Nov. 19, 1935. C. S. PHILLIPS 2,021,807

DISCHARGE VALVE FOR LIQUID CONTAINERS

Filed Feb. 1, 1934

Fig. 1.

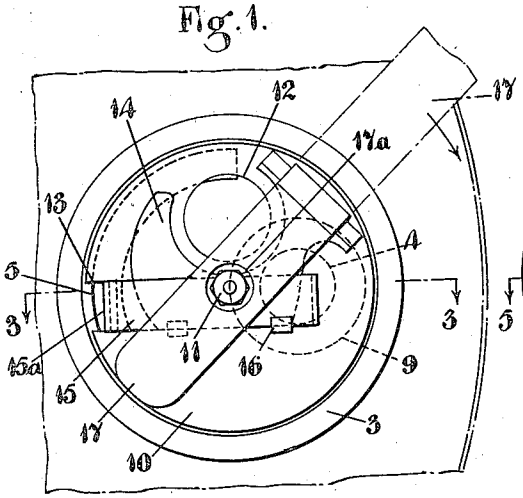


Fig. 4.

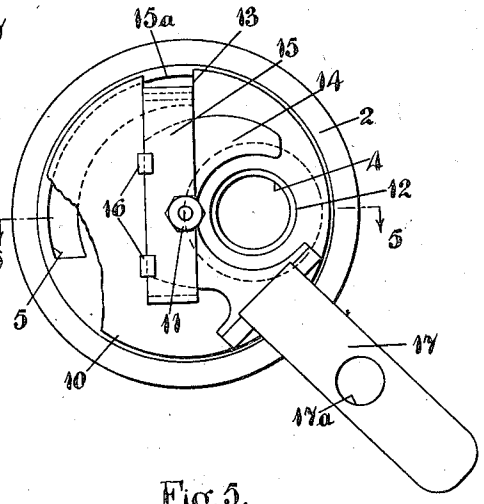


Fig. 2.

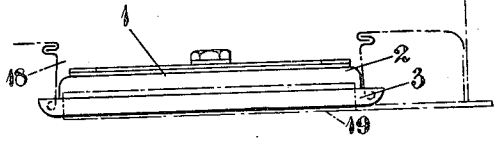


Fig. 5.

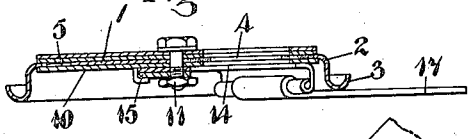


Fig. 3.

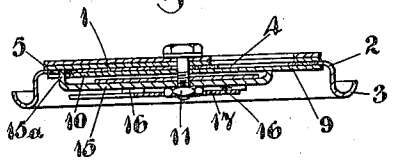


Fig. 7.

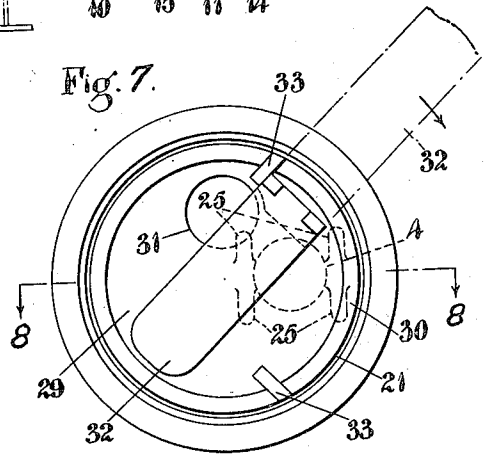


Fig. 9.

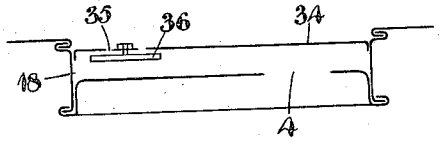


Fig. 8.

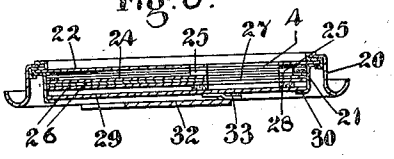
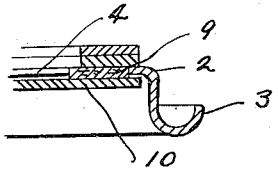


Fig. 6.



INVENTOR:
Clive S. Phillips,
By: Smith, Michael & Gardiner, Attorneys

Patented Nov. 19, 1935 2,021,807

UNITED STATES PATENT OFFICE

2,021,807

DISCHARGE VALVE FOR LIQUID CONTAINERS

Clive Selsey Phillips, London, England, assignor to Phillips Telescopic Taps Limited, London, England

Application February 1, 1934, Serial No. 709,368
In Great Britain March 13, 1933

11 Claims. (Cl. 137—21)

This invention is for improvements in and relating to discharge valves for containers, more particularly for drums and barrels.

The invention has for its object to provide a discharge valve for liquids and granular solids which is of an extremely simple construction, gives a rapid and clean cut-off when closing and which is sufficiently economical to manufacture that it does not materially increase the price of the container, such as a metal drum, and which is comparatively free from liability to damage in transit of the drum or the like and may thus be a permanent fixture thereon.

According to the invention there is provided a discharge valve for a container which comprises a shutter valve so constructed and adapted to be applied to the container that the said valve is substantially flush with or located within the boundaries of the container.

In the case of a metal oil drum or the like, the valve is preferably secured to the bottom of the drum so as to discharge the liquid transversely to the shutter of the valve, thereby ensuring a quick-cut-off and the avoidance of dribbling of the liquid over the container wall; in this position the valve is further protected from damage by the chimb of the container projecting below the bottom wall thereof.

The invention includes within its scope, containers provided with discharge valves as specified in the two preceding paragraphs and the following description.

In order that the invention may be fully understood, reference is directed to the accompanying drawing, in which:—

Figure 1 shows an underside view of a discharge valve constructed in accordance with the invention, the valve being shown closed;

Figure 2 is a side view of the valve shown in Figure 1;

Figure 3 is a section on the line **3—3** of Figure 1;

Figure 4 is a view similar to Figure 1 but showing the valve open;

Figure 5 is a section on the line **5—5** of Figure 4;

Figure 6 shows more clearly a detail of the construction illustrated in Figure 3;

Figure 7 shows an underside view of a modified construction of discharge valve constructed in accordance with the invention, showing the valve closed;

Figure 8 is a section on the line **7—7** of Figure 6; and

Figure 9 is a diagrammatic section through a discharge valve showing the same combined with a device for preventing the unauthorized refilling of a container.

Referring to Figures 1 to 6, the valve comprises a main disc **1**, shown as being built up of a plurality of discs but which can conveniently be pressed from a single sheet of material; the disc is provided with an upstanding flange **2** turned over as shown at **3**. The disc **1** is provided with an outlet aperture **4** and an arcuate slot **5**, the outlet aperture **4** being countersunk to accommodate an annular washer **9** of fibre, cork or like substance which is slightly thicker than the countersunk portion. This extra thickness which is very small is shown clearly in the large scale detail view, Figure 6. An outer disc **10** constituting a shutter is concentrically pivoted on the outside of the disc **1** by means of a bolt **11** and is provided with an outlet aperture **12** and a notch **13**. A segmental spring plate **14** is also mounted on the bolt **11** together with an arm **15**, one side of which engages within two bent over lugs **16** on the plate **14**. One overturned end of this arm bears on the plate **14** whilst the other overturned end **15***a* extends into the notch **13** and slot **5**. The ends of the plate **14** bear on the disc **10** and press the same on to the washer **9** with a force which may be regulated, if desired, by the bolt **11**. A manipulating handle **17** is hinged to the plate **14** and may be packed within the confines of the flanged disc **1** when folded into the position shown in Figures 1 and 3, a hole **17***a* in the handle accommodating the nut of the bolt **11**; in the position of the handle shown in Figures 4 and 5 the valve may be opened or closed by rotating the handle **17** about the bolt **11** and so turning the disc **10** from the closed position shown in Figure 1 to the open position shown in Figure 4. The end **15***a* of the arm **15** limits the movements of the disc **10** by abutting against the ends of the slot **5**.

The flange **2** may be soldered or pressed to the surface of the container itself, or wheeled on to an upstanding neck **18** (Figure 2) provided on a container, which, for example, may be a metal drum or a wooden barrel. For transit purposes prior to sale, the handle **17** may be sealed within the confines of the flanged disc **1** by means of a thin metal cap **19** shown in dot and dash lines in Figure 2 which is pressed into or soldered to the flange **2** and which is torn off or cut away to give access to the handle and enable the contents of the container to be withdrawn through the valve.

If desired, part of the wall of a metal container

may serve as the disc 1 and a depression provided in the said wall to accommodate the washer 9 around the outlet aperture 4.

In the construction shown in Figures 7 and 8, a flanged ring 20, similar to the flange 2, 3 of Figure 1 is provided, and a shallow circular housing 21 is secured thereto in the manner clearly shown in Figure 8, to accommodate the various elements of the valve. An inner disc 22, provided with an outlet aperture 4 is clamped between the elements of the housing and a disc 24 is provided with spring tongues 25 which bear against the disc 22 and force the disc 24 against discs 26. Around outlet apertures 27 in the discs 26 a packing ring 28 is provided which bears against a rotatable shutter disc 29 which is thus pressed against the overturned flange 30 of the housing 21. The disc 29 is provided with an outlet aperture 31 and a folding manipulating handle 32. The operation of the valve is the same as that of the preceding example, stops 33 being provided on the housing to limit the rotational movements of the disc 29 by abutting with the root of the handle 32.

When the valves are fitted to a neck such as 18, Figure 9, a partition 34 may be provided at the base of the neck having an outlet 35 formed therein diametrically opposite to the outlet 4 of the discharge valve and controlled by any type of automatic valve 36 which operates to permit liquid to be discharged from the container in the position shown, but operates to close the outlet 35 if the container is inverted, and so prevents unauthorized refilling of the container, the valve 36 being inaccessible through the opening of the discharge valve 4. It is important to realize that with the construction of valve forming the subject matter of the invention, no air vent is necessary to enable the contents of the container to be withdrawn, because air bubbles through the outlet opening 4 automatically as the liquid issues therefrom, it is thus with the arrangement shown in Figure 9, practically impossible for the container (which is filled through the neck before these devices are fitted) to be refilled by unauthorized persons. Alternatively the plate carrying the non-return valve can be formed as part of the discharge valve itself, whether the latter is fitted direct to a container or into a neck.

The invention is capable of various modifications from the specific examples described above; for example, the shutter of the valve may be pivoted eccentrically with respect to a circular housing having inner and outer closing disc portions somewhat similar to the arrangement shown in Figures 7 and 8, but with the discs stationary and the shutter disposed therebetween and packed with cork or similar discs having apertures therethrough aligned with the outlet apertures in the inner and outer disc portions of the housing. The cork packing discs may be placed on one or both sides of the shutter and the latter need not have an outlet aperture therein but may be arranged to be moved clear of the outlet apertures in the discs and housing when the valve is open. For manipulating the shutter in this construction, an arm-like extension thereof can extend through a slot in the peripheral wall of the housing, or a pin on the shutter can extend through an arcuate slot in the outer disc portion of the housing. Both shutter and packing might be of tapered section to secure progressive compression when closing, in lieu of the compression by spring as described.

Any of the constructions of valve may be sealed by a cap such as 19 shown in Figure 2 or other sealing means, such as a wire and lead seal may be provided to prevent unauthorized opening of the valves. The shape and size of the apertures may, of course, be varied as required. The washer 9, and the countersinking necessary to house this, may be omitted when dealing with viscous liquids and granular solids and the handle might be so arranged to fly back automatically to the closed position on release, by spring action.

In all constructions one member of the housing of the valve can be formed from the wall of a metal container, and it is to be understood that the valve may be placed on any desired wall of a container, either vertical or horizontal or any intermediate angle; for example, in the latter case a portion of the wall of the drum might be dished or displaced at an angle to enable the valve secured thereto to lie at an angle to the axis of the drum.

Preferably, however, the valve is secured to the bottom of the container, near the chimb in the case of a drum, as shown in Figure 2. With this arrangement of the valve on the drum it will be readily appreciated that the drum may be arranged to stand upon a support with that portion of the bottom of the drum in which the valve is located projecting beyond the forward edge of the said support thus enabling a receptacle to be placed below the valve into which liquid from the drum may be discharged when the shutter is manipulated to open the discharge aperture of the valve.

The guillotine effect of the shutter on the liquid stream issuing transversely of the shutter ensures a clean and rapid cut-off of the liquid, whilst the construction of the discharge valve and its application to the drum provides a maximum amount of protection against damage to the valve during the transport of the drum so that the valve may be incorporated as a fixture thereon. Moreover, the relatively small size and simplicity of the discharge valve ensures that it may be produced at an extremely economical price.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A discharge valve comprising a pair of flat discs concentrically assembled together parallel with one another and rotatable relatively to one another about their common centre, an upstanding flange on one disc within which the second disc is disposed, a hole in each disc disposed eccentrically with respect to said common centre and registerable with one another, packing material between said discs around the hole in the flanged disc and carried by said flanged disc, means pressing the discs together into sealing contact with said packing, and a foldable handle on the second disc adapted when folded to be disposed within the confines of said flange.

2. A discharge valve as claimed in claim 1, in combination with a cap sealed to the upstanding flange of the first disc with the handle folded and sealed within said cap and flange.

3. A discharge valve comprising a pair of flat discs concentrically assembled together parallel with one another and rotatable relatively to one another about their common centre, an upstanding flange on one disc within which the second disc is disposed, a hole in each disc disposed eccentrically with respect to said common centre and registerable with one another, packing mate-

rial between said discs around the hole in the flanged disc and carried by said flanged disc, means pressing the discs together into sealing contact with said packing, a foldable handle on the second disc adapted when folded to be disposed within the confines of said flange and stops adapted to limit the movements of the second disc when the holes in the two discs are in register with one another and in a position of the discs in which the holes are out of register with one another.

4. In combination, a liquid container, an outlet neck thereon, a discharge valve as claimed in claim 3, sealed to the outer end of said neck, a partition extending across said neck at an inner point thereof, an aperture in said partition located at a point inaccessible from the hole in the flanged disc of the discharge valve, and a non-return valve opening outwardly adapted to control said aperture in the partition.

5. In combination, a liquid container, an outlet neck thereon, a discharge valve as claimed in claim 1 sealed to the outer end of said neck, a partition extending across said neck at an inner point thereof, an aperture in said partition located at a point diametrically opposite to the hole in the flanged disc of the discharge valve, and a non-return valve opening outwardly adapted to control said aperture in the partition.

6. A discharge valve comprising a sheet metal disc provided with an upstanding rim, a hole in said disc disposed eccentrically thereof, a second disc rotatably mounted concentrically upon the first disc and parallel thereto, a hole in said second disc having the same eccentricity as the hole in the first disc, a foldable handle, for rotatably moving the second disc relatively to the first, which is arranged when not in use to be folded to an inoperative position where it is disposed within the boundary formed by the upstanding rim, a stop for limiting the movement of the second disc when the holes in the discs register with one another and means adapted to press the two discs into contact with one another.

7. A discharge valve comprising a sheet metal disc provided with an upstanding rim of uniform height, a hole in said disc disposed eccentrically thereof, a second disc rotatably mounted concentrically upon the first disc and parallel thereto, a hole in said second disc having the same eccentricity as the hole in the first disc, a handle, for rotatably moving the second disc relatively to the first, which is hingedly secured to said second disc so as to be foldable when not in use to an inoperative position where it is disposed within the boundary formed by the upstanding rim, a stop for limiting the movement of the second disc when the holes in the discs register with one another, a packing washer disposed between the two discs around the hole in the first disc and carried by said disc and means adapted to press the discs towards one another.

8. A discharge valve comprising a pair of flat discs parallel to one another and concentrically assembled together so as to be rotatable relatively to one another about their common centre, a hole in each disc disposed eccentrically with respect to said common centre and adapted to register with one another in a predetermined relative position of the discs, means for pressing the discs together and a foldable handle, formed of sheet material hingedly secured to one disc, which in the folded position is disposed flat on the said disc and in the unfolded position extends substantially radially from said disc so as to be conveniently accessible for the purpose of rotatably moving the said disc relatively to the other disc.

9. A metal container provided with an outlet opening in one end and adjacent the chimb of the container, an annular depression around said opening, a packing washer disposed in said depression around said opening with one face thereof projecting above the surrounding surface of said container, a shutter pivotally mounted on said end of the container and operable to be moved to close or open said outlet opening, means pressing said shutter into sealing contact with said projecting face of said washer when said outlet opening is so closed and a foldable handle hingedly secured to said shutter for manipulating the same, which in the folded position is disposed flat on the said shutter within the confines of the chimb and in the unfolded position extends substantially radially from said shutter so as to project beyond the said chimb.

10. A metal container as claimed in claim 9, provided with a stop adapted to limit the movement of the shutter when the outlet is open.

11. In a discharge valve the combination comprising two flat concentric and coaxial discs rotatable relatively to one another about their common axis, an upstanding flange on one of the discs within which the other disc is disposed, an aperture in each disc located eccentrically with respect to the common axis of the discs and registrable with one another in one relative position of the discs and non-registrable with one another in another relative position of the discs, means pressing the discs together into sealing contact and a foldable handle on the disc disposed within the said upstanding flange, which handle is adapted when folded to lie within the confines of the flange.

CLIVE SELSEY PHILLIPS.