Aug. 14, 1928.

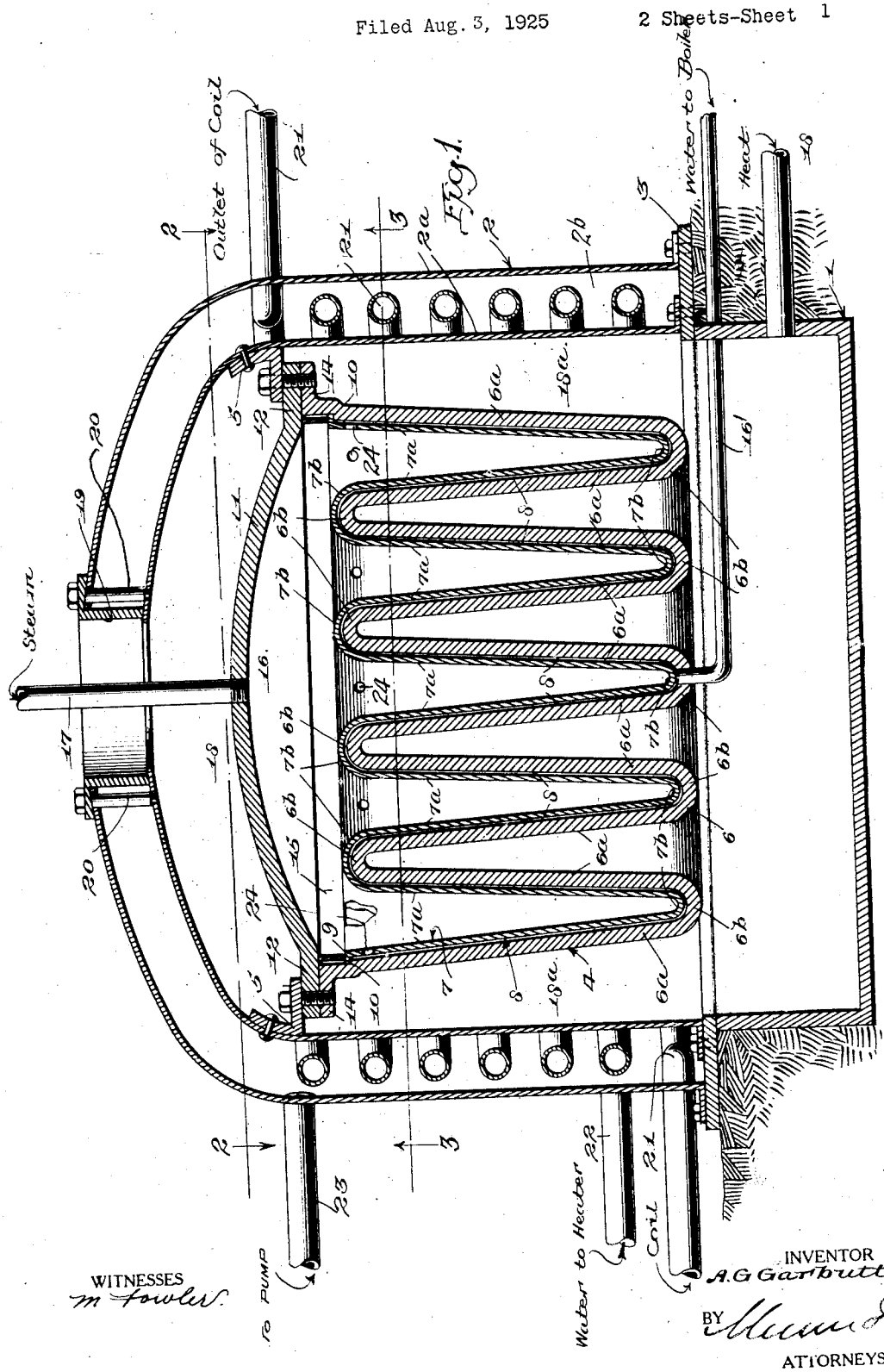
1,680,608

A. G. GARBUTT

FLASH BOILER

Filed Aug. 3, 1925

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 2.

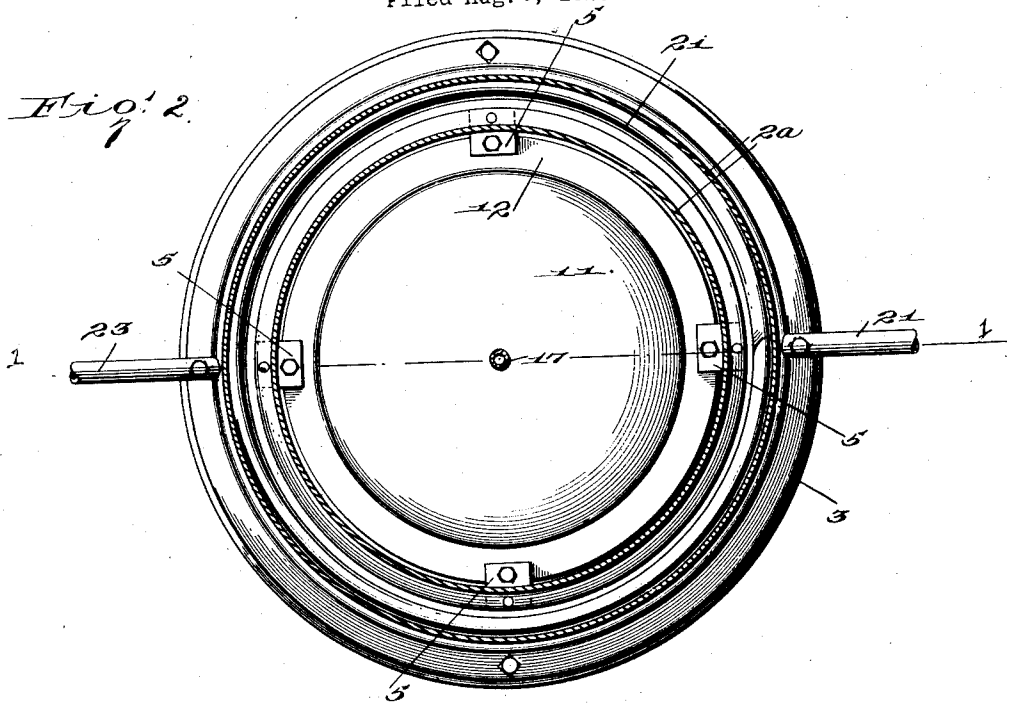
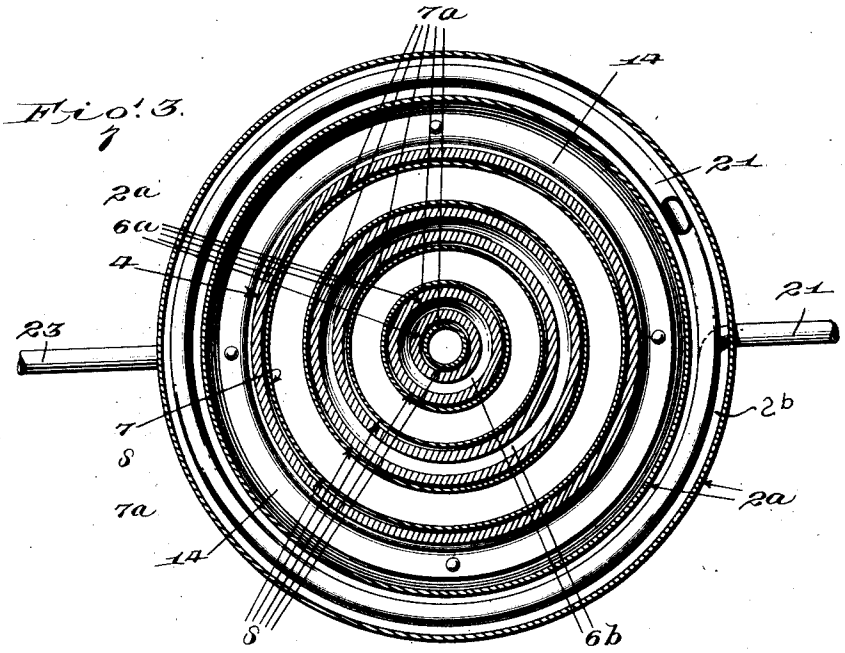


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

ALLIE GLENN GARBUTT, OF VALDOSTA, GEORGIA.

FLASH BOILER.

Application filed August 3, 1925. Serial No. 47,957.

This invention relates to an improved flash boiler which is capable of producing in an economical and efficient manner a high steam pressure from a relatively small amount of water.

A further object of the invention resides in the provision of a device of this character which is of simple and durable construction, easily taken apart for purposes of cleaning, replacement and repair, and comparatively inexpensive to manufacture.

Other objects and advantages reside in certain novel features of the construction, arrangement and combination of parts which will be hereinafter more fully described and particularly pointed out in the appended claims, reference being had to the accompanying drawings forming a part of this specification, and in which:

Figure 1 is a view in transverse vertical section on line 1—1 of Figure 2;

Figure 2 is a view in horizontal section on line 2—2 of Figure 1, and

Figure 3 is a similar view on line 3—3 of Figure 1.

Referring to the drawings the numeral 1 designates an annular base which also provides a fire chamber on which a double walled casing 2 is mounted, the casing 2 being secured to a supporting plate 3 suitably fixed to the base.

A steam producer 4 which operates to flash the water supplied thereto into steam is suspended by angle brackets 5 on the casing 2. The steam producer comprises an outer heavy wall 6 made of spaced annular sections 6^a, adjacent sections 6^a being oppositely inclined and being connected at their ends as at 6^b. An inner wall 7 of corresponding formation is arranged adjacent to but spaced from the wall 6 and with the outer wall defines a thin sinuous water space 8, the wall 7 also having oppositely inclined walls 7^a connected at their ends by curved connecting portions 7^b. The wall 7 has outwardly directed lugs 9 which rest on an annular ledge 10 formed on the wall 6 so as to support the inner wall on the outer wall in spaced relation thereto. A dome or top plate 11 is provided and has a peripheral flange 12 bolted to an outwardly directed flange 14 provided on the outer wall 6. The dome 11 presses down on a ring 15 which engages the lugs 9 to prevent upward displacement of the inner wall 7. The dome 11 with the ring 15 and the inner wall 7 defines a steam space 16.

Water is supplied to the water space 8 by means of a pipe 16′ which extends through the fire box and is connected to the outer wall 6 at its center. The steam may be taken from the space 16 through a pipe 17.

Heat from an oil burner, a gas burner or from any other suitable source is supplied to the fire box through a conduit 18 and the hot gases so supplied pass under the outer wall 6 into direct contact with the sections 6^a and connecting portions 6^b of said outer wall. These gases then pass through the fire spaces 18^a between the steam producer 6 and the casing 2 and pass out through a sleeve 19 which defines an exit or flue through the casing 2. Stay bolts or other suitable fastening devices 20 hold the sleeve 19 in position and aid in properly spacing the walls 2^a of the double walled casing 2.

In the space 2^b defined between the walls 2^a an auxiliary heater is provided and comprises a coil 21 receiving heat or hot gases from the fire box, the flue, or from an independent source and serving to heat water supplied to the space 2^b by means of a pipe 22. A pipe 23 leads from the upper portion of the space 2^b to the suction of a pump used to force water through the pipe 16′ to the steam producer. In this way the feed water is preheated and while hot is supplied to the water space 8 where it is spread out as a thin film and subjected to intense heat to cause it to flash instantly into steam which issues from between the walls at 24 into the steam space 16. Hot dry steam is produced in this way during the sinuous travel of the thin film in rising and falling sheets from the center to the periphery of the producer and high economy in the use of water is effected.

In small boilers stay bolts are entirely eliminated in the steam producer but in large boilers stay bolts may be extended from the dome 11 to the walls 6 and 7. With the use of such stay bolts a boiler of any desired capacity may be produced.

The exhaust gases of an automobile engine or other engine may be utilized as a source of heat by coupling the exhaust to the conduit 18 and coil 21.

I claim:

1. A flash boiler of the character described having a steam producer comprising a plu-

rality of concentric annular sections, connections between the alternate ends of adjacent sections forming a producer zigzag in cross section, said sections and said connections being made up of closely spaced walls defining a sinuous water space through which the water travels spread out into a thin film and in the form of rising and falling sheets.

2. A flash boiler of the character described having a steam producer comprising a plurality of concentric annular sections, connections between the alternate ends of adjacent sections forming a producer zigzag in cross section, said sections and said connections being made up of closely spaced walls defining a sinuous water space through which the water travels spread out into a thin film and in the form of rising and falling sheets, adjacent annular sections being oppositely inclined.

3. A flash boiler of the character described, having a steam producer comprising a plurality of concentric annular sections, connections between the alternate ends of adjacent sections forming a producer zigzag in cross section, said sections and said connections being made up of closely spaced walls defining a sinuous water space through which the water travels spread out in a thin film and in the form of rising and falling sheets, means co-acting with the outer wall of the outermost annular section to define a steam space, the inner wall of the outermost annular section being apertured to define a steam outlet from the water space.

4. A flash boiler of the class described having a steam producer comprising spaced walls defining a water space and made up of annular sections, adjacent sections being connected at their alternate ends, and a dome co-acting with the walls to define a steam space, and means for supplying water to the water space there being a steam outlet from the water space to the steam space.

5. A flash boiler of the character described having a steam producer comprising spaced walls defining a water space and made up of annular sections, adjacent sections being connected at their alternate ends, and a dome co-acting with the walls to define a steam space and means for supplying water to the center of the water space, there being a peripheral steam outlet from the water space to the steam space.

ALLIE GLENN GARBUTT.