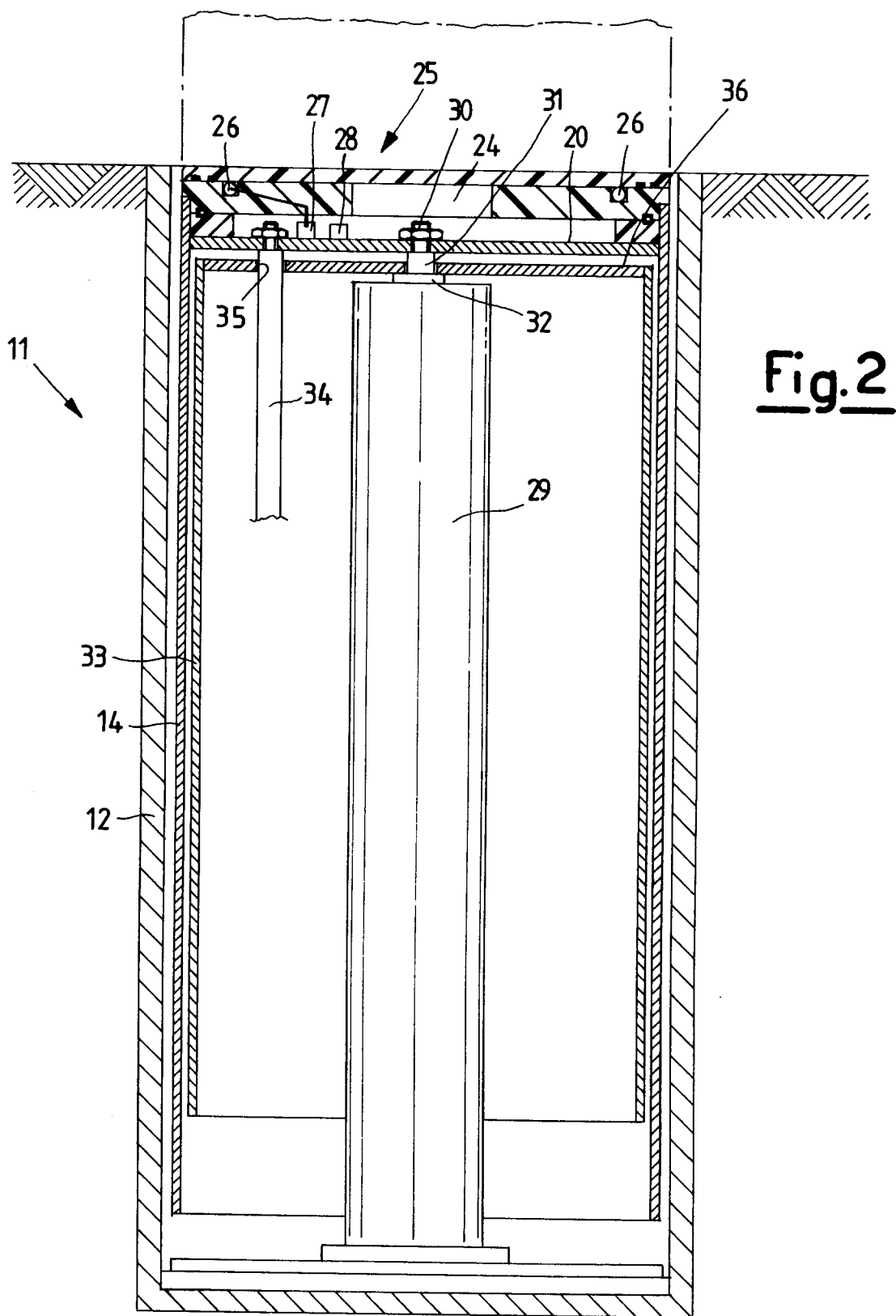


Fig.1



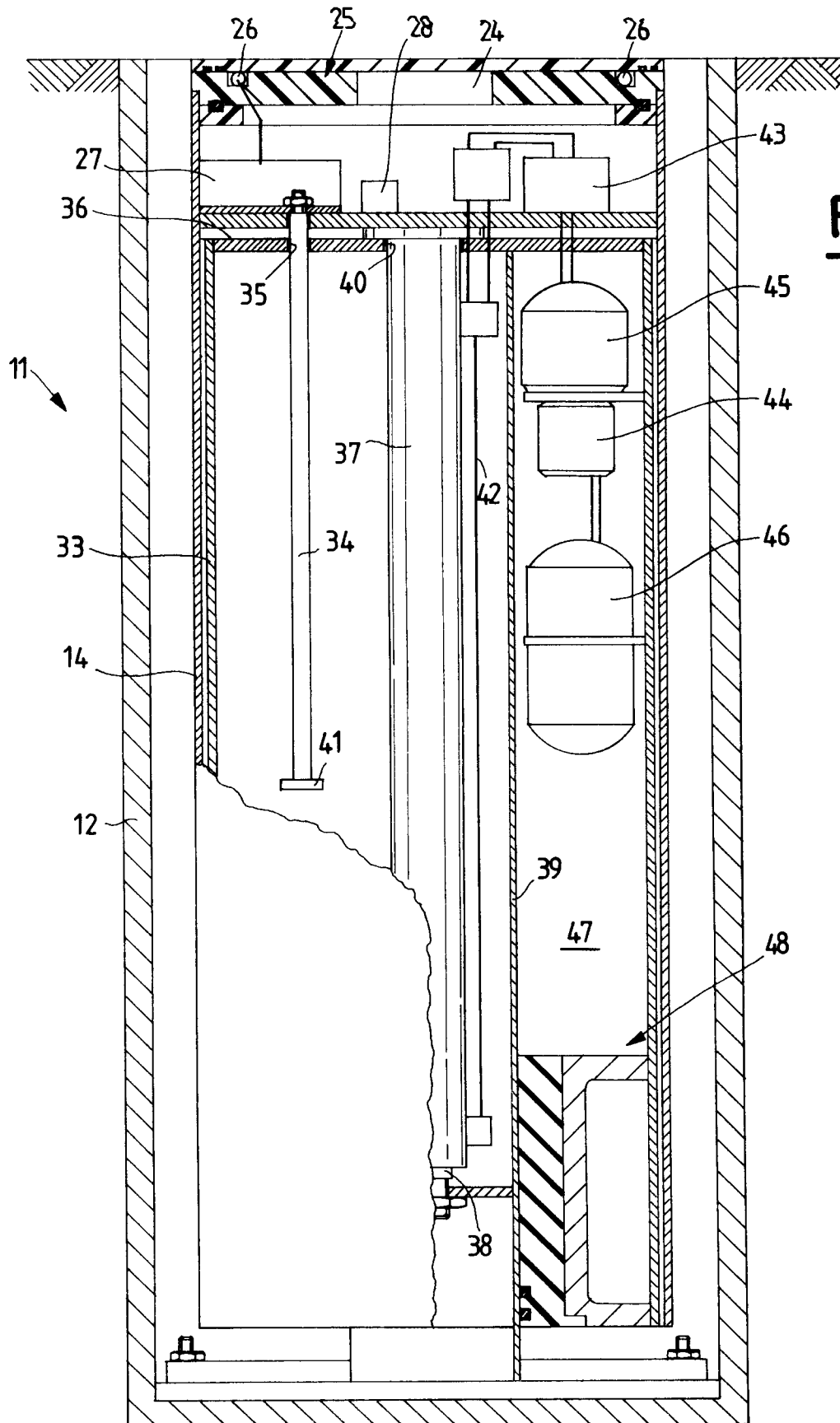


Fig.3

Fig.4

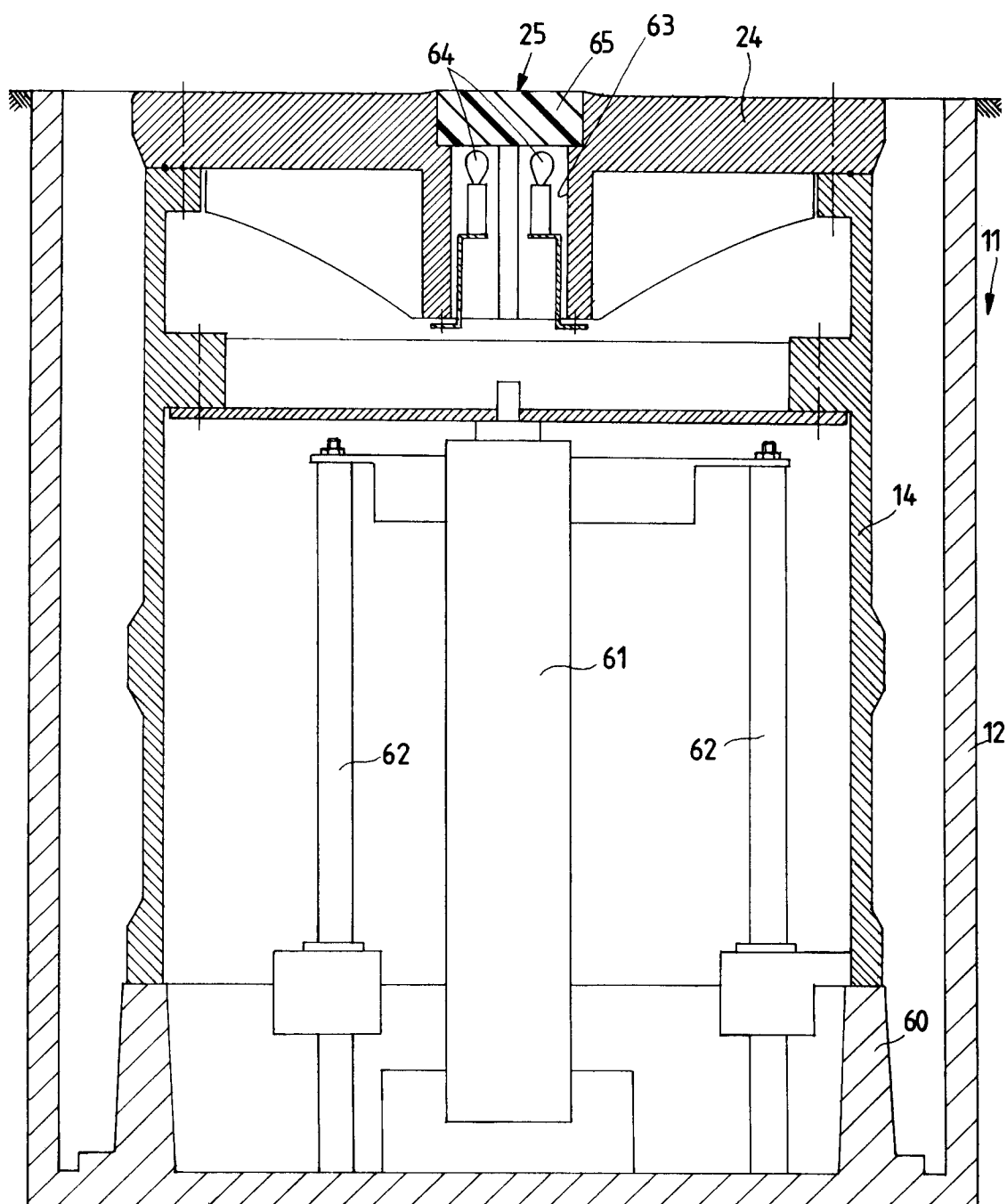
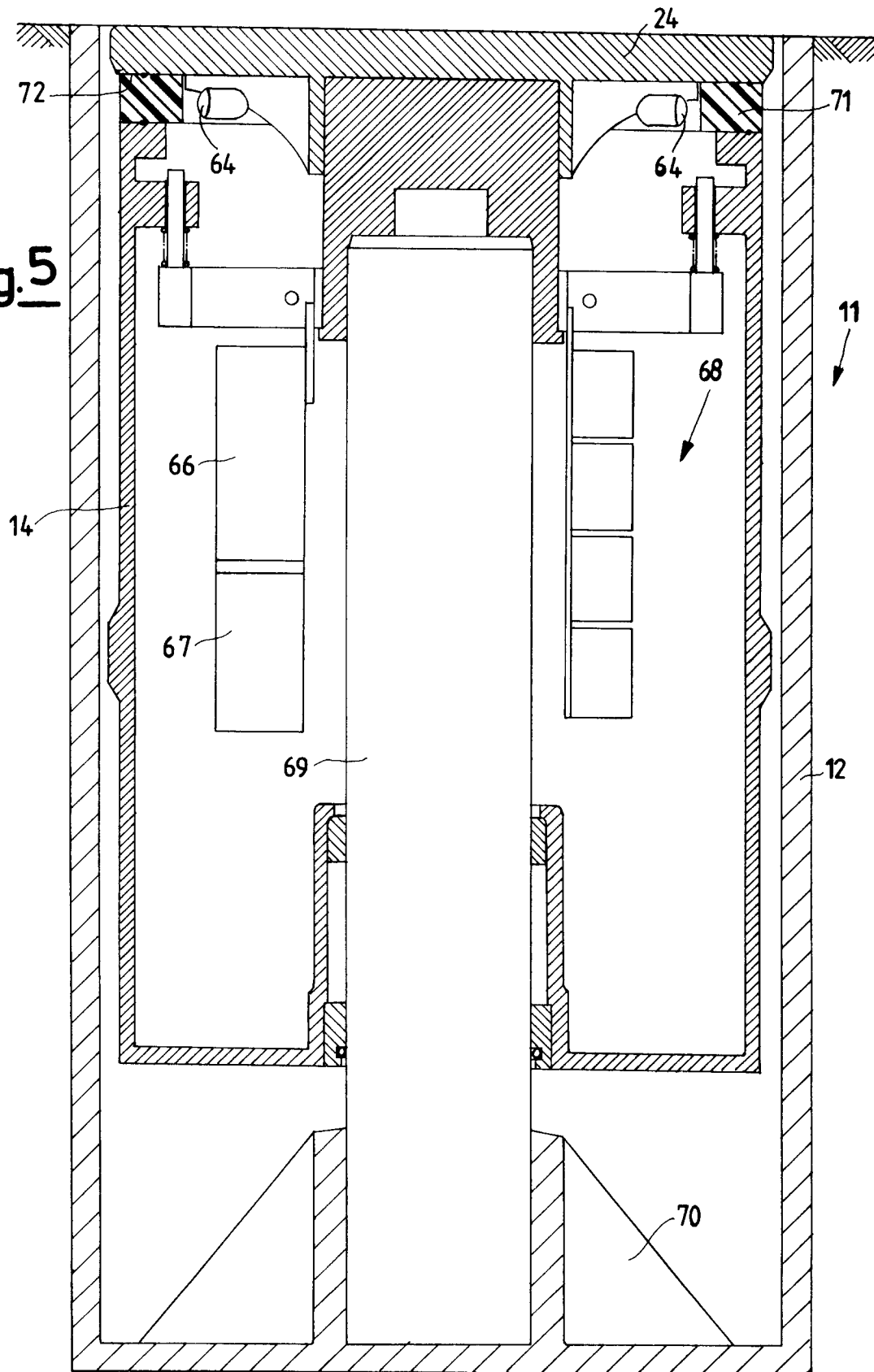


Fig.5





European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 93 20 3122

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)
X	DE-U-86 16 261 (J. LÖW)	1-3,5,15	E01F13/00
Y	* page 7, paragraph 2 *	4,6,8,14	
	* page 8, paragraph 5; figures 1-3 *		

Y	WO-A-80 02576 (A. STEINMANNS ERBEN)	4	
A	* page 7, paragraph 2; figure 1 *	1	

P,Y	FR-A-2 687 702 (P. VASSAL)	6	
P,A	* page 3, line 28 - line 34; figures 1,2 *	1	

Y	FR-A-1 246 051 (D.T. EMMEL)	8	
	* page 4, column 1, paragraph 2 - page 5, column 1, paragraph 1 *		
A	* page 7, column 1, paragraph 3 -paragraph 4; figures *	1,2,5	

Y	DE-A-21 58 977 (FISCHER STAHLBAU)	14	
A	* page 8, paragraph 3 - page 9, paragraph 1 *	1,9	
	* page 10, paragraph 2; figure 3 *		

A	FR-A-1 023 190 (A. MARREL)	1,2,9	TECHNICAL FIELDS SEARCHED (Int.Cl.5)
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A	FR-A-2 621 625 (G. CLAPIER)	1,10	
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A	FR-A-2 596 782 (Y. VERRA)		

The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 22 February 1994	Examiner Verveer, D
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	