

No. 756,052.

PATENTED MAR. 29, 1904.

M. H. PLUNKETT.
STEAM GENERATOR.

APPLICATION FILED SEPT. 11, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

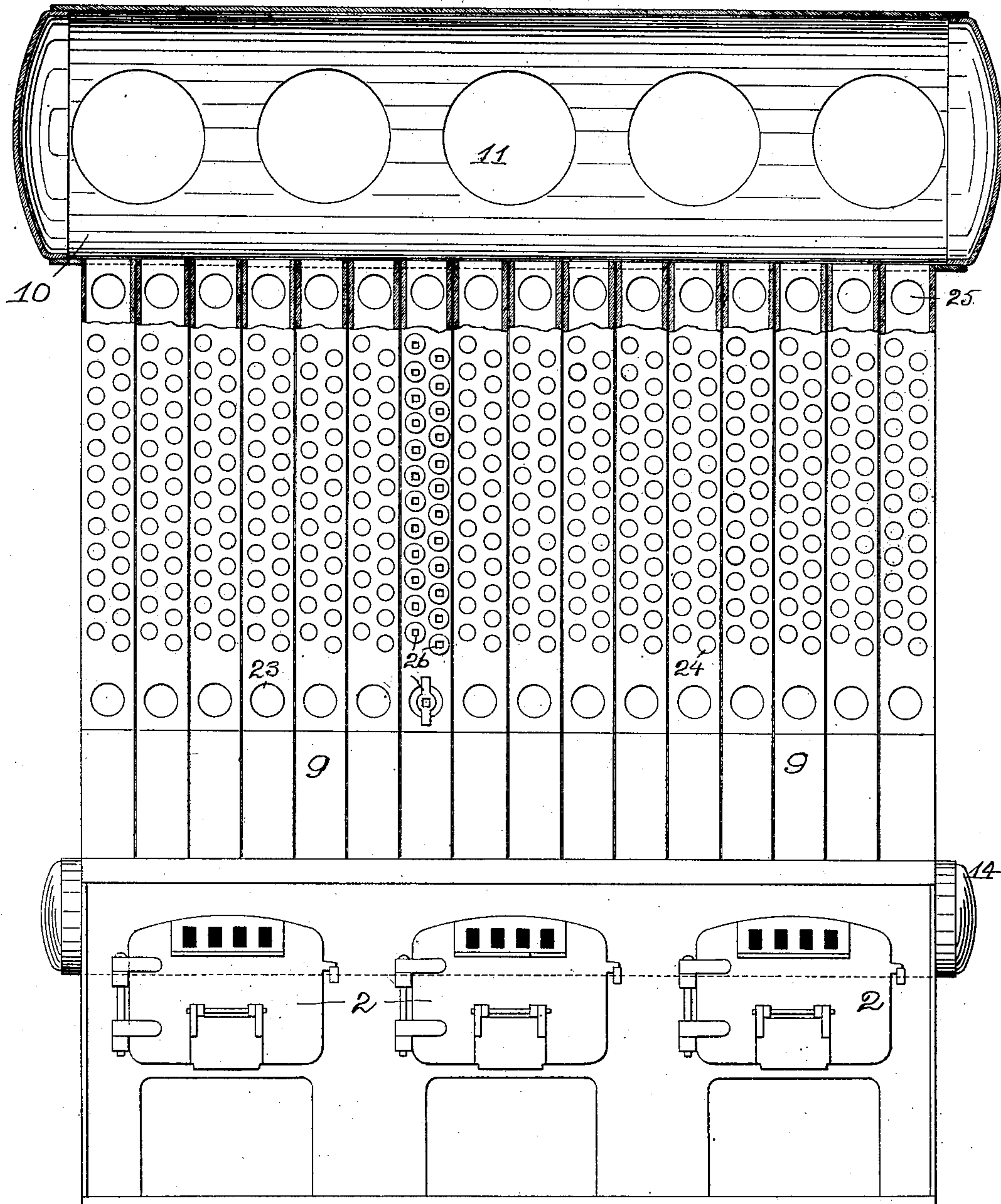


Fig. 1.

Witnesses:

Ida J. Ford.
Chas. M. Havell.

By

Inventor:

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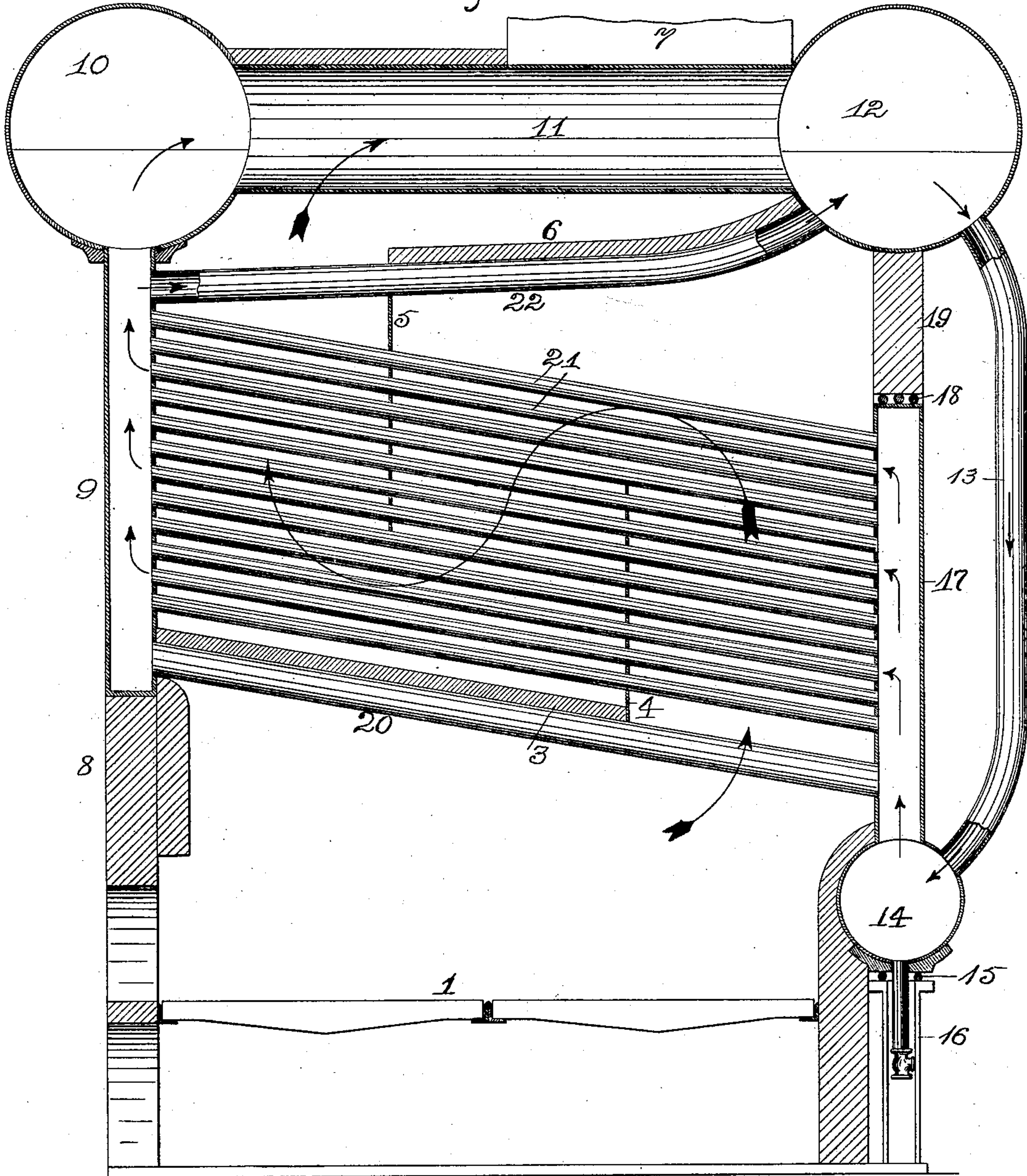
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STEAM GENERATOR.

APPLICATION FILED SEPT. 11, 1903.

NO MODEL.

2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

MICHAEL H. PLUNKETT, OF BALTIMORE, MARYLAND.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 756,052, dated March 29, 1904.

Application filed September 11, 1903. Serial No. 172,762. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL H. PLUNKETT, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Steam-Generators, of which the following is a specification.

This invention relates to water-tube boilers or steam-generators in general, but especially to such generators as are especially intended for use with marine engines.

The object of this invention, stated in general terms, is to provide a steam-generator of the water-tube class with improved and increased steaming capacity, while at the same time guarding against the defects discovered in the practical use of such generators.

In carrying out this object I provide straight steaming-tubes of large diameter, so that they will stand strong forced draft without burning out, and at the same time I provide means to accommodate the increased volume of circulation and to avoid injury from expansion strains.

The invention consists in a steam-generator of this class, the improved construction, arrangement, and combination of the parts of which will be first fully described hereinafter and afterward specifically claimed.

In order that others skilled in the art to which it most nearly appertains may be enabled to construct and use my invention, I will now proceed to describe it in connection with the accompanying drawings, in which—

Figure 1 represents a view of my improved generator in front elevation, partly in section and with parts omitted; and Fig. 2 represents a sectional view on a vertical plane cutting through from front to rear, parts being shown in elevation.

Where the same parts appear in both figures, they will be indicated by the same reference characters.

Referring specifically to the drawings, 1 indicates the grate-bars, of any approved construction; 2, the usual furnace-doors; 3, 4, 5, and 6, baffle-plates, and 7 any usual form of stack or uptake, the baffle-plates being arranged to cause the fire-gases to take the direction indicated by the feathered arrows in

Fig. 2, whereby all of the water-tubes are thoroughly heated and the heat of the gases fully utilized.

The front of the generator comprises suitable supports 8 for a front water-wall composed of front headers 9, arranged side by side on said supports and communicating at their upper ends with a front transverse steam-drum 10, which drum is connected by large pipes 11 with a rear transverse drum 12, which in turn is connected by a curved pipe 13 (located outside the rear wall of the generator) with a rear transverse mud-drum 14.

The mud-drum 14 is supported, through the medium of rollers 15, upon a suitable upright support 16 and communicates with the lower ends of rear headers 17, which form the rear water-wall and which also, through the medium of rollers 18 and a wall 19, serve to support the rear transverse steam-drum. From each of the rear headers, near their lower ends, large-sized water-tubes 20 extend in a forward and upward direction to the corresponding front header, while in vertical alignment with the large tubes water-tubes 21, of the ordinary size, extend in vertical series from the rear to the front headers parallel with the large tubes 20. From near the upper ends of the front headers large-sized curved water-tubes 22 extend in vertical alignment with tubes 20 and 21 to the rear steam-drum.

Suitable provision may be made for removing any or all of the water-tubes for the purposes of repair or renewal—such, for instance, as shown in Fig. 1—by providing openings 23, 24, and 25 in the front headers opposite the tubes 20, 21, and 22, which openings may be closed when the generator is in use by plugs, as at 26.

As indicated by the arrows, the circulating fire-gases first come in contact with the large tubes 20, which, owing to their size, carry a large body of water, and are therefore less liable to be burned out by the fierce heat to which they are exposed than would tubes of ordinary size be under the same circumstances. These tubes also, by reason of their large capacity and greater degree of heat, start upward in the front headers a strong current,

thus insuring a free circulation of the water therein.

The provision of the large tubes 22, which connect the front headers with the rear steam-drum, assures an outlet for the steam and water circulating upward in the front headers of sufficient capacity to absolutely prevent any choking up or retarding of the circulation at these points, which would be liable to take place, especially when the large pipes 20 are used.

Any expansion of the water-tubes 20 and 21 is permitted by the mounting of the rear headers and the mud-drum between rollers, as described, the curved formation of pipes 13 and 22 permitting them to give sufficiently for the same purpose.

While I have especially described the form of the various parts, it will be obvious to the skilled mechanic that changes and variations therefrom might be made without departing from the spirit and scope of the invention.

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

1. A steam-generator, comprising front and rear transverse steam-drums in communication with each other, front headers closed at their lower ends and connected at their upper ends with the front drum, water-tubes inclined upwardly toward and discharging into the front headers, rear headers, water-tubes connecting the front headers near their upper ends directly with the rear steam-drum, and connections through the rear headers between the rear steam-drum and the first-named water-tubes, substantially as described.

2. A steam-generator comprising front and rear transverse steam-drums in communication with each other, front headers closed at their lower ends and communicating at their upper ends with the front steam-drum, rear headers communicating with the rear steam-drum, water-tubes inclined upwardly toward the front and discharging from the rear into the front headers, and water-tubes connecting the front headers at their upper ends directly with the rear steam-drum, substantially as described.

3. A steam-generator, comprising front and rear transverse steam-drums in communication with each other, front headers closed at their lower ends and communicating at their upper ends with the front steam-drum, rear headers communicating with the rear steam-drum, ordinary water-tubes upwardly and forwardly inclined and directly connecting the rear and front headers, and extra-sized water-tubes below and parallel with the ordinary water-tubes, also directly connecting the two sets of headers, substantially as described.

4. A steam-generator, comprising front and rear transverse steam-drums in communica-

tion with each other, front headers closed at their lower ends and communicating at their upper ends with the front steam-drum, rear headers communicating with the rear steam-drum, water-tubes of ordinary size inclined forwardly and upwardly and connecting the rear and front headers, and water-tubes connecting the front headers near their upper ends with the rear steam-drum, substantially as described.

5. A steam-generator comprising front and rear transverse steam-drums communicating with each other, front headers communicating at their upper ends with the front steam-drum, rear headers, connections between the rear steam-drum and the lower ends of the rear headers, and forwardly and upwardly inclined water-tubes directly connecting the rear and front headers, substantially as described.

6. A steam-generator comprising front and rear transverse steam-drums communicating with each other, front headers connected directly with the front drum at their upper ends, rear headers, a transverse mud-drum connected to the lower ends of the rear headers, curved pipes outside the furnace-walls connecting the rear steam-drum with the mud-drum, water-tubes connecting the rear and front headers, and water-tubes directly connecting the front headers near their upper ends with the rear steam-drum, substantially as described.

7. A steam-generator comprising a front steam-drum, front headers connected at their upper ends with and supporting said drum, rear headers supported on rollers, straight water-tubes connecting the front and rear headers, a rear steam-drum supported on rollers on top of the rear headers, pipes connecting the front and rear drums, and connections between the rear drum and the rear headers, substantially as described.

8. A steam-generator, comprising front and rear steam-drums, pipes connecting said drums, front headers connected directly with the front drum at their upper ends, a mud-drum supported on rollers, rear headers communicating at their lower ends with the mud-drum, straight water-tubes connecting the rear and front headers, curved pipes connecting the front headers directly with the rear steam-drum, rollers on top of the rear headers supporting the rear steam-drum, and curved pipes outside of the furnace-walls connecting the rear steam-drum with the mud-drum, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

MICHAEL H. PLUNKETT.

Witnesses:

JOHN L. HEBB,

JOHN KRUMHOLTZ.