

No. 620,994.

Patented Mar. 14, 1899.

A. TESTE.  
STEAM BOILER OR GENERATOR.

(Application filed Nov. 29, 1898.)

(No Model.)

FIG. 1

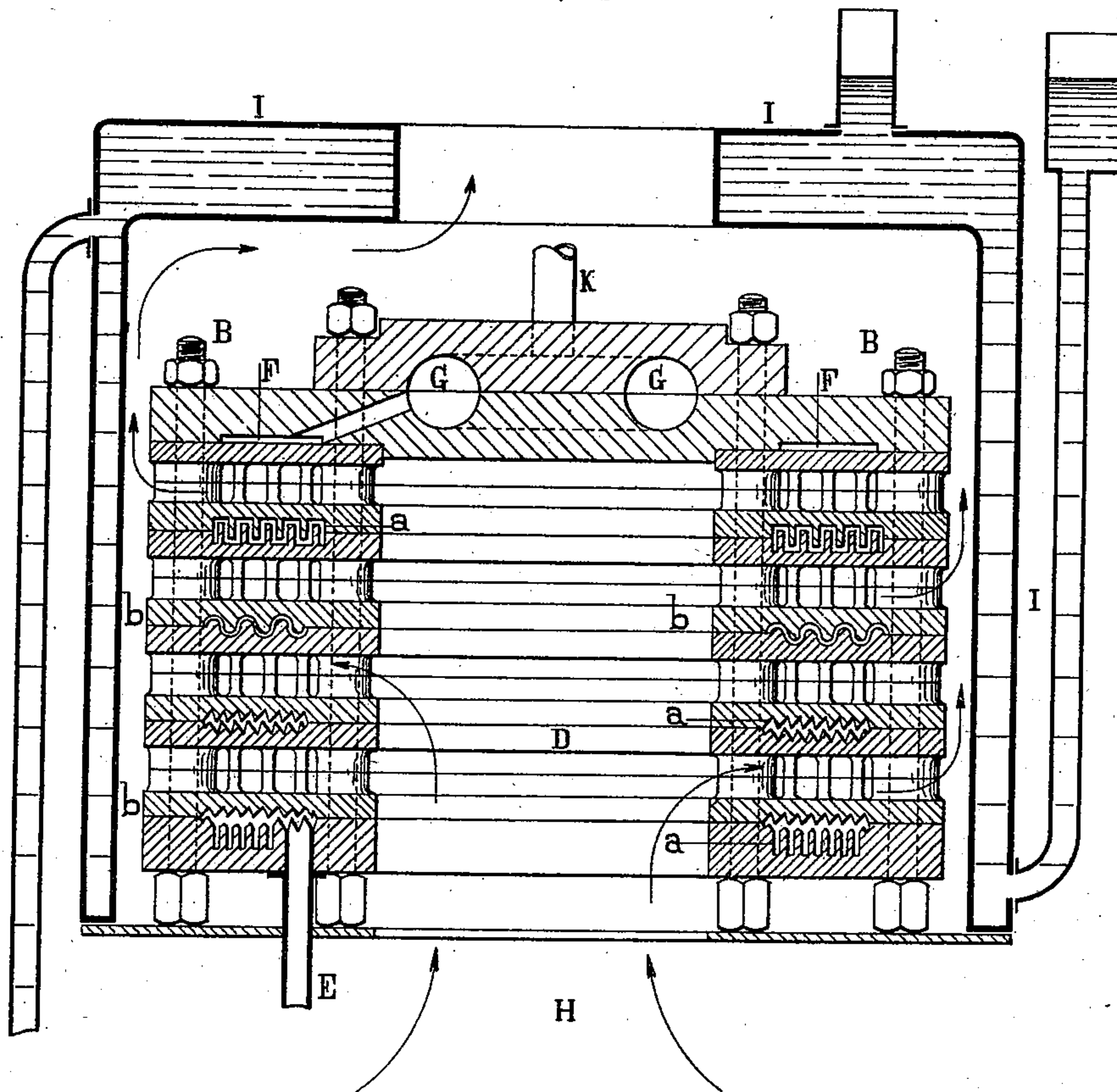
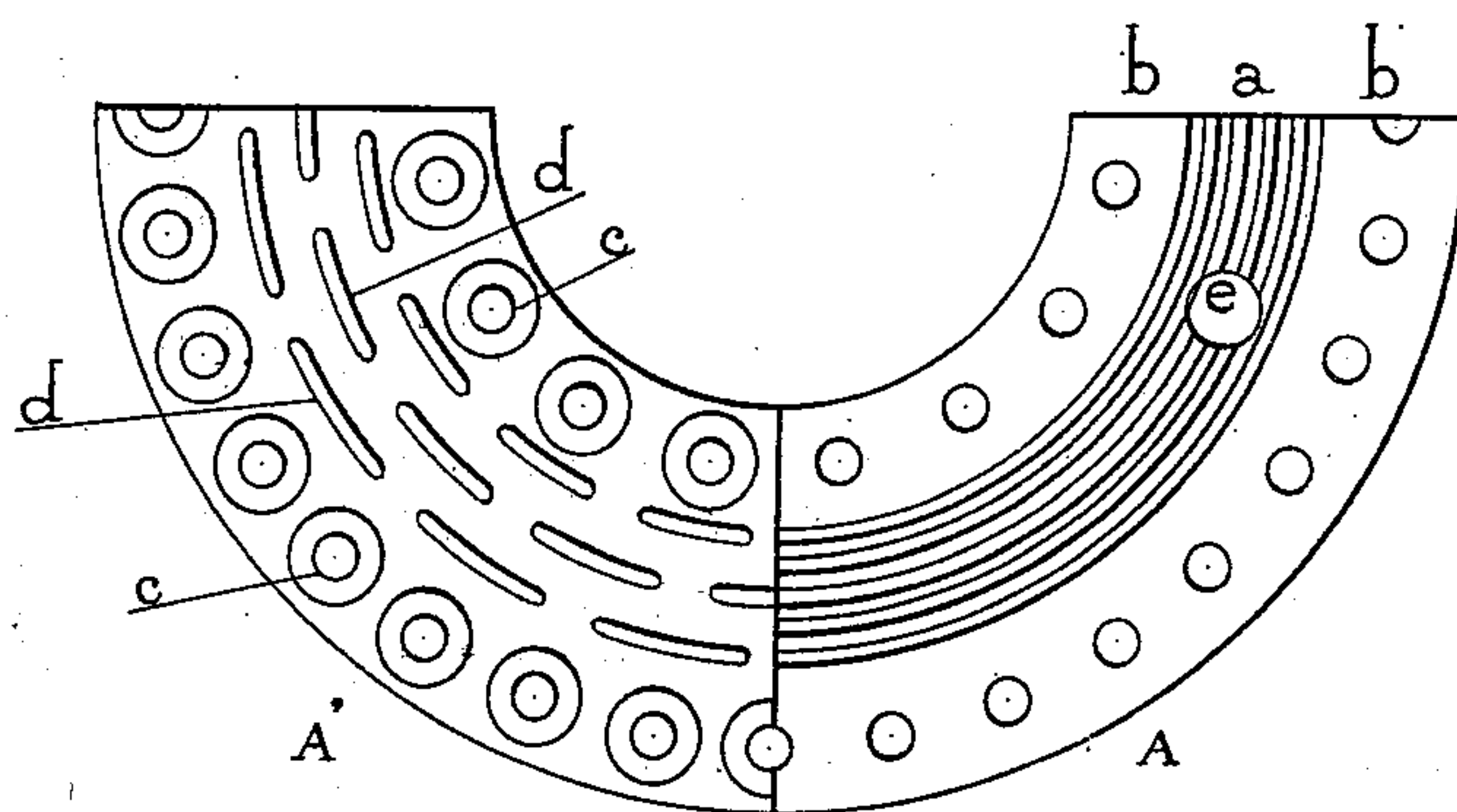


FIG. 2



Witnesses:  
E. H. Bolton  
O. H. Mumr

Inventor  
Auguste Teste

By

*Renard & Co.*  
his Attorneys.



# UNITED STATES PATENT OFFICE.

AUGUSTE TESTE, OF LYONS, FRANCE.

## STEAM BOILER OR GENERATOR.

SPECIFICATION forming part of Letters Patent No. 620,994, dated March 14, 1899.

Application filed November 29, 1898. Serial No. 697,786. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUSTE TESTE, a citizen of the French Republic, residing at Lyons, France, have invented an Improved Steam Boiler or Generator, of which the following is a full, clear, and exact description.

The subject of my invention is a rapid steam-generator characterized by its mode of construction, which permits by means of simple elements, superposed in variable quantities, to constitute considerable heating-surfaces in a small bulk and renders the maintenance easy by the rapid separation and reunion of these elements.

The elements of which I have just spoken may be of divers shapes, but are always constructed and put together in the manner indicated in the following description.

The accompanying drawings show by way of example a generator of this system of cylindrical form.

Figure 1 is a vertical section, and Fig. 2 is a half-view in plan, of one element.

Each element is composed of two superposed circles or rings A A' of cast or stamped metal, possessing on its two faces projections and indentations, the object of which will be hereinafter explained. The inner face of each circle has channels *a a*. (Shown at the right-hand side of Fig. 2.) These circles or rings being superposed, as shown at Fig. 1, leave between the projections between the grooves an annular space or channel, the sides of which are of broken or undulated section and remain at a slight distance from each other. This channel is closed on the interior and exterior edges of the circles or rings by two annular joints *b b*, formed by flat parts or faces. The section Fig. 1 shows several forms of these channels, which may even be of rectangular section, as shown by the upper element. The exterior face of these circles or rings has two rows of bosses or projections *c c*, formed with holes for the passage of the fixing-bolts B B, and, further, with other projections *d d*, of variable shape and arrangement, forming circuitous passages to divide the heated gases which circulate between each element. The left-hand part of Fig. 2 shows this face of the element. These bosses and projections may consist of separate pieces; but it is preferable to make them in

one piece with the circles or rings in order to facilitate the transmission of heat. Finally, there exists on each circle or ring an orifice *e*, which secures intercommunication of the channels *a a* of the superposed elements. These communications are alternately at opposite sides of the elements in order that the fluid, water, or vapor which flows through these channels may traverse their entire length. When the elements thus formed are superposed as in Fig. 1 and secured firmly together by the bolts B B, it will be understood that a continuous channel of flat section and very extended on the surface is formed, in which water may be caused to circulate by means of a pump discharging into the lower element by the tube E, while the heated gases from a furnace will be caused to circulate from the interior to the exterior of the elements through the spaces provided with obstructions which separate them. The upper element has no central opening. The space F which it leaves between its two plates communicates with the closed chamber G, made in the center of the element and acting as a superheater. It is to this chamber that the steam-pipe K is connected. A greater efficacy may be given to the superheater G by causing it to enter the central opening and by providing it with projections or wings, either external or internal.

The furnace may, according to convenience, be arranged to consume either coal, coke, or mineral oils. This latter case is supposed in the drawings.

The burners, which would be placed at H, send their heated gases into the central space D, from whence they pass between the elements into the interior of a casing I, which directs them toward the chimney. The casing I may be made of refractory material; but it is preferred to form it, as shown in the drawings, of two metallic sides, between which the feed-water is caused to circulate before being sent into the lower element.

In certain cases other than circular forms may be given to the elements, and the heated gases may be made to circulate between these elements in any suitable manner.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—



1. A steam-generator composed of pairs of plates having between the members of each pair a narrow space, connections between the pairs of plates to form a continuous channel, the said pairs of plates being separated from each other to allow the products of combustion to circulate across their upper and lower surfaces, and the projections in the spaces between the pairs of plates to form circuitous passages for the heat products, substantially as described.

2. A steam boiler or generator consisting of the combination of a series of circles or rings arranged in pairs, a series of annular projections and recesses on the meeting face of each circle or ring, arranged to form when two circles or rings are juxtaposed narrow annular spaces for the circulation of the water or steam, flat fitting-surfaces outside and inside of such projections or recesses, hollow bosses on the outer face of each circle or ring, bolts passing through such hollow bosses to secure the various pairs of circles or rings together, studs or projections on the outer face of each circle or ring to form circuitous passages for the heated gases from the furnace, passages at alternate sides of each pair of circles or rings connecting the water-space of one element with that of the next, a feed-water pipe communicating with the water-space of the lowest pair of circles or rings, an inclosing disk or head, serving as a superheater, provided with annular steam-spaces communicating

with the water-space of the upper pair of circles or rings, a steam-supply pipe communicating with said steam-space, a casing inclosing the generator but leaving smoke-space all around the latter, an opening in the casing-bottom communicating with the furnace and an opening in the casing-top communicating with the chimney substantially as herein set forth.

3. A steam boiler or generator consisting of the combination of a number of elements consisting of pairs of plates formed with spaces and flat jointing-surfaces on their meeting faces, hollow bosses on the outer faces of such plates to receive bolts to secure such elements together, studs or projections on the outer faces of said elements to afford circuitous passages for the heated gases, means of communication between the steam-spaces of the several elements, a feed-pipe communicating with the steam-space of the lower element, a steam-chamber serving as a superheater above the uppermost element and communicating with the steam or water space of the latter and a casing inclosing said generator, substantially as herein set forth.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTE TESTE.

Witnesses:

THOS. N. BROWN,  
MAS VACHON.