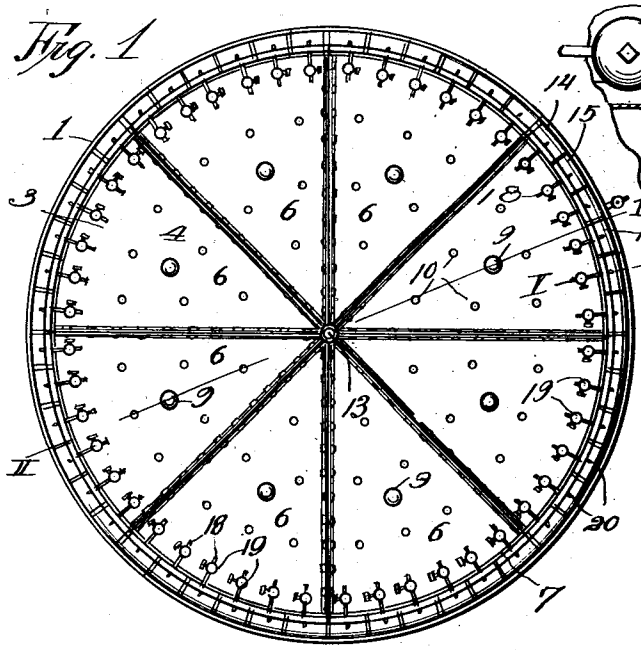
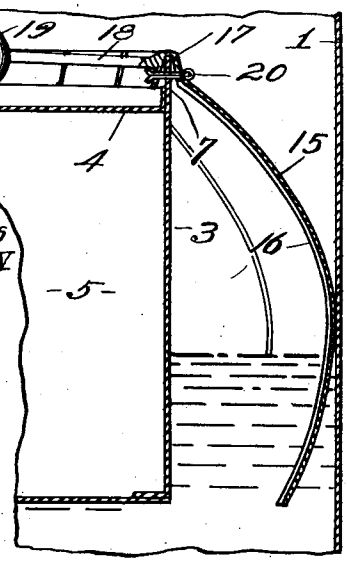
April 17, 1928. 1,666,415

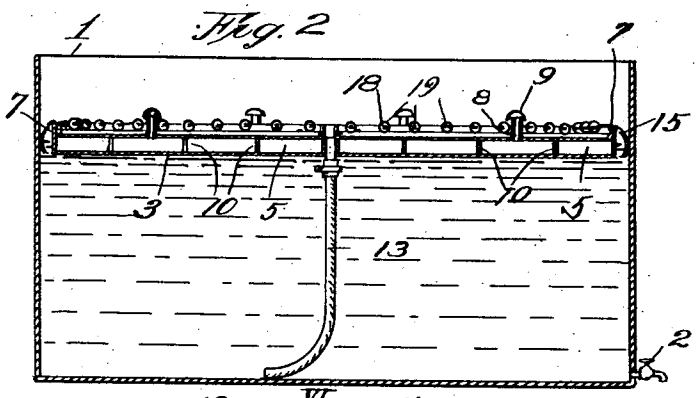
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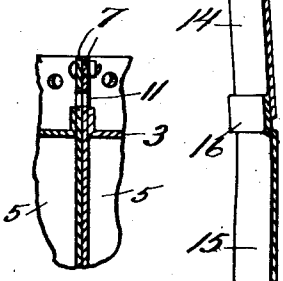
FLOATING DECK OR COVER FOR OIL TANKS

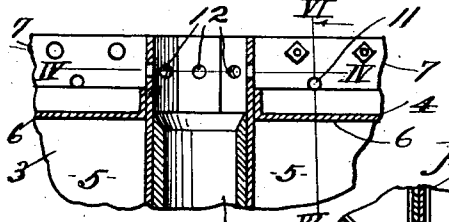
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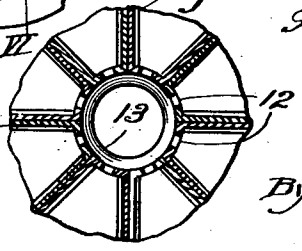


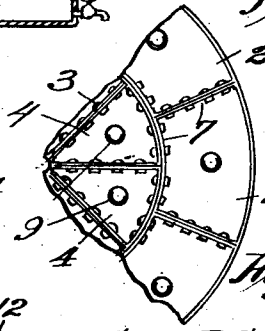












Witness:

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By Thorpe Gerard Attys.

Patented Apr. 17, 1928. 1,666,415

UNITED STATES PATENT OFFICE.

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FLOATING DECK OR COVER FOR OIL TANKS.

Application filed September 22, 1924. Serial No. 739,122.

This invention relates to floating decks or covers for oil tanks, and more especially for large oil tanks, such as common for storage and like purposes in territory where oil is pumped from wells, and my object is to produce a deck or cover which is unsinkable to serve as an insulator for retarding evaporation of oil and loss entailed thereby, and the generation of vapor whereby explosive mixtures may form, and to protect the oil in the tank from being set on fire by lightning or flames from a burning well or tank.

A further object of the invention is the provision of a floating deck or cover having a seal for the space or joint between the deck and the wall of the tank, and for centralizing the deck with respect to the tank to guard against the formation of a material break in the seal at any point around the deck.

A still further object is to produce a buoyant deck having a pan at the top for holding water to increase the effectiveness of the insulation against fire, generation of gas and evaporation of oil, and to make provision for conducting excess water caught in the pan, to the bottom of the tank, and thereby avoid any possibility of the deck becoming submerged in the oil or sinking to the bottom of the tank.

Another object is to provide hollow standardized deck sections of sheet metal or the like, susceptible of association in producing knock-down circular decks or covers of predetermined diameters, for convenience of handling, storage and transportation.

With these general objects and others of a contributory character in view, the invention consists in certain novel and useful features of construction and combinations of parts as hereinafter described and claimed; and in order that it may be fully understood, reference is to be had to the accompanying drawing, in which:—

Figure 1, is a plan view of an oil tank equipped with a floating deck or cover embodying the invention.

Figure 2, is a vertical section of the same on the line II—II of Figure 1.

Figure 3, is an enlarged vertical section of the upper central part of the deck or cover to disclose points of communication between sections of the pan, and openings for the escape of excess water from the pan.

Figure 4, is a horizontal section on the line IV—IV of Figure 3.

Figure 5, is fragmentary magnified vertical section corresponding to part of Figure 2.

Figure 6, is a vertical section on the line VI—VI of Figure 3, and on the same scale as said figure.

Figure 7, is an enlarged horizontal section of a plurality of adjoining plates of a set constituting the seal for the space or joint between the deck and the wall of the tank.

Figure 8, is a plan view on a reduced scale, of a part of a deck or cover made of two series of segmental sections arranged in concentric relation, this type of construction being particularly desirable and suitable for very large tanks.

Referring now to the drawing, in detail, where similar reference characters identify corresponding parts in all the figures, 1 indicates an oil tank of the customary or any preferred type, and 2 a common form of drain cock for the water which may accumulate in the tank below the oil therein.

The floating deck or cover is indicated at 3, and in the preferred construction has an upwardly-flanged top 4, and is formed with a plurality of air compartments 5. The deck is preferably composed of a series of segmental sections or pontoons of sector shape in horizontal section 6, having upwardly-projecting marginal flanges 7, (see Figures 2 and 5) bolted together in the assembling of the sections to form the deck, as shown clearly in Figures 1, 3, 6 and 8, the said flanges projecting to a higher plane than the flanges of the top, to form a water pan, of which the top 4 constitutes the bottom. Each air compartment or pontoon has a vent in the form of a short tube 8, projecting from the top 4 to a plane above the flanges 7, and a suitably-supported hood 9 overlying the tube to exclude rain without interfering with the free ingress and egress of air to and from the air compartment, and each section is stiffened or braced by vertical rods 10 or the like.

The radial flanges 7 of the deck, are provided with openings 11, to permit of free circulation of water from one chamber of the pan to another, and the sections have openings in the flanges at their inner ends, as at 12, in a higher plane than openings 11, so

that excess water may flow from the pan down through a flexible tube 13, leading to the bottom of the tank and accommodating variations in the altitude of the deck. The water collected below the oil can be withdrawn by opening the drain cock 2.

The deck floats on the body of oil in the tank and is of substantially less diameter than the latter, and to bridge or close the space or joint between the deck and tank wall, a seal capable of automatic expansion and contraction is provided. The seal encircles the deck and consists of a series of segmental plates 14 and 15, arranged in overlapping relation at their side edges, the plates 15 having inwardly-offset portions or edges 16, underlying the corresponding or adjacent side edges of the plates 14, as clearly shown in Figure 7. The arrangement of the plates is such that the exterior surfaces of all the plates describe a common circle so that they all can contact simultaneously with the wall of the tank and thus form an efficient seal for the said space or joint.

Each of the sealing plates is formed with a transverse and slightly arcuate bent portion 17 of inverted V shape for fitting pivotally on the circumferential flange of the deck, and extending radially inward from said bent portions are lever arms 18 upon which are adjustably secured weights 19, adapted for holding the convex sides of the sealing plates yieldingly against the wall of the tank, it being preferred that the parts shall be so proportioned, as shown, that any material shifting or drifting of the deck from its central position in the tank, shall be immediately checked by the descent of the weights at the opposite side from that toward which the drift occurs, upon the top of the deck, as said weights, through the overlapping relation of the whole series of sealing plates, tend to transfer and apply pressure outwardly on the free ends of the sealing plates at the side of the deck approaching the tank wall. In other words any tendency of the float to move from its central position, results in expansion of the sealing circle of plates and the space or joint remains properly bridged or sealed. To guard against dislocation of the sealing plates, cotters 20 extend through the bent portions 17 and the circumferential flange of the deck, as shown in Figure 5, the connection being loose to avoid interfering with the ready pivotal operation of the sealing plates in response to shifting of the deck.

For the smaller sizes of tanks, the deck will preferably be composed of a single circular series of segmental sections, but for large tanks, it is contemplated that there shall be two or more concentric series of sections, as indicated by Figure 8, with a proportionately greater number of the sealing plates to provide for the sealing of a space or joint of increased diameter, the extra series of sections being bolted together and to the inclosed series, as indicated in said Figure 8.

From the above description it will be apparent that with a floating deck of the character described, oil in a tank can be protected and conserved, and the knock-down character of the deck makes it feasible of manufacture, shipment and erection at minimum expense, and besides provides for replacement of injured or lost parts without material loss of time, it being understood, of course, that the invention is susceptible of modification in minor particulars without departing from the spirit and scope or sacrificing any of the advantages of the appended claims.

I claim:

1. A buoyant deck for oil tanks comprising a plurality of pontoons of sector shape in horizontal section and having marginal walls extending upwardly to provide water pans, the pontoons being placed in a circular series to form a circular deck, means for attaching the pontoons together, means for discharging excess water from the water pans, and a circular series of sealing plates surrounding and pivotally mounted on the deck and adapted for movement in a vertical plane, the plates being pivoted to the deck at their upper end and having their swinging ends extending down into the liquid supporting the deck, and means for yieldingly urging the sealing plates to swing outwardly with respect to the deck.

2. A buoyant deck as claimed in claim 1 in which certain of the sealing plates have offset edges and adjacent sealing plates have their edges set in said offsets.

3. A buoyant deck for oil tanks having a circular series of sealing plates surrounding and pivotally mounted on the deck and adapted to move in vertical planes, the upper ends of said sealing plates being pivoted to the deck and the sealing plates being curved outwardly into engagement with the oil tank and hence curved inwardly and terminating in the liquid supporting the deck.

4. A buoyant deck for oil tanks having a circular series of sealing plates surrounding and pivotally mounted on the deck and adapted to move in vertical planes, said sealing plates being pivoted at their upper ends to the deck and extending from said pivotal point down into the liquid supporting the deck where said sealing plates terminate, the center of said sealing plates being curved outwardly into engagement with the tank, and means for yieldingly urging the plates outwardly.

5. A buoyant deck for oil tanks having a circular series of sealing plates surrounding and pivotally mounted on the deck and adapted for movement in a vertical plane, the upper ends of the plates being pivoted

to the upper portion of the deck and the plates being hence curved outwardly into contact with the tank and hence inwardly and terminating in the liquid supporting the deck, part of the sealing plates having inwardly offset edges so that adjacent plates may overlap while the outer walls of the plates remain in a common circle.

6. A buoyant deck for oil tanks having a circular series of sealing plates surrounding and pivotally mounted on the deck and adapted for movement in a vertical plane, the upper ends of the plates being pivoted to the upper portion of the deck and the plates being hence curved outwardly into contact with the tank and hence inwardly and terminating in the liquid supporting the deck, part of the sealing plates having inwardly offset edges so that adjacent plates may overlap while the outer walls of the plates remain in a common circle, and means yieldingly urging the plates to swing outwardly with respect to the deck.

7. A floating deck for oil tanks having a circular series of sealing plates surrounding the deck, said sealing plates having their upper ends pivoted to the deck above the liquid supporting the deck, the sealing plates being adapted to move in vertical planes, the sealing plates curving outwardly from the deck and having their central curved portions adapted for engagement with the tank, the sealing plates terminating at their lower ends in the liquid supporting the deck.

In witness whereof I hereunto affix my signature.

CHARLES R. GALLAGHER.