July 4, 1933. H. C. BOARDMAN 1,916,252

TANK LADDER

Filed Feb. 3, 1932

Fig. 1.

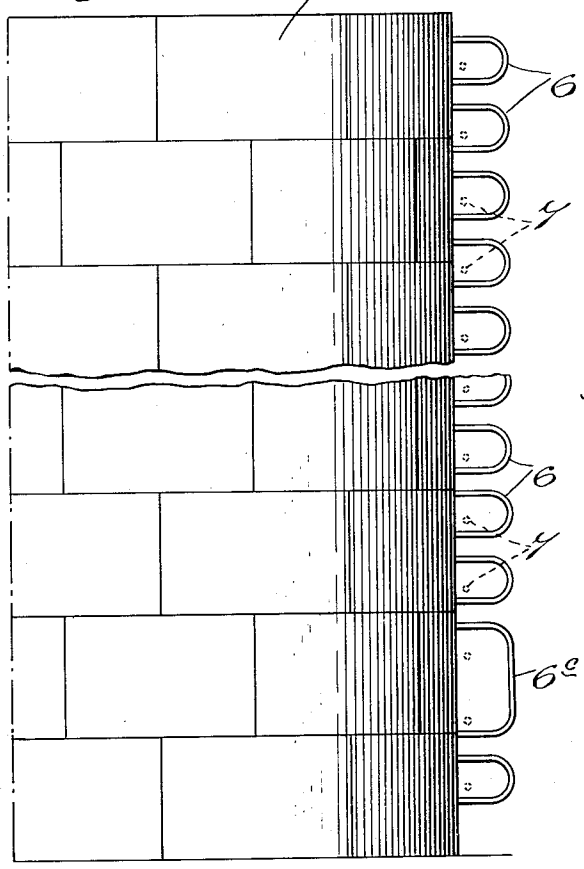



Fig. 2.

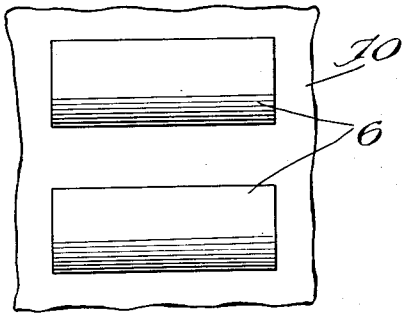



Fig. 3.

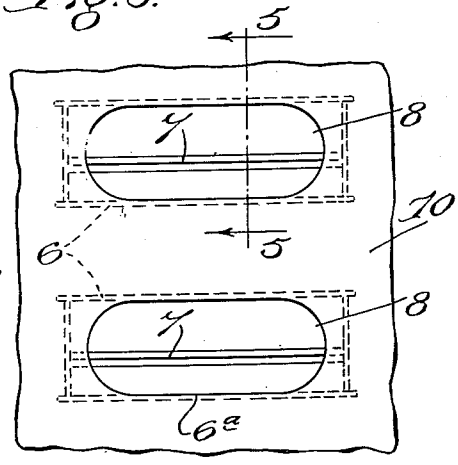



Fig. 5.

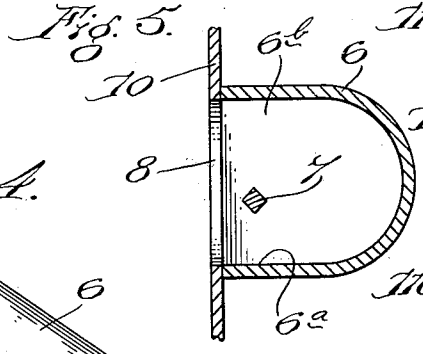



Fig. 6.

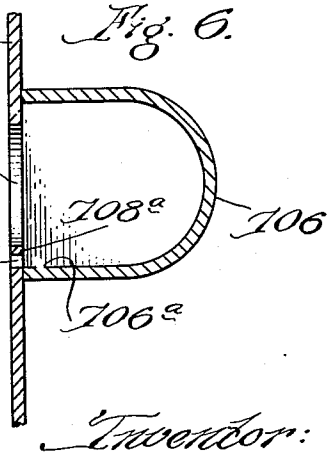
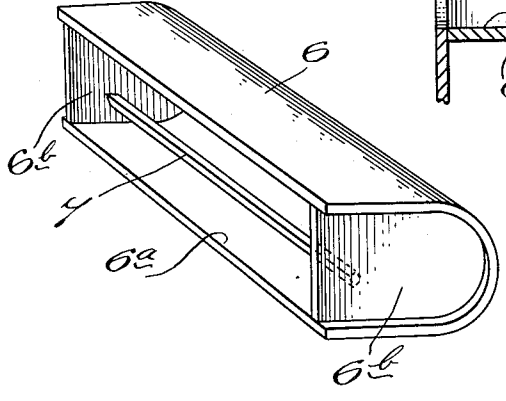



Fig. 4.




Inventor:
Harry C. Boardman.
By Dyrenforth, Lee, Chrilton & Wiles.
Attys.

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# UNITED STATES PATENT OFFICE

HARRY C. BOARDMAN, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHICAGO BRIDGE & IRON COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS

## TANK LADDER

Application filed February 3, 1932. Serial No. 590,767.

This invention relates to improvements in tank ladders and, more especially, a ladder for interior use.

The principal feature of my invention is the construction of such a ladder that leaves the interior of the tank entirely free from inner projections or extensions. That is, the inner wall of the tank is perfectly smooth (except for apertures). By the use of my invention, for example, it is possible to provide a tank with a floating deck or roof on the inside that rises and falls with changes in level of the liquid. There may, therefore, be provided a ladder for interior use which does not interfere with the working or operation of such floating deck or roof.

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 fragmentary view in side elevation; Fig. 2 is a fragmentary view in front elevation; Fig. 3 is a fragmentary view in rear elevation, looking from the inside of the tank; Fig. 4 is a view of one of the boxes carrying one of the foot supports; Fig. 5 is a view taken as indicated by the line 5—5 of Fig. 3; and Fig. 6 is a view similar to Fig. 5 showing a modification.

For the purpose of illustrating the invention, I have shown in the drawing a cylindrical tank 10 made of sheet metal plates. The wall of this tank is provided with a vertical row of suitably spaced apertures 8, 8.

Arranged in conjunction with the apertures are a series of foot supports carried by the wall and lying entirely outside of the inner surface thereof. These foot supports are so arranged that the apertures permit the placing of a foot thereon. It is understood, of course, that the supports may also be grasped by the hand. There are also provided a box or boxes on the outside of the wall covering the apertures. There may be one box for each aperture, or a single box may cover one or more apertures.

In the form shown in Figs. 1 to 5, inclusive, the foot supports are rungs 7, arranged outside of the wall 10, one opposite each aperture. In using the ladder, the apertures give access to the rung 7 from the interior of the tank.

Each aperture is covered by a substantially semi-cylindrical box fastened to the outside of the wall 10 in any convenient manner as, for example, by welding. A single box may cover one or more apertures. For example, as shown in Fig. 1, the boxes 6, 6 each covers one aperture; and the box $6^c$ covers two apertures. The lower edge of the box is indicated by $6^a$. The end walls of the boxes are indicated by $6^b$.

In the form shown in Figs. 1 to 5, inclusive, the rungs 7 are carried by the end walls $6^b$ of the boxes. In this construction, the boxes are so placed that their lower edges $6^a$ are substantially flush with the lower edges of the aperture 8. This will permit the boxes to drain into the tank.

In the modified form shown in Fig. 6, the wall of the tank is indicated by 110, the aperture by 108 and the box by 106. In this form of construction, the lower edge of the box $106^a$ is placed some distance below the lower edge $108^a$ of the aperture and in such case, such lower edge $108^a$ of the aperture may itself serve as a foot support or hand grasp. When this construction is employed, there is preferably provided a drain hole $110^a$ substantially level with the lower edge $106^a$ of the box in order to permit drainage of the box into 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 tank having a vertical row of apertures in one wall; foot supports supported from said wall lying entirely outside of the inner surface thereof, said apertures per-

mitting the placing of a foot on said supports; and a box or boxes on the outside of the wall covering said apertures.

2. Apparatus as claimed in claim 1, in which the foot supports comprise rungs supported from the wall, said rungs lying outside of said apertures and adjacent thereto.

3. Apparatus as claimed in claim 1, in which the foot supports comprise rungs supported from the wall, said rungs lying outside of said apertures and adjacent thereto and carried by said box or boxes.

4. Apparatus as claimed in claim 1, in which the foot supports comprise rungs supported from the wall, said rungs lying outside of said apertures and adjacent thereto and carried by the end walls of said box or boxes.

5. A tank provided with a vertical row of apertures in one wall, boxes outside of the wall covering said apertures, and foot supports inside of said boxes.

6. A tank provided with a vertical row of apertures in one wall, boxes outside of the wall covering said apertures, and foot supports inside of said boxes carried by the end walls thereof.

7. Apparatus as claimed in claim 5, in which the boxes are substantially semi-cylindrical in shape, horizontally arranged, and in which the foot supports are carried by the end walls of said boxes.

8. Apparatus as claimed in claim 5, in which the lower edges of the boxes are substantially flush with the lower edges of the apertures to permit drainage from said boxes into the tank through said apertures.

9. A tank provided with a vertical row of apertures in one wall, a box or boxes covering said apertures, the lower edges of the box or boxes being spaced below the edges of the apertures, whereby the lower edges of the apertures form foot supports.

10. Apparatus as claimed in claim 9, in which drainage holes are provided through the wall of the tank, under the apertures, substantially flush with the lower edge or edges of the box or boxes.

In witness whereof, I have hereunto set my hand this 30th day of January, 1932.

HARRY C. BOARDMAN.