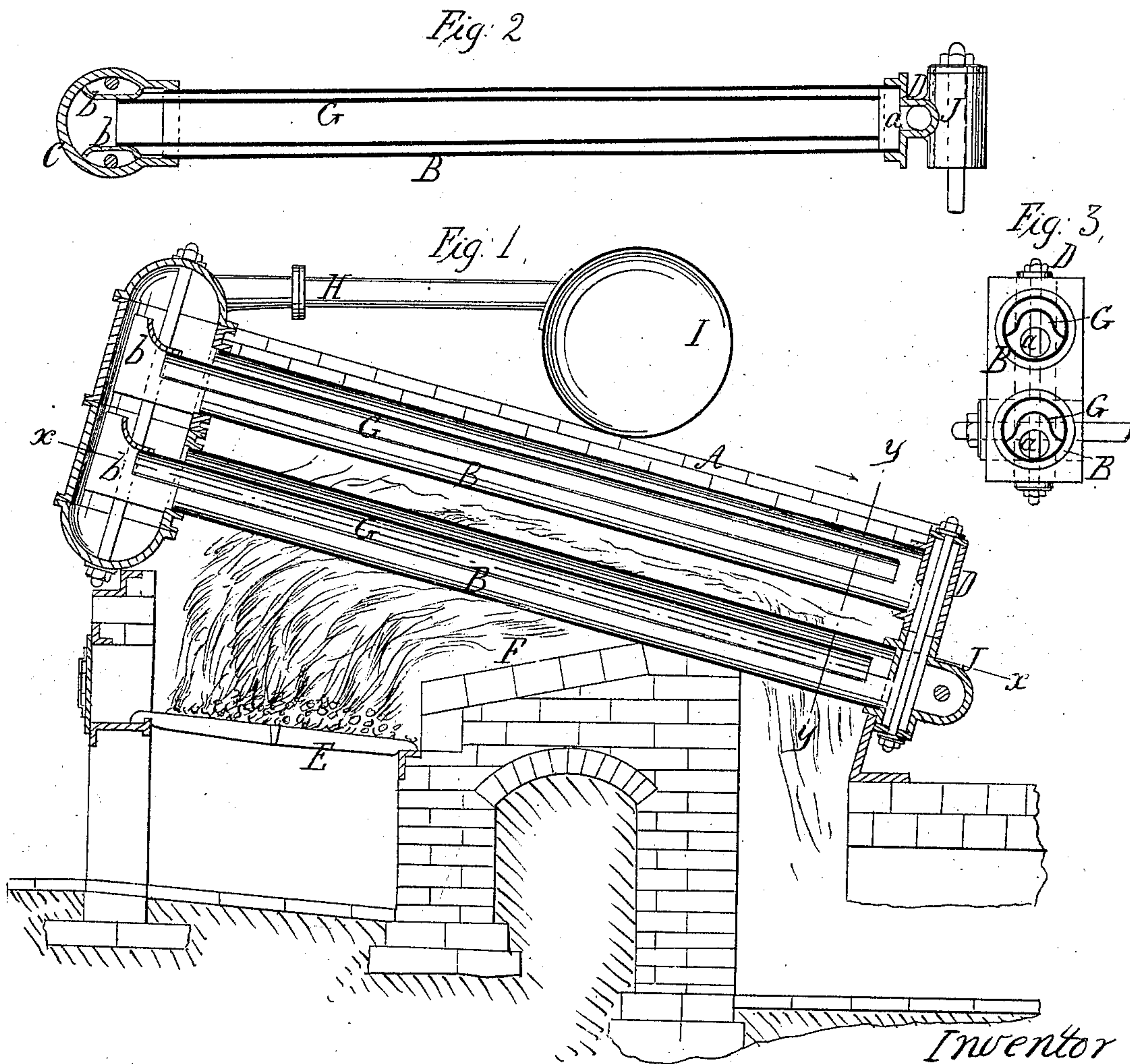


T. H. MULLER.
STEAM GENERATOR.

No. 82,146.

Patented Sept. 15, 1868.



Witnesses;
E. J. Kastenhuber
C. Wahlers

Inventor
T. H. Muller
per
Van Sertvoort & Knapp
Attys

United States Patent Office.

T. H. MÜLLER, OF NEW YORK, N. Y.

Letters Patent No. 82,146, dated September 15, 1868.

IMPROVEMENT IN STEAM-GENERATORS.

The Schedule referred to in these Letters Patent and making part of the same

TO ALL WHOM IT MAY CONCERN:

Be it known that I, T. M. MÜLLER, of the city, county, and State of New York, have invented a new and useful Improvement in Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification, in which drawing—

Figure 1 represents a longitudinal vertical section of this invention.

Figure 2 is a detached section of one of the tubes, the plane of section being indicated by the line *xx*, fig. 1.

Figure 3 is a transverse section of the boiler, the line *yy*, fig. 1, indicating the plane of section, and looking in the direction of the arrow opposite to that line.

Similar letters indicate corresponding parts.

This invention relates to a steam-boiler which is composed of a series of horizontal or inclined tubes, containing the water, and so arranged that they are exposed to the direct action of the fire.

In boilers of this class, as now made, the steam generated at the bottom part of the tubes rises, and accumulates in the upper part of said tubes, thus preventing the water from coming in contact with said parts, which at the same time are exposed to the direct action of the fire, and therefore liable to be burnt out in a short time.

This difficulty I have overcome by the arrangement of a diaphragm, extending in a longitudinal direction through each tube, in such a manner that the steam generated in the bottom of each tube is prevented from rising beyond the diaphragm, while a current of water passes through the space between said diaphragm and the upper part of the tube, thus preventing the fire from coming in contact with any part of the tube unprotected by water, and at the same time providing for a free circulation of the water through the boiler. The ends of the diaphragms are provided with downwardly-projecting flanges, so that the steam, on escaping from under each diaphragm, is prevented from obstructing the downward course of the water.

A represents a steam-boiler, which is composed of a series of tubes, B, which are placed in an inclined position, and terminate, at their highest ends, in a chamber, C, and at their lowest ends, in a connecting-pipe, D, the communication between the tubes B and the pipe D being effected through holes *a*, while the ends of the tubes which communicate with the chamber C are open, as clearly shown in the drawing.

Said tubes are so situated, in relation to each other, and to the grate E and flue F, that the fire can play freely all round the same.

Through each tube, in a longitudinal direction, extends a diaphragm, G, which, by preference, is made arched, as shown in fig. 3 of the drawing, and the chamber C connects, by means of a pipe, H, with the steam-dome I.

The diaphragms G project into the chamber C, and their ends are curved up and provided with side flanges *b*, which extend downwards, as shown in fig. 1, the object of which arrangement will be presently explained.

The feed-water is introduced through a pipe, J, situated at the lowest end of the boiler, and communicating with the pipe D, through an opening, as shown. This pipe also serves for blowing off.

When the boiler is to be put in operation, it is filled with water until all the tubes B are full, and then the fire is lighted. As the fire strikes the tubes B, steam is formed, and the bubbles of steam, on disengaging themselves from the water, collect under the diaphragms G, and pass up, through the chamber C and pipe H, into the dome I, as indicated by red arrows in fig. 1. At the same time a downward current of water is created through the spaces between the upper surfaces of the diaphragms and the tubes B, and the fire is not permitted to come in contact with any portion of the tubes unprotected by water.

The flanges at the upper ends of the diaphragms G prevent the upward currents of steam from checking or interfering with the downward currents of water.

In practice, the chamber C and pipe D will be made in sections, so that the boiler can be readily taken apart, whenever it may be desired.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The construction of the diaphragms G, extending in a longitudinal direction through the tubes B, substantially as described.

2. The construction of the flanges *b* at the ends of the diaphragms G, substantially as set forth.

T. H. MÜLLER.

Witnesses:

W. HAUFF,

E. F. KASTENHUBER.