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54 Positioning device for ships.

57 A positioning device for ships, in particular for ships in a lock, comprising two parts, extendable at both sides of a ship beyond the hull and the width of the ship at the relevant side, if in extended position, one of these parts being capable of fitting into an appropriate vertically extending recess at a side of the lock.

The extendable parts may be operated by a hydraulic or pneumatic unit and are preferably provided with wheels or rollers at their far ends.

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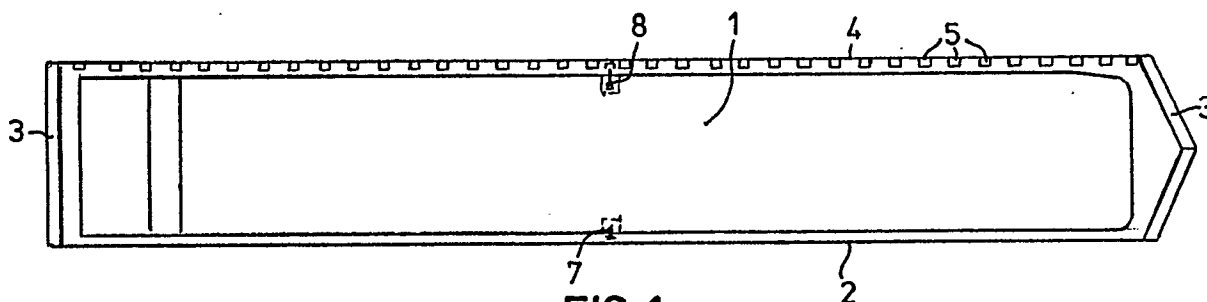


FIG. 1

Positioning device for ships.

The invention relates to a positioning device for ships, in particular for ships passing a lock.

Ships passing a lock will move upwards and downwards as the case may be, when the lock is filled or emptied in order to obtain the same level as the waters at the relevant outside of the lock. Unless adequate precautions are taken, the ship may move in the longitudinal direction of the lock. This may cause damage to the lock, especially to the doors. This applies the more for ships which fit tightly into the lock, thus allowing very little space for any movement, once inside the lock. The width of these ships is usually such that only a rather limited space is left at either side of the ship. Hitherto manpower was required to keep the ship in position. The mooring ropes of the ship have to be eased off or tightened either manually or with a mechanism with direct or remote control. In the latter case at least two men are required, one forward and one after the ship, to make the required adjustments. This is not only rather laborious but also rather expensive in requiring manpower and mechanical adjustment devices demanding a continuous consumption of energy. In addition the system is vulnerable to the extent that cooperation between the men should be very precise, as otherwise the ship will veer out of position. Thus damage might be caused, not only to the ship proper, but also to the doors of the lock, if the ship would move in the longitudinal direction of the lock.

According to the present invention a positioning device is provided, allowing the ship to be positioned in the lock in such a way, that any substantial longitudinal and lateral movement of the ship during locking is prevented or at least will be reduced to a minimum. In addition the device according to the invention can be operated and controlled by one man, preferably from the bridge of the ship.

Thus the present invention relates to a positioning device for ships, comprising two parts, extendable from opposite sides of the ship, each part extending beyond the hull and the width of the ship at the relevant side and the parts together filling substantially the free space between the hull of the ship and the walls of the lock. Both parts may be extended by means of a hinge, or alternatively a telescopic mechanism, allowing the parts to acquire the desired length. The parts are positioned in appropriate free areas in the sides of the ship, wherein the mechanism for governing the devices are positioned. As some locks are provided at one side with vertical spaced-apart beams, it will be possible to make one of the parts, once extended,

fit into the spaces between successive beams, thus preventing longitudinal movement of the ship. The other part will then be extended against the opposite wall of the lock, thus preventing any substantial lateral movement of the ship, this other part hereafter being referred to as blocking part.

The blocking part may be an ordinary straight rod or actually any other suitable extendable device, optionally at its far end, intended for contacting the wall of the lock, provided with a wheel or roller in order to facilitate any displacement along the wall and preventing damage thereto, as might be caused otherwise by the device.

The other part, intended to fit between successive beams may also be an ordinary straight rod or actually any other suitable extendable device, preferably being provided with wheels or rollers at its far end, facing the wall and the beams, to facilitate movement of this part along the wall and the beams and preventing damage thereto. Each one of the parts may be of a telescopic type.

If desired the parts together with their operating mechanism may be positioned in opposite sides of the ship movable in the longitudinal direction, allowing proper positioning of the "beam" part facing the space between successive beams.

The invention will now be illustrated by means of the accompanying drawing, showing an embodiment of the present invention without limiting the invention thereto.

In the accompanying drawing

Fig.1 shows a plan view of a ship in a lock with the two opposite positioned parts which form the positioning device,

Fig.2 shows a cross-section of a ship in a lock, illustrating the functioning of the positioning device according to the invention at various water levels,

Fig.3 shows a plan view of the part of the positioning device, that fits into a steel beam, such as an I-beam or a U-beam, and

Fig.4 shows a plan view of the blocking part, that is the supplemental part for the part shown in Fig.3, which two parts together provide the positioning device according to the invention.

In Fig.1 a ship 1 is located in a lock 2, provided with doors 3. A side 4 of the lock 2 is provided with wooden fenders 5 and a beam 8. A holding arm 6, which prevents the ship from displacement in the longitudinal direction, is provided with a hydraulic unit (shown in Fig. 3) and can be extended by means of said hydraulic unit once the ship is in the lock, in order to fit into steel beam 8 between successive wooden fenders 5. The blocking arm 7 is connected in a similar way with

another hydraulic unit at the opposite side of the ship 1, whereby it is prevented that the ship will move in the lateral direction.

In Fig.2 the same reference numbers have been used for identical parts. In lock 2 in Fig.2 a steel beam 8, between the wooden fenders 5, is used to receive a holding arm 6. In Fig.2 a ship 1 is shown in a lock 2 at high water level. If water is discharged from the lock, the ship 1 will be lowered to the position at low level, presented as ship 1', with the positioning device extended. As will be obvious from Fig.2, the holding arm 6 and the blocking arm 7 are displaced downwards along the wall of the lock in a substantially vertical manner, whereby the holding arm 6 follows the path provided by the steel beam 8, while the blocking arm 7 simply follows the relevant vertical wall of the lock. Thus displacement of the ship 1,1' is prevented both in the longitudinal direction and in the lateral direction.

Fig.3 shows a holding arm 6, which fits on a steel beam 8, which in the drawing fits between two spaced apart wooden fenders at the lock side 4. The holding arm 6 is provided with three (3) rollers 9, 10, of which one roller 9 is positioned at the head of the arm 6 and the two other rollers 10 are positioned at both sides of the head of the arm 6. The arm itself is connected with a hydraulic unit 11, capable of extending and withdrawing arm 6. The hydraulic unit 11 is positioned within the hull of the ship 1 and if desired may be displaceable in the longitudinal direction of the ship (not shown).

Fig. 4 shows the blocking arm 7 fitted on a similar hydraulic unit 11', mounted at the opposite side of the ship 1. The blocking arm 7 is provided with a roller 12 for contact with the side 4 of the lock. As the blocking arm 7 will follow the substantially flat surface of the side 4 of the lock, one roller 12, mounted on the head of the blocking arm 7, will be sufficient. The hydraulic unit 11' is mounted in a similar way as the hydraulic unit 11.

Since a ship will usually pass a lock in both directions in due course, the holding arm 6 and the blocking arm 7 are usually made identical and that as described for holding arm 6.

It will be obvious that variations and modifications of the positioning device according to the invention, as shown in the drawing, can be realized within the scope of the present invention. Thus the blocking arm 7 may, for example, be provided with a horizontal and/or vertical cross-bar, which is provided with two or more rollers instead of the one roller 12. The number of rollers for holding arm 6 may be varied as well. Instead thereof the rollers may be replaced in part or completely by wheels. The mounting of the two arms 6 and 7 of the positioning device may also be modified. Thus the arms 6 and 7 may be provided with hinges, whereby

the use of hydraulic units is avoided, or the hydraulic units may be replaced by pneumatic units without deviating from the inventive concept. The arms 6 and 7 are preferably positioned midships or at any rate symmetrical with respect to the center at midship.

Claims

1. A positioning device for ships, in particular for ships in a lock, characterised in that it comprises two parts (6,7) extendable at opposite sides of a ship (1) each part (6, 7) extending beyond the hull of the ship at the relevant side, if in extended position, with one part (6) being capable of fitting into an appropriate vertically extending recess at a side of the lock.

2. A positioning device according to claim 1, characterised in that the extendable parts (6, 7) are extendable by means of corresponding hinges.

3. A positioning device according to claim 1, characterised in that the extendable parts (6, 7) are extendable by means of a corresponding hydraulic or pneumatic unit.

4. A positioning device according to any one of the preceding claims, characterised in that the extendable parts (6, 7) consist of an arm.

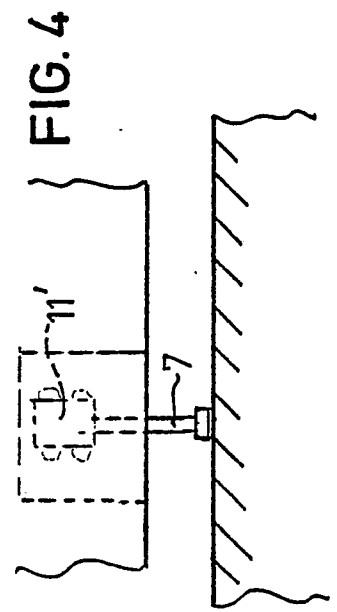
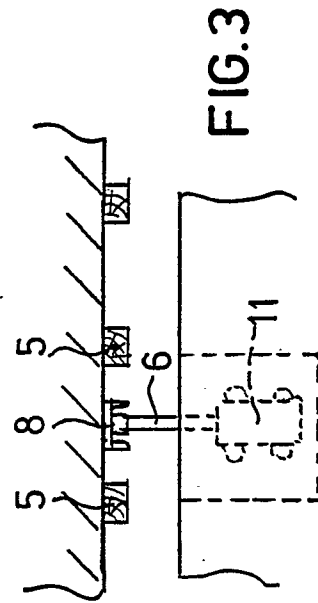
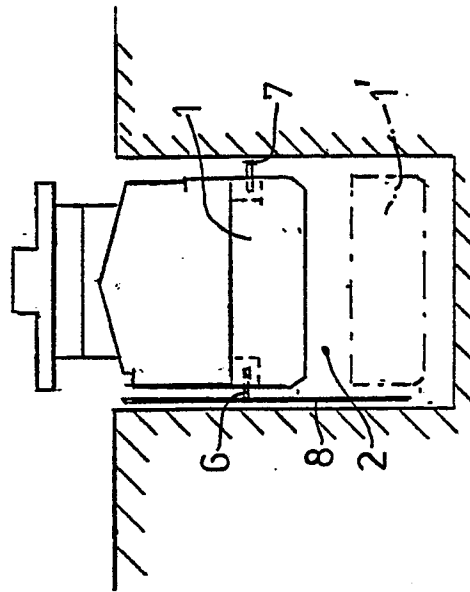
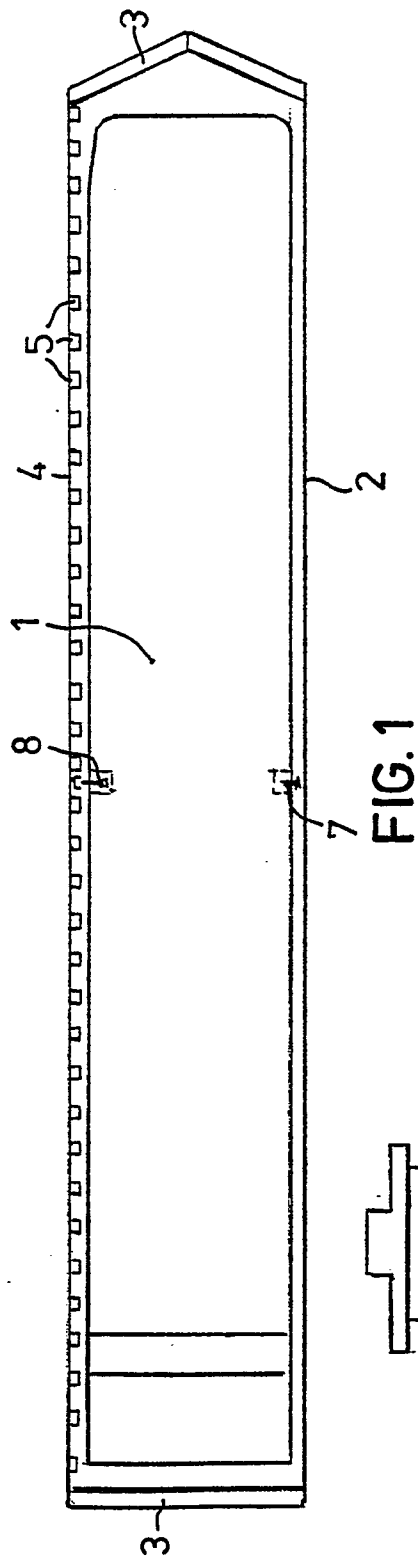
5. A positioning device according to claim 4, characterised in that the extendable parts (6, 7) are provided with at least one wheel or roller (9, 10, 12).

6. A positioning device according to claim 5, characterised in that the extendable part (6) is a holding arm (6), provided with one roller (9) at the head of the arm (6) and two rollers (10) at opposite sides of the head of said arm.

7. A positioning device according to claim 5, characterised in that the extendable part (7) is a blocking arm (7), provided with a roller (12) at the head of the arm (7).

8. A positioning device according to claim 7, characterised in that the holding arm (6) and the blocking arm (7) are identical.

9. A positioning device according to any one of the preceding claims, characterised in that in a lock the part (6) can fit into a recess, provided by a steel beam rail, while the other part (7) can be extended against the opposite wall of the lock.





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)
Y	FR-A-2 249 801 (ISHIKAWAJIMA-HARIMA JUKOGYO K.K.) * Page 10, line 11 - page 11, line 15; figures 20-23 *	1-6,9	B 63 C 1/10 B 63 B 21/00
A	---	7,8	
Y	US-A-2 697 410 (ANSCHUTZ) * Whole document *	1-6,9	
A	---		
A	GB-A-2 123 776 (HITACHI ZOKEN) * Page 2, lines 89-109; figures 1,2,7-11 *	1-9	
A	---		
A	DE-A-2 508 744 (HOWALDTSWERKE-DEUTSCHE WERFT AG) * Page 4, paragraph 5 - page 6, paragraph 5; figures 1-4 *	1-9	

			TECHNICAL FIELDS SEARCHED (Int. Cl.5)
			B 63 B B 63 C
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24-01-1990	Examiner DE SENA Y HERNANDORENA A
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			