

(No Model.)

J. ROBB.
STEAM GENERATOR.

No. 321,251.

Patented June 30, 1885.

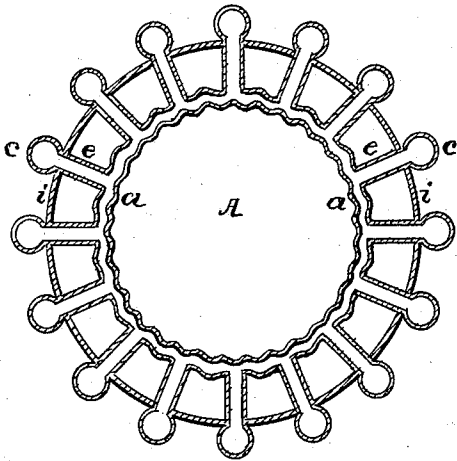


Fig. 2.

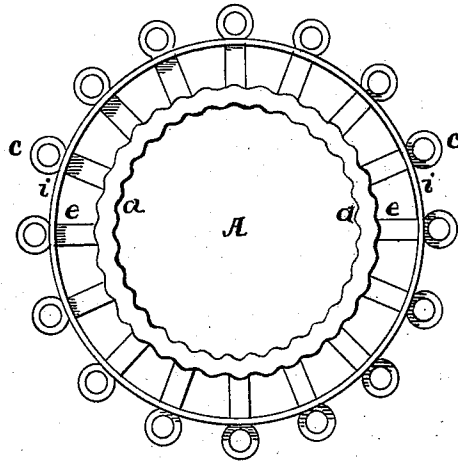
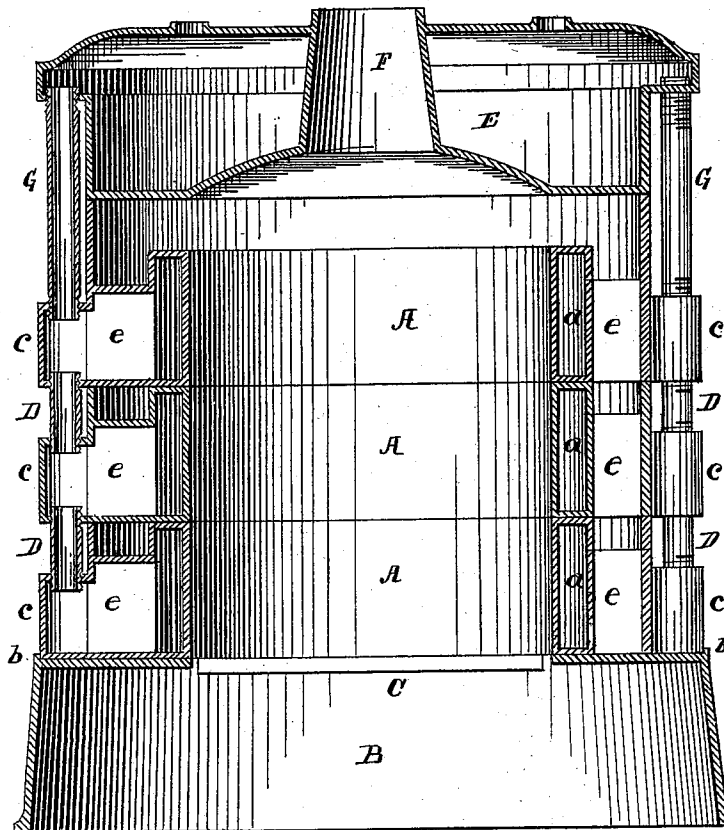


Fig. 1.



Witnesses:

Sayton A. Spyle
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Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN ROBB, OF AKRON, OHIO.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 321,251, dated June 30, 1885.

Application filed March 14, 1885. (No model.)

To all whom it may concern:

Be it known that I, JOHN ROBB, a citizen of the United States, and a resident of the city of Akron, in the county of Summit and State of Ohio, have invented a new and useful Improvement in Steam-Generators, of which the following is a specification.

My invention has relation to improvements in that class of steam-generators in which the boiler is composed of a series of hollow horizontal annular cases of cast-iron united together, the whole constituting an annular water-space surrounding a central fire-pot.

The objects of my invention are, first, to increase the heating-surface; second, to utilize heat which by devices now in use is lost; third, to prevent leakage at the points where the cases are united; fourth, to simplify the method of uniting the cases, and, fifth, to produce a generator which shall be compact, durable, simple in construction, and give the greatest effect from the fuel used.

My invention consists in the devices illustrated in the accompanying drawings, as hereinafter described, and as specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan of one of the annular cases of which my improved generator is composed; Fig. 2, a horizontal section of the same at the line *xx* of Fig. 3; Fig. 3, a vertical section of a generator at the line *yy* of Fig. 1, the outer case or shell being omitted to avoid confusion of lines.

The case A consists of one entire casting, embodying an inner hollow central shell, *a*, closed at top and bottom, from the outer wall of which extend hollow radial arms *e e*, terminating in enlarged hollow cylindrical ends *c c*, the open spaces in all of which parts unite. Immediately inside of the ends *c c*, and embracing the arms *e e*, is a thin solid vertical shell, *i*. The generator rests on a circular cast base, B, which constitutes an ash-pit and a support for the grate C, Fig. 3; but as no specific claim is made thereon, further detailed description of it is omitted, except that it has about its upper outer edge a raised rim, *b*, to retain the generator in position. Upon this base are placed three or more of the cases A before described, which are united in the fol-

lowing manner: In the top of the ends *c c* of the lower case A, and in the top and bottom of the ends *c c* of the two succeeding cases, are screw-threaded holes arranged to register accurately. The cases are connected by short screw-threaded tubes D D, termed "nipples," which are turned into the holes in the ends *c c* of the first case further than they are designed to be left, and then turned back until they enter and connect the next case, thereby uniting the interiors of the several cases. By this construction the use of gaskets, with their liability to leak, is avoided, the joints are perfectly tight, and the parts can be easily separated and replaced. The inside of the shells *a a* constitutes the fire-pot, and may be lined, if desired. The flame, smoke, and heat, rising, passes over the upper edge of the top shell *a*, and thence downward through the space between the shells *i a* and arms *e*, and thence upward outside of the shell *i*, and between it and an outer case of sheet-iron, which incloses the cylindrical ends *c c*, and which, for the reason hereinbefore stated, is not shown. With the exception of the upper case A the top and bottom of the shells *i a* are in the same planes. The arms *e* are not as high, leaving a space between the top of each and the bottom of the succeeding one above, through which the heat of the down-draft circulates. The cylindrical ends *c c* are still shorter, to afford space between them to use tongs to insert the nipples. In the upper case A the shell *i* projects above the plane of the shell *a*, and upon this rests the top case, E, which is a shallow closed cylinder with an overhanging hollow cornice, provided on its under side with screw-threaded holes corresponding with the holes in the ends *c c* of the case A immediately beneath, and with which they are connected by nipples G G. The bottom of the case E is crowning toward the center, and through it passes a direct-draft flue, F, to be used or closed, as desired.

It is obvious that one of the cases A can have a space for a firing-door left therein; but as that is a matter of mechanical construction and not an element of my invention, it has not been shown in the drawings.

I claim as my invention—

1. In a steam-generator, the case A, consist-

ing of the annular hollow shell *a*, with hollow radial arms *e e*, connecting with and projecting therefrom, terminating in hollow cylindrical ends *e e*, and the annular solid shell *i*, embracing said arms between their ends, all constructed and arranged substantially as and for the purpose hereinbefore set forth.

2. In a steam-generator, the combination of a number of cases placed one on another, each of said cases consisting of an annular hollow central shell with hollow radial arms projecting therefrom, and having an annular vertical shell embracing said arms between the ends thereof, said cases being united by screw-threaded nipples entering adjacent faces of the arms near their outer extremities, substantially as shown, and for the purpose specified.

3. The herein-described steam-generator, consisting of the cases *A A A*, each having radial arms *e e*, shell *i*, and cylindrical ends *e e*, united by nipples *D D*, the whole resting on the base *B*, and surmounted by the case having an overhanging cornice united with the upper case *A* by nipples *G G*, and provided with the flue *F*, all constructed and arranged substantially as shown, and for the purpose specified.

In testimony that I claim the foregoing I have hereunto set my hand this 11th day of March, A. D. 1885.

JOHN ROBB.

Witnesses:

C. P. HUMPHREY,
E. W. STUART.