

Sept. 27, 1932.

P. KRAUSE,

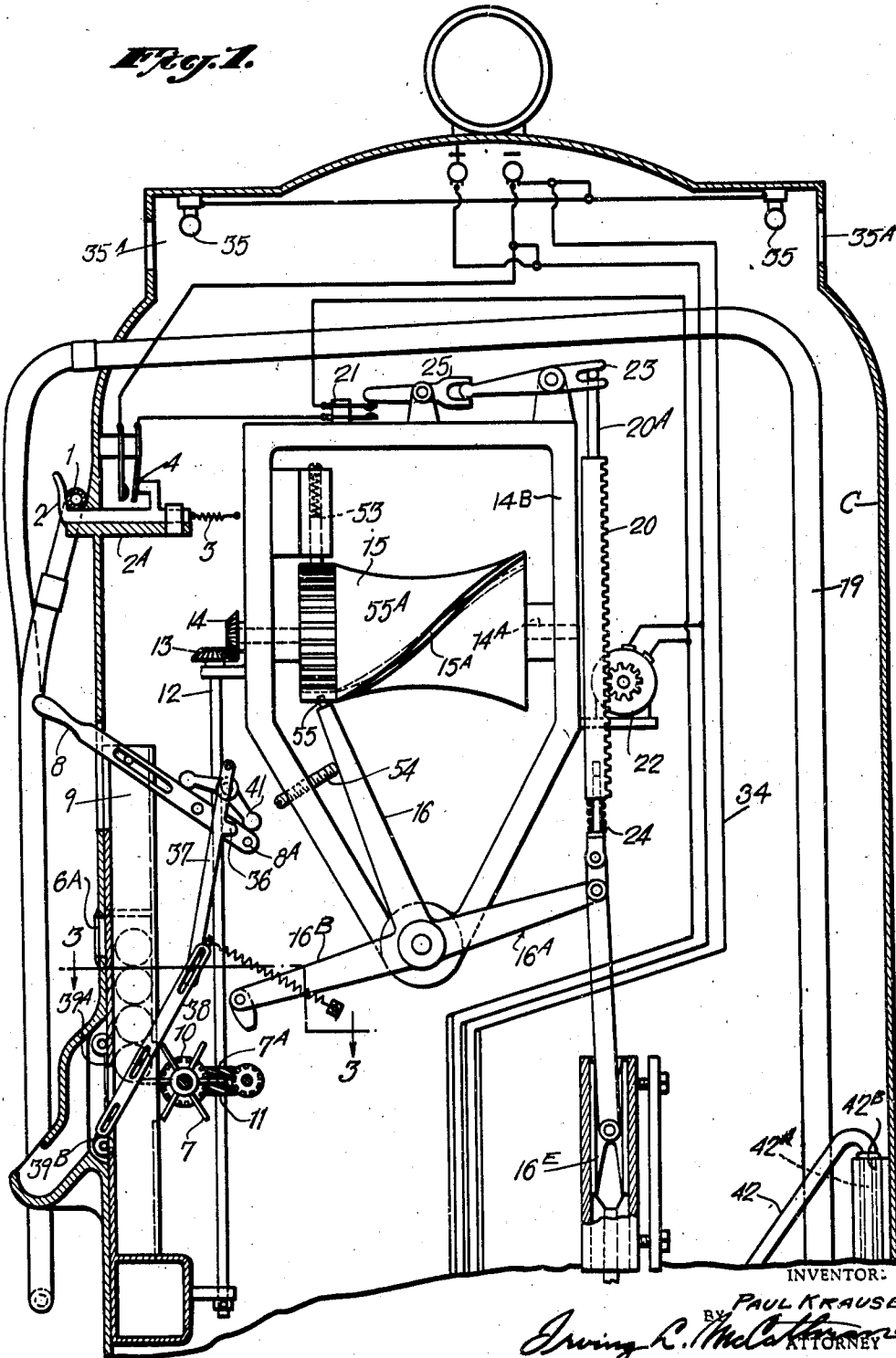
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LIQUID PUMP

Filed Dec. 31, 1928

4 Sheets-Sheet 1

Fig. 1.



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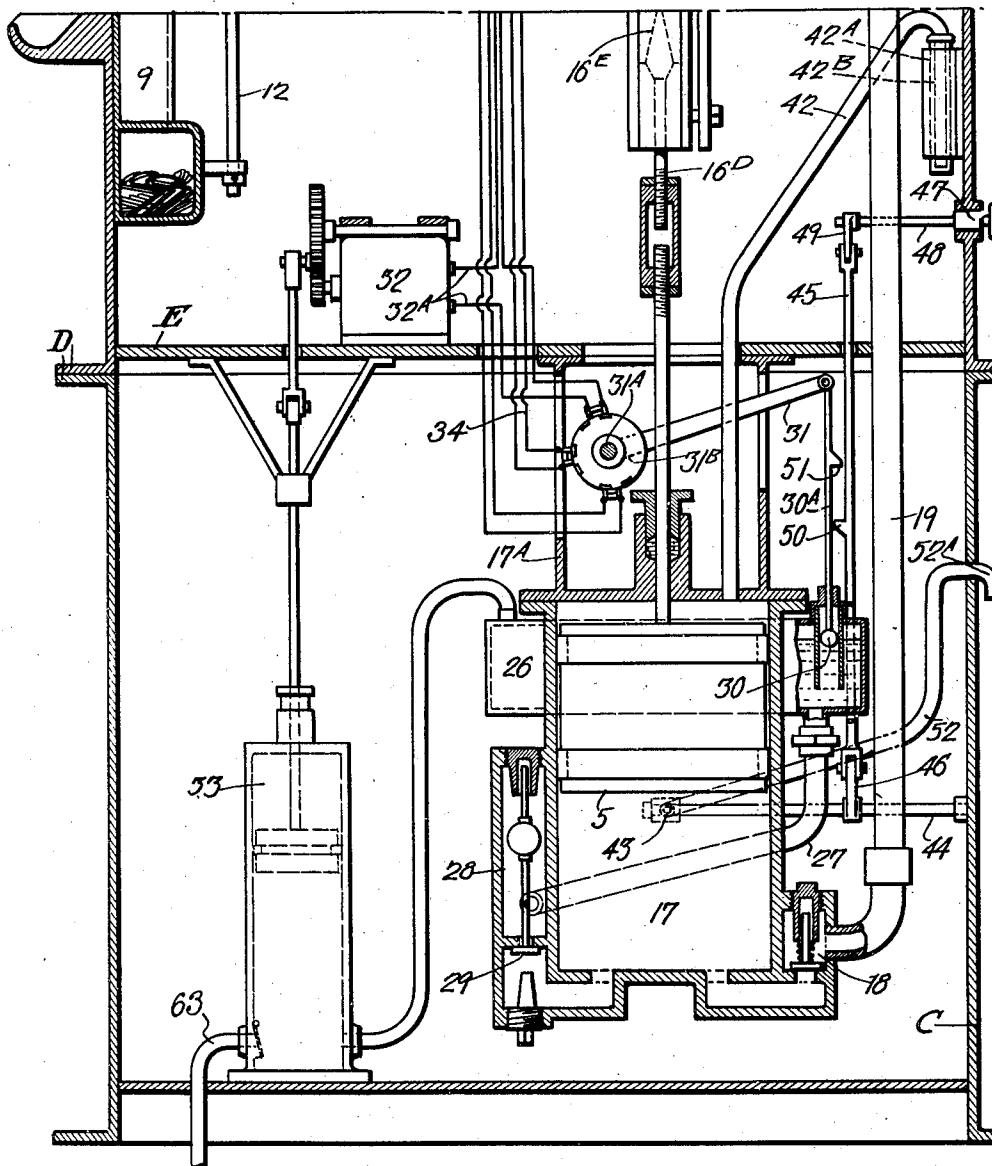
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Fig. 2.



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Fig. 4.

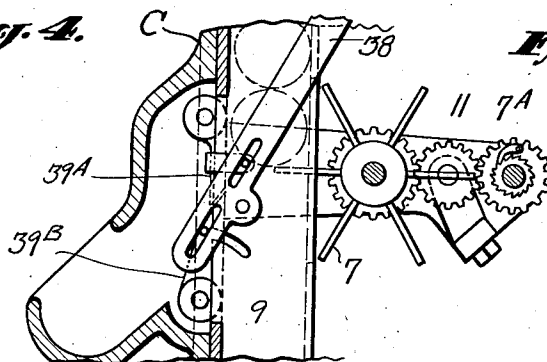


Fig. 5.

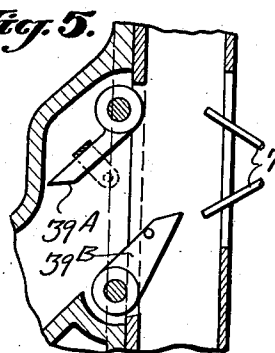


Fig. 3.

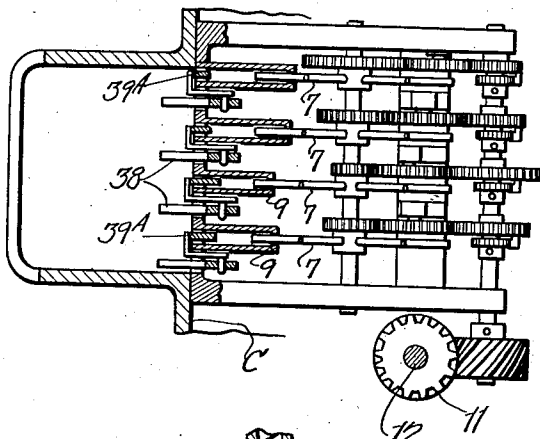
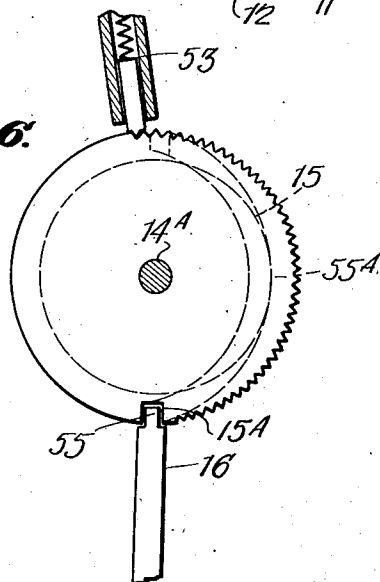


Fig. 6.



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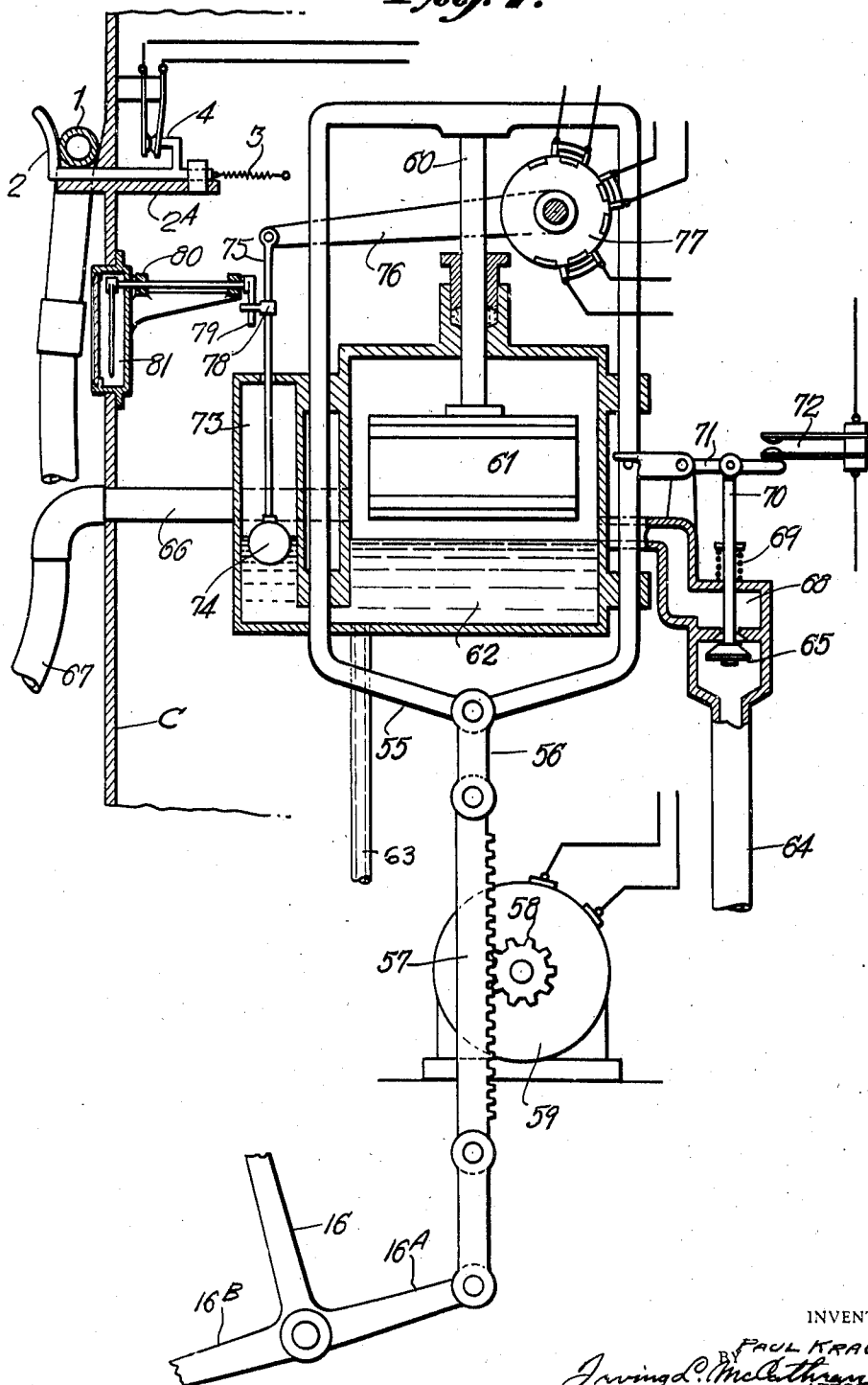
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4 Sheets-Sheet 4

Fig. 7.



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UNITED STATES PATENT OFFICE

PAUL KRAUSE, OF BABYLON, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF ONE-THIRD TO WILLIAM E. SPRAGUE, OF BABYLON, NEW YORK, AND ONE-THIRD TO HARRY TAYLOR, OF BABYLON, NEW YORK; LUCY A. SPRAGUE ADMINISTRATRIX OF THE ESTATE OF SAID WILLIAM E. SPRAGUE, DECEASED

LIQUID PUMP

Application filed December 31, 1928. Serial No. 329,464.

This invention relates to oil and other liquid dispensing pumps and in particular to a type adapted to be used for supplying gasoline or oil to a motorist.

5 A particular object of my invention is to provide a coin operated liquid dispensing pump in which the amount of liquid dispensed will be determined by the number of coins inserted in the coin chute.

10 A still further particular object of my invention is to provide in an automatic liquid dispensing machine, motor operation which will automatically measure and discharge the amount of liquid purchased, and a machine
15 which may be placed along a highway at points remote from the regular gasoline filling station for the purchase of oil or gasoline by the motorist, means being also provided in the machine for indicating when the machine is empty. It is also an object of my invention to provide an arrangement in a machine of the foregoing character, with means for discharging coins over and above what are
20 necessary to pay for the amount of gasoline or oil discharged by the pump in the event that the contents of the pump is exhausted.

To enable others skilled in the art to fully comprehend the underlying features of my invention that they may embody the same in the various modifications in structure and relation contemplated, drawings depicting a preferred form have been annexed as a part of this disclosure and in such drawings, similar reference characters denote corresponding
35 parts throughout all the views, of which,

Figure 1 is a view of the upper part of an oil pump constructed in accordance with my invention, the same being illustrated in section to show the mechanism of the pump.

40 Figure 2 is a view similar to Figure 1 of the lower part of the pump, the same being also shown in section to show working parts and particularly the pumping mechanism.

Figure 3 is an enlarged section taken on the line 3—3 of Figure 1, illustrating the coin handling mechanism.

Figure 4 is an enlarged view in sectional elevation of the coin mechanism illustrated in Figure 1.

50 Figure 5 is a view in section of a portion of

Figure 4, illustrating the operation of shunting members to discharge a coin when the pump is exhausted.

Figure 6 is an enlarged view taken in end elevation at one end of the measuring drum, 55 and

Figure 7 is a view in side elevation of a modified form of a portion of the pumping mechanism as employed in the pump illustrated in Figure 2.

Referring to the drawings in detail, the pump casing is indicated by C, the same being preferably made in two sections and being joined through the medium of the flanges D, a suitable partition E being employed adjacent the flange D which is arranged to support some of the operating mechanism to be hereinafter referred to. A suitable feed hose 1 and nozzle are employed in connection with the housing C to lead
60 therefrom the oil or gasoline or other liquids to be dispensed and after the hose nozzle 1 is removed from the sliding hook 2, which is suitably positioned on a cast portion 2—A in the housing C. Coins used in the purchase of the liquid are inserted into the coin slots 6 through a coin opening 6—A in the housing C. Any number of coin slots 6 may be employed or rather, chutes, for the reception of coins with which the liquid is purchased. 65

The maximum number of coins which can be inserted into the different slots at one time is governed by the depth of the respective slots or chutes. When any of the chutes are filled to their capacity, the last coin protrudes partly into the coin slot 6—A and prevents any further insertion of the coins. 70

After inserting a coin into any one of the coin slots, the first coin inserted comes to rest on an arm of the spider gear 7 and every other coin inserted, of course, rests upon the preceding coin. After a coin or coins are inserted into one or more of the coin slots, then the lever or levers 8 are pulled down and being pivotally connected to the plunger pieces 9, move said plunger pieces down and thereby force the coin into engagement with the spider gear 7, turning the latter. On the spider gear shaft 7—A is mounted a spiral gear 10 which engages with a spiral gear 11 100

carried on a vertical shaft 12. This shaft is supported by a bearing on each end and is provided with a bevel gear 13 at its upper terminus, which in turn, engages with the bevel gear 14 carried on the end of a drum shaft 14—A. This shaft is suitably supported in a frame 14—B which may be secured in any manner to the inside wall of the housing C. When the gear 14 is actuated through the medium of the bevel gear 13 it revolves the shaft 14—A and also the drum 15 carried on said shaft and within the frame 14—B.

The revolving movement of the drum is of course limited to the movement imparted the spider gear 7—A which in turn, is controlled by the number of coins pressed down by the plunger or coin follower 9. This drum 15 is provided on its outer surface with a spiral slot 15—A which extends spirally about the drum 15.

As the measuring drum 15 revolves, it permits movement of the rocker arm 16 which is pivoted in the frame 14—B and is provided with the extended arms 16—A and 16—B and allows the piston 5 which is connected to the rocker arm extension 16—A by the piston rod 16—D and cross head 16—E to move downwardly and in so doing, an amount of liquid equal to the amount of coins inserted is forced out of the piston chamber or cylinder 17, past the check valve 18 and through pipe 19 into the gas tank of the vehicle or other receptacle. The piston chamber or cylinder 17 is suitably mounted in the lower part of the housing and may be suspended through the medium of the frame 17—A from the flooring or partition E which extends across the housing C, as illustrated in Figure 2.

To the rock arm 16—A is also connected a rack 20 which is disposed substantially in vertical alignment with the piston rod 16—E and this rack 20 carries at its upper end, an extension 20—A which is arranged to operate a switch 21 through the medium of the intermediate levers 23 and 25, both of which are pivoted on the frame 14—B, the levers 23 being arranged to be engaged by the extension 20—A of the rack 20. As the rack 20 moves downward, the switch 21 is closed but the circuit of motor 22 is still open until switch 4 is closed when the hose is hung up at which time the motor 22 becomes operative and returns the piston 5 to its starting or raised position. This piston 5 is arranged within the cylinder 17 and of course is actuated vertically to draw in the contents of a supply tank and discharge it through a suitable pipe that connects with the supply hose 1. When the rack 20 moves upward, it engages the switch operating lever 23 through its projection 20—A and breaks the circuit of the switch 21 through the lever 25 which breaking of the circuit stops the motor

22. When the rocker arm 16 which is connected as before described, to the piston rod 16—D, moves up so that the piston 5 is in its uppermost position, the spring 24 positioned in the rack rod, permits the rack 20 to move upward to assure a full return of the rock arm 16 to break the switch contact of the switch 21.

As the piston 5 is moved upward to its highest position, it draws in a full measure of liquid into the piston chamber 17 from the tank 26 which is above the level of the piston chamber 17 and partly in back of the same as viewed in Figure 2. The liquid flows from tank 26 through the pipe 27 into the float valve chamber 28 and past the float valve 29 into the piston chamber 17. The float valve 29 prevents the liquid being forced back into the tank 26 when the piston 5 operates in a downward direction.

As the liquid flows from tank 26, the float 30 drops and in so doing, moves the switch lever 31 which is pivoted on the shaft 31—A together with a switch disk 31—B, the shaft being held in any suitable support connected to the frame 17—A and the switch arm 31 and switch disk 31—B being revolvable simultaneously to close a plurality of circuits. The switch disk 31—B, as the float 30 drops, closes the circuit of motor 32 through the wires 32—A and the motor becomes operative and pumps the liquid through the pump 33 from the main supply tank which is preferably buried in the ground adjacent the dispensing tank into the main supply tank 26.

The upward movement of the float 30 as the tank 26 is filled shuts off the current to the motor 32 when the proper level of the liquid in the tank 26 is obtained. Should the main tank, that is the supply tank which is buried, become empty, then, of course, the pump 33 which is actuated by the motor 32 would not maintain the full level of the liquid in tank 26 and the float 30 would drop further down and thereby pull down the switch lever 31 and revolve the switch disk 31—A so that the motor circuit 32—A would be broken and the motor stopped. Continuing this excess downward movement of the float and the consequent revolving movement of the switch disk 31—B, the circuit of the motor 32 is maintained broken and the motor is rendered inoperative regardless of the other switches in the circuit. When the float 30 has moved down to its lowermost position, a lighting circuit 34 is closed and a sign 35—A signifying "Empty" is illuminated by the bulb 35. This sign 35—A may be one painted upon a strip of glass positioned in the upper part of the housing C and so arranged that it is not visible until the lights 35 are illuminated.

When the main tank is not empty, then the upward travel of the piston 5 draws the liquid from the tank 26 into the piston cham-

ber 17 and in so doing, lowers the level of the liquid in the tank 26 which causes the float 30 to drop, but when the float 30 has dropped an inch or so, it pulls the switch lever 31 on contact of the circuit 32 and starts the motor which keeps the level in the tank 26 above the "off" position, that is, keeps the switch 31—B in such a position that the circuit 32—A is broken and the pump 32 cannot supply more liquid to the tank 26.

The method of operation of my device can be explained by saying that when the tank 26 is full and the piston chamber 17 is full and coins are inserted into the coin chute, the piston 5 will travel downward and force the liquid by its weight into the tank of the vehicle or into any other receptacle. When the receptacle has been filled, the motor 22 is started by the hanging up of the hose nozzle 1 and this motor returns the piston to its starting position, it being of course understood as before described that the distance of the downward travel of the piston is consequently the amount of liquid dispensed which is governed by the number of coins inserted into the coin chute.

As the piston travels upward it draws in the amount of liquid dispensed in the piston chamber 17 from the tank 26 and as the level in the tank is lowered, the float is lowered also and being connected to the switch disk 31—B, the latter is moved to close the circuit of the motor 32 which becomes operative and operates the pump 33 which transfers the liquid from the main tank to the tank 26 and keeps the latter at an operating level until it is full when the rising of the float 30 shuts off the motor 32. Should the piston 5 draw part of the liquid out of the tank 26 which would be enough to bring the float 30 below the operating level, then the whole mechanism would become inoperative. This of course, applies only when the main tank becomes empty.

If more coins are inserted than the automat can deliver paid for, then the rock arm 16 would travel its full swing as would the rock arm 16—B, the latter then would engage the projection or extension 36 on the lever 37, the latter in turn engaging the lever 38 and opening the two shutters 39—A and 39—B which allow the surplus coins to be discharged into the tray 40 which is cast integral with the housing C and which is protected by a suitable rain shed which also acts as a preventative against tampering with the shutters 39—A and 39—B from the outside. At the same time that the rock arm 16—B engages the projection 36 on the lever 37 it also engages the pin 8—A on the lever 8 which in turn, causes the slide 9 to pass down over the coin opening 6—A in the housing C to prevent the insertion of further coins.

In the event of a leak past the piston 5, the

liquid is visible in a glass tube 42—A which is suitably positioned in the casing 42—B secured to the housing C and connected through the medium of the pipe 42 with the top of the piston chamber 17. Upon the exhaustion or emptying of the main tank and tank 26, there is a possibility that air may get into the piston chamber 17 and for this reason, use is made of a vent cock 43 which is placed on the outside of the piston chamber 17 and suitably connected thereto. The latter is operated by the rod 44 which is connected to rod 45 by the lever 46 and operated by key 47 through rod 48 which is connected to rod 45 by the link 49.

The rod 45 is provided with a projection 50 which engages the projection 51 on the float rod 30—A. Now, as the automat has become inoperative through the emptying of the main tank and the latter being filled again and the automat is to be put in operating position, key 47 is inserted and turned one-quarter of a turn or as much as is necessary to open the vent cock 43 through the manipulation of the rod 45 and also to raise the float 30 through engagement of the projections 50 and 51 to a position where the switch disk 31—A will operate motor 22 and also motor 32 and consequently break the lighting circuit 34 which makes apparent the "Empty" sign. When the tank 26 is filled and also the piston chamber 17, any air in the latter having passed out through the vent cock 43 and the pipe 52 connected to the same, permits the complete filling of the piston chamber 17.

It will be noted that pipe 52 is above the level of the piston chamber 17 and said pipe 52 leads to the outside of the automat casing and it will be evident when the tanks 26 and piston chamber 17 are full, a discharge of the liquid will occur and the vent cock 43 can then be closed. After the automat is in operating position, it will of course, govern itself automatically until the main tank again becomes empty. In order to provide a positive operation of the operating drum 15, use is made of a spring operated plunger 53 which prevents any lost motion in the gears operating the drum and provides a yieldably ratcheting movement for said drum. The set screw 54, which is adjustable in the frame 14—B governs the backward swing of the rock arm 16. On the extreme end of the rock arm 16 is provided a tongue 55 which engages into the groove 15—A in the drum 15, this groove extending around the drum 15 and being wide enough to permit the free operation of the tongue 55 when the drum and rocker arm move into position. Upon the return movement of rocker arm 16, the tongue 55 on the rocker arm being in engagement with the groove 15—A on the drum 15 revolves the drum back to its nor-

mal position to permit engagement of the arm 16 with the stop 54.

In the modified form of my invention as illustrated in Figure 7, I have made use of a different type of construction in which the supply tank or pump is placed above the operating lever 16 as illustrated in Figure 1. In the present form of the invention, I have provided a frame 55 which, through the medium of a suitable link 56, is connected to the rack 57, the rack, in turn, being operated by a pinion 58 carried on the ends of a suitable motor shaft forming a part of the motor 59. This frame 55 has a depending piston rod 60 to the end of which is secured, a floating piston 61 which operates in the cylinder 62 to displace the liquid drawn into the cylinder through the pipe 63 from the usual pump mechanism illustrated in Figure 2 and identified by the numeral 33, which latter pump draws the liquid to be dispensed from an underground supply tank. The pipe 63 is provided with a suitable check valve, if desired. In order that the cylinder 62 may properly overflow, I provide an outlet overflow pipe 64 in which is positioned a spring held valve 65 which will prevent return of the liquid in the pipe 64 into the cylinder 62 once it has been discharged therefrom.

It is quite evident that the frame 55 will move downward depending upon the throw of the arm 16 which operates along the drum as illustrated in Figure 1 and the amount of liquid displaced will depend upon the step to which the piston 61 is submerged, the liquid in the chamber 62 will of course flow out through the pipe 66 and through the hose 67 to the vehicle tank or other point of discharge. The supply cylinder is provided with the overflow outlet 68 in which is disposed the normally closed valve 65 which is retained in its normally closed position through the medium of the spring 69. The stem of the valve 70 is arranged for depression by the lever 71 whose outer end is arranged to close the contacts 72 to complete a circuit at a predetermined point in the downward movement of the frame 55. The piston chamber 62 will be also provided with an integral float chamber 73 in which a float 74 has free vertical motion, the upper end of the float rod 75 being connected with an operating lever 76 which is arranged to revolve the contact disk 77, this disk having on the surface thereof contacts as illustrated in connection with the contact disk 31—B of Figure 2. The float arm 75 is also provided with a strap member 78 which engages a rock arm 79 secured on the end of an indicating pointer 80 which is housed in a suitable casing 81 held in the wall of the pump housing. It will be quite evident that when the liquid in the chamber 62 is at its normal height, the contact disk 77 will be in the proper position for maintaining the desired electric circuit

but should the liquid in the main supply tank become exhausted, the cylinder 62 would become empty with the result that the float would fall and would act to close the lighting circuit which would illuminate the light positioned behind the "Empty" sign.

The switch operating lever 71 is provided with a pin and slot connection to the frame 55 and is so arranged that it will operate to open the overflow valve 65 and open the contacts 72 when the member 55 moves upwardly, it being normally restored to its horizontal position through the medium of the spring 69 surrounding the valve stem 70 when the member 55 is lowered to displace liquid.

It is evident, therefore, that I have provided an automatically operated coin controlled liquid dispensing pump which will accurately measure the amount of liquid to be dispensed and which will automatically prevent collection of coins when the main supply tank of the pump is empty. It will be further noted that I have provided in a pump of the character referred to, means for indicating an empty condition of the pump and also automatic means for constantly maintaining the auxiliary tank replenished so that quick and efficient operation of the pump as a unit is maintained.

It is evident also that in a construction of a liquid dispensing pump of this character, that the same needs no attention but continues its operation automatically without regard to the amount of liquid purchased and the pumps may be placed at remote points along a highway for the convenience of the motorists and can be so adjusted that any particular amount of gasoline, for instance, will be dispensed, depending upon the number and value of the coins deposited in purchasing the liquid.

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

1. In a liquid dispensing device of the character described, a housing, a pump in the housing for drawing liquid from a remote source of supply, a tank into which said liquid is emptied from the pump, a cylinder for receiving said liquid, a piston for discharging the liquid from the cylinder to the exterior of the housing, a float in the tank and a switch member controlled by said float for controlling the operation of said pump.

2. In an oil pump, a revolvable drum, and a gravity operated piston controlled by the movements of said drum for discharging liquid from said pump.

3. In a liquid dispensing pump, a revolvable drum, a spiral groove on the periphery of said drum, a discharge piston for dispensing oil from said pump, a rock arm associated with the piston and an extension on said rock arm for engaging the spiral groove on

the drum whereby the amount of liquid discharged is controlled.

4. In an oil pump of the character described, a revoluble drum having a spiral slot therein and means engaging said slot controlled by the movement of the drum for permitting discharge of a predetermined amount of fluid from the pump.

5. In an oil dispensing pump of the character described, a housing, having an opening therein, means for closing said opening, an oil holding cylinder, a piston for forcing oil from the cylinder to the exterior of the pump, a lever for operating said closing means so that the entrance to the opening of the housing may be closed and a lever operated by said piston and arranged to control the movement of said closing means whereby said housing opening is closed when the contents of the pump is exhausted.

6. In a liquid pump, a revoluble, spirally slotted drum, a lever the operation of which is controlled by the slot of said drum, and a liquid discharge including a piston mechanism controlled by said lever.

7. In a liquid pump, a revoluble slotted drum, a lever controlled by said drum, a liquid discharge mechanism including a piston controlled by said lever, and means for returning said piston after its discharge stroke.

8. In a device of the character described, a revoluble, spirally slotted drum, a liquid discharge mechanism including a piston operable in a piston chamber and controlled by the operation of said drum, and an auxiliary pump for supplying said chamber.

9. In a machine of the character described, means for discharging a liquid, a motor for retracting said discharge means, a circuit including said motor, a switch in the circuit, and an operator controlled by said discharging means for actuating said switch.

10. In a liquid pump, a spirally slotted rotatable drum, a lever controlled by movement through the slot in said drum, a gravity operated liquid discharge mechanism controlled by said lever, a switch, a motor for returning said mechanism to normal position after a discharge, a circuit including said switch and motor, and said discharge mechanism being arranged to operate said switch to break said circuit upon return of said mechanism to normal position.

11. In a liquid pump, a piston arranged to have a suction and discharge movement, a motor for providing the suction movement, a switch, a circuit including the motor and the switch, and a lever associated with the piston and the switch for operating the latter upon a movement of said piston.

In testimony whereof I affix my signature.

PAUL KRAUSE. [L. S.]