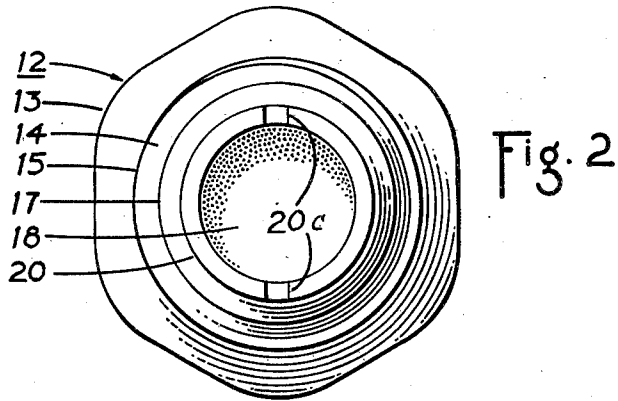
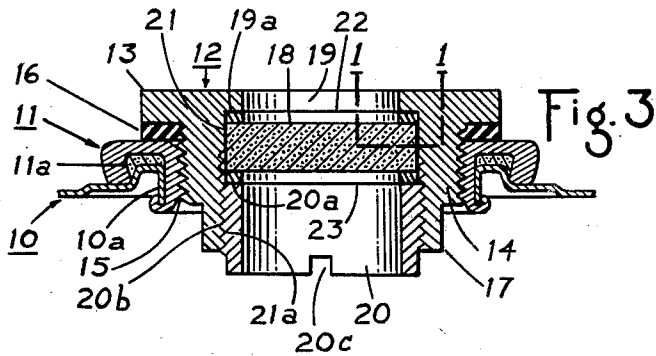
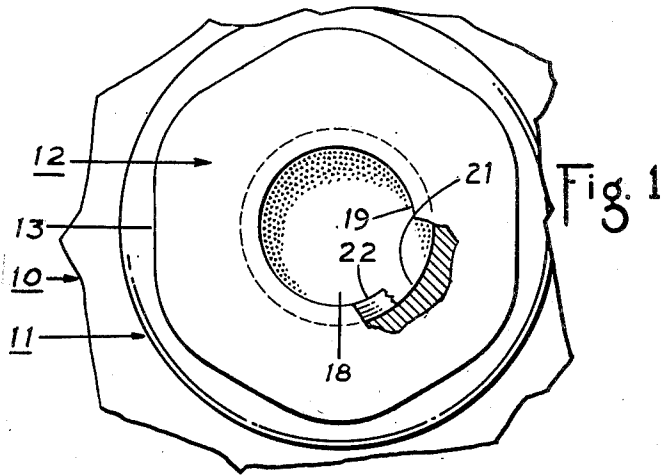


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VENT AND FILTER PLUG CLOSURE

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VENT AND FILTER PLUG CLOSURE

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The instant invention relates to vent plug closures and more particularly to the type used in steel containers for shipment of various kinds of acids, especially sulphuric acid, nitric acid, and the like.

It is well known that much factual evidence supports the statements by manufacturers and shippers in the chemical industry regarding the difficulty and expense incurred when certain gas forming acids are shipped and stored in containers not equipped with venting plugs for the bung hole in such containers, and in several instances some containers have leaked and others have exploded due to internal pressure built up by the acid contents of such containers. It is known, too, that while dangerous internal pressure may at times be detected through evidence of rupture in the heads of the containers, yet, the risk and uncertainty of dependence on such procedure is obvious.

In view, then, of the necessity for maximum safety provision covering both the interstate and overseas shipment of acids, this invention contrives to eliminate the hazard attending the leakage and destruction of acid products in shipping and storing the same, and especially under conditions where such shipment and storage demands that the said acid products remain for substantially long periods of time in unusually high temperatures and are subject to sustained agitation.

One embodiment of this invention is the provision of a porous core or disk portion disposed centrally therein, which, through exhaustive tests has proved to be a venting means possessing a substantially high venting rate and a substantially low leakage rate, thereby carrying out the purpose of maximum, practical and economical safety provision as intended.

The said core or disk is formed from carbon, carborundum, or, certain other suitable materials, selectively used according to known requirements with respect to the fact that certain types of acids exert a deleterious action on certain materials used in this core or disk, and it accordingly becomes necessary to provide the disk made from material which is proof against attack by acid action, as is regulated by known standards.

It is known, of course, that a vent plug porous disk of this type will leak acid to some very slight degree when the container is under agitation or in a position to bring the acid against the venting means in the container, and, as evidenced in the tests above mentioned, very slight

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amounts of acid are drawn through the porous material of the disk by capillary action. This leakage thus produced, is, however, very slight, even when the container is placed so as to bring the disk below the acid level, and although the venting capacity of the disk is thus slightly reduced, the disk will still vent to a safe pressure when the container is again set in upright position, to bring the device to top position in the same.

A definite advantage in this improved vent closure is the provision therein of such a degree of porosity as will maintain adequate venting performance regardless of the white sulphate and similar deposits which at times may form and dry on the outside surface of the metal container, resulting from said slight leakage of said porous disk portion of the device.

Another advantage of this invention is the provision of baffle means on a portion thereof to minimize the splashing of acid against the porous disk when the container is positioned uprightly.

It is believed to be obvious to those skilled in the art that this invention is, for the purpose intended, of such character and construction as enables economical and practical manufacture thereof, while at the same time imparting the highest possible degree of safety in actual use.

A clear understanding of this improved vent plug closure may be had from reference to the following specification and the accompanying drawings forming a part of this application.

Figure 1 is a top plan view showing a fragmentary portion of the container wall, while a fragment of the metal body and shoulder portion is broken away on or about the line 1—1 of Figure 3 showing part of the outer edge of the venting disk and a part of one of the sealing gasket members.

Figure 2 is a bottom plan view of the device shown in Figure 1, but without the wall portion and the internally threaded collar member of the container; and,

Figure 3 is a sectional view taken centrally through the device, and showing the same removably mounted in sealing engagement with the usual collar member and acid resistant sealing washer of the container, a part of the wall section of the container also being shown.

Referring in detail to the drawings and first with reference to Figures 1 and 3 there is shown the vent plug assembly in which is contained the porous venting portion enabling release there-through of gases resulting from pressure built up within a container, which, for the instant

provision is a metal drum type container, the wall of which is designated generally by the numeral 10 having the flanged aperture 10a adapted for fixed crimped engagement therein of the internally threaded collar member 11 encasing the acid resistant sealing ring 11a, and while the collar member 11 with its sealing ring 11a is illustrated for the purpose of more clearly defining the actual use of the invention, these last named parts are not, however, any part of the invention.

Fitting in removable and threadable engagement with said collar member 11 is the improved vent plug closure 12 having the flange portion 13 extending outwardly circumferentially from the upper part of the externally threaded body portion 14, the threads 15 of which engage the corresponding threads in the said collar member 11. Between the underside of the flange portion 13 and the upper face of the collar member 11 is imposed the acid resistant sealing washer 16 which functions to thoroughly seal the juncture of the device 12 and the collar member 11 in use on said drum type container.

The lower part of the body portion 14 is formed in the depending circular sleeve-like portion 17 which is of somewhat narrower diameter than that of the threads 15, and serves the twofold purpose of a baffle means for minimizing the splashing of acid against the porous venting disk portion 18—which will be later explained—and, as a means for threadably and removably engaging the hollow lock member 20.

Axially through the vent plug closure assembly 12 is the outlet port 19 in axial alignment with the inverted well opening 21 which is of substantially larger diameter than said port 19 and is adapted to seat the sealing gasket 22 against the shoulder 19a while said gasket 22 engages the periphery of the top of the venting disk 18 and the gasket 23 engages the periphery of the bottom of the venting disk 18, and it will be evident from reference to Figure 3 that the gasket 22, the vent disk 18 and the gasket 23 are interposed between said shoulder 19a and the annular upper face 20a of the lock member 20 and are thus held in acid-tight connection by means of the threads 20b externally on the lock member 20 engaging the corresponding threads 21a internally on and part way up into said bore opening 21.

The venting disk 18 comprises substantially a solid, though porous embodiment of the hereinbefore mentioned material and possesses the capacity for enabling the escape therethrough of gases under interior pressure as then explained.

The venting disk 18 thus positioned and engaged has produced an effective and safe means for providing against the damage and destruction of the containers and their acid contents, as well as preventing property damage in storing and shipping such material.

It is here noted that so far as the present invention is concerned, the venting disk 18 itself may be of different precise carbon, carborundum or other suitable venting materials and of various density with respect to its enabling the passage of gases therethrough, but, in any case, the invention is characterized by the safety factor resident in its control of said acid produced gases as mentioned. It is noted too, that the sealing gaskets 22 and 23 may be made from lead or other suitable acid resistant sealing material.

The oppositely positioned notches 20c in the

lock member 20 provide means for the engagement therewith of a torque wrench to effect the acid-tight engagement of the parts assembled interiorly of the device.

Normally, with the plug closure 12 removed from the acid container, the container is filled as desired and it is then necessary only to screw the assembled unit comprising this invention into the collar member 11 of the container and tighten it against the sealing washer member 16, thus rendering the container safe for either storage or shipping in sustained temperatures which have heretofore resulted in costly damage and loss.

Though the illustrated provision and structure is a practical exemplification of the invention, it is not a limitation, as modification and change are contemplated within the scope of the claims.

What is claimed is:

1. A vent plug closure for containers comprising in combination a circularly formed body member, a flange extending outwardly circumferentially from the top of said body member, thread means exteriorly on said body member for engaging corresponding thread means in a container for liquids, a circularly formed baffle portion on said body member and depending from the bottom of said body member to minimize the splashing of liquids into the bottom of the body member, an outlet port axially in the top face of the body member, a well opening of substantially larger diameter than the outlet port and communicating therewith, an annular shoulder formed by and at the juncture of said outlet port and said well opening, a sealing gasket member in engagement with said annular shoulder, a substantially flat, round porous venting disk member in engagement with said sealing gasket member, a second sealing gasket member in engagement with and beneath said venting disk, thread means within said well opening, a cylindrically formed locking member, thread means externally on said locking member to enable its engagement with said thread means in the well opening and in turn enable said locking member to impinge in liquid-tight engagement the said two sealing gasket members and porous venting disk member against said annular shoulder and within said body portion, and a pair of oppositely disposed notches in the lower edge of said locking member to enable engagement of a torque wrench.

2. A vent plug closure as called for in claim 1, wherein a flat type sealing washer is adapted for superimposed engagement between the flanged portion on said vent plug closure and the collar member in the container for liquids.

3. A vent plug closure for containers comprising in combination a flange body member and a substantially rounded porous venting member mounted therein, threaded means externally of said body member for engaging with a correspondingly threaded collar member in a container for liquids, a circular splash baffle extending from said flange body member below said thread means and said venting member, an outlet port axially in the upper surface of said body member, a well opening in said body member in axial alignment with and of substantially larger diameter than said outlet port and communicating therewith, a circular shoulder formed at the junction of said outlet port and said well opening, a sealing gasket member interposed between said porous venting member and said circular shoulder and an externally threaded locking member engaging corresponding threads in said

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well opening to impinge the said sealing gasket member and said porous venting member in liquid-tight engagement with said shoulder in said body member.

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