

Sept. 19, 1944.

S. HINDS

2,358,712

LIQUID DISPENSING APPARATUS AND PRESELECTING MECHANISM THEREFOR

Filed Dec. 15, 1939

19 Sheets-Sheet 2

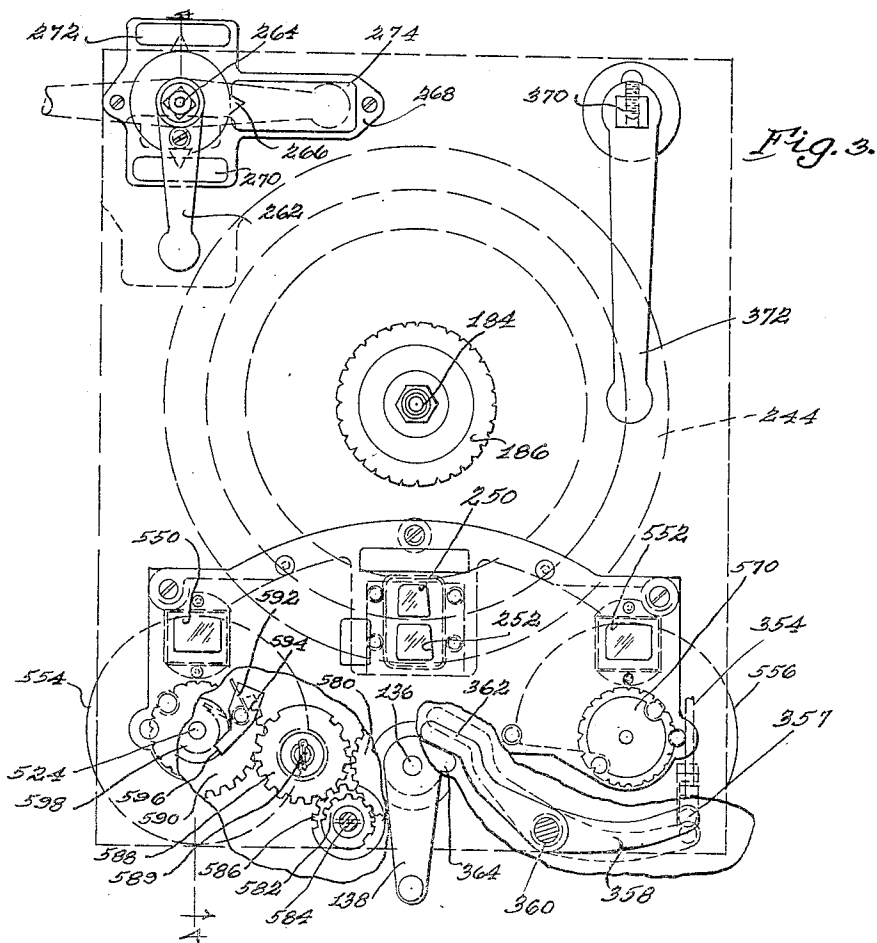


Fig. 3.

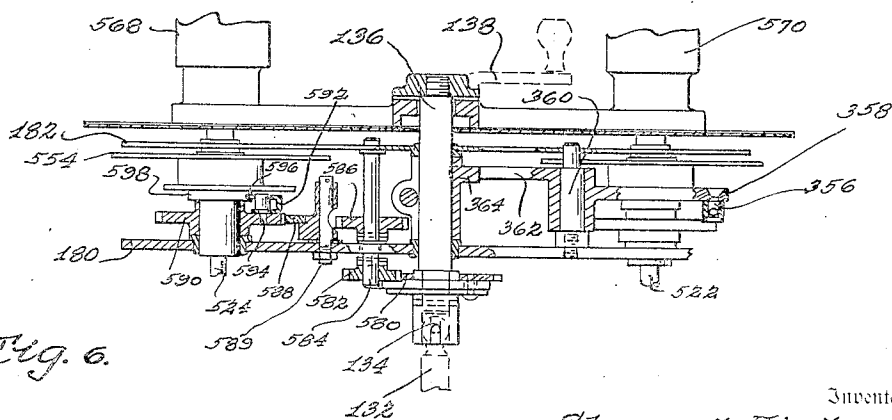


Fig. 6.

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LIQUID DISPENSING APPARATUS AND PRESELECTING MECHANISM THEREFOR

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19 Sheets-Sheet 3

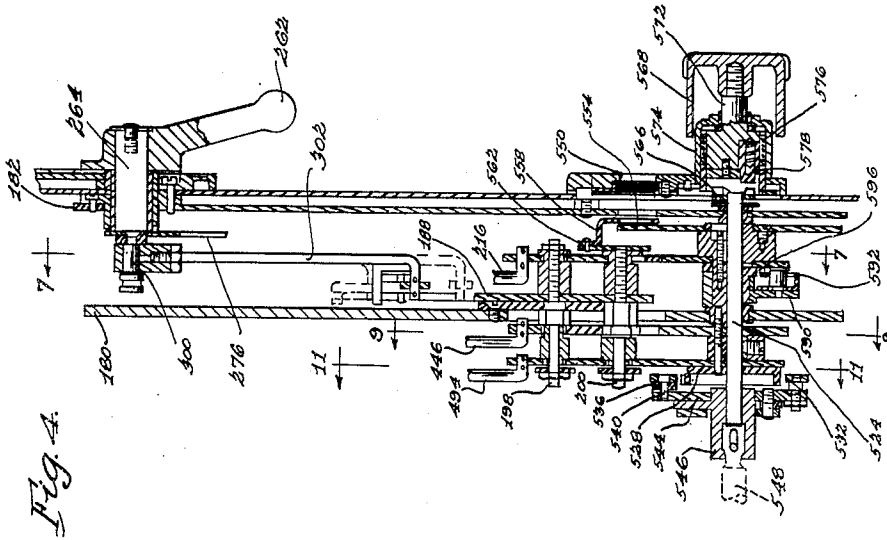


Fig. 4.

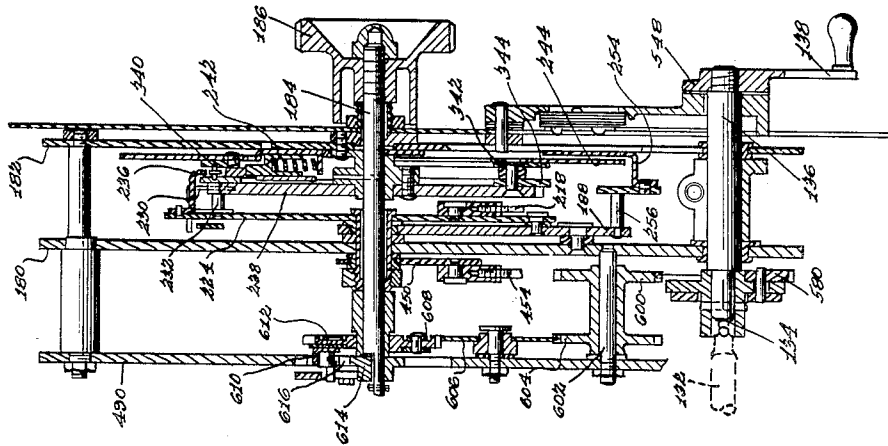


Fig. 5.

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Fig. 7.

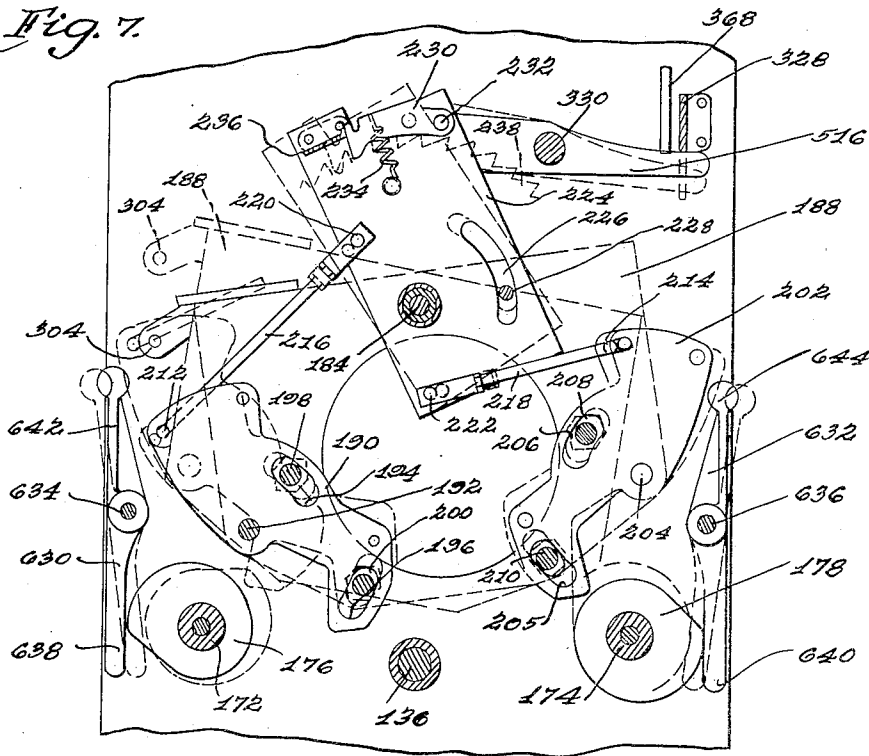
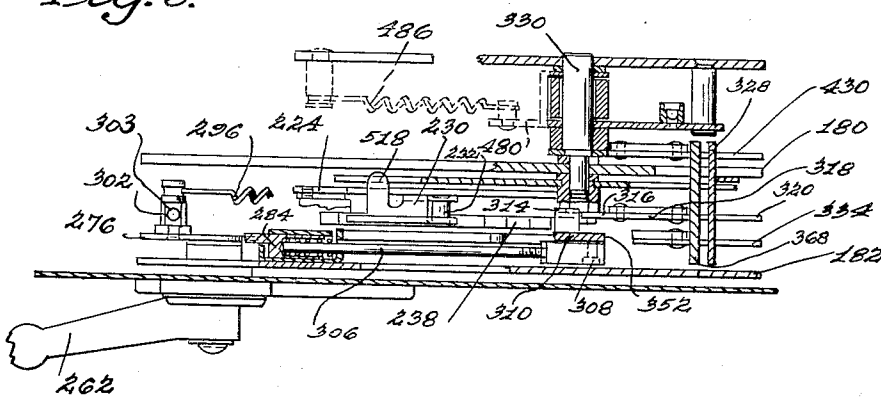


Fig. 8.



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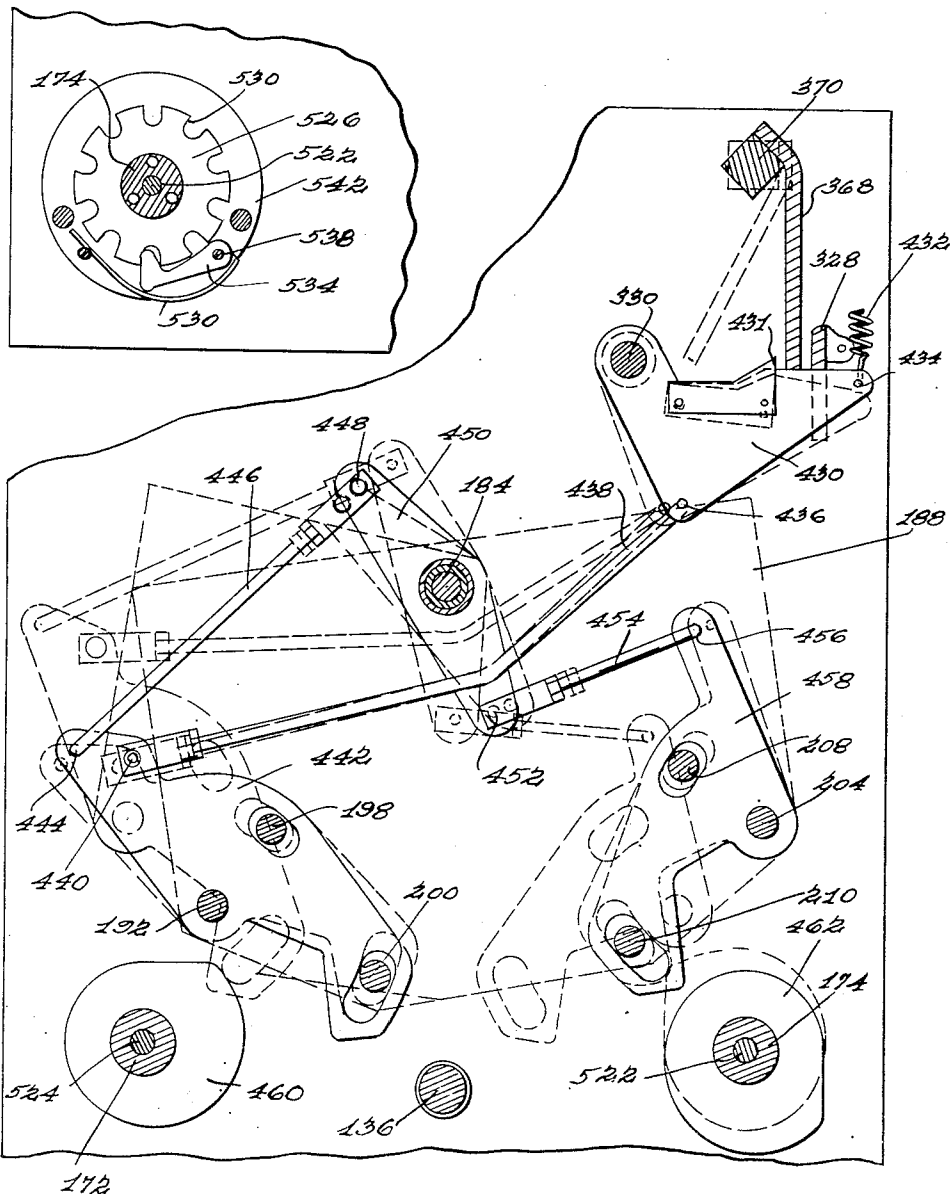
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Fig. 10.

Fig. 9.



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Fig. 12.

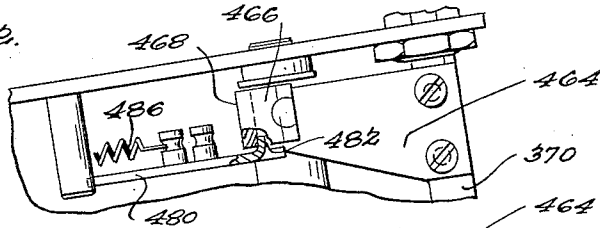
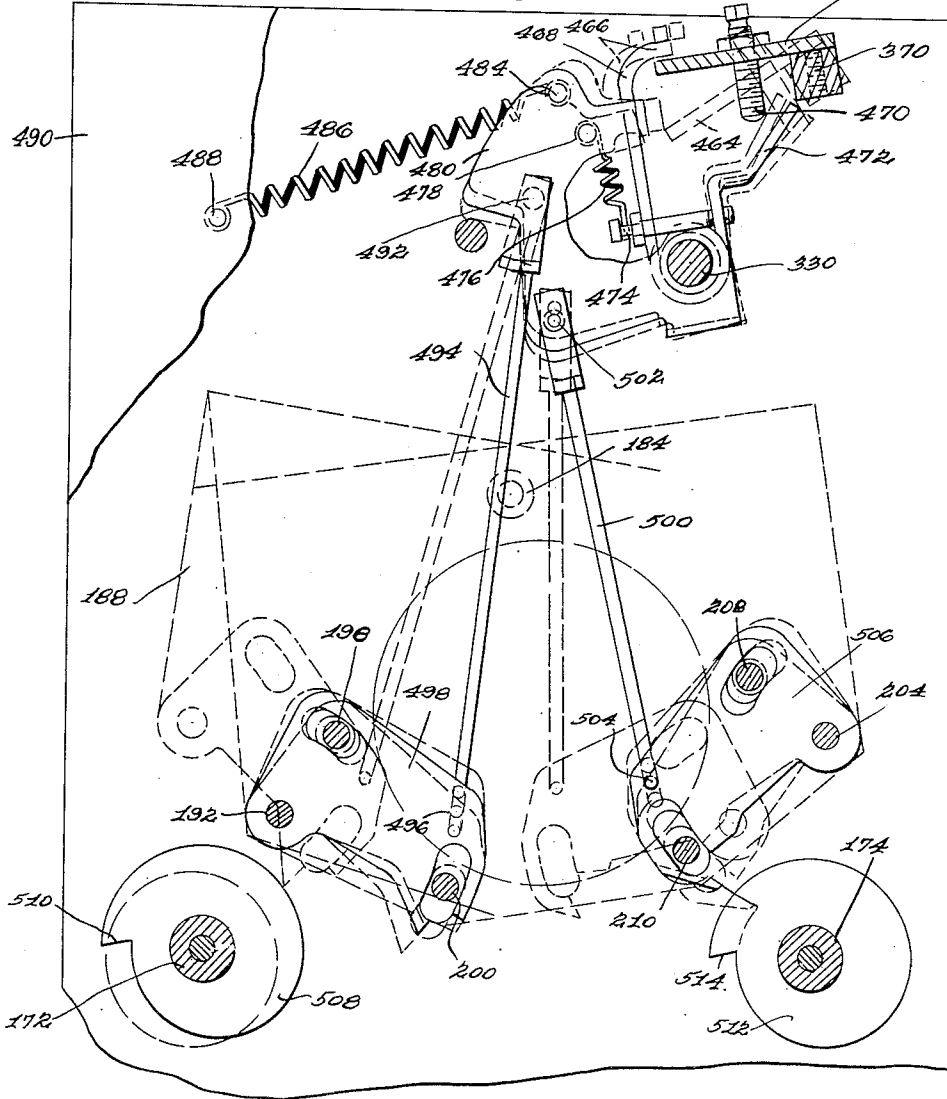


Fig. 11.



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Fig. 16.

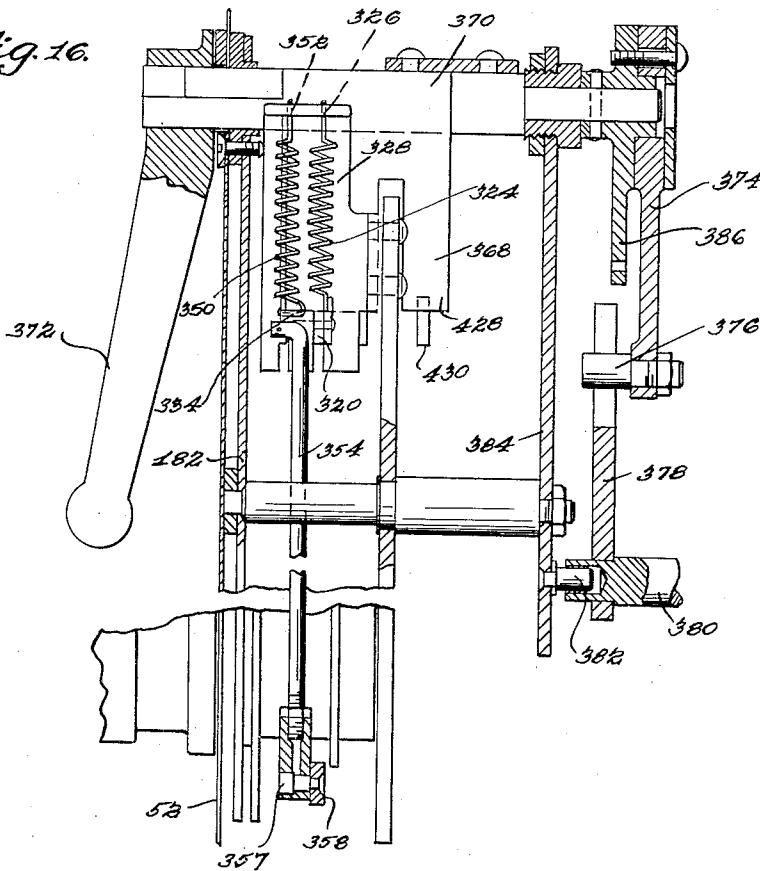
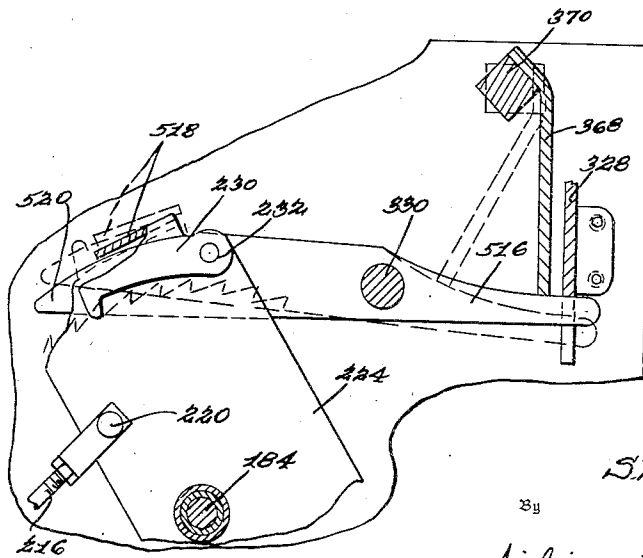


Fig. 15.



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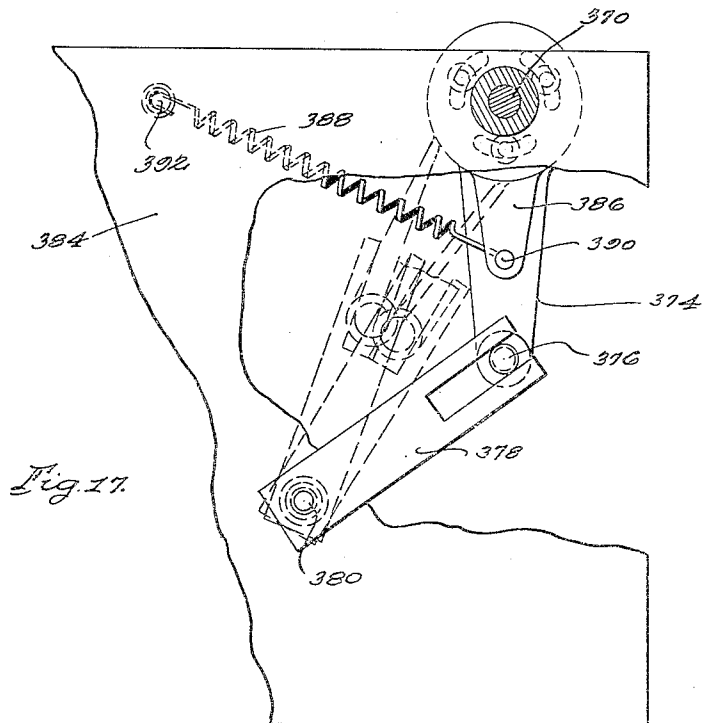
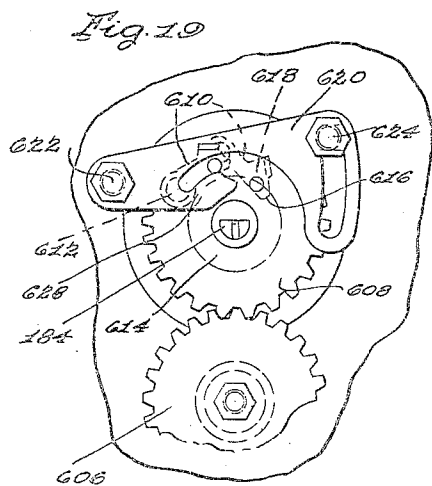
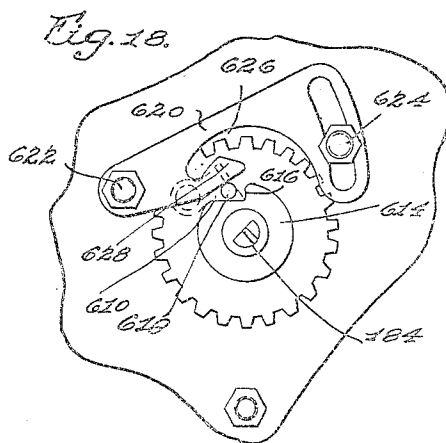
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LIQUID DISPENSING APPARATUS AND PRESELECTING MECHANISM THEREFOR

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Fig. 20.

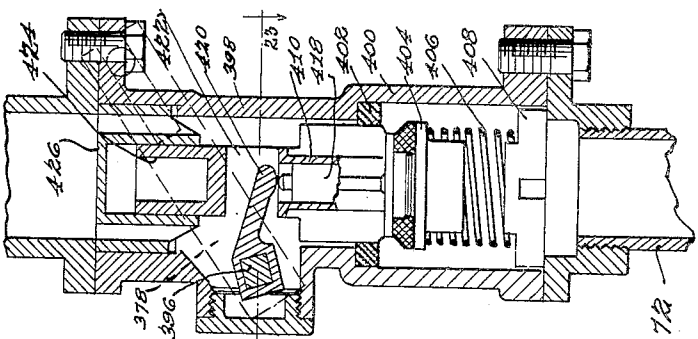


Fig. 21.

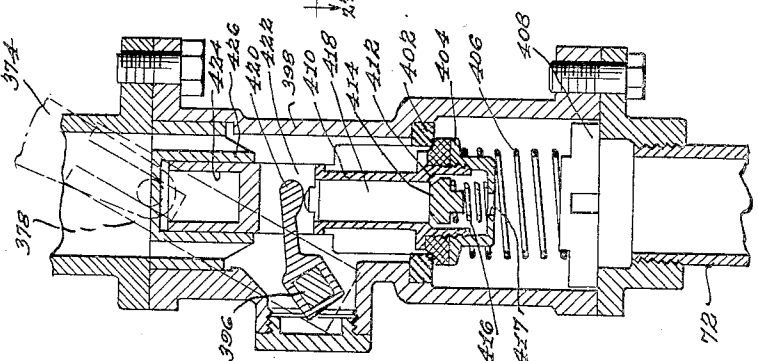


Fig. 22.

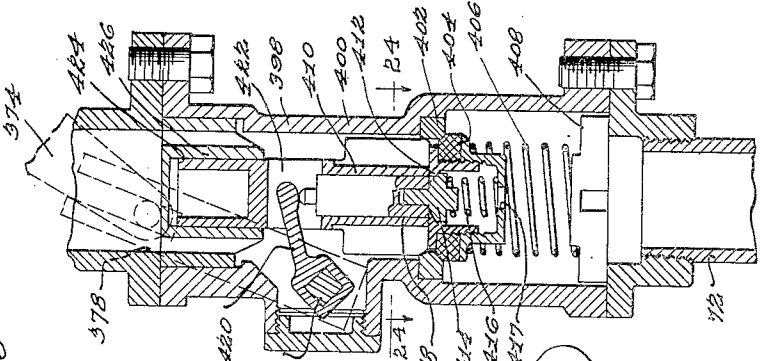


Fig. 23.

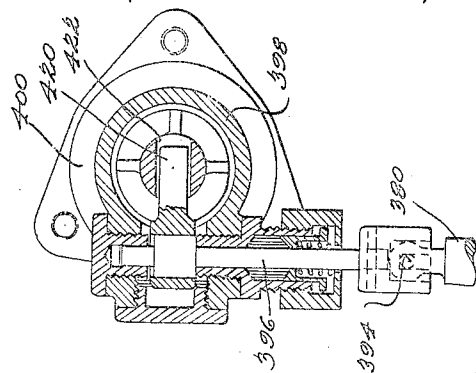
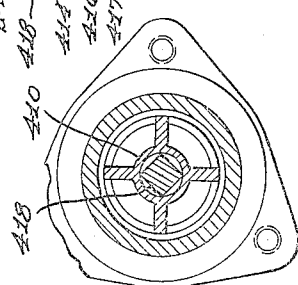


Fig. 24.



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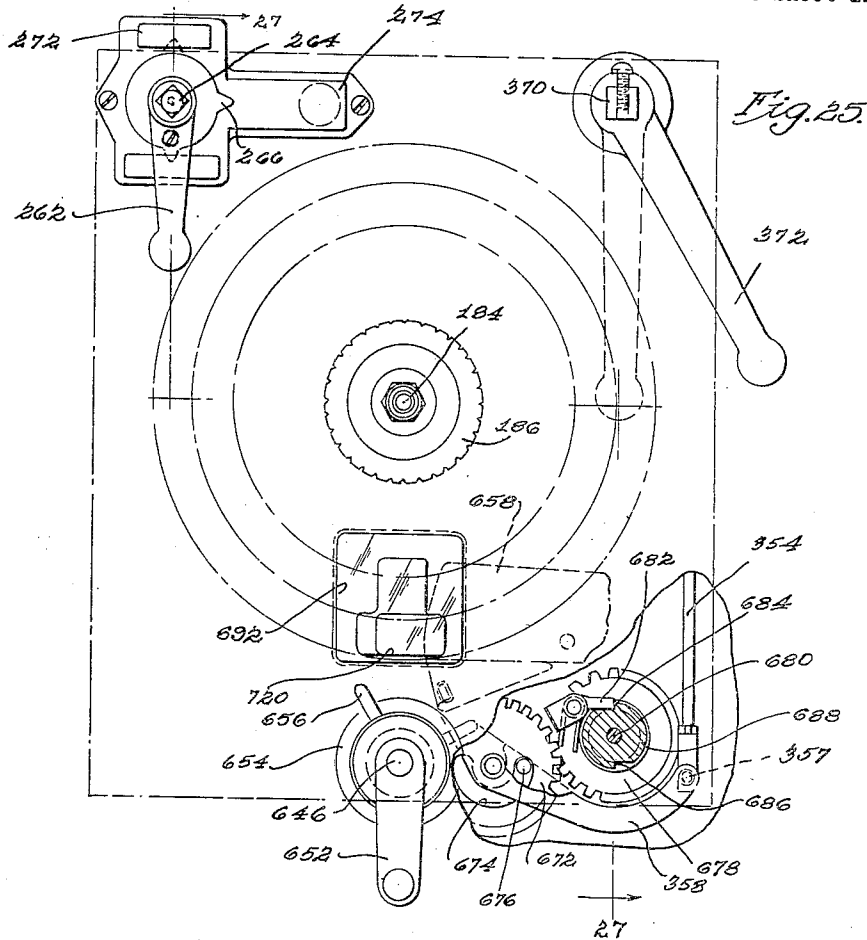
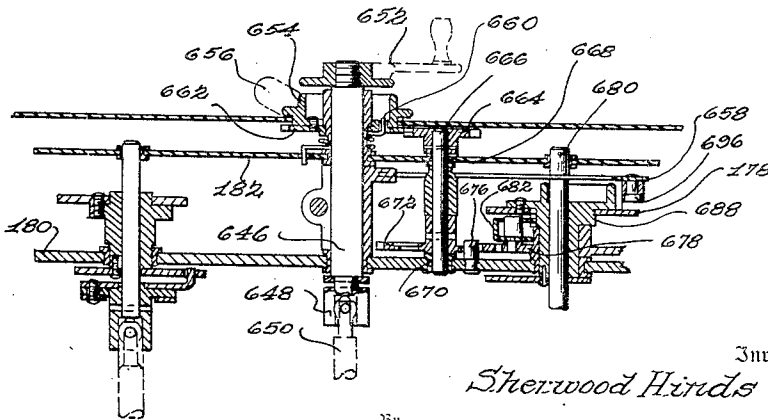


Fig. 26.



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Fig. 28.

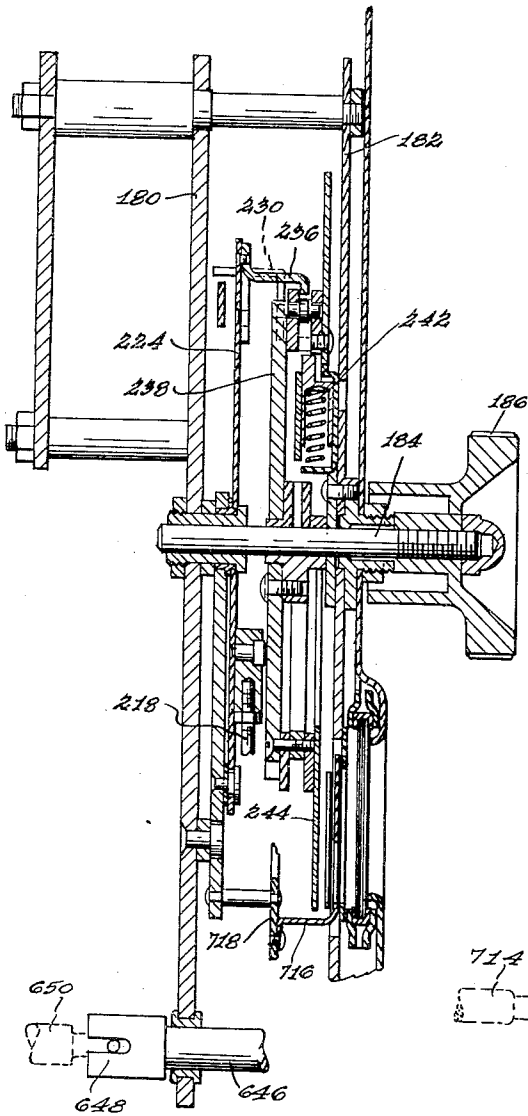
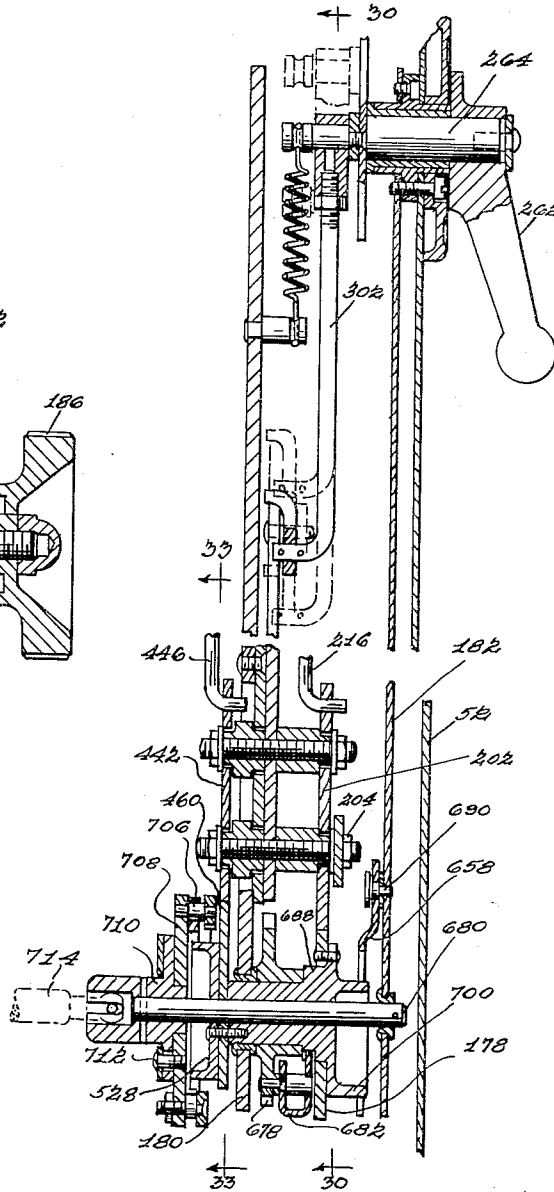


Fig. 27.



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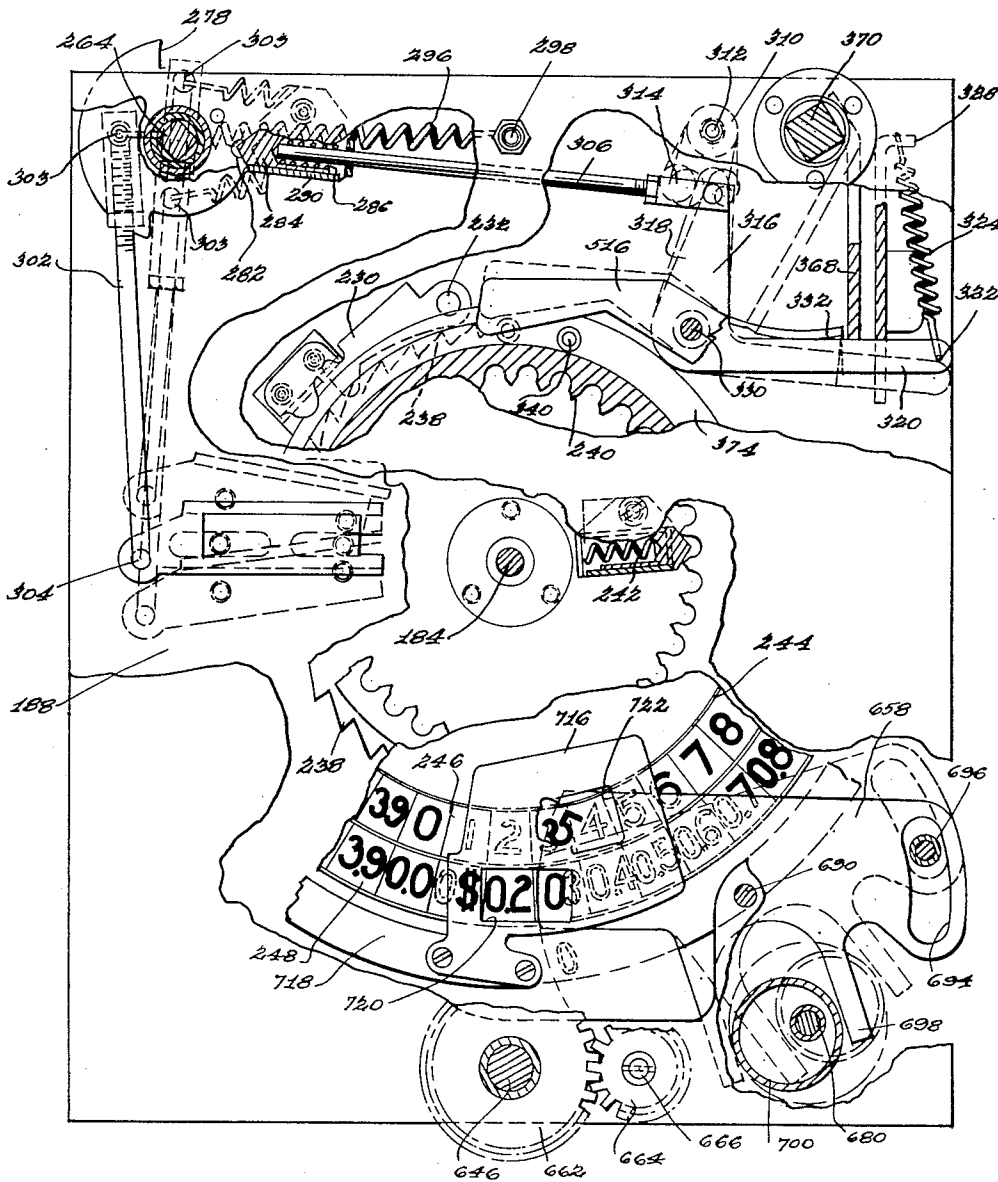


Fig. 29.

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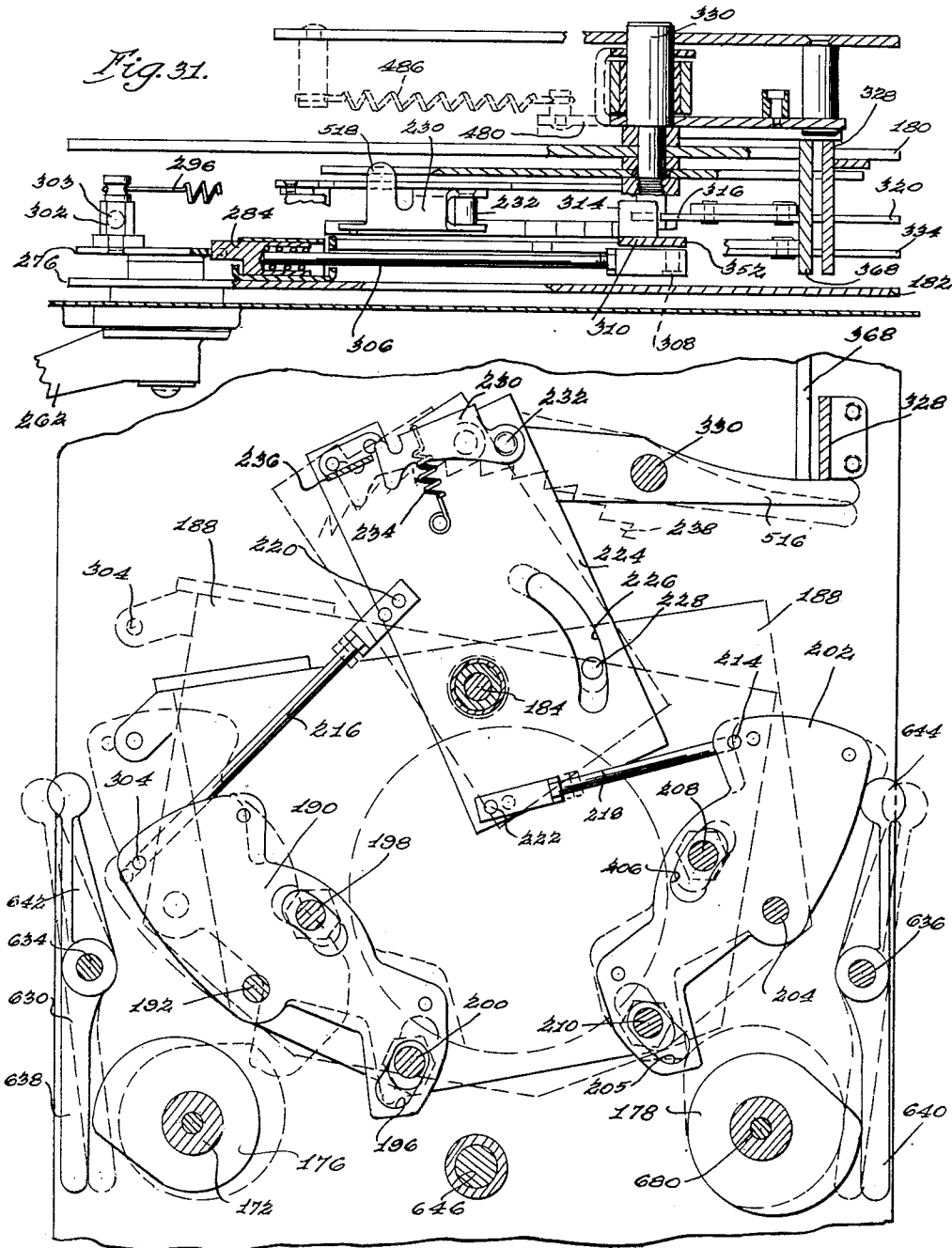


Fig. 30.

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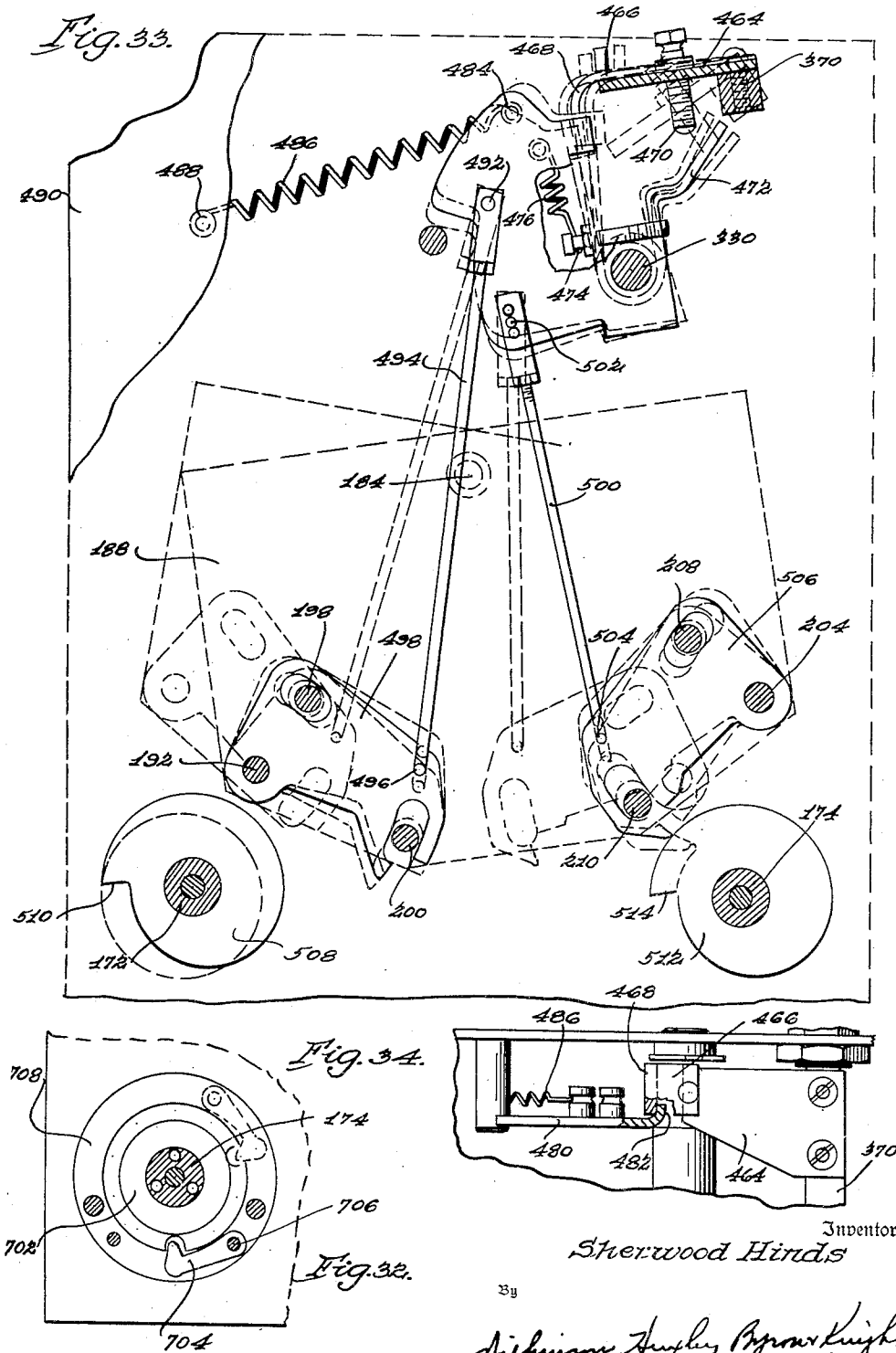
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LIQUID DISPENSING APPARATUS AND PRESELECTING MECHANISM THEREFOR

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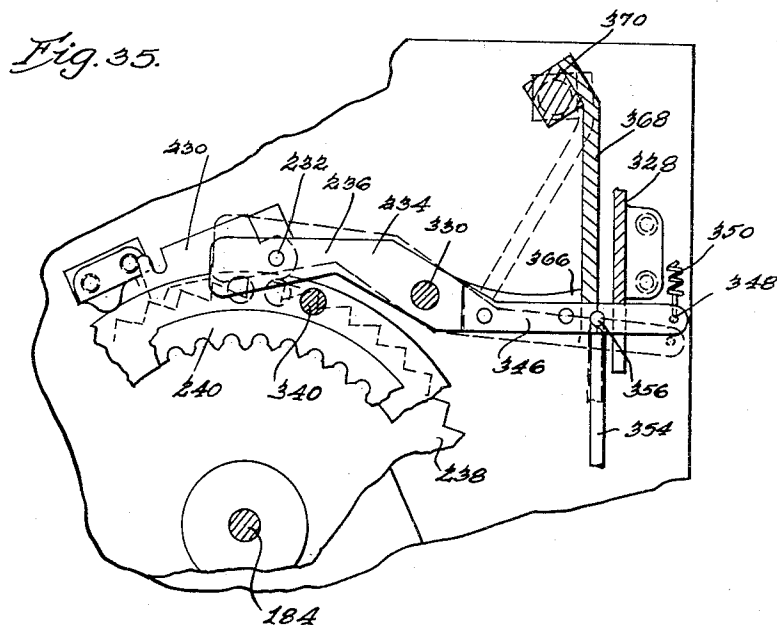
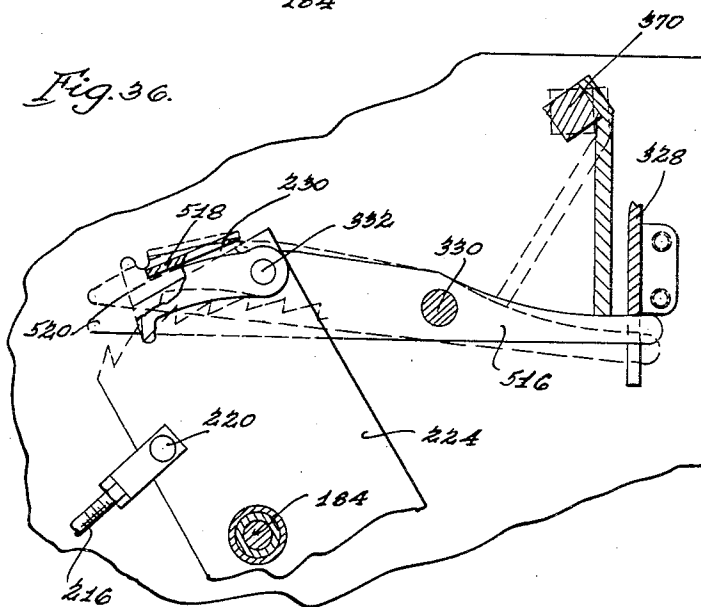
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LIQUID DISPENSING APPARATUS AND PRESELECTING MECHANISM THEREFOR

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Fig. 38.

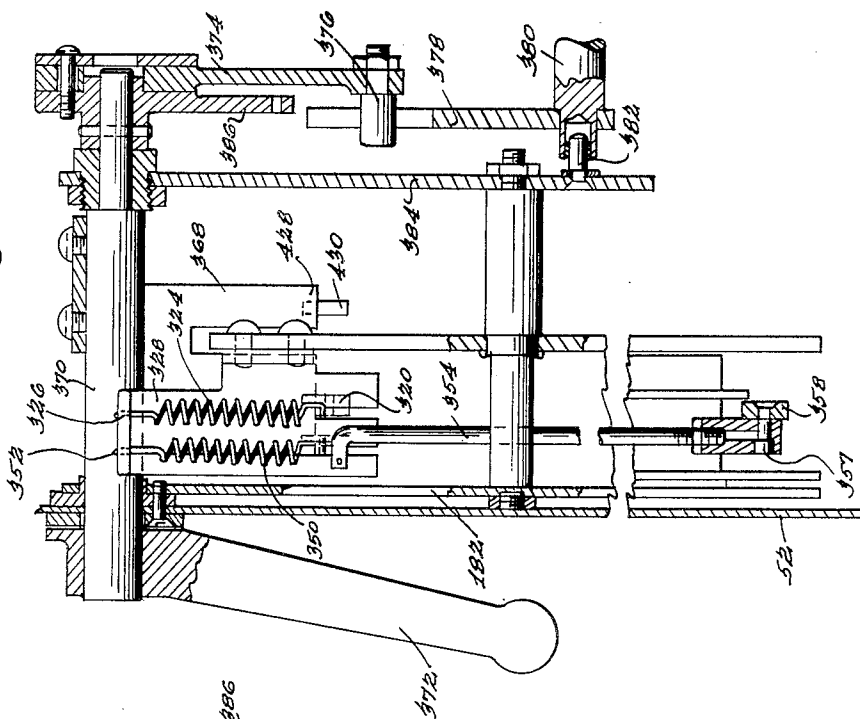
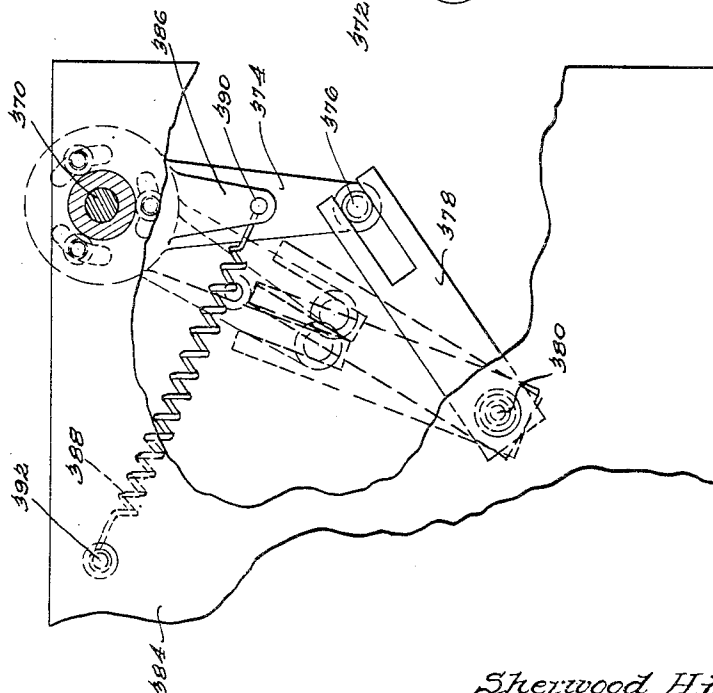


Fig. 37.



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LIQUID DISPENSING APPARATUS AND PRESELECTING MECHANISM THEREFOR

Filed Dec. 15, 1939

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Fig. 39.

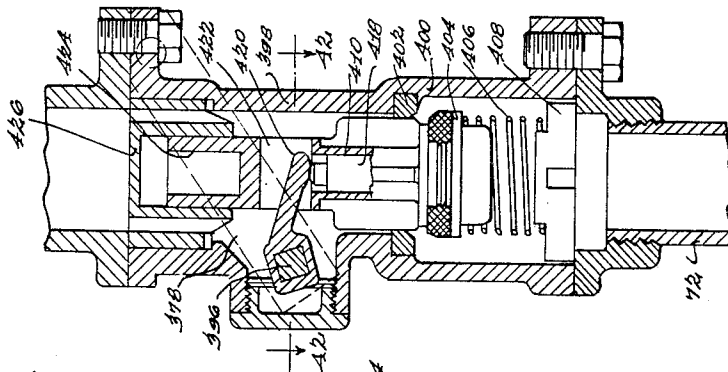


Fig. 40.

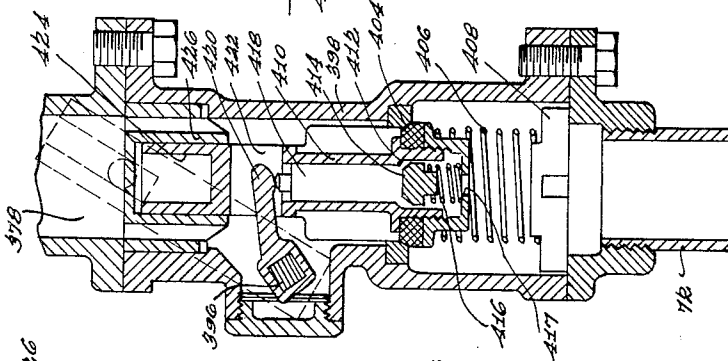


Fig. 41.

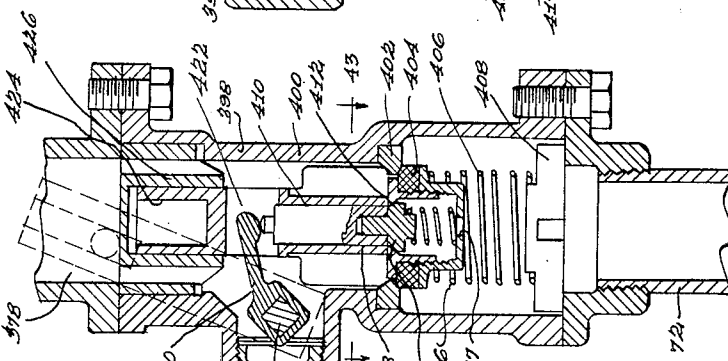


Fig. 42.

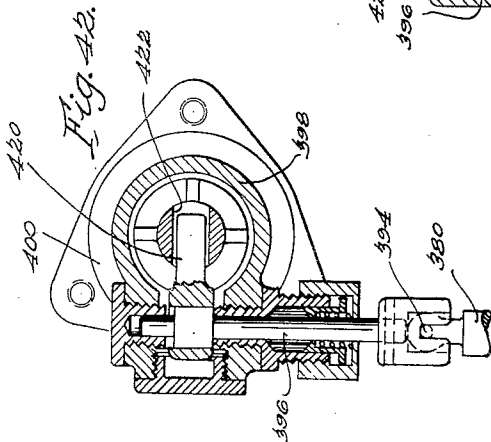
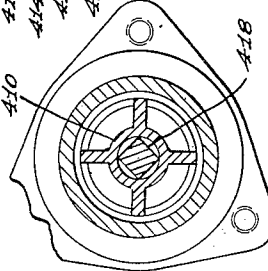


Fig. 43.



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LIQUID DISPENSING APPARATUS AND PRESELECTING MECHANISM THEREFOR

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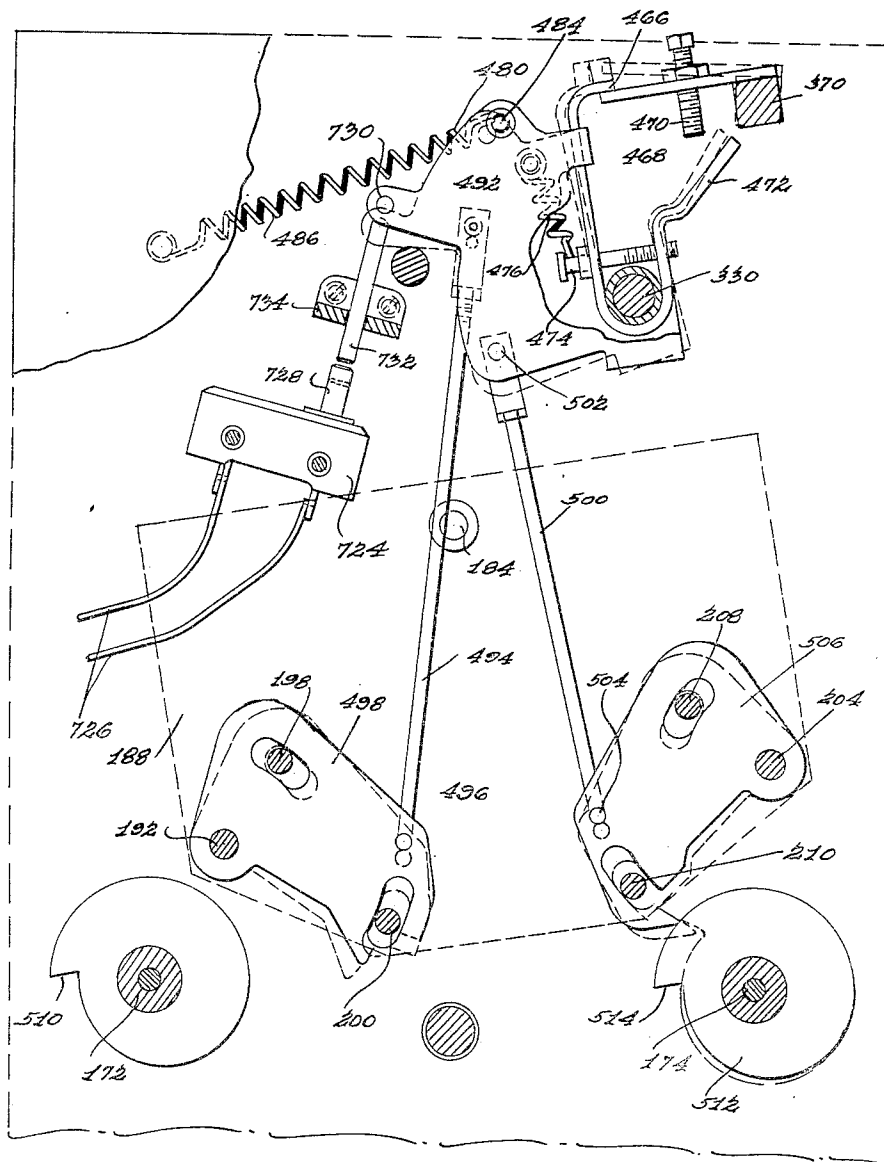


Fig. 44.

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UNITED STATES PATENT OFFICE

2,358,712

LIQUID DISPENSING APPARATUS AND PRE-SELECTING MECHANISM THEREFOR

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Application December 15, 1939, Serial No. 309,502

28 Claims. (Cl. 222—31)

This invention pertains to preselecting mechanism.

It is an object of this invention to provide preselecting means for control mechanism.

Another object is to provide preselecting means controlled by registering mechanism, and controlling control means.

Still another object is to provide preselecting mechanism for operating control means, said mechanism being controlled by registering means, the control means being conditioned to a predetermined position only when the registering means has been moved to a predetermined position.

A further object is to provide preselecting mechanism for a liquid dispensing apparatus.

A still further object is to provide preselecting mechanism for a liquid dispensing apparatus wherein preselection may be made in either the cost of the liquid to be dispensed, or the amount of liquid to be dispensed.

Yet a further object is to provide preselecting mechanism for a liquid dispensing apparatus controlled by the register of said apparatus.

Another further object is to provide preselecting mechanism for a liquid dispensing apparatus which positively prevents liquid from being dispensed after the selected amount or cost of the liquid has been registered.

A still further object of the invention is to provide preselecting mechanism for a liquid dispensing apparatus wherein the mechanism is controlled by the register and wherein having once dispensed a predetermined amount of liquid, the liquid dispensing apparatus is rendered inoperative until the register has been reset.

With these and various other objects in view, the invention may consist of certain novel features of construction and operation as will be more fully described and particularly pointed out in the specification, drawings and claims appended hereto.

In the drawings, which illustrate embodiments of the device and wherein like reference characters are used to designate like parts—

Figure 1 is an elevation, partly in section, of a liquid dispensing apparatus provided with preselecting mechanism embodying the invention;

Figure 2 is an enlarged side elevation of a registering mechanism such as illustrated in the liquid dispensing apparatus shown in Figure 1, showing the connecting means for operating the preselecting mechanism;

Figure 3 is a fragmentary side elevation of a liquid dispensing apparatus casing showing the

application thereto of one form of preselecting device, the operating means thereof being shown in inoperative position;

Figure 4 is a vertical sectional elevation taken substantially in a plane through the shafts 524 and 264 of Figure 3, i. e., substantially in the plane as indicated by the line 4—4 of Figure 3;

Figure 5 is a sectional elevation through the preselecting mechanism, the same being taken substantially on the vertical center line of Figure 3, that is, in a plane through the shafts 184 and 136;

Figure 6 is a fragmentary sectional bottom plan view showing a portion of the reset and selecting mechanism illustrated in Figure 3, the same looking upwardly of said figure;

Figure 7 is an elevation through a portion of the operating mechanism of the preselecting device, the same being taken substantially in the plane as indicated by the line 7—7 of Figure 4;

Figure 8 is a fragmentary sectional top plan view of the preselecting mechanism looking downwardly on the mechanism illustrated in Figure 13;

Figure 9 is a fragmentary elevation of the preselecting mechanism, the same being taken substantially in the plane as indicated by the line 9—9 of Figure 4;

Figure 10 is an enlarged elevation through the fractional money preselecting pawl and ratchet;

Figure 11 is an elevation taken substantially in the plane indicated by the line 11—11 of Figure 4;

Figure 12 is a fragmentary top plan view of a portion of the fractional control mechanism illustrated in Figure 11;

Figure 13 is an elevation of a preselecting mechanism showing parts thereof broken away to illustrate the subtracting ratchet, the dial arrangements, and the selecting cam of the preselecting mechanism;

Figure 14 is a fragmentary elevation of the subtracting cam and portions of the latch mechanism for the valve control plate;

Figure 15 is an enlarged fragmentary sectional elevation of the subtracting pawl mechanism;

Figure 16 is an enlarged fragmentary sectional elevation through the valve opening mechanism and valve plate control mechanism;

Figure 17 is an enlarged fragmentary elevation showing the connection between the valve operating shaft and the valve shaft;

Figure 18 is an enlarged fragmentary elevation showing the locking pawl for the main pre-

selecting shaft showing the pawl in engaged position before the register has been reset to zero;

Figure 19 is an enlarged fragmentary elevation showing the position of the pawl shown in Figure 18 after the register has been reset to zero;

Figure 20 is an enlarged fragmentary sectional elevation through the control valve showing the same in fully opened position;

Figure 21 is an enlarged fragmentary sectional elevation showing the main valve in closed position, but the dribble valve in open position;

Figure 22 is an enlarged fragmentary sectional elevation showing the main valve and dribble valve in fully closed position;

Figure 23 is a sectional plan through the valve and control shaft, the same being taken substantially in the plane as indicated by the line 23—23 of Figure 20;

Figure 24 is a sectional plan of the valves taken substantially in the plane as indicated by the line 24—24 of Figure 22;

Figure 25 is a fragmentary side elevation of a liquid dispensing apparatus casing showing the application thereto of a modified form of preselecting device, the operating means thereof being shown wherein the preselector is inoperative but the control valve is in open position;

Figure 26 is a fragmentary sectional bottom plan view showing a portion of the reset and selecting mechanism illustrated in Figure 25, the same looking upwardly of said figure;

Figure 27 is a vertical broken sectional elevation taken substantially in the plane through the shafts 264 and 680 of Figure 25, that is, substantially in the plane as indicated by the line 27—27 of Figure 25;

Figure 28 is a sectional elevation through the preselecting mechanism illustrated in Figure 25, the same being taken substantially on the vertical center line of said figure, that is, in a plane through the shafts 184 and 646;

Figure 29 is an elevation of the preselecting mechanism shown in Figure 25 showing the parts thereof broken away to illustrate the subtracting ratchet, the dial arrangements, and selecting cam of the preselecting mechanism;

Figure 30 is an elevation of a portion of the operating mechanism of the modified form of preselecting device, the same being taken substantially in the plane as indicated by the line 30—30 of Figure 27;

Figure 31 is a fragmentary sectional top plan view of the modified form of preselecting mechanism looking downwardly on the mechanism illustrated in Figure 29;

Figure 32 is an enlarged elevation through the fractional money preselecting pawl and ratchet;

Figure 33 is an elevation taken substantially in the plane as indicated by the line 33—33 of Figure 27;

Figure 34 is a fragmentary top plan view of a portion of the fractional control mechanism illustrated in Figure 33;

Figure 35 is a fragmentary elevation of the subtracting cam and portions of the latch mechanism of the valve control plate of the modified form of preselecting device;

Figure 36 is an enlarged fragmentary elevation of the subtracting pawl mechanism of the modified form of preselecting device;

Figure 37 is an enlarged fragmentary elevation through the valve opening mechanism and

valve plate mechanism of the modified form of preselecting device;

Figure 38 is an enlarged fragmentary elevation showing the connection between the valve operating shaft and the valve shaft of the modified form of preselecting device;

Figures 39 to 43 inclusive are views of the valve mechanism used in the modified form of preselecting device, the same corresponding to Figures 20 to 24 inclusive;

Figure 44 is an elevation corresponding to Figures 11 and 33 showing a switch control mechanism for the operating switch of the liquid dispensing apparatus controlled by or interlocked with the preselecting mechanism.

Referring first of all, more particularly to the liquid dispensing apparatus illustrated in Figure 1, the apparatus consists essentially of a base 50 supporting a casing 52, said casing being reinforced by suitable internal bracing such as illustrated generally at 54. Within said casing is mounted the pump 56, the suction side 58 of which is adapted to be connected to a source of liquid supply. The outlet side of said pump is connected to the piping 60, which in turn is connected to the inlet of the air separator 62, the drain-back 64 from said separator being connected as at 66 to the suction side of the pump and the atmosphere chamber of the air separator being vented to the atmosphere by means of the pipe 68. The outlet side of the pressure chamber of the separator is connected as at 69 to the inlet side of the meter 70. The outlet side of the meter 70 is connected to the piping 72 which is connected to the inlet side of the visigauge 74, the outlet side of the visigauge being connected to the piping 76, to which the dispensing hose (not shown) is connected. The other end of said hose is connected to the nozzle 78 which is shown in supported, inoperative position on the fixed support 80. The nozzle is provided with the nozzle guard 82 and a dispensing lever 84 is disposed within said guard and is adapted to control the usual dispensing valve. In supported position the outlet 86 of said nozzle is adapted to project into the boot 88 provided in said casing, and the lever 84 is locked against dispensing movement.

The pump is adapted to be operated by means of the motor 90, said motor being provided with the pulley 92 adapted to receive belt 94, which in turn is received by the pulley 96 provided on the pump shaft. The motor is controlled by means of the switch 98 which is connected through the rod 100 to the bell crank 102. Said bell crank is pivoted to the casing as at 104, one arm 106 of said bell crank being adapted to be engaged by the push button 108 disposed below the fixed support 80, and which, when projected inwardly, moves the bell crank in a clockwise direction to close the switch 98.

Another arm 110 of said bell crank is adapted to be engaged by the push button 112 disposed above the fixed support 80 and being engageable by the pivoted lever 114 which, in turn, is adapted to be engaged by the guard 82 when the nozzle is placed on the support 80. When the push button 112 is in its inward position it has moved the bell crank in a counterclockwise direction to open the switch.

The bell crank is provided with the arm 116 connected as at 118 to the interlock 120, said interlock being connected through the shaft 122 to the registering mechanism 124 of the computing head 126, and said interlock is arranged in

such a way that, having opened the switch, the register must be reset to zero (or to a predetermined position), before the switch can be re-opened to dispense an additional amount of liquid. The register is adapted to be operated by the variator 128, which may be of a construction such as shown in Slye Patent No. 2,111,996, granted March 22, 1938, and is adapted to be driven by means of the meter shaft 130, said meter shaft being rotated by the meter in proportion to the amount of liquid passing through said meter.

The register 124 is provided with a reset shaft 132 which is adapted to be coupled as at 134 (Figures 5 and 6) to the shaft 136, said shaft being provided with the reset crank 138. The register is of the well known numeral wheel or direct reading type such as used in dispensing pumps now being sold and includes a lower bank of numeral wheels 140 for registering the number of gallons or parts thereof dispensed. The register is also provided with upper banks of numeral wheels 142 adapted to indicate the cost of the number of gallons dispensed. Price synchronizing means (not shown) such as shown in Slye et al. Patent No. 2,151,239, granted March 21, 1939, may also be used, and the register is driven in the well known manner by the meter shaft 130. The cost numeral wheels 142 are driven through the variator 128, all as shown and described in said Patent No. 2,111,996, and the gallons numeral wheels are driven through a gear train from said meter shaft. In each case, due to the width of the variator, there is provided an idler gear for driving suitable numeral wheel drive gears 143 and 145 provided on the shafts 144 and 146 of the gallons and money registering wheels for driving the lowest denominational wheel. The idler gears 162 for driving the gallon wheels 140 through the gears 143 are mounted on the shafts 148, and the idler gears 168 for driving the money wheels 142 through the gears 145 are mounted on the shafts 150. It is understood that the lower value numeral wheels transfer their motion to the higher value numeral wheels in the well known manner through the Geneva or other transfer mechanism indicated generally at 151. In resetting operation, rotation of the crank 138 sets all the numeral wheels to zero in the well known manner.

A support 152 is secured to the register and is provided with suitable shafts 154 and 156 having couplings 158 and 160 thereon, the shafts 154 and 156 being provided with the gears 164 and 166 of the same size as the gears 143 and 145. The gears 164 and 166 are adapted to be driven by the gears 165 and 167 mounted on the shafts 148 and 150. The gears 165 and 167 are of the same size as the idler gears 162 and 168, and rotate with said gears on the shafts 148 and 150 for driving the gallons and money numeral wheels through the gears 143 and 145 whereby the shafts 154 and 156 rotate at the same speed, respectively, at which the fraction of a gallon numeral wheel, and the units money wheel

The liquid dispensing apparatus is provided with preselecting mechanism indicated generally at 170, said preselecting mechanism being so constructed and arranged that it may be rendered inoperative to permit the liquid dispensing apparatus to be operated continuously, or the preselector may be operative to control the liquid dispensing apparatus. In the latter case, either the number of gallons and fractions thereof de-

sired may be preselected, or the cost of the liquid to be dispensed may be preselected. In the modification of the preselector illustrated in Figures 3 to 24 inclusive, the preselecting mechanism is provided with the amount cam shaft 172 (Figures 7, 9 and 11) which is adapted to be coupled to the coupling 158, and said preselecting mechanism is provided with the cost cam shaft 174 adapted to be connected to the coupling 160. The shafts 172 and 174 are provided respectively with subtracting cams 176 and 178 (Figure 7).

The preselector mechanism 170 is conveniently mounted between the supporting plates 180 and 182 through which shafts 172 and 174 pass, and the setting shaft 184 extends therethrough, being provided with the setting knob 186. The shifting or shifter plate or support 188 is rotatably mounted on the shaft 184 and is provided with the gallons or amount cam lever 190 pivoted as at 192 to the shifting plate 188, said cam lever being provided with the slots 194 and 196 adapted to have cooperative relation with limiting and positioning means such as the nut and shaft assemblies 198 and 200 whereby the relative movement about the shaft 192 is controlled and the cam lever 190 is maintained in the plane of the subtracting cam 176. The shifting plate 188 is also provided with the money cam lever 202 pivoted as at 204 thereto and being provided with the slots 205 and 206 adapted to have cooperative relation with the limiting and positioning means 208 and 210 whereby said cam is limited in its relative movement and is maintained in the plane of the subtracting cam 178. The amount and money cam levers 190 and 202 are pivotally connected as at 212 and 214 to the rods 216 and 218, said rods being pivoted as at 220 and 222 to the pawl carrier 224. Said pawl carrier is pivotally mounted with respect to the shaft 184 and is provided with the slot 226 and the positioning means 228 for preventing tipping of the pawl carrier.

The pawl 230 is pivoted as at 232 to the pawl carrier 224, said pawl being urged in a counterclockwise direction about its pivot by means of the spring 234, one end of which is connected to the pawl, the other end of which is anchored to the pawl carrier, said pawl being guided or prevented from tipping by means of the guide 236 provided on the carrier 224. The pawl 230 is adapted to have cooperative relation with the subtracting ratchet 238, said ratchet being non-rotatably mounted on the shaft 184.

In the embodiment illustrated it is proposed to have the preselecting device capable of operation up to forty gallons, where selection is made in gallons, or up to \$4.00, where selection is made in money, and therefore in this instance the subtracting ratchet 238 is provided with forty teeth. In view of the fact that the ratchet is provided with forty teeth it is necessary that the pawl carrier move 9° clockwise, and counterclockwise, from the continuous service position, or a unit multiple thereof, as distinguished from a fractional multiple thereof to insure proper engagement between the pawl 230 and the teeth of the subtracting ratchet 238. In order to arrest the movement of the subtracting ratchet 238 the internal arresting gear 240 (Figure 13) is provided non-rotatably mounted on the shaft 184 and being provided with the same number of teeth as provided on the subtracting ratchet 238.

The spring-pressed plunger 242 is fixedly mounted on the plate 182, engages the teeth of the arresting gear 240 and prevents an unauthor-

ized movement of the subtracting ratchet due to inertia, drag or the like, and when the plunger 242 is in the relative position shown in Figure 13, the pawl 230 and ratchet 238 are in the relative position shown in Figure 7. The preselecting dial 244 is fixedly mounted on the shaft 184 to rotate with the ratchet 238, said dial being provided with an inner bank of numerals 246 (Figure 13) designating the number of gallons to be selected, and an outer bank of numerals 248 designating the cost of liquid dispensed to be selected, the bank 246 being graduated from 0 to 39, and the bank 248 being graduated from 0 to \$3.90. The casing 52 is provided with the windows 250 and 252 to reveal the selected numerals of the gallons or money banks of numerals. In order that only the selected bank of numerals will be visible in the windows 250 or 252, a shutter 254 (Figure 13) is mounted as at 256 on the shifting plate 188, said shutter being provided with the staggered apertures 258 and 260 so disposed that only one of said apertures at any one time registers with the windows 250 or 252 whereby only one bank of numerals is visible at any one time. Said apertures 258 and 260 are so spaced that when the liquid dispensing apparatus is set for continuous operation no numerals will be visible in the windows 250 or 252.

The shifter plate 188 is moved by the selecting lever 262 disposed outwardly of the casing, said lever being mounted on the shaft 264 and being provided with the index 266 for indicating the setting of the preselecting mechanism effected by the selecting lever 262. For convenient selection the plate 268 is provided indicating, in the present instance, the amount (gallons) selection 270, money selection 272, and the continuous service selection 274. By moving the lever 262 so that the pointer is disposed in a downward direction, the shifting plate 188 is moved in a clockwise direction so that the shaft 172 is operable and the amount selection is effective. If the lever 262 is moved so that the pointer is horizontal, neither shaft 172 nor 174 is operative so that the liquid dispensing apparatus is set for continuous service, whereas if the pointer is moved upwardly the shifting plate is moved counterclockwise and the shaft 174 is operative so that the preselector is operable to select in money. The shaft 264 is provided with the selecting cam 276 (Figure 13), said cam being provided with the shoulders 278 and 280 corresponding respectively to the amount and money selections. Said cam is also provided with the notch 282 corresponding to the continuous service selection.

When the selecting lever 262 is in depending vertical position as shown in Figure 3, continuous service has been selected, in which case the selecting cam 276 will be in the position as shown in Figure 13, and the plunger 284 will be engaged in the notch 282. This plunger 284 is urged toward the notch by means of the spring 286 disposed between said plunger and the support 288 secured to the plate 182, said support 288 also being provided with the portion 290 for guiding the plunger 282, said portion 290 being provided with the shoulders 292 and 294 adapted to operate as stops for the amount shoulder 278 and the money shoulder 280. A contractile spring 296 is secured at one end as at 298 to the plate 182 and at the other end as at 300 to the selecting cam 276. In the position shown in Figure 13, i. e., in the continuous service position, the axis of the spring passes through the

axis of the shaft 264. When, however, the selecting lever 262 is rotated toward either the amount or the money side, that is, in either a clockwise or a counterclockwise direction, the spring acts as a toggle and urges the shoulders 278 and 280 toward seated position on the stops 292 and 294. The cam is connected to the shifter plate 188 by means of the rod 302, said rod being pivotally connected to the selecting cam as at 303 and being pivotally connected to the shifter plate as at 304. The rod 306 extends through a guide in the member 288 and into the plunger 284 for movement by said cam 276 through said plunger as viewed in Figure 13, said rod being pivoted as at 308 to the lever 310, said lever being pivoted as at 312 in the plate 182, movement of the cam therefore moving the lever 310.

The lever 310 has a laterally projecting lug 314, said lug 314 being in engagement with the upstanding leg 316 of the bell crank 318, said lug being for the purpose of locking the valve open during continuous operation, and prevents the valve from being closed during zeroizing when the device is set for continuous operation. The other leg 320 of said bell crank is connected as at 322 to one end of the spring 324, the other end of said spring being connected as at 326 to the stationary frame member or support 328 supported by the plate 180. The bell crank 318 is pivoted to the shaft 330, and the leg 320 of the bell crank 318 is provided with the valve control plate shoulder 332. The lever 334 (Figures 8 and 14) is pivotally mounted on the shaft 330, and the inner leg 336 thereof is provided with a cam portion 338 adapted to be engaged by the pin 340 mounted between the plates 342 and 344 (Figure 5), said plates being non-rotatably mounted on the shaft 184, the plate 342 serving as means for supporting the dial 244. The outer leg 346 of the lever 334 is pivotally connected as at 348 to the contractile spring 350, the upper end of said spring being anchored as at 352 (Figure 16) to the support 328.

The rod 354 (Figures 3, 14 and 16) is pivotally connected as at 356 to the outer leg 346 and extends downwardly and is pivotally connected as at 357 to the lever 358 (Figures 3 and 16), said lever being pivoted as at 360, the inner arm 362 of said lever being disposed in the path of the cam 364 fixedly mounted on the reset shaft 136. Thus rotation of the reset shaft causes the lever 358 to move about the pivot 360 to cause downward movement of the rod 354 which causes the control valve (to be later described) to close, if it is opened, when the reset shaft is moved to reset the register. This occurs unless the apparatus is set for continuous flow, at which time the arm 362 is raised away from the path of the cam 364. The leg 346 of the lever 334 (Figure 14) is provided with the shoulder 366 adapted to have cooperative engagement with the valve control plate 368 fixed to the shaft 370. The shaft 370 extends outwardly of the casing 52 and is provided with the valve control handle 372. The inner end of the shaft 370 is provided with the lever 374 (Figures 16 and 17) fixedly but adjustably mounted on the shaft 370 and provided with the pin 376 engaging the bifurcated end of the lever 378. The lever 378 is fixed to the shaft 380 pivoted as at 382 to the fixed support 384. The lever 374 is provided with the arm 386, and the spring 388 is pivoted as at 390 to the arm 386, the other end being anchored as at 392 to the plate 384. The shaft 380 extends transverse-

ly of the pump and is coupled as at 394 (Figure 23) to the shaft 398 extending into the housing 398 of the valve assembly 400, disposed in the dispensing line 72.

The valve assembly 400 (Figures 20 to 24 inclusive) consists essentially of the housing 398 having the valve seat 402 for the main valve member 404, said valve member being urged toward closed position by means of the spring 406 seated at one end on the valve, and on the other end, on the spider 408. The main valve 404 is provided with the hollow guide stem 410 extending upwardly and being provided with the dribble valve seat 412. The dribble valve 414 is urged toward seated position by means of a spring 416, one end of which is seated on the valve 414, the other end of which is seated within the main valve 404, and communication to the dribble valve is had through an opening 418 provided in the main valve. A portion of the hollow stem 410 is circular, and the dribble valve stem 418 is another shape, shown square, permitting the passage of liquid between the stem 418 and the stem 410. The upper end of the stem 418 is adapted to be contacted by the lever or lever arm 420 provided on the shaft 398 and extending into the cut-out portion 422 of the stem 410. The upper end of the stem 410 is provided with the cylindrical guide 424 extending into the cylindrical member 426 disposed in the valve housing 398 whereby a dashpot is formed.

When it is desired to include a fractional money (penny) calibration in the form of the pre-selector described, the valve control plate 368 is provided with a depending portion 428 (Figure 16) adapted to have cooperative relation with the lever 430 (Figure 9), said lever being pivoted to the shaft 330. The lever 430 is provided with the shoulder 431 offset with respect to the shoulder 366 of the lever 334, and the lever 430 is urged upwardly by the contractile spring 432 pivoted as at 434 to the lever, the upper end thereof being attached (not shown) to the plate 180. The lever 430 is pivoted as at 436 to the rod 438, said rod passing downwardly below the shaft 184 and transversely of the pre-selector, being pivoted as at 440 to the fractional gallon cam lever 442. The cam lever 442 is pivoted on the shaft 192, that is, on the same pivot as the gallons cam lever 190, and said fractional gallons cam lever is also provided with the guide and positioning members 198 and 200. The upper end of the fractional gallon lever is pivoted as at 444 to the rod 446, the opposite end of said rod being pivoted as at 448 to the equalizing lever 450, said lever being pivoted about the shaft 184, and pivoted at the lower end of said lever at 452 to the rod 454. The rod 454 is pivotally connected as at 456 to the upper end of the fractional money cam lever 458, said cam lever being likewise pivoted as at 204 and guided and positioned by the members 208 and 210.

The amount cam shaft 172 is provided with the amount tripping cam 460, and the shaft 174 is provided with the money tripping cam 462, said tripping cams respectively being adapted to have cooperative engagement with and being disposed in the same plane as the fractional gallon cam lever 442 and the fractional money cam lever 458. It will be noted that the numerals of the amount indications 246 of the dial 244 are not in fractions. If it is desired to indicate the fractions on the same dial, it is only necessary to

make the number of lobes on the cams 460 and 462 correspond to the number of said fractions, that is, if half gallons are to be indicated, it will be necessary to have two lobes on said cam spaced 180° apart. If one-quarter gallons are to be indicated it will be necessary to have four lobes spaced equally at 90° apart, and so on. The shaft 370 is provided with the trip plate 464 (Figures 11 and 12) which, when the valve 404 is in fully open position (Figure 20), assumes the dotted line position as shown in Figure 11. However, when the valve 404 is moved to closed position, but wherein the dribble valve 414 is in open position as shown in Figure 21, the member 464 will move to the full line position as shown in Figure 11, wherein it engages the shoulder 466 of the latch member 468, said latch member extending downwardly and being mounted on the shaft 330.

The member 464 is provided with an adjustable screw 470 adapted to engage the upward extending member 472 also mounted on the shaft 330 and being connected to the latch member 468 to move therewith. The member 468 is connected as at 474 to the spring 476, the opposite end of said spring being connected as at 478 to the pivoted plate 480, said plate having a flanged portion 482 (Figure 12) adapted to engage the latch member 468. The plate 480 is pivoted on the shaft 330 and is connected as at 484 to the spring 486, said spring being secured as at 488 to the plate 490 spaced from and secured to the plate 188 (Figure 5).

The member 480 (Figure 11) is pivotally connected as at 492 to the rod 494, said rod being pivoted as at 496 to the amount shut-off cam lever 498, said lever being pivoted to the shaft 192 and being guided and positioned by the members 196 and 200. The rod 500 is pivoted as at 502 to the plate 480, the lower end of said rod being pivoted as at 504 to the money shut-off cam lever 506, said lever being pivoted to the shaft 204 and being guided and positioned by the means 208 and 210. The amount cam shaft 172 is provided with the shut-off cam 508 provided with the shoulder 510, and the cost cam shaft 174 is provided with the shut-off cam 512 provided with the shoulder 514.

As already pointed out, movement of the shaft 370 causes movement of the valve control plate 368, and when said plate moves in a clockwise direction, as viewed in Figure 7, it rocks the pawl release lever 516 in a clockwise direction around its pivot 330, which causes said lever to engage the projection 518 (Figures 8 and 15) on the pawl 230, said projection being laterally disposed to overlap the arcuate edge 520 of the lever 516. The configuration of the edge 520 is such as to permit relative unobstructed movement between the release lever 516 and the pawl 230 during ratcheting movement of said pawl.

In order to subtract fractions of amounts and money, means, such as shown in Figures 5 and 10 is provided, the construction illustrated in Figure 10 being shown as adapted for use on the money cam shaft 174, it being understood that the same type of mechanism applies for the amount cam shaft 172. The shaft 522 extends through and is secured to the hollow shaft 174, there being a similar shaft 524 extending through and being secured to the hollow shaft 172. The hollow shafts 172 and 174 are provided with the ratchet wheels 526 and 528 which, in the embodiment shown in Figure 10, is for pennies, and thus is provided with ten notches 530. Where this is

applied to amount cam shaft 172, and where it would be used for computation of pints and quarts, eight notches 532 (Figure 5), similar to the notches 530, are provided. The number of notches used in the wheels 526 and 528 varies according to the kind of calculation to be made, i. e., where the monetary system is based on pounds (English) and the measurement is based on the metric system, the number of notches to be used in the ratchet wheels would be 12 and 10, respectively.

The pawls 534 and 536 (Figures 5 and 10) are pivotally mounted as at 538 and 540 on the pawl carrier plates 542 and 544, said plates being connected to the couplings rotatably mounted on the shafts 522 and 524 (one of said couplings being shown at 546 in Figure 5), said couplings being connected respectively to the money and amount couplings 160 and 158 (Figure 2) of the register. In Figure 4 the coupling 546 is shown connected to the shaft 548, which in turn is connected to the coupling 158 (Figure 2). Adjacent the windows 250 and 252 (Figure 3) there are provided the windows 550 and 552 through which the selected fractions of amounts and money can be viewed. The dials 554 and 556 (Figures 5 and 13) are non-rotatably carried on the shafts 524 and 522 and are adapted to be viewed through the windows 550 and 552, except however, the shutters 558 and 560 are provided secured as at 562 and 564 to the plate 188 for concealing or revealing the selected numerals.

In order to shift the dials 554 and 556, the shafts 524 and 522 are provided with setting means. As this setting means is identical, only the setting means for the shaft 524 is described. The setting means consists essentially of the ratchet wheel 566 (Figure 4) fixedly mounted on the shaft 524. There is provided the setting knob 568, a similar setting knob 570 being provided for the fractional money dial. The knob 568 is provided with the shaft 572 extending into the fixed housing 574, the knob being urged outwardly of the housing by means of the spring 576, thereby tending to disconnect the spring-pressed pawl 578 from the ratchet wheel 566. It is thus necessary to move the knobs 568 and 570 inwardly toward the shafts 524 and 522 in order to engage the pawls and ratchets to permit setting of the dials 554 and 556. In order to reset the fractional dials to zero when the register is being reset to zero, the reset shaft 136 (Figures 3 and 4) is provided with the gear 580, said gear meshing with the gear 582 provided on the shaft 584. The shaft 584 is also provided with the gear 586 which meshes with the idler gear 588, said idler gear being mounted on the shaft 590 and meshing with the gear 590 rotatably mounted on the shaft 524.

The gear 590 is provided with a spring-pressed pawl 592 pivotally mounted thereon as at 594, and being adapted to engage the notch 596 provided on the ratchet wheel 598, said ratchet wheel being connected to the shaft 524 and consequently the dial 554. Thus, when the reset handle 138 is rotated to reset the register, the gear train 580, 582, 586, 588 and 590 causes the pawl 592 to rotate the ratchet wheel 598 to zeroize the dial 554, there being similar mechanism for the fractional money indication, it being noted that the gear 582 is one-half the size of the gear 586 in order to cause the proper zero setting of the dial upon rotation of the reset handle 138.

When the handle 138 is operated to reset the 75

register to zero, it also returns the dial 244 to zero position. The means for returning the dial 244 to zero consists essentially of the gear 600 (Figure 5), which is operated by the gear 580, said gear 600 being mounted on the shaft 602 and serving to rotate the same size gear 604. The gear 604 meshes with the gear 606 (Figures 18 and 19), which in turn meshes with the gear 608 provided with the pawl 610, said pawl being pivoted thereto at 612. The pawl 610 is adapted to rotate the ratchet wheel 614 by engagement with the shoulder 616 provided thereon, said ratchet wheel being fixed to the shaft 184 on which the dial 244 is mounted so that rotation of the reset handle 138 operates the train of gears to return the dial 244 to zero position. To reset the register it is necessary to move the handle through 360° plus a predetermined angle which, in the present registers such as shown herein, is 45°, after which the handle returns through the 45° angle.

In order to permit setting of the dial 244 by the knob 186 by rotation in either direction, the pawl 610 is provided with the pin 618. A pawl lifter 620 is pivotally mounted adjacent the pawl as at 622, being guided by the pin and slot connection 624, said pawl lifter being provided with the arcuate portion 626 and a shoulder 628 adjacent the arcuate portion. When the pawl is being used to rotate the ratchet wheel 614 it will lift the pawl lifter 620 by means of the pin 618, as shown in Figure 18, the pin engaging under the shoulder 628, it being understood that the reset direction is a clockwise one.

When the device is reset to zero and the pawl is returned through the said 45° angle, the pin 618 will enter the slot between the shoulder 628 and the arcuate portion 626, causing the pawl to be raised to a position to permit the shoulder 616 to pass below the pawl. Thus the knob 186 may be rotated in a counterclockwise direction (as well as in a clockwise direction) to set the dial 244, as the pawl 610 has been rendered inoperative. When the selecting lever 252 has been moved either to the gallons position 270, or the money position 272, the shifter plate 188 will have been moved through an angle of 9° about the shaft 184, either clockwise or counterclockwise to the dotted line positions as indicated in Figure 7, and rotation of either the shaft 172 or the shaft 174 causes movement of the cam levers 190 or 202 about their pivots 192 or 204, depending on the position selected. If the lever 262 is moved counterclockwise for selection by money, then the cam lever 202 is moved to a position to be moved by the cam 178, in which case the lever 190 is inoperative with respect to the cam 176. Once the cam lever 202 (or lever 190) has been moved by the cam it is necessary to provide means to return it to its position where it can be engaged by the next revolution of the cams 176 (or 178). This means consists of levers 630 and 632 pivotally mounted as at 634 and 636, the levers being provided with the depending arms 638 and 640 adapted to be contacted by the cams 176 and 178 to be moved in a clockwise and counterclockwise direction, respectively, thus causing movement of the upper ends 642 and 644 of said levers. This movement of said levers will cause engagement between said upper ends thereof and the respective cam levers 190 and 202 to return them to a position to be engaged by the cams 176 and 178, this rocking movement causing rocking movement of the pawl carrier 224 to thereby move the pawl successive notches in the subtracting

ratchet 238, thus causing subtracting movement of said ratchet.

In operation of a liquid dispensing apparatus provided with a preselector of the character described, and assuming that an amount of liquid has been dispensed, but that the motor is inoperative, the reset handle 138 is rotated to zeroize the register 124, thus causing the dials 244, 554 and 556 to be moved to zero position. If the device is to be operated to preselect by money, the selecting lever 262 is moved in a counterclockwise direction to horizontal position, as viewed in Figure 3, wherein the pointer 266 is moved upwardly to the money legend 272, which movement causes rotation of the shaft 264 to a position where the shoulder 280 of the cam 276 engages the stop 294. This movement of the selecting cam 276 causes the rod 302 to be moved downwardly to the lower dotted line position as shown in Figure 13, causing the shifter plate 188 (Figure 7) to be moved 9° in a counterclockwise direction about the shaft 184, placing the cam lever 202 in a position to be engaged by the cam 178. This movement causes the shutter 254 (Figure 13) to be moved to permit the selected numerals to appear in the window 252. This is accomplished by rotating the knob 186 until the selected numerals are visible in said window. As selection by money has been chosen, the lower banks of numerals are those visible. Also the shutters 558 and 560 (Figures 5 and 13) will be moved so that the numerals in the window 550 will be concealed, but the numerals in the window 552 will be revealed. The cost selection can now be made.

Assuming the cost selected is \$1.53, the knob 186 is rotated to the position where \$1.50 becomes visible in the window 252. As the money bank of numerals 248 of the dial 244 is graduated in even tens, it is necessary to rotate the dial 556. To accomplish this the knob 570 is depressed and rotated until the numeral 3 appears in the window 552, at which time the pawl 534 (Figure 10) will have been moved to the third notch on the ratchet wheel 526. The valve control lever 372 is then moved in a counterclockwise direction to rotate the shaft 370, causing said shaft to rotate the levers 374 and 386 (Figures 16 and 17) in a counterclockwise direction. The lever 374 moves the lever 378 and the shafts 380 and 396 (Figure 23) in a clockwise direction moving the lever arm 420 downwardly. Movement of the lever arm 420 downwardly causes the valve 404 and the dribble valve 414 to be moved to fully opened positions, i. e., the lever 420 and the valves 404 and 414 are moved from the positions shown in Figure 22 to those shown in Figure 20. The spring 388 normally tends to move the valves 404 and 414 to closed positions, but when the lever 420 is moved to valve open position under the conditions described, the valve control plate 368 (Figures 9, 14, 15 and 16) will be moved from the dotted line position shown in Figure 9 to the full line position shown in said figure, wherein the valve plate will be latched by engagement with the shoulder 366 provided on the leg 346 of the member 334 (Figure 14). The liquid dispensing apparatus is now in condition for dispensing. It is, therefore, only necessary to move the push button 108 inwardly to close the switch 98 to start the motor 90, it being understood, of course, that the nozzle valve must be opened to permit liquid to pass through the meter to be dispensed in the well known manner.

Rotation of the meter shaft 130 in accordance

with the liquid passing through the meter will cause rotation of the variator and register. In the embodiment of the register and computer mechanism shown, the operation of the register is indicated by the amount numeral wheels 140 and the cost numeral wheels 142, it being understood, of course, that a clock type apparatus, as distinguished from a direct reading type of apparatus, may be used. Rotation of the numeral wheels 140 and 142 causes rotation of the couplings 158 and 160 through the gear train (Figure 2), which in turn causes rotation of the coupling provided on the shafts 524 and 522 (Figures 4 and 10) and said shafts. As the device has been set according to a preselected amount of money, rotation of the coupling on the shaft 522 causes rotation of the ratchet wheel 526, and has moved the cams 178, 462 and 512 to a position where it is first of all necessary to absorb the movement of the three notches, that is, the three cents.

During dispensing, therefore, continued rotation of the shaft 174 causes the cam 178 to move the cam lever 202 in a clockwise direction about the pivot 204, the cam lever 202 being returned by the lever 632, thus causing oscillation of the pawl carrier 224 through the rod 218. The oscillation of the pawl carrier 224 causes the pawl 230 to oscillate, which in turn progresses the subtracting ratchet in a counterclockwise direction the distance of a tooth for each oscillation of the pawl. The shoulder 518 (Figure 15) of the pawl 230 rides over the arcuate edge 520 of the release lever 516, which release lever is inoperative during this progressive movement of the ratchet. The dial 244 is likewise moved in a subtracting direction and will not override or move inaccurately due to its inertia because of the engagement of the teeth of the arresting gear 240 by the plunger 242. The subtracting movement above described will take place until liquid of a predetermined cost has been dispensed, which cost will be slightly less than the preselected cost. For example, when the dial 244 is in a position where the numeral in the window 252 is just passing "One," so that less than ten cents worth of gasoline is to be dispensed, mechanism is put in operation to reduce the volume of liquid dispensed so that the liquid dispensing apparatus can be rendered inoperative to dispense any liquid at the precise time the preselected cost is reached. At the time that only the predetermined amount remains, the pin 340 (Figure 14) engages the cam portion 338 of the lever 334, moving said lever in a clockwise position to move the shoulder 366 in an unobstructed position with respect to the control plate 368. The control plate 368 therefore has a tendency to move in a clockwise direction by action of the spring 388, but is prevented from moving any appreciable distance by means of the shoulder 431 of the lever 430 which is adapted to be engaged by said plate, the plate then having overridden the shoulder 366.

The dial 244 will be moved finally to its zero position by means of the plunger 242, as the pawl 230 by this time has moved the subtracting ratchet to a position where the plunger 242 has been moved to the zero tooth in the arresting gear 240. Continued movement of the cost cam shaft 174, just prior to the zero position, causes the cam 462 to rock the cam lever 458 in a clockwise direction about its pivot 204, which causes the equalizer 450 to be moved in a counterclockwise direction, which in turn causes the rod 438 to be moved toward the left as viewed in Figure 9,

moving the lever 430 downwardly to release the cam plate 368 from the shoulder 431, this action taking place when the money cam shaft has moved to a position where it is desired to close the main valve 404, but retain the dribble valve 414 in open position, i. e., this action takes place as the "One" numeral of the dial 244 is passing the window 252. In the embodiment shown the dribble valve is desired to remain open during the dispensing of the final three cent cost of the liquid.

Release of the cam plate 368 from the shoulder 431 causes clockwise movement of the shaft 370 due to the spring 388. Clockwise movement of the shaft 370 causes the member 464 (Figure 11) to be moved to engage the shoulder 466, which permits counterclockwise movement of the shaft 396 (Figure 23) to the position shown in Figure 21, wherein the main valve 404 is closed and the dribble valve 414 is retained open. The rate of flow of the dispensed liquid is therefore diminished so that only a small amount of liquid will be dispensed until the cost cam shaft 174 has been moved to a position where the cam engaging portion of the cam lever 506 (Figure 11) drops off the shoulder 514, at which time the spring 486 causes final unlatching of the latch member 468 by moving the member 480 in a counterclockwise direction about the pivot 330, permitting the member 464 to move to final position wherein the dribble valve is permitted to close, as shown in Figure 20, as the shaft 370 will move to its final position, moving the shafts 380 and 396 to valve closed position. It will thus be seen that the final movement of the cam 512 (Figure 11) prevents operation of the mechanism until a predetermined time, and the spring 486 tends to operate the device to final closed position. After the valve is closed the money dials are in zero position, and the valve 400 cannot be again latched in open position until the register has been reset to zero and a preselected cost has been set up on the dials.

Operation of the amount dial is, of course, done in a similar way to that described on the money dials.

Referring now to the modification illustrated in Figures 25 to 43 inclusive, a form of mechanism is shown similar in general to the modification shown in Figures 2 to 24 inclusive, but wherein the zeroizing means for the preselector has been eliminated and, instead of preselecting in cents (United States currency), the preselection is made in multiples of five cents. This has made it possible to eliminate certain parts. Where mechanism similar to that shown in Figures 2 to 24 inclusive, is used, similar numerals have been used, it being understood that the description for the same numbered parts is the same as already described.

In this construction the reset shaft 646 is adapted to be connected through the coupling 648 to the shaft 650, which in turn is connected to the reset mechanism of the register, and the reset crank 652 is provided for manually resetting said registering mechanism. In this form of the device the penny selecting means is eliminated and the setting member 654 (Figures 25 and 26) for setting five cent units is provided journaled on the shaft 646. The member 654 is provided with the extension 656 for permitting oscillation of the member 654 between two positions for moving the signal 658 (Figures 25 and 29) between the zero and five cent positions. The spring 660 is connected to the member 654

and to the plate 182, and tends to return the member 656 to the full line position as shown in Figure 25. The member 654 is provided with the gear 662 which meshes with the gear 664 fixedly mounted on the shaft 666, the ratio of the gears 662 to 664 being two to one. The shaft 666 is journaled as at 668 in the plate 182, and as at 670 in the plate 180, and is provided with the gear 672, said gear being provided with the arcuate slot 674 (Figure 25) of 180° having cooperative engagement with the stop 676 for limiting the travel of the gear 672. The gear 672 meshes with the gear 678 provided on the money cam shaft 680, and rotatably mounted with respect thereto.

The gear 678 is provided with the spring-pressed pawl 682 adapted to have cooperative engagement with the shoulders 684 or 686 of the ratchet wheel 688, said ratchet wheel being pivotally mounted on the shaft 680. The notches 684 and 686 correspond to the five cent position and the zero position of the signal 658. The signal 658 is pivoted as at 690 and is provided with the numerals 5 and 0 (Figure 29), the signal being movable to dispose one or the other in the window 692. The signal 658 is provided with the elongated slot 694 for receiving the pin 696 for limiting and guiding the travel of the signal 658, and the signal is provided with the depending spaced fingers 698 embracing the cam 700 eccentrically mounted on the shaft 680, said cam serving to operate the signal. The notches 684 and 686 are so arranged that movement of the ratchet wheel 688 causes rotation of the eccentric cam 700 to a position where either the numeral five or the zero is visible in the window 692. The dotted line position (Figure 29) indicates the position of the signal wherein the numeral five appears in the window, whereas the full line position shows the position where the zero is to be read in the window.

Where the preselector is adapted to compute only in multiples of five cents, the ratchet wheel 702 is provided with only two teeth separated 180° apart, the position of the teeth corresponding to the full and dotted line position of the eccentric cam 700. The pawl 704 is spring-pressed toward the ratchet 702 and is pivotally connected as at 706 to the carrier 708. The coupling 710 is connected to the shaft 680 by the adjustment 712, and the shaft 714 connects said coupling to the money wheels coupling of the register such as shown at 160 in Figure 2. In order to determine which numerals are to be visible in the window 692, the shutter 716 is provided secured to the support 718, the shutter being provided with the money openings 720 and the amount openings 722 adapted to be rotated by the member 718 into the position in the window 692 for showing the selected numerals. The member 718 is controlled from the selecting handle 262 which is connected to the shifter plate 188 as already described. After adjusting the preselector by operation of the handles 262 and 372, and preselection by the knob 186 and member 654, the liquid dispensing apparatus may be operated and the preselector will subtract to zero as the register moves to the chosen price or quantity, at which time the device renders the valve 400 inoperative, all as described with respect to the first modification.

Referring now to the modification illustrated in Figure 44, means is provided adapted to be associated with either of the modifications above

described to perform an additional function. With this construction a means is provided for opening a switch which will cause the motor to cease operation after the control valve 400 has been closed, that is, after the selected amount of liquid has been dispensed. In this connection a normally closed switch 724 is connected to the conductor 726 in the motor circuit. The switch is adapted to be opened by means of a plunger 728, and the plate or member 480 is pivotally connected as at 730 to the plunger 732 slidably disposed in the guide 734. When the latch member 468 is engaged with the member 482 (Figure 12), that is, at all times when the dribble valve 414 is open, the plunger 728 will be in a position where the switch 724 is closed. When, however, the spring 486 is permitted to move the member 480 at the time the dribble valve is fully closed, the plunger 732 will be moved sufficiently to move the plunger 728 to open the switch 724 to thereby break the motor circuit to stop the motor.

It is to be understood that I do not wish to be limited by the exact embodiments of the device shown; which are merely by way of illustration and not limitation, as various and other forms of the device will of course be apparent to those skilled in the art without departing from the spirit of the invention or the scope of the claims.

What is claimed is:

1. In preselector mechanism, the combination of spaced rotatable shafts, a shifter member disposed between said shafts, oscillatable cam levers pivotally mounted on said shifter member, cam members on said shafts, a selecting lever for selectively moving said shifter member to a position where certain of said cam levers are movable by the cams on either of said shafts or to a position where said cam levers are removed from said cams, a dial shaft, a dial mounted on said shaft and having rows of numerals around the periphery of said dial and calibrated to correspond to the motion of said spaced shafts, a subtracting ratchet provided on said dial, an oscillatable pawl carrier mounted on said dial shaft, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for each spaced shaft and said carrier whereby movements of said spaced shafts are transmitted to said carrier in accordance with the shaft selected by movement of said shifter member, a control shaft movable between a plurality of operative positions and an inoperative position, a pair of latch members, one of said latch members being adapted to hold said control shaft in one operative position and another of said latch members being adapted to hold said control shaft in a different operative position, means on said subtracting ratchet for rendering the first named latch member inoperative to permit the second named latch member to become operative, a cam lever for each spaced shaft on said shifter member being connected to said second latch member and adapted to be moved by a cam on the selected of said spaced shafts to render said second latch member inoperative when the selected of said spaced shafts has moved to a predetermined selected position, latching means for maintaining said control shaft in a third operative position after said second latch member has been rendered inoperative, cam levers on said shifter plate operable by said spaced shafts when they have been moved to a predetermined position, said last

named cam levers being connected to said latching means and rendering said latching means inoperative to permit said control shaft to move to inoperative position when said last named predetermined position of the selected one of said spaced shafts has been reached.

2. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl carrier mounted on said dial shaft, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for said first named shaft and said carrier whereby movements of said first named shaft are transmitted to said carrier, a control shaft movable between a plurality of operative positions and an inoperative position, a pair of latch members, one of said latch members being adapted to hold said control shaft in one operative position and another of said latch members being adapted to hold said control shaft in a different operative position, means for rendering the first named latch member inoperative to permit the second named latch member to become operative, a cam lever for said first named shaft on said shifter member being connected to said second latch member and adapted to be moved by a cam on said first named shaft to render said second latch member inoperative when the first named shaft has moved to a predetermined selected position, latching means for maintaining said control shaft in a third operative position after said second latch member has been rendered inoperative, a cam lever operable by said first named shaft connected to the latching means and rendering said latching means inoperative to permit said control shaft to move to inoperative position when the last named predetermined position of the first named shaft has been reached.

3. In preselector mechanism, the combination of spaced rotatable shafts, a shifter member disposed between said shafts, oscillatable cam levers pivotally mounted on said shifter member, cam members on said shafts, a selecting lever for selectively moving said shifter member to a position where certain of said cam levers are movable by the cams on either of said shafts or to a position where said cam levers are removed from said cams, a dial shaft, a dial mounted on said shaft and having rows of numerals around the periphery of said dial and calibrated to correspond to the motion of said spaced shafts, a window disposed adjacent a portion of said dial for reading the selected row of numerals in accordance with the selected spaced shaft, a member movable by the selecting lever to reveal the selected row and conceal the other row, a subtracting ratchet provided on said dial, an oscillatable pawl carrier mounted on said dial shaft, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for each spaced shaft and said carrier whereby movements of said spaced shafts are transmitted to said carrier in accordance with the shaft selected by movement of said shifter member, a control shaft movable between a plurality of operative positions and an inoperative position, a pair of latch members, one of said latch members being adapted to hold said control shaft in one opera-

tive position and another of said latch members being adapted to hold said control shaft in a different operative position, means on said subtracting ratchet for rendering the first named latch member inoperative to permit the second named latch member to become operative, a cam lever for each spaced shaft on said shifter member being connected to said second latch member and adapted to be moved by a cam on the selected of said spaced shafts to render said second latch member inoperative when the selected of said spaced shafts has moved to a predetermined selected position, latching means for maintaining said control shaft in a third operative position after said second latch member has been rendered inoperative, cam levers on said shifter plate operable by said spaced shafts when they have been moved to a predetermined position, said last named cam levers being connected to said latching means and rendering said latching means inoperative to permit said control shaft to move to inoperative position when said last named predetermined position of the selected one of said spaced shafts has been reached.

4. In preselector mechanism, the combination of spaced rotatable shafts, a shifter member disposed between said shafts, oscillatable cam levers pivotally mounted on said shifter member, cam members on said shafts, a selecting lever for selectively moving said shifter member to a position where certain of said cam levers are movable by the cams on either of said shafts or to a position where said cam levers are removed from said cams, a dial shaft, a dial mounted on said shaft and having rows of numerals around the periphery of said dial and calibrated to correspond to the motion of said spaced shafts, a window disposed adjacent a portion of said dial for reading the selected row of numerals in accordance with the selected spaced shaft, a member movable by the selecting lever to reveal the selected row and conceal the other row, a subtracting ratchet provided on said dial, an oscillatable pawl carrier mounted on said dial shaft, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for each spaced shaft and said carrier, whereby movements of said spaced shafts are transmitted to said carrier in accordance with the shaft selected by movement of said shifter member, a control shaft movable between a plurality of operative positions and an inoperative position, a pair of latch members, one of said latch members being adapted to hold said control shaft in one operative position and another of said latch members being adapted to hold said control shaft in a different operative position, means on said subtracting ratchet for rendering the first named latch member inoperative to permit the second named latch member to become operative, latching means for maintaining said control shaft in another operative position after said first latch member has been rendered inoperative, cam levers on said shifter plate operable by said spaced shafts when they have been moved to a predetermined position, said last named cam levers and said operating means of said oscillatable dial being operatively connected to said latching means and rendering said latching means inoperative to permit said control shaft to move to inoperative position when said last named predetermined position of the selected one of said spaced shafts has been reached.

5. In preselector mechanism, the combination of spaced rotatable shafts, a shifter member

disposed between said shafts, oscillatable cam levers pivotally mounted on said shifter member, cam members on said shafts, a selecting lever for selectively moving said shifter member to a position where certain of said cam levers are movable by the cams on either of said shafts or to a position where said cam levers are removed from said cams, a dial shaft, a dial mounted on said shaft and having rows of numerals around the periphery of said dial and calibrated to correspond to the motion of said spaced shafts, a window disposed adjacent a portion of said dial for reading the selected row of numerals in accordance with the selected spaced shaft, a member movable by the selecting lever to reveal the selected row and conceal the other row, an oscillatable dial on one of said spaced shafts calibrated for an increment of measure of one of the rows on said dial, the calibration being visible in said window, means for moving said oscillatable dial to render it operative or inoperative, operating means movable by said last named means for conditioning the respective selected shaft in accordance with the reading of said oscillatable dial, a subtracting ratchet provided on said dial, an oscillatable pawl carrier mounted on said dial shaft, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for each spaced shaft and said carrier, whereby movements of said spaced shafts are transmitted to said carrier in accordance with the shaft selected by movement of said shifter member, a control shaft movable between a plurality of operative positions and an inoperative position, a pair of latch members, one of said latch members being adapted to hold said control shaft in one operative position and another of said latch members being adapted to hold said control shaft in a different operative position, means on said subtracting ratchet for rendering the first named latch member inoperative to permit the second named latch member to become operative, latching means for maintaining said control shaft in another operative position after said first latch member has been rendered inoperative, cam levers on said shifter plate operable by said spaced shafts when they have been moved to a predetermined position, said last named cam levers and said operating means of said oscillatable dial being operatively connected to said latching means and rendering said latching means inoperative to permit said control shaft to move to inoperative position when said last named predetermined position of the selected one of said spaced shafts has been reached.

6. In preselector mechanism, the combination of spaced rotatable shafts, a shifter member disposed between said shafts, oscillatable cam levers pivotally mounted on said shifter member, cam members on said shafts, a selecting lever for selectively moving said shifter member to a position where certain of said cam levers are movable by the cams on either of said shafts or to a position where said cam levers are removed from said cams, a dial shaft, a dial mounted on said shaft and having rows of numerals around the periphery of said dial and calibrated to correspond to the motion of said spaced shafts, a subtracting ratchet, an oscillatable pawl carrier mounted on said dial shaft, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever

for each spaced shaft and said carrier whereby movements of said spaced shafts are transmitted to said carrier in accordance with the shaft selected by movement of said shifter member, a control member movable between operative and inoperative positions, latch members, one of said latch members being adapted to hold said control member in one operative position and another of said latch members being adapted to hold said control member in a different operative position, means on said subtracting ratchet for rendering one latch member inoperative to permit another latch member to become operative, a cam lever for each spaced shaft on said shifter member being connected to said second latch member and adapted to be moved by a cam on the selected of said spaced shafts to render said second latch member inoperative when the selected of said spaced shafts has moved to a predetermined selected position, latching means for maintaining said control member in a third operative position after said second latch member has been rendered inoperative, cam levers on said shifter plate operable by said spaced shafts when they have been moved to a predetermined position, said last named cam levers being connected to said latching means and rendering said latching means inoperative to permit said control member to move to inoperative position when said last named predetermined position of the selected one of said spaced shafts has been reached.

7. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl carrier, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for said first named shaft and said carrier whereby movements of said first named shaft are transmitted to said carrier, control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to be moved by a cam on said first named shaft to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means for maintaining said control means in a third operative position after said latch means has been rendered inoperative, a cam lever operable by said first named shaft connected to the latching means and rendering said latching means inoperative to permit said control means to move to inoperative position when the last named predetermined position of the first named shaft has been reached.

8. In preselector mechanism, the combination of spaced rotatable shafts, a shifter member disposed between said shafts, oscillatable cam levers pivotally mounted on said shifter member, cam members on said shafts, a selecting lever for selectively moving said shifter member to a position where certain of said cam levers are movable by the cams on either of said shafts or to a position where said cam levers are removed from said cams, a dial shaft, a dial mounted on said shaft and having rows of numerals

around the periphery of said dial and calibrated to correspond to the motion of said spaced shafts, a window disposed adjacent a portion of said dial for reading the selected row of numerals in accordance with the selected spaced shaft, a member movable by the selecting lever to reveal the selected row and conceal the other row, a subtracting ratchet provided on said dial, an oscillatable pawl carrier, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for each spaced shaft and said carrier whereby movements of said spaced shafts are transmitted to said carrier in accordance with the shaft selected by movement of said shifter member, a control member movable between operative and inoperative positions, latch members, one of said latch members being adapted to hold said control member in one operative position and another of said latch members being adapted to hold said control member in a different operative position, means on said subtracting ratchet for rendering the first named latch member inoperative to permit the second named latch member to become operative, a cam lever for each spaced shaft on said shifter member connected to said second latch member and adapted to be moved by a cam on the selected of said spaced shafts to render said second latch member inoperative when the selected of said spaced shafts has moved to a predetermined selected position, latching means for maintaining said control member in a third operative position after said second latch member has been rendered inoperative, cam levers on said shifter plate operable by said spaced shafts when they have been moved to a predetermined position, said last named cam levers being connected to said latching means and rendering said latching means inoperative to permit said control member to move to inoperative position when said last named predetermined position of the selected one of said spaced shafts has been reached.

9. In preselector mechanism, the combination of spaced rotatable shafts, a shifter member disposed between said shafts, oscillatable cam levers pivotally mounted on said shifter member, cam members on said shafts, a selecting lever for selectively moving said shifter member to a position where certain of said cam levers are movable by the cams on either of said shafts or to a position where said cam levers are removed from said cams, a dial shaft, a dial mounted on said shaft and having rows of numerals around the periphery of said dial and calibrated to correspond to the motion of said spaced shafts, a window disposed adjacent a portion of said dial for reading the selected row of numerals in accordance with the selected spaced shaft, a member movable by the selecting lever to reveal the selected row and conceal the other row, a subtracting ratchet provided on said dial, an oscillatable pawl carrier, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for each spaced shaft and said carrier, whereby movements of said spaced shafts are transmitted to said carrier in accordance with the shaft selected by movement of said shifter member, a control member movable between operative and inoperative positions, latch members, one of said latch members being adapted to hold

said control member in one operative position and another of said latch members being adapted to hold said control member in a different operative position, means on said subtracting ratchet for rendering the first named latch member inoperative to permit the second named latch member to become operative, latching means for maintaining said control member in another operative position after said first latch member has been rendered inoperative, cam levers on said shifter plate operable by said spaced shafts when they have been moved to a predetermined position, said last named cam levers being connected to said latching means and rendering said latching means inoperative to permit said control member to move to inoperative position when said last named predetermined position of the selected one of said spaced shafts has been reached.

10. In preselector mechanism, the combination of spaced rotatable shafts, a shifter member disposed between said shafts, oscillatable cam levers pivotally mounted on said shifter member, cam members on said shafts, a selecting lever for selectively moving said shifter member to a position where certain of said cam levers are movable by the cams on either of said shafts or to a position where said cam levers are removed from said cams, a dial shaft, a dial mounted on said shaft and having rows of numerals around the periphery of said dial and calibrated to correspond to the motion of said spaced shafts, a window disposed adjacent a portion of said dial for reading the selected row of numerals in accordance with the selected spaced shaft, a member movable by the selecting lever to reveal the selected row and conceal the other row, an oscillatable dial on one of said spaced shafts calibrated for an increment of measure of one of the rows on said dial, the calibration being visible in said window, means for moving said oscillatable dial to render it operative or inoperative, operating means movable by said last named means for conditioning the respective selected shafts in accordance with the reading of said oscillatable dial, a subtracting ratchet provided on said dial, an oscillatable pawl carrier, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for each spaced shaft and said carrier, whereby movements of said spaced shafts are transmitted to said carrier in accordance with the shaft selected by movement of said shifter member, control means movable between operative and inoperative positions, latch members, one of said latch members being adapted to hold said control means in one operative position and another of said latch members being adapted to hold said control means in a different operative position, means on said subtracting ratchet for rendering the first named latch member inoperative to permit the second named latch member to become operative, latching means for maintaining said control means in another operative position after said first latch member has been rendered inoperative, cam levers on said shifter plate operable by said spaced shafts when they have been moved to a predetermined position, said last named cam levers and said operating means of said oscillatable dial being operatively connected to said latching means and rendering said latching means inoperative to permit said control means to move to inoperative position when said last

named predetermined position of the selected one of said spaced shafts has been reached.

11. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl adapted to move said ratchet, connections between a cam lever for said first named shaft and said pawl whereby movements of said first named shaft are transmitted to said pawl, control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to be moved by a cam on said first named shaft to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means for maintaining said control means in a third operative position after said latch means has been rendered inoperative, a cam lever operable by said first named shaft connected to the latching means and rendering said latching means inoperative to permit said control means to move to inoperative position when the last named predetermined position of the first named shaft has been reached.

12. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl carrier, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for said first named shaft and said carrier whereby movements of said first named shaft are transmitted to said carrier, control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to be moved by a cam on said first named shaft to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means, a cam lever operable by said first named shaft connected to the latching means and rendering said latching means inoperative to permit said control means to move to inoperative position when the last named predetermined position of the first named shaft has been reached.

13. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl adapted to move said ratchet, connections between a cam lever for said first named shaft and said pawl whereby movements of said first named shaft are transmitted to said pawl, con-

control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to be moved by a cam on said first named shaft to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means, a cam lever operable by said first named shaft connected to the latching means and rendering said latching means inoperative to permit said control means to move to inoperative position when the last named predetermined position of the first named shaft has been reached.

14. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl carrier, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for said first named shaft and said carrier whereby movements of said first named shaft are transmitted to said carrier, control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means, a cam lever operable by said first named shaft connected to the latching means and rendering said latching means inoperative to permit said control means to move to inoperative position when the last named predetermined position of the first named shaft has been reached.

15. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl adapted to move said ratchet, connections between a cam lever for said first named shaft and said pawl whereby movements of said first named shaft are transmitted to said pawl, control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means, a cam lever operable by said first named shaft connected to the latching means and rendering said latching means inoperative to permit said control means to move to inoperative position when the last named predetermined position of the first named shaft has been reached.

16. In preselector mechanism, the combina-

tion of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl carrier, a pawl mounted on said carrier adapted to move said ratchet in accordance with the movement of said carrier, connections between a cam lever for said first named shaft and said carrier whereby movements of said first named shaft are transmitted to said carrier, control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to be moved by a cam on said first named shaft to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means, a cam lever for rendering said latching means inoperative to permit said control means to move to inoperative position when a predetermined position of the first named shaft has been reached.

17. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl adapted to move said ratchet, connections between a cam lever for said first named shaft and said pawl whereby movements of said first named shaft are transmitted to said pawl, control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to be moved by a cam on said first named shaft to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means, a cam lever for rendering said latching means inoperative to permit said control means to move to inoperative position when a predetermined position of the first named shaft has been reached.

18. In preselector mechanism, the combination of a rotatable shaft having a plurality of cams thereon, cam levers adapted to be respectively operated by said cams, a dial shaft, a dial mounted on said shaft calibrated to correspond to the motion of said shaft, a subtracting ratchet provided on said dial, an oscillatable pawl adapted to move said ratchet, connections between a cam lever for said first named shaft and said pawl whereby movements of said first named shaft are transmitted to said pawl, control means movable between operative and inoperative positions, latch means adapted to hold said control means in different operative positions, means on said subtracting ratchet for causing the latch means to become operative, a cam lever for said first named shaft connected to a portion of said latch means and adapted to render another portion of said latch means inoperative when the first named shaft has moved to a predetermined selected position, latching means, a cam lever for rendering said latching means inoperative to per-

mit said control means to move to inoperative position when a predetermined position of the first named shaft has been reached.

19. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating means and gallonage indicating means, preselector mechanism including indicating means adapted to be set to a selected figure above zero, a cost cam shaft and an amount cam shaft provided by said preselector mechanism, means coupling the said shafts to the registering means so that the cost cam shaft rotates in synchronism with the cost indicating means and the amount cam shaft rotates in synchronism with the gallonage indicating means, subtracting mechanism in associated relation with the indicating means of the preselector for returning said indicating means to zero position, and a selecting lever for operatively connecting the subtracting mechanism to the cost cam shaft or to the amount cam shaft depending on the particular setting of said lever.

20. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating wheels and gallonage indicating wheels, preselector mechanism including a cost cam shaft coupled to the registering means to rotate in synchronism with the cost indicating wheels and an amount cam shaft also coupled to the registering means to rotate in synchronism with the gallonage indicating wheels, a rotatable indicating dial provided by the preselector mechanism and adapted to be set to a selected figure above zero, subtracting mechanism for returning the dial to zero position, and a manually actuated selecting lever for operatively connecting the subtracting mechanism to the cost cam shaft or to the amount cam shaft depending on the particular setting of said lever.

21. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating means and gallonage indicating means, preselector mechanism including indicating means adapted to be set to a selected figure above zero, a cost cam shaft and an amount cam shaft provided by said preselector mechanism, means coupling the said shafts to the registering means so that the cost cam shaft rotates in synchronism with the cost indicating means and the amount cam shaft rotates in synchronism with the gallonage indicating means, subtracting mechanism in associated relation with the indicating means of the preselector for returning said indicating means to zero position, connections between the subtracting mechanism and said shafts respectively whereby either shaft during rotation thereof may actuate the subtracting mechanism, and a selecting lever for rendering either one of said shafts operative depending on the particular setting of the lever.

22. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating wheels and gallonage indicating wheels, preselector mechanism including indicating means adapted to be set to a selected figure above zero, a cost cam shaft and

an amount cam shaft provided by said preselector mechanism, means coupling the said shafts to the registering means so that the cost cam shaft rotates in synchronism with the cost indicating wheels and the amount cam shaft rotates in synchronism with the gallonage indicating wheels, subtracting mechanism in associated relation with the indicating means of the preselector for returning said indicating means to zero position, connections between the subtracting mechanism and said shafts respectively whereby either shaft during rotation thereof may actuate the subtracting mechanism, and a selecting lever for rendering either one of said shafts operative depending on the particular setting of said lever.

23. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating wheels and gallonage indicating wheels, preselector mechanism including a rotatable indicating dial adapted to be set to a selected figure above zero, a cost cam shaft and an amount cam shaft provided by said preselecting mechanism, means coupling the said shafts to the registering means so that the cost cam shaft rotates in synchronism with the cost indicating wheels and the amount cam shaft rotates in synchronism with the gallonage indicating wheels, subtracting mechanism including pawl and ratchet means in associated relation with the indicating dial of the preselector for returning said dial to zero position, connections between the subtracting mechanism and said shafts respectively whereby either shaft during rotation thereof may actuate the subtracting mechanism, and a selecting lever for rendering either one of said shafts operative depending on the particular setting of said lever.

24. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating wheels and gallonage indicating wheels, preselector mechanism including a cost cam shaft coupled to the registering means to rotate in synchronism with the cost indicating wheels and an amount cam shaft also coupled to the registering means to rotate in synchronism with the gallonage indicating wheels, a rotatable indicating dial provided by the preselector mechanism and adapted to be set to a selected figure above zero, said dial having an inner bank of numerals designating gallons and an outer bank of numerals to indicate the cost of the liquid, subtracting mechanism in associated relation with the indicating dial for returning the dial to zero position, a selecting lever for operatively connecting the subtracting mechanism to the cost cam shaft or to the amount cam shaft depending on the particular setting of said lever, and shutter means also actuated by the selecting lever for rendering visible either the inner or outer bank of numerals on the indicating dial depending on which shaft is operatively connected to the subtracting mechanism.

25. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating means and gallonage indicating means, preselector mechanism including indicating means adapted to be set to a selected figure above zero, a cost cam shaft and an amount cam shaft provided by said preselect-

tor mechanism, means coupling the said shafts to the registering means so that the cost cam shaft rotates in synchronism with the cost indicating means and the amount cam shaft rotates in synchronism with the gallonage indicating means, subtracting mechanism in associated relation with the indicating means of the preselector for returning said indicating means to zero position, connections between the subtracting mechanism and said shafts respectively whereby either shaft during rotation thereof may actuate the subtracting mechanism, and a selecting lever having three selecting positions, said lever in one of said positions rendering the cost cam shaft operative and in a second position rendering the amount cam shaft operative, and said lever in the third position rendering both shafts inoperative.

26. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating means and gallonage indicating means, preselector mechanism including a cost cam shaft and an amount cam shaft, independent means coupling the shafts to the registering means so that the cost cam shaft rotates in synchronism with the cost indicating means and the amount cam shaft rotates in synchronism with the gallonage indicating means, a rotatable indicating dial provided by the preselector and adapted to be set to a selected figure above zero, a subtracting ratchet for said dial, an oscillatable pawl for actuating said ratchet to return the indicating dial to zero, and a selecting lever for operatively connecting the oscillatable pawl to either the cost cam shaft or the amount cam shaft depending on the particular setting of said lever.

27. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating means and gallonage indicating means, a valve in said flow line for controlling the flow of liquid, preselector mechanism including indicating means adapted to be

set to a selected figure above zero, a cost cam shaft and an amount cam shaft provided by said preselector, means coupling said shafts to the registering means so that the cost cam shaft rotates in synchronism with the cost indicating means and the amount cam shaft rotates in synchronism with the gallonage indicating means, subtracting mechanism in associated relation with the indicating means of the preselector for returning said means to zero position, a selecting lever for operatively connecting the subtracting mechanism to the cost cam shaft or to the amount cam shaft depending upon the particular setting of said lever, and operative connections between the indicating means and said valve for closing said valve when the indicating means has reached said zero position.

28. In apparatus of the character described, the combination with a liquid flow line and a meter for measuring the liquid flowing through said line, of registering means operated by said meter and including cost indicating means and gallonage indicating means, a valve in said flow line adapted to be opened after said registering means has been set to zero, preselector mechanism including indicating means adapted to be set to a selected figure above zero, a cost cam shaft and an amount cam shaft provided by said preselector, means coupling said shafts to the registering means so that the cost cam shaft rotates in synchronism with the cost indicating means and the amount cam shaft rotates in synchronism with the gallonage indicating means, subtracting mechanism in associated relation with the indicating means of the preselector for returning said means to zero position, a selecting lever for operatively connecting the subtracting mechanism to the cost cam shaft or to the amount cam shaft depending upon the particular setting of said lever, and connections between the indicating means and said valve having operation to partly close said valve in advance of the indicating means reaching zero and having operation to completely close said valve upon said indicating means reaching zero.

SHERWOOD HINDS.