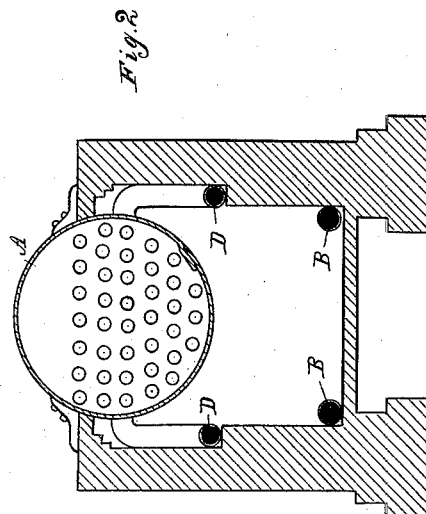
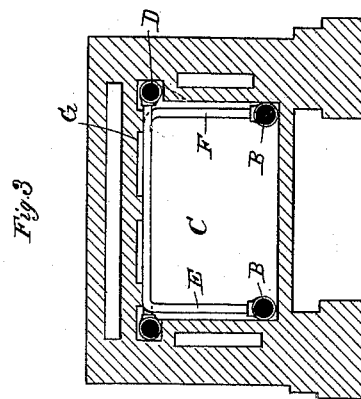
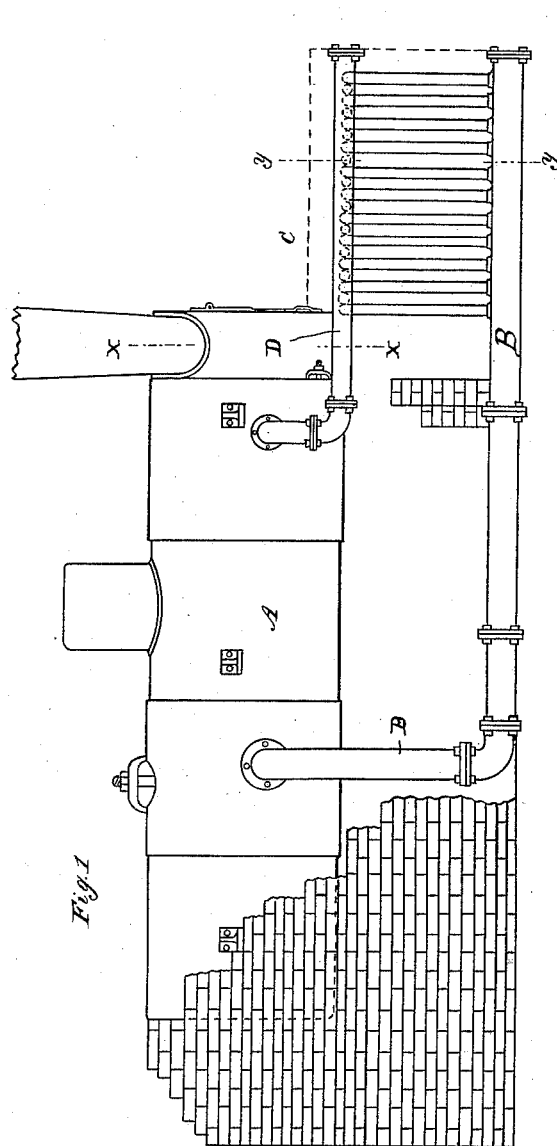


(No Model.)

T. CRANEY.
STEAM GENERATOR.

No. 344,635.

Patented June 29, 1886.



Attest:
John Schuman.
W. Sprague

Inventor:
Thomas Craney.
by his Atty
W. Sprague

UNITED STATES PATENT OFFICE.

THOMAS CRANEY, OF BAY CITY, MICHIGAN.

STEAM-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 344,635, dated June 29, 1886.

Application filed October 29, 1885. Serial No. 131,257. (No model.)

To all whom it may concern:

Be it known that I, THOMAS CRANEY, of Bay City, in the county of Bay and State of Michigan, have invented new and useful Improvements in Steam-Generators, and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a new and useful improvement in steam-generators; and the invention consists in the peculiar arrangement of a series of circulating-pipes in connection with a steam-boiler of the usual kind, whereby two objects are gained—one, to increase the effective heating-surfaces, and the other to gain proper supports for a fire-arch and combustion-chamber, all as more fully hereinafter described, and set forth in the claims:

In the drawings which accompany this specification, Figure 1 is a side elevation of my improved generator, with the brick setting partially removed. Fig. 2 is a cross section on line *x x*, in Fig. 1. Fig. 3 is a cross-section on line *y y* in Fig. 1.

A is a steam-generator of the ordinary kind, set in the usual manner. B is a circulating-pipe connecting with the boiler near the rear end below the water line, thence passing downward and forward along the side wall of the boiler, terminating at the front wall of the furnace-chamber C, which latter is placed in front of the boiler. The opposite side of the boiler is provided with a similar pipe.

D is another circulating-pipe connecting with the boiler near the front and below the water-line, thence passing downward to the height of the top of the furnace-chamber, and then forward along the side wall of the boiler, terminating in the front wall of the combustion-chamber. The opposite side of the boiler is provided with a similar pipe.

E and F are connecting-pipes between the pipes D on one side and the pipes B on the other side, and forming the sides and top of the furnace-chamber. The furnace-chamber itself is provided with a so-called "fire-arch," G, which is supported upon the pipes E F in any desired manner, and above this fire-arch

air-heating flues are arranged, which form part of a system of smokeless combustion, which I intend to arrange in connection with my improvement, but which does not form a necessary part thereof. The side walls of the furnace-chamber are preferably built outside and between the pipes E F.

The difficulty of constructing a fire-arch in connection with a steam-generator is well understood. It is almost impossible to keep it in place for any length of time, or prevent it from injuring the side walls of the furnace-chamber by its expansion and contraction under the influences of the heat. The obvious way to steady this arch would be to give it considerable height; but this is inadmissible in connection with a boiler-furnace, as its greater height would make it an obstruction, besides giving the furnace an undesirable elevation in the center, which would require the setting of the grate at a low height, or the setting of the boiler at an inconvenient elevation.

In my improvement the fire-arch can be built level. It is well supported and can never slip or work down or create injury to the adjoining walls, and the pipes which support it form a part of a very effective circulating system, which greatly adds to the steam-generating power of the generator, as they receive a large amount of the waste heat expended upon the walls of the furnace.

If desired, the furnace may be constructed as well under the boiler; but I consider the increased gain in heating-surface on the under side of the boiler to more than compensate any other loss.

The pipes D and B are provided at their free ends with removable plates, for the purpose of cleaning.

What I claim as my invention is—

1. In a steam-generator, the circulating-pipes B D, arranged one above the other on the sides of the boiler and having interconnecting pipes E F, forming the sides and top of the furnace-chamber, substantially as described.

2. In a steam-generator, the circulating-pipes B, connecting with the boiler near the rear and terminating at the front wall of the furnace-chamber, and the circulating-pipes

D, connecting with the boiler near the front and terminating at the front wall of said furnace-chamber at the top thereof, in combination with the pipes E F, connecting the
5 pipes B on one side of the boiler with the pipes D on the other side, and forming the sides and top of the furnace-chamber and a

support for the fire-arch, substantially as described.

THOMAS CRANEY.

Witnesses:

H. S. SPRAGUE,

CHARLES J. HUNT.