C. S. SMITH.

STEAM GENERATOR.

No. 190,632. Patented May 8, 1877.

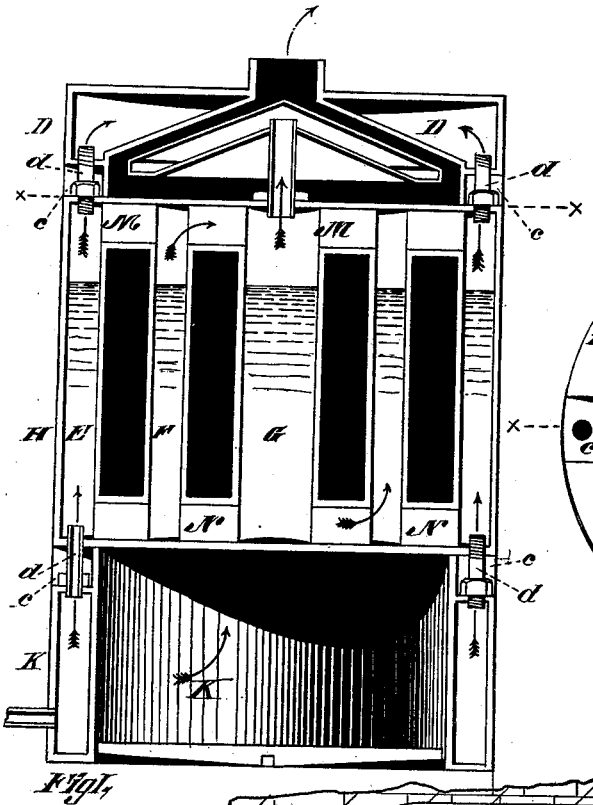

Fig I.

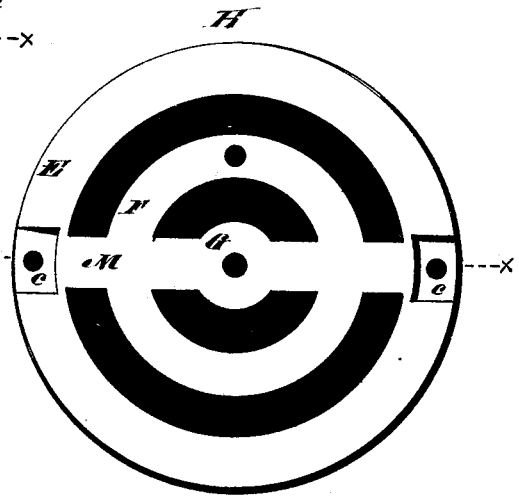

Fig II.

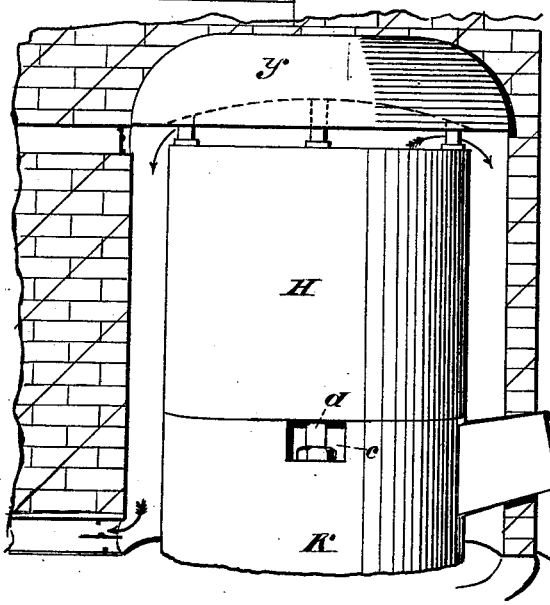

Fig III.

Witnesses
Stockwell Bettes.
Philip Johnson

Inventor
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atty

UNITED STATES PATENT OFFICE.

CHARLES S. SMITH, OF WESTFIELD, MASSACHUSETTS, ASSIGNOR TO HENRY J. BUSH AND GEORGE L. LAFLIN, OF SAME PLACE.

IMPROVEMENT IN STEAM-GENERATORS.

Specification forming part of Letters Patent No. **190,632**, dated May 8, 1877; application filed March 19, 1877.

To all whom it may concern:

Be it known that I, CHARLES S. SMITH, of Westfield, State of Massachusetts, have invented an Improvement in Steam-Generators, of which the following is a specification:

My invention relates more particularly to improvements upon the steam-generator of George L. Laflin, patented October 8, 1872, No. 131,958, in which (in brief) a series of annular reservoirs to contain the water are arranged concentrically above the fire, and within a reservoir forming, in effect, the wall of the boiler and fire-box, and so arranged as to leave flues by the intervals between them, while all of the water and steam space in the generator is made common by connecting piping; and the nature of my improvements are fully shown in the accompanying drawings and following description.

Figure I shows a sectional elevation of a generator. Fig. II is a top view of a part of the same, and Fig. III is an elevation, showing a modified form of steam-drum.

In the patent above quoted each reservoir is cast separately, and provided with two or more lugs upon its walls, which, resting upon corresponding lugs upon the next surrounding section, support it, and eventually throw all of the weight of the suspended reservoirs upon the one set of lugs upon the outer case, and the reservoirs, when so arranged and suspended in place, are tapped from the outside, in order to be severally connected both in their lower portions to permit a circulation of the water, and in their top for the passage of steam; and as, by the method of tapping from the outside, the reservoirs can only well be made to communicate with each other by each being made to communicate with the outside one, it is necessary to use a large quantity of tubing and make many water-tight joints. The pipe-connections are liable to be unfavorably affected by the action of heat, and more or less interfere with the flue-space, and have to be, moreover, each connected to the outer reservoir by headers upon the outside of the generator, and consequently in a position liable to be damaged when the generator is in position, or in course of transportation; to obviate all of which, without any claim to having modified the principle illustrated in the aforementioned patent, I have constructed my generator as follows:

The section H, containing the concentric reservoirs E F G, is cast in one piece, the reservoirs being held together and joined both at top and bottom by the cross heads M N, which are large enough to afford the freest circulation both to water and steam. This section rests upon the one, K, cast also in one piece, and which, while affording a solid and firm support, forms a fire-pot, surrounded by a water-space. The section H, in its turn, supports the cast drum D, for containing the steam.

When these several parts are arranged together in the order described, the only pipe-fitting necessary to connect their water and steam spaces is that of the lock-nut nipples *d d* on opposite sides of sections K and D, and these are recessed in the pockets *c c*, so that when the section H is placed in position, and the nipples, by means of their nuts, caused to make a close connection between it and sections K and D, the nipples are perfectly protected from all chance of derangement or injury by the pockets *c c*, and, being upon the outer side of the boiler, are defended from contact with the fire.

Being thus able to cast the section H in the general form of a section of a cylinder, I am able to make them of various capacities as to water-space, either to have greater depth or an increased number of concentric reservoirs, and have them interchangeable with the parts K D, and by reason of the few nipples needed to join the parts, and the small degree of skill required to fit them, I am able to ship the generator in pieces, to be put together by anybody without special knowledge, while there is no part that can be easily damaged during such shipment.

Fig. III shows a drum, *y*, constructed to, while deflecting the heat from its under surface over the tops of reservoirs E F G, project beyond the sections K H, to close the top of a space left surrounding the generator, to form a down-draft, to enable the entire generator to be packed with hot air. This drum is con-

nected by lock-nut nipples at two or more places to the steam-space in section H, and, while acting as a chamber for the steam and a deflector for the heat, serves also to define and close up the top of the space immediately surrounding the generator.

Now, having described my invention, what I claim is—

1. The combination of sections K H, having the concentric reservoirs E, F, G, and D, and heads M N, connected together, for the purpose specified.

2. The section H, cast in one piece, with the concentric reservoirs and connecting-heads M N, in combination with sections K D, when all arranged substantially as shown, and connected by lock-nipple nuts *d d*, recessed in pockets *c c* from the outer wall of the generator, substantially as described.

CHARLES S. SMITH.

Witnesses:
ANDREW L. BUSH,
FRANK S. EWING.