

(No Model.)

B. S. COMSTOCK.
STEAM GENERATOR.

No. 300,446.

Patented June 17, 1884.

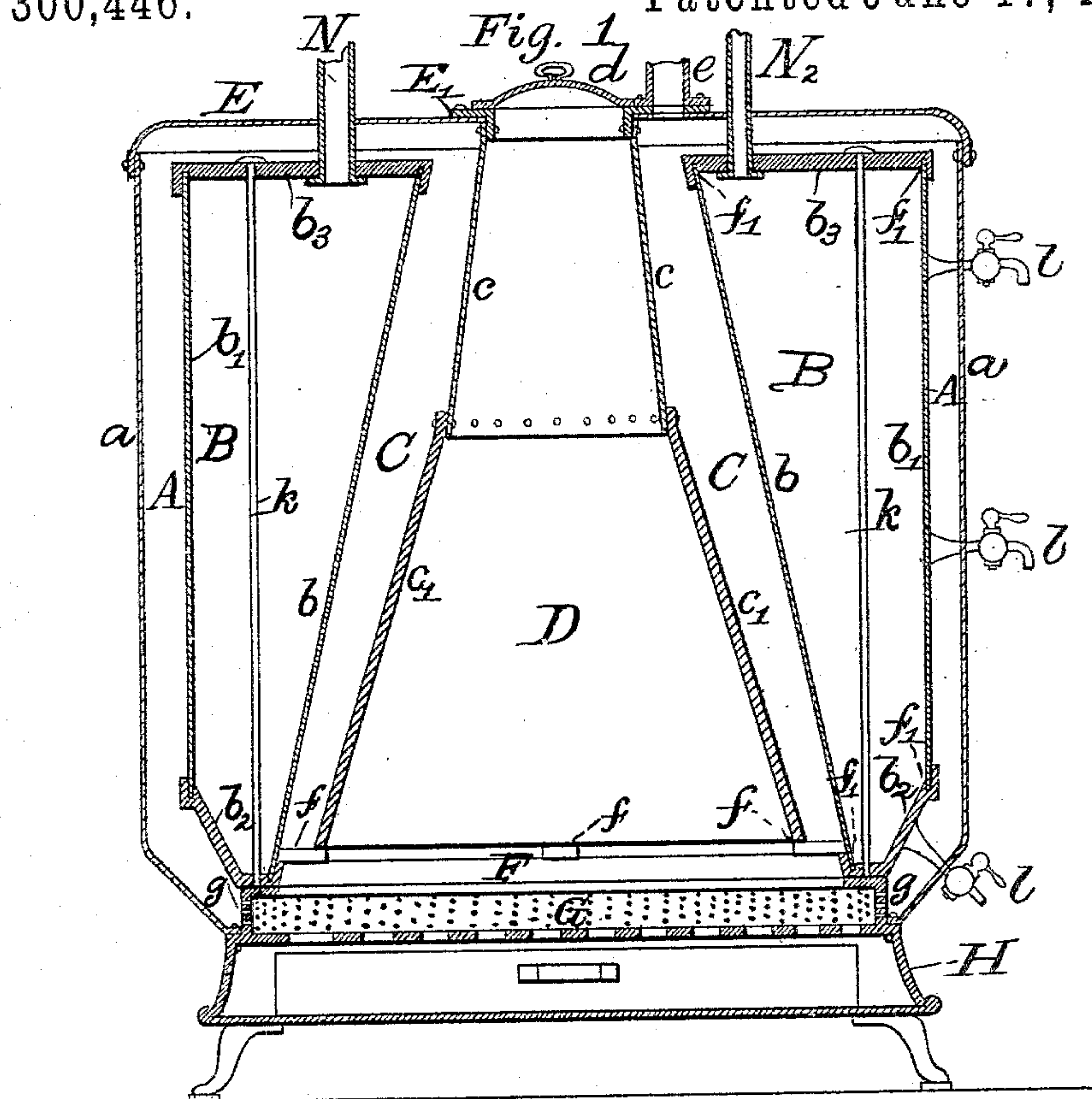
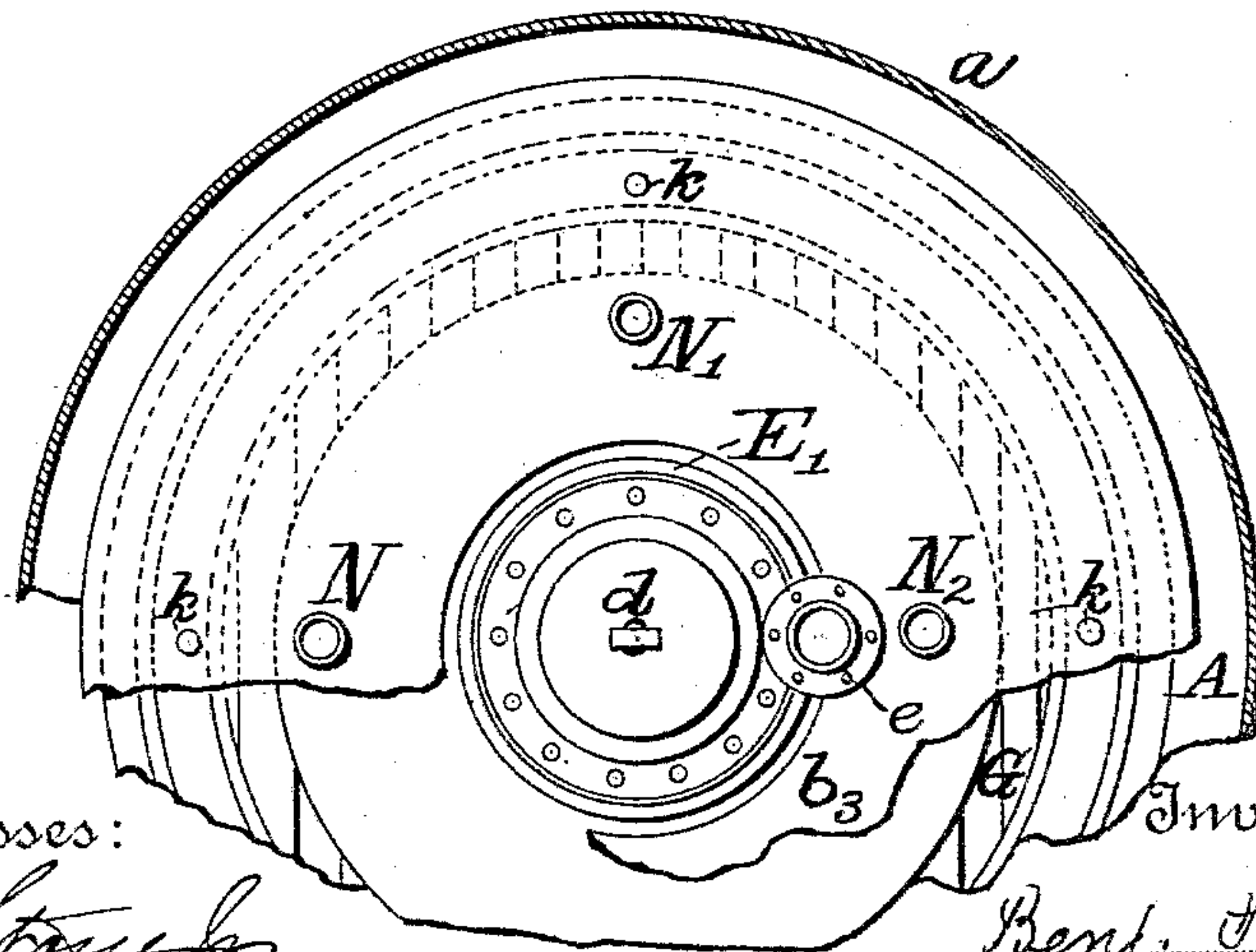


Fig. 2.



Witnesses:

For C. Strong
A. C. Moore

Inventor:

Benj. S. Comstock
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UNITED STATES PATENT OFFICE.

BENJAMIN S. COMSTOCK, OF NEW YORK, N. Y.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 300,446, dated June 17, 1884.

Application filed February 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN S. COMSTOCK, of the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Steam-Generators, which improvements are fully set forth in the following specification and accompanying drawings.

The object of my invention is to more thoroughly utilize the heat generated by the combustion of the fuel, and to adapt the parts to each other in the manner best fitted to combine simplicity and lightness of construction with water and steam tight jointure.

My invention consists in constructing the inner and outer walls of the annular water-chamber of a steam-generator in a way best adapted to effectively utilize the heat, the outer wall being a cylinder jointed at its top and bottom into cast-metal sections, and the inner wall a truncated cone jointed at its top and bottom in like manner, each wall being preferably a single piece of sheet metal.

It also consists in the combination, with the water-chamber, of a fuel-magazine separated therefrom by an intervening annular space in the form of a truncated cone, such space constituting a flue for the combustion-chamber, and a hot-air chamber surrounding the water-chamber.

In the accompanying drawings, Figure 1 represents a front elevation of my improved steam-generator in vertical section. Fig. 2 is a plan view of the same, partly in section.

In these drawings, *a* represents the outer wall of a hot-air chamber, *A*, surrounding the entire generator, which wall rests upon a suitable base, *H*, of cast metal. The chamber *A* is covered by a suitable metal top, *E*, the center of which is provided with a cast-metal collar, *E'*, for holding in position and supporting a sheet-metal wall, *c*. The wall *c* forms the inclosing wall for the upper portion of a fuel-magazine, *D*, which is provided with a suitable lid or cover, *d*, resting upon the collar *E'*.

To the lower edge of the wall *c* is secured a cast-metal section, *c'*, which incloses the lower portion of the fuel-magazine and surmounts a combustion-chamber, *F*, and, like the wall *c*, is constructed in the form of a truncated cone. This portion of the combustion-chamber may also have, when necessary, extension-pieces

resting upon the grate or base, in order to better support the same.

An annular water-chamber, *B*, surrounds the fuel-magazine *D*, but is separated therefrom by an intervening space, *C*, constituting a flue for the escape of the gases and smoke from the combustion-chamber *F*. The outer wall of the water-chamber *B* consists of a cylinder, *b*, preferably of a single piece of sheet metal supported upon an annular casting, *b'*, which rests upon the base *g* of the combustion-chamber. The inner wall, *b*, is constructed in the form of a truncated cone, likewise preferably of a single piece of sheet metal, and fitted at its lower edge into the annular casting *b'*. This inner wall may be corrugated, if deemed necessary, in order to afford a greater heating-surface.

Upon the upper edges of the walls *b* and *b'* is supported an annular top, *b''*, preferably of cast metal, jointed therewith by means of the grooves and flanges *f'*. The top *b''* is held tightly in position by means of suitable bolts, *k*, extending therefrom through the lower casting, *b'*, or by lateral bolts, as hereinafter described. The inner wall, *b*, of the water-chamber converges toward its top, that the flames and hot air from the combustion-chamber may impinge against it with greater force and through a greater distance as they escape through the flue *C* and smoke-pipe *e*. The heat developed in the combustion-chamber will thus be more completely communicated to the water contained in the chamber *B*, particularly at its lower part, where the steam is most rapidly generated.

The grate *G* may be constructed in one piece with the base *H*, as indicated in the drawings, or it may be constructed separately in any well-known manner. In either case, however, I prefer to provide it with a circular shoulder, *g*, and lateral perforations therein, as shown in the drawings, leading into the chamber *A*, to allow the hot air and gases from the combustion-chamber to circulate about the outer wall of the water-chamber. It is evident, however, that the hot-air chamber *A* and said circular shoulder *g*, as described, may be dispensed with and the wall *c* supported from the top *b''* of the water-chamber. A suitable pipe, *N*, is provided for conducting the steam from the water-chamber *B*, and a pipe,

N², for replenishing the same. Suitable air and safety-valve devices may be applied to a pipe, N', also leading from the water-chamber, which latter is supplied with gage-cocks.
5 The joints of the water-chamber are preferably made steam-tight by fitting the sheet-metal portions *b* and *b'* into annular grooves *f'* in the castings *b*² and *b*³, respectively, packing the same with a filling of prepared asbestos, and
10 binding the same in their relative positions by means of the bolts *k*. In order to sustain a greater steam-pressure, it may sometimes be preferable to hold the sheet-metal portions in position in the cast-metal sections by means
15 of lateral bolts or rivets extending through the cast-metal flanges and grooves and the ends of the sheet-metal sections fitted therein.

I am aware that it is not new to construct the inner and outer walls of a water-chamber each of a single piece of metal, and to joint
20 the same into cast-metal sections.

I am aware, also, that it is not new to construct an annular water-chamber with a converging inner wall, and to combine the same
25 with a conical central water-chamber, form-

ing a conical flue, and I do not, therefore, herein broadly claim such construction.

What I claim as my invention is—

1. In a steam-generator, the combination, substantially as hereinbefore set forth, of a 30 combustion-chamber and an annular water-chamber, the inner wall of which converges toward its upper extremity, and a fuel-magazine having its wall approximately parallel with said inner wall of said water-chamber, 35 and forming therewith an intervening flue in the form of a truncated cone.

2. In a steam-generator, the combination, substantially as hereinbefore set forth, of a 40 combustion-chamber, having a grate with a circular shoulder and perforations therein, with the annular water-chamber, an enveloping cylinder forming a hot-air chamber, and a conical fuel-magazine depending from the top of said cylinder.

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Witnesses:

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GEORGE H. SULLIVAN.