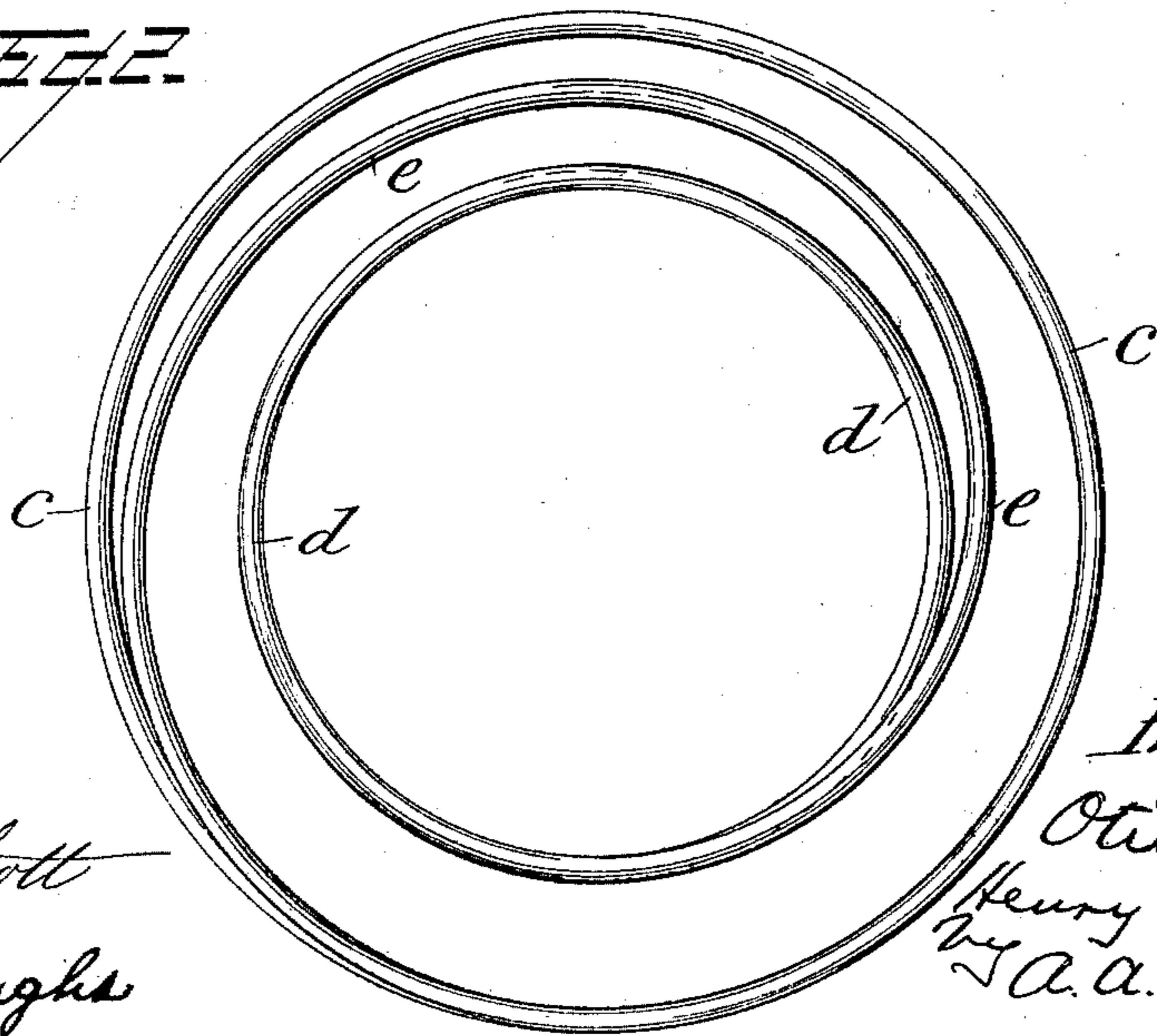
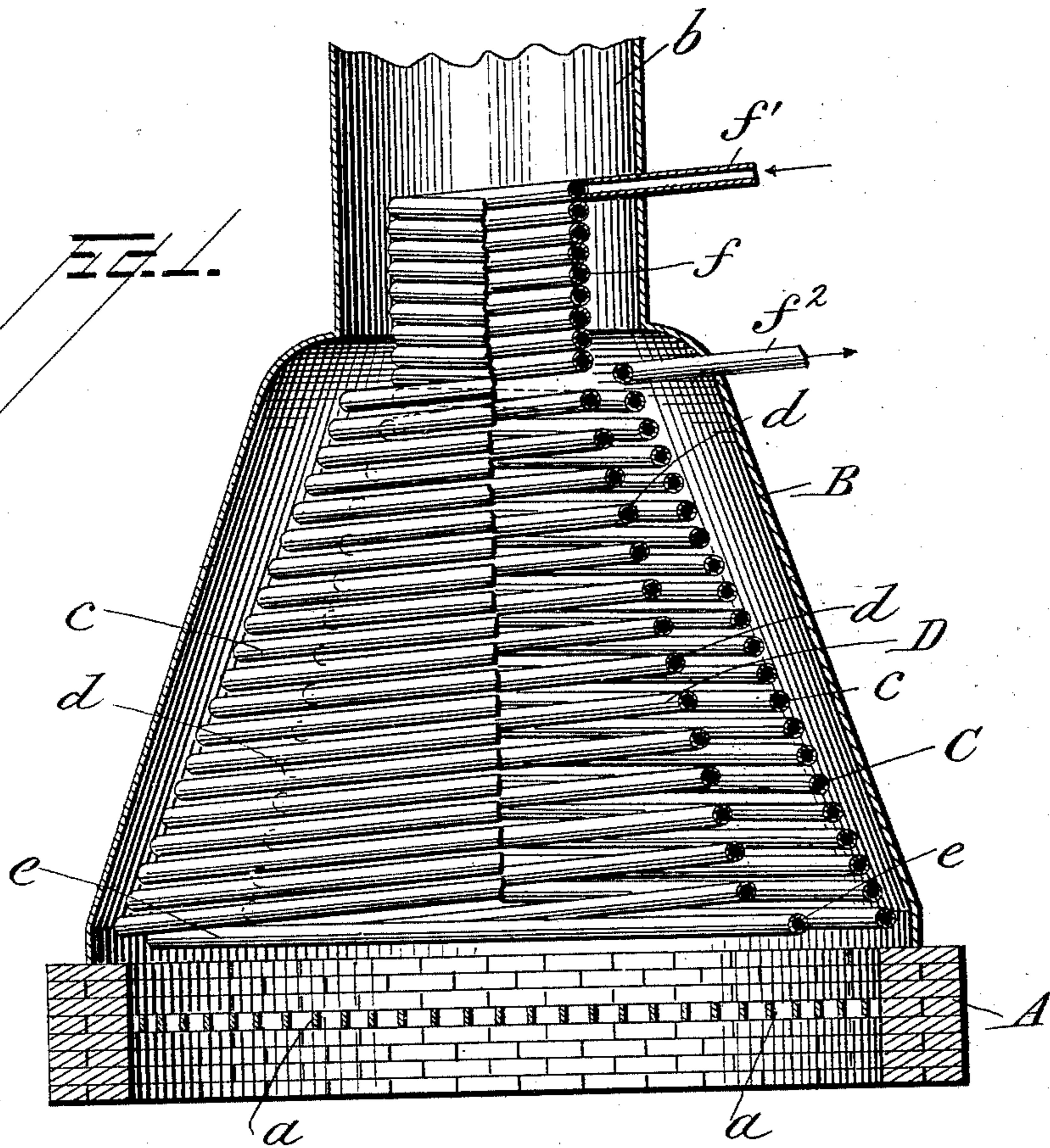


(No Model.)

O. JONES & H. P. ASHLEY.  
STEAM GENERATOR.

No. 488,970.

Patented Dec. 27, 1892.



Attest:

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# UNITED STATES PATENT OFFICE.

OTIS JONES, OF SENOIA, AND HENRY PERCY ASHLEY, OF ATLANTA, ASSIGNORS OF FIFTEEN THIRTY-SECONDS TO J. P. WOODSON, R. M. FARRAR, R. L. SIBLEY, G. A. CABANISS AND W. G. PASCHALL, OF ATLANTA, GEORGIA.

## STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 488,970, dated December 27, 1892.

Application filed November 24, 1891. Serial No. 413,018. (No model.)

*To all whom it may concern:*

Be it known that we, OTIS JONES, of Senoia, in the county of Coweta, and HENRY PERCY ASHLEY, of Atlanta, in the county of Fulton, State of Georgia, have invented certain new and useful Improvements in Steam-Generators; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which said drawings form a part of this specification.

This invention relates as above stated to apparatus in which heat may be applied to the heating of water in the generation therefrom of steam, the invention consisting of a peculiar arrangement of coils whereby the fullest possible benefit is obtained from the fuel consumption, the invention comprising elements of construction to this end, and being fully described hereinafter.

In the accompanying drawings, Figure 1 is a vertical section through a boiler of this construction, showing the position of the various elements and their form. Fig. 2 is a detail in plan view of the coil crossing from one conical coil to the other.

Referring to the drawings, *a* designates a grate set in a frame or base *A* of any construction suitable in the premises, or if gas is to be used as the fuel, a burner of suitable form may replace the grate. In the present instance the grate is represented as being supported within a base *A* of terra-cotta, brick or analagous material. Upon this base is set a conical casing *B* of metal, protected, if desired, from the heat by a non-conducting lining. To the top of the casing an uptake *b* is attached.

*C* and *D* designate, respectively, series of coils of pipe having, in the main, conical forms and are supported by suitable means, one within the other, within the casing *B*. The heights of their conical portions are substantially the same, the inclination of their sides, however, are of different degrees of slant. They have the lowest of their coils *c* and *d*, of which they are respectively formed, connected by a helical coil *e* extending par-

allel to the fire and as near as possible to its upper surface. The upper of the coils *d* is continued to form a cylindrical extension *f* that projects into the uptake *b*, the upper end of the said extension being connected with the inlet pipe *f'*. The coils of this extension are wound as close together as possible so as to present the greatest amount of surface possible to the action of the heat. Its object is to allow the utilization of the products of combustion to the greatest possible extent. The cold water entering from the inlet pipe *f'* will at first be presented to the action of the heat at a point where it is comparatively cool and then gradually to an increasing temperature. The two series, if both were wound alike, would not produce the result sought as the inner series being nearer to the fire would allow the water passing through it to be heated to a higher degree than it would be in passing through the outer series, although the diameters of the coils *c* are greater than those of the coils *d* giving the former a greater heating surface. In the present instance the outer series is the superheater and to adapt it to its purpose it should be so constructed that the water or steam in passing through it will be heated to a higher degree than it would be in passing through the inner series. In order to secure this result the coils *c* of the outer series are wound closer together than those of the inner series, or rather, vice versa, the coils of the inner series are wound farther apart than those of the outer. In this way and by reason of the coils *c* of the outer series having greater diameters than those of the inner series, thereby giving a greater length of pipe, a much greater heating surface is given to the outer series, which insures the proper heating of the steam after it has passed into the superheater. The outer series while not being so directly acted upon by the heat, will not be so liable to be burned out as it would be if nearer to the flames as it is not protected by the passage of water through it. The upper end of the series *C* is connected with the eduction pipe *f''*.

This invention is primarily intended for use in propelling engines, and to this end only steam sufficient for one or two strokes is in

the generator at one time. With this premise several advantages of the generator will be better appreciated.

The operation of the device is as follows:

- 5 Water sufficient for one or two strokes is admitted, or to be more exact, forced into the upward extension of the coil *d* which being cooler than the other portions of the coils has not the same liability to injury from the introduction of cold water, thereupon the said  
10 water is heated and by the time it is approximately half way down the coil *d* it is converted into steam, and as it passes onward through the coil *e* and the bottom coil of the  
15 coils *c* and *d* it is superheated, which operation continues until it has exit from the upper end of the coil *c* and passes to the cylinder of the engine.

Having thus described our invention what we claim as new and desire to secure by Letters Patent of the United States, is:—

In a steam generator, the combination of the two series of coils, substantially conical in form, one placed within the other, the inner series having a cylindrical extension  
25 above the outer series and having the coils of its conical portion wound farther apart than those of the outer series, substantially as described.

In testimony whereof we hereunto affix our  
30 signatures in presence of two witnesses.

OTIS JONES.

HENRY PERCY ASHLEY.

Witnesses:

A. P. WOOD,  
EDWARD P. WOOD.