March 10, 1942. J. L. CLEM 2,275,842

LIQUID DISPENSING DEVICE

Filed Sept. 16, 1940 3 Sheets-Sheet 1

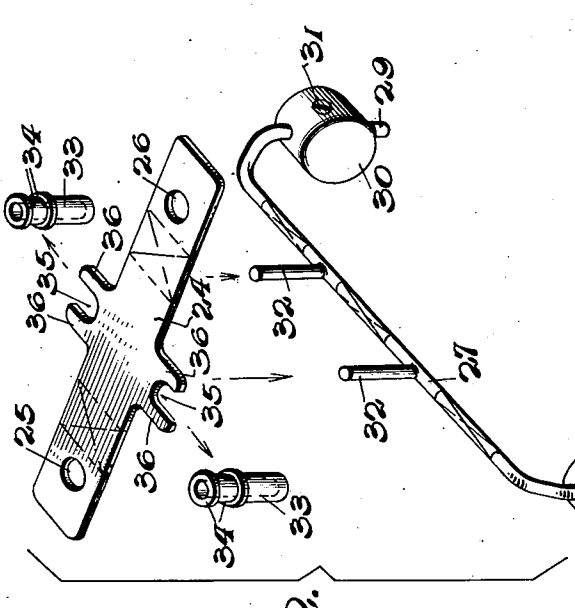


Fig. 2.

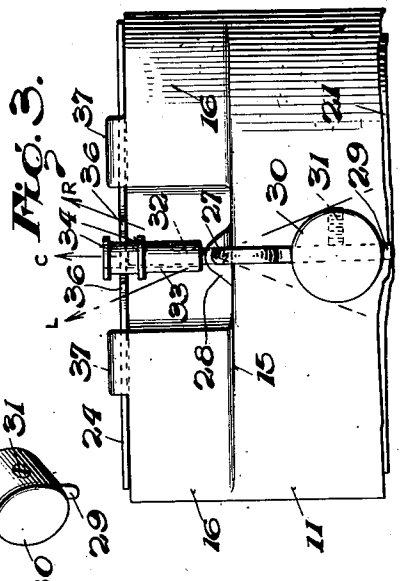


Fig. 3.

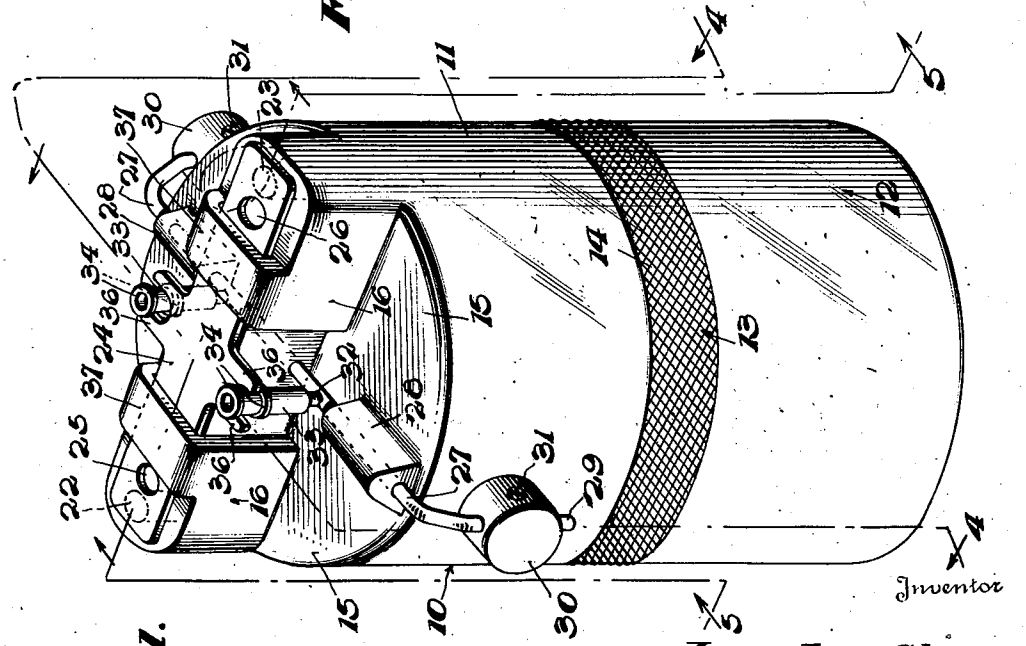


Fig. 1.

Inventor

Jesse Lee Clem.

By Cushman, Darby & Cushman

Attorneys

March 10, 1942. J. L. CLEM 2,275,842

LIQUID DISPENSING DEVICE

Filed Sept. 16, 1940 3 Sheets-Sheet 2

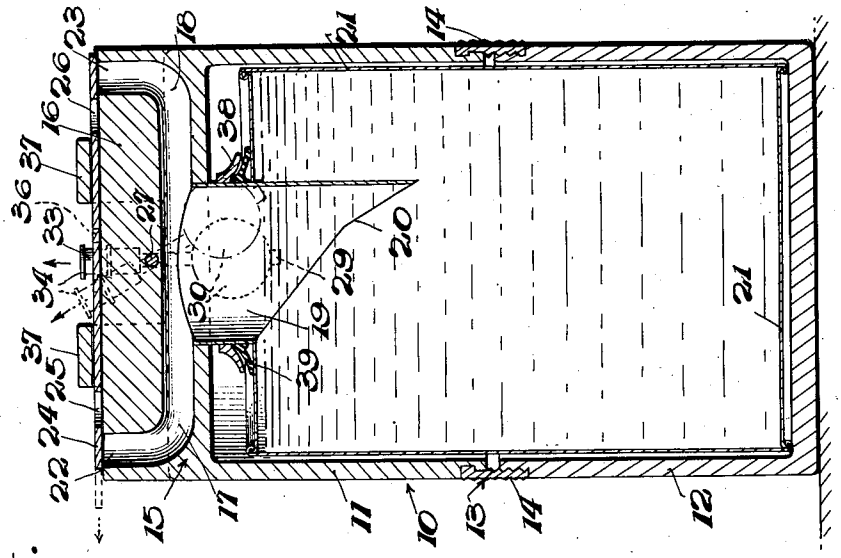


Fig. 5.

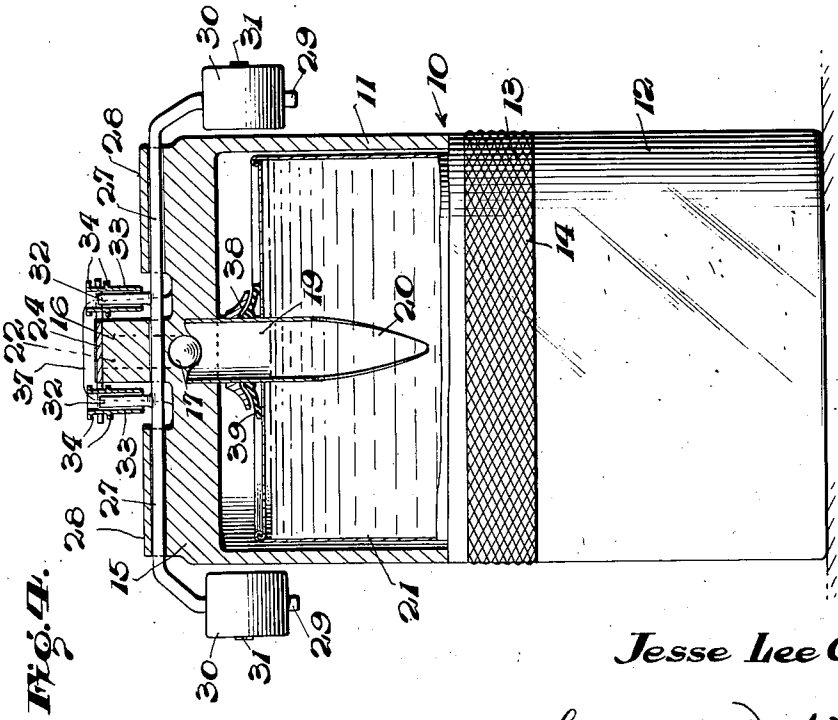


Fig. 4.

Inventor

Jesse Lee Clem.

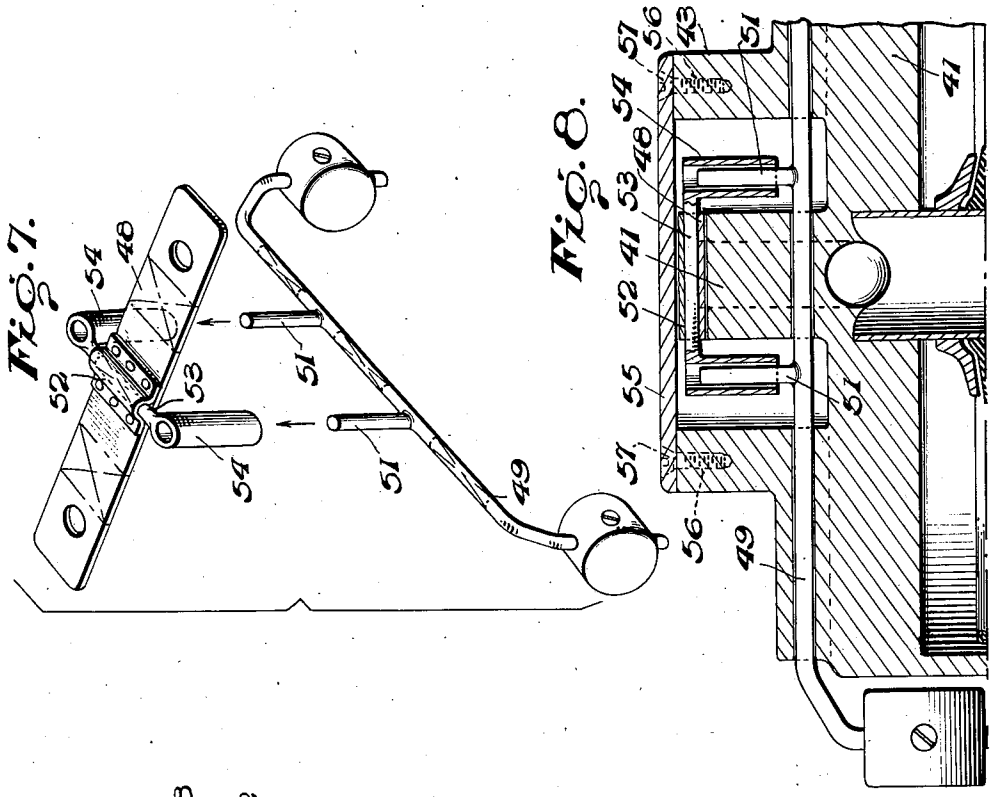
By Lemmon, Darby & Lemmon

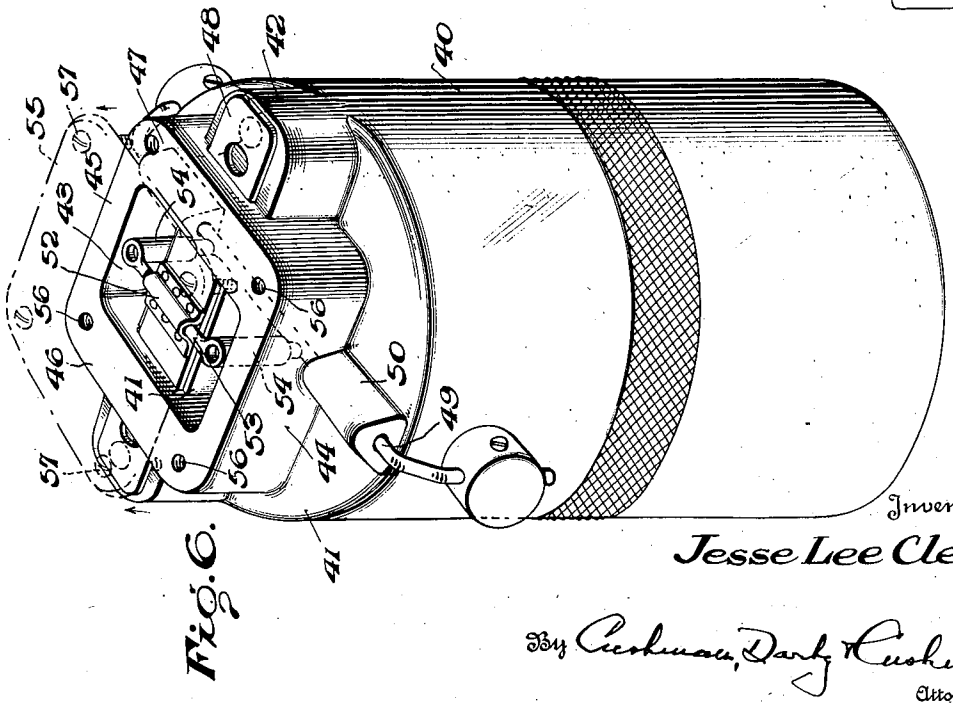
Attorneys

March 10, 1942. J. L. CLEM 2,275,842

LIQUID DISPENSING DEVICE

Filed Sept. 16, 1940 3 Sheets-Sheet 3





Inventor

Jesse Lee Clem

By Cushman, Darby & Cushman

Attorneys

Patented Mar. 10, 1942 2,275,842

UNITED STATES PATENT OFFICE

2,275,842

LIQUID DISPENSING DEVICE

Jesse Lee Clem, Portland, Oreg.

Application September 16, 1940, Serial No. 357,064

8 Claims. (Cl. 221—13)

The present invention relates to liquid dispensing devices.

An object of the invention is the provision of a dispensing device having liquid discharge and air vent passages which are automatically uncovered when the device is tilted.

A further object is to provide weight controlled valve means which normally close the passages when the device is in upright position but automatically uncover said openings when the device is tilted.

Another object is the provision of liquid discharge and air vent passages which are interchangeable, that is, one passage is used for dispensing liquid and the other as an air vent when the device is tilted in one direction; conversely, the first-mentioned passage is used as an air vent and the other as a liquid discharge passage when the device is tilted in the opposite direction.

A further object is the provision of a liquid dispenser which may be easily manipulated by grasping its body and is so constructed that the user may pour from either side.

Another object is to provide a dispensing device having means for piercing a sealed container and for effecting a seal around the perforated portion of the container, whereby the contents of the container will be shielded from contact with the atmosphere.

With the foregoing and other objects in view, the invention will now be more particularly described, reference being had to the accompanying drawings in which:

Figure 1 is a perspective view of my invention,

Figure 2 is a perspective view of certain of the elements of the liquid dispenser,

Figure 3 is a fragmentary side elevation of the top portion of the dispenser,

Figure 4 is a section on line 4—4 of Figure 1,

Figure 5 is a section on line 5—5 of Figure 1,

Figure 6 is a perspective view of a modified form of the invention,

Figure 7 is a perspective view of certain of the elements of Figure 6, and

Figure 8 is an enlarged fragmentary sectional view showing the operating means for the valve plate illustrated in Figure 6.

Referring now to the drawings, the numeral 10 designates generally my liquid dispenser and comprises a container enclosing member consisting of an upper cap or cup-like section 11 and a lower section 12 also of substantially cup formation. As shown in Figure 5, the upper section 11 is provided with an internally threaded ring or band 13 fixed to its lower end and adapted to threadedly engage an externally threaded portion of the lower section 12. Preferably, the outer surface 14 of the band 13 is knurled to facilitate removal of one section from the other. The sections 11 and 12 may be cast, molded, or otherwise formed of any desired material.

The upper section 11 is provided with an end or base 15 having a ridge 16 extending transversely thereof from one edge to the other. Within this ridge are formed a pair of passages 17 and 18 which communicate with each other centrally of the ridge. These passages also communicate with a centrally disposed perforating tube 19 which is preferably formed of metal and is rigidly mounted in the under side of the base, projecting downwardly therefrom, as clearly shown in Figures 4 and 5. This tube is of substantially oval formation in cross section and is provided with a perforating or cutting portion 20 adapted to pierce an end of a sealed container 21 when pressure is applied to the top of the section 11.

The outer portion of the passage 17 extends substantially at right angles to the rest of the passage, that is, longitudinally of the section 11 and terminates in a discharge opening 22 adjacent one end of the ridge 16. The passage 18 is formed in a similar manner and terminates in a discharge opening 23 located adjacent the opposite end of the ridge 16.

The top of the ridge 16 is substantially flat and supports a flat strip of material constituting a valve plate 24. The valve plate (see Figure 5), is of a length sufficient to cover the discharge openings 22 and 23 when the dispensing device is in its upright inoperative position. This plate is, however, provided with openings 25 and 26 positioned inwardly of the ends of the plate so that when the dispensing device is in its upright position, these openings will be located inwardly of the discharge openings 22 and 23. In this position, the valve plate closes and seals the passages 17 and 18.

I provide means for automatically actuating the valve plate 24 to uncover the discharge openings 17 and 18 when the dispensing device is tilted. This means comprises a shaft 27 which extends at substantially right angles to the ridge 16 and valve plate 24 and is journalled in bearings 28 formed on the base 15 on opposite sides of the ridge 16. The opposite ends of this shaft are bent downwardly to form end portions 29 which normally extend longitudinally and exteriorly of the upper section 11 of the dispenser. Upon each end portion 29 is mounted a weight 30. As shown in Figure 1, each weight is preferably detachably connected to the shaft by means of a set screw 31.

The shaft 27 is formed with a pair of laterally projecting arms 32 which normally project upwardly on opposite sides of the ridge 16. Each arm loosely supports and is embraced by a sleeve 33, the upper end of which is formed with a collar 34. Each collar 34 is received within a re-

cess 35 formed in an extension 36 of the valve plate 24. As clearly shown in Figures 1, 4 and 5, the upper and lower flanges of the collar 34 are sufficiently spaced from each other and from the recessed portion of the valve plate to permit the plate to be moved by the collar when the shaft 27 is rotated about its axis and swings the arms 32 and the sleeves 33. It is to be further observed that the diameter of the collar 34 is less than the width of the recess 35, so that a binding action between the collar and extension 36 is prevented when the shaft is rotated.

In order to maintain the valve plate in correct position on the ridge and to guide the plate in its movements thereon, the ridge is provided with a pair of spaced strips 37. These strips also constitute stop elements which are adapted to contact with the extensions 36 of the plate and thereby limit the movement of the plate in either direction.

When it is desired to utilize my dispensing device and assuming that a sealed container of milk or other liquid is to be opened and dispensed, the container 21 is first placed within the lower section 12 of the dispenser. The upper section is then placed over the top of the container so that the lower end of the perforating tube 19 contacts the top end of the can. Thereafter by applying pressure to the section 11, the tube 19 will pierce the top end of the container and enter the same as shown in Figures 4 and 5. In order to constitute a stop and seal for the punctured portion of the container, I provide a collar 38 and a collar-like gasket 39 which engage the top of the container and surround the perforated portion. It will be apparent that as the ring 13 is screwed upon the lower section 12, the gasket 39 will be compressed against the top of the container and provide an effective seal. It is to be understood that the dimensions of the sections 11 and 12 are of such size as to accommodate a standard size can and that dispensers of different sizes may be provided to accommodate containers of different sizes as desired.

After the dispensing device has been applied to a container, as above described, and it is desired to dispense a quantity of milk or other liquid, this may be easily and quickly accomplished by tilting the dispenser in a direction transverse to the axis of the shaft 27. Assuming that the dispenser is tilted to the left as shown in Figures 3 and 5, the weights 30 will move to the left and rotate the shaft about its axis, thereby moving the arms 32 and sleeves 33 to the right. This action will slide the valve plate 24 on the ridge 16 to the right sufficiently to permit the left hand end of the valve plate to uncover the discharge opening 22. At the same time, the opening 26 in the right hand end of the plate will register with the discharge opening 23, which in this arrangement, constitutes an air vent and thereby facilitates the ready flow of liquid through the tube 19, passage 17 and discharge opening 22 into a suitable receptacle.

If the dispenser should be tilted in the opposite direction, that is, to the right as shown in Figure 5, then the movement of the several elements is just reversed. The weight will swing to the right, moving the arms 32 and sleeves 33 to the left and, in turn, sliding the valve plate 24 to the left. This action will move the valve plate sufficiently to uncover the discharge opening 23 and register the opening 25 with the discharge opening 22. It will be apparent that the functions of the passages 17 and 18 will be reversed, that is, the passage 18 will be the pouring opening while the passage 17 will constitute the air vent. As stated above, the clearance between the recessed portions of the valve plate and the collars 34 is such as to permit a free movement of the plate in either direction without binding. It is to be understood that the plate is of such a length and the openings 25 and 26 are so positioned that the plate will readily uncover one or the other openings 22 or 23, while one or the other openings 25 or 26 will automatically register with its respective discharge opening.

Referring now to Figures 6, 7 and 8, there is disclosed a modified form of the invention in which most of the movable parts are enclosed. In this construction, the liquid dispenser is designated generally by the reference character 40 and the base 41 is provided with a ridge 42 similar to the ridge 16 of Figures 1 to 5. The base 41 in addition to having the ridge 42, is also provided with a substantially square shaped enclosure 43. This enclosure consists of walls 44 and 45 which extend parallel to the ridge 42, and these are connected by similar walls 46 and 47 which bisect the ridge 42, as clearly shown in Figure 6. A valve plate 48, similar to the plate 24, is supported on the ridge 16 and passes through suitable aligned openings or slots in the walls 46 and 47.

A shaft 49 is journalled in bearings 50 and also passes through openings in the walls 44 and 45. This shaft is similar to shaft 27 and is provided with laterally extending arms 51 each of which is positioned within the enclosure 43. As will be observed, each arm is located between the ridge and one of the walls 44 and 45.

The valve plate 48 differs from the plate 24 in that the extensions 36 are eliminated. Instead, this plate is provided with a strap 52 which cooperates therewith to form a bearing for a cross shaft 53. The ends of this shaft are integrally connected to sleeves 54 corresponding to the sleeves 33. These sleeves embrace arms 51, as clearly shown in Figure 8.

The dispenser 40 is also provided with all of the other elements present in the form shown in Figures 1 to 5 and since these elements all operate in the same manner as those of the dispenser 10, they will not be referred to and described in detail. The tops of the walls of the enclosure 43 are flat to receive a cover 55 and are provided with threaded openings 56 for receiving screws 57 by which the cover may be detachably secured on the enclosure and thereby conceal the majority of the moving elements of the dispenser.

In operation of this modified construction, a tilting action of the dispenser 40 will effect a rotation of the shaft 49 and swing the arms 51 about the axis of the shaft. This action will also move the sleeves 54 which, in turn, will slide the valve plate 48 on the ridge 42 to cover or uncover the several openings, as the case may be. In view of the fact that the shaft 53 is pivotally mounted on the valve plate, there will be no binding action between the sleeves 54 and arms 51 when the dispenser is tilted. That is, the sleeves 54 will swing with the arms 51 and, in turn, will slide the valve plate upon the ridge 42. There will, of course, be a slight relative longitudinal movement between the sleeves and the arms when the shaft 49 is rotated about its axis. As in the embodiment illustrated in Figures 1 to 5, the device is capable of dispensing liquid by tilting the dispenser in either direction transverse to the axis of the shaft 49.

While the drawings disclose the preferred embodiment of the invention, it is to be understood that, if desired, the valve plate and the means for operating the same may be used with different constructions. That is, it is not necessary to employ a sectional casing which will entirely envelop a container from which the liquid is to be dispensed.

It is thus to be understood that the construction shown and described is merely illustrative of the preferred embodiment and that such changes may be made as fall within the purview of one skilled in the art without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. In a liquid dispensing device, a base having a pair of passages communicating with the interior of the device, a valve plate slidably mounted on the base and overlying and normally closing said passages when the device is in upright position, a shaft journalled in said base and having an end portion offset from its axis, a weighted element secured to an end portion of the shaft for rotating the latter about its axis when the device is tilted, and means connecting the shaft and valve plate for sliding the plate to cover and uncover the discharge passages when the shaft is rotated.

2. In a liquid dispensing device, a base constituting an end of the device and provided with a ridge extending across the base transversely of the device, said ridge having formed therein a pair of pouring and venting passages communicating with the interior of the device, each passage having a discharge outlet adjacent an end of the ridge, a valve plate slidably mounted on the top of the ridge and normally closing the discharge openings when the device is in upright position, and gravity actuated means mounted on said base exteriorly thereof and connected to said valve plate for sliding the latter to uncover the discharge openings when the device is tilted.

3. In a liquid dispensing device, a base constituting an end of the device and provided with a ridge extending across the base transversely of the device, said ridge having formed therein a pair of pouring and venting passages communicating with the interior of the device, each passage having a discharge outlet adjacent an end of the ridge, a valve plate slidably mounted on the top of the ridge and normally closing the discharge openings when the device is in upright position, a shaft journalled in said base transversely of the ridge and below the valve plate and having an end portion offset from its axis, a weighted element secured to the end portion of the shaft for rotating the latter about its pivot when the device is tilted, an arm projecting laterally from said shaft, a sleeve loosely positioned on said arm and provided with a collar at one end engaging said valve plate and imparting sliding movement thereto to uncover the discharge openings when the shaft is rotated.

4. In a liquid dispensing device, a base constituting an end of the device and provided with a ridge extending across the base transversely of the device, said ridge having formed therein pouring and venting passages communicating with the interior of the device, each passage having a discharge outlet adjacent an end of the ridge, a valve plate slidably mounted on the top of the ridge and normally closing the discharge openings when the device is in upright position, said plate having openings, one adjacent each end and normally positioned inwardly of one of the discharge openings when the device is in upright position, and means mounted on said base and connected to said plate for sliding the latter on the ridge when the device is tilted whereby such tilting operation will slide the valve plate so that one end thereof will move inwardly of and uncover the pouring discharge opening while the opening in the other end of the plate will register with the vent discharge opening.

5. In a liquid dispensing device, a base having a pair of passages communicating with the interior of the device, a valve plate slidably mounted on the base and overlying and normally closing said passages when the device is in upright position, a shaft journalled in said base and having an end portion offset from its axis, a weighted element secured to an end portion of the shaft for rotating the latter about its axis when the device is tilted, and means connecting the shaft and valve plate for sliding the plate to cover and uncover the discharge passages when the shaft is rotated, said means including an arm projecting laterally from said shaft, a second shaft journalled on and transversely of said valve plate, and a sleeve fixed to said second shaft and loosely positioned on said arm.

6. In a liquid dispensing device, a base having a pair of passages communicating with the interior of the device, a valve plate slidably mounted on the base and overlying and normally closing said passages when the device is in upright position, a shaft journalled in said base, a weighted element secured to said shaft eccentrically to the axis thereof for rotating the shaft when the device is tilted, and means connecting the shaft and valve plate for sliding the plate to cover and uncover the discharge passages when the shaft is rotated.

7. In a liquid dispensing device, a cap-like member adapted to be positioned over a sealed liquid container, said member having a passage therein extending throughout substantially its diameter, the opposite ends of said passage extending transversely of the cap and terminating in discharge openings, a perforating tube depending centrally from the member and communicating with the central portion of the passage, a valve plate slidably mounted on said member in the path of the discharge openings and normally closing said openings when the member is in upright position, and means mounted on said member and operatively connected to said valve plate for sliding the latter to uncover the discharge openings when the member is tilted.

8. In a liquid dispensing device, a base having a pair of passages communicating with the interior of the device, a valve plate slidably mounted on the base and provided with a pair of openings, each located adjacent one of the passages but not in register therewith, when the device is in upright position, and gravity actuated means carried by said base and connected to said valve plate intermediate its openings, said means being adapted to slide said valve plate in either of two directions to uncover said passages when the device is tilted.

JESSE LEE CLEM.