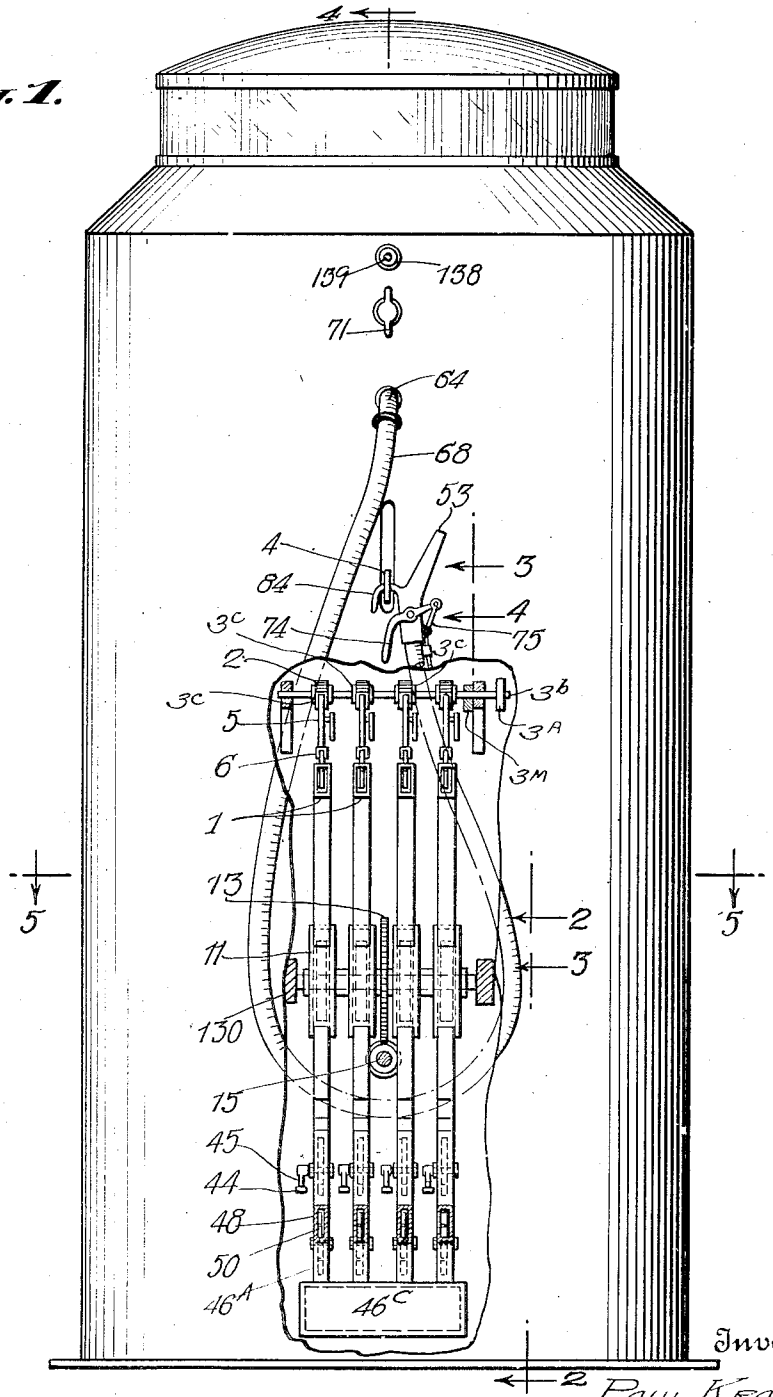
Jan. 17, 1933. P. KRAUSE 1,894,275

LIQUID PUMP

Filed Nov. 10, 1928 5 Sheets-Sheet 1

Fig. 1.



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LIQUID PUMP

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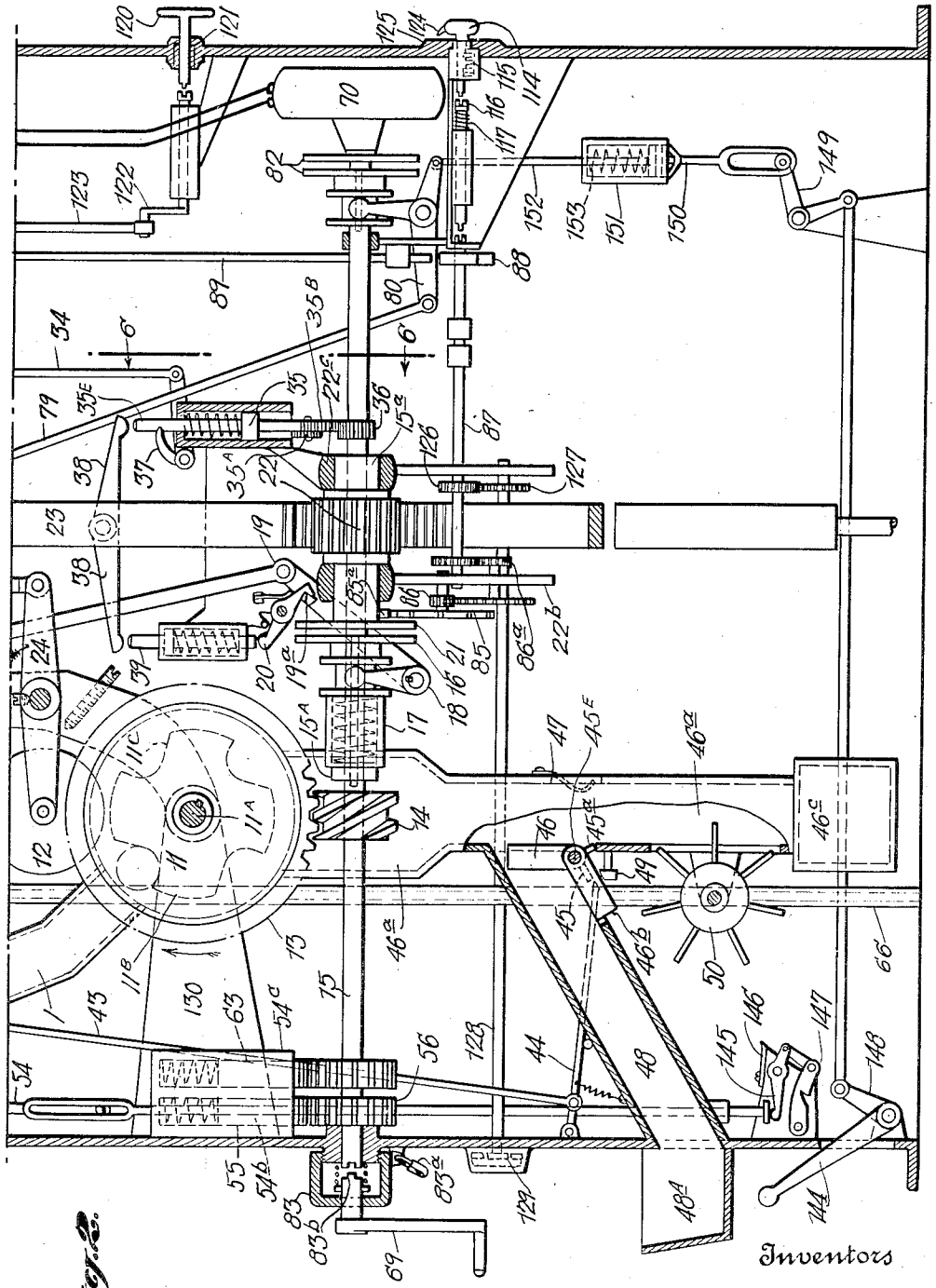


Fig. 2.

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LIQUID PUMP

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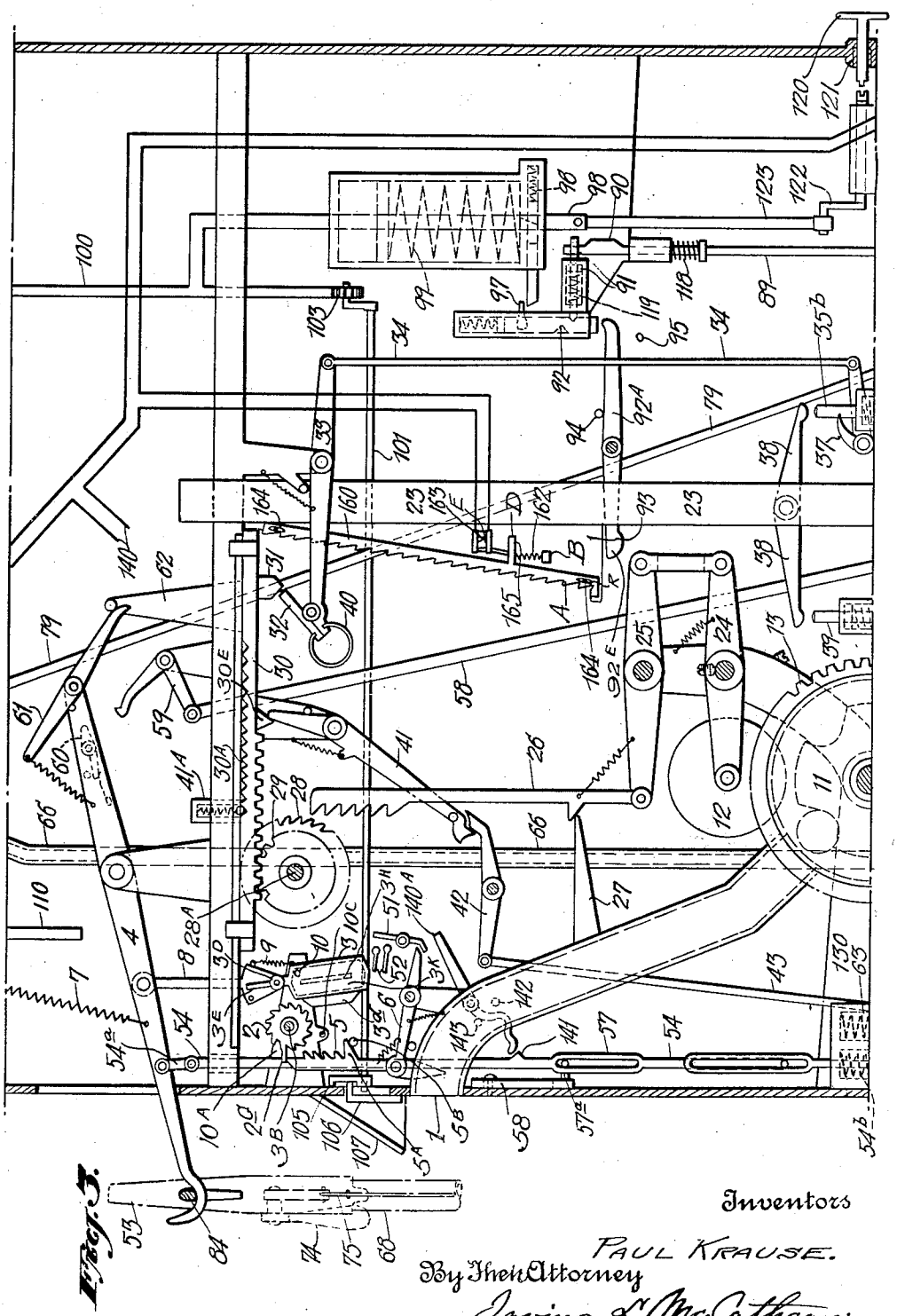


Fig. 3.

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LIQUID PUMP

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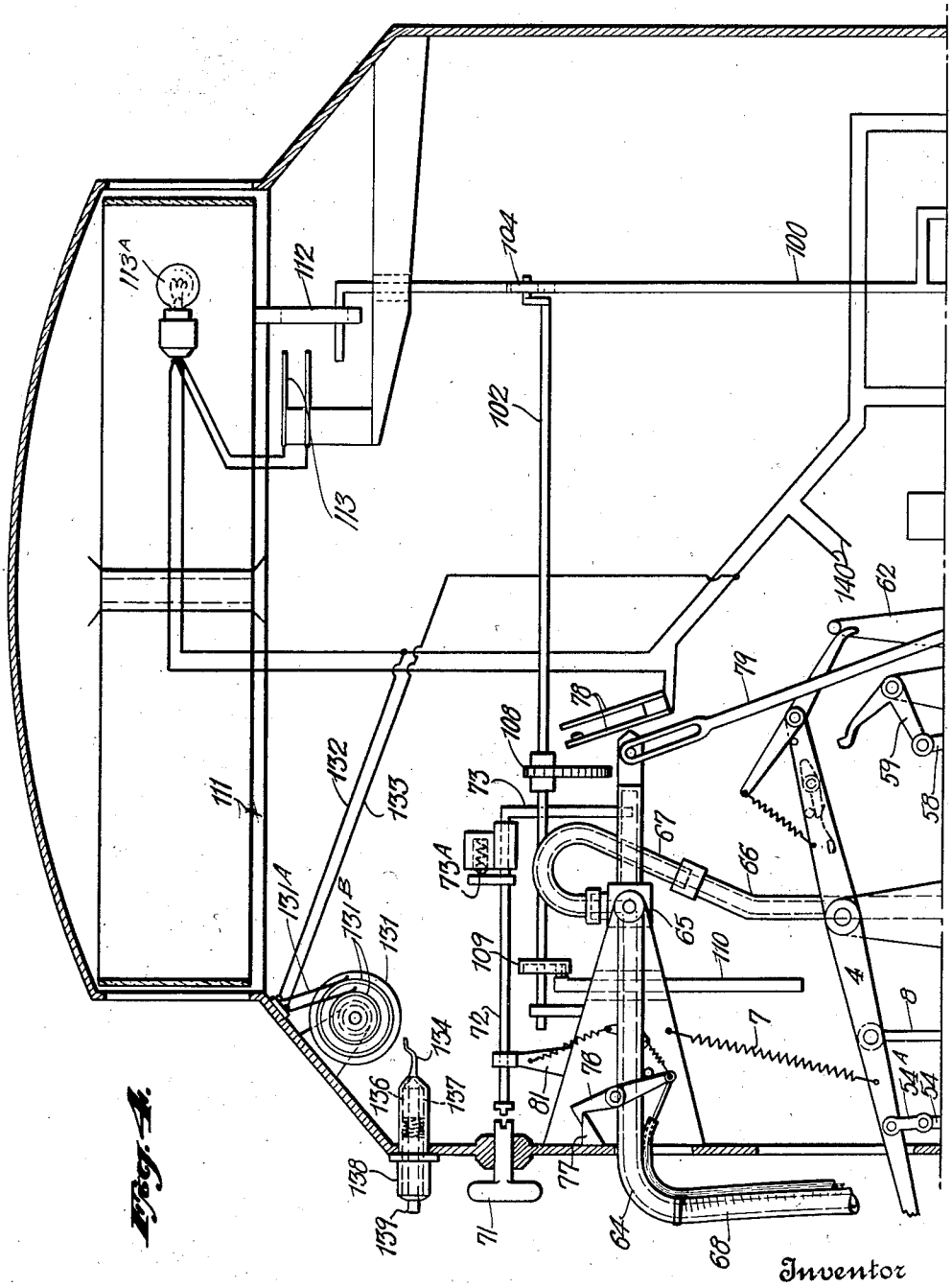


Fig. 4.

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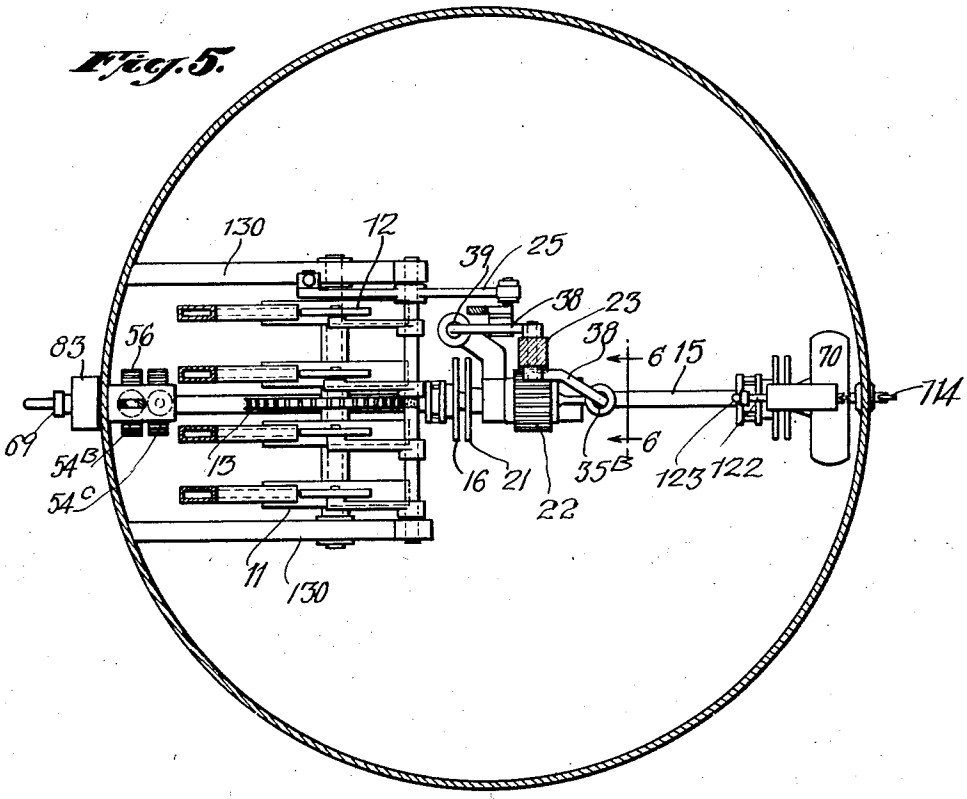
Irving L. McCathran.

Jan. 17, 1933. P. KRAUSE 1,894,275

LIQUID PUMP

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Fig. 5.



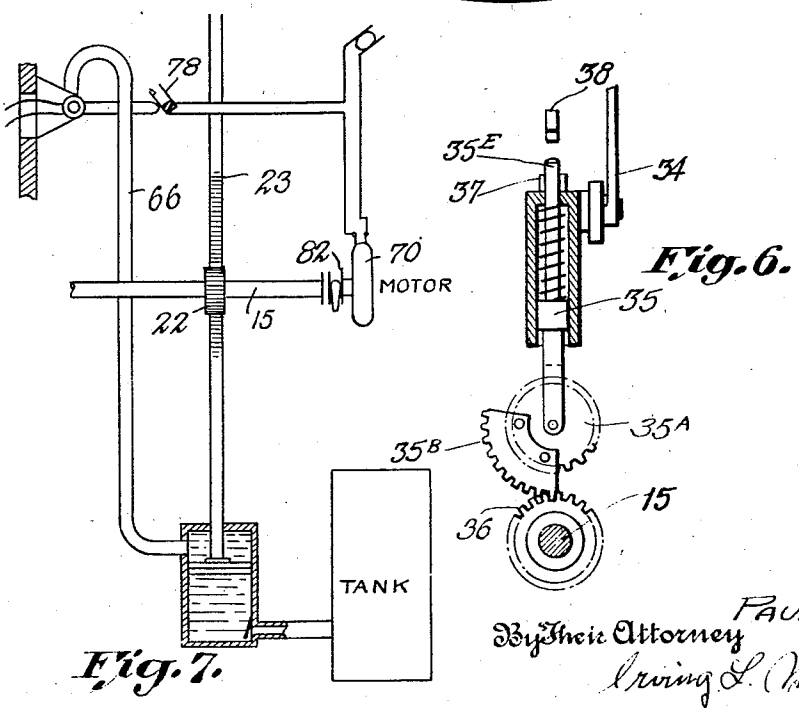


Fig. 7.

Fig. 6.

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Patented Jan. 17, 1933 1,894,275

UNITED STATES PATENT OFFICE

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

LIQUID PUMP

Application filed November 10, 1928. Serial No. 318,520.

This invention relates to liquid dispensing machines and in particular to one for automatically providing gasoline, lubricating oil, or the like to motor vehicles.

A particular object of the invention is to provide an automatic liquid dispensing machine which may be operated by hand or electricity and which will automatically measure and discharge the amount of liquid purchased, depending upon the number of coins and the denomination of same which are placed in the coin mechanism of said machine.

A further object of the invention is to provide an automatic machine of the character referred to which may be placed along a highway at points remote from the regular gasoline filling station which may be operated by the operator of an automobile for the filling of a gasoline tank or for the purchase of any amount depending upon the number of coins that the operator happens to have, the machine being adaptable to receive nickels, dimes, quarters and half dollars and if desired, silver dollars or other coin-like tokens.

A further object of my invention is to provide in a dispensing machine of this character, a means whereby the hand control of the machine as well as the electric control thereof may be regulated. Another means is provided whereby any number of different coins may be inserted in the different slots at the same time, the mechanism being automatically set by the coins so that a predetermined amount of fluid will be vended.

Another feature employed in the improved machine is an indicator for showing when the machine is empty, means also being employed for closing the entrance to the coin slot when the supply of fluid has been 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 prefered form has been annexed as a part of this disclosure and in such drawings, similar reference characters denote corresponding parts throughout all the views, of which,

Figure 1 is a view in front elevation illustrating my automatic liquid dispensing machine, a part thereof being broken away to show the coin mechanism.

Figure 2 is a section taken through a portion of the machine on the line 2—2 of Figure 1.

Figure 3 is a view similar to Figure 2 taken on the line 3—3 of Figure 1.

Figure 4 is a view similar to Figure 3 but taken on the line 4—4 of Figure 1.

Figure 5 is a section taken on the line 5—5 of Figure 1 and illustrating in top plan view, a part of the coin detecting mechanism.

Figure 6 is a section taken on the line 6—6 of Figure 2 and illustrates one of the control members.

Figure 7 is a diagrammatic view of the pump and discharge mechanism.

Referring to the drawings in detail, 1 indicates one of a number of coin slots, each of which is shaped to admit a different size of coin, such as a nickel, dime, quarter, half dollar or other coin of predetermined dimension. Any given number of coins may be inserted in each slot and any given number of different coins may be inserted in the different slots simultaneously. A counting gear is provided indicated by the numeral 2 which is arranged to lock its particular slot when the capacity thereof is reached. This counting mechanism includes among other things, a pivoted member 3 which is secured to the hook lever 4, said pivoted member bearing on a suitable wheel 3—A attached to a shaft 3—B upon which the counter wheel or gears indicated by the numeral 2 are carried see Figure 1. These counting wheels or gears 2 are revolvably mounted upon the shaft but are normally held from rotating relatively thereto through the medium of suitable friction disks 3—C which are secured to the shaft and have yieldable bearing arrangement with the gears. This revolving of the counting gear shaft is accomplished through the medium of the extended portion 3—D, provided at one side of the pivoted member 3 which is arranged to engage the wheel 3—A to turn all of the counter wheels against the actuating ratchet bars which act as stops in

addition to their normal function as will be hereinafter described.

The counting wheels or gears 2 are each moved a tooth at a time or any predetermined number of teeth by a corresponding ratchet bar 5 which is attached to its pivoted lever 6 whose depending end protrudes into the adjacent coin slot, the rack 5 being thereby moved upwardly by the inserted coin each engaging the depending end of lever 6 and the latter being returned to its coin slot engaging position again by a suitable spring attached to said lever 6.

This spring, connecting the ratchet bar 5 and the lever 6, holds the ratchet bar against the teeth of the counting wheels or gears 2. A suitable extension 5—A on the ratchet bar 5 is arranged to strike a pin 5—B upon completion of the downward movement of said ratchet bar to disengage the same from the counting wheels or gears 2, allowing the latter to be turned to their zero count position by the member 3, it being understood that when the hose is removed from the hook lever 4, the latter is pulled upwardly by the spring 7. The member 3 consists of a plate partitioned as at 3—H which is pivoted as at 3—D to the enlarged plate end of the rod 8 which, in turn, is connected to the hook lever 4. This plate end is provided with limiting pins and a suitable extension 3—E on the member 3 limits the pivotal movement of the latter. This extended portion of the member 3 is normally retained against the left hand pin by the spring 9 which connects the member 3 with the plate end of the lever 8. The angles of the compartments within the member 3 when it is normally in the position hereinbefore referred to, due to the connecting spring 9, maintain the guide pin 10 which is secured to a bracket 10—A above the right hand compartment of the member 3 and causes the guide pin 10 to travel down this right hand compartment on an upstroke of the lever 8, thus causing the extended portion 3—D of the member 3 to engage against the wheel 3—A fastened to the counting wheel shaft, the upward movement of the member 3 returning all of the counting wheels or gears to their zero position. When the counting wheels are moved the limit of their predetermined travel, the extension on the rack 5 or protruding tooth, as it might be called, comes into contact with a suitable pin carried on the bracket 10—A, thus preventing any further upward movement of said rack. This stop pin may be adjustably mounted in the bracket 10—A so that the limit of movement afforded the counting gears will be adjustable. Each of the counting gears are provided with an extension 2—G which is arranged to normally rest on top of the rack 5 but which in its furthest advance movement is arranged to engage the stop pin carried in the bracket 10—A and indicated by numeral 10—C. This contact stops the revolution of the gear further and, in turn, prevents operation of the rack 5 with the result that the extended portion of lever 6 cannot move out of the coin slot 1 when a coin is inserted. This arrangement locks the coin slot and prevents further insertion of the coin. There is one of these counter arrangements for each of the slots and the locking of one or more of the slots does not affect the others wherein the limit of coin insertion has not been reached.

When the member 3 has completed its upward movement and has set all the counting gears at zero, the pin 10 will have struck the angular bottom of the member 3 and the member 3 will be cammed over until the pin is in alignment with the left hand compartment 3—K thereof which arrangement will guide the member 3 away and clear of the counting wheels upon a downward movement of the lever 8 when the hose is again hung up upon lever 4 due to the fact that the pin strikes the partition plate 3—H and swings the member 3 toward the right. This movement of the lever 3 away from the counting gears, of course, leaves them in their zero position and ready for the insertion of coins in the slots. Should any of the counters not have been moved from their zero position when the member 3 in its upward movement, sets the counters at zero, no harm will be done as the counter gears are mounted between friction disks, as hereinbefore described, on the shaft to which the wheel is attached upon which the member 3 bears and which it turns backward in its upward movement.

Any number of coins may be inserted in any or all of the coin slots to their capacity, this capacity being varied, of course, to suit the particular machine from which the fluid is to be delivered.

Each coin slot leads into a separate coin pick-up disk 11, the disks or wheels, as they might better be termed, being mounted on a common shaft 11—A and each being housed in a suitable casing 11—B. Upon inserting one or more coins of single or mixed denomination, the coins drop down their respective coin slots 1 or chutes and on to the coin pick-up wheels 11, the coin pick-up recesses 11—C in the periphery of said wheels, are so spaced that no two coins will be picked up at once. The drive shaft 11—A of the coin wheels 11 has a spiral gear 13 attached at one end thereof which is driven by the gear 14 mounted on the pump drive shaft 15. On the pump drive shaft 15 is mounted the driving member 15—A, of the clutch 16, the latter being actuated by the spring 17 but positively operated by a clutch throw-out yoke 18 which is mounted on a suitable shaft which has keyed thereto, the clutch throw-out lever 19. On this clutch throw-out lever 19 is mounted

a catch 19—A which engages catch lever 20 which holds the clutch out of engagement with the driven member 21 of the clutch combination, the driven clutch member being part of a hollow shaft whereon is mounted the pump rack drive gear 22, said hollow shaft being journalled in suitable bearings disposed at either side of the lift pump rack 23.

After a coin is picked up by any of the coin pick-up disks or wheels 11, the rotation of the disk brings the coin into engagement with the rocker wheel 12 and the latter is lifted up by the coin and through the medium of the compound levers 24 and 25, operate the ratchet bar 26, the upper end of which is serrated and arranged to engage the ratchet tooth gear 28. This ratchet bar 26 in moving upwardly, leaves the ratchet bar throw-out stop 27, which is mounted upon the coin chute 1 and meshes with ratchet tooth gear 28 which, in turn, operates to move the pump stop rack 30 through the medium of the gear 29 which is mounted on a shaft common with the ratchet tooth gear 28 and indicated by the numeral 28—A. The moving to the left of the pump stop rack 30 brings the bevel stop 31, which is a part of said rack into engagement with the trip lever 32 which is mounted on one end of a plunger gear trip lever 33 and causes depression of the lever 32 which, being operatively connected to rod 34 through the medium of the lever 33 trips the plunger 35 and plunger gear 35—A and brings it into engagement with gear 36 which is mounted on the pump drive shaft 15. This plunger gear is illustrated in Figure 6.

The plunger gear 35—A has a high tooth segment 35—B which, after full revolution of the plunger gear 35—A, engages with the gear 36 and raises the plunger gear 35—A to its disengaged position as shown in Figure 6 thereby bringing the plunger rod 35—E which is attached to the plunger 35, into engagement with the rocker arm 38 which, in turn, depresses the plunger 39 which in its downward travel, disengages the catch lever 20 thereby releasing the clutch throw-out lever 19 and permitting engagement of the clutch and consequent operation of the pump.

This gear arrangement is for the purpose of permitting the pump drive shaft 15 to rotate and with it, the gear 14, without moving the pump rack until it has rotated the coin disks 11 until the latter are empty or partly empty of coins which actuate the pump stop rack. After the plunger rod 35—E has operated, it returns to its normal position and is engaged by the catch 37 and holds gear 35—A out of engagement with the gear 36 until it is tripped again. Upon the return movement of stop rack 30, the bevel stop 31 depresses the trip lever 32 and does not operate lever 33 or the mechanism connected therewith. The trip lever 32 is held in its operating position by the circular spring 40.

The stop rack 30 is provided on its upper side with the notches or serrations 30—A which are engaged by a ball spring detent 41—A. The notches are so spaced that each notch represents a distance of movement of the stop rack 30 from the pump rack stop 160 as the equivalent of the amount of liquid to be delivered for a coin. For instance in this case, it might be assumed that five cents is the basic unit and the distance of the rocker wheels 12 from the coin and the fulcrums of the levers operated by said rocker wheels permit travel of the stop bar 30 one notch to indicate five cents, two notches for ten cents, five notches for twenty-five cents and ten notches for fifty cents. After the stop bar 30 has travelled its limit, the bevel stop 31 also engages lever 41 and brings the same to bear on the ratchet bar 26, disengaging the latter from gear 28 thus preventing operation of the stop mechanism when the limit of the latter is reached. The lever 41 at the same time engages the lever 42 which is connected through the rod 43 to a throw bar 44 which moves the finger 45 which in turn, is attached to the shaft 45—E bearing the flipper angle piece 46 to move the same into engagement with the spring 47 in connection with which it is yieldably held in place until the coins which are left over after the preceding coins have operated the stop mechanism to its limit of movement rest thereon after coming down the chute 46—A. Any coins which may be in the slot when the total capacity of the machine for one operation is reached are shunted down chute 48 by the extended portion 46—B of the flipping angle piece 46 which is moved back to the position shown in Figure 2 by the return of the stop rack 30.

Upon the return of the pump rack stop 30, the projecting tooth 30—E at the right hand end thereof throws the lever 41 into its neutral position thereby releasing lever 42 which permits the throw-bar 44 to return to its normal or rest position and in so doing, it engages with the finger 45—A and brings the flipper piece 46 over the dead center and being over-balanced by the portion 46—B thereof, returns said flipper to its rest position against the stop 49 which also limits the clock-wise rotation of the flipper piece when the member 46—B is disposed across the vertical slot 46—A to deflect coins down through the chute 48 and into the exterior receptacle 48—A. A counting or registering arrangement 50 is provided having extension fingers which reach into the coin chute 46—A, each coin, of course, pressing one of the fingers and causing rotation of the member 50 which actuates any of the well-known commercial types of counters to record the number of

coins that pass through the tube 46—A and into the coin holding receptacle 46—C.

The hook lever 4 is provided on its outer end with the hose receiving hook as is usual in this type of construction, the hose being provided at its outer end with the usual nozzle 53 and the hook lever itself being arranged in neutral position when the hose end is hung thereon. The shaft 3—B upon which the counting gears 2 are mounted between friction disks, is itself, held by a friction disk 3—M which exerts a greater friction on the shaft than do the counter friction disks. This prevents the shaft from turning with the counters but does not prevent the shaft together with the counters from being turned backward or to zero by the wiping contact of the groove plate 3 on the wheel 3—B attached firmly to the shaft.

To the hook lever 4 is attached the rod 54 by a link 54—A which is located inside the pump housing. The lower end of the rod 54 is provided with an off-set 54—B which extends through a suitable slot in a housing 54—C secured on the inner wall of the pump casing. Within this housing 54—C, there is provided the plunger pawls 55 and 63, see Figure 2, the pawl 55 of which is arranged to engage a ratchet wheel 56 carried upon the shaft 15. This connection prevents the pump drive shaft 15 from being moved in clockwise direction until the hook lever 4 is released by the disengagement therefrom of the nozzle 53, such disengagement, of course, causing the upward movement of the rod 54 which slips the plunger 55 out of engagement with the ratchet wheel 56. On the rod 54, there is also provided a slotted portion 57 in which rests a pin 57—A that is fastened to a slide 58, the slide having a suitable pin and slot connection with the inside wall of the pump casing and being arranged to have vertical movement to the bottom of the coin chute 1 adjacent the entrance thereof, when the hook lever 4 and the rod 54 move upwardly.

When the long end of the hook lever 4 travels upward, the short end moves down and releases the pump rack stop 30 as well as the lock plunger 55, just referred to. Now upon inserting a coin or coins, the machine can be operated, the clutch 16 being tripped which causes the clutch lever 19 to travel downward. This moves the rod 58 and lever 59 and the latter is then above and in the path of the catch 60 on the hook lever 4. The hanging up of the hose 68 by its hook 84 on the hook end of the lever 4 causes the downward movement of the long end of the hook and the upward movement of the short end. The catch 60 on its short end engages the free end of the lever 59 throws the clutch and hooks it out of engagement on the catch lever 20. At the end of the upward travel of the short end of the hook lever 4 and after the clutch is disengaged, the arm 61 attached to the short end of the hook lever 4 engages the finger 62 which is attached to pump rack stop 30 and forces the latter back to its original position in which position, the pump rack cannot be moved upwardly. Use is made of suitable springs to hold the various levers, catches and push rods in operating position as illustrated and in view of the fact that these are mechanical expedients, it is not believed that any detailed mention need be made thereof.

The plunger 63 within the housing 54—C and before referred to, prevents the pump drive shaft from turning in a counter clockwise direction at all times and of course prevents the pump rack from moving downward when the clutch is engaged and the pump is in operation. In supporting the hose in proper relation to carry out certain features in my invention, I have provided a pipe 64 which is pivoted in bearing 65 and which bearing has a feed pipe 66 attached thereto, and through connection with the flexible hose 67, allows the pipe 64 to move freely up and down. On the long end of the pipe 64 is attached, also, a discharge hose 68 and a nozzle 53 see Figures 3 and 4.

It is to be understood that the pump and all of the mechanism can be operated either by hand through the crank 69 or by the electric motor 70. If the pump or vending machine is to be operated by hand, then the key 71 is moved inwardly to engage and is turned to rock the rod 72 which, in turn, moves the cam lever 73 attached thereto over the short end of the pipe 64 and locks the latter in the position illustrated in Figure 4. The cam 73 is held in position by the ball detent 73—A associated therewith.

If the pump or vending machine is to be operated by electric motor 70, then the key 71 is turned in the opposite direction to move the cam 73 out of the way of pipe 64 to permit the latter to be moved up and down which operates the mechanism about to be described.

After a coin or coins are inserted into the coin slot or slots, (it of course being understood that a single coin or any number of coins may be inserted into one or all of the coin slots), the hose 68 is taken off the hook lever 4 and the nozzle 53 is inserted into the gasoline tank of a car or any other receptacle. The lever 74 mounted on nozzle 53 is then depressed and through the medium of the Bowden wire 75, operates the catch lever 76 which is movably fastened to the pipe 64 and hooks on to a stationary catch member 77, thus permitting the pipe 64 to be pulled downward about its pivot point, as hereinbefore described. As the pipe 64 is pulled downwardly, the end thereof, which is beyond the pipe bearing 65 moves upward and in so doing, closes the switch 78 which completes the motor circuit as the switch 52 has

been previously closed in a manner hereinafter to be described. The upward movement of the end of the pipe 64 also pulls up the rod 79 which connects the pipe 64 with the motor clutch 82 through the medium of the lever 80 so that the clutch faces 82 are brought into contact with each other and thus operatively connect the motor 70 and the pump drive shaft 15.

If the receptacle should become filled before the mechanism stops, then releasing the hose 68 will permit the pipe 64 to be pulled up by the spring 81 and the return of the free end of the pipe 64 beyond its fulcrum point, renders the clutch inoperative as well as cutting off the power from the motor by opening the switch 78 with the result that the flow of gasoline or liquid stops, because the pumping action has ceased.

When the machine is operated by the motor, the crank 69 is removed by unscrewing the cap 83 and a closed cap is screwed in its place and locked. Suitable means for locking either cap are provided as at 83—A, the crank 69 being held in its normally declutched position from the end of the shaft 15 through the medium of the suitable spring arrangement 83—B.

The pump drive shaft on which the driving clutch member 16 and driving clutch member 82 of the motor is mounted, passes through the hollow shaft 15—A whereon the driven clutch member of the pump drive gear 22 is mounted, it of course, being understood, that this pump drive gear 22 does not operate unless either one of the clutches is engaged to their respective mating members, and has a ratchet return movement to permit gravity return of the lift pump rack 23 under the influence of the weight of liquid in the pump cylinder, (not shown).

An object of my invention is to provide a mechanism for locking the machine when the contents thereof have been exhausted, means being also employed for informing the public of this condition and in order to carry out this object, I employ on the shaft 15—A upon which the pump drive gear 22 is mounted, an extension 85—A which is arranged to engage a suitable escapement wheel or gear 85, which is in turn, mounted on a stud shaft supporting another gear 86, there being provided a ratchet attachment between the gear 85 so that the gear 86 is moved in one direction only, regardless of the direction of the movement of the gear 85. The gears 85, 86 are mounted on a suitable shaft which is journalled in a depending portion 22—B which is cast integral with the bearing 22—C in which the shaft 15—A is journalled. The gear 86 cooperates with a gear train 86—A which operates the shaft 87, on the latter of which is mounted, the cam 88 whose high portion is arranged to engage the rod 89. This rod 89 is of course, held in a suitable bearing and is provided at its upper end with a bevelled projection 90 which engages into the slot of a catch 91 which, when operated, trips the push rod 92, the latter being actuated by a spring to bear down upon the rocker arm 92—A and force the same against the stop rack support 93 attached to the pump rack 23. The rocker arm 92—A is held in neutral position by the counterweight which is cast integrally with its left end as at 92—E, neutral position being that position in which the right hand end of the lever 92—A beyond its point of fulcrum is brought up against the pin 94.

As the pump stop rack 23 and rack support 93 attached to the same, move upwardly, the pressure of the push rod spring now bearing through the push rod 92 on the rock arm 92—A forces the latter to follow the upward movement of the pump rack 23 and stop rack support 93 until the right end of the rocker arm 92—A rests on the pin or stop 95 against which it remains until the return of the pump rack 23 and stop rack support 93 which, in their downward movement, depress the left end of the rocker arm 92—A causing the right end thereof to travel upwardly to push the push rod 92 up to engage the sliding lock 96. This sliding lock 96 is moved through the medium of a finger 97 which is pivotally held in a slotted portion of the push rod 92 and is operable only against the lock 96 upon an upward movement of the rod 92. This finger 97 moves out of the way of the sliding lock 96 on a downward travel of the push rod 92. In the upward movement, however, of the push rod 92 when the lock 96 is moved back against its actuating spring, it disengages the main spring rod 98 which permits actuation of the main spring 99 to move the rod 98 upwardly. This rod is rigidly secured to the rod 100 and the latter is connected to the rods 101 and 102 through the medium of the groove plates 103 and 104 respectively, the plates being attached to the rod 100 and being in the nature of cam plates which operate the eccentrically turned ends of said rods 101 and 102. Actuation of these plates impart a radial movement to the rods 101 and 102. The rod 101 is provided at one of its ends with a groove plate 105 which actuates a coin slot lock slide 106 which is concealed beneath a rain shed 107 provided on the outer surface of the pump casing, this slide 106 acting to lock the coin slot and bearing the suitable wording "Empty" or the like, in order that the buying public can be informed for the reason for the locked coin slots. The rod 102 has also a crank on its right hand end which is actuated by the grooved plate 104 on the rod 100 which turns the rod 102 a part of one revolution in the opposite direction to the turning movement of rod 101. The opposite end of the rod 102 is provided with a cam 108 and also with a grooved cam plate 109. The

turning movement of the rod 102 moves the cam 108 into position over the right end of the pipe 64 and locks the latter, preventing operation thereof. The grooved plate 109 is moved at the same time and being engaged with the push rod 110, moves the latter downwardly to engage the hook lever 4 locking the same. The upper end of the rod 100 is operatively connected to the drum 111 through the medium of the groove plate 112 which depends from said drum 111 and in which the offset end of the rod 100 moves upon an upward movement of the rod to rotate the drum 111 a part of a revolution. This drum 111 is provided with alternate open and closed spaces on its face, in the nature of a stencil which brings into the closed spaces bearing the inscription "Empty" into view. Corresponding stencil-like openings are provided in the machine housing. At the same time the offset end of the rod 100 moves upwardly, it comes into contact with the switch 113, closing the latter and lighting the electric light 113—A which illuminates the "Empty" sign.

In order to set the machine in operation again, the key 114 is inserted into the lock 115 and meshes with the end of rod 116 which is normally held out of engagement with the key through the medium of the spring 117. A push on the key 114 connects the rod 116 with rod 87 to which the registering gears and cam 88 are attached and by turning the cam 88 over until the high point thereof is out from under the rod 89, the latter comes to rest on the low portion of the cam being moved downwardly by the spring 118 and the high point of the cam is in the position it normally occupies at the beginning of its travel. As the rod 89 moves downwardly, it disengages the bevel 90 from the catch 91 and the latter is forced by spring 114 into the catch of the push rod 92 holding the latter in neutral position when the pump rack 23 and stop rack support 93 are moved upward. Up until this time, the push rod 92 has been held in neutral position by the rocker arm 92—A through the downward pressure of the stop rack support 93 resting on said rocker arm.

Now, upon inserting bar key 120 into lock 121 and engaging the key 120 with the crank bar 122, which, by the way, is connected to the lower end of rod 123, the upper end of said rod being movably connected to the main spring rod 98; and turning the bar key 120, the main spring 99 is compressed and the slide catch 96, being held by a spring in the back of the slide catch, in contact with the main spring rod 98, enters the notch in the latter and holds the main spring in this position until it is released again.

The rod 100 is pulled back also by the foregoing action and operates all mechanism attached thereto in reverse manner and puts the machine in its operating condition again.

Key 114 has a pointer 124 attached to it which points to a scale 125 provided on the pump housing which is marked in gallons to show the capacity of the machine. This enables the cam 88 to be set to the amount contained in the machine at the time of the setting of the same during the refilling operation and it also can be used as a check-up when inspecting a machine to determine the number of gallons that have been used at any time.

On the shaft 87 is also attached the gear 126 which meshes with gear 127 which, in turn, is attached to the shaft 128, the latter engaging in a gear train 129 which is encased in a suitable housing and which indicates the total amount of liquid dispensed and also the amount at each operation. The indications made by the indicator may be carried out through the medium of a series of counting wheels which are suitably attached to the gears and the construction of this mechanism, it is believed, need not be considered in detail at this point as any suitable commercial counting mechanism may be employed.

It is to be understood, of course, that the machine may be operated electrically without using the mechanism connected to and operated by the pipe 64 and in this connection, a reel 131 is employed having wound thereon a double wire drop cord, this reel being electrically connected to the cord through the medium of the two flat spring contacts 131—A which bear on the two insulated rings 131—B which are mounted on the outside of side disks of the reel 131. From the attached end of said spring contact, two wires 132 and 133 continue the circuit, the wire 132 connecting the minor side of the line from the inlet while the wire 133 connects the plus side of the circuit between the switch 78 and the switch 52. Neither of the motor circuits will operate before switch 52 is closed. The free end of the drop cord 134 is connected to the two switch blades 136 and 137 within the plug 138 wherein plunger 139 is mounted and held in neutral position by a suitable spring employed for that purpose. By pulling the plug 138 out of its socket in the pump housing, the cord is pulled with it and when taken the desired distance, for instance, to the gas tank of an automobile to be filled, then by pressing in on the plunger 139, the latter slides between the two switch blades 136 and 137 and completes the circuit, providing coins have been inserted and the switch 52 is closed by the arm 6 which protrudes into the coin slot 1. The two electric wires leading from the switch 52 are joined to the circuit through the medium of the wires 140 see Figure 4, these wires not being shown completed through to the switch 52, in order to avoid confusion in the illustration.

Switch 52 is operated by the arm 6 which

has a bevelled end bearing against the offset end of switch lever 51 and when the front end of arm 6 which protrudes into the coin slot is raised by the inserted coin, the rear end of the arm 6 moves downward and in pushing switch lever 51 out of its way of travel, moves the upper end of the switch lever 51 on to the two switch points of the switch 52 and closes the circuit. The strip of material which bridges the two contact points on switch 52 is necessarily insulated from the switch lever 51. The switch is thrown in its "off" position by the arm 140—A and rod 54 after the machine has dispensed the amount of fluid purchased. The rod 54 being connected to the hook lever 4, is moved downward when the hose is replaced on the hook lever and in moving downward, the bevel 141 comes into contact with the left end of arm 140—A which is particularly shaped and by depressing the left end of the arm 140—A, the right end of said arm 140—A is brought to bear on the lower end of the switch lever 51, moving the same off the contacts and into the path of the arm 6, which movement leaves it in a position to operate again upon the insertion of coins.

As the bevel 141 on the rod 54 bears down on the left hand end of the arm 140—A and moves the latter through its useful distance, the lower portion of the arm 140—A abuts the stop pin 142 and as the arm is of spring steel, it yields and permits the bevel 141 on rod 54 to slip past and the arm 140—A is moved clear of the switch lever 51 by the spring attached to said arm.

The contact point of the left end of arm 140—A is now above bevel 141 on rod 54 and as arm 140—A must not be moved on the upward movement of the rod 54, the left portion of arm is so shaped that it will yield to the pressure of bevel 141 and permit the latter to be slipped past without moving the arm 140—A as the latter is resting against the stop pin 143 which prevents the upward movement of the arm 140—A.

After coins are inserted and the hose 68 is taken from the hook lever 4, and the latter has travelled upwardly and pulled up rod 54 which is attached thereto and upon the upward movement of the rod 54, lever 145 is released and is pushed downward by the spring 146 which causes ratchet bar 147 to bear on and catch the lever 148, lever 144 is moved downward until lever 148 is locked in the catch of the ratchet bar 147. Lever 148 is connected through a rod with the lever 149 which, in turn, is connected to the slotted end of the rod 150 which is fastened to the spring housing 151, wherein the disk end of the rod 152 is held by spring 153, the latter acting as a yielding medium between the rod 150 and the rod 152, said rod 152 being connected to the motor clutch arm 80. By moving the lever 144 and thereby moving all of the parts connected thereto, the motor clutch is engaged and as the spring 153 is sufficiently compressed and the mechanism locked in operating position by the ratchet bar 147, the machine will operate upon the closing of the circuit in the plug 138.

After the machine has operated and the rod 54 is moved downward by the hook lever 4, when the hose is hung up on the latter, then the end of the rod 54 presses down on lever 145 which trips the ratchet bar 147 releasing lever 148 and all of the mechanism attached thereto, which of course, makes the motor clutch 82 inoperative. The rod 79 which is connected to the motor clutch throw-out arm 80 and pipe 64 has a slotted upper end and moves freely when the clutch is operated from the lever 144.

Referring to a detailed operation of the stop rack, it will be noted that on the front side of the stop rack support 93, is attached a narrow rack 160 which is movably fastened through a pin and slot connection R to said stop rack support 93. The teeth on the rack 160 are the same shape as the teeth on the stop rack support 93 but the spring 162 bearing against the movable rack 160 and the fixed spring support on the stop rack support 93, presses the rack 160 which slides in the groove 163 located at each end upward just far enough so that the teeth on the rack 160 protrude above the teeth on the stop rack support 93 and when the stop rack support 93 moves against the sliding stop bar 30, then the teeth on the rack 160 are moved down and even with the teeth on the stop rack support 93 and in so doing, the rack 160 moves down and stop 165 attached to the rack 160 moving downward, breaks the contact of the switch 163 which stops the motor when the stop rack support 93 abuts the sliding stop bar 30.

It is quite evident that in a machine of this character that any number of coin slots or disks may be employed and operating levers used in connection with each.

It is also evident that other means may be employed for indicating that the pump is empty, if desired.

It is evident, therefore, that I have provided an automatic liquid dispensing machine which may be operated by hand or by electricity and which will automatically measure and discharge the amount of liquid purchased, depending upon the number of coins and the denomination of the same which are placed in the coin slot.

It is further evident that I have provided in a dispensing machine of the character referred to, a means for indicating when the machine is empty and also a means for closing the entrance to the coin slot when the supply of fluid has been exhausted.

While I have illustrated and described my invention with some degree of particularity,

I realize that in practice various alterations therein may be made. I therefore reserve the right and privilege of changing the form of the details of construction or otherwise altering the arrangement of the correlated parts without departing from the spirit of the invention or the scope of the appended claims.

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

1. In a liquid pump, a shaft a motor for operating the shaft, a pumping rack, a pinion on the shaft for moving said rack, a toothed member yieldably mounted on the pumping rack, a switch normally maintained in closed position by the toothed member, a motor circuit of which said switch and motor form a part, a stop member movable into the path of and arranged to actuate the toothed member for breaking the motor circuit at a predetermined time and means for moving said stop member into the path of the toothed member a predetermined distance.

2. In a liquid pump, a pivotally mounted filling pipe, a pump rack for discharging the pump contents through the pipe, a shaft operatively connected to the rack, a motor, a clutch for connecting the motor and the shaft, and a link connecting said pipe and clutch for moving the clutch to operating position upon a pivotal movement of the pipe.

3. In a liquid pump, a pivotally mounted filling pipe, a pump rack for discharging the pump contents through the pipe, a shaft operatively connected to the rack, a motor, a clutch for connecting the motor and the shaft, a link connecting the clutch with said pipe for moving said clutch to operatively connect the motor and shaft upon a pivotal movement of said pipe, and means for manually controlling said clutch.

4. In a liquid pump, a pumping member, a pivotally mounted liquid discharge pipe, a circuit completing switch operable upon a predetermined movement of said pipe, a motor in the circuit for operating said pumping member, and means for controlling the movement of the pipe.

5. In a liquid pump, a movable pumping member, means for operating said member including a motor, a motor circuit, a rack depressibly mounted on the member, a switch normally held closed by said member in its non-depressed position, said switch being disposed in said motor circuit, and means for depressing said rack to open said switch at a predetermined point in the travel of said pumping member.

6. In a liquid pump, a pumping member, a liquid discharge hose, a pivoted arm upon which the end of the hose is hung, an operating shaft, a gear connecting the shaft and the pumping member, a motor for driving said shaft, a clutch for operatively connecting the gear and the shaft, and a lever arranged to be engaged and moved by said arm for operating said clutch.

7. In a liquid pump, a pumping member and a liquid dispensing member, a motor circuit, a lighting circuit, a light switch, a motor switch arranged to be engaged by said dispensing member for breaking said motor circuit at the end of a dispensing operation, and means including a rod movable endwise for engaging said light switch for completing said lighting circuit upon exhaustion of the pump content.

8. In a liquid pump, a pumping rack, a drive shaft, a pinion on the shaft for moving said pumping rack, a toothed stop rack movably mounted on the pump rack, a switch normally maintained in closed position by said stop rack, a motor, a motor circuit of which said switch forms a part, a stop member and means for moving said stop member into the path of said toothed stop rack for breaking the motor circuit at a predetermined time.

9. In a liquid pump, a pumping rack, a liquid discharge hose, a drive shaft, a pinion on the shaft for moving said pumping rack, a toothed member movably mounted on the pumping rack, a switch normally maintained in closed position by said toothed member, a motor, a motor circuit of which said switch forms a part, a stop member movable into the path of said toothed member for breaking the motor circuit at a predetermined time and stopping the pumping rack, and a coin controlled means for moving said stop member a predetermined distance.

10. A pump of the character described, a pump rack, a motor, an operating shaft, a gear on the shaft for actuating said rack, a clutch connecting the shaft and the motor, a filling hose, a pipe to which said hose is connected, said pipe being pivoted within the pump housing and a connection between the pipe and the clutch whereby the latter is manipulated upon a pivotal movement of said pipe.

11. In a pump of the character described, a pump rack, a motor, an operating shaft, a gear on the shaft for actuating said rack, a clutch connecting the shaft and the motor, a filling hose, a pipe to which said hose is connected, said pipe being pivoted within the pump housing, a connection between the pipe and the clutch whereby the latter is manipulated upon a pivotal movement of said pipe and a key operated cam member for preventing pivotal movement of said pipe.

In testimony whereof I affix my signature.

PAUL KRAUSE. [L. S.]