W. H. McNUTT.

NON-EXPLOSIVE CLOSURE AND SPOUT.

APPLICATION FILED MAY 11, 1907. RENEWED SEPT. 18, 1908.

929,974. Patented Aug. 3, 1909.

Fig. 4.

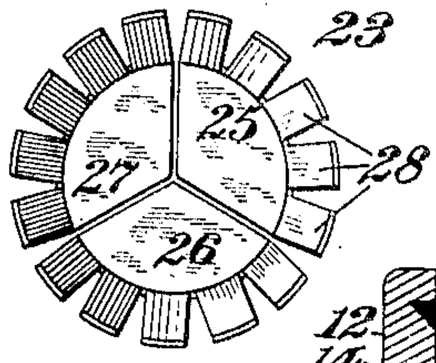


Fig. 1.

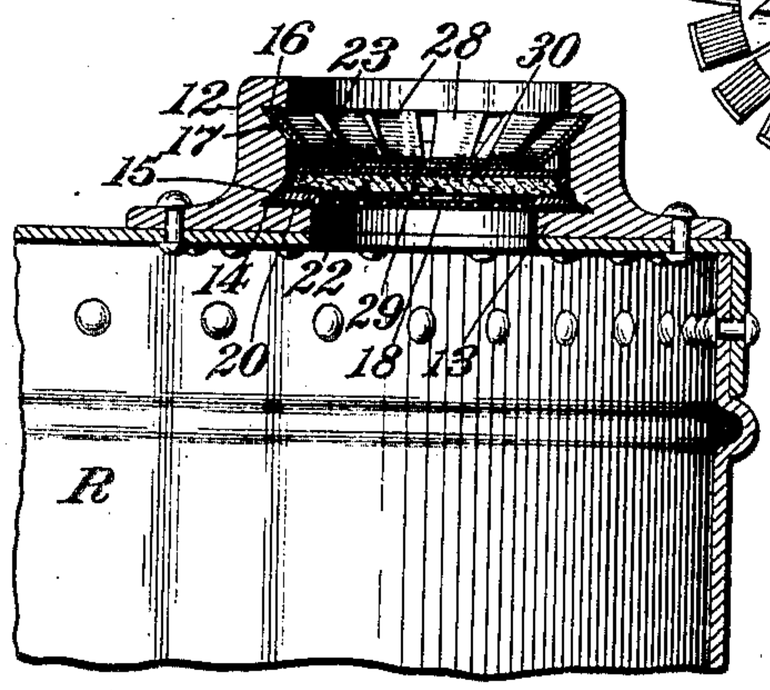


Fig. 2.

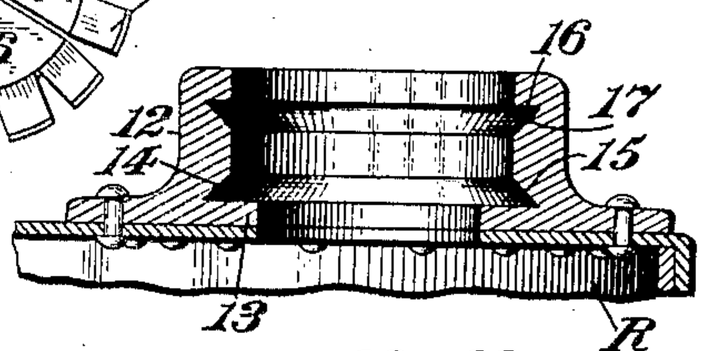


Fig. 3.

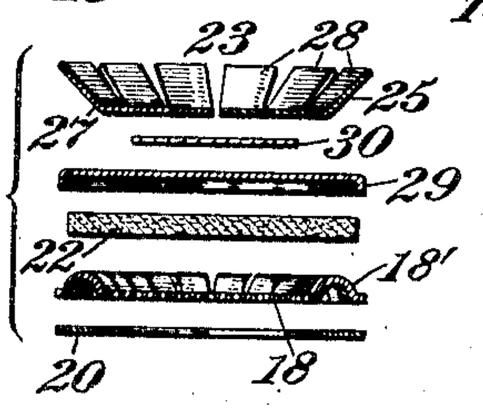


Fig. 8.

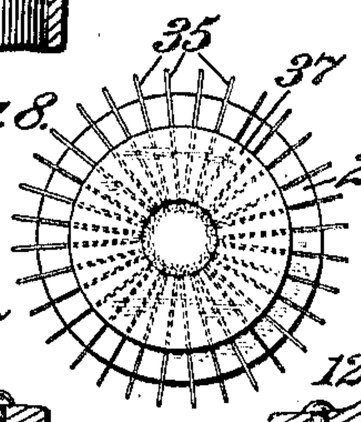


Fig. 6.

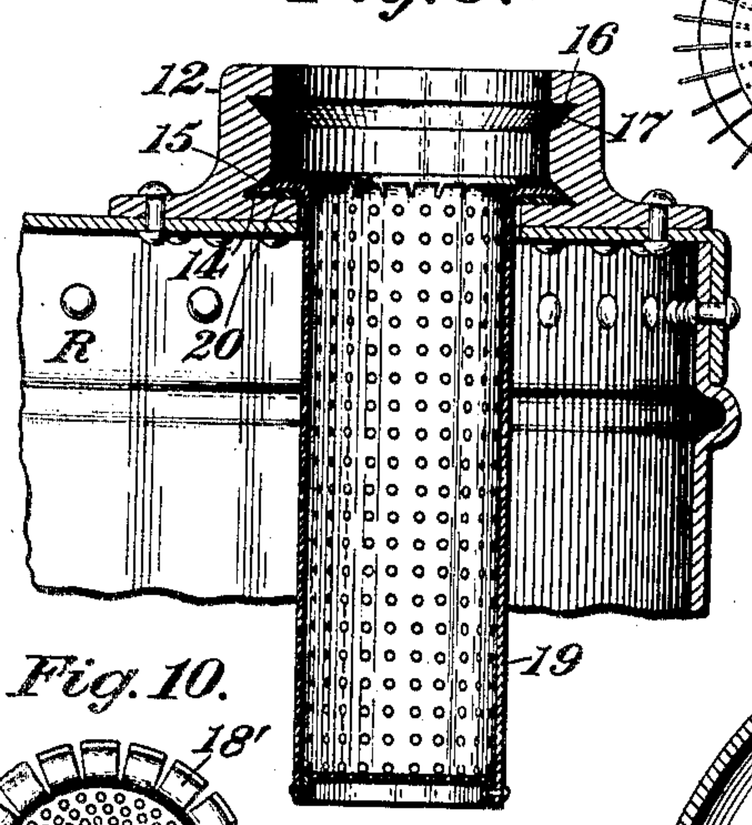


Fig. 5.

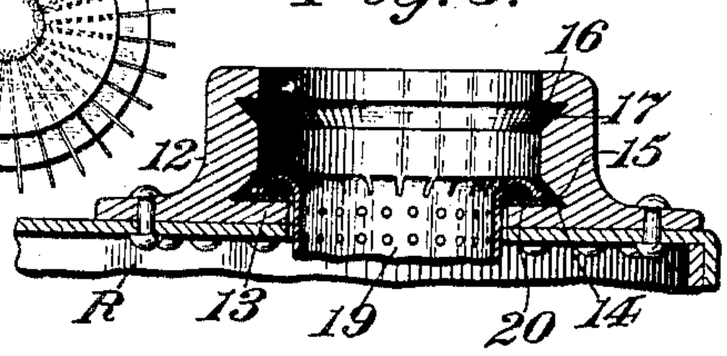


Fig. 7.

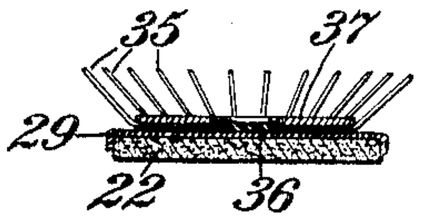


Fig. 9.

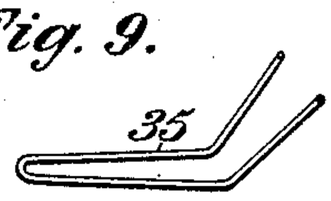


Fig. 10.

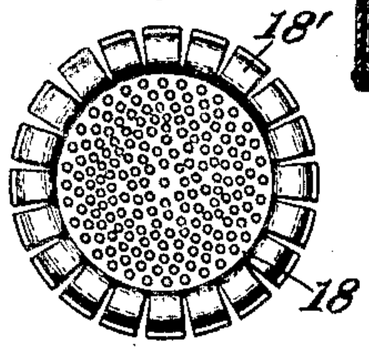
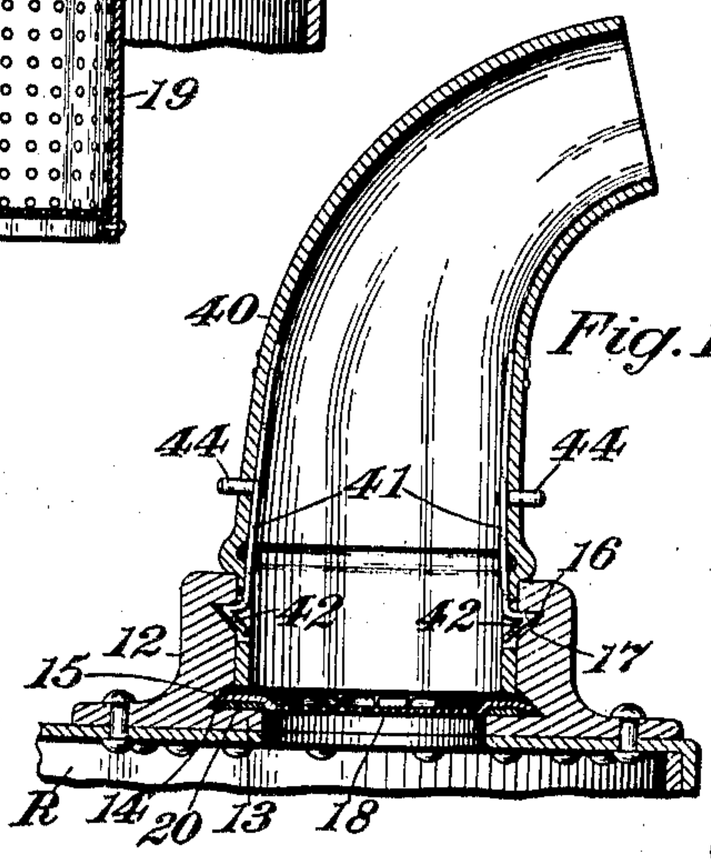


Fig. 11.



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UNITED STATES PATENT OFFICE.

WILLIAM H. McNUTT, OF NEW YORK, N. Y.

NON-EXPLOSIVE CLOSURE AND SPOUT.

No. 929,974. Specification of Letters Patent. Patented Aug. 3, 1909.

Application filed May 11, 1907, Serial No. 373,086. Renewed September 18, 1908. Serial No. 453,670.

To all whom it may concern:

Be it known that I, WILLIAM H. McNUTT, a citizen of the United States, residing in New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Non-Explosive Closures and Spouts, of which the following is a specification.

This invention relates to closures for receptacles, especially designed for use with volatile or inflammable liquids, such as gasolene and similar hydro-carbons of a highly inflammable nature.

One of the objects of the invention is to provide an improved closure that can be readily applied without the use of special tools, by merely pressing certain parts in position, and then locking them by means of a soldering iron; whereby the abnormal elevation of temperature will melt the solder and permit certain parts to blow out, while other parts of a perforated character will permit escape of the confined gas, yet prevent back-firing into the receptacle.

A further object of the invention is to provide in such a device a form of pouring spout that can be readily connected when the fusible member is removed, which can be easily accomplished by applying a soldering iron to the fusible retainer.

In the accompanying drawings, illustrating embodiments of my invention Figure 1 shows in section the upper portion of the receptacle with the closure applied thereto and the various parts in position. Fig. 2 shows in section the closure member before the application of the several closing parts. Fig. 3 shows in section the several closure parts in consecutive position in which they are inserted. Fig. 4 shows in plan a segmental fusible member. Fig. 5 shows the diaphragm member in the act of being inserted in the sleeve. Fig. 6 shows the succeeding stage, with the diaphragm member locked in position. Fig. 7 shows a modified form of fusible member. Fig. 8 is a plan view of Fig. 7. Fig. 9 shows one of the elements of the member shown in Fig. 8. Fig. 10 is a plan view of the diaphragm member shown in Figs. 1 and 3; and Fig. 11 shows the pouring spout in position in the sleeve.

The closure comprises a sleeve member 12 secured to the receptacle R in any suitable manner, as by rivets. The sleeve is shown as provided with an abutment in the form of an internal flange 13 at the inner end of its bore, and with a groove 14 in its bore adjacent the flange which groove has an inclined wall 15 as shown. At the upper part of the sleeve is a groove 16 having an inclined wall 17.

The sleeve has its lower end protected by a suitable diaphragm member, that may comprise a disk 18 containing minute openings or perforations, and having its marginal portion 18′ formed bowed as shown in Fig. 3. The diameter of the diaphragm is not greater than the bore of the sleeve so that it may be inserted from the top to rest on the flange in the manner illustrated in Fig. 5. But in Figs. 5 and 6, the diaphragm member is in the form of a perforated tube 19 with its lower end closed. A suitable washer 20 is preferably placed between the flange 13 of the sleeve and the flange of the diaphragm member. Thereupon the flange is spread out flat as indicated in Figs. 1 and 5, that can be readily done by a suitable plunger or plug. This will cause the edge of the diaphragm flange to enter the groove 14 in the sleeve and securely lock the diaphragm in position. If preferred the flange portion of the diaphragm, in either construction, may have radial incisions forming tongues, as indicated in Fig. 10. A suitable closure member is next placed upon the diaphragm member, and is shown in the form of a disk 22 that is preferably formed of a non-metallic material, such as fiber. A fusible member is locked in the bore to retain the closure disk 22 in position, and in one form is shown as comprising a segmental member 23, shown separately in Fig. 4 as comprising three sector shaped segments 25, 26 and 27. This member is provided with a flaring periphery that may be composed of tongues 28. Suitable fusible means are provided for locking these segments together so that the cup-shaped member can be pressed down on top of the closure and the tongues will spring outwardly into the groove 16 and lock it and the closure in position. In the arrangement shown, a disk 29 of metal is placed over the closure 22, and then a thin disk of solder 30 is placed on the metal disk, and then the three-part segmental piece 23 is placed on top of the solder plate with the tongues projecting into the groove in the sleeve. Next, a hot iron, such as a soldering iron, is placed on the segmental member, causing the solder

plate to melt and secure the three segments to the metal plate 29. When set, the segmental plate will be rigidly connected with the disk 29 and locked in position. The tongues projecting into the groove will securely retain the closure in position at normal temperature. But upon elevation of temperature, as by a fire occurring that would generate gas in the receptacle, the solder will melt, and the pressure of the confined gas will blow out the closure and the segmental member, when the vapor can escape through the diaphragm disk member, or diaphragm tubular member. But the latter member will prevent any back-fire of the flame in the receptacle the diaphragm member being securely locked in the sleeve.

A modified form of locking member is shown in Figs. 7, 8 and 9, in which a series of bent wire members 35 are placed radially on a disk of solder 36, that is laid on the metal disk 29. Then a flat ring of metal 37 is placed on the wires, and a soldering iron applied thereto. This will cause the solder disk to melt and permit the adjacent portions of the wires to be soldered between the plate 29 and the ring 37. The extremities of the wires project conically and can be pressed into the groove 16 in the same manner that the tongues of the segmental member 23 operate. The solder will melt upon a fire occurring, loosening the wires and permitting the closure to blow out.

When it is desired to move the closure it is only necessary to apply a soldering iron to loosen the segmental member, when the closure can be removed.

To facilitate the pouring out through the sleeve, a spout member 40 is provided of a size to snugly fit in the bore of the sleeve. The spout is provided with spring members 41 having lugs 42 that enter the groove 16 in the sleeve, and thereby lock the spout in position. The spout can be removed by pins 44 projecting from the spring members 41.

Having thus described my invention, I claim:

1. In a closure for receptacles, a sleeve member having an internal flange at one end of its bore, and having a groove in its bore adjacent the other end, a diaphragm member having minute openings and having a flange portion engaging said flange of the sleeve, a closure member located between the diaphragm member and the segmental member, and a segmental circular member located in the sleeve and connected with the closure member, the segmental member engaging the walls of said groove by its margins, the segmental member having its segments united by fusible means to retain the members in position at normal temperature, whereby the segmental member will be loosened by heat, permitting escape of the closure member from internal pressure in the vessel.

2. A closure for receptacles comprising a sleeve member having a flange portion at the inner end of its bore, a diaphragm member secured in the bore at the flange portion and having minute openings therein, the bore of the sleeve having an internal groove, a closure member located on the diaphragm member, a segmental circular member having its segments rigidly connected by fusible means with its peripheral portions projecting into said groove and engaging the closure member whereby the two members are normally locked in position, but upon elevation of temperature, the fusible means will loosen the segmental portions permitting internal pressure to blow out the closure member and segmental member.

3. A closure for receptacles comprising a sleeve member having a flange portion at the inner end of its bore, a diaphragm member secured in the bore at the flange portion and having minute openings therein, the bore of the sleeve having an internal groove, a closure member located on the diaphragm member, a segmental member having its segments rigidly connected by fusible means with its peripheral portions projecting into said groove and engaging the closure member whereby the two members are normally locked in position, but upon elevation of temperature, the fusible means will loosen the segmental portions permitting internal pressure to blow out the closure member and segmental member, and a spout member fitting into the bore of the sleeve and provided with spring lugs projecting outwardly to engage in the said groove in said sleeve bore, to lock the spout member in position therein.

4. A closure for receptacles comprising a sleeve member having an internal flange at the inner end of its bore, the bore having an internal groove adjacent the flange and also having an internal groove near its other end portion, a diaphragm member having minute openings therein, and having a flange that is grooved to permit the diaphragm to be inserted in the bore and to have the flange extended into the groove by flattening thereof, a closure member on the diaphragm member, and a segmental member having sector shaped segments and a flaring rim, the segmental member being placed on the closure member with its rim portions projecting into said groove, the sector segments being connected by the solder normally locking the closure in position to close the diaphragm, but permitting the closure member to blow out upon elevation of temperature melting the solder and loosening of the parts of the segmental member.

5. A closure for receptacles comprising a sleeve member having an internal flange at the inner end of its bore and a groove in its bore adjacent the flange, the sleeve also hav-

ing a groove in its bore in proximity to the other end, a perforated diaphragm having a flange engaging the flange of the sleeve and projecting into the adjacent groove to lock the diaphragm in position, a closure disk placed on the diaphragm marginal portion and closing the bore, a metal disk placed on the closure member, a segmental member having sector shaped segments and a flaring rim formed of a series of tongues projecting into said second groove, the segmental member being united to the metal disk by solder, the sleeve having a lower wall of its upper groove inclined to permit the segmental member to lock the closure against the diaphragm at normal temperatures, whereby the solder will melt upon elevation of temperature loosening the said sectors and permitting the closure and segmental member to blow out from internal pressure in the receptacle.

6. In a closure for receptacles, a sleeve member having a groove in its bore, a closure member located in the sleeve bore, and a segmental member in the bore engaging the closure member and having its segments united by fusible means, the segmental member having peripheral portions projecting into said groove whereby the said two members are normally locked in the closure, but upon elevation of temperature the fusible means will loosen the segmental portions permitting internal pressure to blow out the said two members.

7. A closure for receptacles, comprising a sleeve member having a groove in its bore, a closure member in the sleeve bore, and a segmental member having sector shaped segments and engaging the closure member, the segmental member having a flaring rim projecting into the groove in the sleeve, the sector segments being connected by solder normally locking the closure in position but permitting the closure member to blow out upon elevation of temperature melting the solder and loosening the parts of the segmental member.

8. In a closure for receptacles, a sleeve member having a groove in its bore, a closure member located in the sleeve bore, and a segmental member in the bore engaging the closure member and having its segments united by fusible means, the segmental member having peripheral portions projecting into said groove whereby the said two members are normally locked in the closure but upon elevation of temperature the fusible means will loosen the segmental portions permitting internal pressure to blow out the said two members, and an apertured diaphragm member located in the sleeve inside of said members.

9. A closure for receptacles, comprising a sleeve member having a groove in its bore, a closure member in the sleeve bore, and a segmental member having sector shaped segments and engaging the closure member, the segmental member having a flaring rim projecting into the groove in the sleeve, the sector segments being connected by solder normally locking the closure in position but permitting the closure member to blow out upon elevation of temperature melting the solder and loosening the parts of the segmental member, and an apertured diaphragm member located in the sleeve inside of said members.

10. A closure for receptacles, comprising a sleeve member having an abutment in its bore, a closure member in the sleeve bore above the abutment, and a segmental member having sector shaped segments engaging the wall of the sleeve bore, the sector segments being connected by solder normally locking the closure in position but permitting the closure member to blow out upon elevation of temperature melting the solder and loosening the parts of the segmental member.

11. A closure for receptacles, comprising a sleeve member having an abutment in its bore, a closure member in the sleeve bore above the abutment, and a segmental member having sector shaped segments engaging the wall of the sleeve bore, the sector segments being connected by solder normally locking the closure in position but permitting the closure member to blow out upon elevation of temperature melting the solder and loosening the parts of the segmental member, and a finely apertured diaphragm secured in the sleeve below the closure member.

12. A closure for receptacles, comprising a sleeve member having an abutment in its bore, a closure member in the sleeve bore above the abutment, a segmental member having sector shaped segments engaging the wall of the sleeve bore, the sector segments being connected by solder normally locking the closure in position but permitting the closure member to blow out upon elevation of temperature melting the solder and loosening the parts of the segmental member, and a finely apertured diaphragm member having a flange secured between said abutment and the closure member.

13. A closure for receptacles comprising a sleeve member having an internal flange at the inner end of its bore, the bore having an internal groove adjacent the flange and also having an internal groove near its outer end portion, a diaphragm member having minute openings therein, and having a flange extended into the groove, a closure member above the diaphragm member, and a segmental member having sector shaped segments, the segmental member being placed on the closure member and projecting into said outer groove, the sector segments being connected by the solder normally locking the closure in position to close the bore, but per-

mitting the closure member to blow out upon elevation of temperature melting the solder and loosening of the parts of the segmental member.

14. A closure for receptacles comprising a sleeve member having an internal flange at the inner end of its bore and a groove in its bore adjacent the flange, the sleeve also having a groove in its bore in proximity to the outer end, a perforated diaphragm having a flange engaging the flange of the sleeve and projecting into the adjacent groove to lock the diaphragm in position, a closure disk placed on the diaphragm and closing the bore, a metal disk placed on the closure member, a segmental member having sector shaped segments and a flaring rim formed of a series of tongues projecting into said second groove, the segmental member being united to the metal disk by solder to lock the closure at normal temperatures, whereby the solder will melt upon elevation of temperature loosening the said sectors and permitting the closure and segmental member to blow out from internal pressure in the receptacle.

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