(No Model.) 3 Sheets—Sheet 1.

J. E. DAME.

STEAM GENERATOR.

No. 518,689. Patented Apr. 24, 1894.

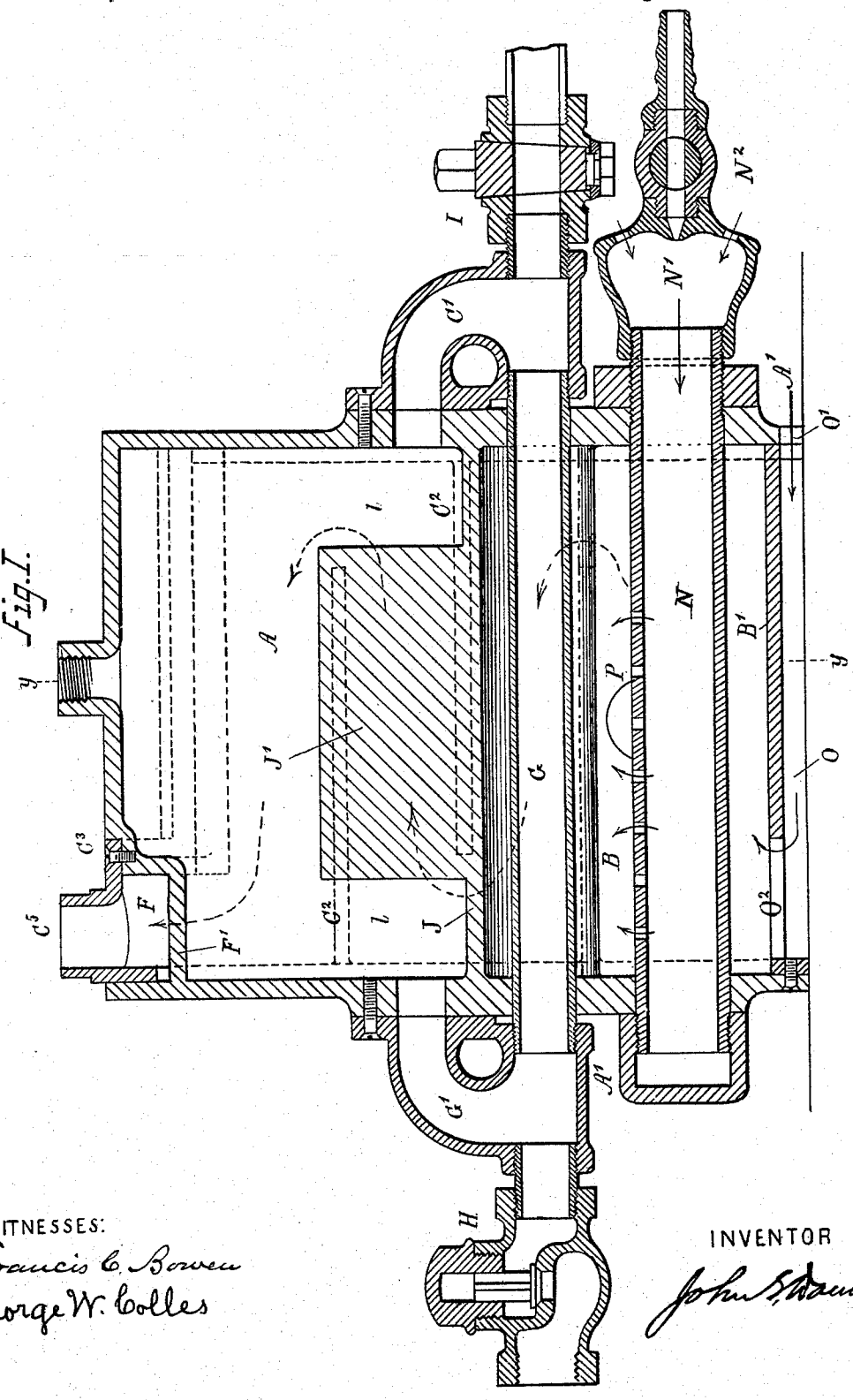


Fig. I.

WITNESSES:
Francis C. Bowen
George W. Colles

INVENTOR
John E. Dame

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

J. E. DAME.

STEAM GENERATOR.

No. 518,689. Patented Apr. 24, 1894.

Fig. III.

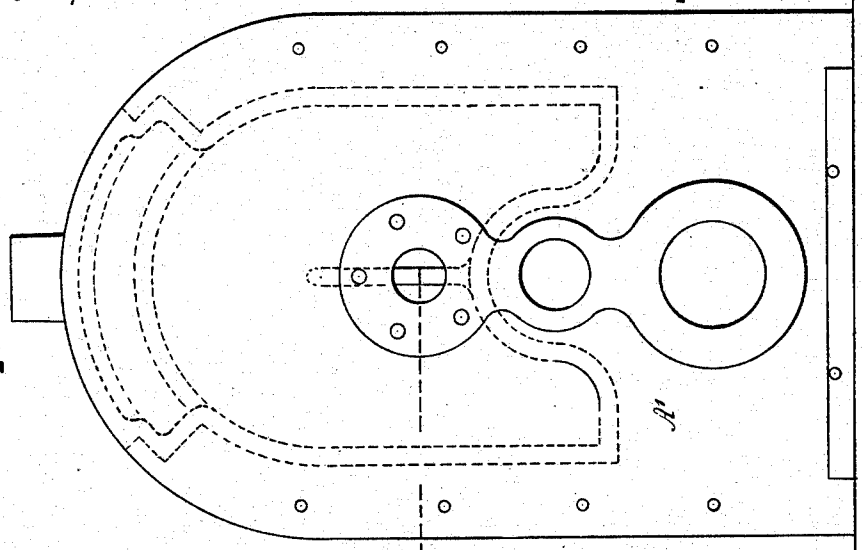


Fig. IV.

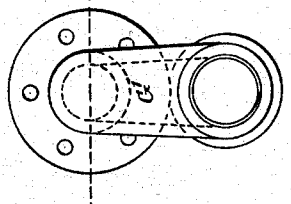
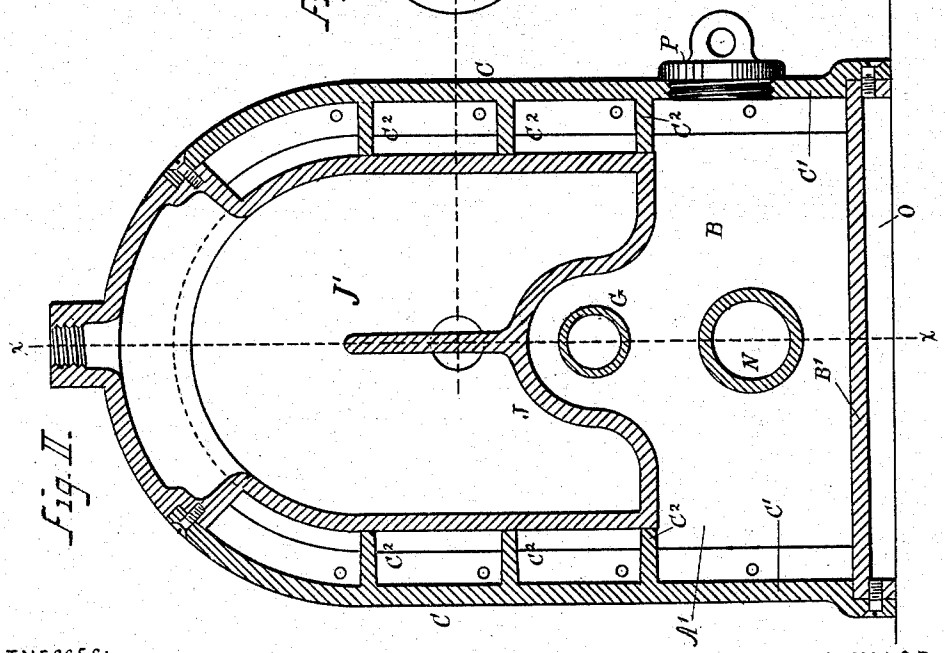


Fig. II.



WITNESSES:

Francis C. Bowen

George W. Colles

INVENTOR

John E. Dame

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

J. E. DAME.

STEAM GENERATOR.

No. 518,689. Patented Apr. 24, 1894.

Fig. VII

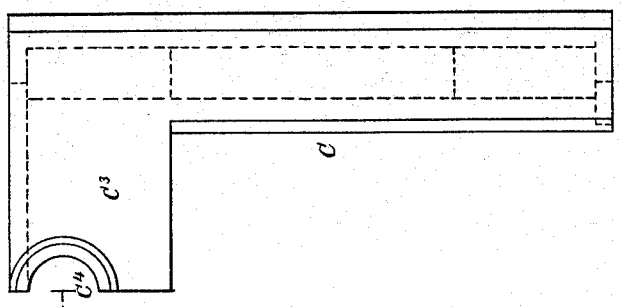


Fig. V.

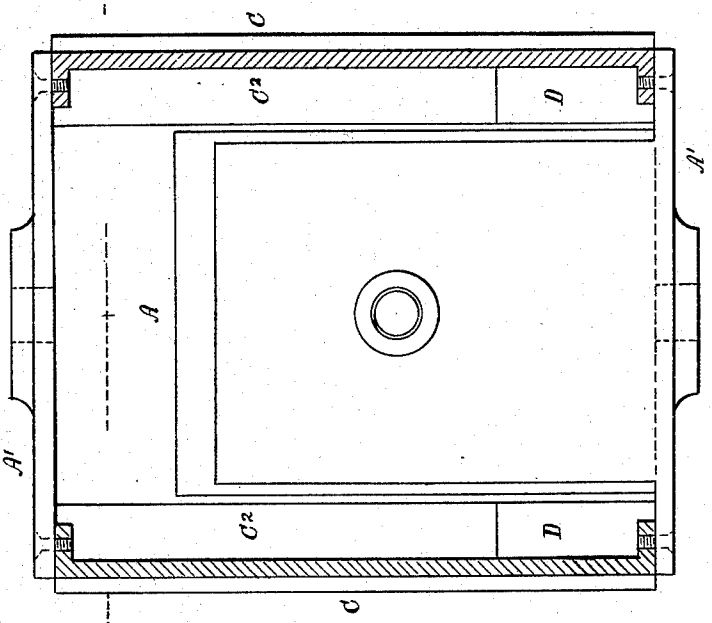
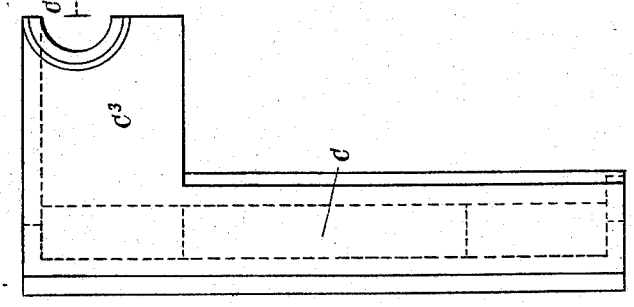


Fig. VI.



WITNESSES:

Francis C. Bowen

George W. Colles

INVENTOR

John E. Dame

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

JOHN E. DAME, OF BROOKLYN, NEW YORK.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 518,689, dated April 24, 1894.

Application filed November 21, 1893. Serial No. 491,599. (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 for Heating and other Purposes, of which the following is a specification.

My invention is a steam generator to be employed especially in conjunction with a radiator and more particularly an individual radiator, in a room, for heating; but which is adapted to other general purposes.

The novel features of my generator and the advantages arising therefrom, are hereinafter fully described with reference to the accompanying drawings, in which—

Figure I. represents a vertical longitudinal section being indicated by the lines *x x* Fig. II. Fig. II. represents a vertical cross section thereof on the line *y y* Fig. I. Fig. III. represents an end view thereof, omitting some of the parts. Fig. IV. represents a front view of a return bend, detached. Fig. V. represents a plan view of the apparatus with the jacket in horizontal section. Figs. VI. and VII. represent plan views of the parts composing the jacket, detached.

Similar letters of reference indicate similar parts.

The letter A indicates a steam chamber; B a flue or combustion chamber under the steam chamber; C C two sections of a heating jacket each covering one side of the steam chamber; D return flues in both sections of the jacket and F a cross flue over the steam chamber.

The ends A′ of the steam chamber are extended downward as shown in Fig. I and constitute the ends of the fire chamber B; and the sections C C, of the heating jacket are likewise extended as at C′ C′ (Fig. II) and constitute the sides of the fire chamber, the jacket sections being properly secured to both the ends and sides of the steam chamber, and also to the bottom B′ of the fire chamber. Each of the jacket sections C C, is formed with inwardly projecting flanges C^2, to create the desired return flues; these flanges terminating at points alternately within the opposite ends of the jacket as indicated by dotted lines in Fig. I; each is also formed with a transverse cap plate C^3 (Figs. I, VI, and VII) which overlap a transverse depression F′ (Fig. I) in the top of the steam chamber, to create the desired cross flue. At the junction of the two cap plates C^3, each has a semi-orifice, C^4, to create an outlet C^5 (Fig. I) from the cross flue. The lower member of the series of return flues D, of each of the jacket sections, communicates directly with the fire chamber B; and the cross flue F communicates with the upper members of said flues, so as to inter-connect the upper flues with each other. The products of combustion from the fire chamber B, thus pass in circuitous course through the jacket sections C C, to the outlet C^5, with the effect of heating the sides of the steam chamber A, for producing steam in a rapid and economical manner.

Through the fire chamber B, extends a water supply pipe G, with its ends projecting therefrom, both of which ends are connected to the steam chamber A, by means of return bends G′, so as to permit a continuous circulation of the water through the supply pipe and steam chamber. One of the return bends G′ carries a water feed valve H, which in this example is a check valve and the other carries a blow-off cock I.

In the bottom of the steam chamber A, is a central raised part or arch J, which extends the whole length thereof; and the point at which the water supply pipe G, extends through the fire chamber is within this arch. The water supply pipe G is thus subjected to the action of the heat in the fire chamber within the arch J, whereby the effect of such heat is materially increased. The arch J also serves to extend the heating surface afforded by the bottom of the steam chamber; and this surface may be further extended by a central web J′ upon the arch rising in the steam chamber; this web terminating within the opposite ends of the chamber so as to create at those points, openings *l* for the free circulation of water.

Under and parallel to the water supply pipe G in the fire chamber B is a perforated tube N constituting a gas burner; and under the bottom B′ of this chamber is an air space or chamber O, which is open at one end, O′, (Fig. I.) and communicates with the fire chamber at the other end, as through a hole O^2 in its said bottom. When the burner N is

used, it is preferably fitted with a mixer N′ of air and gas, together with a gas cock N^2, like a Bunsen burner, while the fire chamber B is fitted with a screw plug P, for access to the burner.

In the operation of the apparatus when the gas issuing from the burner N, is ignited, the bottom and both sides of the steam chamber A, are at once enveloped by flame, and as soon as steam is formed and commences to escape from the chamber it is replaced by water at the boiling point from the supply pipe G, through the return bends G′, so that the measure of supply is maintained without interruption to the generator of steam. The water supply source may be a tank, to which may be conducted the condensation from the radiator.

It may be remarked that oil may be used in my apparatus instead of gas.

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

1. A steam generator comprising the steam chamber, the fire chamber thereunder, the heating jacket in sections each covering one side of the steam chamber, return flues in both sections of the jacket; the lower one of which flues communicates with the fire chamber, a cross flue over the steam chamber inter-connecting the upper return flues of the sections, and an outlet from the cross flue, all substantially as and for the purpose herein described.

2. A steam generator comprising the steam chamber, with a transverse depression in the top thereof, the fire chamber under the steam chamber, the heating jacket in sections each covering one side of the steam chamber, each formed with the inwardly projecting flanges, to create return flues, the lower one of which communicates with the fire chamber; each also formed with a transverse cap-plate overlapping said depression of the steam chamber, to create a cross flue inter-connecting the upper return flues of the sections, and with a semi-orifice at the junction of the two cap plates, to create an outlet from the cross flue, all substantially as and for the purpose herein described.

3. A steam generator comprising the steam chamber, the fire chamber thereunder, the water supply pipe extending through the fire chamber, return bends connecting both ends of the supply pipe to the steam chamber, one with a water feed valve, and the other with a blow off cock, all substantially as and for the purpose herein described.

4. A steam generator comprising the steam chamber with a central arch in the bottom extending the whole length thereof, the fire chamber under the steam chamber, the water supply pipe extending through the fire chamber at a point within said arch of the steam chamber, and return bends connecting both ends of the water supply pipe to the steam chamber, all substantially as and for the purpose herein described.

5. A steam generator comprising the steam chamber, with a central arch in the bottom extending the whole length thereof, and a central web upon the arch with openings at its opposite ends, the fire chamber under the steam chamber, the water supply pipe extending through the fire chamber at a point within said arch of the steam chamber and return bends connecting both ends of the water supply pipe to the steam chamber, all substantially as and for the purpose herein described.

6. A steam generator comprising the steam chamber with a central arch in the bottom thereof, the fire chamber under the steam chamber, the water supply pipe extending through the fire chamber at a point within said arch of the steam chamber, return bends connecting both ends of the water supply pipe to the steam chamber, a burner consisting of a perforated tube, which extends through the fire chamber under and parallel to the water supply pipe, and an air space or chamber under the fire chamber, open at one end and communicating with the fire chamber at the other end, all substantially as and for the purpose herein described.

JOHN E. DAME.

Witnesses:
PERCY R. KLOCK,
FRANCIS C. BOWEN.