

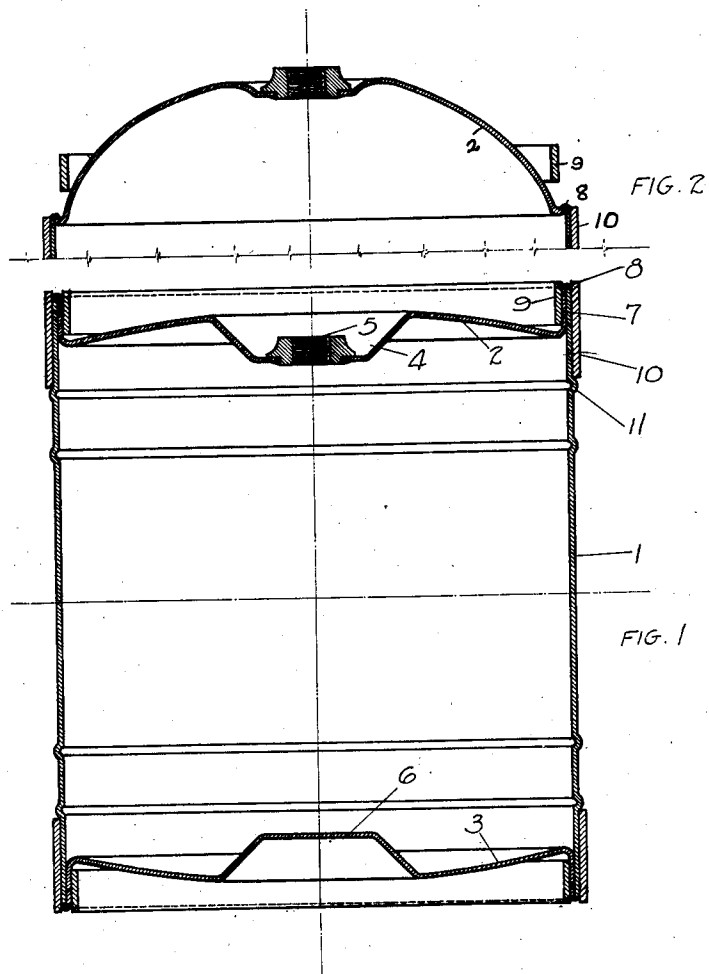
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J. M. KELLEY

TANK

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UNITED STATES PATENT OFFICE.

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TANK.

Application filed September 5, 1924. Serial No. 736,059.

To all whom it may concern:

Be it known that I, JOHN M. KELLEY, a citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Tanks, of which the following is a specification.

This invention is designed to improve the construction of tanks or containers which may, under certain conditions, be subjected to excessive pressure. As shown it is particularly designed for containing high-test products of petroleum which under normal temperature have a slight pressure but when subjected to the higher temperatures have a pressure which is destructive to the container. In order to give the greatest strength to the container it is desirable that the ends may take, under excessive pressure, a dome-shape. Such a use, however, is not convenient for every-day use in that it does not give a stable support for the container. In accordance with the present invention the ends have a shape for ordinary use of a strength readily adapting them for normal pressures and the strength is such as to permit the ends to assume a dome or spherical shape when excessive pressures are placed upon them.

The invention is illustrated in the accompanying drawings as follows:—

Fig. 1 shows a section of a tank.

Fig. 2 a section of the upper portion of the tank showing the shape assumed by the ends under excessive pressure.

1 marks the side wall of the tank, 2 the top and 3 the bottom. The top has a central depression 4 in which is provided the filling and discharge fitting 5. The bottom has a similar depression 6, the purpose of the depression in the bottom being to make the bottom of a contour balanced as to expansion under pressure with that of the top.

The ends, top and bottom, have peripheral outwardly extending flanges 7, these flanges extending outwardly slightly beyond the central portions of the ends so that the tank normally will rest on the edges of the tank. The outer edges of the flanges 7 are secured to the edges of the side wall by a continuous joint, ordinarily an electric weld as indicated at 8, it being understood that the indication of the weld is somewhat exaggerated.

Preferably while the walls are still hot

incident to the welding an inner ring 9 is pressed into the flange 7 so as to stiffen the edge as a support for the tank and to retain the flange in its normal position. An outer ring or hoop 10 is heated, slipped over the outside of the side wall opposite the flange 7 with a close fit and allowed to contract in cooling as to bring the hoop into pressed engagement with the side walls.

When this structure is subjected to pressure such as may occur in fires the excessive pressure forces the ends outwardly to a spherical or dome-shape, such as shown in Fig. 2, gradually rolling out the outer flange 7 and forcing out the inner ring, the flange rolling out and practically reversing itself at the flange. This is readily accomplished, the walls of the ends next to the welded edge taking on a direction quite close to alignment with the side wall, or in other words, the side wall is very nearly tangent to the expanded ends. It will be understood that under normal conditions it is desirable to have the liquids which are ordinarily used in these containers under some pressure and, therefore, this possibility of yielding expansion is of some importance in that when expanded the container will stand a very much greater pressure without rupture and consequently adds very greatly to the safety of the container.

It will be noted that the hoops extend slightly beyond the weld, thus the hoops protect the weld in ordinary use.

It will be noted also that the ring 10 rests on a bead 11 so as to assure its maintaining its position when the tank or container is subjected to shock.

What I claim as new is:—

1. In a tank, the combination of a side wall; and an end having an outwardly turned flange at its periphery, said flange connected at its extreme edge with the side wall and lying freely against and disconnected from the inner surface of the side wall back of the edge whereby the end will be retained under pressure in its original shape and under greater pressure will be expanded outwardly to a dome shape rolling the flange outwardly in the outward expansion movement of the end.

2. In a tank, the combination of a side wall; an end having an outwardly turned flange at its periphery, said flange connected at its extreme edge with the side wall and

lying freely against and disconnected from the inner surface of the side wall back of the edge whereby the end will be retained under pressure in its original shape and under greater pressure will be expanded outwardly to a dome shape rolling the flange outwardly in the outward expansion movement of the end; and a ring in pressed engagement with the inside of the flange.

3. In a tank, the combination of a side wall; an end having an outwardly turned flange at its periphery, said flange connected at its extreme edge with the side wall and lying freely against and disconnected from the inner surface of the side wall back of the edge whereby the end will be retained under pressure in its original shape and under greater pressure will be expanded outwardly to a dome shape rolling the flange outwardly in the outward expansion movement of the end; and a ring in pressed engagement with the outside of the wall opposite the flange.

4. In a tank, the combination of side walls; and ends having outwardly turned flanges at their peripheries, said flanges connected at their extreme edges with the side walls and lying freely against and disconnected from the inner surfaces of the side walls back of the edges whereby the ends will be retained under pressure in their original shape and under greater pressure will be expanded outwardly to a dome shape rolling the flanges outwardly in the outward expansion movement of the ends, said ends being of contours balanced as to expansion under pressure.

5. In a tank, the combination of side walls; ends having outwardly turned flanges at their peripheries, said flanges connected at their extreme edges with the side walls and lying freely against and disconnected from the inner surfaces of the side walls back of the edges whereby the ends will be retained under pressure in their original shape and under greater pressure will be expanded outwardly to a dome shape rolling the flanges outwardly in the outward expansion movement of the ends, said ends being of contours balanced as to expansion under pressure; and rings in pressed engagement with the insides of the flanges.

6. In a tank, the combination of a side wall; an end having an outwardly turned flange at its periphery, said flange connected at its extreme edge with the side wall and lying freely against and disconnected from the inner surface of the side wall back of the edge whereby the end will be retained under pressure in its original shape and under greater pressure will be expanded outwardly to a dome shape rolling the flange outwardly in the outward expansion movement of the end; and a ring in pressed engagement with the inside of the flange, said ring extending outwardly beyond the edge of the side wall and the flange to protect the same.

7. In a tank, the combination of a side wall; an end having an outwardly turned flange at its periphery, said flange connected at its extreme edge with the side wall and lying freely against and disconnected from the inner surface of the side wall back of the edge whereby the end will be retained under pressure in its original shape and under greater pressure will be expanded outwardly to a dome shape rolling the flange outwardly in the outward expansion movement of the end; and a ring in pressed engagement with the outside of the side wall opposite the flange, said ring extending beyond the edges of the flange and side wall to protect the same.

8. In a tank, the combination of a side wall; an end having an outwardly turned flange at its periphery, said flange connected at its extreme edge with the side wall and lying freely against and disconnected from the inner surface of the side wall back of the edge whereby the end will be retained under pressure in its original shape and under greater pressure will be expanded outwardly to a dome shape rolling the flange outwardly in the outward expansion movement of the end; a ring in pressed engagement with the outside of the side wall opposite the flange; and a ring in pressed engagement with the inside of the flange, said rings extending beyond the edges of the flange and side wall to protect the same.

In testimony whereof I have hereunto set my hand.

JOHN M. KELLEY.