H. A. HALL.

COIN CONTROLLED VENDING MACHINE.

APPLICATION FILED JUNE 1, 1914.

1,183,557.

Patented May 16, 1916.

3 SHEETS—SHEET 1.

Fig. 1.

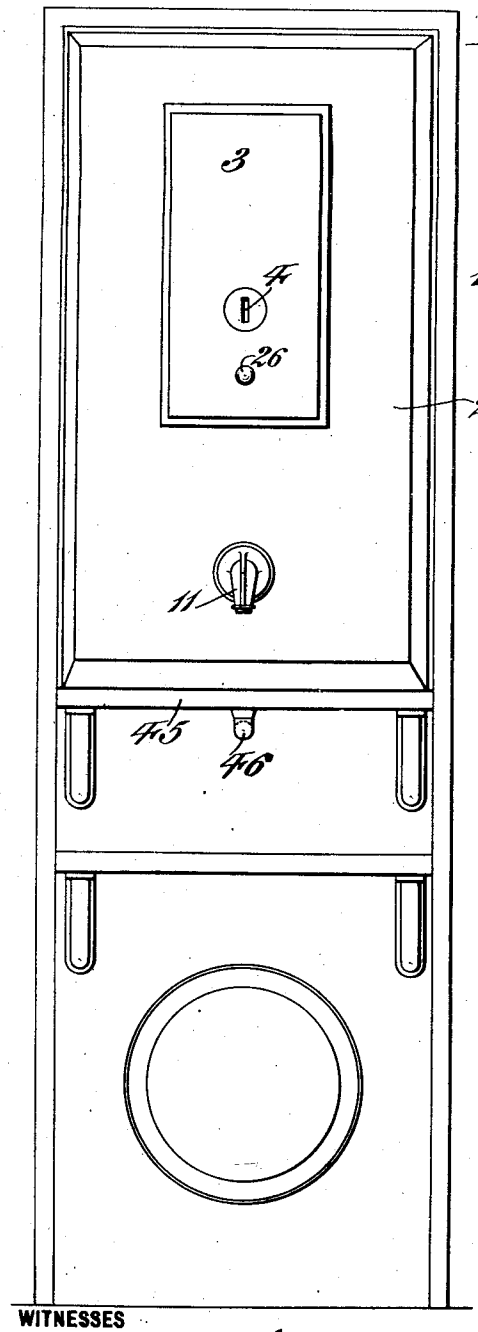


Fig. 2.

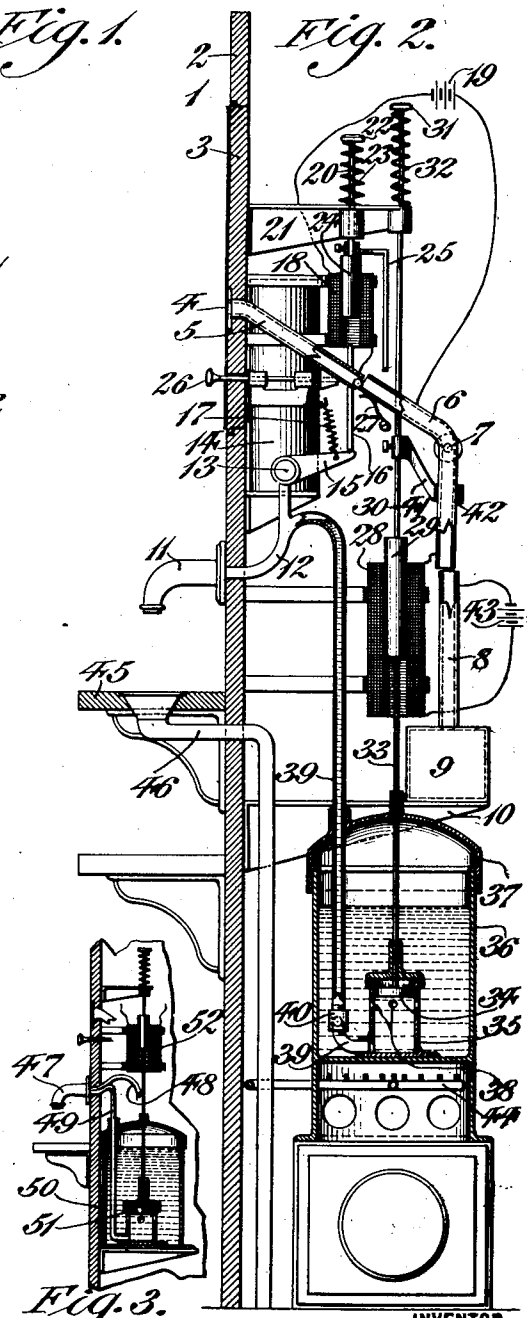


Fig. 3.

WITNESSES

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3 SHEETS—SHEET 2.

Fig. 4.

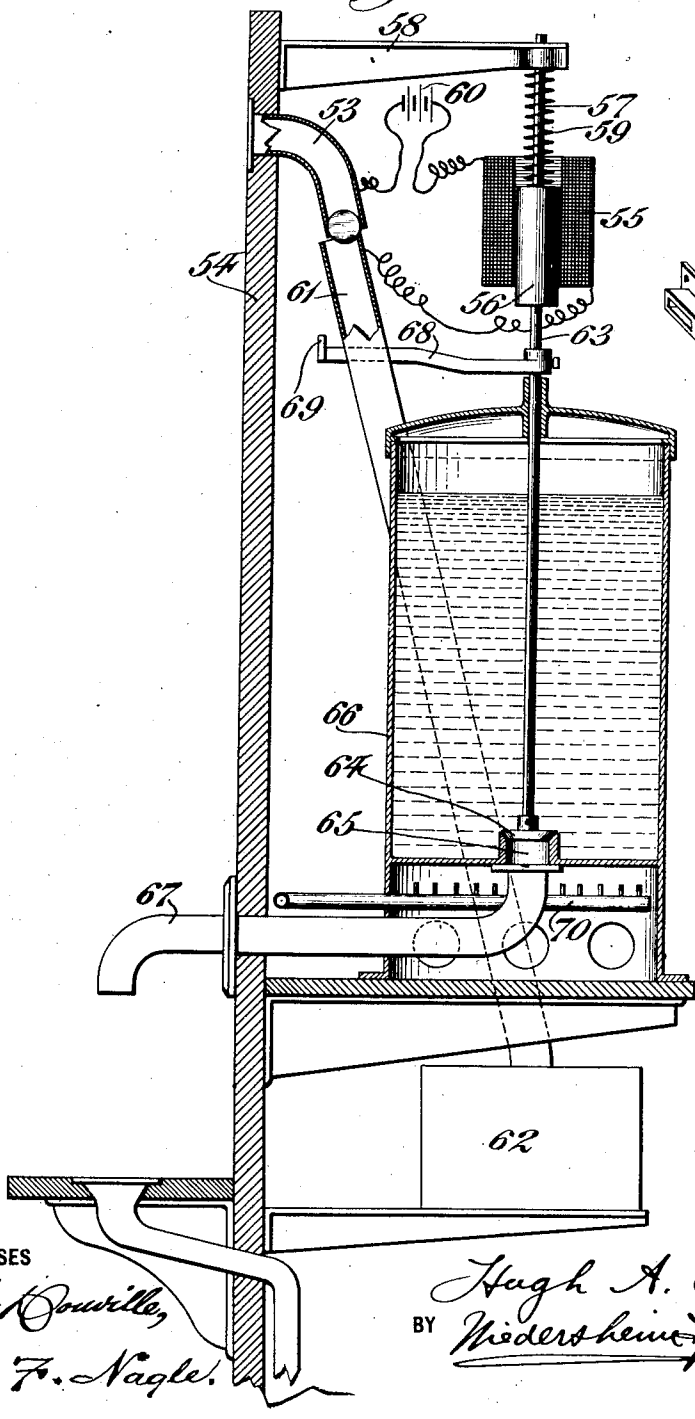
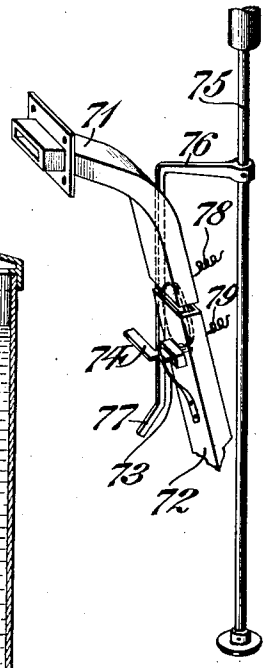


Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

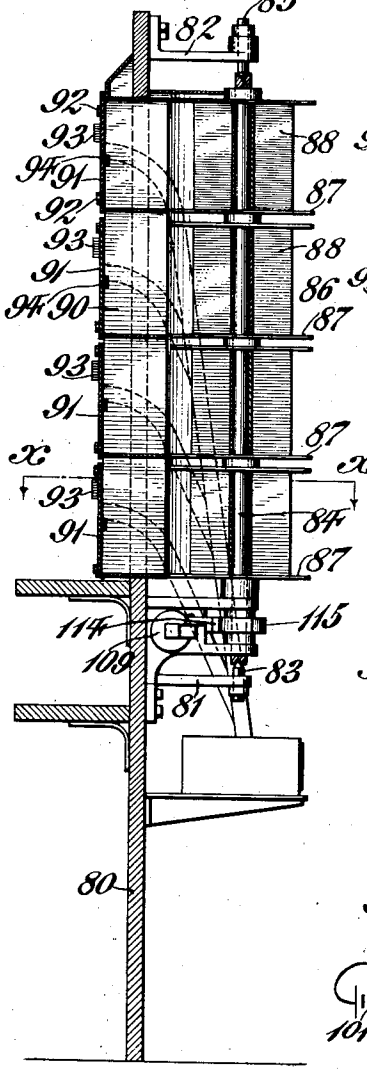


Fig. 7.

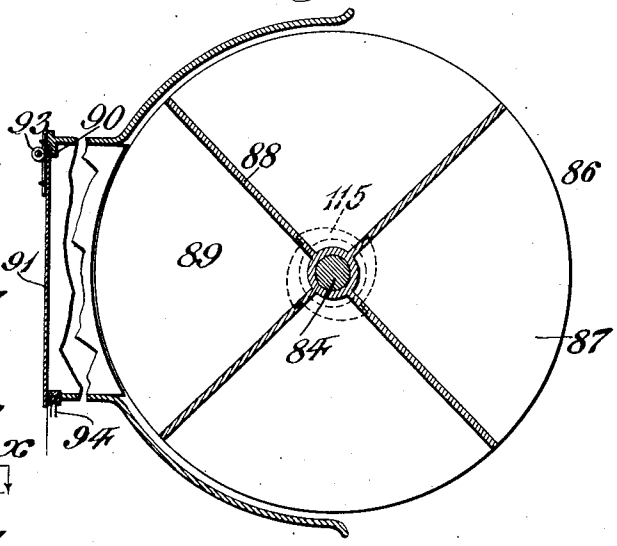


Fig. 8.

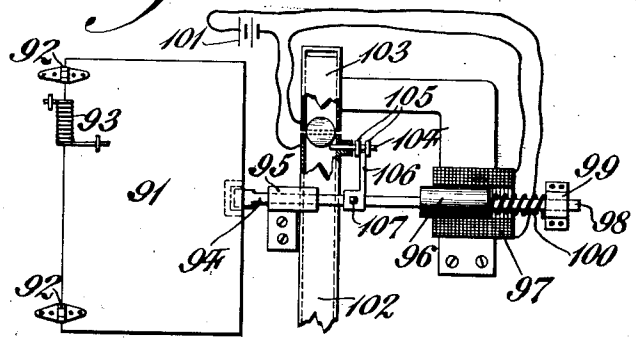
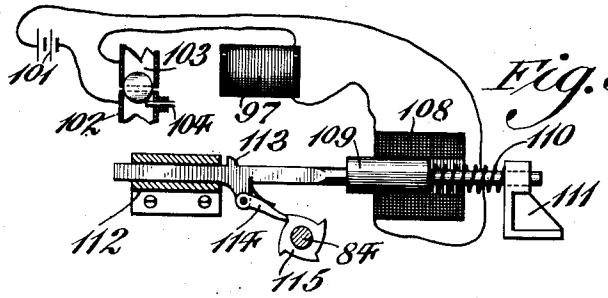


Fig. 9.



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UNITED STATES PATENT OFFICE.

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COIN-CONTROLLED VENDING-MACHINE.

1,183,557. Specification of Letters Patent. Patented May 16, 1916.

Application filed June 1, 1914. Serial No. 842,023.

To all whom it may concern:

Be it known that I, HUGH A. HALL, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Coin-Controlled Vending-Machine, of which the following is a specification.

My present invention consists of a novel coin or check-controlled vending machine, wherein novel means are employed for controlling the operation of the vending mechanism.

It further consists of a novel construction and arrangement of a sectional coin chute and novel means coöperating therewith for actuating the coin chute during the cycle of the operation of the machine.

It further consists of a novel construction and arrangement of an electrical device for controlling liquid dispensing apparatus, the opening of the doors of the vending machine and the intermittent movement of the container for the articles to be vended.

It further consists of a novel construction and arrangement of a coin chute and a novel construction and arrangement of solenoid coöperating therewith, and controlled by the coin or check employed to operate the machine.

Other novel features of advantage will more clearly hereinafter appear in the detailed description.

For the purpose of illustrating my invention, I have shown in the accompanying drawings certain forms thereof which in practice will give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the exact arrangement and organization of these instrumentalities as herein set forth.

Figure 1 represents a front elevation of a vending machine embodying my invention. Fig. 2 represents a sectional elevation thereof. Fig. 3 represents a sectional elevation of another embodiment of my invention. Fig. 4 represents a sectional elevation of another embodiment of my invention. Fig. 5 represents a perspective view of another embodiment of the coin chute and its adjuncts which may be employed. Fig. 6 represents a sectional elevation of the vending machine when employed to vend solid articles, certain parts thereof having been admitted for the sake of clearness of illustration. Fig. 7 represents a section on line *x*—*x* of Fig. 6. Fig. 8 represents a front elevation, partly in section, of the device seen in Fig. 6, showing the manner of controlling the doors. Fig. 9 represents in section a diagrammatical view of the mechanism employed for intermittently rotating the container.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—Referring first to the embodiment seen in Figs. 1 and 2, 1 designates a vending machine embodying my invention, the same consisting of a front wall or casing 2, having a removable plate 3 therein, which is provided with an aperture 4, adapted to receive the coin or check which is to operate the machine. The aperture 4 communicates with a coin-chute 5, the lower end of which is adapted to register at certain times with the upper end of the coin-chute 6, which is pivotally supported as at 7, and its lower end is adapted to be brought into and out of register with the upper end of a coin-chute 8, which is adapted to discharge into a coin receptacle 9, carried in the present instance by means of the brackets 10, supported in any desired manner. The embodiment seen in Figs. 1 and 2 in the present instance is adapted to vend one or more liquids, and I have illustrated the same as being adapted to furnish, for example, a predetermined quantity of cream with a predetermined quantity of coffee, it being of course understood that any desired type of liquid may be vended.

11 designates a discharge spout carried in any desired manner, in the present instance, by the front wall 2 of the vending machine, said spout communicating by means of a conduit 12 and a valve 13 with an upper container 14, which is adapted to receive, the cream, for example. The valve 13 is provided with an arm 15, from which extends an upwardly directed arm 16, it being seen that a spring 17 is employed, one end of which is secured to a fixed point, the other end of which is secured to the arm 15, in order to maintain the valve 13 normally in closed position and the rod 16 in its raised position, and as seen in Fig. 2.

18 designates a solenoid, one end of the coil of which is connected to the coin-chute 5, while the other end thereof is connected through the battery 19 with the coin-chute

6. The rod 20 of the solenoid plunger is guided in the bracket 21 supported in any desired manner, and the upper end of said rod 20 is provided with a head 22 between which and the bracket 21 is interposed a spring 23, thereby normally maintaining the plunger 24 in the solenoid in raised position.

25 designates a rod or bar adjustably carried by the rod 20 and adapted to engage with, during the cycle of the operation, the upper portion of the coin-chute 6.

26 designates a manually actuated plunger for bringing the lower end of the coin-chute 5 into register with the upper end of the coin-chute 6. The coin-chute 6 is maintained in normal position by means of a spring 27.

28 designates a solenoid supported in any desired manner and having its plunger 29 provided with a rod 30, which is also guided in the bracket 21 and has at its upper end a head 31, between which and the bracket 21 is interposed a spring 32.

33 designates a rod also secured to the plunger 29 of the solenoid 28 and connected with the piston 34 of a pump casing 35, which latter is located within an outer container 36 having a removable cover 37, through which the rod 33 passes. The pump casing 35 is provided with a desired number of ports 38 and is provided with a discharge conduit 39, which communicates with the discharge spout 11. If desired, this conduit 39 may be provided with an upwardly opening check-valve 40, although the same can be dispensed with, if desired. The upper rod 30 of the plunger 29 has adjustably mounted thereon an arm 41, having a conical shaped aperture 42 therethrough and through which the coin-chute 6 extends. One end of the coil of the solenoid 28 is connected with the lower end of the coin-chute 6, while the other end thereof is connected, through the battery 43, with the coin-chute 8, and I also preferably employ a burner or source of heat 44, by means of which the liquid, such as, for example, coffee, in the container 36, may be maintained at a desired temperature.

45 designates a shelf or table supported in any desired manner beneath the discharge spout 11 and provided with a drain pipe 46, which may lead to any desired location.

In the embodiment seen in Fig. 2, I have located the container for the cream above the discharge spout 11, in order that the cream will feed by gravity to such discharge spout 11, and it is also within the scope of my invention to locate the container for the cream beneath the discharge spout and pump or force a predetermined amount of cream through the discharge spout, as illustrated in Fig. 3. In this embodiment, 47 designates a discharge spout, which communicates with a conduit 48 corresponding to the conduit 39, seen in Fig. 2, and said discharge spout 47 also communicates with the conduit 49, which latter communicates with a pump casing 50, the plunger 51 of which is controlled by a solenoid 52, which is constructed and operates in the same manner as the solenoid 18 and its adjuncts, seen in Fig. 2, except that in Fig. 3, the rod of the solenoid plunger is directly connected with the piston of the pump, while in Fig. 2, the plunger 24 contacts with the rod 16.

In the embodiment seen in Fig. 4, I have illustrated a vending machine for liquids in which the liquid flows from the container by gravity and the solenoid is employed to control the operation of a valve. In this embodiment, 53 designates a coin-chute, which extends through the casing 54 of the machine, in order that the intending purchaser may insert a coin in such chute. 55 designates a solenoid having its plunger 56 provided with a rod 57 guided in a bracket 58, and between said bracket 58 and the plunger 56 is interposed a spring 59. One end of the coil of the solenoid 55 is connected to the battery or other source of electric supply 60 with the coin-chute 53, while the other end thereof is connected with a coin-chute 61, the upper portion of which is movable, and the lower portion of which discharged into a coin-receptacle 62. 63 designates a rod secured to the plunger 56 of the solenoid and also connected with a valve 64 of any desired or conventional type, which controls a port 65 in a liquid container 66. This port 65 communicates with the discharge spout 67. 68 designates an arm adjustably mounted on the valve-rod 63 and having a deflected end 69, which is adapted to engage with the coin-chute 61 to cause the upper end thereof to be brought into register with the coin-chute 63, as will be hereinafter fully explained in the description of the operation. I also provide a source of heat 70, such as, for example, a gas burner.

It is not essential that the coin-chute have the sections thereof located out of alinement, and in Fig. 5, I have shown another embodiment, which is within the scope of my present invention. In this embodiment, 71 designates the upper portion of the coin-chute, and 72 a lower portion which is in register therewith at all times. 73 designates a spring carried by the coin-chute 72, in the present instance, and bearing against a movable stop 74, which extends into the coin-chute 72 in the path of a coin passing therethrough. 75 designates a valve-rod corresponding with the valve-rod 63 and operated in a similar manner to said valve-rod to control the discharge of liquid from a container. This valve-rod 75 has adjustably mounted thereon a rod 76 having at its lower end a cam-face 77, which, on the upward movement of the valve-rod 75, will en-

gage the stop 74 and move the same out of the coin-chute 72 so as to permit a coin to pass therethrough. The coin-chute 71 is connected by the line 78 with a battery and solenoid corresponding to that seen in Fig. 4 and by the line 79 with the other section 72 of the coin-chute.

In Figs. 6 to 8 inclusive, I have shown a vending machine, which is within the scope of my present invention and adapted to vend articles of a solid nature or in package form, means being employed to open the proper door of the vending machine and also to move the container for the article to be vended when the compartment of said container is empty.

80 designates the support for the vending machine structure and is provided with brackets 81 and 82 respectively, the bracket 81 having a bearing 83 therein in coöperation with the lower end of the shaft 84, which carries the container to the articles to be vended, the upper portion of said shaft engaging a journal 85 carried by the bracket 82. 86 designates a container carried by the shaft 84 in any required manner. The container 86 is formed of a desired number of lateral members 87, which with the radial members 88, form superposed compartments 89, it being understood that the number of compartments formed by the members 88 and the number of such members 88 employed will vary in accordance with the conditions and requirements of the case and the number of superposed compartments will vary in the same manner, it being apparent that any desired number may be employed. The front wall 90 of the machine is provided with doors 91, a number of which preferably correspond to the number of superposed compartments, and for purposes of illustration, I have shown four series of superposed compartments and four doors each of which communicates with its respective series of compartments. Each door 91 is hinged to the casing of the machine as at 92 and is provided with a spring 93 constructed and located in any desired manner, but which in the present instance has one end connected with the door 91 and the other with a fixed or stationary point, so that the spring normally tends to maintain the door in closed position. Each door is locked by means of a plunger 94, which interlocks therewith in any desired manner, and which is adapted to move in a stationary guide 95, said plunger being connected with the solenoid plunger 96 of the solenoid 97. This latter is provided with a rod 98, which engages a guide 99 and between said guide 99 and the solenoid plunger 96 is interposed a spring 100. One end of the coil of the solenoid 97 is connected to the battery 101 with the upper end of the coin-chute 102, while the other end of said solenoid coil is connected with the coin-chute 103, which registers with the coin-chute 102. 104 designates a plunger having collars 105 therein, between which is located the free end of an arm 106, the other end of said arm being adjustably mounted on the plunger rod 94 by means of the set screws 107. The additional circuit employed for rotating the shaft 84 and thereby the container for the articles to be vended is illustrated in Fig. 9, from which it will be seen that a second solenoid 108 is connected in the same circuit as the solenoid 97, so as to be simultaneously energized therewith and cause the plunger 109 to move rearwardly against the spring 110, which abuts against the bracket 111. The forward end of the plunger 109 is guided in a bracket 112, and is provided with a slot 113 which engages said bracket 112 to limit the movement of the plunger in one direction. 114 designates a spring pressed pawl carried by the plunger rod engaging with a pawl 115, so that a partial rotation is imparted to the container for the articles to be vended.

The operation of my present invention will now be apparent to those skilled in this art, and is as follows: Referring first to Figs. 1 and 2, the intending purchaser inserts a coin of the proper denomination into the coin-chute 5, it being understood that the opening in the outer end of said coin-chute is of such dimensions that it will receive only a coin of a predetermined size. The coin passes freely through the chute 5, but is stopped by its engagement with the upper end of the chute 6, thereby closing the circuit through the solenoid 18, thus causing the plunger 24 thereof to move downwardly against the tension of the spring 23. The solenoid 24, in its downward movement, contacts with the rod 16, thereby rocking the arm 15, and opening the valve 14, which will permit the cream or other material in the tank or container 14 to pass through the conduit 12 and discharge nozzle 11 into the cup or other receptacle which is placed beneath such discharge spout. The downward movement of the plunger 24 causes the arm 25 to engage the upper end of the coin-chute 6, thereby bringing the same into register with the coin-chute 5 and permit the coin to pass into the coin-chute 6, thereby opening the circuit and permitting the springs 23 to return the plunger 24 of the solenoid to its initial position. As the rod 25 moves rearwardly, the coin-chute 6 will rock on its pivot 7, preferably due to the spring, as shown in Fig. 2, so that the lower end of the coin-chute 6 will be out of register with the upper end of the coin-chute 8 and the coin will form a contact as soon as it is arrested by its engagement with the coin-chute 8 and the circuit of the solenoid 28 will be closed. This will cause the solenoid plunger

29 to move downwardly against the tension of the spring 32 and the piston 34 will cause a predetermined amount of liquid in the container 36, such as for example, coffee, to pass through the conduit 39 and discharge spout 11. The downward movement of the plunger rod 30 causes the arm 41 to bring the lower end of the coin-chute 6 into register with the coin-chute 8 and the coin is then free to pass through the coin-chute 8, thereby opening the circuit, and the coin is received in the coin receptacle 9. As soon as the circuit is opened in the manner described, the spring 32 causes the plunger 29 and the piston 34 to be raised into the initial position of such parts, as seen in Fig. 2.

It is also within the scope of my invention to positively force the liquid from the tank or container 14, as will be understood by reference to Fig. 3, from which it will be seen that the solenoid 52, which corresponds to the solenoid 18, has its plunger connected with a piston 51, whereby the cream, for example, can be positively forced through the discharge spout 47.

In the embodiment seen in Fig. 4, instead of pumping the liquid from the container provided therefor, such as, for example, the container 66, the liquid feeds from said container through the port 65 to the discharge spout 67 by gravity, and such feed is controlled by the valve 64, which in turn, is controlled by the plunger 56 of the solenoid 55. The coin, which is inserted in the coin-chute 53, is stopped by the upper end of the coin-chute 61, thereby closing the circuit to the solenoid and causing the plunger 56 to be moved upwardly against the spring 59, thereby opening the valve 64. Owing to the provision of the arm 68, the deflected end 69 thereof will move the coin-chute 61 into register with the coin-chute 53, so that after a predetermined amount of liquid has been discharged, the coin will pass into the coin-chute 61 and open the circuit. The coin then passes through the coin receptacle 62 and the spring 59 is then free to act to cause the valve 64 to close.

It is unnecessary in all cases to have a sectional coin-chute, the sections of which are out of register at certain times in the cycle of the operation, and which are brought into register in order to permit the coin or check to pass through the coin-chute. In the broad scope of my invention, the coin-chute may be sectional or have portions thereof insulated from each other, and in the embodiment seen in Fig. 5, the sections of the coin-chute register with each other, and a spring pressed stop 74 is provided. When the intending purchaser inserts a coin into the coin-chute, it will be arrested in its passage, owing to contact with said stop 74, thereby closing the circuit and energizing the solenoid to cause the plunger rod 75 thereof to be advanced against a spring similar to that seen in Fig. 4. On a predetermined movement of the plunger rod 75, the cam face 77 will move the stop 74 out of the path of the coin, thereby permitting said coin to pass on, due to gravity, and the circuit will be closed.

It is also within the scope of my invention to utilize the coin-chute, the solenoid, and their adjuncts, to control the opening of the doors leading to the different compartments of the container and also to intermittently rotate the container for the articles to be vended, as will now be described with reference to Figs. 6 to 9 inclusive. The coin inserted by the intended purchaser in the coin-chute 103 will be arrested in its movement by the stop 104 and the circuit will be closed, thereby energizing the solenoid 97 and causing the plunger 96 thereof to move rearwardly and withdraw the locking plunger 94 from its engagement with the door 91, thereby permitting the door to open, due to the influence of the spring 93. Simultaneously with the unlocking of the door, the arm 96 will move the stop 104 out of the path of the coin, so that such coin will pass out of engagement with the coin-chute 103, the circuit will be opened, and the parts returned to their initial position.

Preferably in the same circuit with the solenoid 97, is the solenoid 108, so that a predetermined interval after the door 91 is opened, the plunger rod 109 will cause the spring pressed pawl 114 to actuate the pawl 115 and thereby impart to the shaft 84 and the container carried thereby a predetermined travel, which is illustrated as being one-quarter of a revolution. As soon as the stop 104 has been moved to permit the coin to break the contact, the parts return to their initial position.

It will now be apparent that in all the embodiments of my invention, I employ a solenoid, the energizing of which is controlled by a coin, and the opening of the circuit is controlled by mechanism actuated by the plunger of the solenoid. The underlying principle involved may be used to control the vending of any desired material or article, whether of a liquid or of a solid nature, and it is especially adapted to be employed in conjunction with devices for vending articles of food.

It will now be apparent that I have devised a novel and useful coin controlled vending machine, which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described preferred embodiments thereof, which will give in practice satisfactory and reliable results, it is to be understood that the same are susceptible of modification in various particu-

lars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

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

1. Coin controlled mechanism, comprising a coin chute having separated coin-receiving and conducting portions thereof insulated from each other, and a solenoid in circuit with said portions, the circuit being closed by a coin passing through said chute and engaging said portions.

2. Coin controlled mechanism, comprising a coin chute having separated coin-receiving and conducting portions thereof insulated from each other, and a solenoid in circuit with said portions, the circuit being closed by a coin arrested in said chute and engaging said portions, and said solenoid controlling the retention of the coin in the coin chute and thereby the opening of the circuit.

3. Coin controlled mechanism, comprising a coin chute having separated coin-receiving and conducting portions thereof insulated from each other, and a plurality of solenoids in circuit with certain of said portions, a circuit being closed by the engagement of a coin with two adjacent portions of said coin chute.

4. Coin controlled mechanism, comprising a coin chute having separated coin-receiving and conducting portions thereof normally insulated from each other, said sections being relatively movable, and a solenoid in circuit with said portions, the circuit being closed by the engagement of the coin with adjacent portions when said portions have a predetermined relation to each other.

5. Coin controlled mechanism, comprising a sectional coin chute, one section thereof being movably mounted and normally out of register with another section thereof to arrest a coin passing through said chute, a solenoid in circuit with said sections, the circuit being closed by a coin engaging adjacent sections, and means controlled by said solenoid for bringing said sections into register and thereby permitting the coin to open the circuit.

6. Coin controlled mechanism, comprising a sectional coin chute, one section thereof being movably mounted and normally out of register with the other sections, a solenoid in circuit with said sections, and means controlled by said solenoid for bringing said movable section into register with the other sections on a predetermined movement of the plunger of said solenoid.

7. Coin controlled mechanism, comprising a sectional coin chute having the separated relatively-movable coin-receiving and conducting sections thereof insulated from each other, a solenoid in circuit with said sections, a spring tending to move the plunger of the solenoid in one direction, and means adjustably carried by said solenoid for opening the circuit, the circuit being closed by the engagement of a coin with adjacent sections.

8. Coin controlled mechanism, comprising a sectional coin chute, one section thereof being movably mounted and normally out of register with the other sections, to thereby arrest a coin passing through the coin chute, a plurality of solenoids in circuit with adjacent sections of said chute and arranged to be successively operated, the circuit being closed by the engagement of a coin with adjacent sections, a tension device for said movable section, means controlled by the first solenoid for opening the circuit thereof, and means controlled by the next solenoid for opening the circuit thereof.

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