(No Model.) 2 Sheets—Sheet 1.

W. J. RANTON.

GENERATOR.

No. 560,818. Patented May 26, 1896.

Fig. 1.

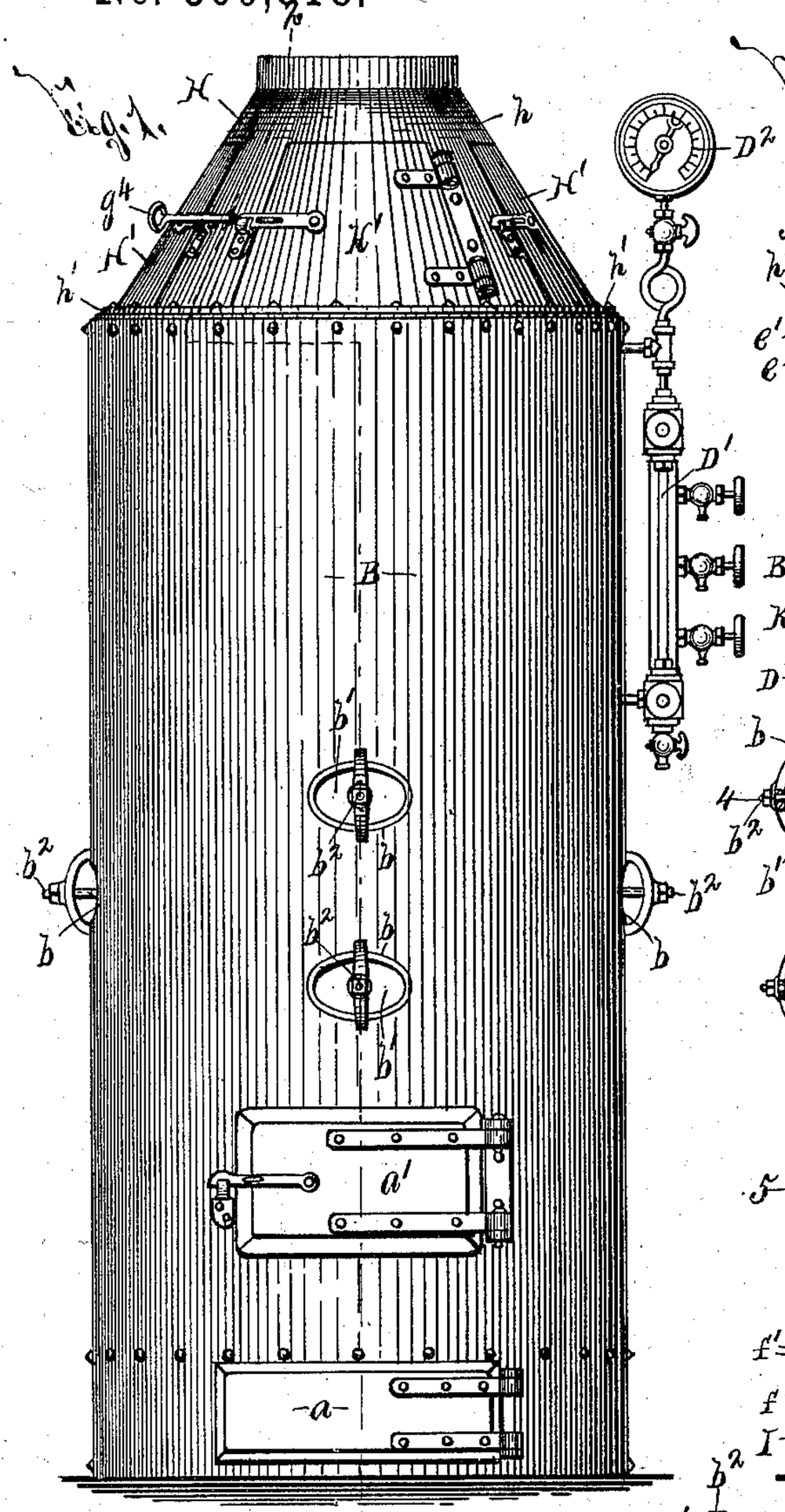


Fig. 2.

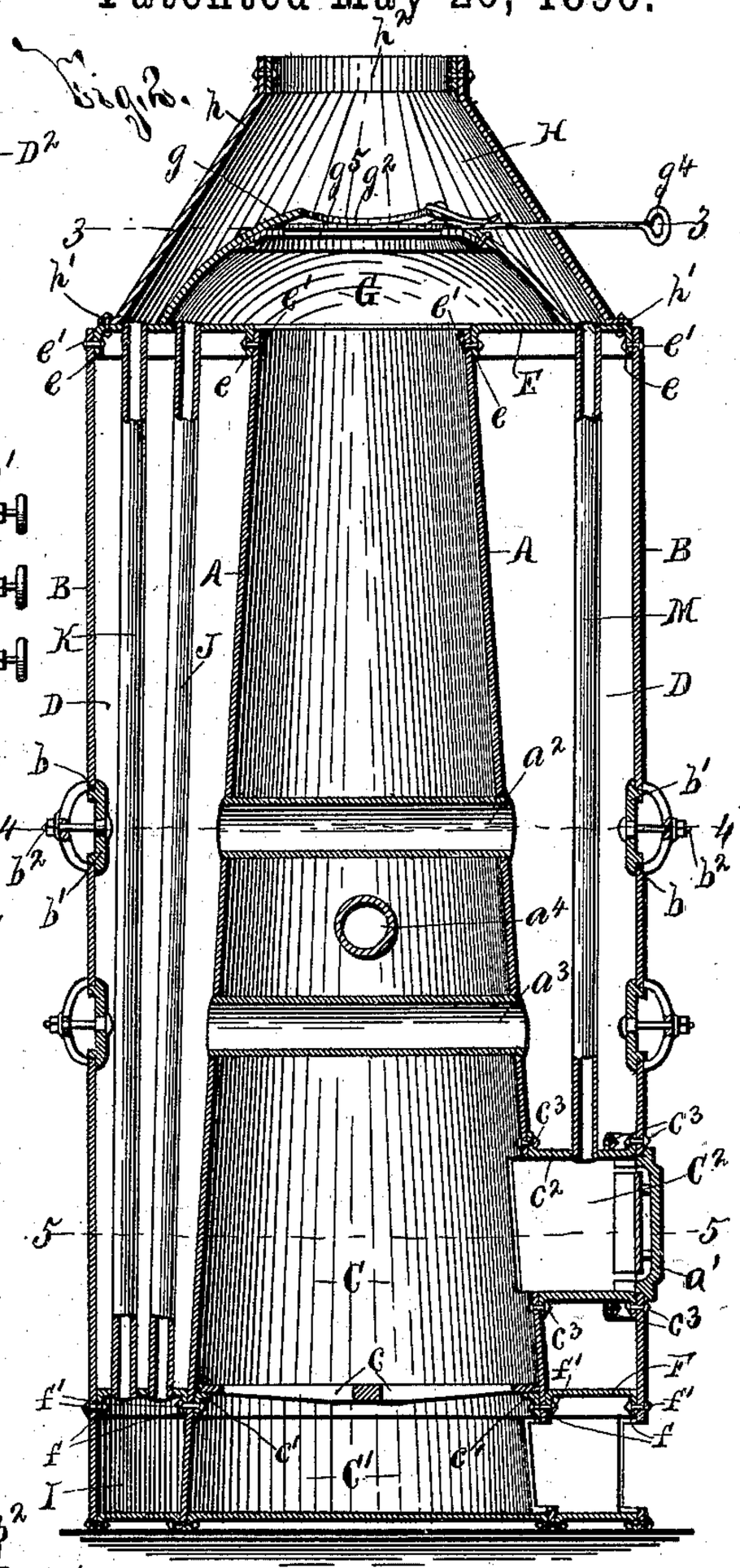
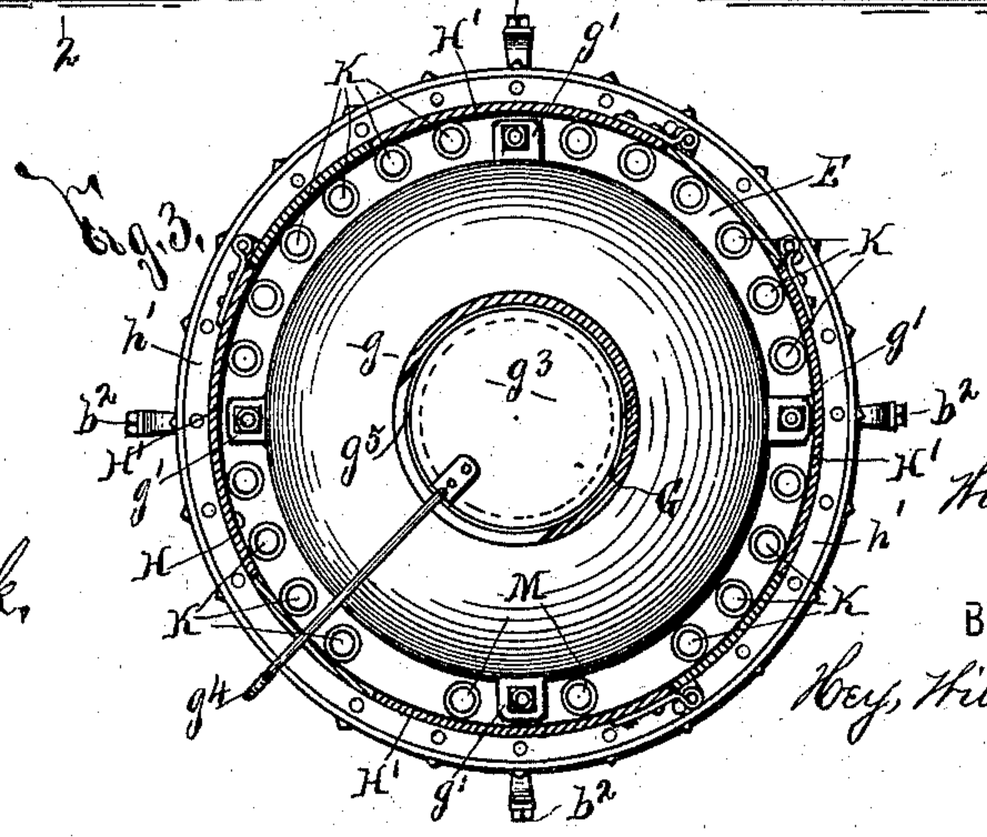


Fig. 3.



WITNESSES:
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ATTORNEYS.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

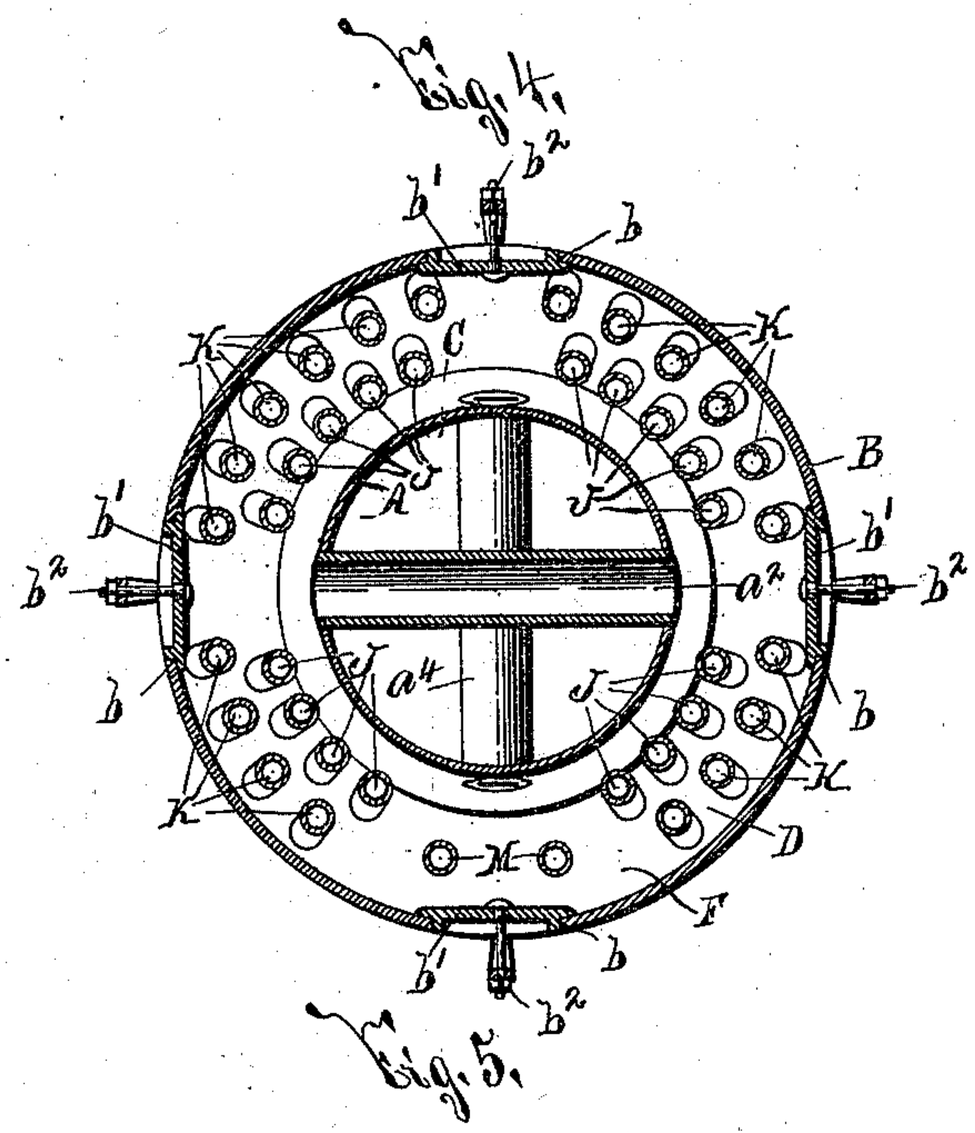
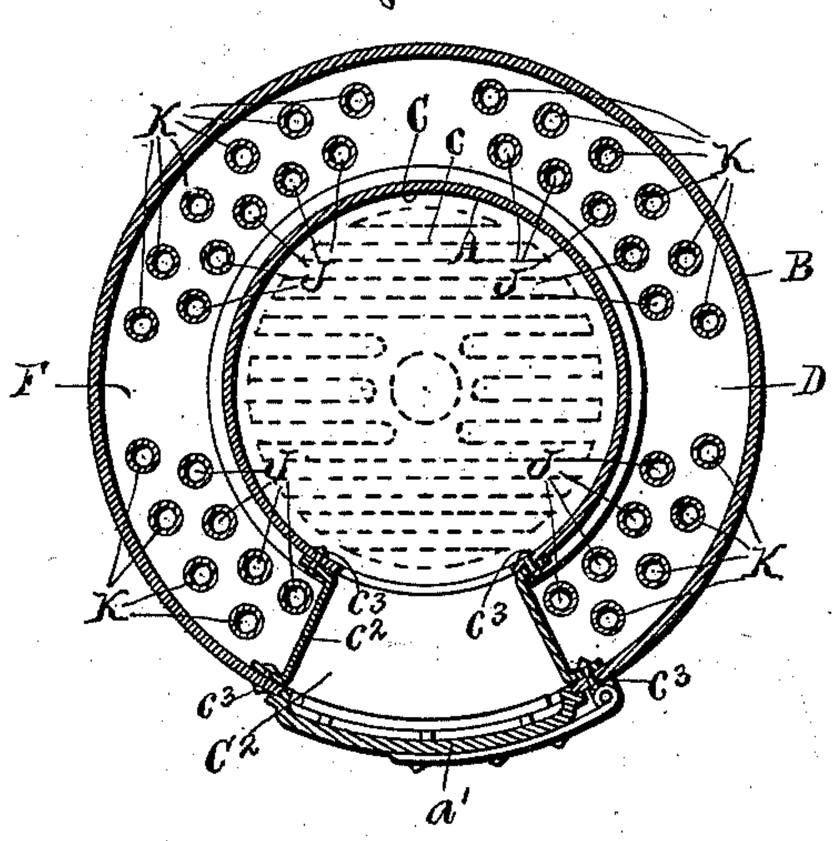


Fig. 5.



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WILLIAM J. RANTON, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE RANTON BOILER COMPANY, OF SAME PLACE.

GENERATOR.

SPECIFICATION forming part of Letters Patent No. 560,818, dated May 26, 1896.

Application filed March 26, 1895. Renewed November 4, 1895. Serial No. 567,957. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM J. RANTON, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Generators, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in generators, particularly applicable for heating houses and other buildings, and has for its object the production of a simple and practical device which is highly efficient in operation and durable in use; and to this end it consists, essentially, in the general construction and arrangement of the parts of the generator, all as hereinafter more particularly described, and pointed out in the claims.

In describing this invention reference is had to the accompanying drawings, forming a part of this specification, in which like letters indicate corresponding parts in all the views.

Figure 1 is a front elevation of my improved generator. Fig. 2 is a vertical section taken on line 2 2, Fig. 1. Fig. 3 is a transverse section taken on line 3 3, Fig. 2; and Figs. 4 and 5 are transverse sections taken, respectively, on lines 4 4 and 5 5, Fig. 2.

A and B represent, respectively, the inner and outer shells of my improved generator, which, as best seen at Fig. 1, are formed of substantially the same length. The inner shell A preferably tapers from its base toward its upper end and is usually formed circular in cross-section. The outer shell B is preferably formed with upright walls and is also usually formed circular and provided with manholes *b*, closed by caps *b'* and suitable fastening means b^2. The ash and combustion chambers C C' of the generator are preferably inclosed by the lower end of the shell A, which extends upwardly above the combustion-chamber.

A suitable grate *c* is arranged within the lower end of the shell A and is mounted upon any desirable construction of support *c'*. A fuel-inlet passage C^2 and an ash-door *a* are arranged above and below the grate *c* and the passage C^2 is closed by a door *a'*. The passage C^2 is preferably formed by a shell c^2, having its opposite ends provided with outwardly-projecting flanges secured by suitable fastening means c^3 to the adjacent faces of the shells A B. Said grate and fuel-inlet passage form no part of my present invention, and consequently they may be of any desirable form, size, and construction.

A water-containing chamber D is formed between the shells A B, and top and bottom plates E F interposed between the opposite ends of the shells A B. The plates E F are formed with downturned flanges *e f*, arranged within the adjacent ends of the shell B and at the outside of the corresponding ends of the shell A, and these flanges are secured in position by suitable fastening means *e' f'*. Any desirable construction of water-glass D' and pressure-indicator D^2 may be connected to the chamber D; but as said parts form no part of my present invention it is unnecessary to further illustrate and describe the same. The peculiar form of the shell A compels the products of combustion to impinge directly against its inner face, but does not prevent combustion of the gases or unduly retard the same. The water is also arranged in a comparatively thin body or sheet entirely surrounding the inner shell A, and is consequently easily heated. The utilization of the heat of the products of combustion is also greatly facilitated by flues presently described and water-tubes a^2 a^3, which are arranged one above the other and extend transversely across the shell A. The outer ends of the tubes a^2 a^3 are secured to the shell A, and a similar transverse tube a^4 is arranged midway between the tubes a^2 a^3 and at right angles thereto.

G H are inner and outer upper draft-chambers arranged above the top plate E, and I is a lower draft-chamber arranged beneath the bottom plate F between the lower ends of the shells A B. The draft-chamber G decreases in area toward its top and is formed with an upwardly-crowning top wall *g*, extending upwardly from the top plate E and provided with an outwardly-projecting flange *g'*, se-

cured to said plate E. The upper portion of the wall g is formed with an aperture g^2, which is opened and closed by a damper g^3. The chamber H is formed with an upwardly-tapering top wall h, extending from the top plate E and formed with a projecting flange h', secured to said plate E. The upper end of the wall h is provided with an outlet-opening h^2, to which a suitable draft-pipe (not illustrated) may be connected, and said wall is formed with a series of doors H'. A hand-piece g^4 is guided through the wall h of the chamber H and is connected to the damper g^3, which is movable in guides g^5, secured to the inner face of the wall g beneath the aperture g^2.

Downflow-flues J, inclining toward each other from their lower ends, connect the chambers G I, and substantially upright upflow-flues K, interposed between the flues J and the shell B, connect the chambers H I. The products of combustion, after impinging against the inner face of the shell A and the outer faces of the tubes a^2 a^3 a^4, enter the chamber G and then either pass from the chamber G directly through the aperture g^2 and the opening h^2 or else through the flues J, chamber I, and flues K to the chamber H and thence through the opening h^2.

Additional flues M connect the fuel-inlet passage C^2 with the draft-chamber H for additionally heating the overlying water, and these flues M also operate to increase the direct draft from the combustion-chamber and to prevent the escape of gas when fuel is being inserted. The described construction of flues is particularly practical and effective and serves to reduce to a minimum the amount of fuel requisite for operating my improved generator.

The operation of my invention will be readily perceived upon reference to the foregoing description and the accompanying drawings, and it will be particularly understood that it consists of but few parts, which are easily manufactured and assembled, insures combustion of the gases in a chamber of comparatively large diameter and the effective utilization of the heat of said gases.

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

1. In a generator, the combination of an inner shell inclosing the combustion-chamber and extending upwardly therefrom, an outer water-containing shell surrounding the inner shell, top and bottom plates between the opposite ends of the shells, separate inner and outer upper draft-chambers above the top plate, a damper for closing the inner upper draft-chamber, a lower draft-chamber beneath the bottom plate, and inclined downflow and upright upflow flues respectively connecting the inner and outer upper draft-chambers with the single lower draft-chamber, substantially as and for the purpose specified.

2. In a generator, the combination of an inner shell inclosing the combustion-chamber and extending upwardly therefrom, an outer water-containing shell surrounding the inner shell, top and bottom plates between the opposite ends of the shells, an inner draft-chamber above the top wall formed with an upwardly-crowning top wall provided with an aperture in its elevated central portion, a damper for closing the aperture, an independent outer draft-chamber above the top wall formed with an upwardly-tapering top wall provided with an outlet in its upper end, a lower draft-chamber beneath the bottom plate, and downflow and upflow flues separately connecting the upper draft-chambers with the lower one, substantially as and for the purpose described.

3. In a generator, the combination of an inner upwardly-tapering shell inclosing the combustion-chamber and extending upwardly therefrom, an outer water-containing shell surrounding the inner shell and having substantially upright walls, top and bottom plates between the opposite ends of the shells, inner and outer draft-chambers above the top plate, a lower draft-chamber beneath the bottom plate, flues inclining toward each other from their lower ends for connecting the inner, and lower draft-chambers, and substantially upright flues for connecting the outer and lower draft-chambers, substantially as and for the purpose set forth.

4. In a generator, the combination of an inner shell inclosing the combustion-chamber and extending upwardly therefrom, an outer water-containing shell surrounding the inner shell, top and bottom plates between the opposite ends of the shells, draft-chambers above and beneath the top and bottom plates, flues connecting the draft-chambers, a fuel-inlet passage between the inner and outer shells, and a flue between the upper draft-chamber and the fuel-inlet passage, substantially as and for the purpose specified.

5. In a generator, the combination of an inner upwardly-tapering shell inclosing the combustion-chamber and extending upwardly therefrom, water-tubes arranged at an angle with each other and extending transversely across the inner shell and having their opposite ends secured thereto, an outer water-containing shell surrounding the inner shell and having substantially upright walls, a top plate between the upper ends of the inner and outer shells, a bottom plate interposed between the opposite ends of said shells at a point above their lower edges, an inner draft-chamber above the top wall formed with an upwardly-crowning top wall provided with an aperture in its elevated central portion, a damper for closing the aperture, an outer draft-chamber formed with an upwardly-tapering wall provided with an outlet in its upper end, a lower draft-chamber between said inner and outer shells beneath the bottom plate, downflow-flues inclining toward each other from their lower

ends for connecting the inner and lower draft-chambers, and substantially upright upflow-flues for connecting the outer and lower draft-chambers, substantially as and for the purpose specified.

In testimony whereof I have hereunto signed my name in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 11th day of June, 1894.

WILLIAM J. RANTON.

Witnesses:

CLARK H. NORTON,

K. H. THEOBALD.