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3,241,720 ELECTRICAL CONTROL CIRCUIT FOR BAR DISPENSERS

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This invention relates generally to bar dispensers in the form of a manually operable nozzle structure for dispensing various fluids in a convenient manner to facilitate mixing drinks and the like. More particularly, the invention has to do with a greatly improved electrical control circuit structure for operating various valve controls incorporated within the bar dispenser unit.

Bar dispensers of the type under consideration include a handle and body structure within one end of which there is provided a hose or tubing incorporating a plurality of lines carrying individual fluids. Within the handle and body portions are suitable valves of each of the fluid lines. These valves are preferably electrically controlled so that any one or a combination of fluids may be dispensed from a nozzle structure at the lower front portion of the body in response to actuation of the corresponding valve control.

In units provided heretofore, there is included button type actuators conveniently positioned for depression by the bartender's thumb. Depression of these buttons in turn closes a suitable electrical circuit to operate one of the valve controls corresponding to the particular button.

The fluids involved include tonic, syrups, and other mixers for drinks and during normal usage, the buttons may become corroded and difficult to operate. Further, moisture may penetrate into the inner workings of the unit and render certain electrical portions thereof useless.

In such units as have been described, it is important to provide adequate lighting so that the bartender may identify the various buttons or actuating means for operating the unit in dimly-lit bars. As a consequence, the circuitry involved to provide illumination as well as actuation of the control valves has become somewhat complicated with the disadvantage of bulkiness and more parts subject to possible disorder. In addition, constant repeated rubbing of a button by the bartender's thumb or finger can eventually wear off the identifying symbol for the button with the result that it becomes difficult to identify the proper fluids.

With all of the foregoing considerations in mind, it is accordingly a primary object of this invention to provide a greatly improved bar dispensing instrument incorporating unique electrical circuitry means overcoming the foregoing mentioned problems in connection with present-day dispensers.

More particularly, it is an object to provide an improved electrical control circuit for bar dispensers which is substantially moisture-proof to the end that syrups and other liquids cannot penetrate the mechanism.

Still another object is to provide a bar dispensing unit circuitry in which very little movement, hardly detectable by the bartender, is necessary to operate one of the valve controls.

Another object is to provide a bar dispensing unit incorporating suitable illuminating means for each of the actuating means without appreciably complicating the electrical circuitry involved.

Still another object is to provide a bar dispensing unit in which the actuators operate similarly to push buttons but are recessed in such a manner that a substantially flush panel surface is provided, there being no hardware above the panel so a very compact and neat-appearing dispenser results.

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Briefly, these and many other objects and advantages of this invention are attained by providing a control circuit structure including a top panel means cooperating with a main body portion. Preferably there is also included a bottom panel sandwiching the body portion between the top panel means and the bottom panel. The top panel means includes a plurality of bores incorporating movable elements which, in accordance with the preferred embodiment of the invention, comprise miniature light bulbs. A flexible conducting strip means is secured to the underside of the top panel such that the strip engages the lower tips of the light bulbs within the bores and preferably this strip means is biased against these lower tips to maintain constant contact therewith.

The main or central body portion includes a recessed area for accommodating the flexible strip means in such a manner that when the various top panel means, central body member, and bottom panel are all assembled, the flexible strip means is wholly sealed within the dispensing unit. The recessed area portion accommodating the strip means includes a plurality of contacts positioned within the area at points beneath the various bores but normally out of contact with the strip means. The arrangement is such that depression of the light bulb through the bore urges the strip into engagement with the particular contact disposed beneath the strip within the recessed area to thereby complete a circuit and operate a corresponding valve control. The bores themselves include conducting portions engaging the bulbs so that the bulbs are at all times illuminated and thus there is no difficulty in locating the proper bulb to depress. The bulb thus serves the dual function of providing light as well as providing a medium or movable element for actuating the strip to effect a contact.

The top panel means also includes a transparent flexible cover overlying the various bores and including identifying indicia. On top of this cover there is provided a steel plate having circular openings therein registering with the bores. There is thus provided a substantially flush surface with only small openings exposing the transparent cover over the tops of the light bulbs. The bartender then need only press slightly through the openings to urge the cover and thus the light bulbs through a very small distance within the bores to effect engagement between the flexible strip means and the contacts within the recessed area of the main body portion.

Further features of the invention include added circuitry together with additional light bulbs, strip means, and contacts, so that combination of fluids may be provided.

The entire electrical circuit structure may be made completely moisture-proof since the movement of the light bulb involved is very small and can readily be accommodated by the transparent flexible covering which is sealed about its peripheral edges to a part of the top panel portion. This transparent cover thus acts essentially as a flexible diaphragm for imparting motion and yet completely blocks any moisture and the like from the interior workings of the unit.

A better understanding of the invention will be had by now referring to a preferred embodiment thereof as illustrated in the accompanying drawings, in which:

FIGURE 1 is an exploded perspective view of a bar dispenser illustrating certain details of the top panel means forming a part of the unit; and,

FIGURE 2 is another exploded perspective view of the central body portion of the unit including a schematic diagram of various electrical circuit connections in accordance with the invention.

Referring first to FIGURE 1, there is illustrated a bar dispensing unit including a handle 10 connected to a top panel means 11 provided with a plurality of bores incor-

porating movable elements in the form of light bulbs 12. Immediately below the top panel means 11 is a central body 13 followed by a lower panel 14 sandwiching the panel 13 with respect to the top panel structure 11 as shown.

The top panel means includes a transparent cover designated generally by the numeral 15 and including a dual layer of transparent plastic material 15a and 15b. The lower transparent layer 15a may have printed thereon certain identifying symbols such as indicated at T, Q, G, C, 7_{UP}, W and S. The top layer 15b is affixed to the bottom layer to protect these identifying indicia. The top panel means is completed by a steel plate 16 provided with a plurality of openings 17 arranged to register with the bores containing the light bulbs 12 when the various units are assembled. The assembly is achieved by suitable screw openings such as indicated at 18 arranged to receive elongated screws as will be described in detail subsequently.

As illustrated in the right-hand portion of FIGURE 1, the handle 10 is arranged to receive a hose or tube 19 including a plurality of lines for carrying different fluids. Thus, the various lines are arranged to connect to various sources such as tonic designated by the symbol T, quinine water designated by the symbol Q, ginger ale designated by the symbol G, and Coca-Cola designated by the symbol C, 7_{UP} designated by the symbol 7_{UP}, water designated by the symbol W, and soda designated by the symbol S. These symbols correspond to the various indicia on the transparent cover structure 15 as described. As will become clearer as the description proceeds, the various lines passing into the handle 10 include electrically operated valves for enabling the dispensing of one or more of the fluids from a common outlet nozzle 20 extending downwardly from the bottom panel 14.

Referring now to the exploded view of FIGURE 2, there is illustrated in the upper left-hand corner an elongated screw 21 adapted to be received within the bore 18 and the other various corresponding bores in the central body 13 and bottom panel 14 for assembling the unit. Only one such screw is shown, it being understood that there will be provided other screws for the other various openings shown at the corners.

As also shown in the upper portion of FIGURE 2, a light bulb such as the bulb 12 includes a conducting band portion 22 and a bottom flange 22' as well as a lower contact tip 22''. This bulb as stated is typical of several light bulbs provided for the various bores in the panel means 11. Thus, one of these bores is indicated at 23 and includes a conductive lining for engaging the band 22 of the bulb 12 and effecting electrical contact therewith. There is also provided an annular recessed portion 23' for accommodating the flange 22' of the bulb. In assembling the bulbs within the bores, the bulbs are urged upwardly through the bottom of the bores until the flange 22' seats on the recessed area 23'.

As indicated schematically for the various bores 23, there is provided an electrical lead connecting the various bores together and extending to a common lead 24 passing through a resistance R to a junction point J1. This junction point J1 connects to the lower terminal of a source of electrical energy designated generally by the numeral 25.

Referring now to the central body 13, it will be noted that this body includes a recessed area 26 including a plurality of contact which are designated by the letters T, Q, G, C, and 7_{UP}. Each of these contacts includes an electrical lead collectively indicated at 27 connecting to suitable control valve relay coils respectively designated T', G', Q', 7_{UP}' and Coke'. The other side of these coils connect through a common lead to the junction point J1 and the electrical source 25 as shown.

The central body 13 also includes an additional recessed area 28 including additional contacts designated W and S, respectively. The contact W connects through

an additional control valve relay coil designated W', the other side of which connects to a line 29 to a junction point J2 constituting a terminal of the electrical source 25. The other contact S in the additional recessed area 28 connects through a line 30 to a junction point J3. Another additional control valve relay coil means designated S' is connected between the junction point J3 and the junction point J2 of the electrical source 25.

Between the top panel means 11 and the central body member 13 there is illustrated in exploded view a flexible conducting strip means 32 having small openings 33 and 34 for receiving fastening screws 35 and 36 in turn adapted to be threaded into threaded sockets 37 and 38 on the underside of the panel means 11 so that this additional strip means 32 may be secured to the underside of the panel with various portions of the strip engaging the lower tips, such as the tip 22' of each of the light bulbs within the various bores when the light bulbs are assembled in the bores. The strip means 32 is resilient as described, the portions thereof which engage the tips of the light bulbs being biased upwardly against these tips to hold the light bulbs within the bores. As shown, an electrical lead 39 connects the strip means 32 to the junction point J3 and then through the valve control coil S' to the junction point J2.

Also provided is an additional flexible strip means 40 including a small opening 41 for receiving a screw 42 which screw is received within a threaded bore 43 on the underside of the panel means 11 so that this additional strip 40 is secured to the underside of the panel means and arranged to engage the lower tips of additional light bulbs within the additional bores illustrated. A conductor 44 electrically connects the additional flexible strip 40 to a junction point J4 in the electrical source 25. The junction point J4 essentially is a center tap on the electrical source 25 to define a first electrical source between the junction point J4 and the junction point J2 and a second electrical source between the junction point J4 and the junction point J1.

The bottom panel 14 includes threaded bores such as indicated at 45 for receiving the threaded ends of the screws, such as the screw 21, so that all of the elements illustrated in exploded view may be secured together.

With the foregoing description of the various components making up the electrical control structure of the bar dispenser in mind, the operation of the entire unit will now be described. First, it will be understood by those skilled in the art that the various valve controls schematically indicated by the coils T', G', Q', 7_{UP}', Coke', W', and S', when energized, will serve to actuate suitable valves within the handle 10 so that the corresponding fluid line passing into the hose 19 will be placed into communication with the outlet nozzle 20. In bar dispensing operations, however, it is desirable that there always be provided passing from the nozzle 20 soda with whatever other particular syrup in one or more of the other lines is provided in order to generate the desired mix. It is for this reason that the actuating control in the form of the coil S' as illustrated in FIGURE 2 appears out of place relative to the other various actuating coils connecting to the leads 27.

It is also to be understood that each of the various bores 23 includes a light bulb such as the light bulb 12, although these other light bulbs are not shown to avoid obscuring the drawings.

With the foregoing understandings in mind, the biasing of the flexible strip means 32 and 40 is such that these strips will be out of engagement with the various contacts within the recessed areas 26 and 28 in the body member 13. However, the biasing of these strips is such that they will all engage the tips of the various light bulbs so that a circuit will be completed through the various light bulbs from the junction point J2 of the source 25, through the control valve coil S' to the leads 31 and 39 and flexible strip means 32. From the flexible strip means 32, con-

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tact will be effected to the tip of the various light bulbs so that energy may pass through their filaments to the conducting band 22 and thence to the bores 23 which provide a return circuit through the lead 24 and resistance R to the junction point J1 at the other side of the power source 25. The current passing to the bulbs 12 is not sufficient to actuate the valve under control of the coil S' because of the series connection which results in relatively little current through this coil. The resistance R serves to drop the voltage applied across the various bulbs so that less than 24 volts is applied to the bulbs so that bulbs with a 28-volt rating will last considerably longer.

With all of the bulbs illuminated, the various indicia shown in the transparent cover panel of FIGURE 1 will be clearly visible through the openings 17. If now, for example, the bartender wishes to dispense quinine water, he will depress the transparent cover portion designated by the indicia Q thereby depressing the top of the bulb 12 which in turn will depress the portion of the flexible strip means 32 against the contact Q shown in the recessed area 26. There will then be a circuit completed from the junction point J2 through the soda control valve S', lines 31 and 39, flexible strip 32, through the contact Q and the corresponding one of the leads 27 and control valve coil Q' to the junction point J1 connecting to the opposite side of the electrical source 25. The control valve coils S' and Q' will then be actuated to dispense quinine syrup which will mix with soda in view of the actuation of the soda control valve coil S' upon closing of the flexible strip with the contact Q. In other words, the added current passed when the flexible strip portion is depressed on the contact Q results in sufficient current to now actuate the soda or S' valve control coil.

The same situation will obtain if any of the other flexible strip portions are depressed by their correspondingly positioned light bulbs, such as the T, G, C or 7_{UP} strip portions to engage the correspondingly designated contacts in the recessed area 26.

There are many instances, however, when the bartender desires only to dispense soda itself, or water itself, without any soda mixed with the water. It is for this reason that there is provided the additional flexible strip means 40. With this additional strip means and cooperating additional recessed area 28 with contacts W and S as shown, if the bartender depresses the bulb under the W indicia, contact will be completed through the lead 44 from the junction point J4, flexible strip 40 and contact W in the recessed area 28 through the water control valve coil W' and lead 29 up to the junction point J2 thereby passing water from the dispensing nozzle 20.

If the bartender desires to dispense soda only, he will simply depress the light bulb under the indicia S so as to flex the additional flexible strip portion on the strip 40 to engage the contact S in the additional recessed area 28. A circuit will then be completed from the junction point J4 through the lead 44 to the flexible strip 40 and contact S to lead 30 and junction point J3 and then through the soda control coil S' to the junction point J2. The various coils for actuating the valves will operate under 12 volts so that the first electrical source between the junction points J4 and J2 is sufficient.

A suitable lead 45 extends from the water contact W up to the various additional bores in the panel 11 so that the lights therein will be illuminated since the same will be connected across the second electrical source between the junction point J4 and J2 through the water valve control coil W'. This control coil will not be provided with sufficient current to operate since it is in series with the light bulbs.

It will be clear that by means of the flexible strip structure and the shallow recessed areas as described, only a very small movement of the light bulbs within the bores is necessary to effect the desired contact. Moreover, it will be evident that as a consequence of

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the transparent cover structure 15 described in FIGURE 1 and the secure attachment of the cover plate 16, a thoroughly moisture-proof unit results. Moreover, there are no protruding push buttons or other hardware above the panel 16 so that a very neat and streamlined structure results.

By employing the light bulbs themselves as the movable elements for actuating the strip and thus effecting contacts, a considerable economy in size and number of components is realized. Moreover, by use of the flexible strips themselves serving the dual function of effecting dual contacts to illuminate the light bulbs as well as serve as a medium for providing power across the various valve control coils, further economy is realized together with a great simplification in the circuitry.

Accordingly, it will be evident from the foregoing description that all of the various objects and advantages described heretofore have been fully realized by the present invention.

While specific fluids have been described for the sake of illustration, it should be understood by those skilled in the art that the dispensing unit is not limited to any particular number of fluids to be dispensed and that the principles of the invention are applicable to a greater or lesser number of fluid line controls if desired.

In the light of the foregoing, the electrical control circuit for the bar dispensing unit is not to be thought of as limited to the exact embodiment set forth merely for illustrative purposes.

What is claimed is:

1. In a bar dispenser including a plurality of electrically operated valve controls for dispensing different fluids upon actuation, an electrical control circuit for actuating said valve controls comprising, in combination: a top panel means having a plurality of bores passing therethrough; movable elements in said bores, each of said movable elements being illuminatable to render the elements visible in the dark; a body adapted to be secured to the underside of said top panel means; a flexible conducting strip means secured to the underside of said top panel means and biased into engagement with the lower ends of said movable elements, said body having a recessed area for accommodating said strip means and having contacts disposed beneath the tips of said movable elements so that said strip means is sandwiched therebetween and normally held out of engagement with said contacts until a movable element is depressed from above said panel means to move the same in its bore and urge that portion of said strip means thereunder into engagement with the corresponding contact in said recessed area; a source of electrical energy having one side connected to said strip means, said valve controls being respectively connected between the other side of said source of electrical energy and said contacts; and means connected to said source of electrical energy for illuminating said movable elements.

2. In a bar dispenser comprising a handle member having an inlet hose connection including a plurality of individual inlet lines, electrically operated valve controls for said lines respectively, and an outlet nozzle for passing fluid from any one of said lines upon energization of its valve control, an electrical control circuit structure for actuating said valve controls comprising, in combination: a top panel means; a central body; and a bottom panel sandwiched together and secured to said handle member, said top panel means including a plurality of bores corresponding in number to said individual lines; light bulbs received in said bores respectively; flexible conducting strip means secured to the underside of said panel means and biased into engagement with the tips of said light bulbs, said central body including recessed area means for accommodating said strip means and having contacts disposed beneath the tips of said bulbs so that said strip means is sandwiched therebetween and normally held out of engagement with said contacts until a light bulb is de-

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pressed from above said panel means to move the same in its bore and urge that portion of said strip means thereunder into engagement with the corresponding contact in said recessed area means; a first source of electrical energy connected between said bores and said strip means to pass electrical energy through said bulbs and illuminate the same; and a second source of electrical energy connected between said strip means and to first ends of said valve control means, the other ends of said valve control means connecting to said contacts respectively whereby depressing of any one light bulb to effect engagement between said strip means and its corresponding contact in said recessed area means actuates that valve control means connected to said contact to effect dispensing of the corresponding fluid controlled thereby.

3. An electrical control circuit according to claim 2, in which said handle member includes additional inlet lines and additional valve controls, said panel means including additional bores with additional light bulbs therein; an additional flexible strip means secured to the underside of said panel means and biased into engagement with the tips of said additional light bulbs, said central body including an additional recessed area for accommodating said additional strip means and having additional contacts disposed beneath the tips of said additional bulbs so that said additional strip means is sandwiched therebetween and normally held out of engagement with said additional contacts until an additional light bulb is depressed from above said panel means to move the same in its bore and urge that portion of said additional strip means thereunder into engagement with the corresponding additional contact in said additional recessed area means; one of said additional valve controls being connected between said first source of electrical energy and said additional

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bores and one of said additional contacts, the other side of said first source of electrical energy connecting to said additional strip means so that a given amount of current is supplied to said additional bulbs through said one additional valve control, another of said additional valve controls being connected between said first source of electrical energy and another of said additional contacts and said first mentioned resilient strip means so that said another of said additional valve controls is actuated each time any one of said first mentioned plurality of valve controls is actuated.

4. An electrical control circuit according to claim 1, in which said top panel means includes a transparent cover of flexible material and a cover plate having openings arranged to register with said bores secured to said transparent cover so that said transparent cover may be depressed through said openings to move said movable elements, said transparent cover providing a moisture proof seal.

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