Feb. 25, 1930. H. P. MERRIAM 1,748,576

TANK AND METHOD OF MAKING THE SAME

Filed Aug. 15, 1928

Fig. 1.

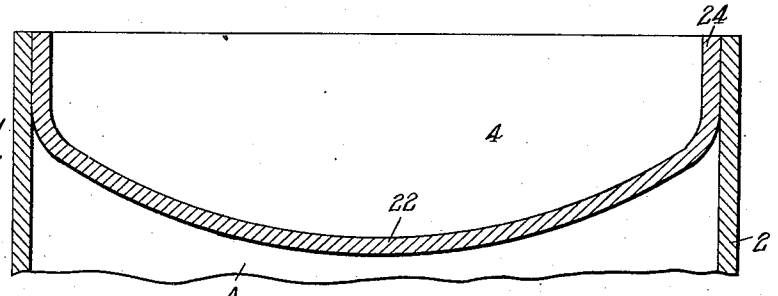


Fig. 2.

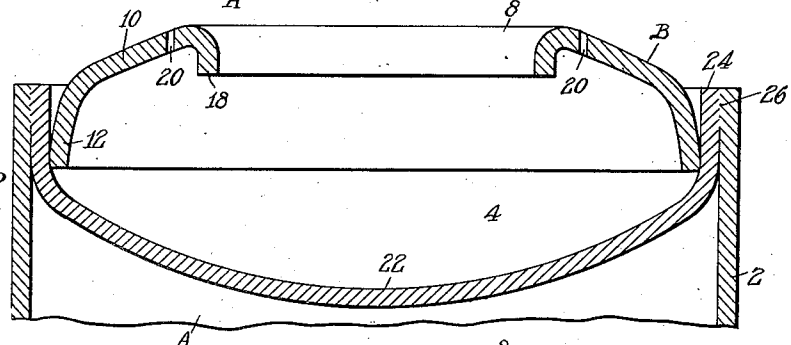


Fig. 3.

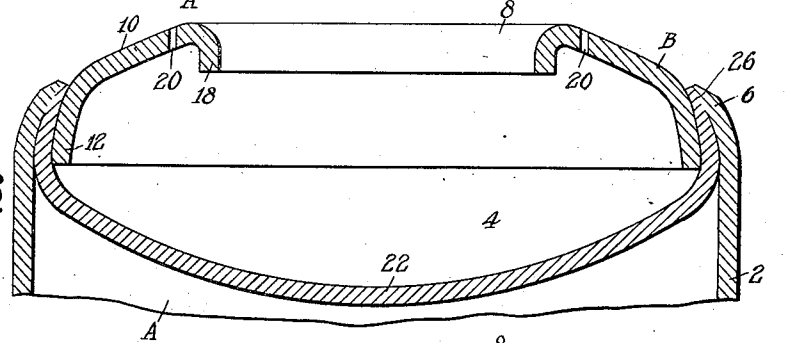
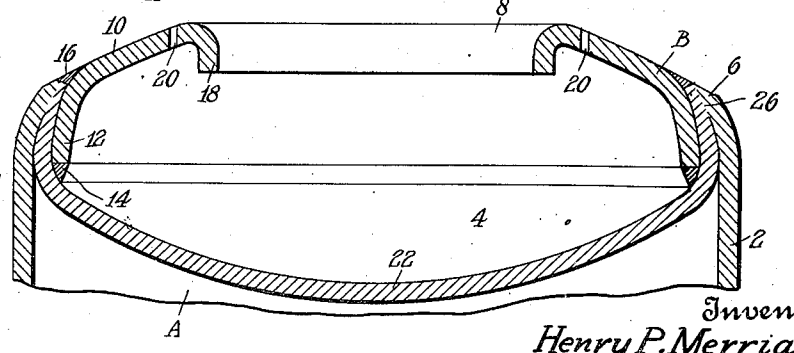


Fig. 4.



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UNITED STATES PATENT OFFICE

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TANK AND METHOD OF MAKING THE SAME

Application filed August 15, 1928. Serial No. 299,861.

This invention relates to metal containers such as tanks for holding gas under high pressure, and has particular reference to an end closure for tanks.

Gases under pressure, acetylene for example, are commonly distributed in steel tanks which are of varied construction, but the high pressure employed makes it imperative that the tanks be sound and sufficiently strong. Many means of closing the tank ends have been devised in an effort to strengthen these portions of tanks, as it is customary to roll the tanks on their bottom edges. When this operation is continually repeated on hard surfaces such as concrete floors, the lower edge becomes deformed and frequently the tanks are rendered unsuited for further use.

One object of the present invention, therefore, is to provide an exceptionally strong and durable bottom end closure for gas tanks.

A further object of the invention is the provision of a tank shell having a separate and independent bottom united thereto in such a manner as to become really a part or continuation of the shell.

A still further object of the invention is the provision of a tank having a unitary bottom reinforced by a false bottom.

Another object of this invention is the provision of a tank for holding gases under pressure, which tank is provided with a false bottom for reinforcing purposes and for providing an element on which the tank may be rolled.

As another object of the invention, the same contemplates the provision of a tank having a recessed lower end in which is fitted a rolling ring which is secured to the tank shell and which serves to reinforce the lower end of the tank.

This invention also contemplates the provision of a method of forming the end closure of a tank or the like.

Other objects and advantages of this invention will be apparent from the following description taken with the accompanying drawings, in which:

Figure 1 is a sectional view of the lower end of a tank showing the bottom initially placed in position;

Fig. 2 is a sectional view of the lower end of a tank showing an end closure or bottom welded thereto and also showing a false bottom or reinforcement in its initial position;

Fig. 3 is a view similar to Fig. 2 but showing the tank end and its associated bottom crimped over the false bottom; and

Fig. 4 is a sectional view of the completed tank end.

Referring now more particularly to the drawings, Figs. 1 to 4 inclusive disclose the several steps required to form the tank end, and Fig. 4 discloses the completed tank end. As shown clearly in Fig. 4, the tank comprises a body portion indicated at A, the same being a tubular metallic shell 2 having a recessed end which is formed by an end closure indicated generally at 4. Secured within the recessed end of the tank is a rolling ring indicated generally at B, the end of which protrudes or extends beyond the end of the shell 2 and said rolling ring B is retained in the recessed end of the tank by reason of the fact that the end of the tank or shell 2 is crimped around the rolling ring, as shown clearly at 6.

The rolling ring B is preferably of the form shown clearly in Fig. 4, and comprises in effect an inverted cup-shaped element having an opening 8 in the base thereof, the base being downwardly bevelled as shown at 10 and the bevel terminating in an annular flange 12 which extends into the recessed end of the tank. The rolling ring B is further secured in position by means of internal and external welds 14 and 16 respectively, weld 14 connecting the lower edge of flange 12 with the end closure 4 and weld 16 connecting the end of the tank shell 2 with the rolling ring above the lower edge of the latter. The rolling ring is provided with an internal flange 18 adjacent the opening for the purpose of strengthening the ring itself, and the base of the ring is provided with weep holes 20 to permit escape or drainage of any water or foreign matter which may by any chance collect within the recessed end of the tank.

The invention herein contemplates also a method of forming the tank end just described, and to that end the tank shell 2 is first provided which is tubular, as shown

clearly in Fig. 1, and the end closure 4 is inserted in the end of this tubular shell 2 also as clearly shown in Fig. 1; the end closure 4 being substantially cup-shaped and providing a concaved base portion 22 and an annular flange or side wall 24 which is adapted to nicely fit the interior of the shell 2 at the end thereof. The next step in the method of the present invention is to connect or unite the end closure 4 with the shell 2, and this is done preferably by flame welding whereby the end closure 4 at the flange 24 is united to form a unitary whole with the end of the shell 2; the union of these two parts being indicated at 26. Obviously, under the influence of a flame weld, the parts are expanded, that is, the end of the shell 2 and the flange 24 of the end closure 4 are expanded due to heat, and while in their expanded position, and prior to cooling, and preferably just after the welding, the rolling ring B is placed in position within the end closure 4, as clearly shown in Fig. 2. The rolling ring having been placed as indicated in Fig. 2, the end of the tank shell and its united flange 24 of the end closure, is then crimped around the flange 12 of the rolling ring, as shown clearly in Fig. 3, and the parts as so positioned will assume the position shown in Fig. 3 upon the cooling of the end of the shell 2, the end of the shell 2 and its associated end closure shrinking onto the rolling ring B at the flange 12 thereof.

As the final step in the method of the present invention, the lower edge of the flange 12 of the rolling ring B is welded to the end closure 4, as shown at 14, and the upper edge of the shell 2 is then annularly welded to the rolling ring B, as shown at 16.

The rolling ring B, it will be apparent, serves to reinforce the end of the tank, and it protrudes or extends beyond the shell 2 to provide a surface on which the tank may be rolled. The rolling ring B also serves as a false bottom and strengthens the lower edge of the shell 2 with its associated closure 4.

It is believed that from the description herein, the construction and operation of the tank of the present invention will be fully apparent to those skilled in the art without further elaboration, but it can be seen that the construction shown and just described provides an end closure for a tank which is extremely strong and durable in operation and which provides a surface on which the tank may be rolled, the rolling ring B being so formed with its beveled surface that sharp corners are eliminated, thereby preserving the life of the end closure by the elimination of such sharp corners or edges and providing a surface on which the tank may easily be rolled.

The drawings herein disclose one embodiment of the invention, but it is to be understood that the drawings are merely by way of example, and that various changes in the form and proportions of the device may be made such as fall within the scope of the appended claims without departing from the spirit of the invention.

What is claimed is:

1. A tank having an assembled head comprising a shell, a bottom for the shell having a side wall fitting within the lower end of the shell and welded thereto, and a false bottom for the shell having a side wall fitting within the shell bottom; said shell and bottom being crimped over said second named wall to secure the false bottom.

2. A tank having an assembled head comprising a shell, a bottom for the shell having a side wall fitting within the shell and welded thereto, and a false bottom fitting within the shell bottom; the shell bottom and shell being shrunk onto the false bottom to secure the latter.

3. A tank having an assembled head comprising a shell, a bottom for the shell having a side wall fitting within the shell and welded thereto, and a false bottom on which the shell bottom and shell are shrunk.

4. A tank having an assembled head comprising a shell, a bottom welded to the shell and positioned within the shell, and a false bottom fitting within the shell bottom and extending beyond the shell; the edge of the shell and the bottom united thereto being bent over the false bottom to secure the latter.

5. An assembled end closure for tanks comprising a bottom having a side wall fitting within a tank shell and welded thereto, a false bottom fitting within the first named bottom and welded thereto, the end of the tank shell being bent over the false bottom to secure the latter.

6. In a tank having an assembled head, an end construction comprising a bottom fitting within and welded to a tubular tank shell, and an end reinforcement comprising a false bottom on which the tank shell and bottom are shrunk, and weld metal connecting the shell to said false bottom, said false bottom protruding beyond the shell to provide an inwardly inclined surface on which the tank may be rolled.

7. The method of forming tank ends which comprises inserting a bottom in a tubular shell, heating the shell and bottom to unite and expand the same, then inserting a false bottom in the first named bottom and crimping the shell end and bottom thereover and finally permitting the shell and bottom to cool to shrink onto the false bottom.

8. The method of forming tank ends which comprises inserting a bottom in a tubular tank shell, flame welding said shell and bottom together, inserting a false bottom in the first named bottom immediately after the welding and permitting the tank shell and its united bottom to shrink onto the false bottom, and

finally welding the false bottom to the tank shell bottom and to the tank shell.

9. The method of forming tank ends which comprises inserting a bottom in a tubular tank shell, welding the shell and bottom together, inserting a false bottom in the first named bottom immediately after the welding and while the welded parts are still at a temperature above normal, crimping the tank shell over the false bottom prior to cooling of the shell, permitting the shell to shrink onto the false bottom, and finally welding the false bottom to the tank shell.

10. The method of securing interfitting inner and outer bottom portions to a container which comprises joining one of the bottom portions to the container by fusion of metal and inserting the other bottom portion before the heat produced by the fusion has dissipated whereby the contraction incident to cooling will shrink the container about the last inserted bottom portion.

11. The method of securing interfitting inner and outer bottom portions to a container which comprises joining the inner bottom portion to the container by fusion of metal and inserting the outer bottom portion before the heat produced by the fusion has dissipated, whereby the contraction incident to cooling will shrink the container and the inner bottom portion about the outer bottom portion.

In witness whereof I have hereunto set my hand.

HENRY P. MERRIAM.