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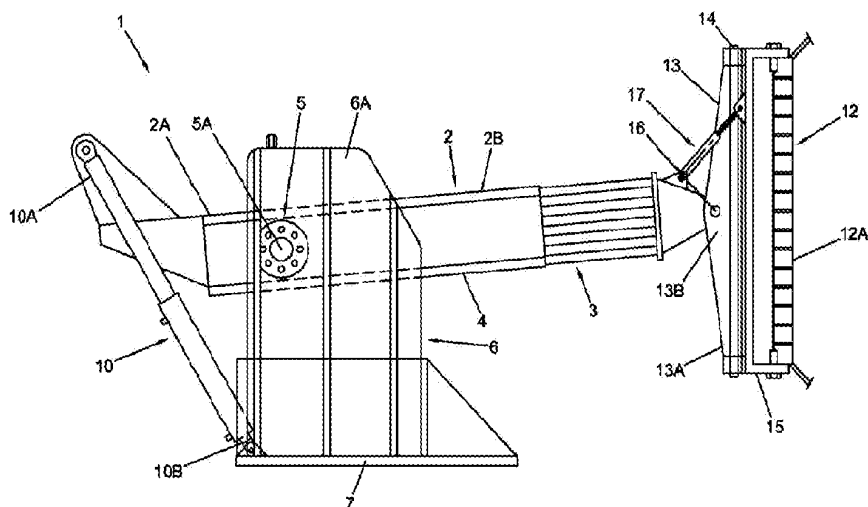
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(54) Mooring device and method of mooring.

(57) Current invention relates to a mooring device (1), suitable for mooring a ship (S) comprising a magnet (12) suitable for making contact by magnetic force to a hull (H) of a ship (S), characterised in that the magnet (12) is positioned on a first end of an arm (2). The invention further relates to a method of mooring, comprising the following steps: providing a mooring device according to the invention on a water surface neighbouring structure, having a ship, barge, vessel or the like (S) approaching the structure, having the magnet (12) of the mooring device (1) facing the hull of the approaching ship (S) and allowing contact between the hull (H) of the ship (S) and the magnet (12) and switching the magnet (12) on.



NL C 2002182

Dit octrooi is verleend ongeacht het bijgevoegde resultaat van het onderzoek naar de stand van de techniek en schriftelijke opinie. Het octrooischrift komt overeen met de oorspronkelijk ingediende stukken.

P85006NL00

Title: Mooring device and method of mooring

The invention relates to a mooring device.

More specifically the invention relates to a mooring device with a magnetic connector.

Such devices are for instance disclosed in the international patent
5 application WO 2004 050 471. In this application, a series of magnets are disposed on a quayside, wherein the magnets are provided with magnetic cores that are comb shaped and wherein the teeth of the comb form the magnetic poles and are oriented away from the quayside.

The magnetic fields are generated with direct current fed excitation
10 windings. In order to compensate for tidal motion of the moored ship, it is proposed to repetitively switch on and off several of the magnets, such that the magnet can slide over the hull of the moored ship.

Alternatively, in this application it is proposed to have the complete magnets pack slidingly connected to the quayside.

15 In this device, the ship is not allowed any motion other than the vertical tidal induced motion of the ship. Motion induced by for example swell, wind and initial mooring and/or manoeuvring speed of the ship cannot be compensated by the proposed system. These motions can possibly impose impacts of the hull against the mooring magnets, causing damage and
20 eventually possible holes in the hull.

Accordingly it is an object of the current invention to provide an alternative mooring device and method of mooring. A further object of the invention is to provide a mooring device that is preventing damage of the ships to be moored, while at the same time providing a secure mooring with possible
25 compensations for tidal motion, swell motion, initial mooring motions, manoeuvring motions and/or other movements of the ship to be moored.

At least this and/or other problems are solved by a mooring device according to claim 1 and a method of mooring according to claim 9.

In a first aspect of the invention a mooring device is presented, suitable for mooring a ship comprising a magnet, suitable for making contact
5 by magnetic force to a hull of a ship, wherein the magnet is positioned on a first end of an arm.

In another aspect of the invention, a method of mooring is provided, which method comprises the following steps: providing a mooring device on a water surface neighbouring structure, having a ship, barge, vessel or the like
10 approaching the structure, having the magnet of the mooring device facing the hull of the approaching ship, allowing contact between the hull of the ship and the magnet and switching the magnet on, such that a secure mooring is performed.

Further advantageous aspects of the invention can be found in the
15 dependent claims.

For a better understanding, embodiments of the adapter will be further elucidated by the following Figures, wherein:

Figure 1a is a schematic side view of a mooring device according to a first embodiment of the invention;

20 Figure 1b is a schematic side view of an alternative embodiment of the invention;

Figure 1c is a schematic side view of a further alternative embodiment of the invention;

Figure 2 is a schematic side view of an actuator, applied inside an
25 extendable arm according to the first embodiment of the invention;

Figure 3 is a partly worked open schematic perspective view of a casing of a first end of the extendable arm of the mooring device according to the first embodiment of the invention;

Figure 4 is a schematic perspective view of an extendable arm
30 element according to a further alternative embodiment of the invention;

Figure 5 is a schematic side view of a connection between a connector and a magnet bracket according to yet another embodiment of the invention;

Figure 6 is a schematic perspective view of a base of the mooring device according to the first embodiment of the invention;

Figure 7a is a first schematic front view of a ship being moored by means of a mooring device according to the invention during low tide,

Figure 7b is a second schematic front view of a ship being moored by means of a mooring device according to the invention during high tide,

Figure 8a is a first schematic front view of a bunker ship being moored by a ship by means of a mooring device according to the invention when the bunker ship is loaded and

Figure 8b is a second schematic front view of a bunker ship being moored by a ship by means of a mooring device according to the invention when the bunker ship is unloaded.

In the figures and the description the same or corresponding parts will have identical or similar reference signs. The embodiments shown should not be understood as limiting the invention in any way or form.

Figure 1 depicts a mooring device 1 for boats, ships or vessels, ranging from small private leisure yachts to large commercial vessels.

The mooring device 1 can be mounted e.g. on a boat's deck or on a quayside and can replace or provide an addition to conventional mooring system such as ropes and shore attachments.

The mooring device 1 can be applied singly or in a row of several units, wherein the number of mooring devices 1 is depending on the needs of the vessel to be sufficiently secured.

The mooring device 1 comprises an elongated arm 2 capable of extending or stretching out in length by means of an extendable arm element 3, which is housed by a solid, protective casing 4. The elongated arm is capable of elongating in the same manner as the position of the extendable arm

element 3 would stipulate within any point, within its restrictions, that the arm can move to.

To a first end 2a of the elongated arm 2, a connector 8 is attached. To this connector 8, a first end 10a of a first actuator 10 is pivotly connected. A
 5 second end 10b of this first actuator 10 is pivotly connected to the baseplate 7 or to the single unit bracket 6a. By the arrangement of the first actuator 10, it can rotate the elongated arm 2, thus allowing the second extending end 2b to move upwards and downwards.

In figure 1, the arm is provided with one extendable arm element 3,
 10 which is internally driven by a second actuator 11 as shown in figure 2. A first end 11a of the second actuator 11 is connected to the connector 8 and a second end 11b is connected to the extendable arm element 3. By the arrangement of the actuator, the extendable arm element 3 can extend or shorten the arm 2. Alternatively, the extending arm can comprise more than one extending
 15 element and can be arranged in a telescopic manner for instance by means of a set of concentrically arranged telescopic elements.

The protective casing 4 of the elongated arm 2 is supported by a hinge 5, pivotly built within two opposing supporting walls 6 of a single unit bracket 6a. The single unit bracket 6a is connected to a base plate 7, which can
 20 be mounted on e.g. a ship S, as depicted in the figures 8a and 8b or on a quayside, as depicted in figures 7a and 7b. The hinge 5 is arranged near a first end 2a of the arm 2, such that a second end 2b of the arm 2 is extending from the single unit bracket 6a.

The actuator 10 can be chosen to be a hydraulic cylinder, a
 25 pneumatic cylinder, a linear electrical actuator and/or any other suitable actuator.

The actuator 10 can be prompted by a for example a smaller hydraulic pump placed on the end and exterior of the mooring device 1 in its entirety, within the spatial restrictions of the place it is mounted on.

Alternatively the actuator can be prompted by e.g. an onboard hydraulic, electric or pneumatic system, when such system is available.

The pivoting motion of the extendable arm 2 ensures the adjustment of the mooring system to the motion of the vessel S e.g. due to swell, oscillation
 5 of water and possible rising or descending movement due to load alleviation or load discharge.

Thus the mooring system 1 allows up- and downward motion of the vessel S while maintaining the vessel S moored.

The elongated arm 2 supports a large electromagnet 12 which is
 10 pivotly connected to the end of the extending arm element 3. The electromagnet 12 is pivotly connected by means of a connecting shoe 13. The connecting shoe 13 is at a first side pivotly connected to the extending arm element 3 by means of an upwardly arranged axis 14. The connecting shoe 13 is at a second side 13b pivotly connected to the magnet bracket 15 by means of
 15 a lying axis 16.

Both axis's 14 and 16 allow the magnet bracket 15 to adapt its position to the shape and rounding of a hull H of a vessel S to be moored. Thus, the surface of the hull H need not be perfectly perpendicular to the mooring magnet surface 12a in order to be moored. Since most hulls H are by nature of
 20 non planar design this additional motion provides more flexibility to the mooring system 1.

In order to maintain the magnet bracket 15 and the magnets 12 in a substantially upright position, a third actuator 17 can be arranged between at its first end 17a to the extending arm element 3 and at its second end 17b to
 25 the connecting shoe 13. The actuator 17 can arrange the orientation of the magnet bracket 15 and the magnet 12 with respect to a lying axis of rotation.

In an alternative embodiment as depicted in figure 1b, the magnet bracket 15 and the magnets 12 can be maintained in a substantially upright position by means of an extendable pilot arm 18, as is schematically depicted
 30 in figure 1b. The pilot arm 18 can be at a first end 18a pivotly connected to the

supporting walls 6 of the single unit bracket 6a and at a second end 18b pivotly connected to the connector shoe 13.

In another embodiment as schematically represented by figure 1c, the arm can be provided with a link system comprising a knee joint 19.

5 In a further alternative embodiment, a further actuator 20 is arranged between the extending arm element 3 and the magnet bracket 15. The actuator 20 can arrange the orientation of the magnet bracket 15 and the magnet 12 with respect to an upright axis of rotation.

10 Thus the actuator 17 provides flexibility towards the orientation of the hull of a ship to be moored in a horizontal sense and the actuator 20 provides flexibility towards the orientation of the hull of the ship in a vertical sense.

In the embodiment as depicted in figure 5, a connector 21 is provided. The connector 21 can be mounted on the extendable arm element 3 of
15 the mooring device 1. A connector shoe 13 is at a first side 13a around an upward axis 14 pivotly connected to the magnet bracket 15 and at a second side 13b around a lying axis 16 pivotly connected to the connector 21. The connector shoe 13 is at the second side 13b provided with edges 22 and 23. The edges 22 and 23 are shaped to be able to touch on end surface 21a of the
20 connector 21 when the connector shoe 13 has rotated about a certain angle A with respect to a vertical axis. This angle A can for instance be chosen to be $+30^\circ$.

In figure 6, the single unit bracket 6 is depicted in more detail. The supporting walls 6a can be connected to the base plate 7 by means of knee
25 plates 24. The hinge 5 can comprise an axis 5a which is pivotly connected to the supporting walls 6a, by means of bearings 25.

The surfaces 22 and 23 of the connector shoe 13 can be provided with approach detectors 25 and 26 such as restrictive sensors. The magnet 12 can be controlled by restrictive sensors 25 and 26 that can be arranged to
30 switch on the electromagnet 12 within the restrictive area and turn off the

effective working of the electromagnet 12 when the outside boundaries of the mounting place are reached to ensure safety and effective working of the system.

Alternatively or additionally a rotational sensor can be used for measuring the rotation of the lying axis 16. This sensor can control the switching of the magnet 12 as well. Similarly force sensors can be applied to measure the forces exerted on the arm 2, the magnet 12 and/or the base structure 6 and 7.

The moment either restrictive boundary is reached and the electromagnet 12 is switched off. When the magnet 12 is switched off, no magnetic force will remain to fix the magnet to the hull and thus the extendable arm 2 and the magnet 12 can automatically move back towards an initial position, where the magnet can be switched on again.

The arm 2 can be moved back to its idle or original position for example by retracting the extending arm element 3 by means of actuator 11 from the hull H of a ship S, moving the arm back to its idle or original position by means of actuator 10, extending the arm by moving the extendable arm element 3 towards the hull H of the ship S, switching the magnet on to regain secure mooring of the ship S.

Thus when the vertical movement of the ship is beyond the reach of the extendable arm 2, the magnet can, step by step, move relative to the hull H of the ship S. This way of stepping over the surface will be preferable performed when more than one mooring device 2 is used, such that the separate mooring devices can step along the surface alternately such that at any time at least one magnet can be in contact with the hull. Thus the ship can be maintained moored without breaking loose.

The operational abilities of the mooring device can also be controllable through remote control which can e.g. overrule an automatic sensor system with the switches 25 and 26. The electromagnet 12 can function as an accretion method to any surface suitable for electromagnetic attachment.

This can entail ship hulls H (quay side mooring) or anything else meant for this objective (harbour side mooring).

In an aspect of the invention the mooring system can be vessel mounted. In that case, the quayside or the structure to be moored by can
 5 additionally be provided with special metal strips or plates, in order to facilitate the mooring by means of the mooring device 2.

To further ensure the adjustment of the involved vessel to oscillation of water and possible rising or descending movement, the elongated arm's function is extended in its support of the electromagnet 12 by a rotational
 10 construction with the upright and lying axis's of rotation 14 and 16, as described above. This rotational constructions, which in fact functions as a homokinetic element ensures the adaptive movement of the electromagnet 12; up and down; and left to right, Thus allowing movement in several degrees of freedom, like for instance six axis's.

15 A single mooring device 1 can solely be effective as a mooring system, but can similarly or alternatively be combined with a number of other, similar mooring devices 1 to create a complete cooperating mooring system. In practical use, a secure mooring is performed by at least two mooring points, such that for secure mooring two mooring devices 1 can be needed in the
 20 mooring system.

Such mooring systems can facilitate the mooring of larger vessels, where the amount of mooring devices 1 can be dependent on e.g. size and weight. In such a mooring system, each single mooring device 1 can be placed in a different position regarding the height of the elongated arm 2 of each
 25 single mooring device 1.

A plurality of mooring devices 1 can thus ensure that when discharging or loading of any kind, a vessel can always be attached to at least all but one of the single mooring devices 1. Due to the functioning of the aforementioned and explained restrictive sensors 25 and 26 in sync with the
 30 functioning of the aforementioned and explained electromagnet 12, the

separate mooring devices 1 can step by step move along the surface of the hull H of the ship S to be moored.

This will maximize safety and guarantee secure attachment of the vessel S to a desired choice of place of attachment, whether this is quay side Q, harbour side or vessel side enabling it to mimic the flexibility of ropes making it manageable on the water and its random movements and flows.

To further ensure adaptability to the water's movements the entire structure can be placed on a sled like basis which enables it to slide forward and backward, confined by e.g. a large spring, controlled by a large hydraulic arm and or actuated by an actuator, which can bring it back to its original starting point. The sled can further provide an additional retraction possibility for securing that the arm can remain within the fender line of the ship, for example during transport or travel.

In any embodiment of the invention as described before numerous adaptations and modifications are possible. For instance, in order to gain flexibility, the magnet bracket can alternatively or additionally be supplied with suction cups, when mooring by means of magnetic forces is impossible, for example when polyester boats are being moored by a quayside mounted mooring device. By applying vacuum to these cups an additional or alternative force can be exerted on the hull of a ship.

Although most embodiments refer to the mooring of a ship by a shore, quay or other fixed world structures, the system can be applied for ship to ship mooring, such as pushed lighter or dumb barge transport.

In the embodiments shown several actuators 10, 11, 17 and 20 are described. These actuators can be hydraulically, pneumatically and/or electromagnetically driven. Besides the actuating function, these actuators can be arranged as dampers to absorb sudden motions of the Ship S.

The single mooring devices 1 or a system of a multitude of mooring devices 1 can be controlled by a suitable logic circuit. Such logic circuit can for instance be a logic computer such as a PLC or a PC.

Since the mooring devices 1 can be used for fuel loading bunker ships flammable and explosive liquids and vapors can thus be emitted, all of the electrical connection, wiring, actuators and other electrical equipment can be made suitable for the highest explosion standards. For this reason a

5 hydraulic or pneumatic actuator system can be advantageous.

These and other adaptations and modifications are possible without departing from the spirit and scope of the invention as defined in the claims.

Conclusies

1. Afmeerinrichting (1), geschikt voor het afmeren van een schip (S) omvattend een magneet (12), geschikt voor het door middel van magnetische kracht contact maken met de romp (H) van een schip (S), gekenmerkt doordat de magneet (12) op een eerste uiteinde van een arm
5 is geplaatst.
2. Afmeerinrichting (1) volgens conclusie 1, waarbij de arm (2) draaibaar met een basis (6,7) is bevestigd, waarbij de basis (6,7) op een kadekant, een oever, een ander schip, een schuit, een dok, een kade een werf, een steiger, en/of andere structuren waaraan een schip kan afmeren,
10 kan worden geplaatst.
3. Afmeerinrichting (1) volgens een van de voorgaande conclusies, waarbij de arm (2) uitstrekbbaar is.
4. Afmeerinrichting volgens conclusie 3, waarbij de arm (2) een behuizing (4) en een uitstrekbbaar armelement omvat en waarbij de
15 behuizing (4) en het uitstrekbbaar armelement (3) door middel van een actuator onderling zijn verbonden, en waarbij de actuator in staat is het uitstrekbare armelement ten opzichte van de behuizing (4) te bewegen.
5. Afmeerinrichting (1) volgens elk een van de voorgaande conclusies, waarbij de magneetklamp (15) draaibaar aan een einde van de
20 arm (2) is bevestigd.
6. Afmeerinrichting (1) volgens elk een van de voorgaande conclusies waarbij de rotatiehoek (A) van de magneet wordt beperkt door benaderingsschakelaars (25,26) die in staat zijn de kracht van de magneet te besturen.
- 25 7. Afmeersysteem, omvattend ten minste twee afmeerinrichtingen volgens elk een van de voorgaande conclusies.

8. Afmeersysteem volgens conclusie 7, waarbij het systeem een centrale logische schakeling omvat voor het besturen van de actuatoren (10, 11, 17, 20) van elk van de afmeerinrichtingen (1) van het systeem.
9. Werkwijze voor het afmeren, omvattende de volgende stappen:
- 5 - Het in een beginstand verschaffen van ten minste één afmeerinrichting volgens conclusie 1 of een afmeersysteem volgens conclusie 8, op een structuur die aan een wateroppervlak aangrenst,
- het met een schip, schuit, vaartuig en dergelijke (S) benaderen van de structuur,
- 10 - het in de richting van de romp (H) van het schip (S) wenden van de zich op een armuiteinde van de afmeerinrichting (1) bevindende magneet (12), en
- het door middel van magnetische kracht toestaan van contact tussen de romp (H) van het naderende schip en de magneet (12).
- 15 10. Werkwijze volgens conclusie 9, waarbij de werkwijze voorts de stappen omvat van:
- Het meten van de hoek van elk van de armen (2) ten opzichte van een staande as door middel van benaderingsschakelaars (25, 26), hoekmeetsensoren, spanningsregistratie en/of kracht registratie sensors,
- 20 - het verschaffen van een signaal door middel van deze schakelaars of sensors wanneer de hoek (A) van de arm (2) ten opzichte van een staande as een grenswaarde overschrijdt,
- het uitschakelen van de magneet (12) van de dienovereenkomstige afmeerinrichting (1) om de magneet van de romp (H) van het schip (S) vrij
- 25 te geven,
- het bewegen van de arm (2) naar zijn beginstand,
- het aanschakelen van de magneet (2) om opnieuw een ferm contact met de romp (H) van het schip (S) in te stellen door middel van magnetische kracht, en
- 30 - het herhalen van de bovengenoemde 5 stappen tijdens het laden, lossen van het schip (S) en/of tijdens de getijdenbeweging van het schip (S).

FIG. 1A

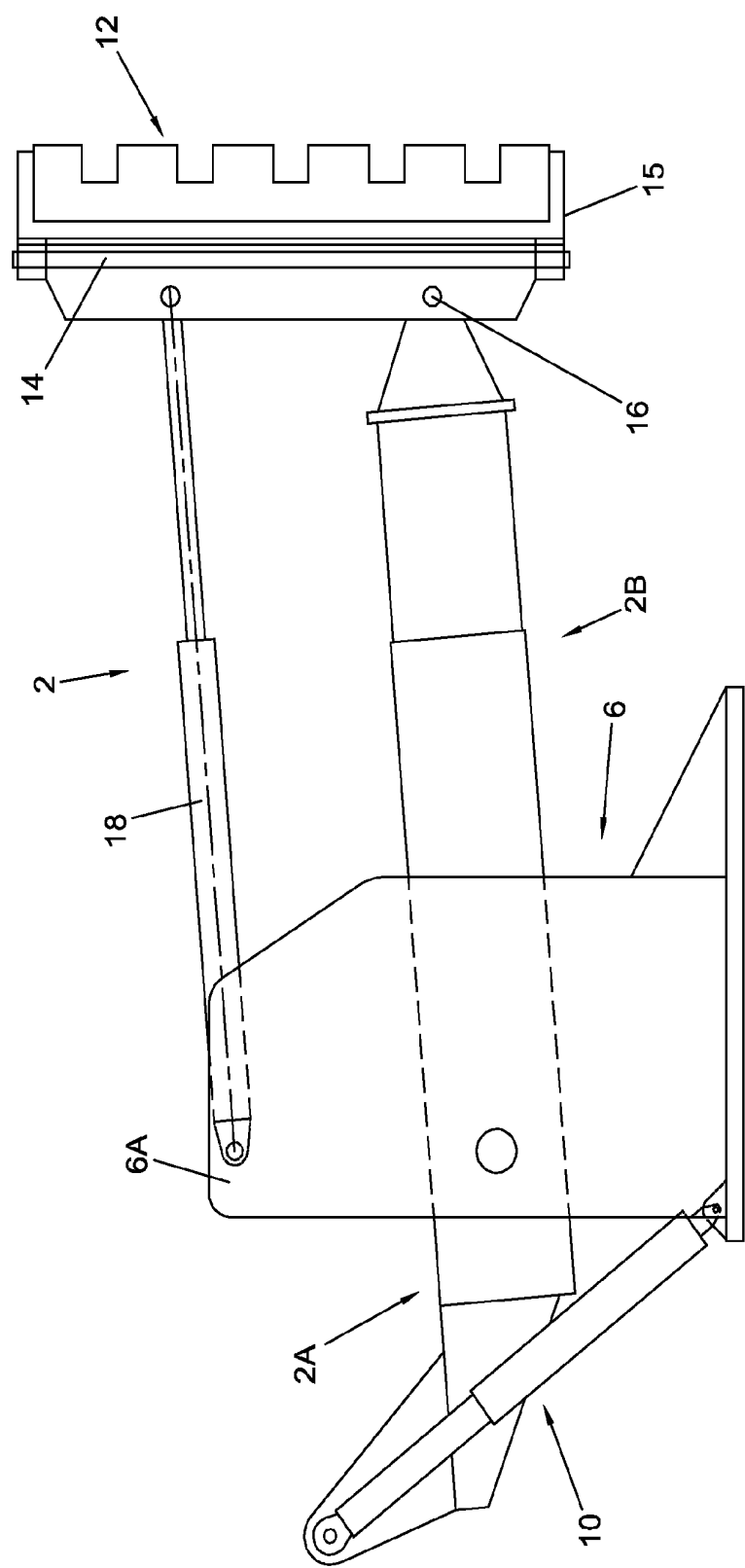


FIG. 1B

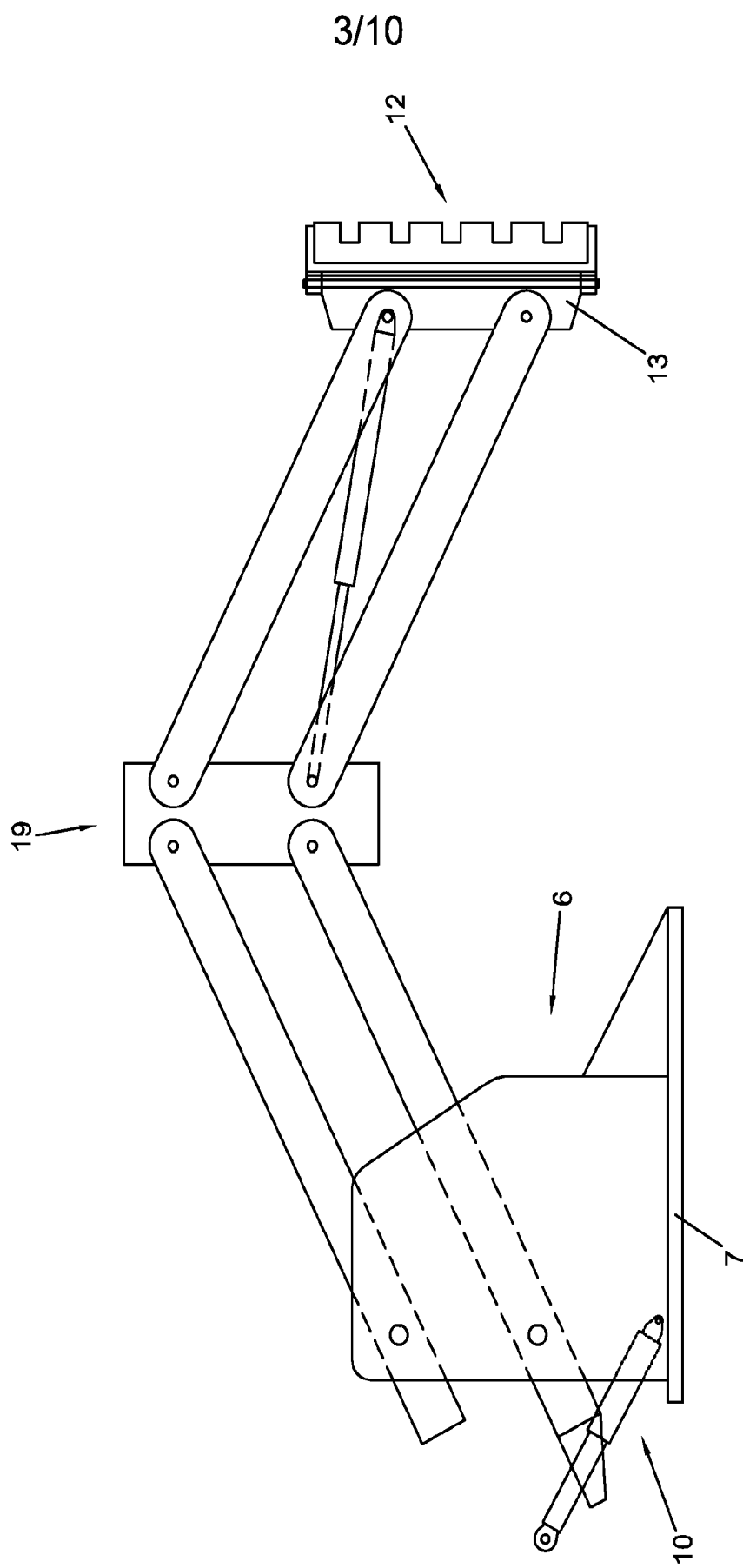


FIG. 1C

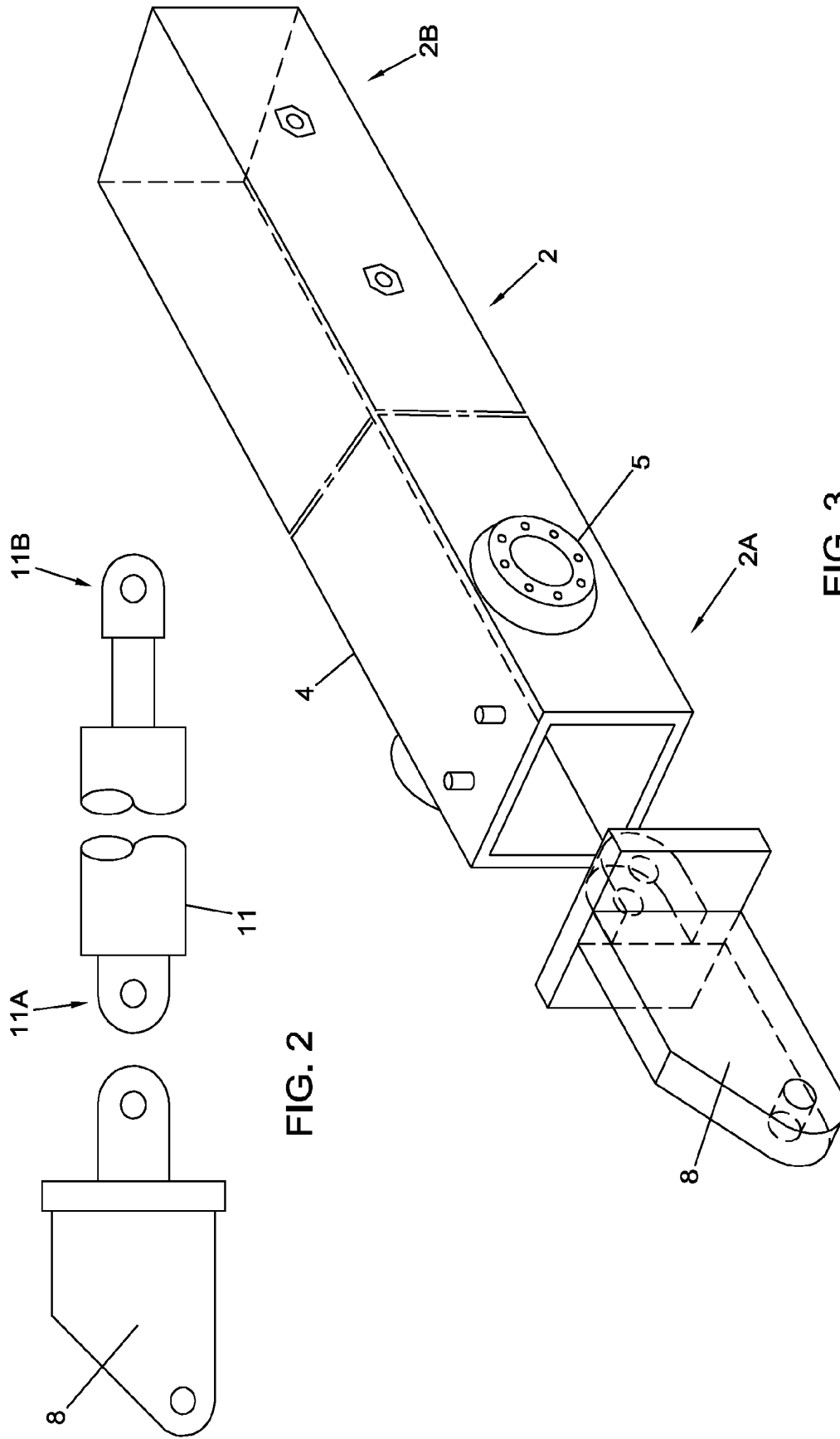


FIG. 3

FIG. 2

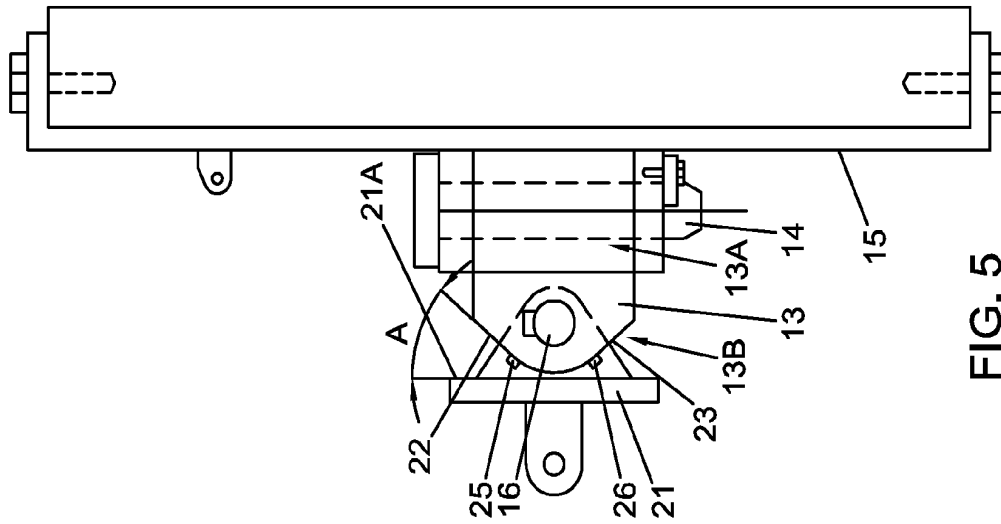


FIG. 5

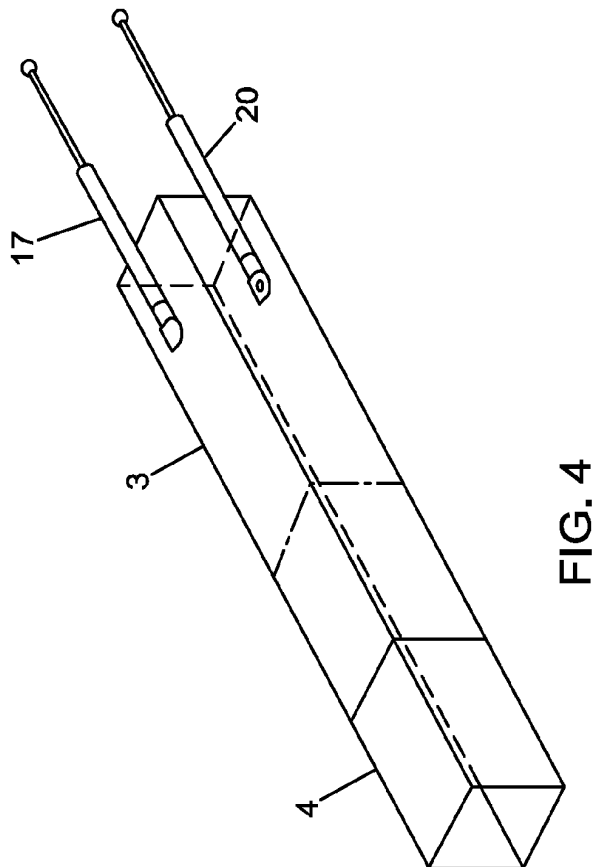


FIG. 4

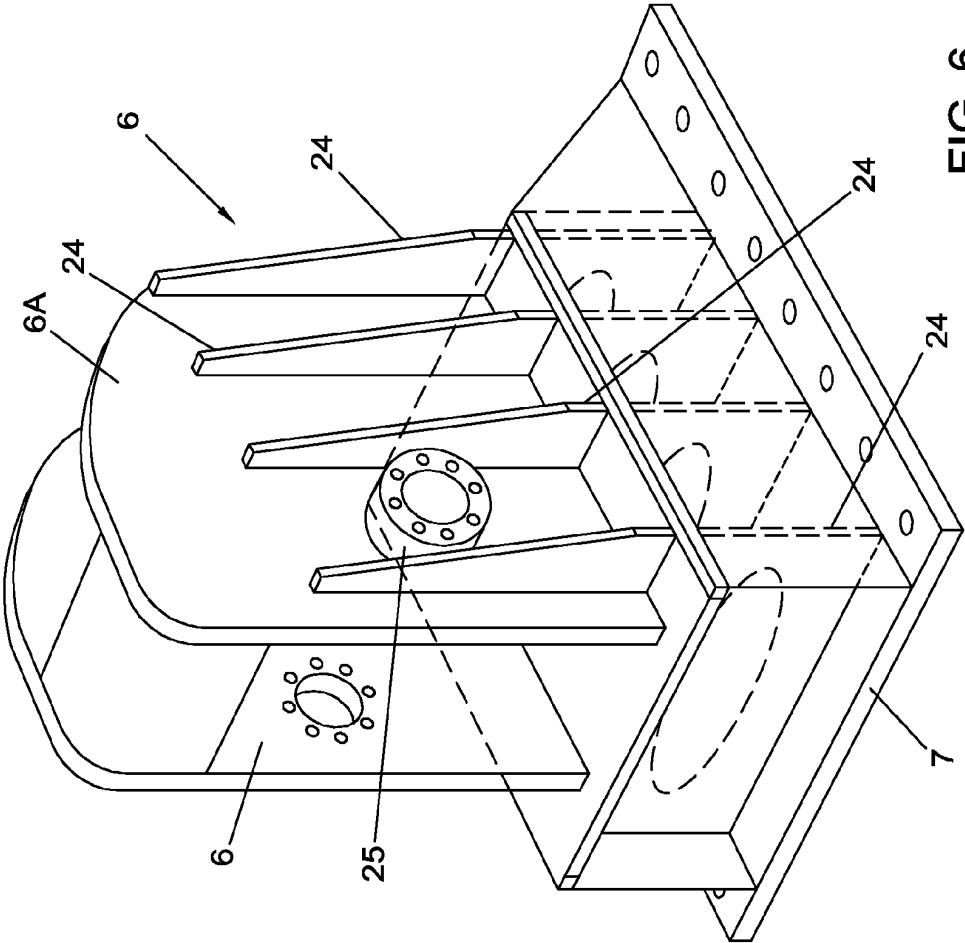


FIG. 6

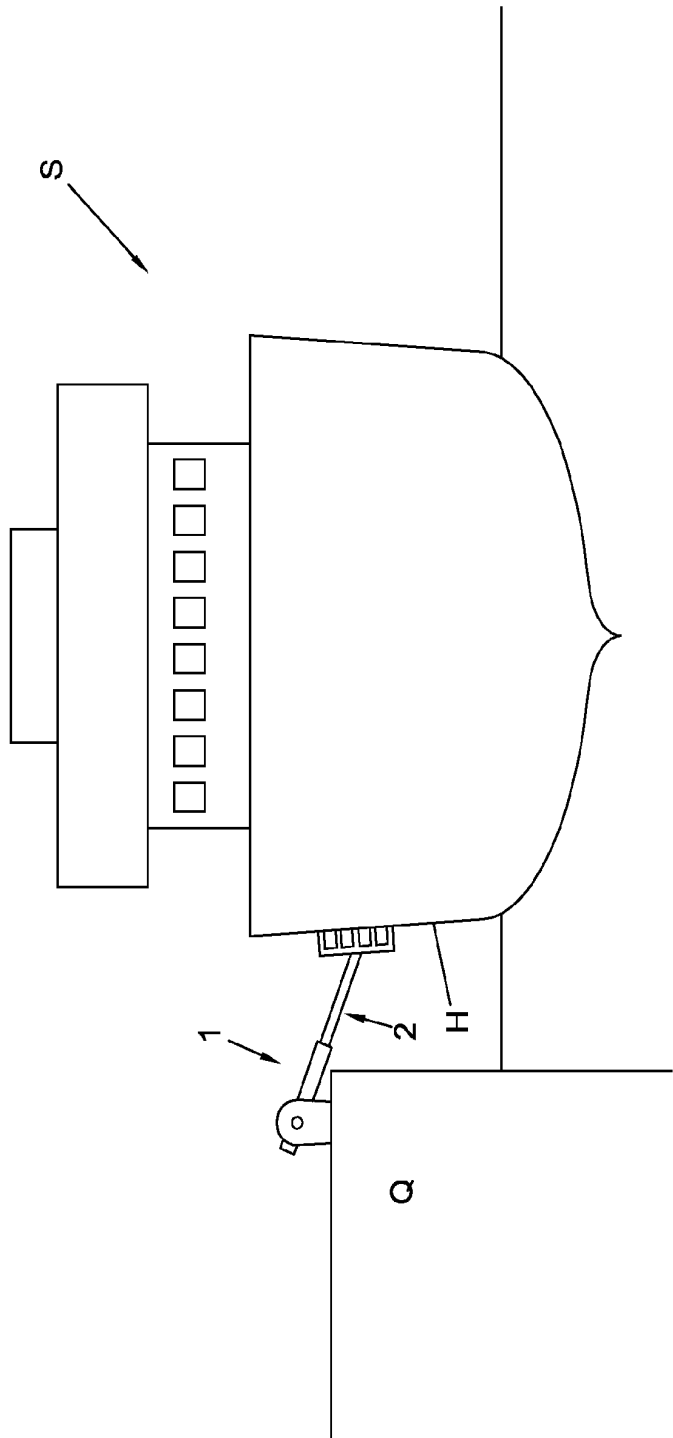


FIG. 7A

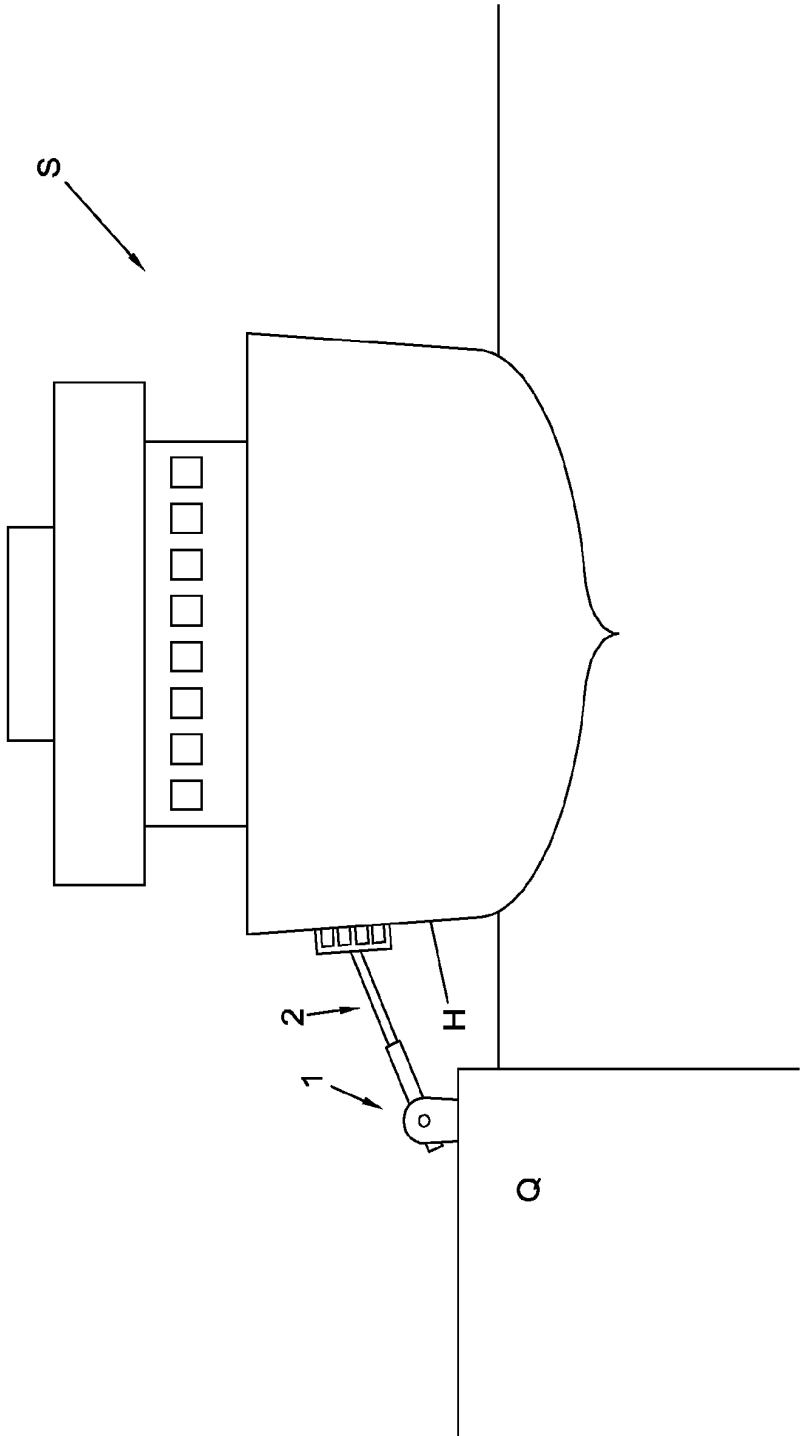


FIG. 7B

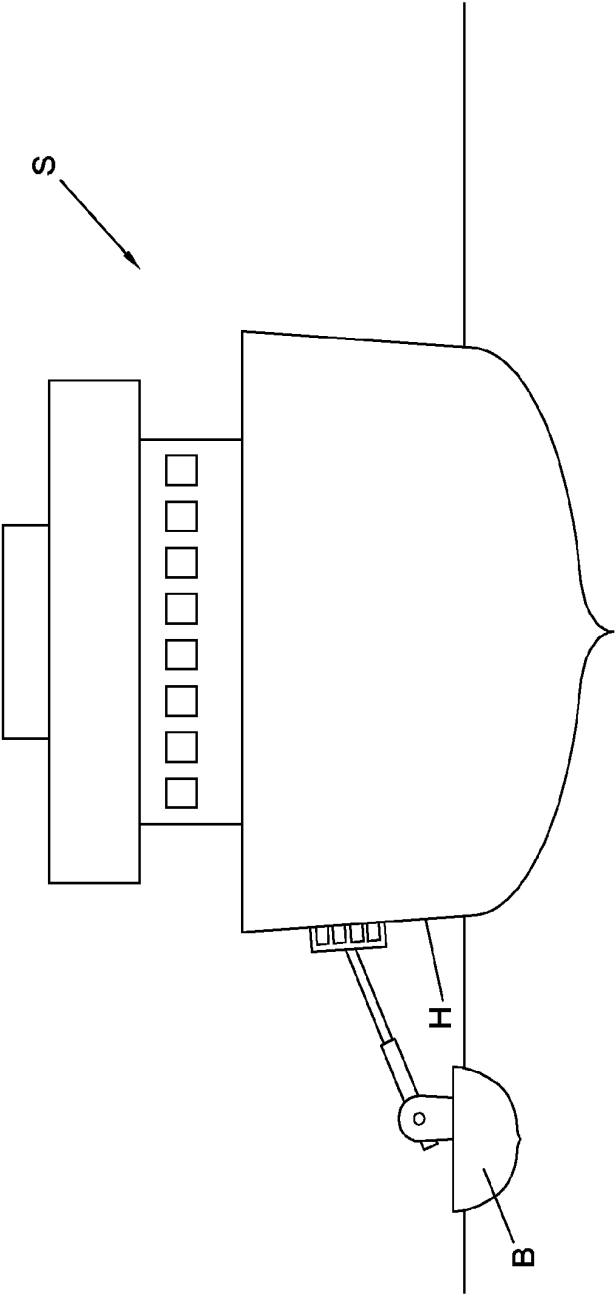


FIG. 8B

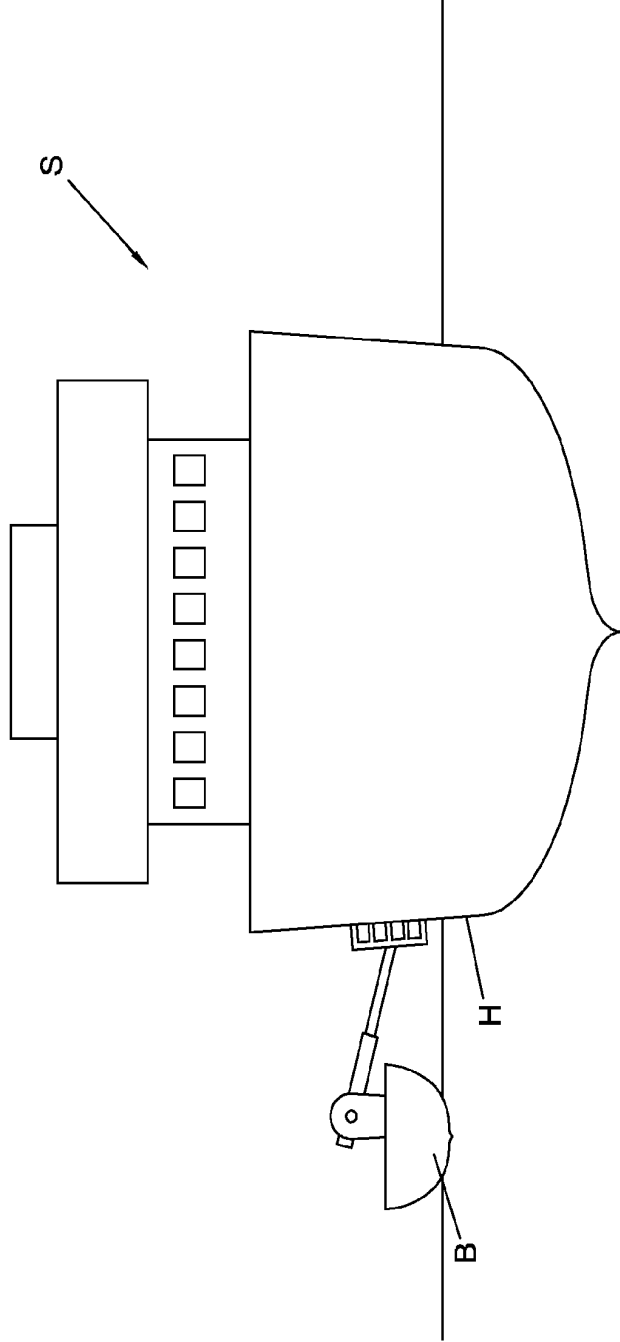


FIG. 8B

SAMENWERKINGSVERDRAG (PCT)

RAPPORT BETREFFENDE NIEUWHEIDSONDERZOEK VAN INTERNATIONAAL TYPE

IDENTIFICATIE VAN DE NATIONALE AANVRAGE	KENMERK VAN DE AANVRAGER OF VAN DE GEMACHTIGDE
	P85006NL00
Nederlands aanvraag nr.	Indieningsdatum
2002182	06-11-2008
	Ingeroepen voorrangsdatum
Aanvrager (Naam)	
Verenigde Tankrederij B.V.	
Datum van het verzoek voor een onderzoek van internationaal type	Door de Instantie voor Internationaal Onderzoek aan het verzoek voor een onderzoek van internationaal type toegekend nr.
30-03-2009	SN 51955
I. CLASSIFICATIE VAN HET ONDERWERP (bij toepassing van verschillende classificaties, alle classificatiesymbolen opgeven)	
Volgens de internationale classificatie (IPC)	
E02B3/20	
II. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK	
Onderzochte minimumdocumentatie	
Classificatiesysteem	Classificatiesymbolen
IPC8	E02B
Onderzochte andere documentatie dan de minimum documentatie, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen	
III. ☐	GEEN ONDERZOEK MOGELIJK VOOR BEPAALDE CONCLUSIES (opmerkingen op aanvullingsblad)
IV. ☐	GEBREK AAN EENHEID VAN UITVINDING (opmerkingen op aanvullingsblad)

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2002182

A. CLASSIFICATIE VAN HET ONDERWERP
INV. E02B3/20

Volgens de Internationale Classificatie van octrooien (IPC) of zowel volgens de nationale classificatie als volgens de IPC.

B. ONDERZOCHE GEBIEDEN VAN DE TECHNIEK

Onderzochte minimum documentatie (classificatie gevolgd door classificatiesymbolen)
E02B

Onderzochte andere documentatie dan de minimum documentatie, voor dergelijke documenten, voor zover dergelijke documenten in de onderzochte gebieden zijn opgenomen

Tijdens het onderzoek geraadpleegde elektronische gegevensbestanden (naam van de gegevensbestanden en, waar uitvoerbaar, gebruikte trefwoorden)
EPO-Internal

C. VAN BELANG GEACHTE DOCUMENTEN

Categorie °	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
X	DE 92 07 648 U1 (ROHR GMBH, 6701 OTTERSTADT, DE) 20 augustus 1992 (1992-08-20) bladzijde 1, regel 22 - regel 31 bladzijde 3, regel 5 - bladzijde 4, regel 16; figuren	1-10
X	NL 7 514 814 A (KOHAN SENDAN KIKAI KK) 21 september 1976 (1976-09-21)	1,3,4,9
Y	bladzijde 3, regel 8 - regel 23 bladzijde 4, regel 8 - regel 25 bladzijde 6, regel 31 - bladzijde 7, regel 9; figuren	7
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☒ Verdere documenten worden vermeld in het vervolg van vak C.

☒ Leden van dezelfde octrooifamilie zijn vermeld in een bijlage

° Speciale categorieën van aangehaalde documenten

A niet tot de categorie X of Y behorende literatuur die de stand van de techniek beschrijft

D in de octrooiaanvraag vermeld

E eerdere octrool(aanvraag), gepubliceerd op of na de indieningsdatum, waarin dezelfde uitvinding wordt beschreven

L om andere redenen vermelde literatuur

O niet-schriftelijke stand van de techniek

P tussen de voorrangsdatum en de indieningsdatum gepubliceerde literatuur

T na de indieningsdatum of de voorrangsdatum gepubliceerde literatuur die niet bezwarend is voor de octrooiaanvraag, maar wordt vermeld ter verheldering van de theorie of het principe dat ten grondslag ligt aan de uitvinding

X de conclusie wordt als niet nieuw of niet inventief beschouwd ten opzichte van deze literatuur

Y de conclusie wordt als niet inventief beschouwd ten opzichte van de combinatie van deze literatuur met andere geciteerde literatuur van dezelfde categorie, waarbij de combinatie voor de vakman voor de hand liggend wordt geacht

Z lid van dezelfde octrooifamilie of overeenkomstige octrooipublicatie

Datum waarop het onderzoek naar de stand van de techniek van internationaal type werd voltooid

9 Juli 2009

Verzenddatum van het rapport van het onderzoek naar de stand van de techniek van internationaal type

Naam en adres van de instantie

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De bevoegde ambtenaar

Dijkstra, Gerard

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2002182

C.(Vervolg). VAN BELANG GEACHTE DOCUMENTEN

Categorie	Geciteerde documenten, eventueel met aanduiding van speciaal van belang zijnde passages	Van belang voor conclusie nr.
Y	WO 2004/050471 A (UNIV DELFT TECH [NL]; GEMEENTEWERKEN ROTTERDAM [NL]; VERWEIJ MARTIN DA) 17 juni 2004 (2004-06-17) in de aanvraag genoemd	7
A	bladzijde 2, regel 13 - regel 17 bladzijde 3, regel 9 - regel 37; figuur 1 -----	1,9
A	DE 11 29 081 B (HAMBURGER HOCHBAHN AG) 3 mei 1962 (1962-05-03) kolom 3, regel 24 - kolom 4, regel 25; conclusie 1; figuren -----	1,2,5,7, 9

**ONDERZOEKSRAPPORT BETREFFENDE HET
RESULTAAT VAN HET ONDERZOEK NAAR DE STAND
VAN DE TECHNIEK VAN HET INTERNATIONALE TYPE**

Informatie over leden van dezelfde octrooifamilie

Nummer van het verzoek om een onderzoek naar
de stand van de techniek

NL 2002182

In het rapport genoemd octrooigeschrift	Datum van publicatie	Overeenkomend(e) geschrift(en)	Datum van publicatie
DE 9207648	U1	20-08-1992	GEEN
NL 7514814	A	21-09-1976	GB 1517737 A 12-07-1978
			JP 925994 C 22-09-1978
			JP 51108497 A 25-09-1976
			JP 53003877 B 10-02-1978
			US 4030441 A 21-06-1977
WO 2004050471	A	17-06-2004	AT 347516 T 15-12-2006
			AU 2003286977 A1 23-06-2004
			EP 1567411 A1 31-08-2005
			NL 1022025 C2 03-06-2004
DE 1129081	B	03-05-1962	GEEN



OCTROOICENTRUM NEDERLAND

WRITTEN OPINION

File No. SN51955	Filing date (day/month/year) 06.11.2008	Priority date (day/month/year)	Application No. NL2002182
International Patent Classification (IPC) INV. E02B3/20			
Applicant Verenigde Tankrederij B.V. te Rotterdam			

This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the application
- ☐ Box No. VIII Certain observations on the application

Examiner Dijkstra, Gerard

WRITTEN OPINION

Application number

NL2002182

Box No. I Basis of this opinion

1. This opinion has been established on the basis of the latest set of claims filed before the start of the search.
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the application as filed.
 - ☐ filed together with the application in electronic form.
 - ☐ furnished subsequently for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. V Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty	Yes: Claims	
	No: Claims	1-10
Inventive step	Yes: Claims	
	No: Claims	1-10
Industrial applicability	Yes: Claims	1-10
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

Reference is made to the following documents:

D1: DE 92 07 648 U1 (ROHR GMBH, 6701 OTTERSTADT, DE) 20 augustus 1992
(1992-08-20)

D2: NL-A-7 514 814 (KOHAN SENDAN KIKAI KK) 21 september 1976 (1976-09-21)

1 The present application does not meet the criteria of patentability, because the subject-matter of claim 1 and 9 is not new.

1.1 Concerning claim 1: the document D1 discloses (the references in parentheses applying to this document):

Afmeerinrichting (fig. 1, nr. 4; fig. 3, 4),
geschikt voor het afmeren van een schip (page 1, lines 1-5)
omvattend een magneet (fig. 4, nr. 9; page 3, line 24),
geschikt voor het door middel van magnetische kracht contact maken met de romp van een schip (page 1, lines 22-31),
waarbij de magneet (9) op een eerste uiteinde van een arm (fig. 3, 4; page 3, lines 20- 25) is geplaatst.

1.2 D1 thus discloses all features of claim 1.

1.3 Concerning claim 9: the document D1 discloses (the references in parentheses applying to this document):

Werkwijze voor het afmeren, omvattende de volgende stappen:
het in een beginstand verschaffen van ten minste één afmeerinrichting volgens conclusie 1 (page 1, lines 6-12) of een afmeersysteem volgens conclusie 8 (page 1, lines 6-12; page 4, lines 5-16)),
op een structuur die aan een wateroppervlak aangrenst (fig. 1, 2),

het met een schip, schuit, vaartuig en dergelijke (S) benaderen van de structuur (page 1, lines 1-3, fig. 1, 2),
het in de richting van de romp van het schip wenden (page 3, lines 26-32) van de zich op een armuiteinde van de afmeerinrichting (fig. 1, nr. 4; fig. 3, 4) bevindende magneet (9),
en het door middel van magnetische kracht toestaan van contact (page 1, lines 26-31) tussen de romp van het naderende schip en de magneet (9).

- 1.4 D1 thus discloses all features of claim 9.
- 1.5 Also D2 discloses "een afmeerinrichting (10) met magneet (22), waarbij de magneet op een uiteinde van een arm (54) is geplaatst".
- 1.6 Therefore the subject matter of claims 1 is also not new according to D2.
- 2 Dependent claims 2-8, 10 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of novelty:
- claim 2: D1, fig. 1, claim 1.
- claim 3: D1, fig. 3. D2, fig. 2, page 4, lines 10-13.
- claim 4: D1, fig. 4, page 3, lines 20-32. D2, fig. 2, page 4, lines 14-21.
- claim 5: D1, fig. 3.
- claim 6: D1, page 4, lines 1-16, fig. 4.
- claim 7: D1, fig. 1.
- claims 8, 10: D1, page 4, lines 1-16.