

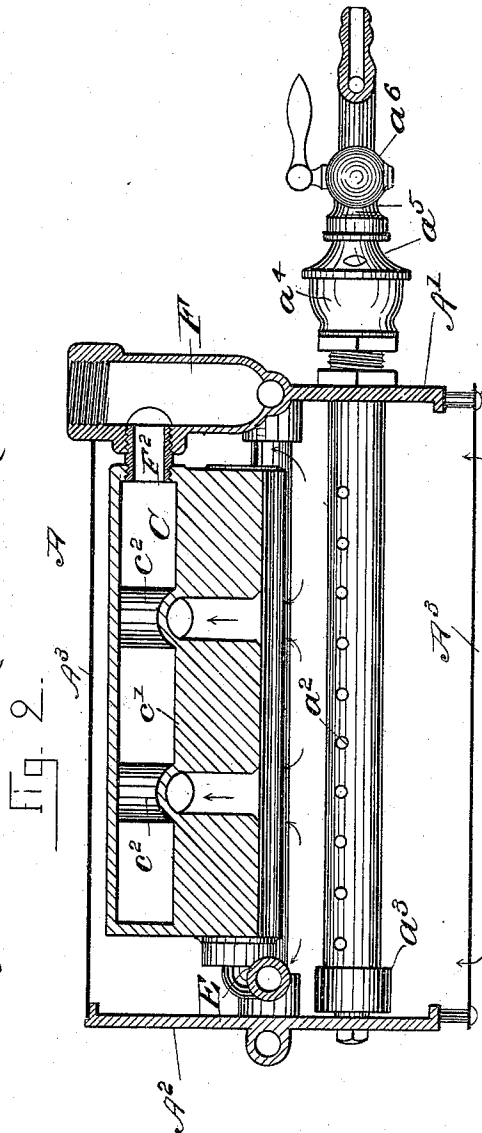
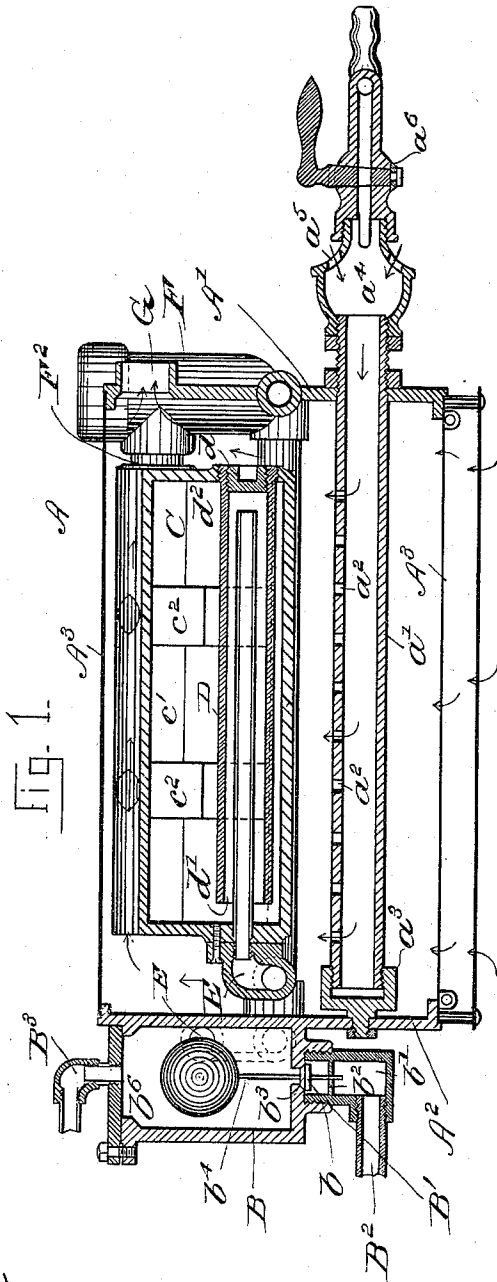
(No Model.)

3 Sheets—Sheet 1.

J. E. DAME.
STEAM GENERATOR.

No. 533,441.

Patented Feb. 5, 1895.



Witnesses:
Gas. L. Eubank.
Chas. Atwood.

Inventor.
John E. Dame
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Attorney.

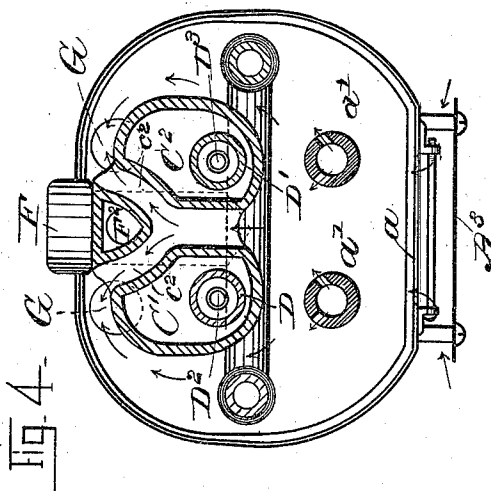
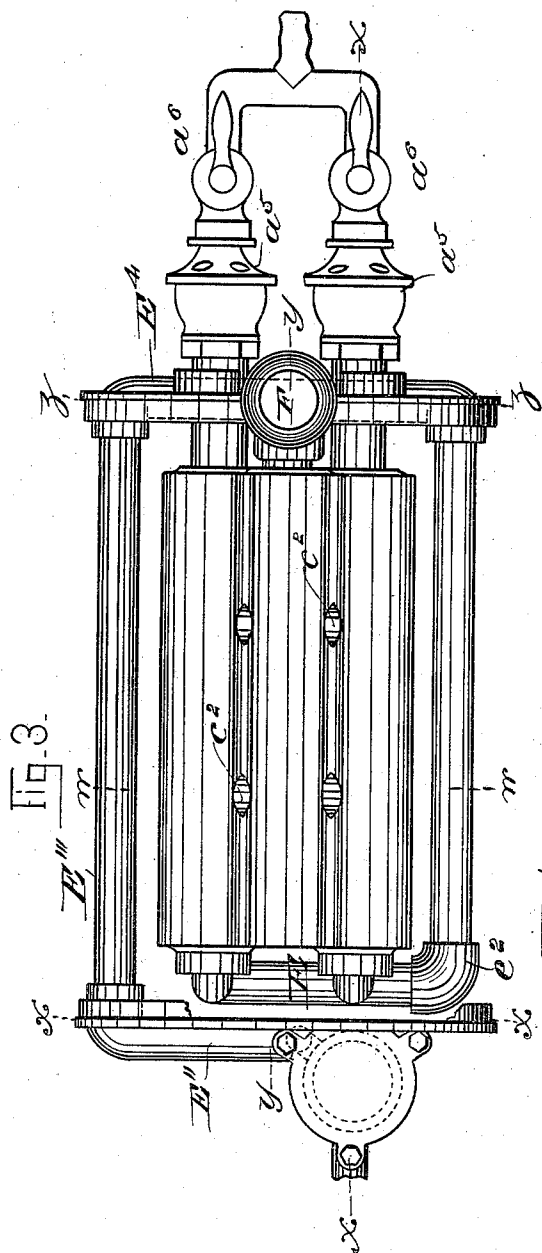
(No Model.)

3 Sheets—Sheet 2.

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STEAM GENERATOR.

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3 Sheets—Sheet 3.

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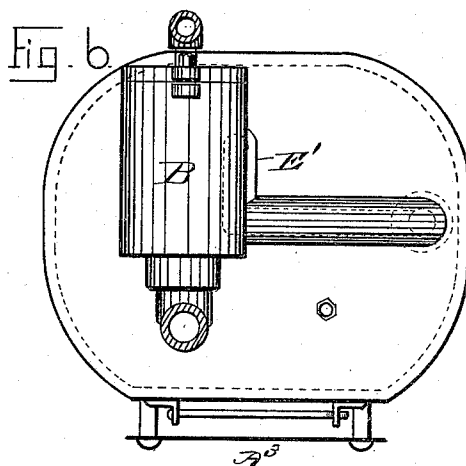
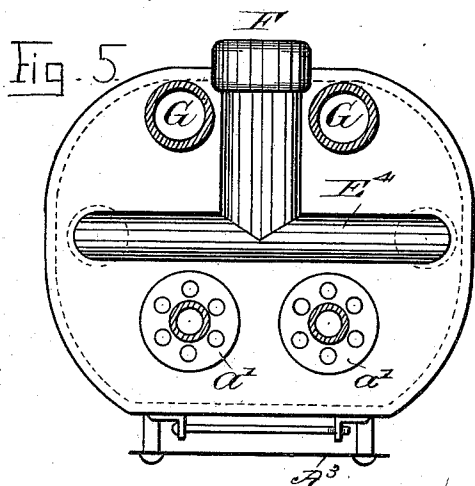


Fig. 7.

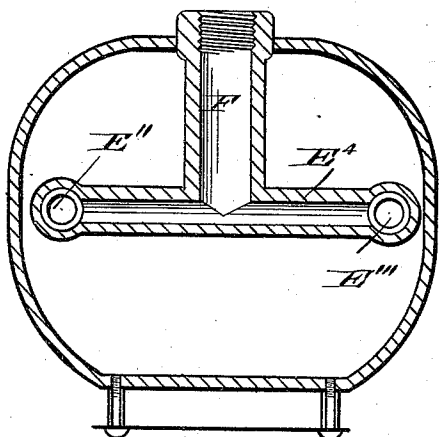


Fig. 8.

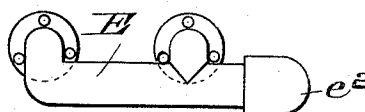


Fig. 9.

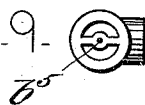
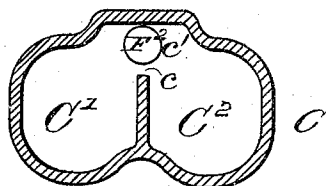


Fig. 10.



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UNITED STATES PATENT OFFICE.

JOHN E. DAME, OF BROOKLYN, NEW YORK.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 533,441, dated February 5, 1895.

Application filed July 11, 1894. Serial No. 517,259. (No model.)

To all whom it may concern:

Be it known that I, JOHN E. DAME, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Steam-Generators, of which the following is a specification.

My invention has relation to certain new and useful improvements in steam generators; and it consists in the construction and novel arrangement of parts as hereinafter more fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

The objects of my invention are to provide a generator of simple construction, whereby a given amount of water is rapidly converted into steam for heating and other purposes; further, to provide an automatic valve to regulate the admission of water to the steam drums; further, to provide a set or series of tubes arranged within the boiler whereby the water is caused to be circulated from one end of the boiler to the other during the process of being converted into steam; further, to provide an inner and an outer circulating medium both having a connection with the main boiler, and, further, to provide the generator with a novelly constructed draft regulator and certain other features as will appear from the specification.

In the drawings forming a part of this specification, Figure 1, is a vertical section of my improved steam generator taken on the line $x-x$ of Fig. 3. Fig. 2 is a similar sectional view taken on the line $y-y$ of Fig. 3. Fig. 3, is a plan view of the steam generator with the outer casing removed. Fig. 4, is a transverse section taken on the line $w-w$ of Fig. 3. Fig. 5, is a front elevation of my improved generator with parts removed. Fig. 6, is a rear end view of same. Fig. 7, is a transverse section on the line $z-z$ of Fig. 3. Fig. 8, is a detail end view of the connecting branch T. Fig. 9 is a detail view of the automatic valve, diaphragm. Fig. 10, is a transverse section of steam drums or boilers.

Referring to the accompanying drawings wherein like letters of reference indicate corresponding parts in all the figures; a designates my improved steam generator which consists of the front and rear heads A' and A^2

connected by a casing or shell A^3 which shell is for a certain distance at its lower part left open as at a for a purpose hereinafter explained. Journaled in suitable bearings formed in the lower part of the front and rear heads is a gas supply pipe a' provided intermediate of its ends with a series of openings a^2 . This pipe is closed at one end by a cap a^3 , while at its opposite end is secured a hollow chamber or mixer a^4 provided with a series of holes a^5 through which air is admitted to force the gas entering the chamber from the cock a^6 into the pipe a' . On the rear head A^2 of the structure is a reservoir B which in this example is in two sections, one including the outer side and bottom, and the other constituting the top thereof as more clearly shown in Fig. 1; and depending from this reservoir is a screw threaded boss b within which is secured a valve chamber b' provided with a perforated diaphragm b^2 . The bottom of the reservoir B, is also provided with a valve seat b^3 . B' designates a valve carried on a stem b^4 , the lower end of the stem passing through the central opening b^5 in the diaphragm b^2 , while the upper end of the stem carries a float b^6 .

B^2 designates the cold water supply pipe, and B^3 designates the return pipe for the water of condensation.

C designates the boiler which consists of the drums C' and C^2 having a central divisional wall or web c extending from the bottom to nearly the top, leaving a passage-way c' . Formed between the drums C' and C^2 at equal distances apart are transverse flues c^2 .

D D' indicate tubes closed at their front ends by plugs d , and supported in suitable screw-threaded openings formed in the front head A' , and extend nearly the entire length of the boiler, a space d' being left between the rear end of these tubes and the head A^2 .

D^2-D^3 designate a second set of tubes somewhat smaller in diameter than the tubes D D' , and are supported in suitable screw-threaded openings formed in the rear head A^2 . The tubes are open at one end, a space d^2 being left between the ends and the plug d while their opposite ends pass through the rear head A^2 and engage screw-threaded ends of a branch T E.

About midway in the wall of the reservoir

B, is secured a tube or pipe E' which extends downwardly a short distance and then runs laterally across the rear of the boiler by means of the branch E'', and then turns and runs parallel with the boiler by means of the branch E''' until it reaches the front of the boiler when it is given another bend and caused to run across the front of the boiler to the opposite side thereof by the branch E⁴ when it is again caused to run parallel with the boiler and secured to the end e² of the branch T E.

Formed in the front head A', is a collecting chamber or reservoir F having a connection with the interior of the boiler by means of the branch pipe F². It will also be seen that the branch E⁴ connects with the reservoir F. Suitable flue openings G are formed in the front head A'.

It will readily be seen that owing to the peculiar construction of my steam generator, and the particular location of the tubes with reference to the steam pipe, drums and reservoir F, that a positive working water separator is also provided—and all danger or liability of the water being carried up into the pipes leading to the radiators or the like from the service pipe (not shown) leading from the top of the reservoir F is overcome.

In order that the entrance of air may be regulated to the flues between the shell A³ and the boiler I provide a draft regulator, which consists of a plate of metal corresponding in size and shape to the opening a formed in the bottom of the shell A³ supported and made vertically adjustable by means of screws or the like.

It may also be stated, that the peculiar sounds and noise often heard in radiators and pipes when steam is turned on owing to the condensation that takes place is entirely overcome, and as the steam is condensed it is allowed to re-enter the boiler through the pipe B³, whence it is again converted into steam, through the proper circulating medium.

The operation of my improved device taken in connection with the above description and accompanying drawings will be readily understood by those skilled in the art.

What I claim as new, and desire to secure by Letters Patent, is—

1. A steam chamber with a base or bottom formed into semicircles and with vertically inclined openings or flues therein affording additional heating surface—a circulating water pipe connected with the steam chamber at one end and with a regulating valve at the other for governing the supply of water from without and maintaining the required level of the same within the chamber, substantially as shown and described.

2. In a steam generator, the steam chamber with a sectional circulating tube therein, a second circulating tube surrounding the chamber, above the combustion chamber, a perforated gas supply pipe below the chamber, carrying a cut-off cock and an air jet, the vertically adjustable draft equalizer in the bottom

of the combustion chamber, a supply pipe and an exhaust pipe for the steam chamber, substantially as described.

3. A combustion chamber having hollow end walls or heads—the steam and water compartments in said walls or heads with connections from within and without said chambers, the regulating draft thereunder, substantially as shown and described.

4. In a steam generator, the combination with the steam chamber, divided into compartments, a circulating pipe or tube for each compartment, each open at one end within the steam chamber, the reservoir B, with an automatic valve, located at the rear of the steam chamber, the reservoir F, communicating with the interior of the steam chamber and located at the front of the steam chamber, and communicating with the interior of the steam chamber, a supply pipe and a discharge pipe for said steam drum, substantially as described.

5. In a steam generator, the combination with the steam chamber, and a sectional circulating pipe therefor, consisting of two tubes of different diameter entering one another each open at one end and forming a circulating medium within the steam chamber, the combustion chamber below the steam chamber, provided in its bottom with an opening closed by an adjustable draft equalizer, the perforated gas supply pipe within the combustion chamber, provided with a regulating cock and an air jet within the combustion chamber, substantially as specified.

6. In a steam generator, the combination with the steam chamber, divided into compartments, a circulating tube for each compartment, communicating with a supply reservoir, a series of transverse flues passing through the steam chamber, a gas supply pipe provided with a cut off cock and an air jet below the steam chamber, substantially as described.

7. In a steam generator, the combination with the steam chamber, divided into compartments, a shell surrounding said chamber forming a flue and combustion chamber, the transverse flues C² passing up through the steam chamber, and communicating with the combustion chamber, and the flues G, substantially as specified.

8. In a steam generator, the combination with the steam chamber divided into compartments by a longitudinal vertical web or wall, a steam passage-way left between the top of the web and top steam chamber, a sectional circulating pipe for each steam chamber communicating with a tube or pipe surrounding the steam chamber, and with the reservoirs B and F, each communicating with the interior of the steam chamber substantially as described.

9. The combination with the steam chamber C, and with a discharging reservoir F, communicating with the interior of the steam chamber, a combustion chamber surrounding

the steam chamber, provided in its bottom with an opening, a vertical adjustable draft regulator, below said opening, all arranged to operate, substantially as specified.

- 5 10. The combination with the steam chamber, having a central longitudinal web or partition, dividing said chamber into compartments, a circulating pipe, composed of the sections D^2 — D^3 entering the sections D — D' ,
10 leaving a space d' — d^2 at each end thereof, a series of transverse flues, passing through

the steam chamber, a combustion chamber below the steam chamber, provided in its bottom with an adjustable draft regulator, a perforated gas supply pipe provided with an air 15 jet entering the combustion chamber, substantially as specified.

JOHN E. DAME.

Witnesses:

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FRANCIS C. BOWEN.