May 12, 1936. W. H. MARSDEN 2,040,701

ULLAGE ROD

Filed June 26, 1933

Fig. 1

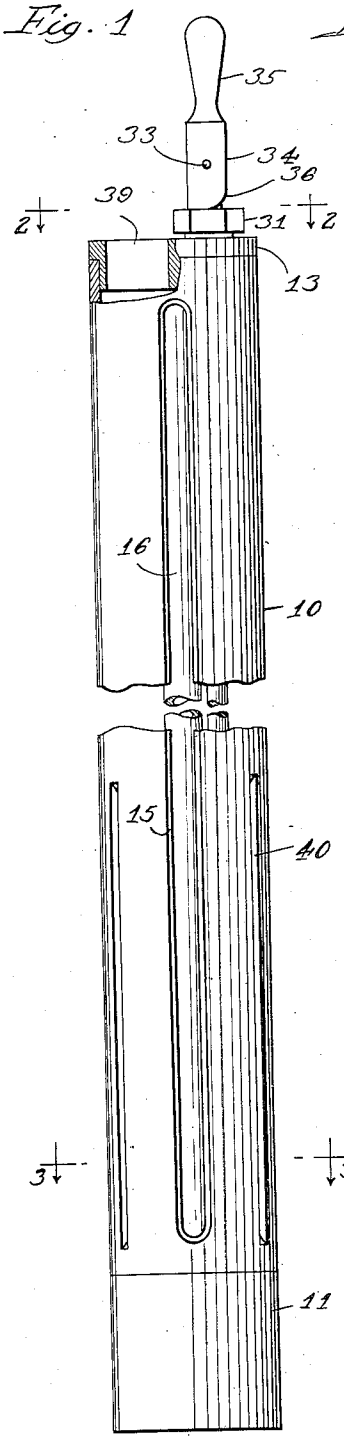


Fig. 4

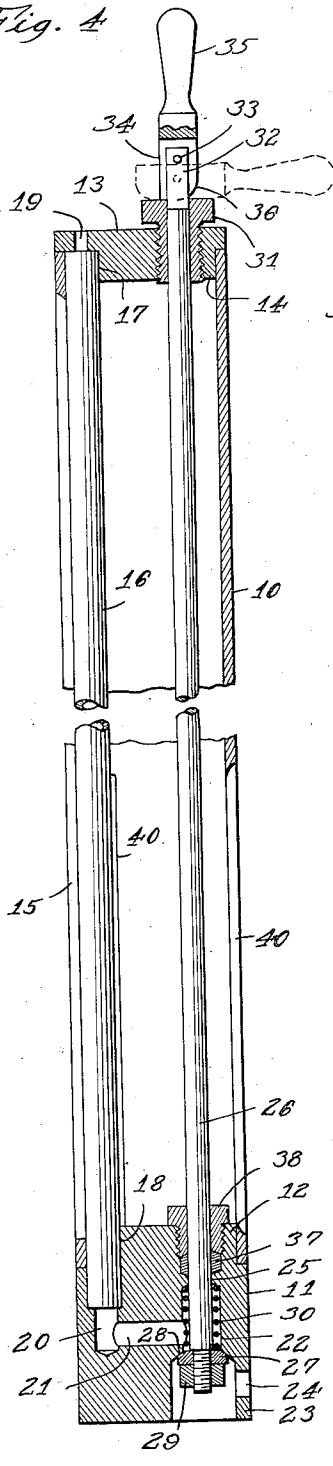


Fig. 2

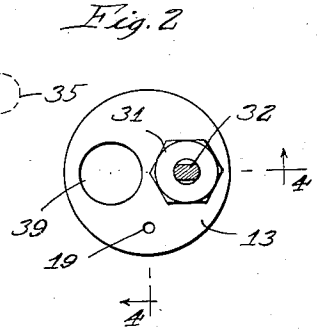
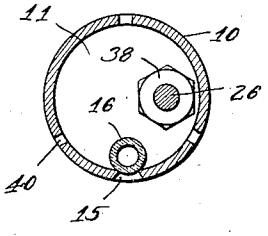


Fig. 3



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ULLAGE ROD

William H. Marsden, Chicago, Ill.

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2 Claims. (Cl. 73—120)

This invention relates to a tank content measuring instrument, more specifically an ullage rod for measuring the contents of gasoline tanks in filling stations.

The large oil companies make a practice of calibrating at each filling station several times each year because of the danger of a tank settling or being thrown out of position in any other way. The practice is to use an ullage rod in checking the contents by graduations, and once the rod has been accurately calibrated, an ordinary wooden rod of the same displacement, suitable for everyday use by the station attendants, is laid alongside and marked to agree with it, so that the contents can be accurately measured. The ullage rods heretofore available were subject to various practical objections which it is the object of the present invention to avoid, as hereinafter described.

The invention is illustrated in the accompanying drawing, in which—

Figure 1 is a front view of an ullage rod made in accordance with my invention, showing a middle portion broken away to permit showing the rod on a larger scale within the confines of the sheet, and showing an upper portion in section for purposes of better illustration;

Figs. 2 and 3 are sections on the correspondingly numbered lines of Figure 1, and

Fig. 4 is a longitudinal section on the broken line 4—4 of Fig. 2.

The same reference numerals are applied to corresponding parts throughout the views.

The rod has the body or casing 10 thereof formed by a piece of round tubing of suitable length, and into the lower end of this tube a metal plug 11 has its reduced portion 12 entered with a press fit to serve as a closure and bottom for the tube. Another plug 13 has a reduced portion 14 entered with a press fit in the upper end of the tube. While a round tube is shown, it should, of course, be understood that I may employ one of square or rectangular cross-section, or any other shape suitable for the present purpose. A longitudinal slot 15 is provided in the wall of the tubular body 10 to serve as a sight opening, and directly behind and visible through the slot is a glass gauge tube 16 suitably cemented at its upper and lower ends in holes 17 and 18 in the top and bottom plugs, respectively. An atmospheric vent 19 in the top plug communicates with the upper end of the tube 16. Passages 20 and 21 are drilled in the bottom plug 11 to establish communication between the lower end of the tube 16 and a parallel bore 22 in the plug 11. The latter opens at its lower end into a chamber 23 in the bottom of the plug 11, opening from the bottom of the plug and through a hole 24 to the side of the plug. A reduction in the bore 22 at 25 affords a guide for a longitudinal rod 26 which extends through the bore 22 and constitutes the stem for a valve 27 adapted to engage a seat 28 adjacent the lower end of the bore 22 to seal the bore and trap liquid in the tube 16. The valve 27 is suitably threaded on a reduced lower end portion of the rod 26 as shown, and has a lock nut 29 threaded beneath and jammed against it. A coiled compression spring 30 fits around the rod 26 in the bore 22 and acts between the upper end of the bore and the valve 27 to normally urge the valve downwardly away from the seat 28. The rod 26 extends through a bushing 31 in the top plug 13 and has a flat end 32 pivoted as at 33 in the forked lower end of a hand lever 35. The end of the forked portion 34 is provided with a cam surface 36 for engagement with the flat top surface of the bushing 31, whereby to permit the rod 26 to be drawn upwardly against the action of the spring 30 by moving the handle 35 in a counterclockwise direction as viewed in Figs. 1 and 4 from the horizontal position indicated in dotted lines to the substantially vertical full line position. The eccentricity of the cam surface 36 is graduated so as to permit one to draw up the valve firmly to its seat and thus definitely eliminate danger of leakage. The length of the rod 26 insures sufficient stretch in this member so that the valve will be seated resiliently but so firmly that leakage is avoided even though there is metal to metal contact between the valve and seat. In the event the wear caused in the operation of the cam surface 36 on the top of the bushing 31 gives rise to the valve 27 being seated too lightly for an oil-tight seal, the operator can remedy the difficulty by merely unscrewing the bushing 31 a trifle to take up for wear, after which the valve can be seated just as tightly as when the parts were new. Leakage along the rod 26 is prevented by packing material at 37 above the guide 25, compressed by a gland nut 38.

In calibrating, considerable time is lost in waiting for the turbulence to subside in the tank after gasoline has been added. I propose to add gasoline by pouring it in through the filler hole 39 in the top plug 13, using a funnel entered in the hole, and allowing the gasoline to spill with minimum violence from the lower end of the rod through vertical slots 40 provided preferably in equally circumferentially spaced relation on the lower

end of the rod, reaching a short distance up from the bottom plug 11, as shown. In this way there is no appreciable agitation of the gasoline in the tank and one may take a reading shortly after adding the gasoline with reasonable assurance of accuracy.

In operation, it is the practice to enter the rod in the tank with the valve 27 in open position, as indicated by the dotted horizontal position of the lever 35 in Fig. 4. The gasoline in the tank is, therefore, free to rise in the gauge tube 16 to the same level as prevails in the tank. Then, assuming that the rod is in a true vertical position for accurate measurement of the depth of gasoline in the tank, the operator closes the valve 27 by moving the handle 35 to vertical position, drawing up tightly on the valve in doing so, to insure against leakage of any gasoline from the tube 16. After removal of the rod, at least far enough to permit marking in accordance with the level in the tube, the rod is then returned to its position resting on the bottom of the tank, and the valve 27 is opened so that the operation described can be repeated after a measured amount of gasoline has been added to the contents of the tank. As previously explained, the addition of measured amounts of gasoline through the rod itself, so as to spill out from the lower end, minimizes agitation of the tank's contents and in that way the work of calibrating is speeded up considerably.

While I have described the invention with particular reference to its use in connection with gasoline tanks, it should be understood that my invention is not limited to this specific application but is useful in connection with any tank filled and emptied in a similar way, regardless of the kind of liquid stored. The appended claims have accordingly been drawn so as to cover all legitimate modifications and adaptations.

I claim:

1. A device of the class described comprising an elongated tubular rod having an open ended transparent gauge tube mounted lengthwise therein and visible from the side thereof, said rod having a liquid inlet in the lower end thereof communicating with the lower end of said tube, a valve movable upwardly toward a seat in the lower end of said rod to close the liquid inlet, a stem extending upwardly from the valve lengthwise through the rod and projecting from the upper end thereof, said valve tending normally to move downwardly away from its seat, and a flat ended hand lever pivoted on a horizontal axis on the upper end of said stem and movable from a transverse position relative to the stem to a vertical dead-center position in alignment with the stem and resting with its flat end on top of said rod to raise the valve and force the same tightly against its seat, said lever having one side of the flat end rounded to provide a cam surface for sliding engagement on the upper end of said rod whereby to force the valve against its seat by cam action, the opposite side of said flat end being square, whereby to prevent movement of said lever past dead-center position.

2. An ullage rod as set forth in claim 1 including a vertically adjustable threaded bearing member for engagement by the lower end of said handle, whereby to adjust the valve and stem relative to the valve seat.

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