April 26, 1960 H. B. STONER ET AL 2,934,613

SELECTOR SWITCH MECHANISM

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Fig. 1.

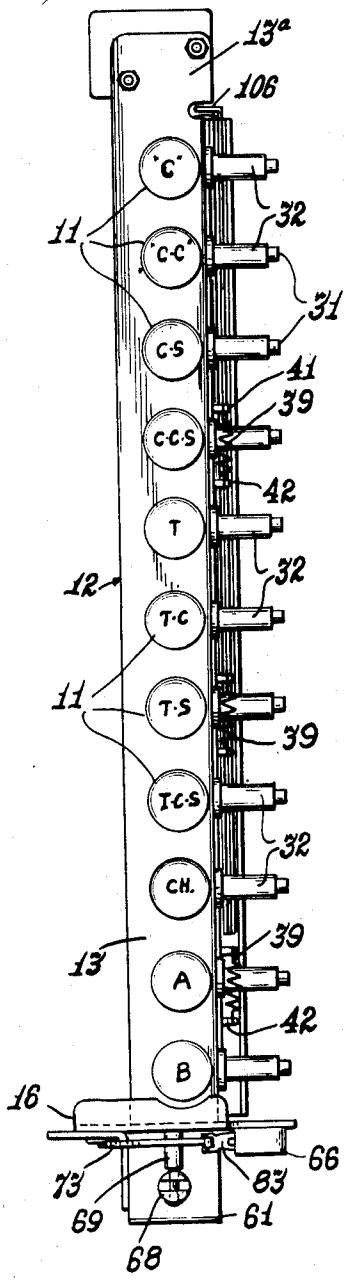
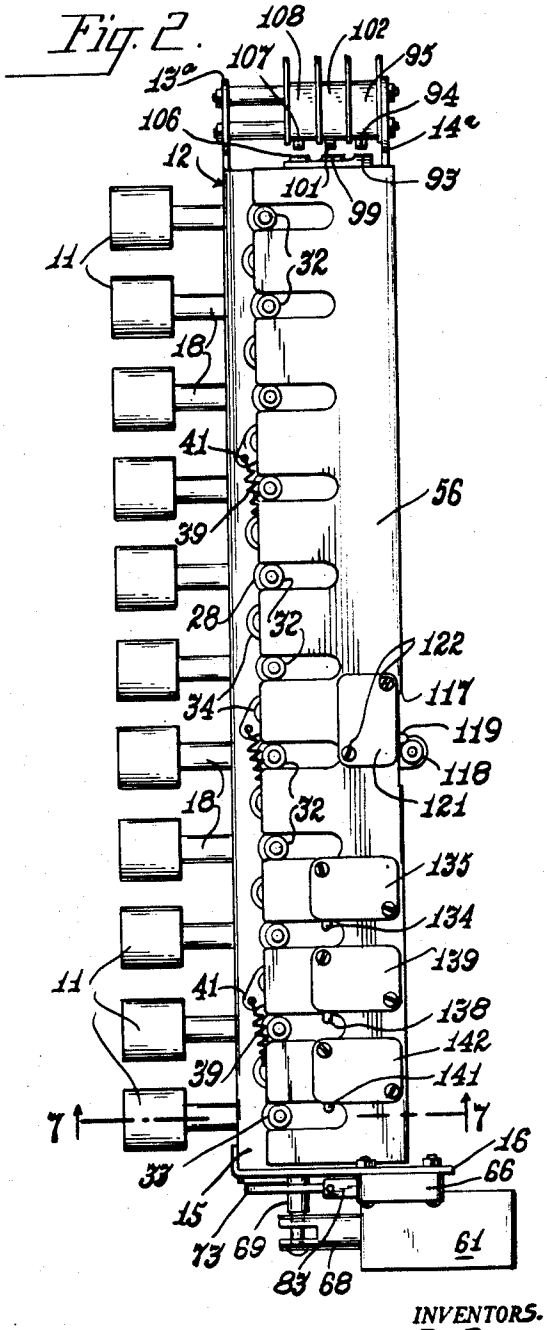


Fig. 2.



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Fig. 3.

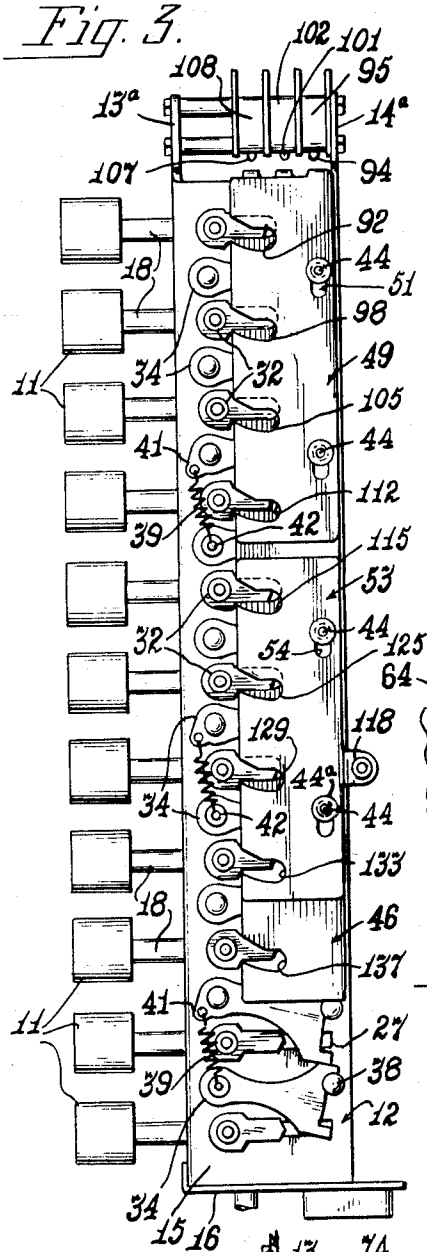


Fig. 4.

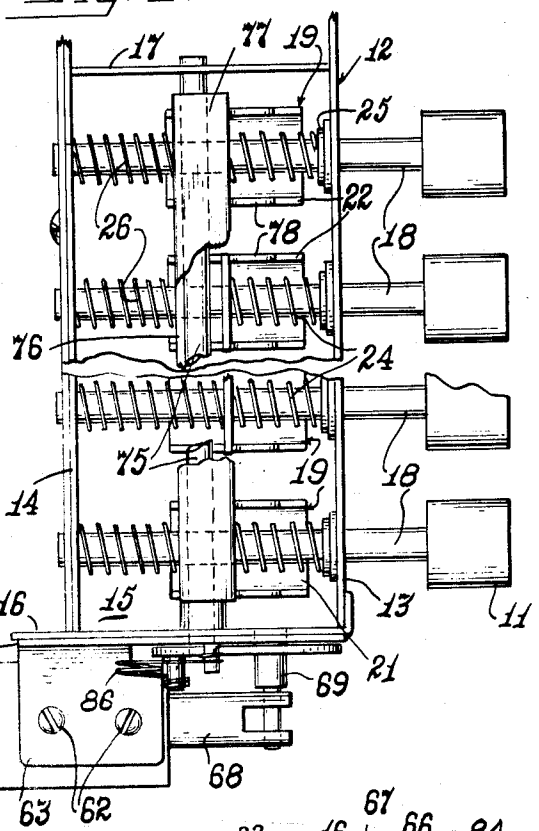


Fig. 5.

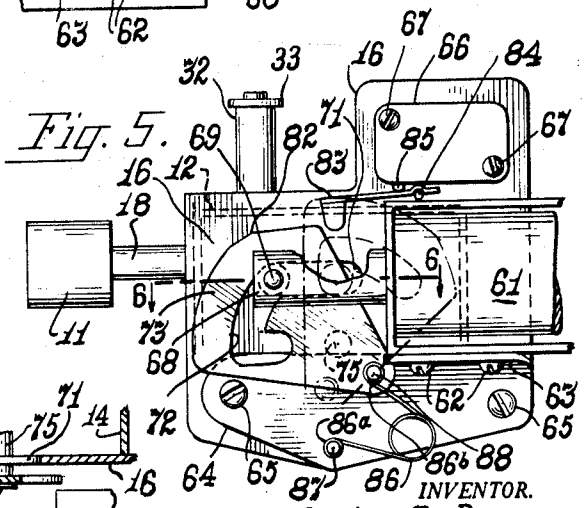
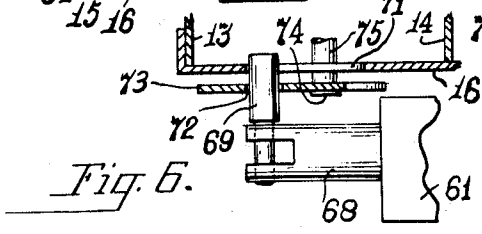


Fig. 6.



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SELECTOR SWITCH MECHANISM

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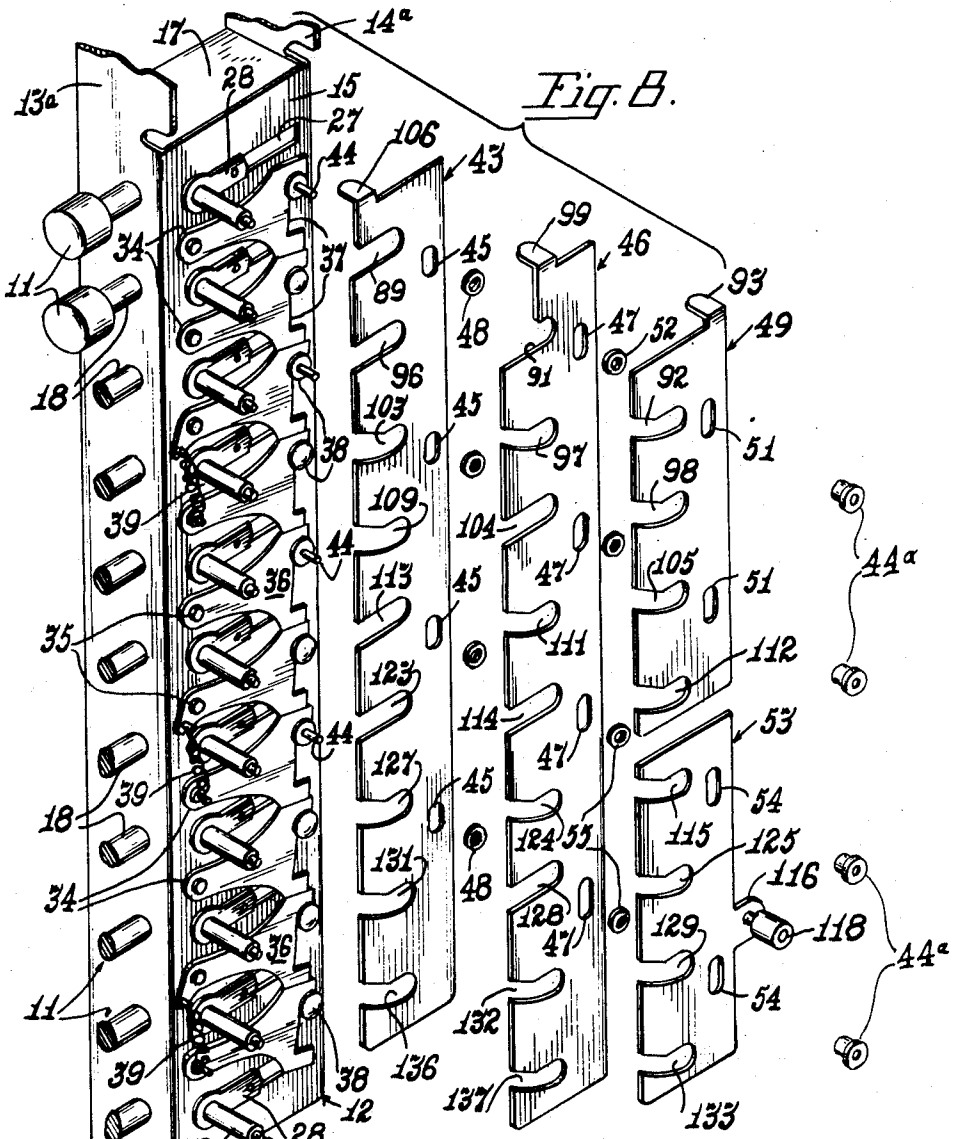


Fig. 8.

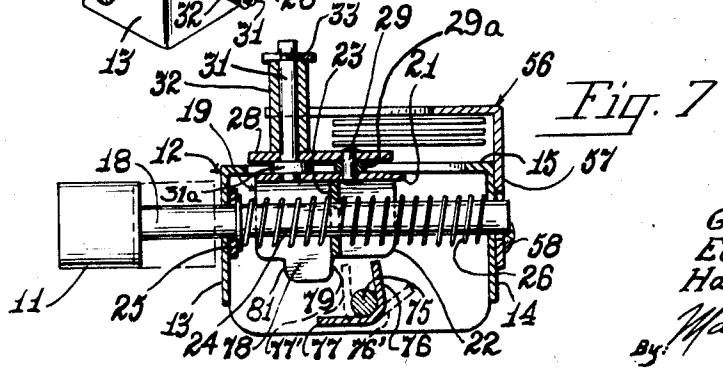


Fig. 7

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2,934,613

SELECTOR SWITCH MECHANISM

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Application December 31, 1957, Serial No. 706,425

9 Claims. (Cl. 200—5)

This invention relates to improvements in a selector switch mechanism and is more particularly concerned with a mechanism adapted for use in coin operated automatic beverage dispensing machines.

Beverage dispensing machines, of the character in which the present selector switch mechanism is adapted to be installed, are designed to dispense bulk beverages such as, for example, hot coffee or tea, black, with sugar, with cream, or with both cream and sugar; hot chocolate or soup or any other beverage or combination of ingredients to make such beverage. Such machines include electrically controlled means for causing operation of certain mechanism for dispensing hot water and one or more ingredients following the deposit of a requisite coin or coins and selective manual pre-setting or post-setting of the selector switch mechanism operable for controlling selective operation of the ingredient dispensing mechanisms.

In such machines, the flow of the hot water is controlled by the opening and closing of a solenoid controlled supply valve, and the dispensing of one or more ingredients, such as coffee, tea, sugar, powdered chocolate or powdered soup, is controlled by electrically operated dispensing mechanisms, the details of which constitute no part of the present invention. Prior known devices or mechanisms used for the selection and operation of one or more of the ingredient dispensing mechanisms involve costly complicated structures susceptible to fraudulent or improper operation, require frequent service to maintain them operable, and usually function in conjunction with ordinary blade-type switches arranged in the various electrical circuits controlling the operation of the ingredient dispensing mechanisms.

The present invention relates to a novel pre-assembled selector switch mechanism comprising a plurality of manually depressible selector plungers accessible on the outside of the machine housing for easy accurate selection and manipulation. These plungers are selectively manually operable by the customer to cause one, or combinations of two or more, of a plurality of selector switches to be closed and to remain closed for an interval of time required to insure the dispensing of measured amounts of ingredients. Due to the specific construction of the mechanism operably connecting the plungers with the switches, considerably fewer switches are required in the present invention than are found in known prior selector mechanisms.

Because the quantity of beverage dispensed must be critically proportioned to insure against too little or too much of any beverage being dispensed, or the dispensing of an insufficient or excessive quantity of the ingredients for making such beverage, the present mechanism is particularly advantageous in that it enables the use of snap-action switches instead of blade switches. Snap-action switches are less affected by temperature or moisture variations, and less subject to the hazard of physical impairment, and hence are more reliable.

Furthermore, the selector switch mechanism includes

novel means actuable when a selected plunger is depressed to effect a beverage selection, to prevent effective operation of any one or more other plungers until such time as the dispensing operation has been completed and the said plunger has returned to its initial ineffective position. Each plunger also includes novel means to prevent jamming or breakage in the event such additional plunger is depressed either while the machine is operating, or in the absence of a coin of the proper denomination having been deposited.

It is therefore an object of the invention to provide a novel selector switch mechanism of the character described.

Another object is to provide, in a selector switch mechanism, a plurality of manually depressible plungers and novel means actuable when a selected plunger is operated to hold said plunger depressed during the operating cycle of the dispensing machine.

Another object is to provide a selector switch mechanism with a plurality of manually operable selector elements and but a minimum number of electric snap-action switches actuable either individually or in predetermined groups upon operation of a selected element.

Another object is to provide a selector mechanism of the character described with a plurality of novel cammed slide plates for providing an operative connection between each of a plurality of selector plungers and one or more switches to be selectively operated by said plungers.

One of the more important objects is to provide novel means to prevent improper operation of the dispensing apparatus resulting from too rapid depression and release of a selected plunger.

Referring to the drawings in which the same characters of reference are employed to indicate corresponding or similar parts throughout the several figures of the drawings:

Fig. 1 is a front elevational view of the selector switch mechanism.

Fig. 2 is a side elevational view thereof as seen from the right-hand side of Fig. 1.

Fig. 3 is a view similar to Fig. 2, but showing the cover plate removed to illustrate the cammed plates and associated mechanism.

Fig. 4 is an enlarged side elevational view as seen from the left-hand of Fig. 1, showing the intermediate portion of the mechanism broken away.

Fig. 5 is an enlarged view of the bottom end of the selector switch mechanism.

Fig. 6 is a fragmentary detail sectional view taken on line 6—6 of Fig. 5.

Fig. 7 is a horizontal sectional view, on an enlarged scale, taken substantially on line 7—7 of Fig. 2.

Fig. 8 is an exploded view of the chassis and cammed slide plate assembly, showing the anti-cheat mechanism carried on the chassis.

Referring to the accompanying drawings, and particularly to Figs. 1 and 2, the novel selector switch mechanism illustrated is adapted to be mounted in the vertical position shown by any suitable means within the casing of a beverage dispensing machine with its plurality of selector plungers (eleven in this instance) generally identified at **11**, extending through one wall of said casing so as to be readily available for easy selection and manipulation by the customer. As will be more fully explained in detail hereinafter, these plungers are selectively operable independently of one another to effect the selection of a desired beverage to be dispensed by the beverage machine.

The entire selector switch mechanism is carried on and within a vertical elongated open ended chassis **12** fabricated from stiff sheet metal stock and comprising a front wall **13**, a parallel back wall **14** and a connecting side

wall 15 (Fig. 7). The open bottom end of the chassis is closed by an end plate 16 (Fig. 5) secured to the chassis walls in any suitable manner, such as by welding. A top end wall 17 closes the top end of the chassis below the upwardly extending end portions 13*a* and 14*a* on the front and back walls 13 and 14 respectively.

The chassis front and back walls 13 and 14 are provided with a plurality of mutually spaced aligned apertures to receive therethrough the stems 18 of the plurality of selector plungers 11 for slidably mounting said plungers on the chassis. Inasmuch as the construction and operation of each plunger 11 are identical, the following description of one of said plungers is equally applicable to all of them.

Selector plungers

The stem 18 of each plunger 11 has operably associated with it a U-shaped cradle 19 (Figs. 4 and 7) including a bridging wall 21 disposed in slidable contact with the inside face of the chassis side wall 15, and laterally extending parallel top and bottom walls 22 disposed on opposite sides of the plunger stem 18. Each of the walls 22 has an open ended slot therein in which is seated an end margin of a substantially square washer 23 slidably mounted on the stem 18. A helical spring 24 carried on the stem 18 has one end in abutment with said washer and its other end is in abutment with a collar 25 secured to said stem 18, so as to provide a yieldable mechanical connection between the cradle 19 and said stem 18.

When the plunger 11 is depressed under normal conditions of operation, the spring 24 acts upon washer 23 and cradle 19 to move said cradle in unison with the plunger for a purpose to be described presently. When the operating pressure on the plunger is relieved, said plunger and its cradle is returned to its initial position by means of a second helical return spring 26 arranged on the stem between the chassis back wall 14 and the cradle washer 23. The return spring 26 is, of course, lighter than the spring 24 so as not to resist movement of the cradle when the plunger is depressed during normal machine operation. In the event that a plunger is depressed when movement of its cradle is prevented, in a manner and under such conditions of operation as will be described presently, the spring 24 will be compressed so as to permit the plunger to be operated through its full operating stroke without movement of the cradle thereon and without damage to the mechanism or breakage of any of its parts or of parts associated with it.

The chassis side wall 15 has a plurality of mutually spaced transverse slots 27 (Fig. 8), one aligned with each plunger stem 18. A plurality of cam plates 28 are seated on the outside face of the side wall 15 and are fixedly connected to the respective cradle walls 21 so as to be movable therewith. One end of each cam plate 28 is secured to its cradle 19 by a rivet 29 (Fig. 7) while its other end is apertured to receive therethrough a pin 31 rigidly secured to said cradle and extending outwardly through the slot 27. Annular spacer elements 29*a* and 31*a* are slidably guided within slots 27 and are mounted on rivets 29 and pins 31 respectively to maintain plates 28 spaced apart from cradle walls 21 for free sliding movement with respect to wall 15. The pin 31 has an elongated sleeve-roller 32 journalled thereon for a purpose to be described presently. A conventional C-shaped retainer element 33 holds roller 32 against longitudinal movement.

Also arranged on the outside face of the chassis wall 15 are a plurality of anti-cheat plates 34 (Fig. 8), each pivotally mounted at one end, as at 35, between adjacent cam plates 28. Each anti-cheat plate has a laterally flared end portion 36 recessed at 37 to receive a rigid guide stud 38 that limits swinging movement of the anti-cheat plate about its pivot 35 and also prevents outward movement of plate 36 so as to prevent cam plate 28 from

sliding inwardly past plate 34. When the switch control mechanism is in its vertical position of use, the anti-cheat plates rock downwardly into the positions substantially as shown in Fig. 8 with their flared end portions 36 in substantial abutment. However, when any one of the plungers 11 is depressed, in a normal selection operation, the cam plate 28 carried therewith is advanced between adjacent anti-cheat plates 34 to rock upwardly the entire series of plates above the actuated cam plate. When this occurs, all of the anti-cheat plates are held firmly against further displacement, and consequently effective operation of a second plunger cannot be obtained owing to the lack of clearance required for its cam plate 28 to advance between adjacent abutting anti-cheat plates.

Although it is not necessary to mount the subject device vertically as disclosed in the drawings, in some instances it is convenient to do so. In this event, it has been found that the combined weight of all of the vertically arranged anti-cheat plates offers excessive resistance to the movement of the lowermost group of plungers 11 and their cam plates 28. This is overcome by providing some, preferably three, of said plates 28 with springs 39 connected at one end to a tail portion 41 (Fig. 3) thereon and at their other ends to rigid studs 42 formed integral with adjacent pivot pins 35. Obviously, the studs 42 may be separate from the pivot pins 35 in which instance they would be mounted directly on the chassis wall. The springs 39 are sufficiently tensioned so as to substantially counterbalance the weight of the attached anti-cheat plate and of the series of plates immediately thereabove, thus relieving the plates therebelow of most of their weight.

Cammed slide plates

Selective depression of any one of the plungers 11 operates to close selected switches in the electrical circuits of the dispensing machine. One such switch is responsive to actuation of any one of the plungers to close the circuit for operating the machine and will be described presently. Additional switches are selectively actuated in response to manual depression of selected plungers 11. These additional switches operate to close the electrical circuits controlling the operation of the various ingredient dispensing mechanisms. The selective switch operating structure, which is best illustrated in Figs. 3 and 8, will now be described.

An elongated cammed slide plate 43 (Fig. 8) is seated for longitudinal sliding movement on the chassis over the anti-cheat plates 34 and is of such length as to extend from adjacent the uppermost end of said chassis to substantially midway between the second and third plungers (identified in Fig. 1 as A and CH) from the bottom end of said chassis. This plate is guided by pins 44 having bearing sleeves 44*a* projecting outwardly from the chassis wall 15 and extending through slots 45 in said plate.

A second cammed plate 46 of like dimensions is arranged over the cammed plate 43 and is similarly guided for longitudinal sliding by slots 47 provided therein and engaged over said pins 44 and sleeves 44*a*. Preferably, thin washers 48 are mounted on sleeves 44*a* and are interposed between the plates to maintain the plates spaced apart slightly and to minimize friction when the cammed plates slide relative to one another in a manner to be described presently.

A third cammed plate 49, which is substantially shorter than the cammed plates 43 and 46, is similarly mounted over the cammed plate 46 on the two uppermost guide pins 44 and sleeves 44*a*, which project through slots 51. Spacer washers 52 separate plate 49 from plate 46. A fourth cammed plate 53 is arranged end-to-end with respect to plate 49 but is spaced below the latter and extends over the cammed plate 46. Plate 53 is guided on the two lowermost guide pins 44 and sleeves 44*a* which project through slots 54 therein. Washers 55 hold

the cammed plate 53 spaced from the underlying cammed plate 46. The cammed slide plate assembly preferably is covered by a cover plate 56 which has a perpendicular flange 57 (Fig. 7) on one edge that overlies and is secured to the chassis back wall 14 by screws 58. Each of the cammed slide plates 43, 46, 49 and 53 is thereby mounted for independent sliding movement longitudinally along the chassis 12 and they are suitably formed, in a manner to be specifically described hereinafter, so as to be selectively shifted in response to actuation of a selected one of the plurality of plungers 11 for closing one or more electrical switches connected in the circuits controlling the dispensing of the ingredients for the selected beverage.

Solenoid holding mechanism

Depression of any one of the plungers 11 operates also to close the main electrical circuit of the dispensing machine through operation of a switch carried by the selector mechanism. The means for accomplishing this function is mounted on the chassis lower end plate 16, as is best illustrated in Figs. 1, 2 and 4–6. As there shown, said end plate 16 carries a solenoid coil 61 mounted, as by screws 62, on an outwardly extending flange 63 formed on a mounting bracket 64 secured by screws 65 to the bottom or outside face of the end plate 16. The solenoid is connected in the main circuit of the dispensing apparatus through a normally open snap-action switch 66 secured firmly by screws 67 to said end plate. The solenoid core 68 is suitably apertured at its free end to receive the reduced end of a pin 69, the other end of which extends through and is guided along a slot 72 in a cam plate 73 secured firmly to a projecting end 74 of a lock-bar shaft 75 mounted for oscillating movement about its axis. Shaft 75 extends the entire length of the chassis and is journalled at its other end in the top end wall 17.

Lock bar

Referring now particularly to Figs. 4 and 7, the lock-bar shaft 75 lies to one side (beneath as shown in Fig. 7) of the plunger stems 18 and the cradles 19 thereon and it carries, for rotation therewith, an elongated V-shaped channel or lock-bar including diverging walls 76, 77. When in its normal rest position, the wall 76 of the lock-bar extends toward the plunger stems and into the paths of projections 78 on the cradle walls 22. When the lock-bar is in this position, the cam plate 73 is in the full line position shown in Fig. 5. Upon depression of any one of the plungers 11, during normal operation of the machine, the leading edge 79 of the respective cradle projection 78 initially abuts the lock-bar wall 76 and then rocks said lock-bar in a clockwise direction, as viewed in Fig. 7, into substantially the position illustrated in dotted lines in said figure. Such rocking carries the other lock-bar wall 77 substantially into the dotted line position 77' where it then lies in the path of the trailing edge 81 of the projection 78 so as to be engaged thereby and prevent the plunger 11 and cradle 19 from returning to their initial positions.

Referring again to Fig. 5, rocking of the lock-bar 75, upon depression of a plunger 11, also rocks the cam plate 73 from its full line position into the dotted line position shown. Such movement of the cam plate 73 slides the core 68 into the solenoid coil 61, through operation of the pin and slot connection 69, 72. At the same time, a cam edge 82 on said cam plate 73 engages a switch arm 83 pivotally mounted on the chassis end plate 16, as at 84, and urges said arm 83 toward the snap action switch 66 so as to actuate its switch operating detent 85 and close the main electrical circuit and energize the solenoid 61. Energization of solenoid 61 will hold the core 68 retracted until such time as the flow of current in said main circuit is interrupted by operation of the usual timing mechanism provided in the dispensing machine for controlling the operating cycle. This timing mechanism forms no part of the present invention and it is therefore not described or shown. However, as soon as the main circuit is broken, the return spring 26 on the actuated plunger 11 returns the plunger 11, cradle 19 and lock-bar shaft 75 to their initial positions.

It frequently happens that a customer depresses and then releases the plunger 11 quite rapidly. In this event, the structure as thus far described would operate in the following manner. The snap-action switch 66 would be closed only for an instant during which time the current through solenoid 61 would not build up to a value sufficiently high to maintain the solenoid core in its retracted position. As a result, the core would immediately return to its initial outward position, cam plate 73 would pivot back toward its initial position, and snap-action switch 66 would immediately reopen. That is, the selector mechanism would not operate to institute the dispensing of the dry ingredients.

In order to prevent this improper mode of operation from occurring when the plunger 11 is depressed and released too rapidly, there is provided a toggle spring 86 (Fig. 5) for delaying the return movement of cam plate 73 for a sufficient time interval for the current to build up in solenoid 61. Spring 86 is in the form of an integral length of wire coiled about itself at its intermediate portion and having one eyelet end 86*a* pivoted to a stud 87 on mounting bracket 64, and its other eyelet end 86*b* pivoted to a stud 88 on the tail portion of cam plate 73. When the latter is in the dotted line position shown in Fig. 5, the end 86*b* of spring 86 will be to the left of the "dead center" (the line between stud 87 and shaft 75) so that spring 86 will urge the cam plate 73 in a clockwise direction as viewed in Fig. 5. As a result, spring 86 tends to delay or retard the return movement of cam plate 73 sufficiently so that before snap-action switch 66 can reopen the current through solenoid 61 will build up to a value high enough to maintain the solenoid core retracted.

Ingredient selection

The dispensing of the ingredients required to make the beverage selected by the customer is controlled by sliding of one or more of the cammed slide plates 43, 46, 49, or 53. Such sliding is effected upon depression of a selected plunger 11. As noted hereinabove, when a coin is deposited in the machine, the electrical system therein is conditioned for machine operation. However, the dispensing machine will not operate until the customer selects the kind of beverage to be dispensed. This is accomplished when the selected plunger 11 is depressed. Depression of such plunger closes the main circuit switch 66 controlling the operation of the dispensing machine and initiates the flow of hot water and slides one or more of the cammed slide plates for closing the requisite circuit or circuits controlling the mechanism for operating one or more of the ingredient dispensing mechanisms. When the operating cycle is completed, the machine is restored to its initial inoperative condition and another operating cycle cannot be instituted until another coin is deposited and a beverage selection is made.

Following is a brief description of the ingredient selector mechanisms actuated when each of the plungers 11 is depressed, it being understood that in each instance the electrical circuits involved in such operation are conditioned by the deposit of the requisite coin, so as to permit such dispensing operation.

Coffee—Black

Specifically, should a customer desire to obtain black coffee, the uppermost plunger 11, marked C in Fig. 1, is depressed. Depression of this plunger closes the solenoid actuated snap-action switch 66 in the main circuit and at the same time carries the sleeve-roller 32 mounted thereon into a plurality of substantially aligned slots 89,

91 and 92 in the cammed slide plates 43, 46 and 49 respectively. The slots 89 and 91 are straight with respect to the path of the sleeve-roller 32 whereas the slot 92 in plate 49 is cam-shaped. Consequently, only said plate 49 is shifted upwardly by the sleeve-roller 32 so as to carry a finger 93 on its upper end into operating engagement with a detent 94 on a normally open snap-action switch 95 mounted between the end extensions 13*a* and 14*a* of the chassis 12. The switch 95 is connected in the electrical supply circuit controlling the operation of the dispenser mechanism for the dry coffee ingredient. Consequently, when said switch 95 is closed the operation of the dispensing mechanism is initiated. When the machine completes one cycle of operation, the main circuit is broken, thus de-energizing the solenoid and permitting spring 26 to urge the displaced cradle 19 and plunger C back to their respective initial positions.

Coffee—Cream

When coffee with cream is desired, the plunger 11 identified as CC, is depressed so as to carry its sleeve-roller 32 into slots 96, 97 and 98 in the slide plates 43, 46 and 49 respectively. The slot 96 is straight whereas the slots 97 and 98 are cam-shaped, and the plates 46 and 49 are thereby shifted upwardly. The plate 49 operates as before to close the switch 95 in the dry coffee ingredient dispensing circuit. The slide plate 46 has a finger 99 on its upper end which operates a detent 101 in a normally open snap-action switch 102 to close said switch. This switch is connected in the circuit to the dry cream ingredient dispensing mechanism. Operation of the machine through one operating cycle is thus initiated to cause the dispensing of coffee and cream.

Coffee—Sugar

To obtain coffee with sugar, the next lower plunger 11 marked CS is depressed. This carries the sleeve-roller 32 thereon into companion slots 103, 104 and 105 in the slide plates 43, 46 and 49 respectively. Because only the slots 103 and 105 are cam-shaped, the plates 43 and 49 only are shifted upwardly. The plate 49 functions as before to close the switch 95 in the dry coffee ingredient dispensing circuit. The slide plate 43 carries a finger 106 on its upper end that abuts a detent 107 in a normally open snap-action switch 108 in the circuit to the dry sugar ingredient dispensing mechanism thus closing said circuit. The beverage now dispensed contains coffee and sugar.

Coffee—Cream—Sugar

When coffee with cream and sugar is to be dispensed, the next lower plunger 11 marked CCS, is depressed. Depression of this plunger carries its sleeve-roller 32 into slots 109, 111 and 112 in the slide plates 43, 46 and 49 respectively. All of these slots are cam-shaped hence all three plates 43, 46 and 49 are moved upwardly to close the respective snap-action switches 108, 102 and 95 for initiating the operation of the mechanism for dispensing the coffee, cream and sugar ingredients.

Tea

Should the customer desire to obtain tea, the next lower plunger marked T, is depressed. The sleeve-roller 32 carried by this plunger is thereby moved into slots 113, 114 and 115 in the cammed slide plates 43, 46 and 53 respectively. Only the slot 115 in plate 53 is cam-shaped, consequently only this plate is shifted upwardly when this plunger is depressed. The slide plate 53 has an ear 116 on its longitudinal edge that projects through a guide slot 117 (Fig. 2) in the cover plate 56. The ear 116 carries a roller 118 disposed for cooperative engagement with a switch detent 119 on a normally open snap-action switch 121 secured, as by screws 122, to the outside face of the cover top wall (Fig. 2). When the slide plate 53 is shifted upwardly in response to depression of the plunger T, the roller 118 abuts and actuates the switch detent so as to close the switch 121 for initially energizing the circuit to the dry tea ingredient dispensing mechanism during machine operation.

Tea—Cream

In the event tea with cream is desired, the next lower plunger 11, marked TC, is depressed to carry its sleeve-roller 32 into slots 123, 124 and 125 in said slide plates 43, 46 and 53. Because only the slots 124 and 125 are cam-shaped, only the plates 46 and 53 are shifted to close the snap-action switches 102 and 121 controlling the current flow in the circuits to the dry cream and tea ingredient dispensing mechanisms only.

Tea—Sugar

To obtain tea with sugar, the plunger 11, marked TS, is depressed. As a result, the sleeve-roller 32 thereon moves into slots 127, 128 and 129 in slide plates 43, 46 and 53 respectively, and because only the slots 127 and 129 are cam-shaped, only the plates 43 and 53 are shifted upwardly thus closing the normally open switches 108 and 121 respectively, for closing the electrical circuits to the dry sugar and tea ingredient dispensing mechanisms.

Tea—Cream—Sugar

The depression of the next lower plunger 11, marked TCS, carries its sleeve-roller 32 into slots 131, 132 and 133 in the cammed slide plates 43, 46 and 53 respectively, and, because all of these slots are cam-shaped all three cammed slide plates are shifted upwardly to close the respective switches 108, 102 and 121 to initiate operation of the dry tea, sugar and cream ingredient dispensing mechanisms.

Chocolate

The selector switch mechanism illustrated, also includes means for selective dispensing of other beverages such as, for example, hot chocolate or either one of two kinds of soup. In order to obtain hot chocolate, the plunger 11, marked CH, is depressed to move its sleeve-roller 32 into operating engagement with a switch detent 134 on a normally open snap-action switch 135 carried on the cover plate 56. Closing of this switch initiates the circuit controlling operation of a dry chocolate ingredient dispensing mechanism. The cammed slide plates 43 and 46 also are shifted upwardly through engagement of the sleeve-roller 32 with cam slots 136 and 137 in the respective slide plates 43 and 46 so as to close the switches 108 and 102 in the circuits for the sugar and cream dispensing mechanisms. The dispensed beverage is chocolate with cream and sugar.

Soup

To obtain one of the two kinds of soup made available in the dispensing machine, the next to the lowermost plunger 11, marked A, is depressed so as to carry its sleeve-roller 32 into engagement with a switch detent 138 of a normally open snap-action switch 139 also mounted on the cover plate 56. When this switch is closed the circuit for the selected dry soup ingredient dispensing mechanism is closed.

Depression of the lowermost plunger 11, marked B, moves its sleeve-roller 32 into actuating engagement with a switch detent 141 in a normally open snap-action switch 142 so as to close said switch and complete the electrical circuit to the second dry soup ingredient dispensing mechanism.

It should be apparent at this time that a selective switch mechanism is provided which has novel operating means readily accessible for easy selective operation and one that is not affected by the presence of heat and moisture. Furthermore, the mechanism is so constructed as to embody but a minimum number of switches, and is cheat proof and damage proof, thus insuring accuracy and reliability in the dispensing operation. It should be understood, however, that the specific structure dis-

closed for purposes of illustration may be varied substantially without deviating from the principle of operation of the subject invention as delineated in the appended claims.

We claim:

1. A selector switch mechanism comprising a plurality of selectively operable elements each manually movable from a normal inoperative position to an operative position, means urging said elements toward the inoperative positions thereof, a plurality of members, means mounting said members for alternative movement between inoperative and operative positions thereof, a plurality of electrical switches, a plurality of switch actuating means each for actuating a respective one of said switches in response to movement of a respective one of said members to the operative position of the latter, means for moving a respective different one or different combination of said members to their operative positions in response to manual movement of each respective one of said elements to its operative position, locking means movable between initial and locking positions thereof, means operatively connecting said elements and said locking means for moving the latter to its locking position in response to manual movement of one of said elements to its said operative position, said locking means comprising means for maintaining said one element in its operative position for the duration of the period that said locking means remains in its locking position, solenoid means energizable to maintain said locking means in its locking position, an additional electrical switch actuable to energize said solenoid means, means responsive to movement of said locking means towards its locking position to actuate said additional electrical switch, and spring means to urge said locking means toward said locking position so as to prevent the locking means from returning to its initial position before sufficient current flows through said solenoid means to energize the latter.

2. A mechanism as recited in claim 1 and comprising a fixed frame, said spring means comprising a toggle spring having one end connected to said locking means and its other end secured to said frame.

3. A selector switch mechanism for a dispensing machine and comprising a plurality of manually operable plungers each reciprocally movable between a normal inoperative position and an operative position, means urging said plungers toward the inoperative positions thereof, a plurality of slide members, means mounting said slide members for alternative sliding movement between inoperative and operative positions thereof, a plurality of electrical switches, a plurality of switch actuating means each mounted on a respective one of said slide members for actuating a respective one of said switches in response to movement of said respective slide member to the operative position of the latter, cam means for moving a respective different one or different combination of said slide members to their operative positions in response to manual movement of each respective one of said plungers to its operative position, locking means movable between initial and locking positions thereof, means operatively connecting said plungers and said locking means for moving the latter to its locking position in response to manual movement of one of said plungers to its said operative position, said locking means comprising means for maintaining said one plunger in its operative position for the duration of the period that said locking means remains in its locking position, solenoid means energizeable to maintain said locking means in its locking position, an additional electrical switch actuable to energize said solenoid means, cam means responsive to movement of said locking means toward its locking position to actuate said additional electrical switch, and toggle spring means actuable in response to movement of said locking means to its locking position to urge said locking means toward said locking position so as to prevent the locking means from returning to its initial position before sufficient current flows through said solenoid means to energize the latter.

4. A selector switch mechanism for a coin-operated dispensing machine and comprising a plurality of selectively operable elements each manually movable from a normal inoperative position to an operative position, means urging said elements toward the inoperative positions thereof, a plurality of slide plates extending in parallel contiguous relation, means mounting said slide plates for alternative sliding movement between inoperative and operative positions thereof, a plurality of electrical snap-action switches, a plurality of switch actuating means each mounted on a respective one of said slide plates for actuating a respective one of said switches in response to movement of said respective slide plate to the operative position of the latter, each of said slide plates having a plurality of cam means, each of said elements having a member movable therewith, and engageable with a respective one or plurality of said cam means for moving a respective different one or different combinations of said slide plates to their operative positions in response to manual movement of each respective one of said elements to its operative position, a rotatably mounted locking shaft oscillatably movable through a locus of angular displacement between an initial position located substantially at one extremity of said locus and a locking position located substantially at the other extremity of said locus, means operatively connecting said elements and said locking shaft for rotating the latter to its locking position in response to manual movement of one of said elements to its said operative position, said locking shaft comprising means for maintaining said one element in its operative position for the duration of the period that said locking shaft remains in its locking position, solenoid means energizable to maintain said locking shaft in its locking position, an additional electrical switch actuable to energize said solenoid means, and cam means secured to said locking shaft and responsive to rotation of said locking shaft toward its locking position to actuate said additional electrical switch.

5. A selector switch mechanism for a coin-operated dispensing machine and comprising a plurality of selectively operable elements each manually movable from a normal inoperative position to an operative position, means urging said elements toward the inoperative positions thereof, a plurality of slide plates extending in parallel contiguous relation, means mounting said slide plates for alternative sliding movement between inoperative and operative positions thereof, a plurality of electrical snap-action switches, a plurality of switch actuating means each mounted on a respective one of said slide plates for actuating a respective one of said switches in response to movement of said respective slide plate to the operative position of the latter, each of said slide plates having a plurality of cam means, each of said elements having a member movable therewith and engageable with a respective one or plurality of said cam means for moving a respective different one or different combinations of said slide plates to their operative positions in response to manual movement of each respective one of said elements to its operative position, a rotatably mounted locking shaft oscillatably movable between initial and locking positions thereof, means operatively connecting said elements and said locking shaft for rotating the latter to its locking position in response to manual movement of one of said elements to its said operative position, said locking shaft comprising means for maintaining said one element in its operative position for the duration of the period that said locking shaft remains in its locking position, solenoid means energizable to maintain said locking shaft in its locking position, an additional electrical switch actuable to energize said solenoid means, cam means secured to said locking shaft and responsive to rotation of said locking shaft toward its locking position to actuate said additional electrical

switch, and spring means to urge said locking shaft toward said locking position so as to prevent the locking shaft from returning to its initial position before sufficient current flows through said solenoid means to energize the latter.

6. A selector switch mechanism comprising a plurality of selectively operable elements each manually movable from a normal inoperative position to an operative position, means urging said elements toward the inoperative positions thereof, a plurality of members, means mounting said members for alternative movement between inoperative and operative positions thereof, a plurality of electrical switches, a plurality of switch actuating means each for actuating a respective one of said switches in response to movement of a respective one of said members to the operative position of the latter, means for moving a respective different one or different combination of said members to their operative positions in response to manual movement of each respective one of said elements to its operative position, a rotatably mounted locking shaft oscillatably movable through a locus of angular displacement between an initial position located substantially at one extremity of said locus and a locking position located substantially at the other extremity of said locus, means operatively connecting said elements and said locking shaft for rotating the latter to its locking position in response to manual movement of one of said elements to its said operative position, said locking shaft comprising means for maintaining said one element in its operative position for the duration of the period that said locking shaft remains in its locking position, solenoid means actuable to maintain said locking shaft in its locking position, an additional electrical switch actuable to actuate said solenoid means, and means secured to said locking shaft and responsive to rotation of said locking shaft toward its locking position to actuate said additional electrical switch.

7. A selector switch mechanism for a dispensing machine and comprising a plurality of manually operable plungers each reciprocally movable between a normal inoperative position and an operative position, means urging said plungers toward the inoperative positions thereof, a plurality of slide members, means mounting said slide members for alternative sliding movement between inoperative and operative positions thereof, a plurality of electrical switches, a plurality of switch actuating means each mounted on a respective one of said slide members for actuating a respective one of said switches in response to movement of said respective slide member to the operative position of the latter, cam means for moving a respective different one or different combination of said slide members to their operative positions in response to manual movement of each respective one of said plungers to its operative position, a rotatably mounted locking shaft oscillatably movable through a locus of angular displacement between an initial position located substantially at one extremity of said locus and a locking position located substantially at the other extremity of said locus, means operatively connecting said plungers and said locking shaft for rotating the latter to its locking position in response to manual movement of one of said plungers to its said operative position, said locking shaft comprising means for maintaining said one plunger in its operative position for the duration of the period that said locking shaft remains in its locking position, solenoid means actuable to maintain said locking shaft in its locking position, an additional electrical switch actuable to actuate said solenoid means, and means secured to said locking shaft and responsive to rotation of said locking shaft toward its locking position to actuate said additional electrical switch.

8. A selector switch mechanism for a dispensing machine and comprising a plurality of manually operable plungers each reciprocally movable between a normal inoperative position and an operative position, means urging said plungers toward the inoperative positions thereof, a plurality of slide members, means mounting said slide members for alternative sliding movement between inoperative and operative positions thereof, a plurality of electrical switches, a plurality of switch actuating means each mounted on a respective one of said slide members for actuating a respective one of said switches in response to movement of said respective slide member to the operative position of the latter, cam means for moving a respective different one or different combination of said slide members to their operative positions in response to manual movement of each respective one of said plungers to its operative position, a rotatably mounted locking shaft oscillatably movable between initial and locking positions thereof, means operatively connecting said plungers and said locking shaft for rotating the latter to its locking position in response to manual movement of one of said plungers to its said operative position, said locking shaft comprising means for maintaining said one plunger in its operative poistion for the duration of the period that said locking shaft remains in its locking position, solenoid means actuable to maintain said locking shaft in its locking position, an additional electrical switch actuable to actuate said solenoid means, cam means secured to said locking shaft and responsive to rotation of said locking shaft toward its locking position to actuate said additional electrical switch, and spring means to urge said locking shaft toward said locking position thereof so as to prevent said locking shaft from returning to its initial position before sufficient current flows through said solenoid means to actuate the latter.

9. A mechanism as recited in claim 8 wherein said spring means comprises a toggle spring, and means connecting said toggle spring to said locking shaft.

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