

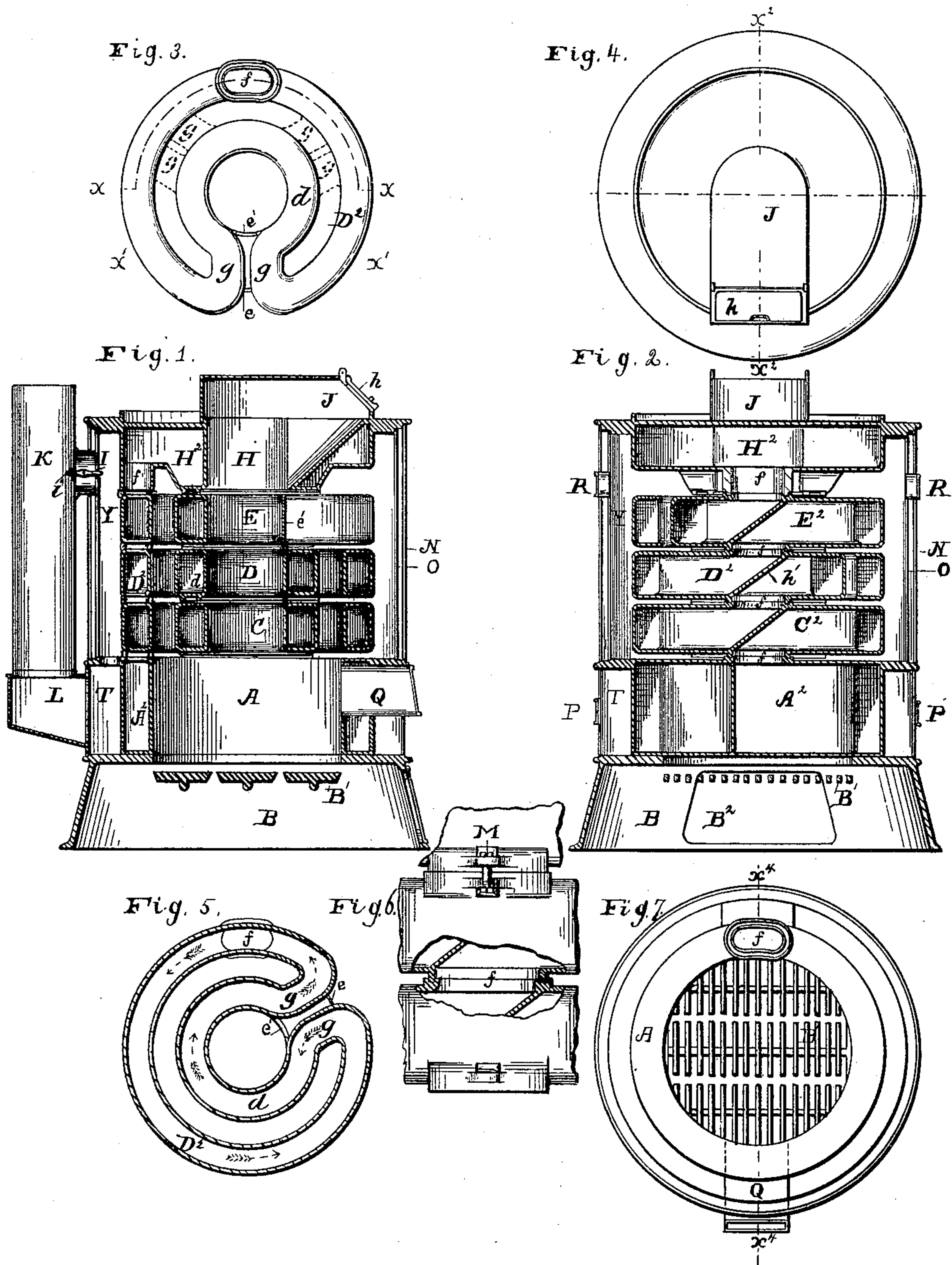
(No Model.)

F. H. PULSIFER, Jr.

SECTIONAL BOILER.

No. 368,235.

Patented Aug. 16, 1887.



WITNESSES:

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FRANK H. PULSIFER, JR., OF AUBURN, NEW YORK.

SECTIONAL BOILER.

SPECIFICATION forming part of Letters Patent No. 368,235, dated August 16, 1887.

Application filed May 23, 1887. Serial No. 239,108. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. PULSIFER, Jr., a citizen of the United States, residing at Auburn, in the county of Cayuga, State of New York, have invented certain new and useful Improvements in Sectional Boilers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to improvements in cast-iron sectional boilers for heating purposes; and the objects of my improvements are, first, to provide a simple and inexpensive boiler formed of sections constructed with an inner and an outer segment of a ring as water-chambers, the ends of said segments or chambers being connected together and forming a continuous passage in each section for the passage and circulation of water; second, to provide from the inner walls of said segmental sections a magazine for the reception of coal; third, to provide within the outer segmental chamber inclined partitions, in combination with openings directly above and under said partitions, to cause the water to circulate entirely through the inner and outer chambers of each section before reaching the section above. I accomplish these objects by the construction illustrated in the accompanying drawings, in which—

Figure 1 represents a vertical section on line $x^2 x^2$ of Fig. 4 of a cast-iron sectional boiler constructed in accordance with my invention. Fig. 2 represents a vertical section following the curved dotted line $x f x$ of Fig. 3 to show the water-passages and inclined partitions leading the water and its circulation all around each section and from one section of the boiler to the other. Fig. 3 is a top view of the second section, E, of the boiler. Fig. 4 is a top view of the uppermost section. Fig. 5 is a horizontal sectional view of the boiler-section E of Fig. 1. Fig. 6 is an enlarged view of the openings f used for circulation. Fig. 7 is a top view of the lowest or fire-pot section of the boiler.

The boiler may have a larger or a smaller number of horizontal sections than shown in the drawings; but I prefer to have it constructed of the following sections: A bottom section, A, forming the fire-pot of the furnace. This section rests upon a cast-iron base, B,

used as the ash-pit. The latter carries the grate B', and is provided with a door, B², for the removal of the ashes passing through the grate. Upon the bottom section, A, the sections C D E are placed one above the other. These are alike in form, and each consists, as shown in Figs. 3 and 5, of an inner hollow segmental ring, d , and an outer segmental ring, D². These segmental hollow rings are connected at their ends by hollow horizontal extensions g , forming continuous passages of uniform size between said segments, through which the water circulates when the boiler is in operation.

To retain the segments C D E in proper position upon each other, they have projecting from the upper surface of the inner segmental ring a flange that enters a corresponding groove, c , in the bottom of the superposed section. The inner segmental rings, d , rest upon each other and form a central magazine for the reception of fuel, the ends of the segmental sections being united by a small plate or web, e' , on the inner periphery, to complete the circular form of the magazine and prevent the products of combustion from entering it on their upward passage. There is also a plate or web, e , that connects the ends of the outer segmental section and forms a partition at that point between the upward and the downward draft. The outer segmental rings, C² D² E², are provided with openings f in their top and bottom for the passage of water from one section to the one next above and to direct the water so that it will pass along the whole length of the segmental rings of each section before it enters the one next above. Each section has an inclined partition, h' , directly opposite the openings f , and said partition is connected at its lower end to one end of the lower opening f and its upper end to the opposite end of the upper openings f of said section. The surfaces of the sections surrounding the water-passages f are cupped on their upper surface to receive a corresponding projection on the lower surface of the adjacent section, the projection being set into the cupped recess of the section next beneath, as shown on a larger scale in Fig. 6. These joints are rendered steam and water tight by suitable packing, and each section is united to the

adjoining section by means of short bolts M, Fig. 6, the bolts being at intermediate distances apart on two adjoining sections.

Upon the section E is placed the upper section or top of the boiler. This upper section has its lower surface so formed as to permit the products of combustion to pass either through the flue I directly into the uptake-flue K or (according to the position of the damper *i*) into the smoke-descending passage Y, extending around the whole circumference of the sections C D E, and thence down into the passage T in the fire-pot section A, and thence in the smoke-passage L at the rear of the furnace, from which they pass into the uptake K.

The sections C D E are so arranged relatively to each other that the ends of the segmental rings or extensions *g* do not coincide vertically above each other, but are at different points, as shown at *g* by dotted lines in Fig. 3. This causes the products of combustion to take a zigzag course and have the caloric well absorbed by the surfaces of the sections. The upper end of the magazine is covered with a hood, J, to which the door *h* is hinged, and can be opened for the admission of coal. There is an air-space between the two jackets N and O. There are also sliding doors R in said jackets and doors P in that portion of the jacket upon the same level with the fire-pot to clear off the dust that may collect. There is also an opening, Q, in the walls of the fire-pot, through which the fire may be kindled and observed. Although I have shown the openings *f* and their inclined partition *h'* in the outer segmental rings, it is evident that they may be located in the inner segmental rings, and substantially the same circulation of the water will thereby be obtained in the sections and from one section to the other.

Having now fully described my invention, I claim—

1. In a cast-iron boiler, the combination of a supporting-section and a top section with intermediate horizontal sections, each consisting of concentric hollow segmental rings united by hollow extensions formed integral therewith, substantially as and for the purpose described.

2. The combination of a supporting-section and a top section with intermediate horizontal sections, each consisting of concentric hollow segmental rings united by hollow extensions formed integral therewith, the inner segmental rings located one above the other and retained by interlocking projections upon each one and forming a central magazine, substantially as and for the purpose described.

3. The combination of a hollow supporting-section, a top section provided with a central opening forming the upper end of a magazine, and a hood over the same with intermediate horizontal sections, each consisting of concentric hollow segmental rings united by hollow extensions formed integral therewith, the inner segmental rings located one above the other and forming a central magazine directly under the central opening in the top section, substantially as and for the purpose described.

4. In a cast-iron boiler, the combination of a supporting-section and a top section with intermediate horizontal sections, each consisting of concentric hollow segmental rings united by hollow extensions, one of said segmental rings being provided with an opening, *f*, in the top and bottom thereof and an inclined partition, *h'*, between said openings, substantially as and for the purpose described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK H. PULSIFER, JR.

Witnesses:

JEREMIAH HARRINGTON,
JAMES HAMILTON.