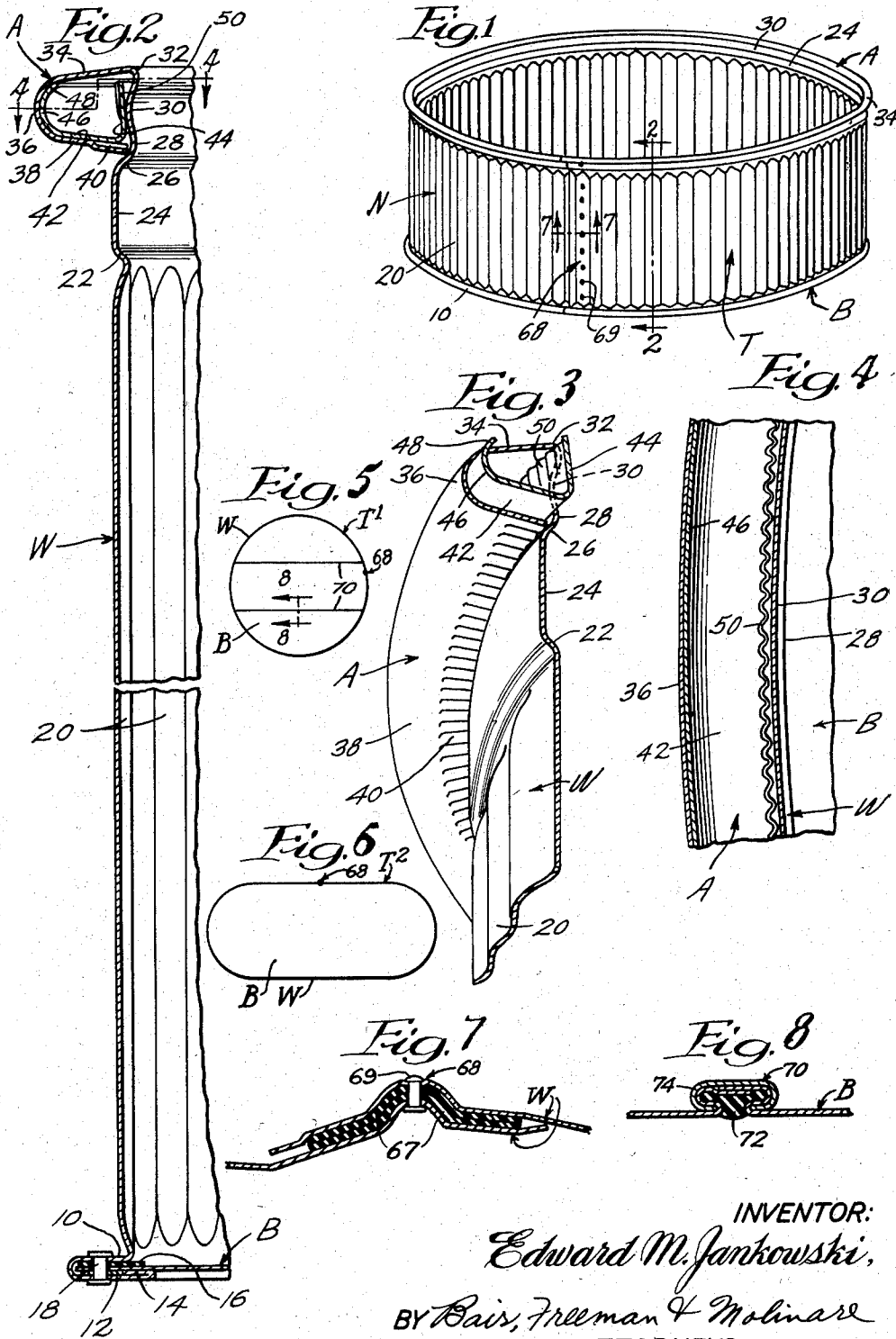


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ANIMAL WATERING TANK

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ANIMAL WATERING TANK

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This invention relates to an animal watering tank and particularly one formed of either sheets of steel or coiled steel stock with a reinforcing bead around the top of the wall.

One object of the invention is to provide a novel type of reinforcing bead which permits the formation of the tank wall by means of sheet metal rolls, the wall being corrugated to a point just under the reinforcing bead, and the portion of the wall adjacent the bead being so formed as to permit the rolling thereof in straight and/or curved sections in such manner as to avoid all buckling and "bubbling" adjacent the reinforcing bead when the section is formed to a desired curve for making round or oblong tanks with rounded ends.

Another object is to provide a combined reinforcing bead and adjacent wall construction so designed that when rolled to a curvature the wall will be formed about a true radius and thus eliminate the necessity of the expenditure of considerable labor in endeavoring to pound or hammer portions of the tank to the desired shape as heretofore found necessary, and at the same time produce a tank that is neat in appearance as distinguished from one having distorted portions and hammer marks, my construction also contributing to the strength of the upper marginal edge of the tank wall so as to preclude its being damaged in shipment or upon contact by animals, etc.

Still another object is to provide a construction in which an excess of material adjacent the upper marginal edge of the tank wall caused by corrugating the wall is adequately taken care of so as to eliminate the production of irregular bulges and depressions, and an unsightly appearance such as experienced in prior constructions.

A further object is to provide a tank wall of greatly increased strength along its upper marginal edge and capable of being formed entirely from sheet metal without the necessity of using split pipes or steel tubes attached to such upper marginal edge as in the prior art (which is a relatively expensive construction) thereby permitting applicant's tank to be manufactured much more economically.

Still a further object is to provide a construction which will compensate for the various degrees of softness, hardness and "springiness" of mill-run sheets or coils of steel so that the tank walls, when completely formed by a series of rolls, will be of the desired shape such as round or oblong with rounded ends regardless of the variations in the stock, and its lower edge will properly interfit with a tank bottom which bottoms are die cut to substantially identical outline shapes.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my animal watering tank, whereby the objects above contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in detail on the accompanying drawing, wherein:

2

Fig. 1 is a perspective view of the general type of animal watering tank to which my invention is applied;

Fig. 2 is an enlarged vertical sectional view on the line 2—2 of Fig. 1 to illustrate the wall in cross section and particularly the reinforcing bead at the top and the adjacent portions of the wall;

Fig. 3 is a perspective sectional view of a portion of the tank wall adjacent the upper edge thereof and showing particularly the reinforcing bead as viewed from below;

Fig. 4 is a horizontal sectional view on the line 4—4 of Fig. 2;

Fig. 5 is a diagrammatic plan view of a round shape of animal watering tank to which my invention is applicable;

Fig. 6 is a similar diagrammatic plan view of an oblong watering tank with rounded ends;

Fig. 7 is an enlarged horizontal sectional view on the line 7—7 of Fig. 1 to show the joint between the ends of the tank wall; and

Fig. 8 is a vertical sectional view on the line 8—8 of Fig. 5 to show a joint between adjacent steel sheets that form the bottom of the tank.

On the accompanying drawing I have used the reference character B to indicate in general the bottom of an animal watering tank, W the wall thereof, and A a reinforcing bead around the top of the wall W. The complete tank is indicated T in Fig. 1.

Describing the completed construction as shown particularly in Figs. 2 and 3, the wall W has along its lower end an out-turned flange 10 which is return-bent to form an inturned flange 12 which terminates in a folded flange 14 extending again outwardly. This construction provides a pocket to receive the edge of the bottom B, and the bottom is riveted into such pocket by a series of spaced rivets 18 throughout the length of the joint. A gasket 16 of tarred felt, rubber or the like is interposed between the bottom B and the flange 10 to insure a water-tight joint.

The wall W is corrugated as indicated at 20 throughout a substantial portion of its height and the corrugations terminate somewhat below the reinforcing bead A. Between the bead and the upper ends of the corrugations I provide a channel-like reinforcement formed of an outward bend 22, a vertical portion 24 and an inward bend 26. Above the channel-like reinforcement the wall W is bowed outward slightly as at 30 which results in inward projections 28 and 32 below and above the outward bend 30, and the portion 28—30—32 serves as a supporting portion for the reinforcing bead A as will hereinafter appear.

An outwardly directed flange 34 extends from the inward projection 32 and there is also an inwardly directed flange 38 which, together with a connecting web 36, form the bead A. The inner marginal edge of the inwardly directed flange 38 is corrugated as illustrated at 40.

I provide a bead liner consisting of a bottom web 42, an inner flange 44 and an outer flange 46. The outer flange 46 has an inturned upper edge 48 and the inner flange 44 has a corrugated margin 50.

In Fig. 5 I show how three two-foot widths of sheet steel may be used to form the tank bottom B of a six-foot round tank T¹. The sections that form the bottom B are economically joined together in a water-tight manner by means of the joint shown generally at 70 which includes interlocked flanges along the adjacent marginal edges of the bottom sections as illustrated in Fig. 8 with a gasket 72 included therein and an enclosing sheet metal channel 74 for the flanges.

The bottom for an oblong tank T² with rounded ends

3

in a size of four feet by ten feet is preferably one piece as shown in Fig. 6.

The tank wall in each instance is formed preferably of a single strip of steel with a single joint indicated at 68. This joint may economically be made by overlapping the ends of the wall W as shown in Fig. 7 and riveting the overlapped ends together by means of a series of spaced rivets 69 with a gasket 67 interposed between the overlapped ends to make the joint watertight. In tank constructions prior to ours, when forming the wall sections on a curvature for round tanks and for the round ends of the oblong tanks there was considerable wrinkling that produced "bubbling" irregular bulges and depressions and an unsightly appearance of the upper marginal edge of the tank wall. Invariably the round tank was untrue to a radius or "out-of-round" and the curved ends of the oblong tanks were likewise untrue to a radius so that to make the tanks presentable, it was necessary to perform considerable hand work in pounding and hammering particularly this portion of the wall.

With my new construction as shown in Fig. 2 the bead supporting portion 28—30—32 formed to substantially the shape shown eliminates the wrinkles, bubbles, irregular bulges and depressions above referred to and results in a smooth and neat appearing wall even when formed to a short radius as required for the two-foot round and two by four foot oblong tanks. The wall W is initially formed by passage of the flat sheet through a series of rolls of a forming machine to form the bottom flange 10—12—14, the channel-like reinforcement 22—24—26 and the elements 34—36—38 of the upper reinforcing bead A. The bead liner 42—44—46—48 is separately formed and is inserted in the bead A as it is formed. As the sheet progresses through the rolls the corrugations 20 are rolled into it and all portions of the sheet are then curved as required to form either the round or obround wall shapes desired. As the sheet leaves the machine it is of the proper shape for the desired tank and its bottom flange 10—12—14 can be readily fitted around the periphery of the bottom B without distorting it. The ends of the wall W are then overlapped as in Fig. 7 for riveting the joint 68 and as soon as the rivets 69 and 18 are inserted and riveted, the tank is complete without further work thereon being necessary.

After considerable experiment with different shapes I found that a cross-sectional shape such as shown in Fig. 2 resulted in curved wall sections which were uniform in curvature or formed on a "true radius" and entirely lacked the irregularities experienced with the prior constructions. The main contributing factor was the particular formation of the bead supporting portion 28—30—32 of the shape illustrated although contributing factors were the channel-like reinforcement 22—24—26, and the shape of the bead liner 42—44—46 with its inturned upper edge 48 and corrugations 50. My new construction eliminates the necessity for substantial hand labor for reshaping as previously required, and eliminates the excess material at the upper marginal edge of the upright wall W because the portion 28—30—32 results in taking up the excess metal in making round or curved tank walls and takes up the excess metal flowing from the formation of the corrugations 20 and from the top portion of the wall in registry with the bead A. This excess metal during the forming operation flows outwardly toward the bead and when a straight wall section is passed through the rolls to form a curved wall section, the curvature at 30 between 28 and 32 tends to bow outwardly and exert greater pressure against the bead liner, particularly its flange 44 which, due to the corrugations 50, permits ready bending of the flange 44 during this operation. Thus the outward bowed portion of the wall W indicated at 30 (which is in registration with the flange 44 of the bead liner) and the inner projection 48 of its outer flange 46—result in the desired uniformity of formation that

4

results in saving entirely all the labor heretofore necessary in endeavoring to hammer the tank to assume a nearly true radius form and a uniform appearance to provide a readily salable tank. At the same time there is increased stiffness and strength of my tank and particularly of the bead A which is important because of possible damage in shipment or contact by animals when in use.

Loading tests have been made of curved sections of my disclosed tank walls which resulted in conclusions that there is approximately 83 percent more strength in the type of wall section shown in Fig. 2 than with prior types. Any buckling in the upper marginal edge of the wall tends to weaken the construction so that under loading tests some point of this portion will fail whereas with the cross-section shown in Fig. 2 the failure occurs at a substantially higher load percentage (specifically 83% as determined by the tests referred to). Also, since the cost of the steel is the major factor in the total cost of animal watering tanks of the kind herein disclosed, it is necessary that any method used for forming the tank walls compensates for the various degrees of softness, hardness and springiness of mill-run sheets of steel and this has been accomplished by the herein disclosed invention. The design of the tank wall would not be of such critical importance if steel could be purchased having uniform characteristics, but at present mill-run steel does not have such uniform characteristics and only special steels of considerably higher price are uniform.

Some changes may be made in the construction and arrangement of the parts of my animal watering tank without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may reasonably be included within their scope.

I claim as my invention:

1. A sheet metal tank wall comprising a hollow reinforcing bead along the upper marginal edge of said wall comprising an outwardly directed flange, an inwardly directed flange terminating in a corrugated margin and a web connecting said flanges together, and a bead liner in said bead comprising a bottom web contacting said inwardly directed flange, and inner and outer flanges, said outer flange contacting said web and terminating in an inturned upper edge contacting said outwardly directed flange, and said inner flange terminating in a corrugated margin, the portion of said marginal edge of said tank wall in registry with said bead being bowed outwardly slightly between the upper and lower extremities of said bead and in line contact intermediate the upper and lower extremities of said bead with said corrugated margin of said bead liner.

2. In a tank wall, a shallow channel-like reinforcement in said wall spaced from the top thereof and having a substantially straight vertical web, a reinforcing bead along the upper marginal edge of said wall and located above said channel-like reinforcement, the portion of said marginal edge in registry with said bead being bowed slightly outwardly between the upper and lower extremities of said bead, and a bead liner in said bead having a corrugated flange surrounding said outwardly bowed portion and contacted by only the outermost diameter thereof where such bowing is maximum.

3. In a curved corrugated sheet metal tank wall, a shallow channel-like reinforcement in said wall above the corrugations thereof and having a substantially straight vertical web, a reinforcing bead along the upper marginal edge of said wall, a bead liner therein including a corrugated flange, the portion of said marginal edge in registry with said bead being bowed outwardly slightly between the upper and lower extremities thereof, said outwardly bowed portion being above said channel-like reinforcement and the outermost portion only thereof

2,869,753

5

exerting pressure on said corrugated flange of said bead
liner.

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