

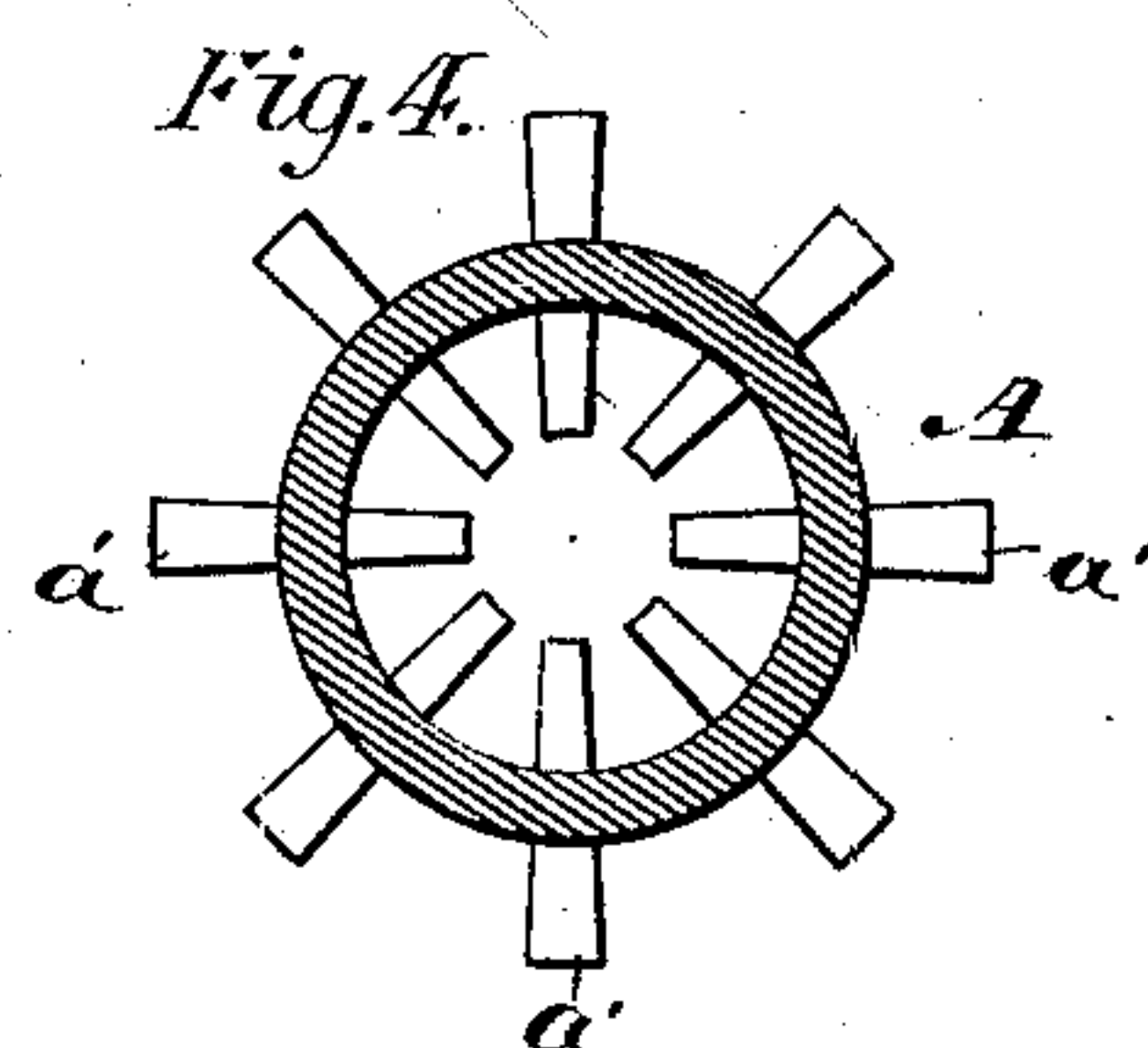
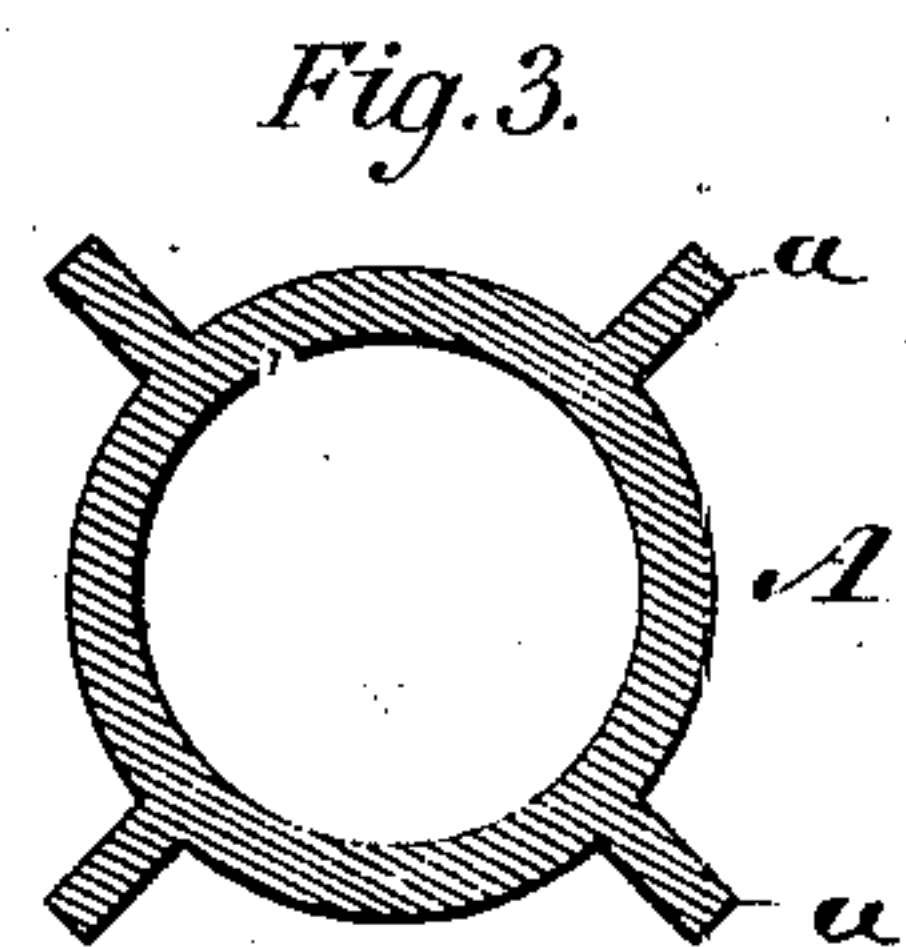
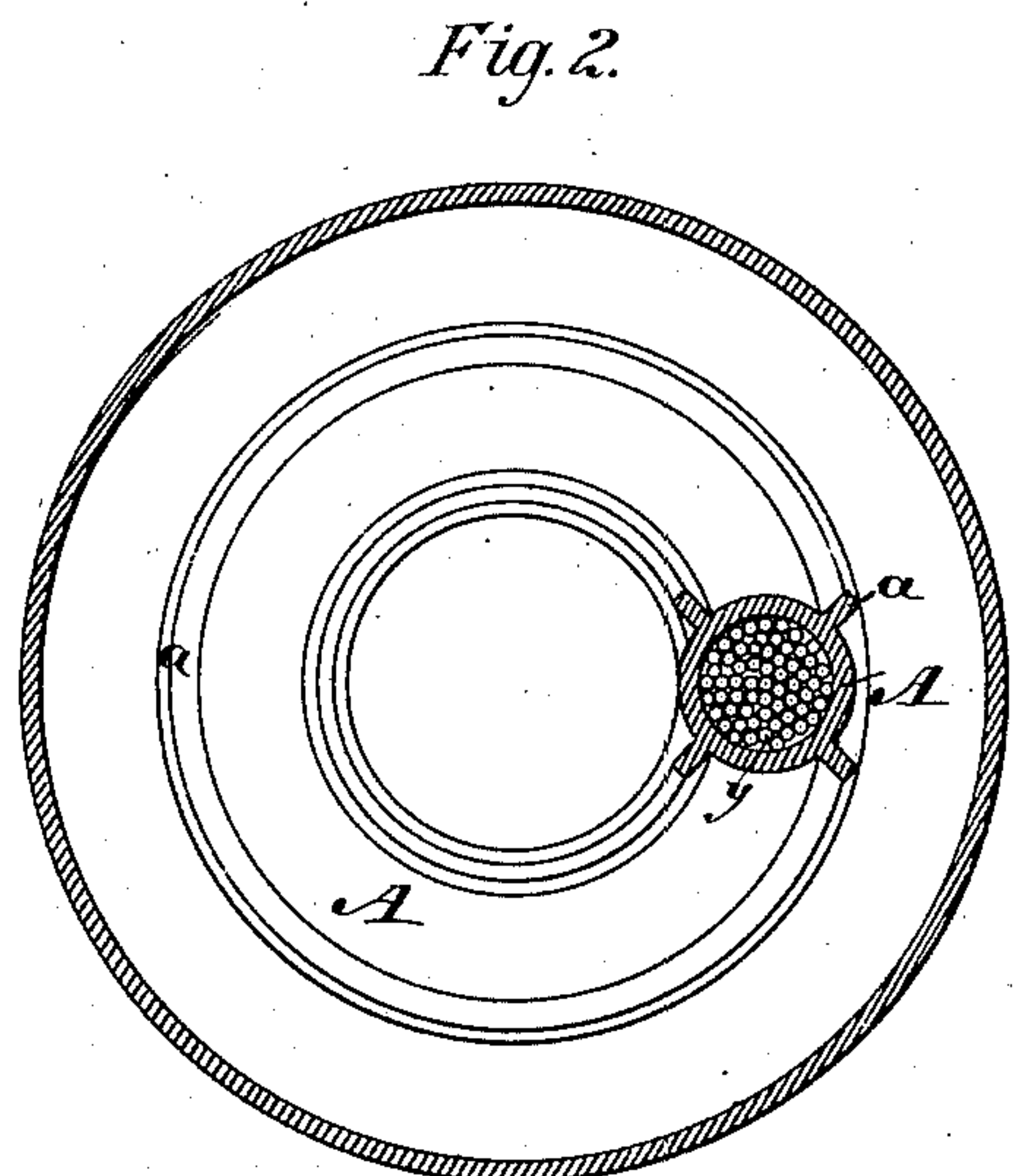
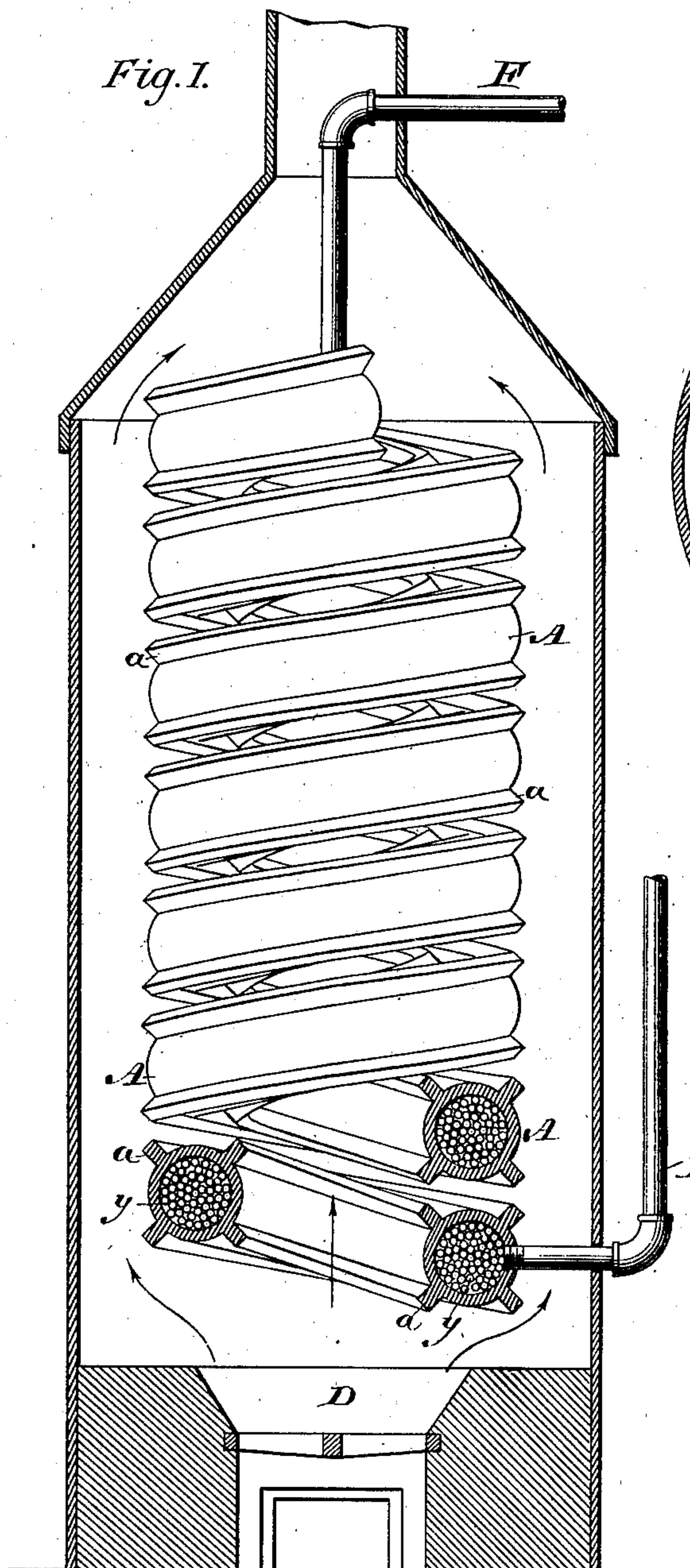
(No Model.)

2 Sheets—Sheet 1.

E. GILLET.
STEAM BOILER.

No. 426,586.

Patented Apr. 29, 1890.



WITNESSES:

Raymond A. Barnes
Edmund C. Davidson

INVENTOR
Etienne Gillet
BY
Raymond Davidson & Wright
ATTORNEYS

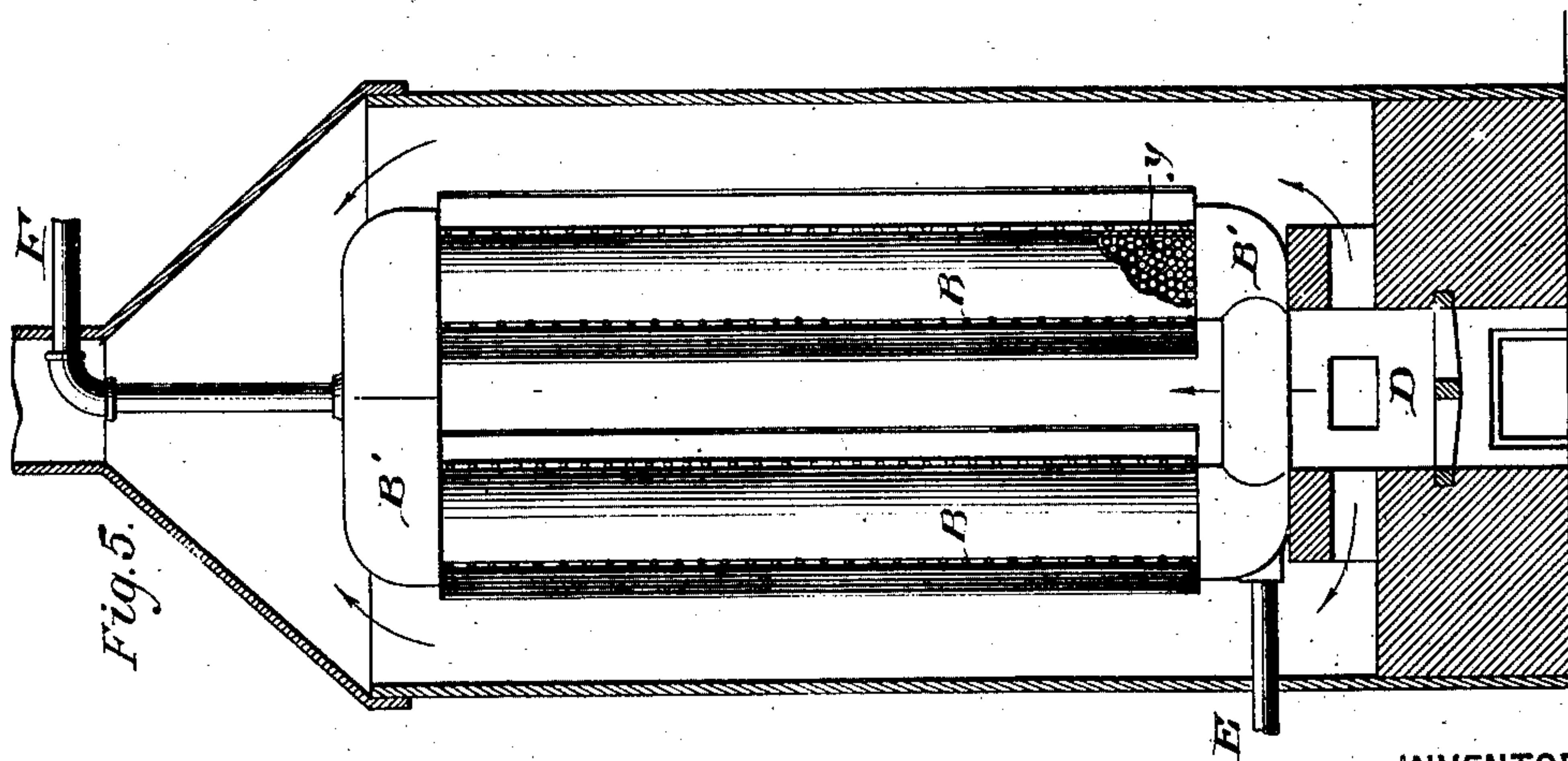
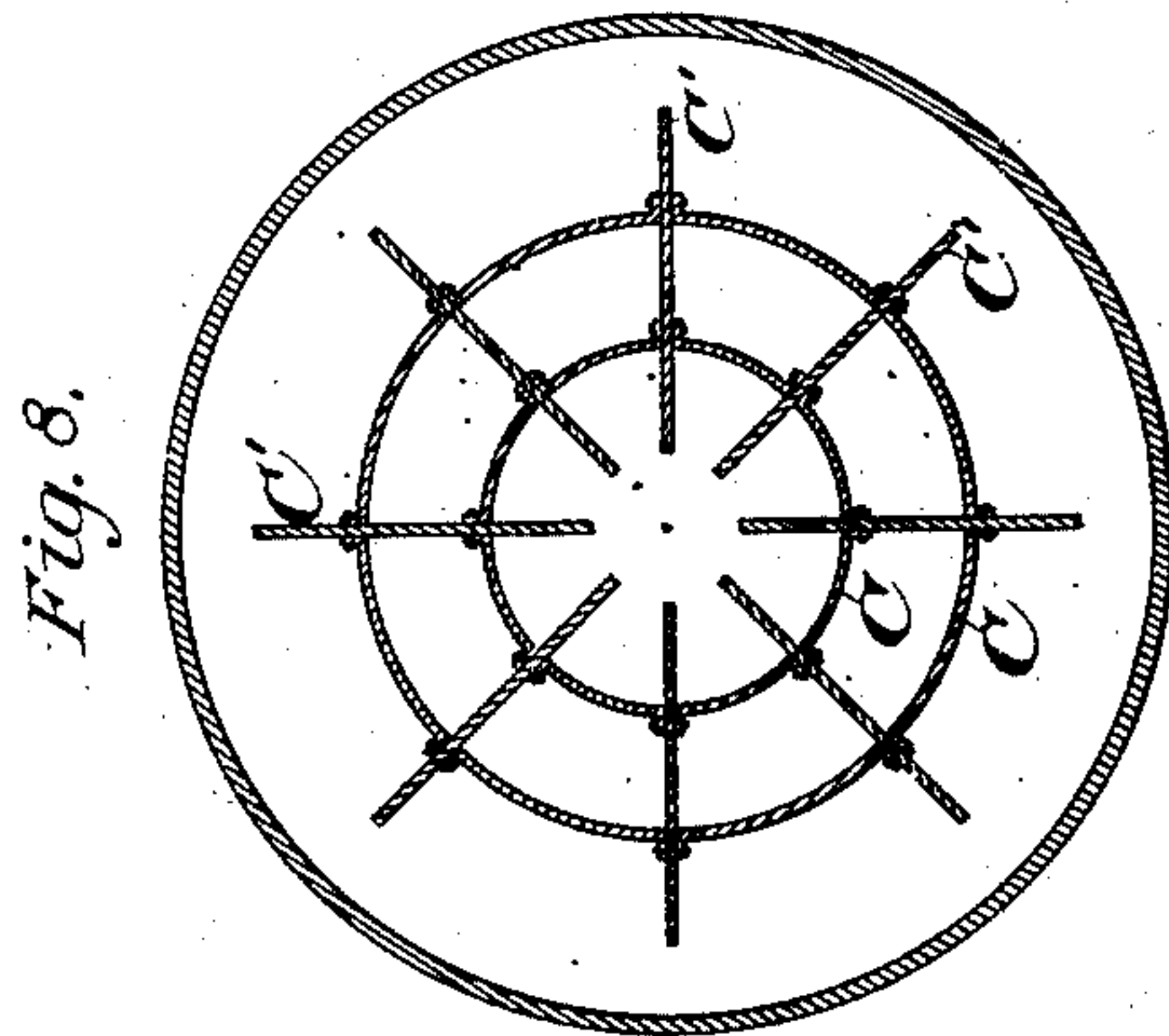
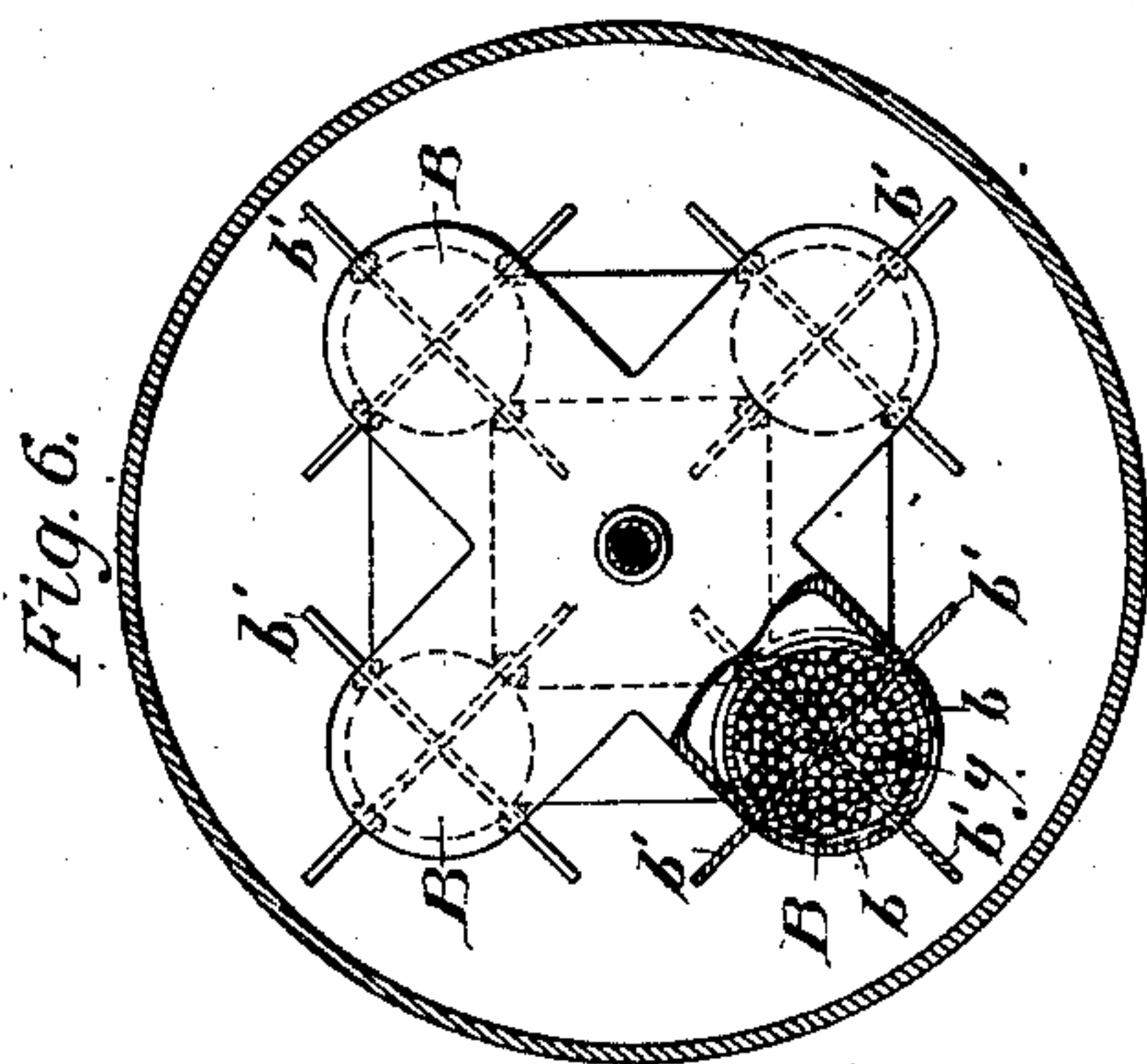
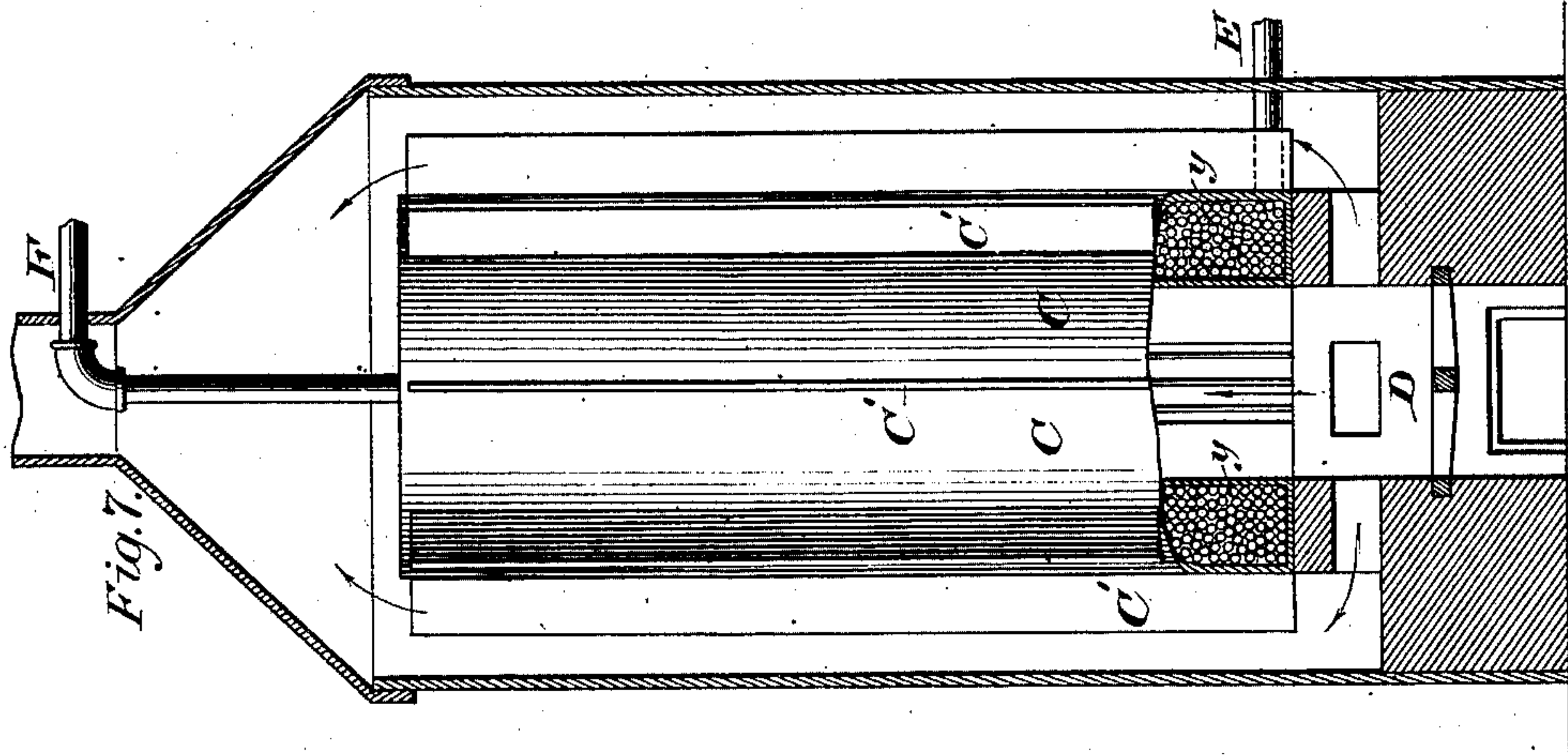
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2 Sheets—Sheet 2.

E. GILLET.
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WITNESSES

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Edward C. Davidson.

INVENTOR

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UNITED STATES PATENT OFFICE.

ETIENNE GILLET, OF NEW YORK, N. Y., ASSIGNOR TO ELIZABETH ALINE GILLET, OF SAME PLACE.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 426,586, dated April 29, 1890.

Application filed January 9, 1889. Serial No. 295,817. (No model.)

To all whom it may concern:

Be it known that I, ETIENNE GILLET, a citizen of the United States, residing in the city of New York, have invented certain new and useful Improvements in Steam-Boilers, of which the following is a specification.

My invention relates to steam-boilers of the class disclosed in my application, Serial No. 295,816, filed simultaneously herewith—that is, the water and steam are confined in a space or passage of small cross-sectional area, where spheroidal formations of water and steam are prevented, the purpose of such a construction and operation being to generate steam quickly and avoid any danger of explosion.

The general operation and principles upon which my improvements are based are set forth in said application.

The special purpose of my present invention is to provide small boilers light and cheap for small motors of all kinds.

I form the small steam or water space desired by filling larger spaces with metal shot or pieces of metal or other material, and I also employ heat-conducting plates to convey the heat of combustion directly into the mass of finely-divided metal.

In the accompanying drawings, Figure 1 is a vertical longitudinal view, with the entire shell in section, of a boiler constructed of a coiled tube filled with shot or finely-communited material, the tube being partly broken away to expose the filling. Fig. 2 is a cross-section of the same. Fig. 3 is a cross-section of the form of tube or pipe shown in Fig. 1; Fig. 4, a cross-section of another form of tube; Fig. 5, a vertical section of a boiler composed of vertical tubular sections formed with interior and exterior projecting heat-conducting plates; Fig. 6, a cross-sectional view of same; Fig. 7, a vertical longitudinal sectional view of a somewhat similar type of boiler, and Fig. 8 a cross-section illustrating the construction of the same.

In Fig. 1 the coiled tube A, which has longitudinal flanges *a*, is filled with shot *y*, so that only finely divided or broken spaces exist for the steam and water.

Fig. 4 shows a tube A, having interior and exterior projecting arms or lugs *a'*, for con-

ducting the heat into the interior of the tube, which is to be filled with shot, as in Fig. 1.

D is the fire-box. Water is supplied under pressure at the base of the boiler through pipe E and steam is taken out at top by pipe F.

In Fig. 5 vertical tubular sections B—four being shown—are connected at top and bottom by manifolds B'. Each section is composed of four quadrant lengths *b*, flanged at their edges, between which flanges plates *b'* are bolted, so as to project inside and outside of the tubular sections to conduct the heat to the interior. The sections are filled with finely-divided material *y* to break up the space. Water is supplied to lower manifold by pipe E, and steam is taken from upper manifold by pipe F. D being the fire-box, the products of combustion pass up centrally between the columns or sections, and also outside, as indicated, in contact with the sections and plates *b'*.

In Figs. 7 and 8 the water or steam space is annular in cross-section, its interior and exterior walls being built up of curved flanged lengths C, between which heat-conducting plates C' are bolted, so as to extend across the annular space and project from its interior and exterior walls. Water is supplied at the base and steam is taken from the top. The products of combustion pass up the central flue, and also outside, heating both sides or edges of the plates C'. The annular chamber is filled with finely-divided material *y*.

In all these forms of boilers (which are exhibited as merely some of the ways in which the invention may be embodied) the water and steam are squeezed or finely divided, and are prevented from assuming spheroidal forms. Consequently levels, gages, &c., are unnecessary, and there is no possibility of dangerous explosion, since the amount of steam and water in the boiler at any one time is exceedingly small. For the same reason steam forms immediately, and there is a marked economy in fuel. The mass of metal absorbs the heat and is not subject to rapid changes of temperature.

The pipe-coil boilers may be made very light, and are specially adapted for use with small engines for running sewing-machines,

small dynamos, tricycles, and various other like purposes.

Since the details of construction are obvious, more specific description is deemed unnecessary.

I am aware that finely-divided metal or material has heretofore been proposed for the same purpose as that herein described, and I do not therefore broadly claim such subject-matter.

I claim as my invention—

1. A steam-generator of the character described, having an elongated or pipe section of relatively-small cross-section in which the steam is generated, and metallic shot or other suitable finely-divided material filling the same, whereby the interior steam and water spaces of the boiler are broken up and are of minute cross-sectional area, a water-supply pipe connected with one end of the elongated chamber, and a steam-exit pipe, connected with the opposite end, substantially as set forth.

2. In a steam-generator, the combination of the steam-generating chamber having heat-conducting plates or projections extending outwardly into the combustion-chamber and inwardly into the boiler-space, and metallic shot or other suitable finely-divided material filling the boiler-space, substantially as set forth.

3. In a steam-generator of the character described, the combination of the interior tube affording a central passage for the products of combustion, the exterior tube, and metallic shot or finely-divided material filling the annular space between them.

4. In a steam-generator of the character described, the combination of the interior and exterior tubes, metallic shot or finely-divided material filling the annular space between them, heat-conducting plates or projections extending inwardly from the interior tube and outwardly from the exterior tube, and a fire-place so arranged that the products of combustion pass inside and outside of the annular chamber.

5. The combination of the interior and exterior tubes C C, formed of longitudinal sections, and the heat-conducting plates C', bolted between the sections.

6. The combination of the interior and exterior sectional tubes, the heat-conducting plates secured between the sections thereof, and the filling of finely-divided material.

In testimony whereof I have hereunto subscribed my name.

ETIENNE GILLET.

Witnesses:

J. F. BENZIENG,
S. SAVERRIERE.