

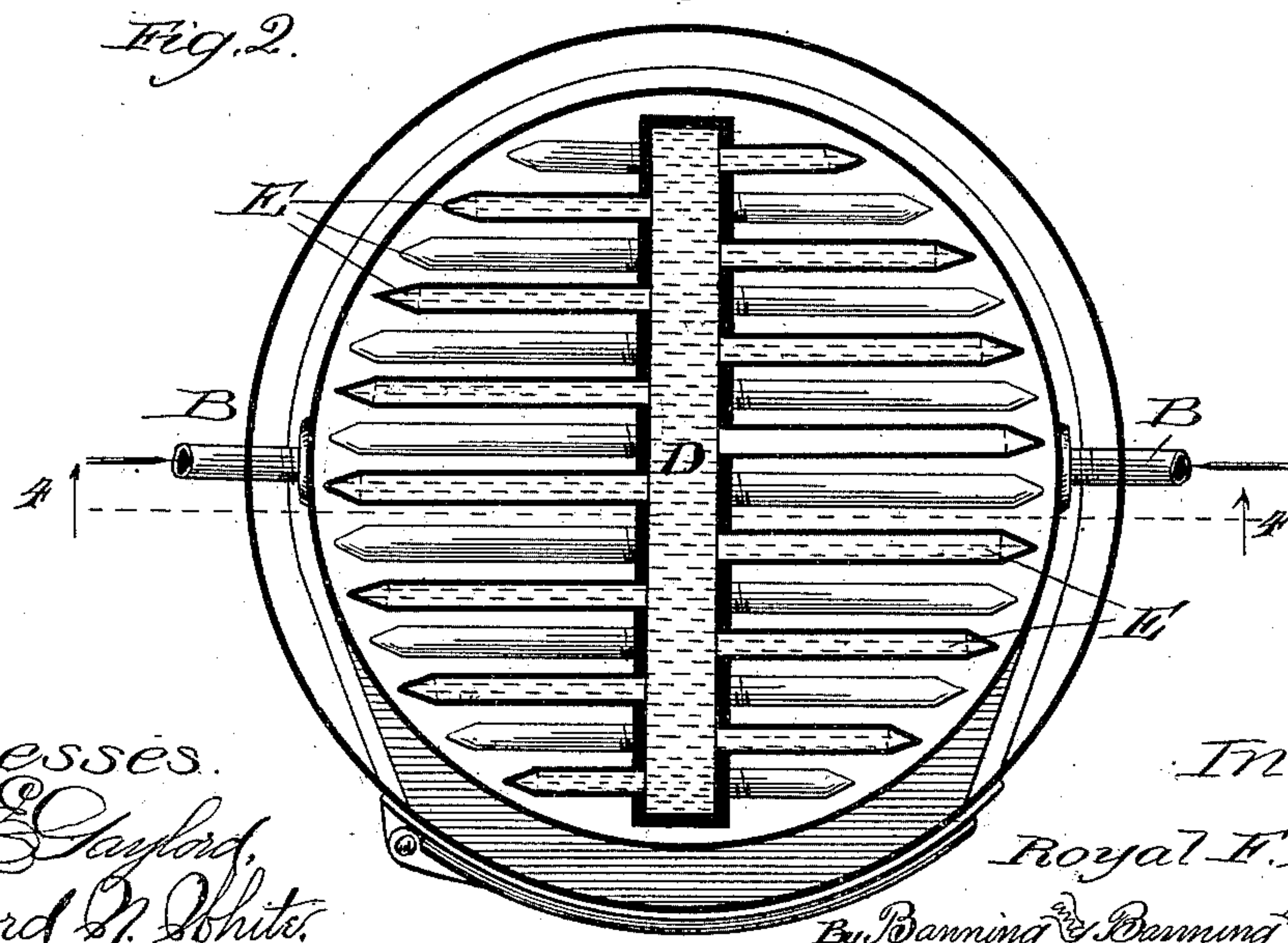
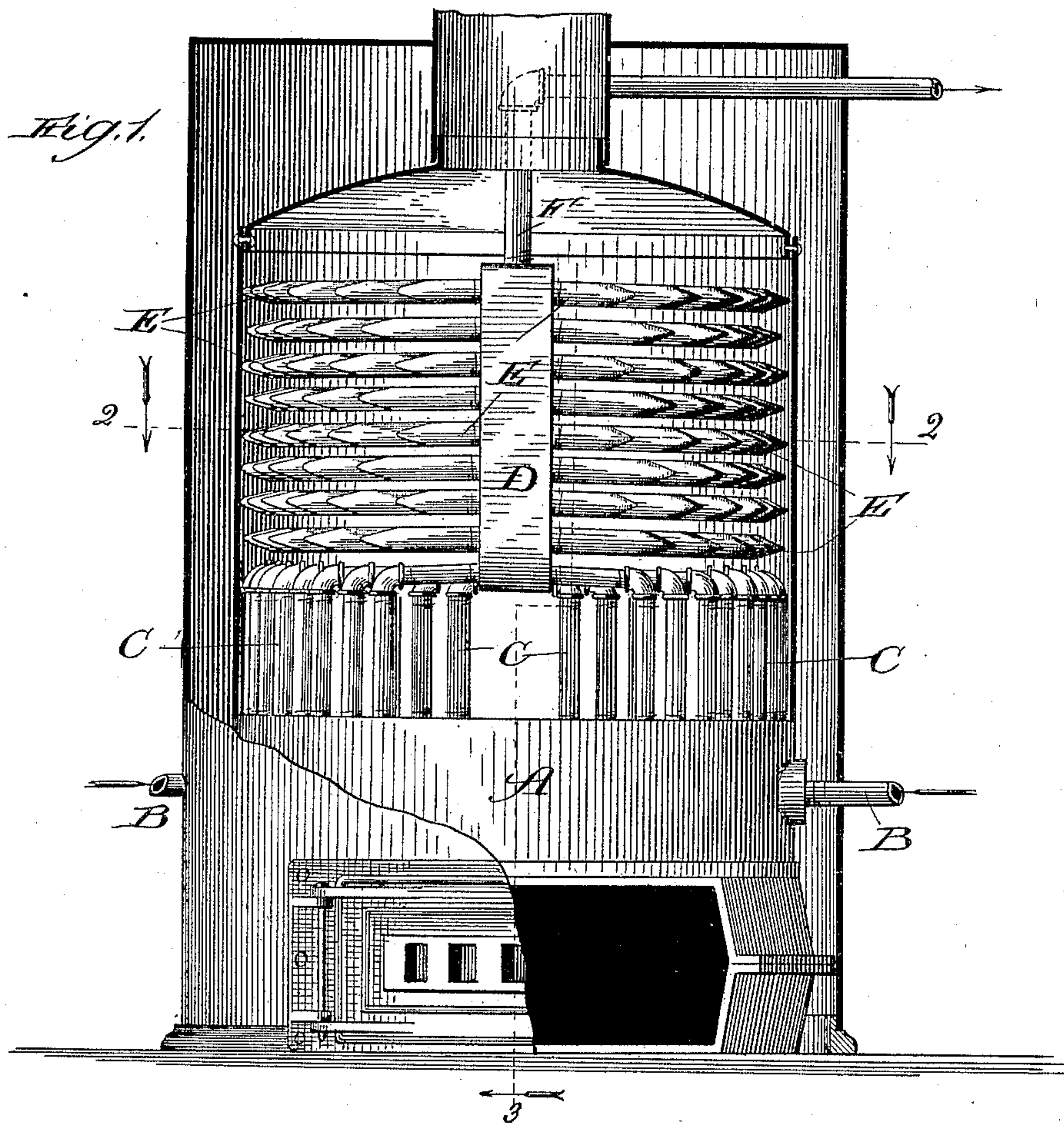
(No Model.)

2 Sheets—Sheet 1.

R. F. BROWN.
HOT WATER BOILER.

No. 424,174.

Patented Mar. 25, 1890.



Witnesses.
C. E. Gaylord,
Clifford W. White.

Inventor,
Royal F. Brown
By Banning & Banning & Payson,
Attys.

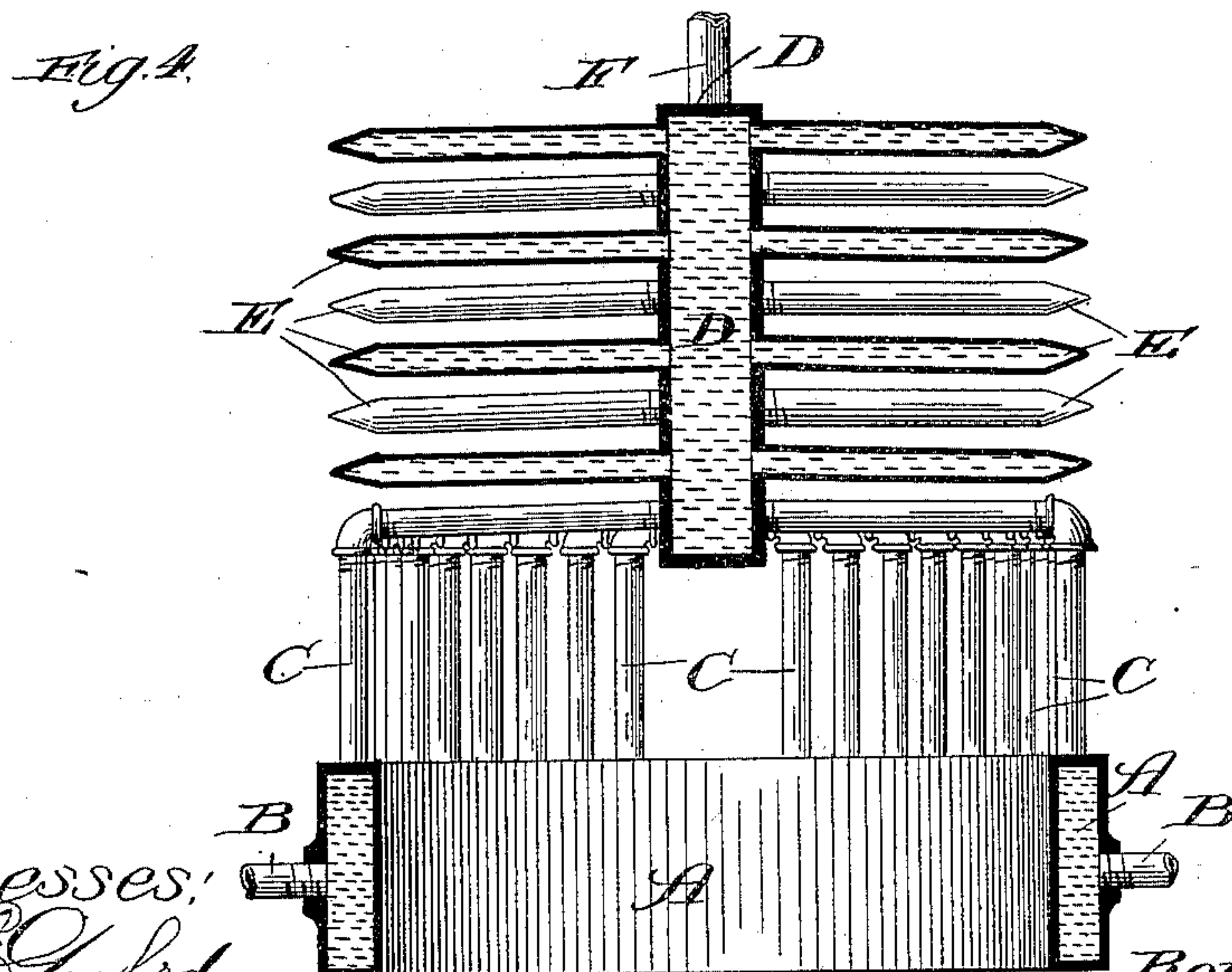
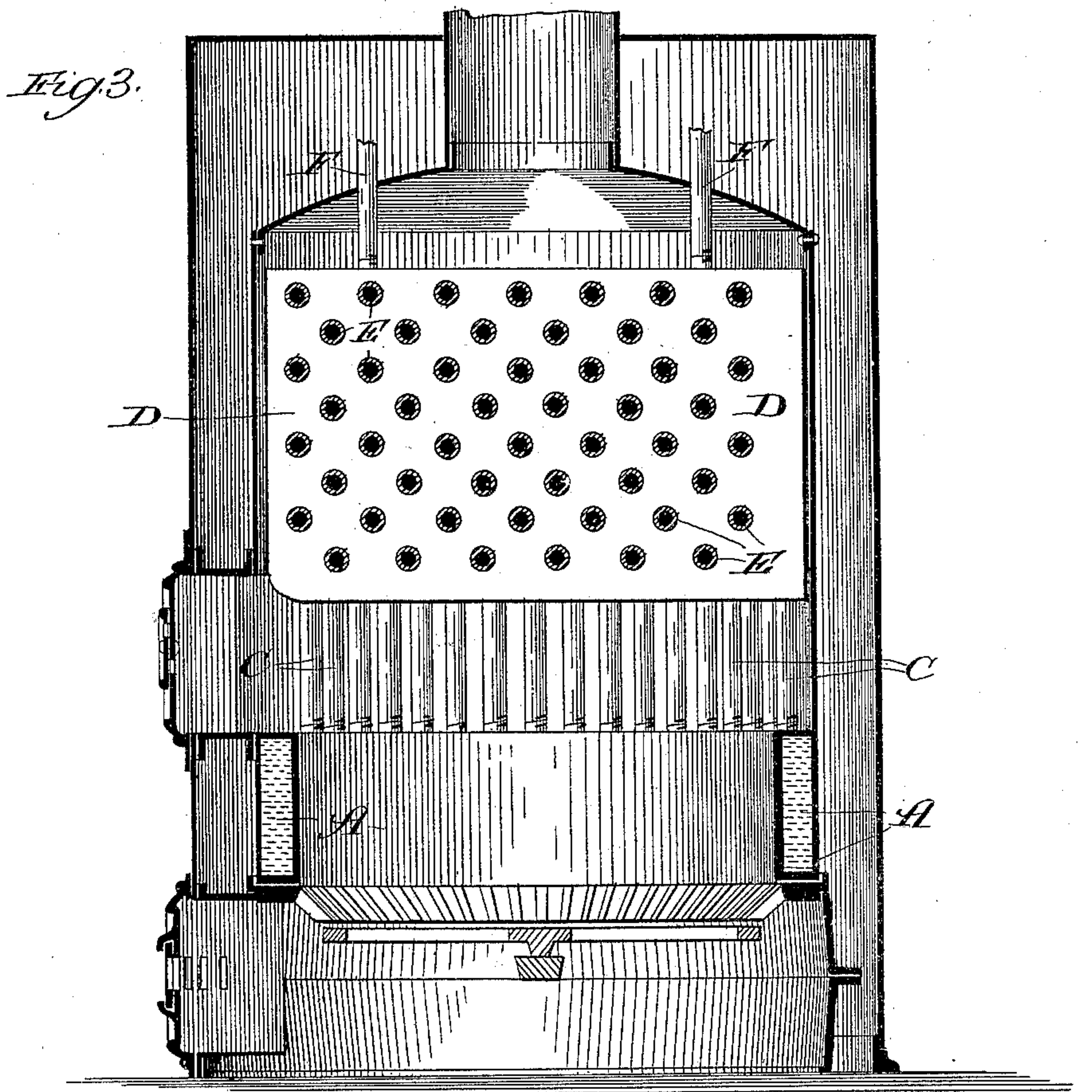
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2 Sheets—Sheet 2.

R. F. BROWN.
HOT WATER BOILER.

No. 424,174.

Patented Mar. 25, 1890.



Witnesses:

Chas. E. Gaylord.
Clifford M. White.

Inventor:

Royal F. Brown

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UNITED STATES PATENT OFFICE.

ROYAL F. BROWN, OF CHICAGO, ILLINOIS.

HOT-WATER BOILER.

SPECIFICATION forming part of Letters Patent No. 424,174, dated March 25, 1890.

Application filed October 24, 1889. Serial No. 328,037. (No model.)

To all whom it may concern:

Be it known that I, ROYAL F. BROWN, a citizen of the United States, residing at Chicago, Illinois, have invented certain new and useful Improvements in Hot-Water Boilers, of which the following is a specification.

In the drawings, Figure 1 is a front elevation of my improved boiler with the inclosing-case broken away. Fig. 2 is a plan view of a section taken through the line 2 2 of Fig. 1. Fig. 3 is in part a vertical section taken through the line 3 3 of Fig. 1, and Fig. 4 is a vertical section taken through the line 4 4 of Fig. 2.

In making my improved hot-water boiler I make a fire-pot consisting of a water-ring inclosed on all sides. This water-ring is preferably made circular in form, so that there will be no corners or projections in the fire-pot to interfere with the complete combustion of all the fuel that may be placed therein, though it may be made of square or of other form. It extends up as far as may be desired, and, preferably, to about the top of the fire-bed. It is made of double walls closed at the top and bottom, so as to afford a space into which water may be introduced and permitted to circulate as it becomes heated.

In the drawings, the pipes through which the water is introduced into the water-ring are designated as B, and they also constitute the return-pipes by which the water from the radiators is carried from time to time into the boiler in the progress of its circulation. Rising from the water-ring are arranged a number of pipes C, which extend up a desired distance and turn in toward the center, terminating at their inner ends in a central rectangular water-chamber D. This central rectangular water-chamber is extended across or substantially across from one side of the fire-pot to the other, and is preferably of short diameter from side to side. All of the water-pipes C from the water-ring terminate in the lower portion of this central water-chamber, either on the same plane, as particularly shown in Fig. 1, or on different planes, as may be preferred, and afford means for the water to rise from the water-ring as it becomes heated and pass upward into the central

water-chamber. A large number of pipes E extend out horizontally, or nearly so, from the central water-chamber on each side, closed at their outer ends and opening at their inner ends into the chamber. These horizontal pipes are preferably arranged, as shown in Fig. 3, in alternate rows, so that the fire and products of combustion may freely rise and circulate between them, striking the bottom and the sides of each tube, which would not so well be the case were they arranged in regular rows one above the other. In this way these pipes and the water with which they are filled are subjected to a much greater degree of heat, so that much more beneficial results will be secured than where they are arranged in regular rows one above the other. At the top of the central water-chamber one or more supply-pipes F are arranged, leading to the various radiators to be heated, so as to convey the water from the central chamber to the radiators as it becomes heated.

It will be noticed that the central water-chamber is made rectangular in form and extends from about one side of the fire-pot to the other. By this arrangement I am able to secure ample space on each side for the arrangement of the horizontal water-pipes and for the circulation between them of the heat and products of combustion. It will be further noticed that this central water-chamber is arranged above that portion of the fire-pot in which the bed of coals is deposited and in which the active combustion takes place. This enables me not only to directly heat the bottom of this central chamber, but also to avoid the inconvenience and detriment that necessarily result where the central reservoir extends down through the body of the fire to the bottom of the fire-pot, breaking up the body of coals and preventing easy access to all portions of the fire-pot. It will be further noticed that the pipes rising from the water-ring all turn to a horizontal position and converge or terminate in the lower portion of the central water-chamber. This enables me to subject each of these pipes as well as the horizontal pipes extending out from the central water-chamber to direct heat through that portion of them which is arranged in a hori-

zontal position, instead of relying upon the heat which would be imparted to them along the sides as the heat and products of combustion move upward. In this way a much
5 greater heat is necessarily imparted to the pipes and utilized in heating the water passing from the water-ring through them into the central water-reservoir.

I am aware of the construction shown and
10 described in the Jewett patent of June 18, 1889, in which pipes lead from the water-ring to the upper portion of the central water-chamber instead of to its lower portion only, and in which such water-chamber opens into
15 a common reservoir at the top, from which the supply-pipes lead, instead of from the central water-chamber, and I wish to disclaim such construction.

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

In hot-water boilers, the combination of a
20 fire-pot consisting of a water-ring, a rectangular central water-chamber arranged above the same, pipes connecting the water-ring and the central water-chamber at or near the bot- 25 tom only of the latter, horizontal closed pipes extending out from the sides of the central water-chamber, supply-pipes leading out of the top of the central water-chamber, and return-pipes leading into the water-ring, sub- 30 stantially as described.

ROYAL F. BROWN.

Witnesses:

GEORGE S. PAYSON,
SUSIE CROWLEY.