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G. W. WILLIAMS

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METALLIC LINED TANK STRUCTURE

Filed May 7, 1929

Fig. 1.

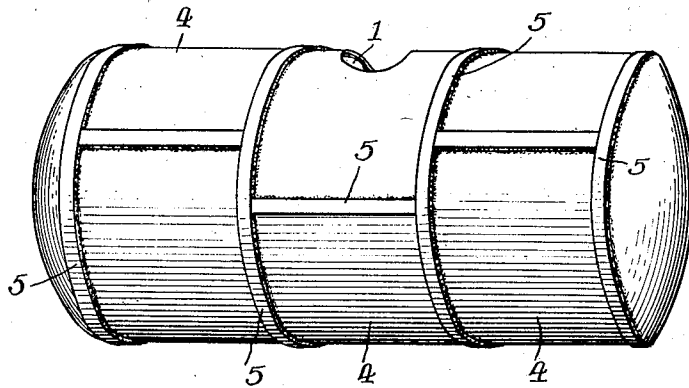


Fig. 2.

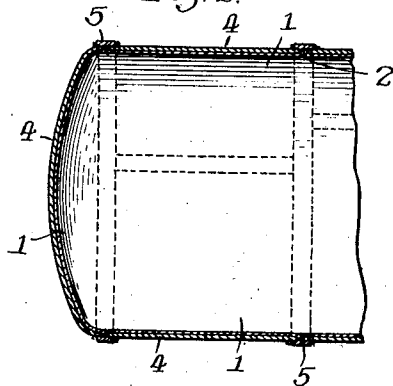


Fig. 3.

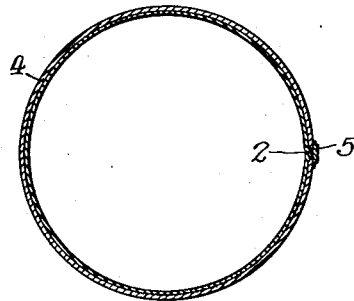
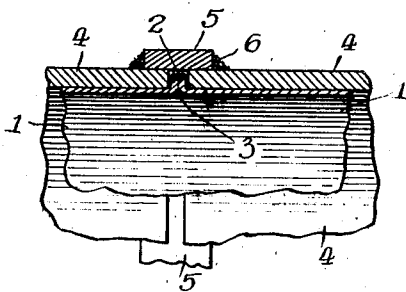


Fig. 4.



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UNITED STATES PATENT OFFICE

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METALLIC LINED TANK STRUCTURE

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The invention relates to tank structures adapted to contain liquid, more especially milk in the process of preparation for consumption as food, and particularly relates to the construction of such tanks with a protective lining for contact with the liquid.

Certain of the non-corrosive steel alloys, and other metals such as tin, are especially adapted for milk receptacles, because there is no appreciable reaction between the metal and the acids normally developed in milk, and the surfaces of the metal exposed to the milk are easily cleaned and kept sanitary. The non-corrosive steel alloys are especially desirable for such use, because of their toughness and their resistance to surface injury in the cleaning process. These metals, however, are prohibitively expensive for use alone in the commercial manufacture of large milk storage tanks of which the walls must be sufficiently thick for strength to sustain the great weight of their contents. This condition has suggested to me the provision of a relatively thin lining of the superior metal in a supporting tank shell of common metal.

The fabrication of a tank shell and a lining therefor, both being constructed from metal sheets joined to produce the desired form of tank, encounters difficulty with any heretofore practiced method of joining the sheets, because of the essential characteristic of milk receptacles that the milk-contacting surfaces be smooth and devoid of seam crevices or other irregularities wherein milk deposits may remain after cleaning the receptacle to support the development of bacteria, and because of the necessity that the thin lining be backed up by contact with the supporting shell throughout its entire area, without spaces alongside overlapping seams in either shell or lining where the unsupported lining may be broken or damaged by an attendant or his tools in cleaning the tank after use.

It is an object of the present invention to provide a milk holding tank of sheet metal construction by which the advantages of the superior metal may be utilized in a comparatively thin lining within a shell of common metal, and having seams or joints so arranged

that the lining is in supporting contact with the shell at all points and presenting a uniformly smooth surface for contact with the milk.

Another object is to provide a method of constructing a lined tank from sections of sheet metal and of joining the sections so that the lining is uniformly supported by the shell and presents a uniformly smooth surface within the tank.

Other objects and advantages will be apparent in the following detailed description of a preferred embodiment of the invention illustrated in the accompanying drawings.

Referring to the drawings, Fig. 1 represents in perspective a tank constructed after my invention. Fig. 2 is a longitudinal sectional view of one end of the tank. Fig. 3 is a cross sectional view of the same. Fig. 4 is a sectional detailed view of a joint in the outer shell and inner lining.

In the drawings, the numeral 1 indicates individual pieces or sections of sheet metal of the superior quality formed into shapes for joining to make up the desired size and shape of the inner lining of the tank structure. The adjoining margins of the sections 1 are flanged outwardly from the milk contacting surfaces, the flanges being in abutting relation and welded along their outer edges as shown at 2. The section joints are also welded or filled with solder along the inner surface of the lining, as shown at 3, the inner weld being ground and polished to present a uniformly smooth continuous surface to the milk.

Outwardly of the lining structure is the supporting shell comprising individual sections 4 of common metal, preferably steel, shaped to lie snugly against the respective sections of the lining between the out turned welded flanges of the latter, the edges of the sections 4 being closely adjacent the respective surrounding flanges. The sections 4 being thus separated by the inter-extending flanges, joining of the sections 4 is accomplished by straps 5 laid over the adjacent marginal portions of the respective sections and secured thereto, as by welding indicated

at 6, to effect a rigid unitary outer shell of the assembled sections.

It will here be apparent that by this form and method of construction, the sheet sections of the lining may be joined to form the
5 desired continuously smooth milk-contacting inner surface, the outwardly extending welded flanges being disposed in the recesses formed between the edges of the supporting
10 outer shell sections. The sheet lining is firmly supported by the snugly fitted shell sections over its entire area except where the equivalent support is given by the rigidly welded flanges. Also, the simple method of
15 construction greatly facilitates inexpensive assembly of the tank structure in large units.

I claim as my invention:

A tank structure comprising a plurality of inner lining sections of sheet metal having their peripheral margins turned out-
20 wardly to form flanges, the flanges of adjacent sections being joined to form a unitary lining having a continuous and uniform inner surface, a plurality of outer shell sections positioned in outer supporting contact
25 with said lining sections, said outer shell sections having form and dimensions similar to the form and dimensions of the respective contacting lining sections over the area with-
30 in said marginal flanges, the adjacent edges of said outer shell sections being thereby separated to provide space therebetween for the extension thereinto of said joined flanges, and a plurality of straps overlying the adjacent
35 marginal portions of said shell sections and said joined flanges, said straps being secured to said shell sections to form a unitary outer supporting shell for said lining.

In witness whereof I have hereunto attached my signature.

40 GEORGE W. WILLIAMS.

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