

(No Model.)

2 Sheets—Sheet 1.

A. M. DIMMICK.
STEAM BOILER.

No. 475,850.

Patented May 31, 1892.

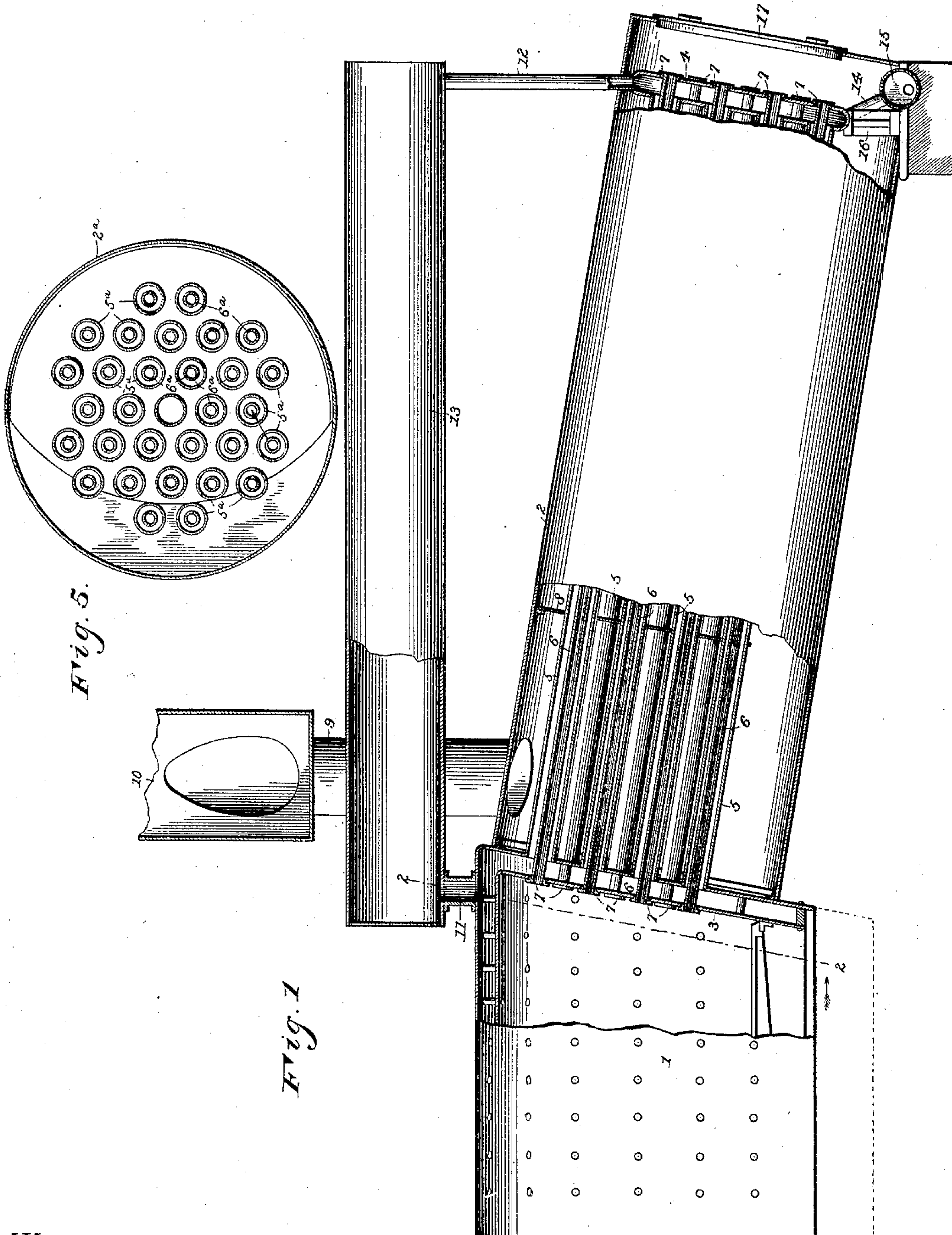


Fig. 5.

Fig. 1

Witnesses;

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J. B. Eggers

Inventor,
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By his Attorneys,

C. A. Snow & Co.

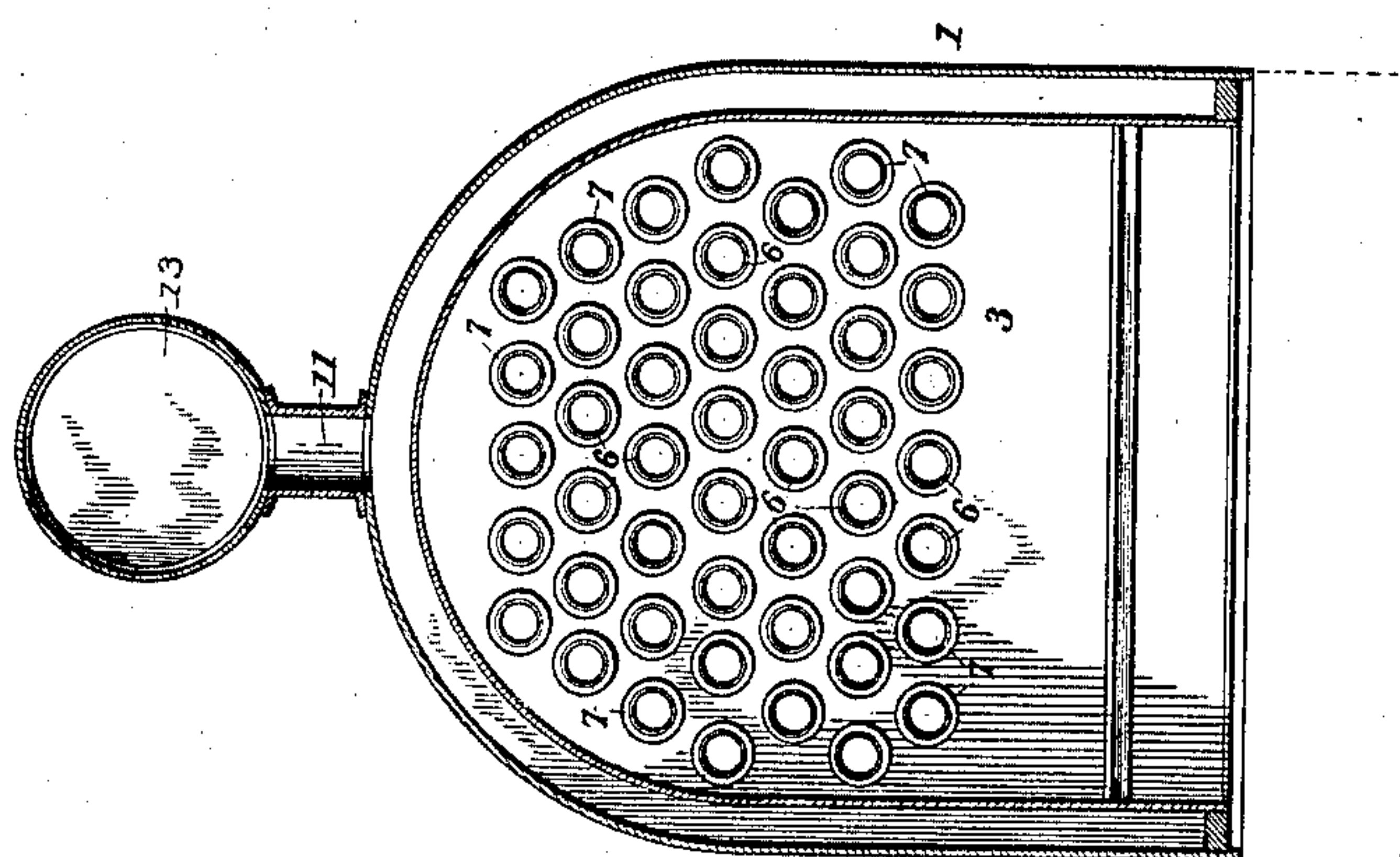
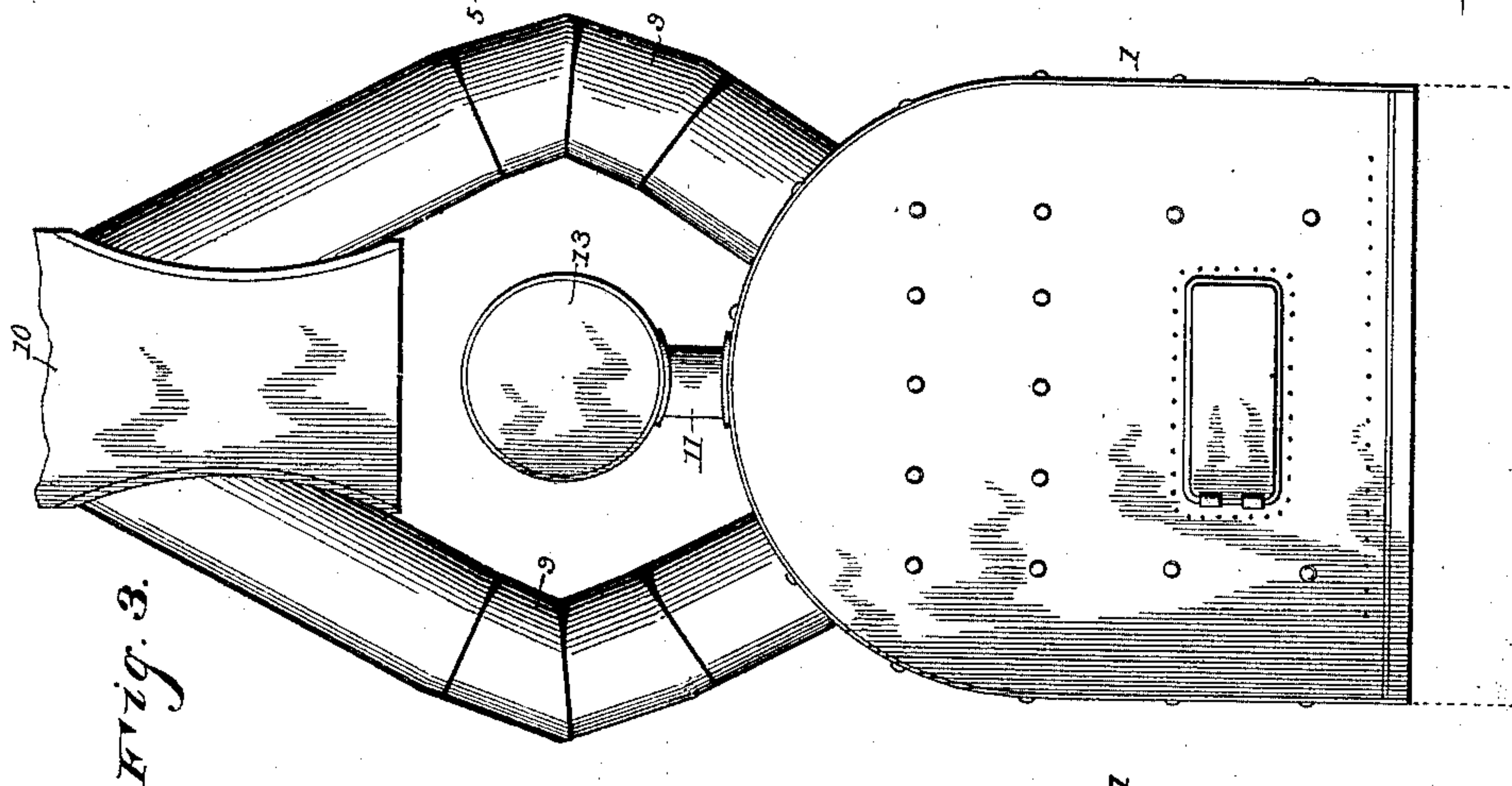
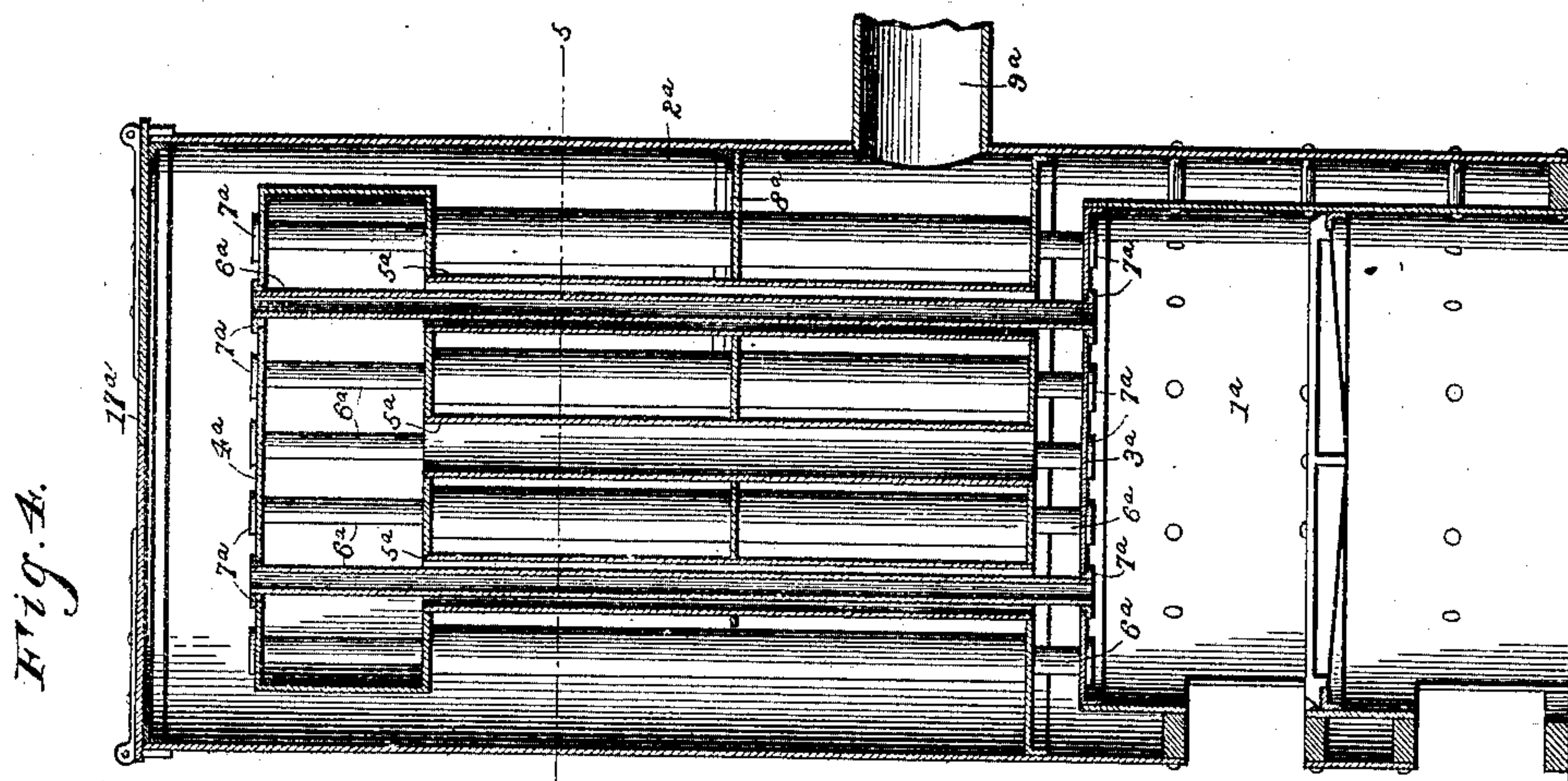
(No Model.)

2 Sheets—Sheet 2.

A. M. DIMMICK.
STEAM BOILER.

No. 475,850.

Patented May 31, 1892.



Witnesses;

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Inventor,
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UNITED STATES PATENT OFFICE.

ALBERT M. DIMMICK, OF WILKES-BARRÉ, PENNSYLVANIA, ASSIGNOR OF
ONE-HALF TO JESSE T. MORGAN, OF SAME PLACE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 475,850, dated May 31, 1892.

Application filed March 31, 1891. Serial No. 387,128. (No model.)

To all whom it may concern:

Be it known that I, ALBERT M. DIMMICK, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Steam-Boiler, of which the following is a specification.

This invention relates to steam-boilers; and it has for its object to provide a device of this class which shall be simple in construction, durable, and efficient in operation, and in which steam may be generated rapidly and at a moderate expense for fuel.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a side elevation, partly in section, of the horizontal boiler constructed in accordance with my invention. Fig. 2 is a sectional view taken on the line 2 2 in Fig. 1. Fig. 3 is a front elevation. Fig. 4 is a vertical sectional view showing the invention applied to an upright or vertical boiler. Fig. 5 is a horizontal sectional view taken on the line 5 5 in Fig. 4.

Like numerals of reference indicate like parts in all the figures.

Referring to Figs. 1, 2, and 3 of the drawings, 1 designates the fire-box, and 2 the boiler-casing, which latter may be constructed of sheet-iron lined with any suitable non-conducting material. At the front end of the boiler-casing is arranged a header 3, which forms the rear wall of the fire-box or furnace, and is continued around so as to form a water-jacket for the fire-box, and a header 4 is likewise arranged near the rear end of the boiler-casing. The fire-box is therefore constructed with double walls, as shown in the drawings, to permit the water to circulate and to absorb as much heat as possible from the fire in said furnace.

The rear wall of the header 3 and the front wall of the header 4 are connected by means of pipes or flues 5, which are expanded and firmly secured in said headers. Smaller flues or pipes 6, extending through the flues 5, are likewise expanded and firmly secured in the front wall of the header 3 and the rear wall

of the header 4, which are provided with bushings 7 to receive said pipes. It will be seen that the inner flues 6 are thus made to serve for the passage of the products of combustion from the fire-box or furnace to the rear end of the boiler-casing, while water is permitted to circulate between the headers through the spaces between the inner and outer flues.

The smoke-flues furnish a direct and the sole outlet for the smoke and products of combustion escaping from the fire-box, and it will be seen that the arrangement is such that the pipes can be readily cleaned and that the flames and products of combustion do not strike the sides of the pipes or flues and cause them to burn out, as is usually the case, and thus the pipes or flues are protected from the direct action of the heat.

Suitably arranged within the boiler-casing are baffle-plates 8, serving to deflect the products of combustion and to force said products to take a circuitous course in their passage from the rear to the front end of the boiler-casing. At the front of the said boiler-casing are arranged the smoke-flues 9 9, connected with the stack 10.

The front and rear headers 3 and 4 are connected by the upwardly-extending pipes 11 and 12 with the steam-drum 13, which is arranged in a horizontal position above the boiler-casing. The lower end of the rear header 4 is connected by a pipe 14 with the mud-drum 15, which is arranged transversely at the rear end of the boiler-casing. The latter is provided with a suitable support 16 for the rear header and with a door 17, through which access may be had to the interior of the casing for the purpose of cleaning the same.

Referring to Figs. 4 and 5 of the drawings, in which the invention has been shown applied to a vertical or upright boiler, 1^a designates the fire-box or furnace; 2^a, the boiler-casing; 3^a and 4^a, the lower and upper headers; 5^a, the outer flues connecting the headers, and 6^a the inner or fire flues. The lower side of the lower header and the upper side of the upper header are provided with bushings 7^a, in which the fire-flues are expanded and firmly secured. One or more baffle-plates 8^a are arranged within the boiler-casing to

cause the products of combustion to take a circuitous course while returning from the upper end of said casing to the lower end, where the smoke-flue 9^a is attached to said casing.

5 In this example of the invention a separate steam-drum is dispensed with, the upper header 4^a being made of sufficient depth to serve as a steam-drum. The upper end of the boiler-casing has a door 17^a, through which
10 access may be had to the casing for the purpose of cleaning the same.

The operation and advantages of this invention will be readily understood from the foregoing description, taken in connection
15 with the drawings hereto annexed. The spaces between the inner and the outer flues are filled with water, which is thus permitted to circulate freely between the headers. The flame and products of combustion from the
20 fire-box will first pass through the inner flues, and will then return through the boiler-casing, completely enveloping the outer flues, and thus causing the greatest possible amount of heat to be absorbed by the water occupying
25 the spaces between said flues. In this manner steam may be generated very rapidly and at a moderate expense for fuel, owing to the very thorough absorption of the heat which is generated.

30 Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a steam-boiler, the combination of the fire-box, the boiler-casing, the header forming
35 one of the walls of the fire-box and continued around to form a water-jacket for the same, a header arranged at the opposite end of the boiler-casing, the water-pipes connecting said headers, the fire-flues extending through said
40 water-pipes and connecting the outer sides of the headers, the said fire-flues serving as the direct and sole escape for the smoke and products of combustion from the fire-box, the baffle-plates arranged within the boiler-casing,
45 and the smoke-exit attached to said boiler-casing at the inner end of the latter, adjacent to the fire-box, substantially as set forth.

2. In a steam-boiler, the combination of the fire-box, the downwardly-inclined boiler-cas-

ing extending from the fire-box and independent of the same, the header forming one of the walls of the fire-box and continued around to provide a water-jacket for the same, a header arranged at the opposite end of the boiler-casing, the water-pipes connecting the
55 inner walls of said headers, the fire-flues extending through said water-pipes and connecting the outer sides of the headers, said fire-flues serving as the sole and direct escape for the smoke and products of combustion
60 from the fire-box, the pipes extending upwardly from the headers, and the steam-drums supported by said pipes outside the boiler-casing, substantially as set forth.

3. The combination of the fire-box, the boiler-casing, the header forming the rear wall of the fire-box, a header arranged near the rear end of the boiler-casing, the water-pipes connecting said headers, the fire-flues connecting
70 the outer walls of the headers and extending through said water-pipes, the pipes extending upwardly from the headers, the steam-drums supported by said pipes, and the smoke-pipes attached to opposite sides of the boiler-casing and connected with a stack above the
75 steam-drum, substantially as and for the purpose set forth.

4. The combination of the fire-box, the lower casing, the header forming the rear wall of the fire-box and continued around to form a
80 water-jacket for the latter, a header arranged near the rear end of the boiler-casing, the water-pipes connecting said headers, the fire-flues extending through the water-pipes, the steam-drum supported upon pipes extending up-
85 wardly from the headers, the mud-drum connected with a pipe extending downwardly from the rear header, and oppositely arranged smoke-stacks communicating with each other, and a common exhaust above said steam-
90 drum, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

ALBERT M. DIMMICK.

Witnesses:

GEO. A. WELLS,

EMMETT D. NICHOLS.