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STABILIZING ATTACHMENT FOR TANK WASHING MACHINES

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Fig.1

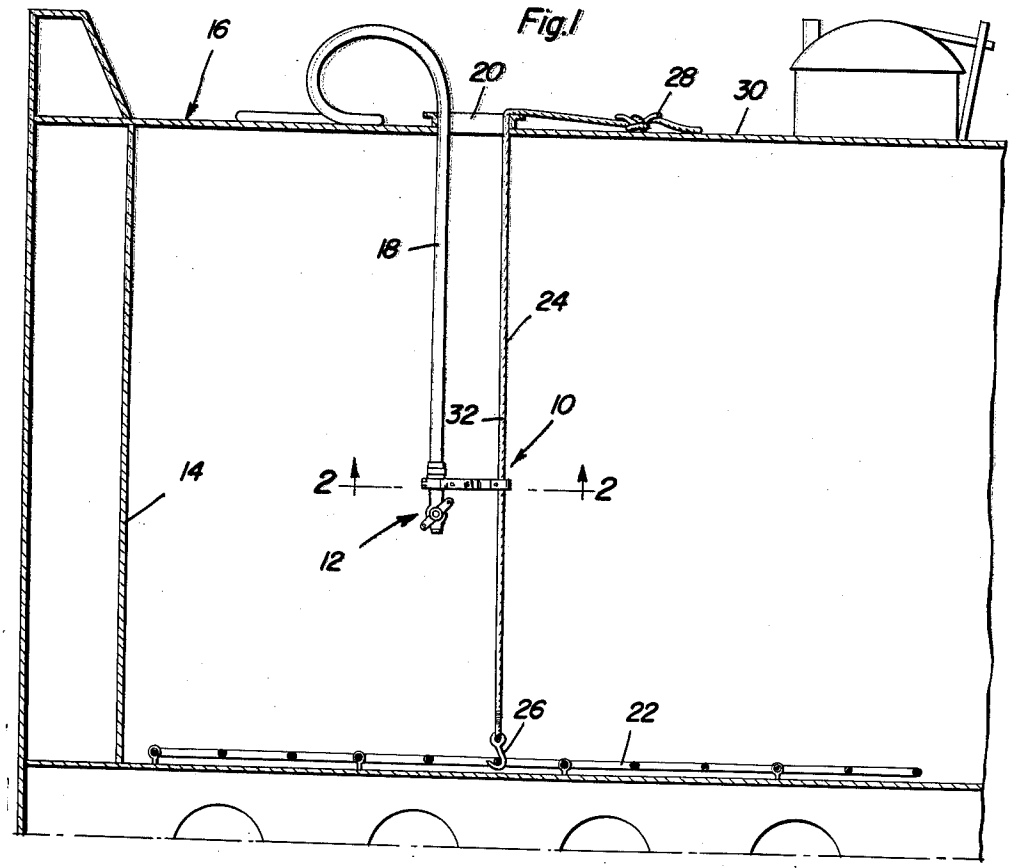


Fig.2

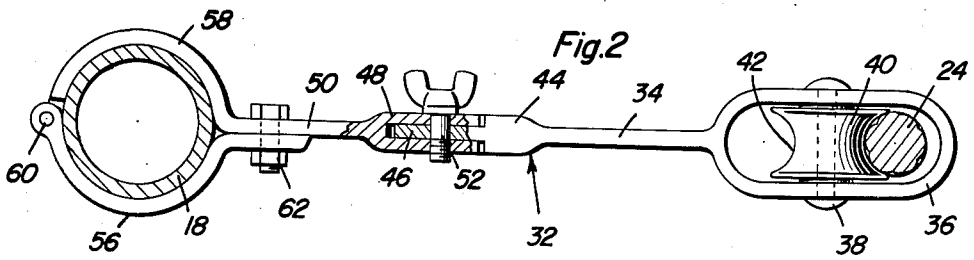
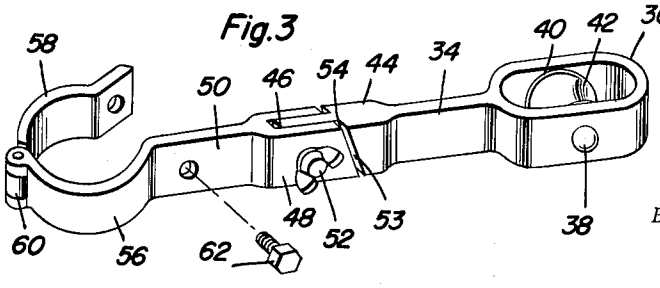


Fig.3



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STABILIZING ATTACHMENT FOR TANK WASHING MACHINES

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The present invention generally relates to a stabilizing device and more particularly to a device for stabilizing washing machines employed for washing tanks of a ship.

In present day practice in the maritime industry, especially on tankers, it is the practice to wash down empty tanks while the vessel is underway thus saving the time required in washing the tank after the vessel docks or reaches port. There have been provided various types of machines for washing these tanks. The tank washing machines are lowered into the tank through a manhole or the like and are supported on the end of a flexible hose. As long as the seas are relatively smooth, the washing machine will operate properly. However, when rough seas are encountered the vessel will naturally roll or pitch. When this occurs, the washing machine will swing and sometimes will come into contact with the side walls of the tank which quite often damages the washing machine.

When the washing machine is damaged, the cleaning of the tanks is delayed and it is also rather expensive to repair or replace the washing machine. The interior of the tanks are usually filled with gaseous material making it relatively impossible for a person to go into the tank and control the position of the washing machine.

Therefore, it is the primary object of the present invention to provide a stabilizing attachment for washing machines of this nature and more particularly the flexible hose which supports the washing machine so that the washing machine will not swing into engagement with the walls of the tanks but which enables the washing machine to move vertically in the tank to effectively clean the tank in the usual manner.

Another object of the present invention is to provide a stabilizing attachment for washing machines of the class described in which the attachment basically includes a guide line movably supporting an arm attached to the flexible hose adjacent the washing machine for guiding the vertical movement of the washing machine in the tank while yet providing a relatively inexpensive structure that is simple in operation, effective for its particular purposes and generally well adapted for the purposes for which it is intended.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a sectional view of the tank of the vessel illustrating the stabilizing attachment for the washing machine illustrating the manner of use thereof;

FIGURE 2 is a plan sectional view taken substantially upon a plane passing along section line 2—2 of FIGURE 1 illustrating the details of construction of the stabilizing attachment; and

FIGURE 3 is a perspective view of the movable component of the stabilizing attachment.

Referring now specifically to the drawings, the numeral 10 generally designates the stabilizing device of the present invention for a washing machine generally designated by the numeral 12 which is employed for washing the interior surface 14 of a tank on a vessel generally designated by numeral 16 such as a tanker. The tanks on a seagoing tanker are normally washed while under

way by the washing machine 12 which is a commercially available part and which is supported by a flexible hose 18. The washing machine 12 and flexible hose 18 is normally lowered through a manhole 20 into the interior of the tank for effectively washing the interior surface thereof. The tanks are also normally provided with heating coils 22 in the bottom thereof for heating the material in the tanks for easier flow. For example, when heavy crude oil or the like is conveyed in the tank, it is desirable to heat such oil for easier flow thereof when discharging the oil.

In order to prevent swinging of the washing machine 12 which would cause the washing machine 12 to bang against the interior surface of the tank, there is provided an elongated flexible line 24 such as a rope, cable or the like which has a hook 26 on the lower end thereof for engagement with one of the pipes of the heating coil 22. The other end of the flexible line 24 extends up through the manhole 20 and is secured to a suitable cleat 28 or the like on the deck 30. Thus, the flexible line 24 is maintained taut and in a generally vertical orientation within the tank.

Movably mounted on the line 24 is a partially foldable stabilizing arm generally designated by numeral 32 and which includes a strap 34 having a loop 36 formed in one end thereof with the loop 36 having a transverse shaft or axle 38 extending thereacross for rotatably supporting a pulley or sheave 40 therein which is provided with a concave external surface 42 generally semi-circular in configuration. The pulley or sheave 40 rollingly engages the flexible line 24 which is disposed between the outer end of the loop 36 and the sheave 40. Thus, the flexible line 24 forms a vertical guide for movement of the stabilizing arm 32.

The end of the strap or bar 34 remote from the loop 36 is thickened as indicated by numeral 44 and is provided with a longitudinally extending lug 46 of reduced thickness which is received between the furcations 48 of the bifurcated end of a strap or bar 50. The strap or bar 50 is secured to the strap or bar 34 by a wing bolt 52 which retains the straps 50 and 34 assembled and also retains them in angularly adjusted position. The ends of the furcations are inclined as indicated by numeral 53 as are the shoulders 54 formed by the reduction in thickness of the lug 46 and said ends 53 and shoulders 54 are engageable with each other for limiting the relative pivotal movement of the bars 34 and 50 in one direction about the pivot axis formed by the wing bolt 52. However, the portions 54 and 53 are sufficiently spaced to allow the arm 32 to fold or "break" enough to facilitate its passage through the manhole 20.

The outer end of the strap 50 is provided with a semi-cylindrical portion 56 hingedly connected to a pivotal semi-cylindrical portion 58 by virtue of a hinge 60. The semi-cylindrical portions 56 and 58 form a clamp for engagement with the hose 18 and the semi-cylindrical portions 56 and 58 are retained in position by a retaining bolt and nut 62 which retains the clamp members 56 and 58 in clamping engagement to the hose 18 so that the stabilizing arm is securely attached to the hose for maintaining the hose and the washing machine generally in adjacent relationship to the flexible line 24 as determined by the over-all length of the stabilizing arm 32.

Due to the simplicity of the construction of the present invention, it may be associated with the tank without personal attention since the hook 26 may be engaged with the heating coil without a person entering the tank. The line is then threaded through the stabilizing device and the stabilizing device is attached to the flexible hose adjacent the nozzle for limiting the swinging movement of the nozzle or washing machine but yet providing for

vertical movement thereof and a certain degree of angular movement in relation to the flexible line.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A stabilizing device for a washing machine for a tank of a seagoing vessel comprising a vertically disposed guide provided with an unobstructed exterior surface mounted in the interior of a tank, and a stabilizing arm rollingly mounted on the guide and adapted to be fixedly connected to a tank washing machine for guiding the movement of the tank washing machine and limiting lateral swinging movement thereof, said stabilizing arm including a loop on one end thereof encircling the guide and a roller mounted in the loop for rolling engagement with the guide, said stabilizing arm further including a pair of hingedly connected clamp members at the other end thereof for clampingly engaging a flexible hose connected to the washing machine for supporting the washing machine within the tank, said stabilizing arm being constructed of two angularly adjusted portions for enabling the device to be moved through an opening in the top of the tank, said guide comprising a vertical flexible line having a hook on the lower end thereof for engagement with a heating coil pipe in the bottom of the tank with the other end of the line being connected to a support on the deck thereby enabling assembly of the device without a person entering the interior of the tank.

2. In combination with the tank of a seagoing vessel, a pipe assembly mounted in the bottom of the tank and forming a heating coil for the liquid material normally disposed in the tank, the top of the tank having a relatively small opening therein, an elongated flexible guide line, a hook on one end of said line for detachable engagement with the pipe assembly whereby the hook and line may be dropped through the opening in the top of the tank and anchored to the pipe assembly, means adjacent the tank opening for anchoring the line thereto, a washing machine for cleaning the interior of the tank, a hose connected to the washing machine whereby the washing machine may be supported movably within the tank, and stabilizing means interconnecting the washing machine and guide line whereby the guide line will limit lateral swinging movement of the washing machine as the vessel rolls while under way, said stabilizing means

being fixedly connected to the washing machine whereby said washing machine may be slidably vertically adjusted through the medium of the hose, said stabilizing means including an elongated arm, split clamp means on one end of said arm for clamping engagement with a portion of the washing machine, the other end of said arm having a loop formed thereon, a roller journaled in said loop, said roller having a concave exterior surface for engaging a portion of the surface of the guide line, the end of said loop serving to retain the guide line adjacent the peripheral surface of the roller thereby precluding lateral movement of the arm in relation to the guide line while permitting rotational movement of the arm about the guide line for enabling movement of the washing machine around the guide line but preventing lateral movement of the washing machine into contact with the walls of the tank, said stabilizing arm comprising a pair of pivotally interconnected sections, lock means retaining the pivotally interconnected sections in lock adjusted position for enabling the arm to be collapsed while inserting it through the tank opening and enabling said arm to be moved through said opening.

3. A stabilizing device for tank washing machines adapted to be inserted into the interior of a tank of a seagoing vessel for washing the interior surface of the tank comprising a guide line, means on one end of the guide line for hooking engagement with a stationary portion of the bottom of the tank without requiring the personal attention of an operator within the tank, a stabilizing arm, means movably retaining the stabilizing arm on the line so that it cannot move laterally into contacting relation with the interior of the tank, said stabilizing arm comprising sections, and hinge means interconnecting the adjacent ends of the sections of the arm thereby adapting the arm to be inserted through a relatively small opening in the tank.

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