

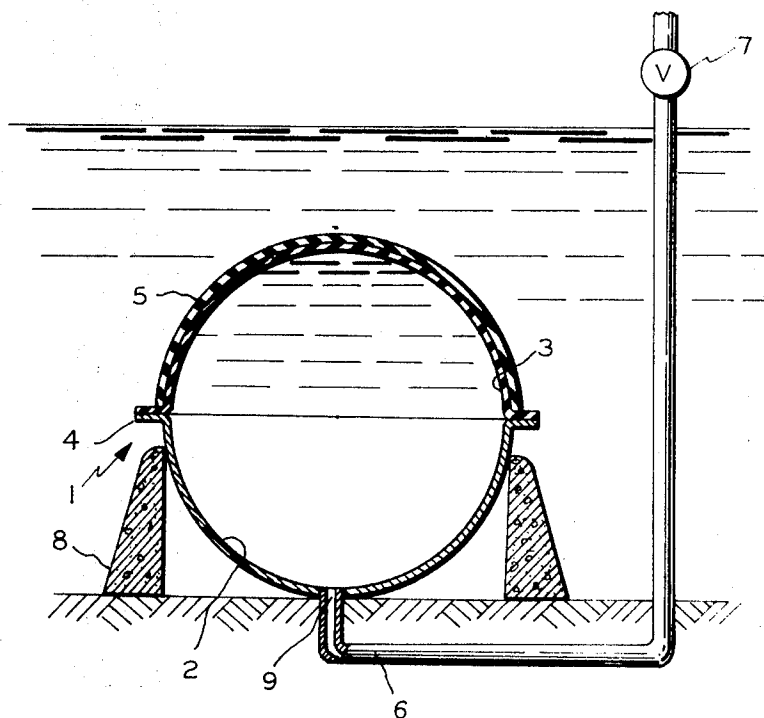
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HIDEO ITOKAWA

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UNDERWATER OIL TANK

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INVENTOR
HIDEO ITOKAWA

BY *Wendroth, Sindt & Ponack*
ATTORNEYS

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UNDERWATER OIL TANK

Hideo Itokawa, 15-34 4-chome, Matsubara,

Setagayaku, Tokyo, Japan

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1 Claim

ABSTRACT OF THE DISCLOSURE

An underwater oil tank. The tank has a rigid lower half which is half-circular in vertical section, and which is fixed on the bottom of a body of water. An upper half made of a water-proof flexible material is half-circular in vertical section when fully expanded and is coupled securely to said lower half. An upper half portion protector covers the outer surface of said upper half. A pipe extends from the bottom of the tank through the body of water to above the water surface.

The present invention relates to an underwater oil tank.

The well-known underwater oil tanks have an upper half portion with a substantially elliptical section which is rigid, while the lower half is made of a flexible material. Therefore, when a liquid having a lower specific gravity than water or sea water, such as for example heavy oil or petroleum, is to be contained in the underwater tank, the lower half which is made of a flexible material can accommodate only a reduced amount as compared with the upper half portion, due to the water pressure exerted outwardly thereof. If further loading is attempted by applying pressure inwardly, the flexible material expands outwardly at the joint with the upper half portion, which may result in producing deformation and possible damage to the flexible material.

The present invention is designed to overcome these defects inherent in the prior art devices and seeks to provide an improved oil tank wherein a liquid can be stored to full actual capacity of both the upper half and the lower half portions and wherein there is no danger of causing deformation or damage.

The underwater oil tank of the invention comprises a rigid lower half which is half-circular in vertical section and which is fixed on the bottom of a body of water; an upper half made of a water-proof flexible material and which is half-circular in vertical section when fully expanded and which is coupled securely to said lower half; an upper half portion protector covering the outer surface of said upper half; and a pipe extending from the bottom of the tank through the body of water to above the water surface.

The invention will now be explained in more detail with reference to the accompanying drawing which is a sectional elevation view of the tank according to the invention.

In the drawing there is shown an oil tank, generally designated by the numeral 1, in a body of water 2 of which is made of a rigid material such as metal, and the upper half 3 of which is made of a plastic material or rubber,

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or a comparatively thin water-proof flexible material such as a fabric impregnated with plastic material or rubber. The upper half 3 is secured to a flange 4 provided around the peripheral edge of said lower half 2. On the outer surface of the upper half 3 is provided an upper half protector 5 secured to the flange 4. This protector 5 is designed to protect the upper half 3, which is made of a flexible material, against waves and other external forces, and is not necessarily water-proof.

It will also be noted that the lower half 2 has at the bottom an opening 9 to which is connected a pipe 6 which extends through the water and emerges above the water surface as shown. A further opening like opening 9 to which a further pipe like the pipe 6 is connected can also be provided in the side of the lower half 2 so that introduction and discharge of the liquid may be effected separately. Reference numeral 8 denotes an oil tank supporting block fixed on the bottom of the body of water. This oil tank supporting block 8 can be constructed in any suitable manner, and also the method of mounting the oil tank 1 thereon can be by the use of ropes or any other suitable means. The pipe 6 can, if desired, be buried under the bottom of the body of water.

In the above-described construction, when a liquid is to be stored in the oil tank 1 the upper half 3 of which is compressed by water pressure, the liquid is injected by a pump through the pipe 6, with the valve 7 in an open position. When it is desired to discharge the liquid, the valve 7 is again opened, whereby the upper half portion 3 is compressed by water under pressure to cause gradual discharge of the liquid contained in the tank. It is, of course, possible to use a pump so as to facilitate the discharging operation.

Thus, according to the present invention, there is provided an excellent underwater oil tank in which a liquid can be contained to the full actual capacity and by means of which it is possible to avoid any danger of damage due to deformation of the flexible material and which also has a simple structure and high efficiency.

What is claimed is:

1. An underwater oil tank comprising a rigid lower half which is half-circular in vertical section and which is fixed on the bottom of a body of water; an upper half made of a water-proof flexible material and which is half-circular in vertical section when fully expanded and which is coupled securely to said lower half; an upper half portion protector covering the outer surface of said upper half; and a pipe extending from the bottom of the tank through the body of water to above the water surface.

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J. KARL BELL, Primary Examiner