S. A. SMITH.

Steam Generating Apparatus.

No. 57,643. Patented Aug. 28, 1866.

Fig. 4.

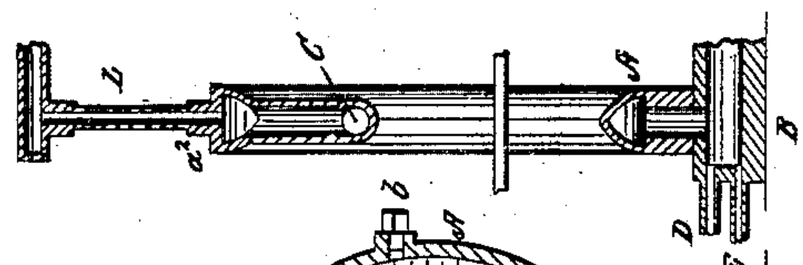


Fig. 3.

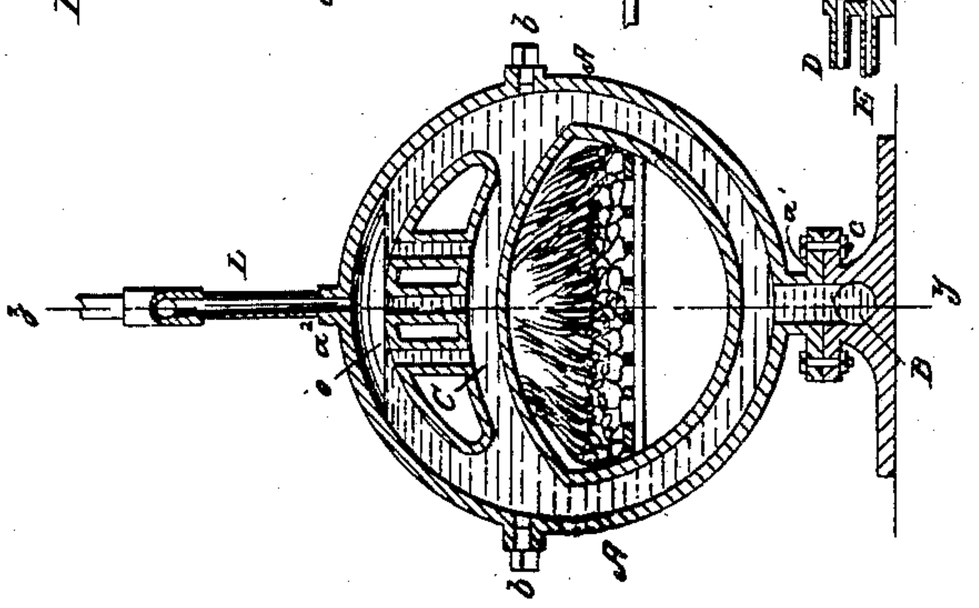


Fig. 2.

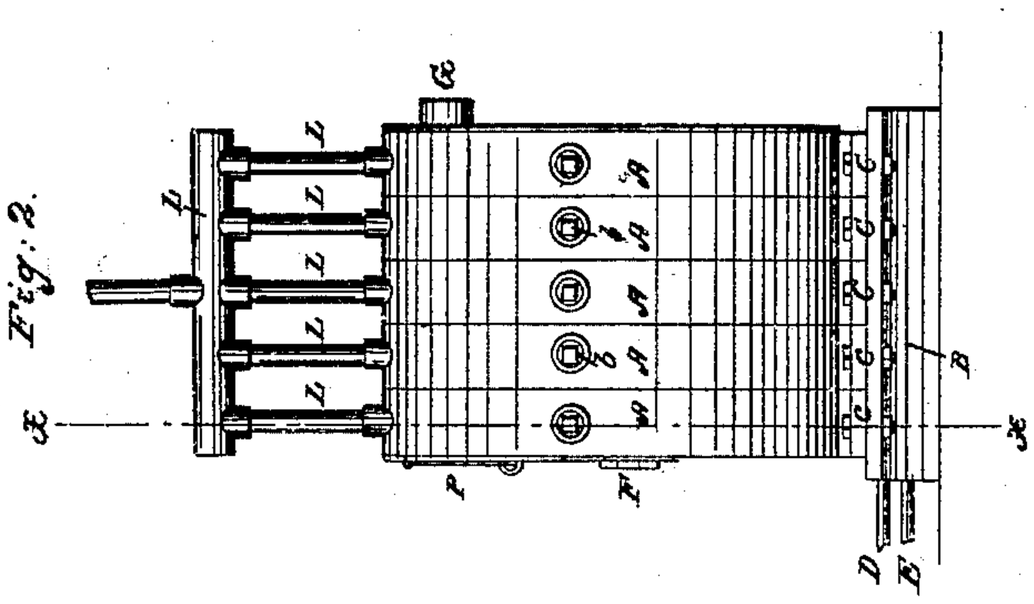
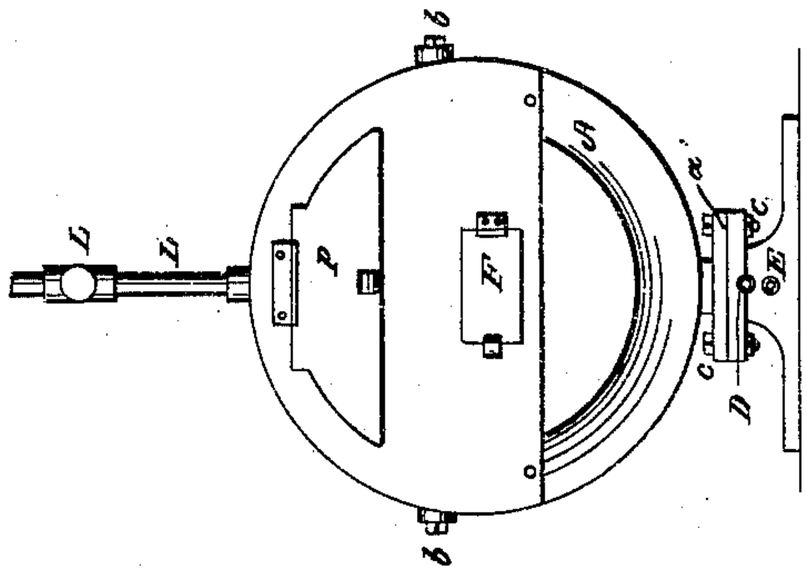


Fig. 1.



Witnesses:
Jno. Lyng
Wm. Trevier.

Inventor:
S. A. Smith
per Munn & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

SCOTT A. SMITH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF, G. V. CRESSON, AND GEORGE W. HUBBARD, OF SAME PLACE.

STEAM-GENERATING APPARATUS.

Specification forming part of Letters Patent No. **57,643**, dated August 28, 1866.

To all whom it may concern:

Be it known that I, SCOTT A. SMITH, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Improvement in Steam-Generating Apparatus; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a front elevation of one of the generating-vessels with steam-pipes and receiver. Fig. 2 is a side view of a series of the vessels, showing the mode of connecting them together. Fig. 3 is a vertical section on the line *x* of Fig. 2. Fig. 4 is a vertical section of the same on the line *y y*, Fig. 3.

Similar letters of reference indicate like parts.

The object of this invention is to produce a cast-iron steam-generator which shall combine features of safety with great economy in cost, durability, and efficiency in operation, and also be so simple in the general nature of its construction that it shall be better adapted to general use than other forms of steam generators or boilers.

This invention consists in the use of a series of annular steam-generating vessels combined with a bottom connecting-reservoir, without reference to any special method of uniting the two, or to any particular form for the body of the vessels themselves or of the bottom reservoir, as any slight alteration in these would not change the character of the invention.

A is an annular vessel, cast in the form shown, having a water communication with the reservoir B through an opening in the base *a'*, meeting a corresponding opening in the reservoir B. They are united by bolts *c' c'*.

a^2 is the steam-opening at top, to which the steam-pipe L is attached, as shown in the drawings. Openings are provided at *b' b'*, through which an instrument may be introduced to remove any deposit which may collect inside of cross-pipe C, which extends from side to side of each vessel A, and is connected with the upper part of said vessel A by small vertical pipes. Such upper part forms the steam-space of the vessel. These openings may be closed with screw-plugs. A series of such vessels A is formed by placing them side by side, as shown in Fig. 2, the space inclosed by them forming a fire-chamber below and flue-space above, the latter communicating with the exit-pipe G. The pipes marked L connect the different vessels together above. The water-line is indicated by the letter O. The position of the grate is indicated in Fig. 3.

D is a pipe, through which water is fed into the reservoir B near its top, permitting sediment to settle on the bottom, to be blown off through the pipe E. The fire-door is at F.

G is the opening for the smoke-pipe. The letter P designates a door, which closes the flue-spaces seen in Fig. 3 above the cross-pipe *c*. The generator, as shown, is arranged for the fire to act only upon the inner surfaces; but by surrounding it with brick or sheet-iron work the heat may be allowed to come into contact with portions of the exterior surface.

The back end of the generator can be closed with an iron plate lined with fire-clay or bricks, or with a second plate, leaving an air-space between them. The sides and top may be covered with sheet-iron. The front end may be closed in the same manner as the back end, but having a fire-door at F and a door in the top at P, through which the upper portions or flues of the vessels can be reached with a brush for removing dust, &c., from the heating-surfaces. An opening is left below the grates for removing the ashes.

All strain upon the vessels or the joints is prevented by this method of connecting separate vessels of a steam-generating apparatus rigidly to a bottom reservoir, thus leaving them free to expand and contract from their point of junction with the reservoir to their tops, while the reservoir serves at the same time as a permanent base for supporting the vessels always in the same relative position to each other, irrespective of any unevenness which may exist or occur in the floor or foundation upon which the generator may be placed.

Such form is given to all parts of the generator that when the water is blown off through the pipe E all loose sediment will find its way unobstructedly to the reservoir B, and thence out through the pipe E.

Comparative safety results from the fact that the giving way of either of the annular vessels would instantly liberate but a small quantity of steam to cause injury. The small diameter of the different parts gives great strength, and the general construction is such that the vessels are relieved from undue strain. This generator can also be placed upon a wooden floor without danger from heat radiated downward from the grate.

The separate parts are easily made, and but little labor is required in putting them together.

Durability is secured by unrestrained expansion and contraction, by freedom from sediment, and by removing the joints away from the fire.

Efficiency is obtained by the facility with which good conducting-surfaces are maintained, and, as the cost of construction is comparatively small, a liberal amount of heating-surface can be allowed in proportion to the work to be done.

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

The method, substantially as described, of constructing a steam-generating apparatus by combining a series of annular generating-vessels with a bottom connecting-reservoir.

The above specification of my invention signed by me this 11th day of December, 1865.

SCOTT A. SMITH.

Witnesses:

A. W. GOODELL,

CHAS. M. BANKS.