

(No Model.)

A. A. PLUMMER.
STEAM GENERATOR.

No. 538,624.

Patented Apr. 30, 1895.

Fig. 1.

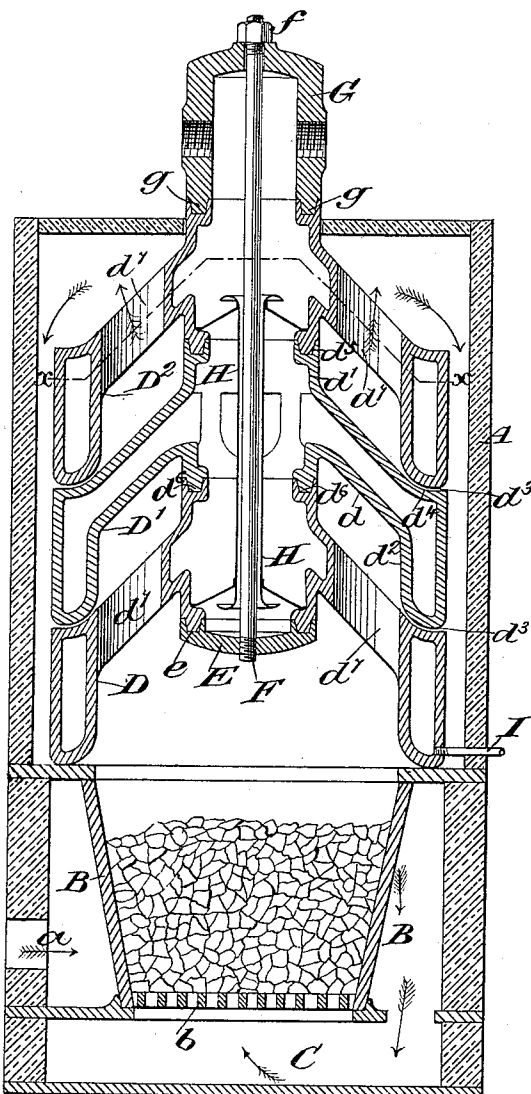


Fig. 3.

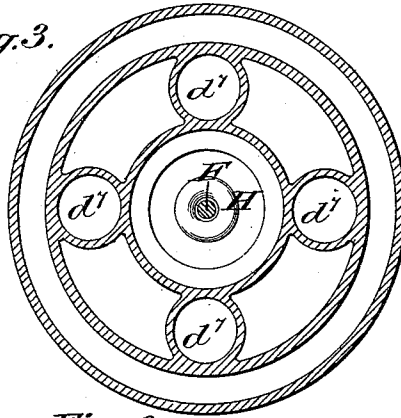
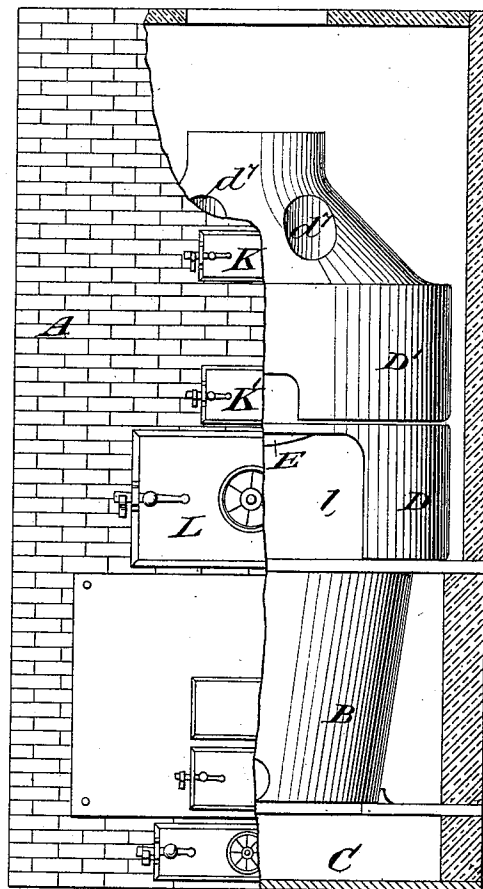


Fig. 2.



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UNITED STATES PATENT OFFICE.

ABNER A. PLUMMER, OF PUTNAM, CONNECTICUT, ASSIGNOR OF ONE-HALF TO JOSEPH F. GARY, OF SAME PLACE.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 538,624, dated April 30, 1895.

Application filed February 26, 1894. Serial No. 501,468. (No model.)

To all whom it may concern:

Be it known that I, ABNER A. PLUMMER, of Putnam, in the county of Windham and State of Connecticut, have invented a new and useful Improvement in Steam-Generators, of which the following is a specification.

My invention relates to an improvement in steam generators in which provision is made for enlarging or diminishing the size of the generator by utilizing a greater or lesser number of similar sections and with the object in view of providing a compact and economical generator which shall expose a very great amount of surface to the direct action of the flame and in which the structure of the parts shall be for the greater part on circular lines to increase strength.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of the generator in vertical central section, showing a generator of three superposed sections. Fig. 2 is a front view of the generator with the wall partially broken away and showing two superposed sections, and Fig. 3 is a transverse section through the generator on line *x x* of Fig. 1.

The wall which forms a setting for the generator, is denoted by A and may be made of brick or any other suitable material and of a height corresponding to the number of superposed sections of which the generator is to consist. The wall herein shown is of suitable height for the setting of a generator of three superposed sections and if two sections only were employed, the wall might be made proportionately lower, terminating for example in Fig. 2, on a line even with the top of the uppermost section therein shown instead of the full height for three sections, as represented.

The fire pot is denoted by B and the air for supporting combustion enters through the base wall at *a*, and, after circulating around the fire-pot, passes down into the ash pit C and thence up through the grate *b*.

The generator proper consists of one or more dish-shaped or concavo-convex sections quite similar in their general structure and arranged to fit one upon another, so as to form tight joints between their interiors for the cir-

culatation of the liquid through them from one to another and at their peripheries forming a fire wall for surrounding and retaining the products of combustion between the chambers formed by them.

The three superposed sections (represented in Fig. 1) are denoted respectively by D, D' and D² and they consist of a comparatively narrow hollow web portion *d*, radiating obliquely from a central hollow hub portion *d'* and terminating at their outer edges in depending oblong annular portions *d*². The lower ends of the depending annular portions *d*² are rounded, as shown at *d*³, to fit corresponding seats *d*⁴ on the upper outer portions of the next adjacent section below.

The central hollow hub portions *d'* are provided at their upper edges with an annular groove *d*⁵ and at their lower ends with an annular tongue *d*⁶, adapted to fit into and form a tight joint in the annular groove *d*⁵ of the section next below. The hollow web portion *d* of the sections is provided with one or more fire flues *d*⁷ extending through them, in the present instance each section being provided with four such flues and the sections are so arranged relative to one another that the flues *d*⁷ of the one section shall fall vertically opposite the intact web portion *d* of the section next above for the purpose of deflecting the products of combustion in their passage upward through the sections, causing them to pursue a zigzag course and hence lie for a greater time in contact with the exposed surface of the sections, and hence impart to the liquid therein a greater amount of heat.

The lower section has its central hub portion conveniently closed by means of a crown piece E provided with an annular groove *e* adapted to receive the tongue *d*⁶ of the section D and said crown piece E is held in position by means of a bolt rod F which extends downwardly through the hub portions of the several sections and has a screw threaded engagement with the crown piece E.

The uppermost of the sections, in the present instance the section D', has its hollow hub portion closed by means of a steam dome G, the lower portion of which is provided with an annular tongue *g* adapted to fit within the

annular groove d^3 of the upper section. The same bolt rod which holds the crown piece E in position, extends through the top of the steam dome G and is there provided with a nut f , which, when screwed down onto the steam dome G, tends to draw the crown piece E snugly into contact with the lower section d and at the same time the steam dome G snugly into contact with the upper section D².

To increase the circulation within the several hollow sections, I provide a central tube H, arranged vertically within the hollow hub portions of the sections, open at top and bottom. The bolt rod F extends through the tube H but leaves sufficient space between it and the interior wall of the tube for the circulation of the liquid.

For purposes of drawing the water out of the several hollow sections, they may each be provided with an outlet tube, such for example as the tube I, shown in connection with the section D which tubes may be provided with suitable stop cocks of any well known or approved form and one of such tubes, as for example I, may be utilized for the purpose of introducing water into the generator from a suitable supply, not shown.

Access to the interior of the furnace wall, for cleaning purposes, may be had through suitable doors K, K' and the fire-pot may be charged with fuel through a suitable door L opposite the opening l in the periphery of the section D.

In use, the products of combustion—after passing in their zigzag course up through the flues in the several sections and through the chambers formed between two successive sections—pass downwardly around the exterior portions of the several generator sections between their peripheries and the interior of

the wall A to an opening at or near the bottom of the generator section D leading to a suitable uptake, the opening and uptake not being shown herein.

It will be observed that the generator may be increased or diminished as to its capacity, by simply adding or removing one of the hollow sections and that the latter may be furnished at pleasure and conveniently shipped separate from one another to be set up wherever desired.

It is obvious that slight changes might be resorted to in the form and arrangement of the several parts without departing from the spirit and scope of my invention. Hence I do not wish to limit myself strictly to the structure herein set forth, but

What I claim is—

A steam generator, comprising a series of concavo-convex or disk shaped hollow sections having their outer hollow rims projected downwardly, the lower end of one rim being fitted to rest in proximity to the upper end of an adjacent rim to form an exterior hollow fire wall, the shallow portions of the hollow sections forming upper and lower walls to combustion chambers and fitted at their central portions to form a continuous vertical water column when the sections are assembled, the said combustion chambers having communication with one another and with the fire pot through fire flues formed in said shallow portions of the sections, and means for holding the sections together, substantially as set forth.

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Witnesses:

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