

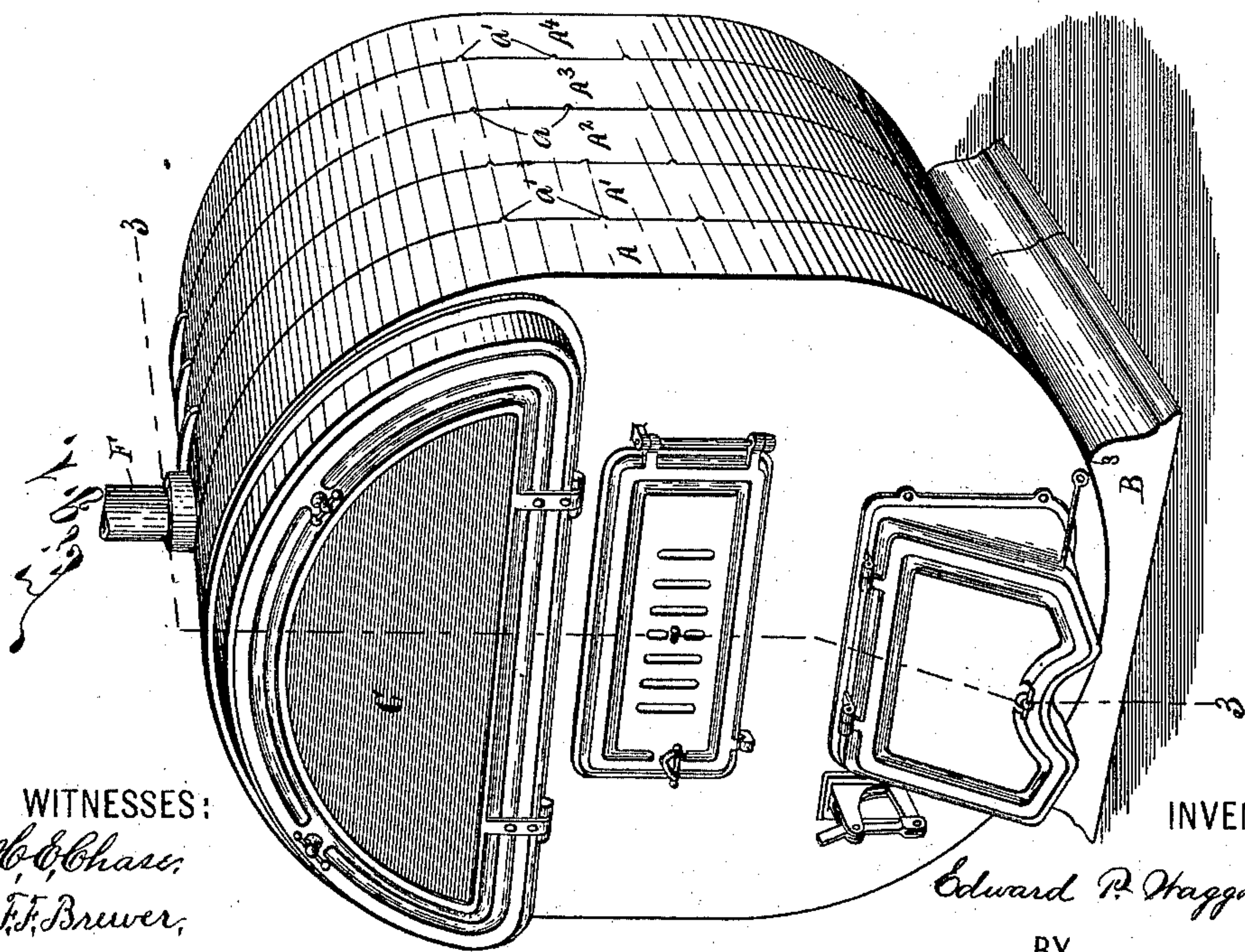
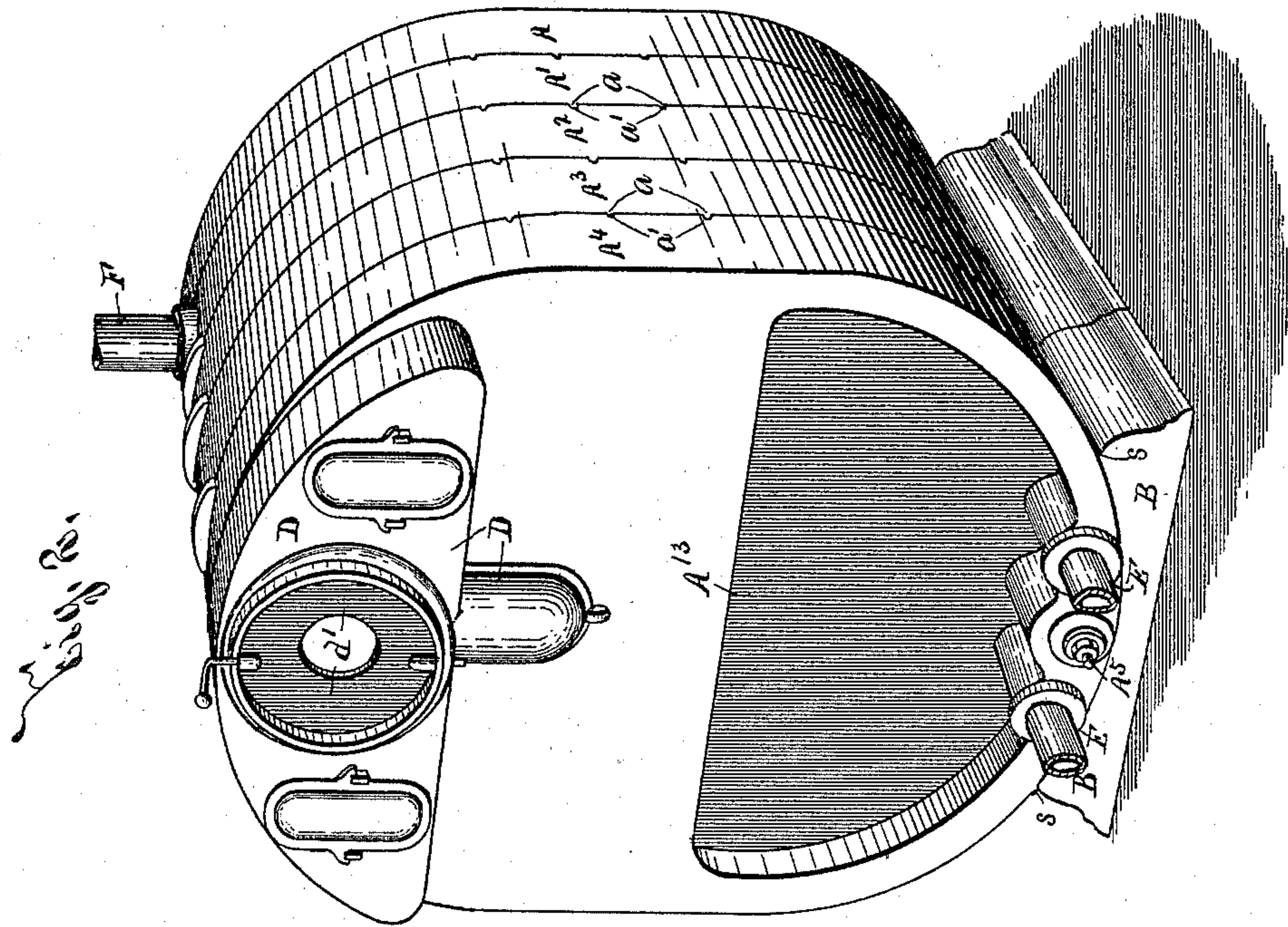
(No Model.)

4 Sheets—Sheet 1.

E. P. WAGGONER.
GENERATOR.

No. 585,803.

Patented July 6, 1897.



WITNESSES:

H. C. Chase,
J. F. Bruver,

INVENTOR

Edward P. Waggoner,

BY

Key + Parsons

ATTORNEYS.

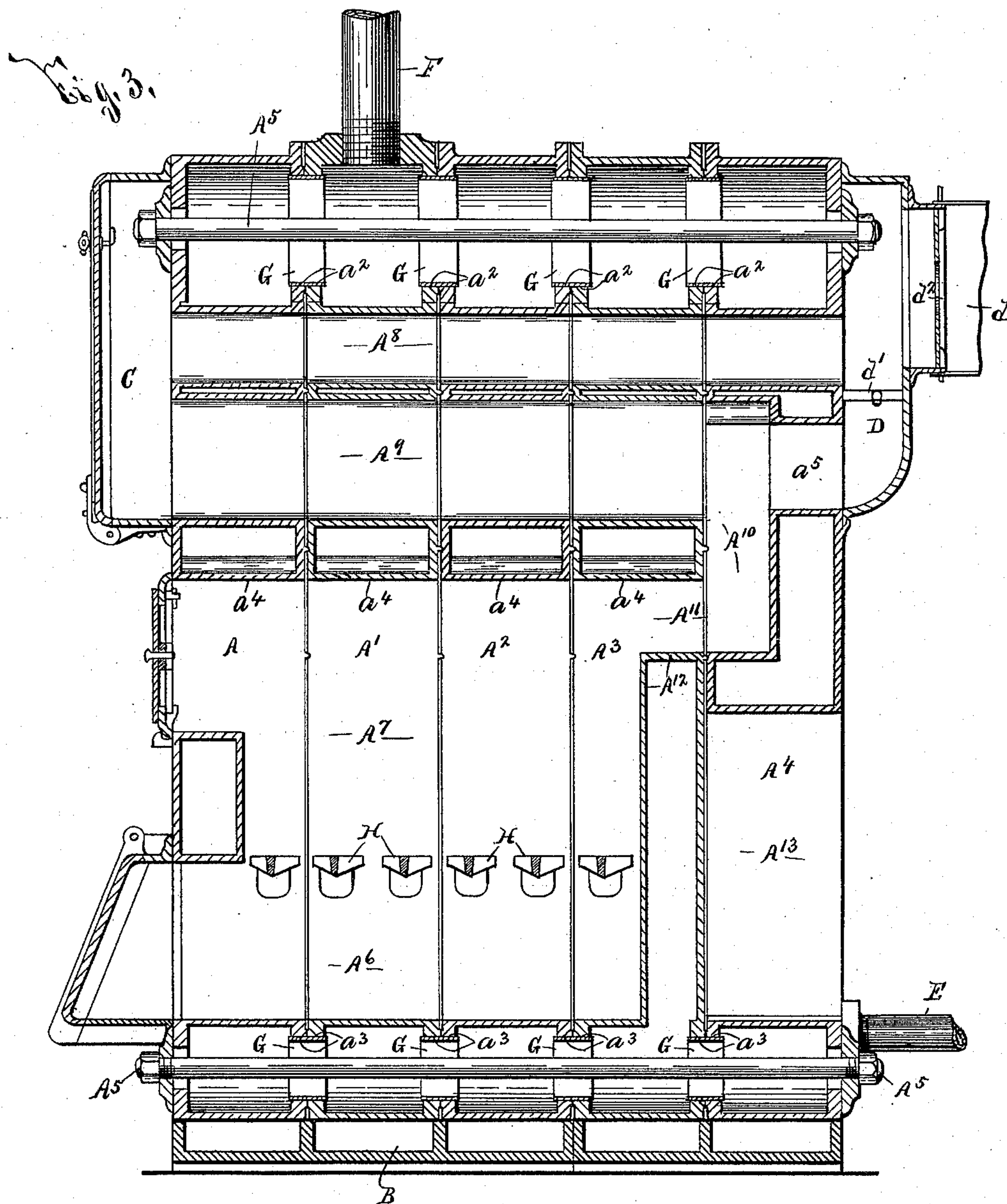
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4 Sheets—Sheet 2.

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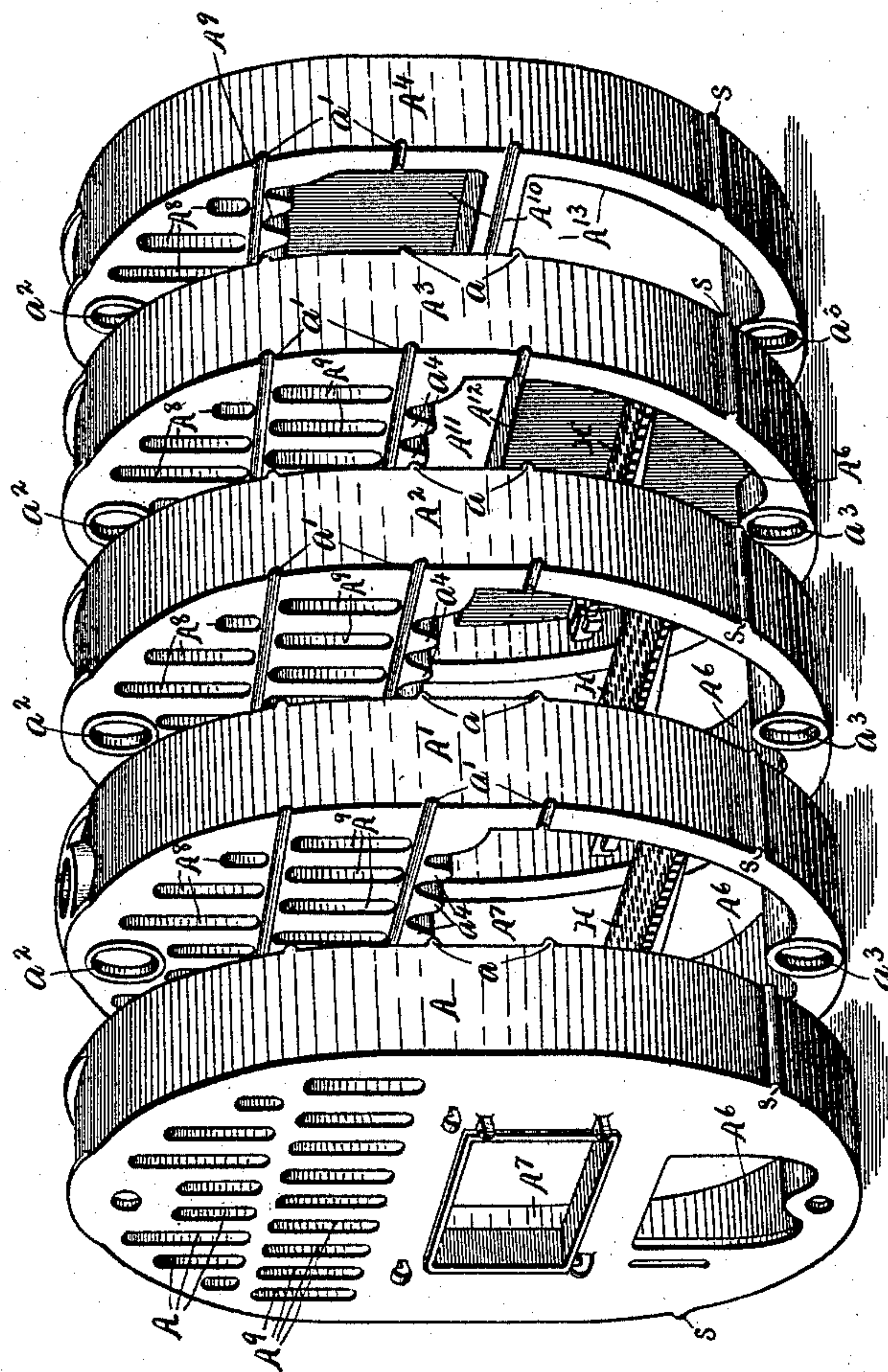
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(No Model.)

4 Sheets—Sheet 4.

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Fig. 5.

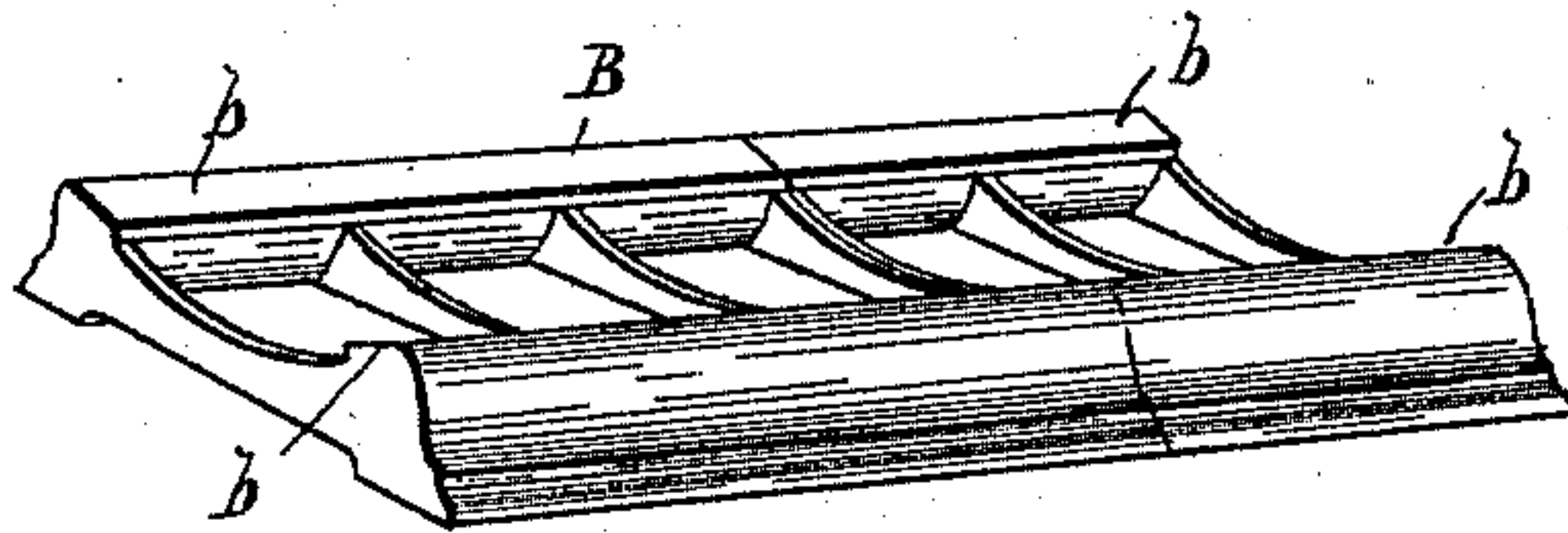


Fig. 6.

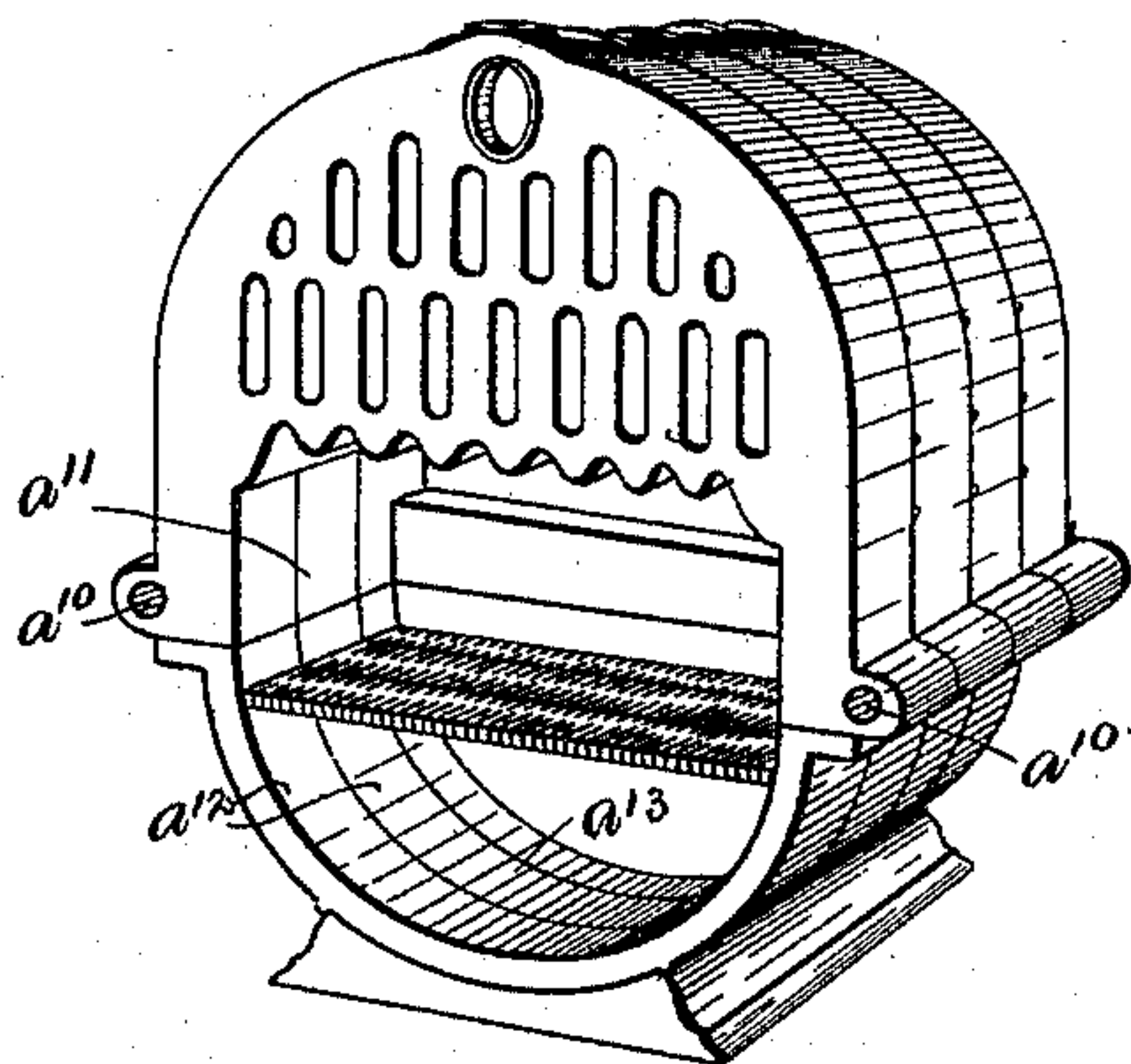
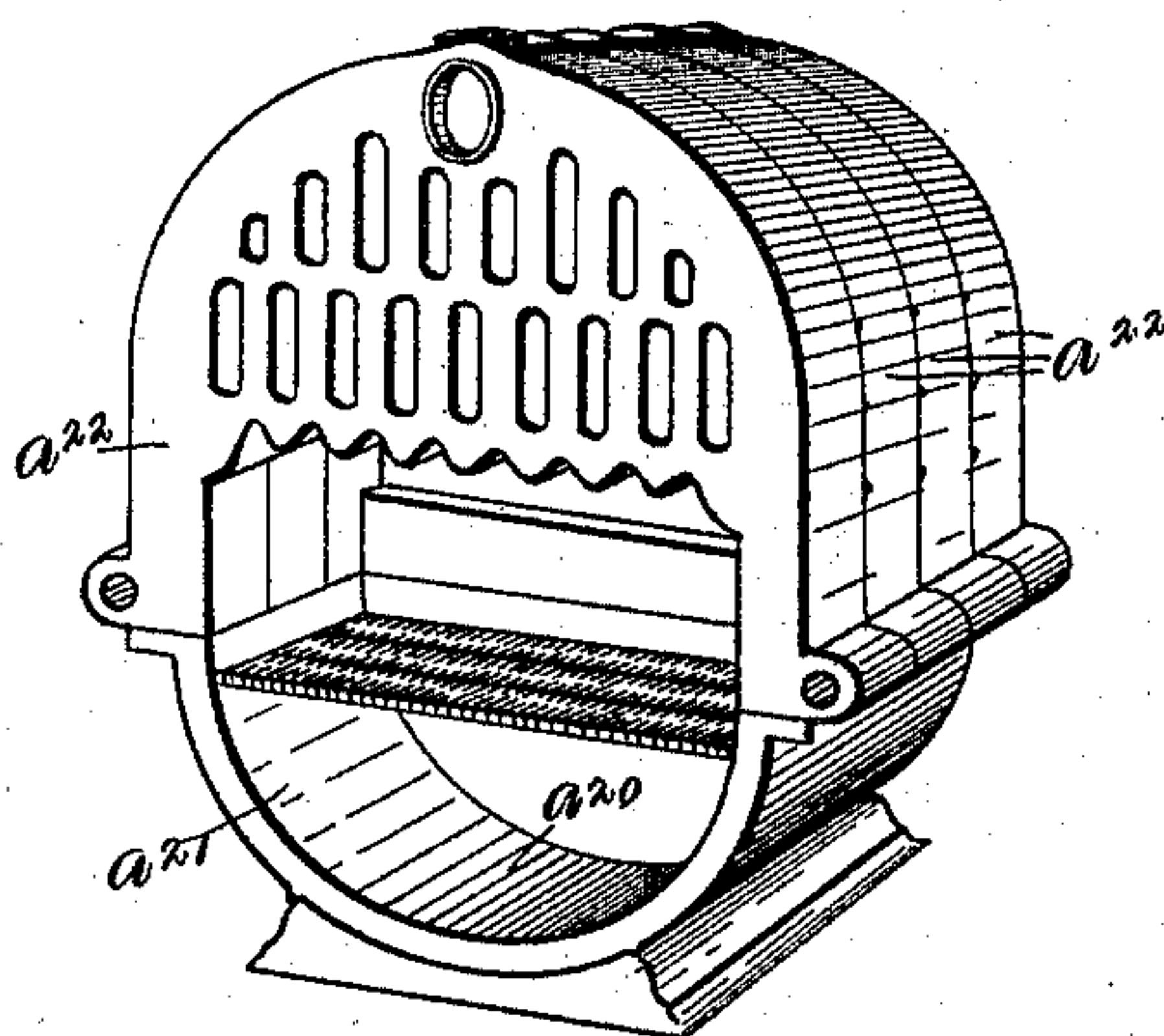


Fig. 7.



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UNITED STATES PATENT OFFICE.

EDWARD P. WAGGONER, OF SYRACUSE, NEW YORK, ASSIGNOR TO THE
A. A. GRIFFING IRON COMPANY, OF JERSEY CITY, NEW JERSEY.

GENERATOR.

SPECIFICATION forming part of Letters Patent No. 585,803, dated July 6, 1897.

Application filed May 19, 1896. Serial No. 592,217. (No model.)

To all whom it may concern:

Be it known that I, EDWARD P. WAGGONER, 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.

My invention relates to improvements in generators particularly applicable for house-heating purposes, and has for its object the production of a device which is economically manufactured, is readily handled and assembled, facilitates a positive and rapid circulation of the heating-fluid, is durable and effective in use; and to this end it consists, essentially, in the general construction and arrangement of the component parts of the generator, all as hereinafter fully 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.

Figures 1 and 2 are respectively front and rear perspectives of my improved generator. Fig. 3 is a longitudinal vertical section taken on line 3 3, Fig. 1. Fig. 4 is a perspective illustrating the detached upright sections of my generator as somewhat separated. Fig. 5 is a perspective of the detached base of my generator, and Figs. 6 and 7 are perspectives of modified forms of my generator.

A A' A² A³ A⁴ are a series of upright sections arranged one in advance of the other for forming the main body of the generator. B is a base upon which said sections are mounted.

C D are chambers secured, respectively, to the front and rear walls of the sections A A', and E F are suitable inlet and outlet fluid-pipes connected to said sections in any desired manner. The top and bottom walls of said upright sections are preferably formed substantially convex, being curved or deflected toward each other and toward the longitudinal center of the generator in opposite directions from substantially their central portions, and the outer faces of the top and bottom walls of a number of said sections are

substantially smooth and continuous or unbroken. The outer faces of the lower extremities of the upright sections are usually provided with shoulders s, extending lengthwise of the generator, for engaging the base B, presently described. The front and rear walls of the sections A A' A² A³ A⁴, which may be provided with interlocking tongues and grooves a a', are formed substantially flat, and are firmly secured together by bolts A⁵, passed through said sections and connections or tubes, presently described, for connecting said sections. The upper and lower portions of said front and rear walls preferably decrease in width toward their top and bottom edges, which are usually rounding.

The sections A A' A² A³ A⁴ are provided with substantially centrally-arranged upper and lower fluid-openings a² a³ in their front and rear walls, which form water-passages extending lengthwise of the generator, facilitate a circulation in the generator, and are usually formed, respectively, in substantially the uppermost and lowermost portions of the extremities of said sections when formed as just described. Consequently the fluid-chambers in said sections, which fluid-chambers form the heating-chamber of the generator, extend downwardly and outwardly from the openings a² and upwardly and outwardly from the openings a³. The corresponding upper and lower openings a² a³ of adjacent upright sections of my generator are connected together by any suitable means and preferably by short tubes or pipes G, having their opposite ends suitably fixed or secured within said openings. Sections of this construction are readily handled, owing to their curved faces, present a large amount of heating-surface with a minimum weight of the material composing their inclosing walls, and produce a particularly practical and effective circulation of the fluid within the generator.

The upright sections A A' A² A³ A⁴ are preferably formed with passages or openings in their lower extremities extending lengthwise of the generator above the fluid-openings a³ and the lower end walls of the sections for forming the bottom and side walls of the ash-

pit A⁶ and the side walls and top of the combustion-chamber A⁷, and, owing to the preferable construction of the lower extremities of the sections A A' A² A³ A⁴, the side walls of said ash-pit A⁶ and combustion-chamber A⁷ incline or curve downwardly. As best seen at Figs. 2 and 3, the top walls of said passages or openings in the lower extremities of the sections A A' A² A³ A⁴ are provided with lengthwise corrugations a⁴, which form the top wall of the combustion-chamber A⁷. The portions of the sections A A' A² A³ A⁴ forming the bottom and side walls of the ash-pit A⁶ and the side walls of the combustion-chamber preferably consist of substantially U-shaped chambers connected together by the openings a³ and opening into the connected fluid-chambers in the upper extremities of said sections. The inner walls of said U-shaped chambers preferably support a suitable grate H for separating the ash-pit and the combustion-chamber.

Suitable upper and lower passages or openings extend lengthwise of my improved generator through the fluid-chambers in the upper extremities of the sections A A' A² A³ A⁴, beneath the fluid-openings a², and the adjacent ends of corresponding passages are aligned with each other and arranged in close proximity to each other for forming continuous or closed upper and lower flues A⁸ A⁹. A fire-passage A¹⁰ extends downwardly in the section A⁴ from the rear end of the lower flues A⁹ to the combustion-chamber A⁷, and the front ends of said upper and lower flues are usually connected as presently described.

As best seen at Fig. 4, the sections A A' A² A³ A⁴ are preferably provided with a number of upper and lower flues A⁸ A⁹, and the lower portions of the rear ends of the flues A⁹ are cut away for forming a comparatively large chamber, which is provided with a rear outlet-passage a⁵ and greatly facilitates the passage of the products of combustion from the fire-passage A¹⁰ into the flues A⁹. The lower end of the fire-passage A¹⁰ is connected to the upper portion of the rear end of the combustion-chamber A⁷ by a fire-passage A¹¹, extending through the section A³, which is arranged in front of the section A⁴ and is provided with a bridge-wall A¹², preferably formed hollow and arranged at the rear of the combustion-chamber beneath the fire-passage A¹¹. The water-containing chamber of the rear section A⁴ preferably extends only a limited distance beneath the fire-passage A¹⁰ and the top edge of the bridge-wall A¹², and an opening A¹³ is formed in said section A⁴ at the rear of the bridge-wall A¹² for decreasing the weight of said section. It is obvious, however, that this opening A¹³ may be dispensed with if desired.

The base B, which may consist of a single piece or several sections arranged end to end, extends from front to rear of the generator beneath the sections A A' A² A³ A⁴, and its upper face has a lengthwise groove therein,

is preferably formed concave, and is provided with separated longitudinal bearing-surfaces b b, inclined downwardly toward each other for engaging the adjacent faces of the lower ends of said sections, which extend downwardly into said lengthwise groove. The chamber C connects the front ends of the flues A⁸ A⁹ and the chamber D connects the rear ends of the flues A⁸ and the outlet a⁵ to a draft conduit or pipe d. Suitable dampers d' d² may be arranged, respectively, in the chamber D and the conduit d for varying the path and the draft of the products of combustion.

It will be readily apparent that although the ash-pit of my generator is inclosed, as described, by U-shaped water-containing chambers at the lower extremities of the upright sections of the generator it may be otherwise formed, if desired. I have therefore illustrated in Fig. 6 a modified construction of my invention in which each section is formed with separated inlet connections a¹⁰, arranged on opposite sides of the base of the combustion-chamber a¹¹, and is provided with separable base portions a¹², formed U-shaped in cross-section, which inclose the ash-pit a¹³ and are suitably secured to the top portions of said sections.

In Fig. 7 I have shown a further modified form of my invention, in which the ash-pit a²⁰ is inclosed by a common base portion or continuous U-shaped wall a²¹, arranged beneath sections a²² of similar construction to the upper and central portions of the upright sections of the preferable form of my invention.

It will also be obvious that I do not herein claim a generator composed of upright sections arranged one in advance of the other and provided with a separable base portion formed continuous or in sections, as the same forms the subject-matter of my pending application, Serial No. 593,473, filed May 28, 1896; nor do I claim the construction of the sections A A' A³ and the base B of my improved generator, except in combination, as said sections and base form the subject-matter of my pending applications, Serial Nos. 617,766, 617,768, 617,767, and 617,769, filed January 2, 1897.

The operation of my improved generator will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be particularly noted that I do not herein specifically limit myself to the exact detail construction and arrangement of its component parts, as the same may obviously be varied without departing from the spirit of my invention.

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

1. A generator comprising upright sections arranged one in advance of the other and inclosing the combustion and heating chambers, a number of said sections being pro-

vided with top and bottom walls formed with substantially smooth and continuous or unbroken outer faces having their opposite ends extended toward the longitudinal center of the generator, and substantially flat front and rear walls having their upper and lower portions decreased in width toward their top and bottom edges, said front and rear walls being formed with upper and lower fluid-openings interposed between their top and bottom edges, substantially as and for the purpose described.

2. A generator comprising upright sections arranged one in advance of the other and inclosing the combustion and heating chambers, a number of said sections being provided with substantially flat front and rear walls having their upper and lower portions decreased in width toward their top and bottom edges, and formed with upper and lower fluid-openings interposed between their top and bottom edges, connecting-tubes having their opposite ends arranged in adjacent openings, and bolts passed through said tubes and sections substantially as and for the purpose specified.

3. A generator comprising upright sections arranged one in advance of the other and inclosing the combustion and heating chambers, a number of said sections being provided with substantially flat front and rear walls having rounding top and bottom portions and upper and lower fluid-openings arranged substantially centrally in the contracted extremities of said rounding portions, the corresponding openings of adjacent sections being connected together, substantially as and for the purpose set forth.

4. A generator comprising upright sections arranged one in advance of the other and inclosing the combustion and heating chambers, said sections having their top and bottom walls formed substantially continuous and convex and being provided with substantially flat front and rear walls having fluid-openings in their upper and lower portions, the corresponding openings of adjacent sections being connected together, substantially as and for the purpose described.

5. A generator comprising upright sections arranged one in advance of the other and inclosing the combustion and heating chambers and the ash-pit, said sections having their top and bottom walls formed convex, and being provided with substantially flat front and rear walls having rounding upper and lower portions, and upper and lower fluid-openings arranged substantially centrally in the contracted extremities of said rounding portions, the corresponding openings of adjacent sections being connected together, substantially as and for the purpose specified.

6. A generator comprising upright sections arranged one in advance of the other, and inclosing the combustion and heating chambers and flues extending one above the other through the heating-chamber, a number of

said sections being provided with substantially continuous and convex top and bottom walls and substantially flat front and rear walls having their upper and lower portions decreased in width toward their top and bottom edges and formed with upper and lower fluid-openings, substantially as and for the purpose set forth.

7. A generator comprising upright sections arranged one in advance of the other and inclosing the combustion and heating chambers, the ash-pit, connected flues extending one above the other through the heating-chamber, and a fire-passage connecting the rear end of the lower flue to the combustion-chamber, a number of said sections being provided with substantially flat front and rear walls having their upper and lower ends decreased in width toward their outer edges and formed with upper and lower fluid-openings, substantially as and for the purpose described.

8. A generator comprising upright sections arranged one in advance of the other and inclosing the combustion and heating chambers and the ash-pit, a number of said sections having the lower extremities of their front and rear walls provided with openings arranged beneath the ash-pit and forming water-passages extending lengthwise of the generator, and water-containing chambers extending upwardly and outwardly in opposite directions from said passages, substantially as and for the purpose specified.

9. A generator comprising upright connected sections arranged one in advance of the other, and inclosing the combustion and heating chambers and the ash-pit, one of the sections being provided with a bridge-wall, and a fire-passage above the bridge-wall, and a number of said sections having the upper and lower portions of their front and rear walls provided with openings forming water-passages extending lengthwise of the generator between its top and bottom walls, the lower openings being arranged beneath the ash-pit, substantially as and for the purpose described.

10. A generator comprising upright connected sections arranged one in advance of the other, and inclosing the combustion and heating chambers, a number of said sections being provided with openings extending therethrough from front to rear above the combustion-chamber said openings having their adjacent ends alined with each other and arranged in close proximity to each other for forming a closed flue extending lengthwise of the generator through the fluid-containing chambers of said sections, one of said sections being provided with a fire-passage depending from one extremity of the flue, and a section next in front of said one of the sections being provided with a hollow bridge-wall, and a fire-passage above the bridge-wall opening into the lower end of the former fire-passage, substantially as and for the purpose specified.

11. A generator comprising upright sections

inclosing the combustion and heating chambers and arranged one in advance of the other, a number of said sections having the upper and lower portions of their front and rear walls formed with fluid-openings, and being provided with openings extending lengthwise therethrough from front to rear above the combustion-chamber said latter openings having their adjacent ends alined with each other and arranged in close proximity to each other for forming a closed flue extending lengthwise of the generator through the fluid-containing chambers of said sections, and one of said sections being provided with a fire-passage depending from one extremity of the flue, and connected to the combustion-chamber, substantially as and for the purpose set forth.

12. A generator comprising upright connected sections arranged one in advance of the other and each provided with openings extending therethrough from front to rear one above the other, the adjacent ends of corresponding openings being alined with each other and arranged in close proximity to each other for forming closed flues, one above the other extending lengthwise of the generator, one of said sections being provided with a fire-passage depending from the rear end of the lower flue and connected to the combustion-chamber, and chambers secured to the outer walls of the front and rear sections for connecting the corresponding ends of said flues, substantially as and for the purpose described.

13. A generator comprising upright sections arranged one in advance of the other and having their upper and lower extremities decreased in width toward their top and bottom edges, and the upper and lower portions of their front and rear walls formed with fluid-openings, said sections being provided with openings extending therethrough from front to rear above the lower fluid-openings for forming the ash-pit and the combustion-chamber, and additional openings extending therethrough from front to rear beneath the upper fluid-openings for forming a flue, said flue being connected to the combustion-chamber, substantially as and for the purpose specified.

14. A generator comprising upright sections arranged one in advance of the other and having their upper and lower extremities decreased in width toward their top and bottom edges, and the upper and lower portions of their front and rear walls formed with fluid-openings, said sections being provided with openings extending therethrough from front to rear one above the other beneath the upper fluid-openings for forming flues one above the other extending lengthwise of the generator, one of said sections being provided with a fire-passage depending from the rear end of the lower flue, and chambers secured to the outer walls of the front and rear sections for connecting the corresponding ends of said

flues, substantially as and for the purpose set forth.

15. A generator comprising upright sections arranged one in advance of the other and having the upper and lower portions of their front and rear walls formed with fluid-openings, said sections being provided with openings extending therethrough from front to rear above the lower fluid-openings for forming the ash-pit and the combustion-chamber, and additional openings extending therethrough from front to rear beneath the upper fluid-openings for forming a flue, one of said sections being provided with a fire-passage depending from the rear extremity of the flue, and a section next in front of said one of the sections being formed with a hollow bridge-wall, and a fire-passage above the bridge-wall opening into the lower end of the former fire-passage substantially as and for the purpose described.

16. A generator comprising upright sections arranged one in advance of the other and having the upper and lower portions of their front and rear walls formed with fluid-openings, said sections being provided with openings extending therethrough from front to rear above the lower fluid-openings for forming the ash-pit and the combustion-chamber, and additional openings extending therethrough from front to rear one above the other beneath the upper fluid-openings for forming flues one above the other extending lengthwise of the generator, one of said sections being provided with a fire-passage depending from the rear extremity of the lower flue, and a section next in front of said one of the sections being formed with a hollow bridge-wall, and a fire-passage above the bridge-wall opening into the lower end of the former fire-passage, and chambers secured to the outer walls of the front and rear sections for connecting the corresponding ends of said flues, substantially as and for the purpose set forth.

17. In a generator, the combination of a base extending lengthwise of the generator, and having a lengthwise groove in its upper face, and upright connected sections mounted upon the base one in advance of the other, and extending downwardly into said groove, substantially as and for the purpose described.

18. In a generator, the combination of a base extending lengthwise of the generator and having its upper surface formed concave in cross-section, and upright connected sections mounted upon the base one in advance of the other and having their bottom walls engaged with the base and formed convex in cross-section, substantially as and for the purpose specified.

19. In a generator, the combination of a base extending lengthwise of the generator and having longitudinal separated bearing-surfaces inclined downwardly toward each other, and upright connected sections ar-

5 ranged one in advance of the other and having their bottom walls extended upwardly in opposite directions from their central portions, and mounted upon the bearing-surfaces said bottom walls being provided with shoulders engaged with opposite sides of the base and having the central portions depressed beneath said bearing-surfaces, substantially as and for the purpose set forth.

In testimony whereof I have hereunto signed my name, in the presence of two attesting witnesses, at Jersey City, in the county of Hudson, in the State of New Jersey, this 7th day of May, 1896.

EDWARD P. WAGGONER.

Witnesses:

N. R. MARVIN,
J. M. C. THOMAS.