

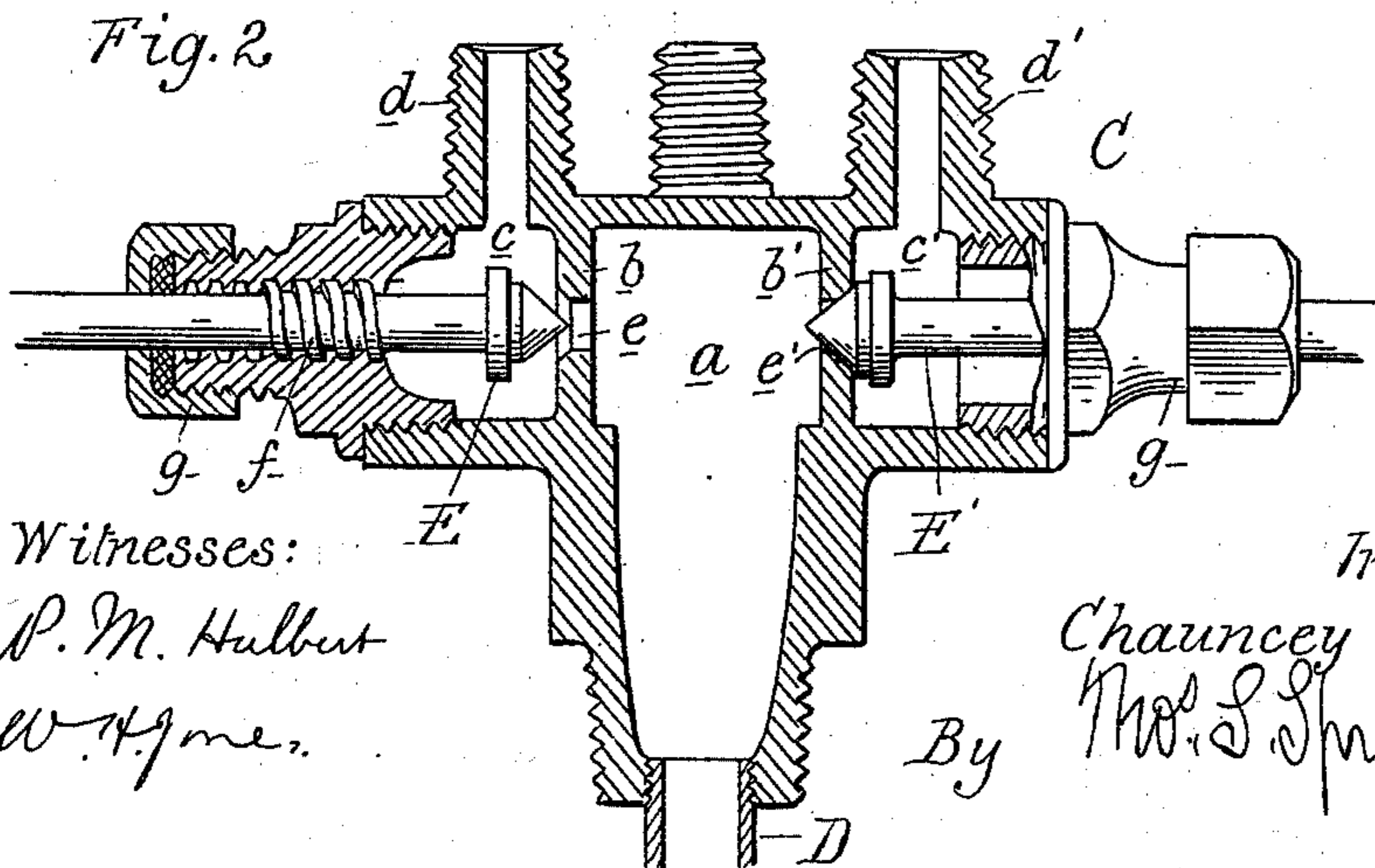
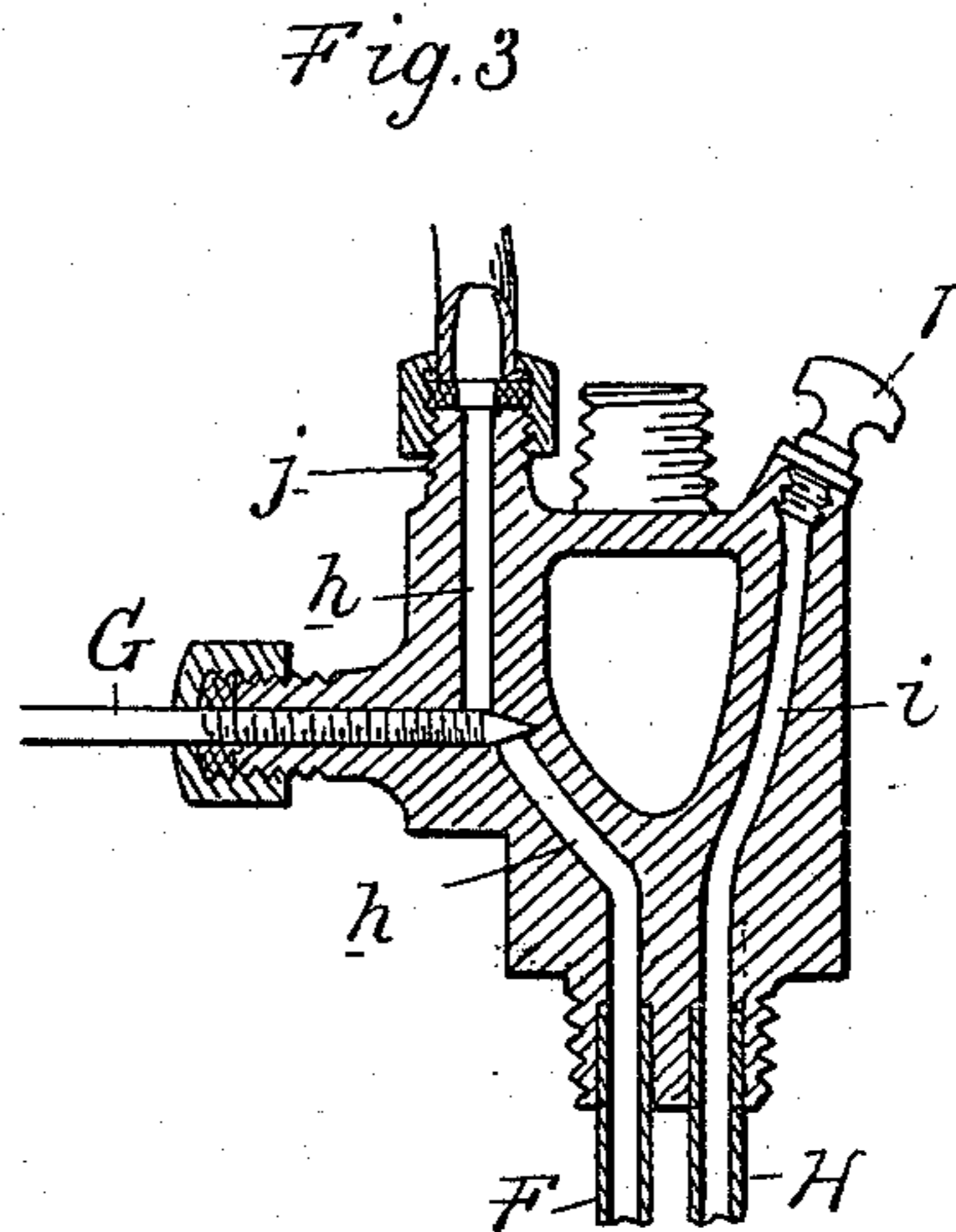
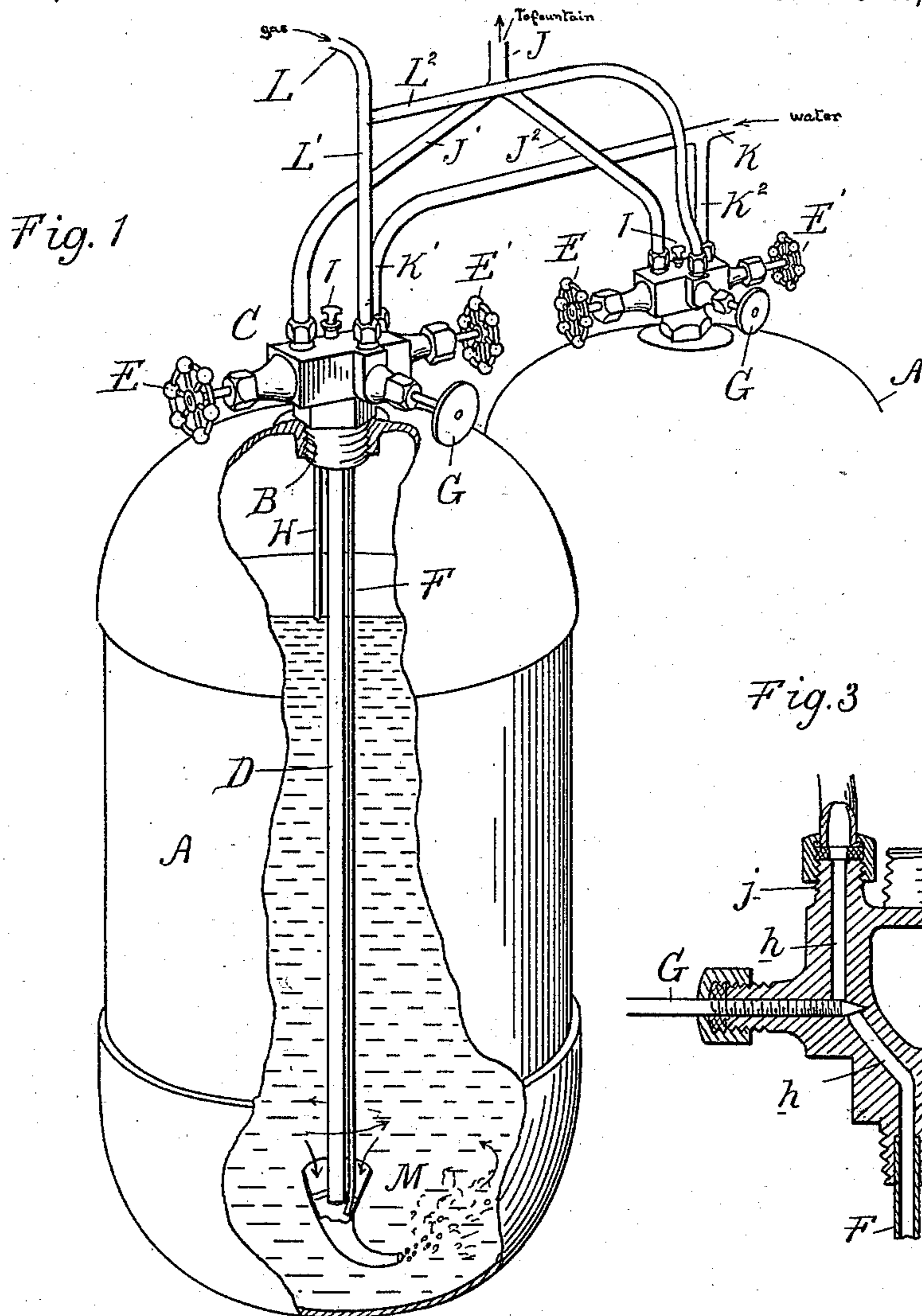
(No Model.)

C. W. GIBSON.

APPARATUS FOR CHARGING LIQUIDS WITH GAS.

No. 561,389.

Patented June 2, 1896.



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UNITED STATES PATENT OFFICE.

CHAUNCEY W. GIBSON, OF DETROIT, MICHIGAN.

APPARATUS FOR CHARGING LIQUIDS WITH GAS.

SPECIFICATION forming part of Letters Patent No. 561,389, dated June 2, 1896.

Application filed August 13, 1895. Serial No. 559,187. (No model.)

To all whom it may concern:

Be it known that I, CHAUNCEY W. GIBSON, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Apparatus for Charging Liquids with Gas, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates more particularly to an apparatus for supplying carbonated water to soda-fountains; and it is the object of my invention to furnish means for charging the water in the tanks or casks with the gas without the necessity of removing or disconnecting said tanks from the fount.

My invention consists in the peculiar construction and arrangement of tanks and the water and gas connections therefor; further, in the peculiar construction of an injector-nozzle through which the gas is introduced into the cask; further, in the peculiar construction and arrangement of the controlling-valve, and, still further, in the peculiar construction, arrangement, and combination of parts, as more fully hereinafter described.

In the drawings, Figure 1 is a sectional perspective view of my apparatus as in use. Fig. 2 is a vertical central longitudinal section through the controlling-valve. Fig. 3 is a cross-section therethrough.

A are the tanks, which are of the ordinary construction, each provided at its upper end with the screw-threaded aperture B.

C is a valve-casing secured in this aperture having the central chamber *a*, to which is connected the pipe D, leading down to the bottom of the tank. Upon opposite sides of the chamber *a* and separated therefrom by the walls *b b'* are the passages *c* and *c'*, connecting, respectively, with the nipples *d* and *d'*.

e and *e'* are apertures through the walls *b b'*.

E and E' are valves controlling these apertures, having screw-threaded stem *f* passing out through stuffing-boxes *g* at opposite ends of the casing.

h and *i* are passages formed through the casing in a plane substantially at right angles to the plane of the passages *c c'*. The passage *h* connects at its lower end with the pipe F, extending to the bottom of the tank, and at its upper end to the nipple *j*.

G is a valve controlling the passage *h*. The passage *i* connects at its lower end with the short tube H, and at its upper end is controlled by the air-valve I.

I preferably connect the tanks A to the fount in pairs, so that while the water in one is being charged that in the other may be drawn off for use. This is shown in Fig. 1 of the drawings, in which J is the pipe leading to the fount and having the branches J' J², connecting to the nipples *d* of each tank.

K is the water-supply pipe, having the branches K' K², connecting to the nipples *d'* of each tank, and L is the gas-supply pipe, having the branches L' and L², connecting to the nipples *j* of each tank.

I preferably use the liquefied carbonic-acid gas, which is contained in a tube or other receptacle connected to the pipe L.

The pipes D and F are preferably joined together at their inner ends into a common injector-nozzle M, adapted to more intimately commingle the two elements and shorten the time required for charging. This nozzle preferably consists of a conical-shaped tube, into the large end of which the pipes D and F are introduced, leaving sufficient space around them for the free circulation of water through the tube.

The discharge end of the nozzle is curved sufficiently to give a whirling motion to the water in the tank.

The parts being thus constructed and arranged, to charge the casks the operator first opens the air-valves I and the valves E' and G, the valves E being closed. Water and gas will then be together introduced into the tank through the nozzle M, in which they are thoroughly commingled. As the water rises in the tank, so as to cover the nozzle M, the force of the jets of gas and water will draw the water into the large end of the cone and eject it from the small end, thereby causing a rapid circulation of the water in the tank and an intimate commingling with the gas with which it soon becomes impregnated. When the water reaches the level of the lower end of the pipe H, so as to be forced out of the valve I, the operator closes that valve and also the valve E'. The gas, however, still continues to enter through the pipe F and to circulate the water through

the nozzle M until the water becomes thoroughly charged. Then the valve G is closed and the valve E opened. The liquid may now be drawn off as needed, and when one of
 5 the tanks is emptied it may be refilled and recharged in the manner above described while the contents of the other tank are being used. Thus the tanks may be used alternately, and all that is required of the oper-
 10 ator is to reverse the valves when necessary. The direction given to the water by the nozzle M is such as to cause the most complete circulation of it within the tank, as in leaving the nozzle it takes a spiral course around
 15 the sides of the tank and is drawn into the nozzle at the vortex of the whirling column.

What I claim as my invention is—

1. In an apparatus for charging liquids with gas, the combination with a tank, of a gas-inlet pipe projecting therein, a liquid-inlet
 20 pipe, the discharge end of which lies adjacent to the discharge end of the gas-inlet pipe, a tapered combining and circulating nozzle open at each end situated at the ends
 25 of said pipes, whereby the liquid and gas are thoroughly commingled and the liquid in the tank is drawn into one end of the combining-tube and commingled and ejected from the other end, substantially as described.

30 2. In an apparatus for charging liquid with gas, the combination with the tank, of water and gas inlet pipes projecting therein, and a combining and circulating nozzle near the bottom of the tank into which both of said

pipes discharge, consisting of a tapering
 curved tube adapted to receive the discharge
 from said pipes in its large end and eject the
 commingled elements from the small end,
 substantially as described.

3. In an apparatus for charging liquids with
 gas, the combination with the tank having
 an aperture at the upper end thereof, of the
 valve-casing C secured in said aperture pro-
 vided with the chamber *a* the passages *c* and
c' on opposite sides thereof and communi-
 45 cating therewith, the valves E and E' con-
 trolling said passages *c* and *c'*, valve-con-
 trolled passages *h* and *i* in the casing, the
 pipes F and D connecting respectively with
 the passages *c c'* and *h*, substantially as de-
 50 scribed.

4. In an apparatus for charging liquids with gas, the combination with the tank having
 an aperture therein, of a valve-casing secured
 in said aperture having walls dividing the
 casing into a central chamber, and passages,
 said walls having apertures, valves control-
 55 ling said apertures, and valve-controlled con-
 duits in said casing leading directly to the
 interior of the tank, substantially as de-
 60 scribed.

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

CHAUNCEY W. GIBSON.

Witnesses:

M. B. O'DOHERTY,
 P. M. HULBERT.