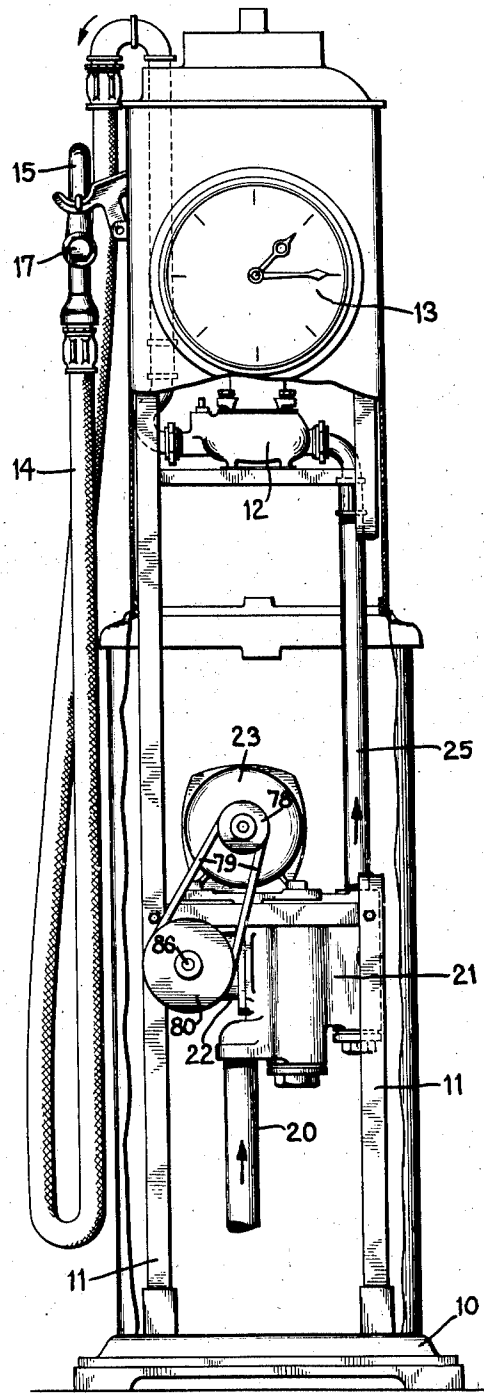
June 6, 1933. W. J. PETER 1,913,128

LIQUID DISPENSER

Filed April 17, 1931 4 Sheets-Sheet 1

FIG.1.



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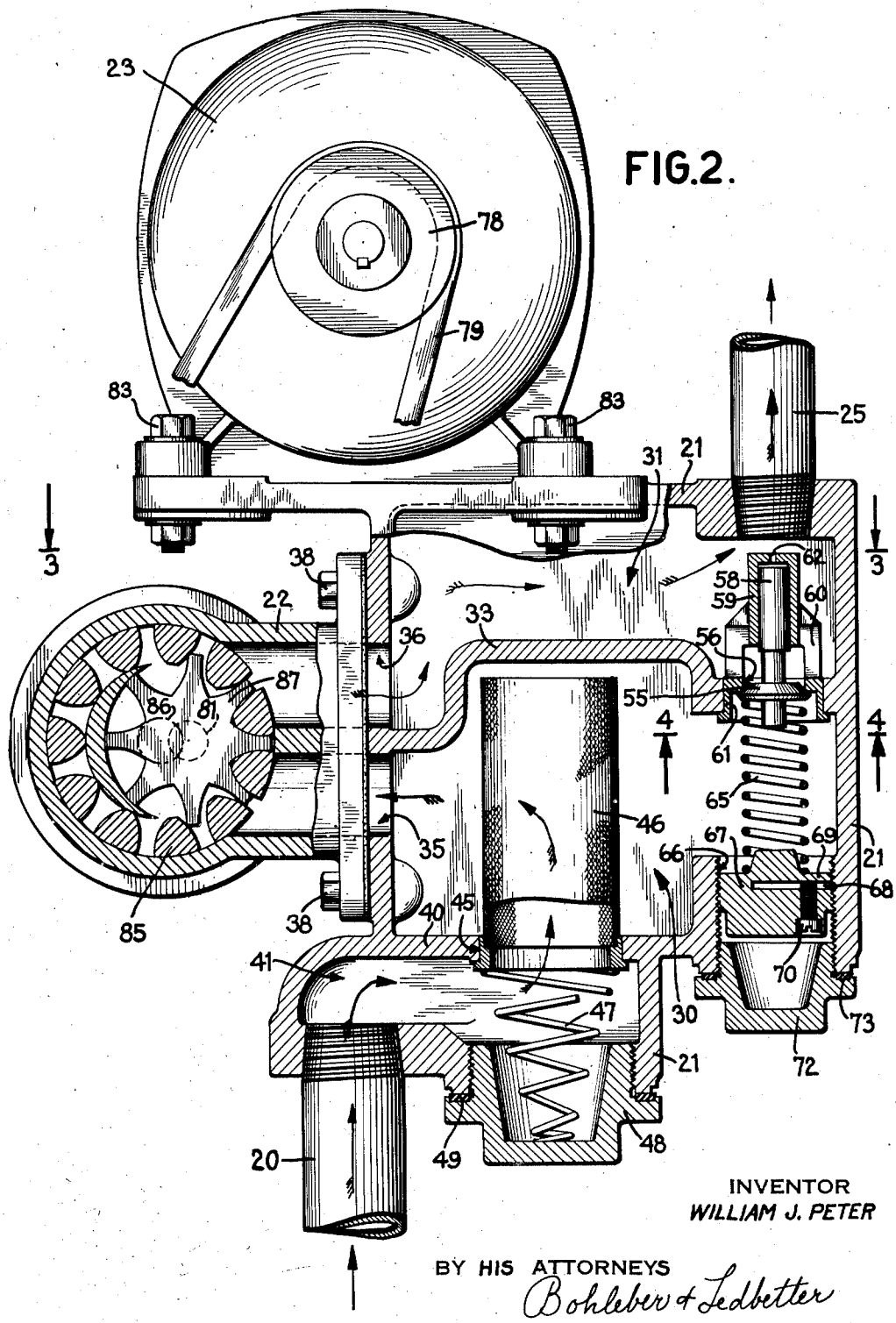
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LIQUID DISPENSER

Filed April 17, 1931 4 Sheets-Sheet 2

FIG.2.



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LIQUID DISPENSER

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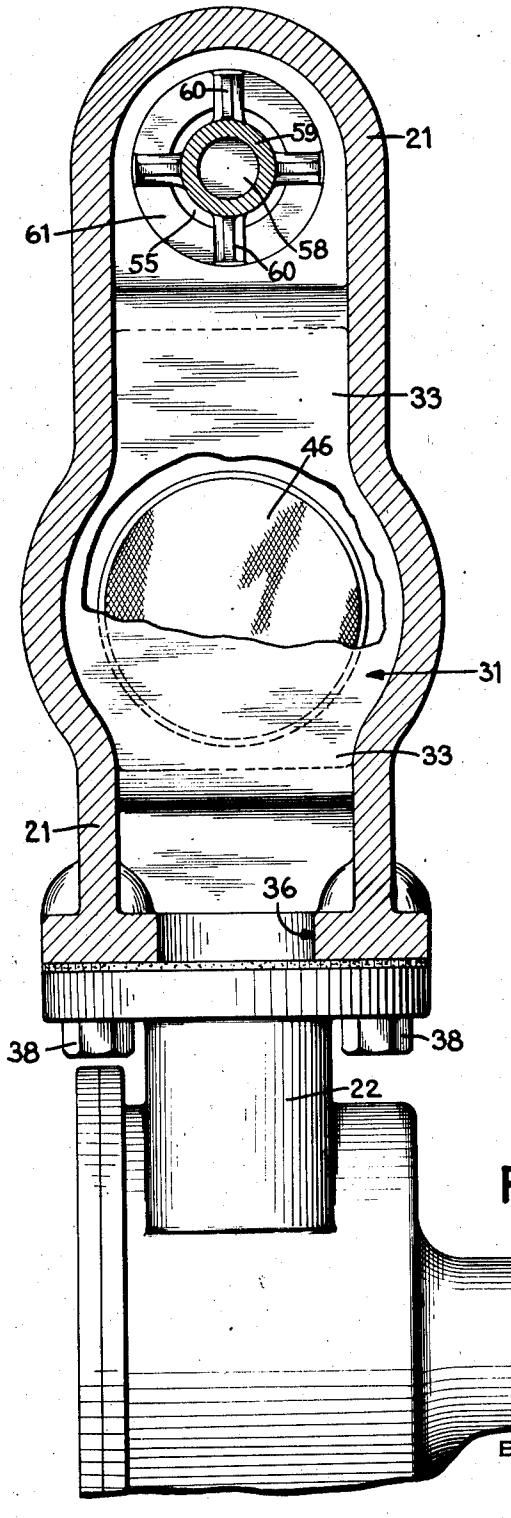


FIG. 4.

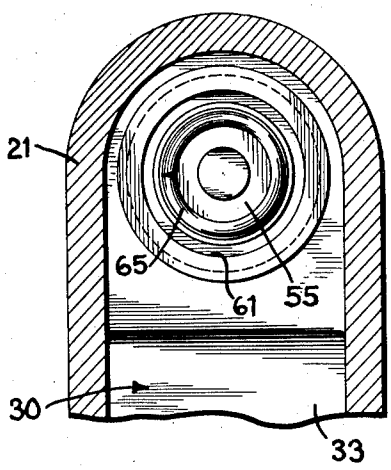
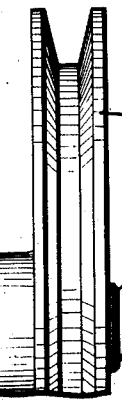


FIG. 3.



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LIQUID DISPENSER

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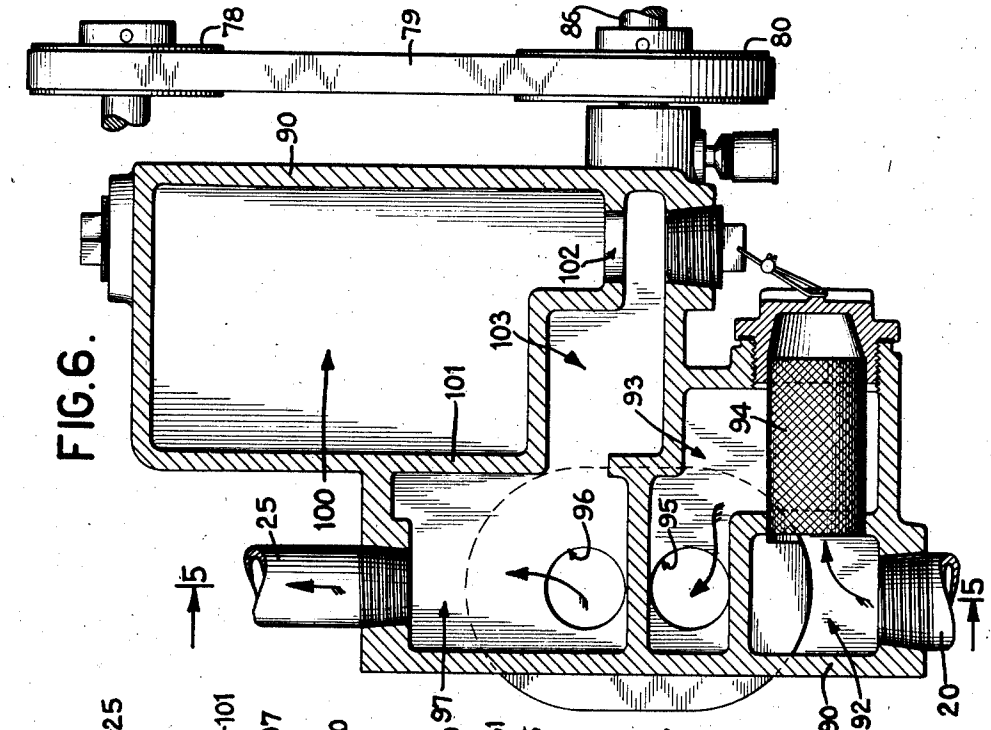


FIG. 6.

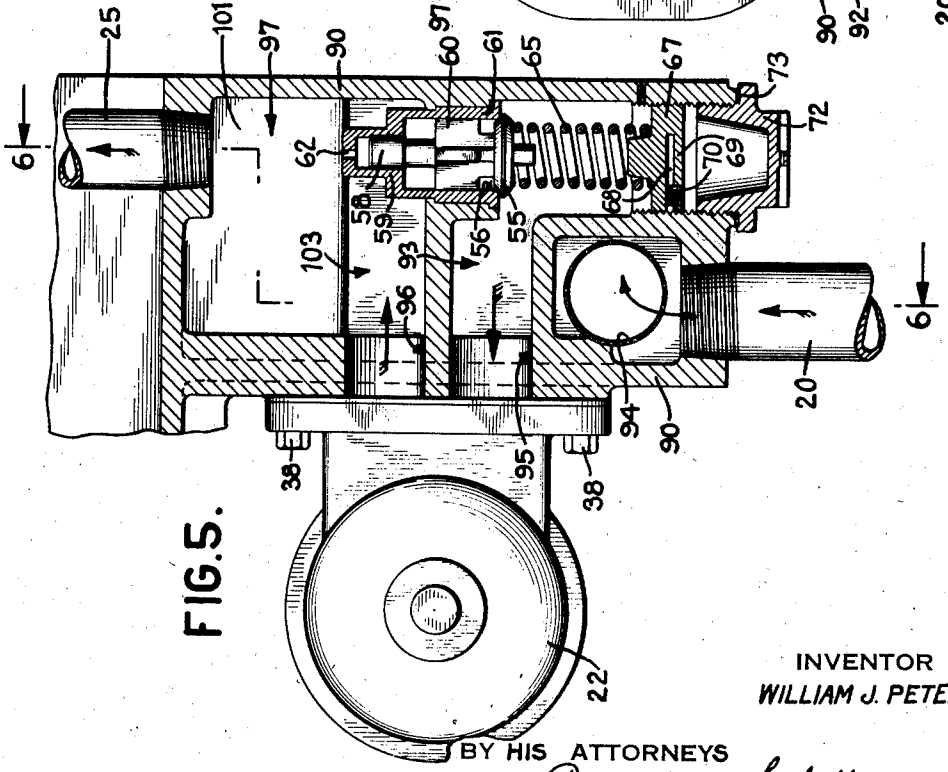


FIG. 5.

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Patented June 6, 1933

1,913,128

UNITED STATES PATENT OFFICE

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LIQUID DISPENSER

Application filed April 17, 1931. Serial No. 530,751.

This invention relates to liquid dispensers and particularly to curb pumps or wall panel pumps and the like for dispensing gasoline, oil or other liquids. The invention contemplates improvements in the pumping assembly whereby a single or unit pipe-connection fitting or housing is utilized to mount a pump and a by-pass valve as well as a strainer and/or other elements constituting any liquid control mechanism which may be desired to install in or on the unit housing or pipe fitting means.

A principal object of the invention is to construct a chambered housing for use in liquid dispensers and to which the gasoline or liquid inlet and outlet pipes or connections are directly made and upon which the pump is carried for forcing the liquid from the storage tank to the point of delivery without mounting the pump driving parts in said chambered housing. A by-pass valve may also be included within this pipe-connection housing to by-pass the liquid from the high pressure or discharge side of the pump back to the suction side thereof when the liquid or gasoline discharge nozzle on the outer end of the usual delivery hose is closed and consequently the pressure on the discharge side of the pump exceeds the delivery pressure of the liquid.

Another object of the invention is to construct a single or unit pipe-connection housing for a liquid dispenser which housing may support a pump and its driving motor for dispensing the liquid, the housing also including a strainer for straining the liquid before delivery at the outlet or discharge nozzle and preferably straining the liquid before it enters the pump.

A still further object is to construct a unit housing for a liquid dispenser which carries a pumping unit thereon and the pipe-connection housing including a by-pass valve by which the liquid is by-passed from the high pressure side of the pump back to the low pressure side whenever the pressure exceeds the normal delivery pressure of the pump when the discharge or delivery valve is closed.

The by-pass valve also is positioned adjacent to the outlet connection or pipe and the pipe-connection housing is constructed so that this object may be attained and particularly so that the by-pass valve is nearer to the outlet connection than the pump itself. Such positioning of the valve brings about the opening of the by-pass valve to return the liquid from the high pressure side of the pump to the low pressure side before the increased liquid pressure, brought about by the closing of the delivery nozzle in the delivery hose line, can reach the pump.

Another object is to position the by-pass valve, through which the high pressure side of the pump is connected with the low pressure or suction side of the pump when the pressure becomes greater than the delivery pressure, remotely from the flow of liquid to the pump so that the flowing liquid will not influence the actuation of the by-pass valve either to open the valve when it should be closed or to hold the valve closed when it should be open.

A still further object is to produce a single housing unit which includes an air cushion chamber therein to absorb the hydraulic shocks transferred through the liquid by the sudden closing of a valve in the delivery hose line.

Other objects of the invention will be more apparent from the following description, taken in connection with the accompanying drawings, which illustrate two embodiments of the invention, in which:

Figure 1 shows a conventional curb pump for gasoline and the like with its outer shell or casing removed to show the general details and construction of the dispensing or pumping assembly or mechanism in its relation to the other parts of the liquid dispenser such as the meter, delivery hose and nozzle which are also shown.

Figure 2 is a cross-section through the single or unit pipe-connection housing which carries the pump and in which a strainer and by-pass valve is housed showing these elements in their respective positions within the housing as well as the mounting for the motor which drives the pump.

Figure 3 is a cross-section through the

housing as taken on line 3—3 of Figure 2 with the pump shown carried on the end of the housing and the relation of the strainer and by-pass valve with respect thereto.

Figure 4 is a cross-section taken on line 4—4 of Figure 2 showing specifically the by-pass valve mounting.

Figure 5 is a section taken on line 5—5 of Figure 6 through a housing of a modified construction and a by-pass valve therein in which the by-pass valve is located in a different position from that shown in Figures 1 through 4 in relation to the inlet pipe and other parts of the housing and with an air chamber included within the housing.

Figure 6 is a section of the modified form of housing taken on line 6—6 of Figure 5 showing the inlet, strainer, pump inlet and outlet, air chamber and connection therewith from the high pressure side of the pump.

Gasoline or curb pumps are ordinarily constructed so that the strainer, the pump and the by-pass valve are separate elements and are all connected together with the usual pipe connections, such as pipe L's, T's and nipples. A usual pump, strainer and by-pass installation on a curb stand or wall panel liquid dispenser therefore includes a great many pipe connections in order to operatively connect these various parts of the pumping unit together with the strainer, pump and by-pass valves in proper relation to each other.

In the usual method of connecting a liquid pump, strainer and by-pass valve mechanism for the pump, it is difficult, if not impossible for all practical purposes, to cut and thread the connecting nipples and connections of proper length so that when they are assembled together and tightened, a strain is not thrown upon the pump and its driving parts as well as upon the other parts of the assembled units. As a consequence, it frequently happens that a strain is set up in pump housings heretofore used when the various pipe connections are made therewith, which strain is sufficient to throw the pumping mechanism and its bearings out of alignment and results in a construction which is not wholly satisfactory in its operation because misaligned bearings heat, jam, freeze and cause trouble.

The assembling of a strainer and by-pass valve in my single or unit pipe-connection housing, to which the pump is later secured, fixes all the parts permanently in their relation to each other so that when pipes are later attached to the pipe-connection housing of my invention, it is impossible to throw a strain upon any of the parts, and as a consequence, the pump bearings and parts are not strained or thrown out of alignment and the pump functions more satisfactorily than heretofore. The by-pass valve also is unstrained and consequently it seats perfectly without being thrown out of alignment which would probably cause the valve to seat imperfectly and leak. In addition, there are only two pipe connections with my unit housing which results in a simpler and more satisfactory structure.

The unit housing for supporting the pump and for housing the strainer and by-pass valve, to be described herein, has particular use with gasoline meter pumps or dispensers such, for example, as a curb pump shown in Figure 1. Inasmuch as the invention pertains particularly to the pipe-connection housing and its assembly, the principal details only of the gasoline dispenser or curb pump stand are shown.

The usual type of gasoline curb pump consists of a base 10 on which an upright sheet metal shell is mounted and in which a frame 11 rises to form a conventional curb pump stand. The frame carries a metering device 12 which controls an indicating dial 13 and the usual delivery hose 14 and discharge nozzle 15 in which a delivery valve may be carried, such as the valve 17, although the delivery valve may be positioned anywhere desired in the delivery pipe line. The gasoline is pumped from the tank or reservoir, not shown, through an inlet pipe 20 into a single or unit pipe-fitting means in the form of a pipe-connection housing 21 bolted to the upright frame standards 11 and this housing carries a pump 22 containing a strainer and by-pass valve which will be described hereinafter. The pump 22 is driven by any suitable driving means, such as the electric motor 23, for drawing the gasoline from the tank and delivering or pumping it out of the outlet pipe 25 through the meter 12, hose 14 and nozzle 15. This describes generally a curb or gasoline pump stand or dispenser for which this invention is particularly adapted and a self-contained conventional pump 22 may be used since the invention has to do with the pipe-connection housing 21 and its general relation to all other parts.

The unit housing 21 consists of an inlet chamber 30 and an outlet chamber 31. These two chambers are formed by a partition 33 which separates the housing into the inlet and outlet chambers, having two spaced ports 35 and 36, one on each side of the partition wall 33, and leading to atmosphere from each internal chamber or passage 30 and 31. The partition 33 is preferably a horizontal one which separates the housing into an upper outlet chamber and a lower inlet chamber but other relative positions of the chambers are within the scope of the invention. A pump inlet port or passage 35 in the side or outer wall of the housing 21 leads to the pump 22 which may be of any type, although the preferred form is a rotary pump having a shaft

and an impeller means many of which are obtainable on the market. Since the pump per se is an element separate and independent of the pipe-connection housing and alone does not constitute the invention, it will not be described in great detail. The pump 22 also has spaced ports connected in registry with the ports 35 and 36 and delivers the liquid or gasoline into the outlet pump passage or discharge port 36 leading to the outlet chamber 31 of the housing 21. The pump is secured preferably to the side of the housing by bolts 38 so that the pump is carried by the housing and for all purposes it is practically a part of the housing in that it serves as a passage-way connection between the two laterally directed ports 35 and 36 which open to atmosphere thru an outer common wall of the member 21. The liquid or gasoline flows through the outlet chamber 31 and the outlet pipe 25 of the housing 21, as previously described.

Thus the housing means 21 serves to place the pump 22 or any other liquid-control mechanism in communication with the inlet and outlet pipes 20 and 25 but doing so without direct and physical connection with the pipes 20 and 25. This is an advantage because ordinary workmanship or labor may be used to install the pipes 20 and 25 inasmuch as the delicate pump or other liquid control means 22 is off to one side and not subject to any of the twisting strain or rough treatment frequently administered to machinery by the rank and file of workman. It is significant that a single housing means 21 serves the several purposes of mounting and supporting a pump in service position, of keeping the piping 20 and 25 away from the pump and thus removes all causes for working or tinkering of pipe fitters around the pump, likewise the housing means 21 places the pipes and pump means in communication, acts as a base or stand for the motor 23, and contains the strainer and by-pass valve means. These purposes being attained in a simple one-piece casting or unit-housing or pipe-connection means constitutes an important feature of the invention.

The pipe-connection housing 21 in its preferred embodiment also has a second partition 40 separating or dividing the housing or particularly the inlet chamber 30 into an inlet passage 41 which connects with the inlet chamber 30 through a strainer opening 45 through the partition 40. A strainer 46 of the basket type is inserted into the strainer opening 45 so that the open end of the strainer is seated in the opening and the strainer itself extends into the inlet chamber 30. A spring 47 holds the strainer 46 in position in the housing and within the strainer opening 45.

The wall of the housing 21 has a threaded opening in axial alignment with the strainer 46 and large enough to pass the strainer therethrough, into which a threaded cap 48 is received. The cap 48 carries a gasket 49 for engagement with the wall of the housing 21 to form a liquid-tight seal. The threaded opening is large enough so that when the cap 48 is removed, the strainer may be removed through the opening and cleaned, repaired or replaced whenever necessary to do so. It will be observed therefore that in the preferred construction the liquid or gasoline passes through the strainer 46 before the liquid reaches the pump 22, because it is desirable to remove all foreign matter from the gasoline or liquid before it enters the pump which foreign matter may otherwise injure or cause excessive wear thereto.

The unit pipe-connection housing 21 carries a by-pass valve 55 which normally closes a by-pass connection in the form of a port or passage 56 between the outlet chamber 31 and the inlet chamber 30. The by-pass port or opening 56 is preferably within the housing and in the partition 33 which divides the housing into the inlet and outlet chambers 30 and 31 respectively and consequently the by-pass valve is inserted directly within the housing and forms a part of the unit housing structure. The by-pass valve 55 carries a valve stem 58 which is slidable in the guide 59 carried upon the open work support or valve cage 60 of the valve seat member 61. A vent 62 is provided in the end of the guide 59 so that neither excess pressure nor suction between the end of the valve stem 58 and the end of the guide 59 will affect the actuation of the by-pass valve 55.

The by-pass valve 55 is preferably positioned so that its axis extends vertically because it is important that the valve seat remain clean of grit and dirt which would hold the valve open when it should be closed. The valve in being positioned vertically enables the gasoline flowing therethrough to wash the seat clean so that the valve will always seat tight when the valve is closed. Another advantage of the vertical position of the valve is that the valve will float or have a certain degree of freedom and adjust itself when it closes so that the valve will align itself upon the valve seat without leaking.

A spring 65 resiliently holds the valve 55 in contact with the valve seat member 61. The other end of the spring 65 seats upon a tension adjusting member 67 which is threaded into a threaded opening 66 in the housing. This tension adjusting member 67 carries a split 68 extending through the greater part of its diameter forming a resilient end 69. A set screw 70 is adapted to press against the resilient end 69 to lock the spring adjusting member 67 in adjusted position. A cap 72 is threaded into the opening 66 with the spring adjusting member 67 which cap carries a gasket 73 for engagement with the housing 21 to form a liquid-tight seal therewith. The

by-pass valve, spring and valve cage member are removable from the pipe-connection housing through the opening 66 whenever desired for repair or replacement and adjustment of the tension of the spring 65 against the by-pass valve 55, which may be accomplished merely by removing the cap 72, loosening of the lock screw 70 and turning the spring adjustment member 67, after which the lock screw 70 is again tightened and the cap 72 is rethreaded into the opening.

It will be noted that the by-pass valve 55 is positioned in a pocket in the inlet chamber which is remote from the flow of the liquid or gasoline from the inlet pipe 20 and through the strainer 46 to the pump 22 as shown by the arrows. In other words, the by-pass valve 55 is positioned in the inlet chamber but remotely from the flow of the liquid therethrough. The by-pass valve is positioned as described above in order that the flowing liquid will not tend to assist or resist the normal opening or closing of the valve 55. The by-pass valve 55 with its by-pass connection 56 is also located immediately adjacent to the outlet pipe 25 from the outlet chamber 31.

In the preferred construction, the by-pass valve 55 and the by-pass opening 56 is placed in axial alignment and adjacent to the outlet pipe 25. The purpose of so positioning the by-pass valve 55 is to enable the valve to respond immediately to excessive pressure or to a pressure exceeding a predetermined value within the outlet chamber 31 as soon as the pressure is built up within the outlet pipe 25 due to the closing of the delivery valve 17 which may be carried by the nozzle 15 or may be positioned elsewhere in the delivery hose 14 or pipe 25. This may be expressed in a somewhat different manner in this way, that the by-pass valve 55 is nearer to the outlet pipe 25 than the pump 22 and consequently when the pressure in the outlet pipe 25 exceeds sufficiently a predetermined value or the normal pump delivery pressure to actuate the by-pass valve 55 such as by closing the delivery valve 17 in the nozzle 15, the by-pass valve will respond and open under this higher or maximum pump pressure before the pressure can build up backwardly to the pump 22. The by-pass valve is therefore more quickly responsive to the maximum pump pressure and adequately protects the pump from damage and wear which would occur if the pump should ever operate and force against a closed liquid line. The pump means 22 runs freely and without injury in event the hose line 14 closes because the by-pass valve 55 quickly opens and affords an open nonresisting liquid circuit.

Any type of pump having a casing separate from and independent of the pipe-connection housing 21 may be used to draw the liquid from a storage supply and force the liquid through the curb dispenser, although a rotary or impeller type is best suited for this sort of service. An internal gear or impeller type of pump is shown having an internal gear 85 carried upon a shaft 86 and a pinion 87 carried on the shaft 81 which is eccentrically positioned with respect to the gear shaft 86. The impeller means and shaft are mounted in the separable casing apart from the housing 21. This type of pump is purchasable upon the market and will not be further described.

The pump 22 is driven by any suitable means, such as the electric motor 23 which carries a pulley 78 upon which the drive belt 79 is mounted for driving connection with the pulley 80 carried upon the pump shaft 86. The motor 23 is bolted directly to the housing by means of the bolts 83 although this is not an essential construction but does offer a more compact and complete pumping unit.

The pipe connection fitting or housing 90 in Figures 5 and 6, has the inlet 20 from the storage tank connected to the inlet passage 92 within the housing which passage connects with the inlet chamber 93. A strainer 94 strains all the liquid before it enters the inlet chamber 93 from the inlet passage 92. The pump inlet port 95 leads to the pump 22 from which the liquid is discharged through the pump outlet port 96 into the outlet chamber 97 to which the outlet pipe 25 is connected leading to the meter 12, hose 14 and delivery nozzle 15. The by-pass valve 55 with its associated parts is similar to the valve shown in Figure 2 and already described herein.

Included with the housing 90 is an air chamber 100 formed by a partition 101 within the housing. The air chamber is connected by an opening 102 to the passage 103 which passage is in direct connection with the outlet chamber 97 on the high pressure side of the pump. Air is pocketed in the air chamber 100 so that when the delivery valve 17 is closed the sudden increase in pressure in the delivery system is cushioned by the resiliency or elasticity of the air within the air chamber. This principle is well understood in hydraulics and will not be further described.

In the preferred construction, the housing means 21 or 90 includes both the strainer and the by-pass valve mounted therein. It is clear, however, that the housing may be provided to carry the pump and to house the by-pass valve without deviating from the scope of the invention and other or separate provisions be made for the strainer. Similarly, it is clear that the pipe-connection housing may be constructed to carry the pump and to house the strainer only, and other provisions may be made for the by-pass valve than within the housing, although the by-pass valve should be carried by the housing. The preferred construction, however, houses both the

strainer and the by-pass valve within the unit housing. The housing may also include an air chamber as a part thereof with any or all of the other parts of the structure described above as being included within the housing.

In the examples of construction described the strainer is positioned centrally of the housing and the pump is mounted upon one side thereof and the by-pass valve with its associated mechanism is mounted in the housing on the other side of the strainer from the pump mounting. By this construction the inlet pipe 20 is connected with the lower part and at one side of the housing adjacent to the pump, whereas the outlet pipe 25 is connected at the top and the other side of the housing. Such construction also enables the liquid flow through the housing 21 to be unobstructed by numerous sharp corners and generally the flow is along curved passages so that the liquid flow is subject to a minimum amount of turbulence and friction in passing through the housing.

In operation the attendant removes the nozzle 15 from the hook 16 and opens the nozzle or delivery valve 17. The electric motor 23 is started usually by removing the nozzle 15 from the hook 16 by mechanism which constitutes no part of this invention and therefore will not be described. The motor, of course, may be started manually. Starting of the motor drives the pump 22 so that the gasoline or liquid flows up through the inlet pipe 20 through the inlet passage 41 into the strainer 46 in the inlet chamber 30. From the inlet chamber 30, the gasoline flows through the passage 35 into the pump 22 and is discharged out through the passage 36 into the outlet chamber 31 and then out through the outlet pipe 25. The outlet pipe 25 conducts the gasoline through the meter 12 and the flexible hose 14, through the nozzle valve 17 and nozzle 15. So long as the gasoline is flowing through the pipe-connection housing, the differential pressure between the outlet chamber 31 and inlet chamber 30 is not sufficiently great to overcome the tension of the spring 65 against the by-pass valve 55 which therefore remains closed.

When the desired quantity of gasoline has been delivered, the nozzle valve 17 is closed, whereas the motor 23 and pump 22 continue to function. The pressure from the pump 22, therefore, builds up, beginning from the delivery valve wherever it may be located in the delivery line, through the outlet pipe 25 in a direction opposite to the direction of fluid flow into the outlet chamber 31. The maximum pressure of the pump 22 is sufficiently great when the liquid is not flowing to press the by-pass valve 55 downward against the tension of the spring 65 so that the liquid flows through the by-pass passage or connection 56 into the inlet chamber 30 thereby forming a complete circuit for the gasoline so long as the pump continues to operate while the delivery valve 17 is closed. It is clear, therefore, that with the delivery valve closed so that no gasoline can be delivered, the gasoline makes a complete circuit from the pump through the passage 36 into the outlet chamber 31 and then through the by-pass passage or connection 56 into the inlet chamber 30 and passage 35 back into the pump. With the delivery valve closed, the pump creates sufficient pressure differential between the inlet chamber 30 and the outlet chamber 31 to open the by-pass valve 55 against the tension of the spring 65.

Upon opening the delivery valve 17 so that the fluid again flows through the outlet pipe 25, the pressure differential between the inlet chamber 30 and the outlet chamber 31 decreases so that the spring 65 closes the valve 55 and thereby stops the by-pass flow of gasoline through the chambers of the housing and the by-pass connection 56. Of course if the electric motor is stopped, such as by a manual switch or by hanging the nozzle 15 upon the hook 16, the pump then stops forcing the fluid or gasoline through the delivery system, whereupon the pump pressure or the high differential pressure between the inlet chamber 30 and the outlet chamber 31 no longer exists and the spring 65 closes the valve 55.

The invention provides, therefore, a unit pipe-connection housing which in its preferred construction, carries a pump and which houses a strainer and a by-pass valve, although it is clear that other provisions may be made for the strainer and other provisions may be made for the by-pass valve, although the latter preferably is carried by the housing if not housed therein. By this construction numerous advantages result which have been outlined in some detail above but which briefly are, the elimination of a great number of pipe connections thereby producing a simplified construction. Another advantage results because the numerous pipe couplings and connections heretofore used resulted in the pump housing being frequently strained and thereby throwing the various parts thereof out of alignment and resulting in an unsatisfactory operation of the pump.

The unit housing also provides smooth flowing passages for the liquid without sharp bends and again, by the construction of the unit housing, it is possible to position the by-pass valve at a point adjacent to and also in axial alignment with the outlet pipe 25 so that the increased pressure brought about by the closing of the delivery valve 17 reaches the by-pass valve 55 before it reaches the pump 22 with the consequent result that the by-pass valve opens to immediately by-pass the gasoline back into the inlet chamber of the pipe-connection housing so that the motor and pump are unaffected by the momen-

tary increased pressure brought about by the closing of the discharge nozzle 17. If an air chamber 100 is provided, for example, as shown in Figures 5 and 6, this chamber will absorb the shock of the sudden increase in liquid pressure brought about by the sudden closing of the delivery nozzle 17. The air chamber may be dispensed with if desired and is not necessarily used in the commercial structure.

It will now be understood that this novel pipe fitting or connecting device 21 or 90 provides a satisfactory mount or installation means for any liquid-control mechanism, such as the pump 22, the air cushion chamber 100, pressure relief by-passing valve means 55, liquid strainer means 46, metering device or other flow controlling instrumentalities. The device serves the several purposes of mounting the mechanism and connecting pipes together without disturbing said mechanism.

What is claimed is:

1. A pipe fitting comprising a member serving as a pipe-connecting device and a support for means thru which liquid is adapted to flow, said member being provided with an inlet passage and an outlet passage, a partition formed in the member setting off said passages, an outer wall forming one side of said member, spaced ports leading from each passage thru said outer wall to atmosphere, the aforesaid partition being disposed between the ports, a connection provided on the member and adapted to receive an inlet pipe leading to the inlet passage, and another connection provided on the member and adapted to receive an outlet pipe leading from the outlet passage, said outer wall of the member formed as a support onto which is adapted to be secured any suitable means to enclose and connect the spaced ports, whereby an inlet pipe is placed in flow-communication around the partition with the outlet pipe.

2. Liquid dispensing apparatus characterized by a unit means serving the several purposes of connecting pipes together and mounting liquid control mechanism in service position, comprising a member having a receiving passage and an outlet passage set off by a partition therein; said member having an outer wall provided with a pair of spaced ports leading from each passage to atmosphere, one port being disposed on each side of said partition; a connection for a pipe leading to the receiving passage and another to the outlet passage of said member, and liquid control mechanism adapted to be attached to the outer wall of said member, said mechanism having a pair of spaced ports which are placed in connected registry with the spaced ports of the member, whereby the liquid control mechanism is itself not subjected to attachment with the two pipes aforesaid but serves to place said pipes in flow-communication with each other around the partition within the member.

3. A liquid dispenser comprising a member adapted to be mounted directly on a supporting structure, said member embodying a pipe-connection means having an internal dividing partition setting off two spaced ports one on each side of said partition, said ports leading to atmosphere thru an outer wall of said member, an inlet pipe adapted to be attached to the pipe-connection means on one side of the partition, an outlet pipe connected with the pipe-connection means on the other side of the partition wall, a meter and hose line connected with the outlet pipe, a liquid-controlling mechanism thru which liquid flows and which also has two ports leading thru an outer wall thereof to atmosphere; the liquid-control mechanism being mounted on and entirely supported by the pipe-connection means and the two ports of both of which are placed in connected registry, whereby said mechanism constitutes a passage-way to complete the liquid-flow circuit around the partition, to communicate the inlet pipe with the outlet pipe, but to avoid securing said inlet and outlet pipes to said mechanism.

4. A liquid dispenser, comprising in combination, a pipe-connection housing embodying a hollow member adapted to be fixed to a supporting structure, said pipe-connection housing having an inlet chamber and an outlet chamber, said housing being provided with pipe connections one leading into each chamber, whereby an inlet and outlet pipe are adapted to be attached directly to said pipe-connection housing, a self-contained pump including a casing adapted to be separated from and independent of the pipe-connection housing and containing a drive shaft and fluid impeller journalled wholly within said casing, said drive shaft being carried in its separate pump casing alone and removable with same independently of and from the pipe-connection housing and not subject to strain or misalignment when the inlet and outlet pipes are attached to said housing, said self-contained pump being mounted on the pipe-connection housing and serving as a passage-way to communicate the inlet chamber with the outlet chamber, a motor mounted on the pipe-connection housing to operate the self-contained pump, a by-pass opening and valve connecting the inlet and outlet chambers and normally closing said opening against the by-passing flow of liquid from the outlet chamber back into the inlet chamber until the outlet pressure reaches a predetermined value against a metering means and a hose line adapted to dispense the liquid.

5. A curb pump or the like for dispensing gasoline, comprising in combination, a base and upright stand, a metering device within

the stand and connected with a delivery hose depending from said stand, a hollow pipe-connection housing secured within the upright pump stand, said pipe-connection housing having an inlet and outlet chamber divided off by an internal partition, a by-pass value mounted in the partition and affording a circulation of liquid from the outlet chamber back into the inlet chamber in event the pressure on the metering device and its delivery hose exceeds a predetermined value, a separate impeller pump casing supported on the pipe-connection housing and having a passage-way which communicates with the inlet chamber through the pump casing and thence leads around the partition and into the outlet chamber, an impeller and drive shaft therefor journalled in the separate impeller pump casing and forming therewith a self-contained pumping unit independent of and detachable from the pipe-connection housing aforesaid, an electric motor supported on the pipe-connection housing and operating the pumping unit, an inlet pipe adapted to extend into the pump stand and be directly connected with the inlet chamber, and an outlet pipe directly connected with the outlet chamber and connected thereabove with the metering device and delivery hose; whereby the pipe-connection housing, the impeller pump, and the electric motor, may first be assembled and adjusted as a unit outside the pump stand, and thereupon installed within and secured to said stand, and the aforesaid pipe connections thereafter made, by which no pipe connections can be made directly with the separate impeller pump casing.

6. A pumping unit for liquid-flow apparatus and the like, comprising a pipe-connection housing, a horizontal partition separating the pipe-connection housing into an inlet chamber and an outlet chamber, a second horizontal partition forming an inlet passage below the inlet chamber and said second partition having an opening therein, a strainer mounted in said opening and extending into the central portion of the inlet chamber, the pipe-connection housing having an opening in the bottom outer wall thereof leading into the inlet passage and in alignment with said strainer for removal of the latter, a cap covering the latter opening, a connection adapted for an inlet pipe leading into the inlet passage, a connection adapted for an outlet pipe leading from the outlet chamber and at one end thereof, a pump having a self-contained casing supported on the side wall of the pipe-connection housing remotely from the outlet pipe connection and containing an impeller means and shaft, the self-contained pump casing serving as a passage-way from the inlet to the outlet pipe connection, a by-pass valve and opening in the first-named partition and disposed under the outlet pipe connection remotely from the normal liquid flow between the strainer and the pump impeller means to normally close the by-pass opening but operative to return liquid from the outlet chamber back to the inlet chamber when the outlet pressure exceeds a predetermined value, the axis of the by-pass valve being parallel with the strainer and adjacent to the outlet pipe connection, the pipe-connection housing having an opening in its bottom in axial alignment with the by-pass valve through which it is removable, and a cap covering the latter opening.

7. A pumping unit for liquid-flow apparatus and the like, comprising a pipe-connection housing, a partition separating the pipe-connection housing into an inlet chamber and an outlet chamber having an outer wall with spaced ports one on each side of the partition, a second partition forming an inlet passage below the inlet chamber and having an opening therein, a strainer mounted in said opening and extending into the central portion of the inlet chamber, a connection adapted for an inlet pipe leading to the inlet passage, a connection adapted for an outlet pipe leading from the outlet chamber, a pump having a self-contained casing secured to the pipe-connection housing remotely from the outlet connection and also having spaced ports which are connected in registry with the spaced ports in said pipe-connection housing, a motor bracket on top of the pipe-connection housing, a motor mounted on said bracket and operatively connected with the pump, a by-pass opening and valve disposed in the first-named partition and mounted under the outlet connection so that said valve is remote from the normal liquid flow between the strainer and the pump and normally closes the by-pass opening but operative to return the liquid from the outlet chamber back into the inlet chamber when the outlet pressure exceeds a predetermined value, the pipe-connection housing having an opening in axial alignment with the by-pass valve through which it is removable, and a cap covering this latter opening.

8. A pumping unit for liquid-flow apparatus and the like, comprising a pipe connection housing, a partition separating the pipe-connection housing into an inlet chamber and an outlet chamber, a port leading from each chamber to atmosphere thru an outer wall forming one side of said pipe-connection housing, a second partition forming an inlet passage below the inlet chamber, a strainer mounted in the second partition and extending into the central portion of the inlet chamber, the pipe-connection housing having an opening at the bottom thereof into the inlet passage and in alignment with the strainer for removal of the latter, a cap covering this last opening, a connection adapted for an inlet pipe leading to the inlet passage,

an outlet connection adapted for a pipe leading from the top of the outlet chamber and at one end thereof, a self-contained pump having a casing secured to the outer wall of the pipe-connection housing remotely from the outlet pipe, the pump having ports connected in registry with the ports in the pipe-connection housing and serving as a liquid-flow passage between the inlet and outlet chambers, an impeller means and shaft mounted in the pump casing, a motor bracket carried by the pipe-connection housing, a motor mounted on the bracket and operatively connected with the self-contained pump, a by-pass opening and valve in the partition between the outlet and inlet chambers and mounted under the outlet connection so that it is remote from the normal liquid flow between the strainer and the pump and normally closing the by-pass opening but operative to return the liquid from the outlet chamber back into the inlet chamber when the outlet pressure exceeds a predetermined value, the axis of the by-pass valve being disposed parallel with the strainer and adjacent the outlet connection, the pipe-connection housing having an opening in its bottom in axial alignment with the by-pass valve through which the latter is removable, and a cap covering the latter opening.

9. A pumping unit for liquid-flow apparatus and the like, comprising a pipe-connection housing adapted to be secured directly to a supporting structure, a partition separating the pipe-connection housing into an inlet chamber and an outlet chamber, an inlet connection at the bottom of the pipe-connection housing leading to the inlet chamber, an outlet connection at the top of the pipe-connection housing leading from the outlet chamber, a self-contained pump having a casing secured to the side of the housing and supported thereby, an impeller means and shaft mounted in the casing and forming a complete pump adapted to be mounted on or removed from the pipe-connection housing without dismantling the pump, the pipe-connection housing and the pump having spaced ports thru a common wall of each and ordinarily leading to atmosphere but adapted to be connected in registry by which the pump serves to communicate the inlet with the outlet connection without attaching any pipes to said pump casing, a motor bracket on top of the pipe-connection housing and projecting over the pump, a motor mounted on the bracket, and a driving connection between the motor and the pump.

10. Liquid flow apparatus and pipe-fitting means therefor, comprising a hollow member having a partition wall dividing off an inlet passage and outlet passage therein, spaced ports one on each side of the partition wall and formed thru an outer wall of said pipe-fitting means and communicating each passage to atmosphere, each passage being provided with a connection adapted to receive a pipe to be attached directly to said pipe-fitting means and to a wall thereof other than said outer wall thru which the spaced ports are formed as aforesaid, a liquid controlling mechanism also having spaced ports and which are placed in connected registry with the aforesaid ports of the pipe-fitting means, said mechanism being secured to the outer wall of the pipe-fitting means and entirely supported thereby and serving to place the two passages in communication with each other, and an air cushion chamber operatively associated with the liquid-flow apparatus and with the mechanism.

11. A pumping unit for liquid-flow apparatus and the like comprising a pipe-connection housing adapted to be fixed to a supporting structure and having an inlet chamber and an outlet chamber, an inlet connection for a pipe leading to the inlet chamber, an outlet connection for a pipe leading from the outlet chamber, a pump casing supported by the pipe-connection housing and connecting the inlet and outlet chambers, the pump casing mounting an impeller means and shaft and forming a complete self-contained pump, motor means carried by the pipe-connection housing to drive the pump, a by-pass opening and valve within the pipe-connection housing between the inlet and outlet chambers and normally closed but operative to return the liquid from the outlet chamber back to the inlet chamber when the pressure exceeds the delivery pressure, and an air chamber included within the pipe-connection housing and connected to the outlet chamber.

12. A pumping unit for liquid flow apparatus and the like, comprising a pipe-connection housing adapted to be carried by a supporting structure, said housing having an inlet chamber and an outlet chamber, an inlet connection adapted to receive a pipe leading to the inlet chamber, an outlet connection adapted to receive a pipe leading from the outlet chamber, a strainer within the inlet chamber through which the liquid passes from the inlet connection, a pump having a self-contained casing carried on the pipe-connection housing and connecting the inlet and outlet chambers, an impeller means and shaft mounted in the self-contained pump casing, a by-pass valve between the inlet and outlet chambers and normally closed but operative to return the liquid from the outlet chamber back to the inlet chamber when the pressure exceeds the delivery pressure, and an air chamber integrally formed with the pipe-connection housing and in communication to the outlet chamber thereof.

In testimony whereof I affix my signature.

WILLIAM J. PETER.