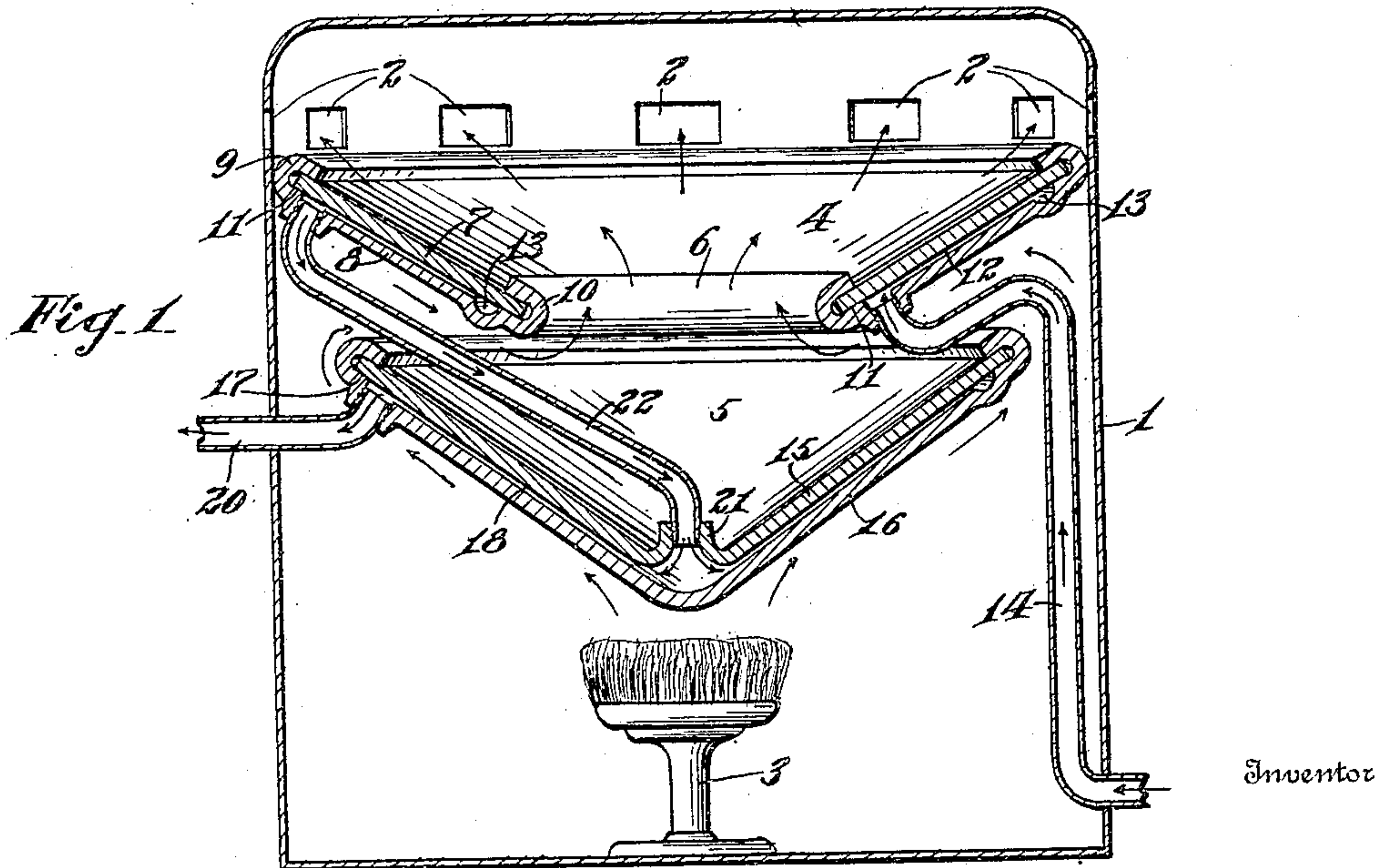
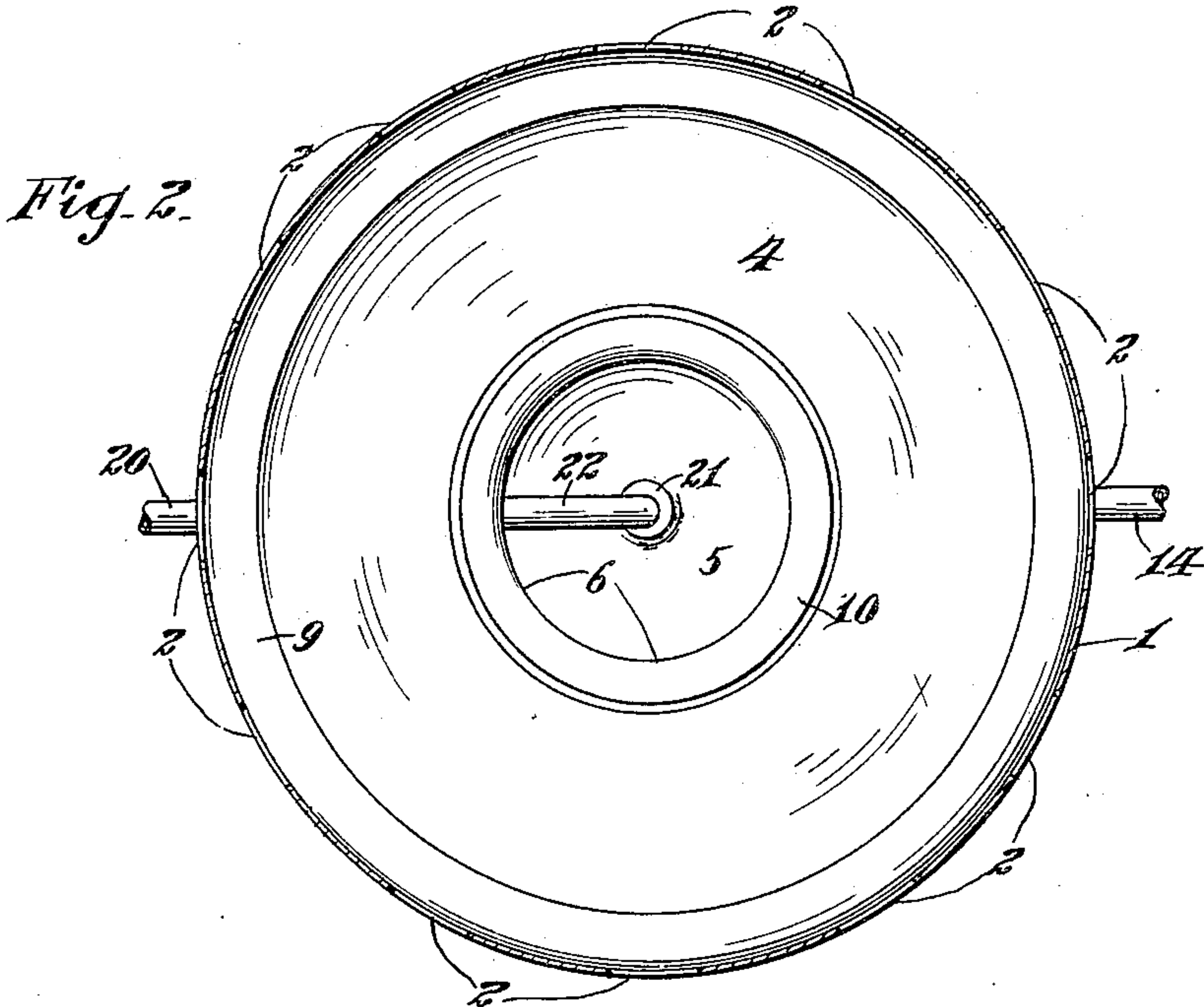


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STEAM GENERATOR.  
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979,356.

Patented Dec. 20, 1910.



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# UNITED STATES PATENT OFFICE.

HERBERT L. THOMPSON, OF ELGIN, ILLINOIS.

STEAM-GENERATOR.

979,356.

Specification of Letters Patent.

Patented Dec. 20, 1910.

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*To all whom it may concern:*

Be it known that I, HERBERT L. THOMPSON, a citizen of the United States, residing at Elgin, county of Kane, and State of Illinois, have invented certain new and useful Improvements in Steam-Generators, of which the following is a specification.

My invention relates to improvements in steam generators, and more particularly to steam generators of the flash boiler type, in which water in circulation is subjected to a large heating surface to rapidly generate steam, the object of the invention being to provide a generator of this type, comprising any number of similar units, which will rapidly generate the steam and superheat the steam to the desired degree before escape.

A further object is to provide improvements of this character of extremely simple construction, which will expose a shallow body of water to a maximum heating surface or surfaces to rapidly generate the steam, and then expose the steam to large heating surfaces, while confined in a narrow space to superheat the steam.

With these and other objects in view, the invention consists in certain novel features of construction, and combinations, and arrangements of parts as will be more fully hereinafter described and pointed out in the claims.

In the accompanying drawings, Figure 1, is a view in vertical section illustrating my improvements. Fig. 2, is a top plan view in section through the boiler casing.

1 represents a boiler casing, having an annular series of openings 2 in its side walls near its upper end, and 3 is a burner of any approved type, to burn oil or gas as may be desired.

4 represents the upper unit of my improved generator, and 5 the lower unit. It will be observed that the upper unit is of a diameter to fit snugly within the casing 1, and is provided with a central opening 6, while the lower unit is of a smaller diameter than is the casing, thus compelling the heat and gases to pass upwardly around the lower unit, thence downward between the two units, thence upwardly through the opening 6 into contact with the upper face of the upper unit and then escape through the perforations 2 as indicated by the arrows.

The upper unit 4 comprises upper and lower truncated conical walls or plates 7 and 8 respectively. The lower wall or plate 8 is made with overlapping upper and lower ends 9 and 10 respectively, bent down upon and securely clamping the edges of the upper plate or wall 7.

The lower wall or plate is made thickest near its edges as shown at 11 forming shoulders, on which the upper plate 7 rests, and provides a narrow annular chamber 12 extending practically from end to end of the unit, and said chamber enlarged at its upper and lower ends by reason of grooves in the lower plate as shown at 13. With the lower enlarged portion 13 of the water chamber in the upper unit, an inlet pipe 14 communicates to supply water from any desired source.

The lower unit 5 comprises two conical plates or walls 15 and 16 respectively, the upper edge of the lower plate 16 being bent over the upper edge of the upper plate 15 to secure the plates together, and this lower plate 16 is made with an annular enlarged shoulder 17, against which the upper plate 15 is tightly held, forming a narrow space or chamber 18 throughout substantially the entire faces of said plates, and the chamber 18 between said plates is enlarged as shown at 19, by reason of an annular groove in the lower plate 16 near its upper edge, and an outlet pipe 20 for steam communicates with this chamber to convey the steam to an engine or other point of discharge.

The upper plate 15 at its center is made with an upwardly projecting internally screw threaded nipple 21, and a pipe 22 connects this nipple 21 with the enlarged portion 13 of the chamber 12.

The operation is as follows: The smoke and gases from the burner 3, pass upwardly into contact with the lower plate 16 of the lower unit 5, thence around the edges of said lower unit and down between said units into contact with the upper plate 15 of the lower unit, and the lower plate 8 of the upper unit, thence through the opening 6 in the upper unit into contact with the upper plate 7 of the upper unit, and thence out through the openings 2 in the casing 1 of the boiler. By this arrangement, it will be noted that all of the plates of the units are subjected to a direct heat from the smoke and gases, and hence will be heated to a high degree.



Water entering the lower portion of the chamber 12 and passing upwardly in a thin or shallow body, will be rapidly generated into steam by reason of its contact with the hot plates 7 and 8, and will pass downward through pipe 22 into the lower end of chamber 18, and thence by reason of the narrow chamber, it will be subjected to intense heat before escaping through pipe 20, and hence will be superheated to the desired degree, and be perfectly dry for effective use.

Various slight changes might be made in the general form and arrangement of parts described without departing from my invention, and hence I do not restrict myself to the precise details set forth, but consider myself at liberty to make such changes and alterations as fairly fall within the spirit and scope of the claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. A steam generator comprising a casing, an upper generating chamber substantially conical in form with a central aperture and arranged with its apex directed downwardly, a lower generating chamber similar in shape to said upper chamber but without a central aperture, said lower chamber being positioned in said casing to leave a space between its outer edges and said casing, means for preventing the passage of gases around the edges of said upper chamber, water and steam connections for and between said chambers, and a burner located under said lower chamber, substantially as described.

2. A steam generator comprising a casing, an upper generating chamber substantially conical in form with a central aperture and located with its apex directed downwardly, a lower generating chamber similar in shape to said upper chamber but without a central aperture, said lower chamber being positioned in said casing to leave a space between its outer edges and said casing, means for preventing the passage of gases around the edges of said upper chamber, a water supply connection with the lower portion of said upper chamber, a connection between the upper portion of said upper chamber and the lower portion of said lower chamber, and a burner located under said lower chamber, substantially as described.

3. A steam generator comprising a casing provided with discharge openings in the upper portion of its walls, an upper generating chamber substantially conical in form with a central aperture, snugly fitting said casing and arranged with its apex directed downwardly, a lower generating chamber similar in shape to said upper chamber but without a central aperture, said lower chamber being positioned in said casing to leave a space between its outer edges and said casing, water and steam connections for and

between said chambers, and a burner located under said lower chamber, substantially as described.

4. A steam generator comprising a casing provided with discharge openings in the upper portion of its walls thereof, an upper generating chamber substantially conical in form with a central aperture, snugly fitting said casing and arranged with its apex directed downwardly, a lower generating chamber similar in shape to said upper chamber but without a central aperture, said lower chamber being positioned in said casing to leave a space between its outer edges and said casing, a water supply connection with the lower portion of said upper chamber, a connection between the upper portion of said upper chamber and the lower portion of said lower chamber, a steam connection with the upper portion of said lower chamber, and a burner located under said lower chamber, substantially as described.

5. In a steam generator, the combination with a casing, of two steam generating units of conical form located one above the other and providing conical chambers, the upper unit having a central opening, an inlet pipe communicating with the lower end of the chamber of the upper unit, a pipe connecting the upper end of the chamber in the upper unit with the lower portion of the chamber in the lower unit, and an outlet pipe communicating with the upper portion of the chamber of the lower unit.

6. A steam generator comprising two units, the upper unit consisting of two truncated conical plates, the ends of one of said plates bent over the ends of the other plate forming a steam generating chamber between said plates, the lower unit comprising two conical plates, the upper edge of one conical plate bent over the edge of the other plate forming a steam superheating chamber between said plates, a water inlet pipe communicating with the chamber in the upper unit, a pipe connecting the upper portion of the chamber in the upper unit, with the lower portion of the chamber in the upper unit, and a steam outlet pipe communicating with the upper portion of the chamber in the lower unit.

7. In a steam generator, the combination with a casing, of two steam generating units of conical form located one above the other and providing conical chambers, the upper unit having a central opening, an inlet pipe communicating with the lower end of the chamber of the upper unit, a pipe connecting with the upper end of the chamber in the upper unit with the lower portion of the chamber in the lower unit, and an outlet pipe communicating with the upper portion of the chamber of the lower unit, and a burner located in said casing below the lower unit, and said lower unit of a diam-



eter less than the diameter of the casing, whereby the smoke and gases from said burner will pass around said lower unit and through the upper unit.

- 5 8. In a steam generator, the combination with a cylindrical casing having perforations in its wall near its upper end, a steam generating unit comprising two conical plates forming a chamber between them and  
10 snugly fitting within said casing below the perforations, and said upper unit having a central opening, a lower conical unit comprising conical plates forming a chamber between them, said lower unit of less diam-  
15 eter than the casing, whereby the smoke and gases will pass around the same and up

through the upper unit, a water supply pipe communicating with the lower portion of the chamber in the upper unit, a pipe connecting the upper portion of the chamber in 20 the upper unit with the lower portion of the chamber in the lower unit, and a steam outlet pipe communicating with the upper portion of the chamber in the lower unit.

In testimony whereof I have signed my 25 name to this specification in the presence of two subscribing witnesses.

HERBERT L. THOMPSON.

Witnesses:

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