July 4, 1933. F. F. NEUMANN 1,916,807

FUEL SUPPLY DEVICE FOR LIQUID FUEL BURNERS

Filed March 19, 1931 2 Sheets-Sheet 1

Fig. 1.

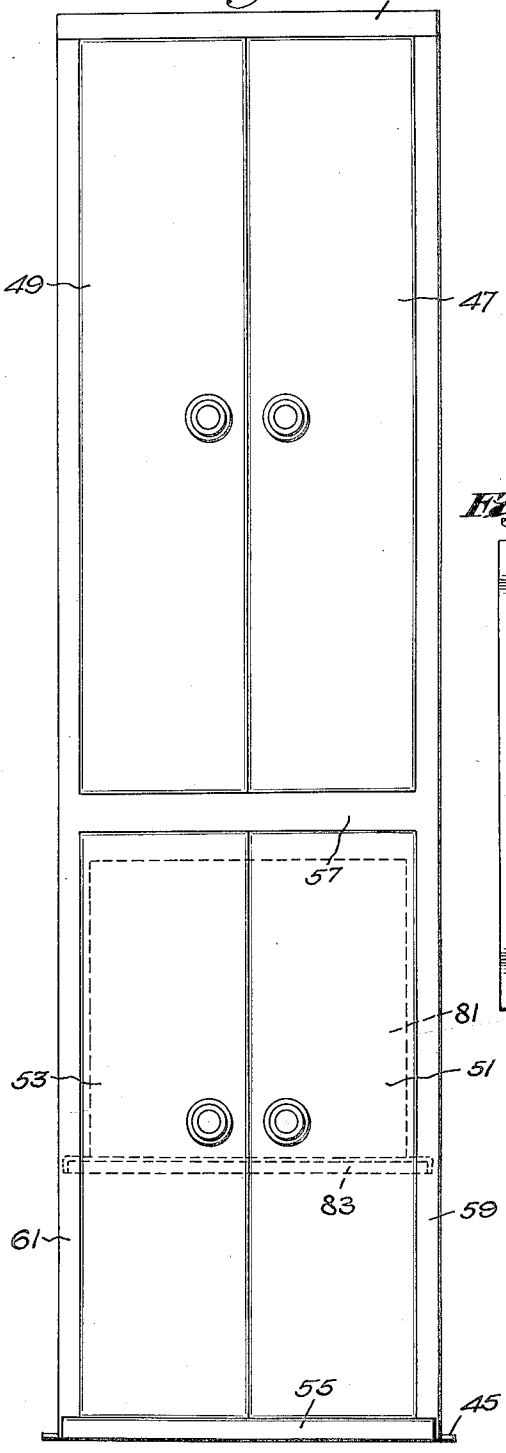

Fig. 6.

Fig. 2.

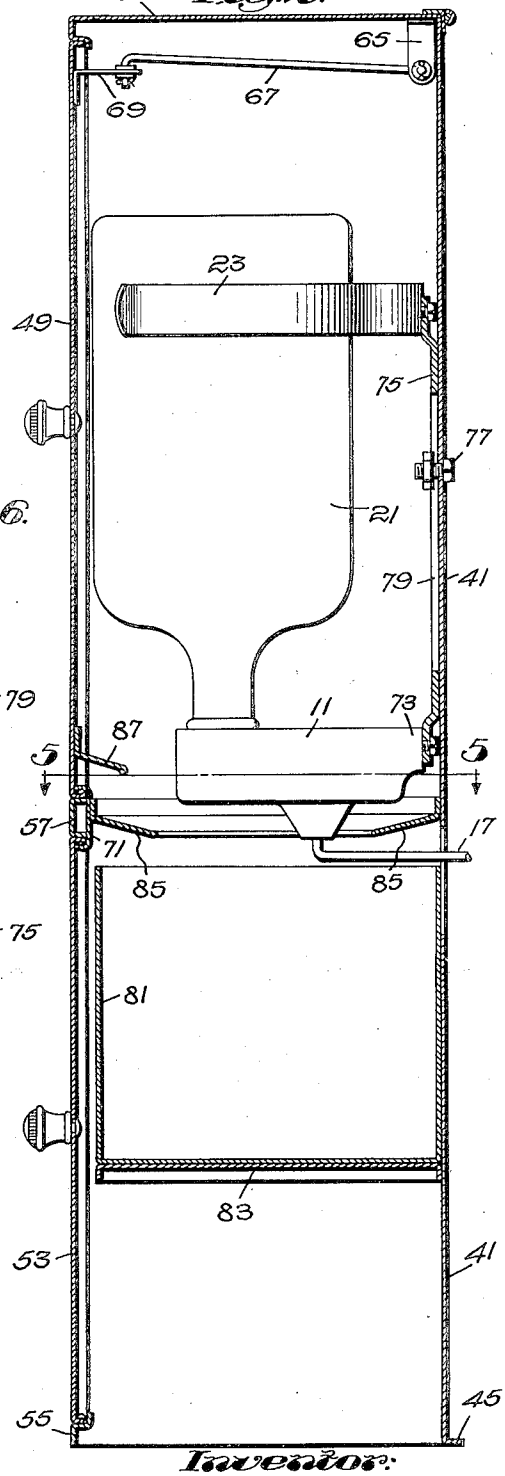

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Fig. 3.

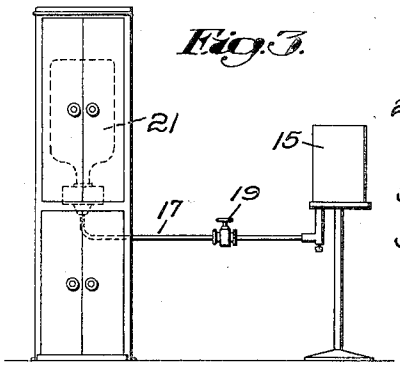


Fig. 4.

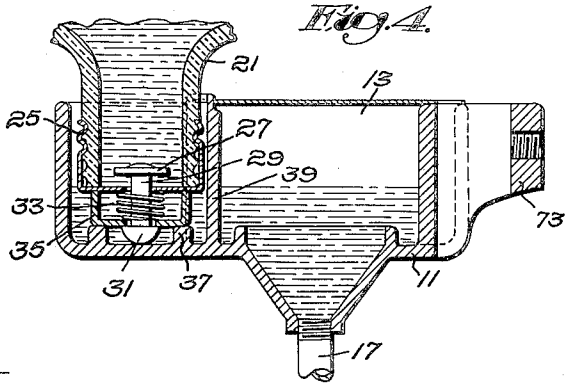


Fig. 5.

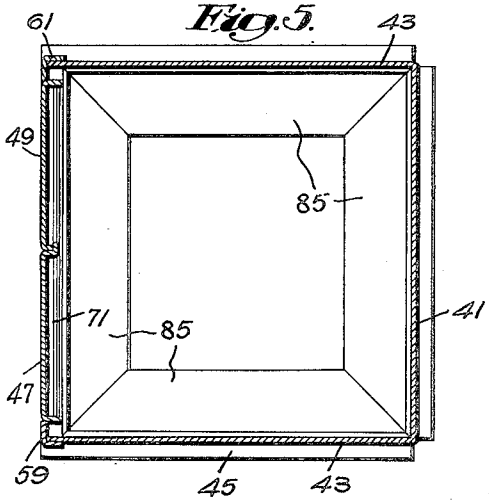


Fig. 7.

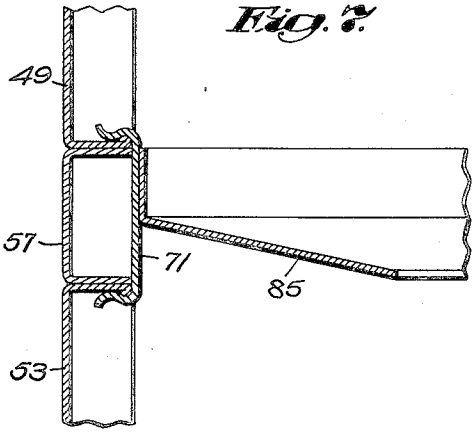
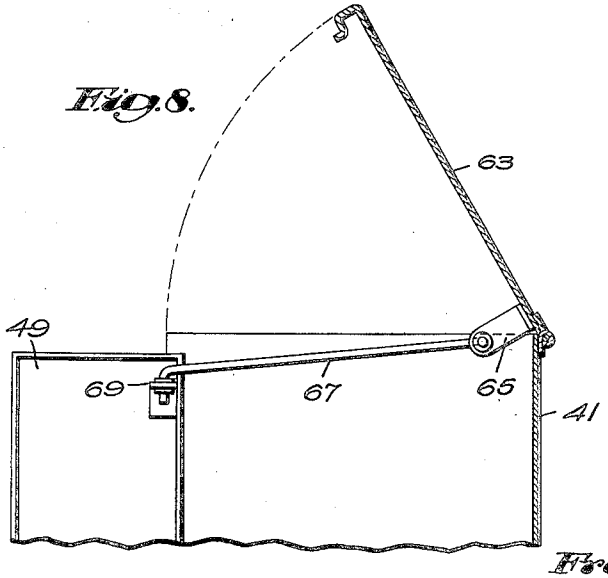


Fig. 8.



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UNITED STATES PATENT OFFICE

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FUEL SUPPLY DEVICE FOR LIQUID FUEL BURNERS

Application filed March 19, 1931. Serial No. 523,910.

This invention relates to fuel supply devices for liquid fuel burners, having for one of its objects the provision of a container or holder for the supply device designed to permit the necessary functioning of the latter while reducing the fire hazard and dangers of leakage and presenting a neat, attractive and sightly appearance. For descriptive purposes the liquid fuel herein referred to is oil, although other forms of liquid fuel may be employed.

In connection with self-vaporizing burners, such as those of the so-called combustion tube type, it is usual to provide a supply receptacle, replenished from an open-mouthed reservoir in liquid-sealed relation to the supply chamber of the receptacle, this serving to maintain a constant level of oil in the supply chamber from which oil is fed by gravity to the burner and there vaporized and burned with a suitable mixture of air.

The replenishing reservoir used is frequently in the form of a glass bottle held inverted with its mouth resting in the supply receptacle, the latter with the bottle being supported by an upright support on which the receptacle and bottle are vertically adjustable to regulate the level of the oil with relation to the burner, there being provided piping connections from the receptacle to the burner.

These parts, the bottle, receptacle and support, are commonly unprotected and open and exposed to view. This ordinary disposition of the supply device is open to several objections. When an exposed glass bottle or other reservoir is employed it is subject to the danger of breakage through an accidental shock or blow. Oil escaping from the bottle through breakage or by leakage incidental to installing or removing the bottle, or due to leakage from the receptacle, drains directly over the floor, causing an unsightly accumulation of oil and increasing the fire hazard, which latter is also present due to the exposed receptacle on which an external accumulation of oil cannot always be avoided. The uncovered disposition of these elements also presents an unsightly appearance, particularly when installed in kitchens or other rooms where finished neatness is required.

In the illustrative embodiment of the invention these objections are overcome by the provision of a container or housing, herein in the form of a cabinet adapted to receive and support the supply receptacle, together with the bottle or other reservoir, and to enclose and protect the same against injury and conceal them from sight, the container or housing being preferably provided with means whereby the oil escaping from the reservoir or receptacle for any cause will be drained into an underlying chamber, also embraced within the housing, thereby preventing its escape on the floor.

The invention will be best understood by reference to the following description when taken in connection with the accompanying drawings showing one specific embodiment thereof, while its scope will be more particularly pointed out in the appended claims.

In the drawings:

Fig. 1 is a front elevation of the cabinet container adapted to hold the receptacle and replenishing reservoir;

Fig. 2 is a cross-sectional, side elevation of the cabinet shown in Fig. 1, with the receptacle and bottle installed therein;

Fig. 3 is a more or less diagrammatic view showing the relation of the supply device to an oil burner;

Fig. 4 is a central, sectional elevation taken through the supply receptacle and mouth of the bottle;

Fig. 5 is a section in plan taken on the line 5—5 in Fig. 2;

Fig. 6 is a front elevation of the adjustable supporting bar which sustains the supply receptacle and the bottle;

Fig. 7 is an enlarged detail showing the door holding spring for the cabinet; and

Fig. 8 is a detail in sectional, side elevation, showing the method by which the top of the cabinet is raised with the opening of the doors to facilitate insertion or removal of the bottle.

Referring to the drawings and to the embodiment of the invention therein shown for illustrative purposes, and first to the func-

tion of the constant-level supply device and its relation to the burner, the supply receptacle (Figs. 2 and 4) comprises a casting 11 which, for descriptive purposes, may be referred to as a bowl. This bowl provides an oil supply chamber 13 in which a continuously replenished supply of oil is maintained at a constant level and from which it is delivered by gravity to the base of the burner 15 (Fig. 3) through an intermediate pipe connection 17 and controlling valve 19. The burner 15 is represented as typifying any of the usual forms of combustion tube burners, the oil gravitating into the base of the burner from the constant-level supply chamber 13 in the bowl.

A constantly replenished supply of oil is maintained in the bowl by any suitable means, a common method of accomplishing this being to provide an oil replenishing reservoir, air tight except for a delivery opening, the reservoir being supported above the supply device with its opening within the latter and immersed in and sealed by the oil therein. The latter escapes from the reservoir to replenish the supply chamber under the well-known barometric principle, maintaining a constant level therein as the oil is withdrawn by gravity therefrom.

In the illustrated form of the invention, a replenishing reservoir in the form of a glass bottle 21 is shown which is placed inverted with its mouth resting in the bowl (Figs. 2 and 5), the bottle being held in that position by means of two resilient arms 23 (Fig. 2).

To assist in inverting and placing the bottle in the bowl and removing it therefrom without danger of leakage or spilling the oil, the bottle is provided with an automatically acting stopper. For this purpose (Fig. 4) the neck of the bottle has threaded on it a metal cap piece 25 having a central discharge opening which, when the bottle is lifted from the base, is automatically closed by a valve 27 but is opened for the escape of oil when the bottle rests in the bowl.

To effect the operation of the valve, the latter is provided with a stem 29 which protrudes, with a suitable clearance, through a central opening in the cap piece and terminates in a head 31 between which and the cap there is provided a spring 33. Between the spring and the head 31 there is provided a U-shaped rest 35 movable with the stem relatively to the cap. When the bottle is inverted and placed in the bowl the U-shaped rest seats on an annular lip 37 and the bottom of the bowl serves to support the bottle, while at the same time the valve is lifted and the spring 33 compressed through the abutment of the stem head 31 against the bottom of the bowl. The oil within the bottle flows into the bowl until its level is sufficient to seal the delivery opening in the bottle cap. If the bottle is lifted for withdrawal from the bowl, the spring expands, causing the valve to close the mouth of the bottle, the U-shaped rest moving with its stem away from the bottle cap.

The oil escaping from the mouth of the bottle flows into the chamber 13 around the sides of the segmental or parti-annular wall 39 which is provided to guide or position the bottle mouth, and, a constant level being maintained in the chamber 13, the oil gravitates to the burner 15 through the pipe or supply conduit 17 which is threaded into the bottom of the bowl.

Referring now to the container or cabinet, this is preferably constructed of fireproof material, such as sheet steel, externally embellished by enameling or painting to present an attractive and neat appearance. It is herein shown of rectangular cross-section, upstanding in form, and of a height to accommodate the bowl, bottle or other reservoir, and also an underlying tank or compartment.

It is herein constructed of a piece of sheet metal bent to form the back 41 and sides 43, provided with an out-turned bottom flange 45 on which it rests. The front is provided with an upper pair of hinged doors 47 and 49 through which access may be had to the bottle and the bowl, and with a lower pair of hinged doors 51 and 53 through which access may be had to the lower compartment.

The front of the cabinet and the sides are connected by a transverse sheet metal bottom member 55 and an intermediate member 57, on which the lower doors are hinged and between which they swing in closing with a tight sealing fit. The front of the cabinet is also provided with the vertical marginal sheet metal members 59 and 61 which, with the transverse members, form the two panels which are closed by the two pairs of doors.

The upper pair of doors is preferably so arranged that the act of opening them also serves to raise the top 63 of the cabinet, causing it to swing up (Fig. 8) so that the top, as well as the upper front of the cabinet, is opened to provide unobstructed access, facilitating the handling of the bottle which, when being installed or withdrawn, must be lifted vertically as well as moved laterally. As is clearly shown in Figs. 2 and 8, the openable side walls 47, 49 and the openable top 63 constitute the entire casing structure across the top and side of the casing closed thereby and at the zone of meeting of said side and top portions of the casing, and open in such a way as to provide an open space continuously extending in said top and side portions and across the zone of meeting thereof. Obviously this special provision greatly facilitates vertical and lateral movement of the reservoir during removal and placement of the same, and its convenience is further augmented when the upper pair of doors 47, 49 is ar-

ranged so that opening them serves to automatically open the top 63.

For this purpose the top (Figs. 2 and 8) is provided at one or both sides thereof with a depending ear 65 which is connected by the link 67 to a lug or plate 69 offset laterally from the axis of the corresponding door, the arrangement being such that, as the door is opened, the plate 69 moves outwardly, exerting a pull on the link 67 and swinging the top upwardly, as shown in Fig. 8. When the door is again closed, the top drops down into close fitting relation to the side walls of the cabinet and to the doors, as shown in Fig. 2. When the doors are closed they are held fast by the door holding device 71 (see Fig. 7) comprising a sheet metal plate secured at the back of the transverse member 57 and having resilient flanged ends which engage frictionally with the sheet metal walls of each door when the latter is moved to closed position.

To support the bowl and bottle within the cabinet, the bowl is provided with a rearwardly extending lug 73 bolted to the bottom of the vertically arranged supporting plate 75 (Fig. 6), the latter having secured to its upper end the two resilient arms 23 which resiliently embrace the sides of the bottle and position the latter in the bowl. Provision is made for vertically adjusting the bowl and the bottle within the cabinet, this being herein accomplished by means of a bolt 77 passing through the rear wall 41 of the cabinet and entering a slot 79 in the supporting plate, by means of which the plate together with the bottom of the bowl can be clamped in any selected position of vertical adjustment while still supported by and within the cabinet. This provides means whereby the desired relation between the level of the oil and the bowl and the height of the burner base may be maintained. As clearly shown in Fig. 2, the cabinet is preferably provided with a vertical slot, conveniently located in its wall 41, through which the fuel supply conduit 17 extends from the cabinet to reach the fuel burner, which vertical slot allows free vertical movement of the conduit 17 during raising or lowering of the receptacle 11.

Herein in the lower compartment of the cabinet there is provided a sheet metal tank 81 supported on a shelf 83, the open top of the tank being directly beneath the bowl and adapted to receive any leakage from either the bowl or the bottle. Preferably the capacity of the tank is sufficient to hold the entire supply of the full bottle in case of breakage of the latter.

To insure the entrance of any oil which may escape from the bowl or the bottle into the underlying tank, a system of deflecting plates 85 is provided immediately beneath the bowl, these plates being secured to the back and sides of the cabinet and to the transverse member 57 and extending for a sufficient distance from the sides of the cabinet to divert any gravitating oil into the tank. A further deflecting plate 87 is also preferably secured to the interior of each upper door 47 and 49 to further insure the entrance of any oil into the tank and prevent its accumulation at or about the bottom of the doors.

When it is desired to remove the bottle, the doors are opened, which also serve to swing upwardly the top 63, and the bottle may be readily withdrawn and a full bottle installed. When the doors are closed the entire supply device, including the bowl and bottle, are entirely concealed, covered and protected. The supply device, although enclosed within and supported by the cabinet, may be vertically adjusted therein and clamped and held in its position of adjustment. Escape of oil on the floor is avoided and also the fire hazard materially reduced due to the fact that all the oil carrying parts from which leakage, escape or exposure of oil is possible are entirely enclosed and protected.

While I have herein disclosed and described for the purposes of illustration one specific embodiment of the invention, it will be understood that the same may be embodied in various forms and that extensive deviations may be made from the construction which is herein specifically described to illustrate the principles of the invention, all without departing from the spirit thereof.

I claim:

1. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type involving a constant level supply receptacle, a liquid supply bottle, a device in which the liquid level is maintained, and a conduit for supplying liquid from said constant level receptacle to the said device; said housing comprising, in combination, a sheet metal cabinet for enclosing and protecting said receptacle and bottle and from which said conduit extends, and a support for carrying said receptacle and holding said bottle in inverted, liquid-sealed, supply relation thereto, said support being secured to a wall of said cabinet and being vertically adjustable therein to raise or lower the liquid level in said device.

2. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type embodying a constant level supply receptacle, a liquid supply bottle adapted to be held in inverted, liquid-sealed, supply relation to said receptacle, a device in which the liquid level is maintained, and a conduit for supplying liquid from said constant level receptacle to the said device; said housing comprising, in combination, a sheet metal cabinet having a compartment for accommodating said receptacle and bottle and adapted for vertical adjustment of the same therein to raise and lower the liquid level

in said device, means in said cabinet for effecting said vertical adjustment to raise or lower said level, and a door for said compartment adapted to open the same for removal and installation of the bottle, the cabinet providing an enclosing and protecting casing for the bottle and receptacle from which only said conduit leads.

3. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type embodying a constant level supply receptacle, and a supply reservoir adapted to supply liquid through a supply conduit to a device in which the liquid level is maintained; said housing comprising in combination a cabinet for enclosing and protecting said supply receptacle and reservoir and from which said conduit extends, and means within said cabinet for supporting said receptacle and vertically adjustable to raise and lower the liquid level in said device.

4. A housing for the liquid supplying apparatus of a liquid level maintaining burner system of the type embodying a constant level liquid receptacle, and a supply reservoir, adapted to supply liquid through a supply conduit to a device in which the liquid level is maintained; said housing comprising, in combination, an enclosing casing for covering and protecting said receptacle and reservoir and from which said conduit extends, and a support for said reservoir mounted for vertical adjustment on a wall of said casing to raise or lower said reservoir and thus raise or lower the liquid level in said device.

5. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type embodying a constant level supply receptacle, and a supply reservoir, adapted to supply liquid through a supply conduit to a device in which the liquid level is maintained; said housing comprising, in combination, a sheet metal cabinet for enclosing and protecting said supply receptacle and reservoir and from which said conduit extends, an underlying tank within said cabinet adapted to receive liquid leakage, and deflecting means between the tank and the receptacle to direct liquid leakage into the former.

6. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type embodying a constant level supply receptacle, and a supply reservoir, adapted to supply liquid through a supply conduit to a device in which the liquid level is maintained; said housing comprising, in combination, a sheet metal cabinet for enclosing and protecting said supply receptacle and reservoir and from which said conduit extends, and an underlying tank within said cabinet adapted to receive liquid leakage.

7. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type embodying a constant level supply receptacle, and a supply reservoir, adapted to supply liquid through a supply conduit to a device in which the liquid level is maintained; said housing comprising, in combination, a sheet metal container for enclosing and protecting said receptacle and reservoir and from which said conduit extends, means for opening the side of the container to permit placement and removal of said reservoir, and means within said container underlying said receptacle for holding liquid leakage.

8. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type embodying a constant level supply receptacle, and a supply reservoir, adapted to supply liquid through a supply conduit to a device in which the liquid level is maintained; said housing comprising, in combination, a cabinet for surrounding said supply receptacle and reservoir and from which said conduit extends, means presented by the interior of the cabinet for holding the receptacle and reservoir, a hinged door for the side wall of the cabinet, a top therefor, and means connecting the door and the top to open the top away from the door side of the cabinet when the door is opened to thus present two adjacent open sides facilitating placement and removal of said reservoir.

9. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type embodying a constant level supply receptacle, and a supply bottle, adapted to supply liquid through a supply conduit to a device in which the liquid level is maintained; said housing comprising, in combination, a cabinet for surrounding said supply receptacle and reservoir and from which said conduit extends, means presented by the interior of the cabinet for holding the receptacle and reservoir, an openable side wall on the cabinet, an openable top therefor, and means for opening both the side wall and the top of the cabinet for installation or removal of the supply bottle.

10. A housing for the liquid supplying apparatus of a liquid level maintaining system of the type embodying a constant level supply receptacle provided with a supply reservoir and having connected to it a supply conduit for the device in which the liquid level is maintained; said housing comprising, in combination, a cabinet for enclosing and protecting said supply receptacle and reservoir and having a vertical slot in its wall through which said conduit extends, and means within said cabinet for supporting said receptacle and vertically adjustable to raise and lower the liquid level in said device, said slot providing for vertical movement of said conduit therein during raising or lowering of said receptacle.

11. A housing for the liquid supplying apparatus of a liquid level maintaining system

of the type embodying a constant level supply receptacle, and a supply reservoir, adapted to supply liquid through a supply conduit to a device in which the liquid level is maintained; said housing comprising an openable casing for removably receiving said reservoir in inverted, liquid sealed supply relation to said receptacle to maintain the constant level therein, said casing serving to enclose and protect said reservoir when positioned therein and comprising an openable side wall and an openable top constituting the entire casing structure across the top and side portions of the casing closed thereby and at the zone of meeting of said side and top portions of the casing, and opening in a manner providing an open space continuously extending in said top and side portions and across the zone of meeting thereof, thereby facilitating vertical and lateral movement of said reservoir during removal and placement of the same as aforesaid.

12. The combination, with liquid supplying apparatus of the type embodying a constant level supply receptacle provided with a delivery conduit for supplying liquid to a device in which a liquid level is maintained, and further embodying a supply reservoir adapted to be positioned in inverted, liquid-sealed supply relation to said receptacle, of a housing comprising an openable casing removably receiving said reservoir in said inverted, liquid-sealed supply relation to said receptacle to maintain the constant level therein, said casing serving to enclose and protect said reservoir when positioned therein and comprising an openable side wall and an openable top constituting the entire casing structure across the top and side portions of the casing closed thereby and at the zone of meeting of said side and top portions, and opening in a manner providing an open space continuously extending in said top and side portions and across the zone of meeting thereof to facilitate combined vertical and lateral movement of the reservoir during removal and placement of the same as aforesaid.

In testimony whereof, I have signed my name to this specification.

FREDERICK F. NEUMANN.