

(No Model.)

G. H. TAYLOR.
STEAM GENERATOR.

No. 429,976.

Patented June 10, 1890.

Fig. 1.

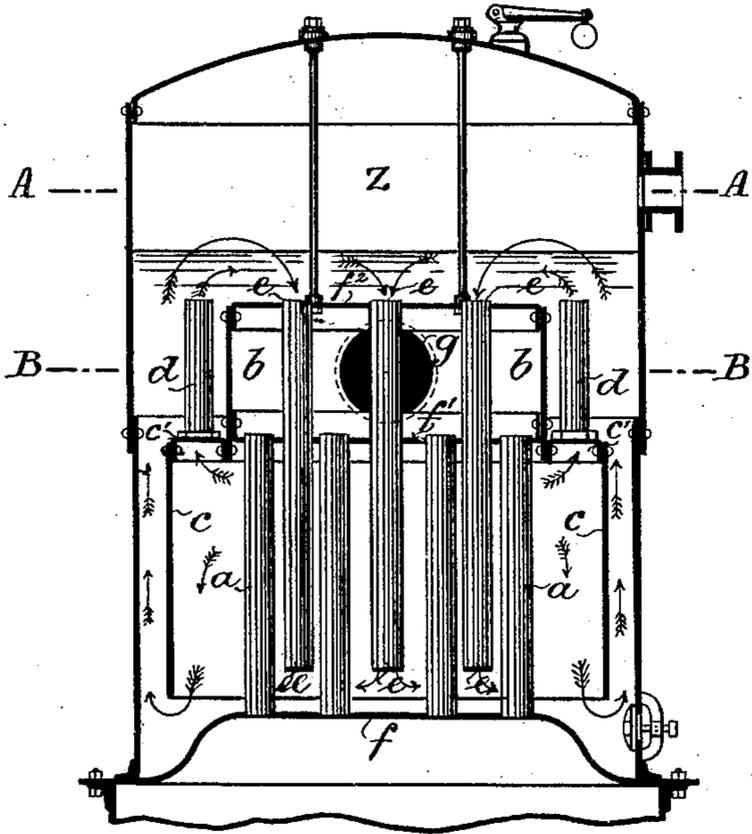


Fig. 2.

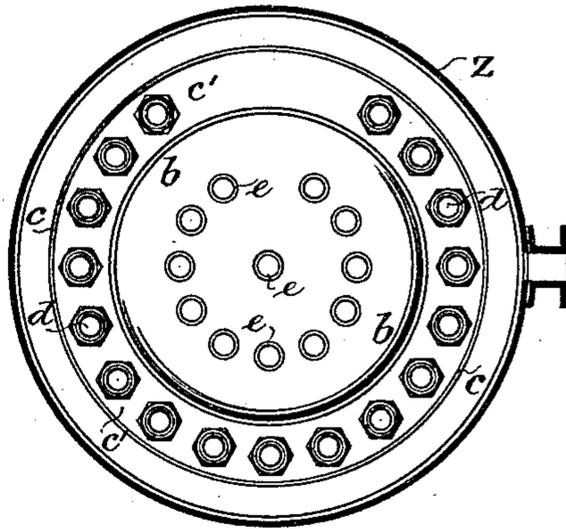
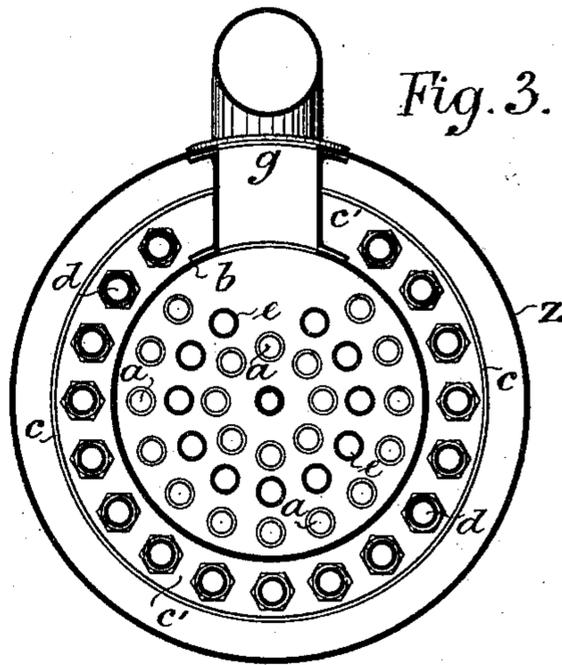


Fig. 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE HENRY TAYLOR, OF LIVERPOOL, COUNTY OF LANCASTER,
ENGLAND.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 429,976, dated June 10, 1890.

Application filed February 25, 1890. Serial No. 341,779. (No model.) Patented in France March 29, 1889, No. 198,216; in Switzerland April 3, 1889, No. 805; in Germany April 5, 1889, No. 49,337; in Belgium April 5, 1889, No. 85,696; in Spain April 24, 1889, No. 9,509; in Italy May 18, 1889, No. 25,462/9, and in Canada May 20, 1889, No. 32,579.

To all whom it may concern:

Be it known that I, GEORGE HENRY TAYLOR, a subject of the Queen of Great Britain and Ireland, residing in Liverpool, county of Lancaster, England, have invented certain new and useful Improvements in Steam-Generators, (for which I have obtained patents in France, dated March 29, 1889, No. 198,216; in Germany, dated April 5, 1889, No. 49,337; in Switzerland, dated April 3, 1889, No. 805; in Belgium, dated April 5, 1889, No. 85,696; in Spain, dated April 24, 1889, No. 9,509; in Italy, dated May 18, 1889, No. 25,462/9, and in Canada, dated May 20, 1889, No. 32,579,) of which the following is a specification.

The object of this invention is to so improve steam-generators as to render them free from "foaming" and "priming," and by creating active circulation within the generator to prevent sediment forming. My construction of steam-generators also permits of the parts being readily cleaned when necessary.

The improved steam-generator is illustrated by the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section; Fig. 2, a cross-section on the line A A of Fig. 1, and Fig. 3 a cross-section on the line B B of Fig. 1.

Z is the shell of the generator. *a a* are the fire-tubes therein conveying the heated gases from the furnace to the cylindrical drum or waste-heat box *b*, which is situated below the water-level. Attached to this waste-heat box is a cylindrical metallic hood *c*, which surrounds the fire-tubes *a a* and the lower portion of the water-circulating tubes *e e*. The hood, where bolted to the waste-heat box *b*, is provided with a flat rim *c'*, sufficiently wide to permit of the relief or anti-priming tubes *d d* being secured thereto. *e e* are the water-circulating tubes carried by the upper plate *f²* of the waste-heat box and passing through the lower plate *f'*. The free ends of these tubes pass downward and terminate a short distance above the tube-plate *f*. The heated gases, as they pass up the fire-tubes *a a* into

the waste-heat box *b*, impart heat to the surrounding water and pass away through the exit-pipe *g*, and may be utilized to heat the feed-water or for other convenient purpose.

The circulation of the water is shown by the arrows in Fig. 1. By contact with the tube-plates *f* and *f'* and fire-tubes *a a* the water becomes heated, and, escaping from within the cylindrical hood *c*, rises up the space between the said hood and the walls of the generator. After becoming cooled it descends through the water-circulating tubes *e e* and returns into the cylindrical hood, where it again becomes heated and a like circulation takes place. In order to reduce the energy of this circulation or ebullition, and thus prevent priming, the relief-tubes *d d* are provided, so as to allow some of the heated water to pass upward through them.

What I claim, and desire to secure by Letters Patent, is—

1. In a steam-generator, the combination, with the lower tube-plate *f* and the waste-heat box *b*, situated below the water-level and provided with exit-pipe *g*, of the fire-tubes *a*, extended downward from the bottom of said box to the tube-plate *f*, and the circulating-pipes *e*, passed through the waste-heat box and extended down to within a short distance of the lower tube-plate, substantially as described.

2. In a steam-generator having a waste-heat box *b*, situated below the water-level and provided with fire-tubes *a* and exit-pipe *g*, the combination therewith of a metallic cylindrical hood *c*, bolted to said waste-heat box and surrounding the circulating-tubes *e*, substantially as described.

3. In a steam-generator having a waste-heat box *b*, situated below the water-level and provided with fire-tubes *a* and exit pipe *g*, the combination therewith of relief or anti-priming-tubes *d*, carried by the rim *c'* of the metallic cylindrical hood *c*, substantially as described.

4. A steam-generator comprising as its essential features a metallic cylindrical hood *c*,

carrying relief or anti-priming tubes *d*, fire-
tubes *a*, surrounded by said hood, and a waste-
heat box carrying water-circulating tubes *e*,
extending downward into the hood *c*, and an
5 exit-pipe *g*, all substantially as shown and
described.

In witness whereof I have hereunto signed

my name in the presence of two subscribing
witnesses.

GEORGE HENRY TAYLOR.

Witnesses:

FRANCIS GILMOUR,
HARRY CREBBIN.