

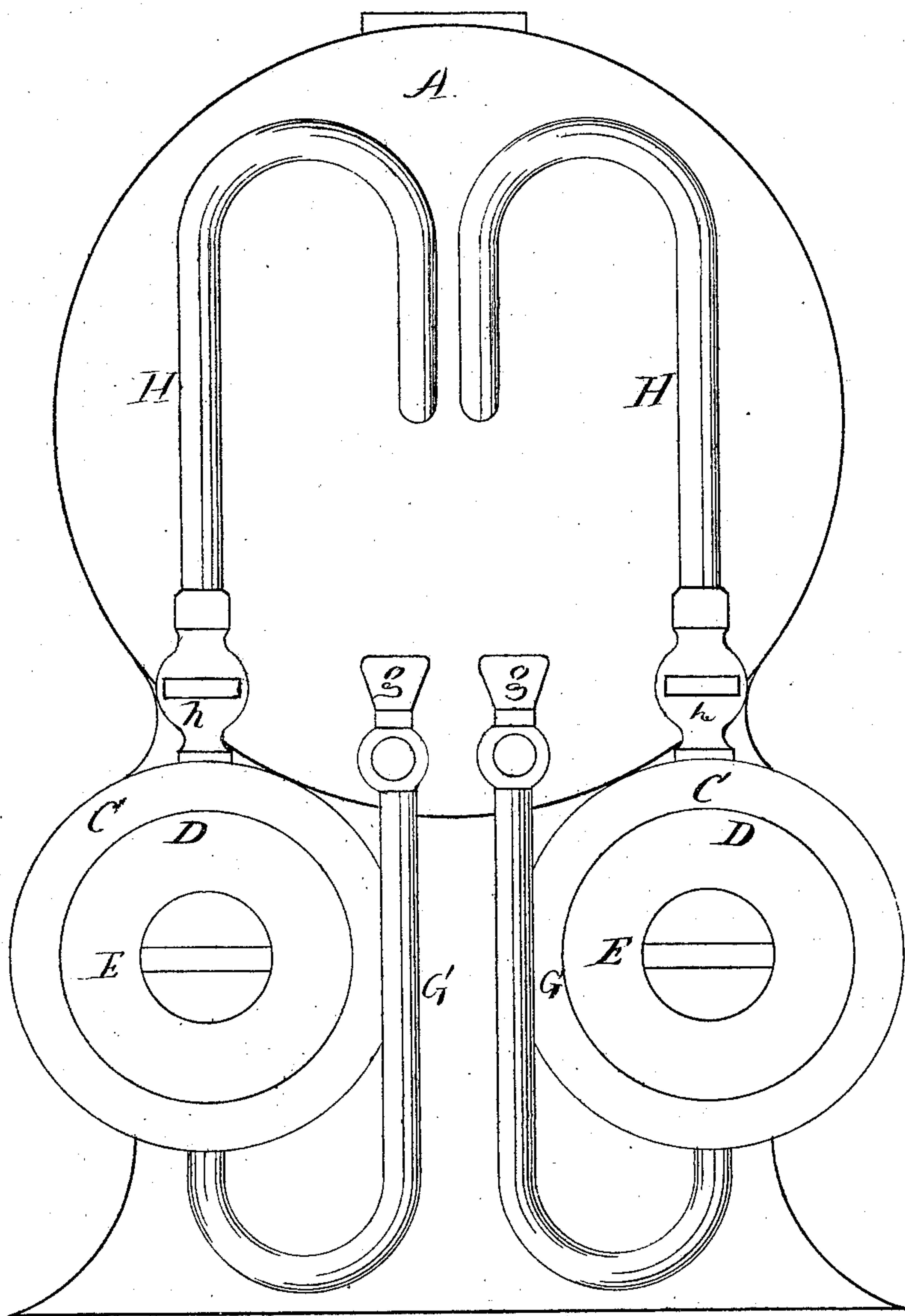
JOHN H. STEINER.

Improvement in Gas Apparatus.

No. 125,496.

Patented April 9, 1872.

Fig 1.



John H. Steiner

*T. M. Coombs
Clerk of the Court*

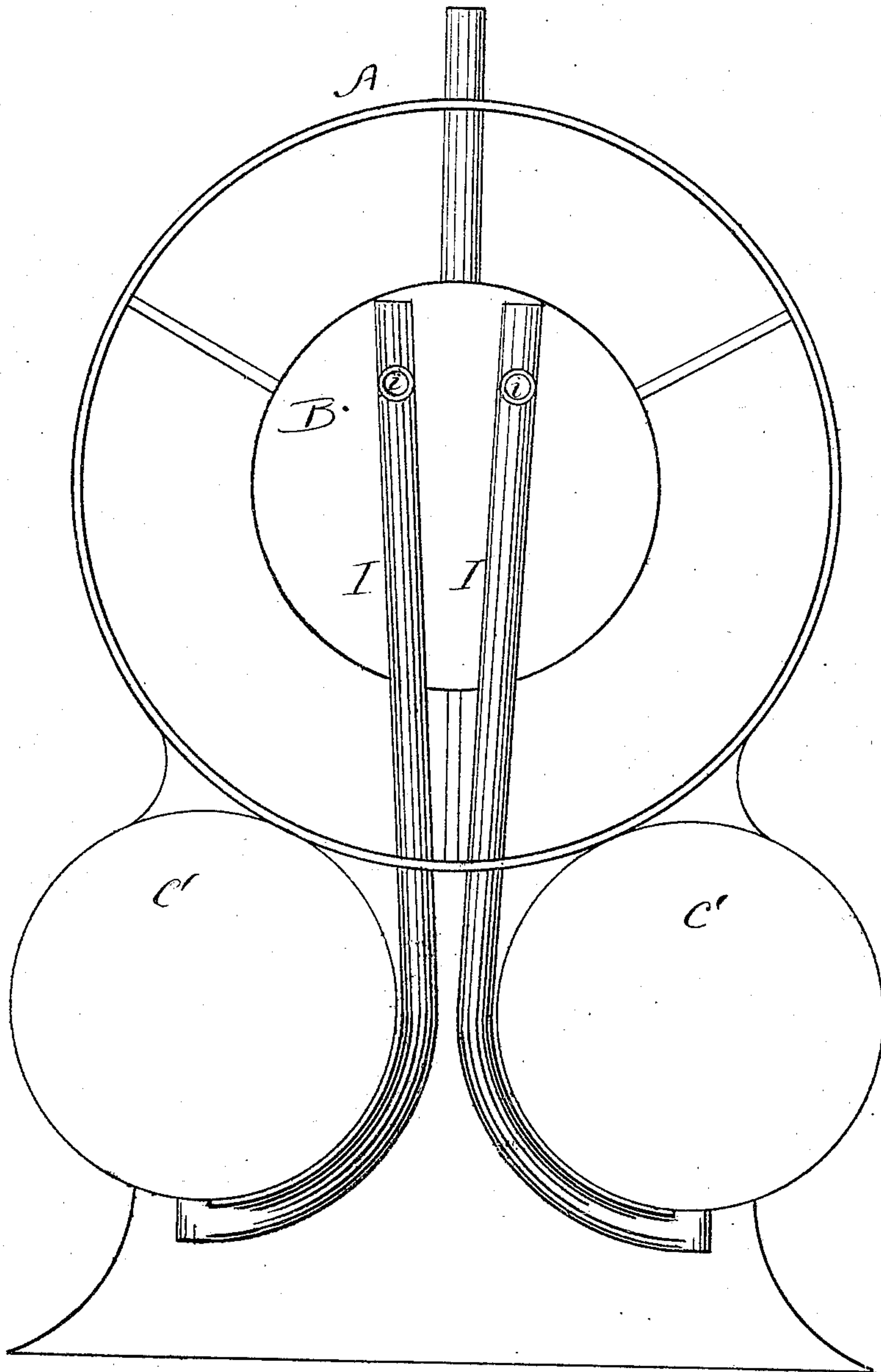
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Fig 2

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John H. Steiner

*T. M. Coverts
Carroll M. Blankman*

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Fig 3

Patented April 9, 1872.

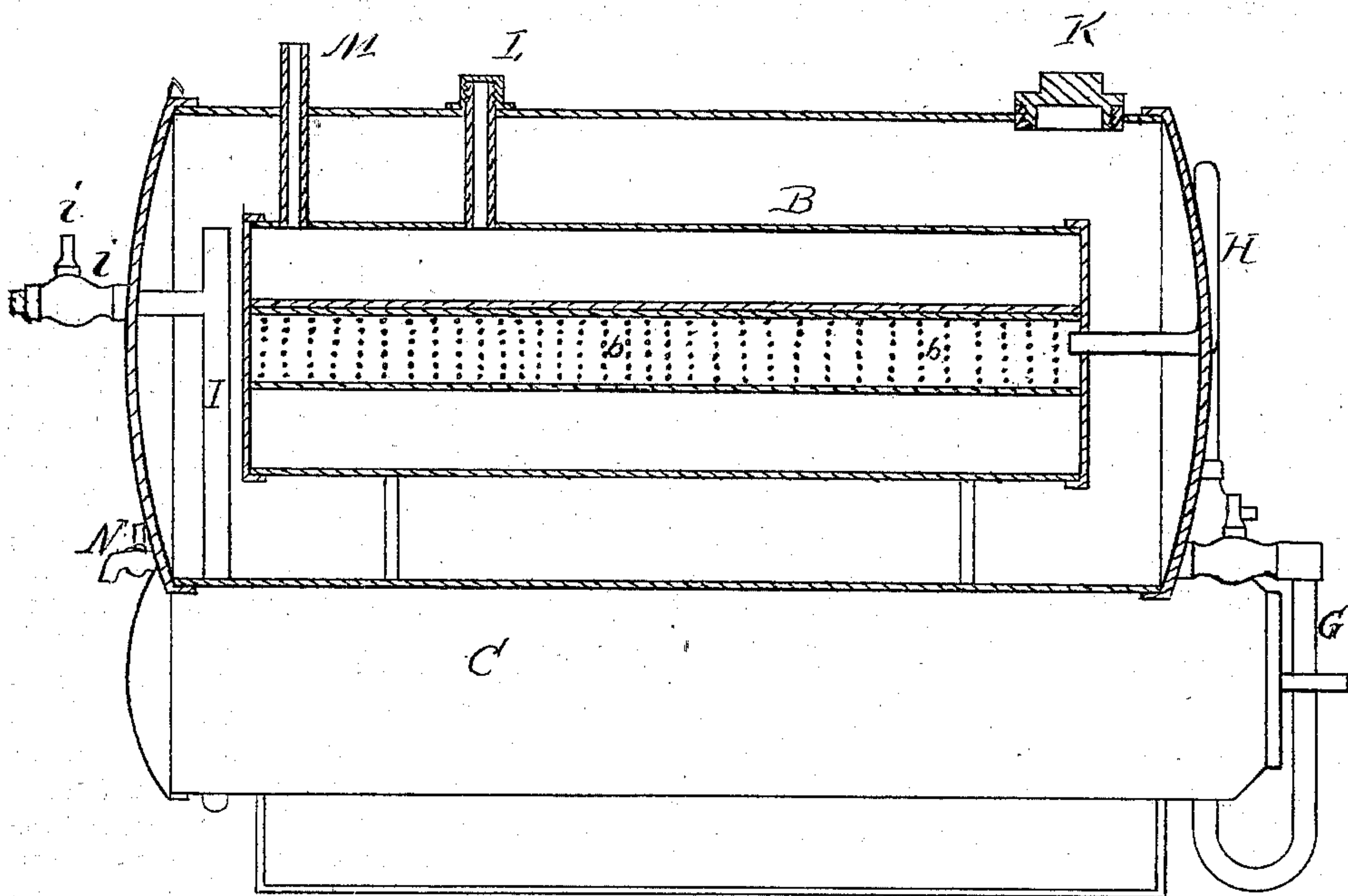
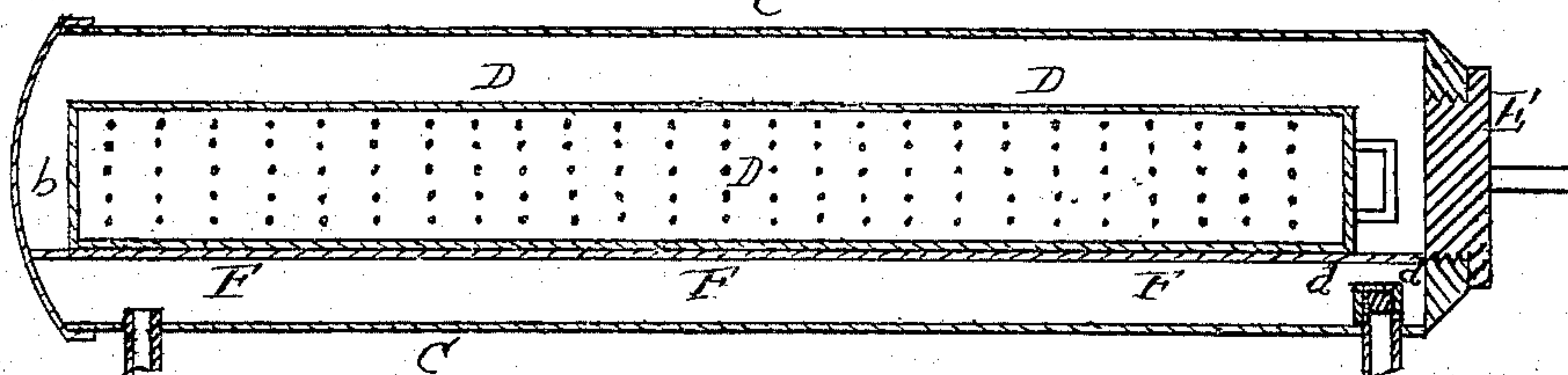


Fig 4



John H. Steiner

*T. M. Coombs
Esq. or M. Blackman*

Received May 7th 1872.

125,496

UNITED STATES PATENT OFFICE.

JOHN H. STEINER, OF CINCINNATI, OHIO.

IMPROVEMENT IN GAS APPARATUS.

Specification forming part of Letters Patent No. 125,496, dated April 9, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, JOHN H. STEINER, of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Gas-Works; and I do hereby declare that the following is a full, clear, and exact description thereof.

The nature of my invention relates to that class of gas-machines in which pure hydrogen gas is generated by the action of dilute acid upon metal scraps or turnings, and afterward carbureted by passing it over or through the volatile hydrocarbons, such as gasoline, &c., in order to give it the proper illuminating qualities; and it consists in a reservoir for holding the dilute acid, placed above one or more gas-generating chambers or retorts, and containing within it a carbureting-chamber, said reservoir and retorts being so connected and arranged that the dilute acid will be automatically supplied to the retorts in proper quantities during the operation of the machine, and stopped when the machine is not in action; and, further, in so constructing and arranging the said retorts and reservoir in relation to each other that the weakened or spent acid or solution in the retorts after use may be returned to the reservoir, or be discharged from the machine entirely by the pressure of the gas within, at the will of the operator.

In the drawing, Fig. 1 represents a front view of my apparatus; Fig. 2, a back view with the end of the reservoir removed; and Fig. 3 is a sectional view of the reservoir and one of the retorts or generating-chambers; and Fig. 4, a sectional view of the retort and tubes for holding the metal scrap.

A represents the reservoir for the dilute acid, within which is a carbureting-chamber, B, located at or near the center of said reservoir, and extending nearly from end to end of the same. Within said carbureter is secured a perforated tube, *b*, extending from end to end of the same, and above it is secured a flat plate or shelf, *b'*. The chamber B is to contain the highly volatile distillates of petroleum, such as gasoline, &c. The gas generated in the retorts below enters at one end of the tube *b*, and passes out through the perforations into and through the hydrocarbon oil, becoming highly carbureted. The space around the tube *b* may

be filled with curled hair, if desired, to divide the body of gas into fine particles and more thoroughly carburet it. By placing the carbureter inside the reservoir it is protected from accident or injury from external influences and from all contact with fire, and the temperature of its contents is kept the same as the temperature of the dilute acid. C C represent the hydrogen-gas-generating retorts, which consist of cylinders placed below the reservoir A and supporting it. Within each cylinder is secured a removable perforated cylinder, D, with a cap, *d*, on its inner end. These cylinders are to contain metal scraps, such as iron or zinc, and are supported on aprons or rests F F, or their equivalents, arranged within the retorts C C. E E are caps that fit and close the ends of the retorts C C, and which may be removed at pleasure for the purpose of removing the tubes E' E' in order to charge them. From the bottom of the reservoir extend the pipes G G in the bottom of the retorts C C, through which the acid water is admitted from the reservoir to the retorts. Said pipes are provided with cocks *g g*, by which the flow of the dilute acid may be controlled, and are provided at their ends in the retorts D D with valves *d d*, to prevent any back flow of the acid into the reservoir, through said pipes, from the pressure within said retort. H H represent pipes proceeding from the top of the retorts C C, through the front end of the reservoir A, into the center of the carbureter B, where they terminate within the perforated tube *b*. These pipes serve to convey the gas generated in said retorts to the carbureter, and are provided with cocks *h h*, by which the flow can be regulated or cut off entirely. I I are pipes extending from the bottom of the retorts, at their rear, up through the back portion of the reservoir, into the same, where they terminate above the level of the acid water when the said reservoir is full. From these pipes the branch pipes *i i* extend through the back of said reservoir, said pipes being provided with stop-cocks *i' i'*. These pipes serve to return the weakened or spent acid water to the reservoir, or to discharge it from the machine entirely through the branch pipes, as may be desired. This is accomplished by the pressure of the gas within the retorts C C automatically when the communication between the retorts and carbureter

is cut off. K is the inlet for filling the reservoir A, provided with a suitable cap. L is a pipe for filling the carbureter B, which is also provided with a cap, and M is the service-pipe for conveying the gas to the burners. N is a stop-cock at the lower part of the rear of the reservoir A for emptying it of its contents.

The operation of my apparatus is as follows: The reservoir is properly filled with dilute acid, and the carbureter B with gasoline. The cylinders E E are charged with scrap iron or zinc, and placed in the retorts, which are then securely closed by the caps. The cocks *g g* in the pipes G G are then turned so as to open communication between the retorts and the carbureter. The acid water flows through the pipes G G into the retorts, lifting the valves at their ends. On coming in contact with the metal scrap in the tubes E E hydrogen gas is immediately generated, which passes through the pipes H H into the carbureter B, entering at one end of the tube *b*, and escaping through its perforations into the gasoline, after which it passes through the pipe M to the burners. It will readily be seen that as the dilute acid rises in the retorts the generation of the gas will be increased, thus increasing the pressure in the machine, and stopping the flow of the dilute acid into the retorts until the pressure is removed by the gas escaping at the burner, thus automatically regulating the quantity of water admitted to the retorts.

The advantages of my machine over all others of its class will be apparent. As above stated, by the arrangement of the carbureter within the generator where it is submerged in acid water, it is prevented from all injury from fire or external influences, and will also render the machine more compact. The peculiar arrangement of the reservoir above the retorts also gives the machine compactness and strength, and places the whole apparatus at the convenient control of the operator. The machine, as will be perceived, is entirely automatic in its action after being set in operation, supplying

the acid water to the retort in proper quantities, and no more, during the time it is in use, and returning the spent acid to the reservoir, or discharging it entirely from the machine, when it is thrown out of operation, thus effectually stopping the generation of gas and the consequent waste of material; besides, the apparatus can be charged while in operation without stopping it by shutting off connection with one retort, when it may be opened and recharged.

What I claim is—

1. A reservoir for containing dilute acid, arranged, in relation to a retort or series of retorts which contain metallic turnings, as described, so as to supply the dilute acid automatically to one or more of the retorts as required, as and for the purpose set forth.
2. The reservoir and retorts, arranged, in relation to each other, in the manner described, so that the weakened or waste acid and water, after use, can be returned to the reservoir or discharged from the apparatus automatically, as and for the purposes described.
3. The construction and arrangement of the carbureter within the reservoir, as herein described.
4. The combination of the perforated tubes or cylinders E E with the retorts C C, substantially as set forth.
5. The diaphragms or aprons F for the tubes to rest upon, as described.
6. The inlet-pipes G G and valves in connection therewith, as herein described.
7. The pipes H H, in combination with the retorts and reservoir.
8. The discharge-pipes I I, extending from the retorts into the reservoir, as and for the purposes described.
9. The combination of the reservoir A, the carbureter B, and retorts C C, as and for the purposes herein described.

Witnesses: JOHN H. STEINER.

T. M. COOMBS,
EDMON M. BLANKMAN.