

May 30, 1961

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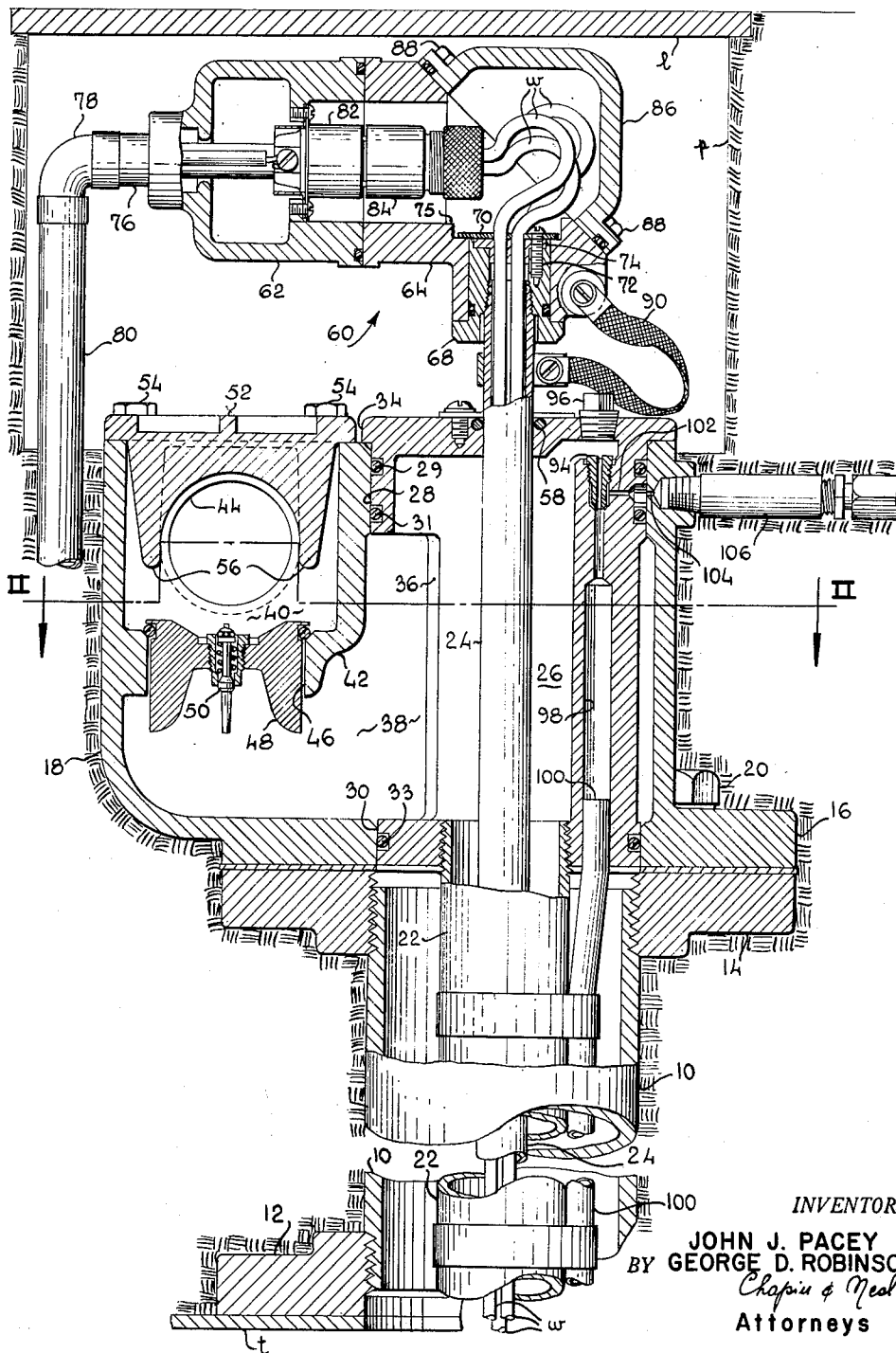
2,986,308

SUBMERSIBLE PUMP MOUNTING APPARATUS

Filed Jan. 13, 1958

3 Sheets-Sheet 1

FIG. 1



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3 Sheets-Sheet 2

FIG. 2

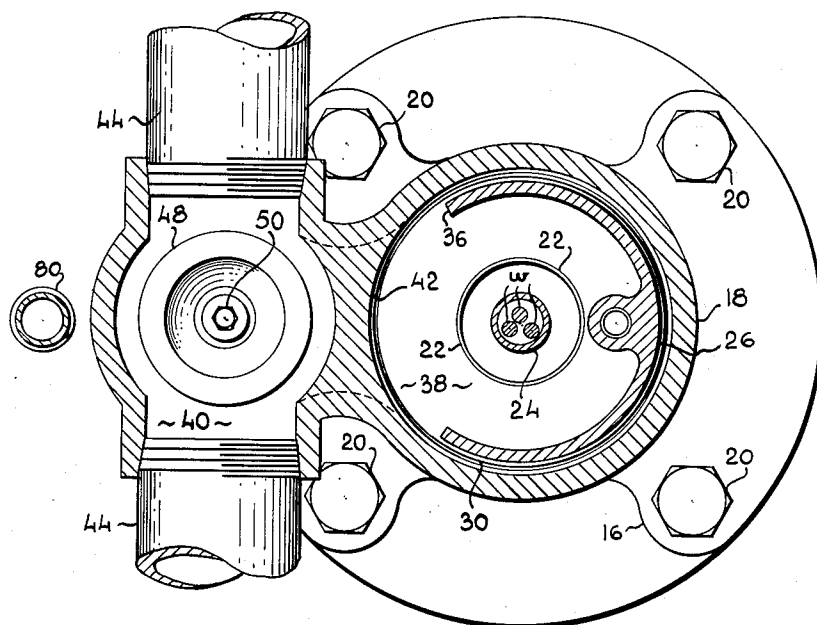
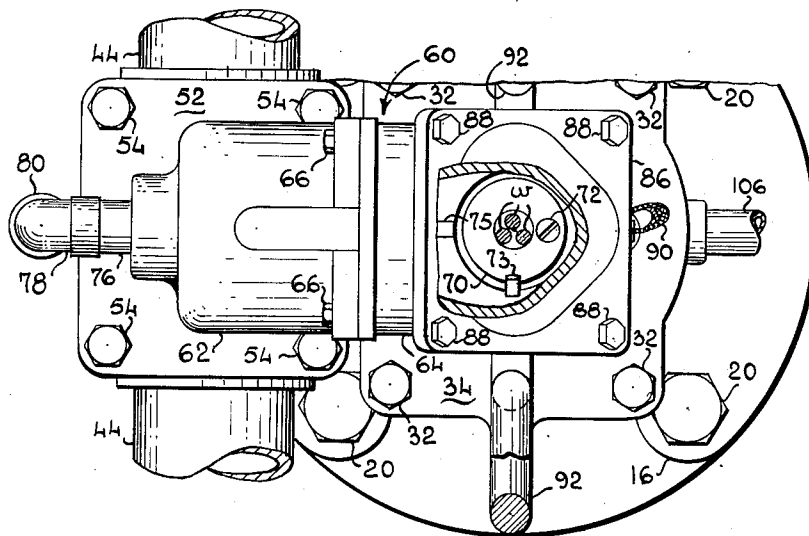


FIG. 3



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3 Sheets-Sheet 3

FIG. 4

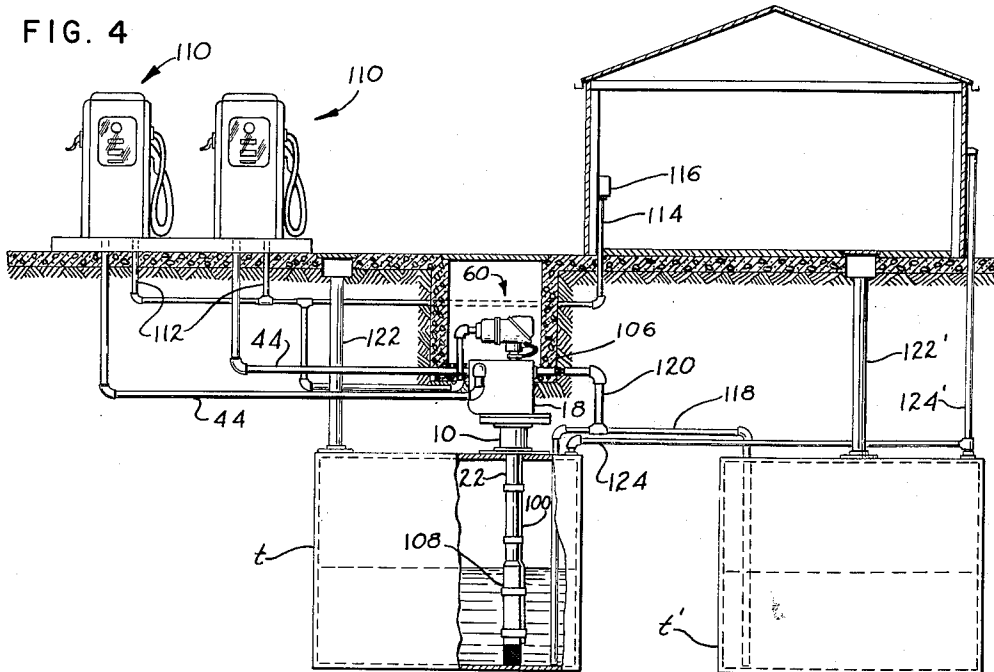
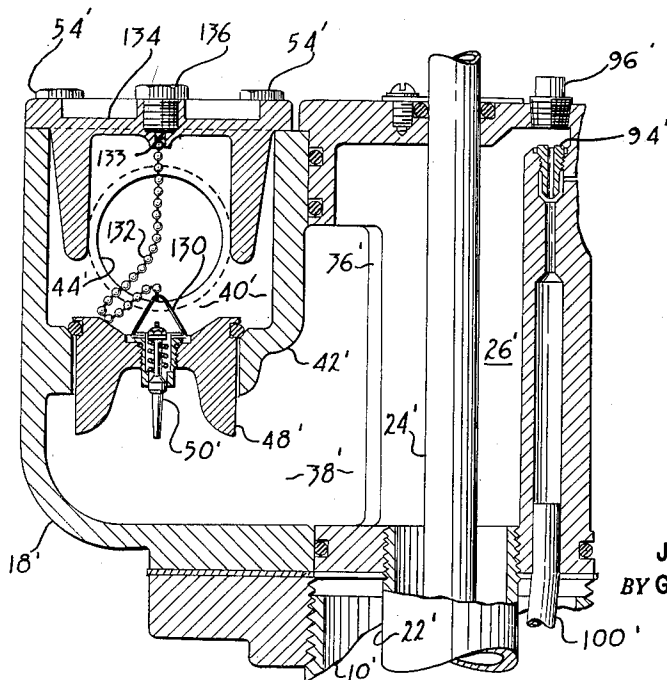


FIG. 5



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SUBMERSIBLE PUMP MOUNTING APPARATUS

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Filed Jan. 13, 1958, Ser. No. 708,463

6 Claims. (Cl. 222—333)

The present invention relates to the mounting of submersible pumps and while not limited to the handling of any one liquid the invention is of particular advantage in the dispensing of gasoline from underground storage tanks.

In the field of retail gasoline delivery there is an increasing practice of using a pump submerged in an underground gasoline storage tank to deliver gasoline to the dispensing units. Certain problems have been encountered, however, in being able to expeditiously withdraw the submersible pump for inspection and repair and particularly to do so without introducing any undue safety hazard. Also there have been other problems in the maintenance of such pumps, as well as the problem of gasoline vapor loss where there is to be a siphon connection between a plurality of tanks, all of which has detracted from the overall inherent advantages to be gained from the use of submersible pump systems.

One of the objects of the invention is to provide improved means for mounting submersible pumps in a manner enabling easy and convenient removal of the pump from an underground storage tank with the maximum possible safety factor.

Another object of the invention is to facilitate the original installation of motor-driven submersible pumps in underground tanks.

A further object of the invention is to accomplish the above ends in a unique manner which incorporates means for maintaining a siphon connection with an adjacent storage tank shown in U.S. Patent 2,821,993, Pacey et al., granted on an application filed August 8, 1956, Serial No. 602,851.

Still another object of the invention is to provide means for improving the siphon maintaining means of the above patent by minimizing gasoline vapor losses and also adapt such improved means to the above-stated object of easy pump removal.

A feature common to both prior installations and the pump mounting of the present apparatus is the provision of a check valve in a casing or header above the tank for preventing drainage of the pipes leading to the dispensing units when the submersible pump is not operating. Yet another object of the invention is to provide means enabling such check valves to be removed for inspection or repair without permitting any substantial amount of gasoline to spill onto the ground or into the pit where access to such pump mountings is generally had.

The above and other related objects as well as the novel features of the invention will be apparent from a reading of the following description of the disclosure found in the accompanying drawings and the particular novelty thereof pointed out in the appended claims.

In the drawings:

Fig. 1 is an elevational view, partly in section, of pump mounting apparatus embodying the present invention and indicating the manner in which it may be advantageously utilized with an underground tank;

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Fig. 2 is a section taken substantially on line II—II in Fig. 1;

Fig. 3 is a plan view of the mounting apparatus seen in Fig. 1 with certain portions broken away and others in section;

Fig. 4 is a diagrammatical showing of the present pump mounting incorporated in a multi-tank delivery system, and

Fig. 5 is a section showing a portion of the apparatus of Fig. 1 in modified form.

Referring first to Fig. 1, the pump mounting apparatus of the present invention comprises a standpipe 10 which is threaded at its lower end into a flange 12 attached to an underground gasoline storage tank *t*. A second flange 14 is threaded onto the upper end of the standpipe 10 and receives the base 16 (see also Figs. 2 and 3) of a casing 18 which is secured thereon by bolts 20. As can be noted from Fig. 1, the preferred practice is to locate the major portion of the casing 18 underground with its upper end slightly above the bottom of a pit *p* which is covered over with a removable lid *l*. Although not so shown (in Fig. 1), it may be found desirable to line the pit *p* with cement or other impervious material.

Within the standpipe 10 is a liquid conduit 22 which joins with a submersible pump at its lower end as in the fashion disclosed in the above-mentioned U.S. Patent No. 2,821,993 Pacey et al. and as will later be referred to in describing Fig. 4 hereof. Also according to the teachings of this same patent an electrical conduit or tube 24 extends interiorly of the liquid conduit 22 to the motor of the submersible pump with wires *w* running therethrough to provide power for the pump motor. In accordance with the present invention the upper end of the liquid conduit 22 is threaded into a housing 26 which is formed at its upper end with a cylindrical portion 28 and a second cylindrical portion 30 of lesser diameter at its lower end. The casing 18 is formed with appropriate upper and lower bores which slidably receive the cylindrical portions 28 and 30. The illustrated packings, in the form of O rings 29, 31 and 33, insure sealed connections with the upper and lower walls of the casing 18 when the housing 26 is secured in place by bolts 32 (see Fig. 3) which pass through an upper housing flange 34 and are threaded into the casing 18.

It will be seen that the housing 26 is apertured at 36 between the cylindrical portions 28 and 30, while the interior of the casing 18 is separated into two compartments by an interior wall 42. One of these compartments provides an inlet chamber 38 in a composite manner with the apertured housing 26 while the other compartment provides an outlet chamber 40. Pipes 44 are threaded into the casing 18 at the outlet chamber 40 and extend to retail dispensing units (later described) in conventional fashion. It will be seen that the casing wall 42 is ported at 46 to provide communication between the inlet and outlet chambers 38 and 40 with a check valve 48 preventing reverse flow of gasoline from the outlet chamber 40 to the inlet chamber 38. In conventional fashion a pressure relief valve 50 is provided in the check valve 48 to permit such reverse flow in a limited manner should some temperature differential cause expansion of the gasoline and excessive pressure in the outlet chamber 40. The upper wall of the casing 18 is apertured to facilitate machining of the port 46 and assembly of the valve 48. This aperture is closed off by a cap 52 which is secured to casing 18 by screws 54. The cap 52 has integral projections 56 which prevent the check valve 48 from being completely raised from its seat on the wall 42 so that the check valve will at all times be in readiness to prevent reverse flow of gasoline.

As has been mentioned, the wires *w* for supplying electrical current to the submersible pump motor extend

through the electrical conduit tube 24, the lower end of the tube 24 being sealed to the upper end of the pump motor (not shown) as the wires *w* extend thereto. The upper end of tube 24 extends through the upper wall of housing 26 with an O ring 58 preventing any leakage of gasoline through the connection therebetween. A junction box, indicated generally by the reference character 60, is mounted on the upper end of electrical conduit tube 24. The junction box 60 comprises two separable portions 62, 64 which are secured together by screws 66 (Fig. 3). Junction box portion 64 is swivelably mounted with respect to the electric conduit tube 24 in the following fashion. A flanged sleeve 68 (Fig. 1) is threaded onto the upper end of the tube 24 and rotatably receives the junction box portion 64. A plate 70 is secured to the upper end of the sleeve 68 by a screw 72 and overlies a counter bored section of the junction box portion 64 to prevent longitudinal movement of the portion 64 on sleeve 68. A finger 73 (Fig. 3) extends from the plate 70 and may be engaged in abutting relation with a lug 75 to limit rotation or swiveling movement of the junction box to less than 360° and thus prevent undue twisting of the wires *w*. It will also be noted that a separator 74 (Fig. 1) is provided at the upper end of the sleeve 68 to hold wires *w* in properly spaced relation in tube 24. It may also be found desirable to pour plastic material around the wires *w* in conduit 24 to provide a vapor proof seal along the length of said conduit.

The other junction box portion 62 is rigidly secured to an inlet electrical tube 76 which is connected to a further tube 80 by way of an elbow 78. The conduit tube 80 extends underground and to appropriate control means later described.

A separable contact unit (Fig. 1) is provided within the junction box 60 and comprises a fixed female portion 82 fastened within the fixed junction box portion 62 with the wires from the inlet electric conduit tube 76 being attached thereto. A pronged portion 84 of the contact unit is disposed within the swivelable junction box portion 64 with wires *w* being connected thereto in conventional fashion. Access is provided to the interior of the junction box 60 by way of a cap 86 which is secured to the junction box portion 64 by screws 88. A grounding cable 90 is provided between junction box 60 and conduit tube 24.

The above described arrangement provides, among other things, a high degree of flexibility in the installation of the tank *t* and the associated submersible pump in that no great accuracy is required in the relative disposition of the pump mounting means, the pipes leading therefrom (as the pipes 44) and the inlet conduit tube (as at 80) which is to supply current to the submersible pump motor. The conventional practice is to lay the inlet conduit tube underground and then bring it upwardly as indicated by the tube 80 into the pit *p* so that all components will be disposed underground. With the swivelable mounting of the junction box 60 it is not necessary that the pipe 80 be in the precise relative location as shown in Figs. 1 and 3. That is, a fairly wide tolerance is available to permit the tube 80 to be disposed in almost any given angular relationship to the casing 18. Regardless of what that angular relationship is, junction box 60 is free to pivot about tube 24 so that it may be aligned with the inlet conduit tube 76. Further, when the junction box 60 is swung to bring it into this proper alignment, there is no tendency to twist the conduit 24 in a manner which would damage the sealed connection at its lower end with the motor of the submersible pump, all of which greatly facilitates the initial installation of the tank and pump mounting means associated therewith.

The present arrangement has further advantages after the original installation in the facility with which the submersible pump may be withdrawn for inspection or repair. The simple steps for removing the pump are as follows. The lid *l* is, of course, removed to provide access to the

pit *p*. Screws 88 may then be removed to obtain access to the interior of the junction box 60, so that the separable portion 84 of the contact unit may be pulled from the fixed portion 82 to break the electric connection therein. At this point note will be taken that this contact unit enables the electrical circuit to the pump motor to be broken in a very simple manner which does not require any specialized talents. Although a simple push pull contact unit is illustrated, other equivalent contact units could also be employed with equal advantage. The screws 66 are then removed to permit separation of the two component parts of the junction box 60 and finally the screws 32 are removed for withdrawal of the housing 26 from the casing 18.

While the order for removing these various screws is not necessarily fixed, convenience is found in the procedure outlined. Moreover, it is of importance that the contact unit (82, 84) be separated before the housing 26 is free for removal. Although the contact unit is designed to minimize the possibility of arcing, there might still be some hazard involved if it were separated in an explosive atmosphere and while the submersible pump was in operation. The present arrangement is therefore purposely constructed so that the contact unit must be separated before the housing 26 can be raised. Thus gasoline vapors cannot be released into the pit *p* before the electrical connection is separated. In other words, the possibility of any igniting spark is eliminated before there is a possibility of an explosive atmosphere existing. Of course, other safeguards such as a remote master switch for the motor pump circuit may also be employed.

With the contact unit separated, the housing 26 may then be removed. In this connection, it will be noted that the fixed portion 62 of the junction box lies outside the vertical outline of the housing 26 and particularly its flange 34. Thus a chain fall or other lifting device may be attached to hook eyes 92 (Fig. 3) and the housing 26 then lifted vertically to withdraw the pump which is suspended from the liquid conduit 22. It will also be noted that the lower diametrical portion of the housing 26 is no greater than the upper diametrical portion and is preferably less, as shown in Fig. 1. Further, all other parts connected to the housing 26 have a vertical outline which is less than that of the stationary parts which they move past as the pump is extracted.

It will be noted that at least by the time the contact unit (82, 84) has been separated, the submersible pump will have been rendered inoperative. The inlet chamber will completely drain in a short time since the outlet chamber 40 is sealed off by the check valve 48 which also prevents draining of pipes 44, leading to the dispensing units and likely containing a considerable quantity of gasoline. Therefor, the housing 26 and the submersible pump will be relatively free of gasoline upon withdrawal.

If the inlet conduit 80 is disposed at some angle other than that shown (Figs. 1 and 3), the procedure for disconnecting the elements is the same. However, once the housing 26 has been raised a distance sufficient for the flange 34 to clear the cap 52 and adjacent screws 54, it will be apparent that it is necessary to rotate housing 26 to the relative position with respect to the fixed junction box portion 62, as seen in Fig. 3, in order to clear the latter. This rotation is possible since the junction box portion 64 is free to swivel about the sleeve 68. Thereafter, the housing and the submersible pump are completely withdrawn in the same fashion as already described. While it would be possible within the spirit of the present invention to eliminate the necessity for rotating the housing 26 in order to clear the fixed junction box portion 62, it has been found preferable for the sake of compactness to utilize the above described arrangement.

Aside from the advantageous features already described the improved apparatus of the present invention also

uniquely incorporates siphon maintaining means which may be employed after the manner taught in the said Pacey et al. patent, as well as providing features not therein disclosed. In this connection, reference is made to an ejector or aspirator 94 (Fig. 1) which is threaded into an inwardly jutting wall of the housing 26. It will be seen that an opening is provided in the upper wall of the housing 26 for manufacturing purposes, as well as to facilitate insertion of the ejector 94. This opening is closed off by a plug 96. The ejector 94 has a central bore which communicates with a passageway 98 formed in the wall of housing 26. A tube 100 is received and preferably sealed in the lower end of passageway 98 to return gasoline from the aspirator to the tank *t*. Preferably the tube 100 is strapped to the conduit 22 and extends a substantial distance down into the tank *t* for reasons discussed below.

The lower end of ejector 94 is spaced slightly from the bore which receives it. Also the lower end of the ejector is frusto-conical and spaced slightly above a matching seat formed in the housing wall. A lateral passageway 102 communicates at one end with the constricted passageway formed by the lower end of the ejector 94. The other end of the passageway 102 is enlarged to insure communication with a passageway 104 in the casing 18. It will be noted that the passageways 102 and 104 are disposed between the O rings 29 and 31 and are thus sealed both from atmosphere and from the pressure of gasoline in the inlet chamber 38. A check valve member 106 is threaded into the casing 18 to connect the passageway 104 to a siphon tube in the same manner as is fully described in the Pacey et al. patent.

The manner in which the present pump mounting is incorporated in a retail gasoline station may best be appreciated from the diagrammatical showing of Fig. 4. It will there be seen that the casing 18 is disposed at the bottom of a cement lined pit with the standpipe 10 connected to the underground tank *t*. The liquid conduit 22 extends downwardly into the tank *t* with the submersible pump (108) above referred to, depending from the lower end of the conduit 22. The gasoline discharge pipes 44 connect with retail dispensing units 110 and the inlet electrical conduit is connected by way of conduits 112 to each of the dispensing units 110 to provide for independent actuation of the pump 108 from either of the said dispensing units. A further electrical conduit 114 extends to a master control switch 116 within the service station building. Adjacent the tank *t* is a second underground tank *t'* with a U-shaped siphon pipe 118 interconnecting the two tanks. It will also be seen that piping 120 connects the bridge of the siphon pipe 118 to the member 106 leading to the aspirator 94 within the casing 18. Also there will be noted conventional fill pipes 122, 122' and vents 124, 124' for the respective tanks *t*, *t'*.

The pump 108 may be actuated by conventional switches at either of the dispensing units 110. Upon initial actuation, gasoline is forced upwardly through the liquid conduit 22 and into the inlet chamber 38 (Fig. 1). As this occurs, air or other gasses trapped in the inlet chamber 38 are expelled through the aspirator 94 and tube 100 back into the tank *t*. Whatever small gas pressure is built up in the inlet chamber 38 is insufficient to unseat the check valve 48 so that liquid must rise above the check valve 48 before there is any delivery of gasoline to the outlet chamber 40, thus assuring that air or other gasses will not be entrained in the gasoline delivered by the dispensing units 110.

A small amount of gasoline will pass through the aspirator 94 after all air and gasses have been forced from the inlet chamber 38. As liquid passes through the aspirator 94, a suction will be created in the passageway 102 and piping 120 to draw air from the siphon pipe 118 and thus create a siphon connection between the tanks *t* and *t'*. The gasoline which is by-passed through the aspirator 94 is discharged back into the tank *t* through

the tube 100 and since this tube extends substantially to the bottom of tank *t*, splashing of the returned gasoline will be completely eliminated, or in the case of an extremely low gasoline level, the splashing will be only of a minor nature. With splashing thus substantially minimized, if not completely eliminated, the major source of excess vaporization of the gasoline is at least substantially eliminated.

A further advantage is obtained from extending the tube 100 at least substantially to the bottom of the tank *t* in that when the pump motor is shut off, the pump itself, being of the ordinary impeller type, will not prevent flow of gasoline back from the inlet chamber 38 into the tank *t* when the pump is shut off. However, with the tube 100 extended into the gasoline there is no opportunity for air to enter the inlet chamber 38, so this chamber, as well as all of the various passageways and conduits associated therewith remains full of gasoline. When the pump is reactivated, gasoline will immediately be delivered from either or both of the dispensing units 110, depending on which are actuated, since there is a solid column of gasoline from the tank *t* to the nozzle of each dispensing unit 110.

A modification of the check valve arrangement is seen in Fig. 5 which is similar to the showing of Fig. 1 and wherein primed reference characters are employed to identify unaltered parts. The check valve 48' remains unchanged both in shape and function. However, a loop 130 is secured thereto by way of the pressure relief valve 50'. A bead chain 132 is attached to the loop 130 and extends through an opening 133 in a modified cap 134 which is secured to the casing 18' by screws 54'. The bead chain 132 is fastened to a plug 136 which is threaded into the cap 134.

This last described arrangement greatly facilitates inspection and repair of the check valve 48. When such is desired, the plug 136 is removed and the valve 48' pulled off its seat to relieve the pressure of the gasoline in the pipes 44' by permitting gasoline to flow back into the tank. The opening 133 is close fitting and may include a packing (not shown) to minimize or eliminate the leakage of gasoline into the pit in which the casing 18' is mounted. When all pressure has been relieved, the cap 134 may safely be removed with no danger of gasoline spillage. When the valve 48' has been repaired it can be replaced and will function in the same fashion as the valve 48 previously described.

Having thus described the invention what is claimed as novel and desired to be secured by Letters Patent of the United States is:

1. In combination, a tank for containing liquids, a submersible pump, an electric motor directly coupled to said pump and apparatus for mounting said pump interiorly of said tank, said apparatus comprising a standpipe affixed at its lower end to the tank and communicating therewith, a casing secured to the upper end of the standpipe, said casing having an interior wall dividing the interior of said casing into two compartments, one of which forms an outlet chamber, a housing extending vertically through the interior of said casing and having slidable sealed connections with the top and bottom walls of the casing, said housing being secured by screw means to the casing, a liquid conduit within said standpipe and secured at its upper end to the lower end of said housing and opening into the interior of said housing, said housing being apertured to place its interior in communication with the other casing compartment thereby forming a composite inlet chamber, the lower end of said liquid conduit communicating with the submersible pump whereby liquid may be forced up through the liquid conduit and into the inlet chamber, a check valve seated in said interior wall of the casing and permitting flow of liquid only from said inlet chamber to said outlet chamber, a cap overlying said check valve, a plug threaded into said cap and closing off an opening in said cap and a bead chain passing through

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the cap opening and interconnecting the plug and the check valve, said outlet chamber being adapted for communication with one or more dispensing units, an electrical conduit extending through said liquid conduit and connected at its lower end to the motor for said pump and with its upper end extending beyond the top of said housing, a junction box composed of two portions one of which is swivelably mounted on top of said electrical conduit and the other portion of which is rigidly secured to a fixed inlet electrical conduit through which wires are brought from an electrical source, a quick disconnect electrical contact unit comprising two separable portions, one portion of which is fixed in the fixed portion of the junction box, electrical wires extending through said fixed electrical conduit and connected to one contact unit portion, other electrical wires connected to the other contact unit portion and extending through the first named electrical conduit to complete the circuit for the pump motor, said swivelable portion of the junction box having a removable cap permitting access to the other portion of the contact unit, said fixed portion of the junction box lying outside the vertical outline of the housing in at least one angular position of the housing, and the bottom slidable connection having a cross section no greater than the top slidable connection of the housing and the vertical outlines of the pump and liquid conduit being no greater than the interior of said standpipe whereby the housing, liquid conduit and pump may be readily removed from the tank as a unit and siphon maintaining means comprising an aspirator disposed in said housing to receive liquid from said inlet chamber, a tube extending from said aspirator to a point adjacent the bottom of said tank, said casing having a passageway communicating with said aspirator and extending to a siphon tube for coupling said tank with an adjacent tank whereby a suction will be created to automatically maintain a siphon connection between the two tanks.

2. In combination, a tank for containing liquids, a submersible pump, an electric motor directly coupled to said pump and apparatus for mounting said pump interiorly of said tank, said apparatus comprising a standpipe affixed at its lower end to the tank and communicating therewith, a casing secured to the upper end of the standpipe, said casing having an interior wall dividing the interior of said casing into two compartments, one of which forms an outlet chamber, a housing extending vertically through the interior of said casing and having slidable sealed connections with the top and bottom walls of the casing, said housing being secured by screw means to the casing, a liquid conduit within said standpipe and secured at its upper end to the lower end of said housing and opening into the interior of said housing, said housing being apertured to place its interior in communication with the other casing compartment thereby forming a composite inlet chamber, the lower end of said liquid conduit communicating with the submersible pump whereby liquid may be forced up through the liquid conduit and into the inlet chamber, a check valve seated in said interior wall of the casing and permitting flow of liquid only from said inlet chamber to said outlet chamber, said outlet chamber being adapted for communication with one or more dispensing units, an electrical conduit extending through said liquid conduit and connected at its lower end to the motor for said pump and with its upper end extending beyond the top of said housing, a junction box composed of two portions one of which is swivelably mounted on top of said electrical conduit and the other portion of which is rigidly secured to a fixed inlet conduit, a quick disconnect electrical contact unit comprising two separable portions, one portion of which is fixed in the fixed portion of the junction box, electrical wires extending through said fixed electrical conduit and connected to one contact unit portion, other electrical wires connected to the other contact unit portion and extending through the first named electrical conduit to complete the circuit for the pump motor,

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said swivelable portion of the junction box having a removable cap permitting access to the other portion of the contact unit, said fixed portion of the junction box lying outside the vertical outline of the housing in at least one angular position of the housing, and the bottom slidable connection having a cross section no greater than the top slidable connection of the housing and the vertical outlines of the pump and liquid conduit being no greater than the interior of said standpipe whereby the housing, liquid conduit and pump may be readily removed from the tank as a unit and siphon maintaining means comprising an aspirator disposed in said housing to receive liquid from said inlet chamber and return it to said tank, said casing having a passageway communicating with said aspirator and extending to a siphon tube for coupling said tank with an adjacent tank whereby a suction will be created to automatically maintain a siphon connection between the two tanks.

3. In combination, a tank for containing liquids, a submersible pump, an electric motor directly coupled to said pump and apparatus for mounting said pump interiorly of said tank, said apparatus comprising a casing mounted in fixed relation above the tank, said casing having a ported interior wall separating the casing into two compartments one of which forms an outlet chamber, a housing disposed interiorly of said casing and having sealed connections with the upper and lower walls of said casing, said housing being apertured to form an inlet chamber compositely with the other compartment of said casing, a liquid conduit interconnecting the housing and the pump, a check valve permitting liquid flow through the port in the interior wall only from the inlet chamber to the outlet chamber, an electrical conduit extending from the pump motor through said liquid conduit to a point above said housing, a junction box comprising two separable portions, one of which is swivelably mounted on the upper end of said electrical conduit, a fixed inlet electrical conduit, the other junction box portion being secured to said fixed conduit, a contact unit comprising two separable portions mounted in said junction box, electrical wires extending through said fixed electrical conduit and connected to one contact unit portion, other electrical wires connected to the other contact unit portion and extending through the first named electrical conduit to complete the circuit for the pump motor, means providing access to the interior of said junction box to permit disconnecting of said contact unit, the fixed junction box portion lying outside the vertical outline of the housing in at least one angular position of the housing, whereby the housing and the pump may be lifted vertically free and clear of the tank and casing, and siphon maintaining means comprising an aspirator disposed in said housing to receive liquid from said inlet chamber and return it to said tank, said casing having a passageway communicating with said aspirator and extending to a siphon tube for coupling said tank with an adjacent tank whereby a suction will be created to automatically maintain a siphon connection between the two tanks.

4. In combination, a tank for containing liquids, a submersible pump, an electric motor directly coupled to said pump and apparatus for mounting said pump interiorly of said tank, said apparatus comprising a casing mounted in fixed relation above the tank, said casing having a ported interior wall separating the casing into two compartments one of which forms an outlet chamber, a housing disposed interiorly of said casing and having sealed connections with the upper and lower walls of said casing, said housing being apertured to form an inlet chamber compositely with the other compartment of said casing, a liquid conduit interconnecting the housing and the pump, a check valve permitting liquid flow through the port in the interior wall only from the inlet chamber to the outlet chamber, an electrical conduit extending from the pump motor through said pipe to a point above said housing, a separable junction box, one portion of which is swivelably

mounted on the upper end of said electrical conduit and the other portion of which is mounted on a fixed inlet electrical conduit, a contact unit comprising two separable portions mounted in said junction box, electrical wires extending through said fixed electrical conduit and connected to one contact unit portion, other electrical wires connected to the other contact unit portion and extending through the first named electrical conduit to complete the circuit for the pump motor, means providing access to the interior of said junction box to permit disconnecting of said contact unit, the fixed portion of said separable junction box portion lying outside the vertical outline of the housing in at least one angular position of the housing, whereby the housing and pump may be lifted vertically free and clear of the tank and the casing.

5. In combination, a tank for containing liquids, a submersible pump, an electric motor directly coupled to said pump and apparatus for mounting said pump interiorly of said tank, said apparatus comprising a casing mounted in fixed relation above the tank, a housing mounted in said casing in sealed relation to the top and bottom walls thereof, a liquid conduit interconnecting the housing and the pump, an electrical conduit extending interiorly of the liquid conduit from the pump motor to a point above the casing, a separable junction box one portion of which is swivelably mounted adjacent the upper end of the electrical conduit and the other portion of which is mounted on a fixed inlet electrical conduit, a separable contact unit comprising two portions mounted in said junction box, electrical wires extending through said fixed electrical conduit and connected to one contact unit portion, other electrical wires connected to the other contact unit portion and extending through the first named electrical conduit to complete the circuit for the pump motor, and means providing access to the interior of said junction box to permit separation of said contact unit, the fixed portion of the junction box lying outside the vertical outline of the housing in at least one angular position thereof whereby the electrical connection to the pump may be readily broken and the housing and pump removed as a unit.

6. In combination, a tank for containing liquids, a submersible pump, an electric motor directly coupled to said

pump and apparatus for mounting said pump interiorly of said tank, said apparatus comprising a casing mounted in fixed relation above the tank, said casing having a ported interior wall separating the casing into two compartments, one of which forms an outlet chamber, a housing disposed interiorly of said casing and having sealed connections with the upper and lower walls of said casing, said housing being apertured to form an inlet chamber compositely with the other compartment of said casing, a liquid conduit interconnecting the housing and the pump, a check valve permitting liquid flow through the port in the interior wall only from the inlet chamber to the outlet chamber, an electrical conduit extending from the pump motor through said pipe to a point above said housing, a separable junction box one portion of which is mounted on the upper end of said electrical conduit and the other portion of which is mounted on a fixed inlet electrical conduit, the fixed portion of said separable junction box portion lying outside the vertical outline of the housing in at least one angular position of the housing, whereby the housing and pump may be lifted vertically free and clear of the tank and casing, and siphon maintaining means comprising an aspirator disposed in said housing to receive liquid from said inlet chamber and return it to said tank, a siphon tube coupling said tank with an adjacent tank, said casing having a passageway communicating with said aspirator and extending to said siphon tube whereby a suction will be created to automatically maintain a siphon connection between the two tanks.

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