

Oct. 25, 1949.

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2,485,557

LIFTER ROOF TANK

Filed April 17, 1946

2 Sheets-Sheet 1

Fig. 1.

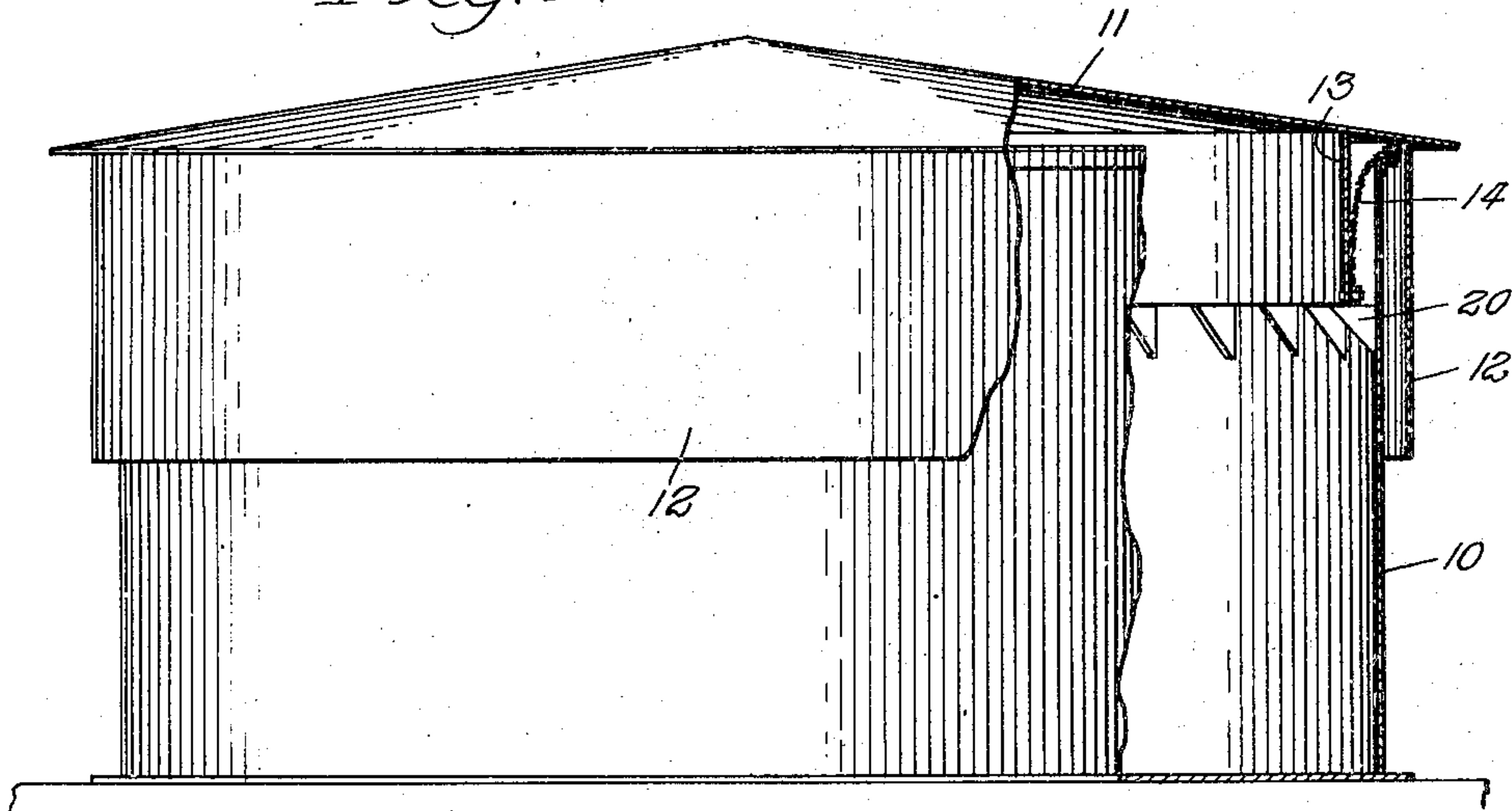


Fig. 2.

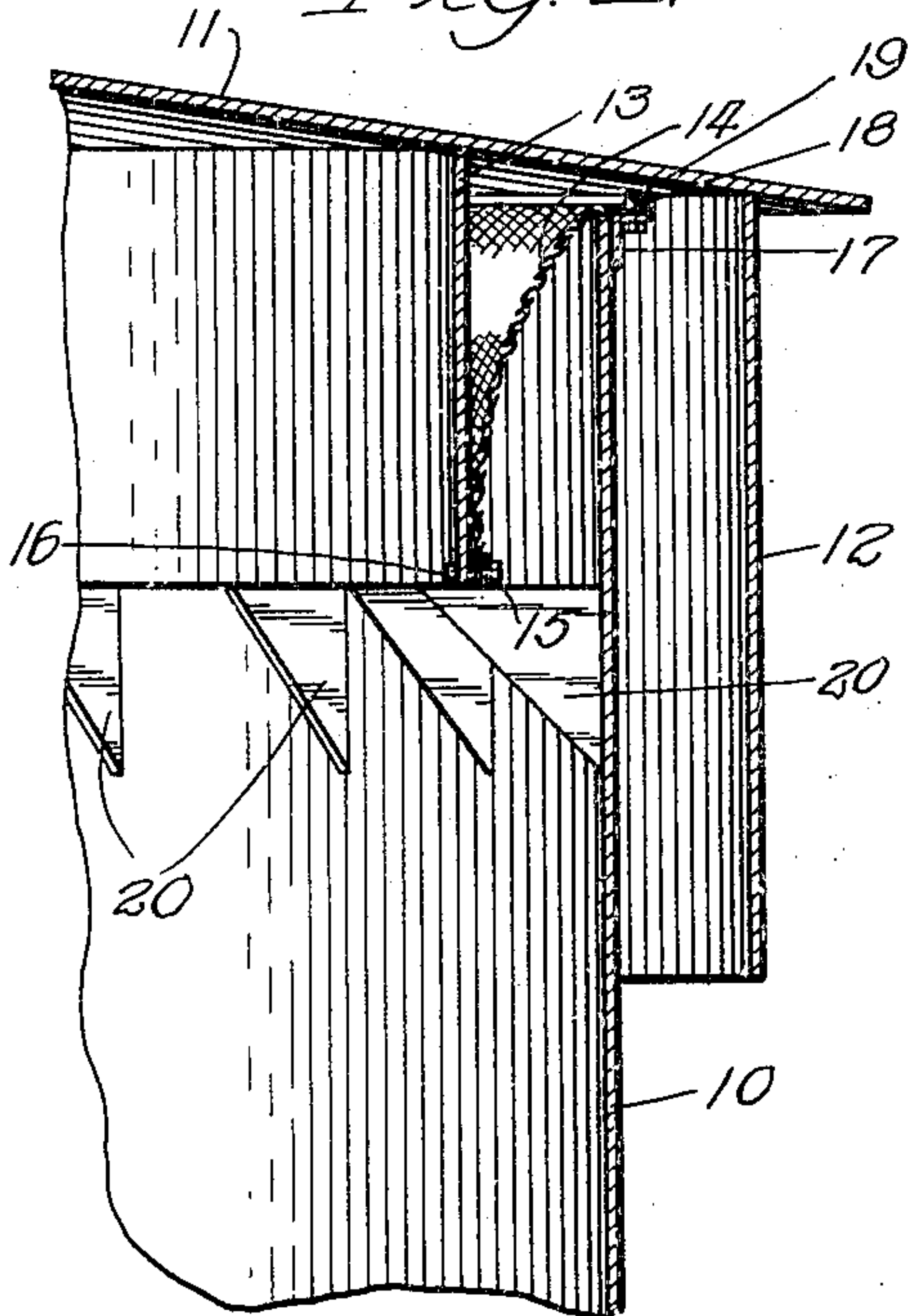
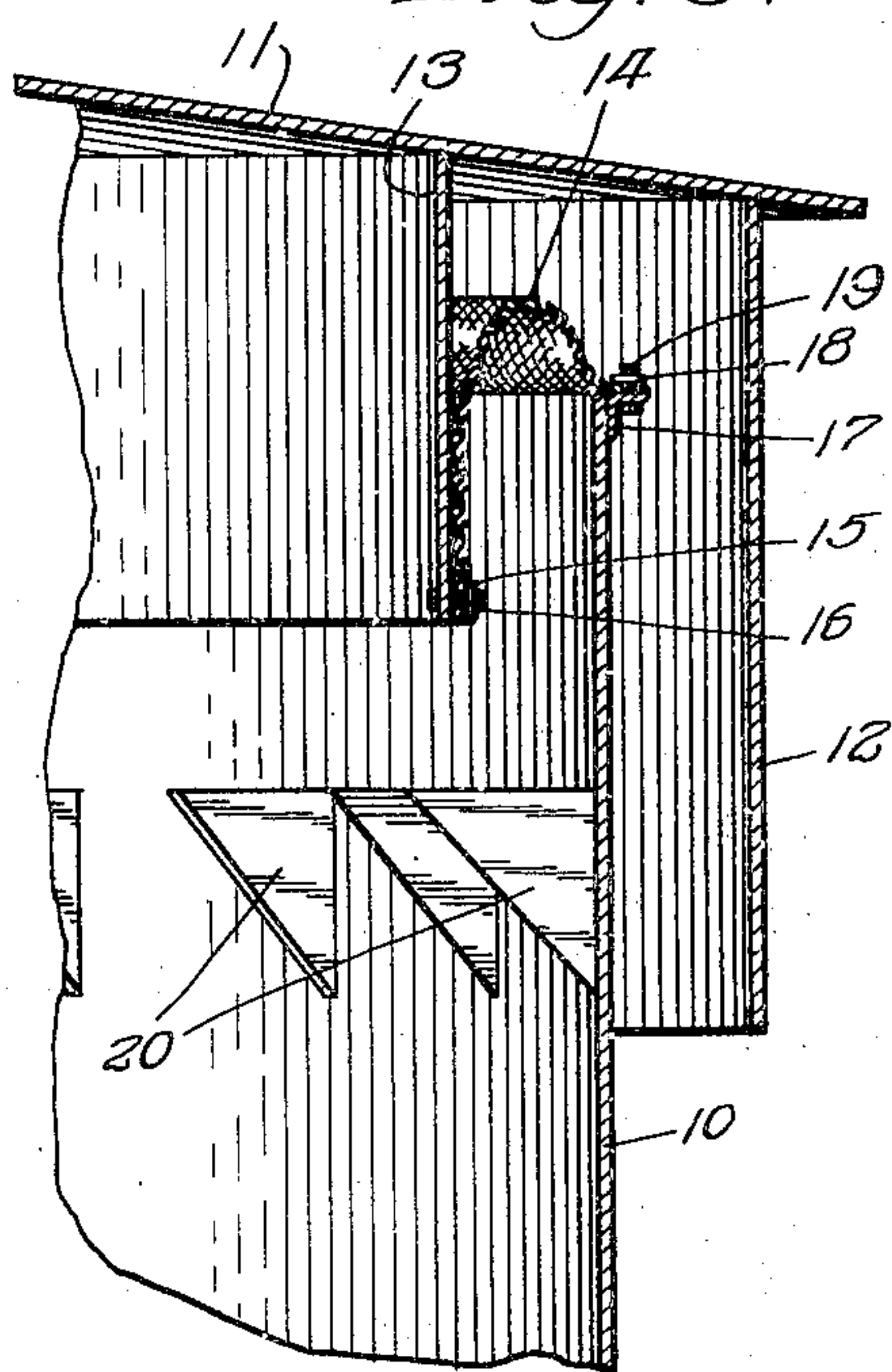


Fig. 3.



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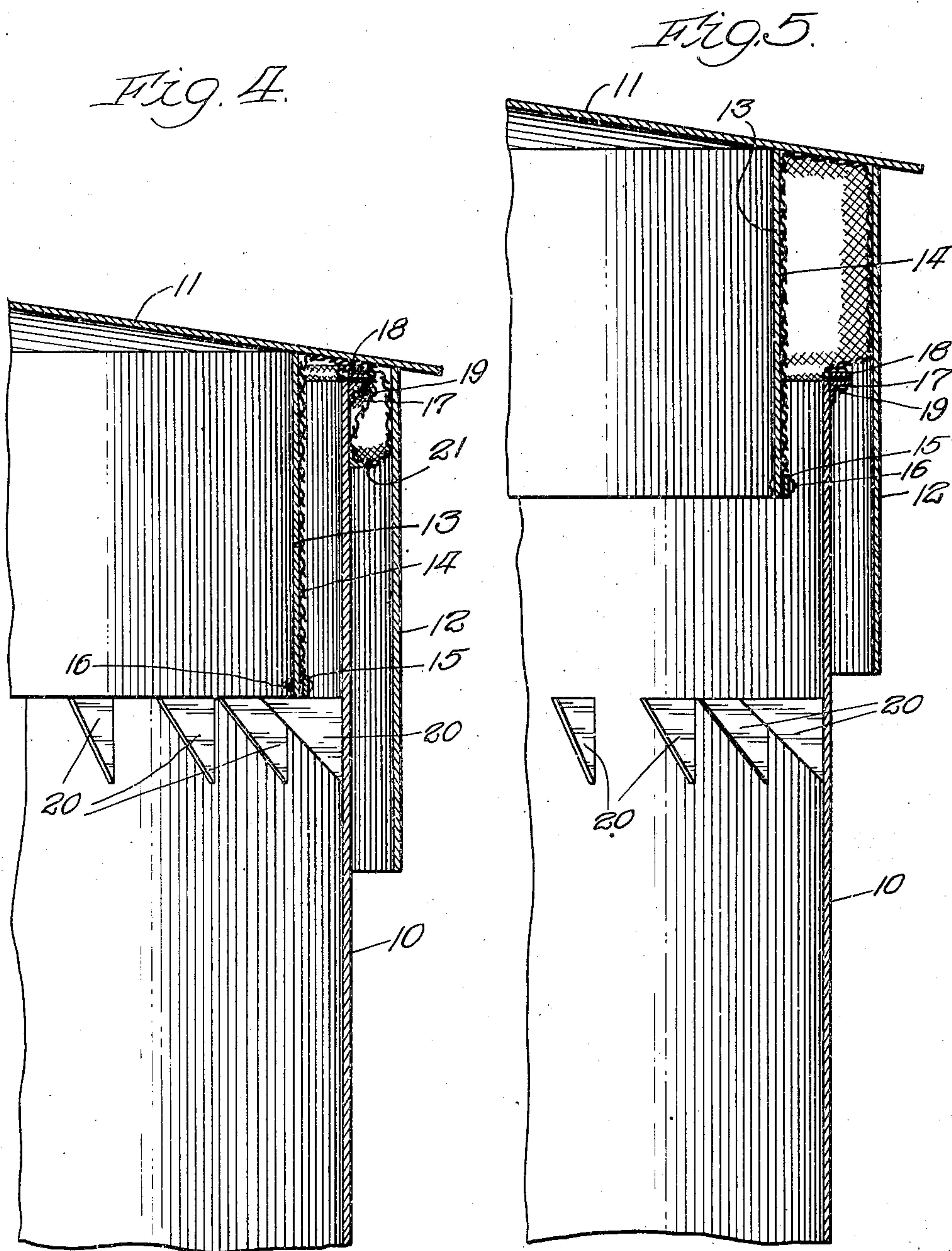
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,485,557

LIFTER ROOF TANK

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Application April 17, 1946, Serial No. 662,725

4 Claims. (Cl. 48—176)

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This invention relates to a lifter roof tank for the storage of gas or mixtures of gas and liquid, and relates particularly to a means for sealing the area between the roof and the shell of the tank.

In lifter roof tanks the roof rises and falls by the pressure of gas within the tank. In effect, therefore, the roof floats on top of the gas. It is necessary that some form of sealing means be provided between the roof and the shell of the tank so as to prevent the escape of gas. This sealing means must be flexible so as to accommodate itself to the various positions of the roof.

The sealing means of the present invention comprises broadly a downwardly extending member attached to the roof and spaced inwardly from the shell, and a flexible member attached to the downwardly extending member and to the shell. The downwardly extending member has the same shape as the shell, but it is smaller in diameter. There are preferably provided brackets around the inside of the shell upon which the downwardly extending member rests when the roof is in its lowest position. The flexible sealing member preferably extends upwardly from the downwardly extending member when the roof is in its lowest position, so that the sealing member will be backed up at substantially all times by the downwardly extending member or other portions of the roof structure.

The invention will be described as related to the embodiment set out in the accompanying drawings. Of the drawings Fig. 1 is an elevation of a lifter roof tank embodying the invention, with the drawings being partially in section; Fig. 2 is a fragmentary vertical section through the top edge of the shell of the tank and the outer edge of the roof; Fig. 3 is a view similar to Fig. 2 showing the roof in its highest position; and Figs. 4 and 5 are views similar to Figs. 2 and 3 showing a wider seal construction.

The lifter roof tank shown in the drawings comprises a shell 10 and a roof 11. A downwardly extending weather skirt 12 is attached to the roof outside of the shell 10. There is also provided a downwardly extending cylindrical section 13 attached to the roof and positioned inside the shell 10. At the bottom of the cylindrical section 13 there is attached an upwardly extending flexible sealing member 14 having its outer edge attached to the top of the shell 10.

The flexible sealing member 14 is of greater width than the shortest distance between the bottom of the cylindrical section 13 and the top of the shell 10 when the roof is in its lowest posi-

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tion. The inner edge of this flexible sealing member is attached to the bottom of the cylindrical section by means of a washer bar 15 and spaced bolts 16. The outer edge of the flexible sealing member is attached to an angle member 17 fastened on the outer top edge of the shell 10 and is attached by means of a second washer bar 18 and spaced bolts 19.

On the inner surface of the shell 10 there are located a number of brackets 20 upon which the cylindrical section is supported when the roof is in its lowest position.

The flexible sealing member 14 is preferably a fabric impregnated with a flexible impervious material such as a synthetic rubber. The sealing member is arranged to be backed up at substantially all times by a portion of the roof structure. In the embodiment shown in Figs. 1 to 3 the downwardly extending cylindrical section 13 serves to back up the flexible sealing member when the roof is in all but the highest positions within the tank. By making the sealing member of greater width it can also be backed up by the weather skirt 12 and the portion of the roof between the weather skirt 12 and the cylindrical section 13, as well as the cylindrical section 13. Such a construction is shown in Figs. 4 and 5. When the roof is in its highest position as shown in Fig. 5 the seal is backed up throughout substantially its entire width by the cylindrical section 13, the weather skirt 12 and the portion of the roof between the members 12 and 13. When the roof is in lowest position, as shown in Fig. 4, the seal forms a loop 21 extending downwardly into the space between the shell 10 and the weather skirt 12. Proper positioning of the brackets 20 serve to prevent pinching of the seal when the roof is in its lowest position.

Having described my invention as related to the embodiment set out in the accompanying drawings, it is my intention that the invention be not limited by the details of description unless otherwise specified, but rather be construed broadly within its spirit and scope as set out in the accompanying claims.

I claim:

1. In a lifter roof tank comprising a shell and a movable roof thereover, sealing means comprising a downwardly extending cylindrical member attached to the roof and spaced inwardly from the shell, a weather skirt attached to the roof and extending downwardly therefrom on the outside of the shell, a flexible sealing member extending from the downwardly extending member to the shell, said sealing member being sufficiently wide

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as to be substantially entirely backed up by the cylindrical member, the weather skirt and the portion of the roof between the cylindrical member and the weather skirt in all positions of the roof.

2. In a lifter roof tank comprising a shell and a movable roof thereover, sealing means comprising a downwardly extending cylindrical member attached to the roof and spaced inwardly from the shell, a cylindrical weather skirt attached to the roof and extending downwardly on the outside of the shell, a flexible sealing member extending from the lower part of the downwardly extending member to the upper part of the shell, said sealing member being sufficiently wide as to be substantially entirely backed up by the cylindrical member, the weather skirt and the portion of the roof between the cylindrical member and the weather skirt in all positions of the roof, and stop members on the shell for determining the lowest position of the roof wherein said portion of the roof is spaced above the top of the shell.

3. The lifter roof tank of claim 2 in which the stop members comprise brackets attached to the inner sidewall of the shell and upon which the

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cylindrical member rests when the roof is in its lowest position.

4. In a lifter roof tank comprising a shell and a movable roof thereover, sealing means comprising a downwardly extending cylindrical member attached to the roof and spaced inwardly from the shell, a cylindrical weather skirt attached to the roof and extending downwardly on the outside of the shell, and a flexible sealing member extending from the lower part of the downwardly extending member to the upper part of the shell, said sealing member being sufficiently wide as to be backed up by the cylindrical member and the weather skirt with said sealing member being substantially out of contact with the shell except at its point of attachment thereto, in all positions of the roof within the tank.

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REFERENCES CITED

The following references are of record in the file of this patent:

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