Jan. 13, 1959 S. R. WEISBERG ET AL 2,868,247

BOTTLE FILLING APPARATUS

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Fig. 1.

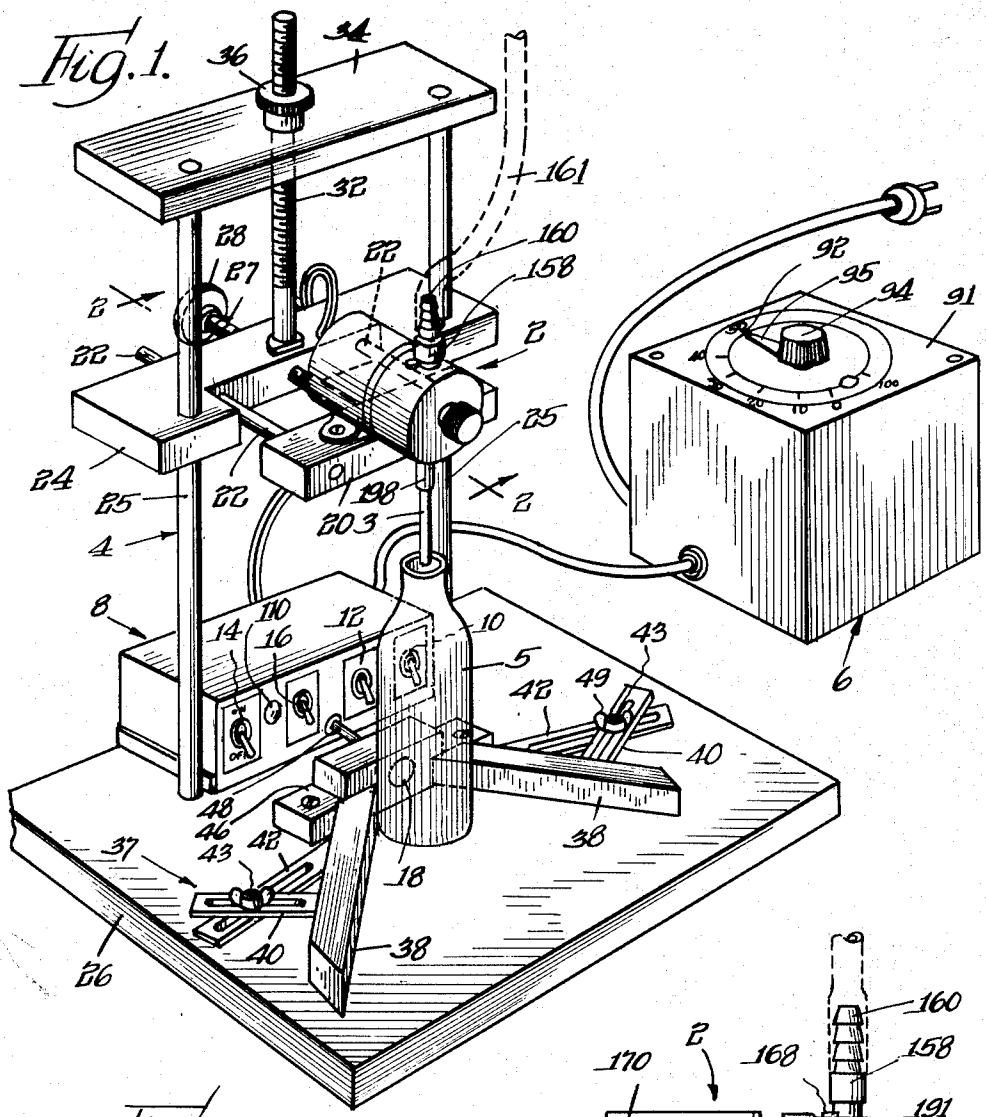
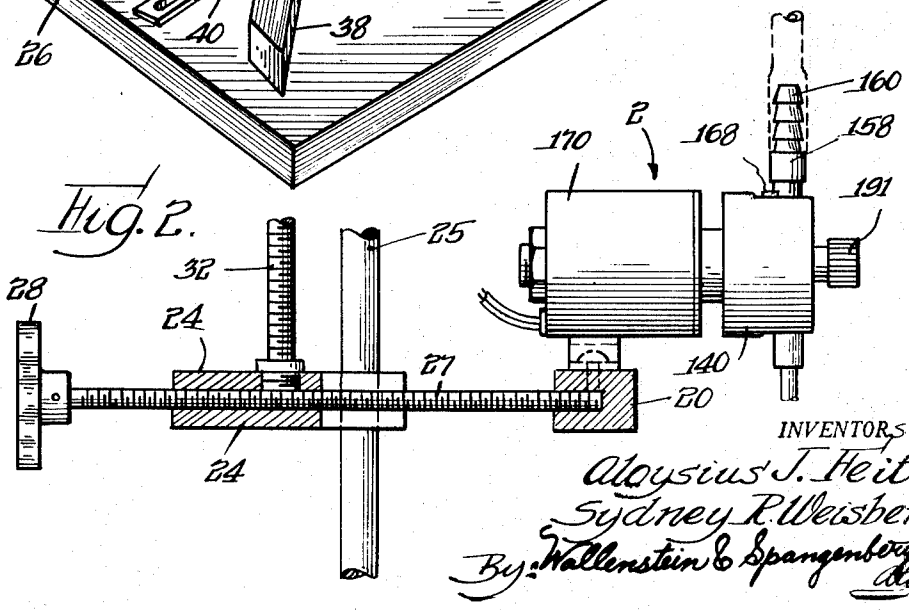


Fig. 2.



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Fig. 3.

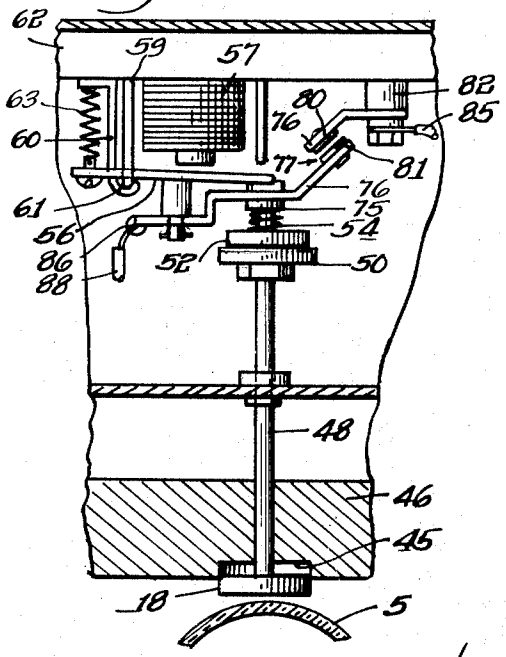


Fig. 4.

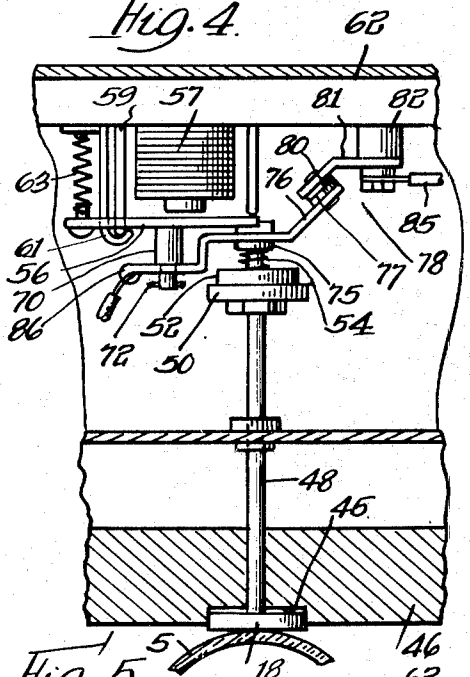


Fig. 5.

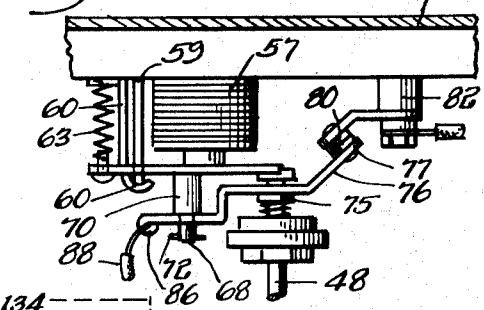


Fig. 6.

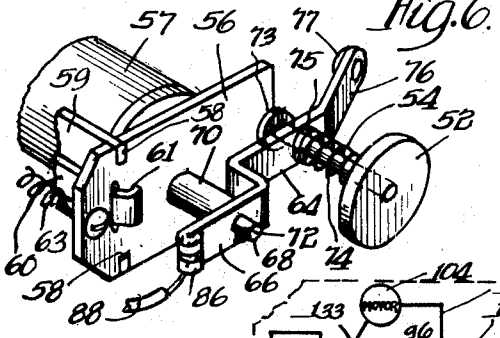
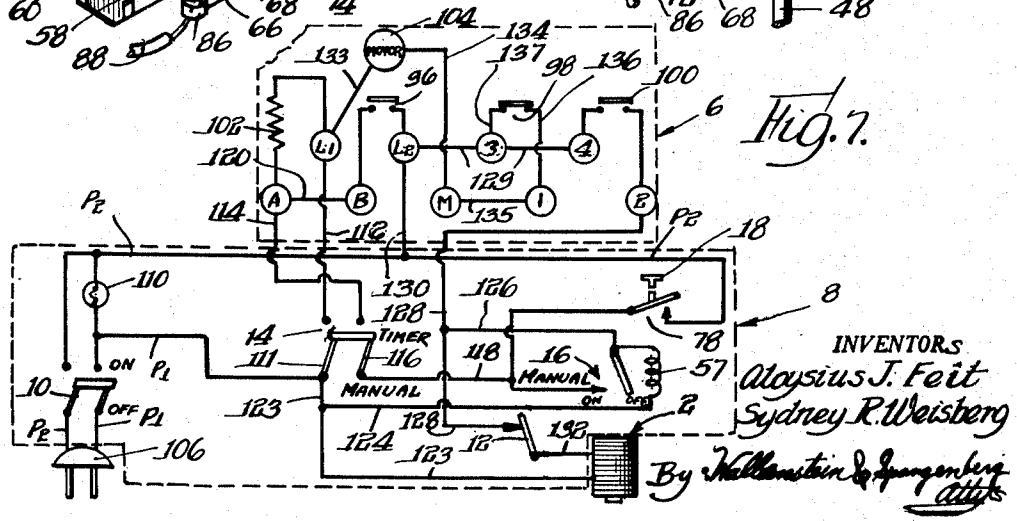


Fig. 7.



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Fig. 8.

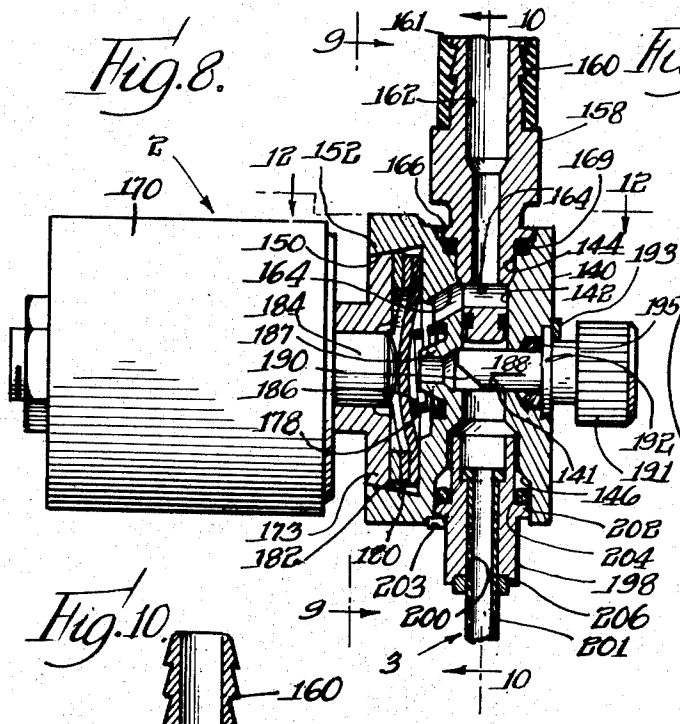


Fig. 9.

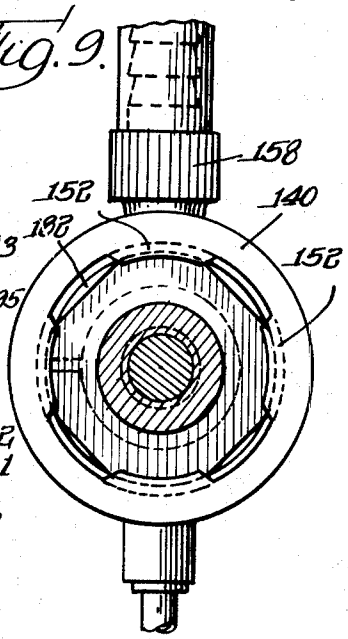


Fig. 10.

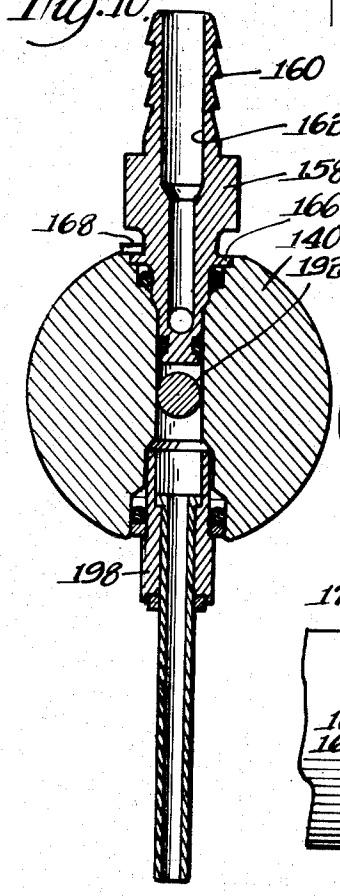


Fig. 11.

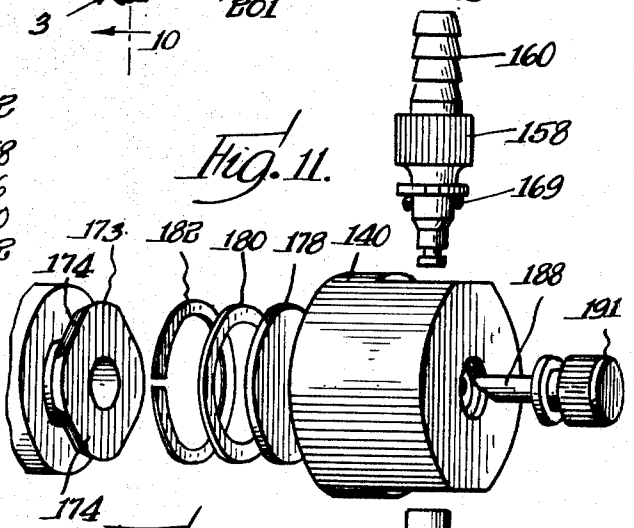
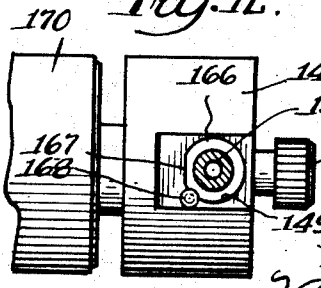
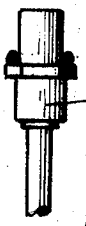


Fig. 12.





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2,868,247

BOTTLE FILLING APPARATUS

Sydney R. Weisberg and Aloysius J. Feit, Chicago, Ill.

Application October 8, 1956, Serial No. 614,700

14 Claims. (Cl. 141—361)

This invention relates to bottle filling apparatus, and more particularly to bottle filling apparatus, particularly, although not necessarily, suitable for filling small bottles, such as perfume bottles.

Among the principal objects of the present invention are: to provide bottle filling apparatus where the opening of a valve discharging fluid or other material into a bottle is initiated by the depression of an actuator member by the bottle as it is positioned below a supply outlet controlled by the valve, where the valve is closed preferably automatically by an automatic timer and, under certain circumstances, upon operation of a manual switch, and where the valve is thereafter prevented from again opening until the bottle is removed from the actuator member and another bottle is moved against the same to depress the actuator member to begin a new filling cycle; to provide bottle filling apparatus of the type above described wherein, although the actuator member may be spring urged to an extended position, the actuator member is held in its depressed position at least during the actual filling operation so that the bottle need not be forced against the actuator member during the filling operation, making the system particularly suitable in the filling of very light bottles where the bottles would otherwise require an externally applied force to keep the bottles in the proper filling position against the actuator member; to provide bottle filling apparatus as just described wherein the aforementioned valve is an electrically controlled valve, such as a solenoid valve, which is associated with a control circuit which selectively provides for controlling the solenoid valve either through an automatic electric timer or a manual switch, and which becomes operative to control the valve after the aforesaid actuator member has been despressed to thereby provide flexibility of operation; to provide apparatus as just described wherein there is further provided during manual or timer operation a means for instantaneously shutting off the valve should this be desired for any reason, such as due to a malfunction in the control circuit or timer control circuit which fails to shut off the solenoid valve; to provide such apparatus where means is provided for readily shifting the position of the supply outlet so that the apparatus may be readily adapted for use with bottles of different sizes; and to provide such apparatus which is inexpensive to manufacture and is reliable in operation.

In accordance with the invention, the aforesaid actuator member is preferably arranged to move the armature of a relay into a position where the contacts controlled thereby initiate, preferably through electric timer, opening of a control valve, preferably a solenoid valve, and also the energization of the relay which holds the actuator member in its depressed position. In such case, the armature, which is spring biased away from the relay core, does not apply any backward force to the bottle which would tend to push it out of alignment with the supply outlet. Both the solenoid valve and the relay

are preferably connected in series with a set of contacts controlled by the electric timer which contacts close for an adjustable interval to open the solenoid valve and energize the relay, and open at the termination of such interval to close the solenoid valve and de-energize the relay. An emergency cut-off switch in series with the solenoid valve is provided for instantaneously shutting off the solenoid valve independently of the timer, where this is necessary or desirable. The electric timer is not re-set for a new cycle of operation until the bottle is removed from the actuator member. Once the bottle is filled, the overall weight of the bottle is usually sufficient to hold the actuator member fully depressed even after the relay is de-energized. The resetting of the electric timer is effected by removing the bottle to return the relay contacts to their normal positions, and, upon subsequent closing of the actuator member, a new timing interval is initiated.

In the interest of system flexibility, switching means are provided for disabling the timer circuit from operation and for inserting the relay in series with its own contacts and also the latter in series with the solenoid valve so that, upon depression of the aforementioned actuator member, a holding circuit is established for the relay and the solenoid valve is opened. Closing of the solenoid valve and de-energization of the relay is effected through manual operation of the switching means.

The supply outlet is mounted preferably upon a base which, by various screw type adjustments, may be moved about in both horizontal and vertical planes. The filling apparatus thus has flexibility in addition to being simple and reliable in operation.

Other objects, advantages and features of the invention will become apparent upon making reference to the specification to follow, the claims and the drawings wherein:

Fig. 1 is a perspective view of a single-position bottle filling apparatus construced in accordance with the invention;

Fig. 2 is a fragmentary enlarged section through a portion of the apparatus in Fig. 1, taken along section line 2—2;

Fig. 3 is an enlarged fragmentary plan view of the relay mechanism controlled by the aforementioned actuator member;

Fig. 4 is a view of the relay apparatus in Fig. 3 following partial depression of the actuator member;

Fig. 5 is a view of the relay apparatus following total depression of the actuator member;

Fig. 6 is a perspective view of the relay apparatus shown in Figs. 3 through 5;

Fig. 7 is a schematic diagram of the circuit which controls operation of the solenoid valve;

Fig. 8 is a partial vertical section through the solenoid valve;

Fig. 9 is a transverse section, taken along section line 9—9 in Fig. 8;

Fig. 10 is a vertical section, taken along section line 10—10 in Fig. 8;

Fig. 11 is an exploded perspective view of the components making up the mechanical portion of the solenoid valve; and

Fig. 12 is a horizontal sectional view through the solenoid valve, taken along section line 12—12 in Fig. 8.

Referring now more particularly to Fig. 1, the components making up the bottle filling apparatus of the invention include a solenoid valve assembly 2 controlling discharge of fluid through a supply outlet 3 beneath which a bottle 5 is supported; and adjustable support structure 4 for positioning the solenoid valve 2 and associated supply outlet in any one of a number of horizontal and vertical positions, an electric timer 6 for controlling the

time of operation of the solenoid valve 2, electrical control apparatus 8 including a power on-off switch 10, an emergency cut-off switch 12, for closing the solenoid independently of the timer when necessary, a manual switch 14 for opening the solenoid valve independently of the timer and a switch 16 for disabling operation of the timer during manual operation, and an actuator member 18 which is depressed when the bottle 5 is moved beneath the supply outlet to initiate opening of the solenoid valve.

The support structure 4 includes a mounting base 20 for the solenoid valve 2. Base 20 is fixed to the ends of a pair of horizontal slide rods 22—22 which are slidably disposed in horizontal holes formed in a slider 24 mounted for vertical sliding movement along vertical rods 25—25 anchored to a base 26. The solenoid valve and supply outlet are moved horizontally forward and backward relative to the slider 24 by a screw 27 threading through slider 24 and fixed to the solenoid base 20. A knob 28 is provided for turning the screw.

The slider 24 and hence the solenoid valve carried thereby may be moved up and down by means of a screw 32 anchored at its lower end to the slider 24 and freely passing through a frame piece 34 fixed to the tops of the vertical rods 25—25. A nut 36 threads around the top of the screw 32 above the frame piece 34, and by turning the nut 36, screw 32 may be raised or lowered relative to the frame piece 34 to thereby raise and lower the slider 24 and the solenoid valve with it. Thus by adjustment of the knob 28 and the nut 36, the position of the bottom of the supply outlet 3 may be adjusted to accommodate different size bottles.

The base 26 provides a relatively large platform for supporting, among other things, bottle guiding means 37. This guiding means includes a pair of adjustable guide bars 38—38 which are pivotably secured to elongated slotted plates 40—40 and 42—42. Screws 43—43 extend upwardly from the base 26 and pass through the slots of the slotted plates 40—40 and 42—42. By shifting the position of the latter plates over the screw shanks, the spacing and angular positions of the guide bars 38—38 may be varied. Wing nuts 49—49 thread over the screw ends and lock the slotted plates in any one of a number of adjusted positions thereof. The guide bars 38—38 are adjusted so that facing sides thereof converge toward the actuator member 18. The bars are so spaced that their spacing at the inner ends is somewhat less than the widest dimension or the diameter of the bottle to be filled so that the bottle when pushed to its limit will completely depress the actuator member 18 within a recess 45 formed in the front face of a block 46 anchored to the base 26.

The actuator member 18, which may be a disc shaped element, is fixed to an operating rod 48 and slidably passes through a bore in the block 46. On the inner end of the operating rod is a contact disc 50 which cooperates with a contact disc 52 fixed to a post 54 which is anchored to the distal end of a pivotally mounted armature plate 56 of a relay 57. A pair of slots 58—58 are provided along the pivot axis thereof in the plate 56. The slots receive short projecting ends of a pivot plate 59 which pivotally supports the armature plate 56 along its outer edge. The armature plate 56 is held over and projecting ends of the pivot plate 59 by a metal retainer strip 60 passing through a hole in the armature plate and bent back at its end 61 to engage the bottom of the armature plate. The relay 57, pivot plate 59 and the retainer strip 60 are secured to an insulating base 62 which is mounted within the housing shown in Fig. 1 forming part of the electrical control apparatus 8. A spring 63 is secured between an end of the armature plate 56 and the insulating base 62 to urge the armature plate away from the core of the relay 57.

A contact strip 64 is associated with the armature plate 56, and includes an offset portion 66 which has a hole which receives the reduced outer end 68 of a post 70 extending from the outside of the armature plate 56. The contact strip is held on the end of the post 70 by a cotter pin or the like 72 which provides for a limited amount of movement of the contact strip along the reduced post end 68 so that the contact strip may be moved to a limited extent relative to the armature plate. Contact strip 64 is held against a base 73 on the bottom of the armature plate by a spring 74 coiled around the post 54, the spring having one end bearing against contact disc 52 and the other end bearing against a washer 75 which abuts the contact strip 64.

The contact strip 64 has an inclined contact carrying end 76 having an electrical contact element 77. The contact 77 is one of a set of contacts 78, the other contact 80 of this set being secured to the end of a metal arm 81 fixed to a terminal post 82 anchored to the insulating base 62. In a manner to be explained, when the contacts 77 and 80 make engagement, solenoid valve 2 opens to discharge liquid or other material through the supply outlet 3. A conductor 85 is fixed to the end of the terminal post 82. The opposite end of the contact strip 64 has a pair of projections bent back at 86 to form terminal lugs to which is soldered a conductor 88.

When the actuator member 18 is partially depressed within the recess 45 of the block 46, contacts 77 and 80 make initial contact as shown in Fig. 4. As the actuator member 18 is fully depressed within the recess 45 as shown in Fig. 5, the armature plate 56 moves away from the contact strip, proper contact pressure thereafter being made by the force of the coiled spring 74. In a manner to be explained, when the contacts 77 and 80 are closed, relay 57 energizes and the armature plate 56 is held against the core of the relay 57, as shown in Fig. 5.

Although there are a number of suitable electric timers now available on the open market, the preferred timer is one manufactured under the trademark "Microflex" by the Eagle Signal Corporation of Moline, Illinois. The timer includes a casing 91 having a dial 92 on the outside thereof and a control knob 94 for moving a pointer 93 over the control dial which indicates the time interval, usually in seconds, of the control interval provided thereby. The "Microflex" timer may have the circuit illustrated in Fig. 7 which includes two sets of normally open contacts 96 and 100, a set of normally closed contacts 98, a clutch indicated by reference numeral 102 which when energized initiates a timing cycle and when de-energized resets the timer, and electric motor 104 which is energized during the reset and timing portions of operation of the timer, but is de-energized at the end of the timed interval and before resetting of the timer. The mechanism of the timer is such that when the clutch 102 is energized the mechanism closes the normally open contacts 96 and 100 for the controlled interval. At the end of the controlled interval the contacts 96 and 100, are opened. The normally closed contacts 98 are closed when the timer is reset and also during the control interval, and are opened at the end of the interval. The timer cannot repeat a timing cycle until the timer is reset, which is obtained by de-energization of the clutch 102. The various connections between the various elements of the timer, terminals A, B, M, 1, 2, 3, 4, L1 and L2 thereof, and the circuitry external to the timer will now be described.

The circuit receives power via a male plug 106 and power lines P1—P2 in which is inserted a double pole single throw switch 10. A light 110 mounted upon the housing of the control apparatus 8 (see Fig. 1) indicates the power-on or power-off condition of the circuit. The energization circuit for the clutch 102 of the timer can be traced from power line P1 through the pole 111 of the manual-timer switch 14 in its timer position, line 112 leading to the timer terminal L1, clutch 102, timer terminal A, line 114, pole 116 of the switch 14, line 118 and through the actuator-operated contacts 78 connected to the power line P2. As soon as the clutch 102 is energized, the mechanism of the timer instantaneously closes

the contacts 96 and 100, the contacts 96 forming a holding circuit for the clutch 102 which holding circuit is in parallel with the circuit containing the actuator operated contacts 78. The holding branch extends from timer terminal A to jumper 120, to timer terminal B, and through the then closed contacts 96, timer terminal L2 and through the lead 130 connecting with the power line P2. The purpose of the holding contacts 96, among other things, is to enable proper operation of the system even though the relay 57 may be slow or sluggish in operation.

As previously indicated, relay 57 and the solenoid valve 2 become energized during the period of the time-controlled interval. The energization circuit of the relay 57 may be traced from power line P1, through line 123, line 124, relay coil 57, lines 126 and 128 leading to timer terminal 2, timer contacts 100, timer terminal 4, jumpers 129 joining terminals 4, 3 and L2, and line 130 connecting with the power line P2. The energization circuit of the solenoid valve 2 can be traced from power line P1, and through line 123, solenoid 2, line 132, emergency cut-off switch 12 which is normally closed, line 128, and the path including timer terminals 2, timer contacts 100, timer terminals 4, 3, and L2 and the line 130 leading to power line P2.

The energization circuit of the timer motor 104 can be traced from power line P1, and through pole 111 of the switch 14, line 112, timer terminal L1, lead 133, motor 104, lead 134, timer terminal M, jumper 135 connecting terminal M with terminal 1, lead 136 extending to the conatcts 98, lead 137, jumpered terminals 3 and L2 and line 130 leading to the power line P2.

The solenoid valve 2 may be instantaneously opened by manually moving the emergency cut-off switch 12 to an open position, thereby opening the circuit to the solenoid valve 2.

Where it is desired to operate the solenoid valve 2 independently of the timer 6, the timer switch 14 is moved to "manual" position and the switch 16 is moved to its "on" position. The energization circuit for the relay 57 can then be traced from the power line P1, and through lines 123 and 124, relay coil 57, the then closed switch 16 and actuator operated contacts 78 extending to the power line P2. The energization circuit for the solenoid valve 2 can be traced from the line P1, and through line 123, solenoid 2, lines 132, 128 and 126, contacts 16 and contacts 78 leading to the power line P2. The solenoid valve can be closed or de-energized by opening the emergency cut-off switch 12 or upon opening of the manual switch 16, the latter resulting in the opening of the contacts 78 when the bottle is pulled away from the actuator member 18.

Although the solenoid valve may be any one of a number of well-known type of solenoid valves, the preferred type of valve construction is shown in Figs. 8 through 12. This valve includes a generally cylindrical valve body 140 having its longitudinal axis in a general horizontal direction. Body 140 has a horizontal counter-bored central recess 141 and a transverse or vertical through-bore 142 which has a counter-bored upper end 144 and a counter-bored bottom end 146. In one side of the cylindrical valve body 140 there is provided a large recess 150 having a number of circumferentially spaced overhanging portions 152 which have a beveled inner surface. A bore 154 joins the vertical bore 142 with the recess 150 at a point above the central bore 141.

Extending into the upper counter-bored portion of the vertical bore 142 is a fitting 158 having a nipple 160 adapted to receive thereover an inlet conduit 161. The fitting has a longitudinal bore 162 extending from the top to almost a point spaced from but near the bottom thereof. This bore joins a transverse through-bore 164 which, when the fitting is mounted on the valve body, communicates with the bore 154 of the valve body. The fitting has a flange 166 with a flat 167 thereon which is sized to seat within a shouldered portion of the valve body bore 142 and is held therein by a bayonet type joint formed by a pin 168 (Fig. 10) whose head overhangs the top of the valve body bore 142. The flat 167 clears the head of the pin 168 when the fitting is initially inserted in the valve body. Turning of the fitting then brings part of the flange 166 beneath the pin head. Sealing rings 169 provide liquid-tight seals between the fitting 158 and the walls of the valve body bore 142.

Cooperating with the valve body 140 is a solenoid 170 from which extends a flanged portion 173 having a beveled peripheral surface complementary in shape to the tapered inner surface of the overhanging beveled portions 152 of the valve body. Flanged portion 173 has a number of flattened portions 174 which provide four-equally spaced projecting sections which, during the assembly of the valve are inserted into the spaces between the overhanging valve body portions 152. By turning the valve body and flanged portion relative to one another the projections sections of the flanged portions become wedged behind the overhanging valve body portions 152.

Sandwiched within the recess 150 is a gasket disc 178 and rings 180—182. The solenoid 170 has a longitudinally movable armature 184 which in the unenergized state of the solenoid pushes the sealing disc 178 against a coil spring 186 surrounding a boss 187 formed centrally within the valve body recess 150 to compress the same to bring the sealing disc 178 against the mouth of the central valve body bore 141 to shut off the valve. When the solenoid is energized, the relay armature 184 moves into the solenoid whereupon the spring 186 presses the sealing disc 178 away from the opening of the bore 141 (Fig. 8) to allow passage of liquid through the bore 162 of the fitting 158, through the bores 164, 154, and 141 into the bottom portion of the valve body bore 142.

A needle valve 188 extends into the bore 141 from the outer face of the valve body, the needle valve having a beveled end 190 which varies the rate of flow of fluid by varying the size of the opening between the outer end of the bore 141 and the bottom portion of the valve body bore 142. The clearance space between the latter bores is varied by rotating the needle valve by the knob 191. The needle valve has a slotted flange 192 which seats within a shouldered outer portion of the bore 141 and is held therein by a pin 193 overhanging the bore 141 to form a bayonet type joint. The space between the needle valve and the valve body is sealed by means of a sealing ring 195.

Extending within the counter-bored bottom portion of the valve body bore 142 is a fitting 198 having a longitudinal bore 200 and an extension 201 forming the supply outlet 3 through which material is discharged into the bottles. The fitting 198 has a flange 202 which has a flat to clear the head of a pin 203 overhanging the bottom of the bore 142 to form a bayonet type joint as in the case of the other fitting. The valve is thus constructed so that the various parts thereof may be disassembled for cleaning or replacement without the use of tools.

The bottle filling apparatus of the invention provides a reliable and simple means for automatically filling bottles, particularly small bottles, with a precise quantity of fluid.

It should be understood that numerous modifications may be made of the preferred form of the invention above described, by deviating from the broader aspects of the invention. For example, it should be readily appreciated that the valve 2 may be any one of a number of well-known constructions. Also, the support structure 4 may be increased in size to accommodate additional bottle filling stations.

We claim as our invention:

1. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a

valve for controlling the passage of material through said supply outlet, start control means movable between a first and a second position, means for normally urging said start control means to said second position, means responsive to movement of said start control means to said first position for holding the same in said position, an actuator in the path of movement of a bottle moved beneath said supply outlet and arranged to move mechanically said start control means to said first position, and manually operable shut-off means for operating said valve to its valve-closing position and for simultaneously disabling operation of said holding means of said start control means.

2. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a solenoid valve for controlling the passage of material through said supply outlet, a relay including an armature, a start switch operated by said armature between timer-operating and non-operating positions, the armature being normally urged to a position where the start switch is in its timer non-operating position, and an electric coil for electrically maintaining the armature in a position where the start switch is in its timer-operating position when the coil is energized, an actuator in the path of movement of a bottle moved beneath said supply outlet, said actuator being arranged to move mechanically the relay armature and the start switch to their timer-operating positions, an automatic timer which when operated actuates said solenoid valve to its valve-opening position, said timer having a control circuit having an active state which initiates operation of the timer and an inactive state, said start switch being connected to operate said control circuit to its active state when the start switch is in its timer-operating position, a load circuit containing said relay coil and solenoid valve and including contacts controlling the energization thereof which contacts are operated for a predetermined time interval by the timer for energizing the relay coil and solenoid valve for such interval, and an emergency cut-off switch in circuit with said circuit solenoid valve for operating the valve to its valve-closing position independently of the timer.

3. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a valve for controlling the passage of material through said supply outlet, start control means movable between a first and a second position, means for normally urging said start control means to said second position, an actuator in the path of movement of a bottle moved beneath said supply outlet and arranged when engaged by the bottle to move mechanically said start control means to said first position, an automatic timer controlled by said start control means, the timer being operated to initiate a timing cycle when said start control means is moved to said first position, said timer having means responsive to the beginning of a timing cycle for opening said valve for a predetermined time interval, said timer being arranged to be automatically disabled for operation following completion of said predetermined time interval and until said start control means is returned to said second position, said start control means being moved to said second position to prepare the timer for a new cycle of operation upon removal of a bottle from said actuator subsequent to said predetermined time interval, manually operable means for disabling operation of said timer and for opening said valve independently of said timer, and said manually operable means also being arranged to close said valve independently of said timer.

4. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a valve for controlling the passage of material through said supply outlet, start control means movable between a first and a second position, means for normally urging said start control means to said second position, means responsive to movement of said start control means to said first position for holding the start control means in said first position, an actuator in the path of movement of a bottle moved beneath said supply outlet and arranged when engaged by the bottle to move mechanically said start control means to said first position, an automatic timer controlled by said start control means, the timer being operated to initiate a timing cycle when said start control means is moved to said first position, said timer having means responsive to the beginning of a timing cycle for rendering said start control holding means operative and for opening said valve for a predetermined time interval, said timer including means which disables the timer from operation following completion of said predetermined time interval and until said start control means is returned to said second position, and said start control means being arranged to be moved to said second position to prepare the timer for a new cycle of operation upon removal of a bottle from said actuator subsequent to said predetermined time interval.

5. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a valve for controlling the passage of material through said supply outlet, start control means movable between a first and a second position, means for normally urging said start control means to said second position, means for holding the start control means in said first position, an actuator in the path of movement of a bottle moved beneath said supply outlet and arranged when engaged by the bottle to move mechanically said start control means to said first position, an automatic timer controlled by said start control means, the timer being operated to initiate a timing cycle when said start control means is moved to said first position, said timer having means responsive to the beginning of a timing cycle for rendering said start control holding means operative and for opening said valve for a predetermined time interval, said timer being arranged to be automatically disabled for operation following completion of said predetermined time interval and until said start control means is returned to said second position, said start control means being moved to said second position to prepare the timer for a new cycle of operation upon removal of a bottle from said actuator subsequent to said predetermined time interval, and manually operable means to close said valve independently of said timer.

6. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a valve for controlling the passage of material through said supply outlet, start control means movable between a first and a second position, means for normally urging said start control means to said second position, means for holding the start control means in said first position, an actuator in the path of movement of a bottle moved beneath said supply outlet and arranged when engaged by the bottle to move mechanically said start control means to said first position, an automatic timer controlled by said start control means, the timer being operated to initiate a timing cycle when said start control means is moved to said first position, said timer having means responsive to the beginning of a timing cycle for rendering said start control holding means operative and for opening said valve for a predetermined time interval, said timer being arranged to be automatically disabled for operation following completion of said predetermined time interval and until said start control means is returned to said second position, said start control means being moved to said second position to prepare the timer for a new cycle of operation upon removal of a bottle from said actuator subsequent to said predetermined time interval, manually operable means for disabling operation of said timer, for rendering said holding means operative to hold said start control means in said first position and for opening said valve independently of said

timer, and said manually operable means also being arranged to disable said holding means and to close said valve independently of said timer.

7. In a bottle filling machine, a platform for carrying bottles to be filled, a supply outlet disposed above said platform and through which material for the bottles is to be discharged, a solenoid valve for controlling the passage of material through said supply outlet, means for adjusting the position of said supply outlet in both a horizontal and a vertical plane, means for guiding a bottle on said platform into position under said supply outlet, a relay arranged adjacent the platform and including an armature, a start switch operated by said armature between timer operating and non-operating positions, the armature being normally urged to a position where the start switch is in its timer non-operating position, and an electric coil for electrically maintaining the armature in a position where the start switch is in its timer-operating position when the coil is energized, an actuator located adjacent the platform and in the path of movement of a bottle moved upon said platform and beneath said supply outlet, said actuator being arranged to move mechanically the relay armature and the start switch controlled thereby to their timer-operating positions, an automatic resetting electric timer which when operated actuates said solenoid valve to its valve-opening position, said timer having a control circuit having an active state which initiates operation of the timer and an inactive state which resets the timer for a new cycle of operation, said start switch being connected to operate said control circuit to its active state when the start switch is in its timer-operating position, a load circuit containing said relay coil and solenoid valve and including contacts controlling the energization thereof which contacts are operated for a predetermined time interval by the timer for energizing the relay coil and solenoid valve for such interval, said start switch, following said time interval and removal of a bottle therefrom, returning to said timer non-operating position and thereby setting the timer control circuit to its inactive state for resetting the timer, an emergency cut-off switch in circuit with said solenoid valve for operating the valve to its valve-closing position independently of the timer, and manually operable switching means for disabling operation of said timer and for connecting said relay coil and solenoid valve in circuit with said start switch where the start switch directly controls the operation thereof.

8. In a bottle filling machine, a platform for carrying bottles to be filled, a supply outlet disposed above said platform and through which material for the bottles is to be discharged, a solenoid valve for controlling the passage of material through said supply outlet, means for adjusting the position of said supply outlet in both a horizontal and a vertical plane, means for guiding a bottle on said platform into position under said supply outlet, a relay arranged adjacent the platform and including an armature, a start switch operated by said armature between timer operating and non-operating positions, the armature being normally urged to a position where the start switch is in its timer non-operating position, and an electric coil for electrically maintaining the armature in a position where the start switch is in its timer-operating position when the coil is energized, an actuator located adjacent the platform and in the path of movement of a bottle moved upon said platform and beneath said supply outlet, said actuator being arranged to move mechanically the relay armature and the start switch controlled thereby to their timer-operating positions, an automatic resetting electric timer which when operated actuates said solenoid valve to its valve-opening position, said timer having a control circuit having an active state which initiates operation of the timer and an inactive state which resets the timer for a new cycle of operation, said start switch being connected to operate said control circuit to its active state when the start switch is in its timer-operating position, and a load circuit containing said relay coil and solenoid valve and including contacts controlling the energization thereof which contacts are operated for a predetermined time interval by the timer for energizing the relay coil and solenoid valve for such interval, said start switch, following said time interval and removal of a bottle therefrom, returning to said timer non-operating position, and thereby setting the timer control circuit to its inactive state for resetting the timer.

9. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a solenoid valve for controlling the passage of material through said supply outlet, a relay including an armature, a start switch operated by said armature between timer-operating and non-operating positions, the armature being normally to a position where the start switch is in its timer non-operating position, and an electric coil for electrically maintaining the armature in a position where the start switch is in its timer-operating position when the coil is energized, an actuator located in the path of movement of a bottle moved beneath said supply outlet, said actuator being arranged to move mechanically the relay armature and the start switch to their timer-operating positions, an automatic resetting timer which when operated actuates said solenoid valve to its valve-opening position, said timer having a control circuit having an active state which initiates operation of the timer and an inactive state which resets the timer for a new cycle of operation, said start switch being connected to operate said control circuit to its active state when the start switch is in its timer-operating position, a load circuit containing said relay coil and solenoid valve and including contacts controlling the energization thereof which contacts are operated for a predetermined time interval by the timer for energizing the relay coil and solenoid valve for such interval, said start switch, following said time interval and removal of a bottle therefrom, returning to said timer non-operating position and thereby setting the timer control circuit to its inactive state for resetting the timer, an emergency cut-off switch in circuit with said circuit solenoid valve for operating the valve to its valve-closing position independently of the timer, and manually operable switching means for disabling operation of said timer and for connecting said relay coil and solenoid valve in circuit with said start switch where the start switch directly controls the operation thereof.

10. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a solenoid valve for controlling the passage of material through said supply outlet, a relay including an armature, a start switch operated by said armature between timer-operating and non-operating positions, the armature being normally urged to a position where the start switch is in its timer non-operating position, and an electric coil for electrically maintaining the armature in a position where the start switch is in its timer-operating position when the coil is energized, an actuator in the path of movement of a bottle moved beneath said supply outlet, said actuator being arranged to move mechanically the relay armature and the start switch to their timer-operating positions, an automatic timer which when operated actuates said solenoid valve to its valve-opening position, said timer having a control circuit having an active state which initiates operation of the timer and an inactive state, said start switch being connected to operate said control circuit to its active state when the start switch is in its timer-operating position, a load circuit containing said relay coil and solenoid valve and including contacts controlling the energization thereof which contacts are operated for a predetermined time interval by the timer for energizing the relay coil and solenoid valve for such interval, an emergency cut-off switch in circuit with said circuit solenoid valve for operating the valve to its valve-closing position independently of the timer, and manually oper-

able switching means for disabling operation of said timer and for connecting said relay coil and solenoid valve in circuit with said start switch where the start switch directly controls the operation thereof.

11. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a solenoid valve for controlling the passage of material through said supply outlet, a relay including an armature, a start switch operated by said armature between timer-operating and non-operating positions, the armature being normally urged to a position where the start switch is in its timer non-operating position, and an electric coil for electrically maintaining the armature in a position where the start switch is in its timer-operating position, an actuator in the path of movement of a bottle moved beneath said supply outlet, said actuator being arranged to move mechanically the relay armature and the start switch to their timer-operating positions, an automatic timer which when operated actuates said solenoid valve to its valve-opening position, said timer having a control circuit having an active state which initiates operation of the timer and an inactive state, said start switch being connected to operate said control circuit to its active state when the start switch is in its timer-operating position, a load circuit containing said relay coil and solenoid valve and including contacts controlling the energization thereof which contacts are operated for a predetermined time interval by the timer for energizing the relay coil and solenoid valve for such interval.

12. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a solenoid valve for controlling the passage of material through said supply outlet, a relay including an armature, a start switch operated by said armature between timer-operating and non-operating positions, the armature being normally urged to a position where the start switch is in its timer non-operating position, and an electric coil for electrically maintaining the armature in a position where the start switch is in its timer-operating position when the coil is energized, an actuator in the path of movement of a bottle moved beneath said supply outlet, said actuator being arranged to move mechanically the relay armature and the start switch to their timer-operating positions, an automatic timer which when operated actuates said solenoid valve to its valve-opening position, said timer having a control circuit having an active state which initiates operation of the timer and an inactive state, said start switch being connected to operate said control circuit to its active state when the start switch is in its timer-operating position, a load circuit containing said relay coil and solenoid valve and including contacts controlling the energization thereof which contacts are operated for a predetermined time interval by the timer for energizing the relay coil and solenoid valve for such interval, and manually operable switch means for disabling operation of said timer and for connecting said relay coil and solenoid valve in circuit with said start switch where the start switch directly controls the operation thereof.

13. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a valve for controlling the passage of material through said supply outlet, start control means movable between a first and a second position, means for normally urging said start control means to said second position, an actuator in the path of movement of a bottle moved beneath said supply outlet and arranged when engaged by the bottle to move mechanically said start control means to said first position, and an automatic timer controlled by said start control means, the timer being operated to initiate a timing cycle when said start control means is moved to said first position, said timer having means responsive to the beginning of a timing cycle for opening said valve for a predetermined time interval, said timer being arranged to be automatically disabled for operation following completion of said predetermined time interval and until said start control means is returned to said second position, and said start control means being moved to said second position to prepare the timer for a new cycle of operation upon removal of a bottle from said actuator subsequent to said predetermined time interval.

14. In a bottle filling machine, a supply outlet through which material for the bottles is to be discharged, a valve for controlling the passage of material through said supply outlet, start control means movable between a first and a second position, means for normally resiliently urging said start control means to said second position, means responsive to movement of said start control means to said first position for holding the same in said position, and an actuator in the path of movement of the bottle beneath said supply outlet and arranged to move mechanically said start control means to said first position.

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