May 7, 1940. L. S. CURRY. 2,199,538

CONSTANT LEVEL CHAMBER

Filed March 17, 1939 2 Sheets-Sheet 1

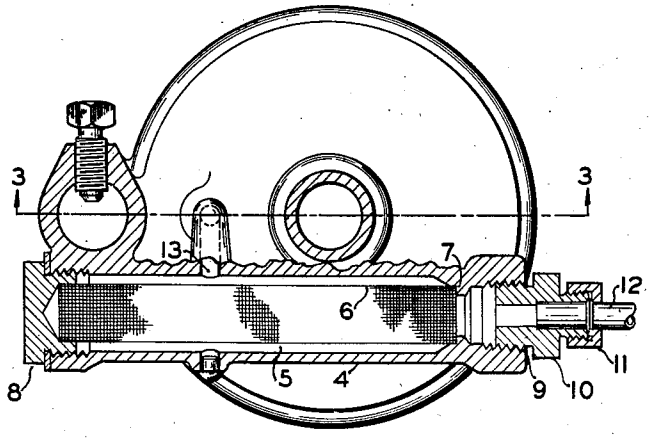


FIG. 2

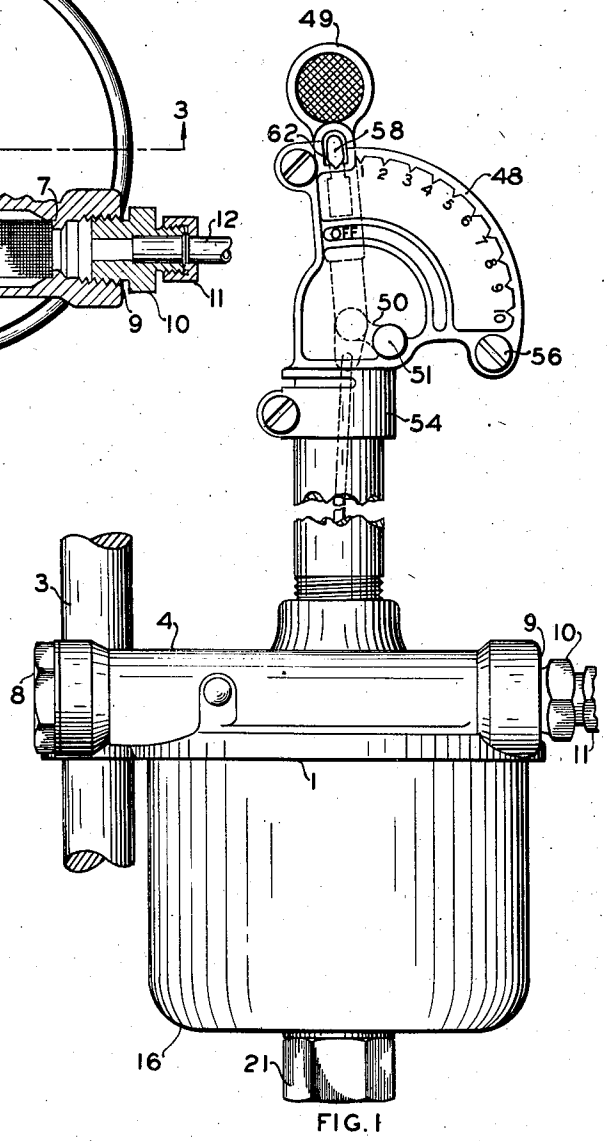


FIG. 1

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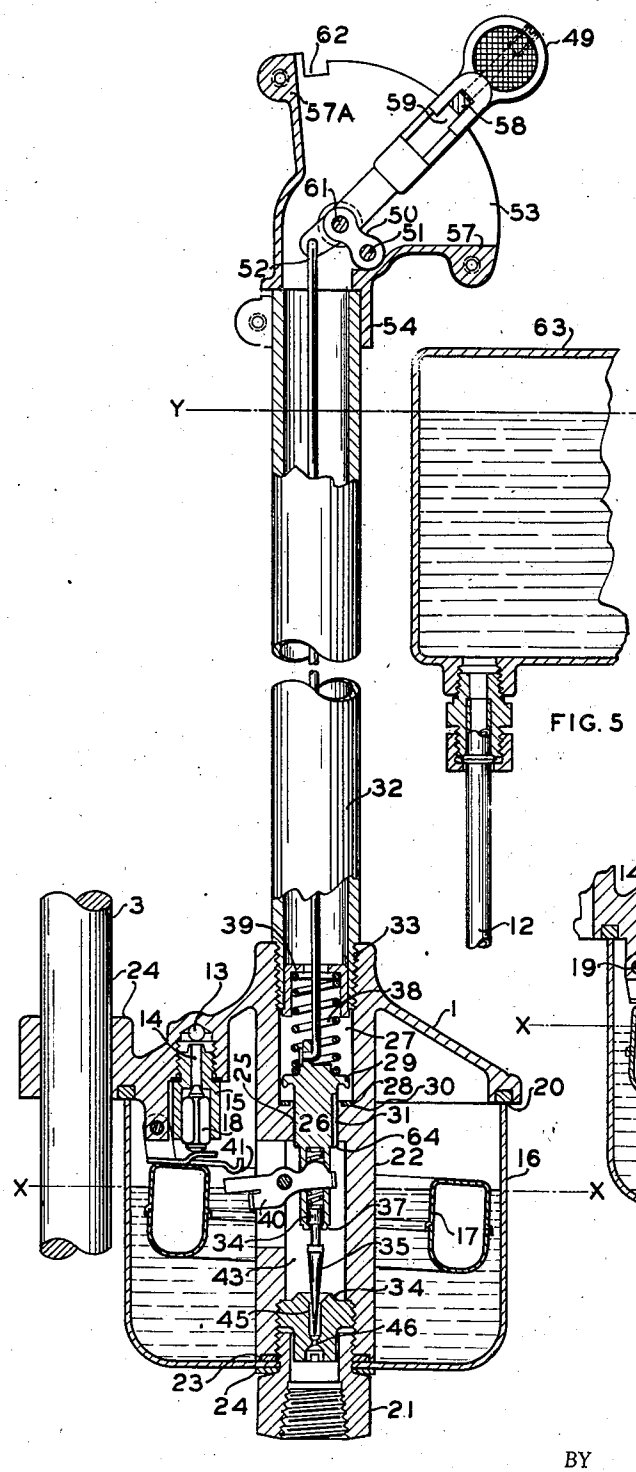


FIG. 4

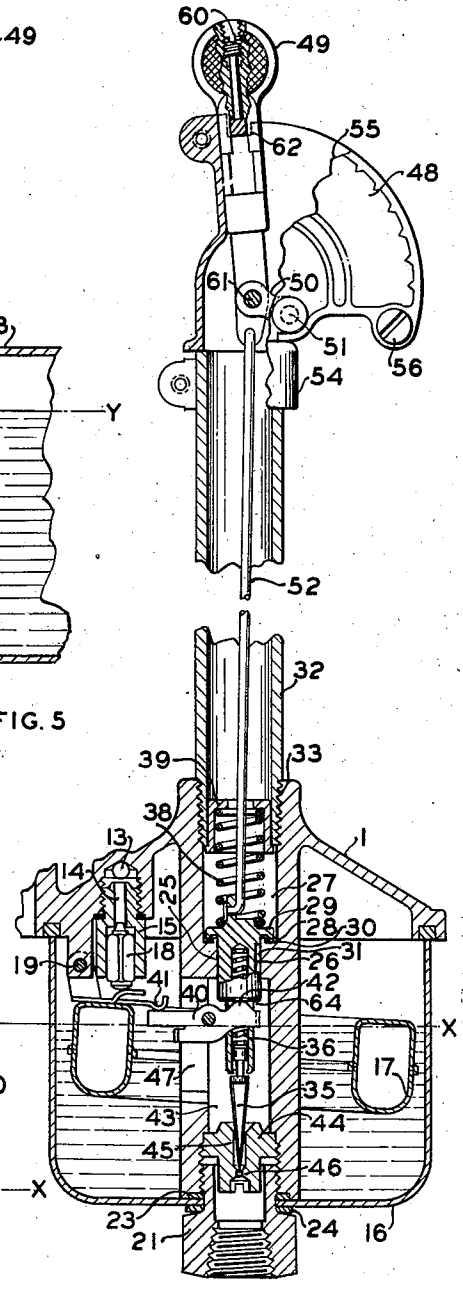


FIG. 5

FIG. 3

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CONSTANT LEVEL CHAMBER

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Application March 17, 1939, Serial No. 262,347

8 Claims. (Cl. 137—68)

This invention relates to fuel supply devices and more particularly to the type used in connection with gravity feed fuel systems for oil burners.

In fuel systems of this type the fuel storage tank is elevated above the burner. To maintain a constant head on the calibrated discharge jet, a comparatively small capacity constant level chamber usually equipped with a float controlled mechanism, manual feed adjustment and shut off is provided.

It is an object of this invention to provide a dependable, low cost, generally new and improved device of the above character.

It is a further object of this invention to provide a device of this character having a vertical vent tube of sufficient length to prevent overflow, and to dispose the indicating manual adjustment lever so as to provide greater convenience and visibility and to provide a single means which will jointly close both inlet and outlet of the constant level chamber.

Other objects and advantages will be better understood from the following description and accompanying drawings, referring to which:

Fig. 1 is an elevation of a device constructed according to my invention.

Fig. 2 is a plan view of Fig. 1 with parts shown in section.

Fig. 3 is a sectional elevation taken on line 3—3 of Fig. 2. This view shows the device in a "shut-off" position.

Fig. 4 is also a vertical section taken on line 3—3. This view shows the device in a partly "on position".

Fig. 5 is a fragmentary view of a fuel storage tank indicating its vertical position with respect to the device.

Referring to the drawings, the reference numeral 1 indicates a main body casting having a perforated boss 2 which provides a means for attaching the device to any suitable support as the rod 3.

A horizontal, cylindrical inlet boss 4 cast integral with the main body member having a bore 5 to receive a cylindrically formed screen 6 is provided. The screen is abutted against a shoulder 7 formed at the intake end of the bore and is held in position by the threadedly engaged plug 8. The intake end 9 is preferably threaded to receive screw fitting 10 having a compression nut 11 for attaching conduit 12.

The cross passage 13 and the bore 14 through the intake valve seat member 15 complete communication to the float chamber 16 in which a constant level of fuel is maintained as indicated with the dot-dash line x—x by the action of the float 17 upon the valve 18, the float being pivoted at 19.

The cup-shaped float chamber 16 is formed as a stamping having a concentric perforation in its bottom and is firmly pressed against the pliable ring washer 20 by reason of the clamping action of outlet fitting 21 which is threadedly engaged in the lower end of the vertical, cylindrical portion 22 of the main body casting.

Pliable gaskets 23 and 24 form a liquid seal between the lower end of the main body casting and float chamber 16 and between float chamber 16 and fitting 21, respectively.

The vertical, cylindrical portion 22 is provided with short bore 25 wherein the valve member 26 is guided. A downward counter bore 27 forms a shoulder or seat at 28 which is engaged by the flange 29 of the valve member 26 when the device is in a "shut-off" position.

A pliable gasket 30 nested in a groove in seat 28 insures a liquid seal. A slot 31 in valve member 26 provides a vent to atmosphere when the device is in any "on-position". It also permits the flow of fuel to the stand pipe shown at 32 which is threadedly assembled to the main body casting at 33.

It will be understood that the length of the stand pipe 32 is sufficient in any installation to extend above the highest level at which the fuel in the storage tank 63 will ever be, as indicated by dot-dash line y—y in Fig. 5.

Valve member 26 is bored to receive the upper, cylindrical portion 34 of the long taper valve 35. A spring 36 urges the valve 35 downward against a stop 37 formed by crimping.

A spring 38 within the counter bore 27 and restrained at its upper end by the formed perforated cup 39 urges the complete valve assembly downward.

A lever 40 pivotally mounted on the main body member engages the lip 41 rigidly attached to the float 17 and lifts the float upward firmly pressing valve 18 upon its seat when the device is in a "shut-off" position by reason of the downward pressure applied to the lever 40 at 42 by the shoulder 64 which is formed by the reduced diameter of the lower part of valve member 26.

A counter bore 43 from the lower end of body portion 22 is threaded to receive orifice block 44 which contains two calibrated orifices 45 and 46.

Communication between the float chamber and counter bore 43 is effected by the provision of slot 47.

As a means for positioning the valve 35 in a definite and indicated position, a quadrant 48, an operating lever 49 and link 50 pivoted at 51 and a rod 52 for connecting operating lever and valve assembly is provided. The quadrant is formed as a casting in two parts, a main quadrant casting 53 which is rigidly attached to the upper end of standpipe 32 by means of the split clamp ring 54 and a quadrant cover casting 55 which is attached by means of screws 56.

Operating lever 49 travels freely between the main quadrant casting and cover in a space provided by bosses 57 and 57a.

An indicator block 58 retained in slot 59 in the operating lever spans both parts of the quadrant and bears on their peripheries. To provide fine adjustment of valve 35 as may be required to compensate for necessary manufacturing tolerances or variations in fuel, an adjusting screw 60 is provided which positions block 58 relative to link pivot 61. In this way valve 35 may be adjusted independent of the movement of lever 49 on the quadrant.

To obtain the substantial vertical travel required to shut off the inlet and outlet to the float chamber and to obtain a detent for the control mechanism in a shut-off position, the notch 61 in the periphery of the quadrant is provided.

In operation, fuel flows by gravity from the storage tank 63 indicated in Fig. 5, enters the float chamber through the inlet boss 4, screen 6 and passages 13 and 14 wherein a constant level is maintained. The operating lever having been set at any "on-position" desired. In event any deleterious substance should find its way to the valve 18 or its seat and become lodged there affecting the function of this valve in such a manner as to admit fuel faster than incident requirements, the level would rise, and in extreme cases may approach the level y—y in the storage tank 63.

By this arrangement the device is completely sealed to a point above the level in the storage tank, so that no greater ill effects would be occasioned by such accident than a slightly greater flow to the burner than was desired, due to the increased head on the discharge orifice.

To forestall any serious damage which may result during operation due to tampering or adjustments of readily accessible parts made by incompetents I have provided two discharge orifices in series. The upper discharge orifice 45 is controlled by the position of the tapered valve 35. The lower orifice 46, however, is fixed and is calibrated to flow less than the maximum which the burner or heater can safely burn.

In an inoperative position the control lever is moved to the left into the shut-off position as indicated in Fig. 3. In this position the spring 38 firmly presses the flange 29 against the seat 28, the valve 35 is also firmly seated at the upper edge of orifice 45. The yielding means provided by the spring 36 insures the seating of both members.

In this position the intake needle is also firmly pressed against its seat by the lever 40. It will be understood that lip 41 is sufficiently flexible to insure seating.

The detailed description and structure shown is intended to be illustrative not limiting, and various modifications within the scope of the following claims are possible.

I claim:

1. In a constant level device for fuel feed systems, means forming a fuel chamber, an inlet and an outlet passage communicating with said chamber, a vent in the upper portion of said chamber, a float operated mechanism for controlling said inlet, and a single control means for closing said inlet, said outlet and said vent.

2. In a constant level device for fuel feed systems, means forming a fuel chamber, an inlet and an outlet passage communicating with said chamber, a vent in the upper portion of said chamber, a float operated valve adapted to control said inlet, a dual valve assembly for controlling said outlet and said vent and yieldable means for closing said float operated valve as said dual valve assembly is moved to a closed position.

3. A device as specified in claim 2 in which said dual valve assembly comprises two valve members, one member being adapted to control said outlet, and one member being adapted to control said vent, said outlet control member being telescoped within said vent control member, yieldable means normally holding said outlet control member in an extended position, and resilient means for normally urging said dual valve assembly toward a closed position.

4. In a fuel control device of the class described, means forming a constant level chamber, an inlet passage, an outlet passage, and a vent for said chamber, a valve for controlling said inlet, a dual valve assembly for controlling said outlet and said vent, a float operated mechanism for operating said inlet valve, a manually operated mechanism for jointly controlling said dual valve assembly and said inlet valve, said manual control mechanism comprising a quadrant, an operating lever adapted to be slidably positioned on the periphery of said quadrant and a connector rod connecting said operating lever with said dual valve assembly, yieldable means for urging said manual control mechanism toward a closed valve position, and means for latching said control mechanism in a closed valve position.

5. A device as specified in claim 4 in which means independent of the positioning of said operating lever on the periphery of said quadrant is provided for the adjustment of said outlet control valve.

6. A fuel supply system for oil burners, comprising a constant level chamber means for supplying fuel under pressure to said chamber, an inlet and outlet for said chamber, a vent tube for said chamber extended vertically to a point above the highest level to which the fuel will rise due to the supply pressure, and a manual control mechanism for the joint control of said inlet, said outlet and said vent.

7. A device of the class described comprising a main body member, a downwardly extending projection on said body member, a substantially cup-shaped fuel reservoir surrounding said extension, a longitudinal passage through said extension, means for attaching said reservoir to said extension, an outlet orifice member mounted in said passage, a valve mechanism for controlling said orifice, a constriction in said passage for guiding said valve mechanism, and means providing communication between said passage and said reservoir.

8. A fuel supply system for oil burners, a constant level chamber, means for supplying fuel under pressure to said chamber, an inlet and an outlet for said chamber, a vent tube for said chamber extended vertically to a point above the highest level to which fuel will rise due to the supply pressure and a manual control mechanism supported by said vent tube for the joint control of said inlet and said outlet.

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