4 Sheets—Sheet 1.

F. W. WIESEBROCK.

SODA-WATER APPARATUS.

No. 190,395. Patented May 1, 1877.

Fig. 1.

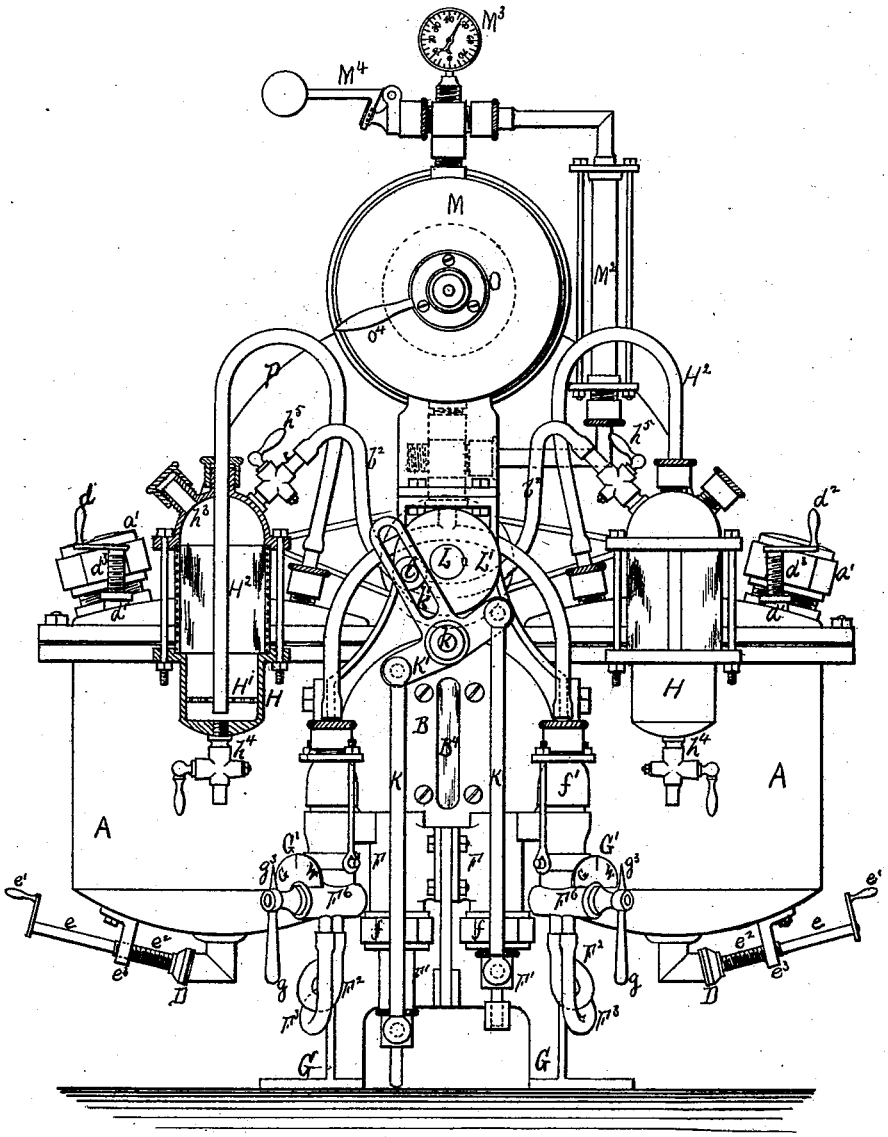

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Fig. 2.

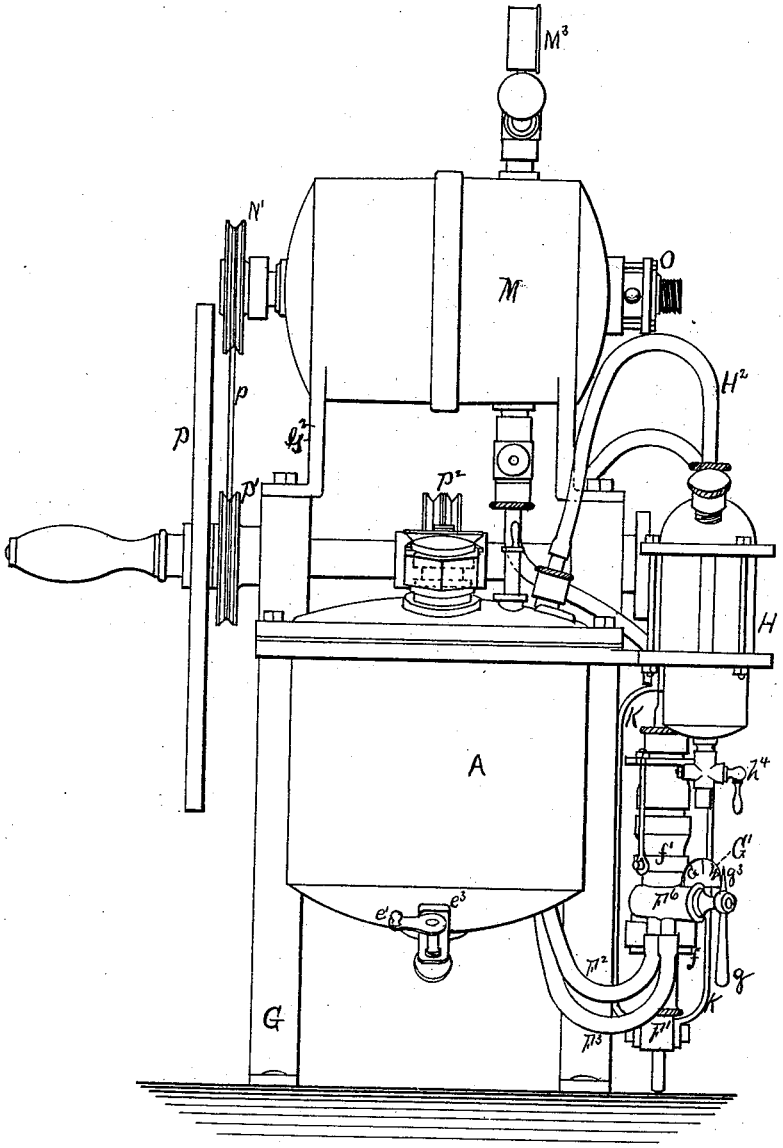

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Fig. 5.

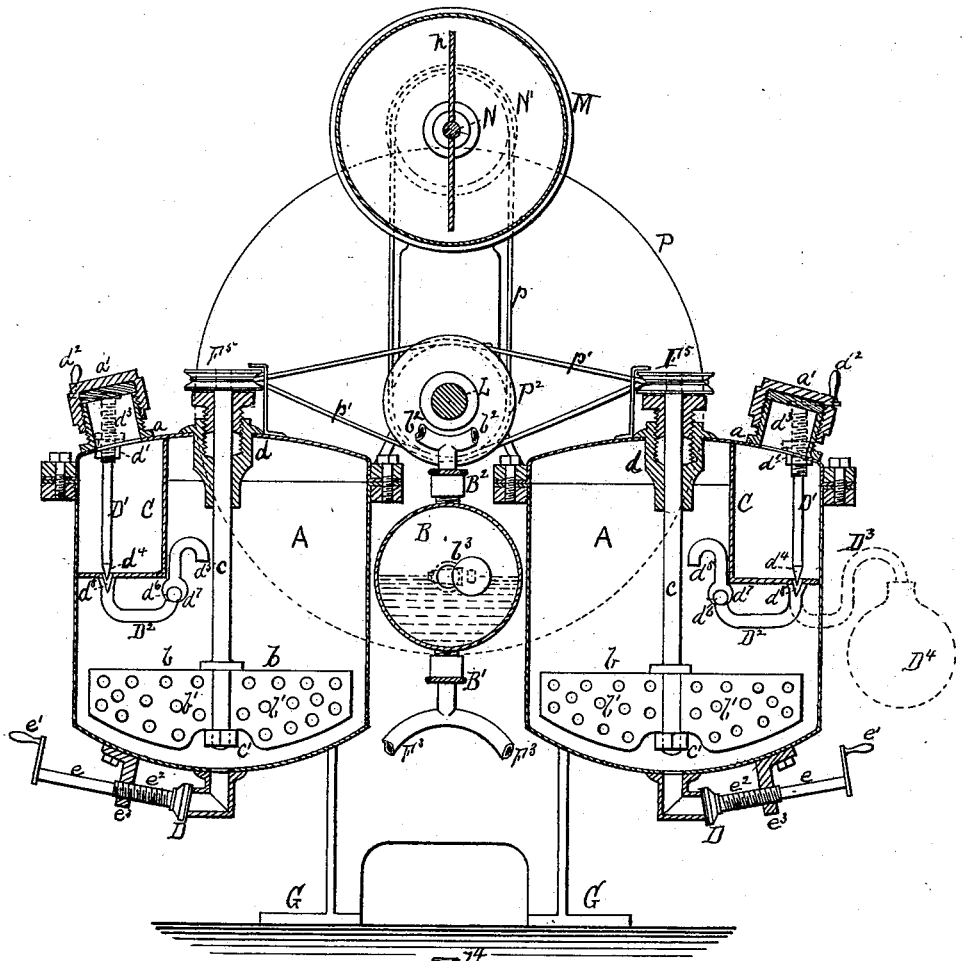
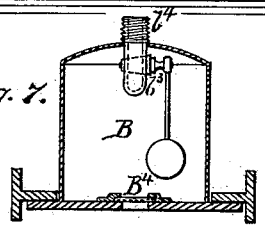


Fig. 7.



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SODA-WATER APPARATUS.

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Fig. 4.

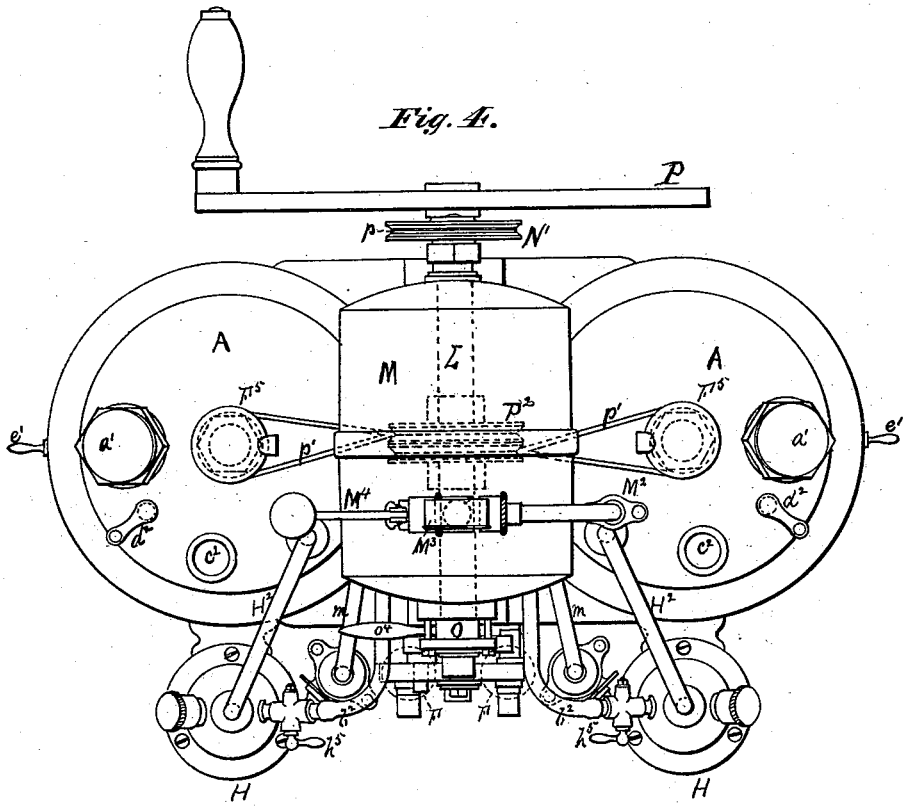

Fig. 5.

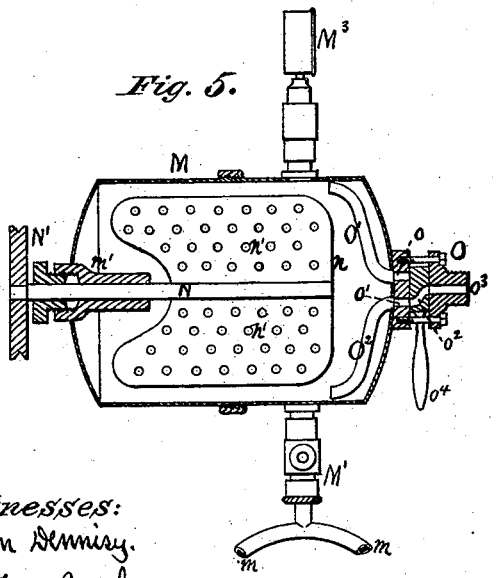

Fig. 6.

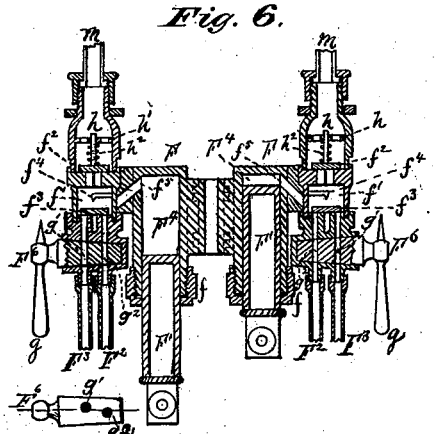

Fig. 8.

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UNITED STATES PATENT OFFICE.

FREDERICK W. WIESEBROCK, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SODA-WATER APPARATUS.

Specification forming part of Letters Patent No. **190,395**, dated May 1, 1877; application filed November 15, 1876.

To all whom it may concern:

Be it known that I, FREDERICK W. WIESEBROCK, of Brooklyn, in the county of Kings and State of New York, have invented an Improved Soda-Water Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, and the letters of reference marked thereon, making part of this specification, in which—

Figure 1 is a front view, partly in section. Fig. 2 is a side view. Fig. 3 is a cross-sectional view. Fig. 4 is a top-plan view. Fig. 5 is a longitudinal cross-section of the agitating-vessel. Fig. 6 is a cross-section of the pumps and their connecting mechanism. Fig. 7 is a horizontal cross-section of the equalizing-chamber. Fig. 8 is a detached view of the cock that regulates the flow of water and gas to the pumps.

The object of my invention is to furnish an apparatus for the manufacture of aerated beverages which shall be so constructed and arranged as to be durable and economic in operation, and automatic in some of its essential parts, and which shall also make aerated beverages in their purest form, as more fully hereinafter described.

The construction and operation of my invention are as follows:

To the frame G are securely attached two generators, A. To the top of each of these generators is secured a stuffing-box, *d*. In this stuffing-box is journaled a stirrer-shaft, *c*, to the lower section of which is firmly attached, by means of a nut, c^1, a paddle, *b*, having numerous perforations, b^1. To the top of this shaft *c* is secured a grooved pulley, F^5. The generators A are also each provided with a bung, *a*, with a suitable cap, *a'*, to close the same. This bung is designed for charging the generators with any suitable carbonate. These generators A are also each provided with a discharge-valve, D, which is operated by means of a spindle, *e*, which works in a short arm, e^3, attached to the bottom of the generator. This spindle is operated by means of a crank, e^1. The whole interior of each generator is lined with lead, or other suitable non-corroding material which will resist the action of caustic acid. In the upper section of each generator, and on one side thereof, is the acid-chamber C, attached in such manner as to form an entirely separate vessel. This acid-chamber is constructed out of any non-corrosive material, and is provided with a bung, c^2, on top for filling the same. In the bottom of this acid-chamber C is secured the seat d^3 of a conical-shaped plug-valve, d^4. This valve d^4 is operated by means of a spindle, D^1, with screw-threads d^3 cut in its upper section, which mesh with screw-threads cut in a short tube, d^1, attached to the top of the acid-chamber C, said spindle being provided with a crank-handle, d^2, to operate the valve d^4. The object of this valve is to close hermetically all communication between the generator and acid-chamber when stopping the apparatus. From the seat d^3 of the valve d^4 leads a pipe, D^2, which extends upward toward the center of the generator, and having a downwardly-pointing nozzle, d^5. This pipe D^2 is provided with a circular chamber, d^7, in which works a ball-valve, d^6, which has for its object the prevention of the escape of gas out of the generator back into the acid-chamber by way of the pipe D^2. This pipe D^2 may also be extended outside of the generator, and communicate, by way of the pipe D^3, with a carboy, D^4, as shown in Fig. 3, and thus feed the acid to the generator direct from the containing-vessel, and dispensing with the acid-chamber, which would be advisable in large apparatus. Of course, if this is done, the valve d^4 must remain screwed down tight into its seat. To the front of the frame G are fastened the pumps F, provided with solid plungers F^1, and having stuffing-nuts *f*. These stuffing-nuts *f* may be provided with slots or holes for the insertion of a tool to tighten the same; or they may be tightened by any other suitable means.

To the pumps F are firmly attached the valve-chambers f^1, in such manner that the discharge-valve f^2 is at least on a level with, if not below, the highest point of the plunger-stroke. f^5 are inclined channels, which connect the valve-chambers f^1 with the chambers F^4 of the pumps. To the lower section of each valve-chamber f^1 is attached a cock, F^6, having two

channels—one for the admission of water, and the other for the admission of gas to the pumps—both channels being closed in the direction of the pumps by the valve f^3, and communicating with the water-pipes F^3 and gas-pipes F^2, as shown in Fig. 6. The openings g^1 g^2 in the cocks F^6 are so arranged that by turning the handle g the apertures for the flow of the water are diminished, while those for the flow of the gas are increased, or vice versa, as shown in Fig. 8. To the sides of each of the valve-chambers f^1 is secured a stop-arm, f^4, which prevents the inlet-valves f^3 from being entirely lifted out of their seats by the inflow of the liquid and gas. The pumps and the valve-chambers f^1, with their connections, may, if desired, be cast in one piece. On the outside of each of the cocks is attached a gage-plate, G^1, to designate the positions of the channels of the cocks by means of the point g^3 of the handle g. h is the valve-rod, to which is attached the discharge-valve f^2. This valve-rod h is held in a vertical position by means of the cross-plate h^1, and has coiled around it a spiral spring, h^2, which rests against the valve f^2 and the plate h^1, so as to facilitate the closing of the valve. The pumps are worked by means of the pitman-rods K K, which are attached at their lower ends to the plungers F^1, and pivoted at their upper ends to the T-shaped slotted cross-bar K′, as shown in Fig. 1. This cross-bar K′ is pivoted at k to a short arm, which extends out from the face of the frame G. Immediately above this short arm is journaled, on the shaft L, the eccentric L′, the pin l of which works in the slot k' of the cross-bar K′, as shown in Fig. 1. The stroke of the pumps can be altered by moving the pin l more or less from the center of the eccentric L′. B is the equalizing-chamber, which feeds the pumps with both water and gas at an always uniform pressure, and is an essential part of the apparatus. The water-supply pipe terminates on the inside of the equalizing-chamber B in a float check-valve or stop-cock, b^3, as shown in Figs. 3 and 7. This float-valve b^3 regulates the quantity of the water or other liquid in the equalizing-chamber, and keeps the supply always the same. The equalizing-chamber B is connected at its bottom with the pumps F by means of a pipe, B^1, having branches F^3 F^3, and at its top with the gas-washers or purifying-cylinders H by means of a pipe, B^2, having branches b^2 b^2. To the rear of this chamber is secured the water-supply nozzle b^4. The gas being brought thus in continuous contact with the water, whatever pressure there will be on the gas in the equalizing-chamber B must necessarily be on the water. For the ready inspection of the interior of the equalizing-chamber B, it is provided at its front with a water-stand glass, B^4, as shown in Fig. 7. Instead of a water-stand glass, a water-gage may be substituted. M is the agitating-vessel, which is fastened to a frame, G^2, securely bolted to the top of the frame G, and is connected with the pump mechanism by means of the pipe M^1, having branches m m, as shown in Figs. 1 and 5. This vessel M is constructed out of cast-steel or other strong material, and lined with pure tin or other suitable metal. To one end of this vessel M is secured a stuffing-box, m'. In this stuffing-box m' is journaled a stirrer-shaft, N, to which is attached a paddle, n, having numerous perforations, n', as shown in Fig. 5. To the end of this shaft N which is outside of the vessel M is secured a grooved pulley, N′. To the vessel M is attached a water-gage, M^2, to indicate the quantity of its contents, while on top of the vessel are secured a pressure-gage, M^3, and a safety-valve, M^4, which are connected by a pipe with the top of the agitating-vessel M. To draw off the contents of the vessel M, there is attached to the end of the same which is opposite to the pulley N′ a three-way sliding cock, O, having channels o o^1 and o^2 o^3. The channel o connects with the gas-outlet pipe O^1, and the channel o^1 with the water-outlet pipe O^2. This cock O is operated by means of the handle o^4. H are cylinders secured to the top of the generators A, and in which the gas is washed or purified. These cylinders are each provided with a perforated disk, H^1, near their bottoms, and a bung, h^3, at their domes, by means of which they are charged with water until about two-thirds full. H^2 are pipes which connect the cylinders with the generators A, and extend at their free ends down through the cylinders H and the perforated disks H^1 to near the bottom of the cylinders. To the bottom of each cylinder is secured a stop-cock, h^4, by means of which the contents of the cylinder may be drawn off when necessary. These cylinders are connected at their domes with the equalizing-chamber B by means of the pipes b^2, in each of which there is a stop-cock, h^5, as shown in Figs. 1 and 4. L is an axle-shaft, which is journaled in suitable bearings in the upper section of the frame G. To this axle-shaft L is keyed the fly-wheel P. Attached to this fly-wheel, and between the same and the frame G, is a grooved pulley, P^1, which is connected with the pulley N′ by means of the belt p. Attached to the center of the axle-shaft L is a double-grooved pulley, P^2, which is attached to the pulleys F^5 F^5 by means of the belts p'.

A water-pipe from a filter or hydrant, having some water-pressure to the square inch, is attached to the float check-valve b^3 in the equalizing-chamber B by means of the nozzle b^4, and the water turned on. The discharge-bungs D in the generators are then closed, and the caps a' taken off the bungs a. Through these are introduced into the generators the proper quantity of any suitable carbonate and water, and the bungs a closed again. Turn the handles d^2 of the spindles D^1 until the valves d^4 in the acid-chamber C

are closed, when the acid is introduced through the bungs c^2. The gas-washers H are then filled up to two-thirds of their capacity with water, through the bungs h^3, and the apparatus is ready to be put in motion. Before, however, imparting motion to the fly-wheel P, the valve d^4 in the acid-chamber C is raised from its seat d by means of the screw-threads d^3 of the spindle D^1, which allows the acid to flow freely into the generators A, and generate carbonic-acid gas. The acid will continue to so flow until the pressure of the gas generated is sufficient to overcome the weight of the acid in the pipes D^2, when the ball-valve d^6 will fall into its seat, and thus practically prevent any more acid from escaping. In the meanwhile motion is imparted to the fly-wheel P, which causes the pulley P^1 and the shaft L to revolve. The pulley P^1 communicates motion to the pulley N′ through the belt p, revolving the paddle n in the agitating-chamber M, and the shaft L communicates motion to the pumps F through the eccentric L′ and pitman-rods K, and also, through the pulleys P^2 F^5 and belts P^1, to the paddles b in the generators A. The gas so generated will pass through the pipes H^2 into the cylinders H, and there be washed or purified by being passed through the water in a distributed state by means of the perforated disks H^1. From these cylinders the gas will pass through the pipes b^2 to the top of the equalizing-chamber B, and from there pass through the pipes F^2 to the pumps F. At the same time the water from the equalizing-chamber B will pass from the bottom of the same through the pipes F^3 into the pumps F. It will be seen that by this arrangement the water and gas enter the pumps always at a uniform pressure, and consequently in a uniform given quantity, and owing to the arrangement of the openings in the cocks F^6, the quantity of gas and liquid can be regulated at will; so it becomes an easy matter to manufacture, by the use of my apparatus, beverages charged not only with any given quantity of gas, but also to have such beverages always impregnated uniformly. The valves f^3 in the pumps being so constructed as to cover, when in their seats, both the gas and liquid supply channels, no liquid can enter the gas-channel, and thereby impede the free delivery of gas to the pumps. As gas is a very compressive medium, especially if the same is pumped under a high pressure, it is obvious that you must have in a pump to compress gas the valve-chamber so arranged that the same will always remain full of liquid, and so form, as it were, a continuous plunger, fitting and filling up all crevices between the plunger and discharge-valve. To accomplish this I construct the channels f^5, which connect the valve-chambers f^1 and the chambers F^4 of the pumps F, at an angle of inclination extending from the top of the chambers F^4 down to the bottom of the valve-chambers f^1, as shown in Fig. 6, and having the valves f^3 on a level with the lower end of said channels. From the valve-chambers f^1 the liquid and gas is forced up by means of the pumps F, and, opening the valves f^2, passes through the pipes m into the agitating-vessel M, where they are thoroughly mixed by means of the stirrer n. The contents of the vessel M can be drawn off into suitable vessels by means of the sliding cock O. This cock O is constructed with a curved channel, o^2, which will communicate with either of the pipes O^1 O^2 for the following reason: If large portable vessels, such as fountains, are filled out of this vessel M, where the quantity of liquid in such fountain has to be ascertained by weight, some of the gas held in the liquid will escape by the passage into such vessel, and it will usually be found that after such fountain has the requisite quantity of liquid, the same will be short of the desired quantity of gas. To obtain the gas-pressure desired the sliding cock O is turned so as to communicate with the gas-pipe O^1 until the gage M^3 indicates the desired pressure. The water-glass M^2 shows the height of the liquid, while the pressure-gage M^3 indicates the pressure, and for safety the valve M^4 communicates with the gas-space in the agitating-vessel M. Only one generator A may be used at a time, since while one is in operation, the other may be recharged, communication with the pump being cut off by means of the stop-cock h^5. I do not desire to confine myself to the use of two generators, two purifiers, and two pumps, as in most cases the apparatus will be equally as effective by the employment of only one pump, one purifier, and one generator.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a soda-water apparatus, an equalizing-chamber by means of which both water and gas are fed to the pump at a uniform pressure, irrespective of the pressure in the generator, substantially as described.

2. In a soda-water apparatus, the valve-chamber f^1, connected with the chamber F^4 of the pump F by an inclined channel, f^5, and valves f^2 f^3, located as described, the whole constructed and arranged to operate substantially as described.

3. In a soda-water apparatus, the agitating-vessel M, provided with a sliding cock, O, said cock so constructed as to connect with either the gas-pipe O^1 or the water-pipe O^2, substantially as described.

4. In a soda-water apparatus, the combination of the generator A, provided with perforated paddle b, spindle c, and pulley F^5, with the acid-chamber C, valve d^4, pipe D^2, ball-valve d^6, and discharge-valve D, substantially as described.

5. In a soda-water apparatus, the combination of the generator A, constructed as described, purifying-cylinder H, constructed as described, equalizing-chamber B, having

float-valve b^3, and pipes H^2 b^2 b^4, substantially as described.

6. In a soda-water apparatus, the combination of the generator A, purifying-cylinder H, equalizing-chamber B, pump F, constructed as described, agitating-vessel M, constructed as described, and pipes F^2 F^3 H^2 b^2 b^4 m, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK W. WIESEBROCK.

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