April 2, 1929. M. W. FELVER ET AL 1,707,462

LIQUID DISPENSER

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Fig. 9

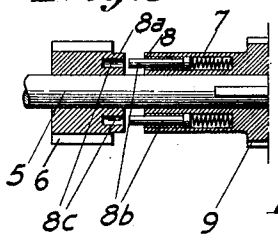


Fig. 1

Fig. 5

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LIQUID DISPENSER

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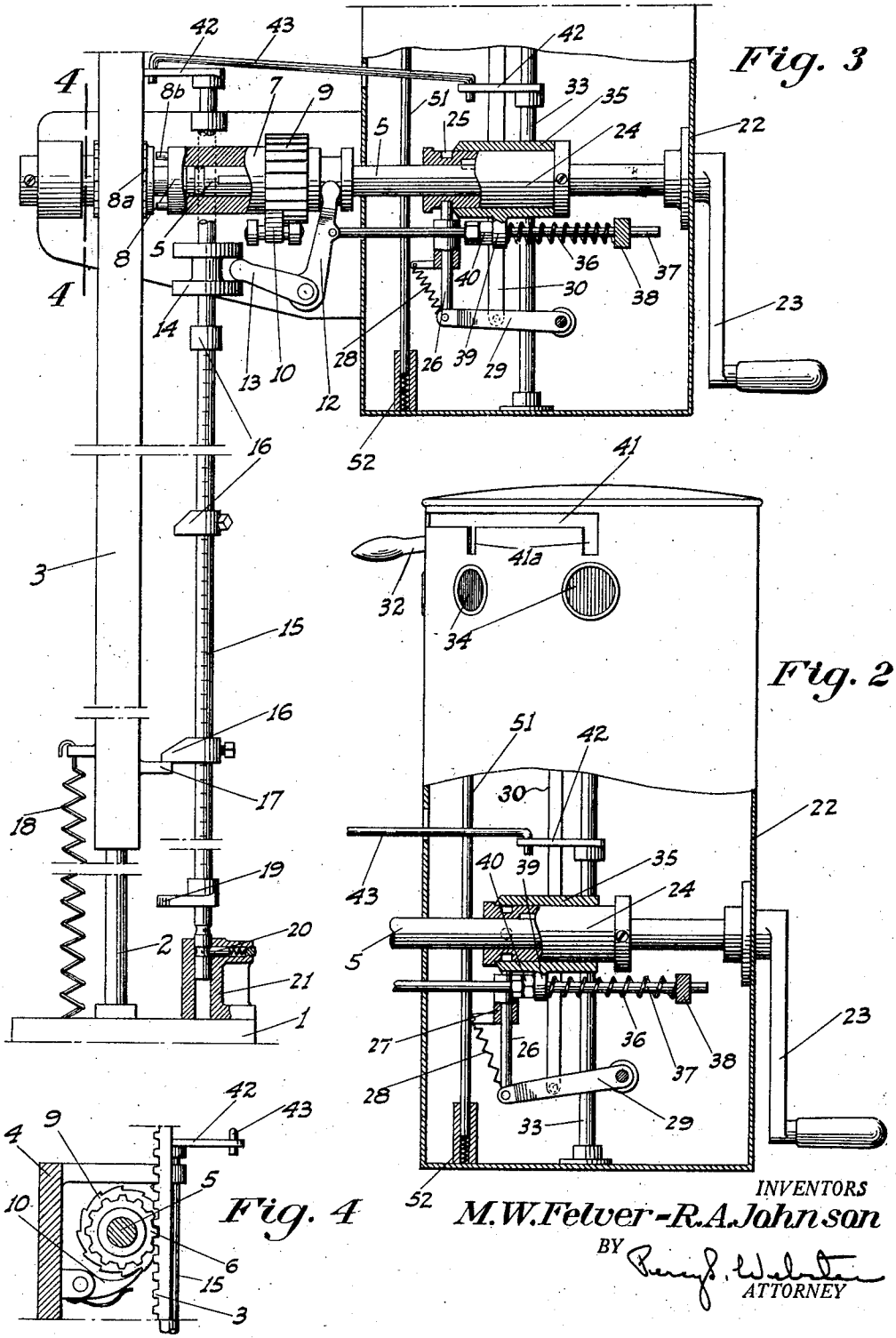


Fig. 3

Fig. 2

Fig. 4

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LIQUID DISPENSER

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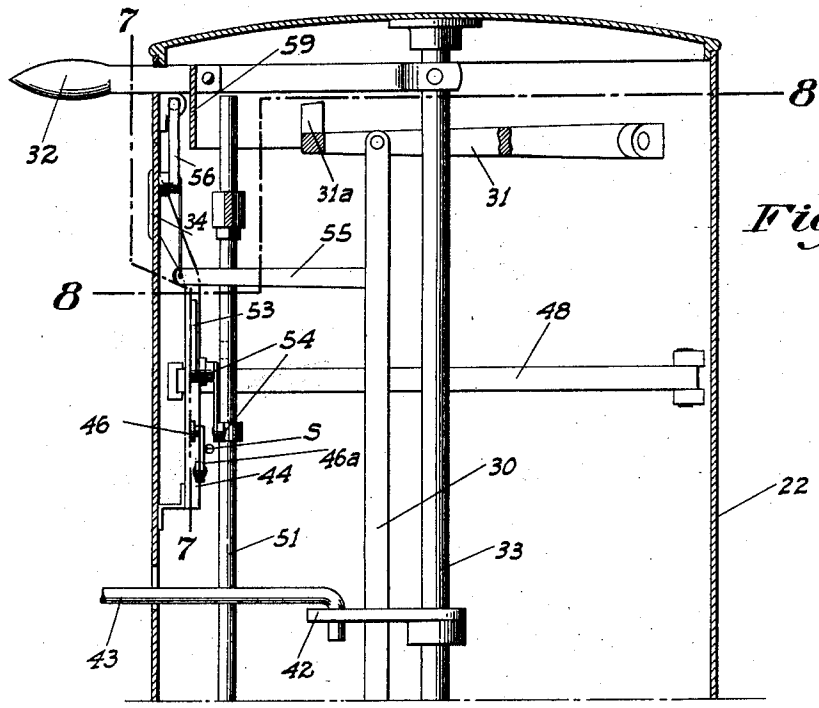


Fig. 6

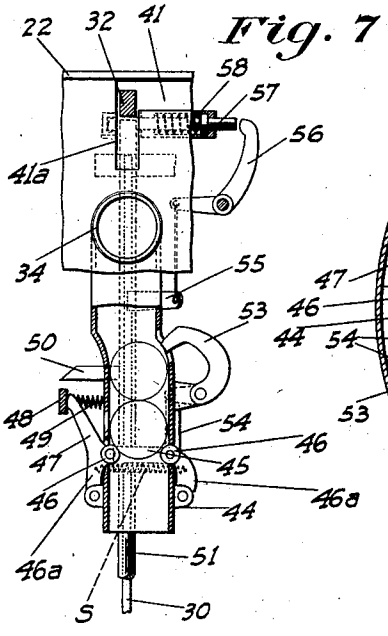


Fig. 7

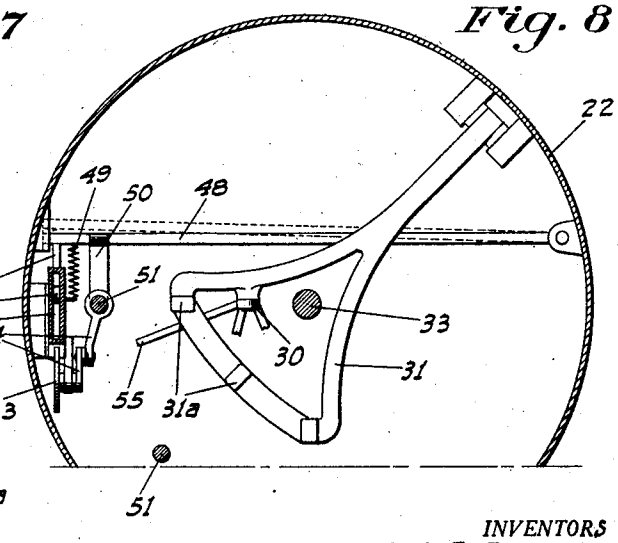


Fig. 8

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UNITED STATES PATENT OFFICE.

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LIQUID DISPENSER.

Application filed December 14, 1926. Serial No. 154,682.

This invention relates to liquid dispensing apparatus, and particularly to one especially intended for dispensing gasoline from the usual rack and pinion type pumps such as are commonly mounted in service or filling stations for this purpose.

The principal object of our invention is to provide an apparatus for enabling the pump to be operated, to dispense gasoline, only after a coin of any certain value has been deposited in the apparatus, and to provide means whereby the size and value of the coin will control the extent to which the pump may be operated. In this manner a definite relation is always maintained between the value of the coin and the volume of gasoline dispensed.

A further object of the invention is to provide simple adjustable means for enabling the extent to which the pump may be operated after the insertion of any certain coin, to be readily altered, so as to allow for any fluctuation in the price or lower value of the product, and thus insure that the user will obtain just the right quantity of gasoline for his money at all times regardless of any change in unit price of the fuel.

The apparatus may be operated by any person without experience and may therefore be installed in any location, to take the place of an attendant to dispense the fuel, or as an auxiliary pump in a manually operated pump station, to be used by any individual motorist when the station is closed and the attendant is absent, and the manually operated pumps are disconnected or locked up.

A further object of the invention is to produce a relatively simple and inexpensive device and yet one which will be exceedingly effective for the purpose for which it is designed.

These objects we accomplish by means of such structure and relative arrangement of parts as will fully appear by a perusal of the following specification and claims.

In the drawings similar characters of reference indicate corresponding parts in the several views:

Fig. 1 is a sectional elevation of the rack pinion operating and control parts of the apparatus shown in their normal or non-operating positions.

Fig. 2 is a similar view of a portion of the control apparatus showing the parts as in position after a coin has been deposited and the lever has been depressed, to release the operating crank and enable the same to be rotated.

Fig. 3 is a sectional elevation of the operating and control structure showing the positioning of the parts after the pump has been operated to dispense a certain quantity of gasoline.

Fig. 4 is a fragmentary cross section on the line 4—4 of Fig. 3.

Fig. 5 is a top plan view of the initial movement and stop setting control lever and the stop members associated therewith, shown as a detached unit.

Fig. 6 is a sectional elevation of the coin controlled structure of the apparatus.

Fig. 7 is a fragmentary vertical section on the line 7—7 of Fig. 6.

Fig. 8 is a transverse section on the line 8—8 of Fig. 6.

Fig. 9 is a sectional elevation of a clutch structure.

Referring now more particularly to the characters of reference on the drawings, the numeral 1 denotes the barrel of an ordinary vertical gasoline pump, whose piston rod 2 is connected to a vertical rack 3. Adjacent the top of the rack when the latter is in its lowermost position is a support 4 turnably mounted on which is a horizontal shaft 5. Turnably mounted on the shaft is a pinion 6 constantly meshing with the rack. Slidably splined on the shaft is a sleeve 7 having at one end a clutch element 8 normally engaging a cooperating clutch element 8^a on the pinion. For reasons hereinafter set forth, the clutch features of element 8 comprise longitudinal spring pressed pins 8^b limited in their outward movement, and normally seated in sockets 8^c in the element 8^a, as shown in Fig. 9. A ratchet wheel 9 on the sleeve engages a pawl 10 mounted on the support 4, and prevents rotation of the shaft 5 and connected parts except in one direction. A yieldable lock or catch structure 11 between the sleeve and shaft serves to hold the sleeve in either its clutch engaging or disengaging positions.

The sleeve 7 is engaged by a shifting fork 12 mounted on the support 4, the fork having a horizontal arm 13 mounted in connection therewith. The outer end of the arm is engaged by a grooved collar 14 which is mounted on a rotatable and longitudinally movable rod 15 disposed adjacent and parallel to the

rack. This rod has a plurality of vertically spaced and circumferentially offset stop members 16 projecting radially therefrom, any one at a time of said stop members being set to face the rack by means of a control structure hereinafter described. Such stop member will then be in position to be engaged by a fixed stop 17 projecting laterally from the rack after the latter has moved upwardly a certain distance. Upon the engagement of the stop 16 by the stop 17, the rod 15 and collar 14 are raised, which operates the shifting fork to cause the sleeve 7 to be retracted and the clutch elements between the sleeve and pinion to be disengaged.

The pinion is then free of the shaft, and a further rotation of the shaft will not effect a further rotation of the pinion or an upward movement of the rack. It will of course be evident that if a lower stop 16 is engaged by the stop 17 the rack will lift a lesser distance, before the clutch is thrown out, than if an upper stop is engaged, and consequently a lesser amount of gasoline will be dispensed from the pump. The pinion being free of the shaft the rack is then free to return to its lowermost and normal position, either of its own weight or with the aid of a spring 18. As the stop 17 approaches its lowermost position, it engages a stop 19 on the rod 15 under the stop 17, so that said stop 19 and consequently the rod 15 will be lowered to their originally positions. This causes the collar 14 to act on the shifting fork and move the sleeve 7 into its original communicating relationship with the pinion, ready for another dispensing operation. The yieldable clutch pins 8^b enables the downward movement of the rod 15, and the consequent shifting of the sleeve 7, to take place when the stop 17 engages the stop 19 with the downward movement of the rack even if the pins are not at first lined up with their respective sockets in the element 8^a. A yieldable lock structure 20 is arranged between the rod 15 and one of its bearing members 21 to hold it in either its upper or lower position.

The shaft 5 projects through a preferably cylindrical casing 22 which is disposed beyond the sleeve 7, the corresponding end of the shaft having a crank handle 23 thereon, whereby the shaft may be readily turned. Keyed onto the shaft inside the casing is a sleeve 24 having adjacent one end a plurality of circumferentially spaced sockets 25. A vertical pin 26 slidable in a bearing 27 in the casing below the sleeve, normally engages the lowermost socket, being held in such engagement by a spring 28; these parts forming a latch structure normally preventing the rotation of the member 24 and consequently of the shaft 5. The lower end of this pin is pivoted on a horizontal arm 29 pivoted in the casing, the arm being connected to a vertical rod 30 which extends upwardly to a connection with a horizontal arm member 31. This member is pivoted at one end in the casing adjacent the upper end of the latter (see Figs. 6 and 8), such connection being had adjacent the free end of the member 31. This arm member is adapted to be depressed so as to lower the rod 30 to depress the arm 29 to move the pin 26 clear of the socket, by means of a horizontal lever 32 pivoted with a transverse axis onto a central shaft 33 turnably mounted in the casing. This lever, while freely rotatable with the shaft, cannot, however, be depressed until a coin of proper size and value is inserted in any one of the different sized coin openings 34 provided in the casing for that purpose. The particular coin control mechanism we employ is described later. It will be seen, however, that until such coin is deposited, the pin 26 will remain engaged with the socket 25, and the crank-handle 23 cannot be rotated to turn the shaft and pinion and raise the rack.

Slidable on the sleeve 24 is an outer sleeve 35, constantly pressed toward the pin 26 by a spring 36. This spring is mounted on a rod 37 which at one end is attached to the fork 12 and at the other end is slidable through a bearing 38 fixed in the casing. This spring is disposed between said bearing and a lug 39 depending from the sleeve 35, and is also slidable on the rod 37, thereby preventing rotation of the sleeve. By means of this arrangement it will be seen that as soon as the pin 26 is depressed clear of a socket 25, the sleeve 35 will move to cover the socket, preventing return of the pin to an engaged position with said socket, and permitting the crank-handle and connected parts to be rotated to cause the rack to be lifted and gasoline dispensed from the pump.

The lug 39 then abuts against a stop in the form of adjustable nuts 40 mounted on the rod 37. Then when the shifting fork is moved to a clutch disengaging position, as previously described, the stop 40 will press against and move the lug 39 to its original position, so that it will clear the socket and allow the pin to again move up into engagement with whatever socket in the sleeve 24 is then alined with the pin. The shaft 5 and the corresponding handle are then again locked from rotation and can only be freed upon the insertion of another coin to enable the rod 30 to be again depressed to release the pin 26.

The lever 32 is free to turn with the central shaft 33 at any time, through a circumferential slot 41 in the casing, so as to aline said lever with any one of the vertical slots 41^a in the casing provided above the corresponding coin openings 34 and communicating with the slot 41. This movement causes the corresponding stop 16 on the rod 15 to be positioned relative to the stop 17 on the rack so that the latter can rise to an ex-

tent which depends on the value of the coin deposited in the corresponding coin opening. This is accomplished by means of radial and parallel arms 42 fixed on the shaft 33 and rod 15, which arms are coupled by a link 43. The circumferential spacing of the stops 16 is the same as the circumferential spacing of the slots 41ª in the casing, so that the proper one of said stops will be lined up with the stop 17 when the lever 32 is lined up with a corresponding slot 41ª. The rod 15 is suitably graduated for practically its entire length, in any suitable units of measurement, so that the stops can be easily and accurately adjusted on the rod to different longitudinal positions as the price of the gasoline fluctuates.

Any suitable coin control mechanism may be used for controlling the depression of the lever 32. We preferably provide a mechanism for the purpose constructed as follows:

Leading downwardly from each coin opening 34 is a vertical coin chute 44, just the sufficient width to readily allow a coin of certain diameter to drop therethrough while being maintained in a vertical position. Projecting into the chute on opposite sides thereof are rollers 46, mounted on pivoted arms 46ª, the rollers normally preventing the coin from dropping past. A light spring S between the arms tends to hold the rollers inwardly of the chute. The arm of one roller has an extension arm 47 projecting above the roller and formed rigid with the arm 46ª.

The upper and free end of the arm 47 engages a horizontal bar 48 pivoted in the casing on a vertical axis. A spring 49 acts to press the bar against the arm, and maintain the latter so that the roller 46 projects inwardly of the chute. The bar when in that position forms a stop for a horizontal lug 50 projecting radially from a vertical rod 51 mounted in the casing and arranged for limited vertical movement, said rod being normally pressed upwardly by a spring 52 (see Fig. 1). The upper end of this rod terminates directly under the lever 32 when the latter is alined with the corresponding slot 41ª. Pivoted in connection with one side of the chute 44 is a presser member 53 whose free end is adapted to project into the chute and when turned on its pivot to bear down on a coin in the chute which is at that time held from further descent by the stop rollers 46. This movement is imparted to the presser by suitable linkage means 54 connecting the presser with the rod 51.

Projecting laterally from the member 30 above the presser is an arm 55 connected to one end of a bellcrank 56 mounted to one side of the coin chute. The other end of this bellcrank is adapted to engage a horizontal stop pin 57 mounted for movement across the slot 41ª, and so positioned as to pass above the lever 32 when the latter is depressed in the slot. The pin is normally held retracted from the slot by a spring 58.

In operation it is assumed in this case that a coin is always in the chute, stopped by the rollers 46, and that another coin lying in superimposed relation on the first coin is necessary to cause the device to operate. This could be avoided if desired, however, by lowering the presser relative to the stop roller. The initial depression of the lever in the slot 41ª first causes the rod 51 to be lowered somewhat, the member 50 being a sufficient distance above the stop bar 48 to allow of a movement of the rod 51 sufficient to actuate the presser, and cause the coin to be pushed past the roller 46 before the lug 50 engages the bar 48. Also the member 31 is normally positioned a sufficient distance below the lever 32 to allow of the above stated depression of the lever taking place without engaging and moving said member 31. The accompanying movement of the arm 47 pushes the bar 48 out of the way of the pin 50, permitting further downward movement of the rod 51 and thus enabling the lever 32 to be depressed for the full depth of the slot 41ª. The arm 31 will then be engaged and depressed, causing the pin 26 to be withdrawn from holding engagement with the sleeve 24 as previously described. At the same time the pin 57 will be advanced to project across the lever 32 so that the latter will be held depressed. The apparatus can then be operated to dispense gasoline from the pump, as previously set forth. As long as the pin 26 is depressed and held from upward movement by the sleeve 35, the rod 30 cannot move up to its normal position, and consequently the stop 57 will be held across the path of the lever 32. The latter will then remain depressed until the rod 30 is released with the declutching action at the termination of each dispensing operation. This prevents any person from moving the lever 32 out of any slot 41ª once he has deposited a coin, and shifting said lever around so that another stop 16, controlled by such lever movement, could be moved to be engaged by the stop 17. If this manipulation of the lever were possible it would allow a greater movement of the rack and consequently a greater amount of gasoline to be dispensed than had been paid for, as will be evident.

Once the pin 26 returns to its normal position the rod 30 also moves up, withdrawing the pin 57 from above the lever. This permits the spring pressed rod 51 to push the lever up to its normal position, such movement of the rod also restoring the presser to its original position. The parts are then all in their normal or inoperative positions, enabling the lever 32 to be again rotated to select the amount of gasoline to be dispensed and ready for the reception of a coin whose value correspond to such selected amount.

It will be noted that although the lever can be freely rotated at any time, even after a coin is inserted in any slot and before the lever is actually depressed, such depression, sufficient to engage the member 31 and lower the member 30, can only take place if the lever is depressed in a slot 41ª corresponding to the coin chute in which a coin has been deposited. This is because unless such coin is in place the arm 47 will not be actuated to shift the bar 48 out of the way of the stop 50, and consequently the lever cannot be depressed sufficiently to engage and lower the arm 31.

Each coin chute has its own control mechanism as above described, except that only one arm 31, and only one member 30 are employed. The arm 31 has a plurality of arcuately spaced lugs 31ª corresponding in number and spacing to the coin chutes and lever slots, and the member 30 has a plurality of arms 55 radiating therefrom to actuate the different lever stops 57. A circular band 59, concentric with the casing, is preferably attached to the lever inwardly of the stops 57, so as to provide a shield inwardly of the slot 41 to prevent the possible insertion of a tool through said slot to depress the arm 31 without using a coin.

Although not so shown the entire mechanism of the structure, with the exception of the lever 32, and handle 23, would preferably be enclosed so as to prevent unauthorized adjusting or tampering with any of the parts of the apparatus.

While we have especially described this device as being for dispensing gasoline, it is obvious that it may be used also for dispensing lubricating oils and other liquids if so desired.

From the foregoing description it will be readily seen that we have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described our invention what we claim as new and useful and desire to secure by Letters Patent is:

1. A liquid dispensing apparatus comprising with a pump operating structure which includes a rotatable shaft, means for turning the shaft, a latch structure normally preventing turning of the shaft, a lever, means between the lever and latch structure for causing the latter to be released when the lever is moved in a certain direction, means functioning automatically after the latch has been released and the shaft has been turned a predetermined number of times for causing the latch structure to again hold the shaft from turning, selective means for governing the extent of rotation of the shaft, and means between such selective means and the lever for actuating the selective means by a movement of the lever in a direction different from that necessary to actuate the latch release means.

2. A liquid dispensing apparatus comprising with a pump operating structure which includes a rotatable shaft, and a pinion turnable on the shaft, means for turning the shaft, a rack engaging the pinion whereby with the turning of the pinion the rack will move longitudinally; normally engaged clutch means between the pinion and shaft, comprising a clutch element on the pinion, a cooperating clutch element slidably mounted on the shaft, and a shifting member for the sliding element; a longitudinally movable and rotatable rod mounted parallel to the rack, a stop projecting from the rack, a plurality of longitudinally spaced and circumferentially offset stops projecting from the rod, means for rotating the rod so as to place any of the rod stops in the path of movement of the rack stop, whereby the rod will be moved longitudinally after different extents of movement of the rack have taken place, and means between the rod and shifting member for causing the sliding clutch element to move away from the pinion clutch element with such movement of the rod.

3. A liquid dispensing apparatus comprising with a pump operating structure which includes a rotatable shaft, and a pinion turnable on the shaft, means for turning the shaft, a rack engaging the pinion whereby with the turning of the pinion the rack will move longitudinally; normally engaged clutch means between the pinion and shaft, comprising a clutch element on the pinion, a cooperating clutch element slidably mounted on the shaft, and a shifting member for the sliding element; a longitudinally movable rod parallel to the rack, a stop projecting from the rack, a stop projecting from the rod to be engaged by the rack-stop to move the rod after the rack has moved a predetermined distance, means between the rod and shifting member for causing the latter to move away from the pinion clutch element with such movement of the rod, whereby the pinion is free to turn on the shaft and the rack may then be retracted to its original position, and another stop on the rod to be engaged by the rack-stop just before the latter has returned to its original position to move the rod in a corresponding direction and cause the clutch means to be again engaged.

4. A liquid dispensing apparatus comprising with a pump operating structure which includes a rotatable shaft, and a pinion turnable on the shaft, means for turning the shaft, a rack engaging the pinion turnable on the shaft and engaging the rack, whereby with the turning of the pinion the rack will move longitudinally; normally engaged clutch means between the pinion and shaft,

comprising a clutch element on the pinion, a cooperating clutch element slidably mounted on the shaft, and a shifting member for the sliding element; a member on the shaft having a peripheral socket, a movable pin normally engaging the socket, means for withdrawing the pin from the socket, a sleeve slidable on the socketed member, spring means acting to move said sleeve to cover the socket when the pin is withdrawn therefrom, connection means between the sleeve and shifting member to cause the sleeve to be retracted from over the socket when the shifting member is moved to declutch the sliding clutch element, means then causing the pin to reenter the socket, and means controlled by the rack after the latter has moved a predetermined distance for thus actuating the shifting member.

5. A liquid dispensing apparatus including a dispensing cylinder having a plunger operating rod projecting therefrom, actuating means for moving the rod, a hand lever movable in two distinct directions, means actuated by the movement of the lever in one direction for enabling said actuating means to function to move the plunger rod, means governed by the movement of the rod a predetermined extent for then causing the operation of the actuating means to be halted, and means governed by a movement of the lever in the other direction for initially controlling the extent to which the plunger rod may be moved.

6. A liquid dispensing apparatus including a dispensing cylinder having a plunger operating rod projecting therefrom, actuating means for moving the rod, selective means for governing the extent to which the plunger rod may be moved by the operation of the actuating means, and a lever for separately controlling the initial operation of said actuating means and the selective means.

7. A structure as in claim 6 having means associated with said lever for preventing the actuating means from functioning until the selective means has been actuated.

8. A liquid dispensing apparatus comprising with a pump operating structure which includes a turnable shaft and means for turning the shaft, a movable lever, a latch structure normally preventing turning of the shaft, means between the lever and latch structure for releasing the latter with a movement of the lever in one direction, said means including a longitudinally movable rod, a stop to extend across the path of movement of the lever, and connections between said stop and the rod for causing said stop to thus move behind the lever with a movement of the latter to release the latch.

9. A structure as in claim 8, with means between said rod and latch structure for causing the latter to return to its normal position when the latch structure becomes reengaged, and means then withdrawing the stop from across the path of movement of the lever.

10. A liquid dispensing apparatus comprising with a pump operating structure which includes a rotatable shaft, a pinion turnable on the shaft and a rack engaging the pinion; means for turning the shaft, normally engaged clutch elements between the pinion and shaft, a longitudinally movable and rotatable rod mounted parallel to the rack, means controlled by the rotation of the rod for governing the extent to which the rack may move longitudinally, means controlled by the longitudinal movement of the rod for causing the clutch elements to be disengaged, and means between the rack and rod for causing the latter to be longitudinally moved when the rack has reached its limit of movement.

In testimony whereof we affix our signatures.

MINOR W. FELVER.
RAYMOND A. JOHNSON.