Dec. 13, 1932. P. KRAUSE 1,890,616

COIN CONTROLLED LIQUID DISPENSING DEVICE

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Fig. 1.

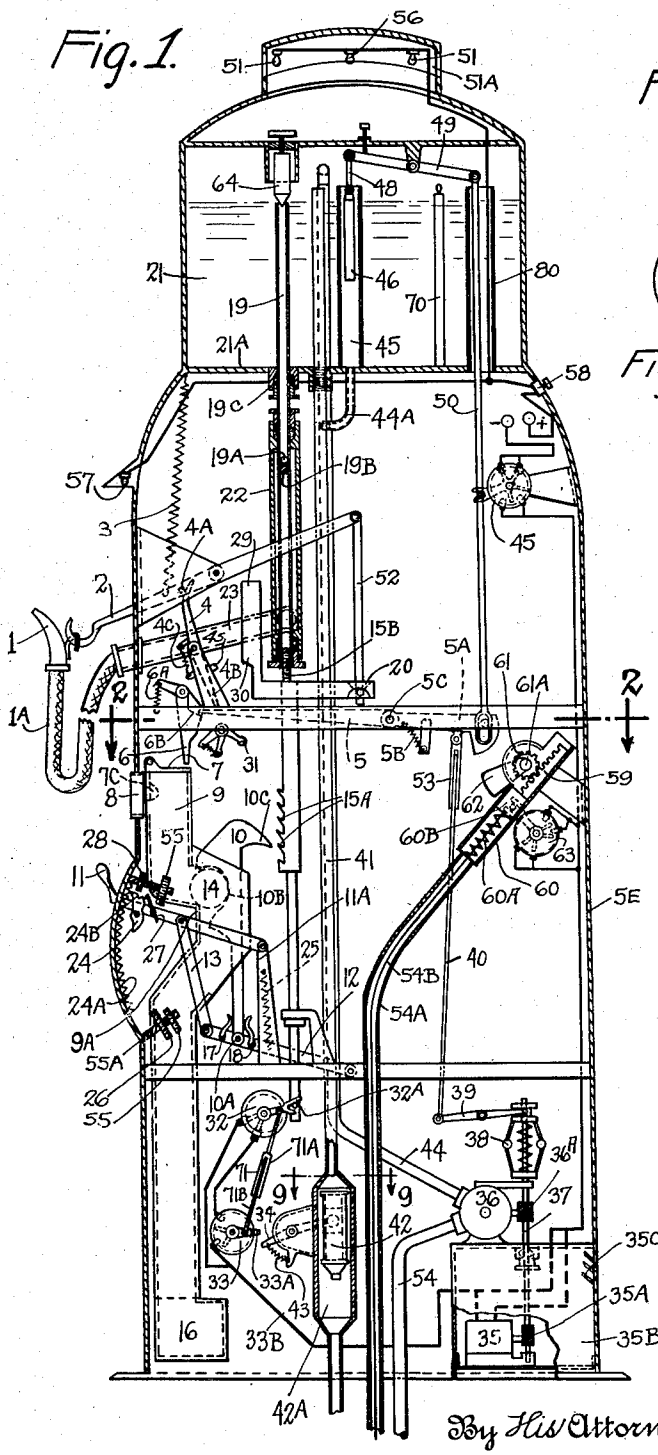


Fig. 8.

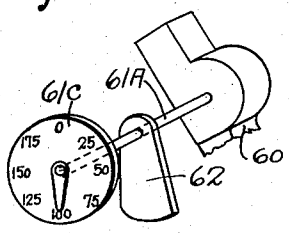


Fig. 10

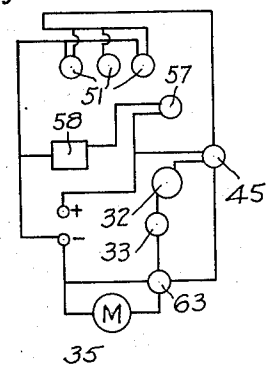
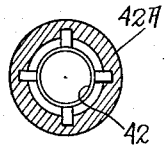


Fig. 9.



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COIN CONTROLLED LIQUID DISPENSING DEVICE

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Fig. 2.

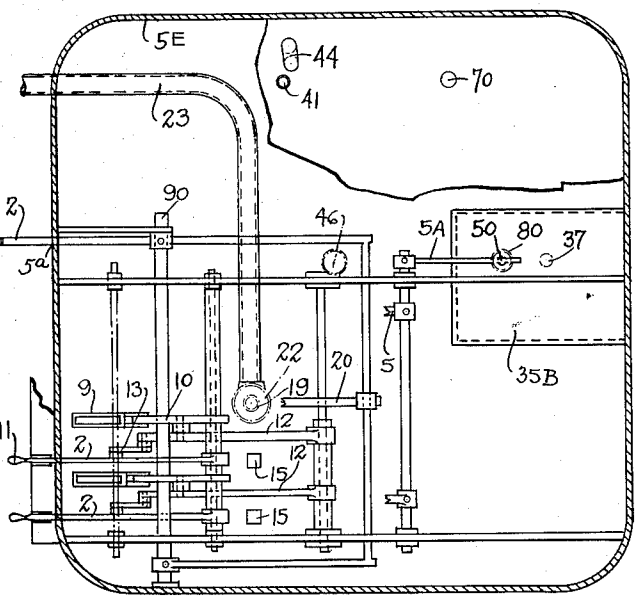
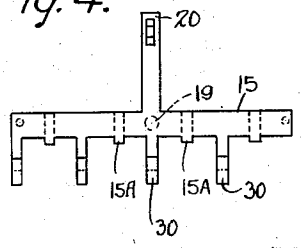


Fig. 4.



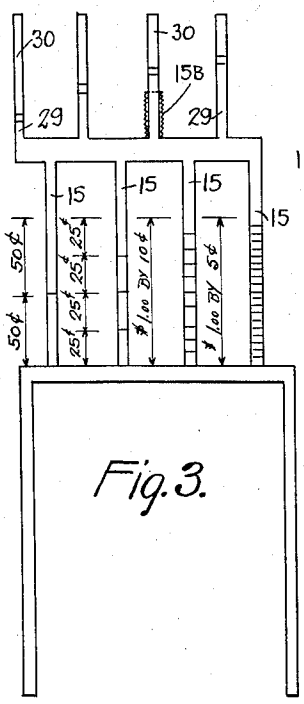


Fig. 3.

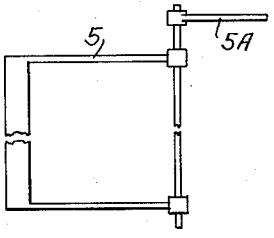


Fig. 6.

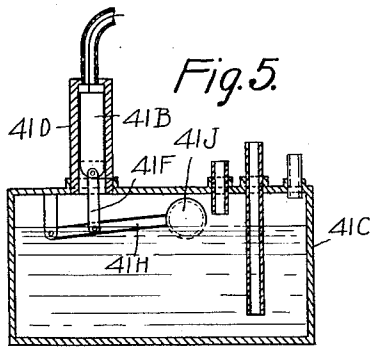


Fig. 5.

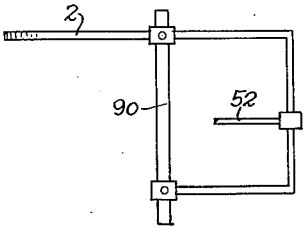


Fig. 7.

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By His Attorney John J. Synek

Patented Dec. 13, 1932 1,890,616

UNITED STATES PATENT OFFICE

PAUL KRAUSE, OF BABYLON, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, OF PART INTERESTS TO WILLIAM E. SPRAGUE AND HARRY TAYLOR, BOTH OF BABYLON, NEW YORK; LUCY A. SPRAGUE ADMINISTRATRIX OF SAID WILLIAM E. SPRAGUE, DECEASED

COIN CONTROLLED LIQUID DISPENSING DEVICE

Application filed June 17, 1929. Serial No. 371,459.

This invention relates to coin controlled liquid dispensing devices and in particular to a device from which gasoline may be drawn by the insertion of suitable coins of any denomination to purchase a needed amount of gasoline.

A still further and equally important object of my invention is to provide a coin controlled mechanism which affects the operation of the pump or dispensing device and permits the discharge of an amount of gasoline or liquid in accordance with the number of coins placed in the various slots of the device.

A still further particular object of my invention is to provide a liquid dispensing device which will indicate when the contents thereof has been emptied and which will also prevent insertion of a coin in the slot at such time. It will be further noted that I have provided a dispensing device which automatically loads its auxiliary tank and automatically cuts off the feed to the auxiliary tank from the main supply tank when said auxiliary tank overflows.

In automatic dispensing devices, I have provided a device which may be placed at the roadside and which does not need the attention of an attendant, the device being coin controlled, coin operated and being wholly automatic in its operation to reject coins and lock itself when a complete purchase has been made. My device is also fool-proof, has few mechanical parts and its operation is positive and the discharge of the liquid content is made accurately.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

In the accompanying drawings:

Figure 1 is a view in elevation, the same being shown in section to illustrate the operating parts of my dispensing device.

Figure 2 is a view in cross section, taken substantially on the line 2—2 of Figure 1 and further illustrates the relative arrangement of the parts.

Figure 3 is a view in front elevation of the ratchet or feed bar whose movement determines the amount of liquid discharged from the dispensing device.

Figure 4 is a top plan view of the feed member illustrated in Figure 3.

Figure 5 is a view in sectional elevation of the main supply tank and its control medium.

Figure 6 is a top plan view of one of the operating levers.

Figure 7 is a top plan view of another one of the operating levers which constitute the hook upon which the end of the discharge hose or nozzle is supported.

Figure 8 is a view in perspective of the float operated locking device and indicator.

Figure 9 is a section taken on the line 9—9 of Figure 1.

Figure 10 is a diagrammatic view of a circuit used in my pump, and showing the arrangement of the switches, lights and motor.

Referring to the drawings in detail, number 1 is a hose nozzle at the end of the usual flexible hose 1—A through the medium of which the liquid may be dispensed. The nozzle is provided with a suitable hook and when the nozzle is removed from the hook lever 2, the spring 3 connected to the lever moves the latter upwardly, which, in turn, releases the lever 4 whose upper end is normally in engagement with the fixed pin 4—A and whose lower end 4—B overlies the end of the lever 5. The lever 4 is normaly urged against the pin 4—A through the medium of the spring 4—C, the upward movement of the freed lever 2 consequently removing the pin 4—A from the path of the lever 4 and permitting operation of the latter. The lever 4 is limited in its counter clockwise movement by a suitable stop 4—S so that its upper end is in the path of the pin 4—A on return of lever 2. After the lower end 4—B of the lever 4 moves out of the path of the end of the lever or operator 5, its free end is urged upwardly by the action of the spring 5—B with the result that it no longer overlies the lever 6 and the spring

6—A secured thereto throws the lever 6 out of the path of the coin slot lock 7 to permit coins to be inserted through the coin mouth 8 and to be deposited in the coin chute 9.

The slot lock 7 is provided with the counterweight 7—C to normally keep the lock closed.

When the hose nozzle 1 has been inserted into the receiving container or the gas tank of an automobile or other vehicle, the coin slot lock 7 operates automatically and permits coins to be inserted into the coin slots 8 from whence they drop down the coin chute 9 and into contact with the ratchet finger 10. The coin chute 9 is provided with a protruding portion 9—A over which the coins, indicated by the numeral 14, ride, it of course being understood that there is a coin chute for each of the various denominations of coins that may be used in the machine, namely, fifty cents, twenty-five cents, ten cents and five cents and each of the coin chutes are provided with a respective ratchet finger or operating member 10 which is pivoted to the lever 12 as at 10—A, and is provided with the coin cut-out 10—B into which rolls the coin when it is deposited in the coin chute.

Inasmuch as the operation of a single coin will be sufficient to illustrate how the machine would operate when any particular coin was inserted, a single coin chute and its companion ratchet lever 10 will be only referred to. After a coin has been inserted into the coin chute 9 and rides down to the position illustrated in Figure 1, the hand lever 11 which is pivoted to the bracket 11—A is moved downwardly and through the medium of the link 13 which is connected thereto and lever 12, it moves the ratchet finger down so that the coin is engaged within the coin cut-out 10—B of the ratchet finger. The offset portion of the coin chute 9 however, is in the way of the vertical movement of the coin after it has been engaged by the lever 10 and the result is that the lever 10 is urged toward the right, in Figure 1 and its hooked end 10—C is brought into engagement with the teeth 15—A of the serrated operator 15. with the result that the operator 15 is drawn down and causes delivery of the liquid as will be hereinafter described.

After the ratchet or operating bar 15 is pulled downwardly by the ratchet finger 10 through the action of a hand lever 11 and its connecting part, a distance determined by the length of the offset 9—A in the coin chute 9 and by the travel of the hand lever 11 and the coin has passed the offset portion 9—A of the chute, it drops out of engagement with the ratchet finger 10 and through the coin chute into the coin box 16. As the coin passes the offset 9—A of the coin chute and drops out of engagement with the ratchet finger 10, the latter, therefore, becomes free to move and is urged to its original, vertical position by the spring 18 which, with its companion spring 17, engage the opposite side of the lower end of the ratchet finger 10 or lever adjacent its pivot point 10—A and normally maintain it in an upright position.

The hand lever 11 must be pulled down its entire travel before it can be returned either by hand or by the spring 25 to its starting position, the spring connecting the lever 12 with the stationary bracket 11—A, as illustrated. To insure the full travel of the hand lever 11 and to prevent return thereof to its starting position before the pull stroke is completed, a ratchet dog 24 is pivoted to the lever 11. The lower end of the ratchet dog is arranged to be tripped by the stop 26 when the hand lever 11 completes its full downward stroke. As the ratchet dog 24 is tripped by the stop 26, the ratchet is forced in a clock-wise direction and out of engagement with the ratchet teeth 24—A which are disposed on the interior wall of the casing adjacent the slot therein through which the hand lever operates. It is not believed that it is necessary to illustrate the slot in the casing which is designated by the numeral 5—A, it being sufficient to note that the spring 27 which presses against the upper part of the dog 24 will keep it normally in engagement with the teeth 24—A so that upon a downward movement of the lever 11, the dog will ratchet over the teeth and will prevent retractile movement of the lever 11.

Upon a movement clockwise of the dog 24 occasioned by its contact with the stop 26, the ratchet spring 27 which is provided with a hooked end engages in the notch 24—B and normally maintains the rack engaging end of the ratchet out of contact with the rack piece, thereby permitting free return of the lever 11 to its normal position. Upon its return to its starting position, the upper end of the ratchet 24 comes into contact with the stop 28 and is pushed out of engagement with the hook formed on the end of the ratchet spring 27, the spring bearing against the upper end of the dog 24 to normally force it into the position illustrated in Figure 1.

The reason for providing means whereby full travel of the hand lever 11 is ensured, is to insure the dropping of the coin out of engagement with the ratchet finger or lever 10 and into the coin box 16; also, to insure the deliverance of the full amount of liquid for the inserted coins and also to prevent the hand lever 11 to be worked up and down at half strokes which might move the operator 15 downwardly and cause liquid to be delivered in excess of the purchase value of the inserted coins.

In order that the liquid may be discharged, the upper end of the ratchet bar 15 or operator is adjustably connected to the discharge tube 19 through the medium of the threaded extensions 15—B which engages within the lower threaded end of said tube 19. The

upper end of the discharge tube 19 passes through the bottom 21—A of a liquid chamber 21 in which the gasoline or liquid to be discharged is housed, this chamber constituting what might be termed an auxiliary chamber from which the liquid is directly dispensed. The top of the discharge tube 19 is level with the liquid in the chamber 21 and upon being moved downwardly by the action of the hand lever, as described, an amount of liquid equal to the value of the coin or coins inserted into the coin slot, is discharged. As the discharge tube 19 is lowered and brought below the liquid level in chamber 21, the liquid enters the discharge tube 19 and runs through the latter and out through the opening 19—A therein and into the chamber 22 or cylinder and from said cylinder 22, the liquid runs into the pipe 23 which is suitably secured to the lower portion of the cylinder 22 and leads the liquid therefrom to the discharge tube 1—A and out through the nozzle 1.

It will be noted that the tube 19 is plugged as at 19—B directly below the opening 19—A so that the liquid will of course, run through the opening 19—A and into the cylinder 22. The discharge tube 19 passes through suitable stuffing boxes 19—C, one of which is disposed in the lower wall of the auxiliary chamber 21 and one of the stuffing boxes being also provided in each end of the cylinder 22 so that leakage of the liquid about the tube 19 is prevented.

As the operator bar 15 starts its downward movement, it engages the arm or lever 32—A of the motor switch 32 and in its downward movement, breaks the motor circuit in the switch and as the arm of the switch 32 is connected to the motor switch 33, it moves at the same time the arm 33—A of the motor switch 33 and closes a circuit. The circuit indicated by the wiring 33—B, therefore, has two switches in it, that is, 32 and 33, but in the present instance, as described, the motor switch is open in switch 32 and is closed in switch 33. The switches being wired in series, makes it necessary that both switches be in contact before the motor 35 can operate.

As the hook lever 2 is pulled down at its hook end, the other end travels up and at the upwardly moving end is connected to the operator bar 15 through the medium of the link 52, whose lower end engages the extension 20 of the operator bar 15; the ratchet bar or operator 15 is returned to its starting position and consequently in its return or upward movement, the lower end of the operator bar 15 again makes contact with the lever of switch 32, this lever being indicated by the numeral 32—A but this movement does not operate the switch lever 33—A due to the self-adjusting connecting link 71 which connects the switch lever 32—A and 33—A. This adjustable link consists of a sleeve 71—A and rod 71—B which have relative, sliding relation.

In the operation referred to, it will be noted that the switches 32 and 33 have now closed the circuit and the motor 35 operates and actuates the pump 36 through shaft 37 and their associated spiral gears 35—A and 36—A respectively. The upper end of the pump drive shaft 37 is provided with a governor 38 which is in operation as long as the motor 35 and pump drive shaft are in motion.

As the governor 38 pulls one end of the lever 39 downwardly, the other end of the lever goes up and with it, the rod 40 which is attached thereto by a pivot pin arrangement. The upper end of the rod 40 is arranged for free sliding movement in the sleeve 53, the latter being secured for pivotal movement to the coin slot lock lever 5—A which, as illustrated in Figure 6, is secured to the lever rod or shaft 5—C to which is also secured the lever 5. If the rod 40 moves upwardly which is caused by the action of the governor, the lever 5 is moved downwardly at its front or left hand end, as seen in Figure 1, and bears on the ledge 6—B which is formed in the lever 6 and the lever 6 is moved so that its lower end overlies the coin slot lock member which, as noted, is pivoted in the upper end of the coin receptacle and is substantially L-shaped, the depending portion thereof which carries the counterweight 7—C at all times blocking the passage or coin slot 8. The insertion of coins, of course, prevents the operation of the automat while the motor 35 and pump 36 are working during which time the supply chamber 21 is being filled by the pump 36 through the supply pipe 44.

As soon as the chamber 21 is filled to its proper level which is determined by overflow pipe 41, the liquid in excess of the proper level runs down the overflow pipe 41 and into a cup 42 which is provided within a suitable housing 42—A, see Figure 1. As this cup 42 is being filled by the overflow, the added weight of the liquid, forces the cup 42 down and does so against the action of the spring 43 which is secured at one end to the end of the lever 34 which is pivoted in a suitable extension of the casing 42—A which carries at one of its ends, the cup 42, the spring at its opposite ends being secured in any suitable manner so that it will normally hold the cup in its raised position. When the cup is lowered, the lever 34, moves upwardly at its outer end and into contact with the lever 33—A of the switch 33, stopping the motor and therewith the action of the governor 38, which, in turn, returns the lever 39 to its neutral position and releases the coin slot lock arm 5 and lever 6 thus unlocking the coin slot 7 and returning the automat to its normal operating condition.

It will be noted that cup 42 has a small hole in the bottom thereof which permits the liquid to drain out slowly after the cup has been moved downwardly or otherwise operated and after the cup is empty, the spring 43 will move the cup through the medium of the lever 34 to its raised or normal empty position. The cup 42 is provided with suitable guides on its side and consequently does not fit snugly into the chamber 42—A wherein it travels. The space between the outside wall of the cup 42 and the inside wall of the chamber 42—A are provided to permit the surplus of liquid after the cup 42 is filled, to pass by the cup 42 and through the overflow pipe to return to the main supply tank indicated by the numeral 41—C.

The motor 35 is housed in a chamber 35—B closed off from the remainder of the mechanism in the casing, the chamber 35—B being vented to the outside of the casing 5—E through the medium of the vent 35—C formed in the side wall of said casing. The purpose of the vent, of course, is to prevent any gases, if inflammable, from becoming ignited in the event that liquid is dispensed which gives off a gas which is inflammable. The same precaution is present in the operation of the switches and in their construction, they all being practically air-tight housings to prevent gases from being ignited by sparks caused by the operation of the switches, the switch arms being disposed outside of the switch while the contact arms and contacts are inside of the switch housings. These constructions are well known and it is not believed that the detailed description of the switches is necessary.

In order that the hand lever 11 may be controlled in its operation in both directions, use is made of adjustable stops 55 which are carried in the brackets 55—A which also support the members 26 and 28 respectively. The supply pipe 44 which is disposed behind the pipe 41 is turned over on its upper end, this turned over end being provided so that the splashing is prevented when liquid is forced into the chamber 21.

As the rack or operating bar 15 is moved downward, the coin slot lock bar 29 which is attached to or formed integral with the operator 15 moves downwardly therewith. On this lock bar 29 there is provided a cam face 30 which comes into contact with the rocker arm 31 pushing the latter down on one end and up on the other, the end that is moving up coming into contact with the lever 6 pushing the lever over the coin slot lock 7 to prevent the insertion of additional coins when the ratchet bar has been moved downward to draw with it, the pipe 19 to cause discharge of the liquid, the coin slot, of course, being locked during such discharge.

As the hose nozzle is hung up on the hook lever 2, the coin slot lock is operated by the pin 4—A on the hook lever 2 coming into contact with the lever 4, the latter of course depressing arm 5 which, in turn, bears on lever 6 through the medium of the shelf 6—B formed on said lever 6 to thereby force the end of the lever 6 over the coin slot lock 7, thus preventing insertion of the coins and operation of the automat before the hose 1 is removed from the hook lever to be inserted into the container where the liquid is to be fed. The hook lever 2 must be released and in its upward position before the coin or coins can be inserted into the coin slot. Link 52 which is attached to the hook lever 2 moves downward freely through the slot in the extension 20 of the bar 15 but does not move the rack bar in its downward travel but upon the replacement of the hose nozzle on the hook lever 2, the upward movement of the link 52 through the medium of the pin in its lower end, takes up the rack bar 15 wherever it may be on its downward travel and returns it to its starting position.

On the supply pipe 44, there is attached, a reservoir or cylinder 45 which is connected to the supply pipe 44 through the small pipe 44—A leading downwardly from the bottom of the cylinder and it will be evident during a filling operation that the cylinder 45 is filled to the same level with liquid as the supply pipe 44. Within the cylinder 45 there is disposed, a freely moving float 46 which is connected to the coin slot lock arm 5 through the medium of a link 48, arm 49 and rod 50, the latter having a slotted end which permits the arm 5 to be operated also by other mechanism as long as the float 46 mechanism is inoperative. The purpose of the cylinder 45 and its associated float 46 together with its connected mechanism is to shut off the motor 35 which operates pump 36 if the main supply tank from which the pump 36 pumps the liquid into the chamber 21, becomes empty. The level of liquid in the supply pipe 44 and consequently in cylinder or float chamber 45 is maintained by the check in the pump 36 to which the supply pipe 44 is connected. As long as the pump operates to supply liquid but when the main supply tank becomes empty, the pump will be operating on air and the liquid in the supply pipe will work back through the pump check valve when the latter is working when the main supply tank becomes empty and air enters the pump chamber.

As the level of liquid drops in the supply pipe 44, it consequently drops in the float chamber 45 and the float 46 drops and moves rod 50 upwardly and also the arm 5 which locks the coin slot 7 through the lever 6 and the rod 50 also operates the switch 45 to break the motor circuit with the result that the motor stops operating, it being again pointed out that all the motor switches are connected in series and all of the switches must be closed

for the motor to work. As the rod 50 moves the arm of switch 45 and breaks the motor circuit, the same movement makes or closes the empty light circuit to illuminate the bulbs 51, the bulbs being disposed in the upper compartment 51—A in which is provided an indicating sign arranged to be illuminated to indicate when the tank is empty. In the wall of the casing 5—E, there is provided a hand throw switch 58 which is arranged to light the regular night lights 56 and 57 but it is to be understood that these lights may be operated by a time switch disposed at any point in the casing.

In order that an auxiliary means may be provided to cut off the motor 35, lock the coin slot and light the "empty" light, I have provided a mechanism which carries out these features and also shows the amount of liquid in the main supply tank. This mechanism consists of a tube of small diameter, paralleling the suction pipe 54 and indicated by the numeral 54—A which houses a Bowden wire, 54—B, which at its upper end is connected to a rack 59 which travels in the housing 60 and is arranged to operate the gear 61. This gear 61 is mounted on a shaft 61—A which is journalled in the housing 60 and which carries exteriorly of the housing a cam 62 which moves with the gear when the latter is moved by the rack 59. The cam 62 moves upwardly upon a downward movement of the rack caused by a downward pull on the Bowden wire, whose lower end is attached to a slide 41—B housed in the sleeve portion 41—D of the main supply tank 41—C. The lower end of the slide 41—B through the medium of a link 41—F is connected to the pivoted float arm 41—H which carries at its free end, the float 41—J. The level of the liquid in the main supply tank, of course, will determine the position of the float which, in turn, will determine the position of the rack 59 which is normally urged upward through the medium of the spring 60—A which acts against the lower enlarged end 60—B of the rack 59. From this enlarged portion 60—B, there extends a pin to the outer side of the housing 60 which is arranged to engage the arm or lever of a switch 63. A movement of the rack portion 60—B downwardly moves the switch in order to break the motor circuit and at the same time complete the "Empty" light circuit. On the end of the shaft 61—A, I also provide an indicating device 61—C which may be extended to one side of the casing and housed within a suitable receptacle so that the base of the dial is visible from the exterior of the casing. The indicating device is of the conventional design and operation and it is not believed that its mechanism need be described.

It will be noted that rod 40 is loosely movable at its upper end in the sleeve 53 which in turn is pivoted to the arm 5—A, this permitting the arm 5—A to operate freely, independently of the rod 40. The upper end of the discharge tube 19 is substantially on a level with the upper end of the overflow pipe 41 and to prevent any overflow into the discharge pipe or tube 19, a plunger is provided which is indicated by the numeral 64 which normally seals the discharge tube 19, the plunger 64 being adjustable and being so closely adjusted that the tube 19 frees itself therefrom by the slightest downward movement. The member 70 disposed in the tank 21 is a displacement member, the purpose being to vary the capacity of the tank 21 so that a greater or less movement of the emptying tube 19 will be required in order to dispense a certain amount of liquid. A housing 80 is provided through which passes the rod 50, the housing at its upper end being disposed well above the ordinary level of the liquid in the tank 21.

If desired, I may provide a plurality of tanks 21 and a plurality of sliding supply tubes or discharge tubes, each draining their own separate chamber which may contain different liquids; for instance, as in a supply fountain for mixed drinks, in which a number of different kinds of drinks might be dispensed through the use of the mechanism described.

It is evident, therefore, that I have provided a new and improved liquid dispensing pump which has few parts, whose operation is positive and which is easily operated and fool-proof.

It is also evident that I have provided a liquid dispensing pump whose electrical control maintains the supply tank full so that the dispensing operation is carried out with a minimum of time and effort, the parts being so arranged that successive operation thereof takes place only after the filling tube has been removed from its supporting hook and when the proper coins have been inserted in their proper coin slot.

It is evident also that a device of the character referred to may be placed on highways at spots remote from town and may be operated at any time to supply liquid fuel to motorists or to supply liquid in any form, for instance, for drinking purposes, where desired.

While I have illustrated and described my invention with some degree of particularity, I realize that in practice various alterations therein may be made without departing from the spirit of the invention or the scope of the appended claims.

What I claim is:—

1. A liquid dispensing mechanism comprising a supply tank, a pipe in the supply tank, an overflow receptacle associated with the tank, a motor, a pump, a motor circuit, switches controlling the circuit, a pipe support, and coin controlled means for moving

the support to control discharge of the liquid through the pipe and operation of the switches, and means operable by the receptacle for opening the motor circuit.

2. In a liquid dispensing machine, a serrated operating member, a hook member, a coin passage constituting a chamber in which the hook member is disposed and closes one side thereof, means for operating the hook member to move a coin, and means in the coin slot for positioning a coin to force the hook into engagement with the operating member, when the hook member is operated.

3. In a liquid discharge machine, a supply tank, a pipe movable therein to permit discharge of the tank contents, a frame to which the pipe is adjustably secured, a coin chute, a frame operating member disposed in the coin chute, a lever for moving said operating member and the coin and an offset in the coin chute for causing a coin to move said operating lever into contact with the frame.

4. In a liquid dispensing machine, a motor circuit, a control switch in the circuit, a liquid tank, a pump driven by the motor for supplying the tank, a coin controlled dispensing pipe in the tank movable to dispense liquid and actuate the control switch to complete the circuit, an overflow pipe leading from the tank, a depressible receptacle in the pipe for catching the overflow liquid, and a lever operated by a movement of the receptacle to operate the control switch, to break the circuit.

5. In a device of the character described, a discharge member, a lever for supporting one end of the discharge member, a serrated operating member, a hooked lever for engaging in said serrated member, a hand lever for operating said hooked member to move the serrated member in one direction, a coin chute having an offset therein and through which said hooked lever operates, said lever being moved into engagement with the serrated member by a coin in the chute, and a connection between the supporting lever and the serrated member for moving the latter in the opposite direction.

6. A liquid dispensing mechanism comprising a supply tank, a pipe movable in the supply tank to permit discharge of the tank contents, coin controlled means for moving the pipe including a hand lever, a coin chute, an offset portion in the chute, a hooked lever and a serrated member with which said hooked lever engages when a coin is positioned between the offset portion and the hooked lever, a link connecting the hooked lever and the hand lever, a rack adjacent the hand lever, and a rack engaging member carried by the hand lever for preventing retractile movement of the handle short of a full operating stroke.

7. In a liquid dispensing machine, a supply tank, a tank supply pipe, a pipe movable in the tank to permit discharge of the tank content, a frame to which the discharge pipe is secured, a coin control means for permitting operation of said frame, a coin slot, yieldable means for closing the coin slot, a lever normally permitting yield of said slot closing means, an arm for moving said lever to a position to prevent yield of said closing means, a float in the supply pipe, and a connection between said arm and said float.

In testimony whereof I have signed my name to this specification, this 4th day of June, 1929.

PAUL KRAUSE [L. S.]