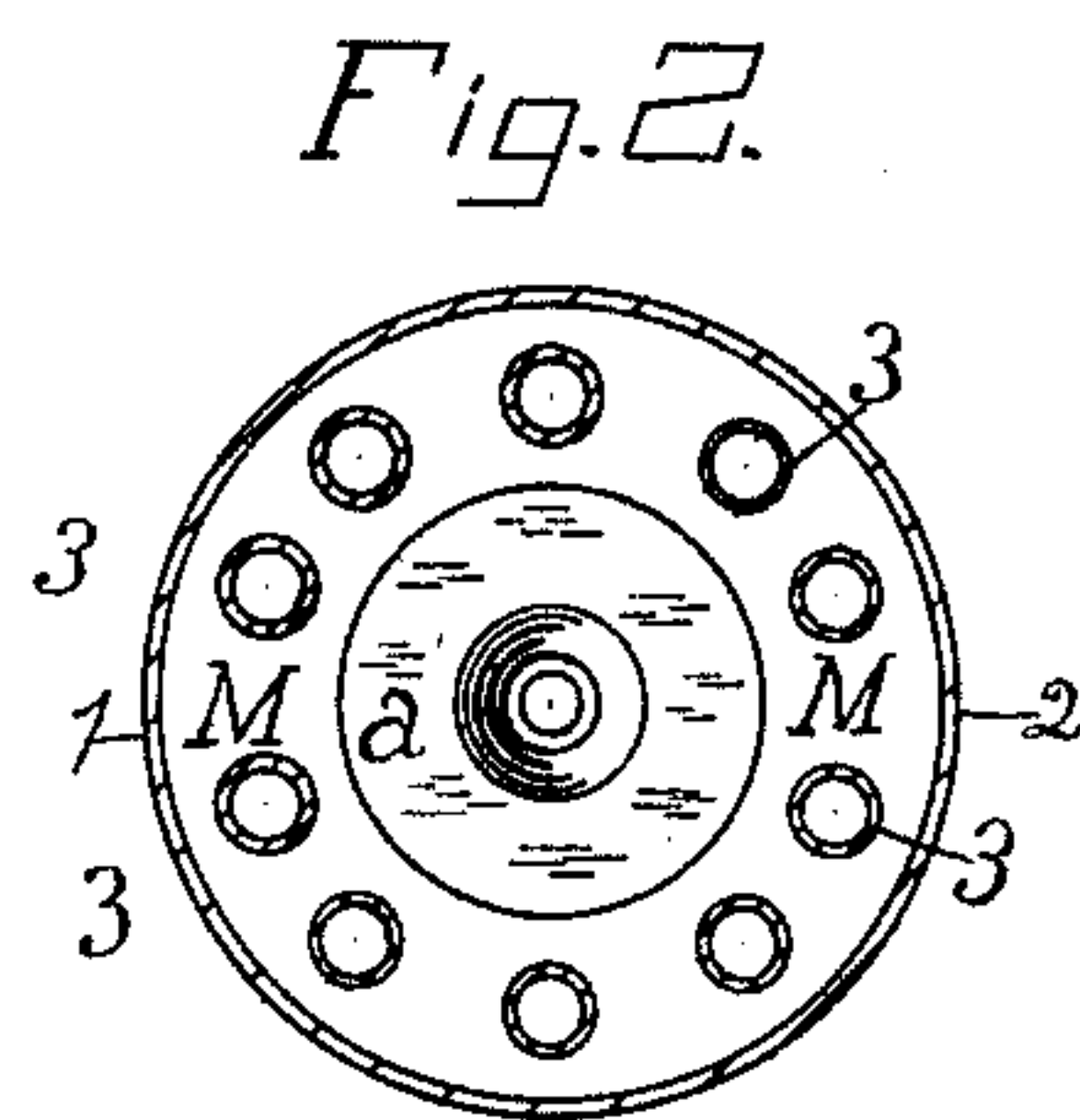
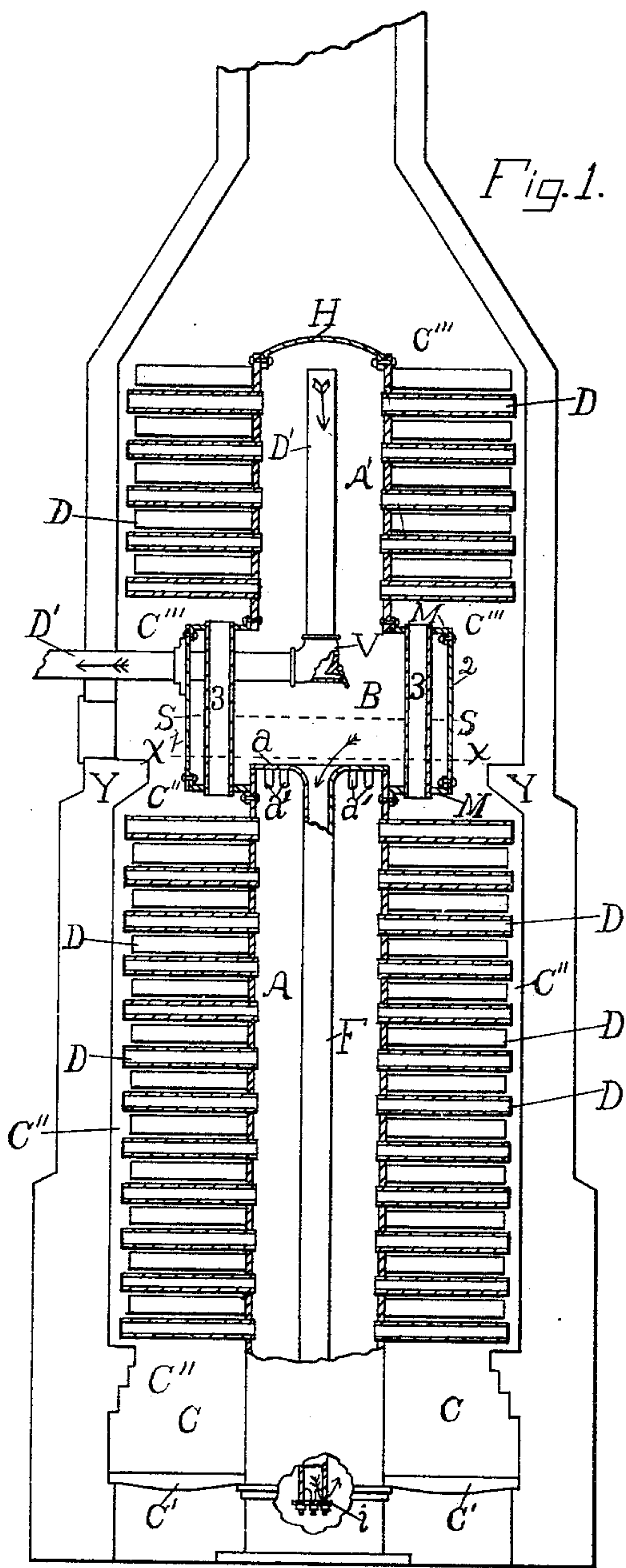


(No Model.)

J. P. SIMMONS.  
STEAM BOILER.

No. 415,302.

Patented Nov. 19, 1889.



Witnesses  
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# UNITED STATES PATENT OFFICE.

JOHN P. SIMMONS, OF LOS ANGELES, CALIFORNIA.

## STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 415,302, dated November 19, 1889

Application filed March 9, 1889. Serial No. 302,732. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN P. SIMMONS, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Improvement in Sectional Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification.

In the drawings, Figure 1 represents a vertical central section of my improved boiler; and Fig. 2 is a plan of the central enlarged portion of the boiler, taken in section at line *x x* of Fig. 1.

My improvement in this class of steam-generating boilers consists in certain important alterations and additions thereto, which, without enlarging its size, will very greatly augment its capacity and utility by providing an enlarged water-surface from which the steam arises and a greater superheating area or division, while additional combustion-flues are so arranged as to cause the heated products of the combustion of the fuel to pass directly through an enlarged water-space centrally located, where the heat is most intense, the effect of which is to produce a better circulation of the water throughout the boiler and an increased volume of steam.

The vertical boiler A is surrounded at the base by a furnace C, having grate-bars C'. The radial tubes D communicate at their inner ends with boiler A and are closed at their outer ends and project into the cylindrical combustion-chamber C''. The boiler A extends into the enlargement B, bounded by a cylinder 1 2, through which combustion-flues 3 extend, connecting the upper and lower combustion-chambers C'' and C'''. The portion above the water line or surface S S of the enlarged cylinder B 1 2 constitutes a steam-drum, and this extension of the boiler is also provided with radial tubes D above enlarged division B, which serve as super-heaters. The top of the boiler is covered by a convex plate H. The pipe D', open at the top, is to communicate through its lateral branch to a steam-engine. This steam-pipe is provided with a trap at its elbow V for the return of

condensed steam to the boiler. The enlargement B is connected with boiler at its top and bottom by annular plates M, as represented in Fig. 2 of the drawings, and the combustion-flues 3 extend through these plates, as shown.

The annular cover *a* of the lower portion of boiler A is provided with lateral openings *a'*, to allow circulation of the water, and for the same purpose the central tube F, which communicates with enlargement B, is made to extend down to a cover or cap *i* at its bottom, and is provided with lateral openings within boiler A, to prevent the circulating water from disturbing any sediment at the bottom of boiler A.

The contracted walls or jambs Y Y around the boiler serve to deflect and concentrate the hot products of combustion around division or enlargement B, a portion of which passes up through the flues 3, which are surrounded by water and steam.

Water is supplied to the boiler in the usual manner, and when it becomes heated it rises in boiler A and passes laterally through openings *a'*, thence toward the center of enlargement or division B to the tube F, and down through said tube to the lateral openings at its bottom, and thus the circulation is continued by the effects of the heat arising from the furnace surrounding the boiler at its base.

As above intimated, the enlarged area of water-surface and steam capacity above the water-line resulting from the enlargement of the boiler at B gives a better return from the fuel consumed, as it furnishes the means of concentrating the heat and a broader surface from which the steam emanates or arises.

Having fully described my invention, I claim and desire to secure by Letters Patent—

1. In a steam-boiler having radiating tubes attached to its lower and its upper sections, as described, the intermediate central section B, of enlarged diameter, extending over a portion of the combustion-chamber C'', connected by annular plates M M with the upper and lower sections of the boiler, substantially as and for the purpose specified.

2. The water-circulating tube F, with lateral openings *a'* under the annular cover *a* and lateral openings above its bottom plate or



cover, in combination with said annular cover *a* and division A of the boiler, substantially as described.

3. The circulating water tube F, connected  
5 to the annular cover *a*, with lateral openings under said cover and lateral openings at its bottom, in combination with divisions A A' and enlarged division B, substantially as described.

4. The steam-pipe D', provided with water- 10 trap V, in combination with the divisions A A' and B and the circulating water tube F, substantially as described.

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Witnesses:

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