Feb. 19, 1957 T. R. PRITCHARD 2,781,950

DISPENSING VALVE

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Fig. 1.

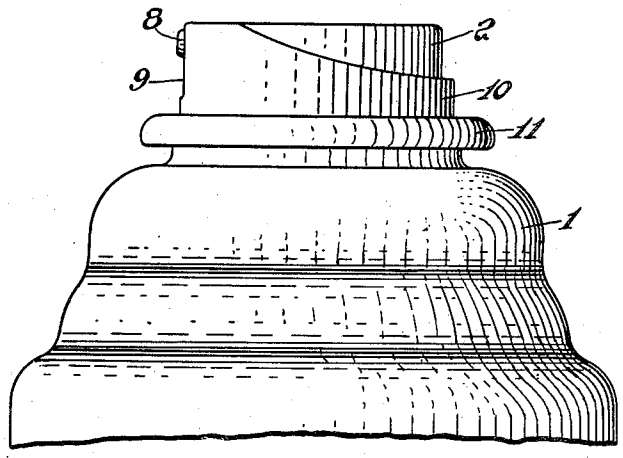
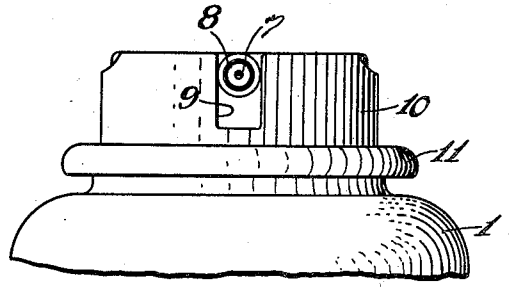


Fig. 2



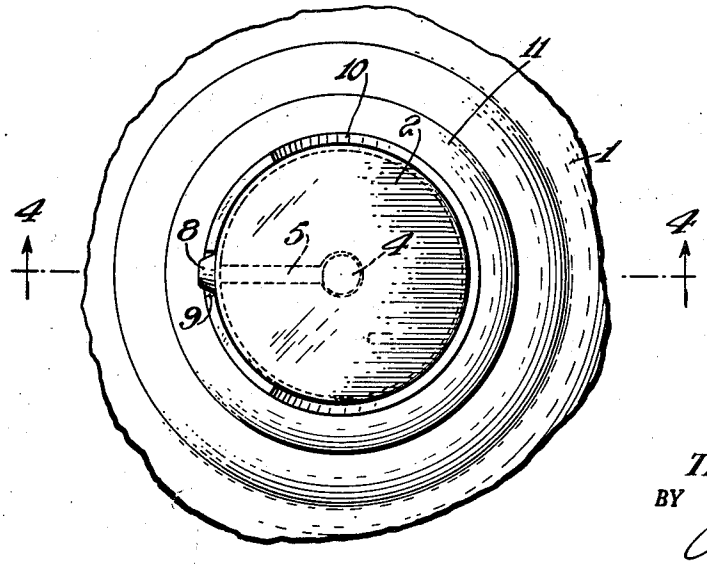


Fig. 3

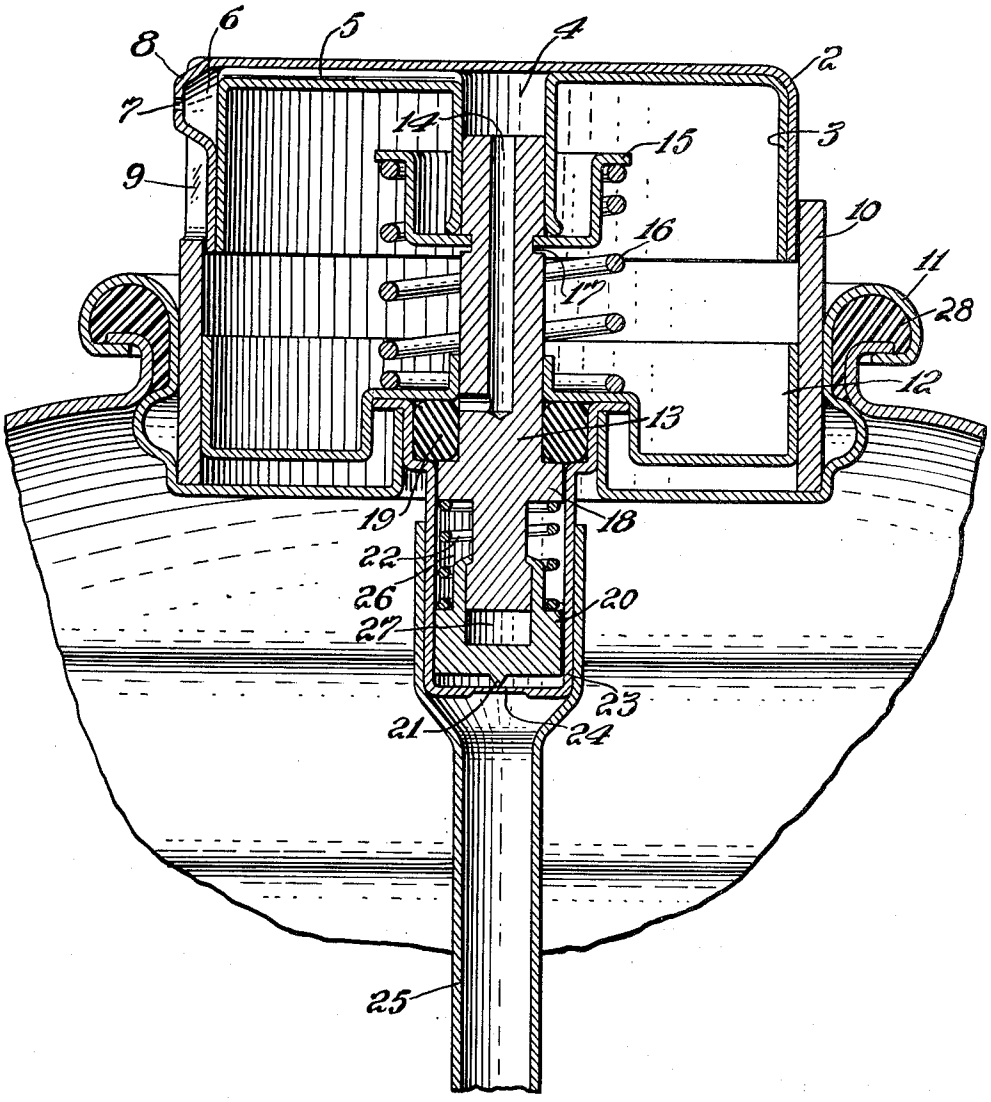
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DISPENSING VALVE

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Fig. 1



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2,781,950

DISPENSING VALVE

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Application January 8, 1953, Serial No. 330,202

1 Claim. (Cl. 222—82)

This invention relates to a dispensing value of the type generally associated with pressure vessels.

The object of this invention is to provide an hermetically sealed closure for pressure vessels until they are readied for use, and thereafter a tight closure operable at the will of the user of the valve. Another object is to provide means within a valve closure for intermittently releasing a measured quantity of material from a container. Still another object is to provide a leakproof closure irrespective of the position in which it may be held or stored.

A further object is to provide an intermittent valve closure suitable for use with containers holding gases or liquids under pressure and from which they are to be released in gaseous or atomized form. It is also an object of the invention to enable simple and economical construction of an intermittent valve closure in which such invention is embodied.

This invention is illustrated in the accompanying drawings in which:

Figure 1 is a side view of a valve closure affixed to the mouth of a pressure vessel, only a fragmentary upper portion of the latter being shown.

Figure 2 is a front view of the closure of Figure 1.

Figure 3 is a top view of the closure of Figure 1.

Figure 4 is a vertical section on the line 4—4 of Figure 3.

Referring to the drawings in which the same number refers to the same or a similar part, the valve closure is shown mounted on, and within, the mouth of container 1. Outwardly, as shown in Figures 1, 2, and 3, there is visible of the valve closure finger piece or button 2 which is vertically slidable in sleeve 10; projection 8, an integral part of button 2 confined and slidable in slot 9 of sleeve 10; and wall 11 by which the valve closure is secured to container 1.

Referring to Figure 4, button 2 is shown having an outer wall and inner wall 3, spaced so that centrally located chamber 4, groove 5, and chamber 6 are formed between them. Opening outward of chamber 6 through projection 8 is outlet port 7. The base of the valve closure is formed with an outer wall 11 and an inner wall 12 between which sleeve 10 is firmly secured. Within this base portion valve plunger 13 is free to slide in the collar formed by inner wall 12. To normally keep button 2 extended, spring retainer 15 seated in groove 17 of plunger 13 bears upon one end of compressible spring 16 which at its other end rests and bears on inner wall 12.

Within plunger 13 there is central passage 14 which opens out upwardly through the top of the plunger into chamber 4 and at its lower end outwardly laterally through the side of the plunger. Plunger 13 has shoulder 18 formed as shown, and, when button 2 is in its normal upwardly extended position, shoulder 18 as well as the side of plunger 13 bears against O ring 19 and thus the lower portion of the plunger is confined within cup 23 and its movement limited therein.

Loosely coupled to plunger 13 at its lower end is extension 20, at the bottom of which piercing point 21 is centrally located. The lower portion of plunger 13 and all of extension 20 is enclosed within a tubular body or cup 23 which is firmly secured at its upper end between walls 11 and 12. Cup 23 is sealed within the upper enlarged portion of siphon 25, the bottom of which is not shown on the drawings.

Directly opposite point 21, cup 23 is provided with a thin area 24 of such thickness that it may be readily pierced by pressing point 21 upon it. Spring 22 bearing against shoulder 18 on one end and on a shoulder formed in extension 20 at the other end, normally urges extension 20 and point 21 against the base of cup 23 separating plunger 13 from its extension by space 27.

Neither the periphery of shoulder 18 or of extension 20 closely fits the inner wall of cup 23, the loose fit being intended to furnish slidable engagement with clearance for the free flow of a fluid under pressure between the opposing surfaces.

The use and operation of this valve closure is as follows.

The valve closure is assembled with siphon 25 and except for crimping of wall 11 appears as in Figure 4 just prior to its application to a container as a closure. It is placed within the mouth of a closure and wall 11 then crimped around such mouth with packing ring 28 to form a seal for contents subsequently to be introduced in the container. Normally, a container to hold fluids under pressure is filled through a filling hole in the bottom of the container and after the container is full this hole is permanently sealed off. With the closure illustrated herein being seated in the mouth of the container the contents will then be completely contained and secure against leakage.

When use is to be made of the container contents, button 2 is pressed downward against the resistance of spring 16, carrying with it plunger 13, which, when it almost reaches the end of its stroke will close space 27 and bear on extension 20 causing point 21 to pierce area 24 of cup 23. Releasing button 2 will restore plunger 13 to the position shown in Figure 4 and at the same time, through the opening made in area 24, the contained fluid under pressure in container 1 will pass upward through the siphon 25 lifting extension 20 upward against the yielding resistance of spring 22 thus permitting the fluid to fill chamber 26 in cup 23. The valve closure is now ready for use. The next complete downward movement of button 2 will connect chamber 26 with passage 14, chamber 4, groove 5, chamber 6 and outlet port 7. During this process of escape, plunger 13 will hold point 21 in the hole it has made in area 24, preventing the escape of fluid from container 1 while the plunger is depressed thus limiting the discharge to only such fluid as is present in chamber 26. Release of button 2 will again cut off chamber 26 from outlet port 7 and permit fluid from the container to fill chamber 26 in readiness for another release cycle.

O ring 19 bearing against plunger 13 seals cup 23 so that no fluid may escape from it except by way of passage 14.

If instead of a factory attached valve closure it is desired to attach such a closure to a pressure vessel having a pierceable seal a modification may be made. The closure instead of a cup with a base may be provided with a tube having an open end adapted to cover the pierceable seal of the vessel. Suitable conventional means for securing the closure in leakproof engagement into the vessel will be employed to secure the same results as the structure illustrated herein.

It is obvious that in other details the construction illustrated herein may be modified without departing from the scope of this invention and by furnishing the illus-

tration herein given, it is not intended to thereby limit such scope.

What I claim is:

A dispensing valve adapted for use with a pressure vessel open at the top, comprising a valve adapted to close and hermetically seal the open top of the pressure vessel; a depending cup with a pierceable bottom, formed in the base of the valve; a sleeve with a vertical slot in its wall, extending upward from such base; a plunger slideably closing the opening of the cup in sealing engagement therewith, having a finger piece confined and slideable within the sleeve in engagement with its slot, and within the cup having an extensible end terminating in a piercing point with yieldable means urging the extensible end and the piercing point against the bottom of the cup; yieldable means urging the finger piece outward of the sleeve; a chamber within the cup communicating with the bottom thereof; and a passage through the plunger connecting an outlet port through the slot engaging portion of the finger piece with an inlet port in the side of the plunger, the said inlet port being spaced from the end of the piercing point so that it will be within the chamber only when the plunger is depressed and the pierceable bottom is penetrated by the piercing point.

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