

J. K. ABBOTT.
Sectional Steam-Boilers.

No 142,976.

Patented September 23, 1873.

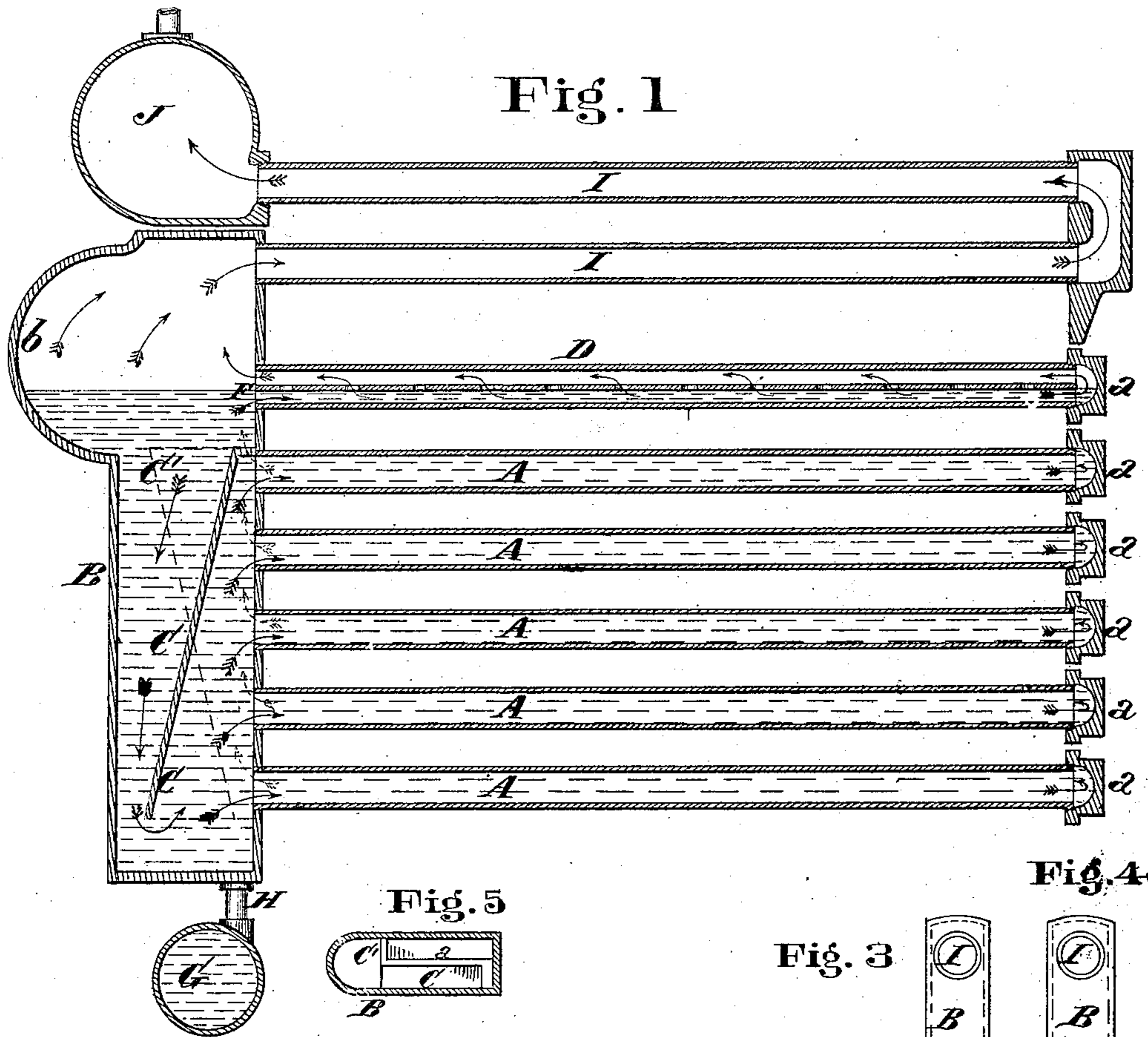


Fig. 2

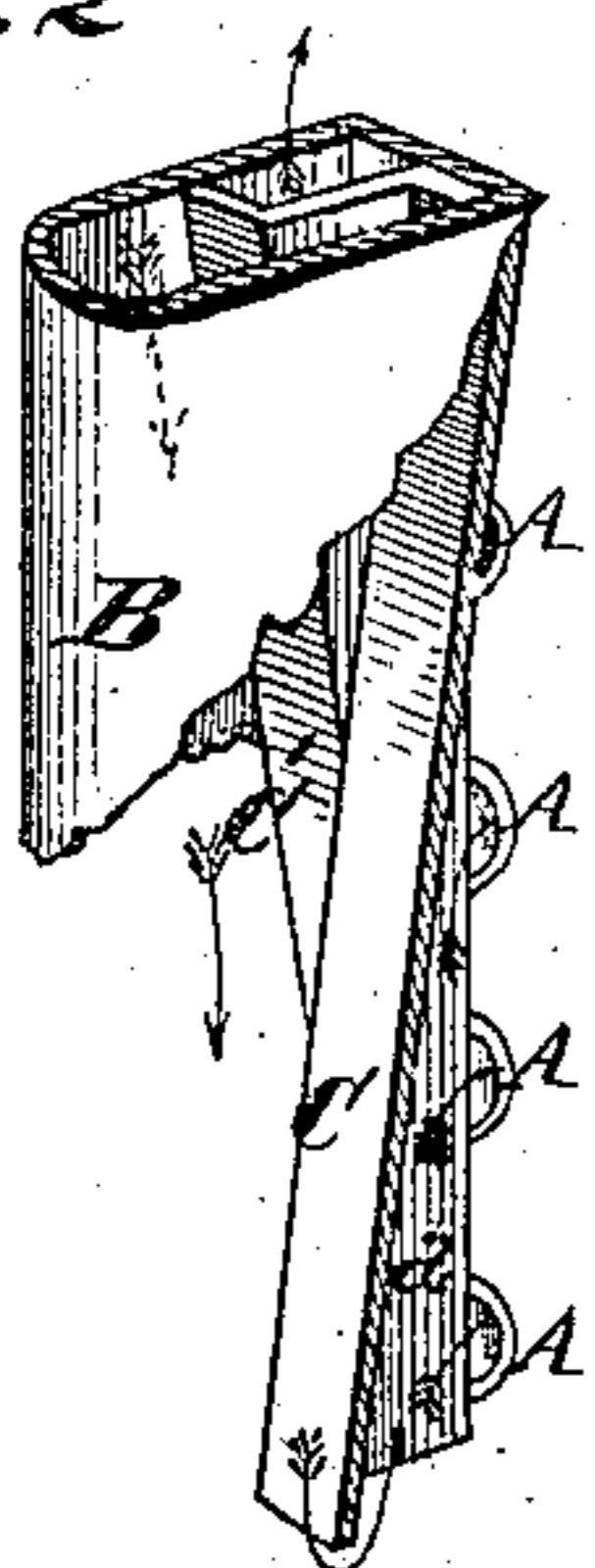


Fig. 5

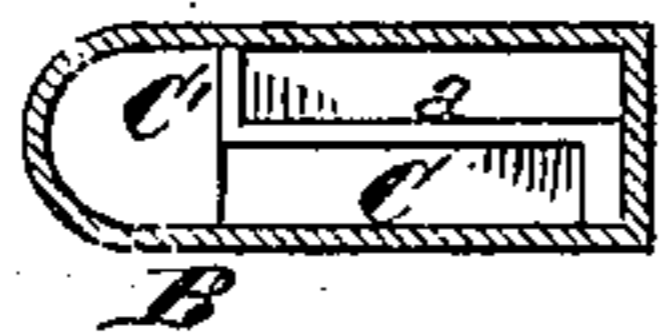


Fig. 3

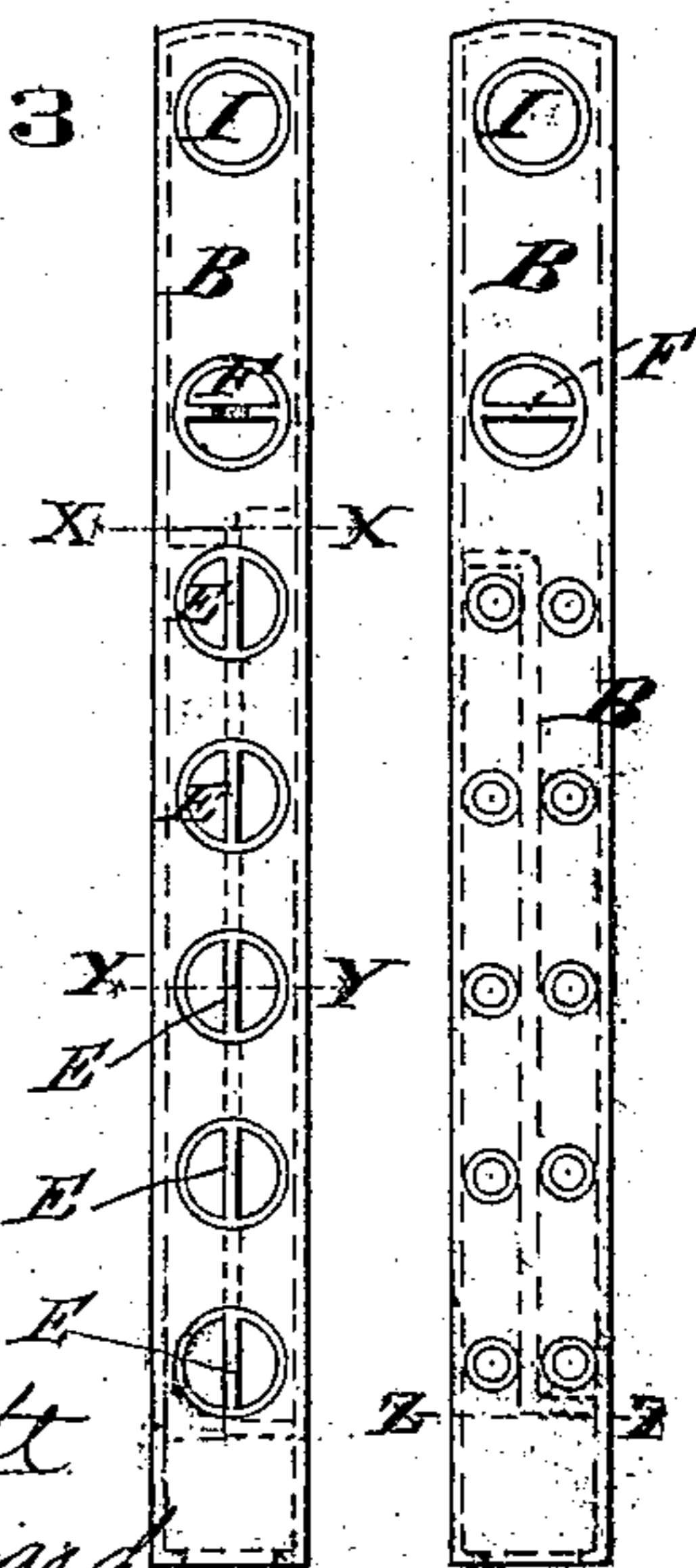


Fig. 6

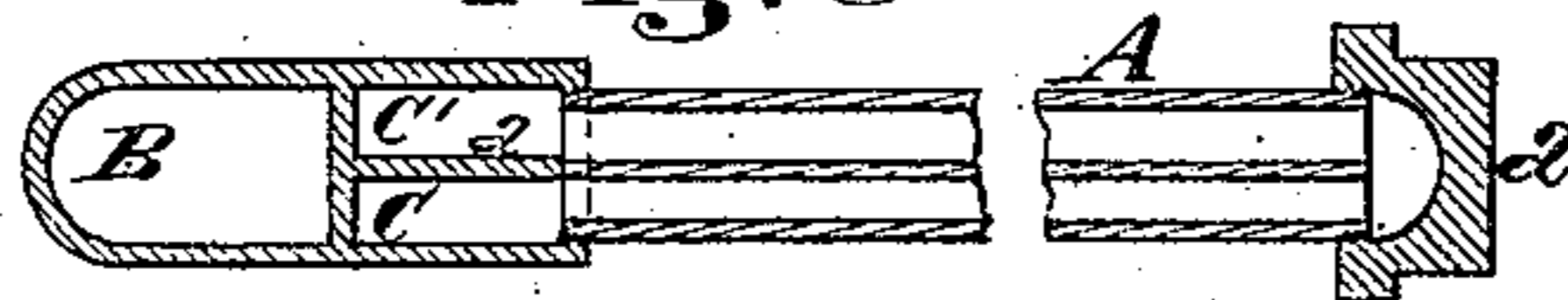


Fig. 7



Attest

Inventor

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Attorney

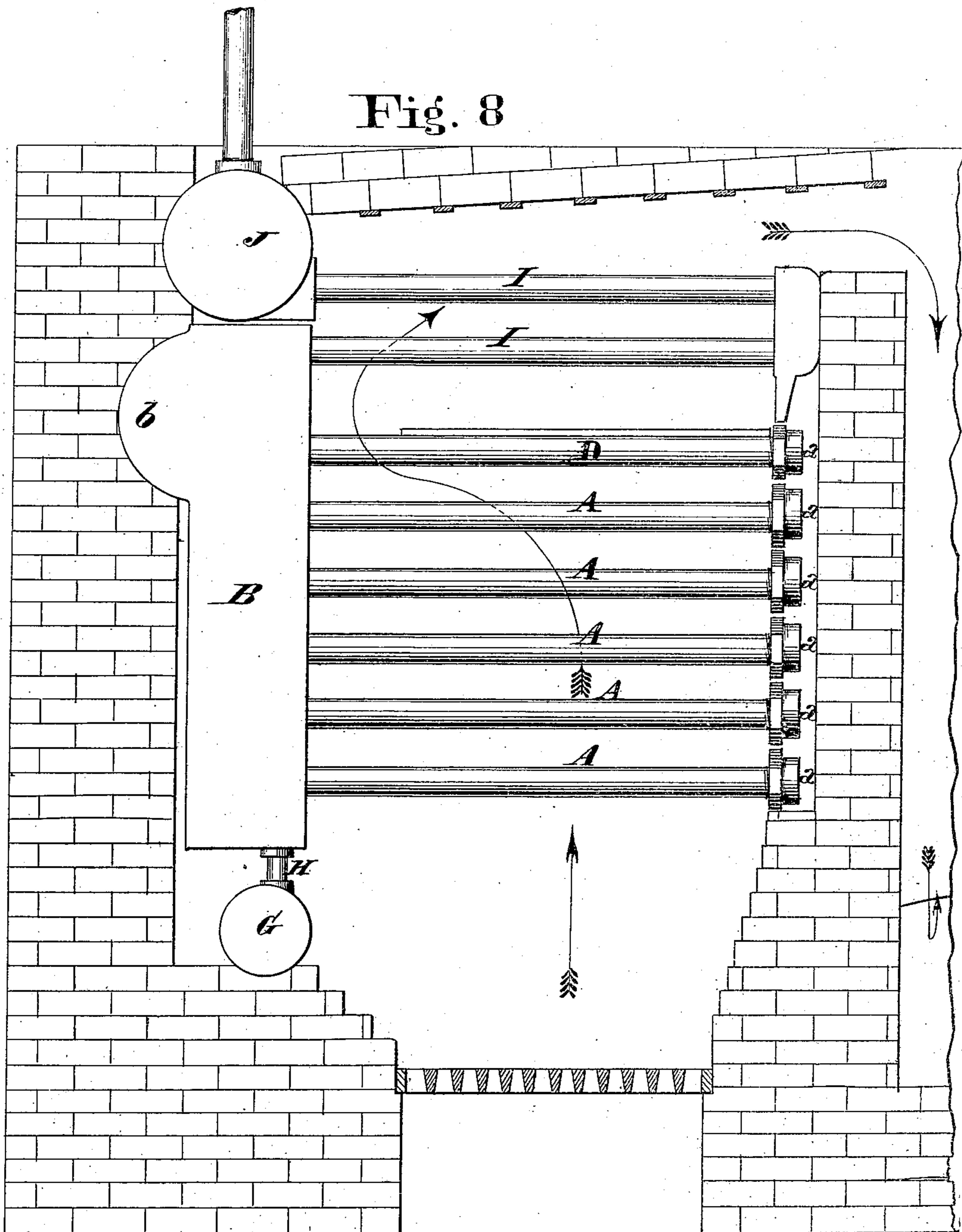
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Fig. 8



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UNITED STATES PATENT OFFICE.

JOSHUA K. ABBOTT, OF CINCINNATI, OHIO.

IMPROVEMENT IN SECTIONAL STEAM-BOILERS.

Specification forming part of Letters Patent No. 142,976, dated September 23, 1873; application filed April 30, 1873.

To all whom it may concern:

Be it known that I, JOSHUA K. ABBOTT, of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Sectional Steam-Boilers or Steam-Generators, of which the following is a specification:

My invention relates to the class of steam-generators of the well-known sectional character; and consists of a peculiar construction of the sections, by which the generating-pipes are each connected by one end only, and a rapid circulation through the pipes, induced without the use of interior tubes. My invention further consists in the peculiar construction and arrangement of water-separating diaphragms in the generating-tubes.

Figure 1 is a vertical section through one of the sections of the generator. Fig. 2 is a sectional perspective view of one of the section-heads used to connect the generating-tubes together. Fig. 3 represents an end view of the preferred form of the section-head. Fig. 4 is the modified construction of the same for double pipes. Fig. 5 is a cross-section on line X X, Fig. 3. Fig. 6 is a cross-section on line Y Y, Fig. 3. Fig. 7 is a cross-section on line Z Z, Fig. 4. Fig. 8 is a cross-section of the complete generator, showing the manner of setting.

Each section or division of the generator is composed of a series of generating-tubes, A, exposed to the fire, a section-head, B, to connect the tubes A together, and hollow caps or return-bends *a*. Each section is constructed with a reverse diaphragm, C C', the part C operating to induce the upward current to flow into the generating-tubes, and the part C' serving to convey the heated water from the generating-tubes in such a way that there is no conflict with the flow of water downward toward the mouth of the part C of the diaphragm. The top of the part C has a closed connection with the case of the section-head, so as to confine the upward flow of water to the supply of the generating-tubes; and the bottom of the part C' has a closed connection with the case of the section-head, so as to confine the operation of this part of the diaphragm to the conduction

of heated water from the generating-tubes. The parts C C' are divided vertically by an X-shaped web, *c*, which forms a part thereof, as clearly shown in Fig. 2. The generating-pipes, to connect on each side of the web *c* to the section-heads B, may be either double, as shown in Figs. 4 and 7, connected at the ends by return bends *a*, or single, as shown in Figs. 3 and 6.

Although the plain single pipes will, in connection with the peculiarly-constructed section-head, circulate the water to a considerable extent, sufficient to render the apparatus a fair steam-generator, I prefer to separate the current of water in each of the single tubes by a diaphragm, E, which compels the water of the inflowing current to pass to the end of the tubes A before it returns for escape.

The upper end of each section-head is enlarged at *b* to provide for the free separation of the steam and water at the water-line, and to prevent violent ebullition from showing too great a fluctuation in the water-line. To assist also in maintaining a steady water-line I provide, in each section-head, a pipe, D, in the center of which the water-line is carried, a perforated diaphragm, F, in each serving to induce circulation and allow for the free escape of steam, as shown by the arrows.

The sections are fed uniformly through a mud-drum, G, common to all, and short connecting-pipes H, and at the upper end all the sections discharge steam through superheating or drying pipes I into a common steam-drum, J.

In place of a single inclined plate, C or C', being used to form a single duct for the supply or discharge of the entire series of tubes A, as shown, the space between the plates C C' and their connecting-tubes may be subdivided so as to make a separate duct for each tube.

The generator may be set in brick-work in the manner shown in Fig. 8, or in any other preferred way.

I claim as my invention—

1. In combination, with the generating-pipes A, the section-heads B, when con-

structed with reverse incline diaphragms C C', substantially as and for the purpose specified.

2. The combination of generating-pipes A, section-heads B C C', and diaphragms E in the generating-pipes, substantially as and for the purpose specified.

In testimony of which invention I hereunto set my hand.

JOSHUA K. ABBOTT.

Witnesses:

FRANK MILLWARD,
J. L. WARTMANN.