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W. H. ROBINSON

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CONTAINER AND CLOSURE STRUCTURE

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Fig. 2.

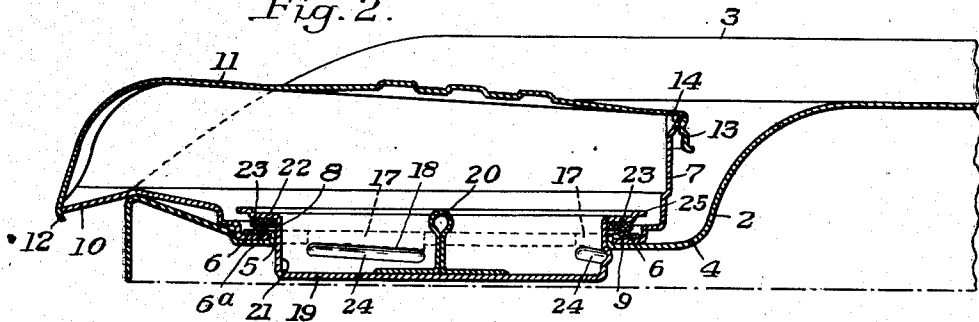


Fig. 1.

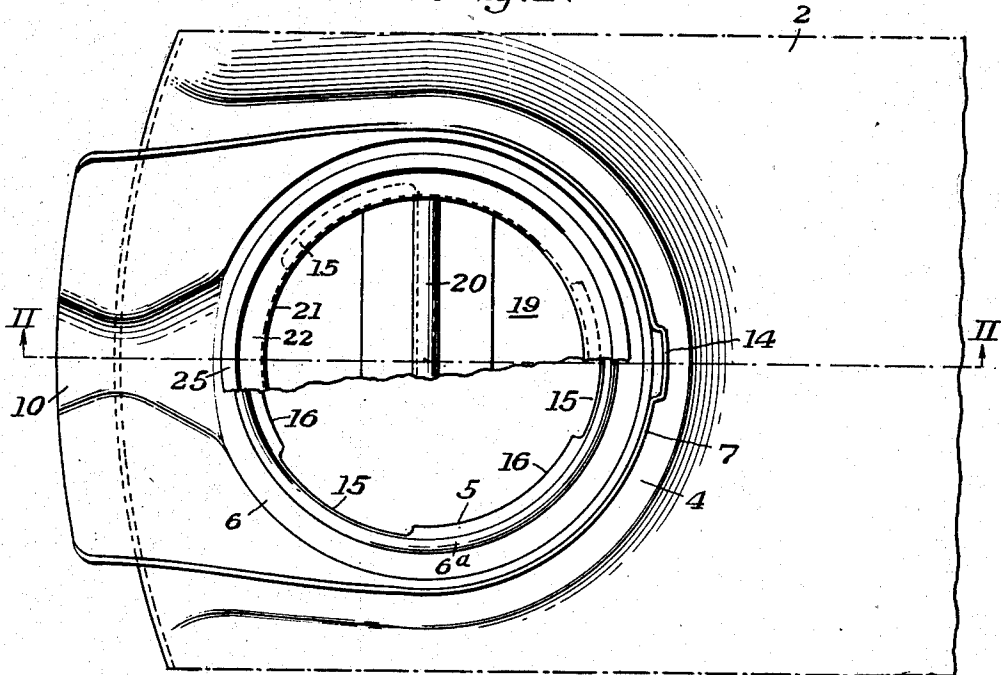
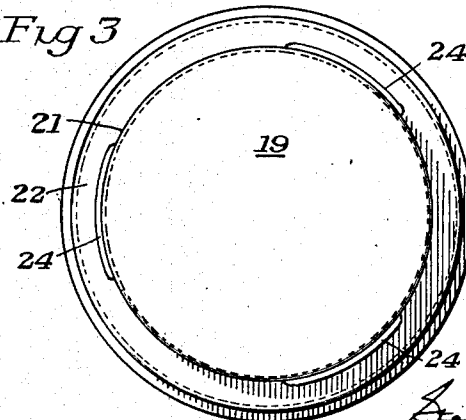


Fig 3



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24 by
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UNITED STATES PATENT OFFICE

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CONTAINER AND CLOSURE STRUCTURE

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8 Claims. (Cl. 220-40)

This invention relates to containers and closure structures therefor. It relates more particularly to storage and shipping containers and especially such containers made out of sheet metal. In sheet metal containers of the type in question there is provided an opening through which the container is adapted to be filled and a closure for such opening. A spout is customarily applied to the container at the opening to guide the contents of the container when being poured out.

The business of supplying containers of the type in question is highly competitive and a commercially successful container must be of sufficiently simple construction that it can be made at low enough cost to meet stiff price competition. Also the container must be structurally strong and particularly the closure for the opening through which the container is filled and emptied must effectively seal such opening under all conditions to which the container may reasonably be subjected in use. Heretofore it has been the aim of manufacturers to compromise between low cost and tight sealing with the result that structures of more complexity than desired have been employed in an attempt to insure a tight seal, yet a tight seal has not always been thus obtained in practice. Also difficulty has been experienced due to the projection inwardly of the container of a neck surrounding the opening and which has in many cases been considered necessary from the structural standpoint to insure satisfactory sealing. This inwardly projecting neck is highly disadvantageous when the container is being filled with liquid, for when the level of liquid in the container rises above the lower extremity of the neck air is imprisoned between the surface of the liquid and the container top which vents out through the filling opening in irregular gushes, resulting in spattering of the liquid over the outside of the container and on anything else which may be adjacent the container. Also the inwardly projecting neck has materially interfered with smooth pouring out of the contents of the container, interrupting the flow and making difficult or impossible the controlled pouring out of the contents in a smooth compact stream. Attempts to do away with the inwardly projecting neck have met with difficulty from the standpoint of obtaining adequate strength and a sufficiently tight seal.

I have devised a container and closure structure which is the simplest and cheapest of any I have seen, yet which provides for adequate strength and an eminently satisfactory and tight

seal. I preferably do away entirely with any inwardly projecting neck so that when the container is being filled it may be filled right up to the rim of the filling opening without danger of spattering due to air venting. This makes it possible to save substantially on the amount of metal going into the container, as the height of the container may be reduced by an amount approximating the height of the inwardly projecting neck which has heretofore customarily been employed. In my copending application Serial No. 377,966, filed of even date herewith, I have disclosed and claimed a container and closure structure accomplishing results similar to those accomplished by the present invention and while the structure of my said copending application has advantages in certain uses the structure herein disclosed and claimed is of even simpler and cheaper design and has other advantages which will be hereinafter pointed out.

I provide for sealing the container opening against the material of the container about the opening and I preferably maintain the closure in place by means engaging the material of the container at the opening internally of the container. I prefer to deform the material of the container at the edge of the opening to form a reinforcement and to seal against such reinforcement. Preferably the material of the container at the opening is provided with one or more slots in the nature of bayonet slots through which lugs or cams on the closure may pass so that upon turning of the closure they may engage beneath parts of the reinforced portion surrounding the opening. The reinforced portion is preferably provided intermediate the slots with inclined cam surfaces with which the lugs on the closure cooperate. A spout may be provided which may be held or clinched to the container by the material of the container at the opening.

Other details, objects and advantages of the invention will become apparent as the following description of a present preferred embodiment thereof proceeds.

In the accompanying drawing I have shown a present preferred embodiment of the invention, in which

Figure 1 is a fragmentary top plan view of a storage and shipping container with the dust cap for the spout removed and with the closure plug partly cut away;

Figure 2 is a central vertical cross-sectional view through the structure shown in Figure 1 and taken on the line II-II of that figure but with the dust cap for the spout applied; and

Figure 3 is an inverted plan view of the closure plug.

Referring now more particularly to the drawing, there is shown a sheet metal container designated generally by reference numeral 2. The portion of the container shown is the top thereof adjacent the rim. The container as a whole may be of standard construction comprising, for example, a cylindrical body having a permanently attached bottom and a top which for purposes of the present invention may also be considered as permanently attached. In a preferred form the top may comprise what is generally known in the art as a lug cover or it may be permanently seamed to the body. Whatever the precise container structure, the container is adapted and intended to be filled through the pouring opening.

The top of the container rises to a maximum height indicated by reference numeral 3 and has adjacent the rim at one point a depressed portion 4, as well known in the art. At such depressed portion 4 the container is provided with a filling and pouring opening designated by reference numeral 5. The material of the container is outwardly and reversely turned about the opening 5 as shown at 6 and has formed therein an upwardly projecting gasket engaging bead 6a. A sheet metal spout 7 is provided, which spout has an opening designated by reference numeral 8 concentric with the opening 5. The metal of the spout at 9 about the spout opening 8 lies between the portions 4 and 6 of the metal of the container and is thereby clinched and held in place. The spout has a lip 10 which overhangs the container wall and a dust cap 11 may be applied over the spout. In applying the dust cap the nose 12 of the cap is hooked over the lip of the spout and the heel 13 of the cap is snapped over the rearward edge 14 of the spout.

The reinforced edge of the material of the container surrounding the opening 5 is formed to provide three equidistant slots 15 as shown in Figure 1. These slots as shown are in the nature of bayonet slots, their inwardly facing edges being of materially greater diameter than the inwardly facing edge portions 16 of the material of the container intermediate the slots. Inwardly of the container the material opposite the edge portions 16 is formed into cam portions 17 having inclined inwardly facing cam surfaces 18.

The opening 5 is adapted to be closed and sealed by a closure 19, which, as shown, is preferably in the nature of a hollow sheet metal plug with a grip portion 20 disposed centrally thereof and welded thereto. The closure or plug 19 has a body portion 21 adapted to project slightly inwardly of the container through the opening 5 and an annular outwardly extending flange portion 22 adapted to overlie the reinforced portion of the container surrounding the opening 5 as shown. A gasket 23 is interposed between the reinforced portion of the container surrounding the opening and the under surface of the flange 22. The body portion 21 of the plug 19 is provided with three equally spaced outwardly pressed inclined projections or lugs 24.

To seal the container the plug 19 has its body portion 21 extended inwardly through the opening 5, this being accomplished by positioning each of the lugs 24 in alignment axially of the opening with one of the slots 15 and moving or

dropping the plug into place toward the interior of the container. The gasket 23 is normally carried by the plug and when the plug has reached sealing position the gasket lies upon the portion 6 of the material of the container. The plug is then turned in the clockwise direction viewing Figure 1 so that the respective lugs 24 wedgingly engage beneath the respective inclined surfaces 18 to maintain the plug tightly in place. The seal is effected at the gasket 23, the tightness of the seal being determined by the twisting force applied to the plug in turning it as above described.

The outer edge portion of the plug flange 22 is somewhat raised as shown at 25 to allow an annular sealing member to be positioned thereunder whereby to provide for sealing the plug in place so that it cannot be removed without rupturing a sealing member, thus leaving a visible indication that the container has been opened. Various forms of seals may be employed, that shown in my copending application Serial No. 377,967, filed of even date herewith, being at present preferred.

The structure above described is exceptionally strong and durable. While the spot 7 may be omitted it is desirably employed, first, because it enhances the utility of the container and, second, because it further strengthens and stiffens the material of the container about the opening. There is no neck of the container extending inwardly from the opening and the container may be filled clear up to the level of the opening 5. The small amount of the contents which may be displaced when the plug is inserted will cause no difficulty. Doing away with the inwardly projecting neck also provides for more easily controlled pouring. The contents of the container flow out in a smooth unimpeded stream, which is not the case when an inwardly projecting neck is employed. The simplicity and low cost of the container will be appreciated. Thus I combine into one a very simple and cheap container which has exceptionally strong structural characteristics and which obviates disadvantages heretofore inherent in similar structures by reason of an inwardly extending neck at the opening interfering with complete filling of the container and with proper pouring out of the contents thereof. I am enabled to materially reduce the overall height of my container, which means a very important saving in material when it is borne in mind that these containers are made by quantity production methods.

While I have shown and described a present preferred embodiment of the invention it is to be distinctly understood that the invention is not limited thereto but may be otherwise variously embodied within the scope of the following claims.

I claim:

1. A container having an opening in its top through which it is adapted to be filled, the material of the top surrounding said opening having its under surface extending generally laterally away from said opening and said material being reversely turned to provide a reinforced portion completely about said opening and a closure for said opening having opposed holding and sealing portions cooperating respectively with opposed faces of said reinforced portion to hold the closure in place and seal said opening, the holding portion being inclined to the plane of the sealing portion, said reinforced portion having therein slot means receiving the holding portion

of the closure when the closure is applied to the container.

2. A container having an opening, a spout at said opening, the material of the container being bent to interlock with the spout and thus hold it against removal from the container, and a closure for said opening having means directly engaging said bent portion beneath the same to hold the closure in place.

3. A container having an opening, the material of the container at the opening being turned outwardly and reversely to form a reinforced portion, said reinforced portion having a plurality of slots formed therein at the edge of said opening, and a closure for said opening having lugs adapted to pass through said slots and upon turning of the closure to bear upon the inside of said reinforced portion to hold the closure in place.

4. A container having an opening, the material of the container at the opening being reversely turned to form a reinforced portion, said reinforced portion being slotted at the edge of said opening, and a closure for said opening having means adapted to pass through a slot in said reinforced portion and upon turning of the closure to bear upon said reinforced portion to hold the closure in place and a sealing portion adapted to cooperate with said reinforced portion to seal said opening.

5. A container having an opening, a spout at said opening, the material of the container at the opening being bent to hold the spout in place and being slotted and being formed to provide an inclined cam surface at a point offset from a slot, and a closure for said opening having means adapted to pass through said slot and upon turning of the closure to bear upon said inclined cam surface to hold the closure in place and a sealing portion to seal said opening.

6. A container having an opening defined by the material thereof, such material extending to the edge of the opening and then being turned outwardly axially of the opening and then outwardly generally radially of the opening and terminating generally radially outwardly of the opening, the outwardly turned portion providing a surface facing generally axially outwardly of the opening, said surface being interrupted at intervals peripherally of the opening to receive closure holding means.

7. A container having an opening in its top through which it is adapted to be filled, the material of the top surrounding said opening having its under surface extending generally laterally away from said opening and said material being reversely turned to provide a portion of multiple thickness completely about said opening and a closure for said opening having a holding portion engaging said portion of multiple thickness inwardly of the container when the closure is in place to positively lock the closure in place, said portion of multiple thickness having therein slot means receiving the holding portion of the closure when the closure is applied to the container.

8. A container having an opening with the material of the container being bent to form a multi-thickness portion at the edge of the opening completely surrounding the opening and extending generally parallel to the plane of the opening and a closure for the opening having means engaging said multi-thickness portion inwardly of the container when the closure is in place to positively lock the closure in place, said multi-thickness portion having therein slot means receiving said locking means when the closure is applied to the container.

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