SERVICE MANUAL

710-850 SERIES

REFRESHMENT MACHINERY INCORPORATED 300 JACKSONVILLE ROAD · WARMINSTER, PENNSYLVANIA 18974 (215) 675-4200

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Service Manual Index

SECTION A
INTRODUCTION

The "RMi Single Cupper Machines", models 850 & 710, are advanced designs of the dependable RMi coffee dispensing equipment. Each machine is completely self contained, except for water and electrical power.

All components, inside the cabinet, are mounted by screws in keyhole slots. There is practically no part which may not be removed with a screwdriver. Simplicity of design — simplicity of construction — make the "Single Cupper Machines" easy to maintain in the field — reduces service costs and downtime. It is easy to clean and to keep clean.

The newly designed electrical circuitry utilizes printed circuits and plug-in components. The circuitry and construction has the approval of both the Underwriters Laboratories and the Canadian Standards Association. Electrical problems are reduced to a minimum and repairs may be made with ease.

These improvements all point to increased Reliability — Service and Profit for you.

SECTION B
SPECIFICATIONS

Model Number	850	710
Cup Capacity (7 oz.)	850	710
Cabinet		
Height	72"	72"
Depth	27-1/4"	27-1/4"
Width	35"	31-1/8"
Weight (Crated)	490 lb.	400 lb.
	223 kg.	182 kg.
Electrical		
Voltage	120	120
Amperage	16 A	16 A
Frequency	60 Hz	60 Hz
Water Pressure	5 psi Min.	5 psi Min.

SECTION C
THE COIN SYSTEM

The "Single Cupper Machine" is designed to accept all coin acceptor mechanisms presently in use on cup drink vending equipment. No provision is currently made to use bill changer devices. Consult your favorite changemaker manufacturer for details and prices.

The coin insert bezel has been placed high, for the users convenience. The coin return plunger is located in a manner to prevent physical abuse without restricting its intended use. The internal linkage between the return plunger and the acceptor is rugged and direct. Coin guides, inside the door, are easily removed if necessary, for cleaning.

The coin box on the models 850 and 710 is located behind the coin acceptor door. Both the acceptor door and the coin box may be secured by padlocks.

Consult the parts manual for details of the systems.

SECTION D
THE ELECTRICAL SYSTEM

The present production models of the "Single Cupper" are assembled with a printed circuit board wiring inside the electrical control box. This space age innovation reduces the amount of "point to point" wiring and a multitude of hand wired connections.

Both printed circuit and hand wired systems are outlined in this section. The circuits are similar and where differences exist they are pointed out. However the discussion will be made on the newer product. Two types of wiring diagrams are also included for the reason that some service people find one type easier to read than the other.

Just a word about nomenclature. Some confusion seems to exist in the description of electrical circuits, especially with regard to relays. The relays used in the RMi models 710 and 850 are all the same type. They are plug-in triple pole, double throw units which are fully interchangeable in the circuit board. They have only two positions depending on whether or not they are powered. When a relay has been "picked", it goes "up." Translation: When the coil of the relay has been powered the moveable terminals are drawn toward the coil and the ones designated as normally open (N.O.) are closed. Likewise, when the relay goes "down" the terminal connections all return to their normally closed position (N.C.). The words "up" and "down" are used throughout this description to indicate the relay position.

SEQUENCE OF OPERATION

When the power cord has been plugged in to the proper source of electricity power will flow into the hot leg, to the 18 ampere circuit breaker. A branch line serves the utility lamp and its switch. The utility lamp switch is operated by the cabinet door, and it will light even if the circuit breaker is open.

A power switch will open both sides of the line. When it is closed power is available to supply the water heater in the main tank. This heating element will not receive power until the water level is up and the tank reservoir float switches are closed (See Water System). When the power is on the display lamps will be lighted, the exhaust fan will run and the water heating elements will operate according to the demand of the thermostats.

The circuit board is protected against burnout by one 10 ampere cartridge fuse and one 10 ampere circuit breaker. *Do not replace the fuse with one of greater current rating.*

There are two safety overflow switches, one in the liquid waste pail and the other in the dry grounds bucket. Both of these safety switches are operated in the normally open position by the weight of a float, providing power to point "A" in the circuit descriptions. These floats will rise if an excessive amount of water is accumulated in either waste pail and open a circuit to prevent any further operation of the machine.

(1) COIN CREDIT ESTABLISHED

An integral part of the coin credit circuit is the "Cup Sold-Out" switch. This switch is held operated by the presence of cups in the throat of the cup dispenser. Power from point A, through the operated contacts of the "Cup Sold-Out" switch, 8 & 2 of K-2 (Vend Relay), 7 & 1 of K-1 (Coin Relay) contacts of the Lo-Level switch on the reservoir will energize the Coin Return Electromagnet (C.R.E.M.) of the coin acceptor. When the C.R.E.M. is energized, coins will be accepted by the coin mechanism.

Coins, equal to the purchase price, will pass through the acceptor and trip the Coin Switch of the coin mechanism. The passing of the coin is momentary and the coin switch will return to its normal position. The momentary operation of the coin switch provides an electrical pulse to K-1 (Coin Relay) causing it to be energized (or go "up").

K-1 is locked closed by the power from point "A", through the "Cup Sold-Out" switch, contacts 8 & 2 of K-2 (which is "down") and through K-1's own contacts 7 & 4. K-1 provides the power for Selector Switch use (point "C") by the power from point "A", through the normally closed contacts of the Coin Switch and contacts 8 & 5 of K-1.

When a selection has been made, the selection relays and K-2 (Vend Relay) will operate (go "up"). When K-2 goes up, K-1 will immediately go "down" which removes power point "C" from the selector switch circuitry.

(2) CUP DISPENSER CIRCUIT

Whenever a selection is made the cup dispenser must operate to drop a cup to receive the beverage selected. Current from point "A" flows through the vend switch (in its normally closed contacts) to relay K-2 terminals 9 & 6, to the Cup Motor Switch (16) of the program timer. When the switch (16) closed a short pulse is sent to the counter and to the cup dispenser motor. When the Cup Dispenser Motor rotates, its switch completes a circuit to complete one revolution once the short cup motor pulse has been removed by switch (16). (See Cup Section). The cup dispenser motor stops at the end of its cycle.

The turret switch, which by-passes the switch 16, will operate the cup turret motor during a vend cycle when there are no cups in the throat of the cup dispensing mechanism. The Turret motor will advance the next column of cups into the dispenser. (See Cup Section).

(3) SELECTION IS MADE FOR BLACK COFFEE

The point where power enters the selection switch assembly is referred to as point "C". If the user presses the Black Coffee button power will flow directly to relay K-3 (Coffee relay). Once "up", K-3 seals through its own contacts 7 & 4, K-7 (Tea Relay) terminals 9 & 3 (K-7 must be down) and the Relay Lock switch (15) circuit of the program timer.

When K-3 goes "up" a circuit is completed from the Cut-Off Switch of the Program Timer through 5 of K-3 to bring K-2 (Vend Relay) up. K-2 seals through its own contacts 7 & 4 and the Relays Lock switch (15) of the program timer.

The power to start the brewer motor comes from point "A", through the Sold-Out Switch to relays K-2 (8 & 5) and K-3 (9 & 6). After the brewer starts, the brewer cut-off cam operates its switch connecting the brewer motor circuit directly to point "A".

The same circuit that starts the brewer supplies voltage to the Coffee Auger switch (10) on the Program Timer and the Brewer Water Switch on the brewer.

K-3 and K-2 remain "up" until the Relays Lock switch (15) cam on the rotating Program Timer shaft momentarily trips the Relays Lock switch (approximately 235° through the cycle's revolution). The tripping of the Relays Lock switch (15) releases all relays ("down"). This applies for all selections.

(4) SELECTION IS MADE FOR COFFEE LIGHT

Power established at Point "C" will bring K-4 (Cream Relay) up when the Coffee Cream Selector switch is activated. The Relays Lock switch (15) on the program timer provides power for K-4 through contacts 7 & 4 of K-4. The Relays Lock power source will bring K-3 (Coffee Relay) "up" through contacts 9 & 6 of K-4 and 9 & 3 of K-7 (Tea Relay), K-7 being "down". K-3 will cause the brewer circuit to function as described in the Black Coffee selection. K-2 (Vend Relay) will go "up" by power through contacts 8 & 5 of K-4.
Note (contacts 8 & 5 of any selection relay will bring K-2 "up").

When the Creme Switch (2) of the Program Timer is closed by the action of its cams, voltage passes to the creme dispensing motor, releasing the amount of creme the cams have been set to deliver for a coffee selection.

Extra creme for this selection is obtained by holding the Extra Creme selection switch operated during the dispensing cycle. This circuit starts at point A, goes through contacts 9 & 3 of K-6 (Chocolate Relay), 9 & 3 of K-8 (Soup Relay) both K-6 and K-8 are "down", Extra Creme selection switch and then to the creme dispensing motor.

(5) COFFEE WITH SUGAR

When the selector button for Coffee Sugar has been pressed a pulse from point "C" picks relay K-5

(Sugar Relay). As K-5 goes up a holding current passes through K-5, terminals 4 & 7, the Relay Lock Switch (15) from point "A".

Terminals 9 & 6 of K-5 establish the circuit which picks relay K-3 through terminals 9 & 3 of relay K-7. K-3 is held through its own terminals 4 & 7 and gets its power from point "A" through the Relay Lock switch (15).

Power from the Relays Lock switch (15) on the program timer is supplied to K-3 by contacts 9 & 6 of K-5 and 9 & 3 of K-7 causing K-3 to go "up". K-3 will cause the brewer circuit to function as described in the Coffee Black selection. K-2 will go "up" due to power applied to it through contacts 8 & 5 of K-5.

When the Sugar Switch (3) on the Program Timer is closed by the action of its cams, voltage passes to the sugar dispensing motor, releasing the amount of sugar the cams are set to deliver for a coffee selection.

Extra sugar for this selection is obtained by holding the Extra Sugar selection switch operated during the dispensing cycle. This circuit starts at point A, goes through contacts 9 & 3 of K-6 (Chocolate Relay), 9 & 3 of K-8 (Soup Relay) — K-6 and K-8 are "down", Extra Sugar switch (6) on the program timer, to the Extra Sugar selection switch and then to the sugar dispensing motor.

(6) CUSTOMER MAKES A COFFEE LIGHT/SUGAR SELECTION

Power established at point "C" is applied in parallel to relays K-4 (Creme) and K-5 (Sugar) when the "Coffee with Creme and Sugar" selection switches are operated. Both K-4 and K-5 will go "up". Each relay is locked in by power supplied from the Relays Lock switch (15) on the program timer and contacts 7 & 4 of each respective relay.

K-3 (Coffee Relay) is brought "up" by power from the Relays Lock switch through contacts 9 & 6 of either relay, K-4 or K-5, and 9 & 3 of K-7, K-7 being down. K-3 when "up" will cause the brewer circuit to function.

K-2 is brought "up" by power from the Program Timer Cut-Off switch (1) through contacts of 8 & 5 of any one of the operated relays K-3, K-4 or K-5. K-2 will cause the Program Timer motor to run. Cams on its rotating shaft will operate the Creme (2) and Sugar (3) switches on the Program Timer to provide voltage to their creme and sugar dispensing motors.

(7) CUSTOMER MAKES A CHOCOLATE SELECTION

When the selector circuit has been energized, power is at point "C", pressing the Chocolate selector button closes K-6 (Chocolate relay). K-6 is held closed during the cycle by current passing through terminals 7 & 4 of K-6, terminals 7 & 1 of K-3 (Coffee Relay), and Relay Lock switch (15) of the Program timer.

Cams on the program timer shaft operate switch (4) (Chocolate Switch) and switch (5) (Chocolate Water Switch). Switch (4) operates the chocolate commodity canister motor to release the proper amount of chocolate powder. Switch (5) opens the Chocolate Water Valve and operates the Chocolate Whipper Motor.

(8) CUSTOMER MAKES A TEA SELECTION

Power at point "C" will bring "up" K-7 (Tea Relay) when the Tea selection switch is activated. The power circuit from point "A", through the Relays Lock switch (15) on the Program Timer, contacts 7 & 1 of K-3 (which is "down"), contacts 7 & 1 of K-6 (which is down) will lock in K-7 through contacts 7 & 4 of K-7.

K-2 is brought "up" by the power circuit from point "A", through the Cut-Off switch (1) on the Program Timer, and contacts 8 & 5 of K-7 (which is "up"). The holding circuit for K-2 is through its own contacts 7 & 4 and the Relays Lock (15) switch on the Program Timer.

The Program Timer motor is energized by K-2, the cams on the timer rotating shaft will operate the Tea switch (13) and the Tea Water switch (14) on the Program Timer. The switches provide voltage to the Tea ingredient dispensing motor and the Tea Water Outlet Valve.

Tea with creme and sugar selections are obtained by pressing and holding the "Extra Creme" and "Extra Sugar" switches on the Selector Panel in the operative position. Refer to Coffee/Light and Coffee/Sugar descriptions for the "Extra Creme" and "Extra Sugar" circuits.

(9) SOUP SELECTION

Operation of the Soup selection switch will bring "up" K-8 (Soup Relay). The holding circuit for K-8 is from power source "A", through the Relays Lock switch (15) on the Program Timer, contacts 7 & 1 of K-6, 7 & 1 of K-7 (both K-6 & K-7 are "down") and 7 & 4 of K-8.

K-2 is brought up by power from point "A", through the Cut-Off Switch (1) on the Program Timer and contacts 8 & 5 of K-8. The locking circuit for K-2 will keep K-2 up, causing the Program Timer Motor to operate. The cams on the rotating timer shaft will operate the Soup (11) and the Soup Water (12) switches and provide voltage to the soup dispensing motor and the soup water outlet valve.

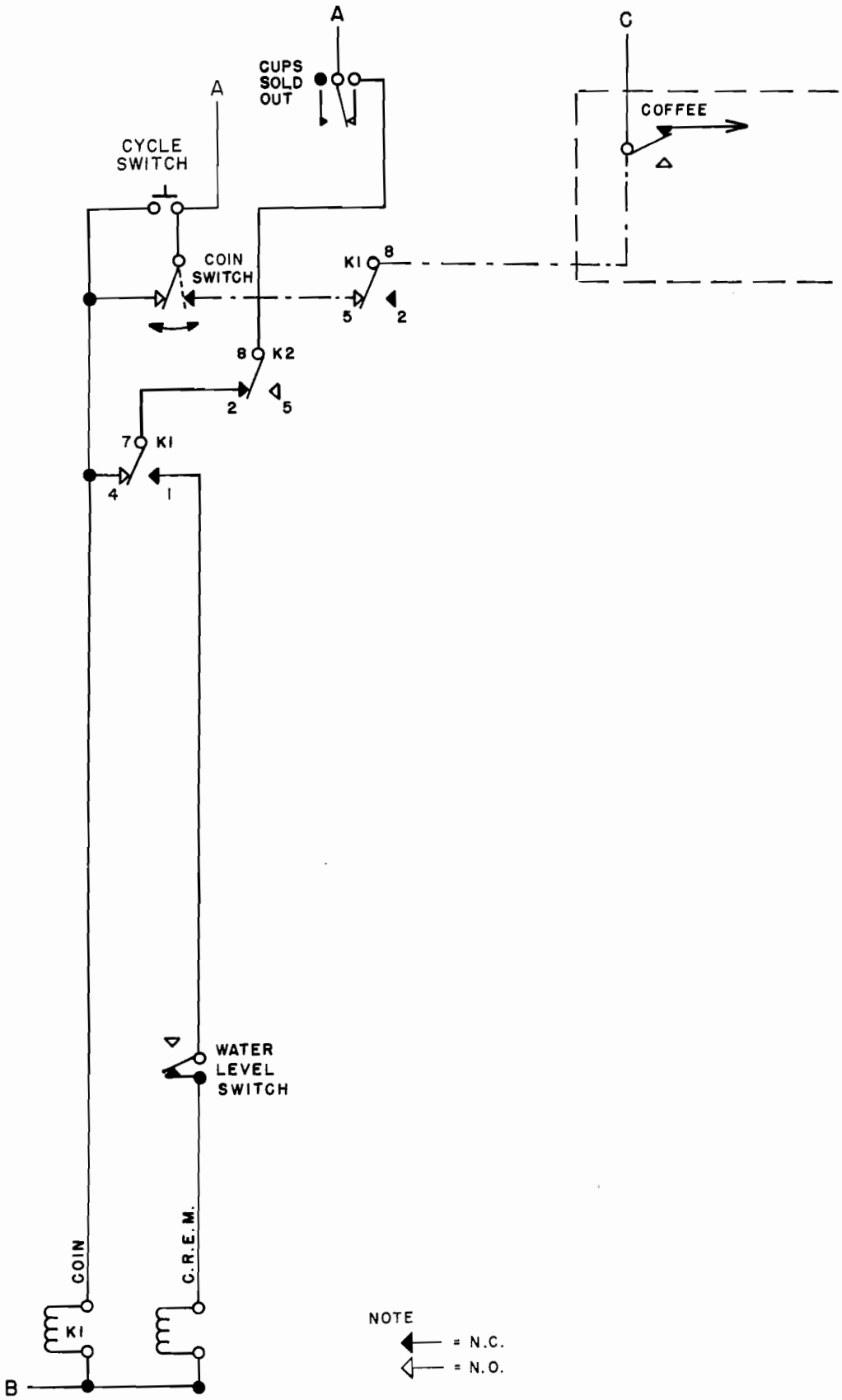


Figure 1 (Coin credit circuit)

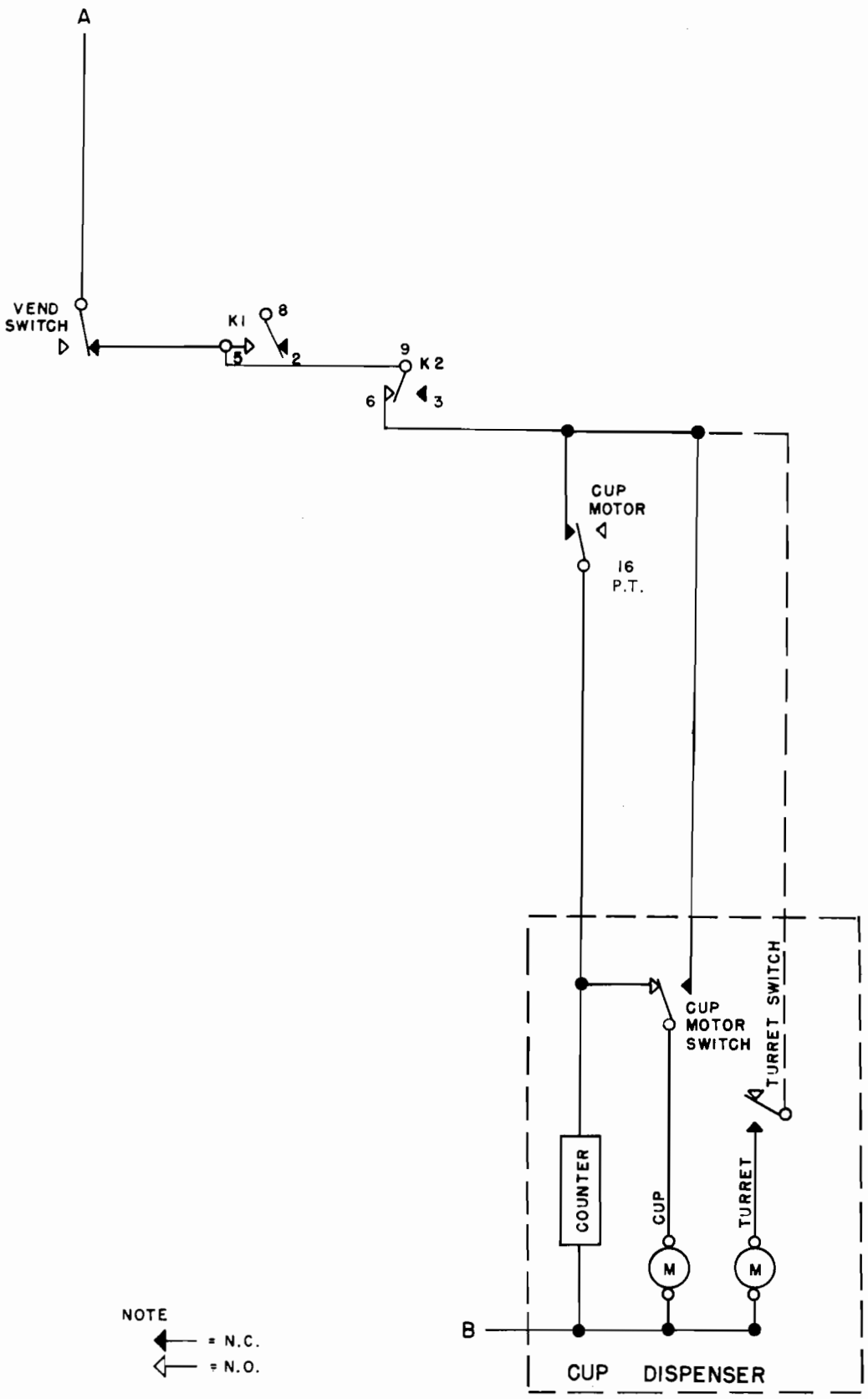


Figure 2 (Cup dispenser circuit)

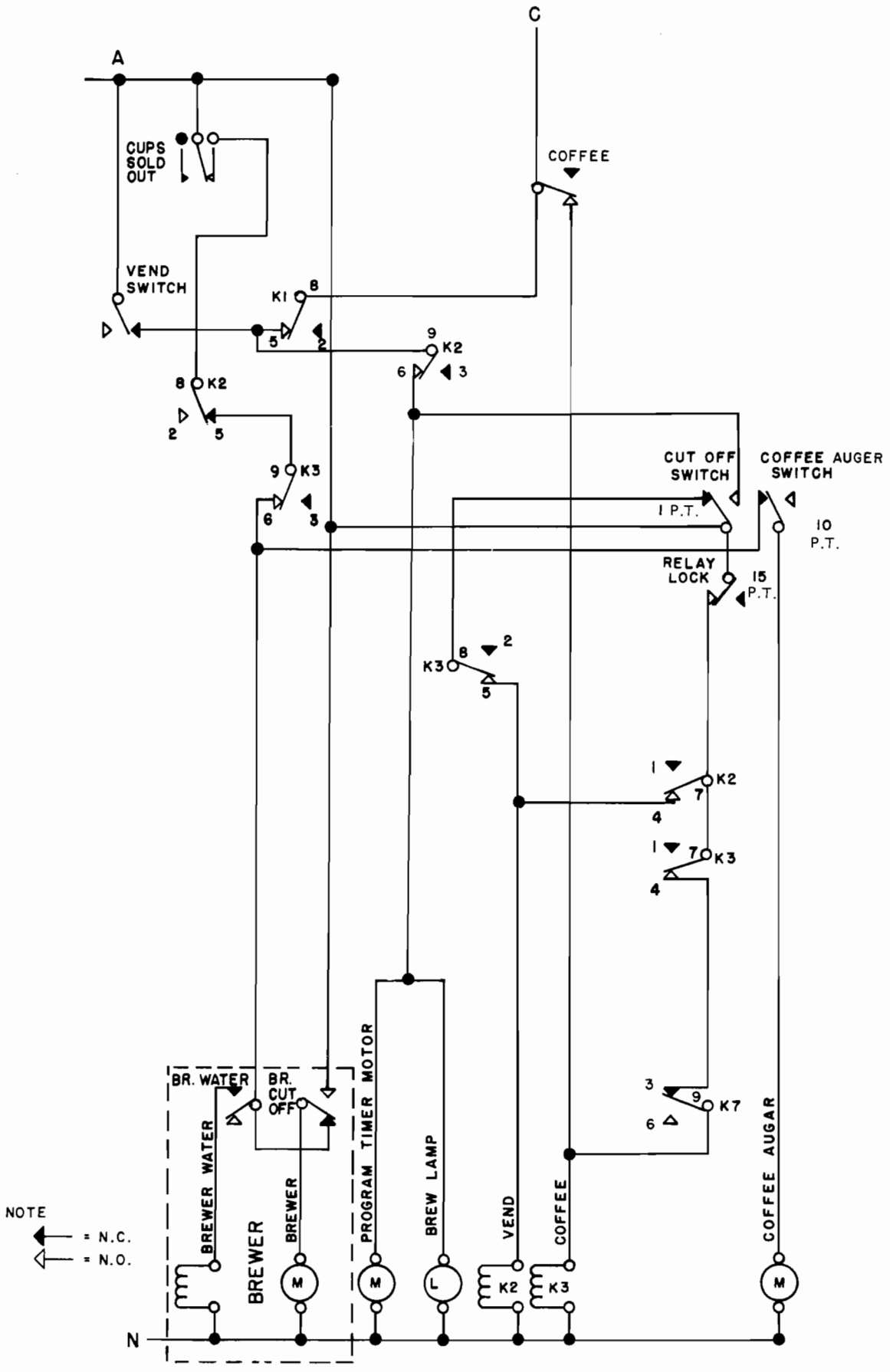


Figure 3 (Black coffee circuit)

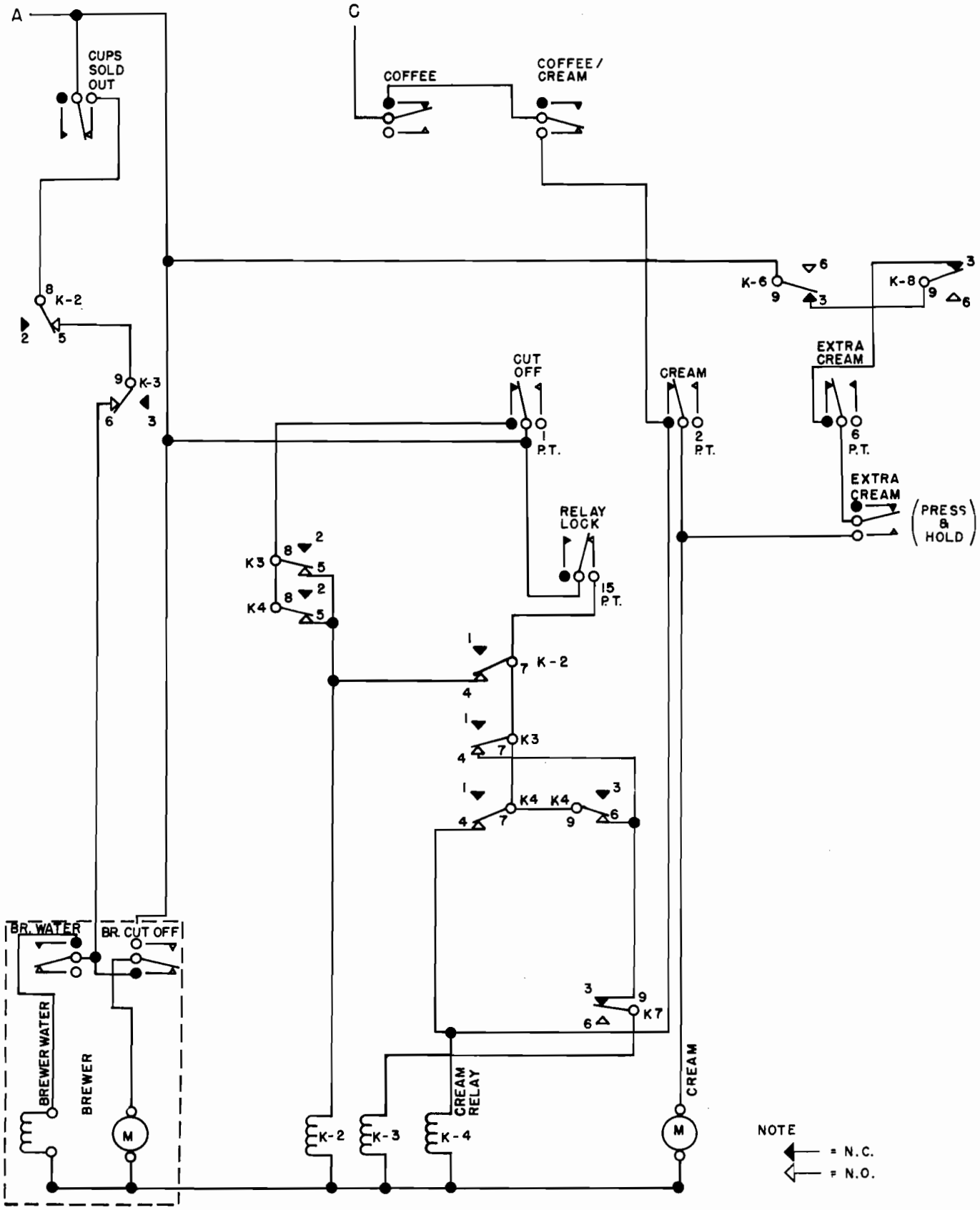


Figure 4 (Coffee- light circuit)

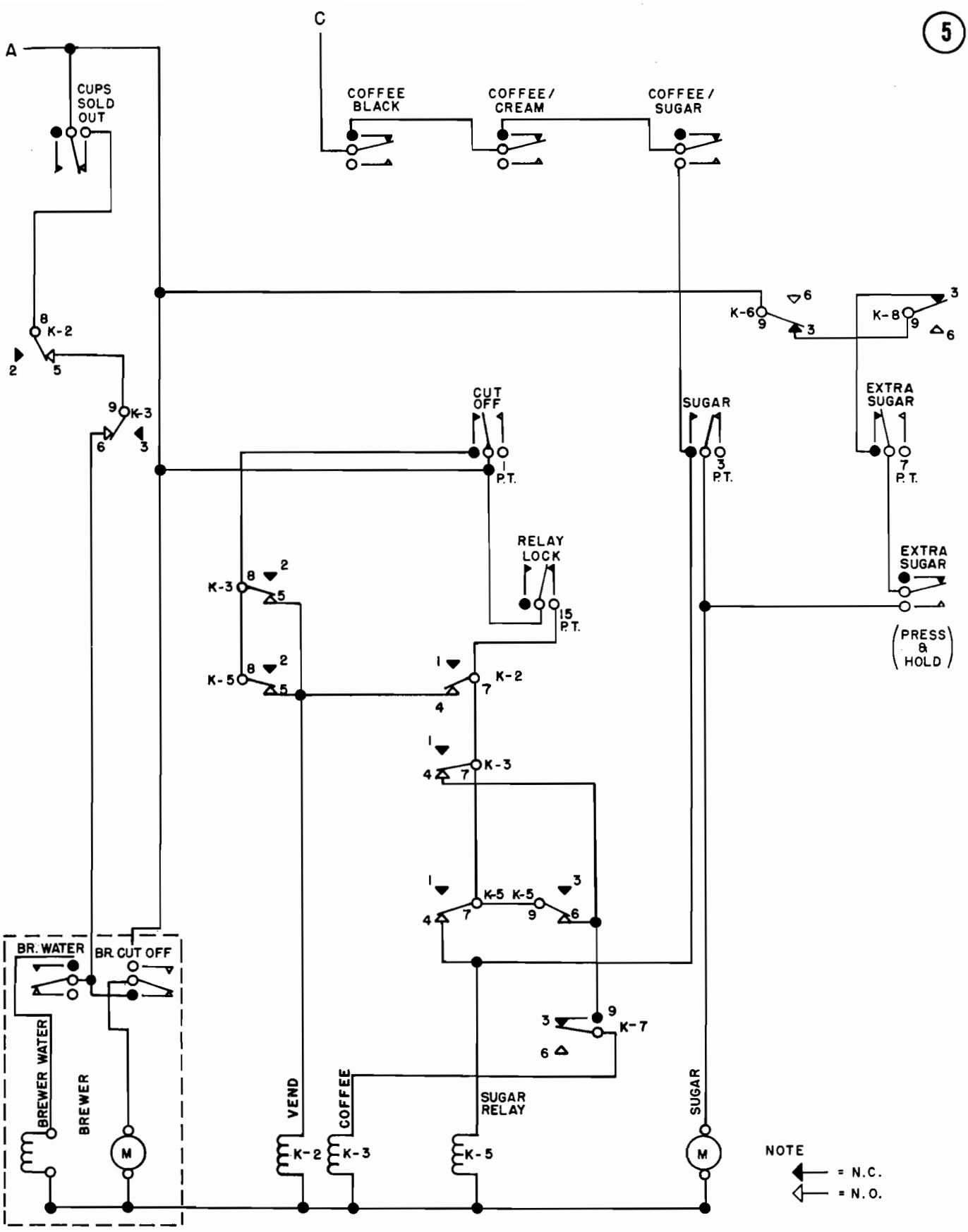


Figure 5 (Coffee black/sugar circuit)

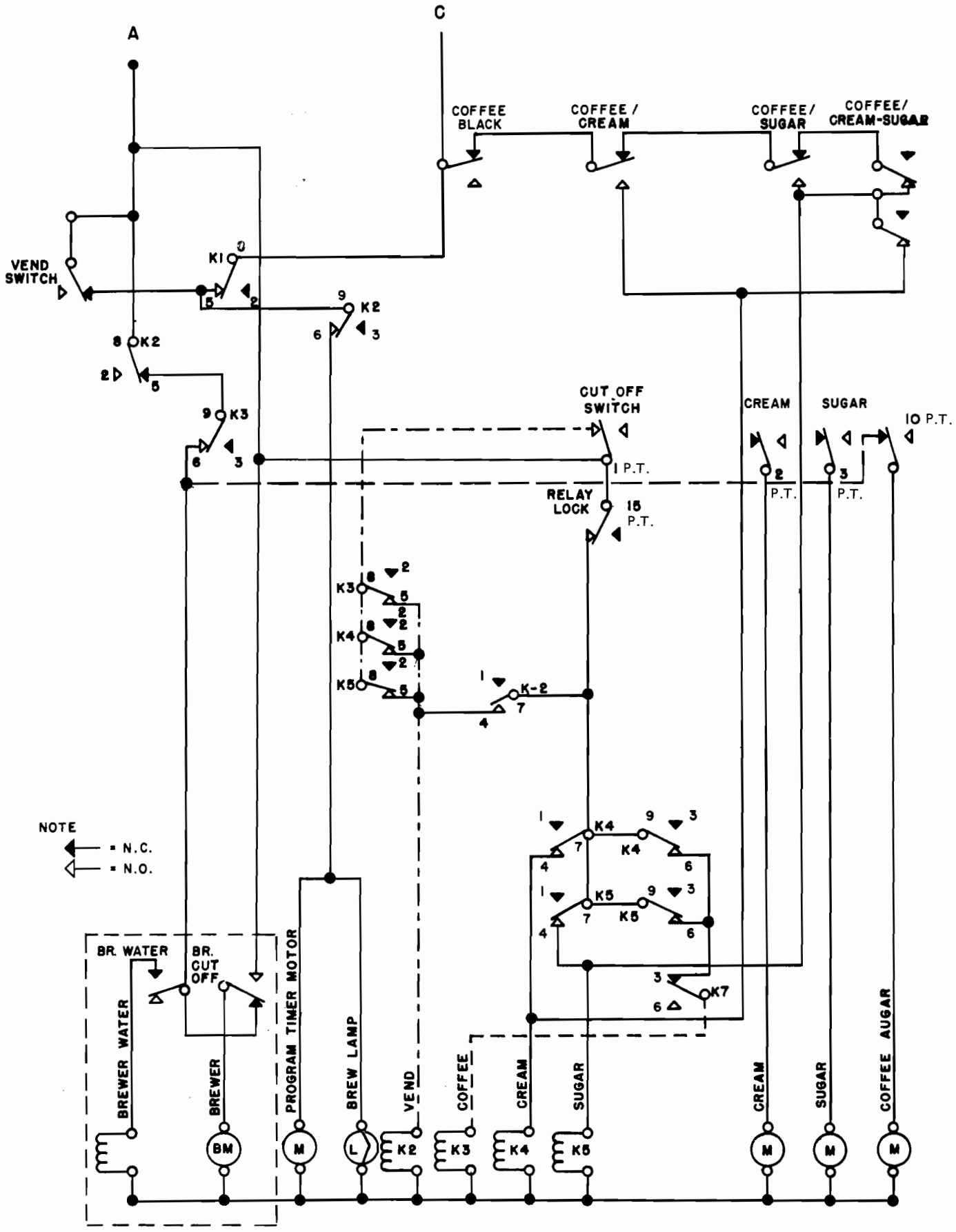


Figure 6 (Coffee light/sugar circuit)

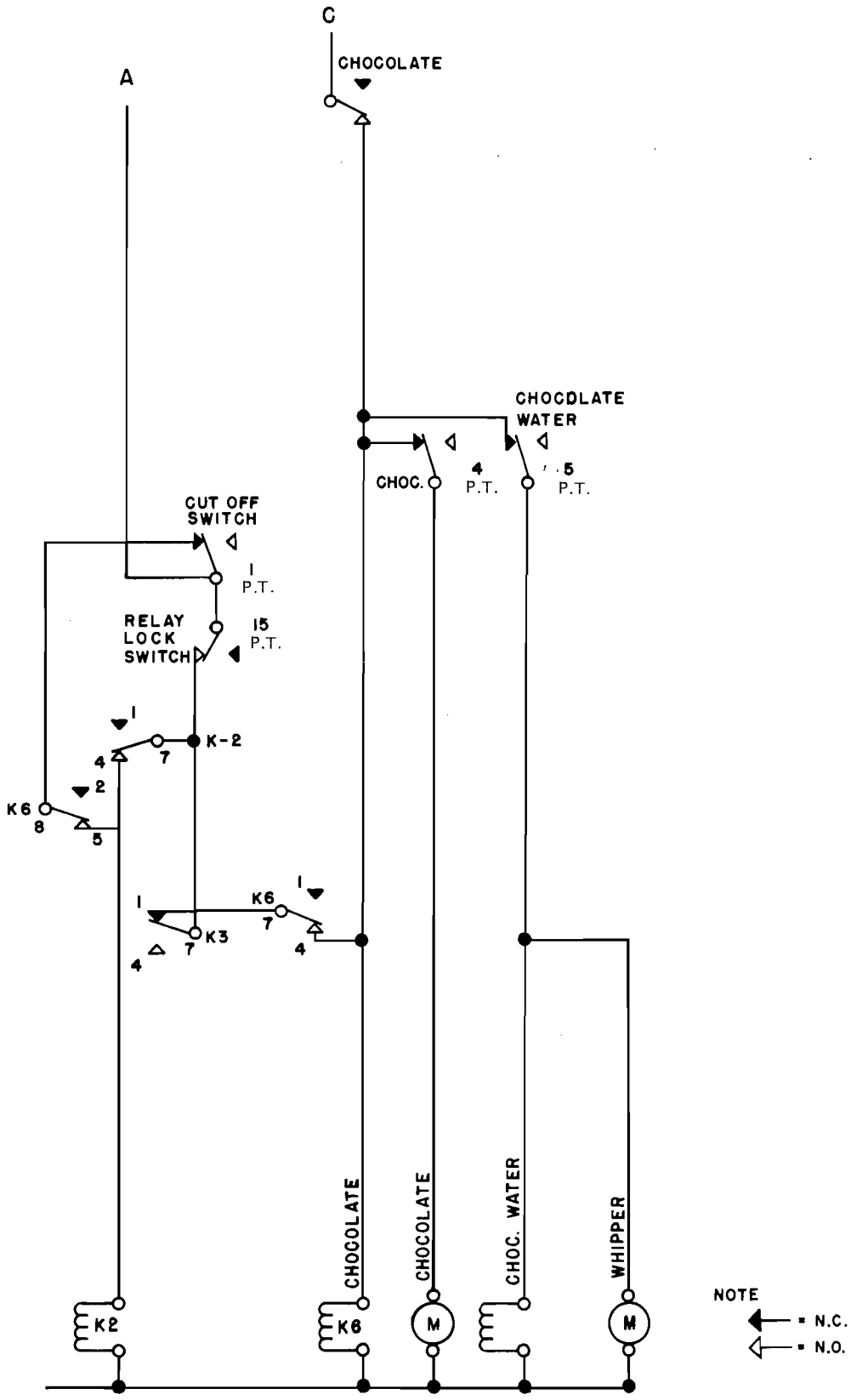


Figure 7 (Chocolate circuit)

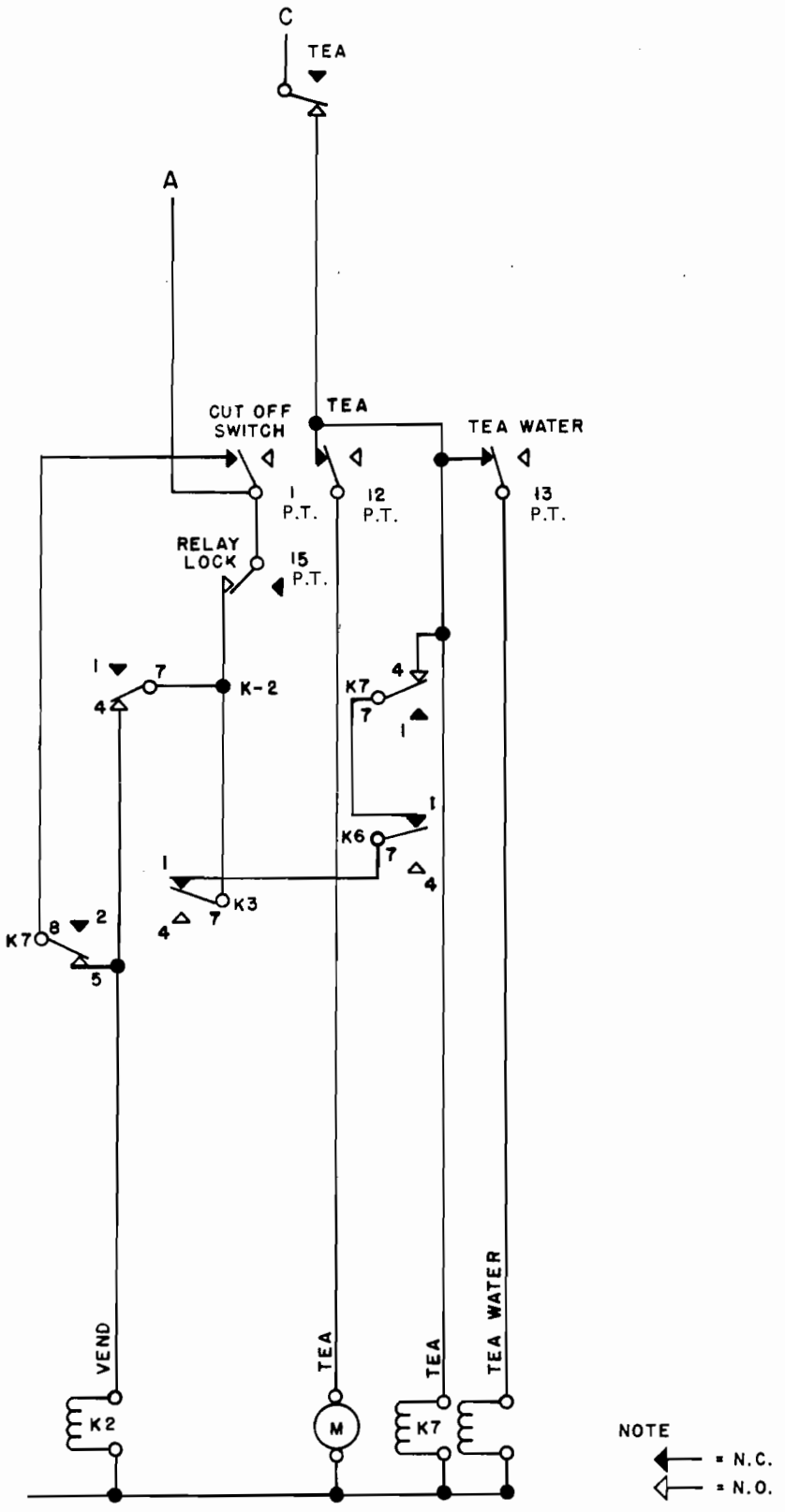


Figure 8 (Tea circuit)

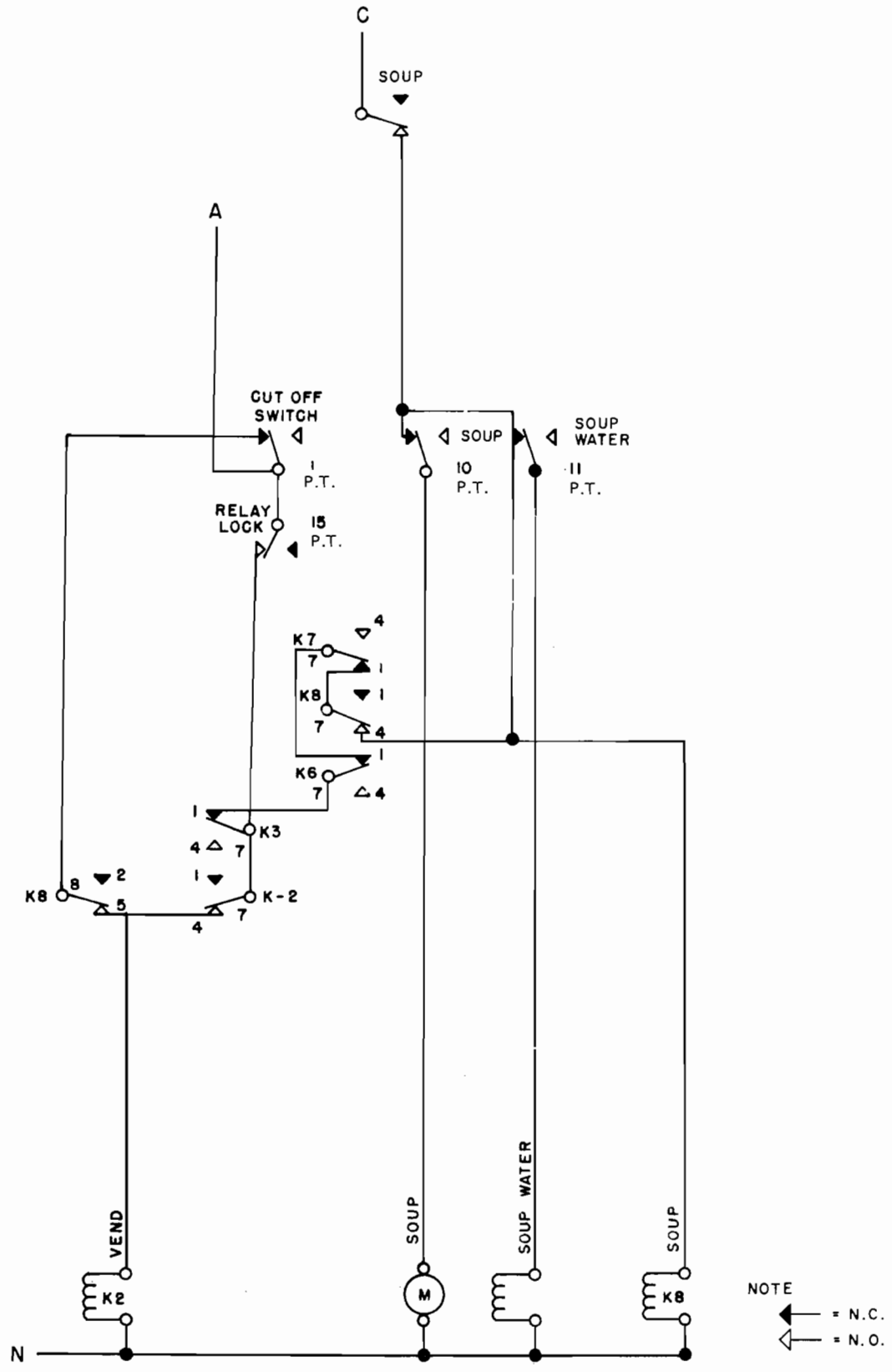
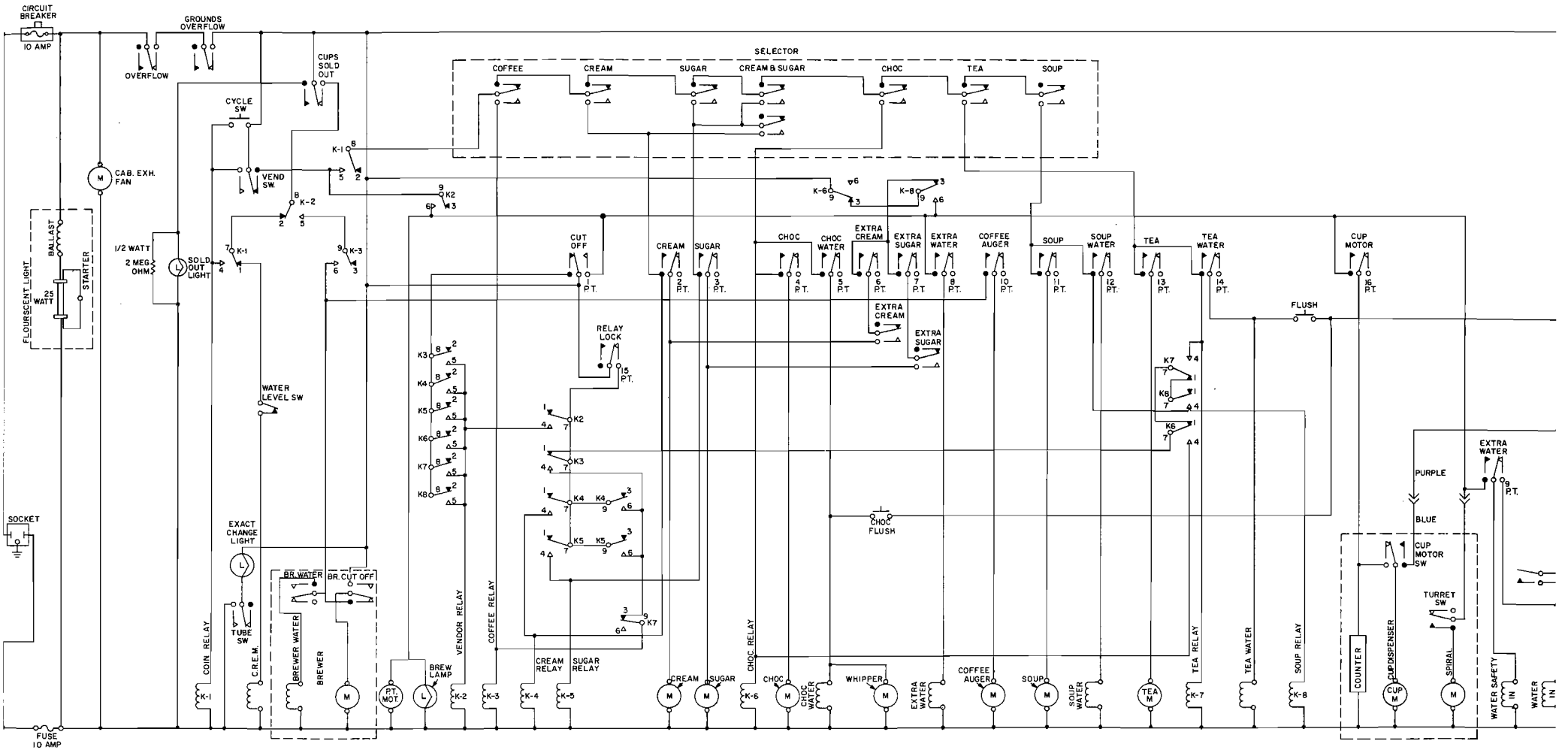


Figure 9 (Soup circuit)



SCHEMATIC DIAGRAM

LEGEND

MODEL NUMBER: RMi 850 & 700

SWITCHES

N.C.

N.O.

P.T.= PROGRAM TIMER

RELAY CONTACTS

COM.

N.O. N.C.

ISSUE DATE: 9-28-73

RELAY INDENTIFICATION

K-1= COIN	K-5= SUGAR
K-2= VEND	K-6= CHOCOLATE
K-3= COFFEE	K-7= TEA
K-4= CREAM	K-8= SOUP

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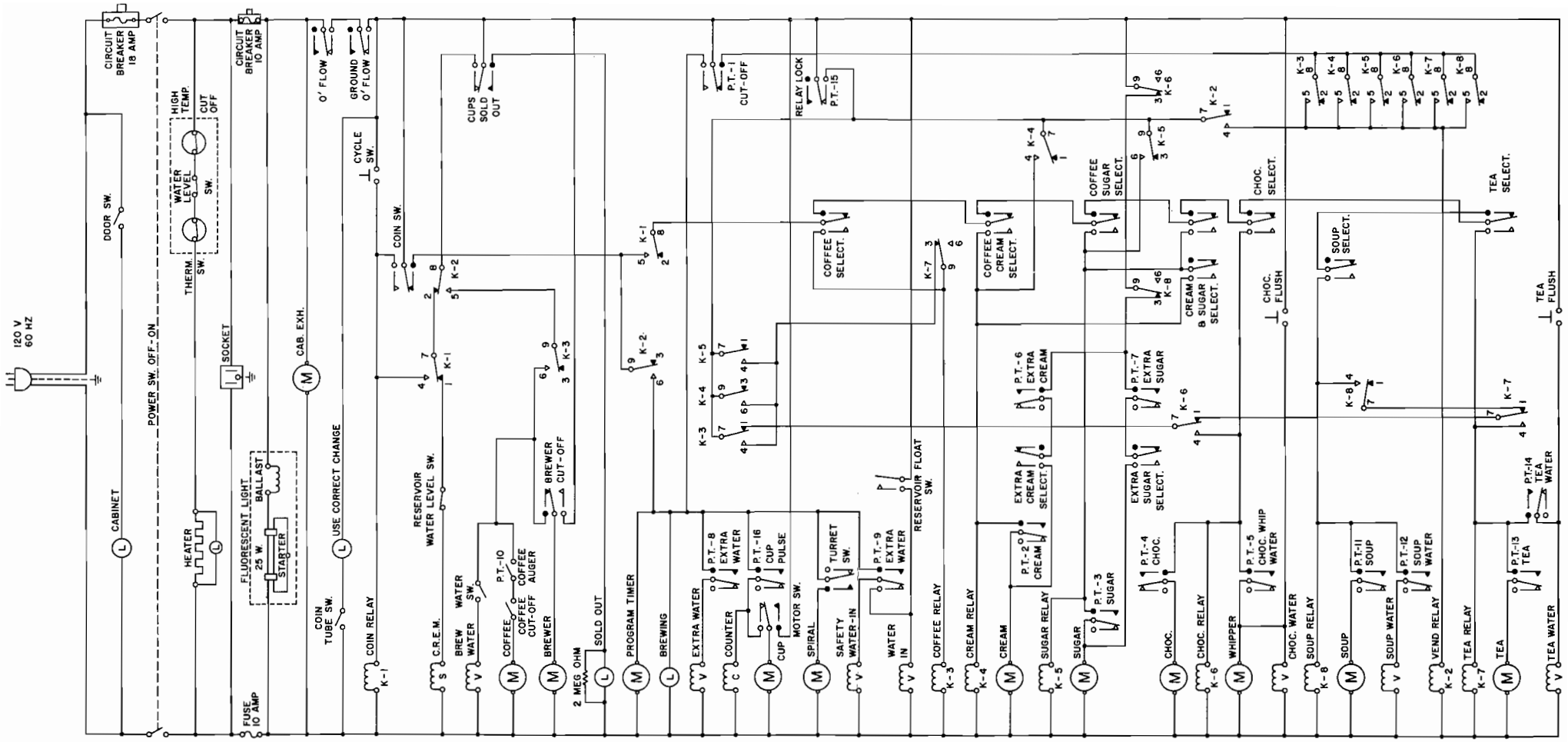

ALTERNATE SCHEMATIC REPRESENTATION OF PRINTED CIRCUIT

LEGEND
MODEL NUMBER - RMi 850 & 710
SWITCHES
COM. N.C. N.O.
P.T. = PROGRAM TIMER

RELAY CONTACTS
COM. 7 — 4 N.O. 1 N.C. (1 OF 3)
COM. 8 — 5 N.O. 2 N.C. (2 OF 3)
COM. 9 — 6 N.O. 3 N.C. (3 OF 3)

RELAY IDENTIFICATION
K-1 = COIN
K-2 = VEND
K-3 = COFFEE
K-4 = CREAM
K-5 = SUGAR
K-6 = CHOCOLATE
K-7 = TEA
K-8 = SOUP

ISSUE DATE: 2-25-74

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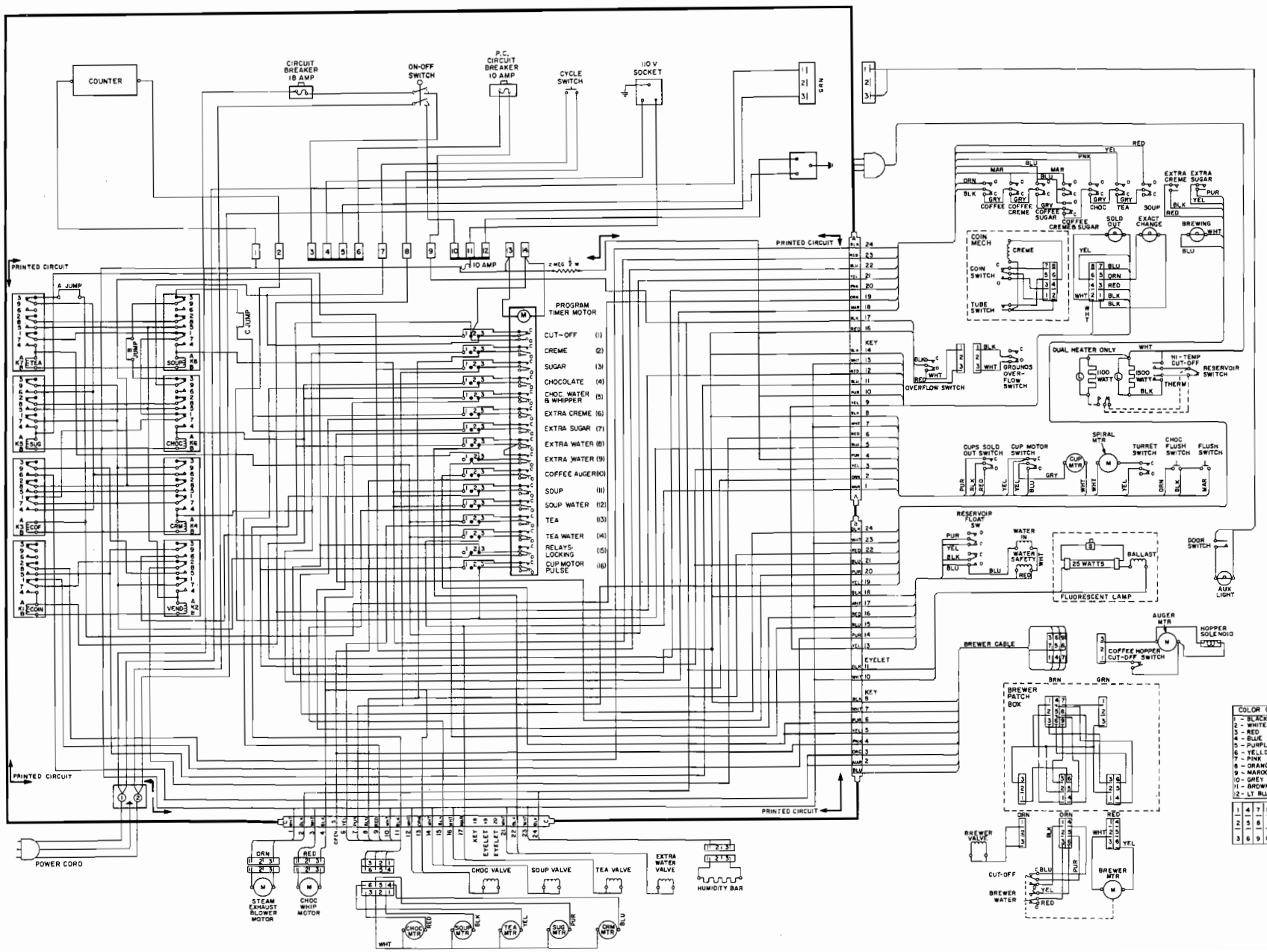

NOTES:

SEE SELECTION OPTION CHA

SELECTION OPTIONS

COFFEE–CHOC–TEA–SOUP

ALL RELAYS ARE USED

COFFEE CHOC.

(A) K-7 & K-8 ARE NOT USED
(B) JUMPER NO. 3 & NO. 9 OF K7
(C) JUMPER NO. 3 & NO. 9 OF K8

COFFEE–CHOC–TEA

(A) K-8 IS NOT USED
(B) JUMPER NO. 1 & NO. 7, NO. 3 &

COFFEE–CHOC–SOUP

(A) K-7 IS NOT USED
(B) JUMPER NO. 3 & NO. 9 K-7

FOR FREEZE DRY IN PLACE OF TEA AND NO BREWER

COFFEE–CHOC–SOUP

(A) K-7 IS NOT USED
(B) JUMPER NO. 3, NO. 9 & A OI

COFFEE & CHOC

(A) K-7 & K-8 ARE NOT USED
(B) JUMPER NO. 3, NO. 9 & A OI
(C) JUMPER NO. 1 & NO. 7, NO.

FOR FREEZE DRY IN PLACE OF SOU AND NO BREWER

(A) K-8 IS NOT USED
(B) JUMPER NO. 3 & NO. 9, NO.
(C) SPLICE RED WITH ORANGE ON SELECTOR SWITCH.

FOR FREEZE DRY IN PLACE OF SOU (13 SELECTION)

(A) CUT JUMPERS A, B & C
1. JUMPER RIGHT OF A TO TO
2. JUMPER LEFT OF A TO BOT
3. JUMPER BOTTOM OF B TO T

WIF
M

RMi IN

THE PROGRAM TIMER

The program timer is the brain of the "Single Cupper". The various cams and switch assemblies control the operation of the machine as soon as it has been actuated by the acceptance of coins equal to the purchase price.

Each cam effects a specific function. Starting from the motor end of the program timer they are:

1. The Cut-Off Cam: After the machine has been activated the cam will permit the switch to close in the normally closed position and will provide a "run" circuit for the program timer, until it reaches the starting point again.

2. The Creme Cam: The high point of this cam holds the switch open until the camshaft has turned about 109°. The black section of the cam will permit the switch to close in the N.C. position. If the machine selection requires creme for the beverage, the creme motor will be run.

3. The Sugar Cam: This cam holds the sugar switch open until the camshaft has turned about 8°. The black section of the cam will permit the switch to close in the N.C. position. If sugar is needed for the beverage selected the sugar motor will run.

4. The Chocolate Cam: This cam will hold the chocolate switch open until the camshaft has turned about 87°. Then it will close to start the chocolate auger motor, provided the selection requires chocolate.

5. The Choc. Water Cam: This cam will hold the chocolate water switch open until the camshaft has turned about 61°, then, if a chocolate selection has been made will open the chocolate water valve. The chocolate homogenizer will also operate as long as the water valve remains open.

6. The Extra Creme Cam: This cam will hold its switch open until the camshaft has turned about 124°. This circuit provides for additional running time for the creme motor — if the Extra Creme switch on the selection panel is held closed by the user. Extra creme can be dispensed on any selection except chocolate or soup. Creme for tea selection is obtained by holding the Extra Creme button in during the cycle.

7. The Extra Sugar Cam: This cam also will hold its switch open until after the camshaft has turned about 95°. This circuit provides for the additional running time for the sugar motor, if the Extra Sugar switch on the selection panel is held closed by the user. Extra sugar can be dispensed on any selection except chocolate and soup. Sugar for the Tea selection is obtained by holding in the Extra Sugar button during the cycle.

8. The Extra Water Cam: This cam will hold its switch open until the camshaft has turned about 97°. It provides for a shot of cool water, to temper the hot beverages temperature.

9. The Extra Water Cam: This cam will hold its switch open until the camshaft has turned about 97°. It opens the Water Safety Inlet Valve so that water, under line pressure, is available to the Cold Shot Valve.

10. The Coffee Auger Cam: This cam will hold its switch open until the camshaft has turned about 84°. When the switch is closed the coffee auger motor will run and release ground coffee to the coffee holding tube at the brewer.

11. The Soup Cam: This cam will hold its switch open until the camshaft has turned about 97°. When the switch is allowed to close the soup dispenser motor is operated to release the soup product.

12. The Soup Water Cam: This cam will hold its switch open until the camshaft has turned about 57°. When the switch is closed the soup water valve will be opened to release water to make the beverage.

13. The Tea Cam: This cam will hold its switch open until the camshaft has turned about 134°. When its switch is closed the tea auger motor will run to release the tea product to make the beverage.

14. The Tea Water Cam: This cam will hold its switch open until the cam shaft has turned about 75°. When the switch is closed it will energize the tea water valve to release the water to make the tea beverage.

15. The Relay Lock Cam: This cam will hold the switch in the N.O. position until near the end of the cycle, approximately 235°. When its switch is opened the locking circuits for the various relays will be opened and the relays will go "down".

16. The Cup Motor Cam: This cam will hold its switch open until the camshaft has turned about 28°. When closed, it provides the starting pulse for the cup dispenser motor. This pulse is of long enough duration to permit the cup dispenser motor to get power from its own cut-off switch.

HOW TO ADJUST THE CAMS OF THE PROGRAM TIMER

Two small open end wrenches are provided for the mechanic to adjust the cams of the program timer. The cams are two part units, a black segment and a white segment. The black segment is set to determine "when" a valve or motor will be activated to release product or liquid. The white segment position is what determines the amount of product or volume of water that will be released to make a specific beverage.

When the valley of the cam is long, much product will be released; shorten the gap and less product will be released.

When the "Single Cupper" left the plant the black segments were all properly set for the machine to operate correctly — each item operating at the proper time. The white segment has been set roughly because each vending operation will have local preferences as to strength of the beverage. The quantity of each product to be delivered for a specific beverage should be determined and the actual product throw measured with a gram scale. Careful programming and setting of the gram throws will assure that an acceptable beverage will be delivered and yet maintain some control over product cost.

Figure 10 (Adjusting cams)

Follow these steps when changing the setting of the "how much" on the program timer:

1. Place the first wrench on the metal hex nut on the motor end of the shaft (see illustration). This wrench is to be held stationary. Do not force it in either direction.

2. Place the second wrench on the hex section of the white cam whose setting you want to alter. In this illustration it is shown on the sugar cam.

3. Hold the wrench on the motor end firmly. Move the second wrench to change the position of the white cam only. Opening the valley of the cam will increase the product throw, or liquid volume. Closing is up will decrease the product throw.

The normal tension between the cams and the camshaft is sufficient to hold the adjustment without tightening anything. There is no adjustment to increase this tension.

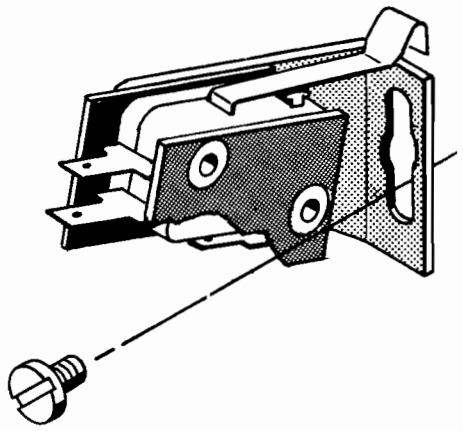

Figure 11 (Cam shaft switch)

HOW TO REPLACE A CAM SHAFT SWITCH:

Each of the switches of the program timer is secured to the frame of the timer with a single screw. The screw operates in a keyhole slot. To remove a switch it is only necessary to release the holding pressure of the screw and push the switch bracket away from the camshaft about 1/4" and lift it out.

Electrically each switch is connected into the circuit board with a two terminal polarized plug. There are two switches (the extra water 8 and 9) which are connected together with a short jumper.

The replacement switch is riveted to its mounting bracket and needs only to be slipped over the mounting screw and positioned on the locating pin on the timer frame. Tighten the screw slightly and operate the timer to be sure that the switch will be held closed in the N.O. (Normally Open) position when its follower rests on the high lobe of the cam. Check also that it will switch to the N.C. position when the follower is in the valley of the cam. After being sure the switch will operate properly, tighten the mounting screw and reconnect the switch plug to the printed circuit board.

SECTION E
THE CUP SYSTEM

Every beverage sold through the "Single Cupper Machine" requires a clean, disposable cup. Inside the machine is a storage area for a large number of cups, and a device called a cup separator to dispense a single cup for each cycle of the machine. Included in the cup system is a "sold out" switch, which will light the sold out lamp when there are no cups available to dispense.

THE CUP MAGAZINE

The storage system of the "Single Cupper" is unique. Cups are stored in an inline flat magazine mounted on the inside surface of the cabinet door. This magazine is completely covered to protect the cups from accidental contamination. The entire magazine may be swung out, for easy access to the inside of the cabinet door, without having to remove the cups from their place. The base plate of the magazine holds the cup dispenser separator.

Cups are moved from the storage position to a position over the dispensing mechanism (often referred to as the "cup drop") as needed. When a stack of cups over the drop has been reduced to four or five cups, the spiral cup motor switch will be closed, which permits the spiral motor to run. Spirals turn simultaneously to advance the remaining stacks of cups on the base plate toward the cup drop opening.

When the stack nearest the drop opening is pushed to the right it will drop into the remaining cups found in the drop mechanism. The new cups will open the cup spiral motor switch and disconnect the spiral motor from its voltage source.

The spirals are so designed that a stack of standard vending cups will nestle between the turns. It is important that the spirals are properly oriented with each other so that the stacks of cups will advance in

a vertical position. Figure 13 of this section illustrates the relationship between the three spirals. When the spirals are properly adjusted the return wire at the ends of the spirals will point as shown. When the upper two (which should be adjusted to the same position) point to 12 o'clock the lower spiral should be advanced to a 2 o'clock position. This done because the lower end of a cup stack is smaller in diameter than at the top rims, where the spiral touches it. The spirals are properly set before the "Single Cupper Machine" leaves the factory and should not have to be adjusted before putting the machine into service. If they are not properly set see the "Adjustment" heading of this section.

The synchronized movement of the three spirals is maintained by the toothed drive belts which connect the spiral sprockets together and to the spiral drive motor sprocket.

Note: Never attempt to adjust the spiral positions by "Jumping" the drive belts on their geared pulleys.

THE CUP DROP MECHANISM

There are two types of cup drop mechanisms used in the "Single Cupper" machines. They are the Reed Electromech and the Lisern. Both mechanisms are lever type and are motor driven. The rotary motion of the motor is turned into a push-pull motion by a crank arm. The cup to be dropped is separated from the rest of the cups in the stack by the cams of the mechanism. The cup is then guided to the cupwell area by a chute. As the cams return to their starting position the next cup in the stack is positioned to be dropped on the next cycle. The cup drop motor is activated on every vend.

ADJUSTMENTS

The cup magazine has two adjustments. These are made when it is desired to change the cup size from either 7 or 8-1/4 ounce cups to a 9 ounce cup. The reverse procedure of items 8 and 9 must be followed when changing from a 9 ounce cup to either the 7 ounce or 8-1/4 ounce cups.

CHANGING TO A 9 OUNCE CUP

1. Remove the cup magazine cover.

2. Remove the cups from the magazine.

3. Remove the two screws (Figure 12) on each of the upper spirals. These screws hold the bearing plate for the spiral and are found on the left hand side of the magazine, as you face it. (Illustration Section D)

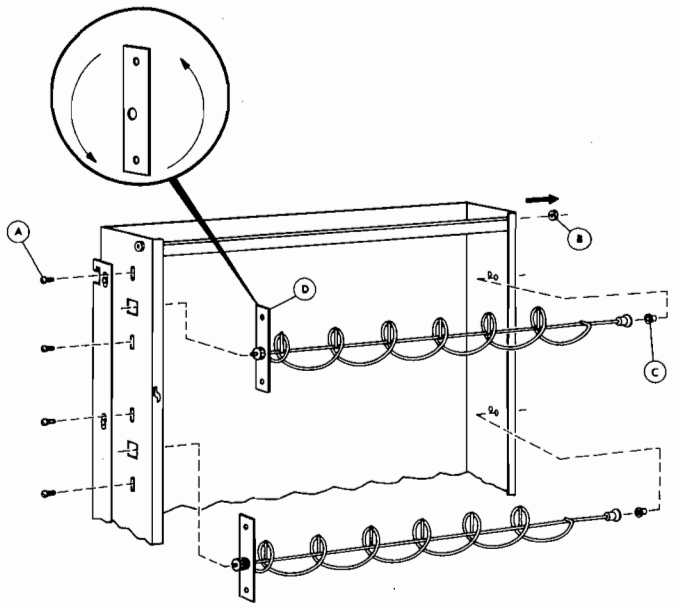

Figure 12 (Changing to a 9 ounce cup)

4. Remove the nut from the right hand end of the magazine support (B).

5. Spring the right side panel of the magazine enough to free the end of the spiral shaft. Pull out toward yourself.

6. Remove the belt from the upper spiral and slip the pulley end of the spiral shaft out of the hole in the left hand side of the magazine after removing the belt from the pulley.

7. Perform the same operation on the center spiral as outlined in Steps 5 and 6.

8. Remove the nyliners (C) from the holes in which the spiral shafts had been and relocate the nyliners to the right hand set of holes.

9. Rotate the bearing plate (D) so that the screw holes for mounting are lined up to the left of the shaft, as you view it from that end. This must be done for both the top and center spirals.

10. Reinstall both the upper and center spiral assemblies. Leave the mounting screws on the bearing plates just loose enough so that the plates can still be hand adjusted.

11. Put the drive belts in place. Leave them loose; do not tighten them at this point.

12. Turn the bottom spiral until the wire on the right hand end points to 2 o'clock as previously described. (Figure 13)

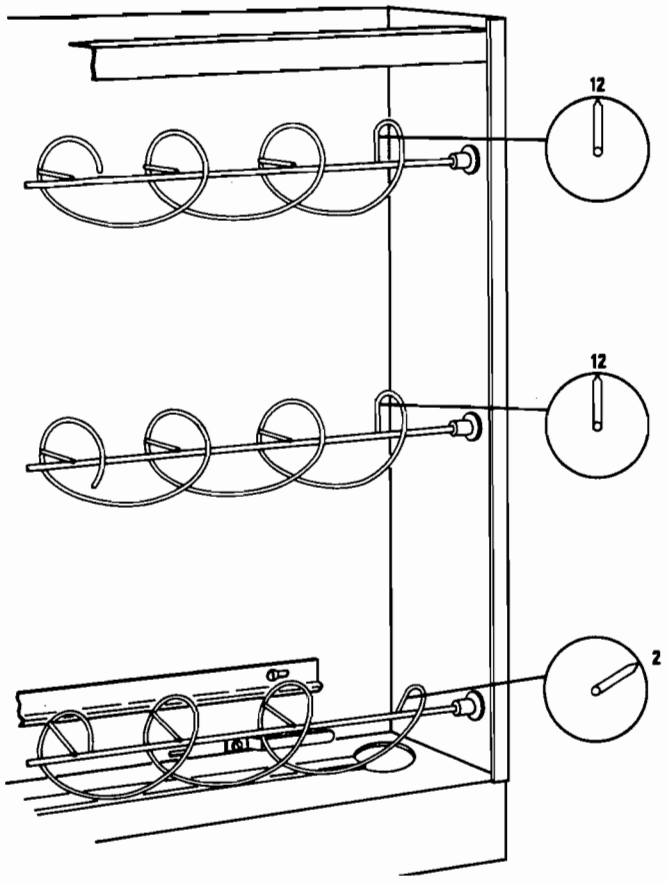

Figure 13 (Spiral adjustment)

13. Position the wire on the right hand end of the center spiral at 12 o'clock. (Figure 13)

14. Tighten the drive belt between the center and bottom spirals by pressing upwards on the center spiral shaft and tightening the mounting screws. Maintain the 12 o'clock and 2 o'clock relationship between the center and lower spirals when tightening the belt.

15. Position the wire of the right hand end of the top spiral at 12 o'clock.

16. Follow a similar belt tightening procedure for the top spiral as was performed on the center spiral. Be sure that the center and upper spirals both point in the direction of 12 o'clock while the bottom spiral points to 2 o'clock (refer to Figure 13).

THE CUP DROP

THE LISERN MECHANISM

If it is desired to change the cup size on a RMi "Single Cupper" machine equipped with the Lisern mechanism, e.g., 7 or 8-1/4 oz. to 9 oz., the mechanism itself must be replaced with one made for the particular cup size.

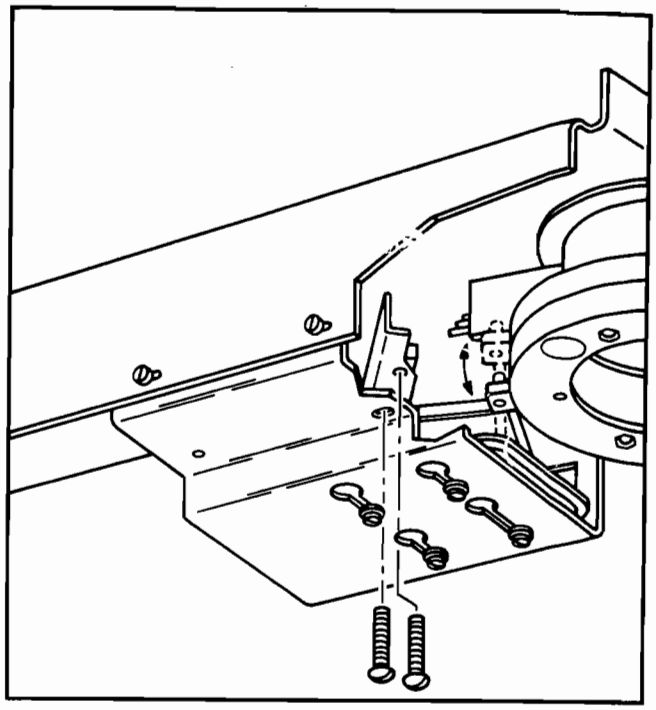

Figure 14 (Lisern mechanism)

ADJUSTING THE STOPPING POINT

Figure 14 is a representation of the switch assembly used with the Lisern Mechanism. When this mechanism is at rest the actuator lever of the Lisern Separator is pulled back against the switch arm. When it is properly adjusted the actuator is approximately 1/32" to 1/16" from its limit of travel. If it is necessary to make an adjustment, slightly unloosen the switch mounting screws and reposition the switch until the proper stopping point has been attained. Retighten the mounting screws after making the adjustment.

THE REED ELECTROMECH

This style of cup drop is adjustable to handle cup diameters from 2-9/32" to 2-59/64". This will cover the range of cup sizes normally used in vending machines.

HOW TO ADJUST THE MECHANISM TO FIT YOUR CUPS

The best way to assure proper sizing of the mechansim is to use a cup of the type and manufacture you plan to use regularly in the "Single Cupper". It is adjusted this way:

1. Be sure the mechanism is in the "at rest" position. (See Figure 15.)

2. Take one cup and place it in the throat of the mechanism.

3. Loosen the wing nut on the underside of the mechanism.

4. Rotate the outer body of the mechanism. Moving it to the right (or clockwise as you view it from underneath) will bring the cams close together to fit a small size cup. Turning it counterclockwise will open the cams and enable you to fit it to a large size cup.

5. Adjust the outer body until the cup you are using drops into the cams far enough to allow the cup to hang by its rim. It must rest equally on all cams. To check the size adjustment press the cup against one of the cams, to one side of the opening in the mechanism, and examine the clearance between the side wall of the cup and the cam directly opposite to the one you are holding the cup against. In this extreme position the clearance should be about 1/2 of the width of the rim of the cup on that side.

6. Secure the adjustment by tightening the wing nut.

7. Recheck the adjustment after tightening the nut to be sure that the adjustment is properly made.

ADJUSTING THE STOPPING POINT

The Reed Mechanism stopping point is directly opposite to that of the Lisern Mech. The actuator arm is in the forward position. The cup drop motor stops when the switch arm is pressed in by the actuator arm. The switch may be repositioned by loosening the two screws which hold it in position and moving it until the proper position has been obtained.

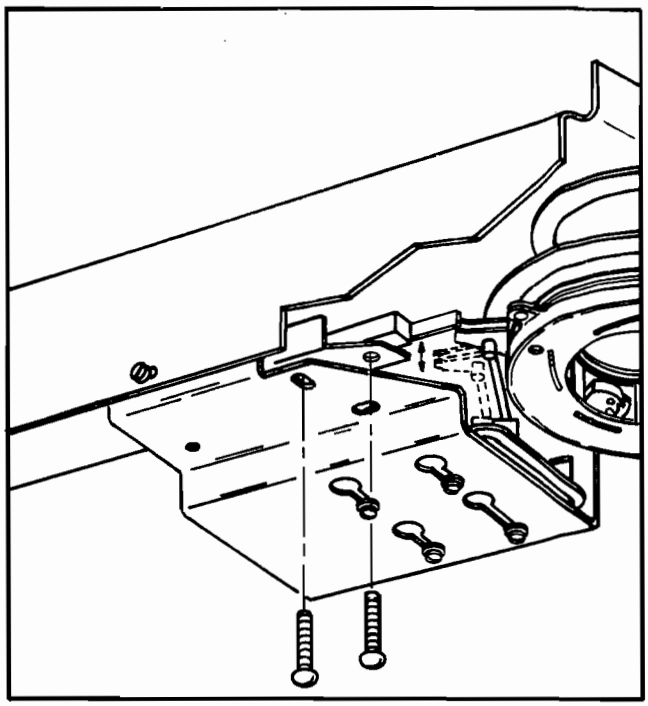

Figure 15 (Reed Electromech)

GENERAL NOTES

No lubrication is required on either the spiral shafts or the cup drop mechanisms. The only lubrication required is to the two motors in the cup system — the spiral drive motor, at the left hand end of the base plate, and the cup drop motor on the right hand end. This should be done twice a year.

SECTION F
THE WATER SYSTEM

The water system in the "Single Cupper" machine is the dependable, open, antisyphon, gravity system used so successfully for many years. The temperature control will maintain the water temperature at a near boiling point without any danger of "steaming".

The anti-syphon feature assures that if the water pressure of the supply mains should drop, no water can be withdrawn from the tank or piping.

The letters used in this description all relate to Figure 16.

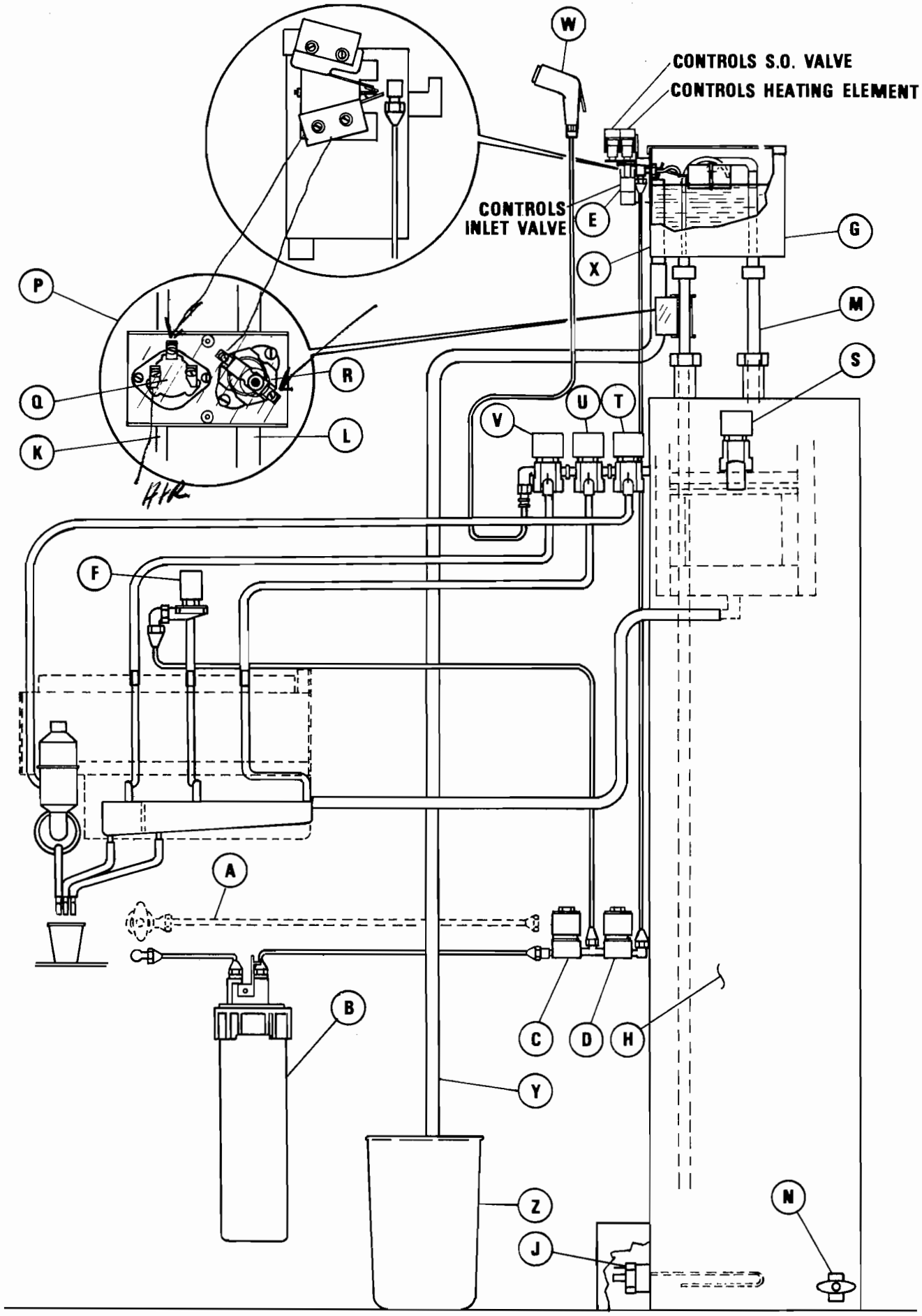

Figure 16 (Water system)

WATER INTAKE SYSTEM

There are two possible configurations in the intake system. The standard method is a straight tube with a shut-off valve between the inlet fitting and the safety overflow valve (A). The optional method provides for a water filter (B) to be installed as a part of the original equipment. The filter housing includes the shut-off valve as an integral part.

The two solenoid valves provide a sure method of controlling the intake water. The first one is the safety overflow valve (C), and the second is the water inlet control valve (D). Both valves will open and close simultaneously during normal operation. They are controlled by the reservoir float switch (E).

Between the two inlet valves there is a branch tube which terminates at the cold shot valve (F). This valve is programmed so that a specific amount of cool water is introduced into each beverage to lower the finished drink temperature to a comfortable drinking temperature.

RESERVOIR AND MAIN TANK

These parts are made of Stainless steel & copper. Water enters the reservoir (G) from the water inlet valves. A small tube inside the reservoir directs the water downward to prevent splashing and possible seepage from under the snug fitting cover. Water runs from the reservoir into the main tank (H) through a standpipe (L). This tube directs the water to where the heating element (J) is located. The heating element is 1500 watts capacity. Directing the incoming water into the heater area prevents cooling of the hot water in the top of the tank.

Air in the tank, which is replaced by the water, escapes to the atmosphere through two tubes. The smaller tube (K) connects the top of the tank to the reservoir and terminates in a 180° bend. This tube is the one which passes the thermostat element and is necessary for the proper control of the water temperature. Another tube (M) also connects the reservoir and the top of the water tank. This is an additional safety device to assure that the system is always open to the atmosphere. It is not possible to build up any pressure within the main tank or the reservoir. The main tank is equipped with a drain valve located in the lower right corner of the front panel (N). The entire tank is fully insulated and jacketed to keep radiant heat losses to a minimum.

THE THERMOSTATIC CONTROL SYSTEM

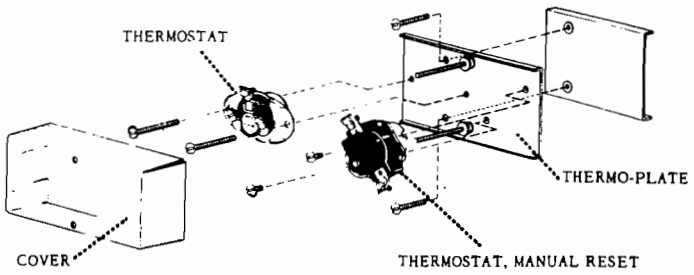

Figure 17 (Thermostatic control system)

Coffee extraction requires hot water as close to boiling as possible. The thermostatic control system has been time proven as a very dependable, yet simple control method. It is located between the reservoir and the main tank, secured to the inlet and vent lines. Its position on these lines is not critical, but it must be firmly secured and in tight contact with the tubes.

The two, non-adjustable thermostats are secured to a "heat sink", or Thermo-plate. Two thermostats are attached to the plate. One of these (Q) is a non-adjustable, automatic reset type, while the other is a non-adjustable, manual reset type (R). (See figure 3.)

When water in the tank is heated there is a boiling of the water around the heating element and the resulting steam bubbles, being lighter, tend to rise to the top of the tank. This circulation of rising steam bubbles and the displacement of an equal volume of water creates a geyser effect in the system: the geysering taking place through the small diameter copper line which passes the heat sink plate. Some of the heat in this passing water is transferred to the plate. When sufficient heat has been transferred and the thermostat (Q) temperature rises enough to trip it the heating element power is turned off. Power will remain off until this thermostat has cooled down and resets.

The second thermostat (R), with the manual reset, will not open until the thermoplate has been heated several degrees above the normal operating level. When this thermostat opens it is necessary for the operator to reset it manually. This is done so that a mechanic may investigate why it opened and take the necessary remedial measures. A clear plastic cover is installed to protect the thermostats from accidental damage.

LOW WATER CONTROL

The heating element circuit (see electrical diagram) connects these two thermostats in series with the inside upper switch of the reservoir and the heating element. (See water system schematic.) This circuit prevents: 1) the necessity to disconnect the heating element while filling the main tank, and, 2) the accidental operation of the heating elements should a low water level condition occur for any reason.

WATER OUTLET SYSTEM

Four valves comprise the water outlet system. They are: the Coffee Water Outlet Valve (S); the Chocolate Water Outlet Valve (T); the Tea Water Outlet Valve (U), and the Soup Water Outlet Valve (V). Each of these valves will release water into its particular segment of the commodity troughs, depending on the beverage selected.

THE COFFEE WATER OUTLET VALVE

This valve is mounted on the face of the water tank directly behind the brewer. It has the shortest connection to the tank and the hottest water will be released from the tank through it. It takes very hot water to brew coffee properly. This valve is operated by a switch assembly mounted on the brewer.

TEA, SOUP AND CHOCOLATE VALVES

These valves are mounted on a manifold which projects from the left side of the water tank along the rear wall of the cabinet. Three valves are provided because each beverage may require a different amount of water to brew the beverage properly, and each beverage is made and released from the machine through its own channel to avoid taste contamination. Each valve is controlled by a separate switch in the program timer (see electrical section for details). Each of these valves is connected to the commodity rack by a flexible tube.

Each valve has a vented elbow fitting at its outlet port. The vent is provided to assure that all the water released into the tubes is drained fully. Venting eliminates "after drip" from these lines.

OTHER FEATURES

1. Rinse Hose

   A convenience feature is the rinse hosw (W). This is provided for maintaining proper machine sanitation. It is long enough to reach each part of the machine which will normally require cleaning. To avoid any possibility of this hose leaking, a storage bracket has been provided, which holds the outlet of the hose above the normal water level in the reservoir.

2. Overflow Tube

   Mounted in the left rear corner of the reservoir is a large diameter standpipe (X) whose top is above the normal water level of the reservoir. Should the water level rise too high, regardless of the reason, the excess will run into the standpipe and pass directly to the liquid waste pail (Z).

3. Overflow Safety

   If the overflow condition continues the level in the waste pail will rise and eventually raise the float of the safety overflow switch shutting the water inlet valves and placing the machine on a "sold out" status. When on "sold out" any coins inserted will be returned.

SECTION G
THE COMMODITY SYSTEM

COMMODITIES

All of the products used to produce the beverages dispensed by the "Single Cupper" machine are dry. In the ten selection machine they are: Coffee, Tea, Chocolate, Soup, Creme, Sugar.

COFFEE

Fresh ground coffee intended for use in automatic single cup dispensing equipment must be carefully prepared by the roaster. There are two factors which have an effect on the quality of the finished beverage:

Grind After roasting the beans must be ground to produce the best particle size for good, rapid extraction. Minor variations in particle size tend to produce major variations in beverage quality.

Bulk Density The bulk density of both green and roasted coffees must also be controlled to get the desired quality from the amount of coffee used to make a single cup.

OTHER COMMODITIES

There are many suppliers whose products are made to dispense properly in automatic equipment, and whose tastes have enjoyed long acceptance with the buying public. We strongly recommend that only such products be used.

THE BREWER

The heart of the "Single Cupper" machine is the Open Cylinder brewer. It has been "time proven", and "experience improved". It is simple, lightweight, easy to clean and easy to service.

HOW IT WORKS

The word "front" used in this description refers to that part of the brewer nearest the observer standing before the open cabinet.

The brewer may be adjusted to stop at any point in its cycle, but the ready-to-vend position we recommend is as follows: The brew chamber should be in place under the cylinder, with the cylinder just pressing lightly against the brew chamber seal. The brew chamber contains the charge of coffee needed to brew the next cup of beverage.

After the purchaser has established a coin credit by inserting acceptable coins equal to the purchase price, he may make a selection. When coffee has been selected and the button pressed the brewer starts.

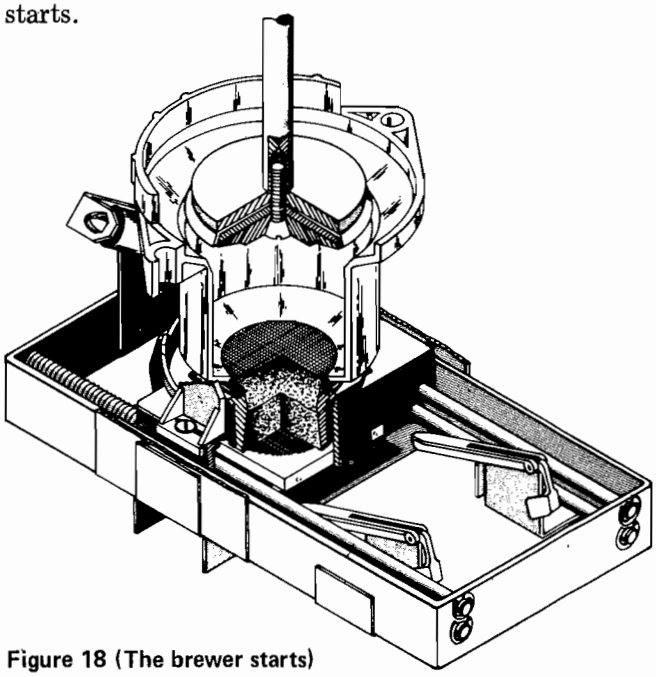

Figure 18 (The brewer starts)

The cylinder is held against the brew chamber seal by two springs. As the brewer starts to run, the coffee outlet valve is opened and enough hot water to brew one cup is released into the cylinder. The temperature of the water is above 200° F.

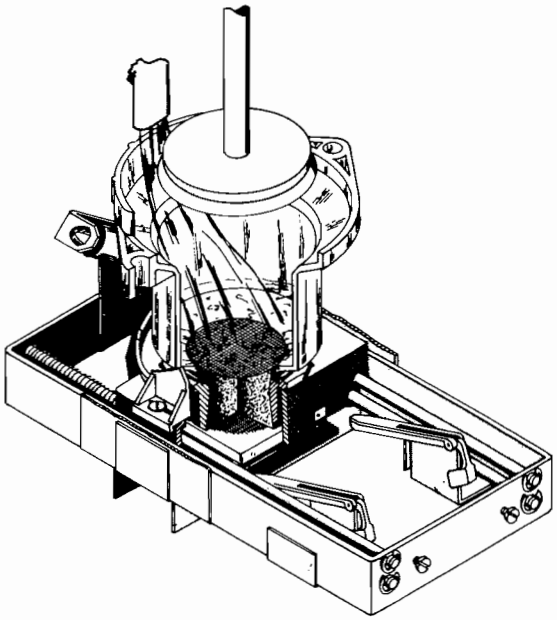

Figure 19 (Hot water enters)

The water runs into the cylinder, through the stainless steel screen and into the coffee filled brew chamber. The screen prevents the coffee grounds from floating up into the cylinder.

As the cycle continues the piston is moved down into the cylinder by a cam on the main shaft. As the piston moves into the cylinder the cylinder springs are compressed continuously further, increasing the pressure of the cylinder on the brew chamber seal.

Air, trapped between the piston and the water in the cylinder, is quickly heated by the water and begins to expand. The downward motion of the piston, plus pressure of the expanding air forces the water through the coffee grounds in the brew chamber and out into the delivery funnel. The heated, compressed air, following the water through the grounds, dries the grounds.

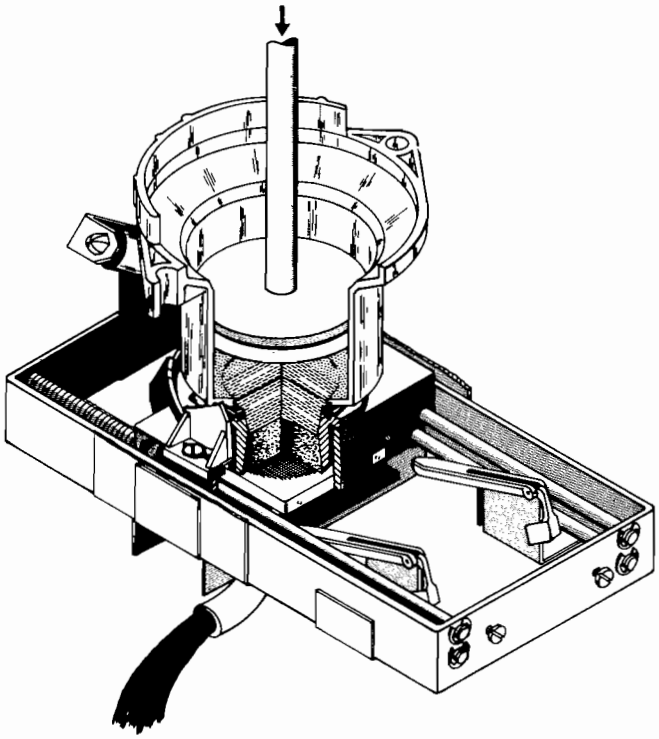

Figure 20 (The piston moves down)

The slack or looseness is taken out of the cable and the piston and cylinder are raised far enough to allow the brew carriage to pass under the cylinder. The cable is then unwound controlling the foward motion of the brew carriage which is moved forward by the carriage springs.

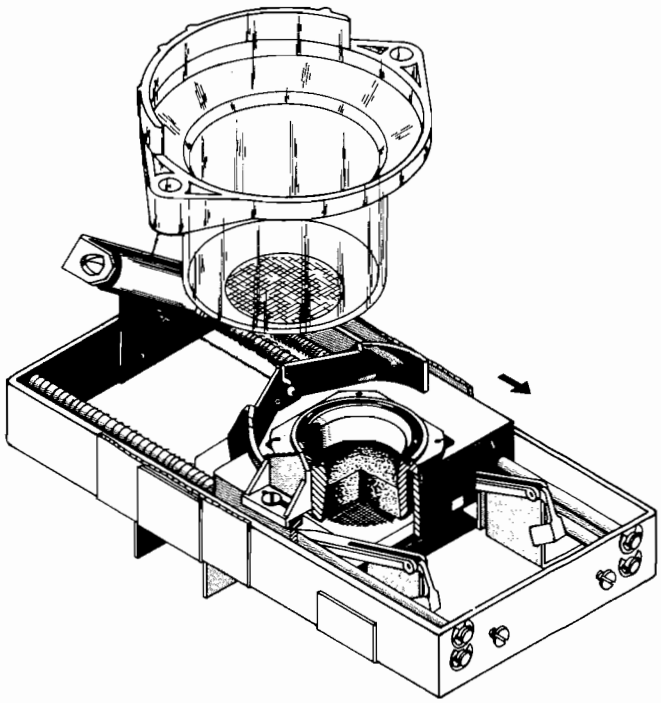

Figure 21 (The cylinder is raised)

As the brew carriage passes over the two white pawls in the base assembly the ears on the brew chamber lift the brew chamber upward against the springs which secure it to the carriage. As soon as the ears are free of the support of the pawls the brew chamber snaps downward, dislodging the grounds into the "spent" grounds pail.

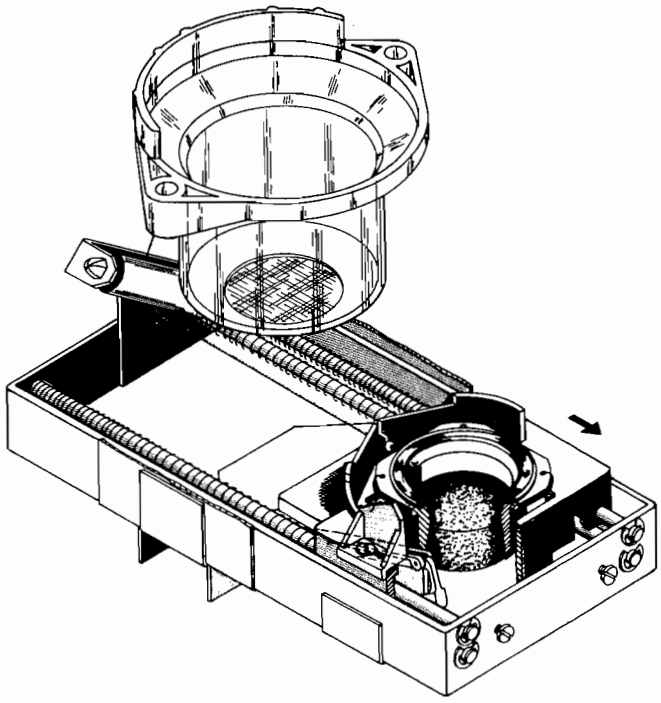

Figure 22 (The carriage moves forward)

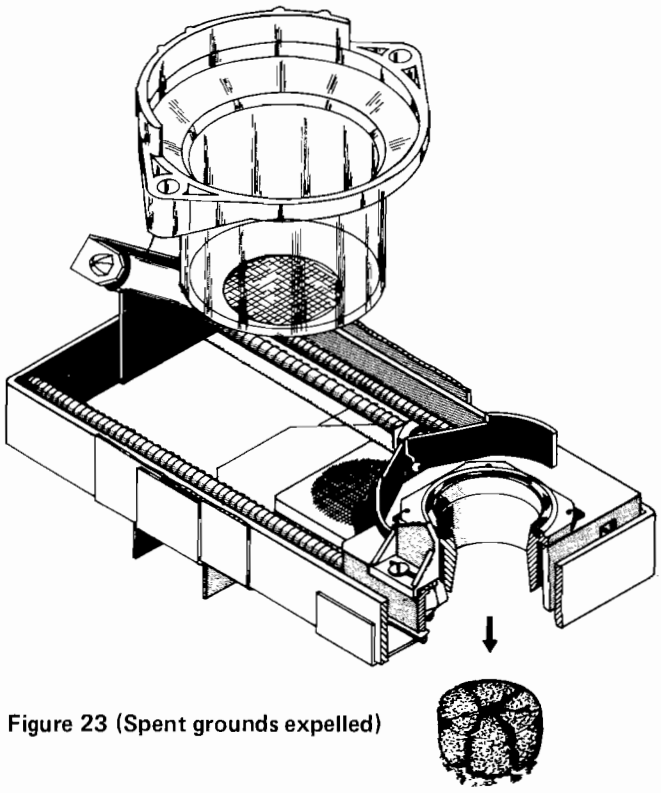

Figure 23 (Spent grounds expelled)

After the grounds are expelled, the cable begins to retract the brew carriage to its original position. As it moves toward the rear of the base assembly, it picks up the filter assembly providing a bottom to the brew chamber. A tripper on the brew carriage triggers the lever of the coffee chute, releasing a fresh charge of coffee into the brew chamber.

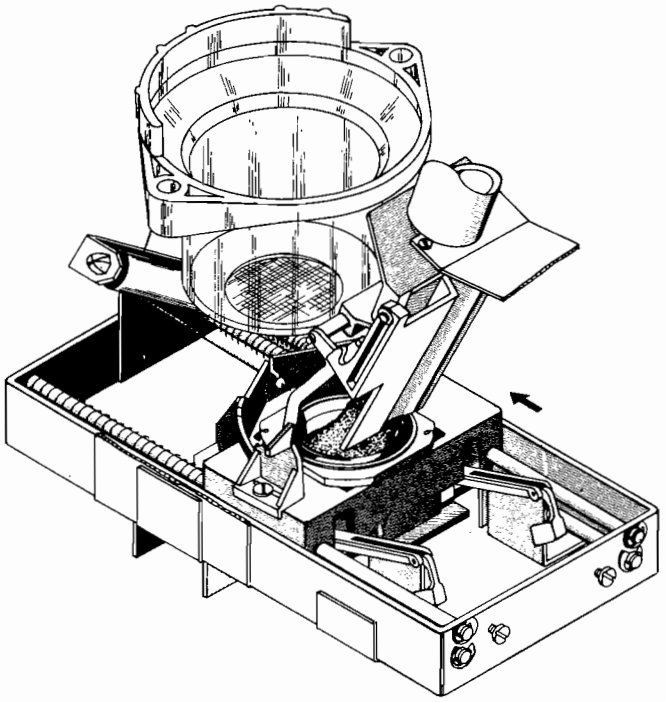

Figure 24 (Fresh coffee into brew chamber)

The brew carriage continues back until it is slightly past the cylinder while the cylinder is coming down. At the proper instant the brew carriage cable is released and the brew carriage will self-align with the cylinder as the cylinder descends to make the light contact with the brew chamber seal.

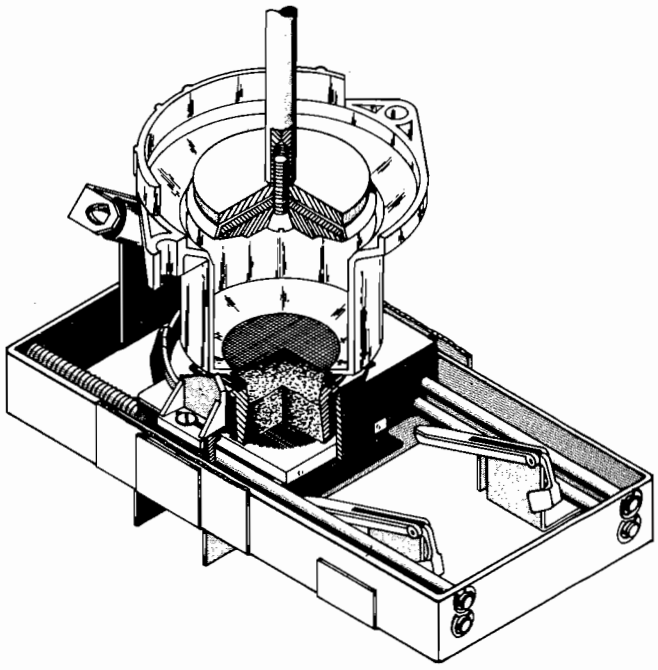

Figure 25 (The brewer is ready to start)

ADJUSTMENTS

The brewer has three principle adjustments: They are, 1) the cut off, or stopping position; 2) the water starting point and quantity per brew; 3) the cable adjustment. The upper front channel of the brewer has a shaft projecting forward which holds two cam assemblies. Each of these cams has a switch associated with it. The switch nearest the channel controls the cut-off point of the brewer. The outer switch regulates the starting point and the amount of water released for brewing each cup.

Each cam assembly has two sections. The main section is attached to a hub, containing set screws, which is secured to the shaft. The adjustable section rotates around the hub and is secured to the main section by a hex-head slotted screw. The cams are cut so that it is possible to change the low section from full closed to open about 180°

THE CUT-OFF CAM

This is the cam which determines the stopping point of the brewer. It is adjusted so that the roller of its switch drops into the valley at the precise point the brewer is to stop. The adjustable section of the cam is set so that it will raise the switch roller after the

brewer motor has turned the shaft only a few degrees. The brewer motor is started by the relay K-3 and runs until the cut-off switch is closed by the rising of the roller. This must be done before the relay K-3 drops out (See electrical section details.). The brewer will run on its switch until the roller drops into the valley of the cam.

THE WATER CAM

This is the cam which determines the starting point of the water released to the brewer. It also determines the amount of water released to make a single cup of coffee. This cam should be adjusted so that the switch roller drops into the valley of the cam, closing the water switch, as soon as possible after the brewer motor starts. The adjustable section must be set to release only the amount of water needed to brew one cup of coffee. This adjustment can best be made by actually brewing a cup of coffee and measuring the volume of the finished drink delivered to the cup. The water flow will be stopped as soon as the switch roller is raised enough to operate the water switch. To increase the amount of water released for a single cup of coffee, increase the valley or low portion of the cam. You can also decrease the amount of water by shortening the valley or low portion of the cam, so the water outlet valve is open for a shorter time.

THE CARRIAGE CABLE ADJUSTMENT

The horizontal movement of the carriage is caused by the springs in the base assembly. The action of the springs is controlled by the brew carriage cable assembly. The cable is wrapped on an outer spool and is wound and unwound to move the carriage in synchronization with the other movements of the brewer. The cable spool is controlled by the rear-most cam in the main cam shaft assembly. The configuration of the cam determines when the cable is reeled in and when it is payed out.

When the cylinder is down on the brew carriage the cable is slack. Just as the cylinder begins to rise the cable assembly tightens, to prevent the brew carriage from jumping forward as the cylinder clears the carriage. As soon as the cylinder is high enough to clear the carriage, the cable is payed out and the carriage moves forward to dump its grounds. After the grounds have been dumped, the cable again winds on the outer spool and pulls the carriage back under the cylinder. The cable goes slack just prior to the cylinder touching the brew chamber seal.

The cable is secured to the outer spool of the spool assembly with a cotter pin. The inner section or hub is secured to a shaft and gear assembly. The gear is rotated by a pivoting gear segment through the motion of a cam on the welded cam shaft assembly. The outside surface of the hub has teeth which will engage similar teeth on the inside circumference of the spool. When the two parts are assembled, they are secured by a screw and washer which prevents them from becoming disengaged.

The proper adjustment of the cable is as follows:

Cycle the brewer and as the brew carriage assembly is being pulled back by the cable, jog the brewer by using the toggle switch located on the main electrical box. When the cylinder starts down, the carriage will be slightly behind the cylinder. As the carriage moves forward, the bottom outside edge of the cylinder should be approximately 1/16" below the top of the vertical guides of the carriage when contact is made between the cylinder and carriage guides. When contact is made the bottom seal point of the cylinder should be 1/16"to 1/32" above the seal ring of the brew chamber. The cable should now be free and not restraining the carriage. The carriage is now being guided by the outside of the cylinder. The cycle will now continue and the cylinder will continue to move down contacting the seal of the brew chamber as the cable goes slack.

If adjustment is required it is suggested that a pencil mark be made across the two plastic parts of the cable spool assembly. Remove the screw and washer and rotate the outer spool one tooth at a time and recycle the brewer. Whe correct timing is obtained replace screw and washer.

Operate the brewer through a full cycle and observe that (1) the cable goes slightly slack just before the cylinder contacts the brew chamber seal, and (2) the cable is not too slack that it will allow the brew carriage to stop under the outer edgeof the cylinder preventing it from sealing properly.

THE STEAM EXHAUST CONTROL SYSTEM

Steam from the hot water needed to make the beverages is controlled by this system. Uncontrolled steam in a vending machine will create severe problems through caking and hardening of the dry products. Such a condition will prevent proper dispensing.

By moving low velocity air, in high volume through the areas where the steam is generated, the steam is removed before it can reach the dry product dispensers. The air is moved by a squirrel cage blower, discharges outside the machine cabinet.

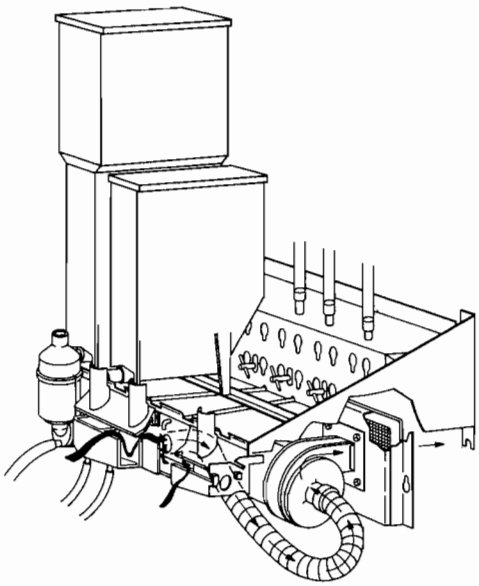

Figure 26 (Steam exhaust control system)

The steam is generated when ever the machine is activated to dispense a beverage. The hot water used to make coffee, tea or soup, passes through the main trough as the dry products are dropped. Immediately adjacent to the trough is a vacuum duct which is connected to the blower by a reinforced plastic duct. Directly over the trough is the Steam deflector and commodity chute. Creme, sugar, tea and soup products are dropped into the moving liquid in the trough directly from their respective canisters. The design of this deflector is such that a constant stream of dry air is pulled down through the commodity chutes of the deflector and actually helps delivery of the product to the water. At the same time this deflector effectively prevents the steam vapor from rising in the area of the commodity canister outlets.

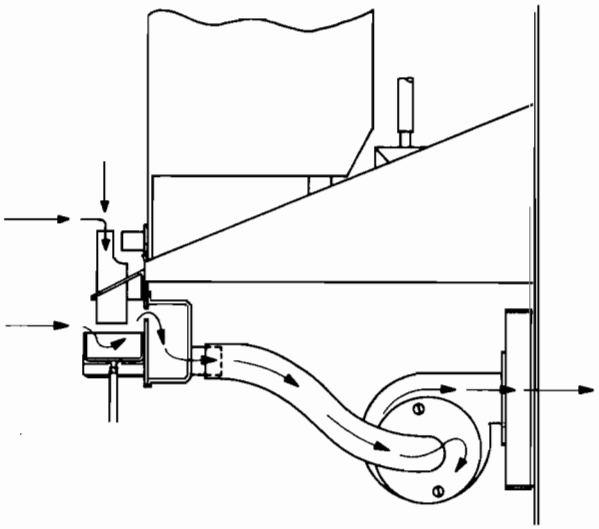

Figure 27 (Steam exhaust flow)

These parts, the trough, the steam deflector, the vacuum duct, its channel to the blower, are all easily removed for cleaning. Cleaning is easily accomplished by rinsing in hot water. The trough itself, which carries the beverage, should be sanitized according to the current industry practices. (Note: These parts should be thoroughly dried after washing.)

THE HUMIDITY BAR

The bar is installed between the face of the front outlet ports, is a vital part of the commodity system. It is electrically heated and, by providing a slightly higher temperature at the canister outlet ports will prevent moisture from being absorbed by the dry products, in areas where high humidity is present. If the "Single Cupper" is operated in a humid atmosphere without the humidity bar in operation it is likely that the dry products will cake and not dispense properly.

The bar is installed between the face of the lower canister supports and the stainless steel canister rack. Small bullet catches hold it securely. If this bar is to be installed in a five selection machine, which will not have a full complement of commodity canisters, a small clip is provided on the canister rack to hold the leg of the humidity bar.

CHOCOLATE HOMOGENIZER

The chocolate beverage is made more attractive and palatable to the user by whipping it as it is delivered. There is a separate mixing system for chocolate. It does not pass through the same mixing system as coffee or the other beverages. As soon as the water for chocolate is released the whipper motor, which runs at high speed, starts. The chocolate powder is dropped from its canister directly into the water stream, into the homogenizer and then to the cup.

The homogenizer parts are all of a food approved plastic material, highly resistant to mechanical damage. They are easily removed, without tools, for sanitization. The assembly is held together by spring clips.

THE COMMODITY RACK

The support for the entire dry product commodity system, is made of stainless steel. It is open construction, with a minimum of horizontal surfaces to catch dust and spillage. The motors which drive the canister augers are all located behind and under the steel cover. Each motor may be removed, if necessary, by loosening four screws and lifting it out.

Water tubes, to direct the water to the trough and homogenizer are also stainless steel and permanently attached to assure proper alignment.

THE COMMODITY CANISTERS

The dry product required to make the beverages which the Single Cupper machine dispenses are all made of rugged translucent plastic containers. They are designed to dispense products on a first in-first out basis in order to insure a fresh product at all times.

The augering system used to dispense the products runs in reinforced nylon bearings to assure long trouble-free life. The dispensing end of the canister may have a louvered spout. These louvers control the accuracy of discharge so that proper mixing is assured for each drink.

The translucent materials permit the routeman to estimate the contents of the canister without having to remove the cover. Commodity levels may be marked on the outside of the canister so that the routeman can easily refill them to a predetermined level. This type of control will reduce the product waste and assure commodity freshness by the elimination of overfilling.

The table will show the capacity of the canisters and explain the differences.

TABLE 1
CANISTER DETAILS

	RMi 850			RMi 850 — 710				RMi 710		
	Creme	Sugar	Choc.	Coffee	Freeze-Dry Coffee	Tea	Soup	Creme	Sugar	Choc.
Louver (No. of Baffles)	Yes (2)	No	No	L.G. No	No	Yes (2)	No	Yes (2)	No	No.
Capacity (Pounds)	5.1	8.1	14	12	3.0	3.0	5.5	3.3	5.5	8.0

SECTION H
PREVENTIVE MAINTENANCE

The best type of service call is the one which will prevent the majority of emergency service calls — those which occur when your machine goes out of operation. Unlike emergency service you can schedule preventive maintenance calls at your convenience. The word preventive conveys the idea of anticipating for forestalling an event and keeping it from happening.

An effective Preventive Maintenance program can keep service calls, outages, and downtime to a minimum. Minimizing these problems can result in:

Reduced and budgetable labor costs.
Extended parts life.
Substantial reduction in lost sales.
Minimizing product wastes.
Increasing customer satisfaction.

An effective Preventive maintenance program must consist of a combination of Sanitation (cleanliness), Inspection and Lubrication.

Dirt accounts for more equipment failures than any other single element. Dirt can be abrasive, corrosive, combustable, adhesive, conductive, resistive, absorbent, and unsightly.

Lubrication of moving parts is necessary to reduce friction and wear. Many motors are "sealed for life" while others require some oil. Use oil sparingly. Excessive oil does not lubricate better than the proper amount but, will add to the dirt collecting ability of the part.

Inspection of the machine interior and exterior should be a function performed by every man who opens the cabinet door to see inside. Each becomes

a trouble spotter. A troublespotter must first learn what normal operation is, then, through the use of his five senses he can detect that which is not normal.

Visual inspections should check for loose wiring connections, frayed or burnt insulation, loose hardware parts, stray parts, etc. in the bottom of the cabinet, signs of wear on moving parts, binding or rubbing, etc.

PREVENTIVE MAINTENANCE CHART

These are the items which require periodic attention to keep your "Single Cupper" in top operating shape.

Brewer

Base Assembly	Drop and clean every week, hot water rinse.
Coffee Filter	Replace every 5 to 10,000 vends.
Piston Seal	Replace every 50 thousand vends.
Motor	Light oil every six months.
Rods and Bearings	Light mineral oil every six months.

Water System

Water Filter	Replace every 25 to 50 thousand vends (depends on local water conditions).
Water Valves (Outlet)	Check periodically for lime build-up. Use a lime neutralizing filter where needed.

Commodity System

All Product Canisters	Empty and clean every six months.
Steam Exhaust System	Dismantle and clean every six months.
Commodity Motors	Light oil every six months.
Delivery Tubes, Troughs, etc.	Follow local health regulations with reference to sanitation.

Cabinet

Lubricate all moving parts — locks, hinges, etc. as required.

Coin Devices

Follow the manufacturers recommendations. Some locations will need more frequent cleaning to maintain their trouble-free operation.