M. J. LEVIN.

APPARATUS FOR DISPENSING GAS IMPREGNATED LIQUIDS.

APPLICATION FILED DEC. 7, 1908.

936,462.

Patented Oct. 12, 1909.

2 SHEETS—SHEET 1.

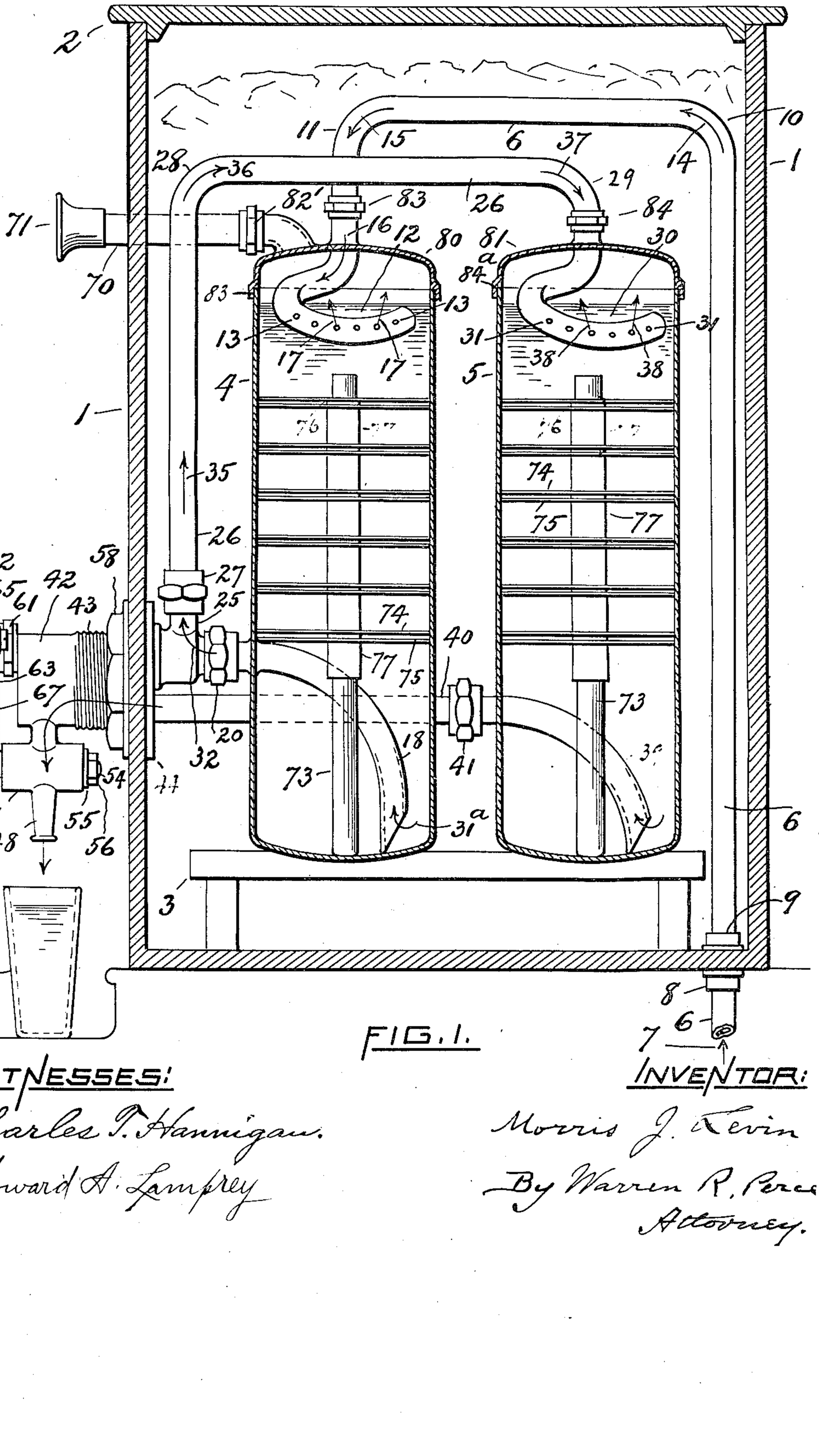

FIG. 1.

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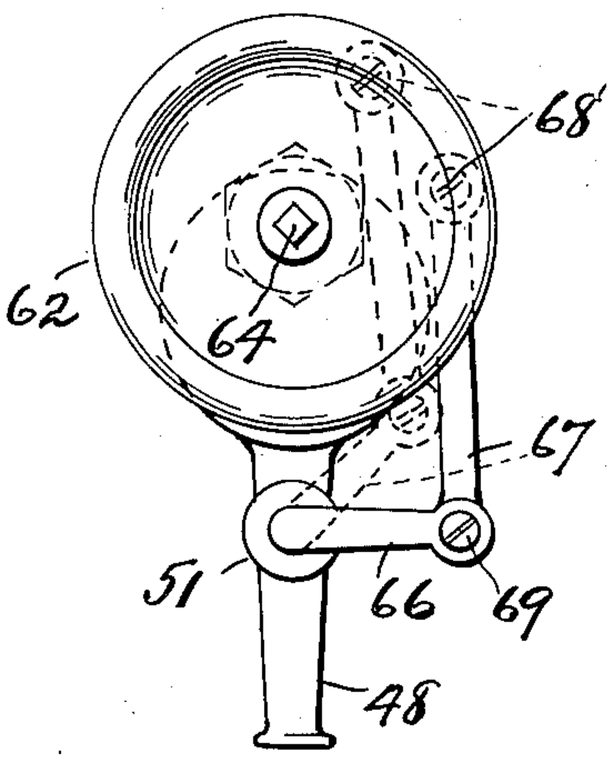

FIG. 3.

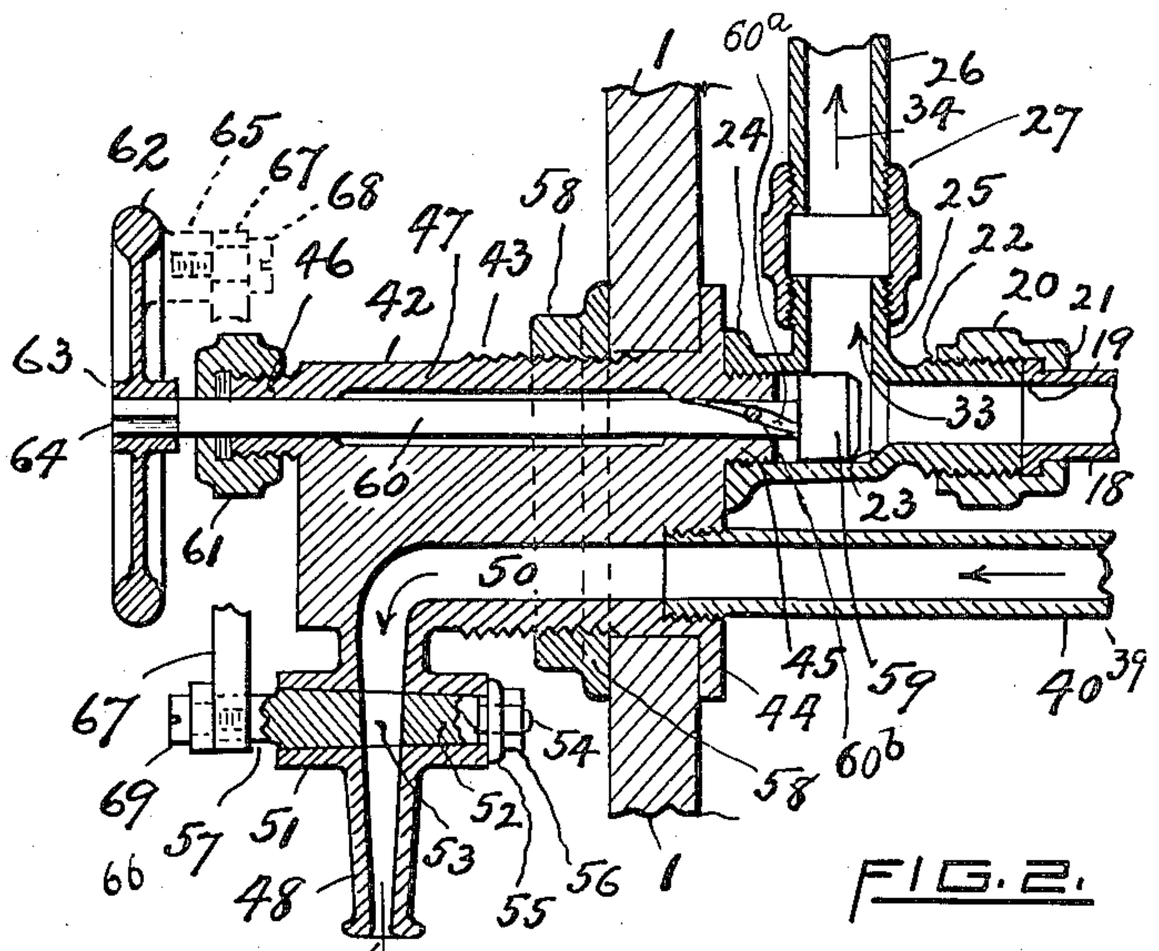

FIG. 2.

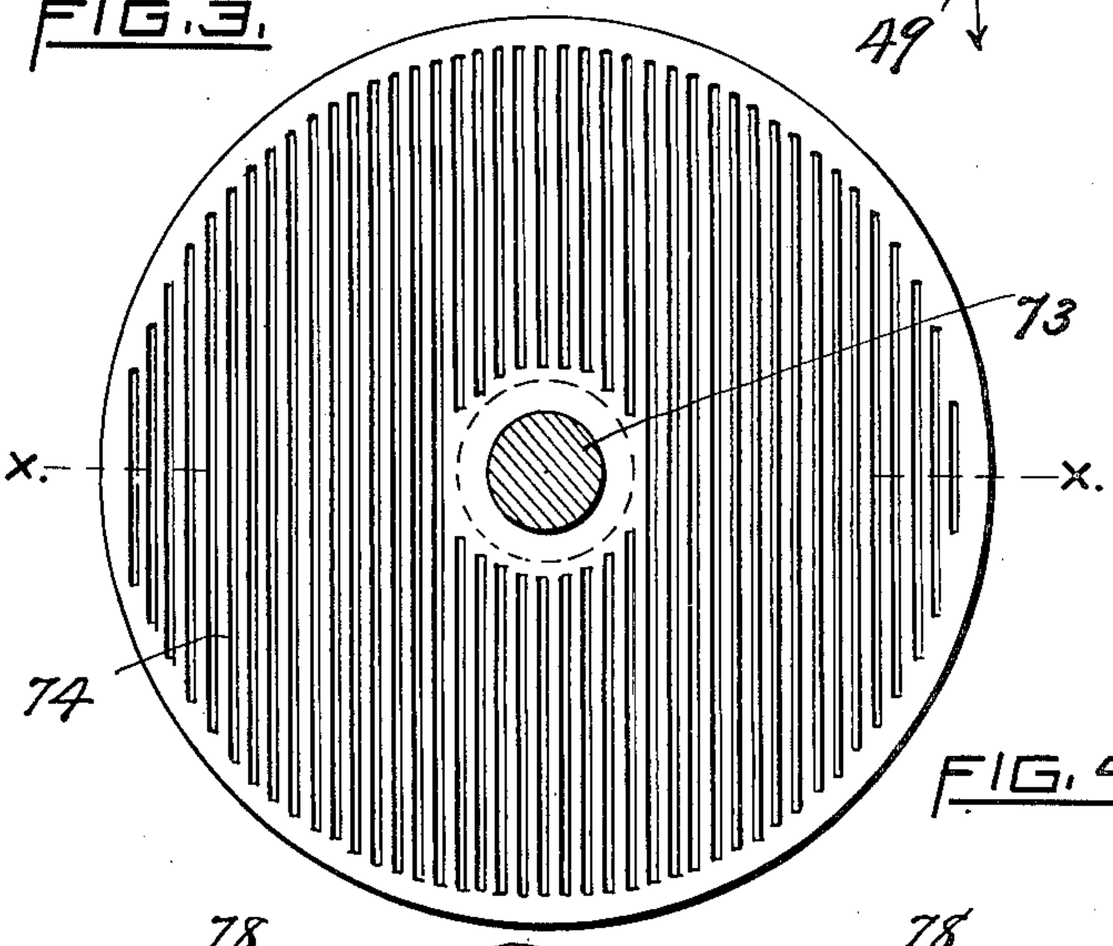

FIG. 4.

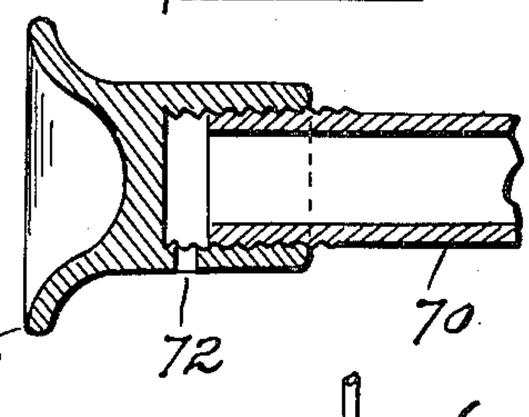

FIG. 6.

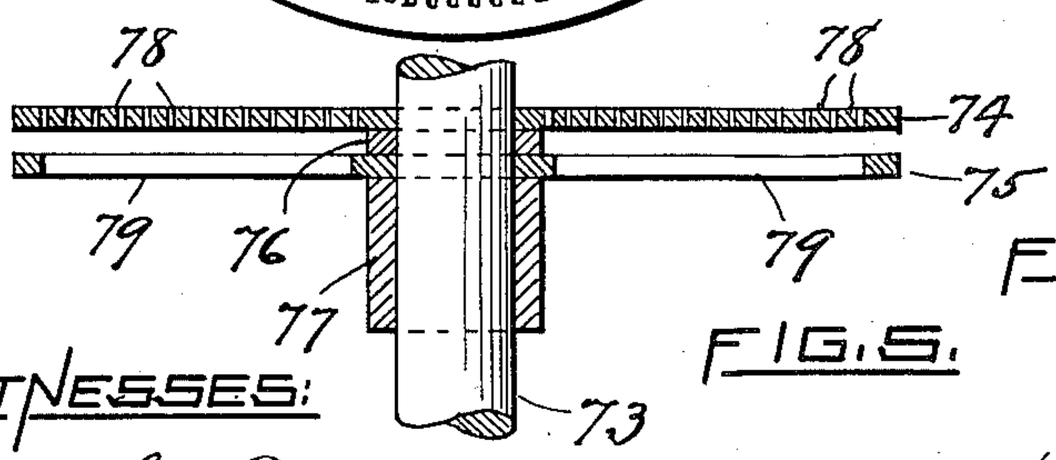

FIG. 5.

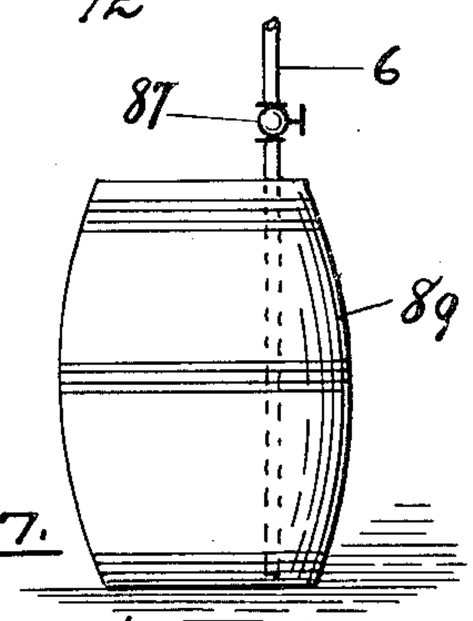

FIG. 7.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR DISPENSING GAS-IMPREGNATED LIQUIDS.

936,462. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed December 7, 1908. Serial No. 466,363.

To all whom it may concern:

Be it known that I, MORRIS J. LEVIN, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Apparatus for Dispensing Gas-Impregnated Liquids, of which the following is a specification, reference being had therein to the accompanying drawings.

Like reference numerals indicate like parts.

Figure 1 is a view of my improved apparatus for dispensing gas-impregnated liquid, said view being partly in elevation and partly in vertical section. Fig. 2 is a view partly in elevation and partly in vertical section showing the several discharging valves and the means of operating the same. Fig. 3 is a view in front elevation of the valve-operating mechanism. Fig. 4 is a plan view of one of the grated or perforated disks constituting an element of my said invention. Fig. 5 is a view of two of said disks, as seen in cross section on line *x x* of Fig. 4, mounted upon a vertical rod. Fig. 6 is a view of the air-vent tube as seen in central longitudinal section. Fig. 7 is a view in elevation (on a reduced scale) of a keg containing the liquid, which is to be dispensed by said apparatus. Figs. 2, 3, 4, 5 and 6 are on a larger scale than Fig. 1, and Fig. 7 is on a reduced scale.

My invention relates to apparatus for dispensing gas-impregnated liquids, such as soda-water, beer, and other beverages; and it consists of the novel construction and combination of the several parts or elements as hereinafter described and set forth in the claims.

In the drawings, 1 represents the exterior portion or case, which is provided with a detachable cover 2. A plurality of tanks rest upon a support 3 within the case and extend vertically. Any desired number of such tanks may be used. I show in the drawing two tanks, designated as 4 and 5, respectively. Beneath this case is a keg or other receptacle containing the gas-impregnated liquid, or other liquid under pressure. This liquid enters and passes through the pipe 6, as indicated by the arrow 7 in Fig. 1.

The pipe 6 is supported at the place where it enters the case 1 by means of the collars 8 and 9 in contact with the bottom of the case, as seen in Fig. 1. The pipe 6 is bent as shown at 10 and 11 and passes into the tank 4 at the top thereof. The end of this pipe, in the portion of it which is within the upper part of the tank 4, is spirally bent, as shown at 12, and is there provided with a plurality of discharging orifices 13 directed radially upward. The flow of the liquid through this pipe is indicated by the arrows 7, 14, 15, 16 and 17.

A pipe 18 has an open end at its bottom near the bottom of the tank 4, and is curved so as to pass out of said tank through the side thereof, as represented in Fig. 1. Said pipe has an annular flange 19, as seen in Fig. 2. A coupling 20, has an annular flange 21, which is engageable with the annular flange 19 of the pipe 18, and is also provided with an interior screw-thread. A pipe 22 has at one end an exterior screw-thread engageable with the screw-thread of said coupling and the bores of the pipes 18 and 22 are equal, so that said two pipes 18 and 22 are continuous with each other. A valve seat 23, annular and beveled as illustrated in Fig. 2, is made. The opposite end of the pipe 22 has an interior screw-thread and is enlarged to form an annular flange 24. An upright pipe or T 25 opens into the pipe 22, as shown, and has an exterior screw-thread. The bore of the pipe 22 between the valve seat and the flanged end 24 of said pipe is of a slightly enlarged diameter for the movement of a valve therethrough, as presently explained. A vertical pipe 26 is connected to the T-branch or pipe 25 by a union 27. The pipe 26 has the bends 28 and 29, and passes through the upper end of the tank 5, and is formed with a spiral curve in the upper part of the tank 5 as appears at 30. The spirally bent end 30 of the pipe 26 within the tank 5 is provided with a plurality of discharging orifices 31. The flow of the liquid through the pipes 18, 22, 25, 26 and 30 is indicated by the arrows 31ª, 32, 33, 34, 35, 36, 37 and 38.

A discharging pipe 39 has its open end located near the bottom of the tank 5. Said pipe 39 is curved so as to pass out from the tank 5 at one side thereof. It is connected with another pipe 40 by means of the coupling 41.

A head or casting 42 has a cylindrical portion, which is provided with an exterior

screw-thread 43, and also has an annular flange 44, adapted to lie in contact with the case 1 on the inner surface thereof. The head 42 also has a rearwardly-directed tubular extension 45, provided with both an exterior screw-thread and a stud pin. The flanged end 24 of the pipe 22 by its screw-thread fits upon the tubular extension 45 of the head 42, and the flange 24 is in contact with the surface of the annular flange 44 of the head 42. The head 42 has also a forwardly-directed tubular extension 46, which is provided with an exterior screw-thread. A straight bore extends through the head 42 from front to rear, and is continuous with the bores of the tubular extensions 45 and 46. This bore is enlarged diametrically, as shown at 47 in Fig. 2.

The head 42 has near its outer end a downwardly-extending discharge pipe or nozzle 48, which has a tapering axial bore 49, continuous with an L-shaped bore 50, which passes through the head 42, as shown in Fig. 2. This L-shaped bore is concentrically enlarged and screw-threaded to receive and engage the end of the pipe 40, which enters the head 42, as illustrated in Fig. 2.

The nozzle 48 has a tubular valve 51, extending therefrom at right angles, and made with a tapering bore. A conical plug or valve 52 is rotatably mounted in the valve tube or case 51, and has a diametrical aperture 53, so that when the plug 52 is turned, said aperture registers with the bore of the nozzle 48, as seen in Fig. 2. The plug 52 has at its smaller end a concentric stem or projection 54, of smaller diameter and which is cylindrical and screw-threaded. A washer or packing 55 is mounted on the projection or stem 54, and a check nut 56 is in threaded engagement with said projection. The outer end of the plug 52 has a concentric stem or projection 57, of smaller diameter and cylindrical in shape. A collar or binding nut 58, having a screw-threaded bore engages the exterior screw-threads 43 of the head 42, and can thereby be brought into tight contact with the exterior surface of the case 1.

A valve 59, shaped as a circular disk with a beveled edge, adapted to fit in the valve seat 23, is supported upon the inner end of a valve stem 60. The valve stem 60 has a spiral groove 60^a along which it is movable by its engagement with the stud pin 60^b of the straight bore of the head 42. A screw-cap or stuffing box 61 has a central tubular bore, through which the outer end of the valve stem 60 passes loosely, and said cap is mounted upon the threaded surface of the forward extension 46 of the head 42.

A hand wheel 62 has a hub 63, with a bore adapted to receive the extreme outer end 64 of the valve stem 60, the latter being provided with angularly-disposed longitudinal faces fitting in said bore which has similar surfaces to engage therewith. The wheel 62 also has on its rear surface a tubular boss 65. The outer end 57 of the plug 52 is provided with bent arm or crank 66, having a tubular end. A link bar 67 is pivotally connected with the tubular boss 65 of the wheel 62 by a screw 68, and with the tubular end of the crank 66 of the plug 52 by a screw 69.

A vent tube 70 extends through the top of the tank 4, as seen in Fig. 1, and projects out from the case 1. It is furnished with an exterior screw-thread. A tubular head or cap 71, having an interior screw-thread, is rotatably mounted on the tube 70 and has an air-admission aperture or opening 72, seen in Fig. 6. In each tank (4 or 5) a vertical rod 73 is placed, resting loosely upon the bottom of the tank. On each rod 73 a plurality of slitted circular baffling disks 74, and 75, are placed, preferably in sets of two each, said sets being equi-spaced upon the rod 73, and extending into contact with the interior cylindrical surface of the tank 4. Each upper baffling disk 74 rests loosely upon a washer or collar 76 which surrounds the rod 73 and said washer or collar rests loosely upon the top surface of the lower baffling disk 75. The lower baffling disk 75 rests loosely upon a tube 77. The lowest tube of the series may be fastened or secured to the rod 73 by cross pin, or in any other suitable manner. The baffling disks 74, 75, are made of sheet metal preferably about $\frac{1}{16}$ of an inch thick, and the slits are preferably about $\frac{1}{16}$ of an inch in width. The washers or collars 76 are preferably about $\frac{1}{16}$ of an inch thick. The baffling disks 74, 75, of each set are so arranged upon the rod 73 that the bars 78 of the baffling disk 74 are at right angles with the bars 79 of the baffling disk 75.

In Fig. 7 is represented a keg 89, into which the pipe 6 extends. In the pipe 6 is a valve 87, allowing the liquid to flow up from the keg 89 through the pipe 6 into the tank 4.

The operation of my improved dispensing apparatus is as follows. The valve 87 being turned, the liquid contents of the keg flow up (by the pressure of the gas therein contained and diffused) through the pipes 6 and 12 into the tank 4; thence through the pipes 18, 22, 25 26 30 into the tank 5; thence through the pipes 39 and 40, bore 50 and nozzle 48 into the tumbler 82, whenever the various valves are in proper position for that purpose. The liquid, when first discharged from the keg is under great gas-pressure,—say from 200 to 350 pounds per square inch, and consequently it is in a very foamy condition, when it is discharged from the orifices 13 of the spirally bent end 12 of the pipe 6, within the tank 4. By these discharging orifices it is delivered in small jets, which strike up against the concave surface of the top of the tank 4 and thence flow down along the cy-

lindrical interior surface of the tank 4 onto the upper surface of the highest slitted baffling disk 74, and thence flows to the slitted baffling disk 75 next below, in series. As the bars of each set of baffling disks are arranged at right angles with each other, this foamy liquid is gradually, in its progress through these slitted baffling disks, which serve as screens, broken up and condensed, and so collects in a denser or more liquid condition at the bottom of the tank 4 and so fills the tank 4 as represented in Fig. 1. Whenever by a quarter-rotation of the wheel or handle 62, the valve stem 60 is moved to withdraw the valve 59 from the valve seat 23, the liquid in the tank 4, still under gas-pressure, flows through the pipes 18, 22, 25, and 26, and is discharged again in like manner from the discharging orifices 31 of the spirally curved end 30 of the pipe 26 into the tank 5, whence it descends through the slitted baffling disks to the bottom of the tank 5 and so fills the same. The quarter-rotation of the wheel 62 not only unseats the valve 59, but at the same time and to the same extent turns the plug 52 and causes the valve aperture 53 to register with the bore 50. This simultaneous valve-operation is caused by the eccentrically-located boss 65 (moving with the wheel 62) and compelling the link bar 67 to turn the crank 66 of the plug 52. Thus the beer or other gas-impregnated liquid is served in a lively, effervescent condition under the natural head (if a fermented liquor) or under the original gas-pressure (if a carbonated liquid). It has been common heretofore to dispense a beer or other beverage in a flat, stale condition, due to the fact that the gas has bubbled off and escaped, and then to top off the beverage in the tumbler with foam by drawing the gas or mingled gas and liquid from another source to enliven the flat, stale mass of liquid constituting the bulk of the draft; but such foam or gassy liquid from another source cannot mix with the denser body of liquid first drawn nor penetrate it to any considerable degree. By my apparatus, as already explained, it is seen that the liquid dispensed is thoroughly and evenly impregnated with the original head or pressure of the beverage before the gas has escaped or bubbled off to any harmful degree.

As shown in Fig. 1, the case 1 is filled with broken ice, which chills the tanks 4, 5, and the pipes 6, 26 and 39, and cools the liquid which is delivered from the nozzle 48. Any desired number of tanks may be used in this construction. If desired, the discharging orifices 13, 31, may be directed downward to deliver the liquid directly upon the uppermost of the baffling disks 74, and said baffling disks, instead of contacting directly with the inner surfaces of the tanks 4 or 5, may be separated therefrom by a small space. In order that the baffling disks and interior portions of the tanks can be cleaned, which is very important, especially if a fermented liquid, instead of a carbonated liquid, is dispensed, provision is made for removing said baffling disks and their supporting rod from the tanks. For this purpose the top of each of the tanks 4 and 5 should be a detachable cover, as shown at 80 and 81, respectively, secured to the body of the tank by a screw thread, or in any other suitable manner. The vent pipe 70 has a coupling 82′; the pipe 6 has a coupling 83; and the pipe 26 has a coupling 84. Thus the screw cap or cover 80 can be detached from the tank 4 and the pipes 70 and 6, and the screw cap or cover 81 can be detached from the tank 5. When the cap or cover 80 has been removed from the tank 4, the rod 73 with the baffling disks 74, 75, thereon can be taken from the tank 4; and when the cap or cover 81 has been removed from the tank 5, the baffling disks and supporting rod therein can be taken from the tank 5. The bottom of the rod 73 is rounded and rests loosely on the bottom of the tank and therefore is easily lifted out of position.

I claim as a novel and useful invention and desire to secure by Letters Patent:—

1. In a liquid-dispensing apparatus, the combination of a tank; a plurality of sets of perforated baffling disks supported in the tank, each of said sets comprising two of said disks held apart a slight distance; and a pipe entering the top of the tank and adapted to discharge a liquid therein under gas-pressure upon the uppermost set of such disks, from which the liquid drips by gravity to the next lower set of disks, and so on through the series, being reduced thereby to a less and less degree of gas-impregnation.

2. In a liquid-dispensing apparatus, the combination of a tank; a rod mounted in the tank axially thereof; a plurality of sets of perforated baffling disks, each having a central aperture, through which said rod extends; means for supporting the disks of each set upon the rod a slight distance apart; and a pipe entering the top of the tank and adapted to discharge a liquid therein under gas-pressure upon the uppermost of such disks, from which the liquid drips by gravity to the next lower disk, and so on through the series, being reduced thereby to a less degree of gas-impregnation.

3. In an apparatus of the class described, the combination of a tank; a pipe entering said tank and adapted to discharge a liquid under gas-pressure; and a plurality of baffling disks each having parallel slots with intervening spaces; and means for supporting said baffling disks in position in the tank so located and arranged that said baffling disks receive *seriatim* the liquid discharged from said pipe, said baffling disks

being arranged with the slots of each baffling disk at right angles with the slots of the next adjacent baffling disk.

4. In an apparatus of the class described, the combination of a vertical tank having a concavo-convex top; a feed pipe entering the tank through the upper portion thereof and arranged to convey into the tank a liquid from a source of supply under gas-pressure; a discharging pipe continuous with the feed pipe and having a plurality of upwardly-directed orifices, adapted to discharge said liquid in jets against the concave inner surface of the top of the tank; a series of slitted baffling disks arranged below said discharging pipe to receive the flow of the liquid *seriatim* and to discharge the liquid consecutively downward by gravity from one to another; and a rod to support said baffling disks in the tank.

5. In a liquid dispensing apparatus, the combination of a tank; a feed pipe entering the tank and supplying thereto a liquid under gas-pressure; a spiral terminal bend in said pipe provided with a plurality of radial discharging apertures; a series of slitted baffling disks arranged to receive the flow of said liquid from said discharging apertures and from one to another consecutively by gravity; and means for supporting the baffling disks in the tank.

6. In an apparatus of the class described, the combination of receptacle adapted to contain a foamy liquid, a tank; a feed pipe to conduct said liquid from the receptacle to the tank; a condensing device in the tank capable of reducing the liquid to a less foamy condition; a second tank located in the same horizontal plane as the first tank; a pipe connecting the bottom of the first tank with the top of the second tank; a valve in said connecting pipe; a condensing device in the second tank capable of reducing said liquid to a still less foamy condition; a dispensing nozzle; a nozzle valve; a pipe connecting the bottom of the second tank and the nozzle; and means for operating both valves simultaneously.

7. In an apparatus of the class described, the combination of a case having a circular aperture; a tank in the case; a supply pipe for said tank; a discharge pipe from said tank; a head extending through said case aperture and having a rearwardly extending tubular boss provided with an interior pin; a forwardly extending tubular boss having a smooth bore; a valve rod having a longitudinal movement in said two bosses and having a spiral groove in engagement with the pin in the first named boss; a valve on said valve rod; a valve seat in the supply pipe with which said valve coöperates; a binding nut engageable with an exterior screw-thread on said head and movable thereon into holding contact with the exterior of the case; an annular flange on the head adapted to holding contact with the interior of the case; an enlarged passage way in the head for the reception of the valve rod; a wheel on the outer end of the valve rod; a screw cap on the end of said forwardly extending boss; an L-shaped bore in the lower part of the head enlarged at its rearward end for the reception of the threaded end of said discharge pipe; a nozzle having a vertical bore which is continuous with said L-shaped bore; a valve case having a tapering bore; a conical plug valve mounted rotatably in said tapering bore and having an aperture registrable with the nozzle bore; a crank on the large end of the plug valve; an eccentrically located boss on the rear face of the wheel; and a link bar pivotally mounted at one end to said wheel boss and pivotally mounted at its opposite end to said crank arm.

8. In an apparatus of the class described, the combination of a rod; two baffling disks each mounted on said rod through a central aperture and having an annular edge with intermediate grate bars or slats arranged parallel one with another with intervening apertures, a collar on the rod between said baffling disks; and a tube on the rod supporting the lower baffling disk, the slots of one baffling disk extending in a direction at right angles to the slots of the other baffling disk.

In testimony whereof I affix my signature in presence of two witnesses.

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