

Oct. 29, 1929.

T. MIDGLEY, JR

1,733,423

LIQUID DISPENSING APPARATUS

Filed April 16, 1925

3 Sheets-Sheet 1

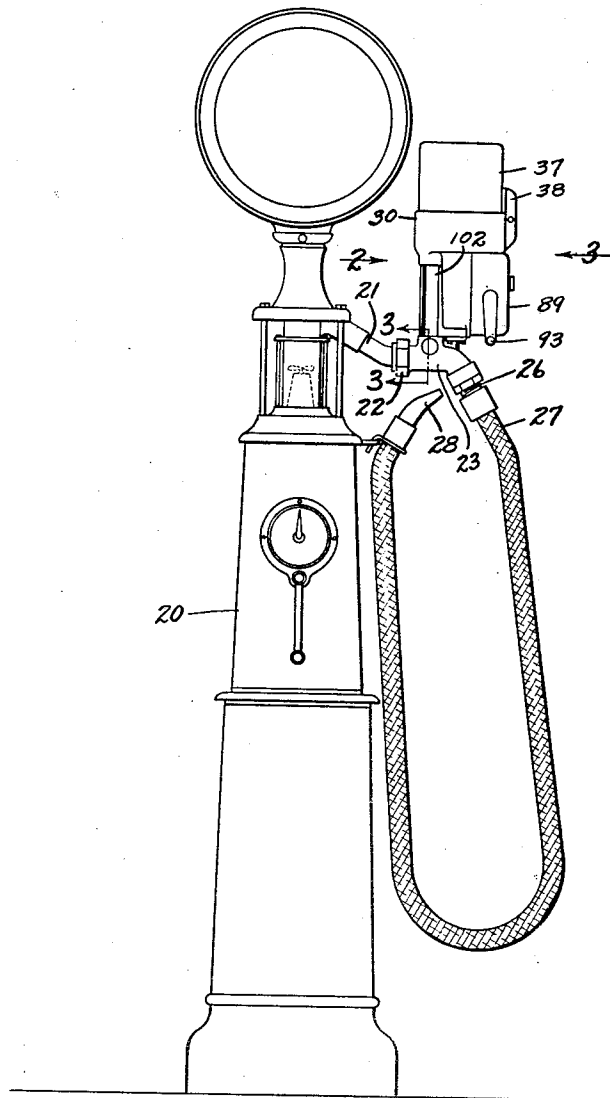


Fig. 1

Inventor

Thomas Midgley Jr.

By Spencer Small Hardman

Attorneys

Oct. 29, 1929.

T. MIDGLEY, JR

1,733,423

LIQUID DISPENSING APPARATUS

Filed April 16, 1925

3 Sheets-Sheet 2

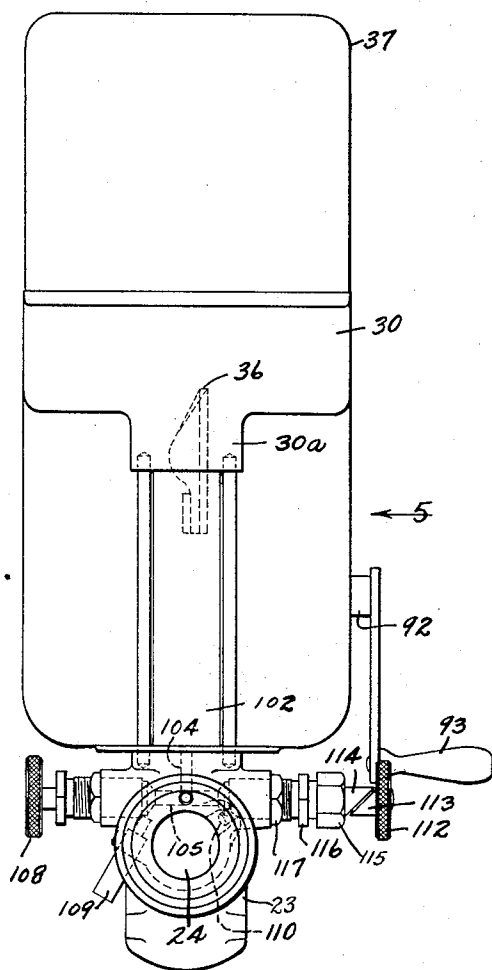


Fig. 2

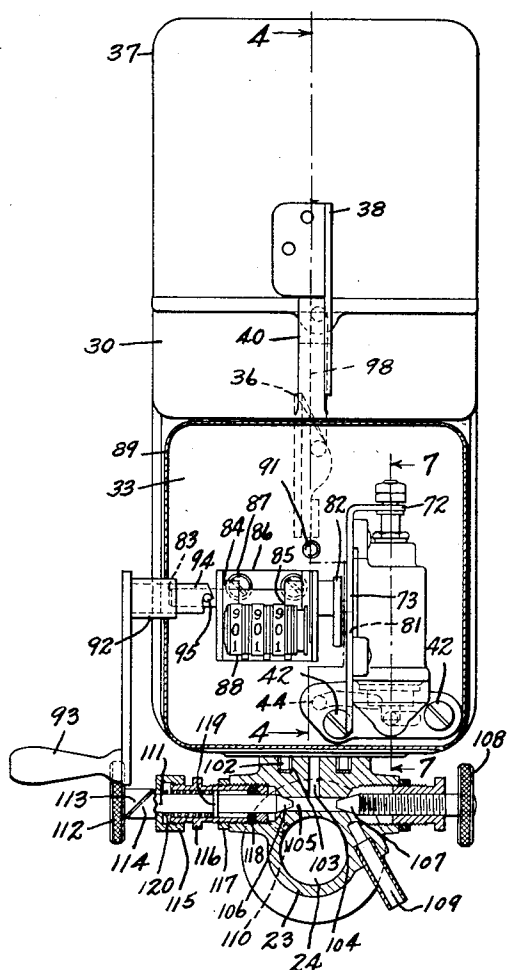


Fig. 3

Inventor

Thomas Midgley Jr

By Spencer Small & Hardman
Attorneys

Oct. 29, 1929.

T. MIDGLEY, JR

1,733,423

LIQUID DISPENSING APPARATUS

Filed April 16, 1925

3 Sheets-Sheet 3

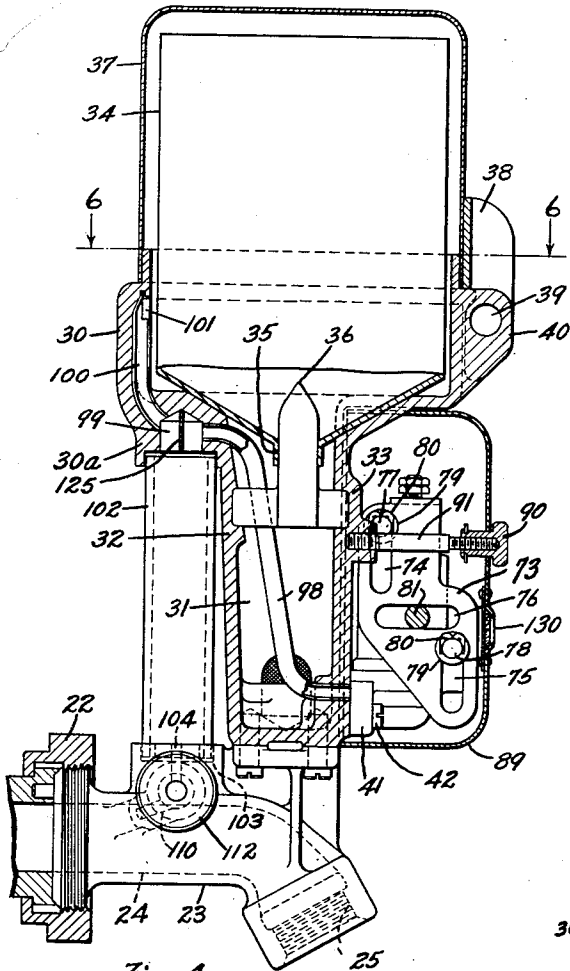


Fig. 4

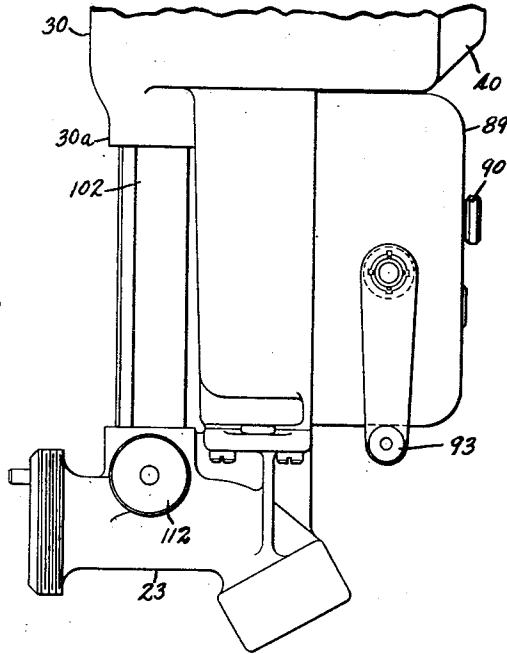


Fig. 5

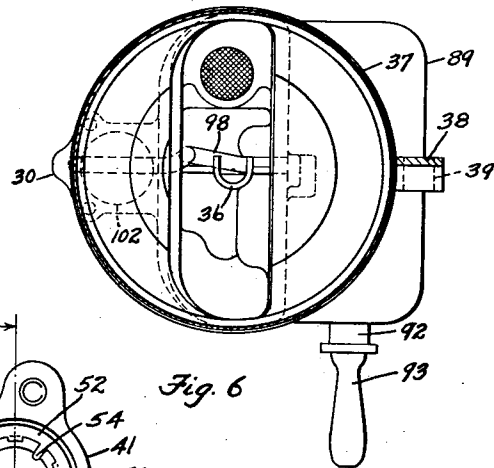


Fig. 6

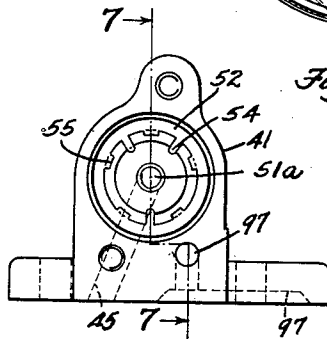
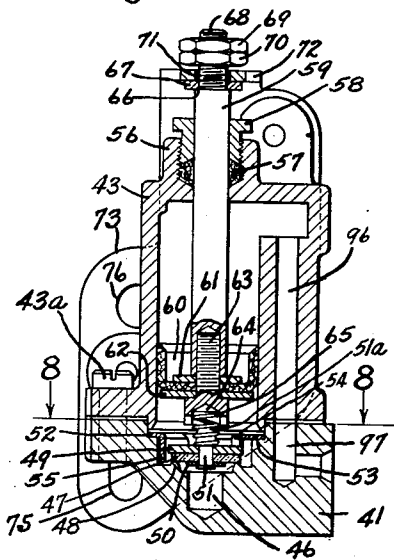


Fig. 8

Inventor

Thomas Midgley Jr

By Spencer Small & Hardman

UNITED STATES PATENT OFFICE

THOMAS MIDGLEY, JR., OF DAYTON, OHIO, ASSIGNOR TO GENERAL MOTORS RESEARCH CORPORATION, OF DAYTON, OHIO, A CORPORATION OF DELAWARE

LIQUID-DISPENSING APPARATUS

Application filed April 16, 1925. Serial No. 23,658.

This invention relates to apparatus for dispensing liquids, and particularly for dispensing liquids for treating fuel for internal combustion engines.

5 One object of the present invention is to provide a safe and convenient liquid dispensing device which can be manufactured at low cost and may be easily attached to devices for dispensing motor fuels.

10 Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings, wherein a preferred form of embodiment of the present
15 invention is clearly shown.

In the drawings:

Fig. 1 is an elevation of a pump for dispensing gasoline or other motor fuel and liquid dispensing apparatus embodying the present
20 invention, shown attached to the outlet of the pump.

Fig. 2 is a side elevation on a larger scale of the liquid dispensing apparatus shown in Fig. 1, looking in the direction of the arrow
25 2 in Fig. 1.

Fig. 3 is an elevation looking in the direction of the arrow 3 in Fig. 1 of the dispensing apparatus shown therein, certain parts being removed, and certain other parts being shown
30 in section taken on the line 3—3 of Fig. 1.

Fig. 4 is a view partly in elevation and partly in section, the section being taken on line 4—4 of Fig. 3.

Fig. 5 is a fragmentary view of the invention looking in the direction of arrow 5 of
35 Fig. 2.

Fig. 6 is a sectional view on line 6—6 of Fig. 4, the liquid supply bottle being removed.

Fig. 7 is a sectional view on a larger scale than the other figures of the liquid measuring pump, the section being taken on line 7—7
40 of Fig. 3 and 7—7 of Fig. 8.

Fig. 8 is a plan view of the pump supporting bracket, the plan being taken on the
45 line 8—8 of Fig. 7.

Referring to Fig. 1, numeral 20 designates a motor fuel dispensing pump having an outlet pipe 21. By means of a pipe union connection indicated at 22 in Figs. 1 and 4, a
50 tubular supporting bracket 23 is attached to

the outlet pipe 21. The bracket 23 is provided with a passage 24 for fuel and the outlet end of bracket 23 is threaded at 25 for receiving a coupling 26 for attaching to the bracket 23 a flexible pipe or hose 27 carrying
55 a nozzle 28.

Bracket 23 supports a liquid container including a cup shaped portion 30 having a cylindrical side wall and bottom walls which merge into a pocket portion 31 bounded by
60 side walls 32 and 33 which are approximately vertical when the apparatus is installed as shown in Fig. 1. The cup portion 30 is shaped to receive an inverted liquid supply bottle 34 constructed preferably of
65 metal having a neck 35 which can be sealed by a thin metal stopper. The side walls 32 and 33 support a seal piercing member 36 which punctures the seal when the bottle 34 is placed in an inverted position within the
70 cup 30. The cup 30 receives a cover 37 to which is attached a clip 38 having a hole registering with a hole 39 in a lug 40 provided by the cup 30. The bail of a padlock can be passed through the holes in the clip
75 and lug in order to prevent removal of the bottle 34. A pump bracket 41, which is attached to the side wall 33 by screws 42, supports a pump cylinder 43 attached by screws 43^a. The side wall 33 is provided with a fuel
80 outlet hole 44 registering, when the bracket 41 is attached as shown, with a fuel inlet passage 45 in the bracket 41. Passage 45 leads into a chamber 46 beneath a valve 47, which valve is shown in Fig. 7. Admission of fuel
85 from the chamber 46 to the chamber above the valve is controlled by the valve 47 cooperating with a valve seat 48. The valve 47 is made preferably of a fine grained leather and is attached to a metal washer 49
90 by a ring 50 and a rivet 51 having a head 51^a extending above the washer 49. Movement of the valve 47 away from its seat 48 is limited by a valve retainer which includes a ring portion 52 supported by an annular
95 ledge 53. The ring is provided with radially inwardly projecting fingers 54 for engaging the washer 49 and limiting the upward movement of the valve 47. The ring 52 is provided
100 also with downwardly projecting fingers 55

which serve to guide the valve washer 49. The cylinder 43 is provided with a stuffing box 56, packing 57 and a bushing 58 for receiving a pump rod 59. A cup shaped leather piston 60 is clamped between washers 61 and 62 and is attached to the rod 59 by a screw 63, the head of which is provided with a recess 64 for receiving a spring 65, which encircles and is attached to the head 51^a of rivet 51. The pump rod 59 is provided with a shoulder 66 for receiving a washer 67 and with a threaded portion 68 for receiving nuts 69 and 70. The threaded portion 68 extends through a notch 71 provided in the horizontal extension 72 of a vertical movable slide 73 provided with vertical extending slots 74 and 75 and a horizontal slot 76. The slots 74 and 75 cooperate with guide pins 77 and 78, respectively, carrying washers 79 retained by clips 80. Pins 77 and 78 are supported by cylinder 43. The slot 76 receives a crank pin 81 attached to a crank arm 82 carried by crank shaft 83 which is supported by bearings 84 and 85 provided by a bracket 86 which is attached by screws 87 to the wall 33. The bracket 86 supports a revolution counter 88 which is operated by the shaft 83 in the usual manner. The counter 88 and the pump are enclosed by a cover 89 which is secured against the wall 33 by nut 90 which cooperates with a stud 91 carried by the wall 33. The cover is provided with an opening in alignment with the end of shaft 83 for receiving the hub 92 of a crank 93. The hub is provided with a central recess for receiving the shaft 83 and with a hook portion 94 for engaging a pin 95 carried by the shaft 83. The cover 89 is provided with a window 130 in alignment with the counter 88.

The pump cylinder 43 is provided with an outlet passage 96 communicating with a passage 97 in the pump bracket 41. When the bracket 41 is attached to the wall 33, the passage 97 is connected with a pipe 98 extending through the wall 33 across the pocket 31 and through the bottom wall 30^a of the cup portion 30. Pipe 98 terminates in a recess 99 which is connected with a pipe 100 opening at 101 into the interior of the cup 30. Originally the pipes 98 and 100 are in one piece which is set in the mold prepared for casting the fuel container portions 30 and 31. The bottom wall 30^a is drilled to provide the recess 99 which separates the pipe portions 98 and 100. The interior wall of the cup portion 30 is cut away to provide an outlet at 101 from the pipe 100.

The bottom wall is recessed to receive a transparent tube or sight glass 102 the lower end of which is received by a recess 103 provided by the bracket 23. Tube 102 is connected with a vertical passage 104 which is connected with a horizontal passage 105 the outlets of which are controlled by valves 106 and 107. If valve 107 be opened by turning

the knob 108, the passage 105 will be connected with a drain pipe 109 leading to the exterior of the bracket 23. If valve 106 be opened the passage 105 will be connected with a duct 110 leading into the passage 24 and in bracket 23. Valve 106 is provided with a valve stem 111 carrying a knob 112 having its hub provided with an oblique surface 113 operating with a similar surface 114 which is provided by the cap 115 threaded upon a bushing 116 which is attached to the bracket 23. Bushing 116 is locked in position by nut 117 and carries a packing ring 118 for the valve stem 111. Stem 111 is provided with a shoulder 119. A spring 120 is located between the cap 115 and the shoulder 119 and tends to maintain the valve 106 in closed position. By turning the knob 112 the surfaces 113 and 114 will cooperate to cam the valve stem 111 toward the left in Fig. 3 to open the valve 106. On releasing the knob 112, the spring 120 will return the valve 106 to closed position.

The manner of using the invention is as follows: The valves 106 and 107 are first closed. The crank 93 is turned to cause the pump piston, on its up stroke, to withdraw measured amounts of fuel from the pocket 31 and at the same time lift the fuel which has passed the piston on its previous down stroke and cause it to be delivered through the passages 96, 97, 98 and 99 to the tube 102. The pump may be constructed so that for each revolution of the crank 93 the amount of fuel withdrawn from the container and delivered to the tube 102 will be the amount required to treat a certain unit of measure of motor fuel dispensed by the fuel pump 20. If, for example, one cubic centimeter of fuel treating liquid is required for each gallon of gasoline or other motor fuel, the pump may be constructed to cause one cubic centimeter of liquid to be removed from the pocket 31 and to be delivered to the tube 102 for each revolution of the crank 93.

By adjusting the nuts 69 and 70 along the threaded portion 68, the displacement of the pump and hence the quantity of liquid discharged for each revolution of the crank 93 can be varied. As gasoline motor fuel is usually purchased in quantities of five gallons or multiples of five, the sight glass 102 may be constructed to receive what is discharged by the pump during five revolutions of the crank 93. The recess 99 is provided with a baffle 125 for directing the liquid issued from the pipe 98 into the tube 102. If the operator should happen to turn the crank 93 more than the number of times required to fill the tube 102, the excess will flow through the pipe 100 into the cup 30 and will leak past the bottle 34 into the fuel pocket 31.

Before the pump 20 is operated to force motor fuel through the bracket passage 24, the valve 106 is opened in order to permit the

contents of the tube 102 to be drained into the passage 104. During this operation the pipe 100 provides a vent to the atmosphere. Before the pump 20 is operated, the valve 106 is closed so that motor fuel will not be pumped into the apparatus for dispensing the fuel treating liquid. Obviously the fuel treating liquid is washed out of the passage 24 by the motor fuel flowing thru it and is mixed with the motor fuel as it flows into the fuel tank of an automobile.

One of the important advantages of the present invention is that it may be attached readily to existing types of motor fuel dispensing pumps and forms a part of the motor fuel line connected with the pump outlet pipe. As already pointed out this is accomplished by using the bracket which supports the liquid container and measuring pump, to provide a pipe coupling between the outlet of the motor fuel pump and the hose which is used to reach from the fuel pump to the gasoline tank of an automobile.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. Apparatus for dispensing liquid for treating motor fuels comprising, in combination, a bracket having a passage for motor fuel and adapted to be connected in the delivery line of a fuel dispensing device, a liquid container carried by the bracket, and measuring means supported by the bracket, and adapted to deliver a proper amount of liquid from the container to the passage in said bracket.

2. Apparatus for dispensing liquid for treating motor fuels comprising, in combination, a bracket having a passage for motor fuel and adapted to be connected in the delivery line of a fuel dispensing device, a liquid container carried by the bracket, and displacement means supported by the bracket for lifting measured quantities of liquid from the container and delivering it to the passage in said bracket.

3. Apparatus for dispensing liquid for treating motor fuels comprising, in combination, a bracket having a passage for motor fuel and adapted to be connected in the delivery line of a fuel dispensing device, and a liquid container and a measuring pump supported by the bracket, and ducts connecting the container and the pump and the pump and the passage in the bracket.

4. Apparatus for dispensing liquid for treating motor fuels comprising, in combination, a bracket having a passage for motor fuel and adapted to be connected in the delivery line of a fuel dispensing device, a liquid container supported by the bracket and including a cup-portion adapted to receive

an inverted liquid supply bottle and a liquid pocket-portion located below the cup-portion, a measuring pump attached to a side wall of the pocket-portion and connected with the container, and a duct connecting the pump and the passage in the bracket.

5. Apparatus for dispensing liquid for treating motor fuels comprising, in combination, a bracket having a passage for motor fuel and adapted to be connected in the delivery line of a fuel dispensing device, a liquid container supported by the bracket, a pump supported by the bracket and having communication with the container for withdrawing measured quantities of liquid from the container, a duct for receiving the measured quantities of liquid from the pump, said duct connecting the pump and passage in the bracket, and including a transparent portion located above said passage, and a valve controlling the admission of fuel from the transparent portion to said passage.

6. Apparatus for dispensing liquid for treating motor fuels comprising, in combination, a bracket having a passage for motor fuel and adapted to be connected in the delivery line of a fuel dispensing device, a liquid container supported by the bracket and including a cup-portion adapted to receive an inverted liquid supply bottle and a liquid pocket-portion located below the cup-portion and adapted to be fed by the supply bottle, a pump supported by the bracket for withdrawing measured quantities of liquid from the pocket portion, and means for connecting the pump with the passage in said bracket, said means including a duct leading from the pump into a bottom wall of the cup-portion of the container, including a vertical transparent tube connected through said bottom wall with said duct and supported by said bracket, and including a duct through the bracket wall connecting the bracket passage with the tube.

7. Apparatus for dispensing liquid for treating motor fuels comprising, in combination, a bracket having a passage for motor fuel and adapted to be connected in the delivery line of a fuel dispensing device, a liquid container supported by the bracket, and including a cup-portion adapted to receive an inverted liquid supply bottle and a liquid pocket-portion located below the cup-portion and adapted to be fed by the supply bottle, a measuring pump attached to a side wall of the pocket portion and having an inlet passage communicating with the interior thereof, and means for connecting the outlet passage of the pump with the passage in said bracket, said means including a duct leading from the pump into a bottom wall of the cup-portion of the container, including a vertical transparent tube connected through said bottom wall with said duct and supported by said bracket, and including a duct through

the bracket wall connecting the bracket passage with the tube.

8. Apparatus for dispensing liquid for treating motor fuels comprising, in combination, a bracket having a passage for motor fuel and adapted to be connected in the delivery line of a fuel dispensing device, a liquid container supported by the bracket and including a liquid pocket-portion having approximately vertical side walls, and including a cup-portion located above the pocket-portion having bottom walls extending beyond the side walls of the pocket portion, said cup-portion being adapted to receive an inverted liquid supply bottle, a measuring pump attached to one side wall of the pocket-portion, and connected through said wall with the container, a transparent tube supported vertically by the bracket adjacent the other side wall of the pocket portion and connected with the bracket passage, and means connecting the tube and pump including a pipe within the pocket-portion extending from one wall thereof to the bottom wall of the cup-portion overlying the tube, and including a passage in said bottom wall connecting the pipe and tube.

9. Apparatus for dispensing a liquid comprising in combination, a housing providing a container, a receiving vessel secured to said housing, a pump supported on said housing and having communications with the container and receiving vessel for delivering liquid from the container to said receiving vessel, and a duct provided in a wall of the housing, communicating with the receiving vessel and the container for conducting to the container excess liquid delivered by the pump.

10. Apparatus for dispensing a liquid comprising in combination, a liquid container, a pump including a piston secured to one end of a pump rod, the other end of the rod having a reduced screw-threaded portion providing a shoulder upon which rests a washer, adjusting nuts on said screw threaded portion of the pump rod, a crank, and means connecting the crank and pump rod, said means including a bifurcated angular portion extending between the washer and adjusting nuts.

11. Apparatus for dispensing a liquid comprising in combination, a housing providing a container having a pocket portion, a fluid receiving member having an intake conduit, a pump housing having a cylinder and an outlet passage, a piston within the cylinder, a pump rod attached to the piston, a pump bracket supporting said pump housing and secured to a wall of the pocket portion, said bracket having passages, one of which is valved and provides communication between the pocket portion of the container and the pump cylinder, the other passage providing communication between the outlet passage of the pump and the intake conduit of the fluid receiving

member, a crank having an eccentric pin, and a plate, slidably supported on the pump housing so as to move in parallelism with the pump piston, said plate being adjustably secured to the pump rod and having a slot for receiving the eccentric pin of the crank.

In testimony whereof I hereto affix my signature.

THOMAS MIDGLEY, JR.