METHOD OF FORMING BUNGS IN METALLIC PLATES

Original Filed July 7, 1945
METHOD OF FORMING BUNGS IN METALLIC PLATES

Roy J. Thompson, Gary, Ind., assignor to Inland Steel Company, Chicago, Ill., a corporation of Delaware

Original application July 7, 1945, Serial No. 603,882. Divided and this application May 3, 1947, Serial No. 745,881

3 Claims. (Cl. 29—148.2)

This invention pertains to threaded openings or bungs, and the method of making a threaded opening, such as for threaded bungs in sheet metal barrels, drums, container heads and the like, or for other structural members.

An object of this invention is to form a threaded opening or bung in an article, the opening being formed from the material of the article without the necessity of using inserts or other extraneous bracing.

Another object of the invention is to easily and quickly form a threaded opening or head in an article in a simple and effective manner and in such a manner as to not affect the strength of the deformed material.

Another object of the invention is to provide a threaded or other opening which forms its own reinforcing means.

Another object of the invention is to provide a threaded opening and the method of forming such an opening which does not weaken the material from which it is made and which may be quickly and economically formed.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate embodiments of the device and wherein like reference characters are used to designate like parts—

Figure 1 is a fragmentary sectional elevation of a plate in which there is to be formed a threaded opening such as a bung or the like;

Figures 2 to 7 are fragmentary sectional elevations showing the successive steps in the formation of a threaded opening from the plate illustrated in Figure 1.

This application is a division of application Serial No. 603,882, filed July 7, 1945, for Threaded opening.

In forming a threaded opening in a metallic plate or base such as an end enclosure, header or the like, of a container, barrel, drum or the like, or in any other structural member, a plate 10 of metal, plastic or other suitable material, is formed at the selected location with a depression 12 which is preferably circular, having a side wall 14 and an end wall 16. The end wall 16 is then depressed a selected amount as shown in Figure 3, providing a rounded portion or rim 18 and a dished or reentrant portion 20. This reentrant portion 20 is punched as at 22 to provide an opening and the flange 24 so formed is then formed to provide a larger opening 26, as shown in Figure 4, retaining the rounded portion 18, the flange 24 being preferably concentric with the wall 14. Flange 24 is then reflanged as at 28 (Figure 5), the edge of the flange preferably being moved into relatively tight engagement with the base of the wall 14, i.e., at the junction between wall 14 and plate 10. In other words, the edge of the flange 24 (reflange 28) does not extend substantially below the junction of wall 14 and plate 10, or is substantially in the plane of the bottom surface of plate 10 adjacent the contact between the edge of flange 24 and the base of wall 14. Also a sealing is effected between the reflanged portion and the base of wall 14. Thus with a container using this construction the container may be fully emptied as by pouring, as no traps for the contents of the container are formed.

In the event a threaded opening is to be provided, the flange 24 is then threaded as at 29. Figure 6, the threads being rolled or otherwise formed. Of course, if a threaded plug is not to be used as a closure the threads may be omitted. As a final step, the recess 32 is formed in the wall 14 in the form of a re-entrant recess, the trough of which extends toward the re-flanged portion 28 moving a portion of said wall 14 further contact with the reflanged portion 28, the recess forming receiving means for a seal and additionally providing a reinforcing rib 34. This contact is over a surface. The plate 16 may then be shaped to its desired shape, depending upon the use to which the article is to be used. Of course, the recess 32 may be omitted if desired, depending upon the strength desired at the opening and use of the article.

The threaded opening may be formed by any desired tool or tools, and of the desired size, depth, etc., as an example of a machine for forming the opening described being shown and described in my co-pending application Serial No. 603,883, filed July 7, 1945, for a Machine for forming threaded openings.

It is to be understood that this application is not to be limited by the exact embodiments of the device shown, which are merely by way of illustration and not limitation as various and other forms of the device will, of course, be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

I claim:

1. The method of forming an opening member in a plate or the like comprising, forming a circular recess having a wall extending from the
plate, the wall being closed by an end portion, dishing and punching such end wall to form a reentrant flange and annular recess, reflanging such flange at its end, and closing said recess in said wall.

2. The method of forming a bung in a metallic plate comprising forming a substantially cylindrical recess, the side wall of which is substantially normal to the plane of the plate, the plane of the end wall being spaced from the plane of the plate, dishing and punching the end wall to form a reentrant flange and annular recess, said flange being disposed substantially equidistant from said side wall and intersecting the plane of said plate, forming a reflange on the reentrant flange adjacent its free edge whereby the edge is flared to tightly engage the plate at the junction between the plate and side wall closing said recess, the bottom edge of the reflange being substantially in the plane of said plate, and threading the reentrant flange between the reflange and junction between the reentrant flange and side wall.

3. The method of forming a bung in a metallic plate comprising forming a substantially cylindrical recess, the side wall of which is angularly disposed with respect to said plate, the plane of the end wall being spaced from the plane of the plate, dishing and punching the end wall to form a reentrant flange and annular recess, forming a reflange on the reentrant flange adjacent its free edge whereby the edge is flared toward the junction between the plate and side wall, the bottom edge of the reflange being substantially in the plane of said plate, threading the reentrant flange, and forming a reentrant recess in said side wall toward the reflange to cause tight contact between a portion of the side wall and reflange.

ROY J. THOMPSON.

REFERENCES CITED
The following references are of record in the file of this patent:

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>680,591</td>
<td>Crosby</td>
<td>Aug. 20, 1901</td>
</tr>
<tr>
<td>1,088,341</td>
<td>Webster</td>
<td>Feb. 24, 1914</td>
</tr>
<tr>
<td>2,135,331</td>
<td>Batt</td>
<td>Mar. 26, 1940</td>
</tr>
<tr>
<td>2,299,183</td>
<td>Shapiro</td>
<td>July 14, 1942</td>
</tr>
<tr>
<td>2,399,183</td>
<td>Shanor</td>
<td>Oct. 20, 1942</td>
</tr>
</tbody>
</table>

FOREIGN PATENTS

<table>
<thead>
<tr>
<th>Number</th>
<th>Country</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>832,897</td>
<td>France</td>
<td>July 4, 1928</td>
</tr>
</tbody>
</table>