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2,021,960

METHOD OF MAKING EXPANSION DOMES FOR TANKS

Original Filed Feb. 15, 1929

Fig. 1.

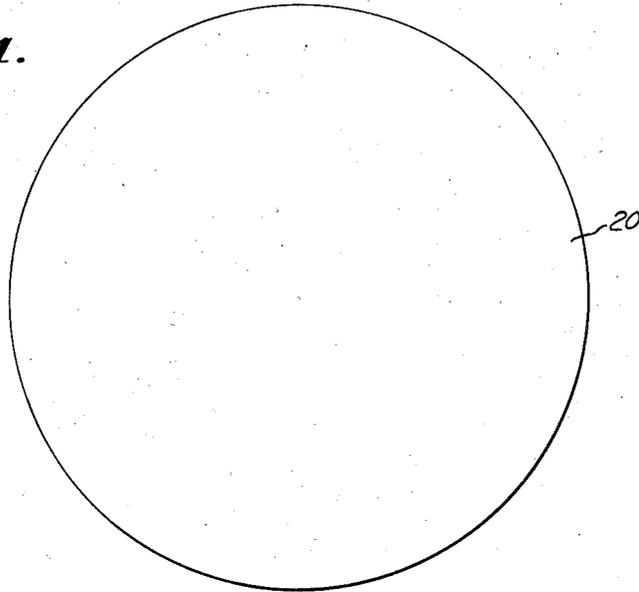


Fig. 2.

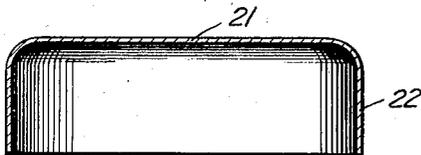


Fig. 3.

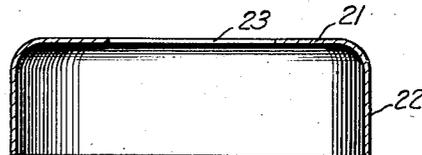


Fig. 4.

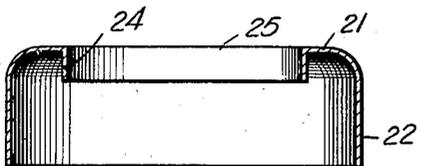
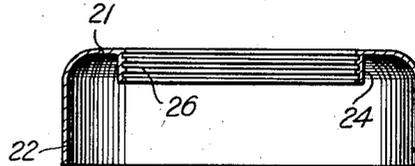


Fig. 5.



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METHOD OF MAKING EXPANSION DOMES FOR TANKS

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Original application February 15, 1929, Serial No. 340,109, now Patent No. 1,876,304, September 6, 1932. Divided and this application July 8, 1932, Serial No. 621,407. Renewed April 26, 1935

7 Claims. (Cl. 29-148.2)

My invention relates to a method of making seamless one piece tank domes and similar dome-like members, wherein the same are made of heavy gauge sheet metal approximating that of a boiler plate. This is a division of my co-pending application Serial No. 340,109, filed February 15, 1929, patented September 6, 1932, Patent No. 1,876,304.

It is a purpose of my invention to provide a method of making a seamless dome or dome-like member serving as an expansion chamber on a tank or similar member, whereby the same may be made of a single piece of heavy gauge sheet metal without any machining except the cutting of a thread, should this be desired.

The said method comprises a plurality of steps, the first of which comprises cutting a disk-like piece from a sheet of metal, the second step forming the same into a cup-like shape with a closed end wall, the third step cutting a concentrically arranged circular opening in said end wall, the fourth step forming a flange on said end wall at said opening turned into the hollow of said cup-like member, and fifth, internally threading the flange, thus formed. If an unthreaded flange is desired the same steps are carried out except that the fifth or last step is omitted.

Other objects and advantages of the invention will appear as the description of the drawing proceeds. I desire to have it understood, however, that I do not intend to limit myself to the particular details shown or described, but that I intend to include as part of my invention all such obvious changes and modifications as would occur to a person skilled in this art and as would fall within the scope of the claims.

In the drawing:

Fig. 1 is a plan view of the disk-like blank from which the expansion chamber or dome is formed.

Fig. 2 is a sectional view thereof after the same has been drawn into a cup-like shape.

Fig. 3 is a similar view thereof after the next step in the making thereof has been performed.

Fig. 4 is a similar view thereof after the inner flange has been formed thereon, and

Fig. 5 is a sectional view thereof complete, but before being attached to the tank.

Referring in detail to the drawing, in Fig. 1 is shown a blank 20 from which a dome such as that forming the subject matter of my invention is made. The method described in detail is that used in making the preferred form of dome, which is a combination expansion chamber and manhead. The first step of the process is the

cutting of the disk 20 from a sheet of metal, which is of a very heavy gauge. The second step of the process comprises die-shaping the disk 20 into a cup-like form such as that shown in Fig. 2, the operation being performed by means of suitably shaped male and female dies, and a hydraulic press is preferably used for carrying out the operation. The cup-like member formed comprises a closed substantially flat top of end wall portion 21 and a downturned peripheral flange 22, forming the cylindrical portion of the body of the dome.

The third step of the method comprises cutting a circular opening 23 in the end wall 21, as shown in Fig. 3, said opening being concentric with the flange or annular wall portion 22. The fourth step comprises die shaping an inturned flange 24 on said cup-like member, by means of male and female dies, in a suitable press, said flange 24 being formed around the opening 25 in said end wall, said opening being larger than the opening 23 due to the formation of the flange 24 from the material surrounding the opening 23. The opening 25 and the flange 24 are concentrically arranged relatively to the cylindrical wall 22 and the flange 24 extends perpendicularly to the top or end wall 21, so that the flange 24 is braced thereby and stiffened so as to be held in a true circular shape. The fifth step of the method comprises internally threading the flange 24, as shown in Fig. 5, said threads being indicated by the numeral 26.

In case the flange 24 is not to be threaded the fifth step of the method is omitted, leaving the dome as shown in Fig. 4 as the finished product of the method.

It will be obvious that domes of different shapes, but having a cup-like body portion providing a circumferential skirting and having an opening in the end wall thereof, from which a flange depends substantially perpendicularly inwardly into the cup-like body portion of the dome-like member can be made by the same method.

What I claim is:—

1. The method of making a tank dome comprising the cutting of a disk of sheet metal, forming the same into a cup-like shape having a closed end wall, cutting a substantially circular opening into said end wall, forming an inturned flange on said end wall at said opening and threading said flange.

2. The method of making a tank dome comprising forming a cup-like member of sheet metal and cutting a substantially circular open-

ing substantially concentrically in the end wall thereof, forming an inturned flange on said end wall at the edge of said opening and threading said flange.

5 3. The method of making a tank dome comprising the cutting of a disk of sheet metal, die-shaping the same into a cup-like shape having a closed end wall, cutting a concentrically arranged opening in said end wall, die-shaping an inturned 10 cylindrical flange of larger diameter than said opening on said end wall by bending the end wall inwardly at and adjacent said opening and threading said flange.

4. The method of making a tank dome having 15 an opening therein surrounded by a flange comprising the cutting of a disk of sheet metal, die-shaping the same into a cup-like shape having a closed end wall, completely removing a portion of said end wall by cutting an opening therein 20 smaller than the diameter of the flange and die-shaping an inturned continuous flange on the uncut portion of said end wall bordering said opening by bending the material in a zone surrounding said opening of a diameter substantially 25 equal to the diameter of the flange into a position substantially perpendicular to that it occupied prior to bending.

5. In the method of making a tank dome 30 having an opening therein surrounded by a flange, the steps of cutting a disk of sheet metal, forming the same into a cup-like shape having a closed end wall, cutting an opening into said end

wall of similar shape to, but smaller than, the opening in the finished dome, and forming an inturned flange of substantially uniform height on said end wall at said opening by bending the material of said end wall in a zone surrounding 5 said smaller opening into said flange.

6. In the method of making a tank dome having an opening therein surrounded by a flange, the steps of cutting a disk of sheet metal, die-shaping the same into a cup-like shape having a 10 closed end wall, completely removing a portion of said end wall to provide a concentrically arranged opening in said end wall, and die-shaping an inturned cylindrical flange on said end wall by bending the material of said end wall 15 immediately surrounding the opening in said end wall into a position substantially perpendicular to that occupied thereby prior to bending thereof.

7. In the method of making a tank dome hav- 20 ing an opening therein surrounded by a flange, the steps of cutting a disk of sheet metal, die-shaping the same into a cup-like shape having a closed end wall, completely removing a portion of said end wall to provide an opening in said end 25 wall smaller than the opening in the finished dome, and die-shaping a continuous flange surrounding the opening in said end wall by bending the uncut portion of said end wall in a zone bordering said opening into a position at an angle 30 to that occupied prior to bending.

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