July 9, 1940. T. F. GILES 2,206,949

PRESSURE LAMP OR STOVE

Filed Dec. 18, 1936 4 Sheets-Sheet 1

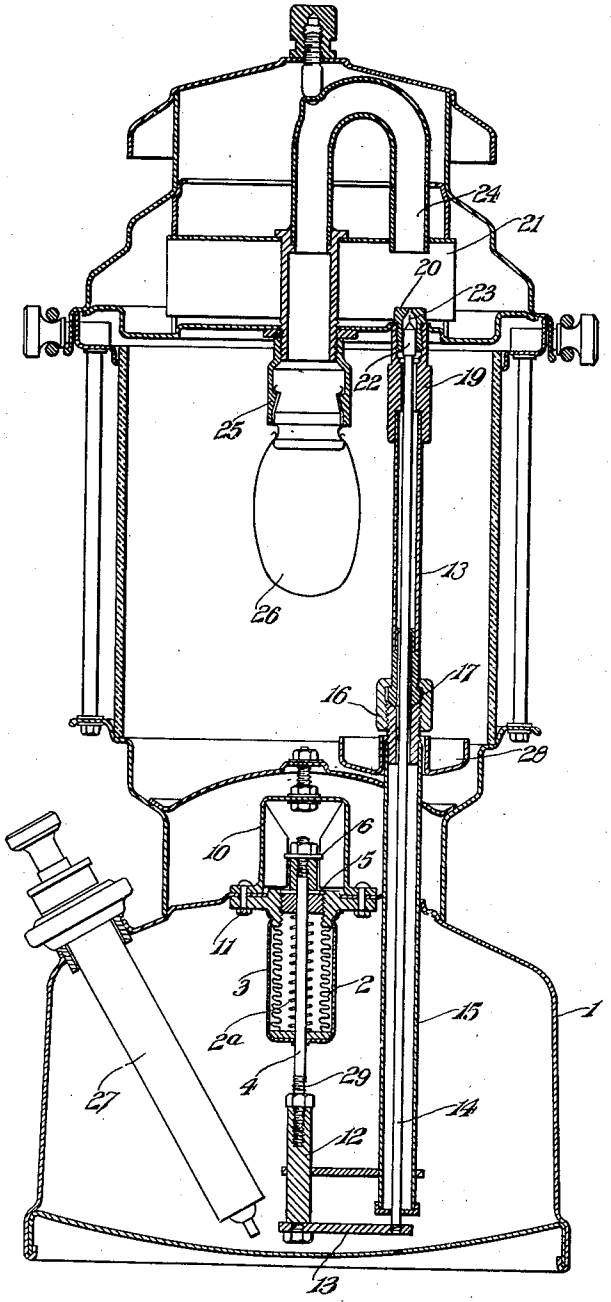


Fig. 1.

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Fig. 2.

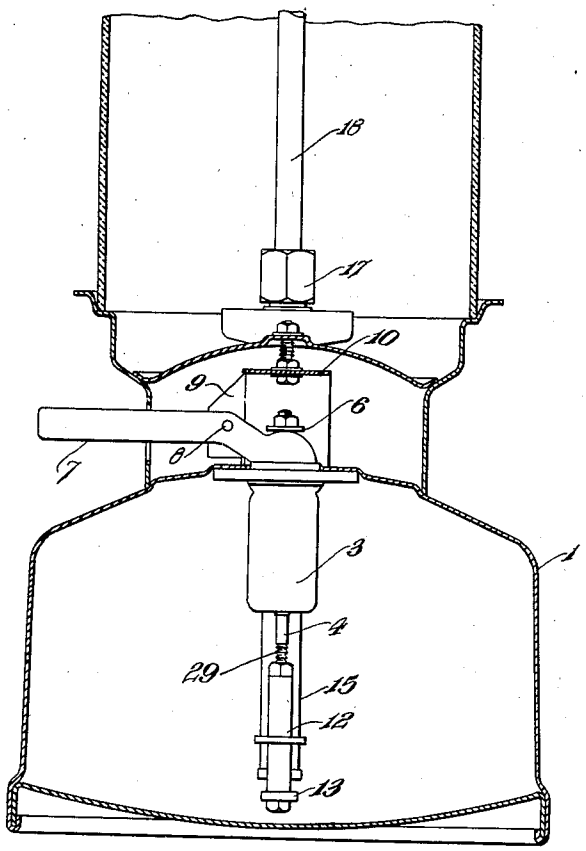
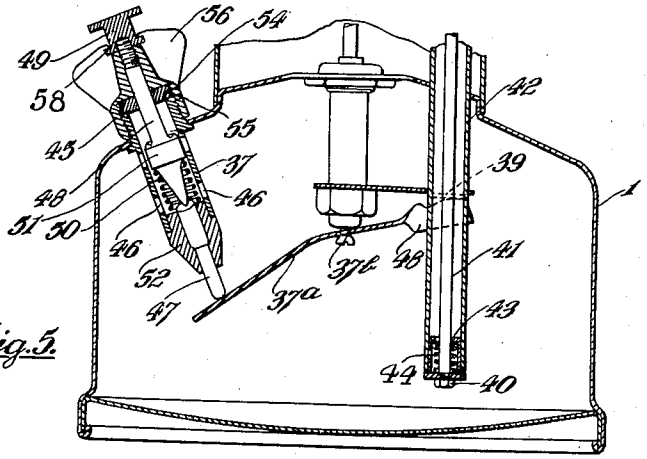


Fig. 5.



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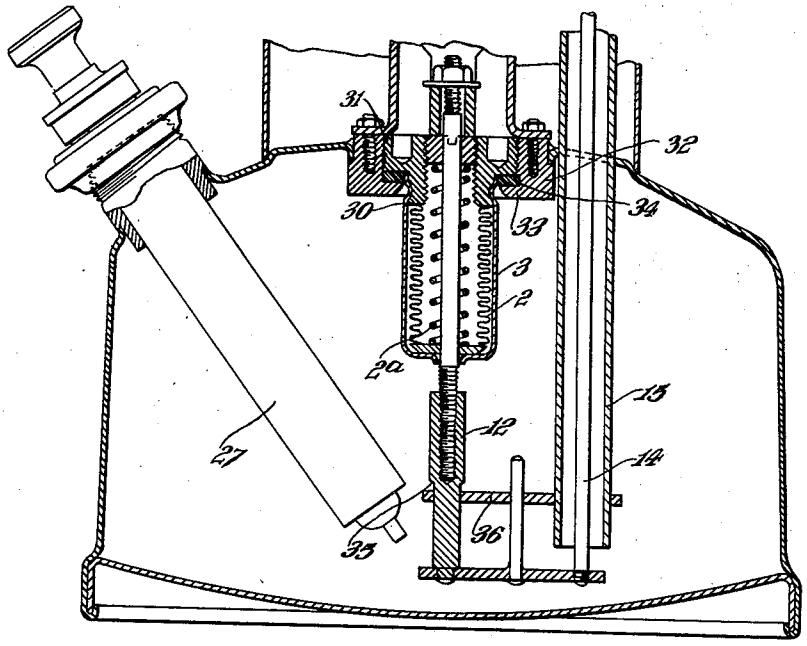


Fig. 3.

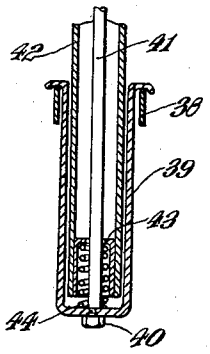


Fig. 6.

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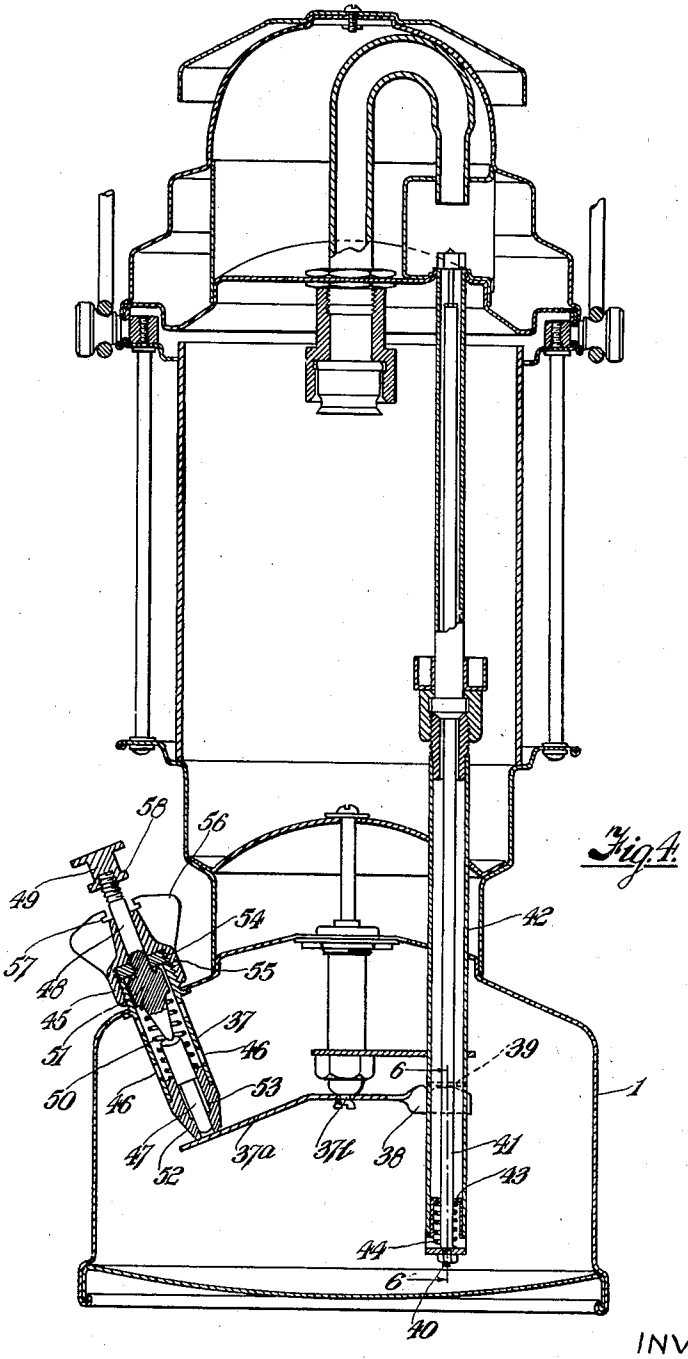


Fig. 4.

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UNITED STATES PATENT OFFICE

2,206,949

PRESSURE LAMP OR STOVE

Thomas Francis Giles, Greenford, England, assignor to The Mantle Lamp Company of America, Chicago, Ill., a company of Illinois

Application December 18, 1936, Serial No. 116,451
In Great Britain February 18, 1936

9 Claims. (Cl. 158—42.1)

This invention relates to lamps and stoves of the kind adapted to burn oil or spirit under pressure and wherein the fuel is conducted from the pressure reservoir through a vapouriser heated during normal operation by the heat of the burner and/or mantle.

Hitherto in pressure lamps and stoves successful operation has been most frequently impeded by the nipple orifice on the upper end of the supply conduit becoming choked. This orifice being of extremely small diameter is easily obstructed by fragments of carbon or impurities in the fuel and owing to its position adjacent the vapouriser is difficult of access for cleaning which ordinarily entails dismantling of the burner parts of the lamp.

In order to overcome the disadvantage above referred to the present invention provides a pressure lamp or stove of the kind above described having a needle for cleaning the nipple orifice of the fuel supply conduit wherein the needle is capable of manual operation from the exterior of the lamp or stove against the action of resilient means disposed within the fuel reservoir, the said resilient means restoring the needle and operating means automatically to normal positions after operation.

The invention also consists in a pressure lamp or stove of the kind described having a cleaning needle and a valve carried at the upper end of a rod extending vertically through the fuel supply conduit and adapted respectively to clean and close the nipple orifice at the upper end of said conduit, the said rod being raised through the medium of a rocking device controlled by resilient means both disposed within the fuel reservoir, the said rocking device being operated from the exterior of the lamp or stove and the parts being restored automatically by said resilient means to open position after operation.

The invention further consists in a pressure lamp or stove of the kind described having a cleaning needle and valve element carried at the upper end of a rod extending vertically through the fuel supply conduit and adapted respectively to clean and close the nipple orifice at the upper end of said conduit, the said rod being raised and lowered by manually operated means and resilient devices respectively, said resilient devices including a metallic bellows interposed in the reservoir for the purpose of closing the valve automatically should an excess pressure be created in the reservoir.

Reference will now be made to the acompanying drawings which illustrate by way of example construction according to the invention and in which:

Figure 1 is a sectional elevation of a pressure lamp,

Figure 2 is a partial sectional elevation taken at right angles to Fig. 1,

Figure 3 is a sectional elevation showing a modification of the lamp shown in Figs. 1 and 2,

Figure 4 is a sectional elevation of an alternative form of construction,

Figure 5 is a partial sectional elevation showing the operative positions of the parts shown in Figure 4 and Figure 6 is a detail view taken on the line 6—6 of Fig. 4 of the means for controlling the movement of the cleaning needle.

Referring first to the construction illustrated in Figs. 1 and 2 there is disposed within the reservoir 1 of a pressure lamp an expansible metallic bellows device 2 enclosed within a casing 3 depending from the cover of the reservoir 1. The bellows device 2 is fixed at its lower end to a vertically slidable rod 4 which extends centrally through the casing and the bellows and passes at its upper end through an adjustable screw threaded sleeve 5 to the exterior of the reservoir where it is provided with a nut and collar 6 beneath which bears one end of an operating lever 7, this lever being pivoted at 8 between cheeks 9 of a housing element 10 which is secured to the cover of the reservoir 1 by means such as rivets 11. The lower end of the rod 4 is connected to an extension 12 whose lower end is fixed to a plate 13 whose opposite end is connected to the base of a rod 14 which extends vertically through a fuel feed conduit 15 passing upwards through the cover of the reservoir 1, and entering the upper portion of the lamp housing at 16 where its upper end is connected by means of a tubular coupling 17 with an upper fuel feed conduit 18 whose upper end enters a housing 19 which terminates in a nipple 20 through which the vapourised fuel is supplied to the mixing tube 21.

The upper end of the rod 14 bears a valve member 22 capable of closing the orifice of the nipple 20 whilst the valve itself terminates in a needle or pricker 23 which is of such dimensions as to be capable of passing through the nipple for the purpose of cleaning it.

The vapourised fuel is mixed with air in the tube 21 and passes through a passage 24 to a burner 25 and mantle 26. The reservoir 1 is also provided with a combined filling device and pump 27 of any usual construction and around the supply conduit 15 is disposed an annular trough 28 for preheating purposes.

Within the metallic bellows is disposed a coiled spring 2*a*, the compression of which is adjusted by means of the screw-threaded sleeve 5 and which serves to prevent collapse of the bellows due to the pressure in the reservoir 1 under normal working conditions, but the springs preferably so adjusted that when a predetermined pressure is reached in the reservoir, the resistance of the spring is overcome and the bellows 2 partially collapsed so as automatically to close the valve 22 and put the lamp out of operation.

The bellows device 2 also operates as a seal to prevent leakage of vapour from the reservoir 1.

In the operation of the device above described cleaning of the nipple orifice is effected by downward pressure applied to the outer end of the lever 7 which lifts the rod 4, plate 13 and rod 14 to push the needle 23 through the nipple orifice 20. This action tends to compress the bellows device 2 and spring 2*a* so that when the pressure on the arm 7 is relaxed the bellows and spring restore the parts to normal position to open the nipple orifice 20. By maintaining pressure on the lever 7 the valve member 22 is caused to close the nipple orifice and the lamp will cease to function and in order to maintain the valve in a closed position when desired means may be provided for locking the lever 7 temporarily in its depressed position. In order that the device may be accurately adjusted the rod 4 and its extension 12 are provided with a screw threaded connection 29 which enables the range of movement of the valve 22 and pricker 23 to be increased or decreased.

The construction shown in Fig. 3 is an alternative to that shown in Figs. 1 and 2 and is designed to enable the bellows device to be removed in case of breakdown for adjustment or replacement. In this construction the upper end of the casing 3 of the bellows device 2 terminates in a sleeve 30 whose upper portion is flanged at 31 and screw threaded to engage a screw threaded socket 32 formed in the centre of the top of the reservoir 1. This socket has an inwardly projecting flange 33 at its base and upon this is disposed a lead or other washer 34 upon the top of which bears the flange 31 when the device is assembled, the screwing down of the sleeve 30 into position binding the two flanges 31 and 33 into close engagement with the washer to form a fluid-tight joint.

In this construction the downward movement of the pricker rod is limited by a shoulder 35 on the extension 12 coming into contact with a fixed guide 36.

An advantage of the arrangements above described with reference to Figs. 1–3 is that should a predetermined limit of pressure in the reservoir 1 be exceeded the bellows device 2 will tend to collapse of its own accord to operate the valve member 22 and cause the lamp to be extinguished.

In the alternative form of the invention illustrated in Figs. 4 and 5 the operating mechanism for the pricker includes a cylindrical sleeve 37 which is secured in the top of the reservoir 1 and extends downwards so that its lower end is normally in contact with an arm 37*a* of a lever which is movable on a fixed pivot 37*b* and whose other arm 38 is forked and engages the flanged upper end of a sleeve or stirrup 39 (Fig. 6) the base of which is fixed by means of a nut 40 to the base of a rod 41 which is movably mounted within a fuel supply conduit 42. Within the lower end of this conduit is a fixed abutment 43 between which and the base of member 39 is disposed a coiled spring 44. The fuel supply conduit 42 extends, as before, upwards through the cover of the reservoir to the upper portion of the lamp where the upper end of rod 41 carries a pricker for cleaning the nipple orifice.

The outer end of the sleeve 37 is normally closed by a screw-threaded filler cap 45 and when this cap is removed the reservoir 1 can be filled through the opening provided, the liquid fuel entering the reservoir through a number of slots or perforations 46 in the sleeve 37. Slidably mounted in the inner end of the sleeve is a plunger 47 whose outer end abuts against the inner end of a rod 48 which has a head or button 49 at its outer end to enable it to be operated by manual pressure so that when released a spring 50 disposed within the sleeve 37 will restore it to normal position. The spring 50 abuts at its upper end against an enlarged portion 51 of the rod 48 and at its lower end against a closure element 52 having a central passage 53 through which the plunger 47 is slidable.

Within the cap 45 is a washer which seats on the upper end of the sleeve 37 when the filler cap is screwed down in closed position as shown. The filler cap is also provided with a small perforation 55 which allows air escape to relieve the pressure in the reservoir when the filler cap is slackened and the pressure on the washer 54 consequently relaxed. The filler cap is provided with wing elements 56 to facilitate manual operation in screwing and unscrewing the cap and the inner portions of these wing elements are provided with slots 57 which can be engaged by projections 58 on the head 49 when it is desired to lock the plunger 47 in the depressed position to maintain the nipple orifice closed. Figure 5 shows the position of the parts when the plunger 47 has been depressed to cause the pricker to enter the nipple orifice and the valve 22 to close. In this position the springs 50 and 44 are compressed so that when the head 49 is given a partial turn to bring the projections 58 out of engagement with the slots 57 both springs will expand and the pricker 23 will be withdrawn from the nipple orifice whilst the plunger 47 and associated parts will be automatically restored to the positions shown in Figure 4.

I claim:

1. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded collar secured to said tank around said opening and carrying a depending flange, a cylindrical casing secured to said depending flange and having a centrally apertured lower end wall, a threaded sleeve in said threaded collar, a rod extending vertically through said casing end wall and said sleeve, a disk in the lower end of said casing and secured to said rod for vertical movement with said rod in said casing, a metallic bellows in said casing around said rod and having its ends secured respectively to said depending flange and to said disk, a compression spring around said rod between said disk and said sleeve, a fuel valve operated by said rod, and a burner supplied with fuel through said valve.

2. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded collar secured to said tank around said opening and carrying a depending flange, a cylindrical casing secured to said depending flange and having a centrally apertured lower end wall,

a threaded sleeve in said threaded collar, a rod extending vertically through said casing end wall and said sleeve, a disk in the lower end of said casing and secured to said rod for vertical movement with said rod in said casing, a metallic bellows in said casing around said rod and having its ends secured respectively to said depending flange and to said disk, a compression spring around said rod between said disk and said sleeve, a fuel valve operated by said rod, a burner supplied with fuel through said valve, a housing element above said collar and over the upper end of said rod, and a lever pivotally supported by said housing element and engaging the upper end portion of said rod, whereby said rod may be raised by manual operation of said lever.

3. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded tubular socket secured to said tank around said opening, an externally threaded collar engaging the threads in said socket and having a depending flange, a cylindrical casing secured to said depending flange and having a centrally apertured lower end wall, said cylindrical casing having an outer diameter smaller than the opening in said socket, said collar having an internally threaded aperture, an externally threaded sleeve engaging the internal threads in said collar, a rod extending vertically through said casing end wall and said sleeve, a disk in the lower end of said casing and secured to said rod for vertical movement with said rod in said casing, a metallic bellows in said casing around said rod and having its ends secured respectively to said depending flange and to said disk, a compression spring around said rod between said disk and said sleeve, a fuel valve operated by said rod, and a burner supplied with fuel through said valve, whereby said cylindrical casing and the said parts connected therewith and contained therein may be removed from and placed in said socket as a unitary structure.

4. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded tubular socket secured to said tank around said opening, an externally threaded collar engaging the threads in said socket and having a depending flange, a cylindrical casing secured to said depending flange and having a centrally apertured lower end wall, said cylindrical casing having an outer diameter smaller than the opening in said socket, said collar having an internally threaded aperture, an externally threaded sleeve engaging the internal threads in said collar, a rod extending vertically through said casing end wall and said sleeve, a disk in the lower end of said casing and secured to said rod for vertical movement with said rod in said casing, a metallic bellows in said casing around said rod and having its ends secured respectively to said depending flange and to said disk, a compression spring around said rod between said disk and said sleeve, a fuel valve operated by said rod, a burner supplied with fuel through said valve, whereby said cylindrical casing and the said parts connected therewith and contained therein may be removed from and placed in said socket as a unitary structure, a housing element above said collar and over the upper end of said rod, and a lever pivotally supported by said housing element and engaging the upper end portion of said rod, whereby said rod may be raised by manual operation of said lever.

5. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded tubular socket secured to said tank around said opening, an externally threaded collar engaging the threads in said socket and having a depending flange, a cylindrical casing secured to said depending flange and having a centrally apertured lower end wall, said cylindrical casing having an outer diameter smaller than the opening in said socket, said collar having an internally threaded aperture, an externally threaded sleeve engaging the internal threads in said collar, a rod extending vertically through said casing end wall and said sleeve, a disk in the lower end of said casing and secured to said rod for vertical movement with said rod in said casing, a metallic bellows in said casing around said rod and having its ends secured respectively to said depending flange and to said disk, a compression spring around said rod between said disk and said sleeve, a fuel valve operated by said rod, a burner supplied with fuel through said valve whereby said cylindrical casing and the said parts connected therewith and contained therein may be removed from and placed in said socket as a unitary structure, said socket having an inwardly extending radial flange below said collar, and a packing ring between said collar and said radial flange.

6. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded tubular socket secured to said tank around said opening, an externally threaded collar engaging the threads in said socket and having a depending flange, a cylindrical casing secured to said depending flange and having a centrally apertured lower end wall, said cylindrical casing having an outer diameter smaller than the opening in said socket, said collar having an internally threaded aperture, an externally threaded sleeve engaging the internal threads in said collar, a rod extending vertically through said casing end wall and said sleeve, a disk in the lower end of said casing and secured to said rod for vertical movement with said rod in said casing, a metallic bellows in said casing around said rod and having its ends secured respectively to said depending flange and to said disk, a compression spring around said rod between said disk and said sleeve, a fuel valve operated by said rod, a burner supplied with fuel through said valve, whereby said cylindrical casing and the said parts connected therewith and contained therein may be removed from and placed in said socket as a unitary structure, said socket having an inwardly extending radial flange below said collar, a packing ring between said collar and said radial flange, a housing element above said collar and over the upper end of said rod, and a lever pivotally supported by said housing element and engaging the upper end portion of said rod, whereby said rod may be raised by manual operation of said lever.

7. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded tubular socket secured to said tank around said opening, an externally threaded collar engaging the threads in said socket, pressure responsive mechanism carried by said collar and of smaller size horizontally than the opening in said socket, a fuel valve operated by said pressure responsive mechanism, and a burner sup-

plied with fuel through said valve, whereby said collar and the pressure responsive mechanism carried thereby may be removed from and placed in said socket as a unitary structure.

8. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded tubular socket secured to said tank around said opening, an externally threaded collar engaging the threads in said socket, pressure responsive mechanism carried by said collar and of smaller size horizontally than the opening in said socket, a fuel valve operated by said pressure responsive mechanism, a burner supplied with fuel through said valve, whereby said collar and the pressure responsive mechanism carried thereby may be removed from and placed in said socket as a unitary structure, a housing element above said collar, and lever mechanism carried by said housing element and connected with said pressure responsive mechanism for manually operating said fuel valve.

9. A liquid fuel burning device including in combination a tank for holding liquid fuel and having an opening in its top wall, an internally threaded tubular socket secured to said tank around said opening, an externally threaded collar engaging the threads in said socket, pressure responsive mechanism carried by said collar and of smaller size horizontally than the opening in said socket, a fuel valve operated by said pressure responsive mechanism, a burner supplied with fuel through said valve, whereby said collar and the pressure responsive mechanism carried thereby may be removed from and placed in said socket as a unitary structure, said socket having an inwardly extending radial flange below said collar, and a packing ring between said collar and said radial flange.

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