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(54) **A device for an easy quick refloating of heavy means, such as anchors, fouled in the sea-bottom.**

(57) A device for an easy quick refloating of an anchor, comprising among other components a shank (7), to one end of which two arms (8) are engaged as made integral by the crown (2), in which the operating or anchoring rope or chain (5) is connected to one end of said shank (7) at the anchor ring (12), characterized in that the anchoring rope or chain (5) is secured to the anchor also at the crown (2), while the connection of said anchoring rope or chain (5) with the anchor ring (12) occurs through engagement means (40) brought to a disengagement position by disengagement means (41), applicable when required from the boat, for coupling with one of the constituting elements (15) of the engagement means (40) to disconnect said rope or chain (5) at the anchor ring (12) and leave the same connected to the anchor (3) only at the crown (2).

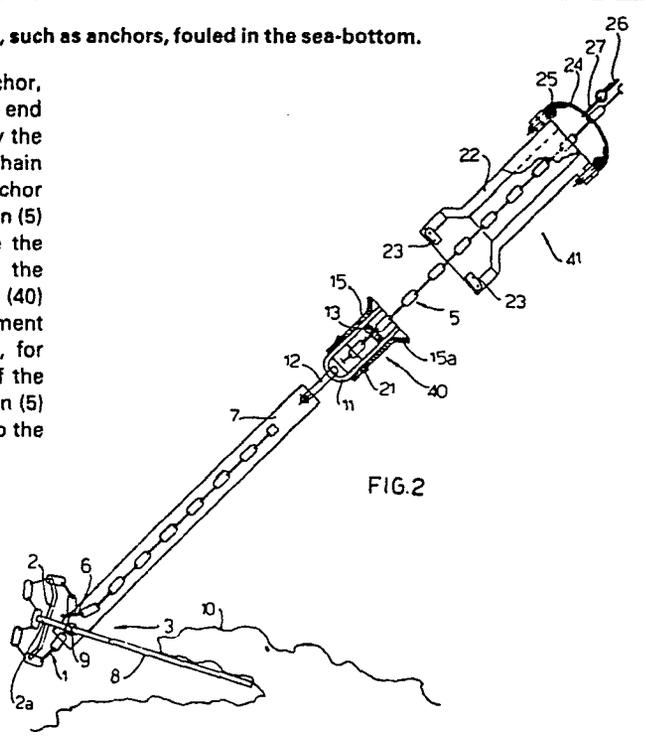

FIG.2

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"A DEVICE FOR AN EASY QUICK REFLOATING OF HEAVY MEANS, SUCH AS ANCHORS, FOULED IN THE SEA-BOTTOM"

This invention relates to a device enabling an easy quick refloating of heavy means fouled in the sea-bottom, such as for example anchors, or enabling the hauling in of the anchoring rope or chain from any object or body located at a predetermined position even, for example after having performed a specific operation. Hereinafter, reference will be particularly made to anchors, it being however understood that by means of quite obvious modifications said device can be applied to an

heavy unaccessible means after being run aground or positioned on the sea-bottom, or work stations.

Usually, an anchor comprises a shank having two arms normally secured or hinged to one end thereof, said arms terminating with triangular ends or flukes. The connecting end between said arms and shank is referred to as crown. Through the anchor ring, said anchoring rope or chain is engaged at the other end of the shank.

The quite frequent drawback of anchors being run aground, particularly in ports or harbours, is such a known subject that to describe this phenomenon a marine term has been properly coined (to be fouled).

An anchor is fouled when it is entrapped in some thing in the sea-bottom, such as a chain, rope, net or heavy body, so that the two arms of the anchor, when the latter drags the bottom for seizing purposes, insert under the obstacle and take such an attitude that the anchor can be brought afloat only by retraction. To do this, a tensile force has to be exerted on the rear portion, that is on the crown.

Sailors of old times used large circular stones having a hole at the center for bringing afloat the fouled anchors and exert such a force at the crown. The rope or chain was inserted through this hole and then the stone was allowed to sink to such a position that, by relying on the weight of the stone resting on the bottom, the anchor could be heaved so that a travel was effected which was reverse to that for fouling.

Various devices intended for the same purpose are commercially available. For example, a so-called "iron hand" has been developed, which is a kind of C-shaped hook for lifting the rope under which the anchor is fouled. However, this device, operated by two ropes, has the disadvantage of use only in case the anchor is fouled with a body which, in turn, can be lifted and retained at such a position by said "iron hand", to disconnect the anchor and then the "iron hand".

Another device at present used provides the use of an anchor with two ropes or chains, of which one for standard use and the other of which for disengaging a disconnecting device arranged between said shank and arms. Thus, upon being released, such arms can rotate and be arranged on the same axis as the shank and then disengage from the obstacle. Such means are referred to as "Maria Teresa". The disadvantage of this device is bonded to the provision of said two ropes or chains which have to be always present and unitedly operated. As apparent, this involves the possible mutual entanglement thereof or knotting thereof both outside and inside the water. Moreover, said "Maria Teresa" might also be dangerous because should the disconnecting device between the arms and shank unfortunately or by misfunction be operated at a time of risk, for example when the anchor is dropped in water to slow down the boat in case of collisions, the anchor with free arms would be uncapable of gripping. Thus, the disconnecting device of the "Maria Teresa" anchor, once operated, that is once the arms have been released from the shank, would make the anchor useless until the anchor is hauled in and brought to standard operating position, that is with the arms integral or fast with

the shank. Thus, the disconnecting device is effective on the anchor structure rendering the anchor useless during hauling in thereof. Further, in this latter device there are high disproportions between the shank and arms strength at the disconnecting device, which considerably restricts the gripping capability of the anchor.

Therefore, it is the object of the present invention to provide a device which by remote operation would allow to translate the rope or chain attachment location, to which the anchor is engaged, from the anchor head, at the anchor ring, to the opposite side of the shank, or crown, to practically haul in it, by using the least number of ropes as possible and leaving integer the structure of the anchor.

It is an auxiliary object of the present invention to provide a device for use only in case of need, that is when the anchor is fauled in the sea-bottom, so that, when not necessary, a portion thereof can be stored and used in a subsequent occasion.

It is a further object of the invention to use said device without disengaging the chain from the winch and hawsehole, as is instead the case for "Maria Teresa" device.

For the sake of brevity, reference will be made hereinafter to an operating chain, as well as of course to any rope, cordage or tie rod, having those modifications made thereto as quite obvious to those skilled in the art.

The object is achieved by providing that the operating chain is engaged, besides with the device according to the invention secured to the anchor ring, also at the crown. Said engaging device comprises engaging means between said rope or chain with the anchor ring of the anchor head and which may be brought to disengagement position by disengaging means, applicable when required from the boat, for coupling with one of the constituting elements of the engaging means, so as to disconnect the chain at the anchor head, and leave it only secured to the anchor at the crown.

A particular approach of the invention provides that said engaging means comprise a part or portion integral with the anchor ring of the anchor, including means for retaining at least a portion or link of the chain to assure load transmission to the anchor, and blocking means for engagement with the part or portion integral with the anchor ring of the engaging means, provided with gripping surfaces for the disengaging means.

Another embodiment provides that said blocking means for the engaging means have a through opening for chain sliding therein.

A particular embodiment provides that the portion of the engaging means secured to the anchor ring comprises a resilient element, such as a leaf spring, the pivotal ends of which engage with at least one annular groove in said blocking means.

A further modified embodiment of the invention provides that

the portion of the engaging means integral with the anchor ring is provided with means for the chain positioning.

A particular embodiment of the invention provides that the disengaging means, comprising a heavy body, include a tubular element having a through opening, internally allowing the chain sliding, secured at one end with auxiliary connecting means, such as a chain or rope. Said disengaging means provide means for coupling with the gripping surfaces provided on the blocking means so as to grip said gripping surfaces only if the force is exerted in a given direction.

A particular embodiment provides that the coupling means in the disengaging means comprise release pawls or rackets, the end positions of which are set by stop means.

Another approach provides that said disengaging means are divided into at least two interhinged valves, so as to aid the chain insertion in the through opening internally provided, when desiring to operate on the fouled anchor by said disengaging means.

Particularly, it is envisaged that the attachment location for the chain to the crown is at the rear end portion of the crown, to be indifferent relative to any gripping position of the anchor, so as to allow for changing the application position o. the force exerted through the chain from the anchor ring to the crown.

The invention will now be described in connection with a

preferred, but not exclusive embodiment thereof, with reference to the accompanying drawings, in which:

Fig. 1 is a side view showing an anchor lying on the sea-bottom and fouled;

Fig. 2 shows the disengagement device on approaching to the engaging means for the chain with the anchor ring of the anchor;

Fig. 3 is a view showing an intermediate step during anchor bringing afloat or recovery upon disconnection of the chain from the anchor ring engaging means through the operation of the disengaging means and by the pull of an auxiliary rope or chain from the boat;

Fig. 4 is a view showing the anchor bringing afloat or recovery at a step subsequent to that of Fig. 3;

Fig. 5 is a detail of the engaging means as mounted and retaining the operating chain; and

Fig. 6 is a sectional view taken along line 6-6 of Fig. 5.

From Figs. 1, 2 and 3 it will be seen that the engaging device 40, integral with the fouled anchor, is then brought to disengaging position by means 41. These Figs. 1, 2 and 3 show a small section of connecting rope or chain 1, in this case a chain, secured to the rear portion 2a of crown 2 of anchor 3 by means of spring catches or rings 4. Said connecting means constituted by chain 1 is suitable to restrain the operating chain 5 at the last ring 6 to allow for sliding and accordingly free rotation of shank 7 relative to arms 8, hinged or pivoted to crown 2 at location 9, and fouled in an obstacle 10. Chain 5 is connected to the boat, the head of which (not to scale) is

quite schematically shown in the figures of the drawings.

The engaging means 40 is shown with reference to Figs. 5 and 6. Such means comprise a fork 11, secured to said shank 7 by means of the anchor ring 12, completed with an inner U-bolt 13 which, by engaging the link 14 of the operating chain 5, restrains the latter so as to assure load transmission of anchor 3. The small section of bell-shaped tube 15 constitutes a blocking means. It is fitted on fork 11 and retained in position by means of two pins 17 inserted within two holes 18 in said fork 11 and kept in engagement in groove 19 through the action of a leaf spring 20. Said groove 19 provides a lead-in surface 19a for insertion or connection and a surface 19b of relative sealing. Provision is also made for a protection collar 21, integral with fork 11, provided with a counterbored end 21a, and an abutment 31 for abutting and protection of said small section tube 15. This would prevent casual impacts from causing a displacement of said small section tube 15. The surface 32 constitutes a guide for the positioning of chain 5.

The device can be mounted with some slight adjusting operation on most of commercially existing anchors. Thus, only a small change to the anchor is sufficient, by providing an attachment location of the operating chain also to the extreme rear portion of crown 2.

The position illustrated in Figs. 1 and 2 shows chain 5 connected to the crown and running along the shank 7. This chain is restrained to the anchor head by the small section of bell-shaped tube 15, making it integral with fork 11 which, in

turn, is integral with anchor ring 12. From the above Figs. 1 and 2, it will be appreciated that should the anchor become fouled, it will suffice to slip off said small section of bell-shaped tube 15 so as the chain disengages from fork 11 on which it is inserted, is released and thus results connected only to the crown 2. This allows for anchor bringing afloat owing to the force exerted on the crown, so as to pull the anchor in direction opposite to that in which it is fouled.

Therefore, a disengaging means should be used for exerting a force in the same direction along which the chain extends, engaging the small section of bell-shaped tube 15 and extracting it from the collar 21 integral with the head of shank 7.

This means is particularly shown in Figs. 2, 3 and 4. It comprises a bell 22 made of heavy material and internally provided with release pawls 23 movable between two extreme positions owing to the provision of per se known stop means (not shown). Said bell 22 is divided into two interhinged valves and completed by a small section of rope 24 connected to the head by means of two rings or catches 25, to which the auxiliary rope 26 is coupled by a catch 27. The disengaging means or member is used as follows.

When anchor 3 has to be brought afloat, valves of bell 22 will be opened onboard, such valves being preferably made of very heavy material, such as cast iron, and the latter will be fitted on the operating rope or chain 5, then closing again and clamping said valves by means of suitable per se known hooks,

not shown on the drawings. It is thus apparent that it is not necessary to disengage the chain from the winch or hawsehole. The bell 22 is lowered as secured to the auxiliary rope or chain 26. Owing to its own weight said bell will exert a force for connection dto the end of said small section of tube 15, overcoming the reaction of the springs of said release pawls 23. Confirmation for the user will be given in that said auxiliary rope will be released of the load due to the weight of bell 22. As above pointed out, said pawls are inwardly movable, while stop means are provided for end positions. By exerting a pull on auxiliary rope or chain 26, said small section of bell-shaped tube 15 is released from fork 11 and accordingly said operating chain 5 is disengaged from fork 11. Thus, said chain is no longer restrained to the anchor ring of the anchor head, but only to said crown 2. By pulling said operating chain 5, the last ring 6 will slide to the end of small section of chain 1 and shank 7, with said fork 11 in abutted condition by means of anchor ring 12, will downward rotate (see Fig. 4).

The anchor 3 will be fouled as said shank 7 will continue in downward rotation and arms 8 will upward rotate, whereas the rear plate of crown 2 will take a nearly aligned position with operating chain 5. Upon release of small section of tube 15, said bell can be recovered by exerting a pull on rope 26.

Then, by pulling said chain 5, the anchor 3 is brought afloat. Said anchor 3 will be brought back to standard position, restraining again the operating chain 5 to fork 11 and upsetting the small section of bell-shaped tube 15 on the

latter until the pins 17 snap into groove 19 (see Figs. 5 and 6). Thus, said shank 7 will be connected again to the operating rope 5, that is with said anchor 3 again at holding position.

Thereby it will be clearly evident that double operating ropes or chains are required only when anchor recovery is concerned, and not during normal use thereof. Additionally, at any time the anchor can be used and cast or dropped into sea when required, as the structure thereof is not at the last involved, neither the chain has to be disengaged from the hawsehole and winch. As a whole, the device is of a limited cost and complete reliability during operation thereof.

As above pointed out, the small section of bell-shaped tube is particularly designed in order to avoid any displacement from its normal position in case of hurried operation, or operation carried out under conditions of rough sea.

The foregoing is only a preferred, but unrestrictive exemplary embodiment of the device according to the invention, which device could be carried into practice through changes or modifications as obvious to those skilled in the art.

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C L A I M S

1. A device for easy quick refloating of an anchor, comprising a shank (7), having two arms (8) engaded to one end thereof and made integral by the crown (2), wherein the operating rope or chain (5) is connected to one end of said shank (7) at the anchor ring (12), characterized in that the operating or anchoring rope or chain (5) is connected to the anchor also at the crown (2), whereas the connection of said operating rope or chain (5) with the anchor ring (12) occurs through engaging means (40) brought to disengagement position by disengaging means (41), applicable from the boat or watercraft, for coupling with one of the constituting elements of the engaging means (40) to disengage the rope or chain (5) at the anchor ring (12) and leave it connected to the anchor (3) only at the crown (2).

2. A device according to Claim 1, characterized in that said engaging means (40) comprise a portion (11, 13, 20, 21) integral with the end of said shank (7) and internally provided with at least one member or means (13) for retaining at least one portion or link (14) of the rope or chain (5), to

assure the load transmission to said anchor, and further comprising snap blocking means (15) for engagement with the integral portion (11, 13, 20, 21) of the engaging means (40), and provided with a connecting or coupling surface (15a) with the disengaging means (41).

3. A device according to Claim 1, characterized in that said blocking means or member (15) is provided with a through opening for internal slide of said rope or chain (5).

4. A device according to Claim 2, characterized in that said portion (11, 13, 20, 21) integral with the anchor ring (12) comprises at least one resilient element (20), the pivot ends (17) of which engage with an annular groove (19) in said blocking means (15).

5. A device according to Claim 1, characterized in that said disengaging means (41) comprise a tubular element (22) provided with a through opening for the internal slide of said rope or chain (5), secured to one end of an auxiliary rope or chain (26), further comprising connecting means (23) for the gripping surfaces (15a) on the blocking means (15) in the engaging means (40) to grip said blocking means (15).

6. A device according to Claim 5, characterized in that said connecting means (23) for the gripping surfaces (15a) comprise release pawls or rackets, the end positions of which are set by stop means.

7. A device according to Claim 1, characterized in

that said disengaging means (41) are divided into at least two interengaged valves to aid an insertion of said rope or chain (5) when desiring to operate with said disengaging means (41).

8. A device according to Claim 1, characterized in that said rope or chain (5) engages with connecting means (1) secured to the rear end portion of the crown (2) which is unaffected relative to any gripping position of the anchor, to allow the changing of the application location for the force exerted through said rope or chain (5) from one to the other end of the anchor (3).

9. A device according to Claim 2, characterized in that said portion integral with the engaging means (40) comprises a collar (21) having counterbored edges (21a) and an abutting surface (31) for abutment and protection of said blocking means (15).

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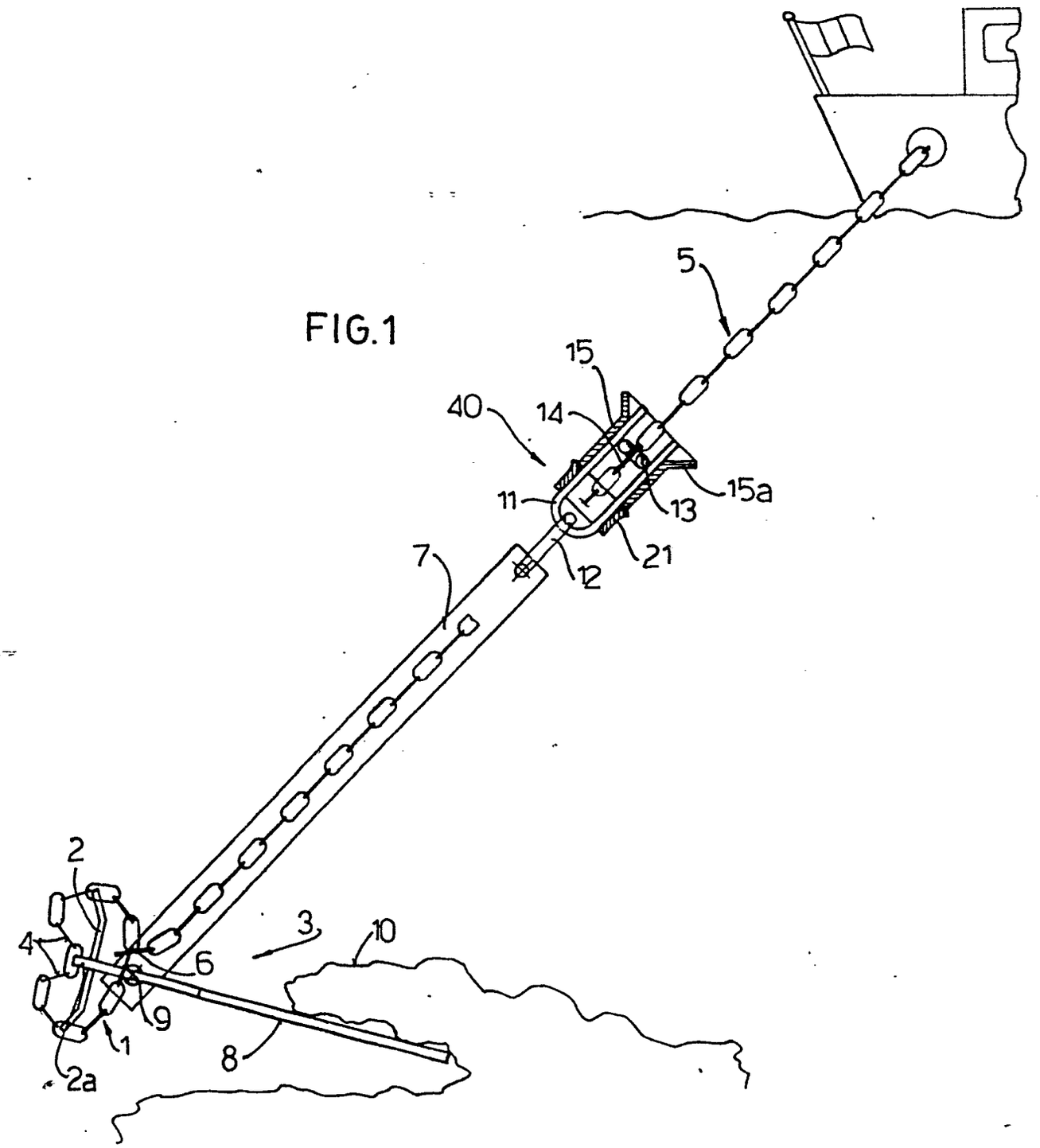
FIG.1



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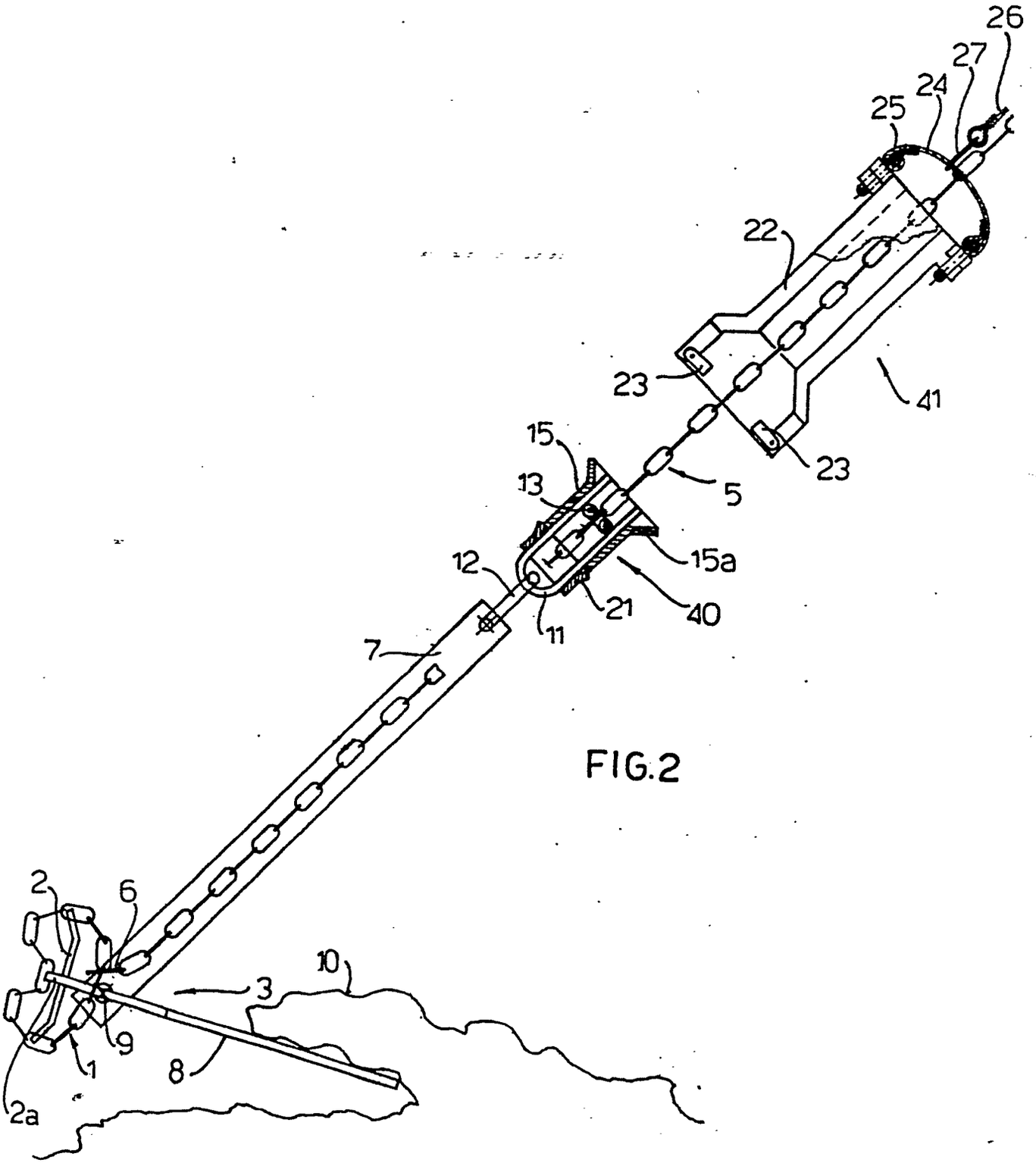

FIG.2

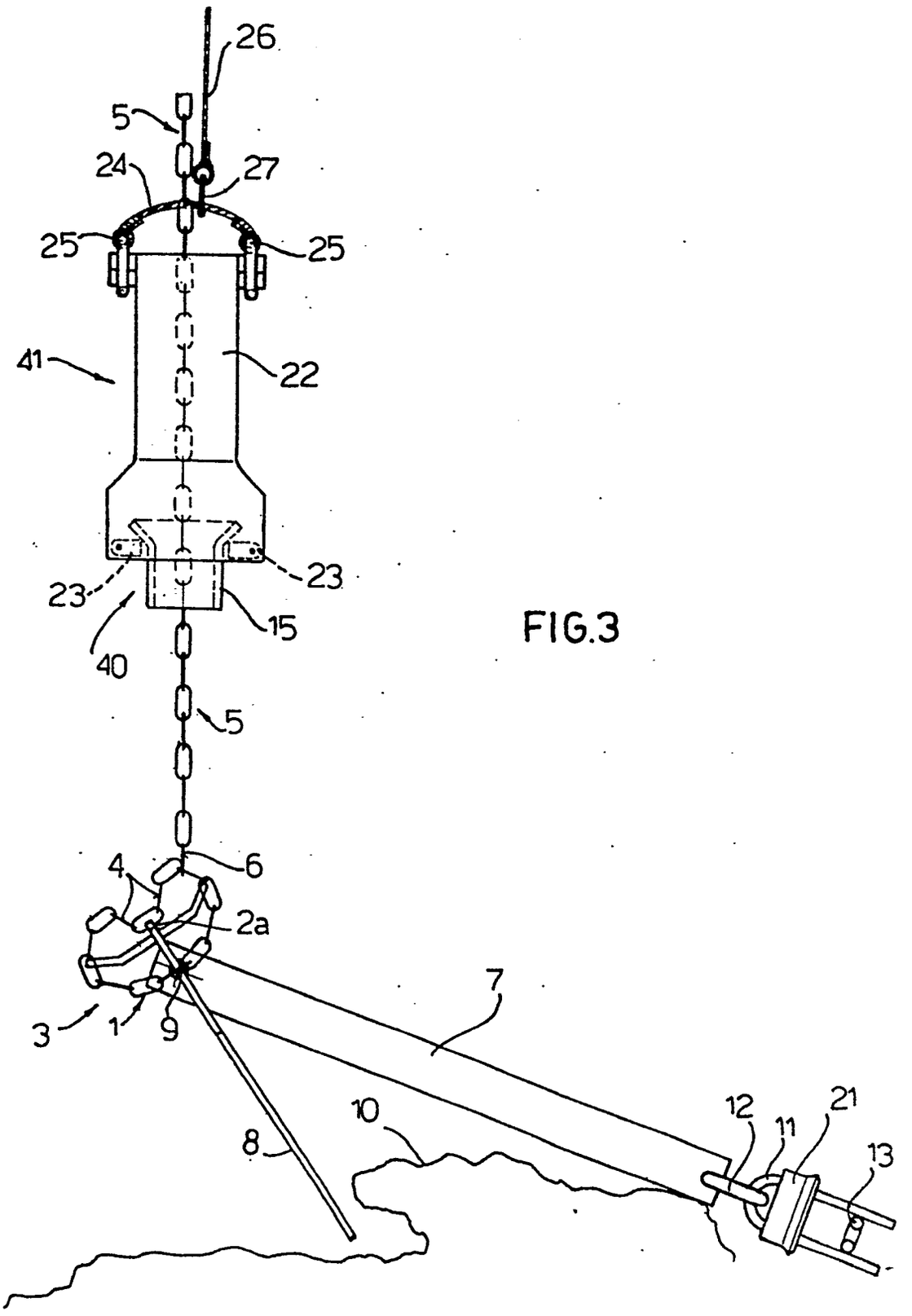

FIG.3

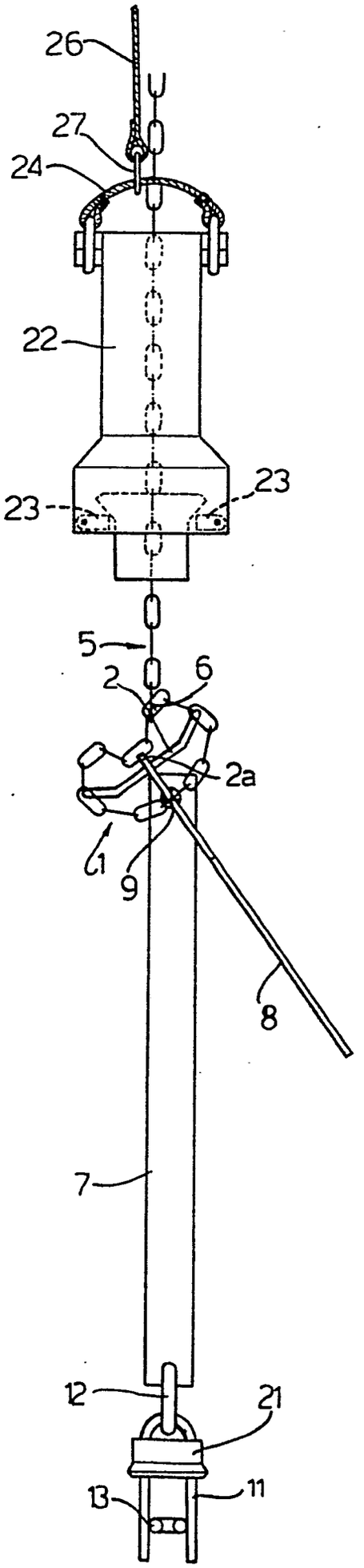

FIG.4

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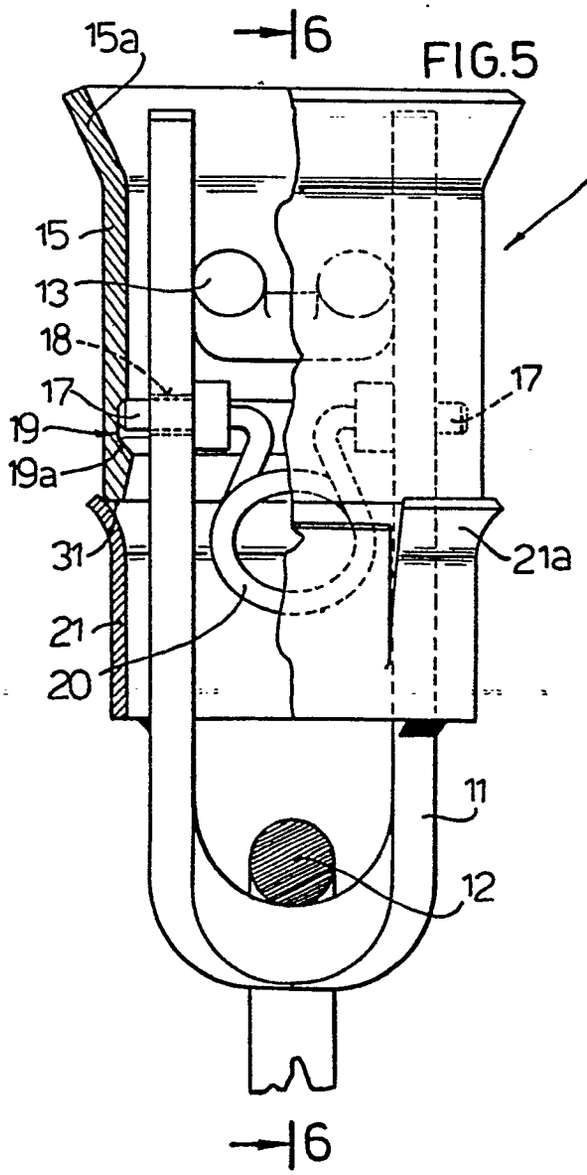

FIG.5

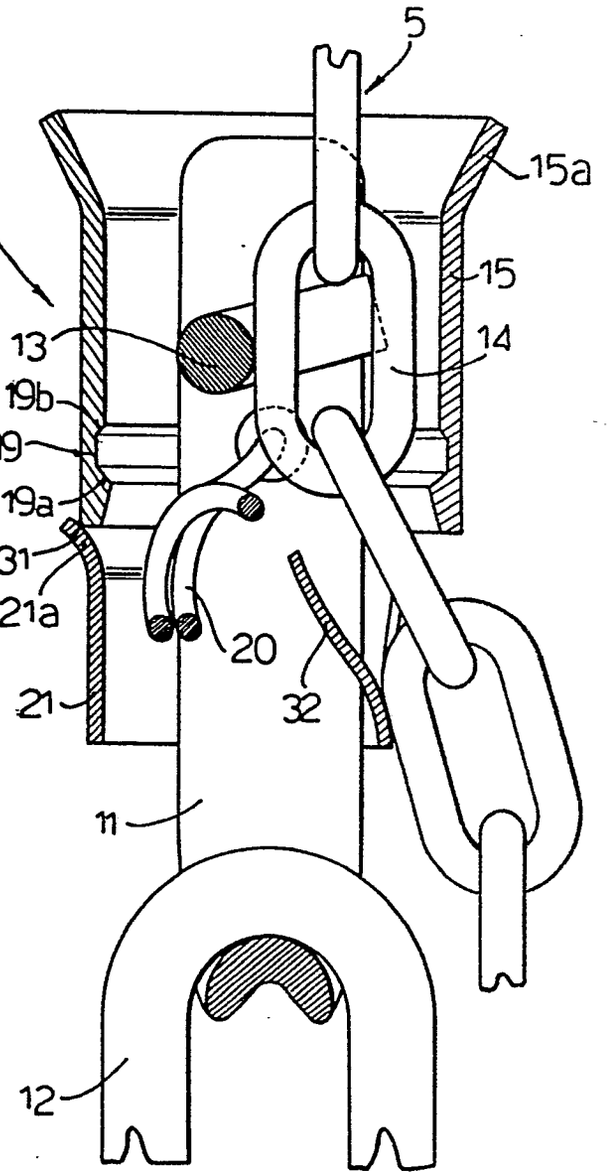

FIG.6

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EUROPEAN SEARCH REPORT

Application number
EP 83 10 5984

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. ³)
A	US-A-2 490 460 (McAVOY) * Whole document *	1	B 63 B 21/22
A	FR-A-2 172 603 (MARTINEZ) * Whole document *	1	
A	US-A-3 150 629 (FIELDS) * Whole document *	1,2	
A	US-A-2 568 006 (ILLSCHE) * Figures 1-7 *	1	
A	US-A-3 905 190 (PEARLMAN) * Whole document *	2	
A	US-A-3 995 577 (GENTRY)		TECHNICAL FIELDS SEARCHED (Int. Cl. ³)
			B 63 B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	14-10-1983	DE SCHEPPER H.P.H.

CATEGORY OF CITED DOCUMENTS

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