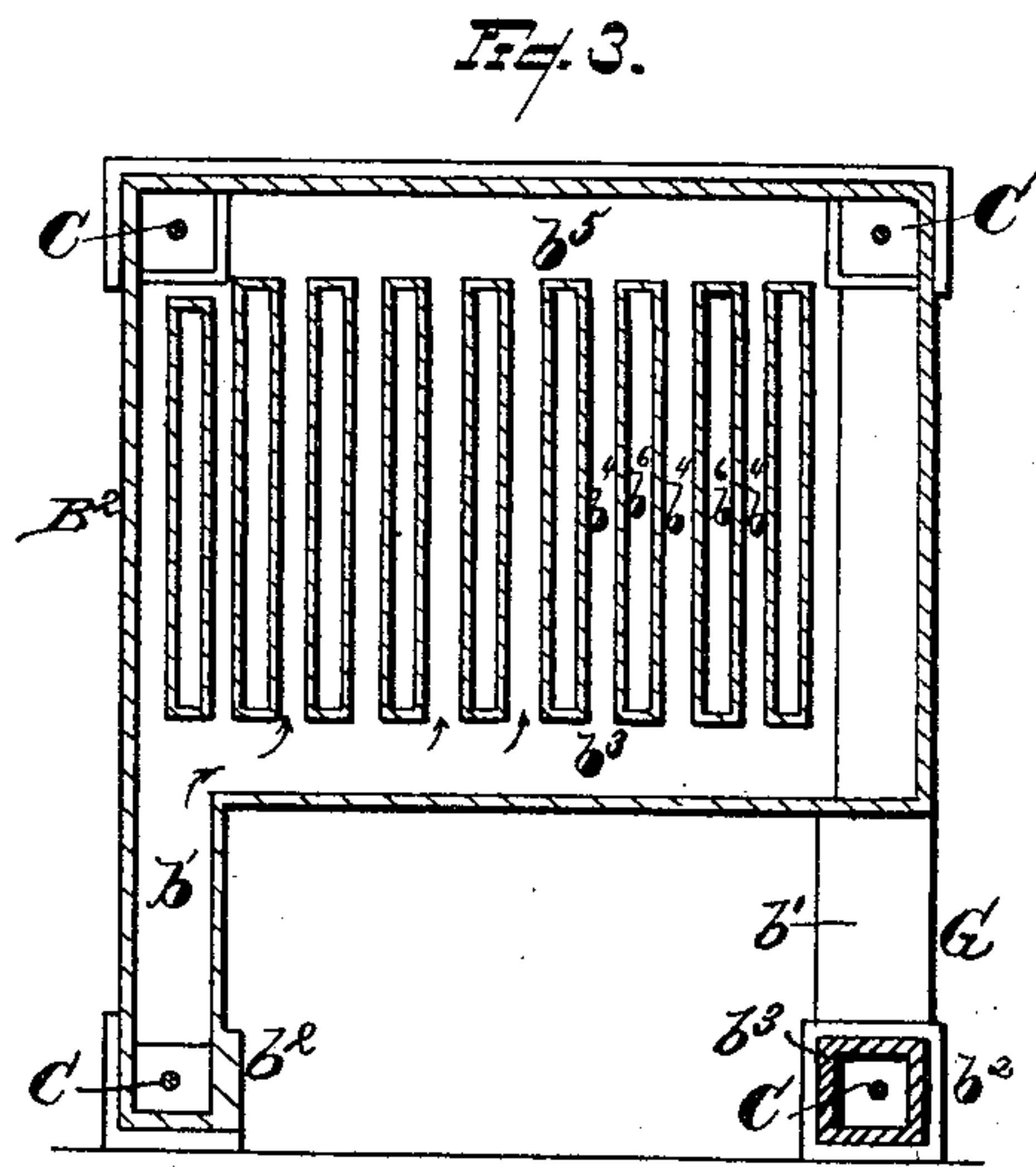
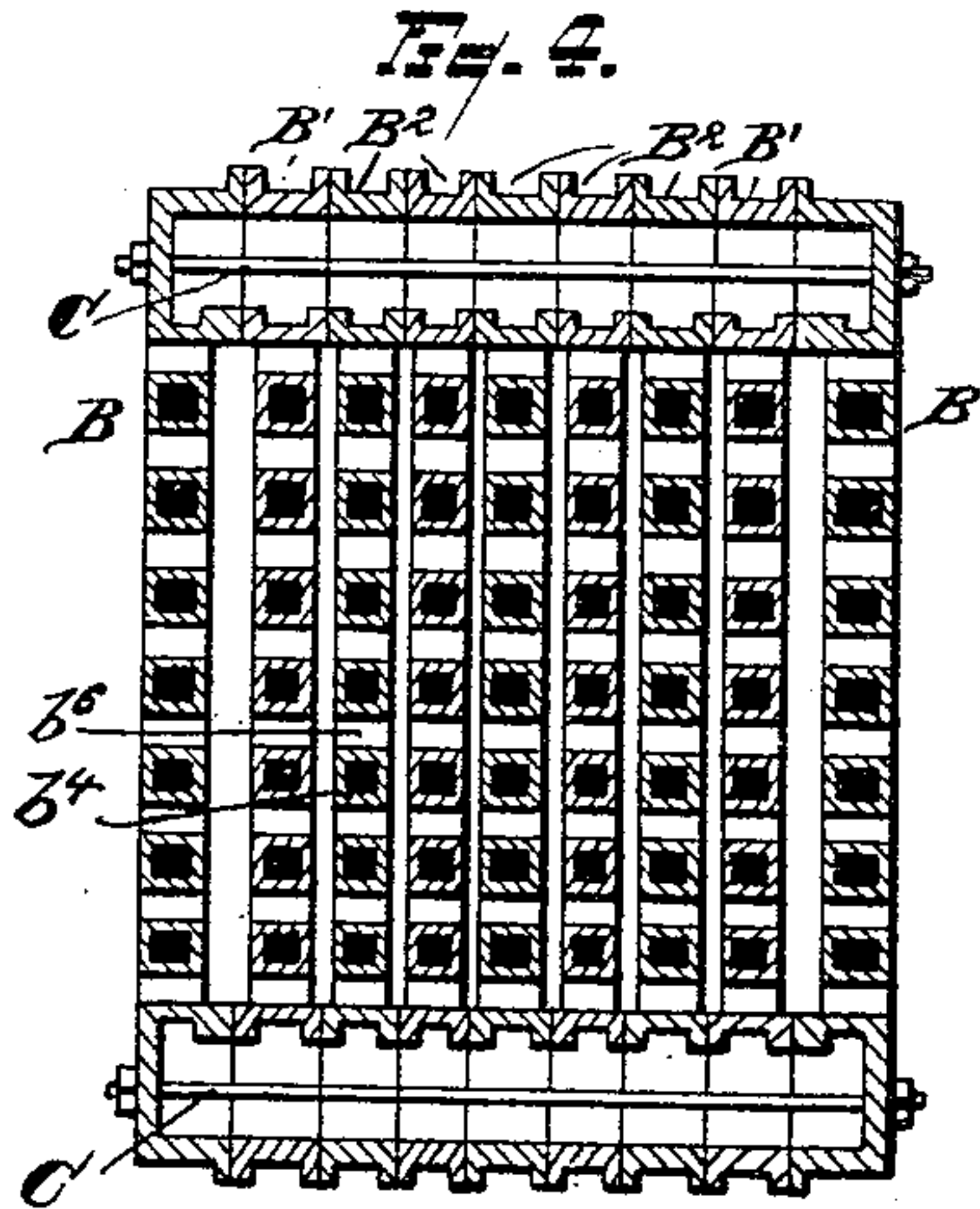
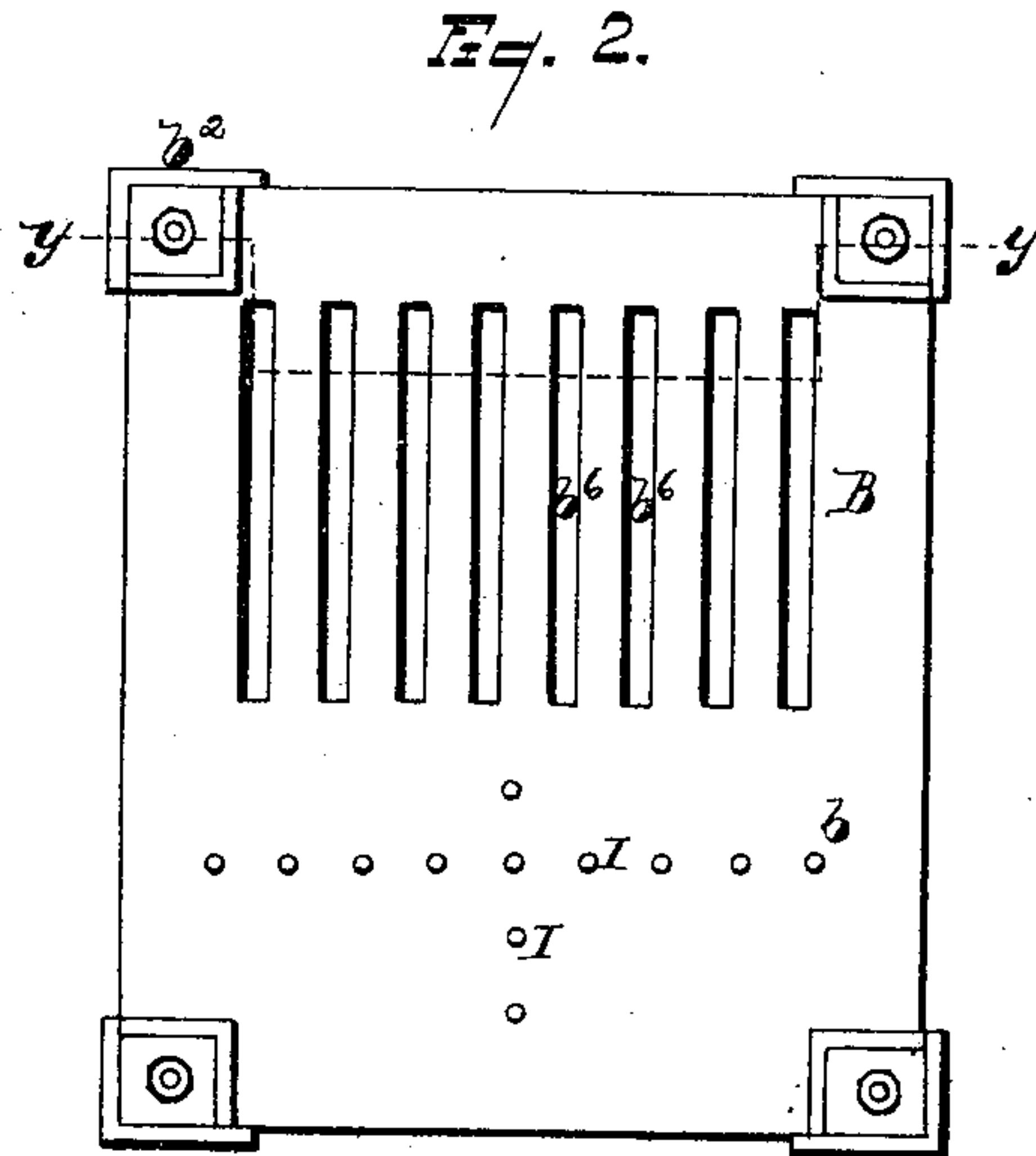
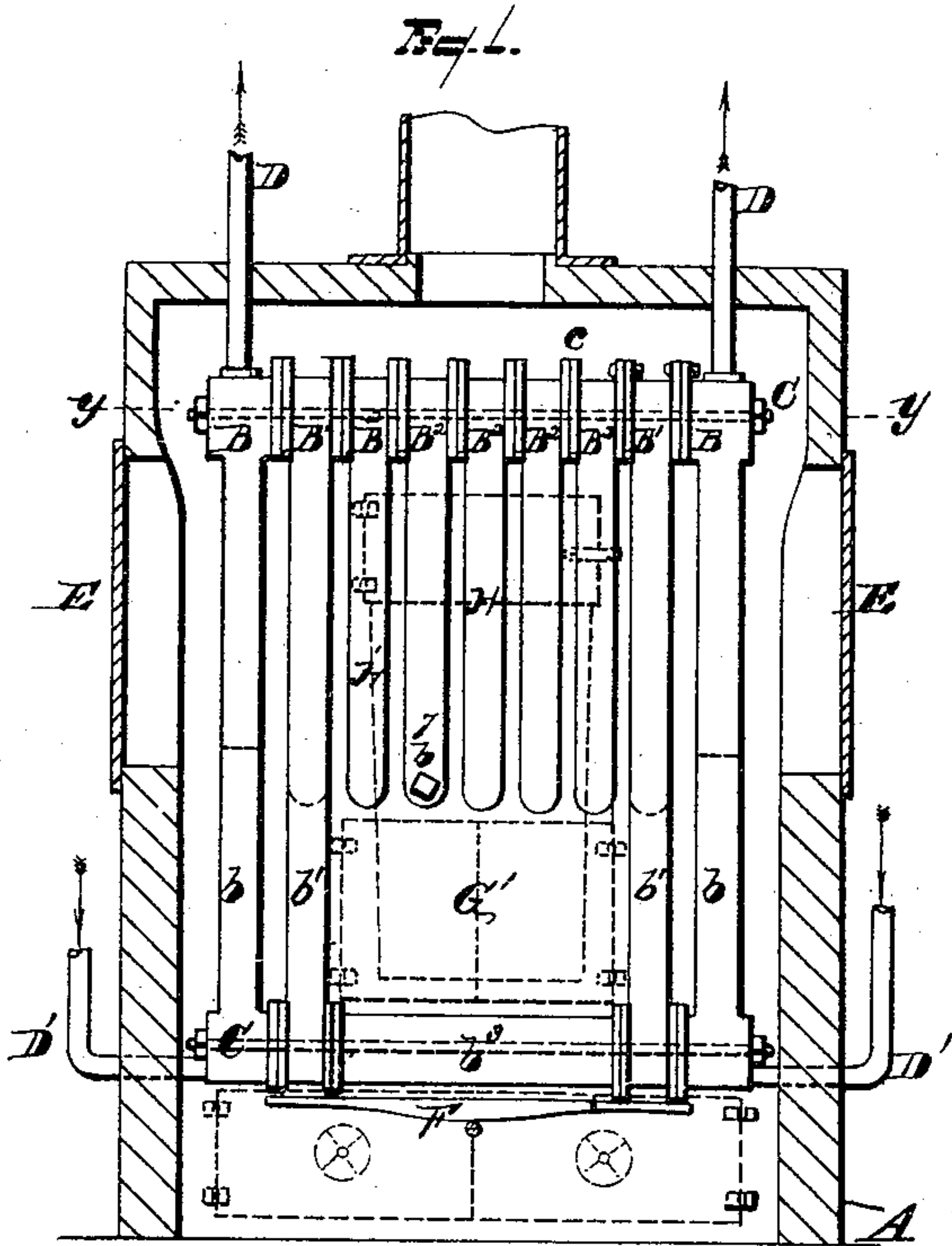


(No Model.)

J. D. MOUAT.
SECTIONAL BOILER.

No. 388,370.

Patented Aug. 21, 1888.



WITNESSES

Samuel E. Thomas.
Th. B. O'Dogherty.

INVENTOR

John D. Mouat
By W. W. Feggen.
Attorney

UNITED STATES PATENT OFFICE.

JOHN D. MOUAT, OF DETROIT, MICHIGAN.

SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 388,370, dated August 21, 1888.

Application filed April 26, 1888. Serial No. 271,920. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. MOUAT, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Sectional Boilers; and I declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

In the drawings, Figure 1 is a sectional view, showing parts in elevation, of a sectional boiler embodying my invention. Fig. 2 is a separate view of one of the side sections of my boiler. Fig. 3 is a sectional view taken through one of the middle sections. Fig. 4 is a sectional view on the line *y y* of Figs. 1 and 2.

It is the purpose of my invention to produce a steam-boiler in which the heating-surface is disposed to the best advantage, so as to derive from the minimum amount of fuel the maximum amount of steam or hot water; also, the construction of a boiler of this character in the form of a sectional boiler, so that by employing more or less sections the boiler may be given a greater or less capacity; also, in a construction which shall admit of thoroughly cleansing the exterior surfaces of the water-tubes; also, in the provision of means for gaining ready access to the interior of those water-tubes which depend downward into the combustion-chamber, and which might become scaled upon the interior.

In carrying out my invention, A represents the walls of an ordinary furnace.

B represents one of my boiler-sections, being one of the extreme sections. The portion *b* constitutes one of the boundary-walls of the fire-box.

B' represents the adjacent sections provided with legs *b'*, which project down at the front and rear of the fire-box.

B² represents those sections which extend opposite the fuel-door. They are provided with a rear leg only, as shown in section in Fig. 3. Each of the sections B and B' and the rear legs of B² are adapted to unite with the adjacent sections along the connecting-hubs *b*², the said hubs constituting, as it were,

a manifold through which the water may circulate, and so unite all the water tubes or loops. Beneath the forward ends of the depending loops B² is provided a single connecting-drum, *b*³, as shown in Fig. 1.

C represents bolts whereby the sections of the boiler are bound together.

D represents steam or hot-water exit-pipes, and D' represents the return-pipes, such as are employed where the boiler is used as a hot-water circulator.

Each of the sections between the extreme sections of the boiler are provided with a head or manifold extending from front to rear, as shown at *b*³ in Fig. 3, and *b*⁴ represents water-tubes, preferably cast solid therewith, which unite the head or manifold *b*³ with the head or manifold *b*⁵ at the top of each section.

*b*⁶ represents openings between the tubes *b*⁴.

E represents convenient doors at the sides of the furnace.

F is the grate.

G is the fuel-opening shown in Fig. 3, and the fuel-doors are also shown at G' by dotted lines in Fig. 1.

H H' in Fig. 1 show, respectively, where a fuel-door and a fuel-magazine could be employed were the furnace to be provided with a base-burning mechanism, and in that event of course the depending sections B² would have to be shortened up or shaped to admit said fuel-magazine.

*b*⁷ shows how removable screw-plugs may be employed at the forward ends of the depending sections B², whereby access may be had to the interior for scraping them clean of any scale that may be formed therein.

By this construction it is obvious that the water-tubes of the boiler can be readily cleaned by inserting a brush or scraper between the tubes, as shown in Fig. 1. So, also, by opening either of the side doors, E, a similar brush or scraper may be passed through between the tubes from side to side of the furnace. So, also, if it is desired to make the boiler of greater or less capacity, the same can be accomplished by employing a greater or less number of sections.

This boiler is particularly well adapted for the purposes of heating by hot water or steam.

As a hot-water boiler, the circulation is rendered very perfect by reason of the fact of the water-tubes being brought into such direct connection with the heated products of combustion.

The heads b^3 immediately above the bed of fuel afford a free space for the water to flow in from the ends, and from which it circulates rapidly up through the tubes b^4 .

The space B^5 and the hubs b^2 at the top of the furnace may serve as a steam-dome in case the boiler is used as a steam-heater.

I prefer to construct this boiler of cast-iron, each section of the boiler being formed in a single casting. The different sections may be held together by single bolts C, or, if preferred, each hub may be provided with flanges c , and these may be bolted directly one to another. The end sections, B, may be provided with stay-bolts I, or the plates may be cast with small partitions or posts upon the inside between the faces for a like purpose.

As a hot-water circulator this boiler is particularly well adapted, because from its construction the water is caused to heat quickly and consequently to circulate with rapidity.

It will be understood that I contemplate as an equivalent construction a boiler in which the sections extend from side to side, instead of from front to rear, in which event the section B would be at the back of the furnace, and all of the other sections from there forward would be like the section B'. So, also, where large capacity is required the furnace may be divided, so as to have several grates and fuel-doors side by side, the said spaces being separated by sections like the section B, the lower

portion of which would form the divided wall between each section and the adjacent section of the furnace. In this way during moderate weather one or more of these separate fire-chambers might be employed, and in colder weather all could be employed.

What I claim is—

1. A sectional boiler composed of end sections, B, extending from top to base, adjacent sections B', extending from top to base at their forward and rear ends, but bridging the fire-chamber between the ends, and sections B², bridging the fire-chamber and extending from top to base at their rear ends, said sections united at their upper and lower ends by communicating hubs, and each of said sections provided with tubes b^4 and flue-spaces b^6 , substantially as shown and described.

2. A sectional boiler composed of end sections, B, extending from top to base, adjacent sections B', provided with water-legs that depend from said sections at front and rear, and the sections B², provided with water-legs depending from the rear of said sections, the tops of the sections and the bottoms of the sections B and the water-legs of sections B' and B² being united by communicating hubs, and each of said sections provided with flues b^6 and tubes b^4 , substantially as shown and described.

In testimony whereof I sign this specification in the presence of two witnesses.

JOHN D. MOUAT.

Witnesses:

M. B. O'DOHERTY,
A. E. MANSFIELD.