June 7, 1932. D. E. LARSON 1,861,868

SEAL FOR FLOATING ROOFS

Filed Feb. 6, 1931 2 Sheets-Sheet 1

Fig. 1.

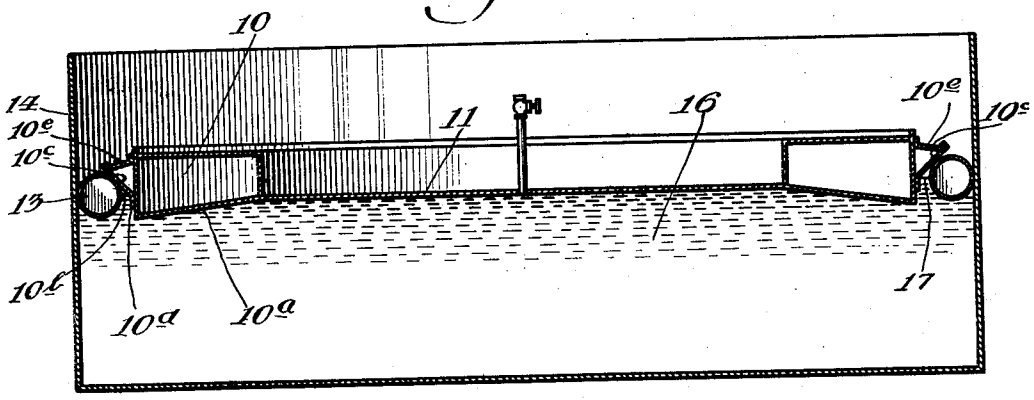
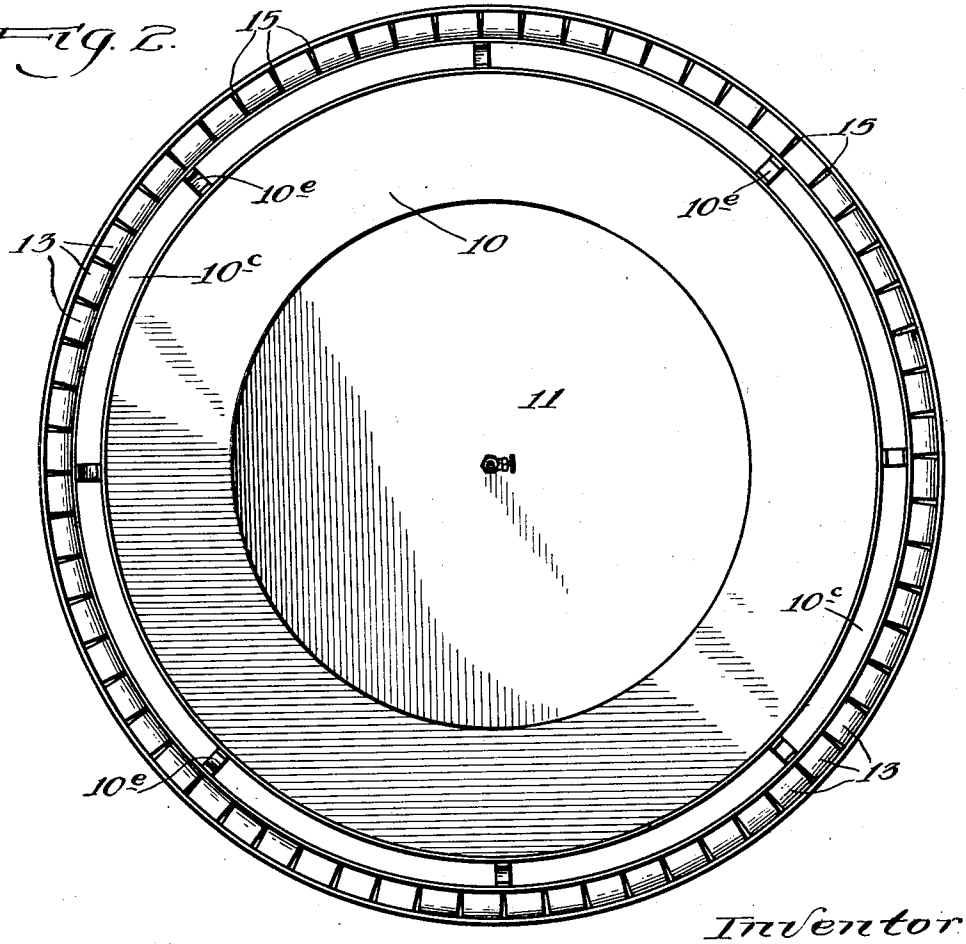


Fig. 2.



Inventor:
Donald E. Larson,
By
Dyrenforth, Lee, Chritton & Wiles
Attys.

June 7, 1932. D. E. LARSON 1,861,868

SEAL FOR FLOATING ROOFS

Filed Feb. 6, 1931 2 Sheets-Sheet 2

Fig. 3.

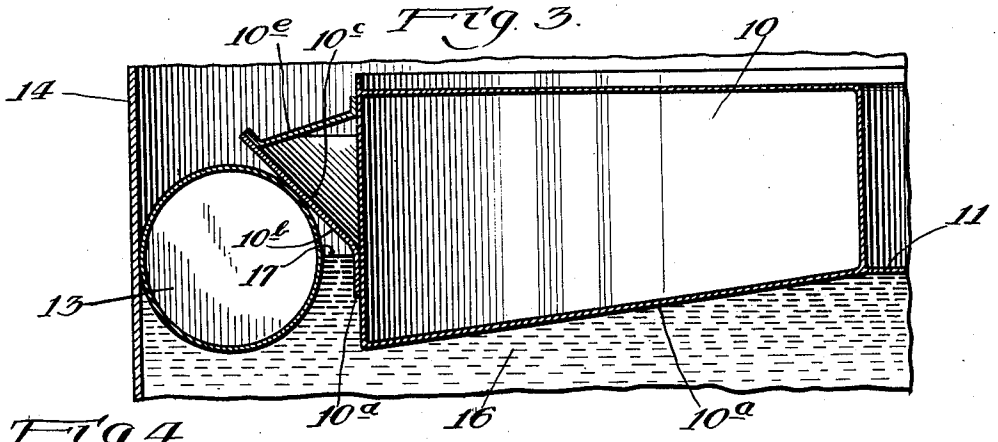


Fig. 4.

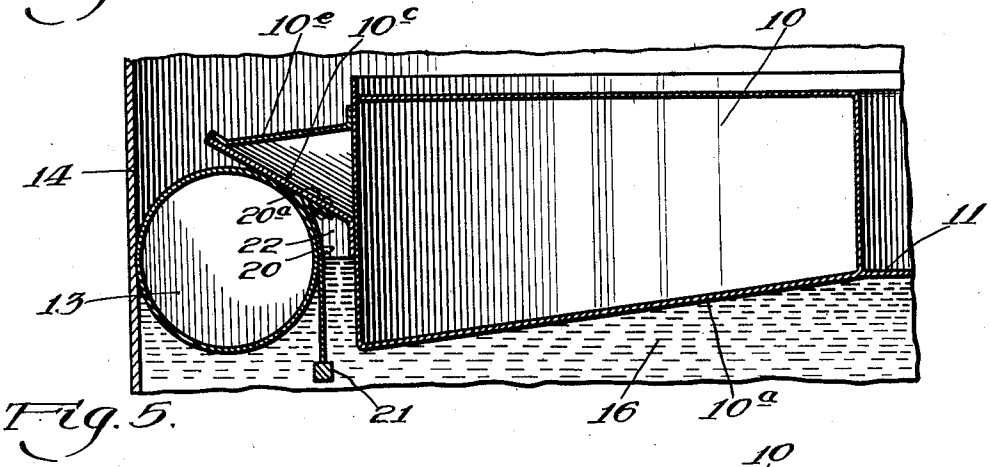


Fig. 5.

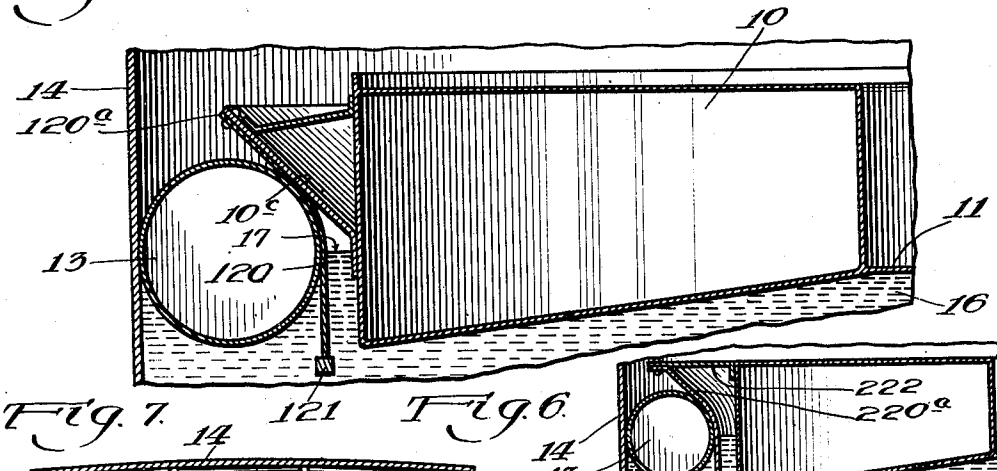


Fig. 7.

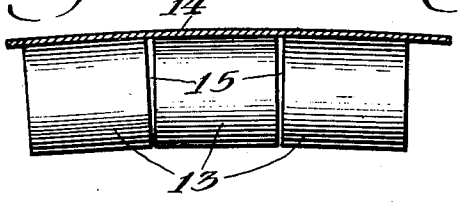


Fig. 6.

Inventor:
Donald E. Larson,
By Lyon, Lyon, Lee, Chretton & Wiles
Atty's.

Patented June 7, 1932

1,861,868

UNITED STATES PATENT OFFICE

DONALD E. LARSON, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO BRIDGE AND IRON COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

SEAL FOR FLOATING ROOFS

Application filed February 6, 1931. Serial No. 514,050.

This invention relates to improvements in floating roofs and, more especially, the sealing means for a floating roof.

For the purpose of illustrating the invention, I have shown the same as embodied in a floating roof of the annular pontoon type. It is obvious, however, that the invention may be employed in connection with practically any kind of floating roof.

Among the features of my invention is the provision of effective and simple sealing means for sealing the space between the periphery of the roof and the wall of the tank.

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 drawings, Figure 1 is a vertical sectional view; Fig. 2 is a top plan view; Fig. 3 is an enlarged fragmentary vertical sectional view; Figs. 4, 5, and 6 are fragmentary views similar to Fig. 3 showing modified forms and Fig. 7 is a fragmentary top plan view.

As shown in the drawings, the floating roof pictured in Fig. 1 comprises the annular pontoon 10 with the central sheet portion 11. As here shown, the pontoon is relatively deeper at its outer edge than at its inner edge so that the bottom of the pontoon as indicated by 10^a, slants downwardly and outwardly. The effect of this is to provide an annular depending rim to form a gas receiving space under the roof.

I shall now describe more particularly the sealing means. The peripheral edge of the roof is provided with an upwardly and outwardly slanting surface 10^b. This surface is here shown as the underside of the annular rim 10^c having its lowed edge 10^d attached to the periphery of the roof. 10^e may indicate braces to assist in sustaining the rim 10^c.

Numerals 13, 13 indicate a plurality of cylindrical buoyant sealing members adapted to float on the liquid in the tank. The buoyancy of these members urges them against the slanting surface 10^b which, in turn, urges them outwardly into contact with the tank wall 14. The sealing members are short enough so there will be narrow spaces 15 between them. The spaces 15 are only wide enough to permit the sealing members 13 to have the necessary radial movement so that they may always stay in contact with the wall 14 of the tank, even though said wall may have variances in diameter or unevennesses.

Numeral 16 indicates the liquid stored in the tank and 17 indicates the liquid level in the space between the edge of the roof and the wall of the tank. The members 13 have a diameter small enough so that they will not jam or stick between the periphery of the roof and the wall of the tank. They are preferably made cylindrical in shape but may be of other forms or shapes.

The modified form shown in Fig. 4 is substantially the same as that just described except that I also provide a flexible annular curtain 20 with its upper edge 20^a attached to the rim 10^c and its lower edge weighted as indicated by 21. The curtain is attached far enough out on the rim 10^c so that it will press outwardly on the sealing members 13 thus assisting in holding them against the tank wall 14. When a curtain like this is used it serves to seal the spaces 15 between the sealing members against escape therethrough of gases from the gas space 22.

The construction shown in Fig. 5 is very much like that shown in Fig. 4 except that the curtain 120 has its upper edge 120^a attached further out on the rim 10^c, the attachment here being shown as at the extreme outer edge of said rim.

In Fig. 6 I have shown a form in which the slanting surface 10^b for the members 13 to be pushed up against is entirely dispensed with. As here shown I rely upon the curtain 220 alone to urge the members 13 against the tank wall 14. As here shown this curtain 220 is weighted as indicated by 221 and has its upper edge 220^a attached substantially above the center of the members 13 to the outer edge of the horizontally projecting rim or plate 222.

Where a curtain is used its lower edge is preferably submerged in the liquid in the tank.

The members 13 as here shown may be hollow cylindrical floats made of sheet metal.

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 possible, 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 a plurality of buoyant sealing members floating on liquid in the tank and a weighted curtain supported from the periphery of the roof, said curtain lying inside of the sealing members and urging them outwardly into contact with the wall of the tank.

2. Mechanism as claimed in claim 1, in which the lower edge of the curtain is immersed in the liquid in the tank.

3. 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 upwardly and outwardly slanting surface on the periphery of the roof, a plurality of buoyant sealing members floating on liquid in the tank and urged upwardly by their buoyancy against said slanting surface and outwardly by said slanting surface into contact with the wall of the tank, and a weighted curtain supported from the periphery of the roof, said curtain lying inside of the sealing members and urging them outwardly.

4. Mechanism as claimed in claim 3, in which the lower edge of the curtain is immersed in the liquid in the tank.

In witness whereof, I have hereunto set my hand this 3rd day of February, 1931.

DONALD E. LARSON.