April 21, 1953 H. L. BERING ET AL 2,635,784

VENT PLUG CLOSURE

Filed May 11, 1950

Fig. 1

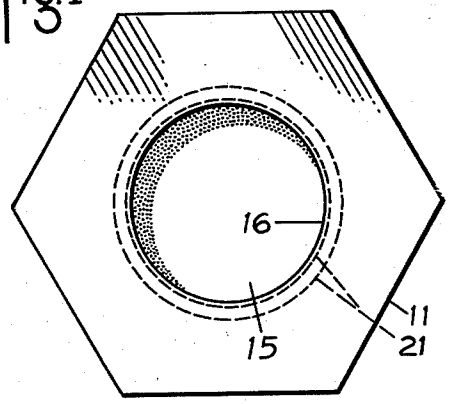


Fig. 2

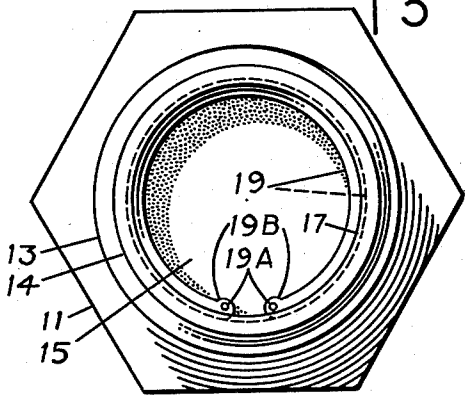


Fig. 3

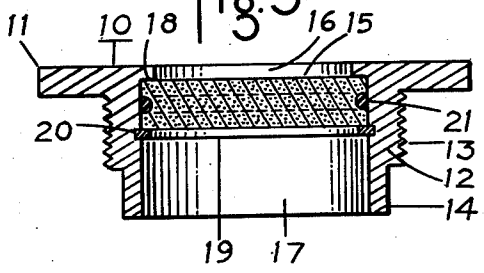


Fig. 6

Fig. 5

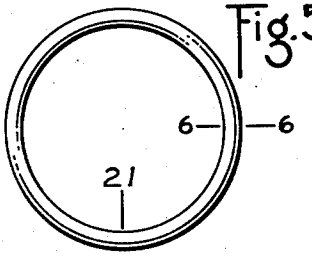


Fig. 7

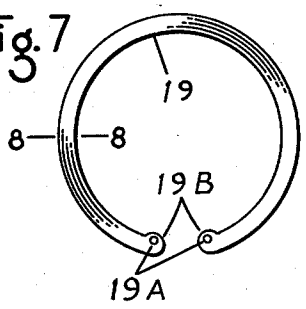


Fig. 8

Fig. 4



HORACE L. BERING
THOMAS P. CALLAHAN
INVENTOR.

BY G. Lorenz Miller
ATTORNEY

Patented Apr. 21, 1953 2,635,784

UNITED STATES PATENT OFFICE

2,635,784

VENT PLUG CLOSURE

Horace L. Bering, Decatur, Ill., and Thomas P. Callahan, Springfield, Mass.

Application May 11, 1950, Serial No. 161,406

1 Claim. (Cl. 220—44)

1

This invention relates to vent plug closures of the type used in steel containers for shipping acids such as sulphuric acid, nitric acid, and the like, and has for its main object the elimination of hazards attending the leakage and destruction of acids in the shipping and storage of the same, over long distances and periods of time, particularly in high temperatures.

In containers for the shipment of acids, substantial pressure is built up within the containers due to gases formed by the acid contents, and unless such pressure is relieved there exists a constant hazard, in that improperly vented containers often leak acid, and under certain temperatures will explode, thus rendering the handling thereof by the workmen extremely dangerous.

This invention contrives to accomplish the safe and practical venting of containers for shipping acids, while at the same time insuring against leakage of acids both in transit and in storage.

It is here pointed out that although this application sets forth a venting disc of similar character to that covered in a previous application bearing Serial No. 152,592, filed in the United States Patent Office on March 29, 1950, still the porous venting disc of the instant application is of different and improved character, its use being effected by but one acid resistant sealing ring positioned in co-operative unitary assembly with the venting disc.

The peculiar structure and arrangement of parts embodied in this invention disclose a principle not heretofore used, and further novelty will appear from reference to the following specification and the accompanying drawings in which:

Figure 1 is a top plan view, the dotted lines indicating the sealing gasket shown in Figure 5.

Figure 2 is a bottom plan view, the dotted line indicating the annularly disposed square groove adapted for seating the retainer ring shown in Figure 8.

Figure 3 is a sectional view taken centrally through the invention from corner to corner of the hexagon.

Figure 4 is an elevational view of the porous vent plug showing especially the annular groove adapted to engage the sealing gasket shown in Figure 5.

Figure 5 is a plan view showing the sealing gasket.

Figure 6 is a sectional view taken on the line 6—6 of Figure 5.

Figure 7 is a plan view showing the retainer ring, and,

2

Figure 8 is a sectional view taken on the line 8—8 of Figure 7.

Referring in detail to the drawings and having reference first to Figure 3 the vent plug closure 10 has the flanged portion 11 surrounding the upper part of the externally threaded body portion 12, the threads 13 thereof being adapted for engagement with corresponding threads provided in known drum type containers for acid.

The depending circularly formed sleeve portion 14 below said threads 13 is of substantially narrower diameter than said sleeve portion and provides baffle means for shielding the porous venting disc 15 from splashing acid when the container is in motion, as, for example, when the same is being transported.

The outlet port 16 opens out from the inverted well opening 17 which is of somewhat larger diameter than the outlet port 16 in order to provide the annular seat 18 for the purpose of seating the top periphery of the venting disc 15, held in such seated engagement by the retainer ring 19 removably engaging the annularly disposed square groove 20 in the well opening 17.

The retainer ring 19, thus positioned, engages the bottom periphery of the venting disc 15, and so functions to retain the venting disc in proper position as illustrated.

Now, in inserting the venting disc 15 into position in the well opening 17, the sealing gasket 21 is first placed in the annularly disposed round groove 22 of said disc, and, as the gasket 21 is made of flexible, acid resistant material—neoprene, for example—it enables the disc 15 with the gasket 21 positioned thereon as described, to be pressed into the well opening 17 and into the position shown in Figure 3, in which position the gasket 21 is compressed radially outwardly against the surrounding wall surface of the well opening 17 to effect a complete acid-tight seal against any escape of acid, either by seepage or capillary action.

Then, the retainer ring 19 is positioned to engage the square groove 20 by means of applying a suitable torc wrench to insertably engage the two apertures 19A in the opposing ends 19B to draw said ends 19B together, thus reducing the diameter of the ring 19 so that it can then be placed in register with the groove 20 in the well opening 17, the wrench hold released from said apertures 19A, thereby allowing the ring 19 to expand to its normal diameter to engage the groove 20 and keep the position of the disc 15 for the practical application and use of the invention.

It will appear obvious to those skilled in the

art that the sealing capacity of the porous vent disc of this invention is dependent on and effected by its unitary assembly with the flexible sealing gasket 21 only, in compressed contact with the annular wall of the well opening 17, and that no other member or part of the device effects the sealing capacity thereof nor is necessary thereto, the retaining ring 19 simply serving to keep the said porous venting disc 15 and its sealing gasket 21 from dislodgement, which might result from extreme vibration or jolting in the handling or transporting of the containers in which this invention is mounted.

Of course, the porous venting disc of the present type may be of different carbon, Carborundum or similar materials suitable for the purpose, and may also be varied as to density depending on the type of acids carried in the containers and, too, with respect to the venting of various types and volumes of gases therethrough.

It is here noted that modification and change may be made within the scope of the appended claims, and that the illustrated provision and structure do not constitute a limitation.

What is claimed is:

A vent plug closure as herein described comprising in combination a substantially cylindrically shaped and flanged body portion having thread means exteriorly thereon for removably engaging corresponding thread means in a container for acids, a flat round pre-shaped and relatively shallow brittle porous venting member having an annularly disposed groove adapted for removable engagement with the body portion, a flexible sealing ring mounted in said annular groove and adapted for compressed engagement with the inner wall of said cylindrically shaped body portion, an annular groove in said body portion, a retaining ring adapted for fixed though removable engagement with said annular groove, a skirt portion integral with and depending below said body portion that surrounds the venting member.

HORACE L. BERING.
THOMAS P. CALLAHAN.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
196,042	Robertshaw	Oct. 9, 1877
1,190,654	Kammerhoff	July 11, 1916
1,275,441	Johnston	Aug. 13, 1918
1,275,598	Probst	Aug. 13, 1918
1,476,300	Larson	Dec. 4, 1923
1,683,338	Evinrude	Sept. 4, 1928
1,940,601	McCrery et al.	Dec. 19, 1933
2,055,602	Dodge	Sept. 29, 1936
2,095,460	Swords	Dec. 12, 1937
2,244,395	Hill	June 3, 1941
2,298,938	Griffin	Oct. 13, 1942
2,314,330	Eshbaugh et al.	Mar. 23, 1943
2,366,428	Scott	Jan. 2, 1945
2,423,173	Brady et al.	July 1, 1947
2,492,006	Raybould	Dec. 20, 1949
2,496,883	McKalip	Feb. 7, 1950

FOREIGN PATENTS

Number	Country	Date
324,418	Great Britain	Jan. 30, 1930
507,941	Great Britain	June 23, 1939