Oct. 24, 1933. G. T. HORTON 1,931,546

FLOATING ROOF AND SEALING MEANS THEREFOR

Original Filed Jan. 14, 1931

Fig. 1.

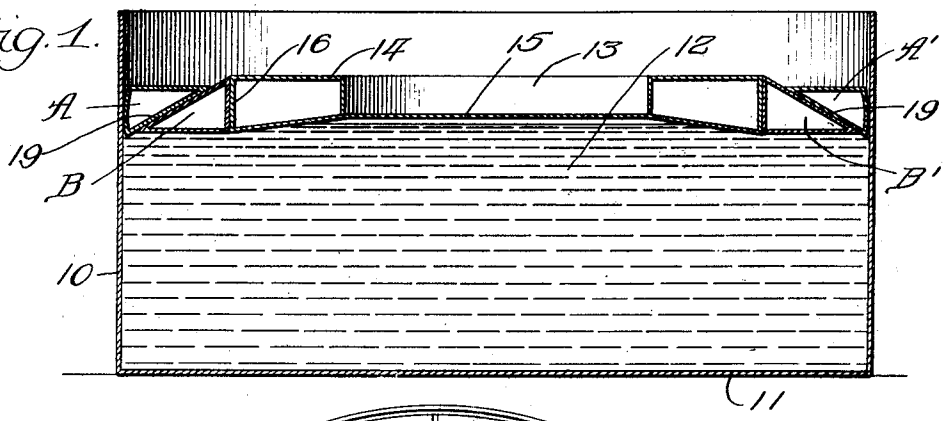



Fig. 2

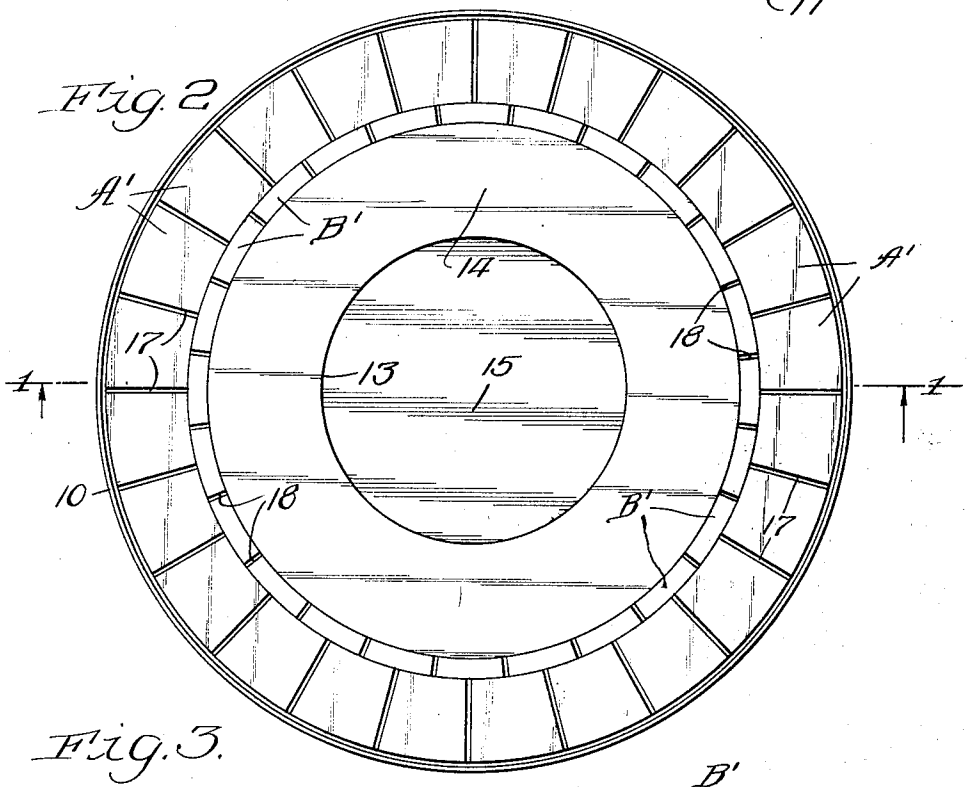
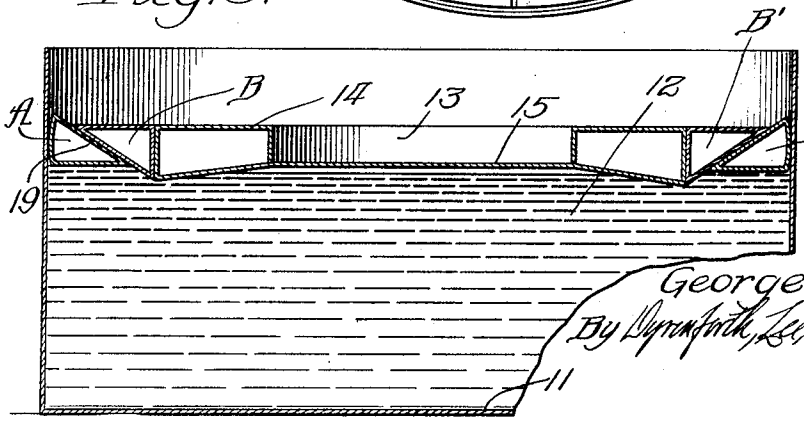



Fig. 3.




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# UNITED STATES PATENT OFFICE

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## FLOATING ROOF AND SEALING MEANS THEREFOR

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Original application January 14, 1931, Serial No. 508,744. Divided and this application June 2, 1932. Serial No. 614,998

2 Claims. (Cl. 220—26)

This invention relates to improvements in floating roofs and sealing means therefor and, more especially, floating roofs adapted for use in liquid storage tanks. My invention is particularly applicable for use in connection with a floating roof in a cylindrical tank, and provides means for sealing the space between the periphery of the roof and the wall of the tank.

Among the features of my invention is the provision of simple and effective means for sealing the space referred to. This is accomplished without the use of flexible fabrics, and the like, which are relatively short-lived.

Another feature of my invention is the provision of a sealing means that also acts as an insulating means.

My improved sealing means is formed of independent members which are easily removable for inspection, replacement, repair, and the like.

This application is a division of my copending application, Serial No. 508,744, filed January 14, 1931.

Other features and advantages of my invention will appear more fully as I proceed with my specification.

In those forms of devices embodying the features of my invention shown in the accompanying drawing—

Figure 1 is a vertical sectional view; Fig. 2 is a top plan view; and Fig. 3 is a view similar to Fig. 1 showing a modified form.

As shown in the drawing, 10 may indicate a cylindrical tank with a bottom 11 containing the liquid 12. Numeral 13 indicates, in general, a floating roof such as is frequently used in oil storage tanks to lessen losses by evaporation. As here shown, this roof includes the annular pontoon 14 with the central sheet portion 15. The periphery of the floating roof is vertical, as indicated by 16.

The principal feature of this invention is the provision of means for sealing the space between the periphery of the roof and the wall of the tank. In general, it may be stated that this sealing means includes an outer ring of radially movable members with beveled inner surfaces and an inner ring with an outer co-operating beveled surface, the buoyancy of one of the rings and the weight of the other urging the beveled surfaces of the two rings into sliding contact. This causes relative sliding movement of the two rings with respect to each other, causing the outer ring to tend to move outwardly and the inner ring to tend to move inwardly. This causes the two rings to fill the space between the periphery of the roof and the wall of the tank.

The rings may take various forms. In both forms of the device, I have indicated, in general, the outer ring by A and the inner ring, by B. In Fig. 1, the inner ring is buoyant. In Fig. 3, the outer ring is buoyant. Each ring is composed of a plurality of box-like members radially movable with respect to each other. The separate box-like members in the outer ring are indicated by A′ and the separate box-like members in the inner ring are indicated by B′.

In the form shown in Fig. 1, the members A′ forming the outer ring are flat on top and have their inner surfaces beveled, the bevel slanting downwardly and outwardly. The outer ring of the device shown in Fig. 3 is very similar, except that the members of the outer ring are turned over. That is, the outer ring A in the device of Fig. 3 is also made up of separate radially movable box-like members having their under surfaces flat and provided with beveled inner surfaces slanting outwardly and upwardly. There are slight spaces 17 left between the members A′ in order to permit the requisite amount of circumferential variation in the ring A caused by radial movement of the members A′.

The inner ring B may likewise be made up of a plurality of independent members B′, B′ with spaces 18 therebetween. In the form shown in Fig. 1, the inner ring B is buoyant. In each of the forms of Figs. 1 and 3, the inner ring B has its outer surface provided with a co-operating bevel in sliding contact with the beveled inner surface of the outer ring A. In each of the devices shown in Figs. 1 and 3, the co-operating beveled surfaces of the two rings are indicated by 19. These surfaces are in sliding contact and the buoyancy of one ring and the weight of the other urges them together.

This causes a tendency for the rings to separate radially. That is, the outer ring will be urged outwardly and the inner ring inwardly (with respect to each other) to cause said rings to keep the space between the periphery of the floating roof and the wall of the tank filled.

To obtain the desired buoyancy, I have here shown the inner ring in the device of Fig. 1 and the outer ring in the device of Fig. 3 made hollow and composed of separate pontoons so that they will float on the liquid and have sufficient buoyancy to cause them to be urged against the other rings to cause the sliding contact re-

ferred to. I have also chosen to make the outer ring in the device of Fig. 1 and the inner ring of the device of Fig. 3 hollow or box-like in construction, thus causing said rings to operate more effectually as insulating media. It will be seen, therefore, that in both forms of the device, the two rings afford an insulating means for the space between the periphery of the roof and the wall of the tank. For example, the liquid, such as oil, stored in the tank, is insulated from the heat of the sun by these rings near the wall of the tank.

By the provision of two rings, sticking or jamming of the sealing means is prevented or lessened. The radial spaces 17 and 18 between the members should be sufficient to allow them to adjust themselves to the varying tank diameters and unevennesses in the periphery of the tank or roof. The top and bottom edges of the members A' are tapered or curved to permit them to pass over rivet heads and other unevennesses, projections or obstructions that there may be on the inner wall of the tank.

While I have shown and described certain embodiments of my invention, it is to be understood that it is capable of many modifications. Changes, therefore, in the construction and arrangement may be made without departing from the spirit and scope of the invention as disclosed in the appended claims in which it is my intention to claim all novelty inherent in my invention as broadly as permissible in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

1. A floating roof and means for sealing the space between the wall of a cylindrical tank and the periphery of said roof, said means including an outer ring of radially movable members with beveled inner surfaces and an inner ring with an outer co-operating beveled surface, one of said rings being made buoyant and adapted to float on liquid in the tank, the buoyancy of said ring and the weight of the other ring urging the beveled surfaces of the two rings into sliding contact, the inner surface of the inner ring and the outer peripheral surface of the floating roof being provided with substantially vertical relatively movable co-operating surfaces.

2. Apparatus as claimed in claim 1, in which the sealing means embody a hollow box-like structure.

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