May 1, 1934. A. L. WALLACE 1,957,398

GASOLINE DISPENSING SYSTEM

Filed Aug. 8, 1930 2 Sheets-Sheet 1

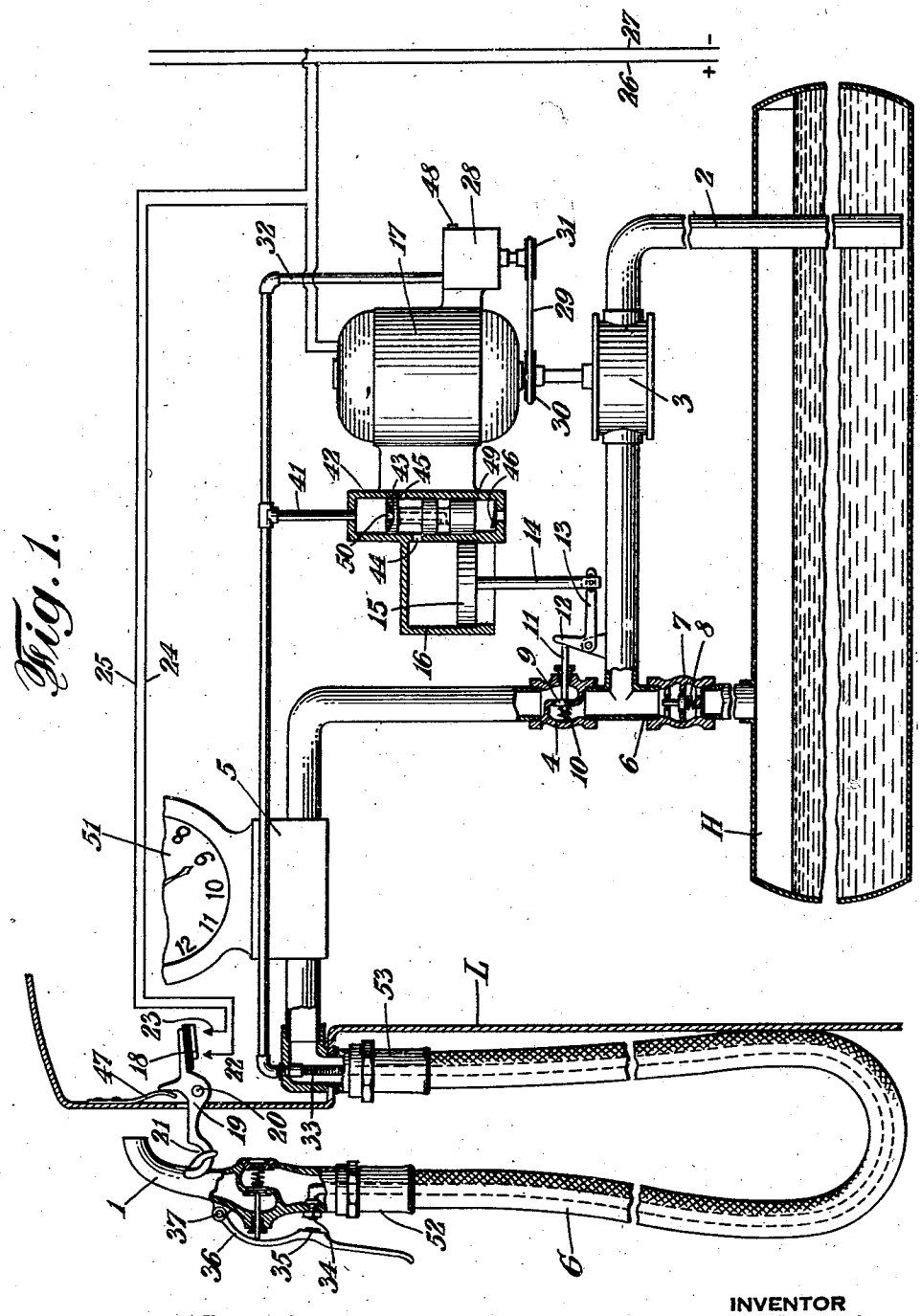


Fig. 1.

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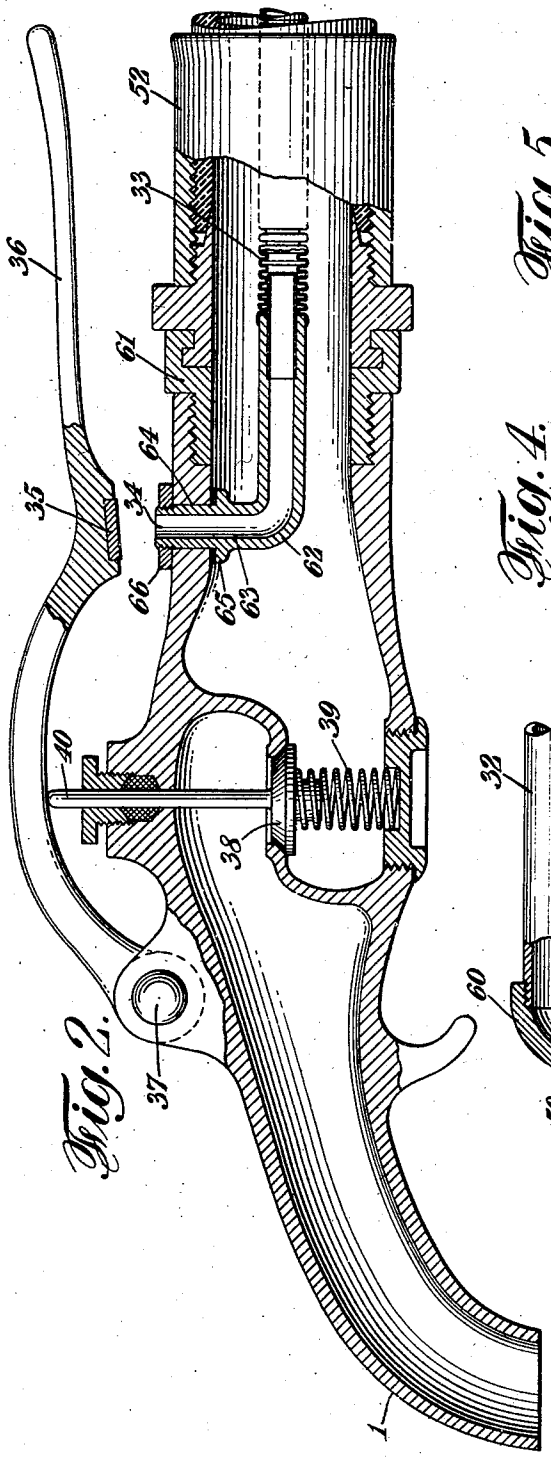


Fig. 2.

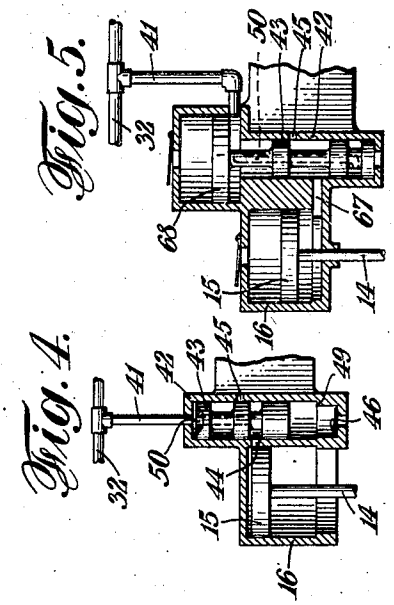


Fig. 5.

Fig. 4.

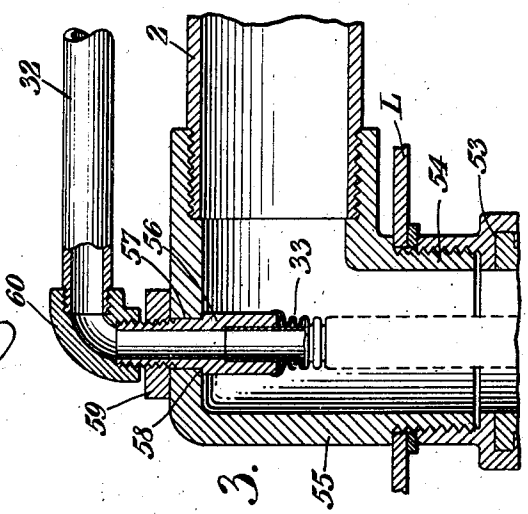


Fig. 3.

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UNITED STATES PATENT OFFICE

1,957,398

GASOLINE DISPENSING SYSTEM

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Application August 8, 1930, Serial No. 473,899

10 Claims. (Cl. 221—95)

This invention relates to a gasoline dispensing system, and an object of the invention is to provide a simple, practical and efficient apparatus, for use for instance at roadside gasoline dispensing stations, and in which the discharge of gasoline through the usual flexible hose is controllable by means located at the free end of said hose.

A further object is to so construct the apparatus that the regular standard flexible hose and its end coupling parts, as now in common use, may be employed without alteration or modification of any kind.

A further object is to so design the apparatus as to feed gasoline under pressure in any metered quantity from the hose but the entire system, including the hose, being without pressure at all other times.

A further and more detailed object is to so construct the apparatus that at the time when the hose is lifted from its supporting hook, and not before that time, the gasoline will begin to be circulated in the system but will not move through the meter and hose except as the result of operation of a special manual control device at the free end of the hose, said manual control device being operable also to stop the movement of gasoline to and through meter and hose instantly at the will of the operator, and the circulation of gasoline in the system being automatically stopped by return of the hose to its supporting hook.

Other objects and aims of the invention, more or less specific than those referred to above, will be in part obvious and in part pointed out in the course of the following description of the elements, combinations, arrangements of parts and applications of principles constituting the invention; and the scope of protection contemplated will be indicated in the appended claims.

In the accompanying drawings which are to be taken as a part of this specification, and in which I have shown merely a preferred form of embodiment of the invention:—

Fig. 1 is a diagrammatic view illustrating a system embodying the features of this invention.

Fig. 2 is an enlarged detail view of the control device at the end of the flexible hose.

Fig. 3 is a similar enlarged detail view showing the structure at the fixed end of the hose.

Fig. 4 is a detail sectional view of the valve mechanism employed for controlling the flow of gasoline in the system, the parts being shown in a different position as compared with the position shown in Fig. 1, and

Fig. 5 is a fragmentary detail view illustrating a modification of the valve mechanism illustrated in Fig. 4.

Referring to the drawings for describing in detail the structure illustrated therein, the reference character L indicates a portion of a suitable form of gasoline delivery stand of the general type found at most roadside gasoline delivery stations.

The reference character G indicates the flexible hose which is connected with the stand, as usual, and which carries a delivery nozzle 1 at its free end.

The reference character H indicates a gasoline supply tank, which is usually buried in the earth, and from which gasoline is to be forced outwardly through the hose and nozzle.

A pipe 2 dips into the tank H and extends therefrom through a pump 3, a valve 4 and a metering device 5, to the hose G. A branch pipe 6 communicates with the pipe 2 at a point between the pump 3 and the valve 4 and leads back to the tank H a check valve 7 being arranged in the pipe 6 normally held closed by a spring as 8 so that the valve will permit movement of gasoline back into the tank from the pipe 2 only when the valve is opened against the force of spring 8.

A valve 4 has its movable element 9 normally held closed by a spring 10, but a stem 11 projects outwardly from said movable element and is arranged to be engaged by one arm as 12 of a bell-crank lever, the other arm as 13 of which is connected to be actuated by a rod 14 which is in turn connected with a plunger 15 movable within a cylinder 16.

An electric motor 17 is indicated for driving the pump 3 and the circuit of this motor includes a suitable contact device 18 controlled by a movable lever 19 pivotally mounted as at 20 upon the stand L and having a hook 21 upon which the free end of the hose may be hung whenever the hose is not in use.

Two stationary contacts as 22 and 23 co-operate with the contact 18 and have conductors as 24 and 25 extending therefrom respectively, the conductor 24 extending through the motor and to a main as 26, and the conductor 25 extending to the opposite main as 27.

Adjacent to the motor 17 is a vacuum pump 28, driven by the motor through any suitable form of connection, as for instance by the belt 29 passing around pulleys 30 and 31 upon the motor and pump shafts respectively. A small air pipe 32 extends from the pump 28 and continues, by way of a flexible extension portion 33,

through the interior of the hose G and opens to the atmosphere at its end as at 34 upon the nozzle 1.

The opening at the end 34 is controlled by a manually operable stopper 35 which is carried upon a lever 36 provided upon the nozzle 1 said lever being pivotally mounted upon the nozzle as at 37, and being, if desired, to serve also as an operating handle for controlling the movable element as 38 of a valve built into the nozzle, said movable element being pressed closed by a spring 39 and having a stem 40 projecting outwardly into position to be engaged by the lever 36.

Whenever the lever is moved to close the opening 34 the valve element 38 will at the same time be automatically moved to open position, and likewise whenever the lever is moved to uncover the opening 34 the valve element 38 will be automatically caused to move to closed position. It may be here noted that the uncovering of the opening 34 necessarily takes place prior to the final closing of the valve element 38.

Communicating with the air pipe 32 is a branch pipe 41 which opens into a small cylinder 42 within which moves a slide valve 43. An opening 44 provides communication between the interior of the cylinders 16 and 42, and a second opening as 45 communicates between the interior of the cylinder 42 and the outer atmosphere.

In the bottom wall of the cylinder 42 is provided a check valve 46 arranged to permit easy movement of air into the cylinder below the slide valve but to retard outward movement of air from below said slide valve.

In operation: Removal of the nozzle 1 from the hook 21 will allow the contact member 18 to close communication between the contacts 22 and 23, a suitable spring as 47 being preferably provided for moving the lever 19 at this time. Closing of the circuit between the contacts 22 and 23 will start the motor and gasoline will immediately begin to be pumped up from the tank H along the pipe 2 and back again through the pipe 6 into the tank H. At this time the valve 4 is closed both by the pressure of spring 10 and by the pressure of gasoline against it. The pressure of the gasoline however overcomes the pressure of spring 8 in valve 7 to hold said valve 7 open.

The operation of the motor at the same time produces, or tends to produce, a vacuum pressure within the pump 28. This is felt along the length of pipe 32 and its flexible extension 33 but is relieved by reason of the fact that the extension 33 is wide open at its end 34 so that the pump 28 merely draws air through the opening 34, extension 33, and pipe 32 and forces it out of a suitable exhaust opening as indicated at 48 upon the pump.

The tendency to vacuum referred to is also felt within the pipe 41 and the cylinder 42 but the relief afforded by the opening 34 is sufficient so that the pull within the cylinder 42 is incapable of lifting the slide valve, which it will be noted stands by gravity in its lower position against a suitable shoulder as 49.

The operator, in due course, having introduced the nozzle 1 into the tank of an automobile, or other receptacle into which gasoline is to be delivered, now presses upon the lever 36 and thereby closes the opening 34 so that the vacuum pull of the pump 48 is no longer relieved but is strongly applied within the cylinder 42 and immediately causes the slide valve 43 to move to an upper position within said cylinder, as indicated in Fig. 4. In this position a suitable passage as 50 which is provided within the slide valve opens communication between the pipe 41 and the interior of the cylinder 16, through the opening 44 thereby applying the vacuum pull upon the plunger 15 and lifting said plunger. The lifting movement of the plunger, operating upon the bell-crank lever 12—13 forces open the valve 4 so that the pressure of gasoline against the valve 7 is relieved and the gasoline is diverted through the valve 4 and the meter 5 and is delivered outwardly through the hose G and nozzle 1 into the receptacle awaiting it.

Movement of gasoline through meter 5 will cause said meter to register the amount in gallons upon a suitable dial as at 51 in the usual manner, and the movement may be continued for the delivery of any desired quantity of gasoline as long as the opening 34 is kept covered and the nozzle is kept off of the hook 21.

When the desired amount of gasoline has been metered the operator simply allows the lever 36 to move upwardly and uncover the opening 34. The inrush of air through this opening will destroy the vacuum within the cylinder 42 and allow the slide valve 43 to fall immediately to its lower position, as indicated in Fig. 1, thus giving communication between the openings 44 and 45 so that air from the outer atmosphere moves freely into the cylinder 16 and permits the plunger 15 to fall and instantly close the valve 4.

Closing of the valve 4 will of course shut off movement of gasoline through the meter, and the gasoline contained within the hose G at this time may be allowed to flow out through the nozzle 1 before the lever 36 is allowed to move sufficiently far to close the valve element 38, or said valve element 38 may be allowed to close for trapping any part of said gasoline within the hose, as may be required by circumstances, it being pointed out however that in either event the fact that the opening 34 is necessarily uncovered prior to the final closing of the valve element 38 as hereinabove pointed out insures that at least a portion of the gasoline contained within the hose at the moment when the opening 34 is uncovered will pass out of the nozzle and thus relieve the hose of pressure.

Closing of the valve 4 again imposes the pressure of the gasoline from pump 3 against the valve 7 opening said valve 7 and thereby again allowing gasoline from the pump 3 to be delivered back into the tank H as before, and this will continue until the motor circuit is broken as by return of the nozzle to supported position upon the hook 21.

It is to be particularly emphasized that the flexible portion 33 of the air pipe extends loosely through the interior of the hose G, having been merely threaded through said hose prior to the assembly of the hose with the other elements of structure recited. The hose is of the regular standard construction well known in this art and the couplings as 52 and 53 at its opposite ends are also of the regular standard construction, and neither the hose nor its couplings have any special appendages or change of form of any kind to accommodate the air pipe.

At its inner end the hose coupling 53 is screwed upon a threaded extension as 54 of an elbow 55 which forms a part of the pipe 2 at the delivery side of the meter 5. The flexible air pipe 33 has a suitable fitting as 56 upon its adjacent end.

This is threaded through an opening 57 in the upper wall of the elbow 55. A shoulder 58 provided upon the fitting engages against the inner surface of the wall of the elbow and a clamp nut 59, threaded upon the outer end of the fitting 56 engages the outer surface of said wall, thereby serving to hold the air pipe in rigid assembly with the elbow and at the same time continuing its open passage-way through said elbow and into the pipe 32 as by means of an ordinary L-fitting 60 which engages the threaded extension of the fitting 56 in the usual manner, all as clearly illustrated in Fig. 3.

At the nozzle end of the hose the usual swivel portion as 61 of the coupling 52 is threaded into or upon the nozzle in the usual manner. The flexible air pipe is furnished with an end fitting as 62, said air pipe being sufficiently long so that the fitting 62 projects a suitable distance beyond the outer end of the coupling. The fitting 62 has a laterally turned end portion 63 which projects through an opening 64 in the top wall of the nozzle. A shoulder 65 engages the inner surface of said top wall and a clamp nut 66 is threaded upon the outer end of the extension so as to engage the outer surface of said top wall and thereby rigidly fix the fitting to the nozzle, it being apparent that the extension 63 of the fitting may be readily introduced into the end of the nozzle and through the opening 64 and fastened tight in its appointed position by the nut 66 prior to the screwing home of the hose coupling onto the nozzle. If necessary a certain amount of excessive length of the flexible air pipe required for quickly and easily performing this operation may be pushed back loosely into the hose upon assembly of the parts.

In Fig. 5 a modified form of mechanism is illustrated suitable for controlling the valve 4 by means of compressed air or other fluid instead of by means of vacuum pull. In this instance the cylinder 16 is closed at its lower end and the passage, as 67, communicating between this cylinder and the cylinder 42 is formed below the lowermost position of the plunger 15. The pipe 41 entering the cylinder 42 communicates with said cylinder at a point below an enlarged head 68 which is formed upon the upper end of the slide valve.

The pump 28 in this instance, instead of being a vacuum pump, is of a character to provide direct fluid pressure.

So long as the opening 34 at the nozzle remains open this pressure will be relieved through said opening but when the opening 34 is closed the pressure is directed against the under-surface of the head 68 thereby moving the slide valve upwardly and opening communication between the pipe 41 and the cylinder 16 by way of the passage 50 as before. Since the opening into the cylinder 16 is below the plunger 15 the pressure from the pipe 41 will now be exerted against the under-side of the plunger and move the plunger upwardly to the same effect as in Fig. 1.

When pressure has been relieved in pipe 41, as by uncovering of the opening 34 at the nozzle, the slide valve will fall to its lower position and allow the pressure within cylinder 16 to exhaust back through the opening 67 and outwardly to the atmosphere through the opening 45.

As many changes could be made in this construction without departing from the scope of the invention as defined in the following claims, it is intended that all matter contained in the above description, or shown in the accompanying drawings, shall be interpreted as illustrative only and not in a limiting sense.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. A gasoline dispensing system, comprising a supply tank, means by which the gasoline may be pumped out of said tank and returned thereinto, a flexible delivery hose having a delivery nozzle at one end thereof, fluid pressure means operable to divert into and through said hose the gasoline being returned to the tank, and a control device for said fluid pressure means located upon said nozzle.

2. A gasoline dispensing system, comprising a supply tank, means by which the gasoline may be pumped out of said tank and returned thereinto, a flexible delivery hose having a delivery nozzle at one end thereof, and fluid pressure means operable to divert into and through said hose the gasoline being returned to the tank, said fluid pressure means including a flexible air pipe extending loosely through said hose from end to end thereof and opening outwardly of the hose at the nozzle end of the hose, and means at the nozzle end of said hose manually operable to control said opening.

3. A gasoline dispensing system, comprising a supply tank, a main pipe line extending therefrom, a pump for moving gasoline under pressure along the pipe line from said tank, a flexible delivery hose continuing from the outer end of said pipe line having a nozzle at its outer end, a valve in said pipe line operable to open and close passage therethrough to the hose, a branch pipe communicating with the main pipe line between the pump and the valve and extending into the tank, a valve in said branch pipe operable to oppose movement of gasoline except under pressure along said branch pipe when the first valve is closed, a movable hook upon which to support the nozzle end of the hose, means dependent upon the position of said hook for operating said pump, and fluid pressure means including a control device carried by said nozzle for effecting operation of the first valve into open or closed position at the will of the operator.

4. A gasoline dispensing system, comprising a supply tank, a pipe line extending therefrom, a pump for moving gasoline under pressure along the pipe line from said tank, a flexible delivery hose continuing from the outer end of said pipe line having a nozzle at its outer end, a valve in said pipe line operable to open and close passage therethrough to the hose, a fluid pressure cylinder, a plunger movable in said cylinder having connection with said valve to operate said valve by movement of said plunger, said cylinder having an opening through the wall thereof, a source of fluid pressure, a pipe line extending from said source having a flexible extension continuing therefrom through said hose and opening to the atmosphere at said nozzle, control means at said nozzle operable to cover and uncover said opening, a slide valve movable to control the opening through the mentioned fluid pressure cylinder, and means whereby operation of said control means at the nozzle will effect operation of said slide valve.

5. A gasoline dispensing system, comprising a stand having a gasoline pipe line extending therethrough, a flexible gasoline hose, a coupling at the inner end of the hose by which it is connected with said pipe line, a nozzle, a coupling at the outer end of the hose by which the nozzle is con-

nected to said end of the hose, and mechanism operable to cause a flow of gasoline along said pipe line and hose to said nozzle said mechanism including a control device located upon the nozzle and a flexible member extending through the hose and couplings being otherwise disconnected from said hose and couplings having one end projecting outwardly beyond the adjacent coupling and connected with the nozzle in co-operative association with the control device and having its other end projecting through the other coupling and into the pipe line.

6. A gasoline dispensing system, comprising a stand having a gasoline pipe line extending therethrough, a flexible gasoline hose, a coupling at the inner end of the hose by which it is connected with said pipe line, a nozzle, a coupling at the outer end of the hose by which the nozzle is connected to said end of the hose, and mechanism operable to cause a flow of gasoline along said pipe line and hose to said nozzle said mechanism including a control device located upon the nozzle and a flexible air pipe extending through the hose and couplings being otherwise disconnected from said hose and couplings and having one end projecting outwardly beyond the adjacent coupling and connected with the nozzle in co-operative association with the control device and having its other end projecting through the other coupling and being sealed through a wall of said pipe line into the stand.

7. A gasoline dispensing system, comprising a supply tank, a pipe line extending therefrom, a pump for moving gasoline under pressure along the pipe line from said tank, a flexible delivery hose continuing from the outer end of the pipe line, a valve in said pipe line operable to open and close passage therethrough to the hose, means by which gasoline contained in the pipe line between the pump and said valve may return to the tank when said valve is closed, a fluid pressure mechanism for operating said valve, and an air pipe extending from said mechanism along the length of said flexible delivery hose to the delivery end thereof and having a control element at said delivery end whereby said mechanism may be controlled at will to operate said valve from said delivery end of the flexible hose.

8. In a gasoline dispensing system, comprising a supply tank, means by which gasoline may be pumped out of said tank and returned thereinto, a flexible delivery hose having a delivery nozzle at one end thereof fitted with a valve by which to control the movement of gasoline through the nozzle and with a handle for the manual operation of said valve, the combination therewith of means including a part operable to divert into and along the hose to said nozzle the gasoline being returned to the tank and another part carried at the delivery end of the hose and controlled by movement of said handle to thereby control operation of said diverting part.

9. A gasoline dispensing system, comprising a supply tank, means by which gasoline may be pumped out of said tank and returned thereinto, a flexible delivery hose having a delivery nozzle at one end thereof fitted with a valve by which to control the movement of gasoline through the nozzle and with a handle for the manual operation of said valve, and means including a flexible air pipe extending through the interior of the hose from end to end thereof having an opening located at the delivery end of the hose and controlled by movement of said handle to divert into and along the hose to said nozzle the gasoline being returned to the tank.

10. A gasoline dispensing system, comprising a supply tank, a pipe line extending therefrom, a pump for moving gasoline under pressure along the pipe line from said tank, a flexible delivery hose continuing from the outer end of the pipe line, a valve in said pipe line operable to open and close passage therethrough to the hose, a valve controlled nozzle at the outer end of the hose having a manually operable handle by which to move the valve thereof, and a fluid pressure means for operating said pipe line valve including a flexible air pipe extending loosely along the interior of said hose and continuing into the interior of said nozzle and having an opening communicating with the outer atmosphere through the wall of said nozzle controlled by the nozzle valve handle.

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