

(No Model.)

E. GURNEY & C. SELLERS.

STEAM AND WATER BOILER.

No. 324,314.

Patented Aug. 11, 1885.

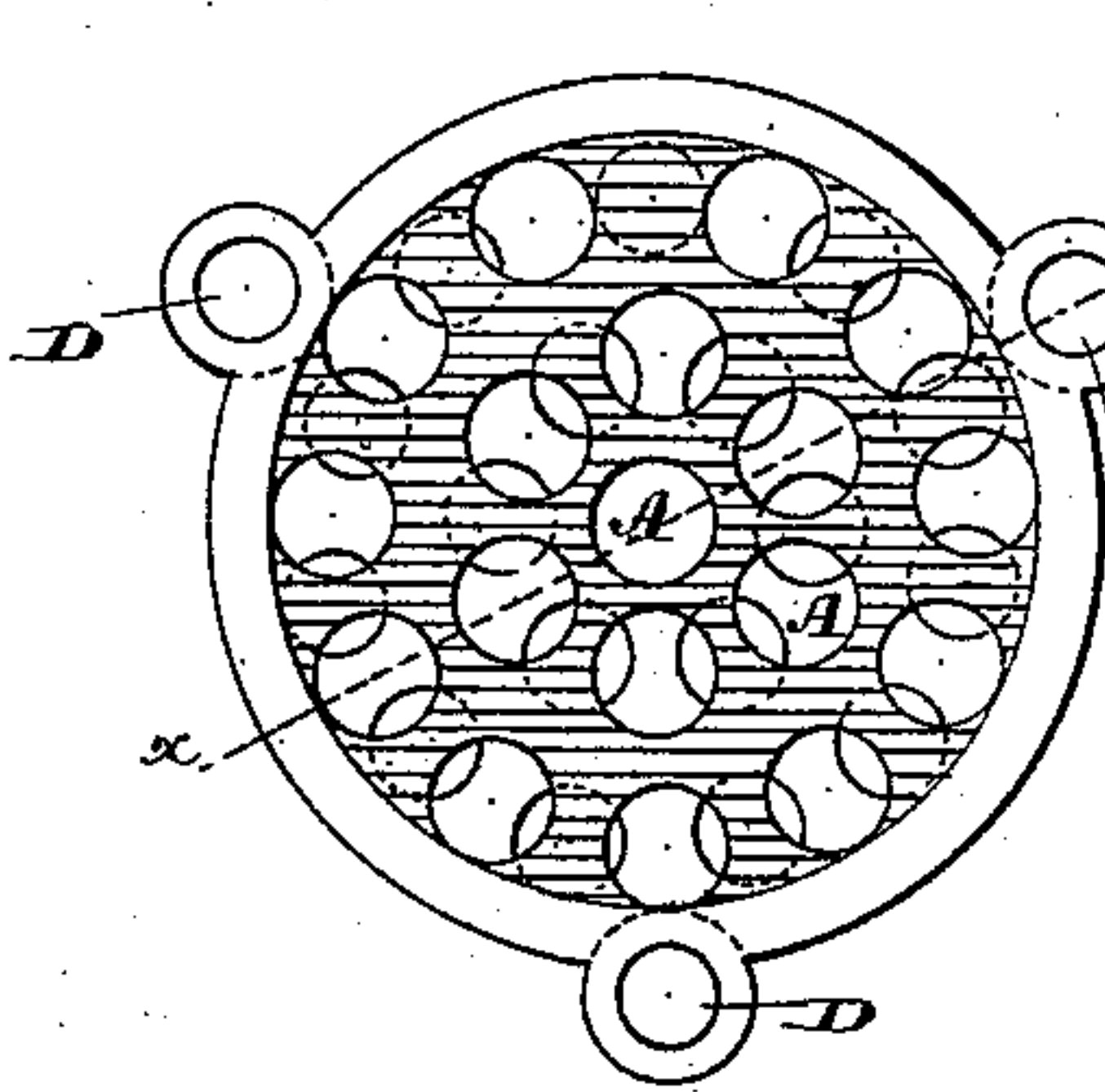


Fig.1.

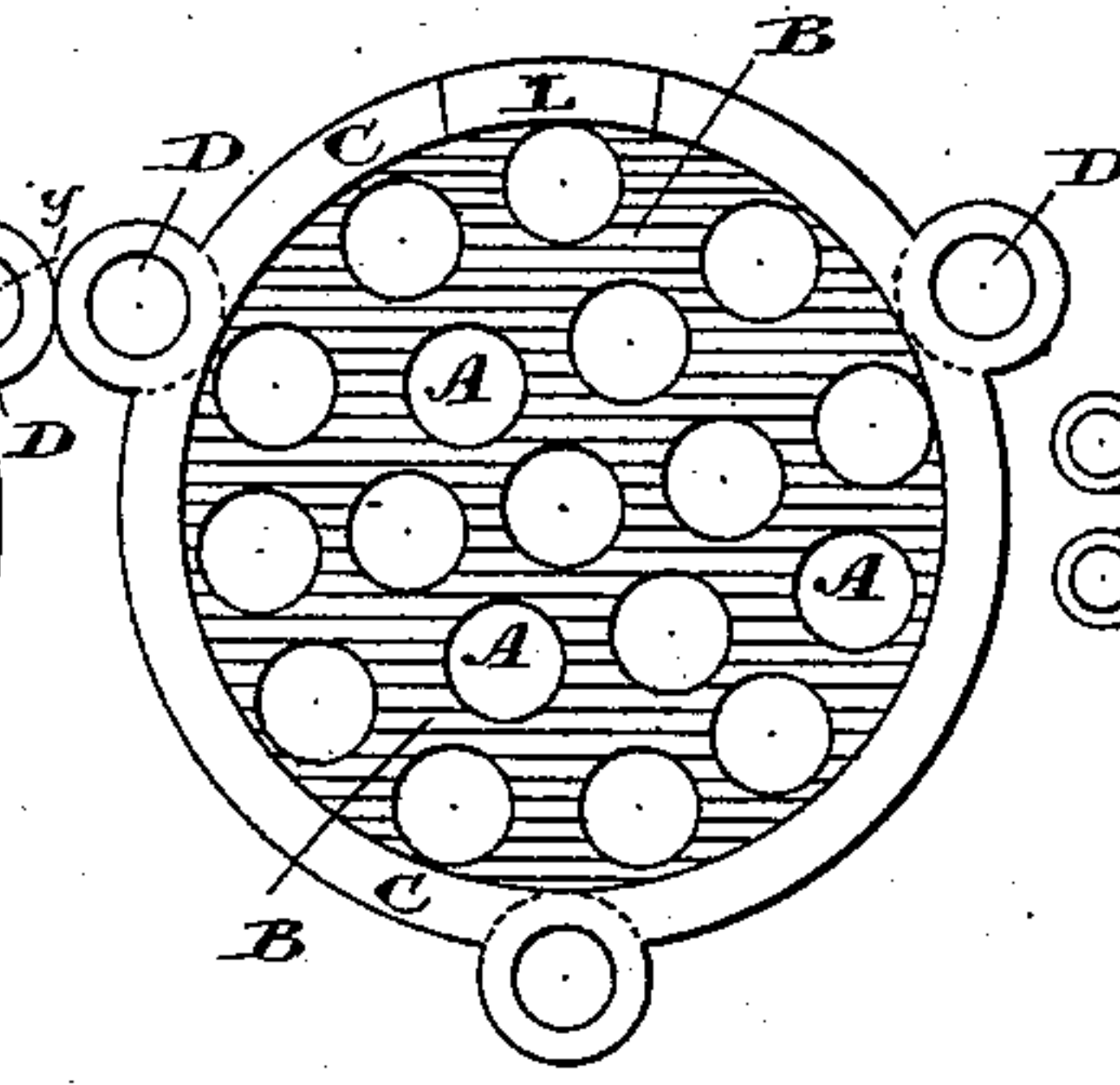


Fig. 2.

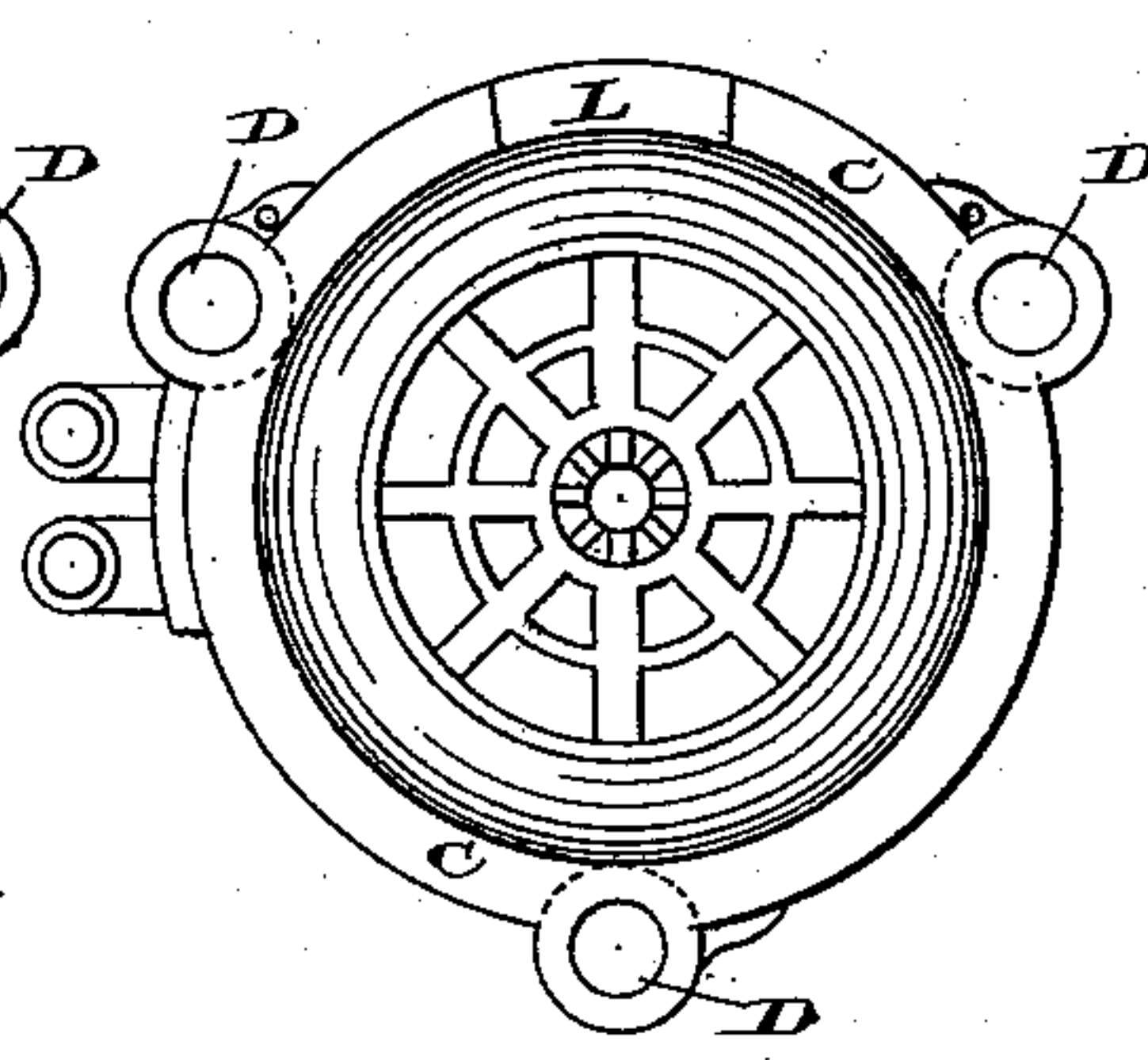


Fig. 3.

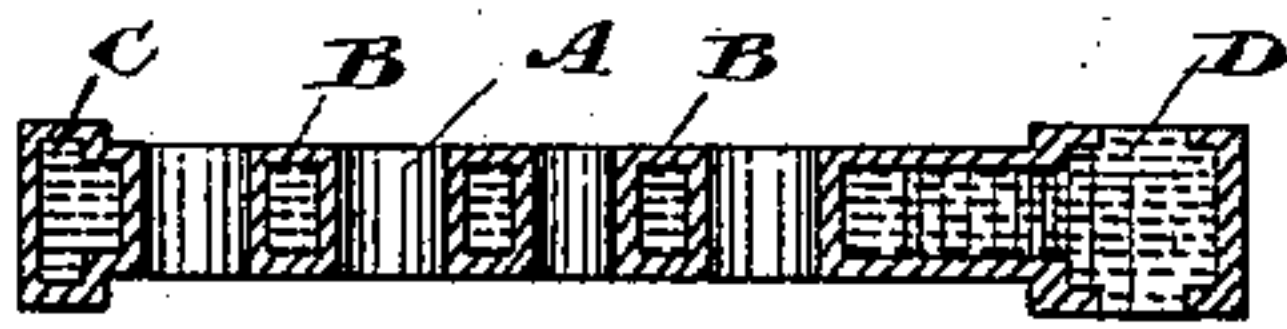


Fig.4.

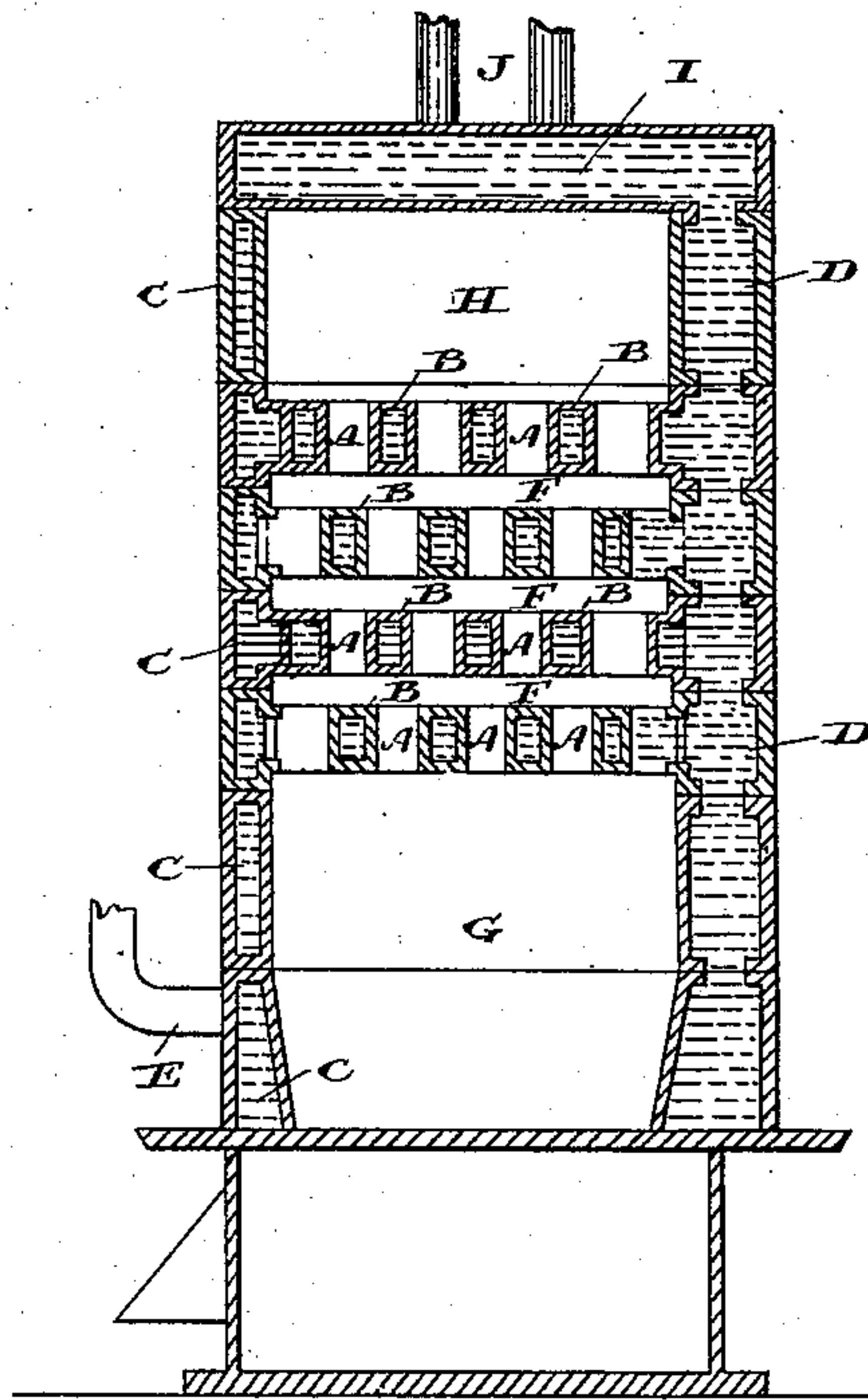


Fig. 5.

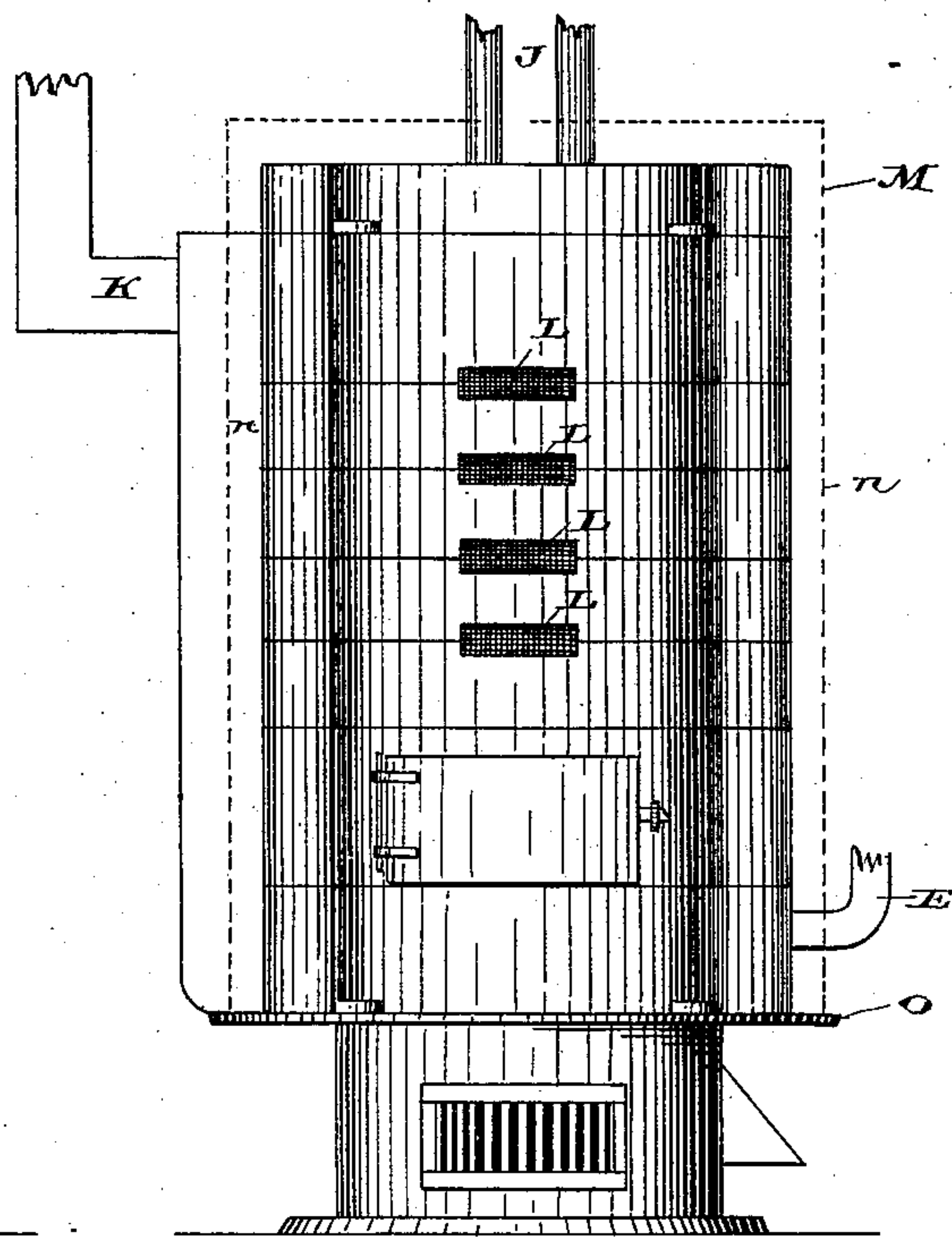


Fig. 6.

Witnesses.

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UNITED STATES PATENT OFFICE.

EDWARD GURNEY AND CHARLES SELLERS, OF TORONTO, ONTARIO, CANADA.

STEAM AND WATER BOILER.

SPECIFICATION forming part of Letters Patent No. 324,314, dated August 11, 1885.

Application filed May 8, 1885. (No model.) Patented in Canada August 18, 1884, No. 20,029.

To all whom it may concern:

Be it known that we, EDWARD GURNEY, manufacturer, and CHARLES SELLERS, foreman, both of the city of Toronto, in the county of York, in the province of Ontario, Canada, have jointly invented certain new and useful Improvements in Steam and Water Boilers for Household Heating Purposes; and we do hereby declare that the following is a full, clear, and exact description of the same.

The object of the invention is to devise a hot-water and steam boiler in which the water is contained within sections detachable one from the other, and so designed that the flame and heated gases passing from the furnace will pass through flues formed in and between the sections, and arranged to provide a large heating-surface, substantially as hereinafter more particularly explained.

Figure 1 is a plan of one of the sections, showing in dotted lines the position of the flues in the section below it. Fig. 2 is a simple plan of a section. Fig. 3 is a plan of the bottom or furnace section. Fig. 4 is a section through *x y* of Fig. 1. Fig. 5 is a sectional elevation of our improved boiler. Fig. 6 is an outside view of the same.

Among the advantages of a boiler built in sections may be mentioned that a boiler so constructed is much safer, as each section may merely be constructed to stand the pressure within itself, and in the event of an explosion the damage would be infinitesimal. A boiler built in sections is also more easily repaired, and it makes it possible to build a boiler of cast metal. These points of advantage, however, are not directly connected with our invention, as there is nothing original in constructing a boiler in sections. The peculiarity consists in the fact that each section has a series of flues, A, carried through it vertically, the walls surrounding each flue forming a partition between the said flues and the spaces B which surround them, and which are intended to contain water. The sections are, as shown, annular in form, the outer hollow ring C, which surrounds the section, being arranged to connect with the water-spaces B and with the water-flues D, which are formed to conduct the water into the ring C. When the sections are placed together, as shown in Fig. 5, all the water-flues D in one section will fit

over the corresponding flues D in the sections next to it. When all the sections are cemented together and water admitted into the bottom ring, C, from the pipe E or otherwise, it will flow freely through the water-flues D into the hollow ring C and around all the flues A, formed between the water-spaces B.

It will be noticed on reference to Figs. 4 and 5 that the depth of each section is greater around the hollow ring C, by which increase in depth a space, F, is left between each section, into which spaces the fire and other heated gases will pass as they ascend from the furnace G through the flues A. With the view of forcing the flame and heated gases to come in contact with the top and bottom plates of each section as they pass through the flues A, we arrange the flues A so that they will not come opposite to each other when placed in the position shown in Fig. 5, which arrangement will cause the spaces F to be completely filled with the heated gases during the passage of the flame and smoke from the furnace G to the smoke-box H, which is formed, as shown, within the ring C, surrounding the smoke-box, but has no connection therewith. The sections surrounding the furnace G are similarly made with hollow sides C, the flues A and water-spaces B in both sections being dispensed with.

The top section, I, which forms a crown for the smoke-box H, has no flues through it, but has simple openings in its bottom which connect with the water-flues D. It has no hollow sides. It is from this top section, I, that the heating-pipes J lead.

As the general operation of hot-water and steam boilers is well understood it is not necessary to enter into a detailed description of its entire operation. It will be sufficient to draw attention to the immense amount of heating-surface we secure by the peculiar construction of our boiler. It will be noticed, first, that the entire furnace G is surrounded by water; that the heated gases arising from it strike against the bottom of a series of cylindrical sections having flues A formed through them and leading into spaces F, which spaces bring the heated gases against the bottom of the water-spaces B, which water-spaces are completely surrounded by the heated gases as they ascend through the flues A into the next

space from the furnace G, into the smoke-box H, whence they pass into the smoke-flue K. We should draw attention to the fact that in order to clean out the spaces F, and also, if necessary, sweep out the flues A, we provide a series of hand-holes, L, through which a brush or other suitable article may be passed.

O is a rim or ledge, on which may rest a sheet-iron casing, M, so that the space between the casing and the outside surface of the furnace may be packed, when so desired, with asbestos, or other suitable non-conductor of heat. The cast-iron cylindrical sections may, if so desired, be made from the same pattern, and in this case the water-spaces B and flues A will be directly over one another, instead of in the manner as shown in the drawings, and the flame and smoke will ascend straight up through the flues A to the smoke-box H, instead of striking the bottom of the water-spaces B, as shown in the drawings.

We are aware that a water-heater has been made in sections, and the sections arranged with connected water-legs, and forming the walls of the furnace-structure, as seen in English Patent No. 4,419 of 1875; but in that case the horizontal sections were formed separate from the water-legs.

In our device the entire furnace and boiler is made of horizontal sections only, and the only connections are those between the water-legs.

What we claim as our invention is—

1. In a steam or water furnace or boiler for house-heating purposes, in which the heating-surface is enlarged by a series of hollow cast-iron cylindrical sections placed over one another, as specified, a section having vertical

heat-flues A, water-spaces B, which connect with a hollow ring, C, the water-legs D open above and below to connect with adjacent similar sections, and the ring C, being of greater depth than the water-chambers B, all formed in a single piece, and adapted to serve as set forth.

2. In a steam or water furnace or boiler for house-heating purposes, in which the heating-surface is enlarged by a series of hollow cast-iron cylindrical sections placed over one another, as specified, two or more sections cast with flues A, water-chambers B, rings C of greater depth than the water-chambers, and water-legs D open above and below to connect the interiors of adjacent sections, the flues A of one section being arranged to break joints with the adjacent sections, while the water-legs D correspond, all arranged to serve as set forth.

3. The boiler and furnace described, formed of whole horizontal sections cast and arranged to provide fire-box G, vertical flues A, which break joints with adjacent sections, horizontal heat-chambers which separate the water-chambers in adjacent sections, and a smoke-chamber above, the interior of the several sections being connected by water-legs D, and the rings C of the middle sections resting fairly upon each other to make a close structure, as and for the purposes set forth.

E. GURNEY.

CHAS. SELLERS.

Toronto, April 22, 1885.

In presence of—

JAMES JILT,

CHARLES C. BALDWIN.