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1,953,389

TANK VESSEL

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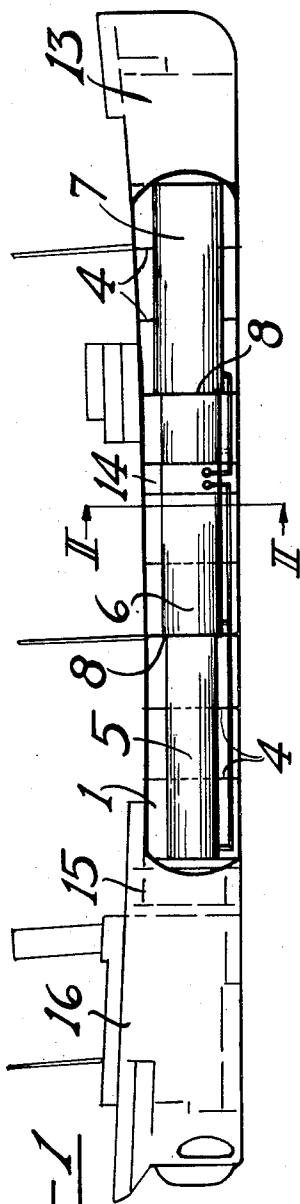


Fig. 1

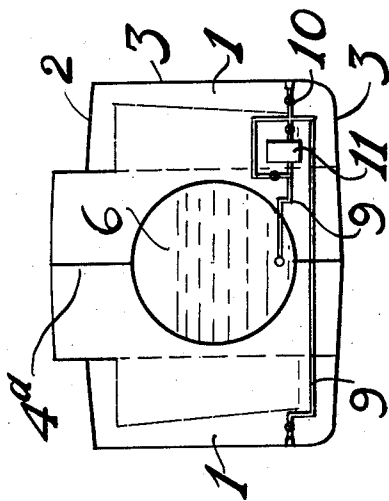


Fig. 2

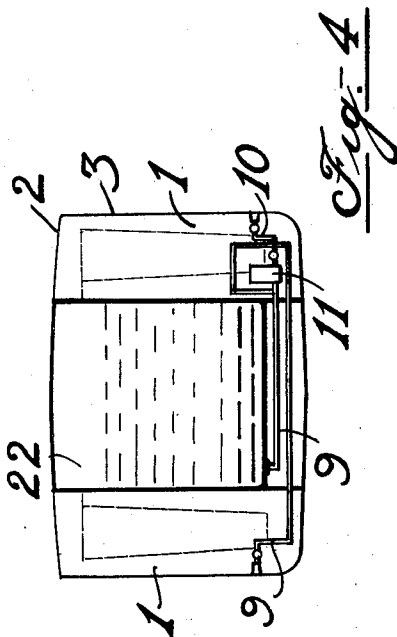


Fig. 4

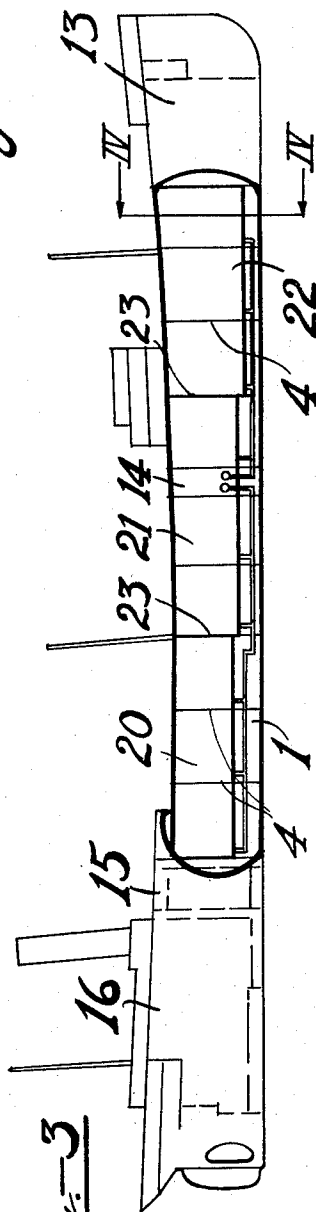


Fig. 3

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1,953,389

TANK VESSEL

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Application January 29, 1932, Serial No. 589,598

3 Claims. (Cl. 114—74)

This invention relates to improvements in the construction of floatable tank vessels such as are used for carrying liquid in bulk. The invention will be fully understood from the following description taken in connection with the accompanying drawing, in which latter—

Fig. 1 is a side elevational view partly in section of a tank vessel embodying the improvements;

Fig. 2 is a transverse sectional view taken along the line II—II of Fig. 1 and shows diagrammatically the means for filling and emptying the ballast compressors;

Fig. 3 is a side elevational view partly in section of a tank vessel embodying a modified form of ballast compartment; and

Fig. 4 is a transverse sectional view taken along the line IV—IV of Fig. 3.

Referring particularly to Figs. 1 and 2 of the drawing, reference numeral 1 designates each of a plurality of cargo tanks which are disposed side by side in the hull of the vessel. The cargo tanks extend upwardly to the deck 2 of the vessel and the bottoms and side walls of the cargo tanks are constituted by the hull 3 of the vessel. Partitions 4 extending transversely across and partitions 4a extending longitudinally of the hull of the vessel divide the hull into the tanks 1.

A plurality of tubular compartments 5, 6 and 7 are disposed longitudinally in the hull of the vessel and are disposed in substantial alignment longitudinally of the vessel. These compartments are adapted to carry ballast such as sea water, or cargo, if desired. The compartments are preferably constructed of rust resisting steel. Each of the ballast compartments extends through two or more of the partitions 4 and are supported in position by means of the partitions. The compartments are disposed in spaced relation to the bottom of the vessel and are preferably supported with their center of gravity at approximately the neutral axis of the vessel with regard to its strength modulus on a vertical plane. The cargo compartments in the preferred embodiment are of successively larger size from fore to aft end of the vessel. Alternatively the cargo compartments may be of successively larger size from the aft to the fore end of the vessel and some of the advantages of the invention will be retained. The ballast compartments are separated from each other by means of the partitions 8. The compartments constitute a sectional ballast compartment. Ballast, such as sea water, is introduced into the ballast com-

partments through valved lines 9 and 10, the inlet ends of which open through sea chests into the ocean. The liquid ballast is discharged from the compartments through the valved lines 10 by means of a suitable suction pump 11. Valves are provided in lines 9 and 10. A forehold 13 is disposed at the bow of the vessel and there is a pump room 14. A cross-bunker 15 and an engine room 16 are provided in the order named from the ballast tank 5 to the rear end of the vessel.

In utilizing the tank vessel for carrying cargo such as hydrocarbon oil, or the like, the cargo tanks 1 are filled up to the deck of the vessel with the oil. The cargo tanks being of progressively smaller size from aft to fore or fore to aft end of the vessel, as a consequence the weight carried by the vessel is respectively progressively less from aft to fore or fore to aft end of the vessel. This is of advantage in maintaining a satisfactory trim of the vessel while carrying a cargo. When the vessel is used without a cargo, it is desirable to fill each of the ballast compartments 5, 6 and 7 with suitable ballast such as sea water. The amount of ballast thus provided is progressively greater from aft to fore or fore to aft end of the vessel with a result that the optimum conditions of trim are obtained when a cargo is not being carried.

In a vessel of this design the ballast water can be run in while the cargo is being unloaded and a vessel in ballast can discharge said ballast while loading. Ballast water carried in this compartment will not ordinarily be contaminated and may be pumped overboard without causing pollution of beaches and navigable waters.

Referring to Figs. 3 and 4, a modified form of ballast compartment is shown applied to a tank vessel of identical construction with that illustrated in Figs. 1 and 2, and like reference numerals are applied to like parts. Ballast compartments 20, 21 and 22 are disposed in substantial alignment longitudinally of the vessel. The ballast compartments are separated from each other by partitions 23. The ballast compartments are rectangular in cross section, are disposed in spaced relation to the bottom of the vessel and extend upwardly to the deck of the vessel. In the embodiment illustrated the ballast compartments are progressively larger in size from the aft to the fore end of the vessel. Alternatively the ballast compartments may be of successively lesser size from the aft to the fore end of the vessel and some of the advantages of the invention will be retained. The relative sizes of the bal-

last compartments are so proportioned to maintain the satisfactory trim of the vessel.

By the construction described the shearing stresses to which the vessel is subjected when in a ballasted condition are reduced below that of a tanker without such construction. The vessel is relatively simple in construction and relatively light in weight. A minimum number and extent of pipe lines is necessary for use in ballasting the vessel. In case additional ballast is necessary, as for example under extreme weather conditions, the additional ballast can be disposed in any one or more of the cargo tanks. Under normal conditions the cargo tanks are used only as compartments for cargo and are, therefore, not subjected to the dirt and the rust incident to the disposal of ballast therein.

In the claims, the term ballast material is intended to include cargo when used for ballast. Various changes and alternative arrangements may be made within the scope of the claims, in which it is the intention to claim all novelty inherent in the invention as broadly as the prior art permits.

We claim:

1. A floating tank vessel, comprising a hull adapted to contain liquid, and a plurality of compartments adapted to contain ballast liquid and disposed in alignment lengthwise of the hull in spaced relation to the bottom of the hull, the compartments increasing in size toward the bow of the vessel. 80

2. A floating tank vessel, comprising a hull adapted to contain a liquid and having an engine room, and a plurality of compartments adapted to contain ballast liquid, and disposed in alignment lengthwise in spaced relation to the bottom of the hull, the compartments increasing in size away from the engine room. 85 90

3. A floating tank vessel, comprising a hull adapted to contain liquid, and a plurality of compartments abutting each other adapted to contain liquid disposed in alignment lengthwise of the hull in spaced relation to the bottom of the hull, the compartments increasing in size toward the bow of the vessel. 95

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