

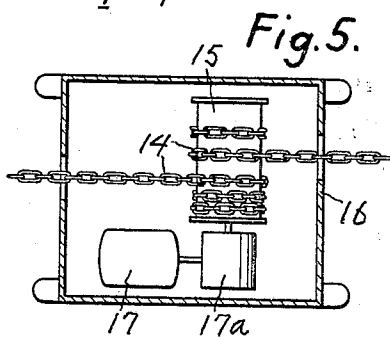
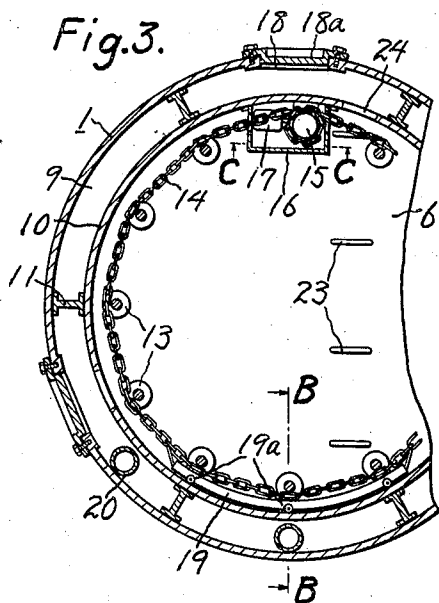
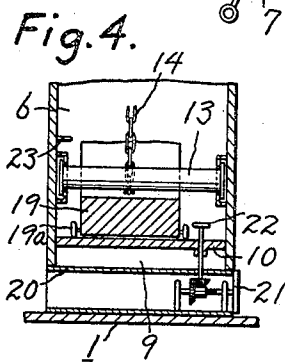
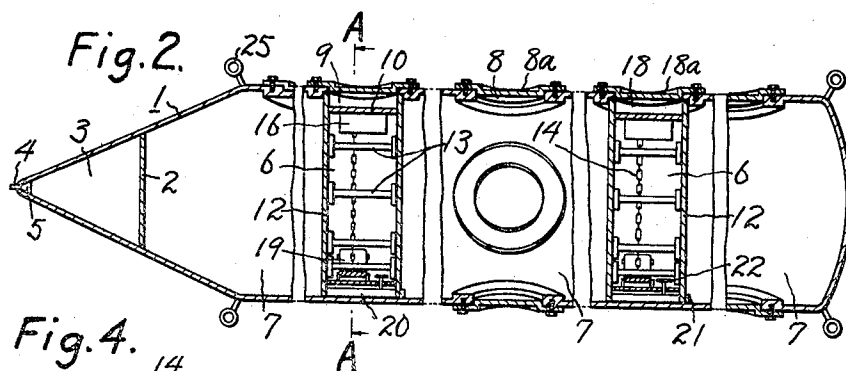
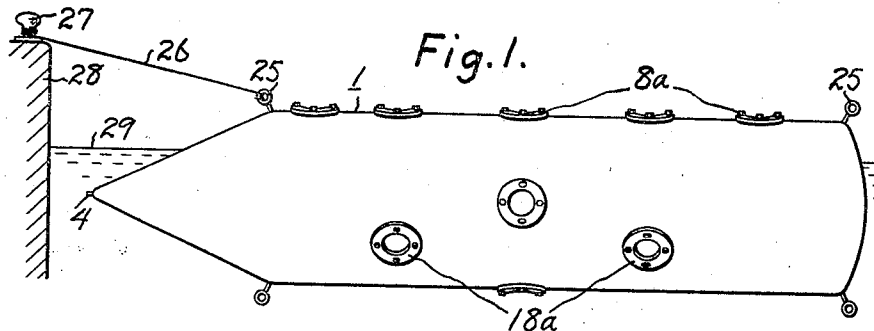
Dec. 9, 1969

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3,482,541

FLOATING TANK FOR PETROLEUM STORAGE USE

Filed Aug. 8, 1968



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3,482,541
FLOATING TANK FOR PETROLEUM STORAGE USE

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Filed Aug. 8, 1968, Ser. No. 751,303

Claims priority, application Japan, Jan. 16, 1968, 43/2,263

Int. Cl. B63b 25/08, 35/00

U.S. Cl. 114—74

4 Claims

ABSTRACT OF THE DISCLOSURE

A floating tank for petroleum storage use, comprising a cylindrical tank, the inside of which is vertically divided into a plurality of petroleum storage chambers by one of more partitioning chambers, said chambers being provided with one or more openings having one or more detachable covers, respectively, a movable chain which is annularly arranged along the periphery of each partitioning chamber within it, and a weight which is attached to said chain and serves to hold a required position of said tank, said tank being able to roll by changing the position of said movable weight, thereby exposing an immersed surface of said tank out of the water to repair it, and said tank being able to sink by introducing water into said partitioning chambers in case of emergency.

This invention relates to a floating tank for petroleum storage use.

A broad site and a great equipment are necessary to set up a petroleum storage tank in or on the ground, and so its establishment expenses are fairly high. Moreover, said tank is looked dangerous and the selection of its site is restricted.

The object of the invention is to do away with such drawbacks, and to provide a floating tank for petroleum storage use, comprising a cylindrical tank, the inside of which is vertically divided into a plurality of petroleum storage chambers by one or more partitioning chambers, said chambers being provided with one or more openings having one or more detachable covers, respectively, a movable chain which is annularly arranged along the periphery of said partitioning chamber with it, and a weight which is attached to said chain and serves to hold a required position of said tank.

The fore end part of said tank may be sharpened and formed into a compressed air chamber having a nozzle and an adjusting valve at the sharpened end.

Said petroleum storage chambers may be able to communicate with each other at their bottoms.

The chief features and advantages of the invention are as follows:

The petroleum storage tank according to the invention floats on the water of the sea, a river or a lake, and therefore, its establishment expenses are very low, and its preservation is easy.

Said tank can be towed to any desired place, and accordingly, said tank, in which petroleum has been filled in the country of origin, can be towed to a distant country.

Said tank can be rolled by changing the position of the movable weight to expose an immersed surface of the tank out of the water, and its damaged or soiled surface can be easily repaired or cleansed.

Said tank can be conveniently sunk by introducing water into the partitioning chambers in case of emergency.

Moreover, if necessary, said tank can be braked by discharge of compressed air from the nozzle during towing of the tank.

Although any of the petroleum storage chambers are damaged to permit flowing out of petroleum, petroleum in other storage chambers is kept safe.

Further, petroleum in said storage chambers may exist at the same level in the tank bottom, resulting in a good stability of the tank.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawing:

FIG. 1 is an elevational view of a floating tank according to the invention, which is moored at a pier;

FIG. 2 shows an enlarged and partly cut, sectional elevation of said tank;

FIG. 3 is an enlarged and partly cut, sectional side view of said tank taken along a line A—A of FIG. 2;

FIG. 4 shows an enlarged sectional elevation of a part of said tank taken along a line B—B of FIG. 3; and

FIG. 5 is an enlarged bottom view of a part of said tank taken along a line C—C of FIG. 3.

Like characters of reference designate like parts throughout the views.

Referring to FIG. 1, 1 denotes the above mentioned floating tank for petroleum storage use consisting of a long cylindrical closed hollow body, which is preferably made of steel and coated with paint, and the size of which may be, for example, 300 meters in length and 30 meters in diameter.

As shown in FIG. 2 the fore end part of said tank is preferably sharpened in order to decrease the resistance of water, and said part has an inside partition 2 forming a compressed air chamber 3 at the sharpened portion, at the end of which a nozzle 4 and an adjusting valve 5 are equipped.

The inside of the tank 1 is vertically divided into a plurality of independent petroleum storage chambers 7 by one or more, for example, two partitioning chambers 6. Each of said storage chambers is provided with one or more openings 8 for charging and discharging petroleum, the central chamber having four openings at equal peripheral distances, and each of said openings is closed with a detachable cover 8a.

The periphery of each partitioning chamber 6 is formed into a double wall having an annular space 9 by arranging an inner annular partition 10 and connecting it to the tank 1 with space bars 11 (FIG. 3). Said space is adapted to permit a man to enter for making repairs.

Along and inside each annular partition 10 and between both the side walls 12 of each partitioning chamber 6, a great number of horizontal rolls 13 are annularly arranged at suitable intervals, over which a chain 14 is hung. The both end parts are wound in opposite directions to each other on a winding drum 15 arranged within a box 16 (FIG. 5), which is secured to the inner surface of the annular partition 10 at its uppermost portion. Said drum is preferably driven by a motor, for example, an electric motor 17 through a reduction gear 17a equipped within said box, and said motor is to be connected to a suitable electric source (not shown) located outside the tank 1 through one of openings 18, which are formed at the peripheral portion of said tank surrounding the annular partition 10, said openings being respectively closed with detachable covers 18a.

Attached to the lower part of each chain 14 an arc-shaped weight 19 is, which is provided with wheels 19a and adapted to move on the inner surface of the annular partition 10, thus serving to change the position of the tank 1.

As shown in FIGS. 3 and 4, within the lower part of each annular space 9 a passage pipe 20 is arranged penetrating the side walls 12 to communicate the petroleum storage chambers 7 with each other. One open end of said

pipe is closed with a plate valve 21 which is to be operated by a handle 22 existing within the partitioning chamber 6. Within said partitioning chamber a plurality of ladder steps 23 are secured to the side wall 12, and near the uppermost one of said steps an opening 24 is formed on the annular partition 10 to permit a man to enter in it.

Attached to the fore end part and the rear end of the tank 1 are a suitable number of rings 25, to each of which a rope 26 is to be connected in order to tow said tank or moor it to, for example, an anchor post 27 at a pier 28.

The preferred embodiment of the invention is thus constructed and its operation is as follows:

The total weight of the weights 19 is so selected that the upper part of the tank 1 projects from the water surface 29 as shown in FIG. 1, when said tank is filled to capacity with petroleum. Said tank is kept stable at that position by means of said weights although said tank rolls and pitches due to waves.

Petroleum is charged in the storage chambers 7 through the openings 8 located at the upper part of the tank 1 after detaching the covers 8a thereof. When said chambers are filled with petroleum and said openings are closed with said covers, said tank may be towed to any desired place by pulling the rope or ropes 26 connected to the ring or rings 25, and moored to any unmoved means such as the anchor post 27 at the pier 28. Said petroleum filled in the tank 1 may be left as it is, or discharged from storage chambers 7 through the openings 8 after detaching the covers 8a. During said towing said tank can be braked by discharge of compressed air of the chamber 3 from the nozzle 4.

In case that the outer painted surface of the tank 1, which is in the water, is damaged or soiled with shellfish and seaweed, the electric motors 17 are connected to an electric source, which is located outside said tank, for example, at a workshop, and started to drive the winding drums 15, then the chains 14 move slowly in one direction on the rolls 13 changing the position of said weights at the same time, whereby said tank rolls to set said weights at the lowest position, and the damaged or soiled surface of said tank is exposed out of the water, then it can be repaired or cleansed after stopping said motors.

Further, in case of emergency the tank 1 can be conveniently sunk by introducing water into the partitioning chambers 6.

The tank 1 has a plurality of the independent petroleum storage chambers 7, and so, although any of said chambers are damaged to permit flowing out of petroleum, petroleum in the other chambers is kept safe. If necessary, said petroleum storage chambers can be communicated with each other by opening the plate valve 21, then petroleum in said chambers comes to exist at the same level in the tank bottom resulting in a good stability of the tank.

What I claim is:

1. A floating tank for petroleum storage use, comprising a cylindrical tank, the inside of which is vertically divided into a plurality of petroleum storage chambers by one or more partitioning chambers, said chambers being provided with one or more openings having one or more detachable covers, respectively, a movable chain which is annularly arranged along the periphery of each partitioning chamber within it, and a weight which is attached to said chain and serves to hold a required position of said tank.

2. A floating tank for petroleum storage use according to claim 1, in which the fore end part of said tank is sharpened, and the sharpened end portion thereof is formed a compressed air chamber having a nozzle and an adjusting valve at its sharpened end.

3. A floating tank for petroleum storage use according to claim 1, in which the both ends of said movable chain are connected to a motor-driven winding drum.

4. A floating tank for petroleum storage use according to claim 1, said petroleum storage chambers are adapted to be able to communicate with each other at the tank bottom.

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