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GASOLINE DISPENSING CONTAINER WITH VENTING MEANS RESPONSIVE TO INTERNAL VAPOR PRESSURE

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Fig. 1.

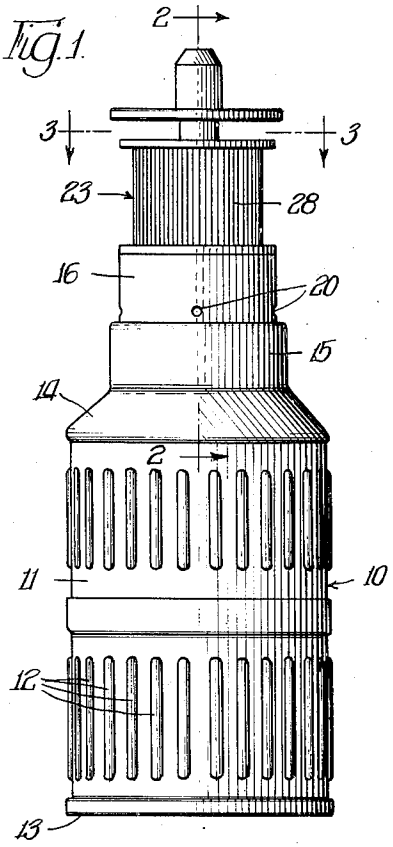


Fig. 2.

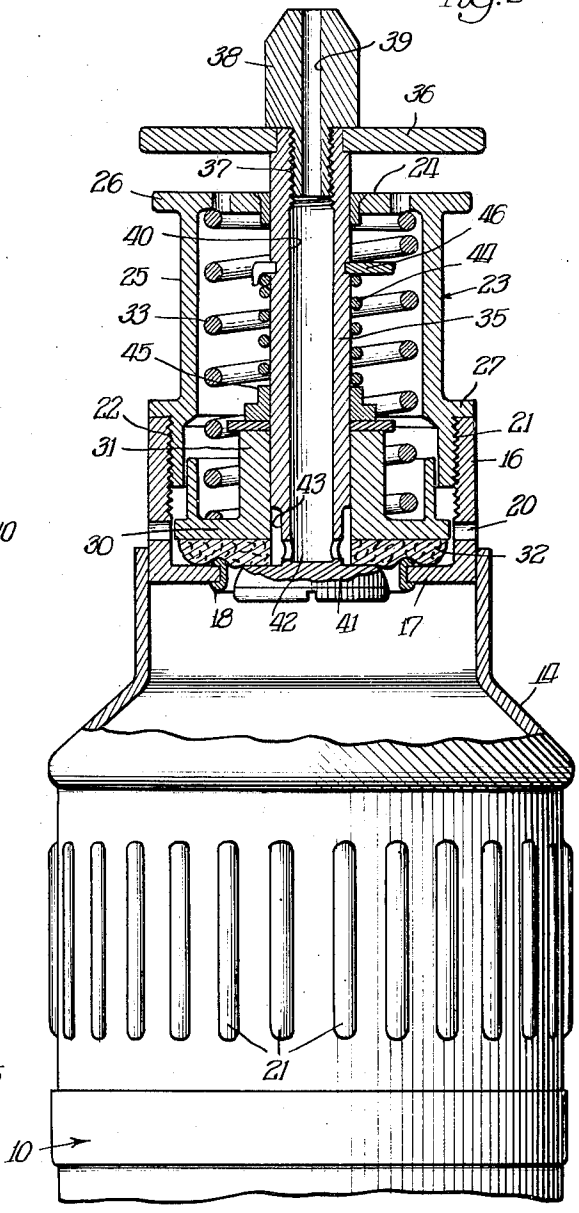
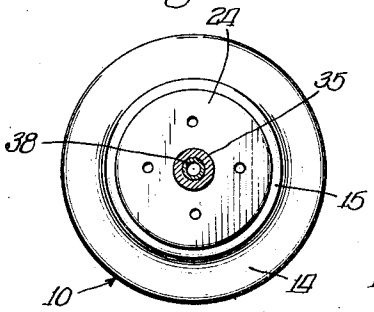


Fig. 3.



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GASOLINE DISPENSING CONTAINER WITH VENTING MEANS RESPONSIVE TO INTERNAL VAPOR PRESSURE

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2 Claims. (Cl. 222—514)

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The invention relates to receptacles for containing highly volatile liquids and has reference in particular to a gasoline safety can having improved nozzle structure for dispensing gasoline in small quantities when manually actuated by the operator and which will additionally vent the volatile vapors upon a predetermined pressure existing within the receptacle and which will be substantially less than the pressure at which an explosion may take place.

Containers for highly volatile inflammable liquids such as gasoline, benzine and the like must be equipped with a safety valve for venting the gaseous vapors from within in order to eliminate the danger of explosion in the event the receptacle and its contents are heated to a high temperature. In Patent No. 2,207,816 granted July 16, 1940, to Charles S. Packer and entitled Receptacle for volatile liquids nozzle structure is disclosed having a dispensing valve for the liquid and an automatically operable safety valve for venting the gaseous vapors to the atmosphere.

An object of the present invention resides in the provision of improvements on the type of nozzle structure shown in said prior patent, and which will be relatively simple in construction and economical to manufacture.

A more specific object resides in the provision of a dispensing container for gasoline and other volatile liquids which will incorporate nozzle structure of the type approved by the fire underwriters, and wherein said nozzle structure will dispense the liquid through a certain passage when actuated by the operator, and which will automatically vent the volatile vapors from within the container through other passages when a predetermined pressure exists within the container.

Another object of the invention is to provide nozzle structure for a dispensing container having central valve means in concentric relation with outer valve means, and wherein said outer valve means provides an automatic release for the gaseous vapors and the inner valve means provides a manually actuated release for the liquid.

Another object of the invention resides in the provision of nozzle structure having a valve member coacting with a valve seat provided by the container and which nozzle structure will contain in itself additional valve means for controlling flow of the liquid from the container.

Another object of the invention is to provide nozzle structure of the character described which

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will include the valve means aforesaid and wherein the nozzle structure as a unit may be readily removed from the container for filling the same, the said container upon removal of the nozzle structure providing a relatively wide passage for facilitating the filling operation.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings which illustrate an embodiment of the invention, and wherein like reference characters are used to designate like parts:

Figure 1 is an elevational view of a gasoline dispensing container embodying the improved nozzle structure of the invention;

Figure 2 is a sectional view taken substantially along line 2—2 of Figure 1 showing the construction of the nozzle in detail; and

Figure 3 is a horizontal sectional view taken substantially along line 3—3 of Figure 1.

The container identified by numeral 10 may comprise any suitable receptacle, preferably of metal, for containing a volatile liquid. The cylindrical wall 11 of the container may have vertical projections 12 formed therein to facilitate handling of the container and which may also add to its decorative appearance. A bottom 13 is suitably secured to the cylindrical wall 11 in any preferred manner as by having the said bottom wall around its periphery flanged or beaded over the said cylindrical wall 11. The upper part of the container is tapered at 14, forming the reduced neck 15 which receives the metal collar 16, the same being hermetically secured thereto as by soldering or welding. The collar 16 provides an inwardly directed annular valve seat 17 which is accordingly located interiorly of the top open end of the container. The valve seat 17 receives the ring 18 which extends around the inside peripheral edge of said valve seat, thereby forming a circular protuberance on the upper surface of the valve seat, the utility of which will be presently described. The collar 16 additionally provides a plurality of vent openings 20 located in spaced relation around the said collar adjacent the connection of the collar with portion 15 of the container. The gaseous vapors from within the container are vented to the atmosphere through said openings 20.

The inside surface of said collar 16 above openings 20 is threaded as at 21 for receiving the

threaded lower end 22 of the body member identified in its entirety by numeral 23. Said body member has an open lower end and a top wall 24 for closing the upper end. Said top wall 24 extends beyond the cylindrical wall 25 of the body member to form an outwardly extending flange 26. A similar flange 27 is formed intermediate the body member exteriorly thereof and said flange 27 provides a stop limiting the extent of the threaded securement which the body member may have with said collar member. As shown in Figure 1, the cylindrical wall 25 of said body member may be knurled as at 28.

A valve member 30 has telescoping relation within the open lower end of the body member 23 and said valve member provides a central boss portion 31 which has a central bore extending therethrough. The flat undersurface of valve member 30 functions as a valve seat for which purpose said surface is provided with a washer 32 of leather or other suitable material. As clearly evident from Figure 2 the valve member 30 is in superimposed relation with respect to valve seat 17, the washer 32 forming part of said valve member, having seating relation on said valve seat 17 to form a valve therewith. It will also be observed that the ring 18 which forms a protuberance on the upper surface of said seat has such coacting relation with washer 32 as to hermetically seal the interior of the container upon pressure being applied to valve member 30 in a downward direction. For this purpose the invention provides the compression spring 33, the same being confined between the valve member 30 at one end and the top wall 24 at its other end. The action of said spring 33 is thus downward with respect to the body member 23 and with the body member in fixed relation on the container the valve member 30 and said washer 32 are forced into coacting relation with valve seat 17. The parts 30 and 17 accordingly provide an outer circular valve for venting the gaseous vapors from within the container and which are discharged to the atmosphere through openings 20.

The invention also provides a valve for controlling the flow of liquid from the container. The liquid is dispensed through the dispensing tube 35 which extends through the bore in the boss 31 of the valve member 30 and through the top wall 24 to project a short distance beyond said wall exteriorly of the body member 23. Said projecting end of the dispensing tube 35 is reduced in diameter to receive the actuating disc 36 and said projecting end is interiorly threaded as at 37 to receive the nipple 38 having a central bore 39 in alignment with and forming a continuation of passage 40 provided by the dispensing tube 35. The threaded securement of said nipple through the projecting end of the dispensing tube functions to lock the actuating disc 36 to said tube. The lower end of dispensing tube 35 is provided with valve means 41 adapted to have seating relation on washer 32. Said parts comprise the second valve for controlling the flow of liquid from the container and which is disposed centrally of the valve seat 17 and also valve member 30. The dispensing tube 35 is provided with a transverse passage 42 located immediately above the valve means 41. Diametrically opposed sides of the tube are reduced somewhat in width as at 43 to facilitate flow of liquid into the passage 40 when the dispensing tube is depressed to effect movement of the valve means 41 from its valve seat 32. For depressing said dispensing tube the operator manually actuates the disk 36. Said disc is conveniently located on the projecting end of the tube and the same can be readily depressed when it is desired to dispense liquid from the container.

Normally the dispensing tube 35 is yieldingly biased in an upward direction by coil spring 44, having encircling relation with the dispensing tube and seating at one end on collar 45 supported by boss 31 of the valve member 30 and being confined at its other end by the releasable retaining member 46. The action of coil spring 44 is to force the valve means 41 into contact with valve seat 32. The valve for the liquid is thus closed and only by manually depressing disc 36 can the operator effect opening of said valve. However, when said dispensing tube 35 is depressed to open the valve it will be understood that this action is entirely independent of the outer valve for venting the gaseous vapors from the container. With said outer valve being maintained closed by the compression spring 33 the liquid will be prevented from leaving the container except through the dispensing tube 35 which discharges the liquid at the end of the nipple 38. Of course some of the vapors within the container will be vented at this time along with the liquid. However, should the container be subjected to excessively high temperatures, as in the case of a fire, and with both valves closed, it will be appreciated that enormously high vapor pressures will be generated within the container which will become dangerously explosive if not vented to the atmosphere. The tension exerted by spring 33 is such as to provide for the lifting of valve member 30 upon a predetermined vapor pressure within the container, whereupon the said vapors are vented to the atmosphere through openings 20. This action takes place automatically and independently of the operator who has no control over the action of valve member 30.. When the pressure within the container has been reduced to a safe level, valve member 30 will cause washer 32 to seat on 17, again sealing the interior of the container. The above action will be repeated again if vapors continue to be generated within the container.

The nozzle structure of the invention is extremely compact and of simple construction, embodying substantially conventional or standard parts that can be easily and cheaply manufactured. Also the nozzle structure can be removed from the container as a unit, providing a relatively large opening for filling the container. Although the nozzle structure is removable as a unit from the container, nevertheless in assembled relation said nozzle structure has coacting relation with a part of said container, namely, the valve seat 17, for the purpose of forming a valve for automatically venting the container.

The invention is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings, as various other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In nozzle structure of the character described, a container for a volatile liquid having a top end portion. a collar member fixed to said top end portion and providing a valve seat within said end of the container, said collar member having a plurality of openings in the wall thereof above the valve seat, a cylindrical body member having a top wall and an open lower end, said

cylindrical body member being releasably secured at said open lower end to the collar member above said openings and being concentrically arranged with respect to the valve seat, a valve member located within the cylindrical body member above the valve seat, resilient means maintaining the valve member in contact with the valve seat to form a valve therewith for automatically venting vapors from the container through said openings when a predetermined pressure develops within the container, a liquid dispensing tube extending axially through the valve member and said top wall and being slidable with respect to the valve member, said dispensing tube at its lower end including a head portion adapted to contact the undersurface of the valve member for valve action therewith, and other resilient means yieldingly maintaining said head portion in contact with the valve member, whereby the dispensing tube moves as a unit with the valve member when the same is lifted from its valve seat but is depressible independently of the valve member for

dispensing liquid from the container through the tube.

2. In nozzle structure as defined by claim 1, additionally including a manually operable actuating disc fixed to the end of the dispensing tube projecting beyond the top wall to facilitate actuation thereof for dispensing liquid, and wherein both said resilient means are located within the cylindrical body member and are disposed in concentric relation therewith.

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REFERENCES CITED

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