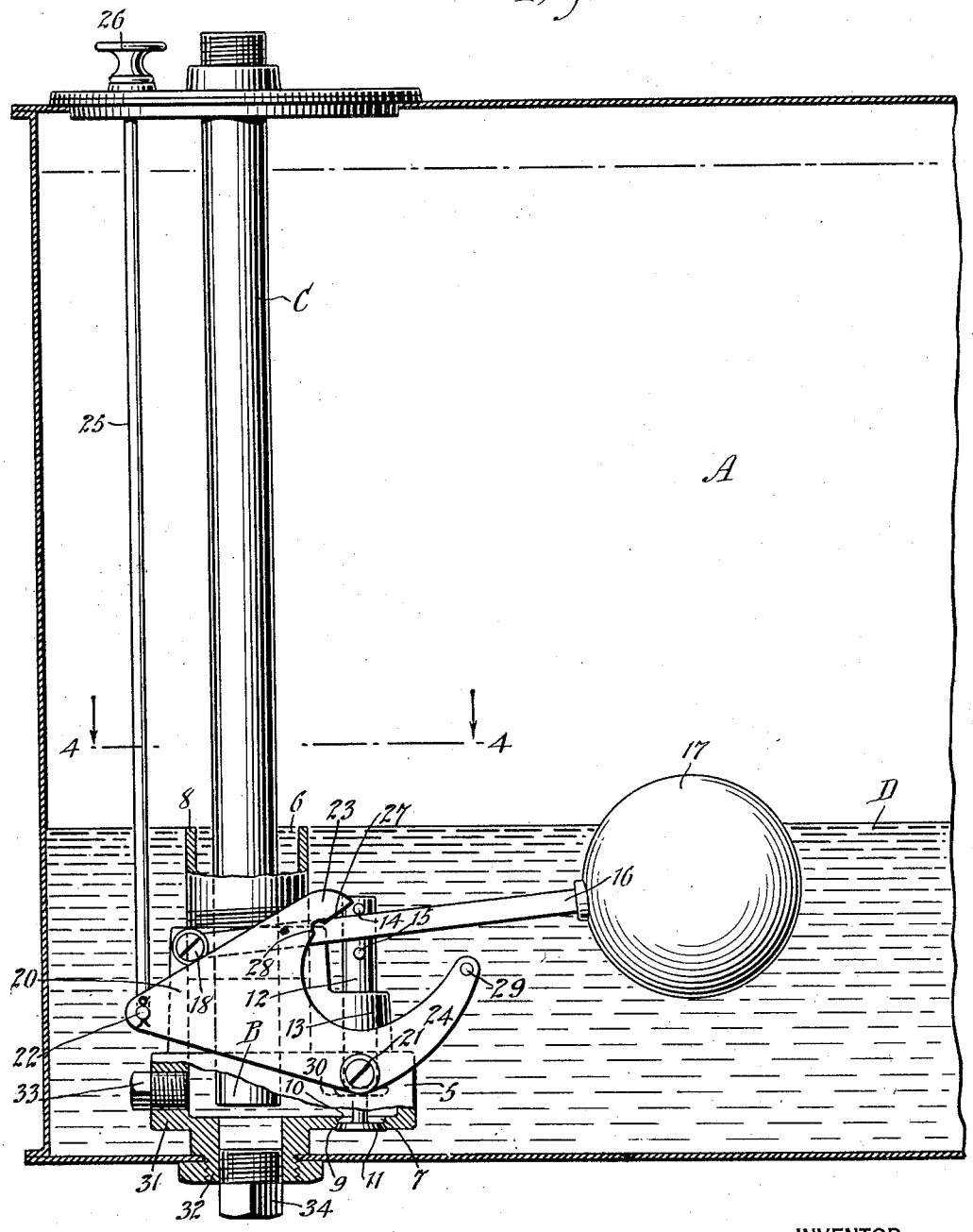
April 18, 1933. L. LAVOIE 1,904,793

OUTLET CONTROL FOR LIQUID CONTAINERS

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Fig. 1.



WITNESSES

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Fig. 2.

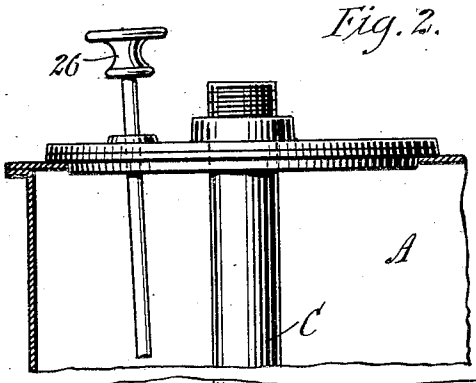
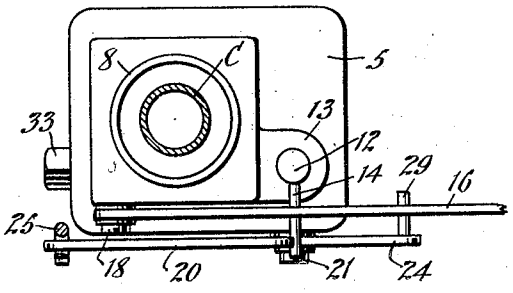


Fig. 4.



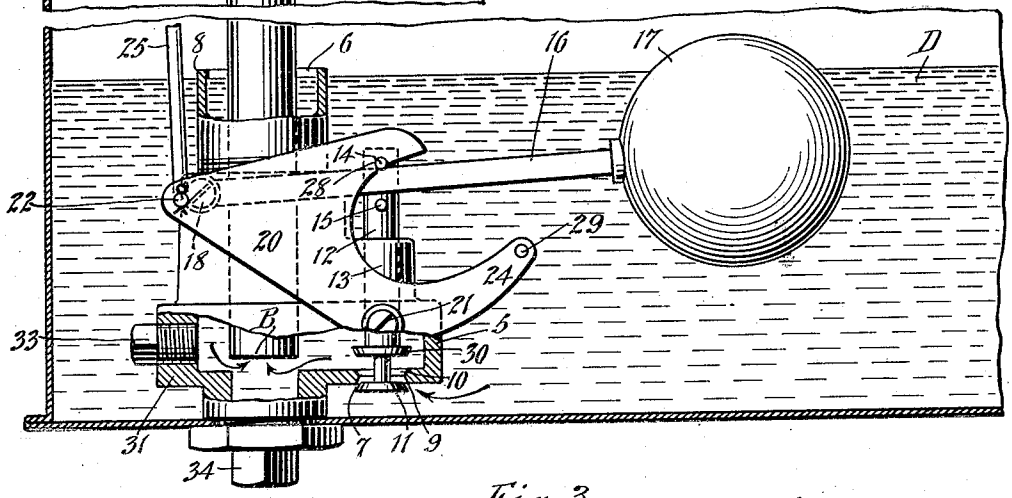
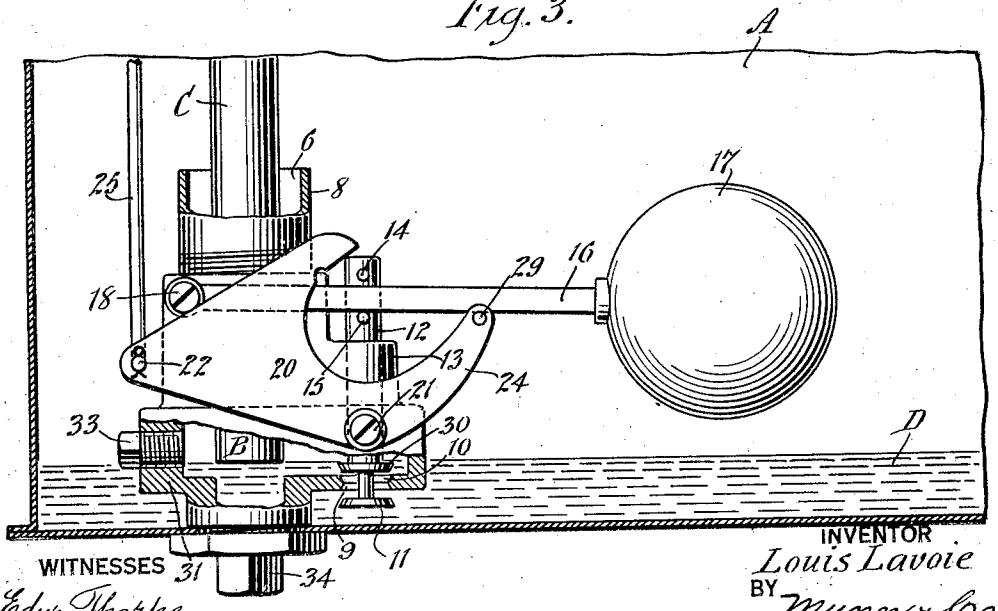


Fig. 3.



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OUTLET CONTROL FOR LIQUID CONTAINERS

Application filed April 2, 1932. Serial No. 602,801.

This invention relates generally to an outlet control device for liquid containers, and comprehends a device of this character by virtue of which the withdrawal of the entire contents cannot be effected without notification by the necessity of manually releasing a predetermined emergency quantity which is automatically reserved by the device until rendered available by said manual release.

The present invention is applicable to various fields but is particularly desirable in connection with liquid fuel tanks on motor vehicles, air or watercraft or the like, where it is especially designed to direct attention to the fact that the fuel supply requires replenishment when the same reaches a predetermined low level in the tank.

The invention broadly aims to provide a device for controlling the tank outlet in such a manner as to reserve a portion of the contents, which is rendered available only by manual release after that portion of the contents above the predetermined reserve quantity has been exhausted.

The invention further aims to provide in a device of the character indicated, means for automatically effecting a resetting of the device upon refilling of the tank or container, to preclude any possibility of a subsequent failure of the reservation of the emergency supply.

As a still further object, the invention resides in the provision of a device of the indicated character, in which use is made of a valve normally closed by the buoyancy of the liquid so as to reserve a predetermined emergency level in a container, with manually operable means for opening said valve to render said reserved supply available and means operable by the buoyancy of the liquid to initially lock the valve open and to subsequently gravitationally release the lock and to retain the valve open gravitationally while withdrawing the emergency supply, the refilling of the container functioning to reclose the valve to insure a subsequent reservation of the emergency supply.

The invention further embodies in a device of the character set forth, a float operable by the buoyancy of the liquid to effect the closing of the valve and to effect the initial locking of the valve in open position when manually opened, together with means embraced by the valve structure functioning to close the valve in event of leakage of the float, to insure the trapping or reservation of an emergency supply.

The invention further aims to provide a device of the indicated character which is comparatively simple in its construction and mode of operation, which is inexpensive to produce and install and which is thoroughly reliable and highly efficient in its purpose.

With the above recited and other objects in view, reference is had to the following description and accompanying drawings, in which there is exhibited one example or embodiment of the invention, while the claims define the actual scope of the same.

In the drawings:

Figure 1 is a fragmentary vertical sectional view through a storage tank or container for liquid fuel or other contents equipped with a control device constructed in accordance with the invention, and illustrating the same in a position to trap or reserve an emergency supply in the tank.

Figure 2 is a similar view illustrating the device actuated to lock the valve in opened condition, to render the emergency supply available.

Figure 3 is a similar view illustrating the valve immediately after the release of the locking means and the gravitational retention of the valve in open condition.

Figure 4 is a plan view of the control device.

Referring to the drawings by characters of reference, A designates a storage tank for liquid fuel or an equivalent liquid which is drawn off from a point adjacent the bottom, the outlet in the present instance consisting of the open lower end B of a feed pipe C which extends through the top of the tank.

The device for controlling the outlet B consists of a casing designated generally by the reference character 5, which casing is formed with vertically spaced upper and lower inlets 6 and 7, the former being pref-

erably defined by the upper open end of a standpipe 8 which may be vertically adjusted with respect to the casing 5, if desired. In the present instance, the feed pipe C for drawing off the contents of the tank extends downwardly through the standpipe 8, with its lower outlet end B located adjacent the bottom of the casing 5. The lower inlet 7 is formed with frusto-conical valve seats 9 and 10, the former flaring downwardly and outwardly and the latter flaring upwardly and outwardly. A valve 11 is provided for the valve seat 9 and is designed to engage on the seat upon upward movement for closing the lower inlet 7. The valve 11 is provided with an upwardly extending stem 12 which is guided vertically through a bearing boss 13 formed on the casing 5. The portion of the valve stem 12 which protrudes above the boss 13 is provided with upper and lower transversely projecting pins 14 and 15, suitably spaced apart to accommodate therebetween the arm 16 of a float 17, which float is preferably in the nature of a hollow fluid tight ball. The arm 16 is journaled on a fulcrum 18 on the casing 5 and the float is normally buoyed upwardly, as illustrated in Figure 1, by the liquid D in the tank A, whereby the arm engages with the upper pin 14 and seats the valve 11 to close the lower inlet 7 of the casing 5. This obviously functions to trap or maintain an emergency level of the fluid D in the bottom of the tank A, which level is determined by the height of the standpipe 8. In other words, the liquid D may be drawn off by the feed pipe C until the level recedes to a plane coincident with the upper open end of the standpipe 8 defining the inlet 6 to the casing 5.

In order to provide means for rendering the emergency supply of the liquid D available, a mechanism is provided for unseating the valve 11 from its seat 9 to open the lower inlet 7, and said mechanism consists of a rockable element or lever 20 which is journaled on a fulcrum 21 at a side of the casing 5. The lever is formed with a terminal 22 and upper and lower furcations 23 and 24. A manipulating rod 25 connects with the terminal 22 and extends upwardly and slidably through the top of the tank A, where it is provided with a head or knob 26. The furcation 23 is formed with an under cam face 27 which is designed upon upward pull exerted on the knob 26 to engage with and cam the upper pin 14 downwardly against the buoyancy of the float 17 to unseat the valve 11 from its seat 9 to open the lower inlet 7. The under side of the furcation 23 is further provided with a locking notch 28, which after downward movement of the valve stem 12 and opening of the valve receives the upper pin 14 and locks the valve open due to a binding action set up between the pin 14 and notch 28 by the upward stress exerted against the pin 14 by the arm 16 of the float 17 under the buoyancy of the liquid D. The valve 11 thus remains unseated and the lower inlet open to permit the flow of the emergency supply into the casing 5 and its withdrawal through the outlet B. It will also be seen that as the liquid level of the emergency supply recedes, the float 17 descends and the float arm 16 engages with the lower pin 15 of the valve stem 12, moving the valve 11 further downwardly, releasing the upper pin 14 from the locking notch 28 and thus engaging with a laterally disposed stop pin 29 on the lower furcation 24 of the lever 20.

The weight of the float 17, the float arm 16 and the lower furcation 24 now precisely counterbalances the remaining portion of the lever 20 and the manipulating rod and knob 26 so that the valve 11 is retained unseated while the liquid D is being drawn off from the tank through the lower inlet of the casing 5. It thus follows that when liquid is again supplied to the tank A, the float 17 will move upwardly, thereby seating the valve 11 on its seat 9 and reclosing the lower inlet 7, the initial lifting of the float from the stop pin 29 permitting the preponderance of the weight on the lever 20 on the left of the fulcrum 21 to return the lever and the manipulating rod and knob to its normal position shown in Figure 1.

From the foregoing, it will thus be seen that a control device has been devised which insures the automatic reservation of a supply quantity of liquid in the tank A which can only be made available by manual release by pulling upwardly on the knob 26 so as to indicate the necessity of replenishing the liquid in the tank while providing an emergency supply available after the indication has been given. It will also be observed that the device automatically resets the device for reserving the emergency supply without relying upon the necessity of manual resetting.

In order to provide means for preventing failure of the device in event leakage develops in the float 17, the valve stem 12 is provided with a second valve 30 normally spaced on the stem above the valve 11. In event of leakage developing, it is apparent that the float 17 will sink, thereby engaging the float arm 16 with the lower pin 15 of the valve stem 12 and normally seating the upper valve 30 on the upper seat 10 of the lower inlet 7 to normally close said lower inlet. It thus follows that when the liquid in the tank A reaches an emergency level somewhat below the upper end of the standpipe 8, the quantity thus reserved will be rendered available after notice by exerting a downward thrust on the knob 26, which it will be found has been raised by the sinking of the float and the engagement of the float arm 16 with the stop pin 29.

As illustrated, the casing 5 is formed with a side outlet 31 and a bottom outlet 32, respectively closed by plugs 33 and 34. This illustration is for the purpose of demonstrating that the liquid may be withdrawn optionally from said outlets instead of through the outlet B and feed pipe C, as, for instance, where it is desired to draw off the liquid by gravity.

While there has been illustrated and described a preferred embodiment of the invention, no limitation is intended to the precise structural details, as it is to be understood that variations and modifications which properly fall within the scope of the appended claims may be resorted to when found expedient.

What is claimed is:

1. The combination with a liquid container having an outlet adjacent its bottom, of a device for controlling said outlet, including a valve normally closed by the buoyancy of the liquid to reserve a portion of the contents at a predetermined emergency level in the container, manually operable means for opening said valve to render said reserved liquid available, means operable by the buoyancy of the liquid to initially lock the valve open, to subsequently gravitationally release the lock and to retain the valve open gravitationally.

2. A device for maintaining an emergency liquid level in a reservoir having an outlet adjacent its bottom, said device including a valve casing surrounding the outlet, said casing having a constantly open inlet adjacent the top and a normally closed inlet adjacent the bottom adapted to be manually opened for permitting withdrawing of the reserved supply.

3. A device for maintaining an emergency liquid level in a reservoir having an outlet adjacent its bottom, said device including a valve casing surrounding the outlet, said casing having a constantly open inlet adjacent the top and a normally closed inlet adjacent the bottom adapted to be manually opened for permitting withdrawing of the reserved supply and means for automatically reclosing the bottom inlet when the reservoir is refilled.

4. A device for maintaining an emergency liquid level in a reservoir having an outlet adjacent its bottom, said device including a valve casing surrounding the outlet, said casing having a constantly open inlet adjacent the top, an inlet adjacent the bottom of the casing, a valve for said bottom inlet, means operable by the buoyancy of the liquid for closing the valve, manually operable means for opening the valve to render the emergency supply available and means for automatically resetting the device and reclosing the valve when the reservoir is refilled.

5. A device for controlling the withdrawal of liquid from a container, including a member defining a chamber having a pair of vertically spaced inlets, the upper of which inlets is constantly open, a valve for the lower inlet, a float operatively connected with the valve for seating the same and closing the lower inlet to reserve a predetermined emergency level in the container, manually operable mechanism for unseating the valve to render the reserved liquid available, said mechanism including a fulcrum element, cooperative means on the valve and said element functioning upon unseating of the valve to initially engage with and lock the valve open by buoyancy of the float and subsequently gravitationally disengageable by the weight of the float when the level recedes.

6. A device for controlling the withdrawal of liquid from a container, including a member defining a chamber having a pair of vertically spaced inlets, the upper of which inlets is constantly open, a valve for the lower inlet, a float operatively connected with the valve for seating the same and closing the lower inlet to reserve a predetermined emergency level in the container, manually operable mechanism for unseating the valve to render the reserved liquid available, said mechanism including a fulcrum element, cooperative means on the valve and said element functioning upon unseating of the valve to initially engage with and lock the valve open by buoyancy of the float and means on said element cooperating with the float to continue to hold the valve open by gravity as the level recedes.

7. The combination with a liquid container having an outlet adjacent its bottom, of a device for controlling said outlet comprising a valve casing having a permanently open upper inlet and having a lower inlet, a valve for closing the lower inlet, a float operatively connected with the valve to seat the same and close the lower inlet to reserve a portion of the contents below the level of the upper inlet, manually operable means for unseating the valve, a detent initially operable by the buoyancy of the float to lock the valve in unseated position until the level of the reserved portion of the liquid recedes, said detent being gravitationally releasable upon subsequent recession of the fluid level and said valve being then retained open by the weight of the float.

8. The combination with a liquid container having an outlet adjacent its bottom, of a device for controlling said outlet comprising a valve casing having a permanently open upper inlet and having a lower inlet, a valve for closing the lower inlet, a float operatively connected with the valve to seat the same and close the lower inlet to reserve a portion of the contents below the level of the upper inlet, manually operable means for unseat-

ing the valve, a detent initially operable by the buoyancy of the float to lock the valve in unseated position until the level of the reserved portion of the liquid recedes, said detent being gravitationally releasable upon subsequent recession of the fluid level and said valve being then retained open by the weight of the float and reclosed by refilling of the container.

9. The combination with a liquid container having an outlet adjacent its bottom, of a device for controlling said outlet, comprising a valve casing having a permanently open upper inlet and having a lower inlet, a valve for closing the lower inlet, a float operatively connected with the valve to seat the same and close the lower inlet to reserve a portion of the contents below the level of the upper inlet, manually operable means for unseating the valve, a detent initially operable by the buoyancy of the float to lock the valve in unseated position until the level of the reserved portion of the liquid recedes, said detent being gravitationally releasable upon subsequent recession of the fluid level and said valve being then retained open by the weight of the float and reclosed by refilling of the container, a second valve for said lower inlet and means cooperating with the float in event of leakage for closing said second valve.

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