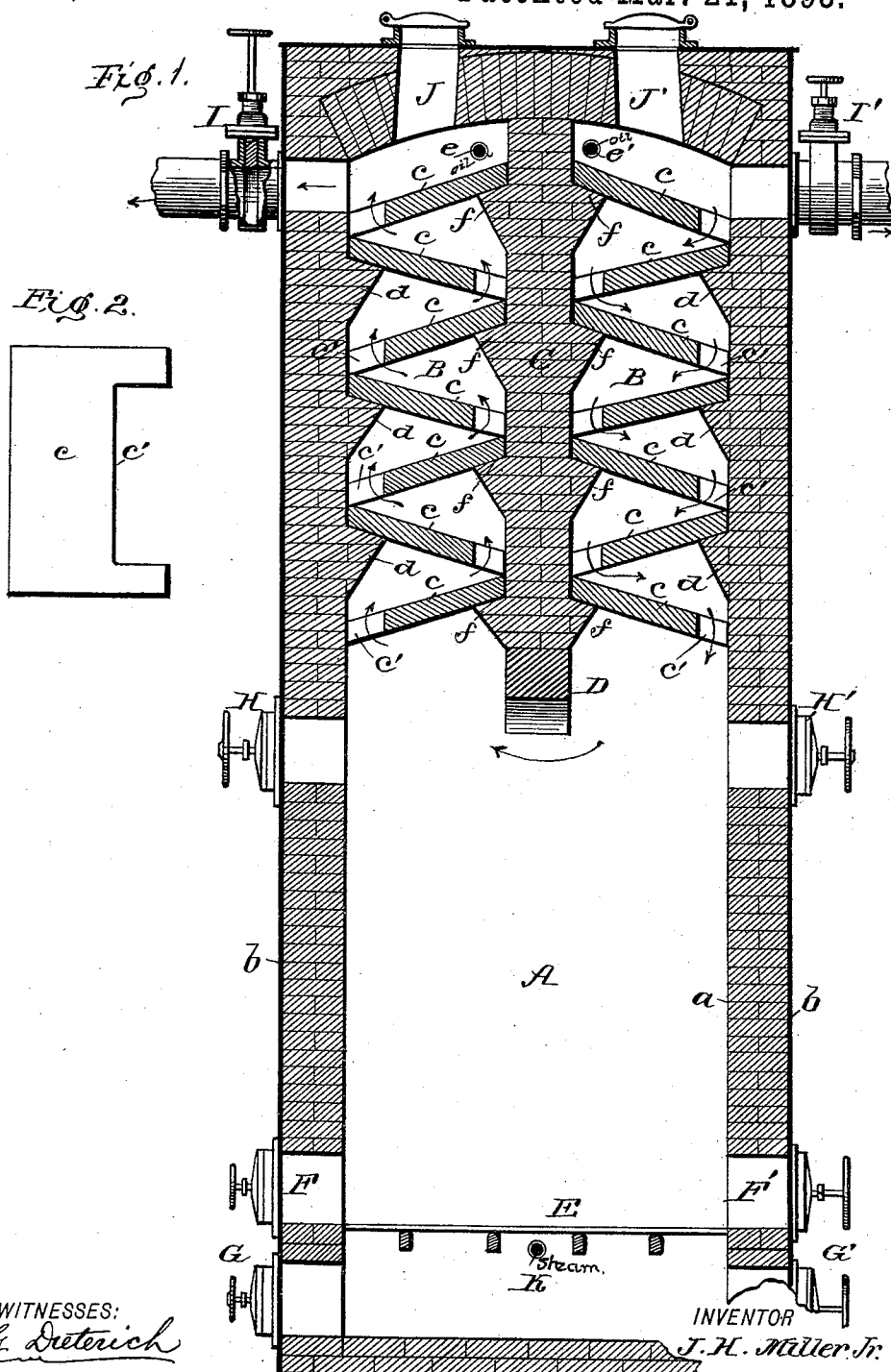


(No Model.)

J. H. MILLER, Jr.
GAS GENERATOR.

No. 494,012.

Patented Mar. 21, 1893.



WITNESSES:
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JOHN H. MILLER, JR., OF GALION, OHIO.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 494,012, dated March 21, 1893.

Application filed December 7, 1892. Serial No. 454,405. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. MILLER, Jr., residing at Galion, in the county of Crawford and State of Ohio, have invented a new and useful Improvement in Gas-Generators, of which the following is a specification.

My invention is in the nature of an improved water gas generator, for the manufacture of gas for either heating or lighting purposes by the decomposition of steam and oil, and it consists in the peculiar construction and arrangement of the generator which is of a simple and practical construction, easily and economically operated, and very effective in producing a large volume and good quality of fixed gas without being fouled by deposits of carbon, as will be hereinafter fully described.

Figure 1 is a vertical longitudinal central section of the entire generator and Fig. 2 is a detail in plan view of one of the tile baffle plates—

The generator is preferably made of rectangular cross section of about eight by ten feet and twenty one feet high which dimensions have a capacity of producing about twenty-thousand feet of gas per hour. It is constructed with an outer steel shell *b* a half an inch thick and a lining *a* of fire brick. In the upper half of the generator the fire bricks of the lining are corbelled out at intervals to form shoulders *d* which afford supports on the side walls for baffle plates as hereinafter described. The upper half of the generator is also divided vertically into two compartments B and B' by a partition wall C of fire brick which is carried upon an arched saddle tile D supported in the side walls at its ends, or it may be upon a brick arch. This partition wall extends to the roof and at points between the shoulders *d* of the side wall its brick work is corbelled out to form shoulders *f* that constitute the inner supports for the baffle plates. These baffle plates are constructed of fire clay tiles *c* of the shape shown in Fig. 2 and having upon one side an opening *c'*. These tiles are placed upon the shoulders *d* and *f* in the two chambers B and B' in zig zag arrangement, one above another in inclined position, and with the opening *c'* at the lower end, the lower edge of one tile resting upon the upper edge of the one below it.

In the upper end of each chamber B and B' there are draft outlets provided with dampers or valves J J' which are opened in firing up and through which the smoke and hot products of combustion are allowed to escape temporarily. In the upper end of the same chambers but opening through the sides of the generator are other outlets provided with gate valves I and I' through which the gas is allowed to pass off into the hydraulic seal. In the top of each chamber B and B' there are also inlet pipes *e* and *e'* for introducing oil which is forcibly introduced by steam injectors in the usual way.

In the sides of the generator and just below the partition wall there are charging doors H and H' through which coke is charged into the chamber A occupying the lower half of the generator.

E is the grate, and F F' are doors opening through the sides just above the grate for removing clinkers, and G G' are doors opening through the sides below the grate for removing ashes.

K is a steam pipe entering the generator below the grate bar and through which steam is introduced below the mass of incandescent coke to be decomposed into its constituent gases for furnishing the necessary element of hydrogen for the synthesis of composition of the fixed gas.

The operation of the generator is as follows: In first firing up, a quantity of wood is placed on the grate E and ignited to set fire to the coke which is charged through the doors H H' into the chamber A, but after the generator is once heated it maintains its heat and the fuel that is alternately charged is ignited without kindling. In firing up, the dampers J J' are opened and the outlet valves I I' are closed. Coke is then charged into chamber A, and is ignited either by the kindling or by the heat of the generator, and the smoke and hot gases pass upwardly through the chambers B B' and out at J J' as from a chimney. When the generator is sufficiently heated the dampers J J' are closed, and one of the outlet valves I or I' being opened, oil is introduced at the top through pipe *e* or *e'* and trickles down over the hot baffle plates, while the steam introduced below the grate rises through the incandescent coke in chamber A

and being decomposed supplies the hydrogen for combining with the gases resulting from the decomposition of the oil trickling down from above.

5 In working the generator, the valves and oil pipes are first adjusted to make gas downwardly in one chamber B' and upwardly in the other chamber B as shown by the arrows, and in the next making the gas made passes
10 downwardly in chamber B and upwardly in chamber B'. Thus for making gas downwardly in B' and upwardly in B, the gate valve I' is closed and I opened, and oil is shut off at pipe *e* and turned on at pipe *e'*. The oil from
15 pipe *e'* then trickles down over the hot baffle plates *c*, passing down with a slow and tortuous course over the hot tiles which disrupt the oil into the constituent gases, which as they move down become thoroughly volatilized or gasified, and when they reach the
20 bottom of the baffle plates they pass under the partition wall where they meet and mix with the hydrogen from the decomposed steam and with the hydrogen they rise through the tortuous path of the baffle plates in chamber B where they are fixed into a permanent
25 gas by the red hot tile, and thence pass off through the gate valve at I. At the next gas making (the generator having been in the mean time heated up as before described) the
30 gate valve I' is opened and I closed and the oil pipe *e'* is closed and *e* opened. The gas making then proceeds downwardly in chamber B and upwardly in B', or just the reverse
35 of that shown by the arrows. The advantage of this reversal is that it keeps the tiles always clean and free from deposits of tar and lamp-black and causes the heat and its effects upon the generator to be uniformly
40 distributed.

With this generator the tile baffle plates are easily put in or taken out, and a great heating surface for fixing the gas is afforded without the use of checker work. The gen-

erator is easily managed, and a very large 45 out-put of good fixed gas is yielded without waste of oil or delays from cleaning out carbonaceous deposits.

I am aware that in water gas generators it is not new to carry the hydrogen gas down 50 through the checker work of one chamber, and up through the checker work in another chamber; and I am also aware that baffle plates have been heretofore employed in gas making and metallurgical operations, and I 55 make no broad claim to these features.

Having thus described my invention, what I claim is—

1. A gas generator having above its fuel chamber a vertical partition wall in the middle forming two compartments with baffle 60 plates arranged in the two compartments, and with oil inlets, draft dampers, and gas outlets arranged at the top of said compartments, substantially as shown and described. 65

2. A gas generator having above its fuel chamber a vertical partition wall in the middle forming two compartments with shoulders on the sides of the partition and generator 70 walls, and fire tile arranged as baffle plates on said shoulders in inclined position one above the other, and provided also at the upper ends of said compartments with inlet oil pipes, draft dampers and gas outlet valves, substantially as shown and described. 75

3. The gas generator consisting of an upright casing with fuel chamber A in its lower part and a vertical partition wall C in its upper part with shoulders *d* and *f*, the tile *c* with openings *c'* on the side arranged in inclined position one above the other on said 80 shoulders, the oil inlets *e e'*, the draft dampers J J' and the gas outlet valves I I', substantially as shown and described.

JOHN H. MILLER, JR.

Witnesses:

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