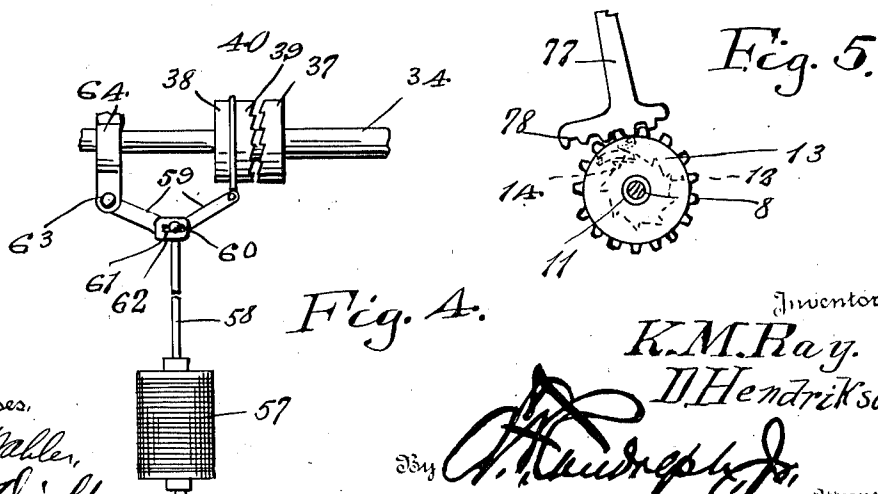
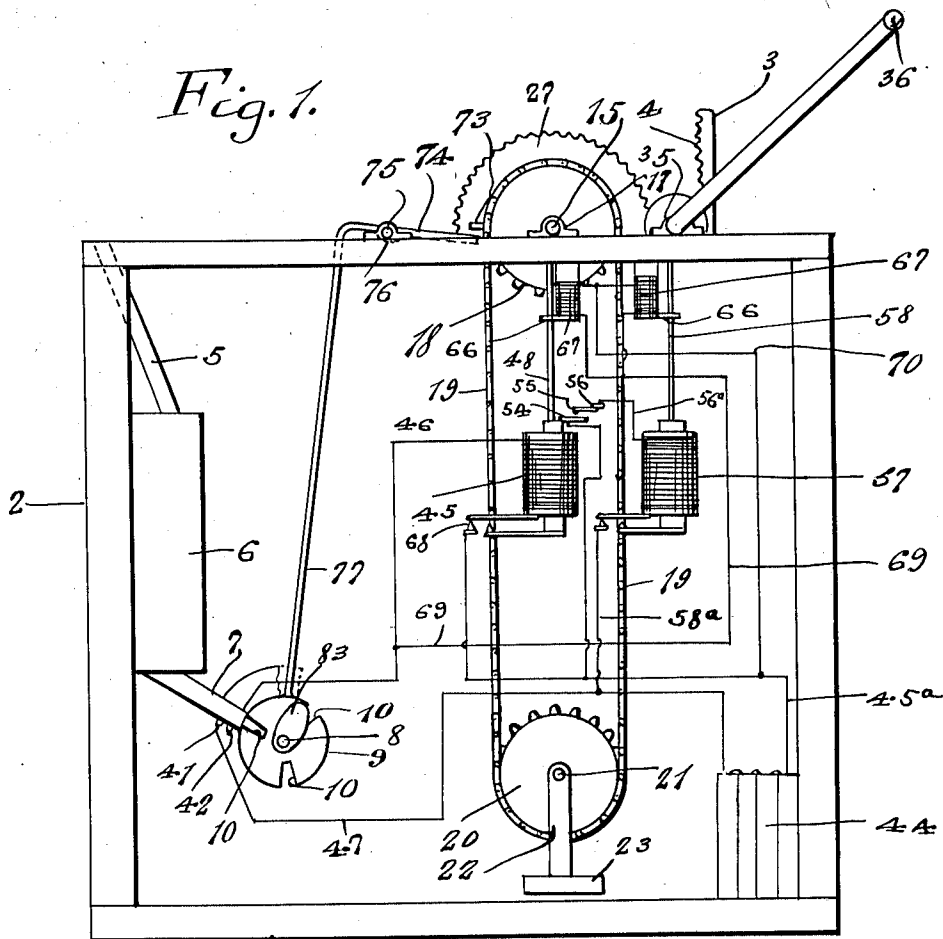


K. M. RAY AND D. HENDRICKSON.
LIQUID VENDING MACHINE.
APPLICATION FILED SEPT. 21, 1917.

1,314,901.

Patented Sept. 2, 1919.
3 SHEETS—SHEET 1.



Witnesses,
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Fig. 2.

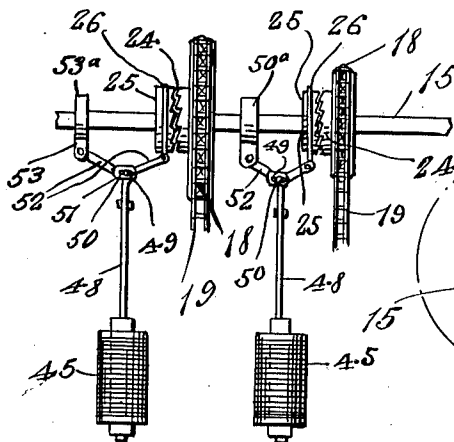
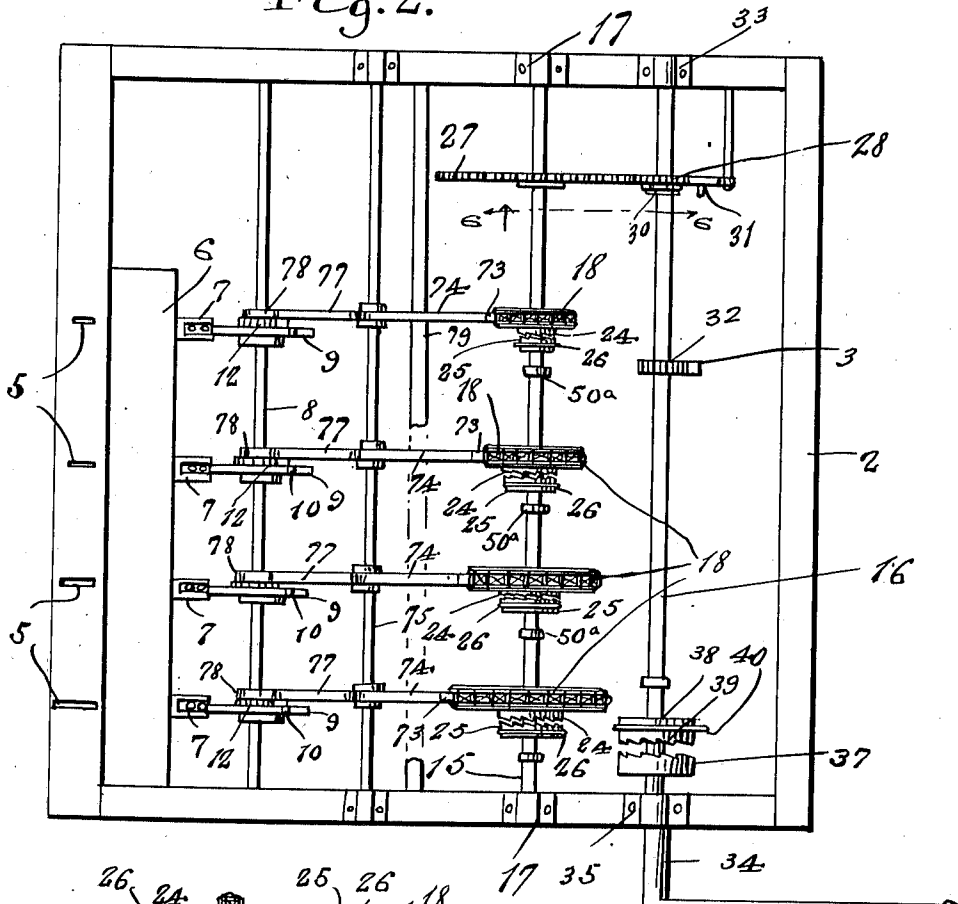
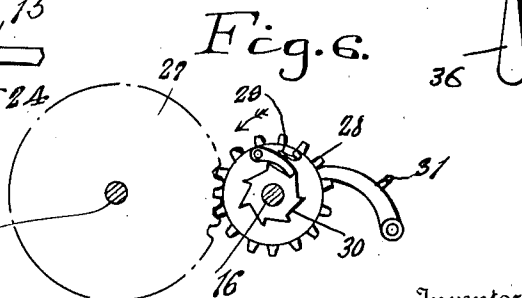


Fig. 3.

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Fig. 6.



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3 SHEETS—SHEET 3.

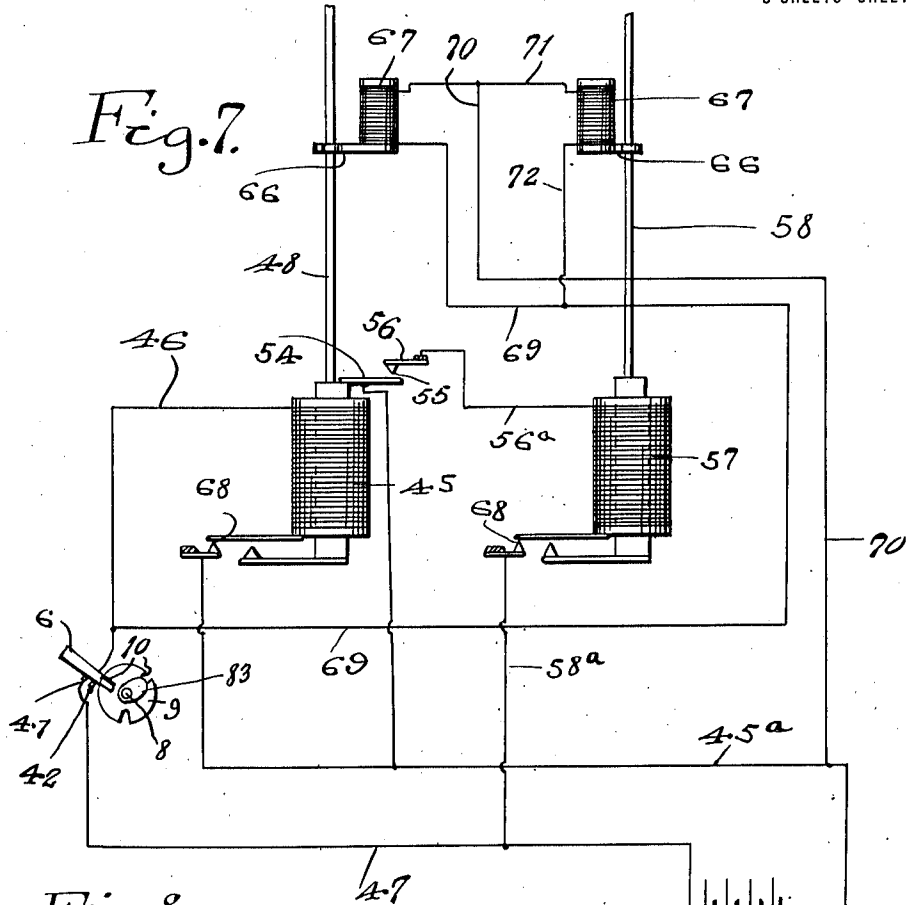


Fig. 8.

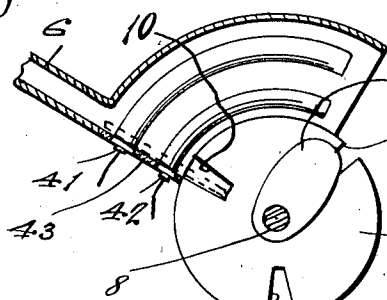
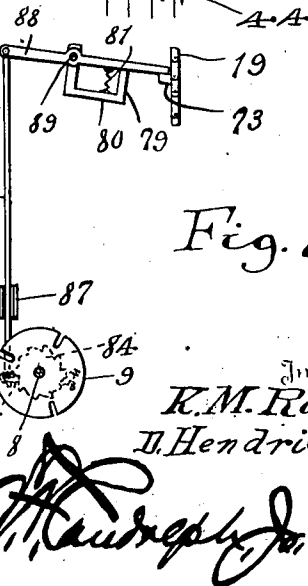
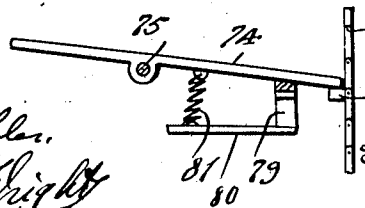


Fig. 9.



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UNITED STATES PATENT OFFICE.

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LIQUID-VENDING MACHINE.

1,314,901.

Specification of Letters Patent.

Patented Sept. 2, 1919.

Application filed September 21, 1917. Serial No. 192,588.

To all whom it may concern:

Be it known that we, (1) KATHRYN M. RAY and (2) DAVID HENDRICKSON, citizens of the United States, residing at (1) Los Angeles, (2) Oakland, in the county of (1) Los Angeles, (2) Alameda, and State of California, have invented certain new and useful Improvements in Liquid-Vending Machines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to liquid vending machines and more particularly to machines especially adapted for vending gasoline and oils for motorists' use and the primary object of this invention is to provide a liquid vending machine, which upon the deposit of a coin will deliver a certain amount of the liquid to be dispensed.

Another object of the invention is to provide a coin controlled liquid vending machine, which includes a means for receiving a plurality of coins of different denominations and for delivering an amount of liquid equal in value to the value of the coin deposited.

A further object of the invention is the provision of a coin controlled liquid vending machine in which the machine for delivering the liquid can be adjusted so that the amount of liquid to be delivered for a coin of a certain denomination can be regulated according to the fluctuating price of oils and gasoline.

A still further object of the invention is the provision of a liquid vending machine in which an electrical circuit is closed by a coin, which operates a clutch and allows the pump stem to be operated so that a certain amount of liquid can be pumped therefrom.

A still further object of the invention is the provision of a coin controlled vending machine, which includes means for automatically opening the circuit when a predetermined amount of liquid has been delivered, so as to prevent further operation of the pump stem.

A still further object of the invention is the provision of means for automatically throwing the coin from between a pair of electrical contacts after a predetermined amount of liquid has been delivered, so as to open the circuit and prevent delivery of any

more of the liquid and to set the machine for the reception of another coin.

A still further object of the invention is to provide a liquid vending machine of the above character, which is durable and efficient in use, one that is simple and economical to manufacture and one that can be placed upon the market at a reasonable price.

With these and other objects in view, the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter specifically described, claimed and illustrated in the accompanying drawings, forming a part thereof in which,

Figure 1 is a side elevation of the improved machine showing parts of the casing removed for clearness,

Fig. 2 is a top plan view of the improved machine showing the top section of the casing removed for clearness,

Fig. 3 is a detail sectional view showing the means for operating the liquid control clutches on the driven shaft,

Fig. 4 is a detail sectional view showing the means for operating the clutch on the main drive shaft for locking the crank thereto,

Fig. 5 is a detail sectional view showing the means for operating the coin receiving disk,

Fig. 6 is a detail section taken on the line 6-6 of Fig. 2,

Fig. 7 is a diagrammatic view of the electric circuit for operating one of the liquid controlled clutches and the clutch on the main drive shaft, and

Fig. 8 is an enlarged detail view of the coin controlled disk showing the means for throwing the coin out of the same,

Fig. 9 is a fragmentary detail view illustrating the manner of pivotally mounting the arms 74 to the casing, and

Fig. 10 is a side elevation of a slightly modified form of an operating mechanism for the coin disk.

Referring to the drawings in detail, wherein similar reference numerals designate corresponding parts, throughout the several views, the numeral 1 generally indicates the improved coin controlled liquid vending machine, which includes an outer casing or support 2 of substantially rectangular formation which is adapted to set over the tank not shown holding the liquid to be dispensed and the pump (not shown) for forcing the same

out of the tank. The pump stem 3 projects into the rectangular casing 2 and has a rack bar 4 secured thereto for a purpose which will hereinafter be more fully described.

5 A plurality of inclined coin chutes 5 extend from the upper front portion of the casing 2 downwardly and through a casing 6, which incloses any preferred type of coin separating means. This means for separating the good coins from the slugs has not
10 been described or illustrated as the same forms the subject matter of another invention. Extending from the bottom of the coin separating means 6 is a plurality of chutes 7 which are in alinement with the first mentioned chutes and receive the coins after the
15 same have been tested. It is to be understood that the chutes are to receive coins of different denominations and are to be so labeled, so as to indicate to the user of the device
20 where to insert a coin of a certain denomination and the chutes are here shown to be four in number and are adapted to receive ten, twenty-five, and fifty cent and one dollar
25 coins, it being understood, however, that any number of chutes can be employed and be made to receive a coin of any desired value. A fixed shaft 8 is positioned directly below the lower ends of the chutes 7 and this shaft
30 carries a plurality of rotatable disks 9 which are positioned in alinement with each one of the chutes 7. Each disk is provided with a series of equidistant spaced slots 10 which are adapted to partially receive the coins
35 from the ends of the chutes. The upper walls of the chutes 7 are cut away at the lower portions thereof so as to allow the disk 9 to carry the coins from the chutes when the disk is rotated.

40 Each disk 9 has a projecting hub 11 which rigidly carries a ratchet wheel 12 and rotatably carries a gear 13. The gear 13 carries a pivoted spring pressed pawl 14 which is adapted to engage the ratchet wheel 12, so
45 that when the gear wheel is rotated in one direction, the same will turn the disk 9, but when the same is turned in the opposite direction the disk will remain stationary.

Rotatably mounted above and in rear of the fixed shaft 8 are a pair of spaced parallel
50 shafts 15 and 16 respectively. The shaft 15 is journaled as at 17 in the side walls of the casing 2 and has a plurality of spaced sprocket wheels 18 rotatably mounted thereon.
55 These sprocket wheels increase in size from the right to the left and are arranged according to the value of the coin deposited. Each of the sprocket wheels 18 has a chain 19 trained around the same and these chains
60 are also made larger or smaller and are arranged according to the value of the coin deposited. These chains each carry a lower floating sprocket wheel 20, which carries a stub shaft 21 having loosely mounted thereon
65 the depending yoke 22, which has a weight

23 secured thereto. The weight tends to keep the chain 19 in an extended position. A clutch section 24 is formed on each of the sprocket wheels 18 and is adapted to be engaged by a cooperating clutch section 25
70 splined on the shaft 15 and these clutch sections carry a yoke 26 slidably mounted in a groove formed in the same. The yokes 26 are adapted to be operated by a mechanism which will be hereinafter more fully de-
75 scribed.

A relatively large gear wheel 27 is keyed on the shaft 15 and engages a relatively small gear 28 rotatably mounted upon the shaft 16. This small gear 28 carries a spring
80 pressed pawl 29, which engages a ratchet wheel 30 keyed to the shaft 15, and when the shaft 16 is rotated in one direction, the small gear will rotate therewith and rotate the large gear 27 and the shaft 15, but when
85 the shaft 16 is rotated in the opposite direction, the gear 18 will remain idle. A pawl 31 is arranged opposite to the pawl 29 and engages the periphery of the gear 28 and positively prevents the gear from rotating in
90 the opposite direction.

A pinion 32 is keyed to the shaft 16 and engages the rack bar 4 on the pump stem 3 and when the shaft 16 is rotated in a counter-clockwise direction the pump stem will be
95 drawn up and the liquid forced from the cylinder, (not shown), of the pump and the shaft 15 is rotated therewith and when the shaft 16 is left free the pump stem will be returned to its normal position by gravity,
100 and the shaft 16 will be rotated in a clockwise direction and the gear 28 will remain idle on the shaft 16 owing to the ratchet and pawl connections 29 and 30, as clearly shown in Fig. 6 of the drawings.
105

One end of the shaft 16 is journaled in one end wall of the casing 2 as at 33 and the opposite end is rotatably mounted in the crank 34, which is journaled in the opposite
110 end wall of the casing 2 as at 35. The crank 34 projects outwardly from the casing 2 and carries a handle 36, whereby the same can be rotated, and the inner end of the crank carries a rigid clutch section 37 which is adapted to be engaged by a sliding clutch section
115 38 splined to the shaft 16. This clutch section 38 has a groove 39 formed therein in which is slidably seated the yoke 40 which is operated by a mechanism, which will be hereinafter more fully described.
120

A pair of spaced contacts 41 and 42 are secured to the lower face of each one of the clutch chutes 7 and are curved arcuately in a rearward direction from the chutes and these contacts are insulated from each other
125 by a non-conducting block 43 and when a coin is dropped in one of the chutes this gap is bridged and a circuit is closed. The current flows from a battery 44 or other electrical source through a lead wire 45* to a
130

solenoid 45 and then through a connecting wire 46 and then through the contacts 42 and 41 and through the lead wire 47 back to the battery. When the solenoid 45 is energized this draws its core 48 upward, which throws the clutch section 25 in engagement with the clutch section 24, as the core has connected thereto by means of a pin 49 which extends through a slot 50 formed in the enlarged head 51 a pair of pivoted links 52. One of the links is pivotally secured to the yoke 26 and the opposite link is pivotally secured to a projecting ear 53 carried by a collar 53^a which is secured to the casing 2 and helps to support the shaft 15 and as the core is drawn upward the links 52 are extended and the clutch section 25 is thrown in engagement with the clutch section 26. There are four of the solenoids 48 in number and one of the same is positioned below each of the sprocket wheels 18 and they operate the clutches 24 in the manner described above when the particular circuit they are in is closed. The core 48 carries a contact 54 and when the same is drawn up out of the solenoid 45, the same makes a connection at 55 with a contact 56 which is connected to a lead wire 56^a, which leads to the solenoid 57 and the same is connected to a second lead wire 58^a which is connected to the lead wire 47 and thus the second solenoid is energized when the core 48 of the solenoid 45 is drawn upward. When the solenoid 57 is energized its core 58 is drawn upward and this core has pivotally connected thereto a pair of pivoted links 59 which are adapted to slide the clutch section 38 in engagement with the clutch section 37 of the crank 44, and lock the same to the shaft 16, whereby upon rotation of the crank 34 in a counter-clockwise direction the shaft 16 will be rotated and the pump stem 3 drawn up and the shaft 15 and the sprocket wheel 18 which has been locked thereto will be rotated therewith. The links 59 are pivotally connected to each other by a pin 60 which extends through a slot 61 formed in the enlarged head 62 of the core 58 and one of the links is pivotally secured to a projecting ear 63 formed on a collar 64 carried by the bracket 65 secured to the casing 2 and the other link is pivotally secured to the yoke 40 carried by the clutch section 48, and when the core is drawn upward the links will be extended and the clutch section will be forced into engagement with the clutch section 37.

In order to save the current from the battery 44, each of the cores 48 and 58 carry an outstanding conducting arm or armature 66 which are adapted to engage a pair of holding magnets 67 and as the cores of the solenoids are drawn up, the circuit is automatically broken at the bottom of the solenoids as at 68 and these magnets are adapted

to hold the cores in their extended positions, until the main circuit is broken. A wire 69 extends from the line wire 46 to the bottom of one of the holding magnets 67 and the top of the magnets has a wire 70 leading to the battery wire 45^a and then to the battery and the opposite magnet has a branch wire 71 connected to the wire 70 and thus to one terminal of the battery and has a second wire 72 leading to the wire 69 and thus to the other terminal of the battery. This wiring diagram is clearly disclosed in Fig. 7 of the drawings.

The sprocket chains 19 carry a projecting lug or finger 73, which is adapted to engage a pivoted lever 74. There are four of these levers in number and they are positioned directly in front of the sprocket wheels 18 and they are pivotally mounted as at 75 on a fixed shaft 76 which is secured to the side walls of the casing 2. These levers have a relatively long downwardly extending arm 77, each of which carries at its free lower end, a segmental wheel 78 which is adapted to engage the gear wheel 13 that is rotatably mounted upon the hub of the disk 9 and when the upper horizontal arm of the lever is struck by the upward movement of the projecting lug 73, the segmental wheel 78 is moved inward which rotates the gear 13 and this gear through the medium of the pawl 14 and ratchet wheel 12, rotates the disk one-third of a turn. A bracket 79 extends downward from the top of the casing and carries a projecting arm 80 to which is secured a contractile coil spring 81. This contractile coil spring is secured as at 82 to the lever 74 and returns the same to its initial position. When the lever 74 returns to its normal position it rotates the gear 13 in a counter-clockwise direction, which fails to move the disk 9 as the dog 14 rides over the ratchet wheel 12. When the disk 9 is turned the one-third of the revolution, the same carries the coin from the chute 7 and the coin rides over a cam 83 which forces the coin out of the slot 10 of the disk. By this construction, it can be seen that when the chain makes one revolution the circuit is open which allows the cores 48 and 58 to return to their normal position carrying the clutches out of engagement with the rigid clutch sections and thus preventing any more of the liquid being pumped from the tank (not shown) until another coin is dropped in one of the chutes.

In operation of the improved device, when a coin is dropped into its respective chute, the same bridges the gap between two contacts 41 and 42 carried by the lower end of the chute which closes the circuit and energizes the solenoids 45 and 57 in the manner described above, which forces the cores 48 and 58 upward which moves the sliding clutches into engagement with the rigid

clutch sections which locks the crank 34 to the shaft 16 and one of the sprocket wheels 18 on the shaft 15. The pump stem 3 can then be forced upward through the medium 5 of the pinion 32 by the crank 34, which will also rotate the shaft 15 and one of the sprocket wheels 18, which will rotate the chain 19 therewith and when the chain has made a complete revolution, the same, 10 through the medium of the projecting lug 73 will operate the lever 74 and thus move the coin from the contacts 41 and 42. By making the chains 19 longer or shorter, more or less of the liquid being dispensed 15 can be given for a certain coin according to the rise and fall of the price of the liquid.

In Fig. 10 is shown a slightly modified form of the device and in this form the method of rotating the disk 9 as shown in 20 Fig. 4 is dispensed with and a ratchet wheel 84 is rigidly secured to the disk 9, which is engaged by a pawl 85 pivotally secured to the end of the arm 86, which takes the place of the arm 77. The arm 86 is slidably 25 mounted between a pair of guides 87 and has its upper end pivotally secured to the outer end of a lever 88, which is used instead of the arm 74. The lever 88 is pivotally mounted intermediate its ends as at 30 89 and the inner end is adapted to be engaged by the lug 73, the contractile coil spring 81 normally holds the inner end of the lever 88 in lowered position and when the lug 73 engages the same, the inner end 35 will rise upward, which will slide the arm 86 downward and the pivoted pawl 85 will ride over the teeth of the ratchet wheel 84 and when the lug 73 rides past the lever 88 the spring 81 will force the lever 88 down- 40 ward and raise the arm 86, which will allow the pawl 85 to catch in a tooth of the ratchet wheel 84 and turn the same the desired fraction of a revolution. A second pawl 90 engages the ratchet wheel 84 and prevents ro- 45 tation of the same in a rearward direction.

In practice, we have found that the form of our invention, illustrated in the accompanying drawings and referred to in the above description, as the preferred embodiment, is the most efficient and practical; yet realizing the conditions concurrent with the adoption of our device will necessarily vary, we desire to emphasize the fact that various 50 minor changes in details of construction, proportion and arrangement of parts may be resorted to, when required, without sacrificing any of the advantages of our invention as set forth.

What we claim as new is:—

60 1. In a coin controlled liquid vending machine, a pump stem, a rotatable shaft, means operatively connecting the shaft with the pump stem, a crank rotatably carried by the shaft, a rigid clutch carried by the 65 crank, a sliding clutch section splined to

said shaft, a normally open electrical circuit, a solenoid arranged in said circuit, a core for said solenoid, means operatively connecting the core to the sliding clutch, a coin chute, a pair of spaced contacts arranged in said coin chute, means for guid- 70 ing a coin over said contacts to close the circuit, a disk arranged below the chute, said disk having a plurality of slots therein adapted for partially receiving a coin, and 75 means for rotating said disk to move the coin from said contacts upon the dispensing of a predetermined quantity of liquid.

2. In a liquid vending machine, a pump stem, a rotatable shaft, means operatively 80 connecting the shaft to the pump stem, a crank rotatably carried by the shaft, a rigid clutch section carried by the crank, a sliding clutch section splined to the shaft, a normally open circuit, a solenoid arranged 85 in said circuit, a core for said solenoid, means operatively connecting the sliding clutch to the core, a coin chute, a pair of spaced contacts arranged in said coin chute, means for guiding a coin over said contacts, 90 a disk arranged below said chute, said disk having a plurality of equidistant spaced slots for partially receiving a coin, a second rotatably mounted shaft, means opera- 95 tively connecting the shafts together, and 95 means for operatively connecting the second mentioned shaft to the disk for rotating the same, after a predetermined amount of liquid has been dispensed.

3. In a liquid vending machine, a pump 100 stem, a rotatably mounted shaft, means operatively connecting the pump stem to the shaft, a crank rotatably mounted upon the shaft, a rigid clutch section carried by the 105 crank, a sliding clutch section carried by the shaft, a normally open electrical circuit, a solenoid arranged in said circuit, a core for said solenoid, means operatively connecting the core to the sliding clutch, a coin chute, a pair of spaced contacts arranged in said 110 coin chute, means for guiding said coin over said chute, a disk arranged below said chute, said disk having a plurality of equidistant spaced slots adapted to receive a coin, a second shaft, means operatively connecting 115 the second shaft to the first mentioned shaft, a sprocket wheel mounted upon said shaft, means for locking said sprocket wheel on said shaft upon the closing of said circuit, and means carried by said sprocket wheel 120 for engaging said disk for rotating the same upon the rotation of said sprocket wheel a predetermined distance, as and for the purpose specified.

4. In a coin controlled liquid vending 125 machine, a pump stem, a rotatably mounted shaft, means operatively connecting the shaft to the pump stem, a crank rotatably mounted upon the shaft, a rigid clutch section carried by the crank, a sliding clutch 130

section carried by the shaft, a normally open circuit, a solenoid arranged in said circuit, a core for said solenoid, means operatively connecting the sliding clutch section to said core, a second rotatably mounted shaft, means operatively connecting the shafts together, a plurality of rotatable sprocket wheels mounted upon said second mentioned shaft, a solenoid arranged in said circuit for each sprocket wheel, a plurality of coin chutes, a pair of spaced contacts carried by each chute and means for energizing the solenoid operatively connected to the sliding clutch on said first mentioned shaft upon the closing of the circuit, and means for energizing one of the solenoids

for one of the sprocket wheels upon closing of the circuit, and means for operatively connecting the second mentioned solenoids to the sprocket wheels for locking the same upon the second mentioned shaft, as and for the purpose specified.

In testimony whereof we affix our signatures in presence of two witnesses.

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DAVID HENDRICKSON.

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