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MACHINE FOR CLEANING GRATINGS BY MEANS OF AN OSCILLATING ARM FOR HYDRAULIC WEIRS.

Machine for cleaning gratings for hydraulic weirs, comprising an oscillating arm (3) which oscillates at a pivoting point (2), and a double-acting cylinder (9) intended to position the oscillating arm (3). The above mentioned arm bears, in its interior, a carriage (5) carting the blade (11), which slides by means of wheels (6) rolling on two rails (4), this arrangement making possible the access to any point of the grating for cleaning purposes, owing to the above-mentioned sliding of the carriage (5) inside the arm (3) and also to the displacement of the machine along the weir by means of the rails or guides on which may slide the rollers integral with the base of the machine.

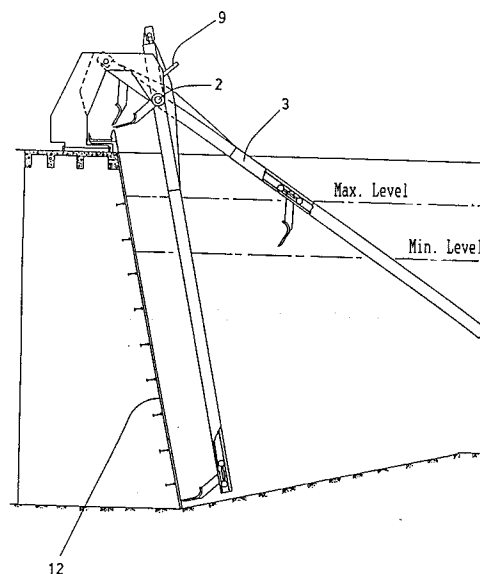


Fig. 1

The present description relates, as indicated in the title, to a machine for cleaning gratings by means of an oscillating arm for hydraulic weirs of the type used for cleaning dirt which is deposited on the gratings of hydraulic weirs, essentially when the flow of the water is utilized for electric power stations.

The mechanisms known in general consist of a machine mounted on a chassis which has a roller system in order to move the machine mounted thereon along the weir by means of rails or guides fixed on the ground. This type of machines incorporate a spoon with an opening system by means of cable which moves along the grating being open when going down and closed when going up.

Also the aforesaid machines usually have a crane jib or crane arm provided with hinges fixed on a guideable base having at their trapping end a pair of clamps capable of trapping voluminous bodies and large size trunks which the spoon or the shovel cannot take out of the water surface; Said machines are handled by an operator which has to be ready at all times to maintain the appropriate cleanness of the water which, as mentioned before, is used to move the turbines of electric power stations.

Another known mechanism consists of a system based on a fixed comb which covers the entire width of the weir going up and down by means of two toothed bars activated by an external electric motor.

Another known system comprises a machine which has a hackle, shovel or the like fixed at the lower end of an arm and that operates by elevating the entire said arm.

Some of the mechanisms or machines described above comprise a transporter which removes the dirt which has been taken out, said transporter being situated in the lower part of the machine, generally on the ground or very close thereto, and the movement of the dirt towards the transporter is limited by an opening such as a window; when the system does not include a transporter, the spoon deposits the dirt on the ground which will then have to be removed manually.

The mechanisms which incorporate a spoon sliding over the grating present the inconvenience that since the spoon moves down very close to the mentioned grating, it cannot clear out trunks or large dimension floating bodies, and even if they manage to trap any of said bodies in the ascending movement, they will not be able to evacuate them since the pass-way through which the dirt is taken out is limited by means of an opening such as a window.

The system for cleaning gratings by a fixed comb has the inconvenience that by sliding very close to the gratings, it cannot trap objects of large

volume or trunks of considerable dimensions, having in addition the inconvenience that their use is limited to weirs of small dimensions as for width and height.

The machines which have a hackle or shovel fixed at the end of an arm which arm being raised entirely in order to take out the dirt accumulated in the gratings, present the inconvenience that, in the case of weirs of a considerable depth, the arm turns out to be excessively long, and also if it takes out a body of large dimensions or voluminous trunks and branches, these materials cannot be evacuated since the pass-way through which they are taken out is limited by an opening such as a window in the same manner as that of other machines.

In order to overcome said inconveniences a cleaner for gratings is proposed by means of an oscillating arm for hydraulic weirs as the object of the present invention, which comprises an arm oscillating over a pivoting point, and rails disposed thereof which permit the displacement of a carriage provided with rollers and having support base on which a shovel or a hackle is fixed which can take out the dirt trapped on the gratings either at the bottom or on the surface of the water even though there are bodies, trunks and branches of considerable dimensions since there are no obligatory pass-way or window between the shovel when unloading and the transporter which removes the collected dirt.

The shovel or hackle which is fixed with the wheeled carriage, is displaced with respect to the oscillating arm by means of a dragging chain which is activated by a hydraulic motor.

The machine for cleaning gratings by means of an oscillating arm for hydraulic weirs hereby proposed has advantage over all of the known systems in that in the descending movement of the spoon, the guiding arm being oscillatory, moves sufficiently away from the grating by the action of a hydraulic cylinder, so that in the phase of approaching the bottom of the grating it can collect the dirt deposited at said bottom.

Another advantage offered by the present invention is that the structure of the machine avoids the need for forming an obligatory pass-way towards the transporter at the moment that the spoon is taking the dirt out, which dirt may be composed of small parts as well as large bodies and trunks of considerable dimensions.

Another economic advantage of this invention is that a complementary crane arm which other cleaning systems for gratings have to install in order to be able to take out the already mentioned large bodies and considerable size trunks, is eliminated.

Another advantage in relation to this invention is that the control of mechanisms by means of a hydraulic center may be carried out either manually or automatically so that the operator of the system may combine the tasks of cleaning with other duties.

Another advantage of the proposed machine for cleaning gratings consists of its capability of cleaning any type of weir and of any depth since its oscillatory arm permits access to any point of the gratings even if said gratings have irregular forms.

The object of the present invention will be better understood by representing through the accompanying drawings a preferred embodiment of the same in which:

Figure 1 shows a side elevation view of the machine for cleaning gratings with the oscillatory arm situated in extreme positions.

Figure 2 shows a side elevation view with the oscillatory arm in stand still or maintenance position.

Figure 3 shows an enlarged detail with the spoon in the position of tilting the dirt onto the transporter.

Figure 4 shows an alternative for the situation of the transporter.

Figure 5 shows a front view of the oscillatory arm and the mechanism of displacement thereof.

Figure 6 shows a detail of the cross-section of the oscillatory arm.

The machine for cleaning gratings by means of an oscillating arm for hydraulic weirs, object of the present invention includes, as it can be observed in the mentioned figures, a machine (1) which through a rotation axis (2) comprises an oscillatory arm (3) having the shape of "U" inside of which a plurality of guides (4) are located which permit the movement of the carriage (5) by means of wheels (6), said movement being transmitted to the carriage (5) by means of chain (7) which is activated by means of a hydraulic motor (8) situated at the exterior end of the oscillatory arm (3) which adopts the positions of oscillation by means of a double-acting cylinder (9) secured to the structure of the machine (1).

The carriage (5) securely supports an arm (10) that at one end of which opposite to the carriage (5) comprises securely a spoon or shovel (11) which upon its raising movement close to the grating (12) takes out the accumulated dirt; and by means of a tilting movement of the mentioned spoon (11), upon reaching to the point (14), the dirt is emptied on to the transporter (13) which then evacuates the dirt towards one side of the weir.

The displacement of the machine (1) along the weir is carried out by means of guides or rails

(15) over which wheels (16) are moveable. All the movements of the system may be controlled either manually by an operator or automatically by means of a preestablished program.

Having sufficiently described the nature of the invention, together with one form of putting it into practice, it is to be understood that it is possible to introduce changes in form, materials, and disposition over all the invention or over the parts that it is composed of, as long as such alterations do not vary substantially the characteristics of the invention claimed as follows:

Claims

1. Machine for cleaning gratings by means of an oscillating arm for hydraulic weirs, of the type used to take out dirt which is accumulated on the gratings of weirs, characterized in that it is composed of an oscillatory arm which by means of a pivoting point and using a double-acting cylinder, said arm may adopt positions which enable the arm to reach to any point of the grating even though said grating has irregular form, the displacement of said machine along the weir being possible by means of wheels which are displaced over guides or rails fixed on the ground.
2. Machine for cleaning gratings, according to claim 1, characterized in that the oscillatory arm is defined by a profile in form of "U" or the like, and guides that are installed along in the interior of said profile, which guide permit the displacement of the carriage which supports a spoon or shovel.
3. Machine for cleaning gratings, according to previous claims, characterized in that the dragging of the carriage which supports the spoon is carried out by means of a chain which runs inside the oscillatory arm, and the movements of said chain being controlled by means of a hydraulic motor situated at the exterior end of the oscillatory arm.
4. Machine for cleaning gratings, according to previous claims, characterized in that in order to place the collected dirt on the transporter this is done by tilting said spoon without a pass-way or a window.
5. Machine for cleaning gratings, according to previous claims, characterized in that it may be activated either by electric or hydraulic mechanisms, said mechanisms can be controlled in manual or automatic forms indistinctly.

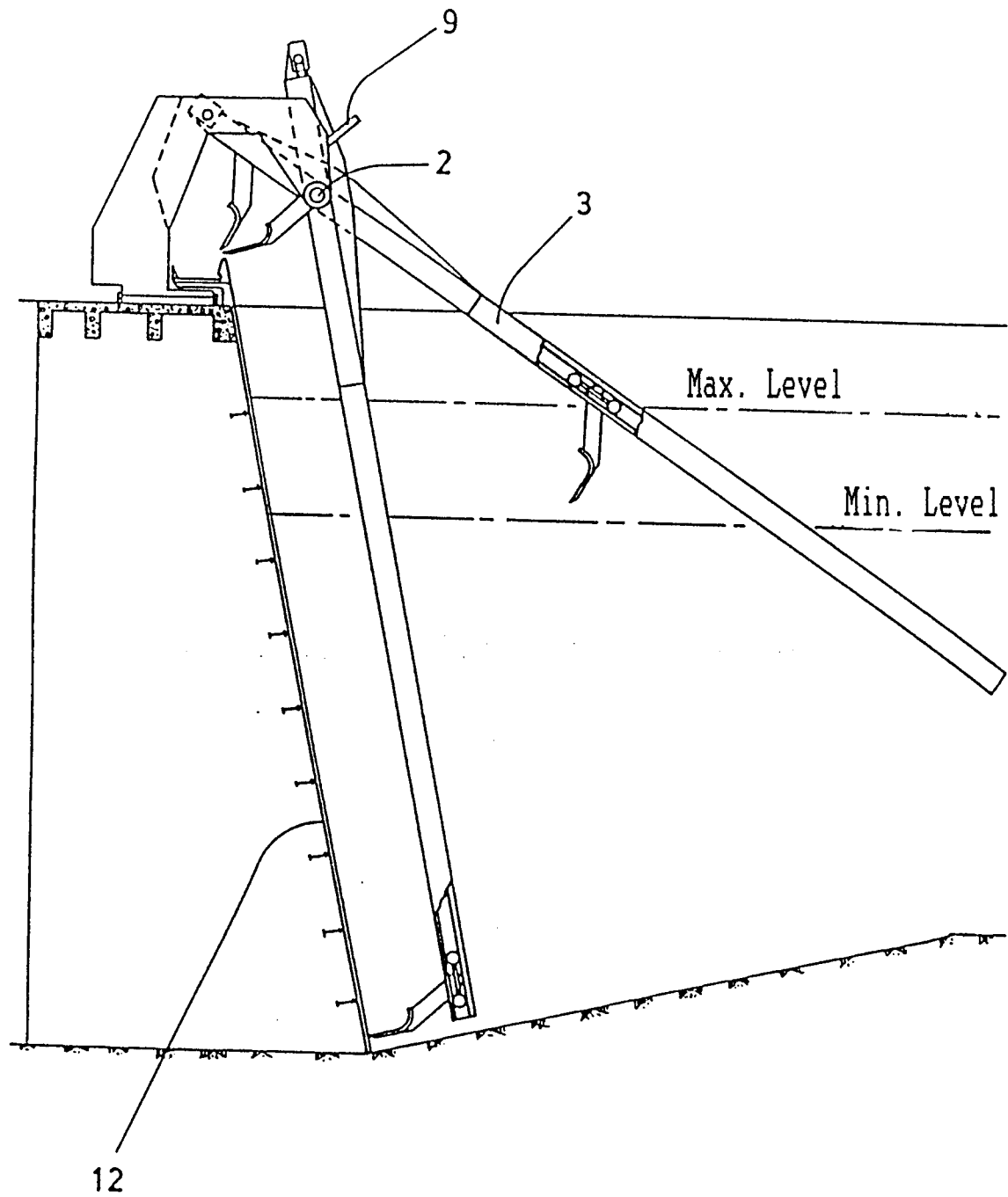


Fig. 1

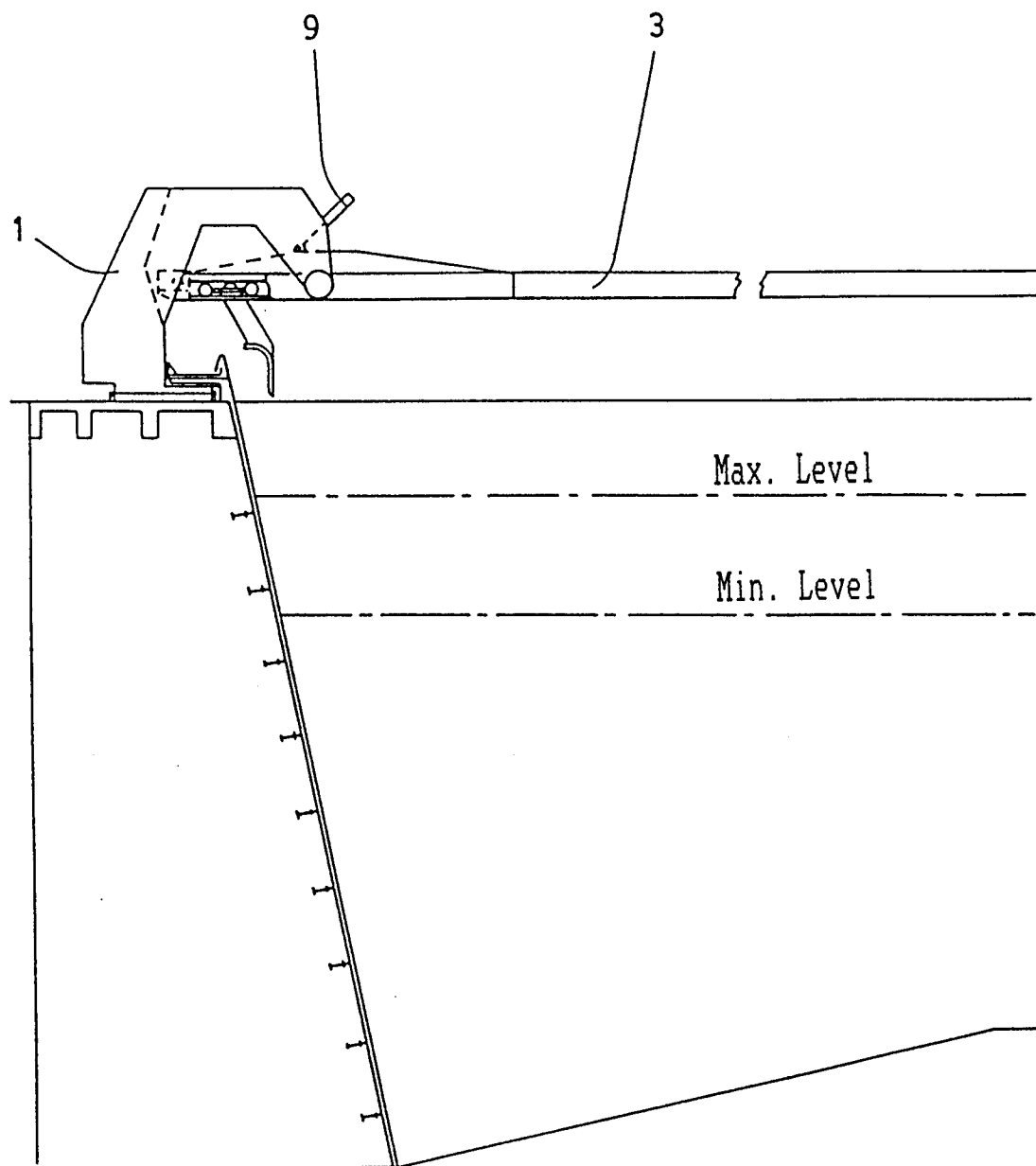


Fig. 2

Fig. 3

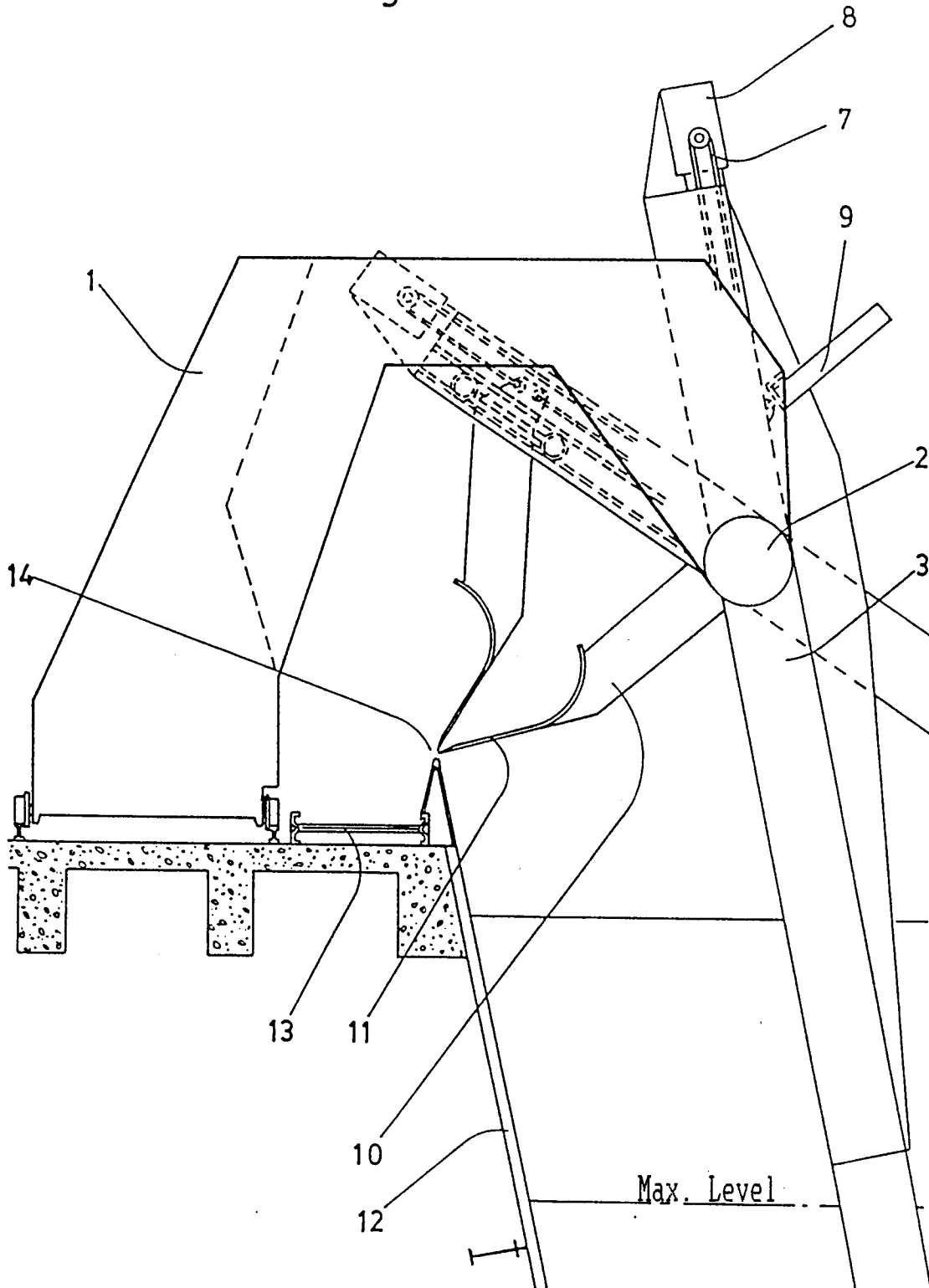
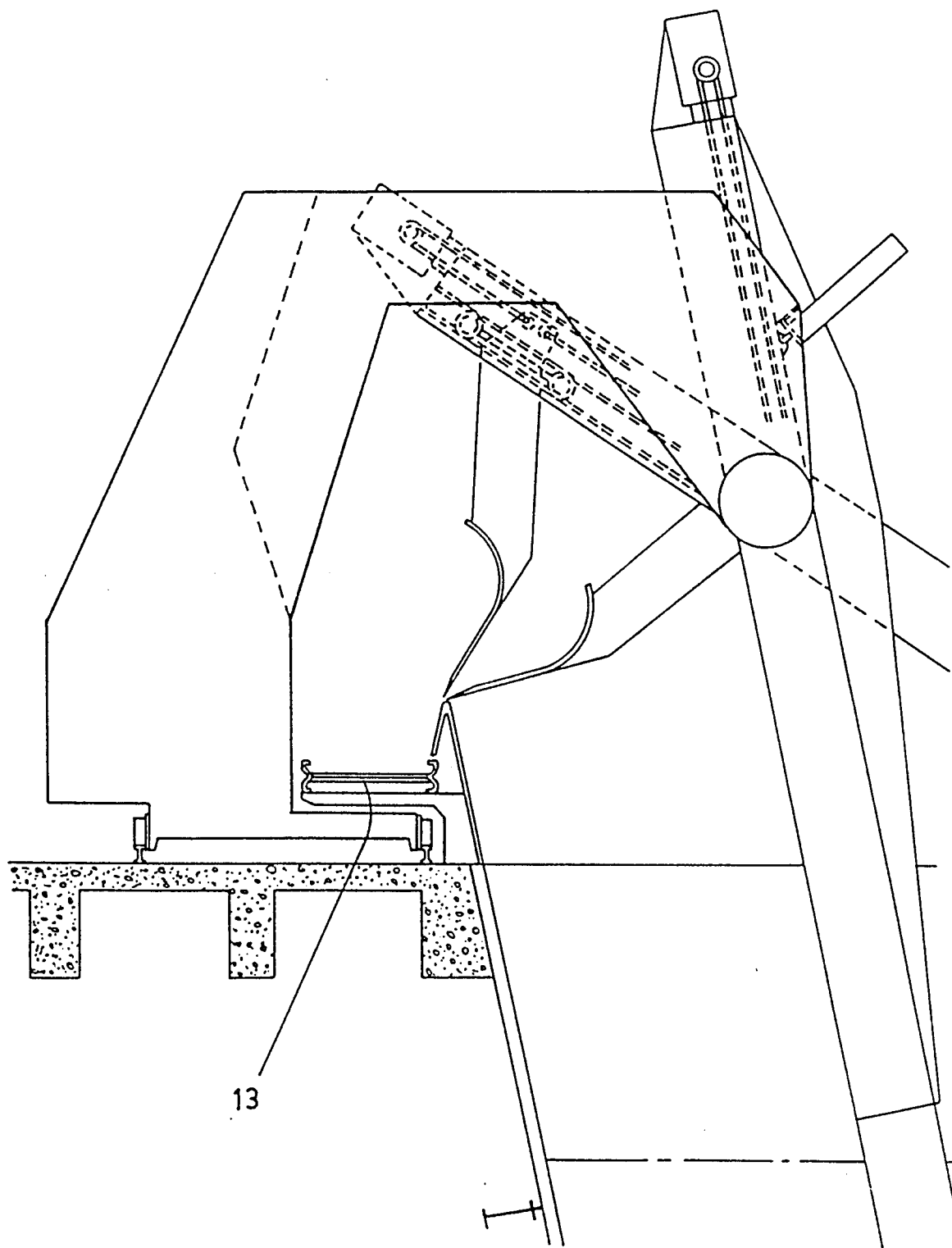


Fig. 4



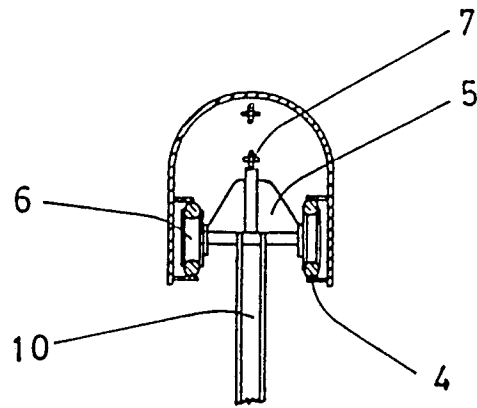


Fig. 6

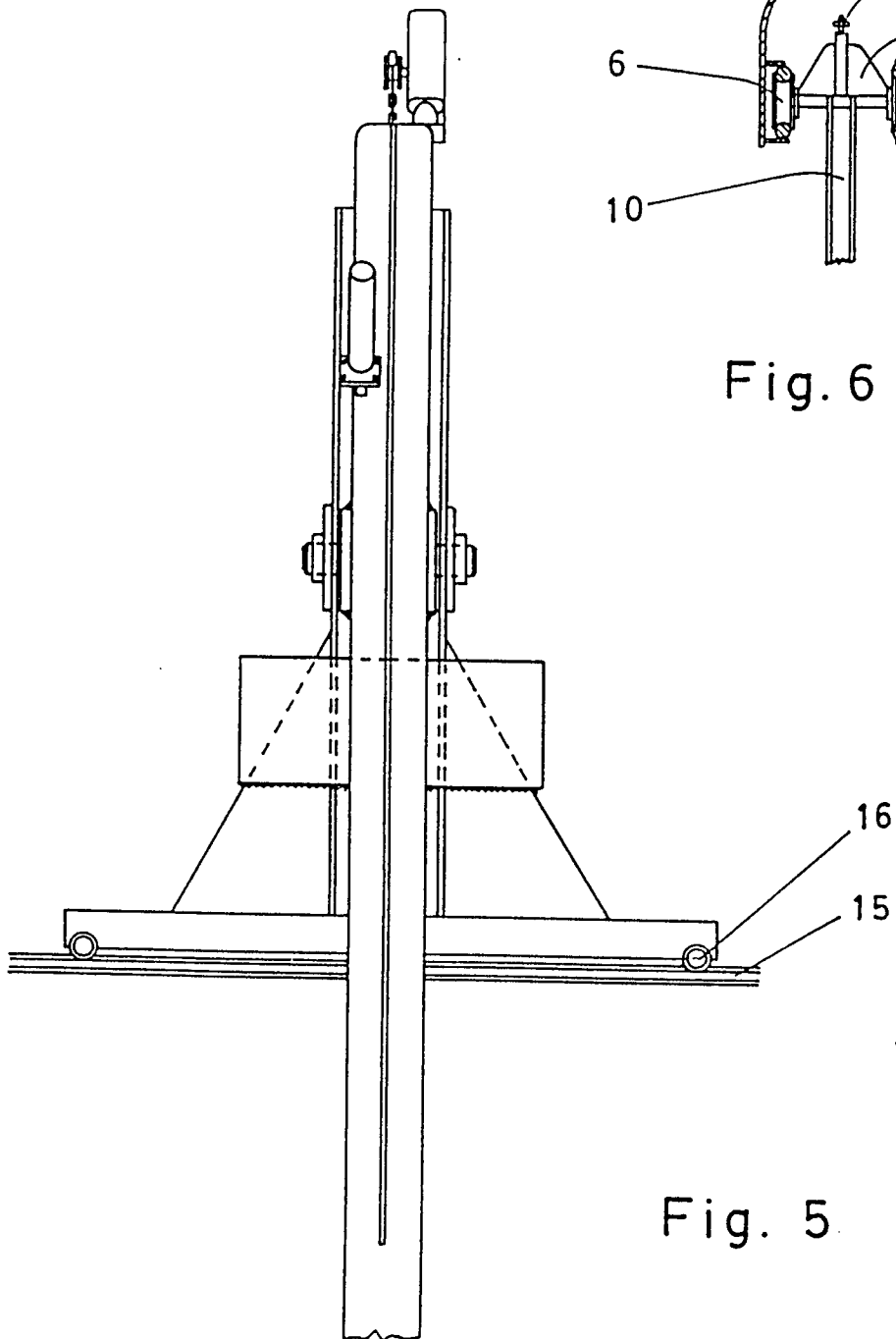


Fig. 5

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 92/00054

A. CLASSIFICATION OF SUBJECT MATTER

Int.Cl.⁵ E 02 B 8/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Int.Cl.⁵ E 02 B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR, A, 2 413 327 (O.M.T.I.P. S.R.L.) 27 July 1979	1
Y	see page 2, line 20 - page 3, line 33; figures 1,2	2-5
X	CH, A, 600 061 (H.BIERI A.G.) 15 June 1978	1
A	see the whole document	3,4
Y	FR, A, 2 302 387 (DUVERNEUIL Y CADENA) 24 September 1976	2-5
A	see page 2, line 19 - page 4, line 5; figures 1-5	1
Y	FR, A, 2 532 863 (DEGREMONT) 16 March 1984 see page 4, line 23 - page 5, line 17; claim 2; figures 1-7	5
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☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"&" document member of the same patent family

Date of the actual completion of the international search
13 November 1992 (13.11.92)

Date of mailing of the international search report
29 December 1992 (29.12.92)

Name and mailing address of the ISA/
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES 92/00054

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	AT, A, 375 116 (WEBER) 10 July 1984 see page 2, line 41 - page 3, line 46; figures 1-3	1-5
A	DE, A, 3 620 474 (SCHÄFER) 23 December 1987 see the whole document -----	1-5