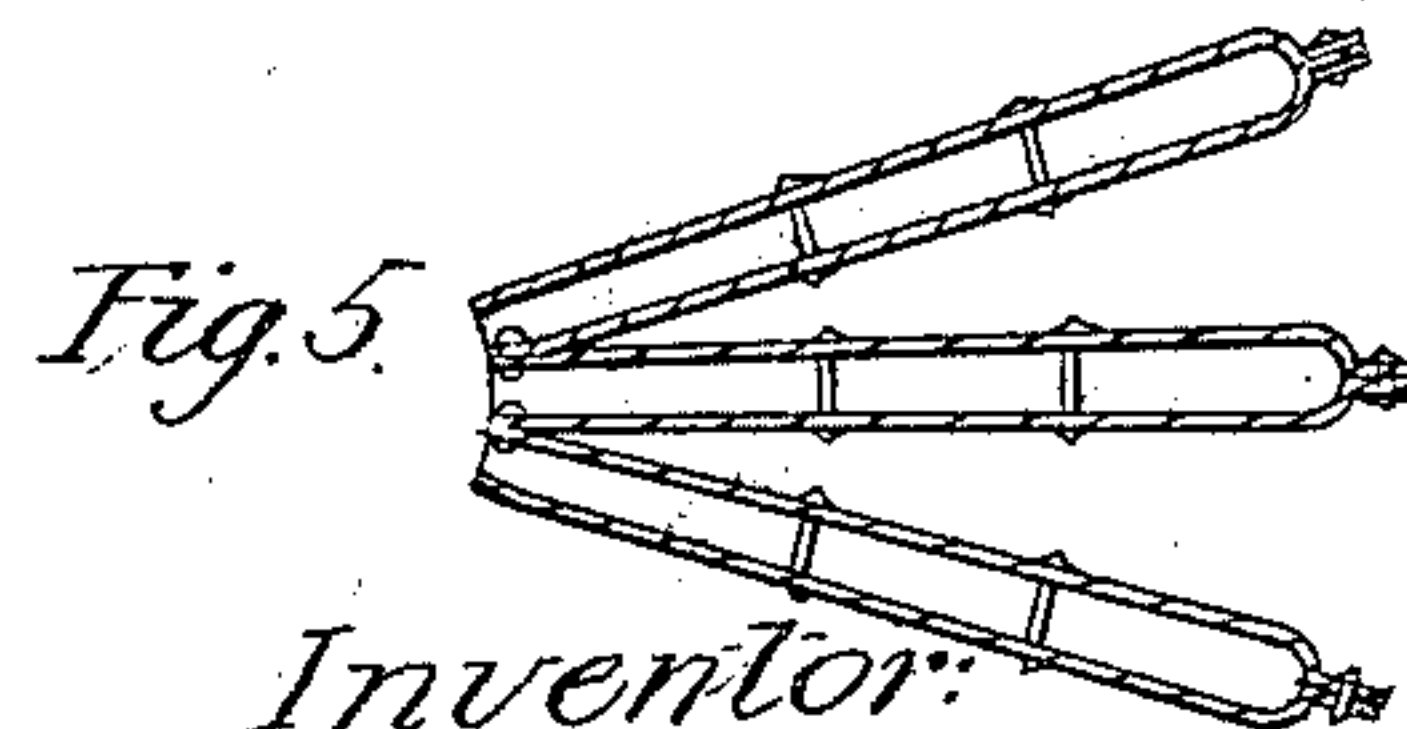
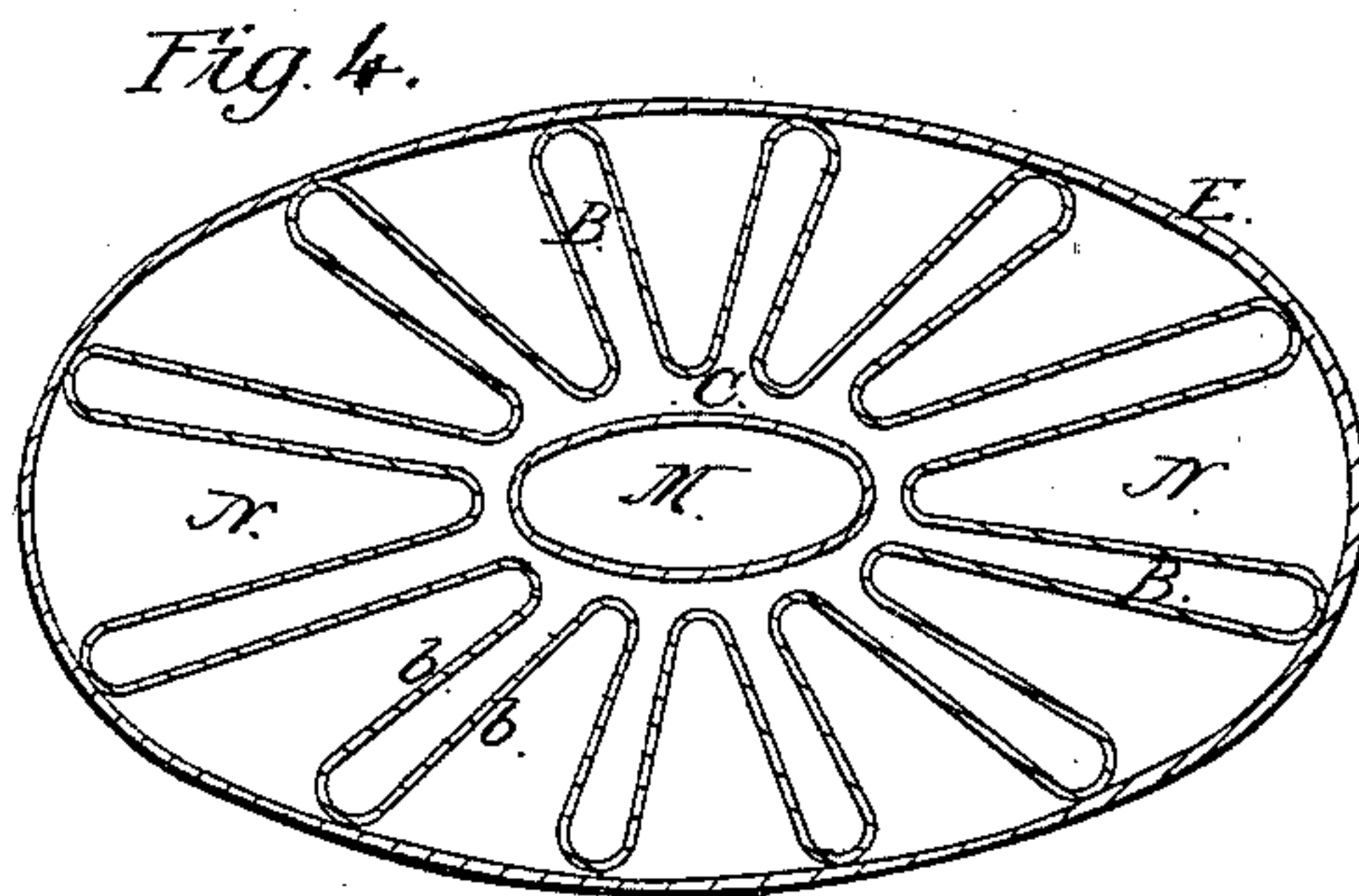
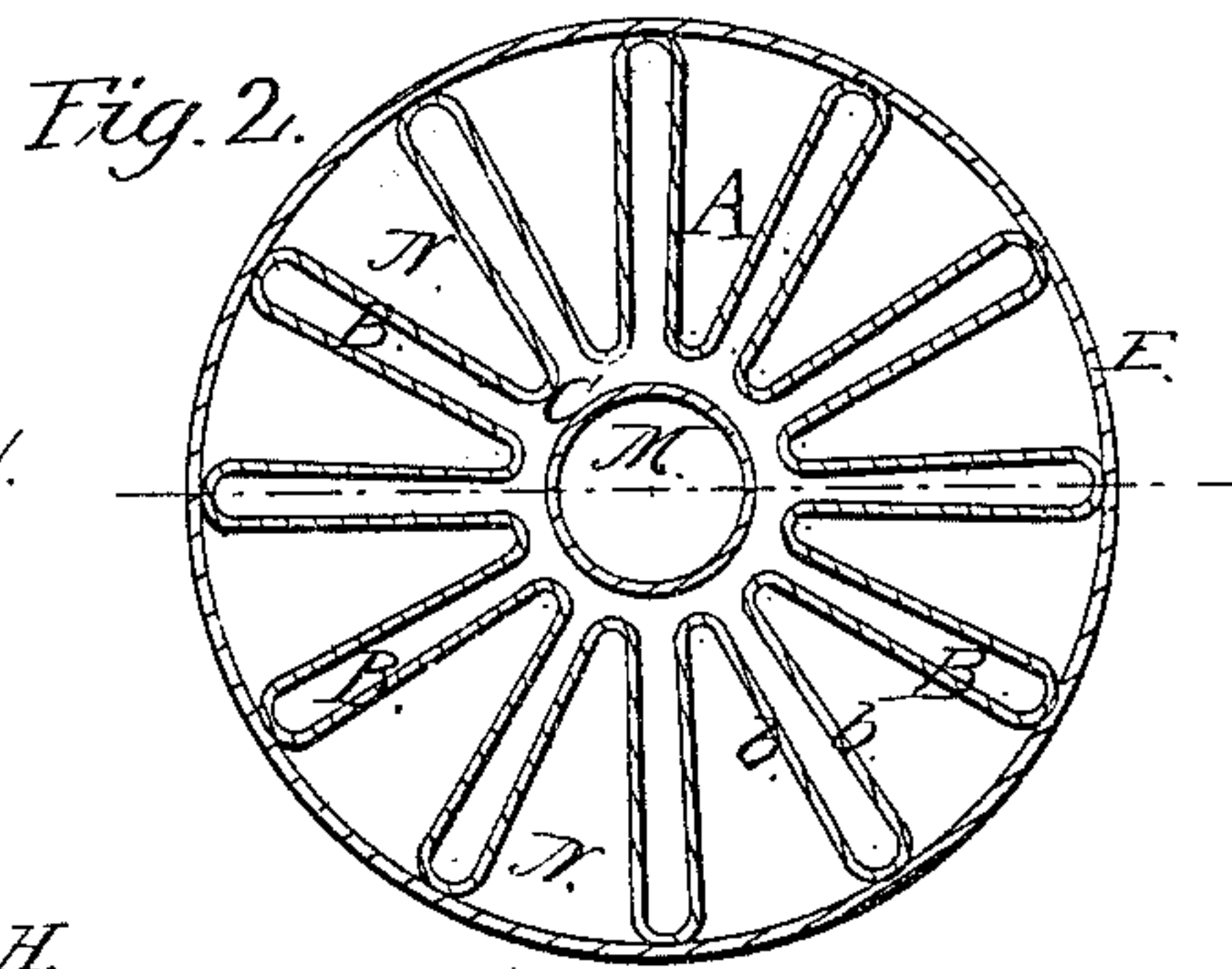
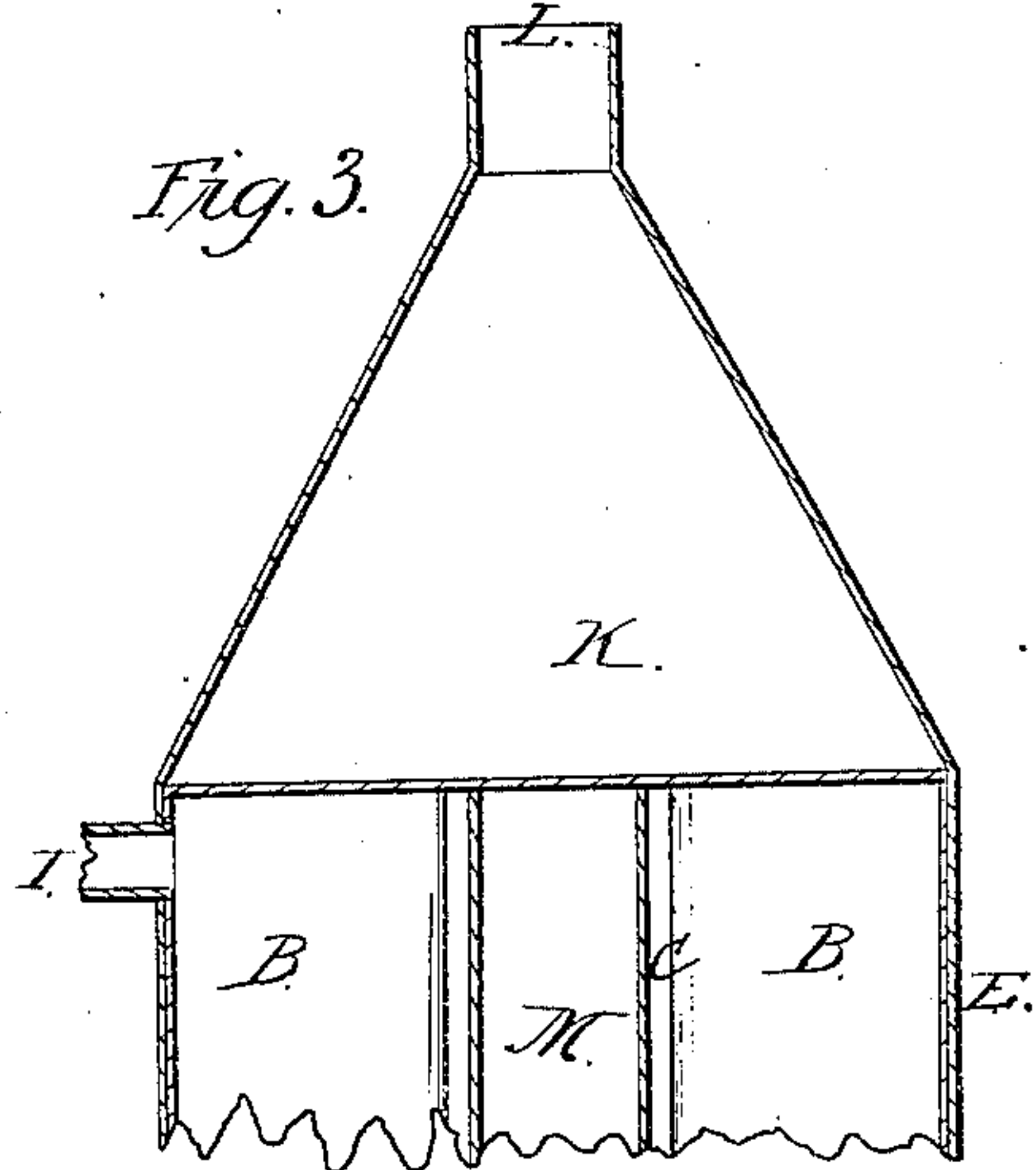
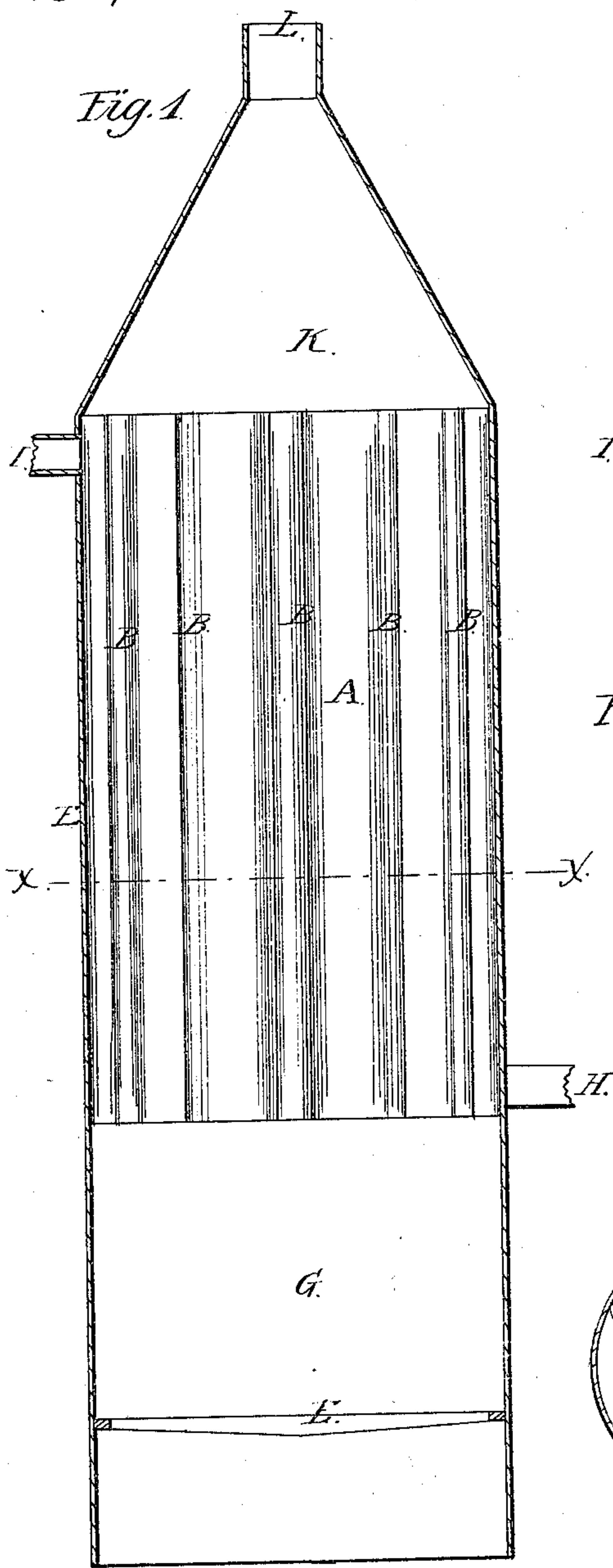


J. A. Davis,

Steam Boiler.

No. 36,373.

Patented Feb. 2, 1869.



Witnesses:

Frank Hamilton

Pennington Halsted

Inventor:
Job A. Davis
By Crosby Halsted & Gould
his attorneys.

United States Patent Office.

JOB A. DAVIS, OF WATERTOWN, NEW YORK.

Letters Patent No. 86,373, dated February 2, 1869.

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, JOB A. DAVIS, of Watertown, in the county of Jefferson, and State of New York, have invented certain Improvements in Steam-Boilers; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention, sufficient to enable those skilled in the art to practise it.

My invention relates to boilers for the generation of steam, and whilst intended and adapted for steam-engines generally, I propose more particularly to use it for such an apparatus as the steam-generator patented to me, September 29, 1868; and

It consists in the construction of a vertical boiler, with radially-arranged chambers, all connected with and opening into a central chamber, the radial chambers extending some distance from the same; also, in the same, in combination with a surrounding shell or case, which serves the double purpose of a heat-chamber and a continuous band or strengthener for the ribs or radial chambers; and also in certain details, and the construction thereof, as hereinafter set forth.

In the drawings—

Figure 1 represents a boiler made in accordance with my invention, the outer casing being shown in vertical section, in order to display the ribbed boiler encased therein;

Figure 2 is a cross-section of the boiler and its casing, taken at the line *x x* of fig. 1;

Figure 3 is a vertical section of the upper part both of ribbed boiler and its casing;

Figure 4 is a cross-section of a modified form of the boiler; and

Figure 5 represents a modified construction, showing how the ribs are made and put together when formed in pieces.

The same letters of reference indicate like parts in the different figures.

A is the boiler proper, which I make of any suitable metal, either cast entire or formed of sheet-metal, and, (as shown in figs. 1, 2, 3, and 4,) of a single piece, except where closed at its top and bottom.

B B, &c., are hollow radial ribs, all radiating from a central chamber, C, so that the continuous and connected space enclosed by the whole series of ribs shall in cross-section resemble the hub and spokes of a wheel. (See fig. 2.)

When cast entire, there are of course no joints in these ribs. When made of a single piece of sheet-metal, there need be no joint in them except to connect the two edges of the sheet.

E is the casing, which surrounds this ribbed boiler, and serves as a continuous band for the same, in direct contact with the extremity of each rib.

The same casing also forms part of the furnace, a suitable grating, F, for the fuel, being provided in the fire-chamber G, beneath the boiler.

H is a suitable water-pipe, or inlet, to supply the boiler, and I is an outlet-pipe for the steam, both being in direct communication with the boiler.

K is a space above the boiler, and within the casing E, and

L is the outlet for the refuse products of combustion.

M is a central tube, not necessarily forming part of the construction, but which, when used, is made open at its bottom and closed at its top, and by thus serving as a central hot-air chamber, affords so much additional water-heating surface.

Water being supplied to the boiler, and the fire made, it will now be seen that, relatively to the size of the boiler and of the whole apparatus, an immensely large heating-surface is obtained, the ratio of which, (when ribbed, as shown in fig. 2,) as compared with a correspondingly-sized boiler without such ribs, being about as twelve to one, or greater.

This ribbed form has also far greater strength in itself than a mere tube, and independent of its outer banding or casing. The ascending column of heated gases filling, as it must, all the spaces N bounded by two ribs and a corresponding portion of the casing, is, as it were, closely compacted into this wedge-shaped space, and that portion of it which is nearest the junction of the ribs being directly above and from the central and hottest portion of the fire, acts upon the largest part of the water-heating surface of such space N, namely, upon a portion of that at the centre of the boiler, and also upon a portion of that in each of the two adjacent ribs.

This central heating of water is very largely intensified when the central tube M is used.

The sides *b b* of each rib I prefer to make parallel with each other, so as to have the steam-space between them of equal breadth.

The ribbed boiler may, (with its casing,) be made oval, or elliptic, instead of circular, in cross-section, as shown in fig. 4, and with or without the central heating-tube.

I sometimes use a steam-reservoir or dome at the top of the boiler, for the same purpose as usual, namely, to give off from the boiler dry steam.

Each hollow rib of the boiler may be made in parts, with its outer edges bolted together; or each rib may be formed of two parts, or sides, the outer edges of each rib being bolted together, and the inner edges of two adjacent ribs being also bolted together, as shown in fig. 5; and when so constructed, it is preferable to connect the same also by strengthening-bolts between their inner and outer ends, somewhat as shown in the same figure.

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

1. The construction of the hollow radial chambers, and their combination with each other, substantially as herein set forth.

2. The hollow radial chambers, combined with the surrounding case or shell, in contact with the hollow radial ribs, and serving to brace the boiler, substantially as set forth.

3. The arrangement of the radial chambers B, shell E, water-supply pipe H, steam-pipe I, steam-space K, and outlet L, substantially as herein described.

Witnesses:

JOB A. DAVIS.

JOHN J. HALSTED,
FRANK HAMILTON.