

(No Model.)

J. ROBB.
SECTIONAL BOILER.

No. 364,958.

Patented June 14, 1887.

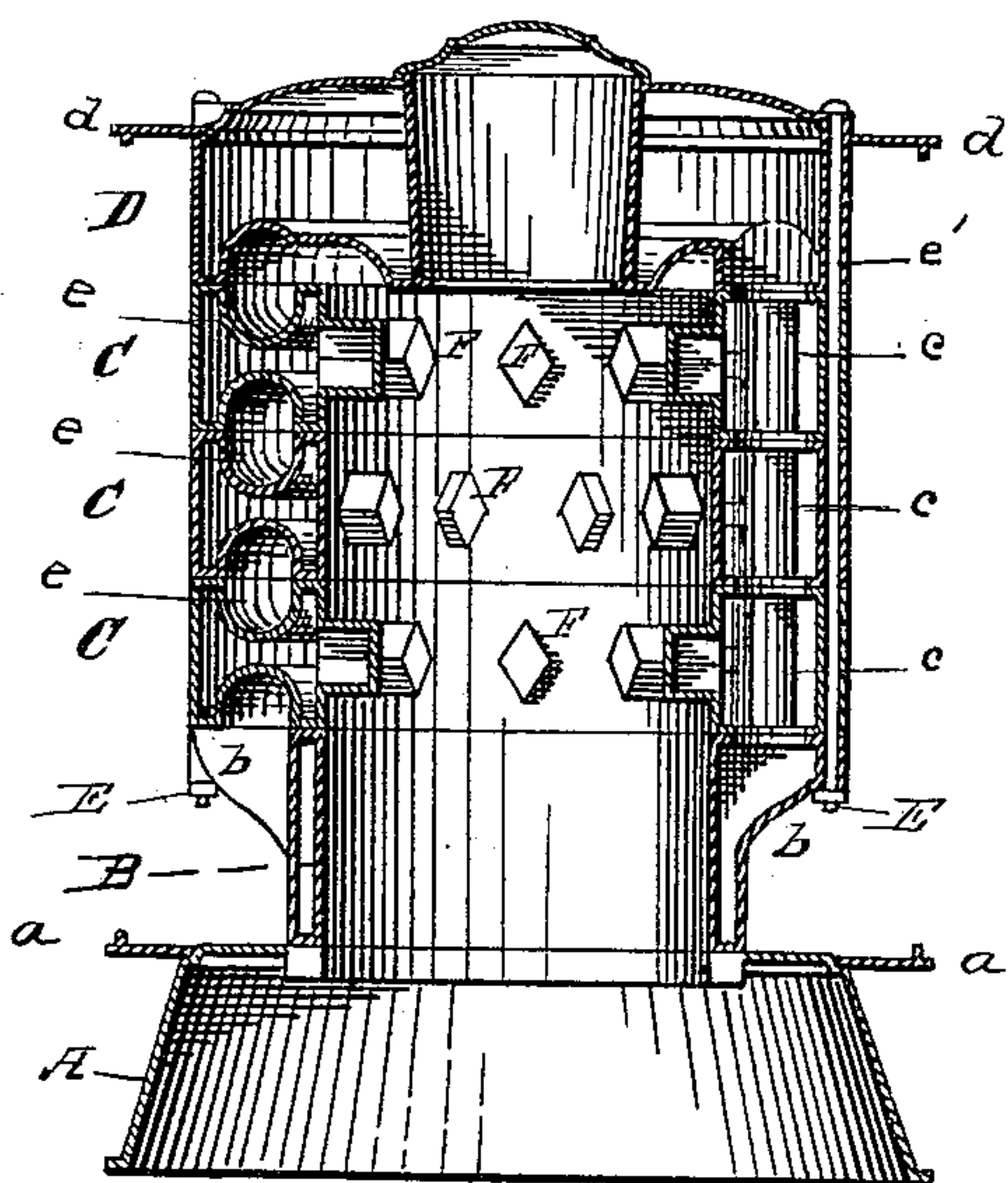


Fig. 2.

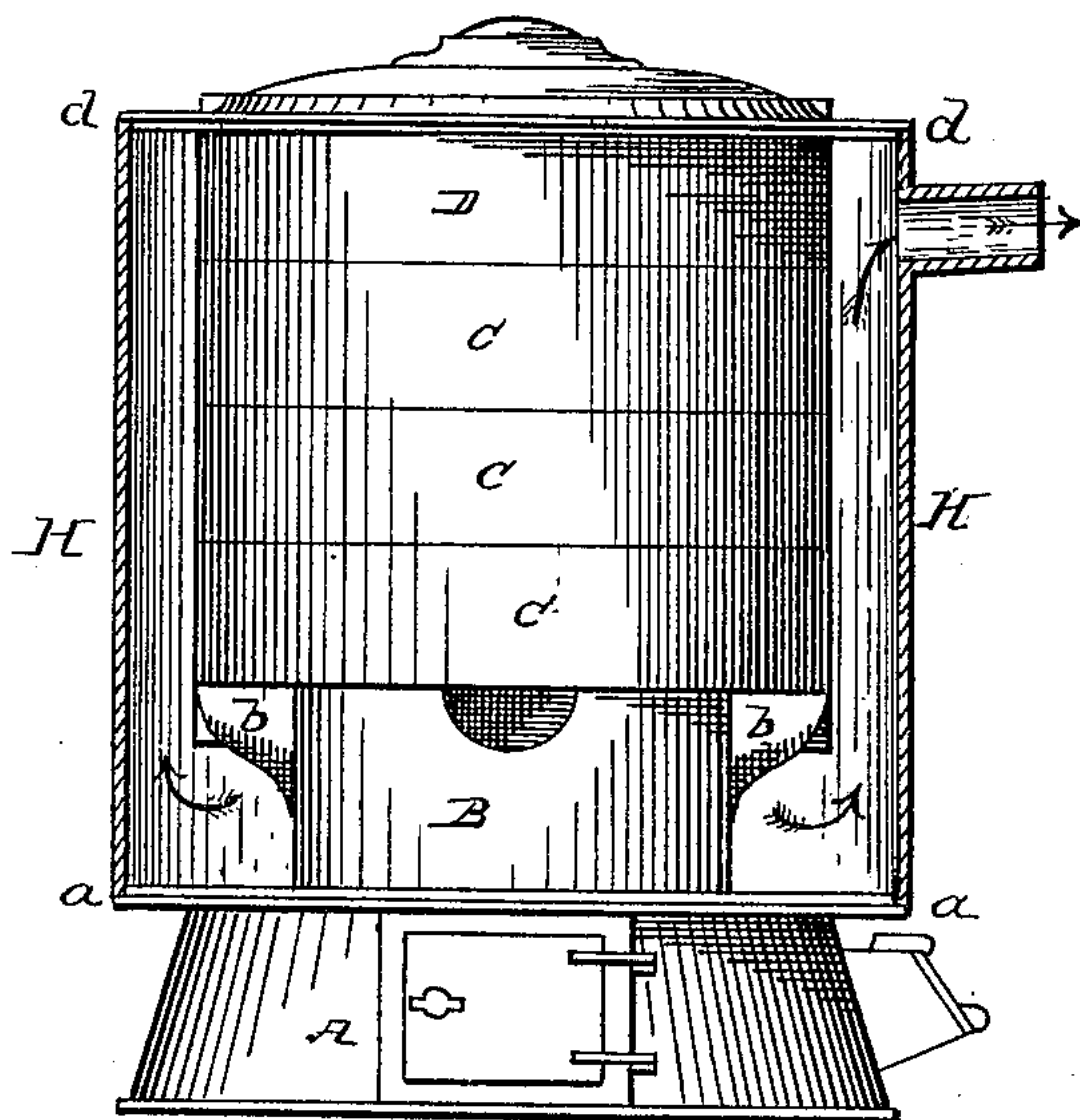


Fig. 1.

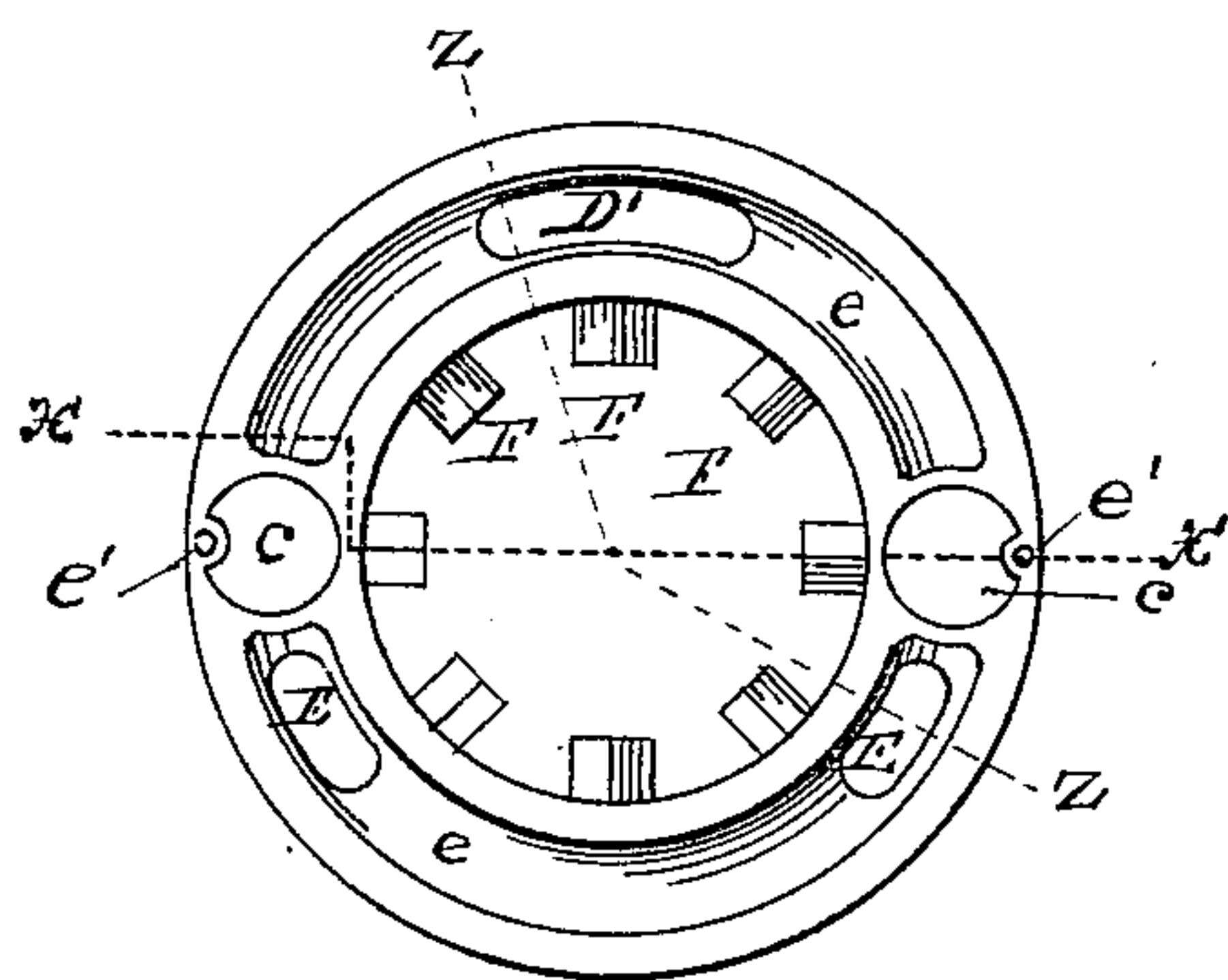


Fig. 4.

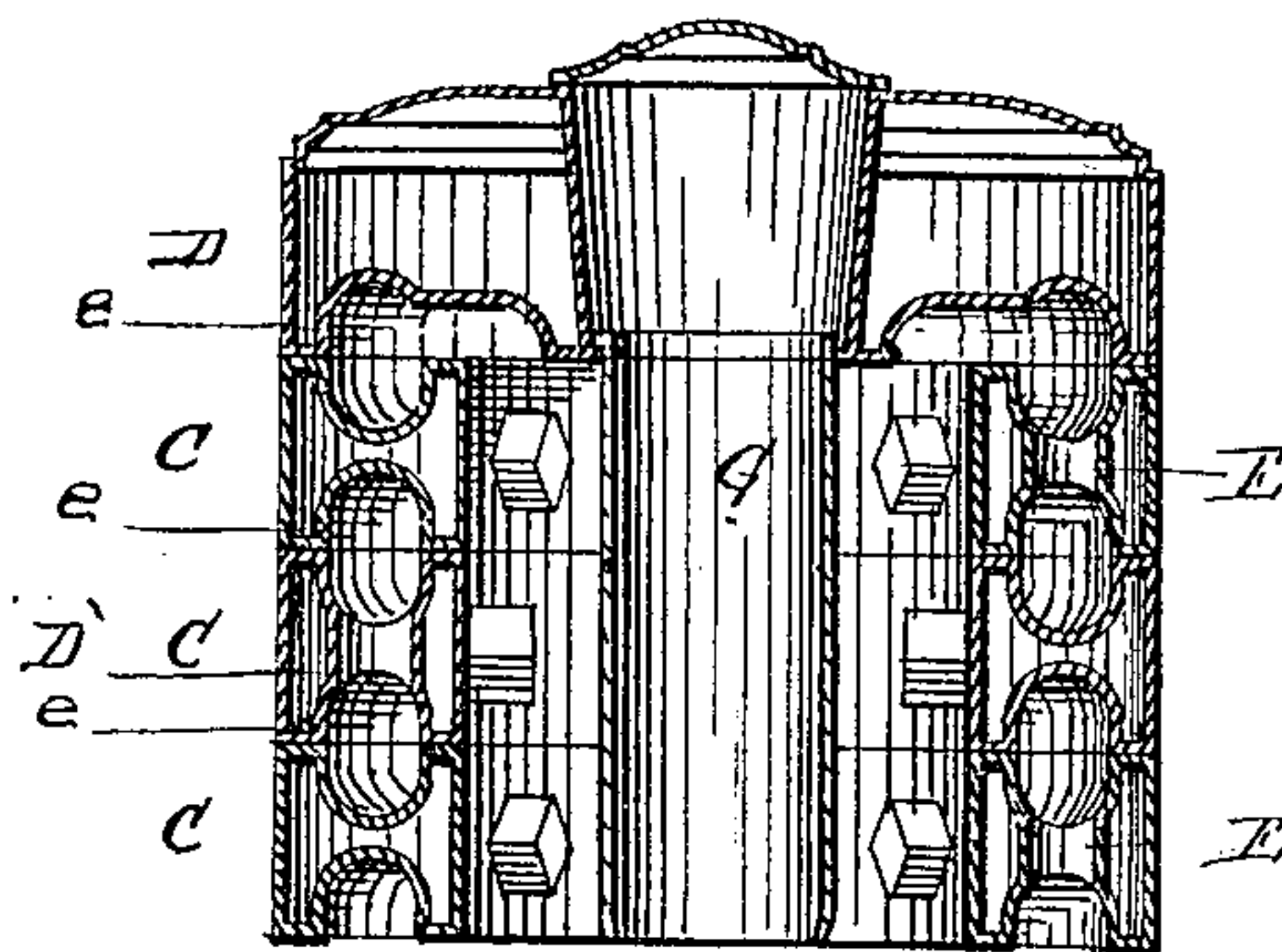


Fig. 3.

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN ROBB, OF AKRON, OHIO.

SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 364,958, dated June 14, 1887.

Application filed April 20, 1887. Serial No. 235,542. (No model.)

To all whom it may concern:

Be it known that I, JOHN ROBB, a citizen of the United States, residing in the city of Akron, in the county of Summit and State of Ohio, have invented a new and useful Improvement in Cast-Iron Sectional Boilers, of which the following is a specification.

My invention relates to improvements in cast-iron sectional boilers for heating purposes. Its objects are to simplify the construction of the sections, to increase the heating-surface, and to prevent leakage at joints.

It consists in the devices illustrated in the accompanying drawings, in which—

Figure 1 is an elevation, the outer case being shown in vertical central section; Fig. 2, a vertical section at the line $x x$ of Fig. 4; Fig. 3, a vertical section of Fig. 1 above the fire-box at the line $z z$ of Fig. 4, and Fig. 4 a plan of one of the water-sections.

The entire boiler consists of a base and ash-pit, A, a fire-box, B, a series of water-sections, C, a top section or dome, D, the magazine G, and outer case, H. The number of water-sections will be regulated by the requirements of the boiler. The ash-pit A, common to boilers of this class, requires no explanation, except that it has an annular flange, a , to receive and retain the outer shell, H. The fire-box B consists of a hollow ring, narrower than the sections C, and having projecting ducts b , which register with the water-ports of the sections. The sections C each consist of a hollow ring having two water-ports, c , on opposite sides in each face, at which points its cross-section is square. Between the water-ports on each side and in each face the shell bends inward, forming semicircular channels e . Three flues pass through each section C, a single one, D' , in the center of the channel at one side, and two, $E E$, at the ends of the opposite channel, and the area of each of the latter should substantially equal the area of the cross-section of the channel, and the sum of their areas equal the area of the flue D' .

In building up the boiler each successive section C is turned half around, so that the ports c register; but the channels containing the flues $E E$ are opposite those having the flue D' , and the opposite channels form a connecting-flue between the others at each side,

and with them constitute the downdraft. The heating-surface of each is not only thereby greatly increased, but the products of combustion pass in this zigzag course along nearly the entire length of each face of each section. From the inner face of each section a number of polygonal closed tubes, F, one angle of each being upward, project into the space between the sections and magazine G, and thereby greatly increase the heating-surface. The top section or dome, D, consists of a hollow ring having water ports which register with the water-ports in the sections, a central opening for the magazine, and two semicircular channels corresponding with the channels in the sections C. The magazine G is a hollow cylinder supported by a flange in the central opening in the dome D.

To unite the fire-box, sections, and dome, holes e' are cast or drilled in the solid metal of each, in which connecting-bolts E are placed. By this arrangement the connecting-bolts expand and contract equally with the sections, and all leakage between sections from unequal expansion and contraction between them and the bolts is avoided.

The entire boiler is inclosed in a case, H, retained between the flanges a and d , which rest, respectively, on the fire-box A and dome D.

In operation the products of combustion pass upward from the fire-box B, between the magazine G and sections C, until they reach the dome D, and enter the semicircular channels in its under face, and thence pass downward through the semicircular channels and flues in the sections until they emerge at the fire-box B, whence they pass upward between the outer face of the sections C and the case H, and escape through an uptake-flue shown at the right of Fig. 1, as indicated by arrows.

I claim—

1. The combination, in a water-section for boilers of the kind specified, of two water-ports on opposite sides in each horizontal face, two semicircular channels in each horizontal face between the water-ports, and three flues passing through said section, one in the center of the channel at one side and the others at the ends of the opposite channel, substantially as shown, and for the purpose specified.

2. In a boiler of the kind specified, the com-

5 bination of the sections C C C, each having water-ports on opposite sides in each face, with semicircular channels between said ports, and three flues, one through the center of the channels at one side and one at each end of the opposite channels, the channel having one flue being placed opposite the channel of the next section containing two flues; substantially as shown, and for the purpose specified.

10 3. The combination, in a boiler of the kind specified, with a fire-box and a dome, of a number of water-sections, each having water-ports on opposite sides in each face, with semicircular channels between the water-ports, and

15 three flues, one through the center of the channels on one side and one through each end of

the opposite channel, said sections being placed with the single flue in one between the two flues in the adjacent section, substantially as shown, and for the purpose stated.

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4. The combination, with the water-section C, having water-ways *c*, semicircular channels *c*, and flues D E E, of the polygonal closed tubes F, constructed and arranged substantially as shown, and for the purpose stated.

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In testimony that I claim the foregoing I have hereunto set my hand this 6th day of April, A. D. 1887.

JOHN ROBB.

Witnesses:

C. P. HUMPHREY,
E. W. STUART.