(No Model.)

W. P THOMPSON.

SECTIONAL STEAM GENERATOR.

No. 281,946. Patented July 24, 1883.

Fig. 1.

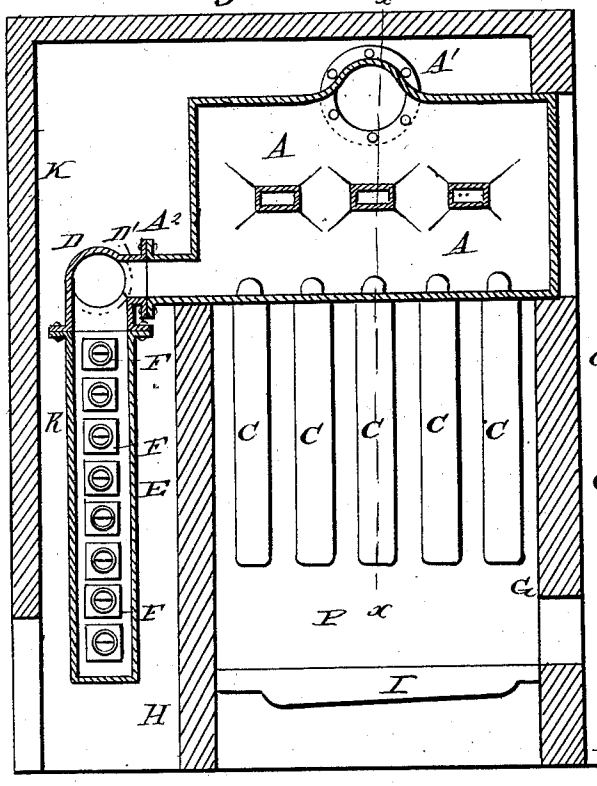


Fig. 2.

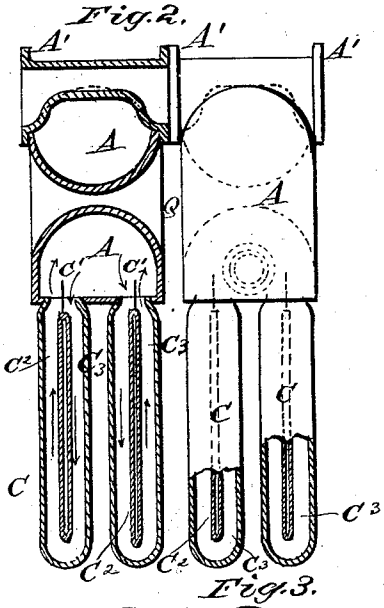


Fig. 3.

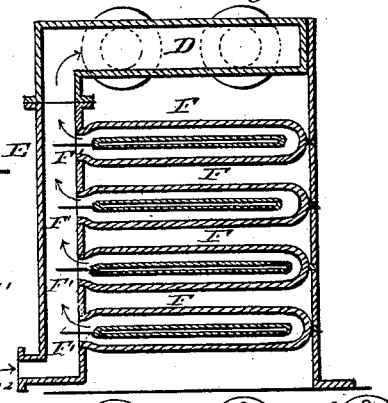


Fig. 4.

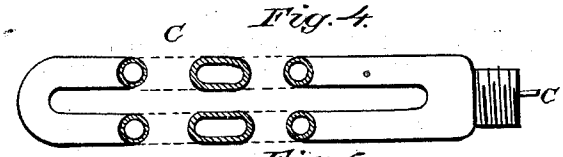


Fig. 5.

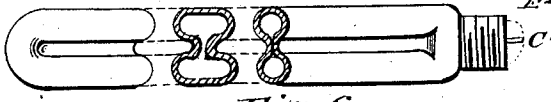


Fig. 6.

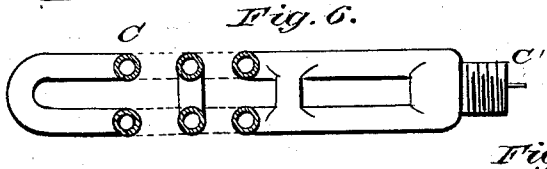
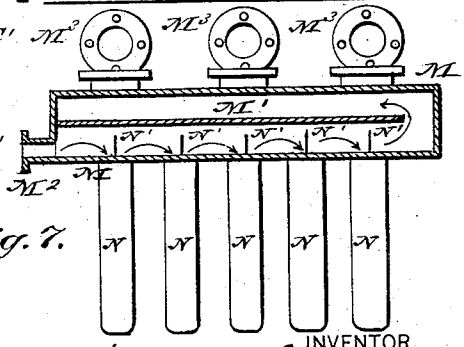


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM P. THOMPSON, OF PHILADELPHIA, PENNSYLVANIA.

SECTIONAL STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 281,946, dated July 24, 1883.

Application filed March 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. THOMPSON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Sectional Steam-Generators; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof as to enable others skilled in the art to make and use the said invention.

This invention relates to that class of sectional steam-boilers wherein water is circulated through tubes placed in a furnace or heating-chamber, and in which the direction of the circulation is to a greater or less degree governed by partitions in the tubes and vessels forming the generator, and has for its object the avoidance of unnecessary joints, liable to leak from strains resulting from unequal or local expansion, and at the same time an increased durability, attended with a reduced cost of production.

This invention, to effect these objects, may be briefly stated to consist of a series of looped or twin or multiple tubes, similar to those employed for steam-heating purposes, and known in the arts as "Bundy's Radiators," (and fully described in Letters Patent of the United States, numbered 130,013, and dated July 30, 1872,) combined with vessels, into which they are inserted, and in which partitions are placed, so as to direct or control the circulation, and so arranged in the furnace or heating-chamber that one or more channels of each tube shall receive more heat than another, thus promoting an ascending circulation in one channel and a descending circulation in another.

I will now proceed to particularly describe the mode of making and using the said invention, referring in so doing to the drawings annexed and the letters of reference marked thereon.

Figure 1 shows a vertical lengthwise section; Fig. 2, a transverse section; Fig. 3, a section made in the plane *x x* in Fig. 1. Figs. 4, 5, and 6 show tubes detached in partial section, and Fig. 7 a section of a modified form of water-pipe.

The same letters of reference apply to the same parts in the several figures.

A A represent tanks, which may be united by flanged joints A′ at the upper part, and at the lower part by flanged necks A^2, to a pipe, D, by flanged nozzles or branches D′, formed thereon. The several flanged joints are united and held in the usual manner by screw-bolts and nuts.

C are looped twin or partitioned tubes screwed into apertures in two rows in the bottom of the tank A. (The form of these tubes C is illustrated in Figs. 4, 5, and 6.) The partition C′ of the tube C extends into the tank A and serves to prevent the ascending current, which rises from the channel C^2, nearest the flue, and therefore the hottest, from interfering with the descending current in the other channel, C^3, farther from the flue, and therefore the cooler. When the boiler-tank A and tubes C are supplied with water and heat is applied, a circulation of water in the tubes C and tank A ensues.

Attached to the pipe D is another pipe, E, into the side of which are inserted twin or looped pipes F, having partitions F′, which cause the water forced in at the inlet E to circulate in the direction shown by the arrows in Fig. 3, and, finally, such water passes through the pipe D into the tanks A.

Instead of the pipes D and E being employed, a horizontal pipe, M, may be used, as shown in Fig. 7, into which twin pipes N are screwed, having partitions N′ extending into the pipe M; and above these partitions N′ is a horizontal partition extending from the end at which the feed-inlet M^2 is located nearly to the opposite end of the pipe M. The combined effect of the partitions N′ and partition M′ is to cause water supplied at the feed-pipe M to pass in the direction indicated by the arrows.

The pipe M, when used, is attached by flanged elbows M^3 to the flanged nozzles A^2 of the tanks A.

The boiler, when in use, is set in a furnace-chamber, P, above a grate, I, between front and rear walls, G and H, and the draft passes upward between the tanks A through the flues Q, after which, meeting the roof J, it descends in a chamber, R, formed of walls H and K, and containing the pipe D or M and tube F or N, heats the inflowing water contained in this part of the apparatus, and a cir-

culation ensues in the water, tending to keep the interior surface of the boiler clean.

I am aware that sectional steam-generators having inverted siphon-tubes with limbs of unequal length inserted in tanks have been made for the purpose of causing circulation of the water therein contained; also, that sectional boilers having suspended tubes provided with internal circulating-guides inserted in tanks arranged in parallel position with intervening draft-flues have been made; and, further, that double or twin or looped tubes have been made for heating by radiation, similar in construction to those described as used in my invention. Neither of these do I claim; but,

Having described my invention and the mode of making the same, what I claim is—

1. In a sectional steam-generator consisting of tanks having inverted siphon or looped or twin tubes attached thereto by single joints and extending downwardly therefrom into a heating or furnace chamber, the combination of said tubes, formed each with channels of equal vertical height with said tanks, and so combined with and arranged in relation to the flues Q as to expose one channel of each of such tubes to greater heat than the other channel for the purpose of causing circulation of the fluid contents thereof, substantially as set forth.

2. In a sectional steam-generator consisting of tanks having looped or twin tubes attached thereto by single joints and extending downwardly therefrom into a heated chamber or furnace in such relation to the flues that one channel of each looped tube is exposed to greater heat than the other, the combination of said tanks and looped tubes with a partition extending upwardly from said tubes in the tanks, between the mouths of the channels of said tubes, for the purpose of preventing interference between the ascending and descending currents, substantially as and for the purpose set forth.

3. The combination of a boiler composed of twin tubes united by single joints to tanks and exposed to heat in a furnace, with a sectional heater or economizer located in the flue leading to the chimney, consisting of twin tubes inserted in a feed-supply pipe, and provided with guiding-partitions directing the course of the feed-water through a long distance for the purpose of using the waste heat of escaping gases, substantially as set forth and described.

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