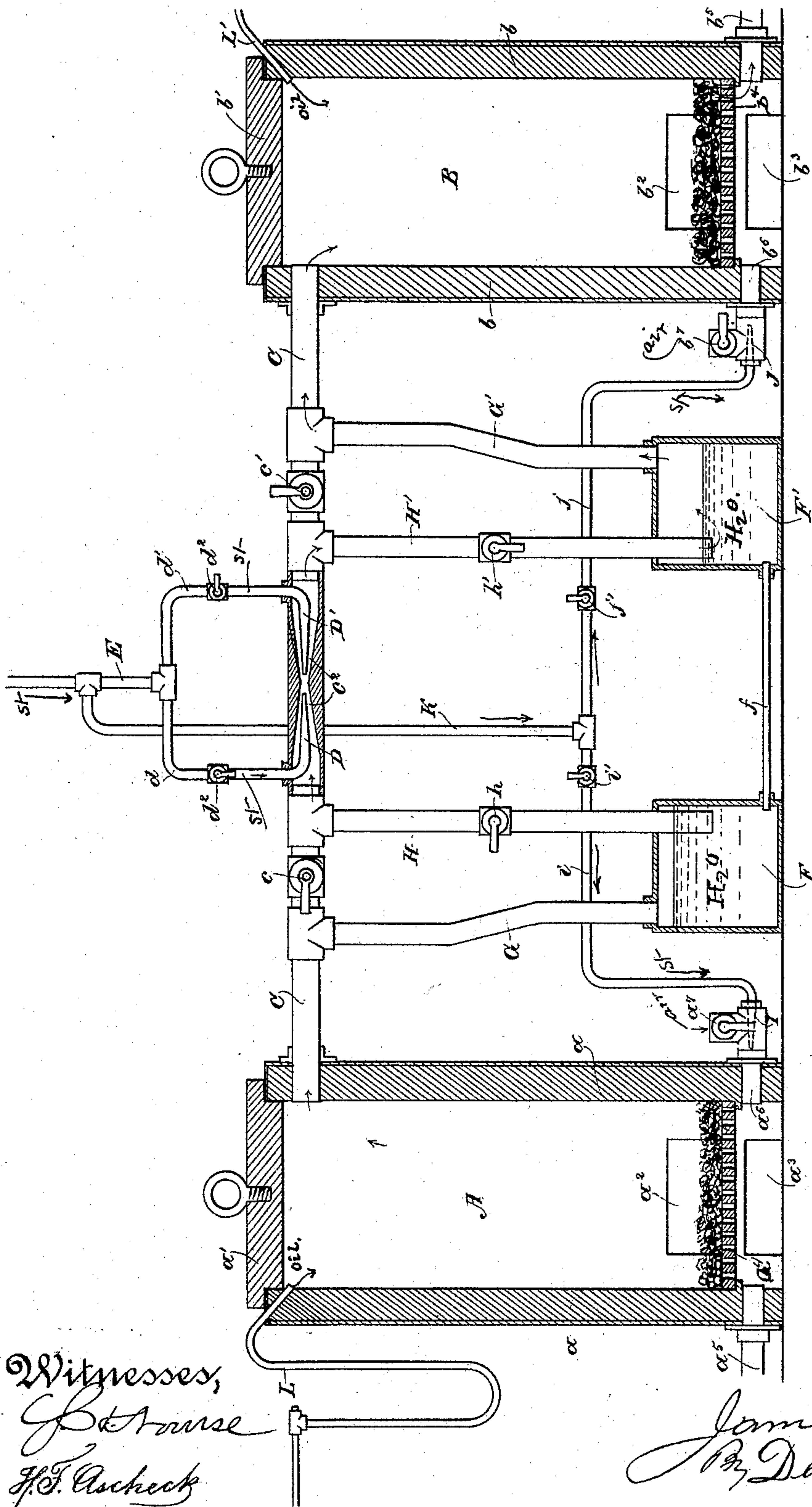


(No Model.)

J. NOLAN.
GAS GENERATOR.

No. 500,935.

Patented July 4, 1893.



Witnesses,
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UNITED STATES PATENT OFFICE.

JAMES NOLAN, OF OAKLAND, CALIFORNIA.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 500,935, dated July 4, 1893.

Application filed April 8, 1893. Serial No. 469,595. (No model.)

To all whom it may concern:

Be it known that I, JAMES NOLAN, a citizen of the United States, residing in Oakland, Alameda county, State of California, have invented an Improvement in Gas-Generators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of apparatus for generating gas.

It consists in the arrangement and connection of the fuel retorts, washers, and injectors which I shall hereinafter fully describe and specifically claim.

The object of my invention is to provide a simple and effective gas generating apparatus, and particularly one which, by reason of its reversibility, is capable of continuous operation.

Referring to the accompanying drawing for a more complete explanation of my invention—the figure is a vertical section of my gas generator.

A is a retort of suitable shape having a proper refractory lining a , a removable cover a' , a door a^2 below, and an ash-pit door a^3 . It has also grate bars a^4 and a discharge a^5 from its lower portion.

B is a second retort of similar character, having refractory lining b , cover b' , doors b^2 and b^3 , grate bars b^4 , and a discharge b^5 .

C is a pipe connecting the upper portions of the two retorts. This pipe has a controlling cock c nearest retort A, and a cock c' nearest retort B. In its center it is formed or provided with the double conical passage c^2 , in the opposing ends of which are seated the oppositely directed injector nozzles D, D', the pipes d d' of which are controlled by cocks d^2 and communicate with a steam supply pipe E.

F is a washer consisting of a closed water containing box. F' is a similar washer. With the top of washer F communicates a pipe G, the other end of which communicates with the pipe C, which connects the two retorts, at a point between retort A and the controlling cock c .

H is a pipe which enters washer F, and has its end below the surface of the water therein. The upper end of this pipe communicates with pipe C at a point between the cock c and the injector nozzle D, and said pipe H has a controlling cock h .

G' H' are pipes connecting washer F' with pipe C, similarly to the pipes G and H, and the pipe H' has a cock h' . A pipe f connects the two washers.

I is a steam injector nozzle which is fitted to a pipe a^6 entering retort A under its grate bars. This pipe has a communication with the outer air, which is controlled by a cock a^7 .

J is a steam injector nozzle fitted to a pipe b^6 entering retort B under its grate bars, said pipe having an air communication controlled by a cock b^7 . The pipes i and j of the injector nozzles are separately controlled by cocks i' and j' and they join in a pipe K which leads upwardly to and communicates with the steam supply pipe E.

L and L' are oil feed pipes leading into retorts A and B respectively.

The operation carried out in this apparatus is as follows: Fuel is placed in both retorts A and B, and being ignited is brought up to a state of incandescence, the injectors I and J then being in full action, the cover being removed to allow the products of combustion to escape. Then fresh fuel is supplied to one of the retorts, as, for example, retort A and its cover replaced. Steam cock i' of injector I is now closed, so that only air shall enter under the fuel in retort A. The cock c in pipe C is opened, and the cock c' closed. The cock d^2 in the pipe d of injector D is opened, and the cock d^2 in pipe d' of injector D' is closed. The cock h in pipe H is closed and the cock h' in pipe H' is opened; and the cocks j' and b^7 of the bottom injector J of retort B are closed. The steam from injector D will now create a suction behind it in pipe C, and the gas generated in retort A will be drawn therefrom into said pipe C, and passing by the injector D and through the double conical passage c^2 , will be forced down through pipe H' into washer F'. From this it will pass up through pipe G' to pipe C again and will enter retort B. In this it will pass down through the incandescent fuel therein and will be fixed, finally issuing from discharge b^5 . If it be desired to enrich it for illuminating purposes, suitable liquid hydrocarbons may be fed to retort B through pipe L'. When decomposition in retort A has reached a sufficient point, the operation is reversed, by adding fresh fuel to retort B, and closing

the cocks which before were opened, and opening those which before were closed, with the exception of the steam cocks *i'* and *j'* which remain closed, as they are only needed
 5 to assist combustion in the first instance. Then the gas from retort B will, under the force of injector D', be passed through washer F and downwardly through the now
 10 incandescent material in retort A, and so discharged through pipe *a*⁵. The connection *f* between the two washers relieves the pressure by driving some of the water in one into the other.

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

1. A gas generator consisting of separate fuel retorts, a pipe connecting them and having a cock, a washer, pipes connecting said
 20 washer with the connecting pipe of the fuel retorts on each side of its cock, and a means for forcing the gas generated in one retort through the washer and into and through the fuel in the other retort, substantially as herein de-
 25 scribed.

2. A gas generator consisting of separate fuel retorts, a pipe connecting them and having a cock, a washer, pipes connecting said washer with the connecting pipe of the fuel retorts
 30 on each side of its cock, and an injector fitted in said connecting pipe for forcing the gas generated in one retort through the washer and into and through the fuel in the other retort, substantially as herein described.

35 3. A gas generator consisting of separate fuel retorts, a pipe connecting them having separate cocks, separate washers, pipes connecting one of said washers with the connect-

ing pipe of the fuel retorts at points on each side of one of its cocks, pipes connecting the
 40 other washer with said connecting pipe one on each side of its other cock, and a means for forcing the gas generated in one retort through one of the washers and into and through the fuel of the other retort, and vice
 45 versa, through the other washer and other retort, substantially as herein described.

4. A gas generator consisting of separate fuel retorts, a pipe connecting them having separate cocks, separate washers, pipes con-
 50 necting one of said washers with the connecting pipe of the fuel retorts at points on each side of one of its cocks, pipes connecting the other washer with said connecting pipe one on each side of its other cock, and a means
 55 for forcing the gas generated in one retort through one of the washers and into and through the fuel of the other retort, and vice versa, through the other washer and other retort, consisting of oppositely directed in-
 60 jectors fitted to said connecting pipe, substantially as herein described.

5. A gas generator consisting of the separate retorts, the pipe C connecting them having the cocks, the separate washers and pipes
 65 connecting them with pipe C on each side of its cocks, the oppositely directed injectors fitted to pipe C, and the oil feed pipes communicating with said fuel retorts, substantially as herein described.
 70

In witness whereof I have hereunto set my hand.

JAMES NOLAN.

Witnesses:

S. H. NOURSE,
 J. A. BAYLESS.