

No. 639,631.

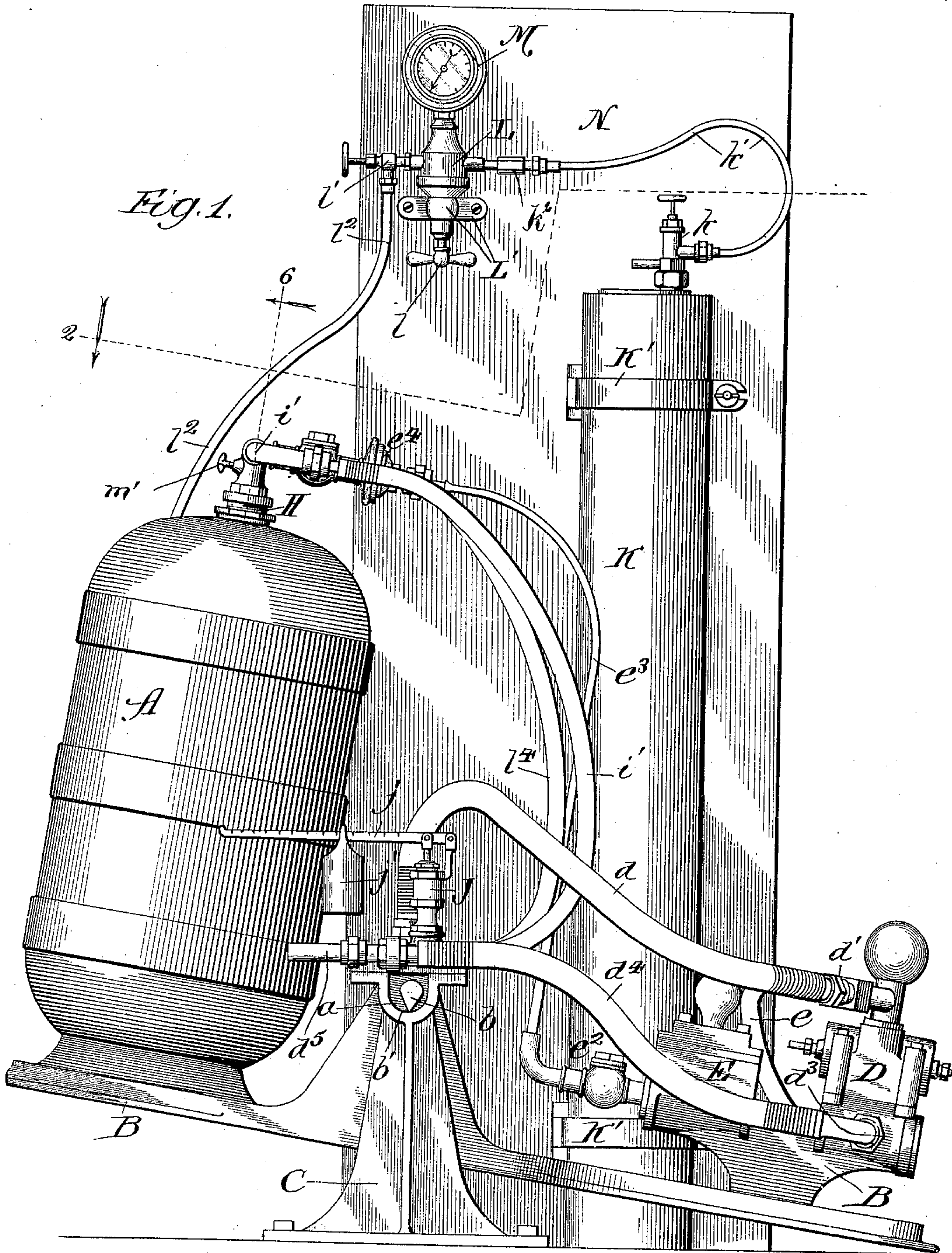
L. TUFTS & H. A. HOPKINS.  
CARBONATING APPARATUS.

Patented Dec. 19, 1899.

(Application filed Mar. 27, 1899.)

(No Model.)

4 Sheets—Sheet 1.



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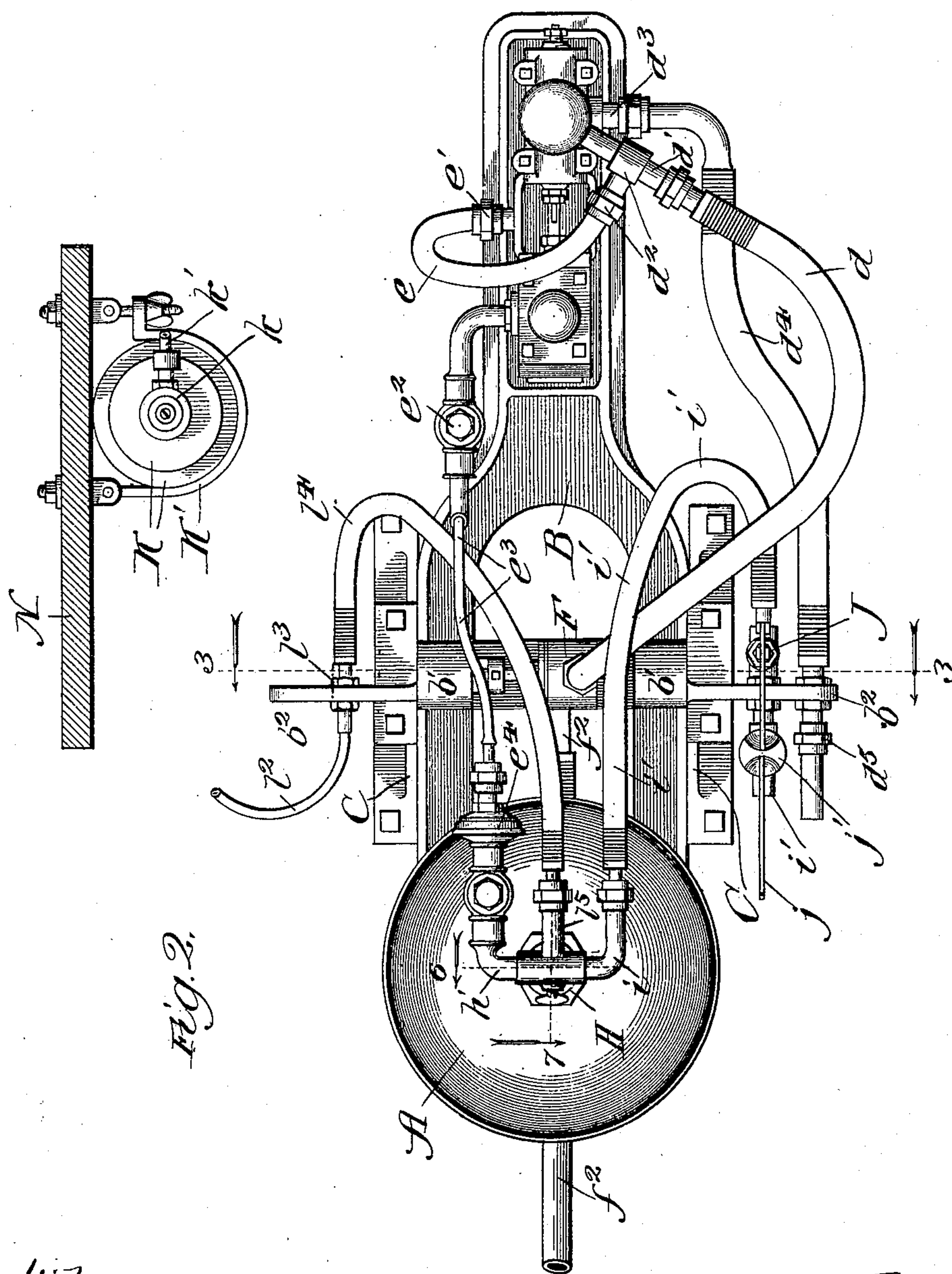


Fig. 2.

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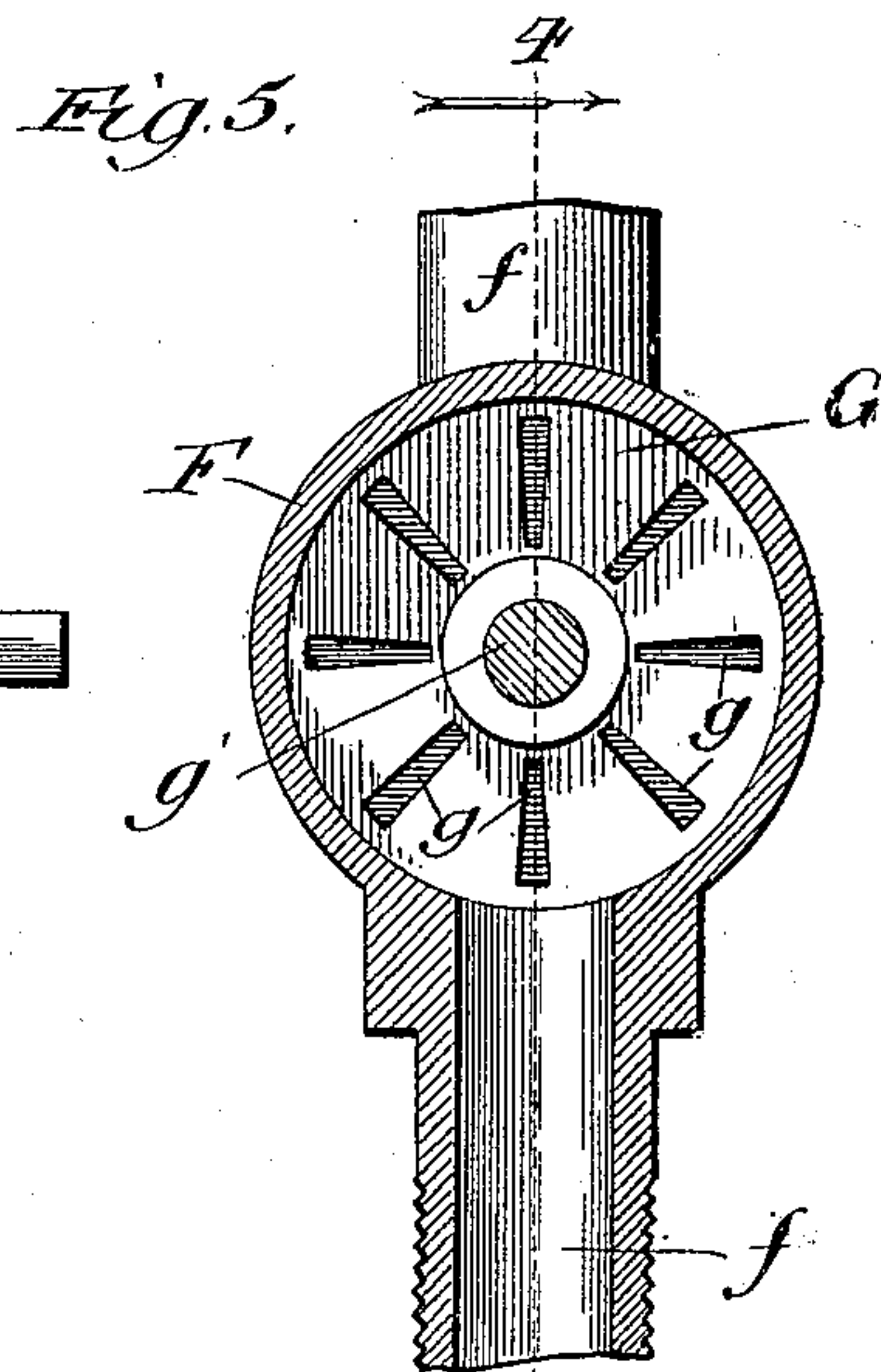
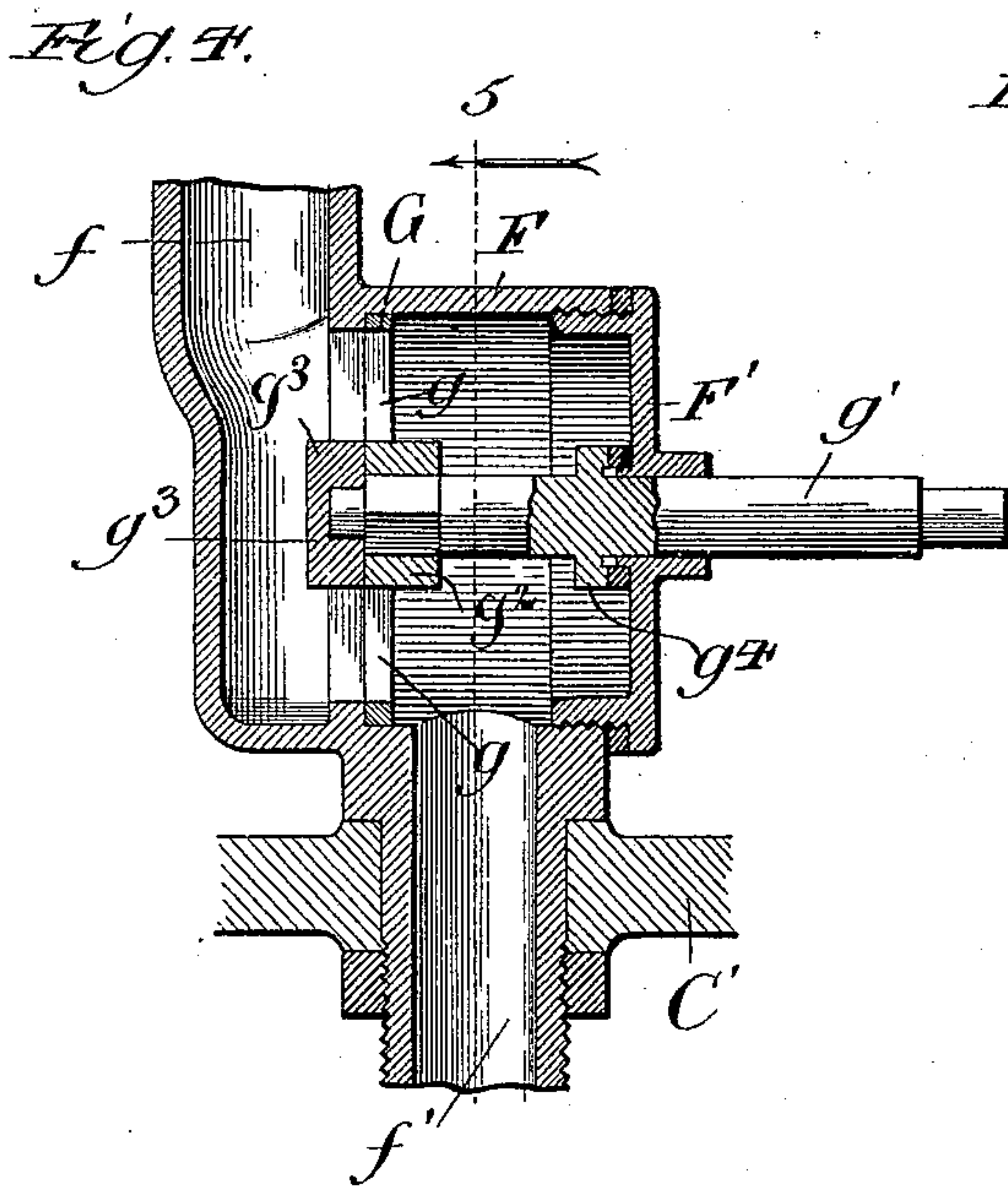
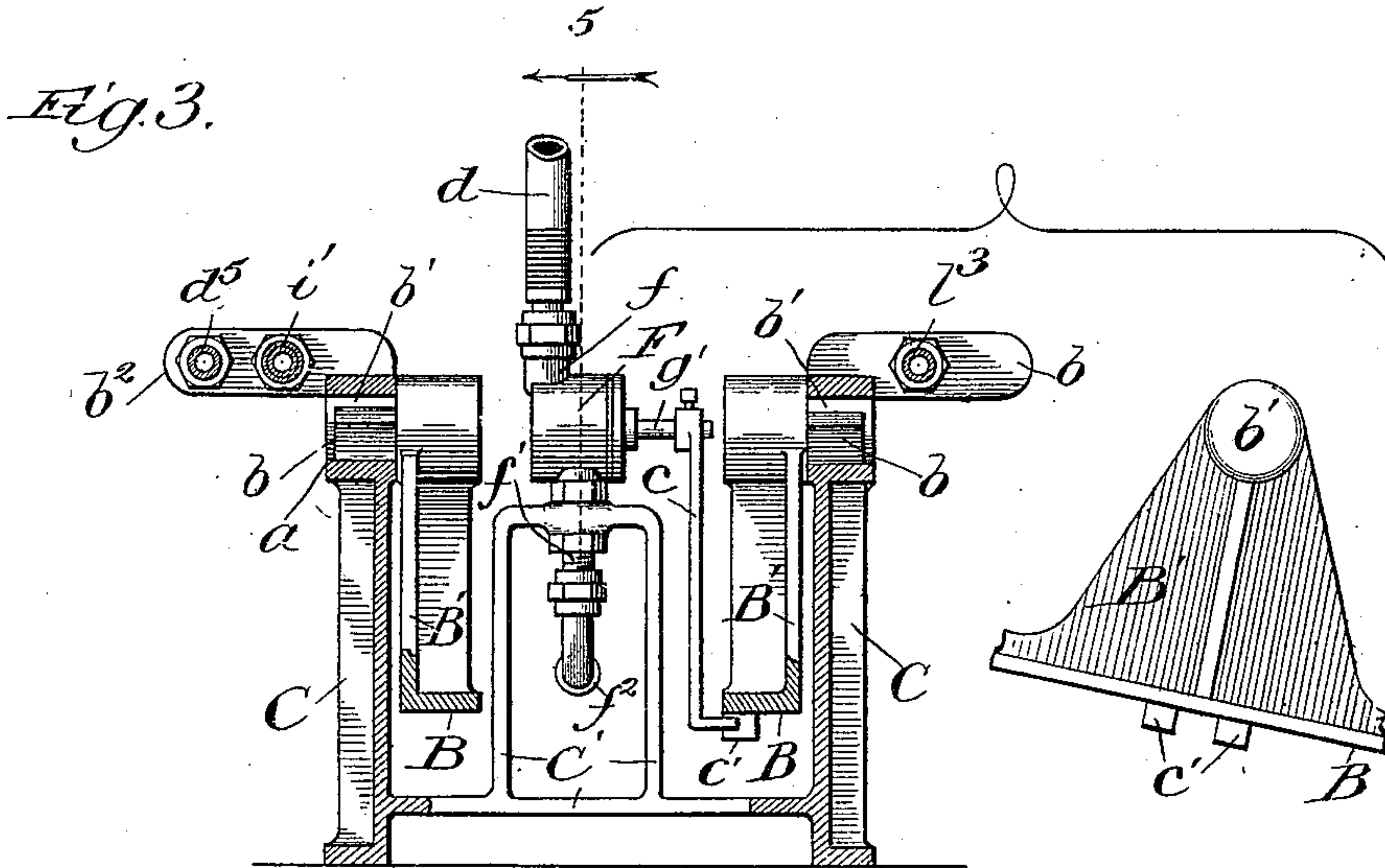
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CARBONATING APPARATUS.

(Application filed Mar. 27, 1899.)

(No Model.)

4 Sheets—Sheet 3.



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4 Sheets—Sheet 4.

Fig. 6.

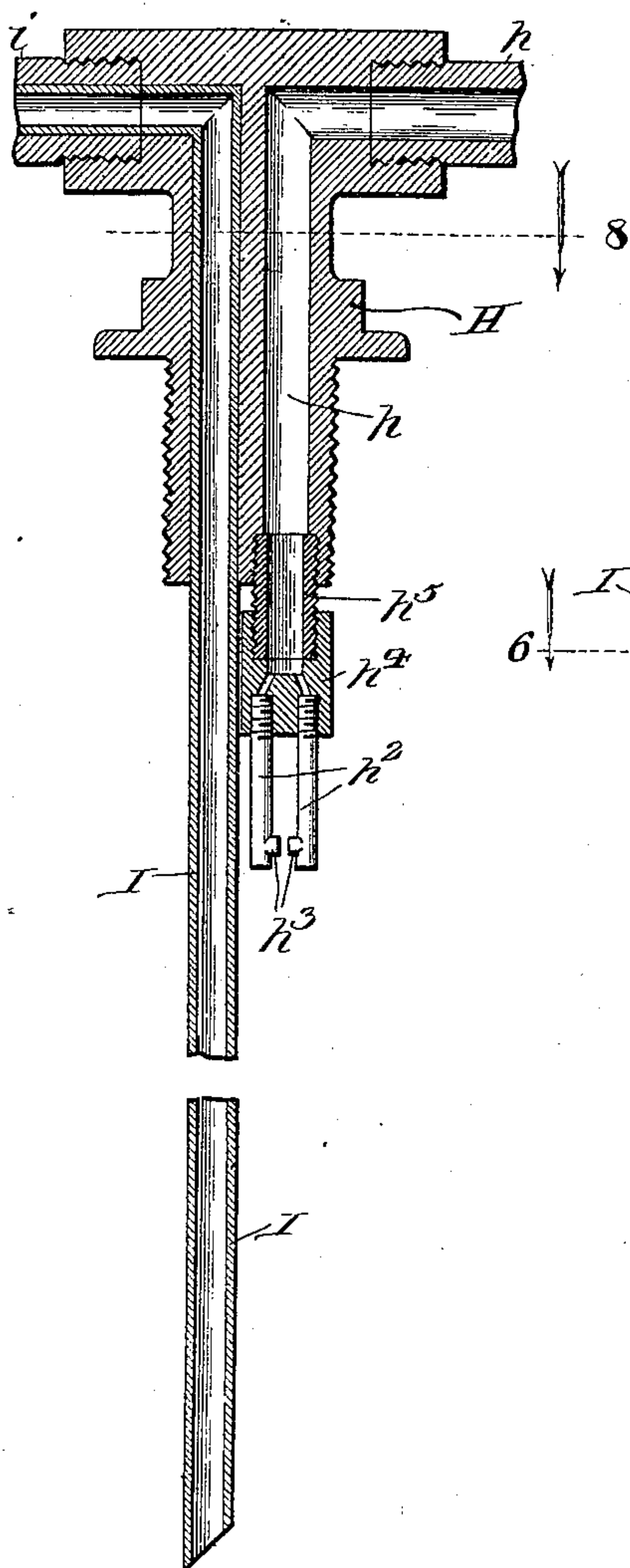


Fig. 7.

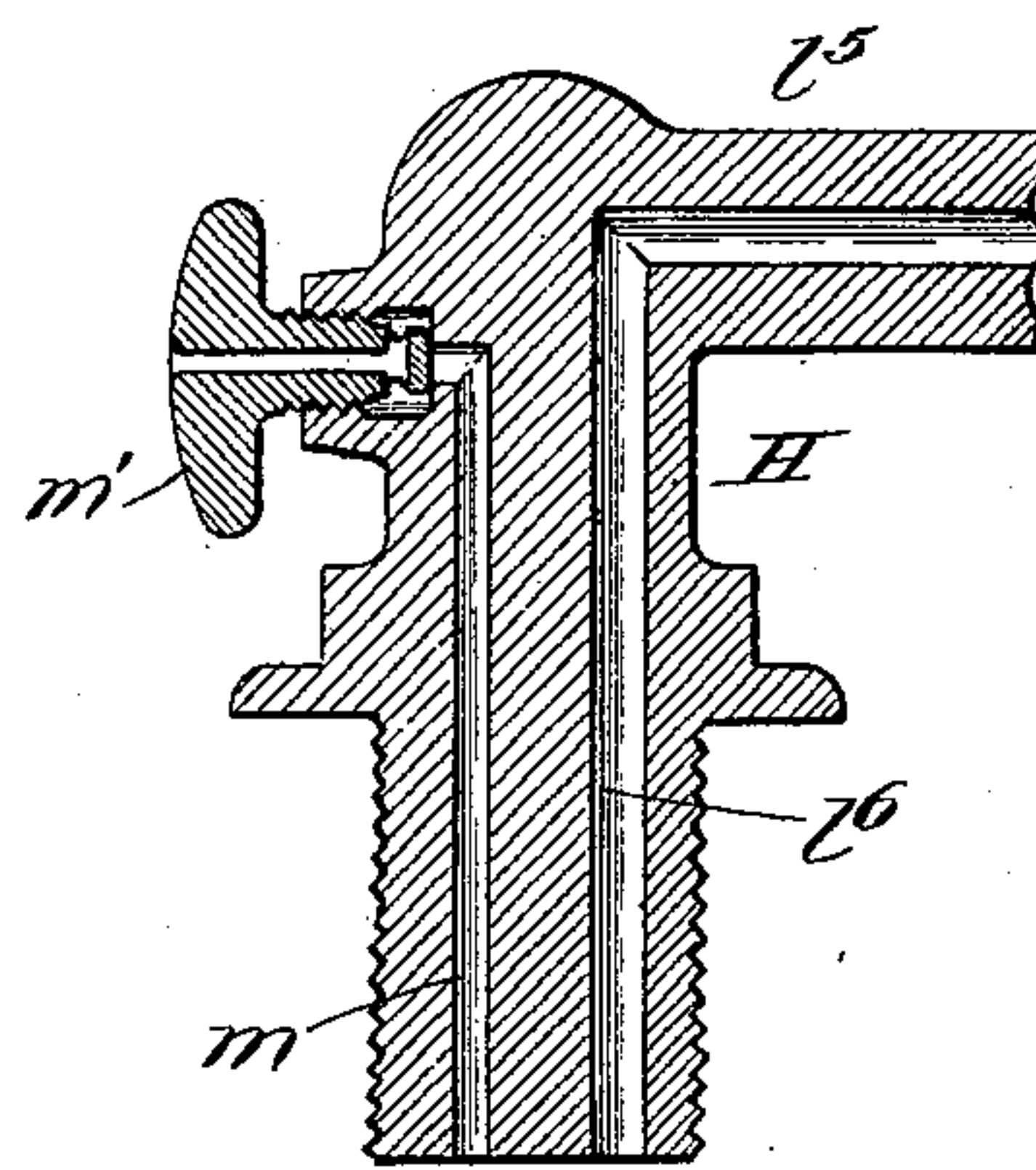
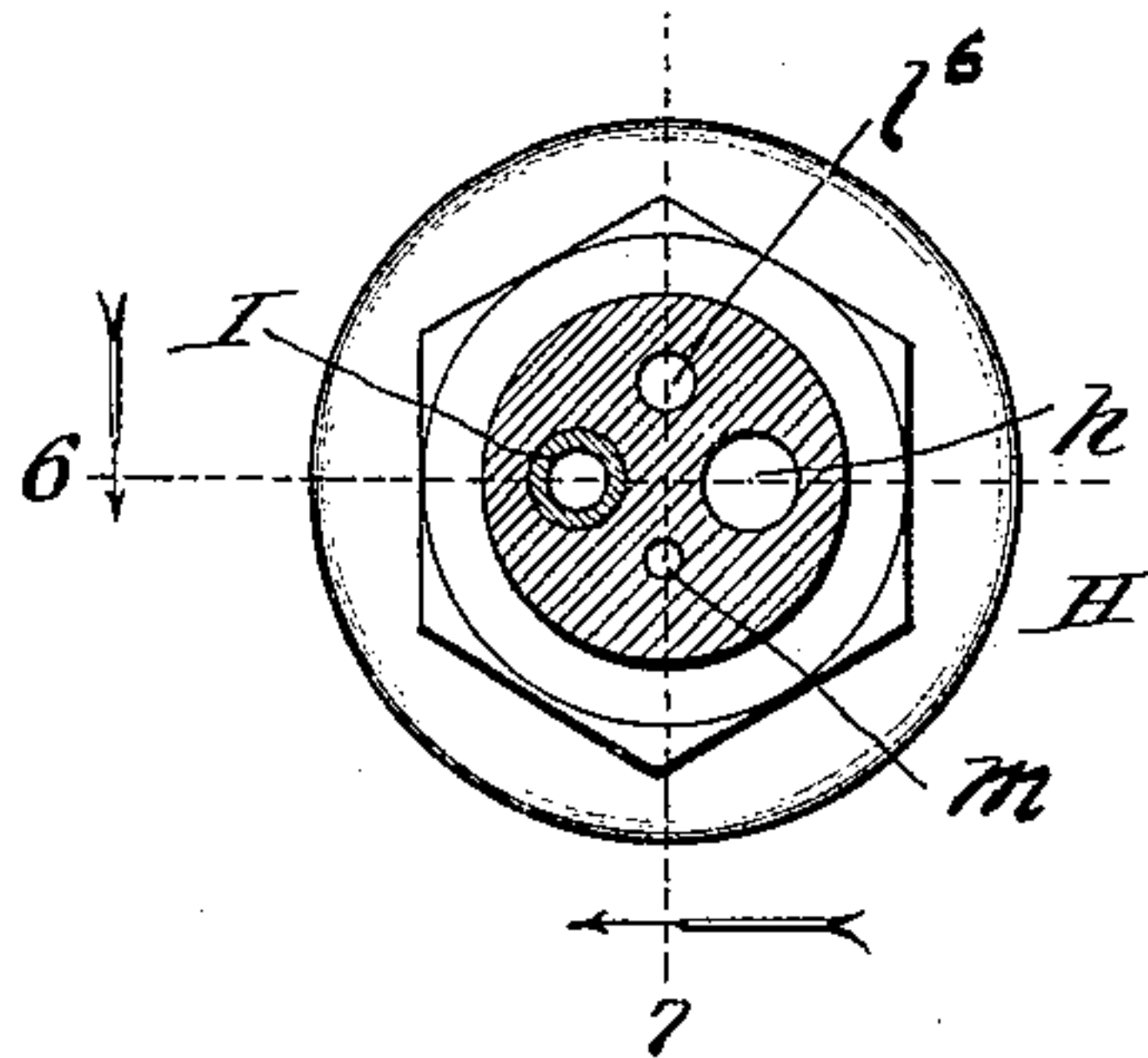


Fig. 8.



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# UNITED STATES PATENT OFFICE.

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## CARBONATING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 639,631, dated December 19, 1899.

Application filed March 27, 1899. Serial No. 710,611. (No model.)

*To all whom it may concern:*

Be it known that we, LEONARD TUFTS, of the city of Medford, and HEBER A. HOPKINS, of the city of Cambridge, in the State of Massachusetts, have invented a new and useful Improvement in Carbonating Apparatus, of which the following is a specification.

Our invention is especially designed for manufacturing soda-water in drug stores and similar places; but it may be used in bottling establishments and elsewhere.

The object of the invention is to provide for a constant and continuous supply of soda-water automatically; and the invention consists in the features and combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of our improved carbonator; Fig. 2, a plan view taken on line 2 of Fig. 1 with parts shown in section; Fig. 3, a detail view, partly in section, taken on line 3 of Fig. 2; Fig. 4, a sectional view taken on line 4 of Fig. 5; Fig. 5, a transverse sectional view taken on lines 5 of Figs. 3 and 4; Figs. 6 and 7, detail sectional views taken on lines 6 and 7, respectively, of Figs. 2 and 8; and Fig. 8, a plan sectional view taken on line 8 of Fig. 6.

In constructing our improved carbonating apparatus we use a receiver or mixing vessel A and mount the same on one end of a rocking or tilting platform B, on which platform and its supports most or all the other working parts are mounted. This platform has two pivots *b*, one at each side, which rest on a bearing *b'* in the upper end of each standard C, forming the support thereof. We prefer to have these pivots of knife-edge form; but other forms may be used, if desired.

A hydraulic or other motor D, with a pump E, is mounted on the end of the rocking platform opposite the end carrying the mixing vessel. A water-supply pipe *d* connects with the union or coupling *d'* of the motor, and a discharge-pipe *d''* connects with the union or coupling *d'''* and has a union or coupling *d''''*, supported by an arm *b''*, for connecting a pipe discharging into a sewer or elsewhere. A tube *e* connects with a union or coupling *d'''''* of the supply-pipe *d* and with a union or coup-

ling *e'* on the pump-chamber, and a discharge-pipe *e''* connects with a check-valve *e'''*, which in turn is connected with the pump and leads to the mixing vessel, a filter *e''''* being interposed in the pipe.

The standards C, through the frame or bracket C', support a valve-casing F, the chamber of which is provided with an inlet-pipe *f'*, supplied by a pipe *f''*, which is connected with the street-main or other source of water-supply, and an outlet-pipe *f'''* leads from the valve-chamber and is connected with the supply-pipe *d* of the motor. A valve G, having a series of radial openings *g*, separates the induction from the eduction portion of the valve-chamber, and this valve has a stem *g'*, the inner end of which fits a socket *g''* in the hub of the valve and projects beyond the valve, being supported in a cross-bar *g'''* of the casing. The valve-stem is provided with a flanged shoulder *g''''*, between which and the cover F' of the valve-casing is placed a suitable packing. The outer end of the valve-stem has secured thereto an arm *c*, the free end of which passes between lugs *c'* on the platform, so that the rocking of the platform causes the lugs to come in contact with the arm *c* and open and close the valve, thus regulating the water-supply.

The top of the mixing vessel is provided with a plug H, preferably having the construction shown in Figs. 6, 7, and 8, with four passages or holes. As shown, one of these passages or holes *h* communicates with the coupling *h'* for the attachment of the liquid-supply pipe *e''*, and the opposite one receives a discharge-pipe I for the carbonated liquid. This discharge-pipe communicates with a coupling *i*, to which is attached a draft-pipe *i'*, forming a continuation thereof, which in turn is provided with a safety-valve J, controlled by a lever *j* and a weight *j'*, as usual; and this coupling-pipe furnishes the attachment for a pipe leading to the dispensing apparatus. The plug H has a vent opening or passage *m*, controlled by a thumb-screw valve *m'*, and also a passage *l''*, communicating with a coupling *l'''* for the attachment of the gas-supply pipe of the equalizing-valve.



A tube or cylinder K, containing liquefied carbonic-acid gas is removably supported on a board N and held in place by means of hinged straps K' or in any other suitable manner, and on this board is placed an equalizing-valve L, held in position by a strap L' or otherwise. The gas-cylinder has a valve  $k$ , and leading from this valve is a pipe  $k'$ , connected with the coupling  $k^2$  of the equalizing-valve, for supplying gas to the valve, and the equalizing-valve has a regulator stem or key  $l$  and a discharge-valve  $l'$ , connected with which is a pipe  $l^2$ , leading to a coupling  $l^3$ , supported in an arm  $b^2$ , from which coupling a pipe  $l^4$  leads to the coupling  $l^5$  for supplying gas through the passage  $l^6$  to the mixing vessel. This passage  $l^6$  communicates with a pipe (not shown) extending into the mixing vessel preferably down to near the bottom thereof. The equalizing-valve has connected therewith a pressure-gage M, by which the pressure at which it is set is indicated. The regulator is set by the hand-screw in its lower part.

The liquid introduced into the mixing vessel to be charged is forced by the pump through the passage  $h$  into tubes  $h^2$ , having laterally and inwardly projecting nozzles  $h^3$ , and by the impact of the two nozzle-streams against each other the liquid is broken or atomized into an exceedingly fine spray. The tubes are connected with a head  $h^4$ , having passages leading from a chamber therein, one to each tube, and the head is connected by a coupling  $h^5$  with the passage  $h$ .

When the apparatus is set up for use in a drug store, the supply-pipe  $f^2$  is connected with the hydrant or other source of supply and the draft-pipe  $i'$  with the dispensing apparatus and when it is set up for use in a bottling establishment connections are made accordingly. Either liquefied gas or gas from a generator may be used, as desired.

In operating the apparatus the regulator is set by means of a hand-screw to the pressure desired, which will be indicated on the pressure-gage. When this pressure is reached in the mixing vessel, the water from the hydrant or other source of supply is turned on and the apparatus is ready for the operation of charging water with gas. At the commencement of the operation the rocking platform is in the position shown in Fig. 1, with the mixing vessel raised, in which position the water-supply passes through the induction or controlling valve and the supply-pipes to the motor and pump-chamber. This starts the motor to operate the pump and force water into the mixing vessel, the water being divided or atomized, as above described, 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 fills the mixing vessel until the supply reaches a point where the weight overcomes the weight of the motor and pump, when the platform will be rocked or tilted

down at the end supporting the mixing vessel. This rocking or tilting, operating through the mechanism above described, closes the controlling-valve, and this stops the action of the motor and pump and shuts off the supply of water or liquid to the mixing vessel.

The drawing off from the mixing vessel of the charged liquid at the dispensing apparatus lowers the quantity in the mixing vessel and when a sufficient quantity has been withdrawn to allow the weight at the pump end of the platform to overbalance the weight at the opposite end the platform is reversely tilted, the controlling-valve opened, and the motor and pump again started to force a supply of liquid into 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 make the weight less than the weight at the pump end of the platform.

The supply of gas to the mixing vessel is automatic after the first starting and through the equalizing-valve is regulated to the pressure desired. The supply of liquid to the mixing vessel is also automatic by the operations of the controlling-valve 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 arrangement for supplying water shown in the drawings is intended for an ordinary hydrant-supply; but the apparatus may be used for charging mineral or other waters generally. All that is required to adapt it to this use is to disconnect the supply pipe of the pump from the hydrant supply-pipe, and connect it with a tank containing the mineral or other water which it is desired to charge, other slight changes being made to suit special conditions.

As mounting the parts on a rocking or tilting platform, as above described, constitutes the most essential feature of our invention, it will be understood that we do not intend to limit ourselves to minor features or details of construction. On the contrary, we contemplate formal changes and the omission of parts or the use of equivalents, as circumstances may suggest or render expedient. In this view it will be understood that while we have described our invention somewhat minutely with reference to details we do not intend to be limited thereto, except as pointed out in the claims.

We claim—

1. In a carbonating apparatus, the combination of a rocking platform, a mixing vessel on one end of the platform, a pump on the other end of the platform, means for introducing water from the pump into the mixing vessel, and mechanism automatically operated through the medium of the rocking plat-



form with the differential weight of the mixing vessel in emptying and filling for starting and stopping the pump, substantially as described.

5 2. In a carbonating apparatus, the combination of a rocking platform, a mixing vessel on one end of the platform, means for supplying gas to the mixing vessel, a motor and pump on the other end of the platform, means  
10 for supplying water to the motor and pump and to the mixing vessel, and mechanism automatically operated by the rocking movement of the platform for controlling the water-supply and stopping and starting the motor  
15 and pump, substantially as described.

3. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of the platform, a pipe supplying gas to the mixing  
20 vessel, a gas-regulator and pressure-gage for the gas-pipe, a hydraulic motor and pump on the other end of the rocking platform, a pipe for supplying water to the motor and pump and to the mixing vessel, and mechanism au-  
25 tomatically operated by the movement of the platform to control the water-supply and stop and start the motor and pump, substantially as described.

4. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of the platform, means for supplying gas to the  
30 mixing vessel, a hydraulic motor and pump on the other end of the platform, a pipe or pipes for supplying water to the motor and pump, a pipe leading from the pump to the mixing vessel for supplying water to the mix-  
35 ing vessel, a spraying device within the mixing vessel, and mechanism automatically operated by the movement of the platform to control the water-supply and stop and start the motor and pump, substantially as de-  
40 scribed.

5. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of the platform, a pipe for supplying gas to the  
45 mixing vessel communicating with a plug at its end adjacent to the vessel, a pipe communicating with said plug and extending down in the mixing vessel to a point near the bot-  
50 tom thereof, a hydraulic motor and pump on the other end of the platform, a pipe or pipes for supplying water to the motor and pump, mechanism automatically operated through  
55 the medium of the rocking platform with the differential weight of the mixing vessel for starting and stopping the motor and pump, and a pipe leading from the pump for supplying water to the mixing vessel, substan-  
60 tially as described.

6. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of the platform, a pipe for supplying gas to the  
65 mixing vessel, a hydraulic motor and pump on the other end of the platform, a pipe or

pipes for supplying water to the hydraulic motor and pump, mechanism automatically operated through the medium of the rocking  
70 platform with the differential weight of the mixing vessel for starting and stopping the motor and pump, a pipe leading from the pump for supplying water under pressure to the mixing vessel, a draft-pipe within the  
75 mixing vessel extending down to a point near the bottom thereof, and a draft-pipe leading from the mixing vessel to the dispensing apparatus, substantially as described.

7. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of the platform, a hydraulic motor and pump  
80 on the other end of the platform, pipes between the pump and the support for the platform for connecting the water-supply with the motor and pump, mechanism automati-  
85 cally operated through the medium of the rocking platform with the differential weight of the mixing vessel for starting and stop-  
90 ping the motor and pump, and pipes for supplying water and gas to the mixing vessel, substantially as described.

8. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of the platform, a hydraulic motor and pump on  
95 the other end of the platform, a pipe for supplying gas to the mixing vessel, a branched water-pipe for supplying water to the motor and pump, a pipe leading from the pump for supplying water to the mixing vessel, and  
100 mechanism automatically operated by the movement of the platform to control the water-supply and stop and start the motor and pump, substantially as described.

9. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, pivot-pins suspending the platform from its support, a mixing vessel on one  
110 end of the platform, means for supplying gas to the mixing vessel, a hydraulic motor and pump on the other end of the platform, means for supplying water to the motor and pump and mixing vessel, and mechanism automati-  
115 cally operated by the movement of the platform to control the water-supply and stop and start the motor and pump, substantially as described.

10. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of the platform, means for supplying gas to the  
120 mixing vessel, a hydraulic motor and pump on the other end of the platform, means for supplying water to the motor and pump and mixing vessel, a valve-chamber having an induction and eduction port, a rocking valve in the chamber, and means for operating the  
125 valve by the rocking or tilting of the platform, substantially as described.

11. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of



the platform, means for supplying gas to the mixing vessel, a hydraulic motor and pump on the other end of the platform, means for supplying water to the motor and pump and  
5 mixing vessel, a valve-chamber having an induction and eduction port, a valve in the chamber, a depending rod on the stem of the valve, and a connection for the depending rod with the rocking platform for shifting the  
10 valve by the rocking or tilting thereof, substantially as described.

12. In a carbonating apparatus, the combination of a rocking platform, a support for the platform, a mixing vessel on one end of  
15 the platform, means for supplying gas to the mixing vessel, a hydraulic motor and pump on the other end of the platform, a chamber

having an induction and eduction port, a pipe leading from the water-supply to the chamber, a pipe leading from the chamber to the  
20 motor and pump, a valve in the chamber, means for moving the valve by the rocking or tilting of the platform for automatically controlling the water-supply and stopping and  
25 starting the motor and pump, substantially as described.

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