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(54) Manhole assembly for covering a well

(57) In a manhole assembly for covering a well of the kind, in which a frame (3) is provided, a cover (1) is allowed to swing between an open and a closed position relative to the frame, the main new feature is that the cover (1) is non-detachably connected to the frame (3) through a hinge device (2), and the cover (1) is guided accurately in its opening and closing movement so that it will fall into a secure closed position by itself. With this arrangement, the cover is allowed to open upon forces acting on the bottom side of the cover, thereby allowing surplus or fluid to be releaved without the risk of the cover bursting open and leaving the well hole uncovered.

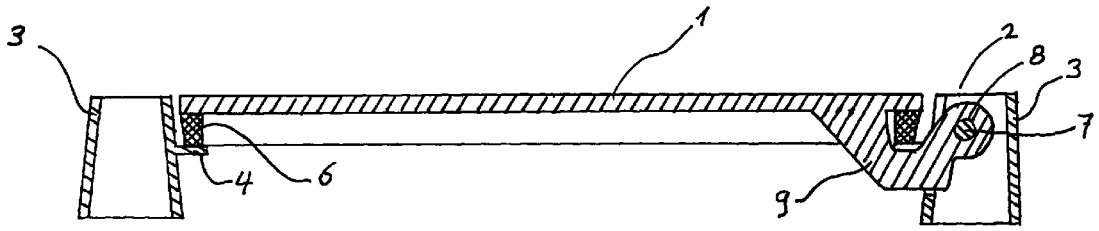

Fig. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates to a manhole cover for covering a well, comprising a cover, a frame and hinge device allowing the cover to swing between an open and closed position, and to a method of controlling said movement.

BACKGROUND ART

[0002] From EP-A-0,533,533 there is known a manhole cover for covering a well of the above-mentioned type, which has a cover that can be locked in the closed position by locking means. For this purpose the lid comprises an opening for introducing a jumper bar with which the locking means interact. The locking means are adapted to give way under the action, when a person attempts to open the cover with a special tool, i.e. a crowbar. In practice, however, the locking means give way to forces acting on the bottom of the cover and due to the pre-tensioned locking means, the cover will burst open when the locking means give way. Forces urging the cover to open are e.g. created when the water level of the well increases due to heavy rain falls in a short period of time and the water level in the canalisation rises quickly, thereby urging the cover to burst open. When the cover bursts open, it can cause damage to nearby vehicles or persons and the cover itself may also be damaged by the enegy that is set free. Moreover, because the known cover is detachable from the frame, since the hinge device does not connect the cover to the frame, the cover is likely to separate itself from the frame. The hole over the well is thereafter not covered any longer and presents a potential hazard to traffic, such as pedestrians and all kinds of vehicles.

DISCLOSURE OF THE INVENTION

[0003] It is the object of the present invention to provide an assembly for covering a well of the kind referred to above, with which it is possible to allow the cover to open upon forces acting on the bottom of the cover without the disadvantages as described above, and this object is achieved with a cover of said kind, which according to the present invention also comprises the features set forth in the characterizing clause of claim 1. With this arrangement, the cover is allowed to open gradually under the influence of a force or pressure from under the cover and will close by itself, when the pressure or force is not acting any longer on the cover, without the risk of the cover detaching itself from the frame.

BRIEF DESCRIPTION OF THE DRAWINGS

[0004] In the following detailed part of the present description, the invention will be described in more detail with reference to the exemplary embodiments of a Manhole assembly according to the invention shown in the drawings, in which

Figure 1 shows a vertical section through a manhole assembly according to the invention, with the cover placed in the closed position,
Figure 2 shows the manhole frame assembly in a view from above,
Figure 3 shows a detail of the hinge device and the latch with the cover in the closed position,
Figure 4 shows the same view as Figure 3, but with the cover in the open position, and
Figure 5 shows a detail of a preferred embodiment of the hinge device.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0005] The manhole assembly shown in Figures 1 and 2 comprises a frame 3 with a receiving face for the cover 1 in the form of a flange 4. On its underside, the cover 1 is provided with a gasket 6 that will come into sealing contact with the flange 4, when the cover is in the closed position. On its underside, the cover 1 may be provided with stiffening ribs and the cover 1 may be provided with a hole for receiving a bar to open the cover 1. The cover 1 is connected to the frame 3 by a hinge device 2. The cover 1 can swing from a horizontal closed position to a more or less vertical open position and vice versa. The hinge device 2 comprises a pin 7 and pin hole 8, whereby the pin holes 8 are provided in lugs 9 that are connected and extend from the cover. The pin 7 can be fixed to the frame directly, or the frame 3 may also be provided with ribs or lugs which have pin holes 8 for receiving the pin 7. The pin and pin hole arrangement of the hinge device 2 can form a double-leaf hinge or a T-hinge or any other suitable type of hinge as easily conceived by a person skilled in the art. The hinge device 2 with the pin 7 and pin hole 8 arrangement provides for exact guidance of the swinging movement of the cover 1 between its open and closed position. Moreover, it secures the cover 1 non-detachably to the frame 8.

[0006] When a force acting on the cover opens the cover 1, e.g. when the water level under the well cover increases and forces the cover 1 to open, the cover 1 will function as a relief valve and gradually open until the water level sinks and the pressure ceases to act on the cover whereby it will automatically fall back into its closed position.

[0007] The cover 1 is "connected non-detachably" to the frame 3 which means that the cover 1 cannot detach itself in the normal swinging movement between the open and closed position. The user of the manhole can remove the cover 1, if necessary, e.g. by removing the pin 7. The pin holes 8 of the hinge device 2 may according to a preferred embodiment be provided with slits 11 opening to the periphery of the lug 9 extending laterally

from the cover 1, in which the pin holes are located. These slits 11 are, as can be seen from Figure 5, placed such that only in the fully open position where the cover 1 comes to a rest, the user can pull the cover 1 out of the connection with the frame 3.

[0008] According to a preferred embodiment, the hinge device 2 is encapsulated and is filled with a lubricant in order to protect it from environmental influences.

[0009] According to another preferred embodiment, the manhole assembly may be provided with a latch 5 to secure the cover 1 in the open position. The latch 5 is connected freely swinging to the cover and extends downwards from the cover 1 from a pivot 10. In the fully open position or substantially fully open position, the latch 5 rests on the flange 4, preferably in a recess, in order to secure the cover in the closed position. By swinging the latch 5 upwards against the gravity force, a user can release the cover 1 and move it into the closed position.

[0010] In order to make sure that the cover 1 does not open upon influences like heavy vehicles driving over the cover, the cover may be aggrevated in particular in an area diametrically opposite to the hinge, and/or the cover may be secured with a resilient means (not shown) urging the cover into the closed position.

[0011] According to another preferred embodiment, the cover is secured in the closed position solely by the gravity force. This securing by the gravity force only has the advantage that the cover cannot burst open upon a pressure exercised on it. The commonly used securing means such as jumpers, latches or hooks cause an initial force to be overcome, whereafter the cover will open abruptly.

[0012] By allowing the cover to open under pressures from under the cover, the cover functions as a relief valve for the pressure that can build up under it. The gradual opening of the cover 1 will not pose a serious hazard and the opening might be so small that vehicles can still pass over the cover thereby pushing the lid down for a short time so that the main function of the cover, i.e. to secure a well-hole, is always provided.

LIST OF PARTS

[0013]

1	cover
2	hinge device
3	frame
4	flange
5	latch
6	gasket
7	pin
8	pinhole
9	lug
10	pivot
11	slit

Claims

1. Manhole assembly for covering a well, comprising a cover (1), a frame (3) and a hinge device (2) allowing the cover (1) to swing between an open position and a closed position,
characterised in that the cover (1) is in a non-detachable connection to the frame (3) through the hinge device (2), whereby the hinge device (2) controls the swinging movement of the cover (1) between the open position and the closed position accurately so that the cover (1) will fall correctly into a secure closed position by itself.

2. Manhole assembly according to claim 1, **characterised** in that the hinge device (2) comprises a pin and pin-hole assembly.

3. Manhole assembly according to claim 2, **characterised** in that the hinge device (2) comprises at least one lug (9) connected to the cover (1) and extending substantially lateral therefrom, said lug (9) being provided with a pin-hole (8) through which the pin (7) extends.

4. Manhole assembly according to claim 3, **characterised** in that at least one rib or lug (9) is extending from the frame (3), whereby the hinge device (2) forms a double-leaf hinge or a T-hinge.

5. Manhole assembly according to claim 3 or 4, **characterised** in that the pin-hole (8) on the at least one lug (9) extending from the cover (1) is provided with a slit (11) opening to the periphery of the at least one lug (9).

6. Manhole assembly according to any of the claims 1-5, **characterised** in that the pivot axis defined by the hinge device (1) is located at the frame (3) or adjacent to the frame (3).

7. Manhole assembly according to any of the claims 1 to 6, **characterised** in that the hinge device (2) is at least partially encapsulated in the flange (3) in order to protect it from environmental influences.

8. Manhole assembly according to claim 7, **characterised** in that the encapsulated space is filled with a lubricant.

9. Manhole assembly according to any of the claims 1 to 8, **characterised** in that the frame (3) comprises a flange (4) for the cover (1) to rest on in the closed position.

10. Manhole assembly according to any of the claims 1 to 9, **characterised** in that a free swinging latch (10) is connected to the cover (1), the latch (10)

securing the cover (1) in the open position.

11. Manhole assembly according to claim 10, **characterised** in that the latch (10) rests on the flange (4) in order to secure the cover (1) in the closed position.

12. Manhole assembly according to any of the claims 1 to 11, **characterised** in that the assembly is of circular shape.

13. Manhole assembly according to any of the claims 1 to 12, **characterised** in that the cover (1) is aggravated, in particular in the area diametrically opposite to the hinge device (2).

14. Manhole assembly according to any of the claims 1-13, **characterised** in that the assembly is provided with resilient means that urge the cover (1) into the closed position.

15. Manhole assembly according to any of the claims 1-13, **characterised** in that the cover (1) is secured in the closed position solely by the gravity force.

16. Manhole assembly according to any of the claims 1 to 15, **characterised** by comprising a gasket (6) attached to the cover (1), said gasket (6) being in sealing contact with the flange (4) when the cover (1) is in the closed position.

17. Method of controlling the opening of a cover of a manhole for covering a well comprising the steps of providing a cover (1), providing a frame (3) and providing a hinge device (2) allowing the cover to swing between an open position and a closed position, **characterised** by the hinge device (2) connecting the cover (1) non-detachably to the frame (3) and the hinge device (2) providing exact guidance for the movement of the cover (1) between the open position and the closed position so that the cover (1) will fall correctly into a secure closed position by itself, secured by the gravity force, and by the step of allowing the cover to open gradually upon forces acting on the bottom of the cover generated by fluid coming up from the well and thereby relieving fluid coming up from the well.

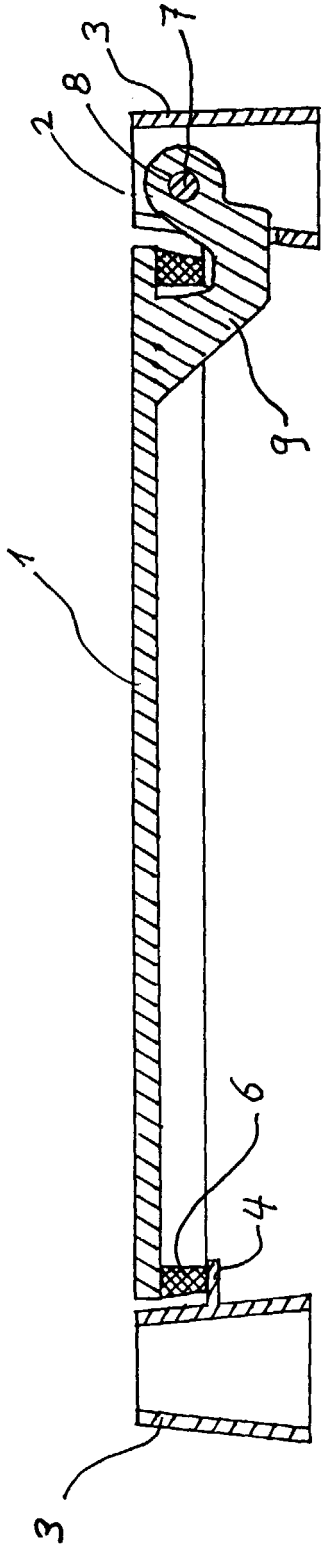

Fig. 1

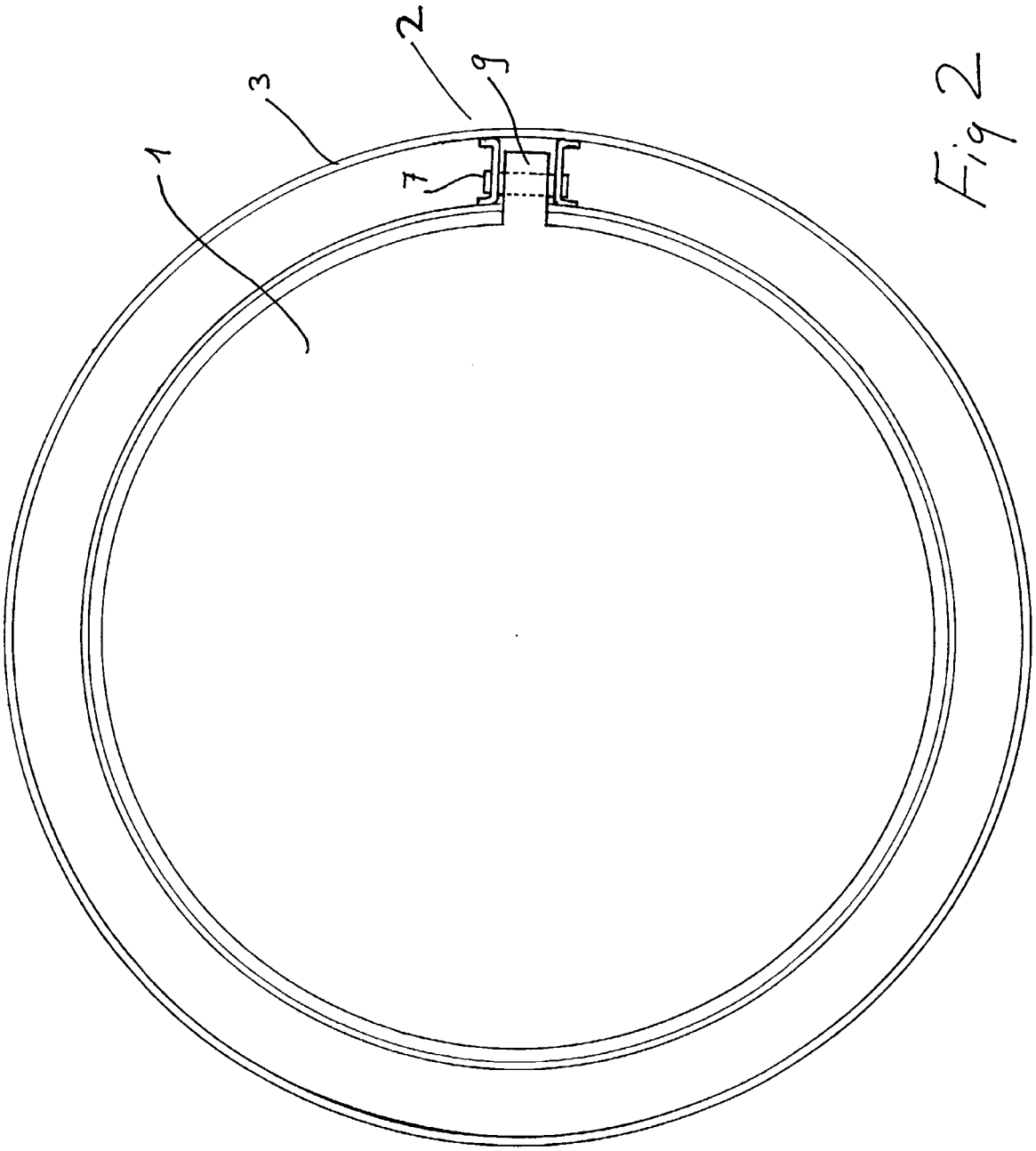

Fig 2

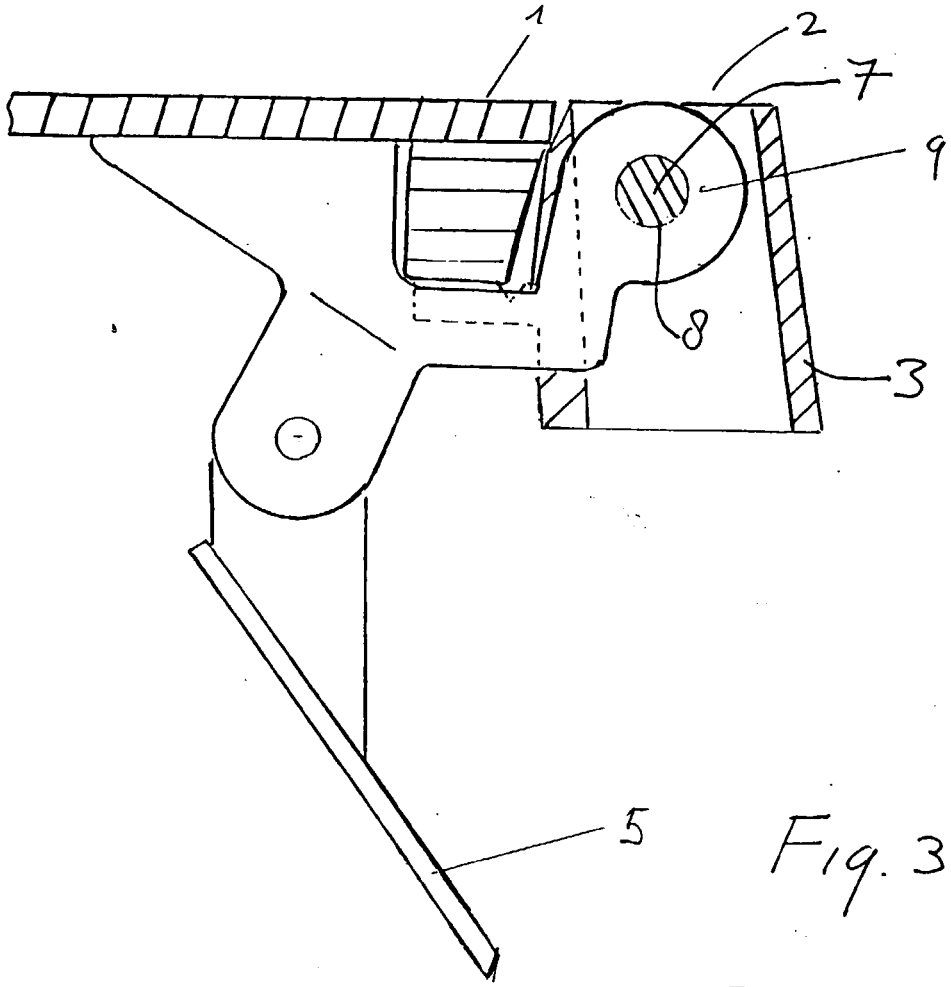

Fig. 3

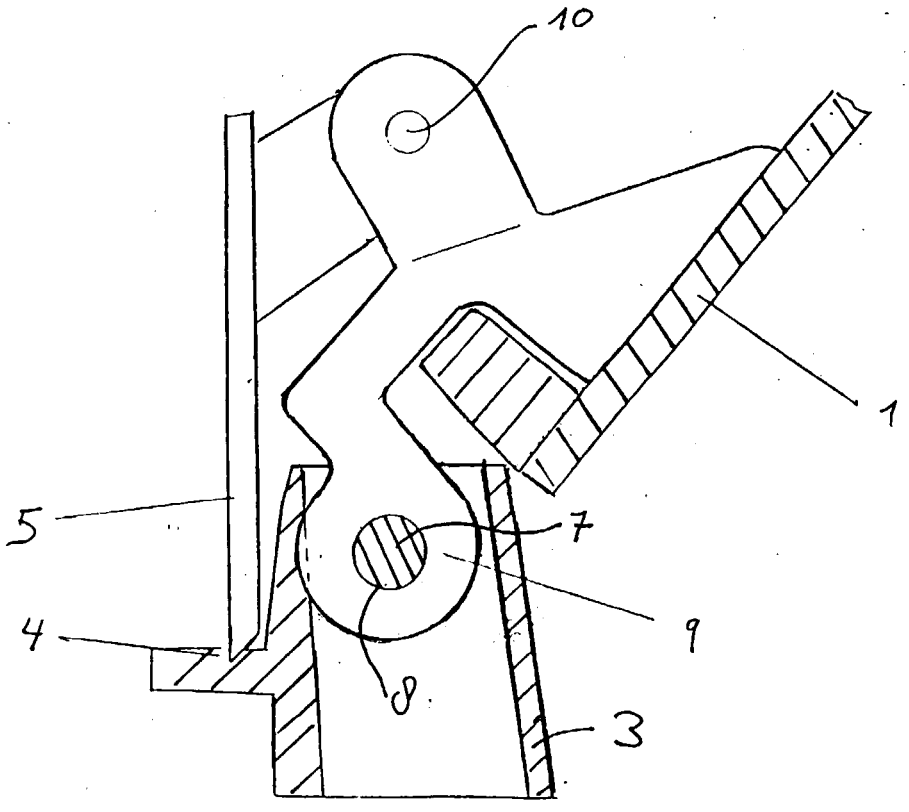

Fig. 4

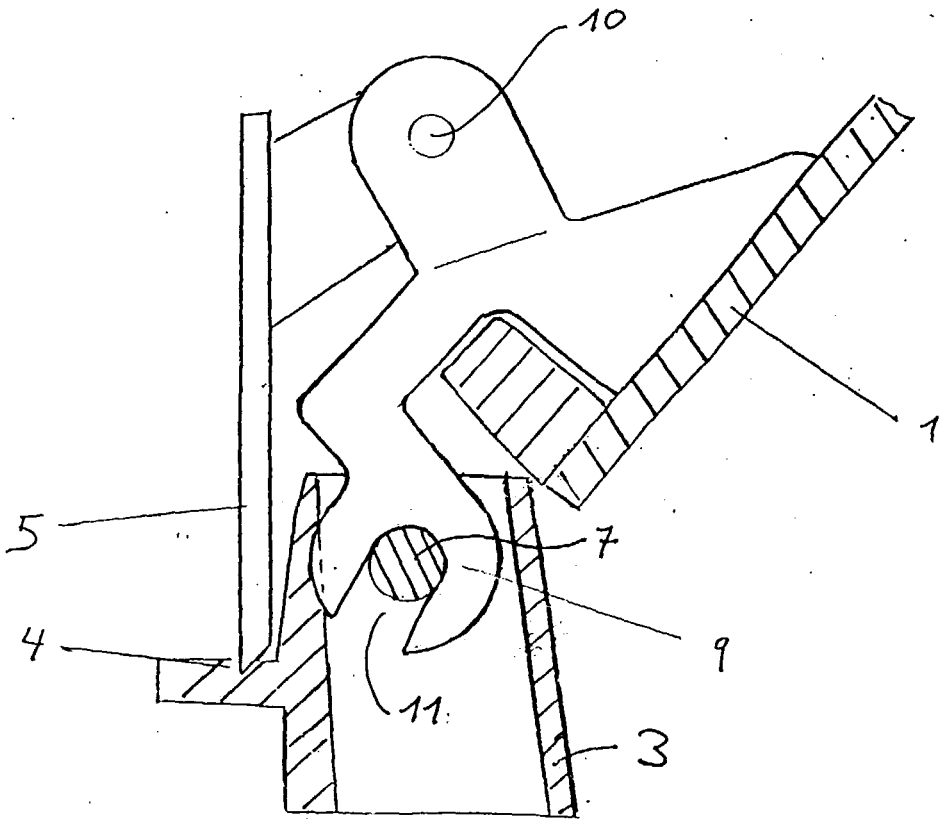

Fig 5

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EUROPEAN SEARCH REPORT

Application Number
EP 98 11 6949

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.6)
X	EP 0 507 708 A (SODIF SA) 7 October 1992	1-4,6,7, 9,10,17	E02D29/14
A	* abstract; figures *	11,12, 15,16	
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TECHNICAL FIELDS SEARCHED (Int.Cl.6)

E02D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	8 February 1999	Blommaert, S

CATEGORY OF CITED DOCUMENTS

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