

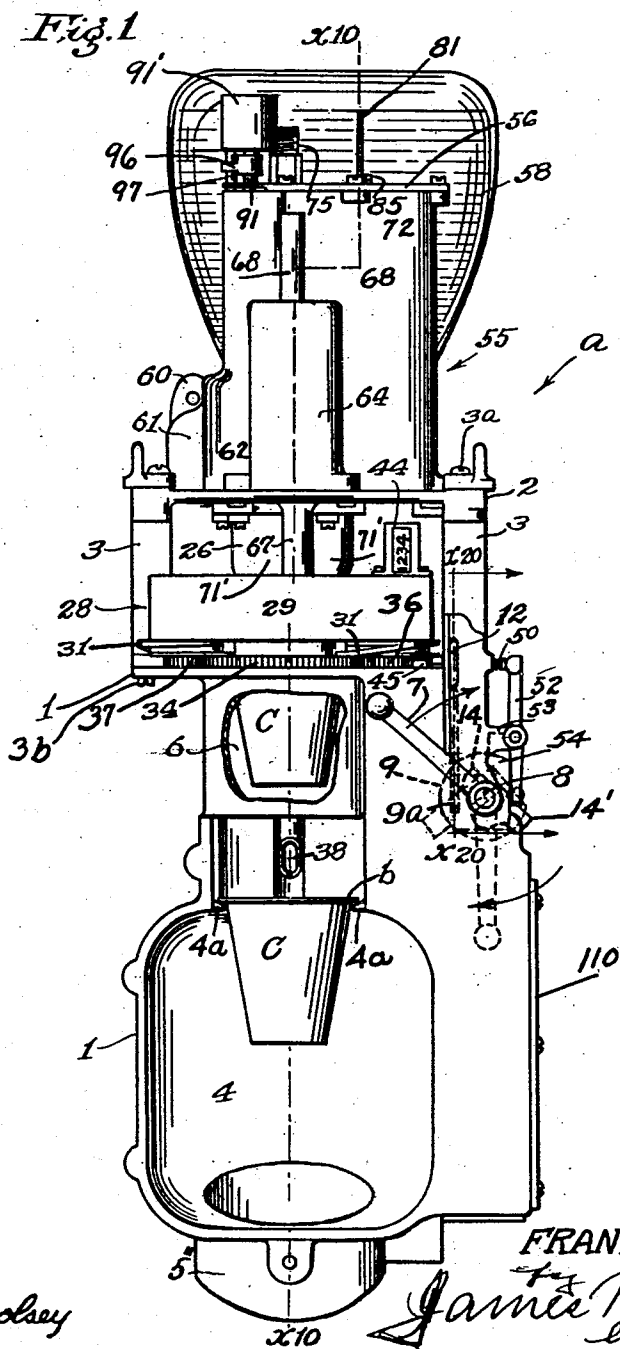
July 5, 1932.

F. A. MADDEN
BEVERAGE DISPENSER

1,865,773

Filed Oct. 26, 1925

8 Sheets-Sheet 1



WITNESS
Robt. S. Woolsey

INVENTOR
FRANK A. MADDEN
By James R. Townsend
his atty

July 5, 1932.

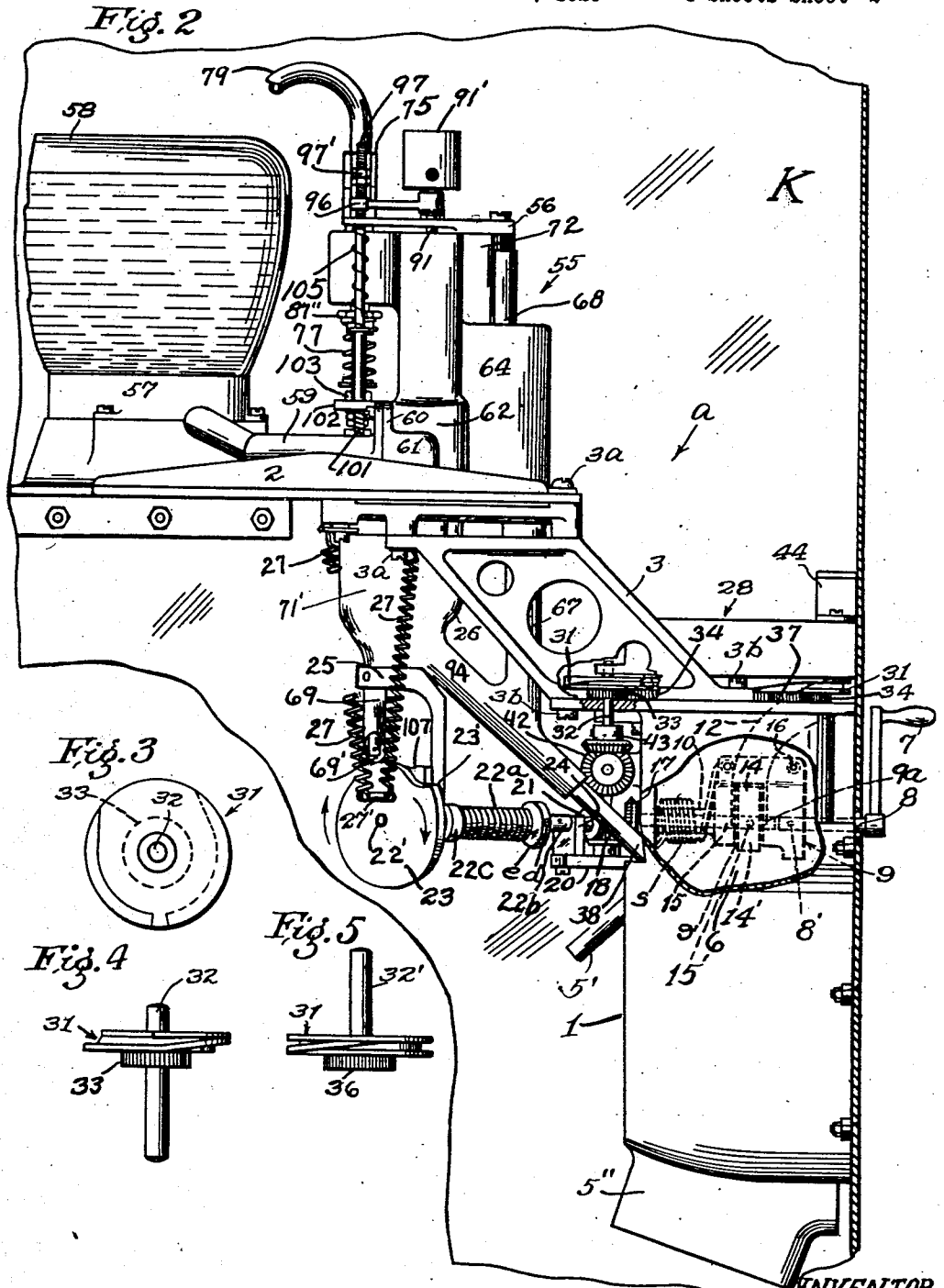
F. A. MADDEN

1,865,773

BEVERAGE DISPENSER

Filed Oct. 26, 1925

8 Sheets-Sheet 2



WITNESS
Robt. S. Woodsey

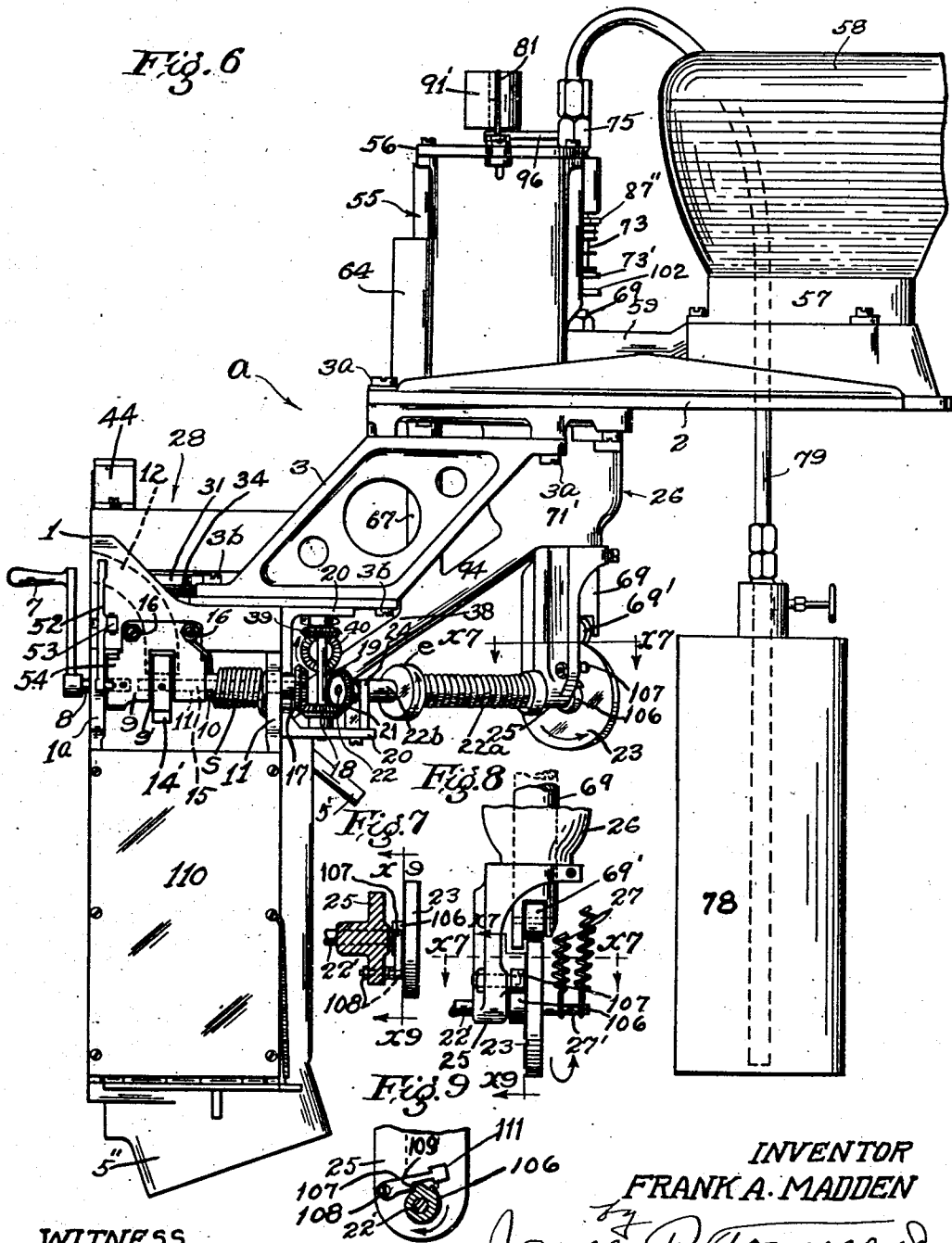
INVENTOR
FRANK A. MADDEN
James R. Townsend
his atty

July 5, 1932.

F. A. MADDEN
BEVERAGE DISPENSER
Filed Oct. 26, 1925

1,865,773

8 Sheets-Sheet 3



WITNESS
Robt. S. Woolsey

INVENTOR
FRANK A. MADDEN
By James R. Townsend
his atty

July 5, 1932.

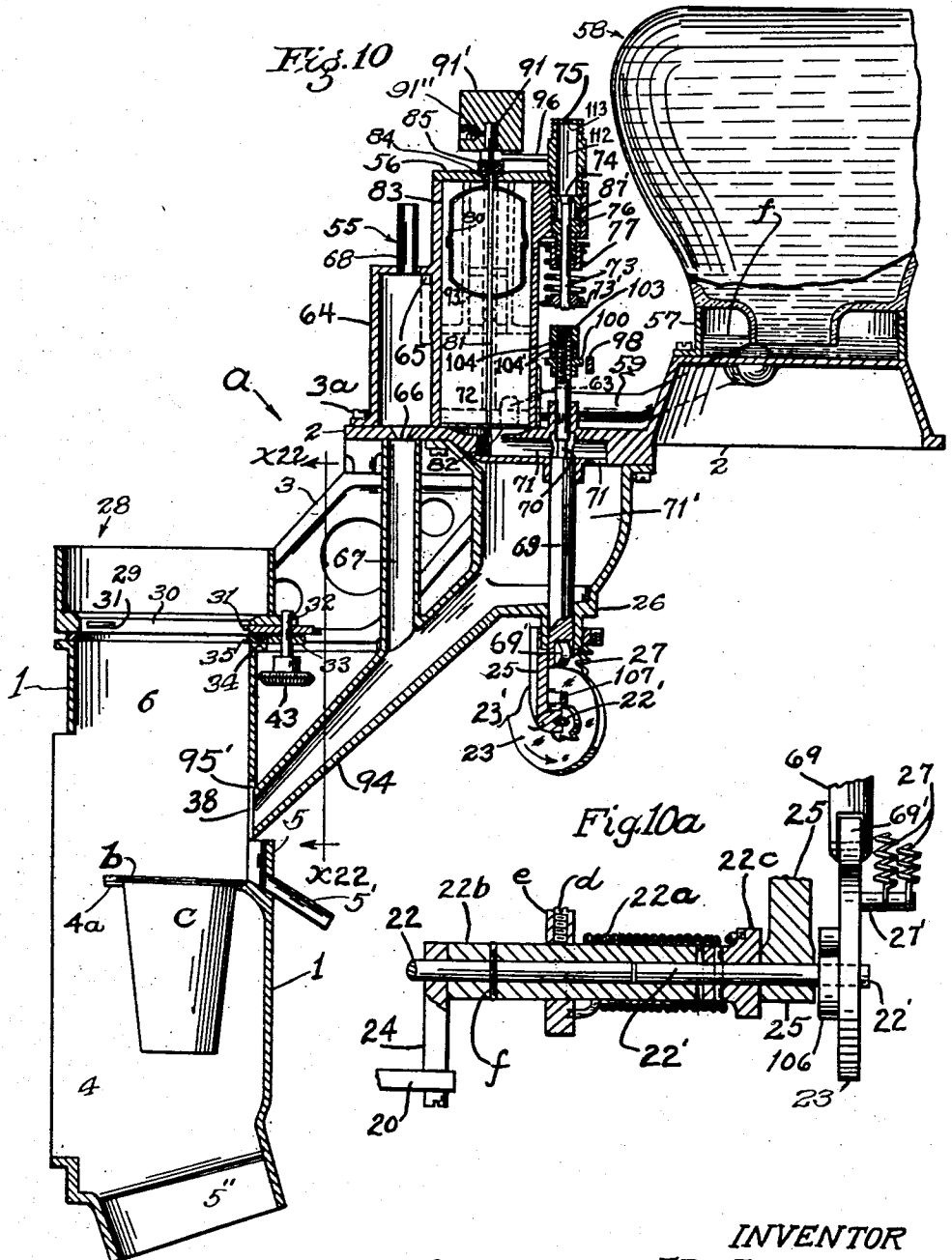
F. A. MADDEN

1,865,773

BEVERAGE DISPENSER

Filed Oct. 26, 1925

8 Sheets-Sheet 4



WITNESS
Robt. S. Woodsey

INVENTOR
FRANK A. MADDEN
James R. Townsend

July 5, 1932.

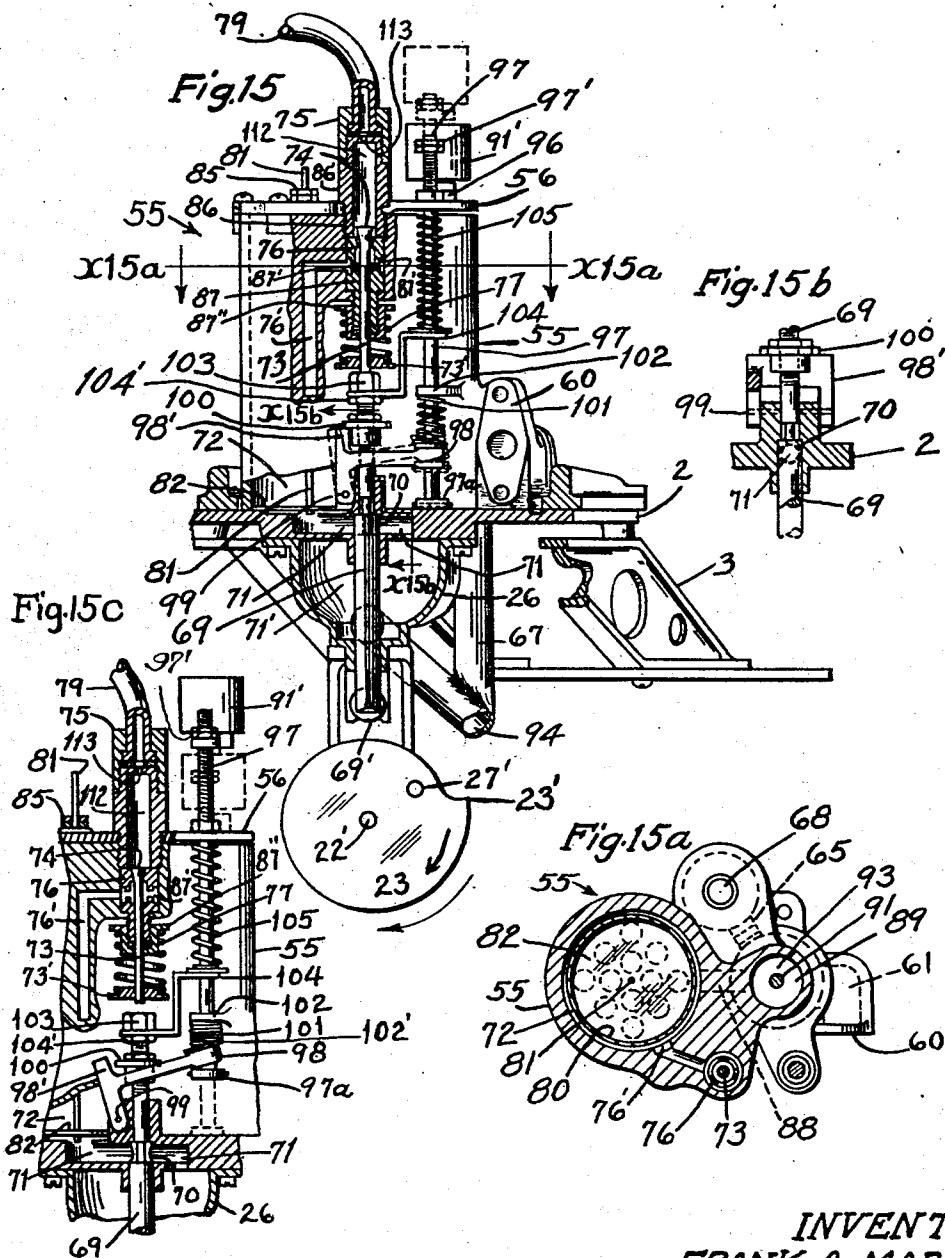
F. A. MADDEN

1,865,773

BEVERAGE DISPENSER

Filed Oct. 26, 1925

8 Sheets-Sheet 5



WITNESS
Robt. S. Woolsey

INVENTOR
FRANK A. MADDEN
by James R. Townsend
his atty

July 5, 1932.

F. A. MADDEN

1,865,773

BEVERAGE DISPENSER

Filed Oct. 26, 1925

8 Sheets-Sheet 6

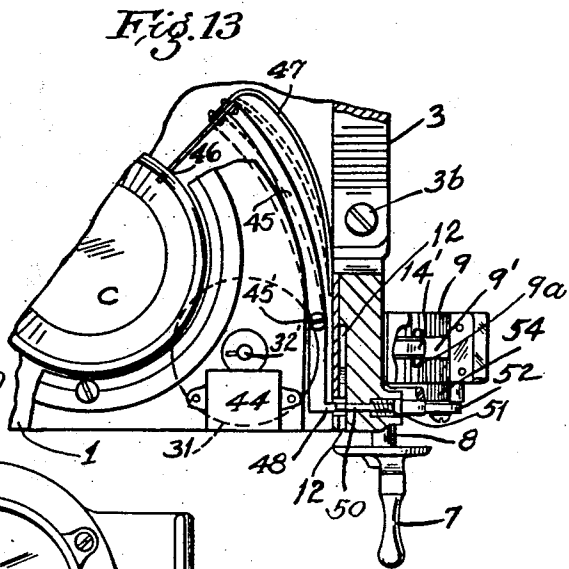
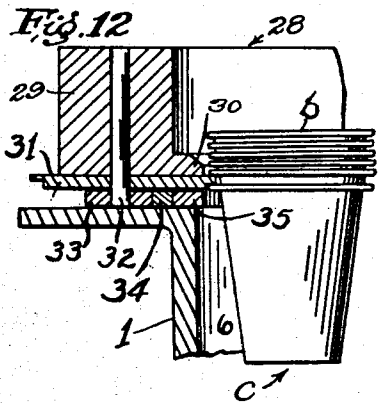


Fig. 11

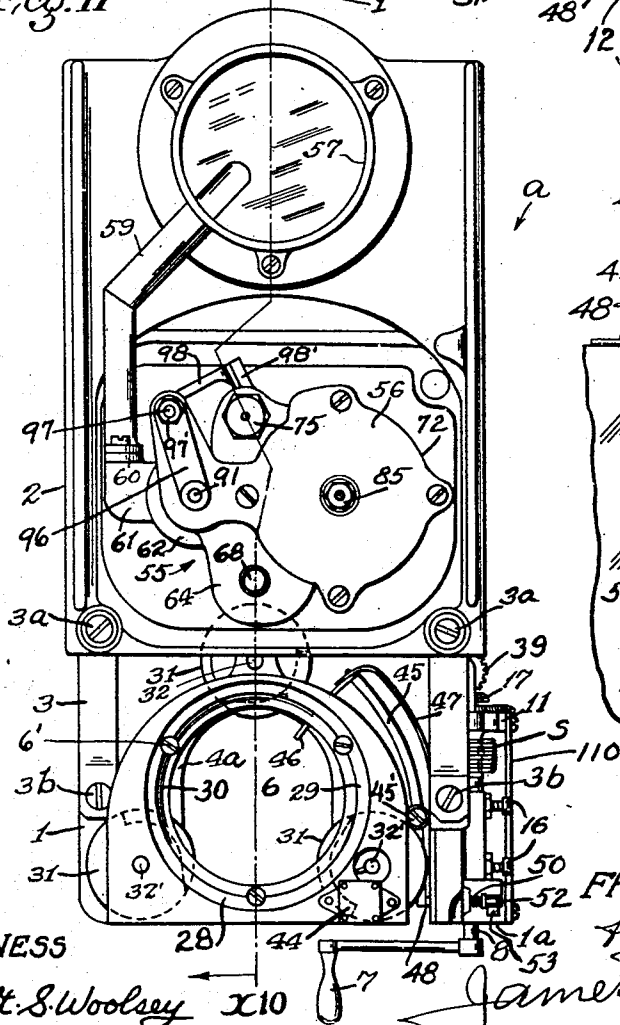
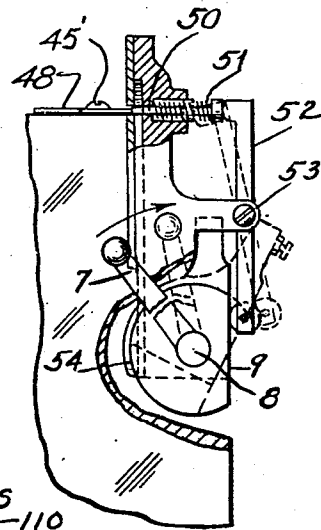


Fig. 14



INVENTOR
FRANK A. MADDEN

WITNESS

Robt. S. Woolsey X10

James R. Townsend
his atty

July 5, 1932.

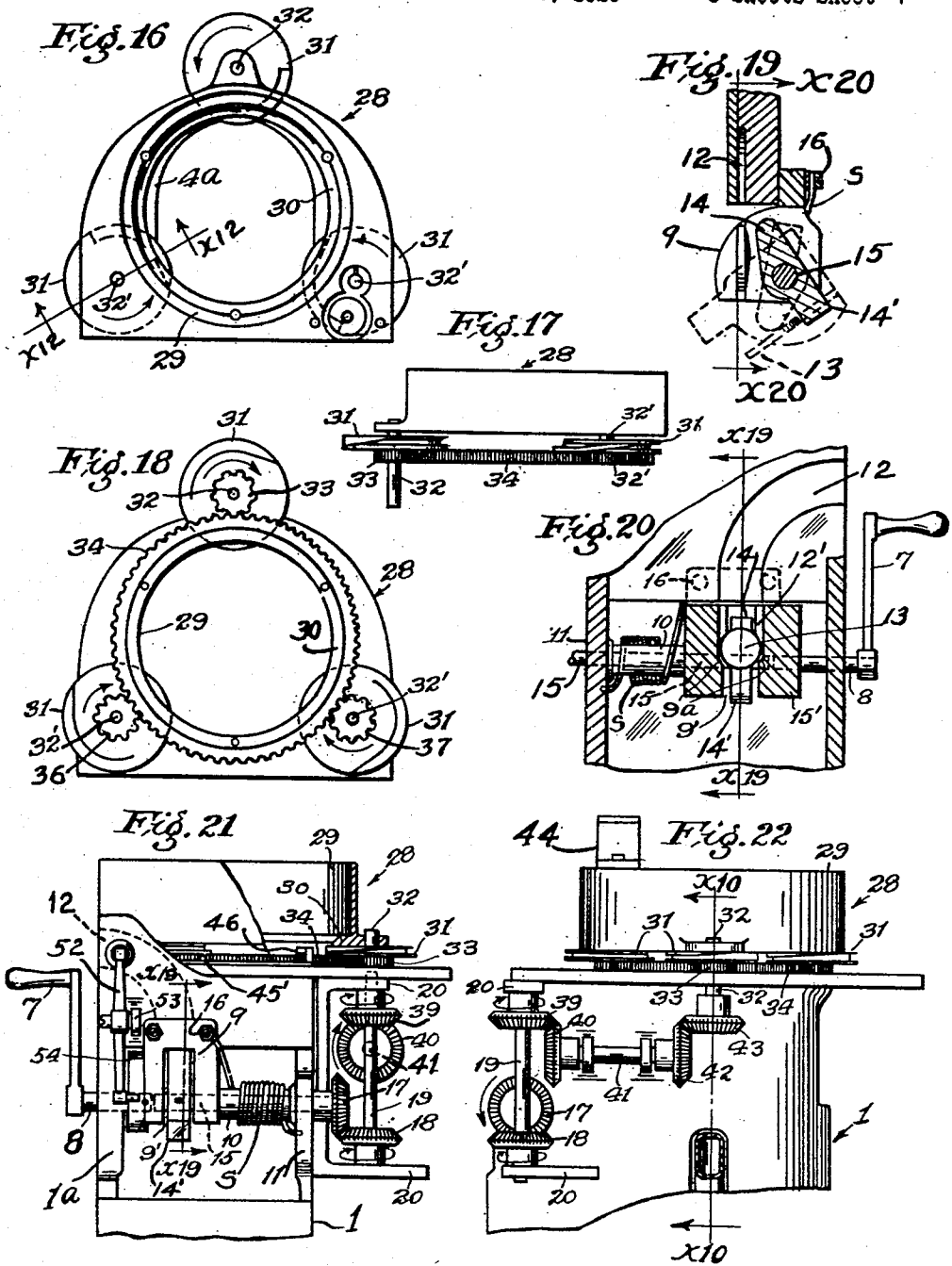
F. A. MADDEN

1,865,773

BEVERAGE DISPENSER

Filed Oct. 26, 1925

8 Sheets-Sheet 7



WITNESS
Robt. S. Woodsey

INVENTOR
FRANK A. MADDEN
by James R. Townsend
his atty

July 5, 1932.

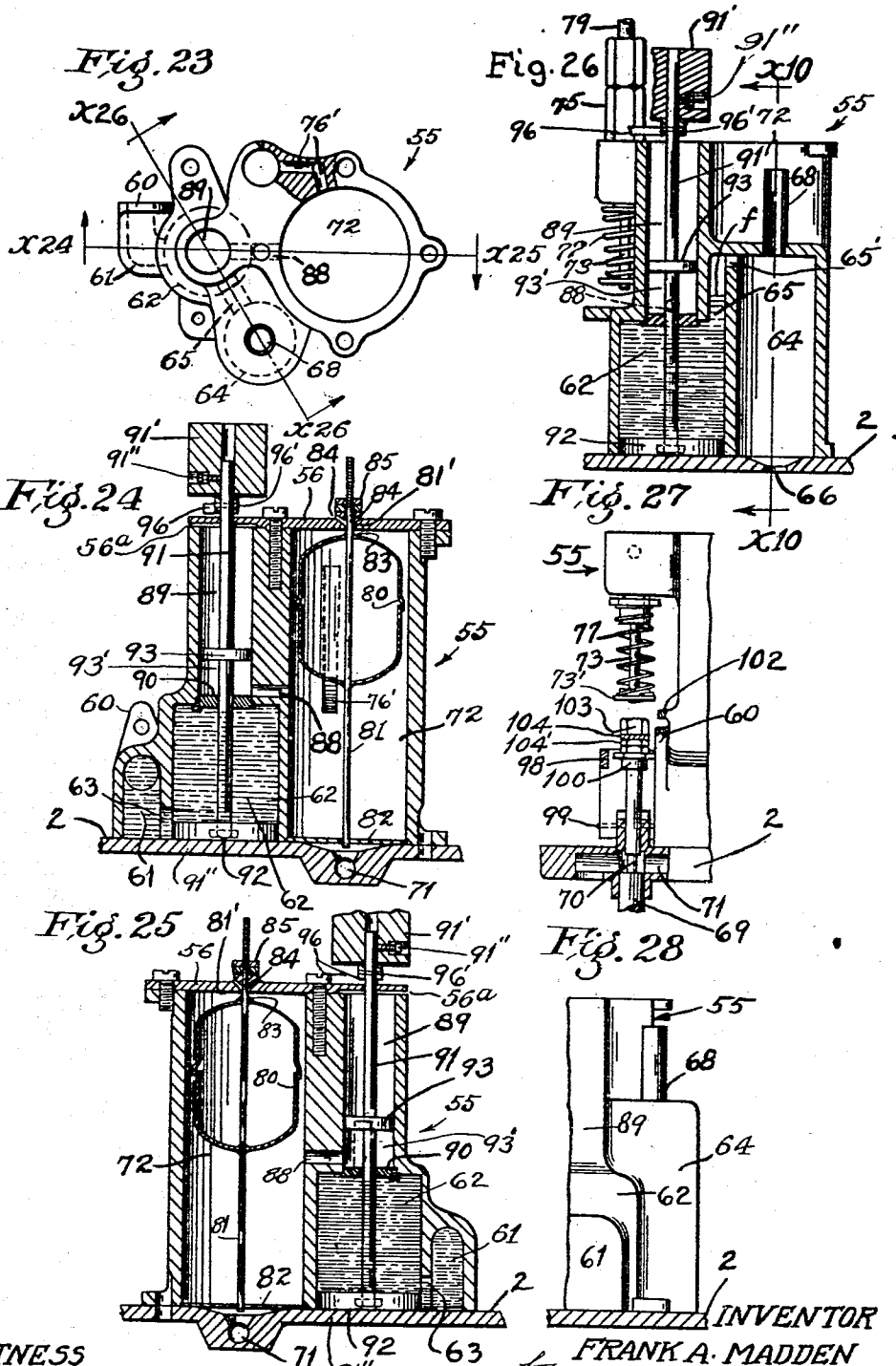
F. A. MADDEN

1,865,773

BEVERAGE DISPENSER

Filed Oct. 26, 1925

8 Sheets—Sheet 8



WITNESS
Robt. S. Woodsey

INVENTOR
FRANK A. MADDEN
James R. Townsend
his atty

UNITED STATES PATENT OFFICE

FRANK A. MADDEN, OF LOS ANGELES, CALIFORNIA

BEVERAGE DISPENSER

Application filed October 26, 1925. Serial No. 64,735.

This invention relates to the art of vending drinks consisting of a mixture of quiescent and effervescent liquids whereby a quiescent syrup and an effervescent liquid is so delivered to a cup that the drink vend-
5 ed will be fresh and not flat or stale.

In devices of this character, when carbonated water and syrup are properly cooled and then mixed together in a container, the
10 tendency of such liquids is to foam; and the amount of foam in the successive drinks dispensed, varies according to the gas pressure in the effervescent liquid used.

An object of this invention is to provide
15 a machine of this character that will dispense to a liquid container a requisite amount of liquids with due regard to the variations of pressure under which such liquids may be delivered, so that each charge of liquid deliv-
20 ered to the container, will, without exception, approximately fill the container to a predetermined level.

Another object is to make provision where-
25 by the liquid delivery mechanism may be adjusted so that the liquid delivered to the container will invariably be in such quantity as to practically fill the cup without overflowing.

A feature of this invention is a construc-
30 tion and arrangement of measuring mechanism which will be governed by gas pressure from the carbonated water to deliver a less amount of such water under high gas pressure than under lower gas pressures and
35 yet fill the containers when the water is not so highly charged with gas.

With this device the amount of carbonated
40 water delivered will be gradually increased as the gas pressure therein lowers so that the combined liquid, syrup and foam will at each operation just fill the container.

I have discovered that it is practicable
45 to combine the forces of gravity, atmospheric pressure and the pressure of gas from the effervescent liquid to accurately measure and deliver a predetermined charge of syrup, and to employ the buoyant force of the effervescent liquid in conjunction with the above-
50 mentioned forces to measure the effervescent

liquid and discharge it with the syrup, into a cup.

I have discovered that by filling with syrup a chamber that has an outlet at the top, and applying gas from an effervescent liquid
55 while the effervescent liquid is being discharged from its container into a measuring chamber, the syrup may be forced out of the syrup chamber in exact quantity and that the effervescent liquid discharged into
60 the measuring chamber therefor, may be so measured that the liquids and foam will when delivered to a cup, always practically fill the cup; there being a larger discharge
65 of the liquid, and less foam, when pressure of gas in the effervescent liquid is low, than when it is high.

An object of the invention is to serve full
70 cups without overflow irrespective of the variations of gas pressure in the effervescent liquid.

In this invention I provide a pressure
75 chamber having at the top a vent, and at the bottom a valved outlet, and connect the chamber through an inlet valve with a pressure tank containing carbonated water or other effervescent liquid under pressure; and I provide a float in the chamber to close the
80 vent when the effervescent liquid from the tank fills the chamber to a predetermined level, and also provide means adapted and arranged to be operated by the pressure in the pressure chamber when the vent and out-
85 lets are closed, to cause the inlet valve of said chamber to be closed and the outlet valve to be opened; and I also provide a pump operable by the pressure in the pressure chamber to supply syrup or other quiescent liquid for mixture with the effervescent liquid when the same is discharged from the chamber.
90

In this invention I provide novel means
95 whereby the vending operation of the machine is started manually and the force thus applied gives tension to spring means that continues the operation automatically and returns the automatically operated parts to initial or normal position.

An object of the invention is to provide a
100 novel vending machine of this character in which a single manual operation, will first

place a cup in position to be filled and made available for use, and second, will properly measure a syrup and effervescent liquid to mix a drink and deliver such syrup and liquid to the available cup without overflowing the cup.

I have provided a cup and beverage machine which may be used as a semi-automatic vending machine for saving the time of soft-drink dispensing clerks.

A feature of this invention is that at each operation of the machine, an amount of liquid under pressure is dispensed into a cup that is made accessible to the operator and is uniformly filled, responsive to the variations of gas pressure in the liquid delivered.

The invention is broadly new, basic and pioneer in that the machine is only started into operation by a predetermined movement of a hand crank which may be at once returned to initial position while the drink is being delivered and mixed; and the crank is then free to be operated, or left at rest.

In this invention provision is made whereby the crank may be freely oscillated after any operation of the machine, without again operating the machine, unless connection between the crank and the operating mechanism is made by an inserted member which is displaced from its operative position when the crank passes a certain position, and such inserted member is then displaced positively by spring actuated means.

The connecting element may be a coin and a further feature consists in means to bar admission of a coin, except when the hand crank is in initial or normal non-operative position.

An object is to keep the machine from becoming untidy through accumulations of drip from the discharged drink.

An object is to positively discharge the coin into the receptacle therefor when it has served its purpose of forming a suitable connection to set the vending machine in motion.

A feature of the invention is the employment of the coin to tension a spring the force of which serves to knock the coin out of its carrier before the vending mechanism delivers a cup or a drink.

Another object is to retain the coin in operative position until the vending mechanism has been started into operation.

Objects are to avoid dependance upon the weight or the impact of either liquid or upon any lever or levers or other mechanism actuated by such weight or impact to determine any operation of the machine; and to utilize a float valve lifted by the effervescent liquid charge to close the gas vent; and to then utilize the pressure in the pressure chamber to discharge the syrup and to release the valve that controls the flow of effervescent liquid from the drum or tank to the pressure cham-

ber and to open a valve to permit the flow of such effervescent liquid from the pressure chamber; and in carrying out the invention I provide a syrup fountain so connected with the syrup measuring chamber as to normally keep such chamber nearly full without back pressure, so that the work of discharging the charge is minimized, and leakage is avoided.

Other objects, advantages and features of invention may appear from the accompanying drawings, the subjoined detailed description and the appended claims.

The invention includes the cup and drink vending machine and the parts and combinations of parts hereinafter more particularly described and claimed.

The principle of the invention may be carried out in various ways and the invention is not confined to details of construction.

The accompanying drawings illustrate the invention in the form deemed most desirable.

Figure 1 is a broken front elevation of a dispensing machine constructed in accordance with this invention with a filled cup ready for delivery and the crank returned to position for starting another operation. Broken lines indicate the position of the crank at the coin dislodging instant.

Fig. 2 is a broken side elevation of the machine looking from the left in Fig. 1 and showing a fragment of the case. A portion of one side wall of the frame is broken to expose the cup passage; broken lines indicate mechanism outside the other wall.

Fig. 3 is a plan of one of the three cup-feeding disks.

Fig. 4 is an elevation of the rear cup-feeding disk.

Fig. 5 is an elevation of one of the front cup-feeding disks.

Fig. 6 is a side elevation looking from the right in Fig. 1.

Fig. 7 is a sectional view on line $\alpha 7$, Figs. 6 and 8, showing in plan the cam wheel and its ratchet.

Fig. 8 is an enlarged fragmental view showing a detail edge elevation of the cam wheel and its connections.

Fig. 9 is a fragmental detail viewed from lines $\alpha 9$, Figs. 7 and 8 showing the ratchet.

Fig. 10 is a sectional view taken on irregular line $\alpha 10$ — $\alpha 10$, Figs. 1, 11 and 22, omitting the pressure liquid pipe and other parts.

Fig. 10a is an enlarged fragmental detail in vertical axial section, of coin holding tension mechanism mounted between the tappet and the cam.

Fig. 11 is a plan view of the machine with most of the parts in the position shown in Figs. 1, 2, 6 and 10, omitting the filled cup shown in Fig. 1.

Fig. 12 is a fragmentary sectional view of the cup dispenser with cups in place, viewed from line $\alpha 12$, Fig. 16.

Fig. 13 is a fragmental plan view of the

crank, the crank controlled coin-slot guard, the cup-retracted coin-slot guard, and a cup holding the cup-retracted guard, retracted. Dotted lines indicate the position of the cup-retracted guard when the cup supply is exhausted. A modified form of crank is shown.

Fig. 14 is a fragmental front elevation showing the crank and the crank controlled coin-slot guard, and a fragment of the cup-controlled coin-slot guard; the frame is broken to show the crank cam and the coin carrier; solid lines show the crank at rest and the crank controlled coin-slot guard withdrawn; broken lines indicate the crank started to turn, and the crank controlled coin-slot guard in slot guarding position.

Fig. 15 is a fragmentary elevation partly in section to illustrate the device for discharging the effervescing liquid such as carbonated water or other pressure liquid; broken lines indicate the position of parts for releasing the pressure valve.

Fig. 15a is a horizontal section on line $\alpha 15a$, Fig. 15.

Fig. 15b is an enlarged fragmental detail of the pressure liquid delivery valve in section on line $\alpha 15b$, Fig. 15.

Fig. 15c is a fragmental elevation of the cylinder head showing the pressure liquid inlet valve and the means for operating said valve.

Fig. 16 is a plan view of the cup dispenser.

Fig. 17 is an elevation showing the left side of the cup dispenser shown in Fig. 16.

Fig. 18 is a view looking up at the bottom of the cup dispenser mechanism shown in Figs. 16 and 17.

Fig. 19 is a fragmentary vertical section on line $\alpha 19$, Fig. 20. Broken lines indicate the position of parts the moment before the knock-out tappet is sprung to eject the coin from the coin carrier.

Fig. 20 is a fragmentary vertical section on line $\alpha 20$ — $\alpha 20$, Figs. 1 and 19.

Fig. 21 is a fragmentary right side elevation of the forward end of the machine; parts are broken away to show interior construction.

Fig. 22 is a fragmentary rear elevation of the forward end of the machine, looking from the right side of Fig. 21, and from a plane indicated by line $\alpha 22$ in Fig. 10.

Fig. 23 is a broken plan view of the frame of the measuring device omitting the cover and movable parts, and tracing the passages therethrough for the pressure fluid and syrup.

Fig. 24 is a vertical section on line indicated at $\alpha 24$ — $\alpha 25$, Fig. 23, looking in the direction of the arrow at $\alpha 24$ with the cover and movable parts in place.

Fig. 25 is a vertical section on line $\alpha 24$ — $\alpha 25$, Fig. 23 looking in the direction of the arrow at $\alpha 25$, with the cover and movable parts in place.

Fig. 26 is a vertical section on line $\alpha 26$ — $\alpha 26$, Fig. 23, with movable parts in place, but omitting the valve unlocking rod and part of the arm for operating it.

Fig. 27 is a fragmentary side elevation partly in section showing the spring mounting for closing the pressure valve.

Fig. 28 is a fragmentary side elevation of the same, looking in the direction of the circle arrow 28, in Fig. 25.

It is intended that in common use the machine a will preferably be housed in a cabinet K, not necessary to be shown herein, and that only part of the front of the machine will be exposed to view, while the remainder of the machine is covered by the cabinet to prevent tampering with or injury to the machine proper.

For the purposes of this description it will be assumed that the drink to be vended shall consist of two components; viz., a syrup flavoring and a charge of carbonated water mixed therewith, the carbonated water being delivered under pressure from a high pressure tank or drum to a pressure chamber from which it is finally discharged into a cup with the syrup.

The cast metal frame of the machine is shown as comprising base and top members 1 and 2 connected by struts 3 at either side spaced apart and secured to said base and top by cap screws 3a, 3b.

The base casting 1 is provided with a recess 4, which is open at the front side and has a horizontal U-shaped forwardly open lip 4a on which the cup in which the drink is to be vended is hung to receive the drink.

A cup 5 and spout 5' to take care of any drip, and a chute 5'' through which to drop the used cups, lead from the frame 1 to suitable receptacles not shown.

The casting 1 is also formed with a vertical passage 6 opening down to the recess 4, and through which the cups are delivered one at a time from a magazine above to the lip 4a, by cup dispensing means, when the machine is operated to vend the drink.

The manually operated actuating mechanism comprises a hand crank 7 fixed to a horizontal shaft 8 that is journaled in a rib 1a at one side of the base casting 1 and projects from the rear face thereof, and that is there provided with a coin carrier 9 rigidly fixed to the crank shaft 8 by a pin 8' and to a bearing 10 that extends to a rib 11 of the frame.

12 is a coin slot open to the front of the frame and of just the cross section to receive and conduct a coin of the denomination required to pay for one of the drinks to be vended.

The coin carrier 9 is preferably U-shaped and the open space 9' between the limbs of the U is of less width than the coin slot 12.

In the inside faces of the limbs of the U,

grooves 12' are cut to continue the coin slot downward, and these grooves are adapted at their lower ends to unitedly form a coin seat 9a to seat a coin 13 to bridge the open space between the limbs of the U to bear against and operate a lug 14 and retract a tappet 14' when the crank 7 is turned for the purpose of operating the vending mechanism.

The lug 14 and tappet 14' are fixed to, and extend on opposite sides of, a transmitting shaft 15 that is journaled in both limbs of the carrier 9, and also in the bearing 10 and in the rib 11.

A coil spring S is arranged to yieldingly hold the coin carrier against the outside of the frame member 1 in position to receive from the coin slot 12 a coin 13 to bridge the space 9' and operate the lug 14 to turn the shaft 15, to which the lug 14 is fixed by pin 15'.

Said slot 12 is formed in the frame member 1, and extends from the front face of said member to deliver a coin into the coin seat 9a in the coin carrier when said carrier and other parts of the machine are in coin receiving position.

When there is no coin in the coin seat 9a the crank 7 may be oscillated almost throughout one revolution and the carrier stops against the frame at each end of its arc of travel.

The spring S returns the carrier with considerable force to its stop on the outside of the frame, and there is likely to be more or less battering of the frame or the carrier, thus misaligning the seat with reference to the slot, and to correct this difficulty adjustable stop lugs 16 in the form of screws are threaded through the carrier to engage the frame so that when the contacting surfaces become battered the coin seat may be again aligned with the slot by screwing the stops further through the carrier, thus to cause the carrier to stop in position to receive the coin from the coin slot.

When the coin slot 12 is unobstructed and a coin of required size is dropped thereinto such coin passes down into the coin seat 9a and then upon oscillation of the crank, the coin engages and swings the lug 14 around, thus transmitting motion to the shaft 15, thereby revolving a bevel gear 17 which is fixed on the inner end of the shaft 15.

The bevel gear 17, meshes with a gear 18 fixed to a vertical shaft 19, which is journaled at the rear of the base member 1 in ears 20, projecting from said member, and is connected to operate the cup delivering mechanism detailed in Figs. 16, 17, 18, 21 and 22.

A gear 21 meshes with the gear 18 and is fixed to one section 22 of a horizontal shaft which is formed of two torsionally connected sections 22, 22'. A revolvable member in the

form of a cam wheel 23 is fixed to the section 22' and is arranged and connected to close the pressure liquid outlet valve and open the pressure liquid inlet valve and to complete the operation of the cup delivering mechanisms.

The lug and tappet 14 and 14', vertical shaft 19, the cup delivering means, and the cam wheel 23 are thus connected for coordinate operation.

A master spring preferably formed of two coils as at 27, eccentrically connected by crank pin 27' to the revolvable member 23 holds the cam wheel 23 normally in a predetermined position, and the operation of the lug 14 by the coin is against the resistance of said master spring and such resistance affords a friction on the coin that tends to hold the coin in the coin seat while operating the lug. The coin enters the coin seat from above, and when the coin carrier is revolved sufficiently to invert the coin seat, the coin would drop out if it were not for the friction caused by the resistance of spring 27, which is given tension by revolution of the cam 23; and when the cam crank pin 27', by which the master spring 27 is eccentrically connected to the cam 23, comes to dead-center as the spring swings across the axis of the cam, the resistance of the master spring to the advance of the lug under the pressure of the coin carried by the coin carrier is so reduced that the friction on the coin would be insufficient to uphold the coin, and the coin would drop out of the inverted coin carrier, thus leaving no connection between the coin carrier and the cam 23, so that the operation of the machine would not be carried on.

To overcome this difficulty, the cam operating shaft is made in the two aligned sections 22 and 22' and these sections are connected to each other by a torsion coupling comprising an intermediate spring 22a the ends of which are fixed to the sections 22, 22', respectively, by means of sleeves 22b and 22c.

Said intermediate spring 22a is of such strength that when it is put under tension by the resistance of spring 27, as it approaches the dead center position, the reaction of such spring against the lug is sufficient not only to frictionally hold the coin until the dead center position is reached, but also to suddenly thrust the cam wheel onward after the spring passes the dead center; and the moment the spring 27 passes such dead center, it is operative to instantly turn the revolvable member or cam 23 to normal or initial position where it comes to rest and is held in such initial position by the tension of the spring 27.

The intermediate spring 22a is so adjusted by means of said screw *d* in the collar *e* on the coupling sleeve 22b which is fixed by pin *f* to the shaft member 22 that the tension of spring 22a will be sufficient to accomplish the results above set forth. The cam 23 when re-

turned to normal position also returns the gears 21, 18 and 17 to a pre-determined normal position and the lug 14, being fixed to shaft 15 which is fixed to gear 17, will be positioned so that lug 14 will be just in front of the coin seat 9a in order that a coin may be easily received in said seat.

When the spring 27 passes the dead center and spring 22a returns to normal position, the lug 14 is withdrawn from the coin so that the coin is free to drop by gravity from the coin seat 9a. Further movement of the cam 23 by spring 27 revolves shaft 15 and moves the tappet 14' against the coin to positively knock the released coin out of the coin seat in the event the coin has not previously fallen therefrom by gravity.

The shaft member 22 is journaled at one end in a block 24, and the other member 22' is journaled in a bearing 25 depending from a casting 26 secured to the bottom of the casting 2.

The spring 27 secured to the eccentric cam pin 27' on the cam wheel 23 and to the frame, yieldingly holds said wheel 23 and its connections at the rest position, and it not only operates the tappet to eject the coin, but also operates means to dispense cups to receive the drinks.

The crank is only oscillatable and stops short of a complete revolution, as indicated in Figs. 1 and 19; and the gears 17, 18, 21 are so arranged that the cam wheel 23 can be turned to a point somewhat more than 180° from rest by operation of said crank and before the crank reaches the limit of its movement the cam wheel and the tappet are automatically caused by reaction of spring 27 to complete a full revolution and return to rest and to perfect the vending of the cup and drink.

The cup dispensing device comprises a magazine 28 mounted on and stationary to the casting 1 and having a circular cup-way 29 above and axially aligned with the passage 6, and having a chamfered internal flange 30 below which thin mutilated worm rimmed or peripherally threaded revolvable cup feeding disks 31, are arranged to support a stack of nested cups C in the magazine. Said disks are mounted on shafts 32 and 32' and are arranged to be revolved relative to the magazine. They are arranged with their spiral peripheries projecting into the cup-way 29 to unitedly support the rim flange of the lowermost cup at one part of the revolution and the spiral peripheral grooves in said disks are adapted to receive the rim flange of the lowermost cup and move such rim down and thus cause the cup to drop into the vertical passage 6 when the disks are turned to the appropriate position for supporting the next cup rim.

Preferably there are three of such disks symmetrically disposed, as shown, and in

fixed relation to respective operating gears.

A gear 33 and its disk 31 are in fixed relation to shaft 32, and the gear 33 meshes with an annular gear 34, which is journaled on a depending collar 35 on the flange 30 and is initially revolved by power applied through the hand crank 7. Disk gears 36 and 37 are fixed to the other disks and mesh with the ring or annular gear 34 to be revolved thereby; so that all three disks revolve alike when the shaft 32 is revolved.

As shown in Fig. 12, the cups C have flanged rims b' and are nested one within another in the chamfered flange 30, with the flange b of the bottom cup resting on the disks 31. As these disks rotate, their threaded peripheries receive and engage the flange b of the bottom cup and move it down until the cup drops through the passage and rests on the lip 4a in the recess 4, ready to receive liquid from the outlet 38 as will be hereinafter described.

The rotation of the disks 31 is effected through a train of gears comprising gear 39 fixed to shaft 19, and meshed with gear 40 that is fixed to shaft 41, to which is fixed gear 42 that is meshed with gear 43, fixed to shaft 32 which turns gear 33 that revolves annular gear 34, by which the disk gears 36 and 37 are revolved. When the crank is turned, with coin in place, the shafts 19 and 41 will be turned, and also the gear 43 and thus revolve the annular gear 34, and the disks 31 will be simultaneously rotated to dispense a cup. The cam wheel 23 on shaft member 22' is turned through an arc to stretch the spring 27 which instantly completes the revolution of the shaft 22, when the spring passes dead center.

A counter 44 is operatively connected to one of the shafts 32'; and records the number of cups dispensed by the machine, and therefore the number of times it is operated.

Means are provided to prevent the insertion of a coin when the supply of cups is exhausted, and such means comprise a spring actuated coin stop operating arm 45 that is pivoted intermediate its ends at 45' and is provided at one end with a part, as finger 46 constructed and arranged to be pressed against the rim of a disk supported cup by a spring 47 that tends to insert a stop 48 mounted at the other end of arm 45 into the coin slot 12 at a point close to the front of the frame so that when the stop is in the hole it will prevent the insertion of a coin far enough into the slot that the coin cannot be withdrawn by the operator.

In this way when the last cup is dispensed from the stack so that it is removed from the part 46 of the device, the spring 47 acts to move arm 45 to insert the stop 48 and prevent loss of a coin by an intending customer.

The friction of the finger 46 on the rims of the cups would prevent the cups from moving down, and it is necessary to withdraw the finger from the cups during the operation of dispensing a cup, and this is effected by a pin 49 normally retracted by a spring 51, and adapted to be inserted into slot 12 through a hole, and into engagement with the stop 48 to push said stop back to oscillate arm 45 and retract the finger 46 from the cup; a lever 52 fulcrumed to the frame at 53 is operable by a cam 54 fixed to the crank-shaft 8, to push the pin 50 into the finger retracting position after a coin has been dropped into the coin carrier, and directly after the crank 7 has been moved to turn the coin carrier and the cup dispensing device. When the pin 50 has been moved into engagement with the stop 48 it has passed transversely through the coin slot 12 so that another coin cannot be inserted in said slot and also provides a means for requiring the handle 7 to be in initial position when a coin is inserted and thereby assures correct positioning of the coin carrier relative to the slot 12 when the coin is inserted.

The cam 54 extends around the axis of the shaft 8 sufficiently to hold the lever 52 and pin 50 in finger retracting position throughout all except a limited initial arc of the crank oscillation, so that while the cup feeding disks 31 are lowering the cup, the finger 46 is held retracted from the path of the projecting cup rim, but when the crank is returned to its initial position shown in solid lines in Figs. 1 and 14, the spring 47 again presses the finger 46 against a cup, and the stop 48 is withdrawn from the coin slot so long as cups are in the cup receptacle, and when the cam 54 is withdrawn from the lever 52, the spring 51 withdraws the pin 50 from the coin slot 12 leaving said slot free for the insertion of another coin.

The drink measuring and dispensing mechanism is contained in and supported by a hollow casting 55 having a cover plate 56, and which is secured to the top member 2 of the machine frame, and the top of which forms a bottom for said hollow casting.

A fountain or tray 57 is provided on the casting 2, and a jar 58 is inverted thereon, and may contain a liquid syrup, flavoring or similar substance to be mixed with another liquid or liquids. A tube 59 leads from the tray 57, and is secured to the casting 55 by screws threaded into flanges 60, and said tube opens into an intake chamber 61 that opens into a measuring chamber or pump cylinder 62 through a passage 63 at the bottom of said chamber and cylinder, and the pump cylinder communicates with an outlet chamber 64 through a duct 65 and port 65' adjacent the top of said outlet chamber 64, which has an outlet at its bottom through hole 66 that aligns with a tube 67 formed in the cast-

ing 26. A vent 68 at the top of chamber 64 admits air to prevent syphoning of liquid from the jar 58.

A rod 69 having a valve 70 thereon extends through the castings 26 and 2, and has at its lower end an anti-friction roller 69' that rests on the cam wheel 23 to ride the cam and be raised thereby while the wheel is rotated part way or during the spring tensioning portion of its revolution; and to cause the valve 70 to temporarily close the passage 71, which leads from the bottom of a pressure and float chamber 72 into the expansion chamber 71' in the casting 26. Near the top of its upward stroke and after the valve 70 is seated and the cam 23 is moving during the spring retracting portion of its revolution, the valve stem 69 lifts a valve stem 73, and unseats a pressure liquid inlet valve 74, and permits the pressure fluid to flow from the fitting 75, through the cage 76 and slot 76' into the chamber 72, while the outlet 71 is closed by valve 70.

A pressure tank or drum 78 containing effervescent pressure liquid such as carbonated water, is connected to the fitting 75 by a suitable pipe 79, so that when valve 74 is opened the chamber 72 is supplied with a charge of pressure liquid.

A spring 77 around the stem 73 tends to normally seat the valve 74. The outlet passage 71 from the pressure chamber 72 must remain closed while the pressure fluid is filling said chamber and until the liquid lifts the float 80 therein and a stem 81 fixed thereto until said float closes a vent hole 81' in the cover 56 and until sufficient pressure is obtained in the pressure chamber to operate the syrup dispensing mechanism as will be more fully hereinafter described. Said stem 81 extends through the hole 81' in the cover and is guided by said cover and by a spider 82 in the bottom of chamber 72. The float 80 has a slight movement to cause a valve 83 on the upper end of the float to close and open the vent at the hole 81', which communicates with diverging vent holes 84 to allow free escape of gas until the float 80 and the vent valve 83 are lifted by the pressure liquid to close the vent when the pressure chamber 72 has received the required charge of effervescent liquid.

Jam-nuts 85 screwed onto the float stem 81 are adapted to normally rest on cover 56 and to support the float close to the top of the chamber 72, so that only a slight lifting of the float is required to cause the valve 83 to close the vent holes 84.

The chambered body formed of the casting 55 is provided with a bore 86 threaded to receive a nipple 86' and adapted to receive the valve seat bushing 87 having at its upper end the cage 76, and provided with outlets 87'; and the valve stem 73 extends down through the cage 76 and bushing 87, which is provided with a gland 87'' that is shouldered

to receive the thrust of the spring 77, which operates between the shoulder of the gland 87'' and the collar 73' fixed to the valve stem 73.

5 When the valve 74 is opened, the efferves-
cing liquid from the drum 78 flows through
the slot 76' into the float chamber 72 until
shortly after the float 80 is raised sufficiently
to cause the valve 83 to close the vent holes
10 84; and the pressure in the pressure chamber
is communicated through a port 88, Figs. 24
and 25, into a cylinder bore 89, that is axially
aligned with and is of less diameter than the
pump cylinder or syrup chamber 62.

15 A cylinder head 90 at the lower end of the
bore 89 prevents the pressure in bore 89 from
flowing into the syrup chamber 62 and a piston
rod 91 extending through such cylinder
head is provided below such head in the syrup
20 chamber 62 with a syrup lifting head 92,
which normally rests with its top below
the top of the syrup inlet 63; and said head
is submerged in syrup to the lever *f* of the
fountain tray 57.

25 A pressure operated syrup pump piston 93
is fixed to the rod 91 above the port 88 which
opens into the bore 89, and a weight 91' is
provided on piston rod 91 so that normally
the syrup piston 92 is submerged in syrup;
30 and as the pressure in the bore 89 becomes suf-
ficient, it raises the piston 93, rod 91, weight
91', and piston 92; and the syrup above pis-
ton 92 in chamber 62 is thus forced out
through duct 65 and port 65' and flows into
35 chamber 64 and thence through hole 66, and
tube 67 into the mixing tube or outlet 94,
which extends from the expansion chamber
71' through a hole 95 in the rear of the cast-
ing 1, and delivers the fluids through the out-
40 let spout 38 into the cup previously delivered
to and resting on the lip 4a.

The tube 94 is so steeply aslant that the liq-
uids discharged thereinto will flow out of the
spout 38 with sufficient velocity to shoot over
45 into the cup C, but the spout terminates suf-
ficiently behind the front rim of the drip cup
to allow any drops which may drip from
the end of the spout to fall into the drip cup
5 and drain out through the drain 5' without
50 smearing the lip 4a or the rim *b* of the cup.

The pressure liquid outlet valve-lock re-
leasing arm 96 fixed by pin 96' to the rod 91,
is movable up and down by said rod 91 and
is adapted to lift the outlet valve releasing
55 rod 97, which is provided with an adjustable
stop formed by nuts 97' on said rod 97.

Said stop is normally spaced from the arm
96 as indicated in Fig. 2 so that when the power
piston 93 is operated by pressure from the
60 chamber 72, the arm 96 will operate with lost
motion to lift the rod 97 at the end of a mea-
suring stroke of the syrup pump piston 92.

The rod 97 has a collar or tappet 97a which
is adapted and arranged to lift the operating
65 arm 98 of the rocking valve lock which is

pivoted at 99 to the casting 2 adjacent the
valve rod 69. Said rod 69 is provided with
a shoulder 100 under which the lock limb 98'
of the valve lock may be moved by the spring
101 when the valve rod 69 is elevated by cam
23 to cause the valve 70 to close the outlet 71
70 as shown in Fig. 15.

When the arm 98 and its lock limb 98' are in
locking position, as indicated in Fig. 15, the
valve rod 69 and valve 70 are held to posi-
75 tively close the outlet 71; and when the arm
96 lifts the rod 97 and its tappet 97a to the
position indicated in Fig. 15c, the valve rod
69 is free to be lowered.

The unlocking rod 97 is guided in the cover 80
56 and the guide 102 which is stationary to
the casting 55, and the spring 101 operates
between the guide 102 resting against the
arm 98 and a washer 102' under the spring
101 to normally force the lock into locking
85 position. 103 is a nut on the rod 69 to clamp
a bracket 104 onto the set nut 104' on said
rod 69. Said bracket is slidable up and down
on the rod 97 so that when the rod 97 is forced
up by pressure on the piston 93 from cham-
90 ber 72 the spring 105 on the unlocking rod
97 acts through the bracket 104 after lock
98' is released to force down the valve rod
69, thus to open outlet 71 from the pressure
chamber and permit the liquid therein to
95 flow by gravity into the expansion chamber
71'. The roller 69' is thus brought to rest on
the cam wheel 23 and the parts remain in the
position shown in Fig. 15c until another op-
eration of the crank serves to turn the cam 23
100 and again lift the rod 69, the valve 70 and
valve 74.

The moment the rod 69 is lowered, its head
103 is withdrawn from the valve rod 73, thus
allowing the valve 74 to close and remain
105 closed and the valve 70 to be opened by spring
105 and to remain open until another opera-
tion of the cam wheel 23 has occurred, where-
upon the operation just described will be re-
peated.

The adjustment of the set nuts 97' deter-
mines the lift of the syrup piston and enables
the operator to predetermine the amount of
syrup to be delivered at each operation of the
110 machine.

This enables the operator to properly pro-
portion the syrup to the water so that syrups
of various degrees of concentration may be
used. The chamber 62 is of larger dimen-
120 sions than the amount of syrup usually re-
quired for the charge of carbonated water
so that the regulation can be to either in-
crease or diminish the charge of syrup.

By experiment I have determined that
when the liquid is heavily charged with gas,
125 the actual liquid in the chamber 72 is so in-
creased in bulk by the presence of the liber-
ated gas therein, that the float will be lifted
by a less quantity of actual liquid in the
chamber 72 than when the pressure in the
130

supply drum or tank 78 is lower, and as the heavily charged water produces a greater amount of foam than the lower charged water, consequently by this method of cutting
 5 off the flow of charged liquid into the chamber by the pressure in the chamber, the amount of liquid and gas delivered to the cup along with the syrup and the resulting foam will in each instance fill the cup to the pre-
 10 determined height so that a full cup will be served at each operation.

The cylinder head 90 may be threaded into the power cylinder 89, the weight 91' is fixed to the piston rod 91 by set screw 91'' and
 15 the arm 96 is fixed to said rod 91 by set screw 96' so that by removing the casting 55 from the member 2 the parts can be easily disassembled.

The piston 93 by which the pressure from the tank 78 and chamber 72 is applied to pump a predetermined measure of the syrup and to release the valves to close the supply valve and open the outlet valve, is spaced above the pressure port 88 so that there is
 20 always a gas pocket 93' below the piston 93 thus to cushion the piston against the force of the liquid from the tank 78.

The cover 56 is recessed at 56a so that the chamber 89 is open to the atmosphere above
 30 piston 93 to permit easy reciprocation of the piston.

Ratchet means are provided to prevent retraction of the dispensing mechanism after starting until completion of its cycle. The
 35 same comprises wheel 23, and a ratchet wheel 106 integral therewith and a finger 107 pivoted at 108. Said finger is provided with a shoulder 109 that engages the teeth of said ratchet and prevents said ratchet and cam 23
 40 from revolving in a reverse direction. A weight 111 makes the finger 107 more positive in its engagement with said ratchet.

The pressure valve chamber 112 formed in the nipple 86' is supplied with effervescent
 45 liquid through a minute port 113 so as to cut down the flow of the pressure liquid on its way to the pressure chamber, and such valve chamber serves as an expansion chamber to allow the gas to expand on its way to the pressure
 50 chamber and to seat the pressure liquid inlet valve instantly when it is unlocked.

The operation of the invention is as follows:

A coin of the required denomination is
 55 placed in the slot 12 and runs down into the grooves 12' and seats in the seat 9a of the coin carrier and providing means for connecting the shafts 8 and 15, thus bridging the opening between the limbs of the coin
 60 carrier.

The crank 7 is then turned to the right in Fig. 14 and the coin engages the lug 14' and turns the sleeve 10, shaft 15 and gear 17, thereby turning the gear 18, its shaft 19, the
 65 gear 21 and its shaft 22, and, acting through

the spring 22a turns the shaft 22' and the cam wheel 23.

The oscillation of the crank 7 is sufficiently ample to turn the crank pin 27' in the direction of the arrows on and adjacent the cam
 70 wheel in Figs. 10 and 15, until the crank pin has swung down and past a vertical, not shown, drawn from the axis 22' of the cam wheel, when the manually tensioned spring 27 operates with a snap action to suddenly
 75 complete the revolution of the cam wheel to drive the gear 21 in the direction in which it was turned by the crank, thus completing the revolution of said gear 21 and the train of
 80 gears and shafts connected therewith.

When the cam wheel 23 has revolved to the top of the cam or tooth 23', the rod 69 has been lifted to such point that the shoulder
 85 100 is above the tip of the lock limb 98' of the locking rocker or support and the spring 101 acting on the arm 98 throws the top of the lock limb under the shoulder 100, thus holding the outlet valve 70 in closed position as shown in Fig. 17.

The snap action revolution of the gear 21
 90 operates the gear 17, shaft 19, gears 39 and 40, shaft 41, gears 42 and 43 and completes the revolution of the cup delivering wheels 31, so that when the cam 23 comes to rest, a cup C has been delivered so that it hangs
 95 by its rim b on the lip 4a.

When the cam is revolved from the normal position in which it is held by the springs 27, the periphery of the cam lifts the roller 69',
 100 the rod 69 and the valve 74 against the pressure of the pressure liquid in the pipe 79, thus allowing the pressure liquid to flow through the slot 76' into the chamber 72, while the outlet 71 from such chamber is closed by
 105 the lifted valve 70.

As the liquid rises in the pressure chamber and after the vent holes 84 are closed by the float 80 the pressure in chamber 72 is communicated through the port 88 into the bore
 110 89 and lifts piston head 93 and the pump piston 92 which in turn lifts the syrup in the syrup chamber 62, thus forcing the syrup up through duct 65 and through port 65', until a charge of syrup has been delivered to syrup
 115 outlet chamber 64 from which it flows by gravity through the port 66 and pipe 67 into the conduit 94.

At the close of the upward movement of the piston 93 and its rod 91, the arm 96 is carried
 120 upward by the rod 91 and acting against the stop 97', lifts the rod 97 and collar 97a which lifts the arm 98 and rocks the valve lock on its pivot 99 and this withdraws the lock limb 98' from under the shoulder 100 which is normally supported by the lock limb.
 125

The effervescent liquid from the supply tank 78 is normally so highly charged with gas that it is necessary to allow a portion of the gas to escape from the pressure chamber in
 130 order to establish a sufficient charge of liquid

in the pressure chamber to afford requisite water for the drink, which is ordinarily in the proportions of about five ounces of water to one ounce of syrup, and therefore, I make provision in the form of the vent holes 84 to permit escape of some of the gas.

The inlet 63 into the pump cylinder extends from the bottom of said cylinder to a sufficient clearance above the top of the pump piston 92 to allow the up-thrust of the piston to cut off the inlet with sufficient quantity of the liquid above the port to supply the maximum amount of syrup for a drink, and the upward travel of the piston being limited by the position of the stop formed by the nuts 97', the amount of syrup expelled from the pump cylinder and caused to overflow through the port 65' can be accurately determined by adjusting said nuts.

When the pressure below the power piston 93 is relieved by opening the outlet valve 71 at the bottom of the pressure chamber, the piston rod 91 and the pump piston head 92 are lowered by gravity, and the weight 91' assures completion of this operation. The piston head 92 is allowed to descend because the syrup which has flowed from the fountain into the space underneath the pump piston, flows back toward fountain 57 during the descent of the pump piston head and returns again to cover the piston with the syrup flowing from the fountain to fill pump cylinder 62 to the level *f* as shown in Figs. 24, 25 and 26.

The charged water from pressure chamber 72 is emptied into expansion chamber 71' so that the water delivered from chamber 72 will be retarded before flowing into the conduit 94 until the gas pressure in chamber 72 is relieved and the water permitted to flow by gravity from the chamber 71'.

The liquids flowing down the conduit 94 are mixed therein and projected over the drip cup into the cup C where they are finally mixed by the force of the discharge; and any drip from the spout 38 falls vertically into the drip cup 5 so as to avoid smearing the drinking cup.

An advantage of my device is that the piston rod 91 when moved upwardly by the pressure in the pressure chamber through the cylinder head 90 into the bore 89 will be thoroughly cleansed by the water from the chamber 72 entering the bore 89, and thus remove any syrup that may have adhered thereto and passed through the cylinder head 90.

The pressure in bore 89 also exerts a force around the rod 91 at the opening in head 90 where said rod passes through the head and tends to prevent the syrup from being pulled through such opening with the bore 89.

I claim:

1. A drink vending machine comprising a conduit; means for supplying one component

of a drink for delivery to a cup; means for supplying another component of the drink for delivery to the cup; a shaft and connection for causing the operation of both of said supplying means to produce a mixed drink, and a spring connected externally to the shaft and arranged so that as the shaft is revolved part way the spring is going past a dead center; and cup delivering means operable by the shaft after the spring passes the dead center to deliver a cup to receive the drink.

2. The combination with a chamber provided with an outlet and adapted to receive liquid under pressure, a pressure liquid inlet valve to deliver pressure liquid to said chamber, means to hold the inlet valve closed, an outlet valve adapted to close the outlet of said chamber, means operable with said outlet valve to open the inlet valve, a cam wheel adapted to cause the outlet valve to close and to cause the inlet valve to open; and means set in motion by pressure from the pressure chamber to close the pressure liquid inlet valve, and to open the outlet valve after the inlet valve has been closed.

3. In a drink vending machine of the character set forth, the combination with a pump cylinder having an inlet at the bottom and an outlet at the top, of a pump piston head having a thickness less than the height of the inlet, a fountain to supply the pump cylinder with liquid to a level below the level of the outlet, and means to raise the pump piston head to discharge liquid from the pump cylinder above the inlet, said inlet being arranged to allow liquid to by-pass at the inlet so that the piston may return to normal standing position.

4. A drink vending machine provided with an outlet; means to place a cup to receive liquid discharged from the outlet; means for supplying one component of a drink to the outlet; means for supplying another component of the drink to the outlet; revolvable means and connections for causing the operation of both of said supplying means to produce a mixed drink; a spring connected eccentrically to the revolvable means and adapted to receive tension during a portion of the revolution of the revolvable means and to be moved past dead-center by said revolvable means and to operate said revolvable means to complete a revolution thereof with snap action upon passing such dead-center, and means connecting the revolvable means with the cup placing means so that the cup will be placed in time to receive the discharge.

5. A drink vending machine provided with an outlet; means adapted to supply an effervescent component of a drink to the outlet; pump means adapted to supply another component of the drink to the outlet; a pressure chamber; an inlet valve to such cham-

ber; an outlet valve from the chamber; a revolvable means provided with a cam and connected to close the outlet valve and open the inlet valve; a spring connected eccentrically to the revolvable means and adapted to receive tension during a portion of the revolution of the revolvable means, and adapted to be moved past dead-center by said revolvable means and to operate said revolvable means to complete the revolution thereof and of said cam upon passing such dead-center; said cam being constructed and arranged to close the outlet valve during the spring tensioning portion of its revolution and open the inlet valve during the spring retracting portion of its revolution; means to retain the valves in the positions thus given said valves until the components of the drink are measured; and means operable by pressure of the effervescent component of the drink to close the inlet valve and open the outlet valve.

6. A drink vending machine provided with an outlet; means adapted to supply one component of a drink to the outlet; means adapted to supply another component of the drink to the outlet; revolvable means provided with a cam; a normally open outlet valve adapted to be closed by the cam to allow temporary accumulation of one of said components preparatory to discharging the same; a spring connected eccentrically to the revolvable means and adapted to receive tension during a portion of the revolution of the revolvable means and adapted to be moved past dead-center by said revolvable means and to operate said revolvable means to complete the revolution thereof and of said cam upon passing dead-center, said cam being constructed and arranged to allow said outlet valve to be opened when the cam is brought to rest by said spring and adapted to close the outlet valve during the spring tensioning movement thereof.

7. The combination with an outlet, of means adapted to deliver to the outlet a drink component; a pressure chamber having an inlet and an outlet; means composing a pressure closed inlet valve, to supply a liquid under pressure to said chamber; a normally open outlet valve for said chamber; revolvable means to close the outlet valve; and a spring connected eccentrically to said revolvable means and adapted to be put under tension by a part revolution of said revolvable means and to continue the revolution of said revolvable means when the line of tension of said spring passes the dead-center; said revolvable means being operable to close the outlet valve while the spring is being put under tension, means to open the inlet valve thus allowing the liquid under pressure to accumulate in the pressure chamber; and means operable by pressure from the pressure liquid to discharge the liquid after the spring passes such dead-center.

8. In a liquid dispensing machine the combination with a pressure liquid tank, of a pressure chamber provided with an outlet at the bottom; a valve for the outlet; a valve between the tank and chamber; a pump operable by pressure from the chamber; means for closing the outlet valve; means for opening the valve between the tank and chamber and means set into operation by pressure from the chamber to close the valve between the tank and chamber and to open the outlet valve.

9. In a liquid dispensing machine, the combination with a pump cylinder, a power cylinder, and a pressure chamber communicating with the power cylinder; of means to supply to the pressure chamber, effervescent liquid under pressure; a pump piston head in the pump cylinder; means to supply liquid to the pump cylinder above the pump piston head; a power piston head adapted and arranged in the power cylinder to be operated by pressure from the pressure chamber, and connected to operate the pump piston head to expel liquid from the pump cylinder; means operable by the power piston head to release liquid from the pressure chamber; and means to conduct the liquid to a receptacle.

10. The combination with a pump piston, of a pump cylinder having an outlet at the top and an inlet at the bottom extending above the top of the piston when at rest at the bottom; a power cylinder above the pump cylinder and open at the top; a piston rod connected to the pump piston and extending through and above the power cylinder; a piston head on the pump rod in the power cylinder; a pressure chamber having a vent, an outlet, and an inlet; means to supply effervescent liquid through the inlet under pressure to the pressure chamber; a valve to close the outlet; a valve to close the inlet; a float in the pressure chamber; means operable by the float to close the vent; a rod connected to operate the outlet valve and adapted to open the inlet valve when the outlet valve is closed; a cam adapted to operate said rod by a portion of the revolution of the cam; a rocking valve lock adapted to support the rod with the outlet valve closed and the inlet valve open while the cam is withdrawn from said rod; and means operable by the piston rod at the end of its upstroke to operate the valve lock and withdraw the lock from the cam operated rod; and spring means to return the outlet valve to open position and the inlet valve to closed position when the valve lock has been operated by the piston rod operated means.

11. A liquid dispensing machine provided with a pressure chamber having a vent at the top, an outlet at the bottom a port between the outlet and the vent, and an inlet valve adapted and arranged to supply effervescent

liquid under pressure to the pressure chamber; a pump cylinder provided with an inlet at one level and an outlet at a higher level; a pump piston head in said pump cylinder adapted to normally rest with its top below the level of the top of the pump cylinder inlet; a piston rod adapted to operate the pump piston and extending outside the pump cylinder; a piston head on the piston rod; a power cylinder in which the piston head is adapted to operate; said port being below the piston head and communicating between the power cylinder and the pressure chamber; means for closing the outlet from the pressure chamber, and opening the inlet valve to the pressure chamber thereby to admit pressure operable through the port of said pressure chamber to actuate the power piston; means to hold the inlet valve open; means to hold the outlet valve closed; means connected to the power piston to cause the inlet valve to close when the power piston is operated; and means to open the outlet from the pressure chamber after the inlet valve has closed.

12. A liquid dispensing machine comprising a pressure chamber adapted to receive effervescent liquid under pressure and provided at the bottom with an outlet and at the top with a vent; a tank adapted to deliver effervescent liquid to said chamber; a valve between said tank and said chamber; a pump provided with an inlet at one level and an outlet at a higher level and adapted to hold quiescent liquid; a fountain to supply such liquid to the pump; means adapted to apply pressure from the chamber to operate the pump; a float in the pressure chamber provided with a valve to close the vent in the top of said pressure chamber when the float is lifted; and means connected with the pump for effecting the closing of the valve between the tank and the pressure chamber.

13. In a machine for delivering liquid under pressure; a pressure chamber having an inlet and an outlet; a valve to close the outlet; a valve to close the inlet; means to open the inlet valve when the outlet valve is closed; mechanism to close the outlet valve; mechanism to close the inlet valve; a wheel provided with a cam; means operable by the cam to operate both of said mechanisms; resilient means to yieldingly hold the cam wheel in non-operative position allowing the inlet valve to close, and the outlet valve to open; crank means to revolve the cam part way; and means to allow the crank to return to initial position and to allow the cam to complete its revolution.

14. A machine for delivering liquid under pressure comprising a pressure chamber having an inlet and an outlet; a valve to close the outlet; a valve to close the inlet; a spring to normally hold the inlet valve closed; means to normally hold the outlet valve open; means to close the outlet valve

and open the inlet valve; a cam wheel to operate the outlet valve closing and the inlet valve opening means successively, and a spring to return the cam to normal operative position.

15. A machine for mixing a liquid under pressure with another liquid, which comprises a pressure chamber having a vent, an inlet and an outlet; a syrup chamber having an inlet and an outlet; means connected to the pressure chamber to deliver pressure liquid thereto; means connected to the syrup chamber to deliver syrup thereto; a piston to expel syrup from the syrup chamber, means to apply pressure from the pressure chamber to operate the piston to expel the syrup; means to close the outlet valve from said pressure chamber and to open the inlet valve to the pressure chamber; means for closing the vent to produce pressure to operate said piston; means to close the inlet valve to the pressure chamber and open the outlet valve from the pressure chamber; means to conduct liquid from the syrup chamber to a place of mixture; and means to conduct liquid from the pressure chamber to said place of mixture to mix the two liquids together.

16. In a machine for delivering liquid under pressure; a liquid pressure chamber having an inlet and an outlet; a valve to close the outlet; a valve to close the inlet; revolvable means to close the outlet valve and open the inlet valve during a portion of the revolution of the revolvable means; means for locking the inlet valve open; means actuated by the pressure of the liquid in the pressure chamber to release the valve locking means; and automatic means to close the inlet valve and stop the flow of liquid into the pressure chamber, and also to open the outlet valve when the valve locking means are released.

17. The combination with a cup holder, of means to deliver liquid to a cup in the cup holder, a pressure chamber having an inlet and also having an outlet connected to the liquid delivery means; a valve to open the inlet and a valve to close the outlet from the pressure chamber; a syrup chamber filled by gravity; a piston to expel syrup from the syrup chamber; means to deliver an effervescent liquid to said pressure chamber; means operable by gas pressure from the effervescent liquid in the pressure chamber after measuring said effervescent liquid to operate the piston to expel syrup into the delivery means; manually operated means to start delivering a cup to the cup holder; and means connecting the valve operating mechanism to the cup delivering means to complete the placing of a cup to receive liquid from the syrup chamber and from the pressure chamber when the pressure outlet valve is opened.

18. A machine adapted to discharge a measured portion of liquid under pressure; comprising a chamber provided with an inlet

by the pressure in said pressure chamber, and operative means connecting said rod and said locking means, to release said locking means as the rod is actuated.

5 27. A measuring and dispensing mechanism comprising a fitting; a tank containing liquid under pressure connected to said fitting; a valve closing said fitting; a chamber connected to said fitting and having a vent
10 and an outlet; manually actuated means for closing said outlet and unseating said valve; means for locking said manually actuated means; means closing said vent after the chamber contains a predetermined amount of
15 liquid; a power cylinder connected by a passage with said chamber; a rod in said cylinder; a piston on said rod adapted to be acted on by the pressure in said chamber; operative means connecting said rod and said
20 locking means to release said locking means as the rod is raised; a pump cylinder; a supply fountain connected to supply syrup to said pump cylinder; and a piston in said pump cylinder connected to said rod where-
25 by the syrup is discharged.

28. In a vending machine, a body having a recess therein, and a waste spout extending down from said recess, and into which used
30 cups may be thrown; said body having a vertical passage opening down into said recess; cup dispensing means mounted on said body; means to actuate said cup dispensing means; a lip in said recess adapted to receive a cup from said cup dispensing means; liquid dispensing means; a tube extending from said
35 liquid dispensing means into said vertical passage adjacent and above said lip, and operative means joining the cup dispensing actuating means and the liquid dispensing means.

40 29. In a vending machine, a measuring and dispensing mechanism comprising a fitting; a tank containing liquid under pressure and connected to said fitting; a valve closing said fitting; manually tensioned spring actuated
45 means to unseat said valve; said mechanism having a chamber provided with a vent and connected to said fitting; means closing said vent after said chamber contains a predetermined amount of liquid; means actuated
50 by the pressure in the chamber to close said valve; said mechanism including a pump cylinder; a fountain adapted to supply syrup by gravity to said pump cylinder; means actuated by the pressure in the pressure chamber to discharge syrup from said cylinder; a
55 cup dispensing device; and means operable by said manually tensioned spring actuated means to operate the cup dispensing device.

60 30. In a drink vending machine having a cup support and a spout terminating a short distance from the rim of said cup at one side thereof, said spout being arranged to discharge liquid with considerable velocity across and over the rim of a cup on the support; a drip cup arranged beneath the end
65

of the spout to receive drip from the spout and discharge it away from the cup.

31. In a machine of the character set forth; a syrup cylinder having an inlet at the bottom and opening at the top through a duct
70 leading up to an outlet; a pump piston adapted to come to rest with its top below the top of the inlet; and means to supply liquid to the cylinder to a normal level in the duct below the outlet so that an upward movement
75 of the piston will expel liquid through the duct.

32. In a machine of the character set forth; a syrup cylinder having an inlet at the bottom and opening at the top through a duct
80 leading up to an outlet; a pump piston adapted to come to rest with its top below the top of the inlet; means to supply liquid to the cylinder to a normal level in the duct below the outlet so that an upward movement of
85 the piston will expel liquid through the duct; and adjustable means to limit the upward stroke of the piston to regulate the amount of liquid expelled by the piston.

33. A drink vending machine comprising
90 valved means for supplying an effervescent liquid component of a drink under pressure; manual means for starting into operation said effervescent liquid supplying means; means operated by gas from the effervescent
95 liquid after the effervescent liquid component of the drink has been measured to supply another component of the drink; and means operated by gas from the effervescent liquid to permit and cause discharge of said components.
100

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 17th day of October, 1925.

FRANK A. MADDEN. 105

110

115

120

125

130