

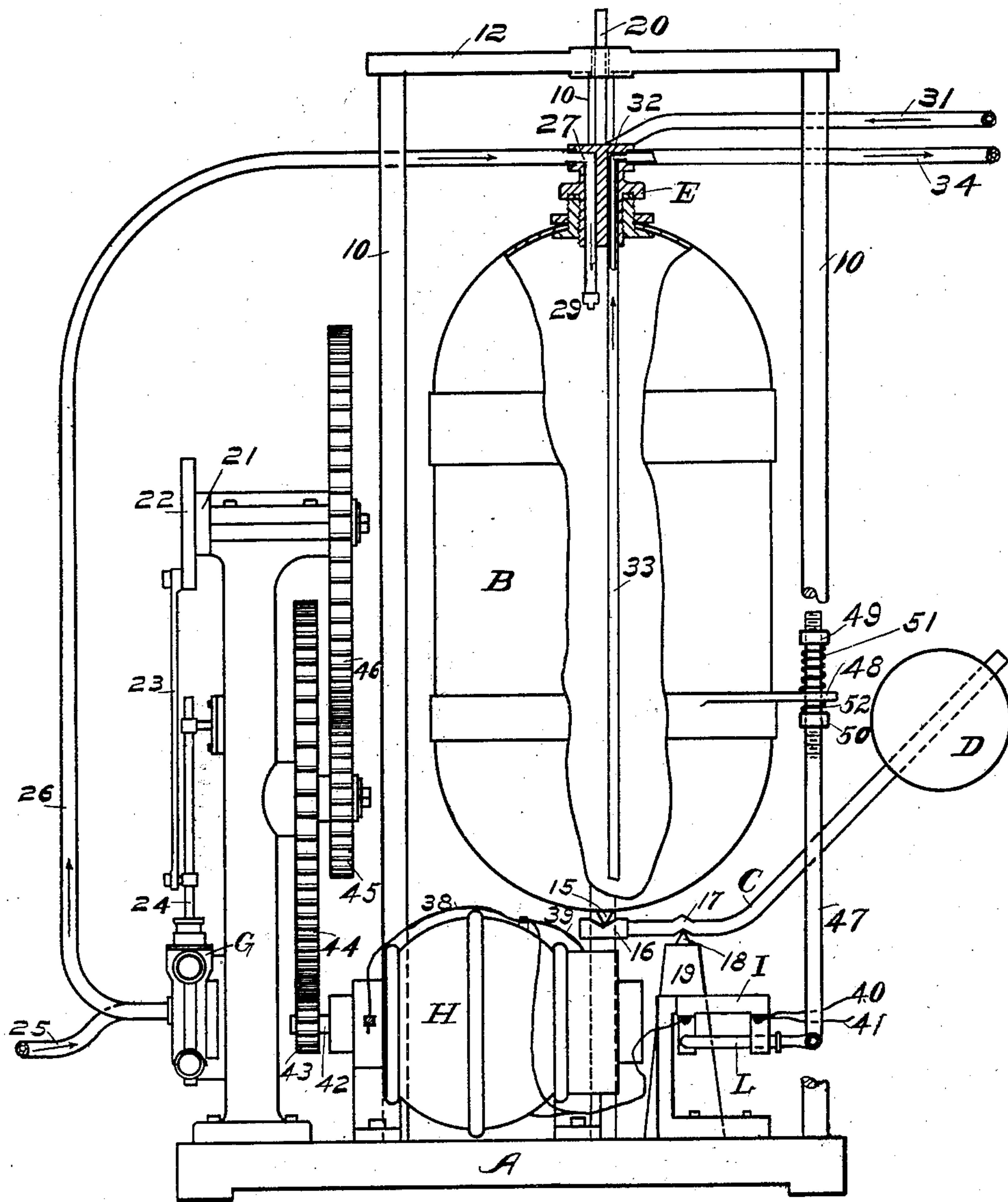
H. A. HOPKINS.
CARBONATING APPARATUS.

APPLICATION FILED APR. 20, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



Witnesses.

F. B. Spaulding
 Ges. H. Priest

Inventor.

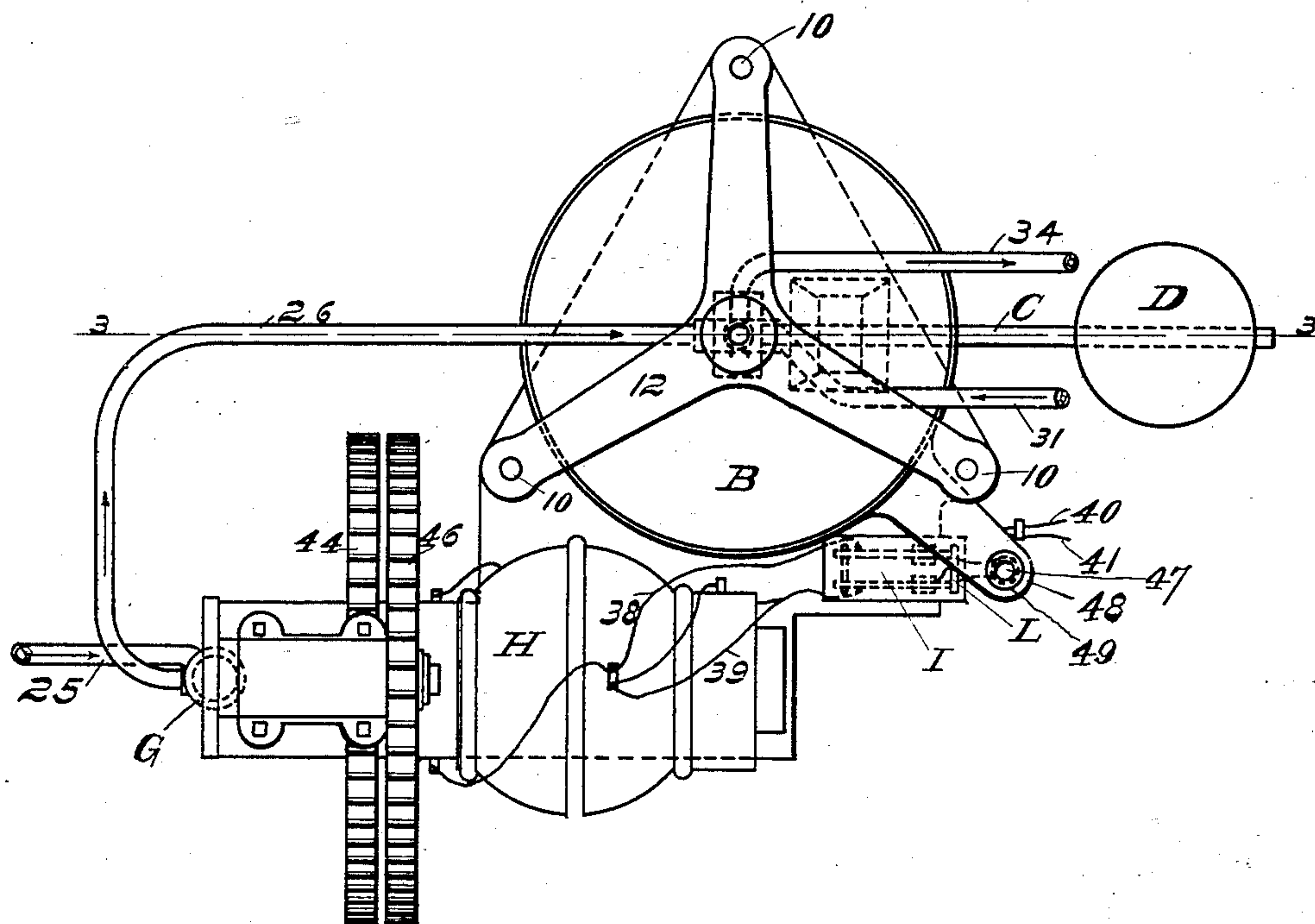
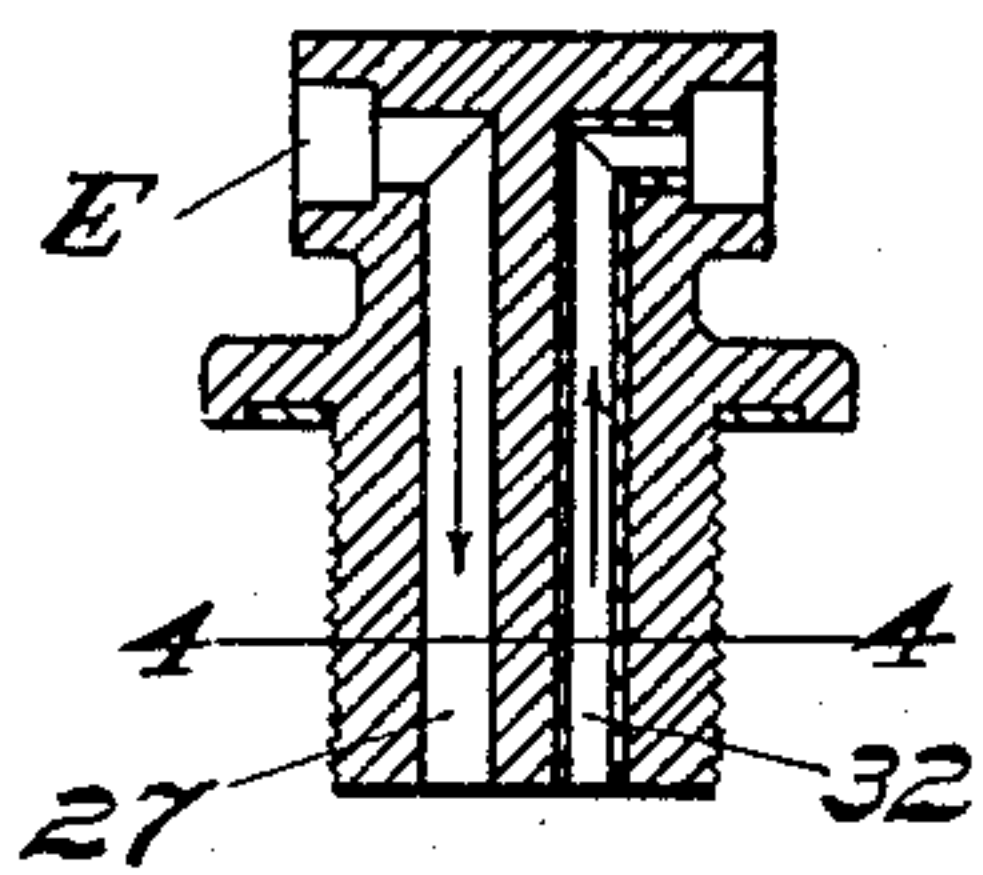
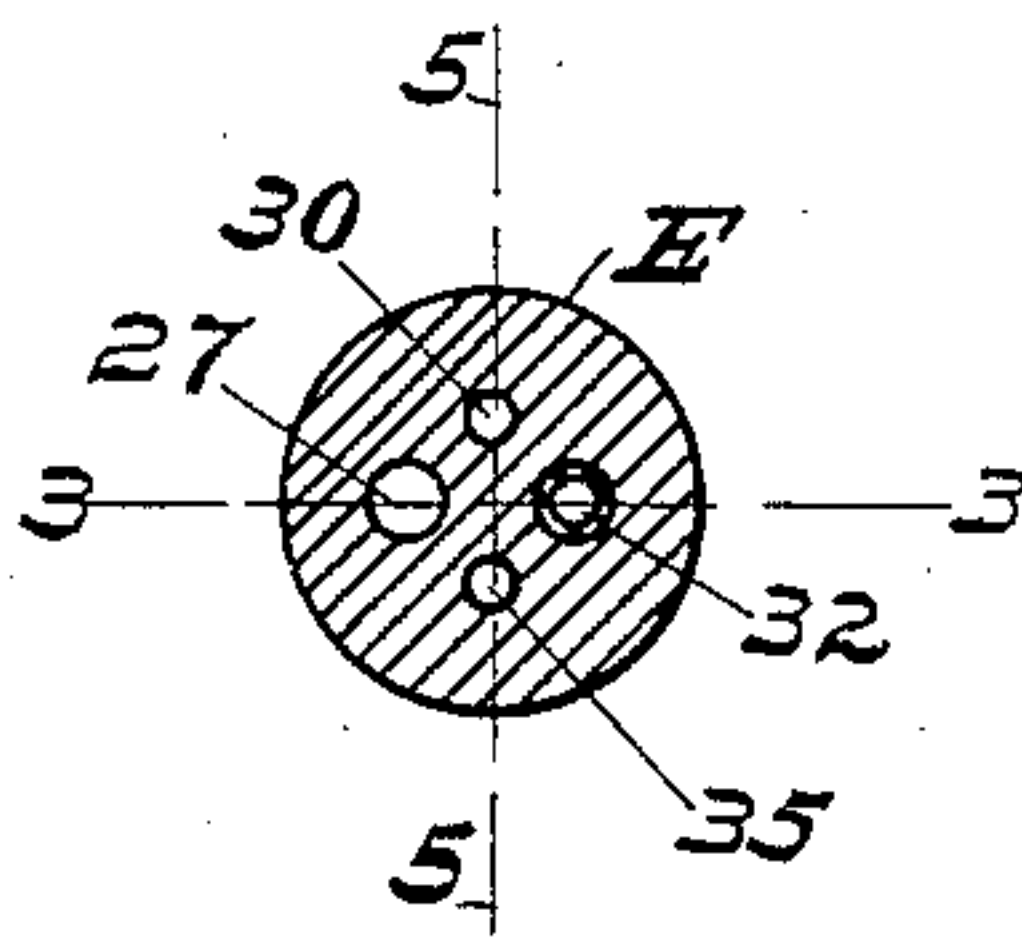
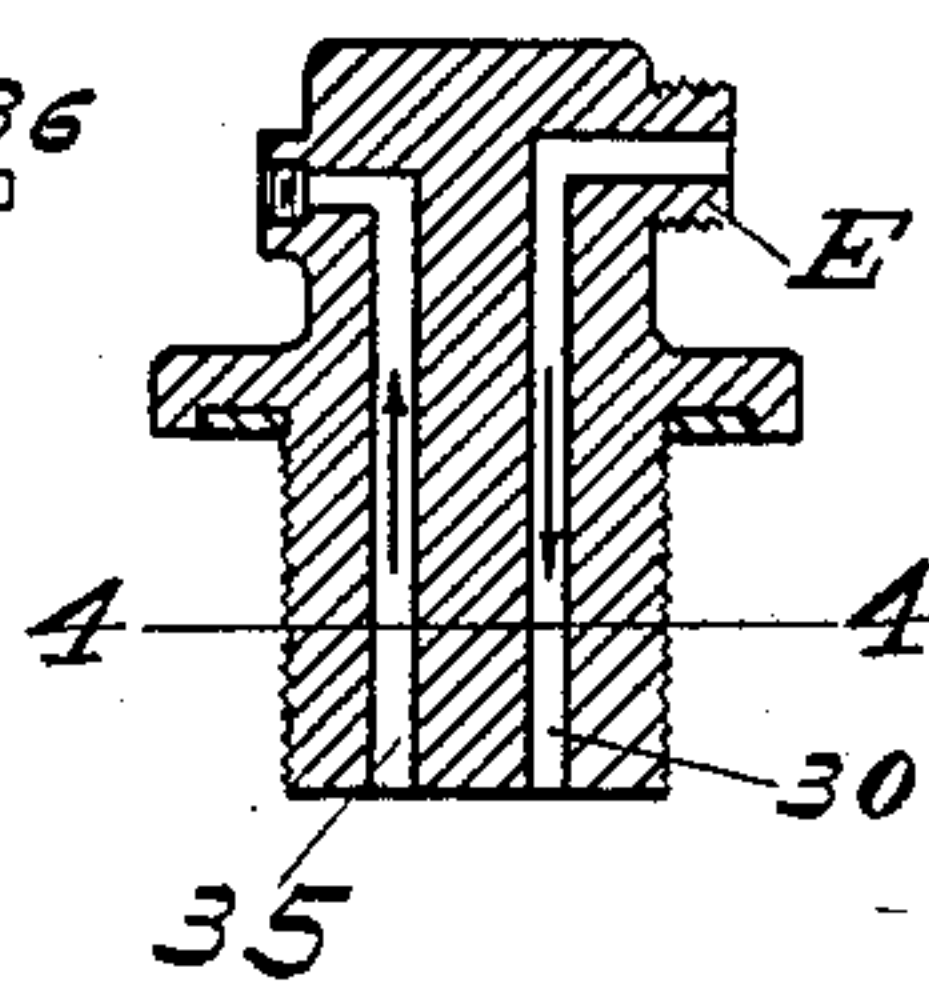
Heber A Hopkins
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NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.*Fig. 3.**Fig. 4.**Fig. 5.*

Witnesses.

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UNITED STATES PATENT OFFICE.

HEBER A. HOPKINS, OF CAMBRIDGE, MASSACHUSETTS, ASSIGNOR TO
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JERSEY, A CORPORATION OF NEW JERSEY.

CARBONATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 736,523, dated August 18, 1903.

Application filed April 20, 1903. Serial No. 153,543. (No model.)

To all whom it may concern:

Be it known that I, HEBER A. HOPKINS, a citizen of the United States, residing at Cambridge, in the county of Middlesex and State
5 of Massachusetts, have invented certain new and useful Improvements in Carbonating Apparatus, of which the following is a specification.

To provide for drug-stores and bottling establishments a simple, effective, and economical apparatus for automatically carbonating water and other liquids is the object of my invention, which consists in an electrically-operated apparatus of this description embodying certain novel combinations of parts
15 and details of construction hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a carbonating apparatus constructed in accordance with my invention, a portion of the mixing vessel being broken away to show the parts within. Fig. 2 is a plan view of the apparatus. Fig. 3 is an enlarged section of the plug of the mixing vessel on the line 3 3 of Fig. 2. Fig. 4 is a horizontal section on the line 4 4 of Figs. 3 and
25 5. Fig. 5 is a vertical section on the line 5 5 of Fig. 4.

In the said drawings, A, Fig. 1, represents
30 the base of the apparatus, from which rises a frame composed of a series of rods 10, connected at their upper ends by a spider 12, having a plurality of arms, one for each rod. Within this frame is placed a vertically-movable receiver or mixing vessel B, provided at
35 its bottom with a pivot-point 15, preferably of knife-edge form, which rests in a V-shaped notch 16, formed in the short arm of a supporting-lever C, fulcrumed at 17 on a knife-edge 18 at the upper end of a post 19 and provided with a counterbalance-weight D, adjustable thereon. From the plug E, at the center of the top of the mixing vessel, projects a vertical pin 20, which passes up through a
45 guide-aperture at the center of the spider 12, whereby the mixing vessel, supported by the lever C, is steadied and held in its proper vertical position as it rises and falls by reason of variations in the weight of its contents, as
50 hereinafter described.

Upon the base A is secured a pump G for forcing pure water or other liquid which it is desired to charge with gas into the mixing vessel B. This pump is provided with a crank-shaft 21, having at its outer end a crank-disk
55 22, which operates by means of a connecting-rod 23 a plunger 24. A supply-pipe 25, leading from any suitable source of supply, communicates with the valve-chamber of the pump, and the discharge-pipe 26 of the pump
60 is connected with the passage 27, Figs. 1, 3, and 4, of the plug E, through which the water is introduced into the mixing vessel by the pump, the lower end of this passage being provided with a suitable spraying head or device 29, by means of which the liquid is broken
65 up or atomized into a fine spray, which falls to the bottom of the mixing vessel, thereby becoming saturated with the carbonic-acid gas under pressure, which is introduced
70 through another passage 30, Figs. 4 and 5, in the plug E, with which is connected a pipe 31, by which the carbonic-acid gas is conducted from a generator or other source of supply. The supply-pipe 31 is connected,
75 as usual, with an equalizing-valve and pressure-gage, (not shown,) by which the pressure of the gas is regulated in a well-known manner.

Either liquefied gas or gas from a generator may be used, as desired. A passage 32
80 in the plug E is provided with a discharge-pipe 33 for the carbonated liquid, said pipe extending to near the bottom of the mixing vessel, as shown in Fig. 1, and to the upper end
85 of the passage 32 is connected the draft-pipe 34, leading to the dispensing apparatus or bottling-table. The plug E also has a vent-opening 35, provided with a screw-plug 36, through which air may be allowed to escape
90 or the gas withdrawn, if required.

The pump is actuated at the proper times by an electric motor H, which is connected by means of wires 38 39 to binding-posts on a switch I, the wires 40 41 from which lead
95 to the proper source of electric energy. When the motor H is supplied with its proper amount of current by the closing of the switch I, its armature-shaft 42 is rotated, and by means of the pinion 43 thereon operates the
100

gears 44 45, the latter meshing with and driving the gear 46 on the crank-shaft of the pump.

The switch I is provided with a lever L, to the outer end of which is pivoted a vertical rod 47, the upper threaded portion of which passes loosely through an aperture in an arm 48, secured to and projecting from the side of the mixing vessel B, and above and below this arm on the threaded portion of the rod 47 are two collars 49 50, the rod being provided with two cushion-springs 51 52, which are arranged on opposite sides of the arm 48 and between the same and the collars and act to cushion the force transmitted by the vertical movements of the mixing vessel through the medium of the arm 48 and rod 47 to the switch-lever L, so that the latter can be operated without shock in closing the circuit. The collar 49 is adjustable on the rod 47 to vary the tension of the springs, whereby the switch may be operated faster or slower and at such time or times as may seem desirable or necessary.

In operating the apparatus the gas is first admitted to the mixing vessel B, and as soon as the desired pressure has been reached the apparatus is ready for the operation of charging water or other liquid with gas. At the commencement of the operation the mixing vessel, which then contains no liquid, is raised vertically to its highest position by the counterbalance-weight D on the supporting-lever C, in which position the switch-lever is brought into contact with the binding-posts to close the circuit and permit the current to pass to the motor, which will then be set in motion to operate the pump, causing the latter to draft the water or liquid to be charged with gas through the pipe 25 and force the same through the pipe 26 into the mixing vessel B, the water being atomized and descending to the bottom of the mixing vessel, receiving in its descent carbonic-acid gas to the amount desired, and thus becoming fully charged or saturated. The charged water gradually rises in the mixing vessel until the supply reaches a point where the weight of the vessel and its contents will overcome that of the counterbalance-weight D, when the vessel will descend, causing its arm 48 to act on the spring 52 and depress the rod 47, thereby disengaging the switch-lever from the binding-posts, which breaks the circuit, thus stopping the motor and pump and shutting off the supply of water or liquid to the mixing vessel.

The withdrawal from the mixing vessel through the exit-pipe 34 of the charged liquid at the dispensing apparatus or bottling-table lessens the quantity in the said vessel, and when a sufficient quantity has been drawn off to allow the weight D to overbalance the weight of the mixing vessel and its contents the said vertically-guided vessel will be raised by the counterbalance-weight D, and the arm 48 will act, through the upper spring 51 and collar 49, to raise the rod 47 and oper-

ate the switch-lever to close the circuit, when the motor will rotate to operate the pump and furnish a fresh supply of liquid to the mixing vessel. This alternate stopping and starting of the pump occurs with each filling of the mixing vessel to its limit and each discharge therefrom to the extent necessary to cause the counterbalance-weight to overcome that of the vessel and its contents.

The supply of gas to the mixing vessel is automatic after the first starting and through the equalizing-valve (not shown) is regulated to the pressure desired. The supply of liquid to the mixing vessel is also automatic by the operation of the controlling-switch I above described, and the result is that the supply of both gas and liquid is at all times automatically controlled and regulated, never requiring the attention of an operator after the first starting and securing uniformity in the product.

The above-described apparatus may be used for charging mineral waters or other waters or beverages, it being merely necessary to connect the supply-pipe of the pump with a tank containing the mineral or other water or liquid which it is desired to charge with gas.

I do not wish to limit myself to the exact method shown of operating the switch for opening and closing the motor-circuit, as it is obvious that the switch may be operated in a variety of different ways by the vertical movements of the mixing vessel.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A carbonating apparatus comprising a vertically-movable mixing vessel or receiver, means for vertically guiding the same, a weighted counterbalance-lever forming a pivotal support or rest for the lower end of the mixing vessel, a stationary pump for supplying water to the mixing vessel, an electric motor connected with a source of electric energy for operating the pump, and means for opening and closing the motor-circuit by the vertical movements of the mixing vessel to stop and start the pump.

2. In a carbonating apparatus, the combination of a vertically-movable mixing vessel, a counterbalance-lever one arm of which forms a pivotal support for the mixing vessel and the other arm being provided with a counterbalance-weight, a stationary pump for supplying water to the mixing vessel, an electric motor connected with the pump, means for supplying gas to the mixing vessel, an electric switch for cutting off or furnishing a supply of current to the electric motor, and means for opening and closing the switch by and during the vertical movements of the mixing vessel.

3. In a carbonating apparatus, the combination of a vertically-movable mixing vessel, a counterbalance-lever one arm of which forms a pivotal support for the mixing vessel and the other arm being provided with a

counterbalance-weight, a stationary pump for supplying water to the mixing vessel, an electric motor connected with the pump, an electric switch for shutting off and furnishing a supply of current to the electric motor, an electric switch-lever, an arm projecting from the mixing vessel, and an operating-rod connecting said arm with the switch-lever for opening and closing the switch by the vertical movements of the mixing vessel.

4. In a carbonating apparatus, the combination of a vertically-movable mixing vessel having a knife-edge pivot at its bottom and a guide at its upper end, a counterbalance-lever forming a pivotal support for said mixing vessel, one arm of said lever being provided with a bearing for the knife-edge of the mixing vessel, the other arm having a counterbalance-weight, a pipe for supplying gas to the mixing vessel, a stationary pump, an electric motor connected with the pump, means for introducing water from the pump to the mixing vessel, an electric switch for shutting off and furnishing a supply of current to the electric motor, a switch-lever, an

arm projecting from the mixing vessel, an operating-rod yieldingly connected with said arm and with the switch-lever for opening and closing the switch by and during the vertical movements of the mixing vessel.

5. In a carbonating apparatus, the combination of a vertically-movable mixing vessel, means for vertically guiding the same, a weighted counterbalance-lever forming a pivotal support for the bottom of the mixing vessel, a stationary pump, an electric motor for operating the same, means for supplying water and gas to the mixing vessel, an electric switch, means automatically operated by the vertical movements of the mixing vessel for opening and closing the switch to thereby stop and start the pump, and a draft-pipe leading from the mixing vessel to the dispensing apparatus or bottling-table.

Witness my hand this 14th day of April, A. D. 1903.

HEBER A. HOPKINS.

In presence of—

P. E. TESCHEMACHER,
F. B. SPAULDING.