July 9, 1940. L. B. WACKMAN 2,207,564

METHOD OF CONSTRUCTING A THREADED BUNG FIXTURE IN A WALL OF A SHEET METAL CONTAINER

Filed Jan. 24, 1939 2 Sheets-Sheet 1

Fig. 1.

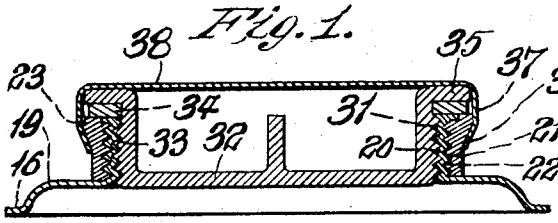



Fig. 2.

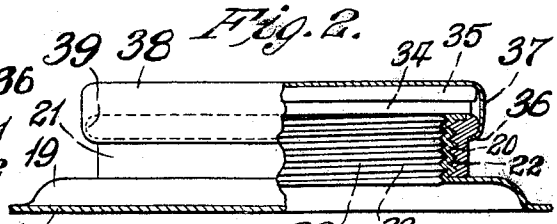



Fig. 3.

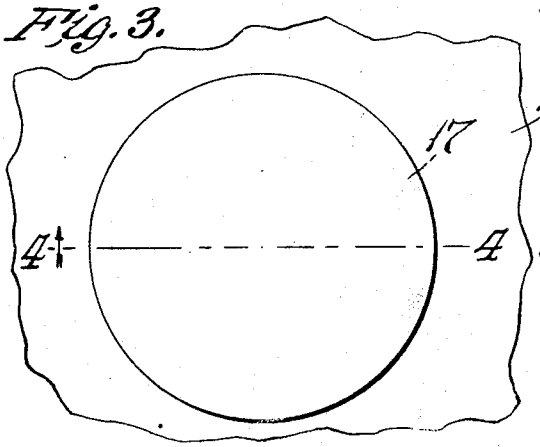



Fig. 5.

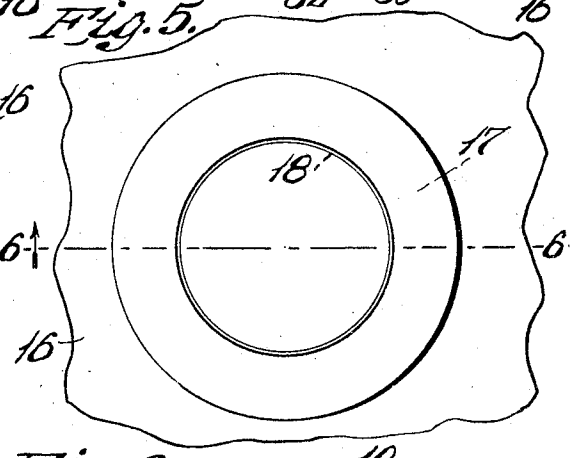



Fig. 4.

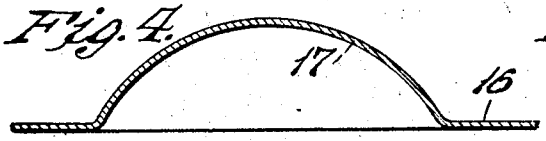



Fig. 6.

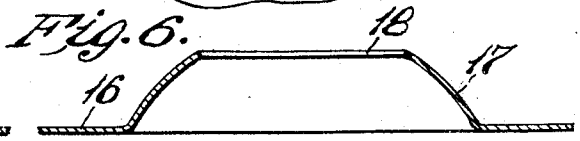



Fig. 7.

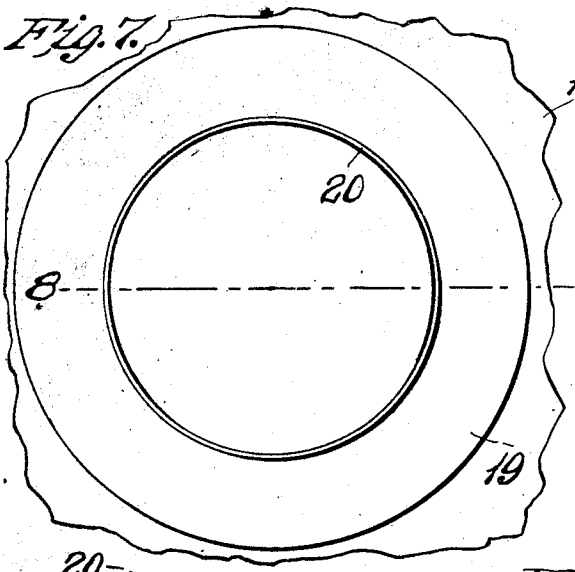



Fig. 9.

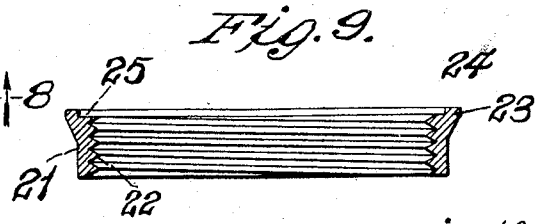



Fig. 10

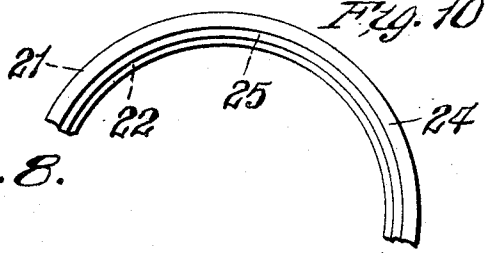
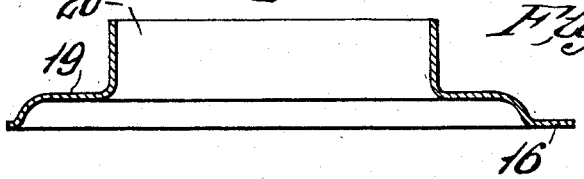



Fig. 8.




Inventor:
Louis B. Wackman.
By Herbert G. Fletcher
Atty.

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Fig. 11.

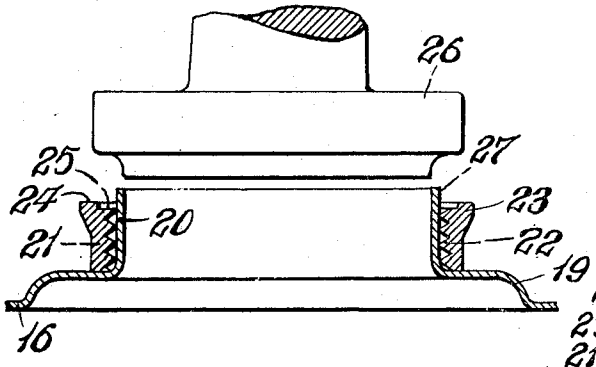



Fig. 13.

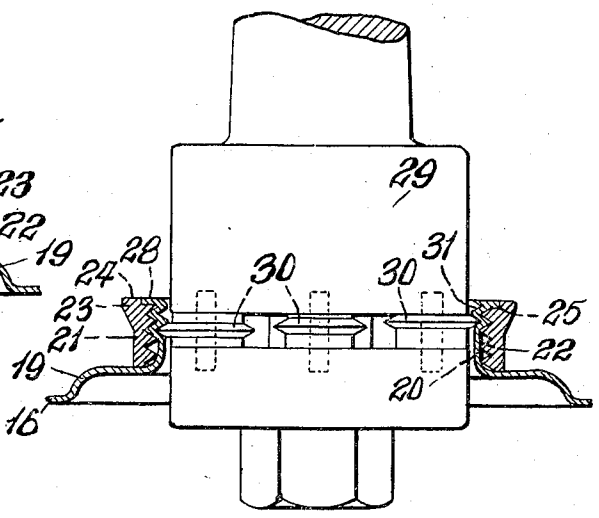



Fig. 12.

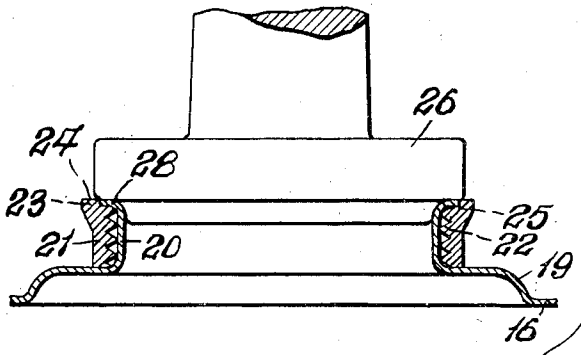



Fig. 15.

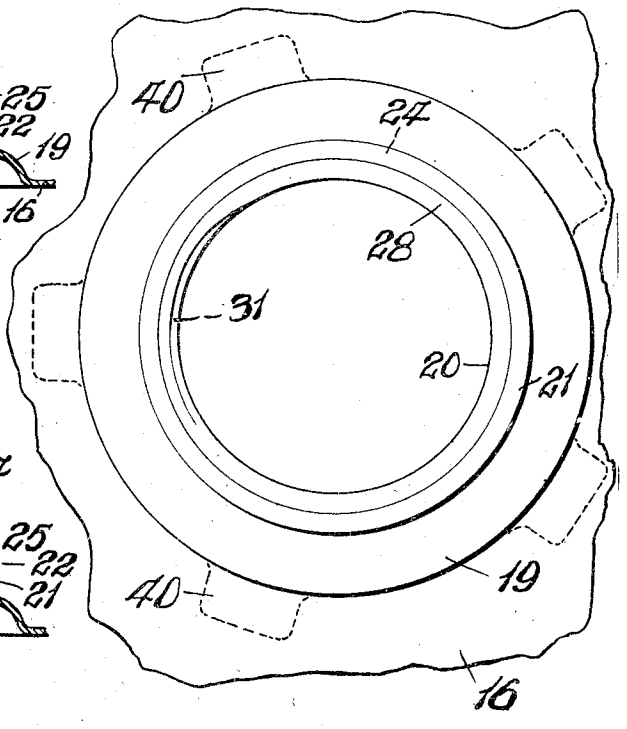
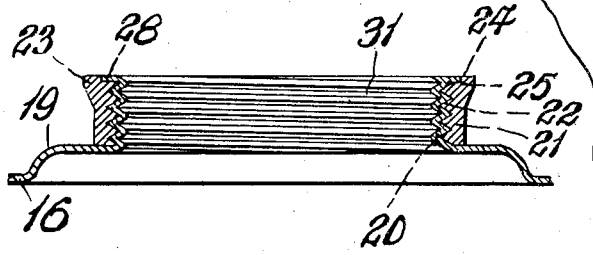



Fig. 14.




Inventor:
Louis B. Wackman.
By Herbert G. Fletcher
Atty.

Patented July 9, 1940 2,207,564

# UNITED STATES PATENT OFFICE

2,207,564

## METHOD OF CONSTRUCTING A THREADED BUNG FIXTURE IN A WALL OF A SHEET METAL CONTAINER

Louis B. Wackman, Richmond Heights, Mo.

Application January 24, 1939, Serial No. 252,560

6 Claims. (Cl. 29—148.2)

This invention relates to a method of constructing a threaded bung fixture in a wall of a sheet metal container such as an oil drum or barrel, and pertains particularly to the application and use of the sheet metal wall stock for a major part of the fixture and in which part the threads of the fixture are formed.

This improved method has been found to be one of the methods which may be applied in making the threaded bung fixture for sheet metal containers, shown in my companion application filed of even date herewith, the purpose of the method and the apparatus of the companion application being to provide a bung fixture having the threads of the bung hole formed in an integral part of the sheet metal stock of the container.

As is well known, sheet metal containers heretofore have structures of threaded bung holes which are either welded to a container wall or are pressed in the wall by crimp stamping and the like. Of these two structures, that which is welded in the container wall has been found to be preferable by reason of being integrally joined therewith so as to be rigidly held against being disturbed by wrench turning on the closure plug of the bung hole structure. The pressed-in type of bung hole structure it has been found, quite often becomes loosened by wrench operation on the closure plug thereof, thereby disturbing the sealing gasket required in the pressed-in structure.

This improved method therefore goes to the provision of means to thread-form a part of the wall stock of a sheet metal container, to represent and be used as a bung fixture and with reenforcing means for the thread-formed part so that the bung fitting constructed by this method will have the unified character of the welded-on bushing by reason of the thread-formed part being a part of the wall stock, and consequently is an integral part of the wall stock.

In view of the foregoing, it is a primary purpose of the invention to provide a method of constructing a bung fixture in an integral part of a wall of a sheet metal container and of threading the integral part.

It is another object of the invention to apply and form reenforcing means for the threaded part of the bung hole fitting.

A further object is to change the formation of a part of a wall for a sheet metal container and to reenforce the re-formed part during forming of screw threads thereon.

Still another object is to provide an annular extending portion from a sheet metal wall for a container and to secure a pre-formed collar over said annular portion and to reshape the annular portion in conformity with the inner periphery of the collar.

Another still further object is to construct a bung hole fitting in the material of a sheet metal wall for a container and to provide an interiorly threaded collar to form part of the fitting and to press portions of the material into the threads of the collar.

Other objects and advantages will appear as this description progresses and by reference to the drawings, in which—

Figure 1 is a transverse vertical sectional elevation taken through a fragmentary portion of a metal container wall and the bung fixture constructed by this improved method, and the figure including a cooperable closure plug and a sealing cap mounted in secured positions over the fixture.

Figure 2 is a fragmentary sectional elevation of the bung fixture illustrated in Fig. 1, with the exception of the fixture showing a modification of the clamping bead for the sealing cap.

Figure 3 is a plan elevation of a fragmentary portion of a sheet metal container wall showing a first step in re-forming that portion of the wall for providing the bung fixture.

Figure 4 is a transverse vertical sectional elevation taken on the line 4—4 of Fig. 3.

Figure 5 is a plan elevation of a fragmentary portion of a sheet metal container wall showing a second step in the operation on the wall.

Figure 6 is a transverse vertical sectional elevation taken on the line 6—6 of Fig. 5.

Figure 7 is a plan elevation of a fragmentary portion of a sheet metal container wall showing the third step in the operation on the wall.

Figure 8 is a transverse vertical sectional elevation taken approximately on the line 8—8 of Fig. 7, showing the completion of the formation of an extending neck in the container wall.

Figure 9 is a transverse vertical sectional elevation of an interiorly threaded collar which is used both in the construction of the bung fixture and as a permanent reenforcement thereto.

Figure 10 is a fragmentary plan elevation of a portion of the collar shown in Fig. 9.

Figure 11 is a transverse sectional elevation through the pre-formed neck and the collar shown in Fig. 9 loosely mounted thereover in readiness for being secured together.

Figure 12 is a transverse sectional elevation similar to Fig. 11 after the securing operation has been effected.

Figure 13 is a transverse vertical sectional elevation of the secured together collar and neck and showing the thread forming operation by a thread rolling tool.

Figure 14 is a transverse vertical sectional elevation of the completely formed and assembled bung fixture which is permanently secured to a container wall.

Figure 15 is a fragmentary plan elevation of Fig. 14.

Referring by numerals to the accompanying drawings, numeral **16** designates a fragmentary portion of a sheet metal container wall in which the bung fixture is formed and constructed, and in the first operation a circular raised portion **17** is formed in the wall, as shown in Figs. 3 and 4. The next operation is in punching a concentric opening **18** in the raised portion **17**, as shown in Figs. 5 and 6, and the following and third operation is in mushrooming and expanding the material of the raised portion **17** surrounding the opening **18** into a straight-walled extending neck **20**, as shown in Figs. 7 and 8.

Simultaneous with the forming of the neck **20**, a surrounding reenforcing embossment **19** for the neck is also formed.

For cooperation with the neck **20**, a collar **21** is provided, said collar being interiorly threaded at **22** and having an annular enlargement **23** at one end, and said collar on its end **24** having a counter-bored annular seat **25**, as shown in Figs. 9 and 10.

The next operation for providing the bung fixture is to mount the collar **21** over the extending neck **20**, in the manner as shown in Fig. 11, in readiness for the flanging operation by a flanging tool **26** beneath which the neck **20** and overengaged collar **21** are positioned. It is to be noted that the free or extending end **27** of the neck **20** extends above the collar a sufficient distance so that when the flanging tool **26** is downwardly moved, that portion of the neck extending above the collar is outwardly flanged and firmly seated in and on the seat **25** of the collar, in the manner as shown at **28** in Fig. 12. The neck **20** is then in readiness for having threads formed therein.

For forming the threads in the neck **20**, the collar **21** and the threads **22** thereof are used as a matrix or die tool for this purpose, and for carrying out the thread forming operation the bung fixture so far constructed and as shown in Fig. 12, is positioned beneath a thread rolling tool **29** so that the pressing rollers **30** of the tool which are disposed in planes suitable for the pitch of the threads **22** of the collar, can be lowered and fed into the neck **20** in a manner so as to follow the contour of the grooves of the threads **22**, as shown in Fig. 13, so that the sheet material forming the neck **20** will be pressed, swedged or rolled into the teeth **22** in conformity therewith.

The flanging-over of the extending end of the neck **20** on the upper end of the collar **21**, provides a rounded annular shoulder at the upper end or mouth of the neck, which facilitates the introduction of the lead roller of the plurality of rollers **30** of the rolling tool **29** into the neck for following the contour of the threads **22** of the collar **21**.

After the rollers **30** of the tool **29** have traveled through the neck, the threading operation thereof will have been completed, thus completing the constructed and assembled bung fixture as shown in Figs. 14 and 15, with the closure plug engaging threads **31** formed on the neck **20** which is integral with the container wall **16**.

After a sheet metal container has been assembled ready for use with bung fixtures constructed in a wall or walls thereof by this improved method, most any kind of closure plugs may be used but for the purposes of this disclosure, a closure plug **32** is provided said plug having the exteriorly formed threads **33** for threading cooperation with the threads **31** of the neck **20** of the bung fixture and the plug **32** carrying a gasket **34** beneath the flange **35** thereof, said gasket when the plug is securely seated in the bung fixture, being compressed in seal-tight engagement in over-lapping relation on the flange **28** of the neck **20** and the end **24** of the collar **21**. Obviously, the gasket **34** is only required to form a seal between the flange **35** of the plug **32** and the flange **28** of the neck **20** of the bung fixture, for preventing any seepage which may occur between the threads of the plug and the neck **20**.

The annular enlargement **23** of the collar **21** is beveled on its underside for providing crimping securance for the lower end **36** of the side wall **37** of a sealing cap **38** which may be mounted over the plug and the bung fixture, as shown in Fig. 1, as may be required.

In the use of a bung fixture constructed under this method, it is obvious that by reason of the essential part thereof being the neck **20** which is integral with the container wall and the same being reenforced by the matrix collar **21**, a bung fixture of the strength and capacity of the heretofore welded-on bung fixtures, is provided, and in consequence, wrenching strains imparted to the closure plug can in no way disturb or effect a bushing made by this improved method, as the same when completed, is obviously homogeneous in character.

In the use of the pressed-in type of bung fixture, it is well known that severe wrenching strains on the plug for loosening or securing it, often loosens the crimped-in securance thereof, and further the threads of pressed-in bung fixtures often become bent and distorted during the assembly of the fixture in the container wall. In following applicant's improved method of bung fixture construction, it is clear that inasmuch as the threading at **31** on the neck **20** is the last and completing operation on the fixture, distortion of the threads is obviously eliminated.

It is also to be noted that the bung fixture when constructed by this improved method, provides for the collar **21** being rigidly locked to the neck **20** by the threads **22** of the collar being interlocked with the threads **31** of the neck which will prevent the turning of the collar in one direction, and the interlocking of the flange **28** of the neck in the seat **25** of the collar will prevent the collar being turned on the neck in the other direction.

It is also important to note that there are no gaskets used in the construction of bung fixtures made in practicing this improved method, and consequently there are no embedded gaskets as are required in the pressed-in bung fixtures to be subjected to chemical erosion from the container contents as does happen quite frequently in the use of bung fixtures having embedded gaskets to aid in maintaining them in seal-tight condition. True, the plug gasket as shown at **34**, may become saturated to the extent of chemical erosion through repeated uses thereof, but as this gasket is always available for inspection, it can be readily replaced.

In the event of breakage occurring in a bung

fixture constructed under this improved method by severe wrenching strains being given to the fixture, such breakage or fissure forming would develop in the wall stock at a point adjacent where the wall stock joins the neck **20**. In this event, repair by welding could readily be accomplished on account of the simplicity of construction of the bung fixture. With respect to the flarging tool **26** and the thread rolling tool **29** which are shown for the purposes of illustration, it is obvious that other types of tools may be used and particularly with respect to the thread rolling tool where a collapsible threading tool may be used in lieu thereof.

The illustration of Fig. 2 shows the embodiment of an annular bead **39** which may be used instead of the beveled embossment shown in Fig. 1, for cap crimping securance, where required.

While an annular reenforcing embossment **19** from which the neck **20** is extended, is shown, other designs of reenforcing embossment may be made and used, such as the embossment having radial projections **40**, as shown in dotted lines in Fig. 15.

While I have described one embodiment of my invention with some particularity, obviously many other embodiments thereof may occur to those skilled in the art to which it appertains. I, therefore, do not limit myself to the precise details described, but claim as my invention all variations and modifications coming within the scope of the subjoined claims.

What I claim is:

1. The method of constructing a bung fixture in a sheet metal wall for a container consisting of forming an extending neck from the wall, of freely mounting an interiorly threaded collar over the neck, of flanging the free end of the neck over the outer end of the collar to hold the neck and collar from turning relative to each other during swedging of portions of the neck into the groove of the thread of the collar, and then swedging portions of the neck into the thread groove of the collar.

2. The method of constructing a bung fixture in a sheet metal wall for a container consisting of stamping an opening in the wall, of extruding an outwardly extending neck from the surrounding material of the opening in the wall, of freely mounting an interiorly threaded collar over the neck, of flanging the free end of the neck over the outer end of the collar to hold the neck and collar from turning relative to each other during outwardly swedging of the wall of the neck into seating conformity with the thread of the collar, and then outwardly swedging the wall of the neck by roller spinning portions of the neck into seating conformity with the thread of the collar.

3. The method of constructing a bung fixture in a sheet metal wall for a container consisting of cupping a portion of the wall, of stamping an opening in the cupped portion, of extruding an outwardly extending neck from the surrounding material of the opening in the cupped portion, of freely mounting an interiorly threaded collar over the neck, of flanging the free end of the neck over the outer end of the collar to hold the neck and collar from turning relative to each other during thread forming on the neck, and then roller spinning the thread on the wall of the neck into seating conformity with the thread of the collar.

4. The method of constructing a bung fixture in a sheet metal wall for a container consisting of cupping a portion of the wall, of stamping an opening in the cupped portion, of extruding an outwardly extending neck from the surrounding material of the opening in the cupped portion, of freely mounting an interiorly threaded collar over the neck, of flanging the free end of the neck over the outer end of the collar to hold the neck and collar from turning relative to each other during threading operation on the neck, and then threading the wall of the neck by successively rolling portions of the neck into seating conformity with the thread of the collar.

5. The method of constructing a bung fixture in a sheet metal wall for a container consisting of stamping an opening in the wall, of extruding an outwardly extending neck from the surrounding material of the opening in the wall, of engaging an interiorly threaded collar having an annular recessed seat formed at one end over the neck, of flanging the free end of the neck with the marginal edge thereof in engagement with the recessed seat of the collar, and of outwardly swedging the wall of the neck into seating conformity with the thread of the collar to form an inner thread on the neck wall.

6. The method of constructing a bung fixture in a sheet metal wall for a container consisting of stamping an opening in the wall, of extruding an outwardly extending neck from the surrounding material of the opening in the wall, of engaging an interiorly threaded collar having an annular recessed seat formed at one end over the neck, of flanging the free end of the neck with the marginal edge thereof in engagement with the recessed seat of the collar, and of roller spinning portions of the neck into seating conformity with the thread of the collar to form an inner thread on the neck wall.

LOUIS B. WACKMAN.