

July 11, 1944.

J. KLONARIS

2,353,341

FUEL SUPPLY

Filed Feb. 19, 1941

4 Sheets-Sheet 1

Fig. 1.

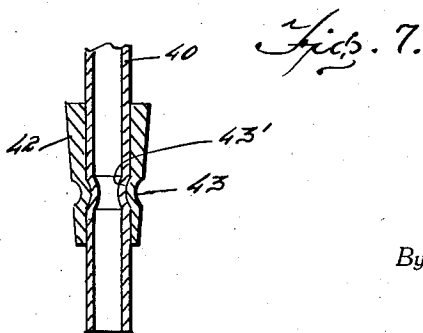
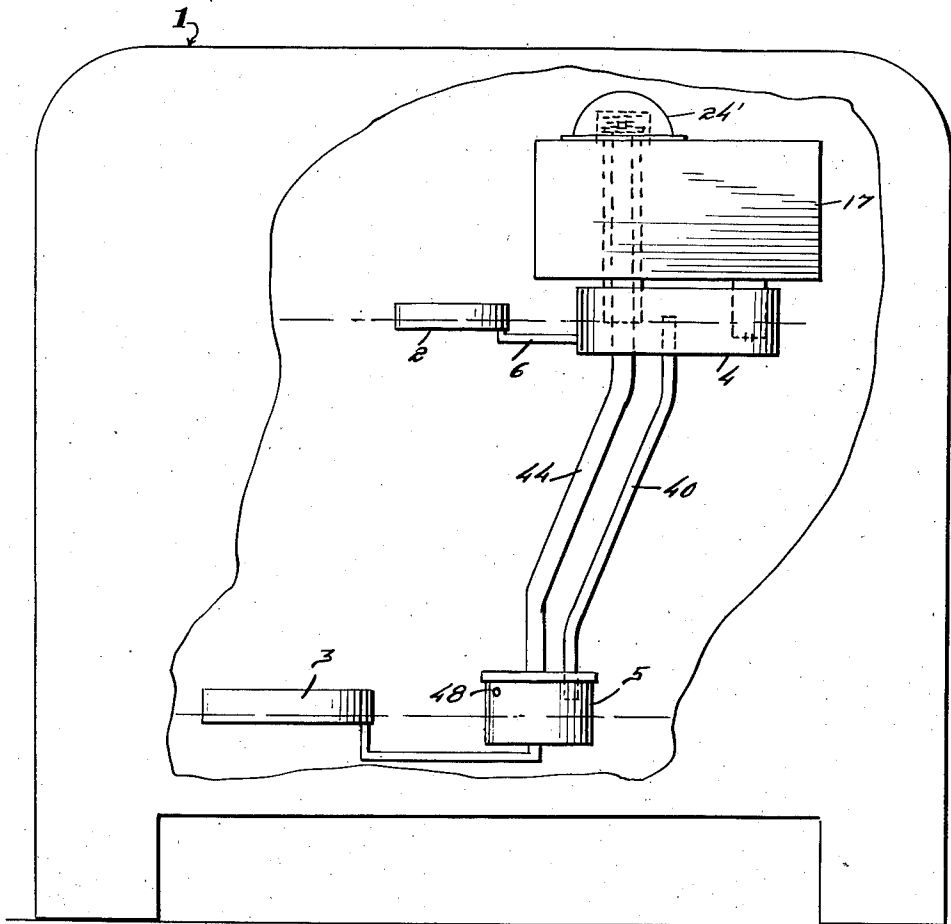


Fig. 7.

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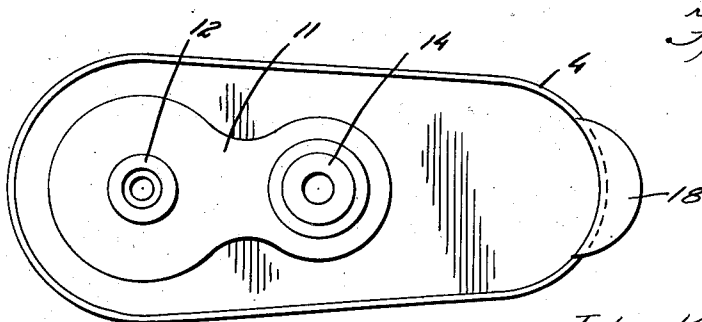
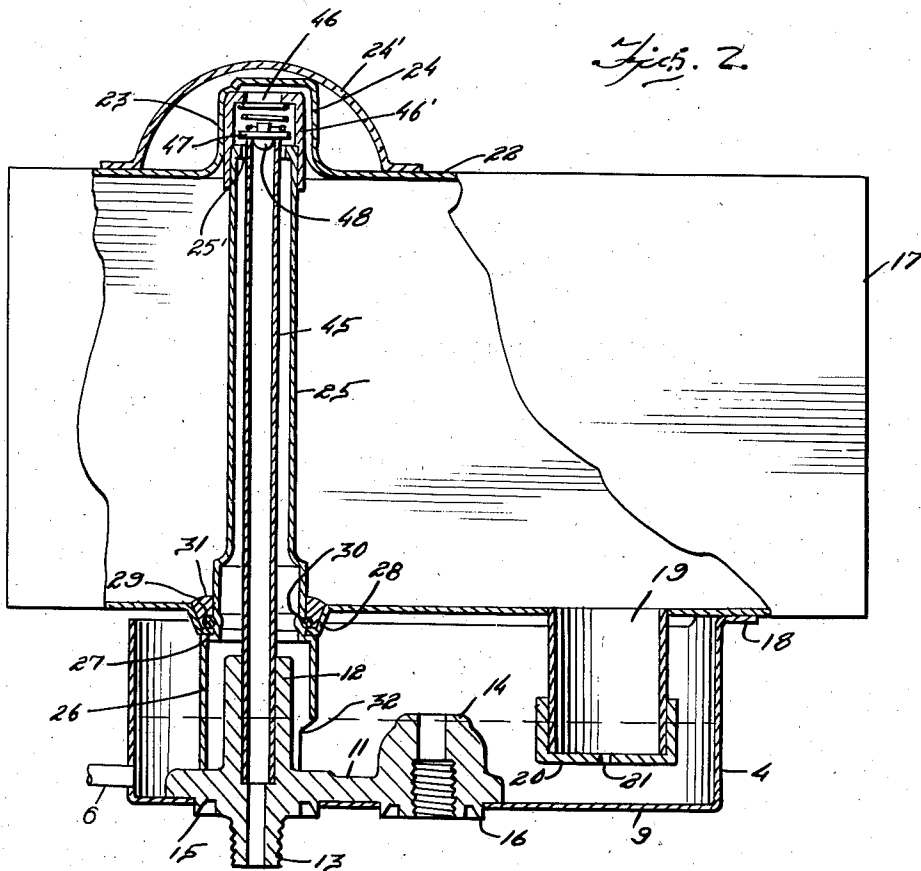
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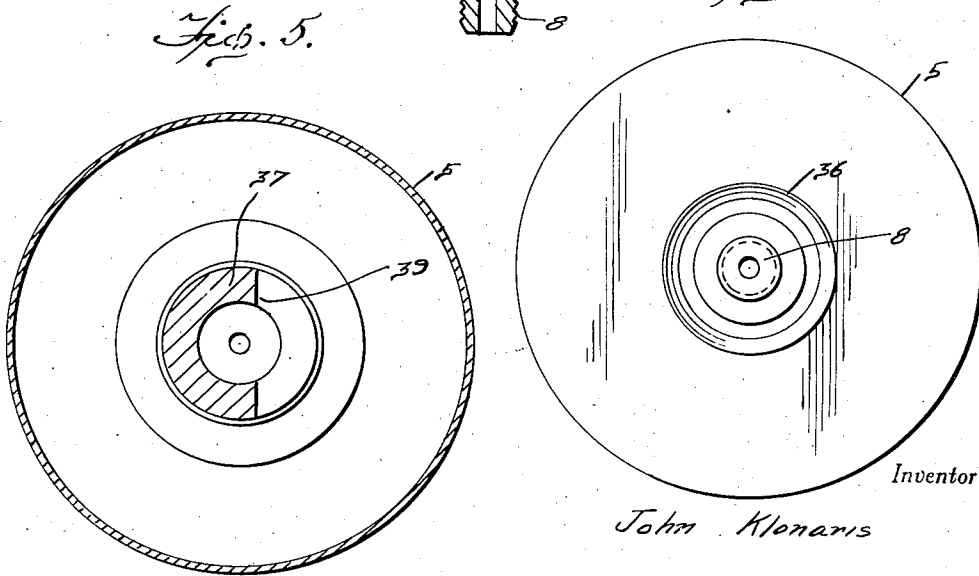
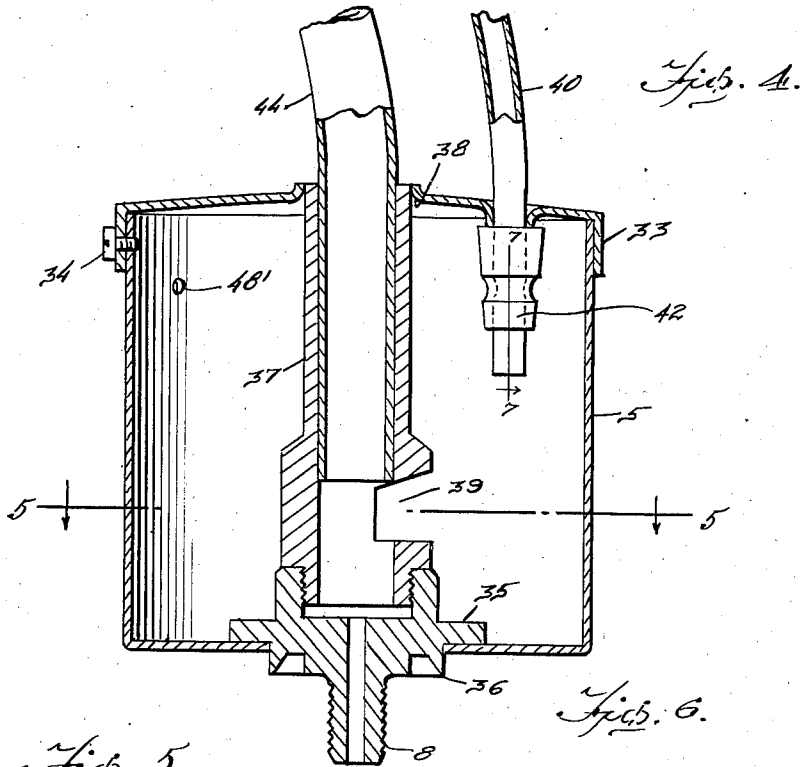
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4 Sheets-Sheet 3



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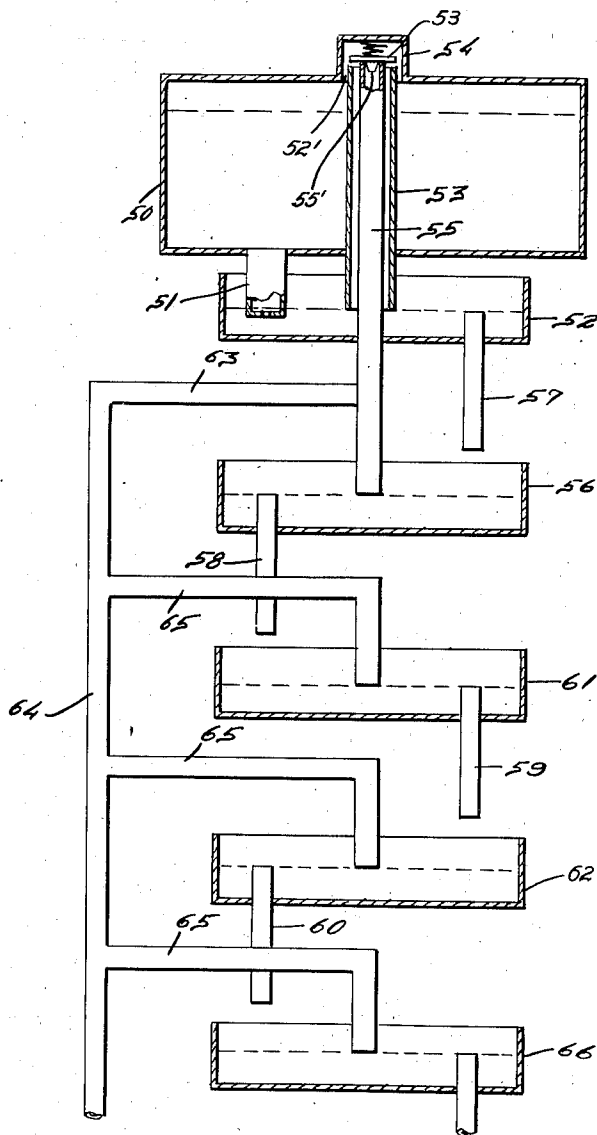
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4 Sheets-Sheet 4

Fig. 8.



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UNITED STATES PATENT OFFICE

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FUEL SUPPLY

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Application February 19, 1941, Serial No. 379,668

5 Claims. (Cl. 158—37)

My invention relates to improvements in fuel supplying apparatus for oil burning stoves and the like.

The principal object of the invention is to provide simply constructed, inexpensive apparatus of the type above designated for quick and easy incorporation in stoves embodying upper and lower burners, as for instance, top and oven burners, to feed both the upper and lower burners, or either, as desired, from a single supply tank and in which the number of moving parts is reduced to a minimum.

Other, and subordinate objects are also comprehended by my invention, all of which, together with the precise nature of my improvements will be readily understood when the succeeding description and claims are read with reference to the drawings accompanying and forming part of this specification.

In said drawings:

Figure 1 is a view in rear elevation of a stove equipped according to a preferred embodiment of my invention, the stove being partly broken away to illustrate the burners therein.

Figure 2 is a view partly in vertical section and partly in side elevation of the fuel supply tank, oil feed bowl for the upper burner, and parts associated with said tank and bowl, all drawn to an enlarged scale.

Figure 3 is a view in top plan of the upper fuel feed bowl detached.

Figure 4 is a view in vertical section of the fuel feed bowl for the lower burner and parts directly associated therewith and drawn to an enlarged scale.

Figure 5 is a view in transverse section taken on the line 5—5 of Figure 4.

Figure 6 is a view in bottom plan of the fuel feed bowl for the lower burner.

Figure 7 is a view in vertical section taken on the line 7—7 of Figure 4, and

Figure 8 is a view partly in vertical section and partly in side elevation of a modified form of the apparatus.

Referring to the drawings by numerals, my improved fuel supply, in the preferred embodiment thereof has been shown as applied to a diagrammatically illustrated table-top stove 1 including a pair of upper and lower, top and oven burners 2, 3, of the well-known sleeve type.

According to the preferred embodiment of the invention, a pair of upper and lower fuel feed bowls 4, 5, are provided for said burners 2, 3, respectively, which are located at the back of the stove 1, the upper bowl 3 being secured to the

stove in any suitable manner, not deemed necessary to illustrate or describe. The usual shank 6 of the upper burner 2 is suitably extended laterally from one side of the upper fuel feed bowl 4 adjacent the bottom thereof into the stove 1. The shank 7 of the lower burner 3 extends laterally from the lower fuel feed bowl 5 into said stove from an oil discharge nipple 8 depending centrally from the bottom of the lower bowl.

The upper fuel feed bowl 4 is of elongated, flat-bottomed, open top form and provided on the bottom thereof with an elongated casting 11 in the longitudinal center of the bowl and having a coupling sleeve 12 upstanding therefrom adjacent one end of the bowl terminating short of the top of the bowl, an externally threaded nipple 13 depending therefrom below the bottom of said bowl in the axis of said sleeve, and a vertically bored boss upstanding therefrom in the approximate center of said bowl to substantially the horizontal center of the bowl and forming an oil discharge nipple 14, as will presently more clearly appear. The casting 11 is anchored to the bottom 9 of the bowl 4 by a pair of annular bottom flanges 15, 16, surrounding said nipples 13, 14, respectively, and which are suitably fitted in said bottom and secured thereto as by solder, not shown.

Surmounting the upper fuel feed bowl 4, and slightly spaced above the same, is a substantially rectangular and larger fuel supply tank 17 closed, with the exceptions presently noted, and disposed lengthwise over said bowl 4 longitudinally of the latter in centered relation thereto. The fuel supply tank 17 rests, adjacent one end, on a lateral flange 18 on one end of said upper bowl 4 and is supported adjacent its opposite end by means presently described. A fluid discharge neck 19 depends from the bottom of said supply tank 17 adjacent one end thereof and into the upper bowl 4 alongside the discharge nipple 14 to a level intermediate the top of said nipple and the bottom 9 of said bowl, said neck having a detachable cap 20 sleeved thereon and provided with a central bleed aperture 21 therein. The top 22 of the fuel supply tank 17 has formed therein, substantially in vertical alinement with the sleeve 12 a dome 23. A suitable guard 24' on said top 22 arching over the dome 23 protects the latter. The dome 23 has formed therein an air channel 24 leading from said tank to the top of said dome.

A standpipe 25 arises from the casting 11 through the bottom of the fluid supply tank

17 and partway into the dome 23, said pipe having an enlarged lower end 26 resting on said casting 11 in surrounding, spaced relation to the sleeve 12 and forming a circumferential shoulder 27 on the pipe slightly below the level of the top of the upper bowl 4. The bottom of the fuel supply tank 17 is provided with an external annular flange 28 seated on said shoulder 27 and through which the standpipe 25 extends, whereby said tank is supported adjacent the before mentioned opposite end by said pipe. A split locking ring 29 fitting in the flange 28 and in a groove 30 in said pipe 25 locks the latter to the fluid supply tank 17. Solder 31 in the flange 28 forms a seal between the flange and pipe. The lower end of the standpipe 25 has a notch 32 formed therein below the top of the nipple 14 to admit fluid into the bottom of said pipe.

As will now be seen, the standpipe 25 provides for admitting air therethrough by way of the notch 32, into the top of the fuel supply tank 17 so that fuel in the latter may flow therefrom by way of the neck 19 and bleed aperture 21 into the upper fuel feed bowl 4 and into said pipe 25, the fuel flowing out of the bowl 4 by way of the shank 6 into the upper burner 2, and when the fuel rises in said bowl 4 and pipe 25 to the level of the top of the notch 32, an air seal is formed in the standpipe 25 establishing the maximum level of fuel in said bowl 4. The top of the notch 32 being below the top of the nipple 14, under the maximum level of fuel in said upper bowl 4, such fuel will not discharge out of the nipple 14 except under conditions presently described.

The lower fuel feed bowl 5 is substantially cup-shaped and closed by a crown type flanged cover 33 detachably secured thereon by a set screw 34. The before mentioned discharge nipple 8 forms part of a cup-shaped laterally flanged fitting 35 secured in the center of the bowl 5 to the bottom of the latter by a depending annular flange 36 extending through said bottom and fixed therein by solder, not shown. A sleeve 37 threaded at its lower end into the fitting 35 extends up into and is fitted into an aperture 38 in the cover 33, said sleeve having a side notch 39 therein adjacent the bottom of the bowl 5 for a purpose presently seen. A fuel discharge pipe 40 threaded into the bottom of the discharge nipple 14 depends therefrom into the lower bowl 5 by way of an opening 41 in the cover 33 and terminates above the notch 39. A retainer sleeve 42 on the lower end of the fluid discharge pipe 40 prevents the same from being pulled out of the cover 33. The sleeve 42 has an internal bead 43 fitting into an external groove 43' in said pipe 40, whereby said sleeve is yieldingly and frictionally locked to said pipe. An air pipe 44 threaded at its upper end into the nipple 13 depends from the latter into the sleeve 37 and is fitted therein to terminate adjacent the notch 39.

An air pipe 45 is fixed at its lower end in the sleeve 12 of casting 11 and extends upwardly through the standpipe 25 in the axis of the latter slightly above the top of said pipe 25. The pipe 25 at its top is open, as at 25', around said pipe 45 to relieve back pressure of air in said pipe 25 caused by rise of fuel in the lower end of the pipe 25. At the top of the standpipe 25 and fitting in the dome 23 is a hood-like valve cage 46' extending above both pipes 25, 45, and having an air outlet aperture 46 communicating with the channel 24 of said hood. A spring pressed, downwardly closing disk valve 47 is normally seated on top of the air pipe 45. The top of said pipe

45 is notched as at 48, for the escape of air therefrom past said valve.

As will be manifest, the fuel supply tank 17 may be lifted off the upper bowl 4 carrying therewith the stand-pipe 25, dome 23, guard 24', valve cage 46 and valve 47, so that the tank may be inverted for filling through the neck 19 and then replaced. During this operation, as soon as said valve 47 is lifted off pipe 45, it is urged into seating position against the upper end of stand-pipe 25 thereby closing said end of said pipe to prevent the fuel from escaping from said tank 17 when the latter is inverted and when it is being replaced. As will be clear, replacement of the fuel supply tank 17 causes said valve 47 to open by engagement of the valve with the upper end of the pipe 45.

The upper edges of the notches 32 and 39 are both beveled upwardly and outwardly to prevent oil adhesion, thus facilitating opening of said notches.

Returning now to the lower fuel feed bowl 5, if the level of the fuel in the upper fuel feed bowl 4 rises above the top of the fuel discharge nipple 14, fuel will be discharged into the lower fuel feed bowl 5 by way of the fuel discharge pipe 40. Air in said lower fuel feed bowl 5 is permitted to pass through the notch 39 upwardly through the pipe 44, nipple 13, pipe 45 and notch 48 and aperture 46 and channel 24 into the tank 17 until the fuel in said bowl 5 rises to the level of the top of the notch 39 at which point an air seal is formed in sleeve 37 preventing the fuel from rising higher in said lower bowl 5. An air vent aperture 48' may be provided in said bowl 5 for the escape of fumes.

Referring now to the operation, if the top burner 2 alone is being used the fuel level in the upper fuel feed bowl 4 will remain constant at the previously described maximum level and for the reasons previously set forth. When the lower burner 3 is used, and the fuel in the lower fuel feed bowl 5 falls below the top of the notch 39, air is admitted to the top of the fuel supply tank 17 by way of notch 39, pipe 44, nipple 13, pipe 45, notch 48, aperture 46 and channel 24, thus causing the supply tank to discharge into the upper fuel feed bowl 4 and raise the fuel level therein above the top of the fuel discharge nipple 14, so that fuel from said bowl 4 may discharge into the lower fuel feed bowl 5 until it again reaches the top of the notch 39, thereby cutting off air to said tank 17 and forming the before mentioned air seal establishing the maximum level of fuel in said lower fuel feed bowl 5.

In the modification shown in Figure 8, I have illustrated how, according to my invention, one fuel supply tank 50 may be equipped to supply a plurality of fuel feed bowls arranged one above the other, or at different levels to feed correspondingly arranged burners, not shown. In this form of the invention, the neck 51 of the supply tank 50 depends into a top fuel feed bowl 52 in the same manner as the neck 19 of bowl 17. A standpipe 53 extends from the bottom of the tank 50 into said bowl to establish by formation of an air seal at the bottom of the pipe, the level of the fuel in said bowl 52 slightly above the bottom of the neck 53, said pipe extending up through said tank into a dome 54 in the top of the latter in the same manner as described with reference to the preferred embodiment of the invention. A smaller pipe 55 in the pipe 53, corresponding to pipe 45, and notched, as at 55', for the same purpose as notch 48, extends through

the bottom of the tank 50 into a second fuel feed bowl 56 to establish a fuel level in the latter in the same manner as pipe 53 functions in bowl 52. The pipe 53 is open, as at 52', around the upper end of the pipe 55, the opening being for the same purpose as opening 25' in the preferred embodiment of the invention. A spring pressed valve 53' is provided in the dome for seating against and closing the adjacent end of the pipe 53 when the tank 5 is removed for filling, and which is held open by contact of the pipe 55 therewith when said tank is replaced, all as and for the same purpose as described with reference to the preferred embodiment of the invention. A fuel discharge pipe 57, corresponding to the nipple 14 and pipe 40, extends downwardly out of the bowl 52 to discharge fluid from bowl 52 into bowl 56 in the same manner and under the same circumstances as described with reference to pipe 40. Fuel discharge pipes 58, 59, 60 extend down from bowl 56 and other fluid feed bowls 61, 62, 66 each to a subjacent bowl and for the same purpose as pipe 57. A laterally extending branch pipe 63 extends from the pipe 55 to a depending extension pipe 64 having right angled branches 65 to the bowls 61, 62, 65 to form air seals in the last mentioned bowls just as formed by pipe 55 in bowl 56.

The operation of the modified form of the invention will be understood since it is the same substantially as described with reference to the preferred embodiment of the invention.

The foregoing will, it is believed, suffice to impart a clear understanding of the invention without further explanation.

Manifestly, the invention is susceptible of modification in other respects than as set forth herein, and right is reserved to such other modifications as fall within the scope of the subjoined claims.

What I claim is:

1. Fuel supply apparatus for use with a pair of upper and lower burners of a liquid fuel burning stove, said apparatus comprising a pair of upper and lower fuel feed receptacles adapted for feeding fuel to said pair of burners, respectively, a gravity feed fuel supply tank surmounting the upper receptacle and having a discharge neck depending into said upper receptacle, a fuel discharge line leading from the bottom of the upper receptacle to the lower receptacle and terminating in an upstanding end in the upper receptacle, means to maintain a constant level of fuel in the upper receptacle below the top of said end of said line adapted to be rendered effective under feed of fuel from the upper receptacle, and means to cause said level of fuel to rise and overflow through said end and line into the lower receptacle adapted to be rendered effective under feed of fuel from the lower receptacle.

2. Fuel supply apparatus for use with a pair of upper and lower burners of a liquid fuel burning stove, said apparatus comprising a pair of upper and lower fuel supply receptacles adapted for feeding fuel to said pair of burners, respectively, a closed gravity feed fuel supply tank for supplying the upper receptacle, an upstanding fuel discharge nipple in the bottom of the upper receptacle, a fuel discharge line from said nipple to the lower receptacle, means to maintain a constant level of fuel in the upper receptacle below the top of said nipple adapted to be rendered effective under feed of fuel from the upper receptacle comprising a stand pipe extending from said upper receptacle into said tank to admit air to the top of the latter, said stand pipe having

an air inlet notch in the lower end thereof sealed by the fuel in said upper receptacle at said level, and means to cause said level of fuel to rise and overflow through said nipple and line into the lower receptacle adapted to be rendered effective under feed of fuel from the lower receptacle.

3. Fuel supply apparatus for use with a pair of upper and lower burners of a liquid fuel burning stove, said apparatus comprising a pair of upper and lower fuel feed receptacles adapted for feeding fuel to said pair of burners, respectively, a gravity feed fuel tank for supplying the upper receptacle, an upstanding fuel discharge nipple in said upper receptacle, a fuel discharge line from said nipple to the lower receptacle, means to maintain a constant level of fuel in the upper receptacle below the top of said nipple adapted to be rendered effective under feed of fuel from the upper receptacle, and means to cause said level of fuel to rise and overflow through said nipple and line into the lower receptacle adapted to be rendered effective under feed of fuel from the lower receptacle comprising an air line extending upwardly from the lower receptacle through the upper receptacle to the top of said tank and having a lower end in the bottom of the lower receptacle provided with an air inlet notch therein sealed by the fuel in said lower receptacle when such fuel reaches a level even with the top of said notch and unsealed when such fuel falls below said top of said notch.

4. Fuel supply apparatus for use with a pair of upper and lower burners of a liquid fuel burning stove, said apparatus comprising a pair of upper and lower fuel feed receptacles adapted for feeding fuel to said pair of burners, respectively, a gravity feed fuel tank for supplying the upper receptacle, an upstanding fuel discharge nipple in said upper receptacle, a fuel discharge line from said nipple to the lower receptacle, means to maintain a constant level of fuel in the upper receptacle below the top of said nipple adapted to be rendered effective under feed of fuel from the upper receptacle, means to cause said level of fuel to rise and overflow through said nipple and line into the lower receptacle adapted to be rendered effective under feed of fuel from the lower receptacle comprising an air line extending upwardly from the lower receptacle through the upper receptacle to the top of said tank and having a lower end in the bottom of the lower receptacle provided with an air inlet notch therein sealed by the fuel in said lower receptacle when such fuel reaches a level even with the top of said notch and unsealed when such fuel falls below said top of said notch, and a discharge nipple in the bottom of the lower receptacle communicating with the lower end of said air line and adapted to be connected to the lower burner.

5. Fuel supply apparatus for a liquid fuel burner of a stove comprising an open top pan-like fuel feed receptacle to which the burner is adapted to be connected, a closed gravity feed tank superposed on said receptacle and having a bottom discharge neck depending into said receptacle, said tank being removable from said receptacle to be inverted for filling through said neck, and means to maintain a constant level of fuel in said receptacle comprising an air dome upstanding from the top of said tank, a stand pipe arising from the bottom of said receptacle upwardly through the bottom of the tank, said pipe having an upper end terminating in said dome and being removable with said tank, the lower end of said pipe having a notch therein sealed by the

fuel when the latter reaches a level in said receptacle even with the top of the notch, and said notch admitting air to said pipe when the fuel falls below said level, and means to close the upper end of said pipe when the tank is removed comprising a valve spring loaded for closing as an incident to removal of said tank whereby the

tank may be inverted and filled without fluid entering said pipe, and means in said stand pipe coacting with said valve when the tank is superposed on said receptacle to maintain the valve open.

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