Jan. 17, 1928. 1,656,241

M. SCHWARTZ

BUSHING STRUCTURE

Filed Nov. 27, 1925 2 Sheets-Sheet 1

Fig. 1.

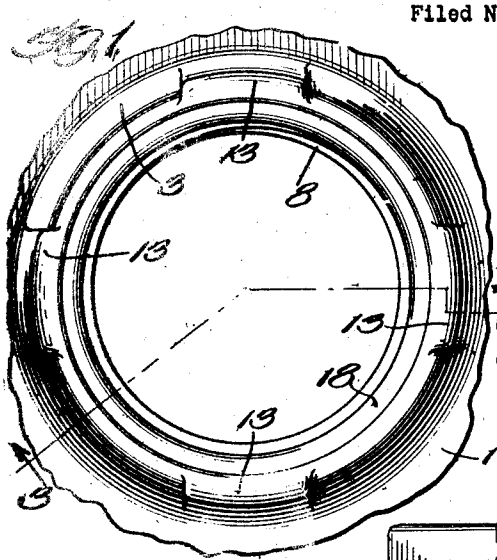


Fig. 2.

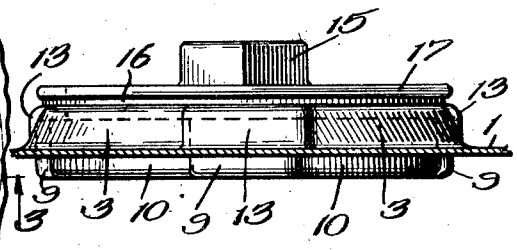


Fig. 3.

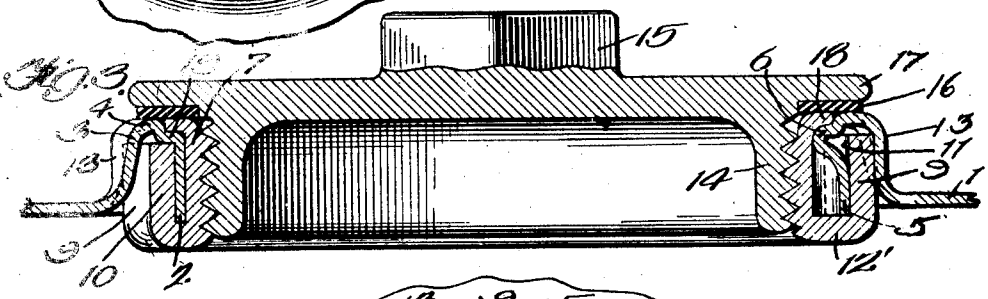
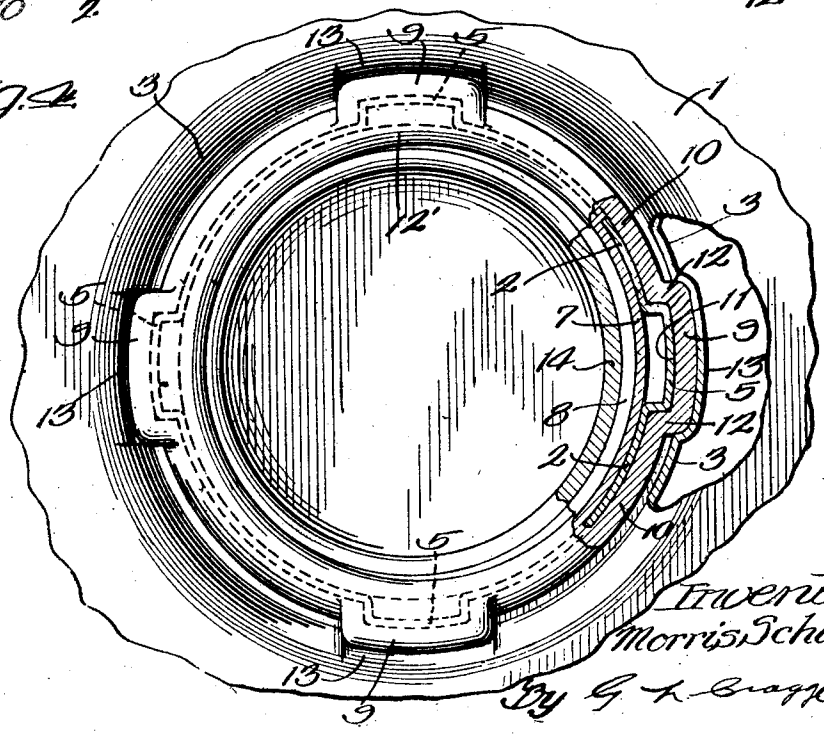


Fig. 4.



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Fig. 5.

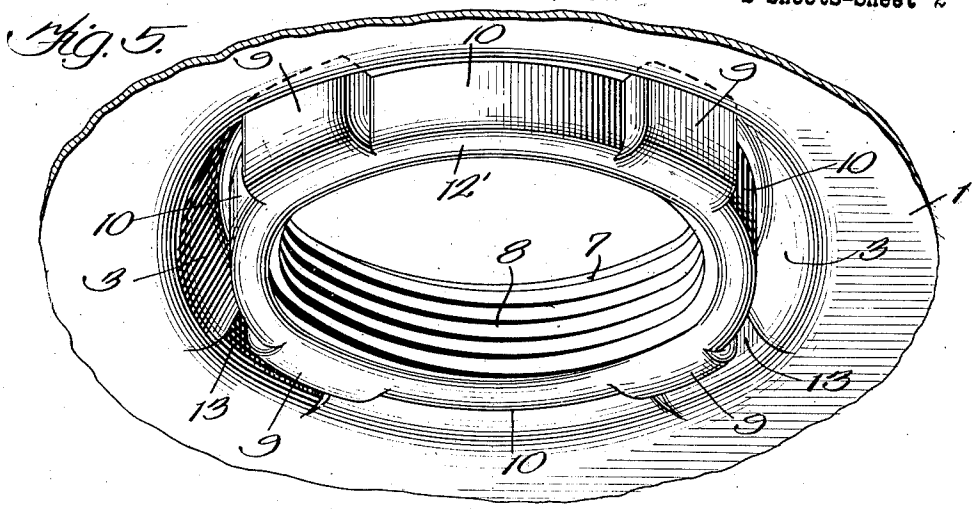


Fig. 6.

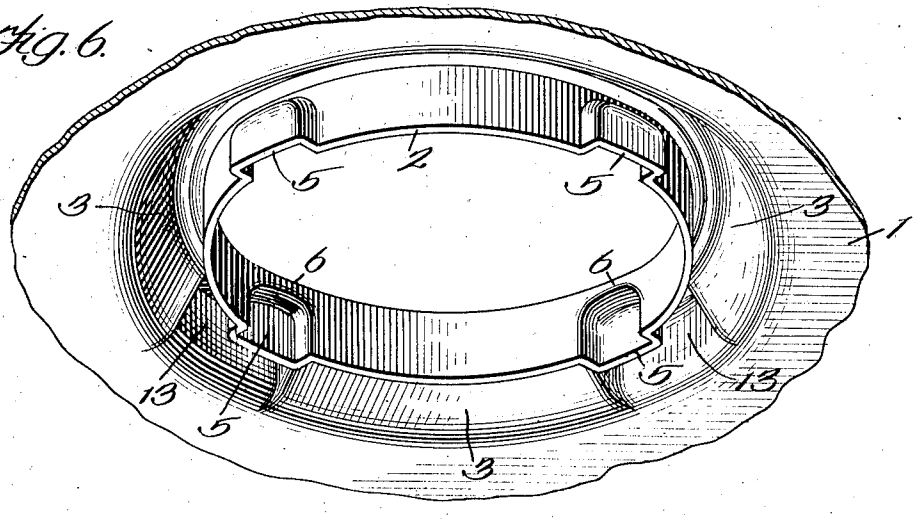


Fig. 7.

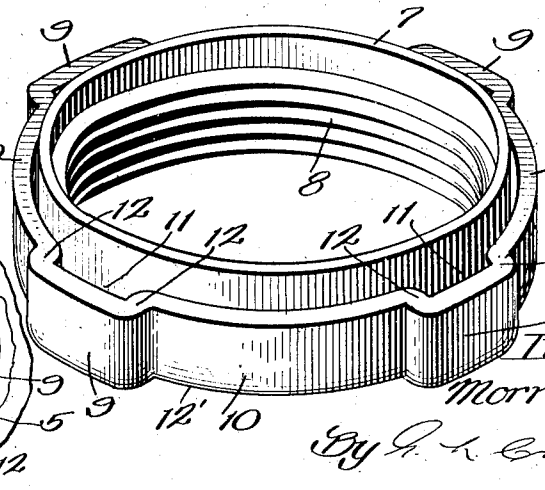
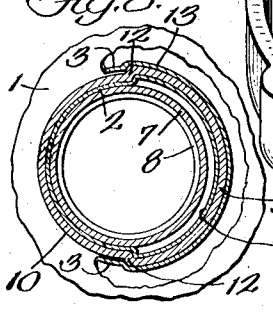


Fig. 8.



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UNITED STATES PATENT OFFICE.

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BUSHING STRUCTURE.

Application filed November 27, 1925. Serial No. 71,782.

My invention relates to sheet metal members, such as the heads or other wall portions of metallic barrels or containers, though the invention is not to be thus limited, and which are provided with rims that enclose bushings, these bushings in the case of barrels or other containers being provided to receive bungs or stoppers and being usually interiorly threaded in order that the bungs may be screwed into the same.

My invention has for its object the provision of an improved construction of the rim portions of such sheet metal members and the bushings surrounded thereby, whereby these two elements may be so locked that the bushings may not be turned and thereby disturb the fluid-tight assembly of the bushings and rims.

In accordance with one characteristic of the invention, the bushing is formed with a returned portion upon the exterior of its body portion and has interlocking connection with the rim upon the exterior of which said returned body portion is disposed. In accordance with another characteristic of the invention, the sheet metal member has a dished part adjacent and surrounding the rim, this dished part and the returned portion of the bushing having interlocking formations serving to hold the bushing from rotation.

In the preferred embodiment of the invention, the rim is outwardly bulged from its unattached edge toward its attached edge, and the returned portion of the bushing is similarly bulged to define a recess that receives the bulging portion of the rim. The body portion of the sheet metal member has its dished part outwardly bulged to receive the bulged outwardly returned bushing portion.

The invention will be more fully explained in connection with the accompanying drawings in which Fig. 1 is a plan view illustrating a construction of my invention, the bung or stopper being absent; Fig. 2 is a view in elevation, on a smaller scale, of the structure shown in Fig. 1, the bung being assembled with the bushing; Fig. 3 is a sectional view on line 3—3 of Fig. 1, on a larger scale with the bung present; Fig. 4 is a view, from beneath, of the structure as it appears in Fig. 3, portions being broken away; Fig. 5 is a perspective view of the complete structure, from beneath, the bung being absent; Fig. 6 is a perspective view, from beneath, of the sheet metal member, the bushing and bung being absent; Fig. 7 is a perspective view of the bushing; and Fig. 8 is a sectional view of another form of the invention taken at right angles to the axis of the bushing and the surrounding rim of the sheet metal member.

The sheet metal member 1, illustrated, may form a part of a structure which is to be supplied with a bushing, such as the end or other wall of a metallic barrel or container. This metal member is formed with a generally circular rim portion 2 which is angular to the body portion of the sheet metal member, this body portion being desirably inclusive of a dished portion 3 that surrounds the rim, there being an annular bead 4 which margins the attached portion of the rim. Said rim thus immediately surrounds a generally circular opening formed through the sheet metal member to permit of the passage of fluid or material through said member. The rim is outwardly bulged at 5 at one place as indicated in Fig. 8 and at a number of places as clearly indicated in Figs. 2, 4 and 6, the bulging extending from the unattached edge of the rim toward its attached edge and preferably only to the rim portion or portions 6 which margin the attached edge of the rim, adjacent the bead 4.

The bushing has a body portion 7 which is preferably interiorly threaded as indicated at 8, this body portion being surrounded by the rim and having as many returned portions 9 as there are bulges 5 in the rim, these returned portions being connected by intervening inset portions 10 which, with the portions 9, surround the body portion 7. In the structure of Fig. 8 there is but one returned bulging portion 9 and one returned inset portion 10 as there is but one bulged portion 5 of the rim. Each bulging rim portion 5 is snugly received in the recess 11 defined

by the corresponding bulging portion 9 so as to engage not only the outer arcuate wall of the corresponding recess 11, but also the end walls 12 of this recess that are transverse to the bushing, these transverse walls of said recess and the engaged bulging rim portion 5 cooperating to prevent the bushing from turning. All of the returned bushing portions 9 and 10 constitute a wall surrounding the rim, this wall being joined with the body portion of the bushing by a continuous annular web 12′ having sealing engagement with the unattached edge of the rim.

The dished part 3 of the body portion of the sheet metal member 1 is itself outwardly bulged as indicated at 13, there being as many bulges 13 as there are bulges 9. In Fig. 8, there is but one bulging portion 13 in the dished part 3 of the sheet metal member 1. In the structure shown in the remaining figures, there are as many bulges 13 in the dished part 3 as there are bulges 5 in the rim, the contiguous bulges 5 and 13 being radially aligned. The bulges 9 upon the bushing, in addition to receiving the bulges 5 upon the rim, are received in the bulges 13 in the dished part 3 of the member 1. There is thus afforded a double locking structure guarding against the rotation of the bushing, the side wall 12 of the bulged bushing portions 9 engaging the radial sides of the recesses at 13. The engagement of the body portion 7 of the bushing and the web 12′ with the rim is so intimate as to guard against leakage. Other engaging portions of the bushing and rim are in as intimate contact as possible for the same purpose. The rim portion 2, where unbulged, is formed to offer no material resistence to the turning movement of the bushing.

The bung or stopper 14 is received in the bore of the bushing. If the bushing is interiorly threaded, the bung is correspondingly threaded and has a polygonal formation 15, whereby a wrench may be applied thereto to screw it tightly into place. A sealing gasket 16 may be interposed between a flange 17 on the bung and the bead 4 and also to overlie the flange 18 formed at the end of the bushing opposite the end from which the returned portions 9 and 10 spring. The flange 18 desirably overlies the unattached ends of the returned portions 10 of the bushing, the circular portion 19 of the sheet metal body member 1 being desirably closely gripped between the flange 18 and the returned bushing portions 10 to effect a further fluid-tight connection between the bushing and the sheet metal member.

Changes may be made without departing from the invention.

Having thus described my invention, I claim:—

1. The combination with a sheet metal member inclusive of a body portion and a circular rim portion angular to the body portion and immediately surrounding a circular opening formed through said member, said rim being outwardly bulged; of a bushing having a body portion surrounded by said rim and a returned portion upon the exterior of its body portion and disposed upon the exterior of the rim, the rim being received between said returned bushing portion and the body portion of the bushing and having its bulging portion in holding engagement with said returned portion, the body portion of the sheet metal member also having a dished part adjacent and surrounding the rim, this dished part being outwardly bulged, the returned portion of the bushing having a portion received in the recess defined by the bulging of the dished part of the sheet metal member, the rim portion of said sheet metal member being formed, where unbulged, to offer no material resistence to the turning movement of the bushing but the recessed and bulging portions of the sheet metal member and bushing being in interlocking engagement and provided with square shoulders to prevent relative turning movement.

2. The combination with a sheet metal member inclusive of a body portion and a circular rim portion angular to the body portion and immediately surrounding a circular opening formed through said member, said rim being outwardly bulged; of a bushing having a body portion surrounded by said rim and an outwardly bulged returned portion upon the exterior of its body portion and disposed upon the exterior of the rim, the rim being received between said returned bushing portion and the body portion of the bushing and whose bulging portion is received by said bulged bushing portion, the rim portion of said sheet metal member being formed, where unbulged, to offer no material resistence to the turning movement of the bushing but the recessed and bulging portions of the sheet metal member and bushing being in interlocking engagement and provided with square shoulders to prevent relative turning movement.

3. The combination with a sheet metal member inclusive of a body portion and a circular rim portion angular to the body portion and immediately surrounding a circular opening formed through said member, said rim being outwardly bulged; of a bushing having a body portion surrounded by said rim and an outwardly bulged returned portion upon the exterior of its body portion and disposed upon the exterior of the rim, the rim being received between said returned bushing portion and the body portion of the bushing and whose bulging

portion is received by said bulged bushing portion, the body portion of the sheet metal member also having a dished part adjacent and surrounding the rim, this dished part being outwardly bulged, the returned bulged portion of the bushing being received in the recess defined by the bulging of the dished part of the sheet metal member, the rim portion of said sheet metal member being formed, where unbulged, to offer no material resistence to the turning movement of the bushing but the recessed and bulging portions of the sheet metal member and bushing being in interlocking engagement and provided with square shoulders to prevent relative turning movement.

In witness whereof, I hereunto subscribe my name.

MORRIS SCHWARTZ.