(No Model.) 2 Sheets—Sheet 1.

E. F. GORDON & H. HOBBS.

A. W. HOBBS, Administratrix of H. HOBBS, deceased.

STEAM GENERATOR.

No. 408,708. Patented Aug. 13, 1889.

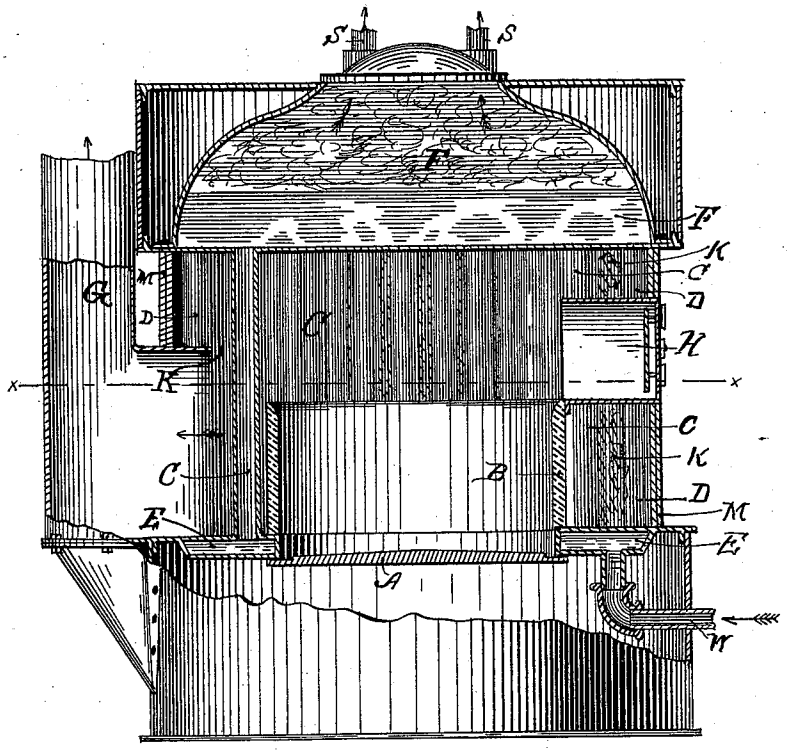


Fig. 1.

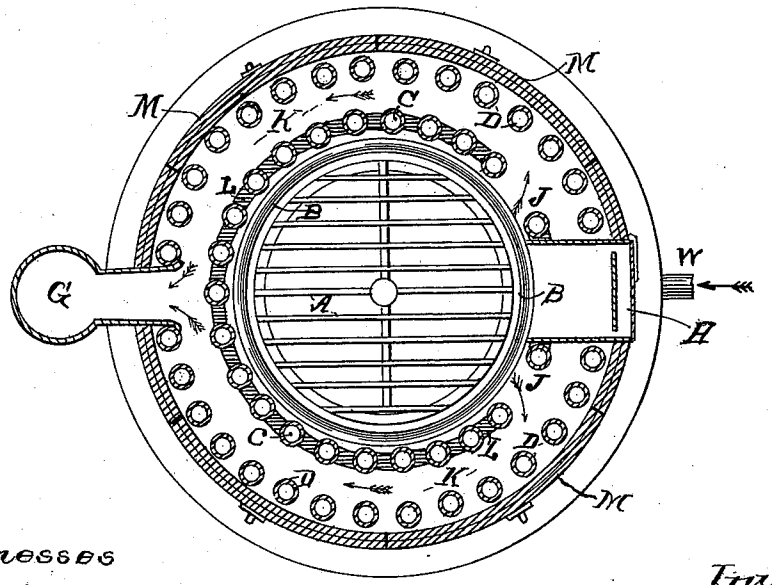


Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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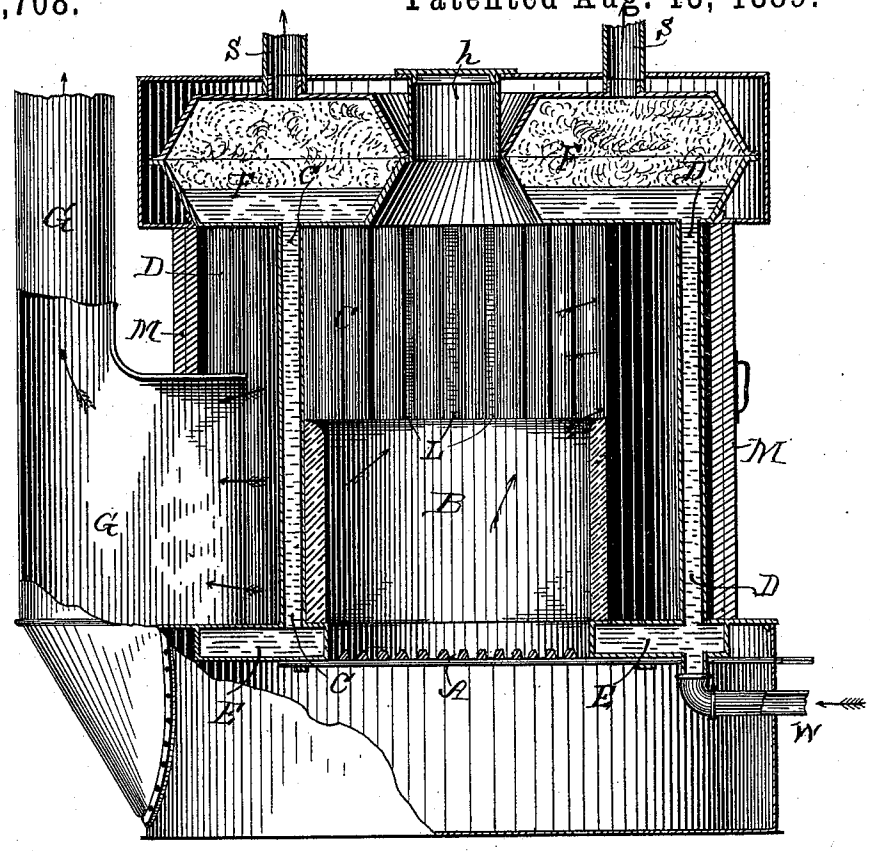


Fig. 3.

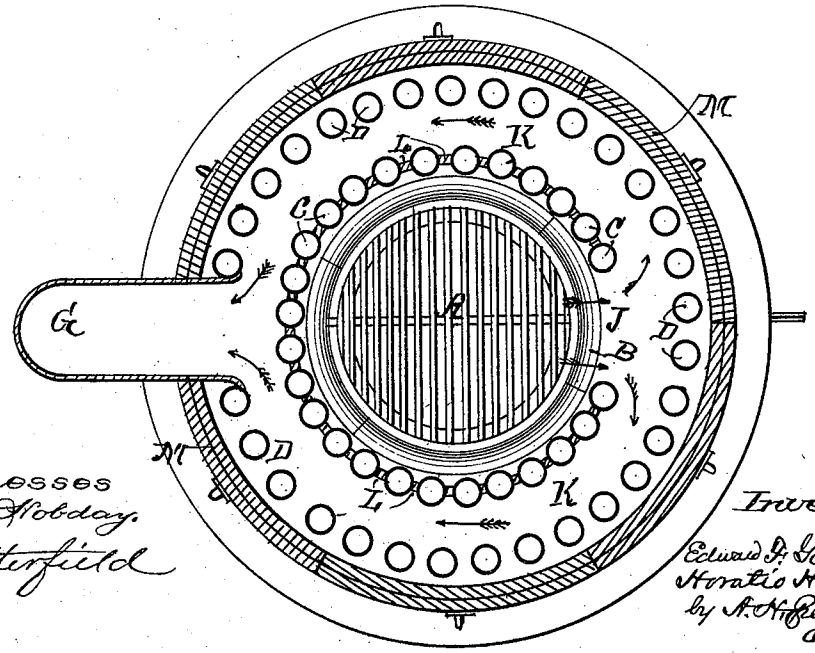


Fig. 4.

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UNITED STATES PATENT OFFICE.

EDWARD F. GORDON AND HORATIO HOBBS, OF CONCORD, NEW HAMPSHIRE; ARMENIA W. HOBBS ADMINISTRATRIX OF SAID HORATIO HOBBS, DECEASED.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 408,708, dated August 13, 1889.

Application filed November 24, 1886. Serial No. 219,752. (No model.)

To all whom it may concern:

Be it known that we, EDWARD F. GORDON and HORATIO HOBBS, both of Concord, in the county of Merrimack and State of New Hampshire, have invented jointly a new and useful Improvement in Steam-Generators, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention is in the nature of an improvement upon that for which Letters Patent of the United States, No. 291,185, were granted to us January 1, 1884, for steam-generator.

In our former patent the fire-pot was surrounded by a double series of vertical water-pipes arranged in concentric circles and extending from a water-ring below to a water and steam space above the fire. Between these two distinct series of pipes was an annular space constituting a horizontal flue, in which the caloric current passed entirely around the fire, a deflector causing it to traverse this flue on the way to the funnel. The feed-opening for introducing fuel was represented at the top, and the water and steam space of annular form surrounding such opening. By our present improvements we locate the fuel-door in the front side of the furnace, opposite to the funnel, and provide two semicircular flues, each extending from one side of said door around between the two ranges of vertical tubes, to the funnel, thus dispensing with the deflector, shortening by one-half the circuit of the caloric current, and thereby improving the draft, while at the same time making the interior of the fire-pot more accessible, lessening the labor of supplying it with fuel, and enabling the entire top of the structure to be utilized as a water and steam space.

Our invention consists in the combination and arrangement of parts herein shown and described, and specifically set forth in the appended claims.

In the drawings, Figures 1 and 2 are respectively vertical and horizontal sections of our improved furnace, taken in planes through the feed-door, and Figs. 3 and 4 like views of a modification.

A is the grate; B, the fire-brick lining of the fire-pot; C, the inner series of water-tubes, and D the outer series concentric therewith, said tubes extending vertically from the water-ring E to the water and steam space F, which have suitable water-inlets W and steam-outlets S.

G is the funnel, and H the feed-door opposite thereto. At each side of said door is an opening J, through which the caloric current enters the semicircular flues K, passing thence to right and left around, at each side of the fire, to the funnel, as will be clear from Fig. 2. These two heated currents, in their passage through the flues K K, impinge upon the exterior surfaces of the successive tubes C and D at each side of such flues, and thereby impart their heat to the water contained in said tubes and rapidly convert it into steam. These currents, being of equal volume, cause the tubes of each side to be equally heated, and since the distance traversed is but half that required under our former plan the draft is strengthened and the steam-making power of the apparatus is increased. We prefer to place one of the water-tubes C at each inner corner of the feed-door H, and between it and the opening J, so as not to heat the door-frame unduly. Where more convenient to feed from above, as in our former patent, the openings J J will be merged into one directly opposite to the funnel.

We employ, as in our former patent, vertical bars L, to fill the spaces between the tubes of the inner series, so that the caloric current can escape from the fire-pot only through the openings provided for it, and must traverse horizontally the flues leading thence to the funnel. We also form the peripheral wall of the furnace outside of the range D of tubes in removable sections M, as in our former patent, to facilitate cleaning out the two semicircular flues.

With our present construction the water and steam space F occupies the entire upper portion of the structure, extending about hori-

zontally across over the fire-pot, and exposing the water therein to a high degree of direct heat over the fire, which was not possible under the plan shown in our former patent, where a large central opening was made for introducing the fuel. Our present plan, therefore, enlarges the capacity of the steam-chamber without increasing the size of the apparatus.

In cases where the top feed is preferable we employ the modified construction shown in Figs. 3 and 4, the fuel being received through the top opening *h*, and the caloric current passing from the fire-pot through opening J and traversing the semicircular flues K K to the funnel.

We claim as our joint invention—

1. In a steam-generator, the water-ring E and water and steam space F, united by the two series of vertical water-pipes C D surrounding the fire-pot, in combination with the lateral feed-door H, the openings J at each side thereof, and the two semicircular flues K, leading thence to the funnel G, substantially as set forth.

2. In a steam-generator, the water-ring E and water and steam space F, connected by the two series of vertical water-pipes C D, and having a suitable feed-opening, in combination with the fire-pot surrounded by said pipes, with flue-opening J and funnel G on opposite sides of the fire-pot, and with semicircular flues K K connecting them, substantially as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, on this 16th day of November, A. D. 1886.

EDWARD F. GORDON.
HORATIO HOBBS.

Witnesses:
L. S. MORRILL,
HENRY W. STEVENS.