

No. 616,266.

Patented Dec. 20, 1898.

F. H. SMITH.  
ACETYLENE GAS GENERATOR.

(Application filed July 26, 1898.)

(No Model.)

Fig. 1.

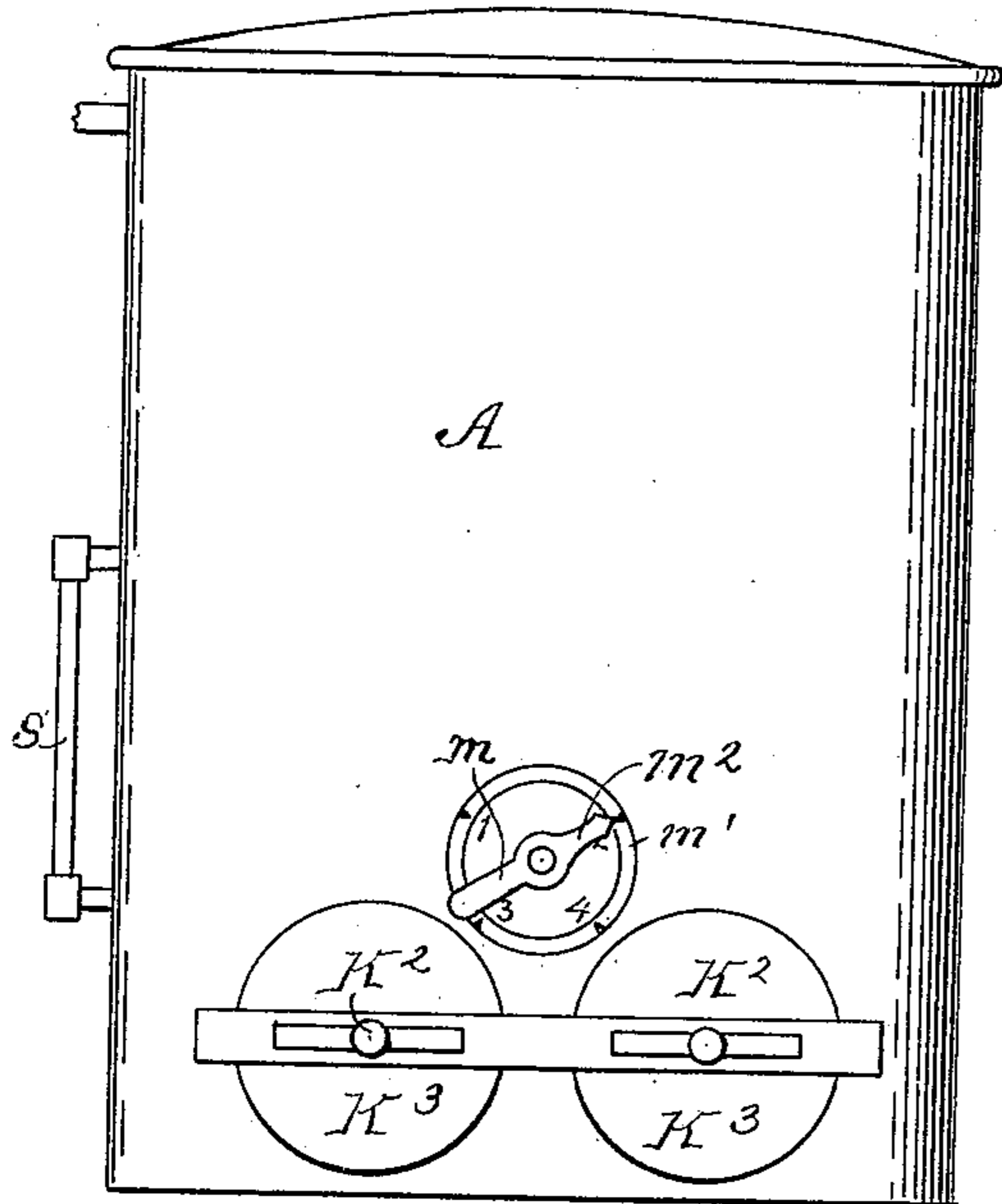


Fig. 2.

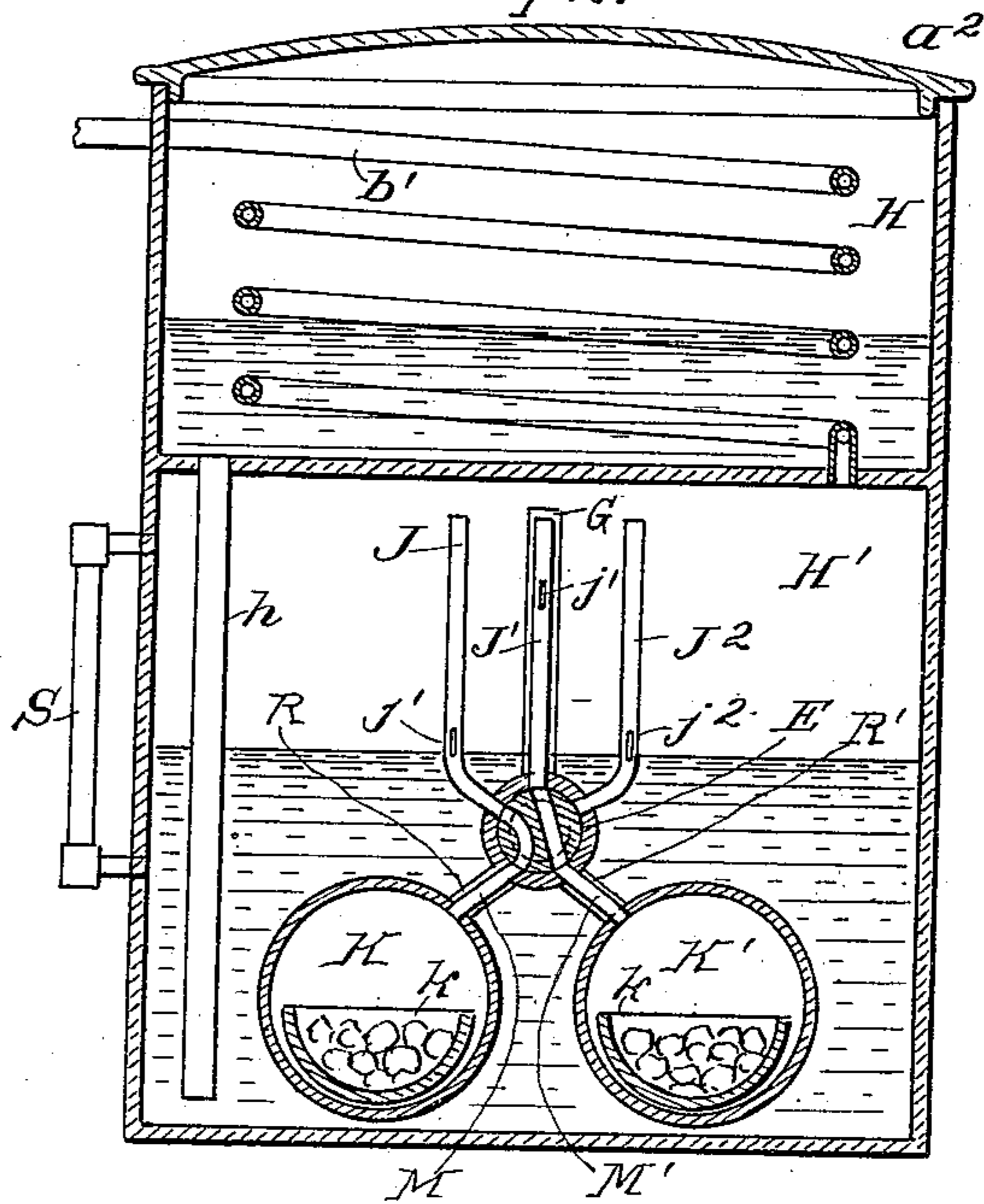
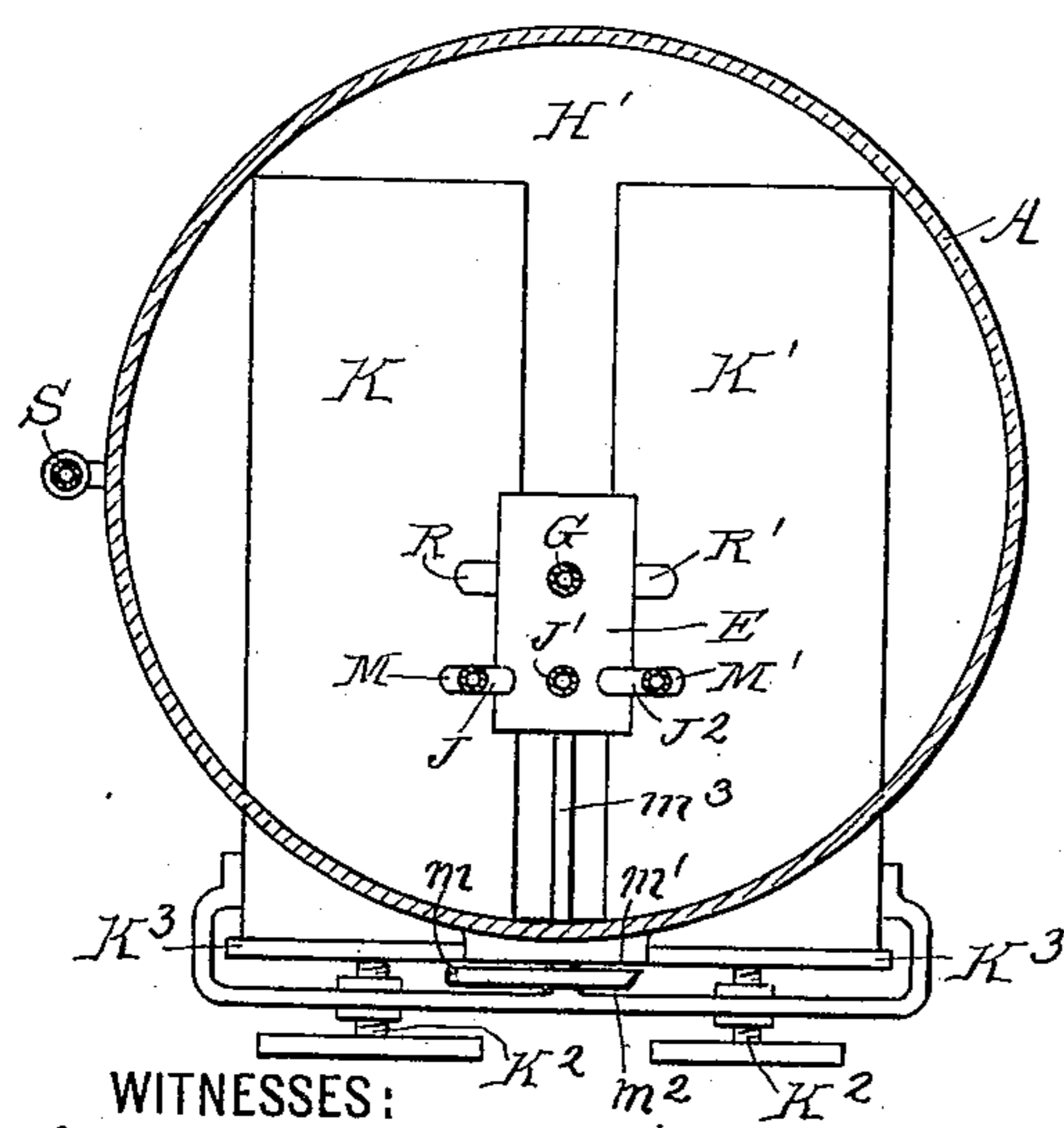


Fig. 3.



WITNESSES:

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Fig. 4.

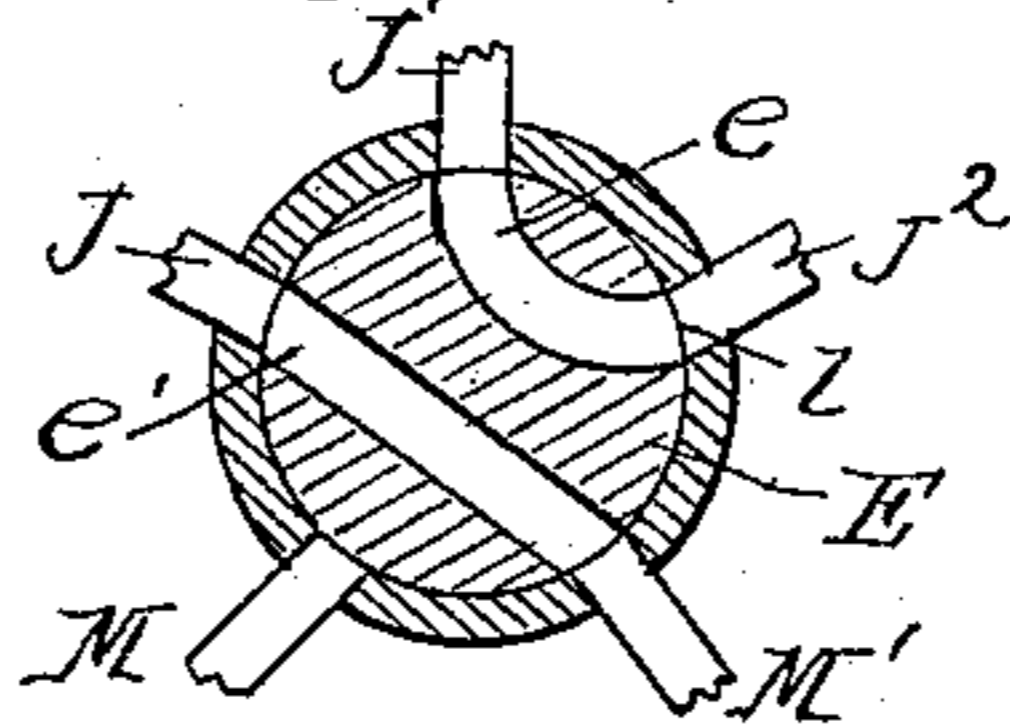


Fig. 5.

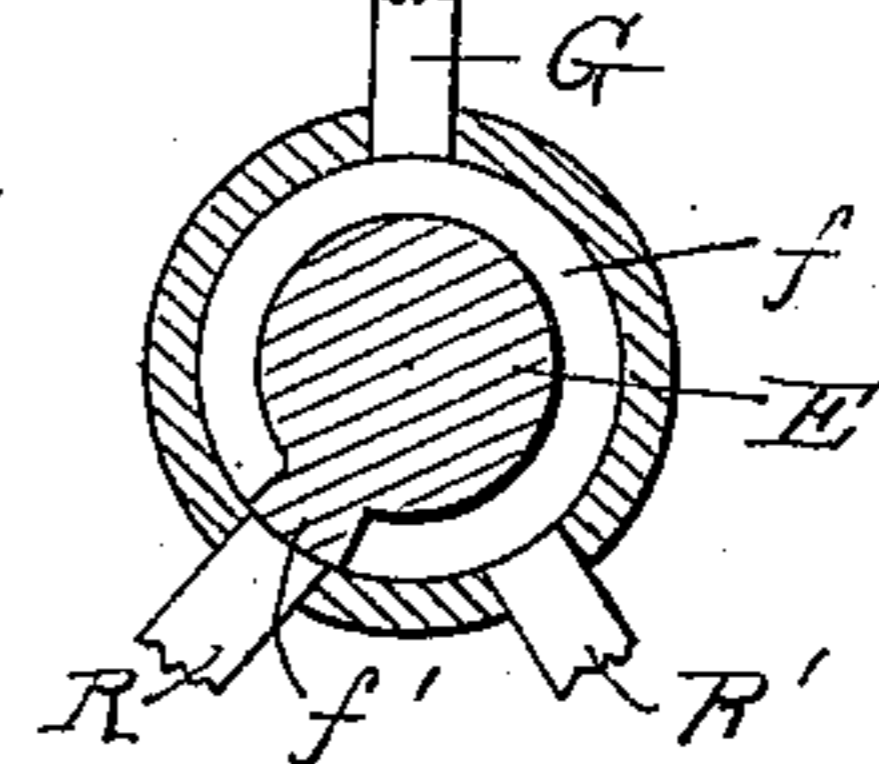


Fig. 6.

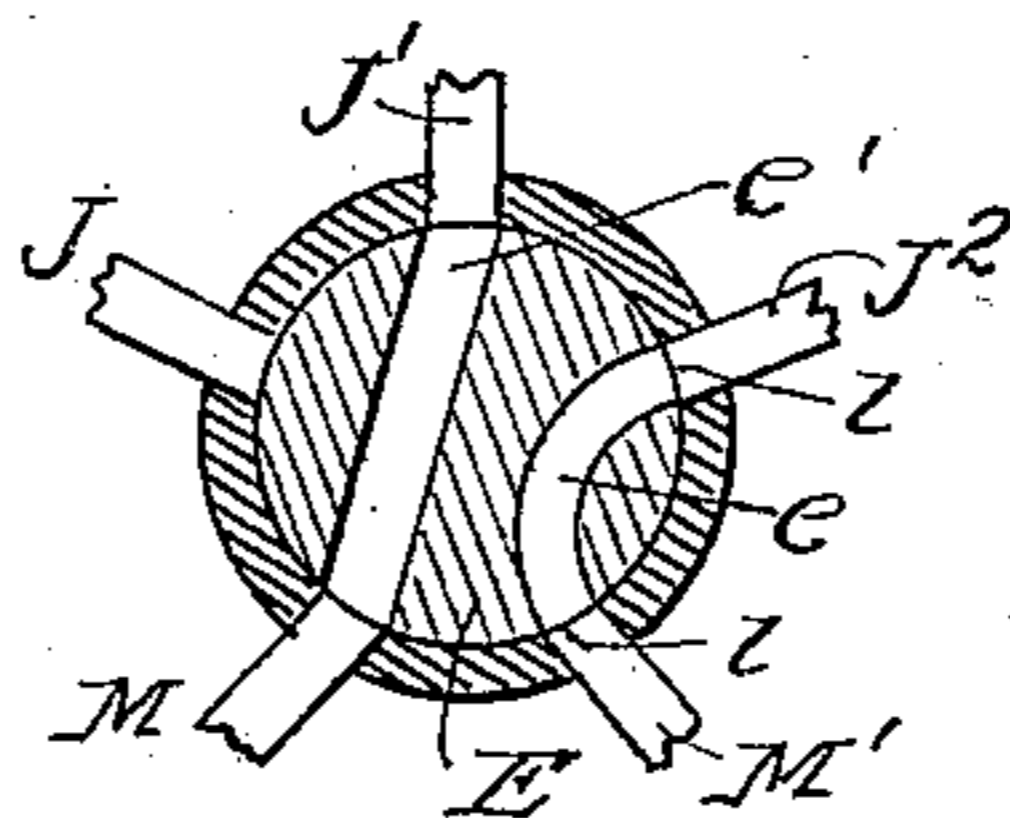
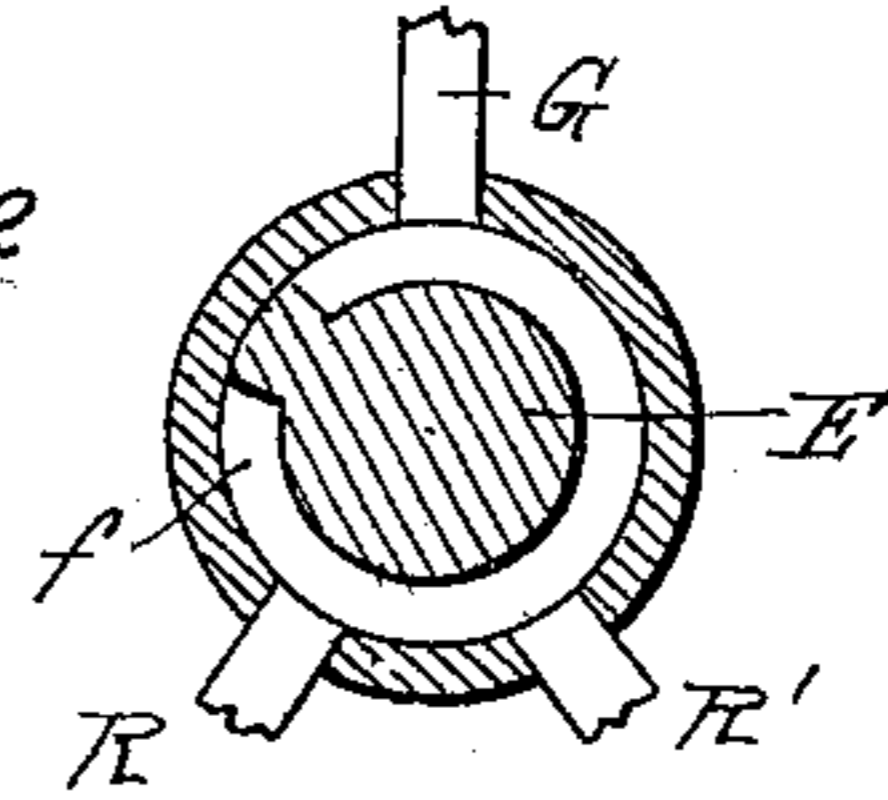


Fig. 7.



INVENTOR

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# UNITED STATES PATENT OFFICE.

FREDERICK HUGH SMITH, OF DUNBLANE, SCOTLAND.

## ACETYLENE-GAS GENERATOR.

SPECIFICATION forming part of Letters Patent No. 616,266, dated December 20, 1898.

Application filed July 26, 1898. Serial No. 686,917. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK HUGH SMITH, a subject of the Queen of the United Kingdom of Great Britain and Ireland, residing at The Limes, Dunblane, in the county of Perth, Scotland, have invented new and useful Improvements in Acetylene-Gas Generators, of which the following is a specification.

This invention relates to improvements in acetylene-gas generators; and its object is to provide a machine wherein the generation of acetylene gas can proceed continuously without interruption due to renewal of charge.

For this purpose I provide two carbid-chambers and a valve connecting same to the water-supply and gas-receiver in such manner that they can be brought into operation alternately, and the placing of either chamber in operative connection establishes a connection from the other chamber to the water-supply, which will come into operation as soon as the carbid in the first chamber becomes exhausted.

My present invention is an improvement on the machine disclosed in my application, Serial No. 652,575, filed September 22, 1897, in that it provides special gas connections between the carbid-chambers and the gas-receiving chamber, with a valve in same operating simultaneously with the water-supply valve.

In the accompanying drawings, which form a part of this specification, Figure 1 is an elevation of a machine embodying my invention. Fig. 2 is a vertical section, and Fig. 3 a horizontal section, thereof. Figs. 4 to 7 are detail views of the controlling valve or cock.

Referring to the said drawings, I employ a tank or box A, divided into upper and lower water-chambers H H', connected with each other by a tube h, depending from the bottom or lower part of the upper chamber H to near the bottom of the lower chamber H'.

Within the lower chamber I mount three upright tubes J J' J<sup>2</sup>, the two outer of which, J J<sup>2</sup>, are provided with slots or openings j j<sup>2</sup> at the same level, while the third or central tube J' is provided with a similar slot or opening j' at a higher level. The tank A has a removable cover a<sup>2</sup>. A coil or tube b' passes up from the upper part of chamber H', through

the chamber H, and thence to points of storage or consumption of the gas, as may be desired. Situated within the lower chamber and below or at the sides of the three upright tubes are two tubular chambers K K', so arranged that the water in the chamber H' is free to circulate around them. These chambers hold the carbid-drawers k, which are approximately of a semicircular shape in section, and access is obtained to the said chambers by flat metal doors K<sup>3</sup>, clamped by screws K<sup>2</sup> or other similar means, insuring a gas-tight joint. This method of arranging the carbid-chambers, so that water is free to circulate around them, effectually prevents the possibility of an explosion through overheating.

For regulating the supply of water to the carbid-drawers I employ a five-way cock E, which has fixed ports or waterways l, leading to the three upright tubes J J' J<sup>2</sup> and the two drawer-tubes M M' and provided at the outside of the generator with an operating-handle m, indicating-circle m', and pointer m<sup>2</sup>, said handle being connected to the stem m<sup>3</sup> of the cock. The effect of this cock is such that the supply of water to the carbid-drawers can be cut off altogether, or the cock can be actuated in either direction to open the ports leading from one outer tube to the tube of the one carbid-chamber and at the same time the ports leading from the central tube to the tube of the other carbid-chamber. For this purpose the stem or movable part of the cock E has cross-channels e e', adapted to cooperate with the water-ports l. I also provide said cock with a passage f, cooperating with ports leading to a pipe G, extending vertically upward above high-water level in chamber H and to pipes R R', leading, respectively, to chambers K K'. The passage f is a circumferential groove extending nearly around the valve-stem, but leaving a cut-off or block f' wide enough to cover one of said ports at a time. This, therefore, constitutes a valve mechanically connected to the five-way cock.

The indicating-circle m' bears suitable marks, such as "To charge A," "To charge B," "A charged," "B charged," or other similar indications, but which are substituted in the drawings by the numerals 1, 2, 3, and 4, respectively.

The action of the generator is as follows: Supposing that both carbid-chambers have been charged and that the operating-handle of the cock points to 4, "B charged," the ports leading from the outer tube J to the tube M will be opened and also the ports leading from the central tube J' to the tube M', as shown in Fig. 2. Upon the introduction of water to the chamber H it will immediately enter the lower chamber H' by the tube *h* until it reaches the level of the lower slots *j j'*, when it will pass through the slot *j*, (the other being closed,) attack the carbid, and form gas. As soon as this gas attains a certain pressure it, acting on the surface of the water in the chambers, forces the water out of the lower chamber H' into the upper chamber H by means of the said tube *h* until the level of the water is brought below the slot *j* of the tube J, when the water-supply being thus stopped any fresh generation of gas is also stopped until a portion of the gas has been consumed and the pressure reduced to allow the water to flow again from the upper into the lower chamber, when the water again reaches the slot *j* and the gas-generation is renewed. This continues until the carbid in the chamber K is exhausted, when the water rises until it reaches the slot *j'* in the central tube J', when it attacks the carbid in the other chamber K'. When one chamber, as K, is exhausted and requires recharging, the handle of the cock is turned to 1 "To charge A," the ports being now arranged as shown in Figs. 4 and 5, stopping the supply to the chamber K' by the central tube J', but enabling it to be done through the side tube J, which before fed the first chamber K. At the same time both gas and water ports leading to chamber K are cut off, as shown. The supply to chamber K is thus stopped, so that the chamber K can be recharged in safety and no backflow of gas can result. Then the pointer is turned to 3 "A charged," and this position (shown in Figs. 6 and 7) alters the supply to chamber K' from the low-level tube J to the other low-level tube J<sup>2</sup>, the ports being also now so arranged that the chamber K last charged will come into operation on high level when the other is exhausted.

The foregoing operation may be reversed, whereupon the opposite action takes place.

A gage S may be applied to chamber H to indicate the water-level therein. When the water in this gage rises, it is an indication that one of the carbid-chambers has become exhausted and requires recharging.

In any case the gas from the carbid-chamber K K' escapes through the same pipe G, the cut-off block *f'* closing only one of the pipes R R' at a time, according to which side of the machine is working.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with upper and lower water-chambers, the latter forming a gas-receiving chamber, a tube connecting the lower parts of the two chambers, two carbid-chambers, a cock connected to each of said carbid-chambers, and tubes connected to said cock and opening into the lower water-chamber at different heights, the said cock having ports and channels adapted to connect the said tubes alternately with the said carbid-chambers, and a valve mechanically connected with the aforesaid cock and a separate gas connection controlled by said valve, from each of the said carbid-chambers to the upper part of the lower water-chamber.

2. In an acetylene-gas generator, the combination with a tank formed with upper and lower water-chambers, connected with each other by a depending tube and having two carbid-chambers arranged side by side within the lower chamber of the tank so that the water can circulate around them, of three upright tubes the two outer of which have slots at a lower level than the slot in the central tube, by which the water is caused to attack the carbid in the one chamber when the carbid in the other is exhausted and a five-way cock for controlling the supply of water by these tubes whereby the two chambers are automatically and alternately brought into action, as described and shown, a valve mechanically connected with said cock and a separate gas connection controlled by said valve, for each of the said carbid-chambers to the upper part of the lower water-chamber.

FREDERICK HUGH SMITH.

Witnesses:

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