

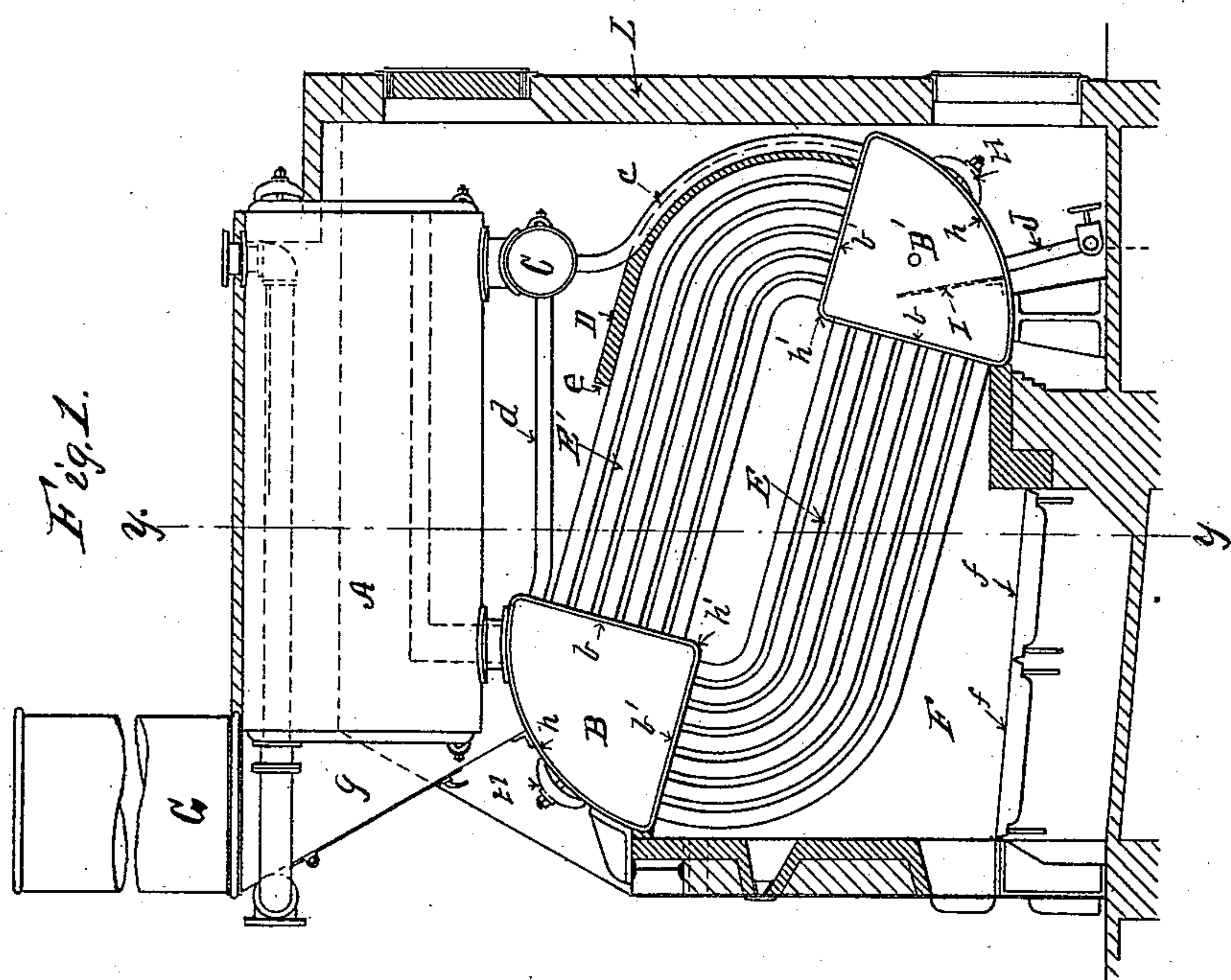
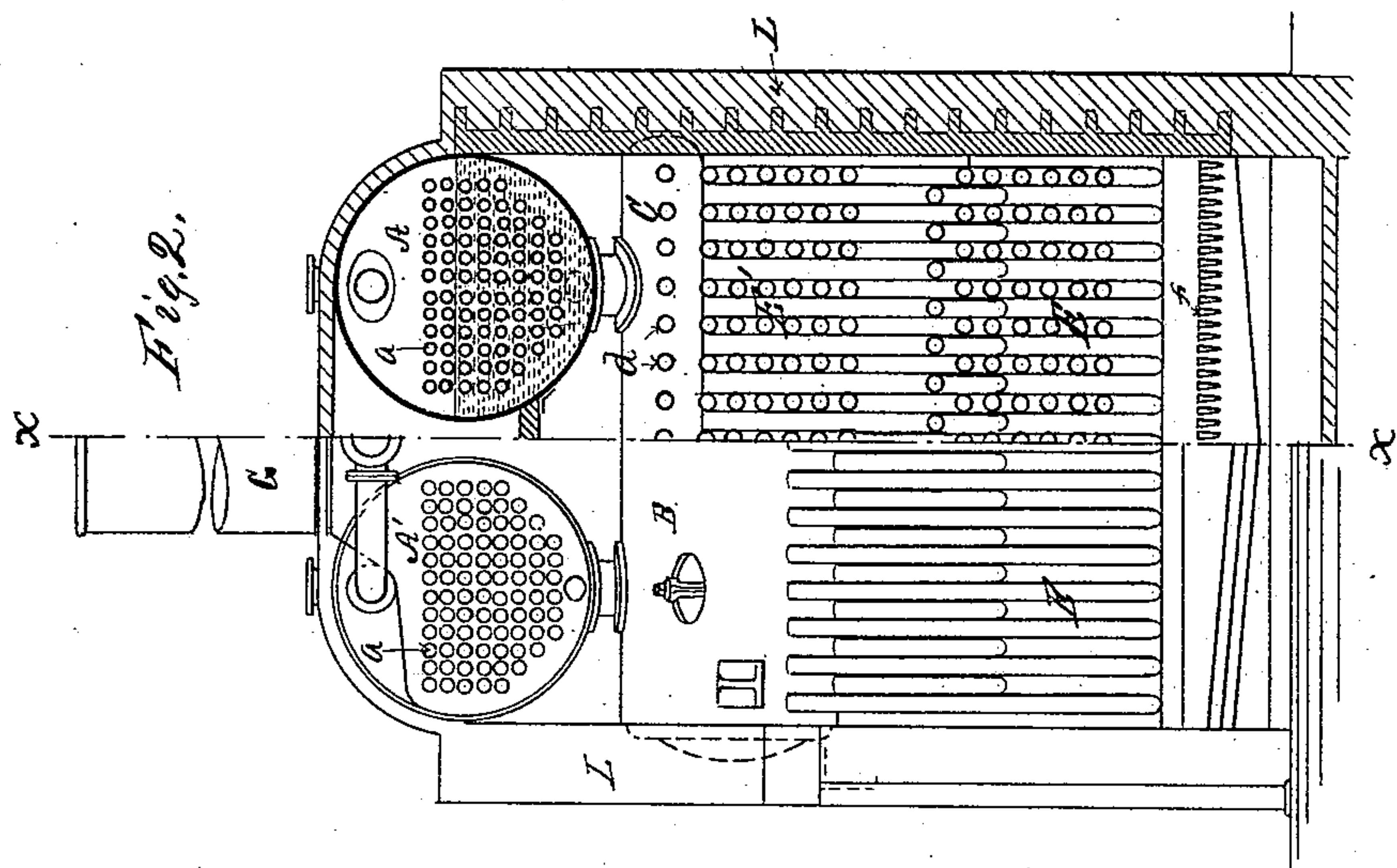
(No Model.)

3 Sheets—Sheet 1.

H. W. SELLER.
WATER TUBE BOILER.

No. 464,109.

Patented Dec. 1, 1891.



WITNESSES:

F. J. Bassett

A. L. Jackson

INVENTOR

Harry W. Seller

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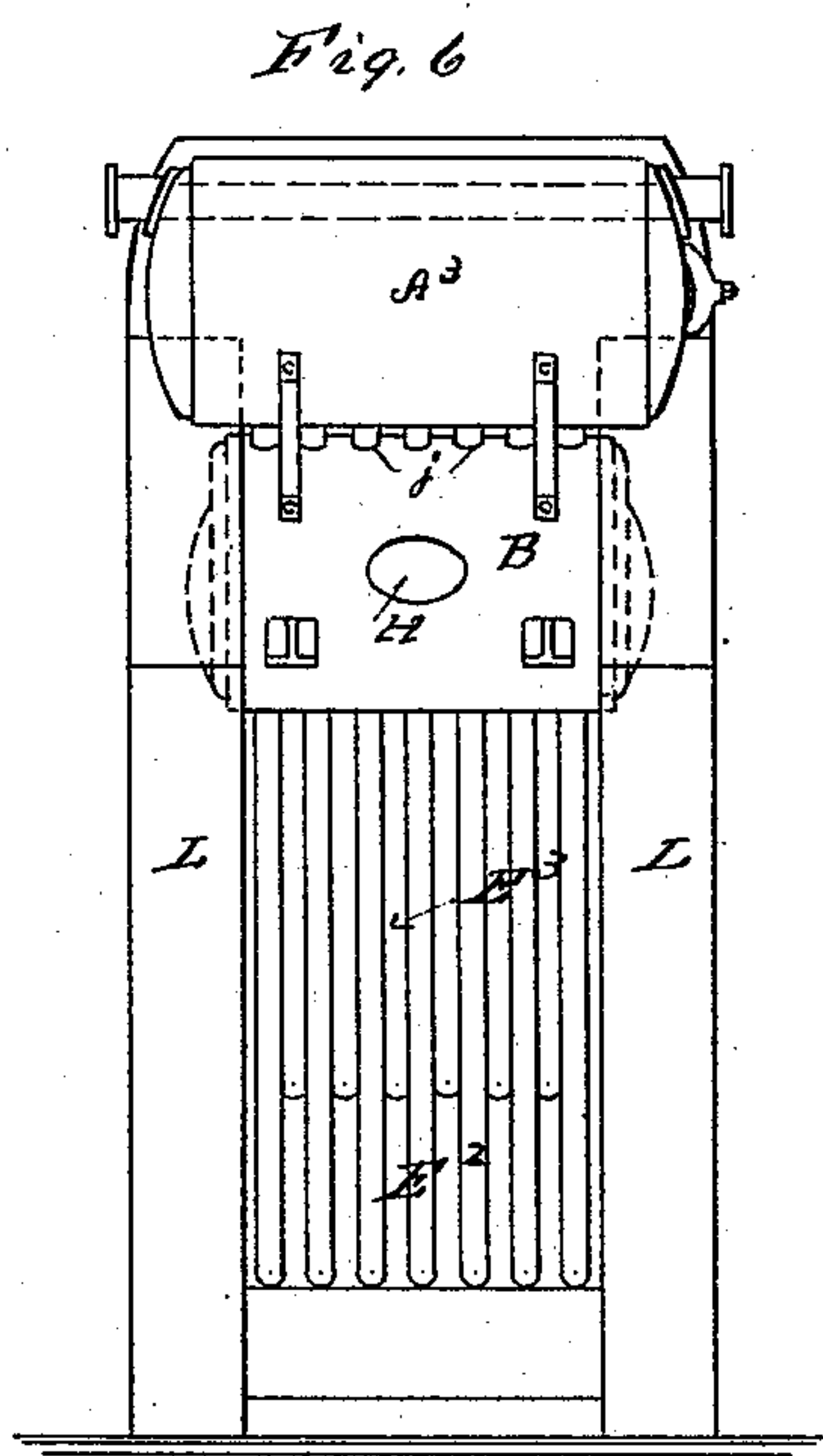
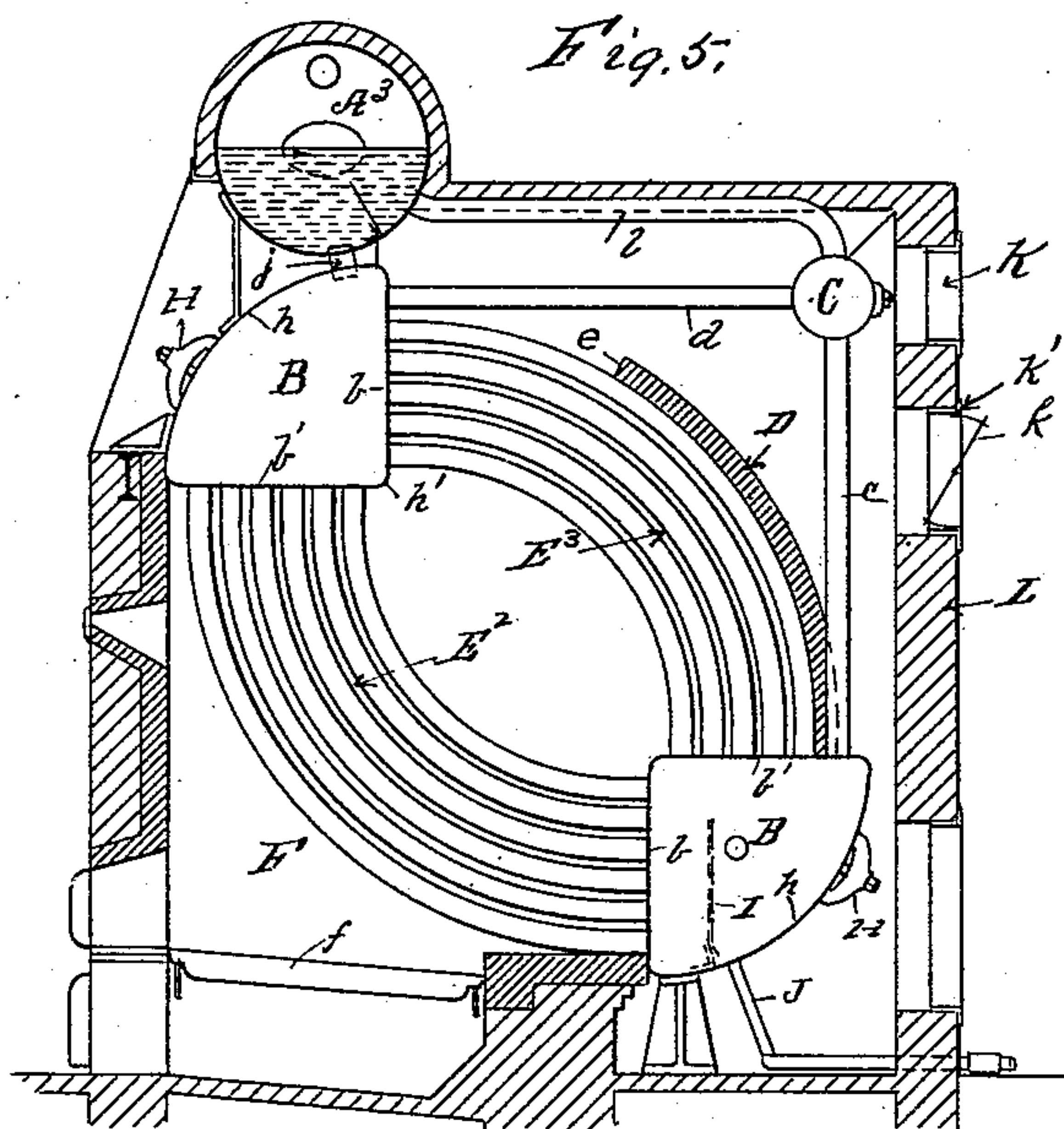
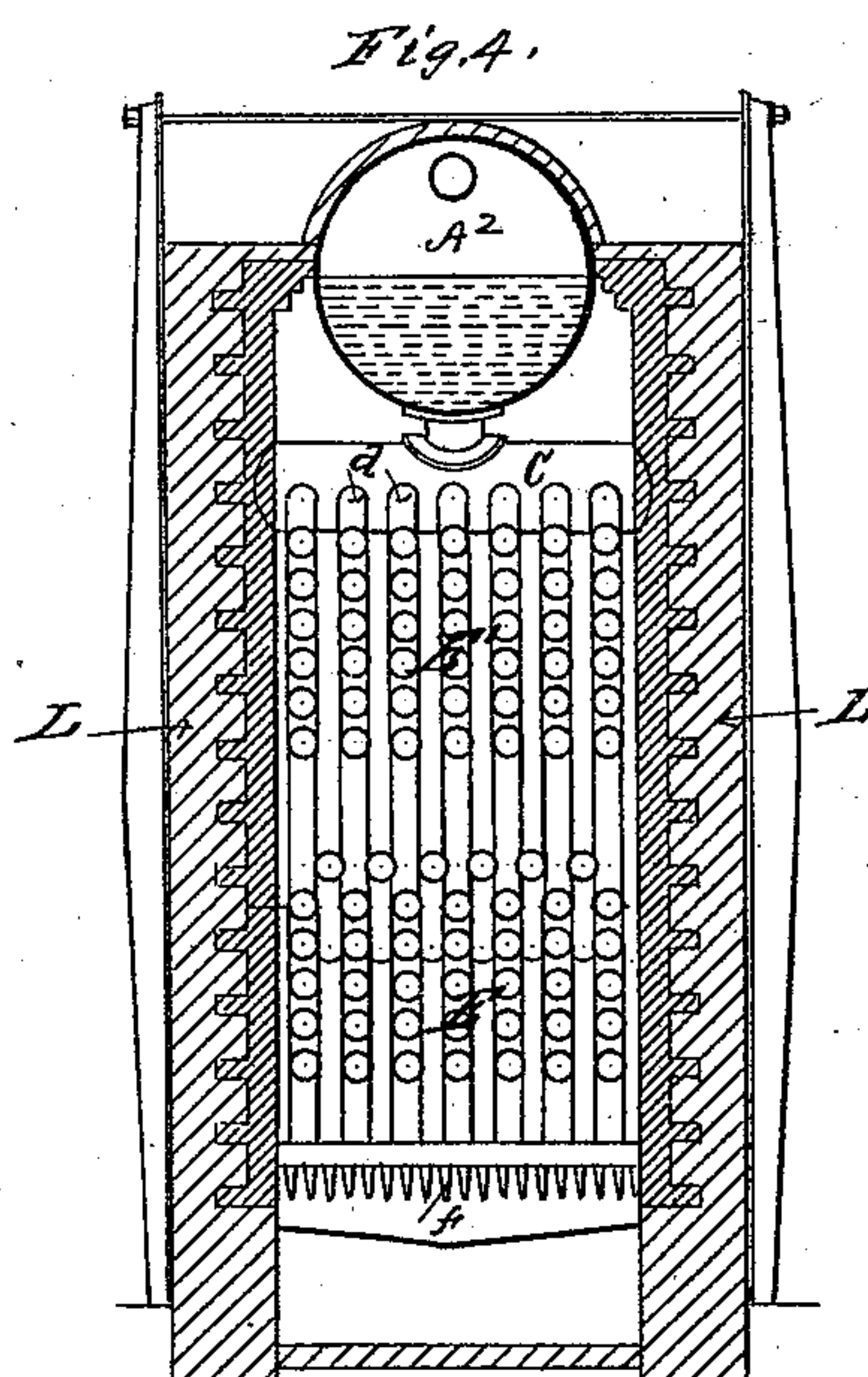
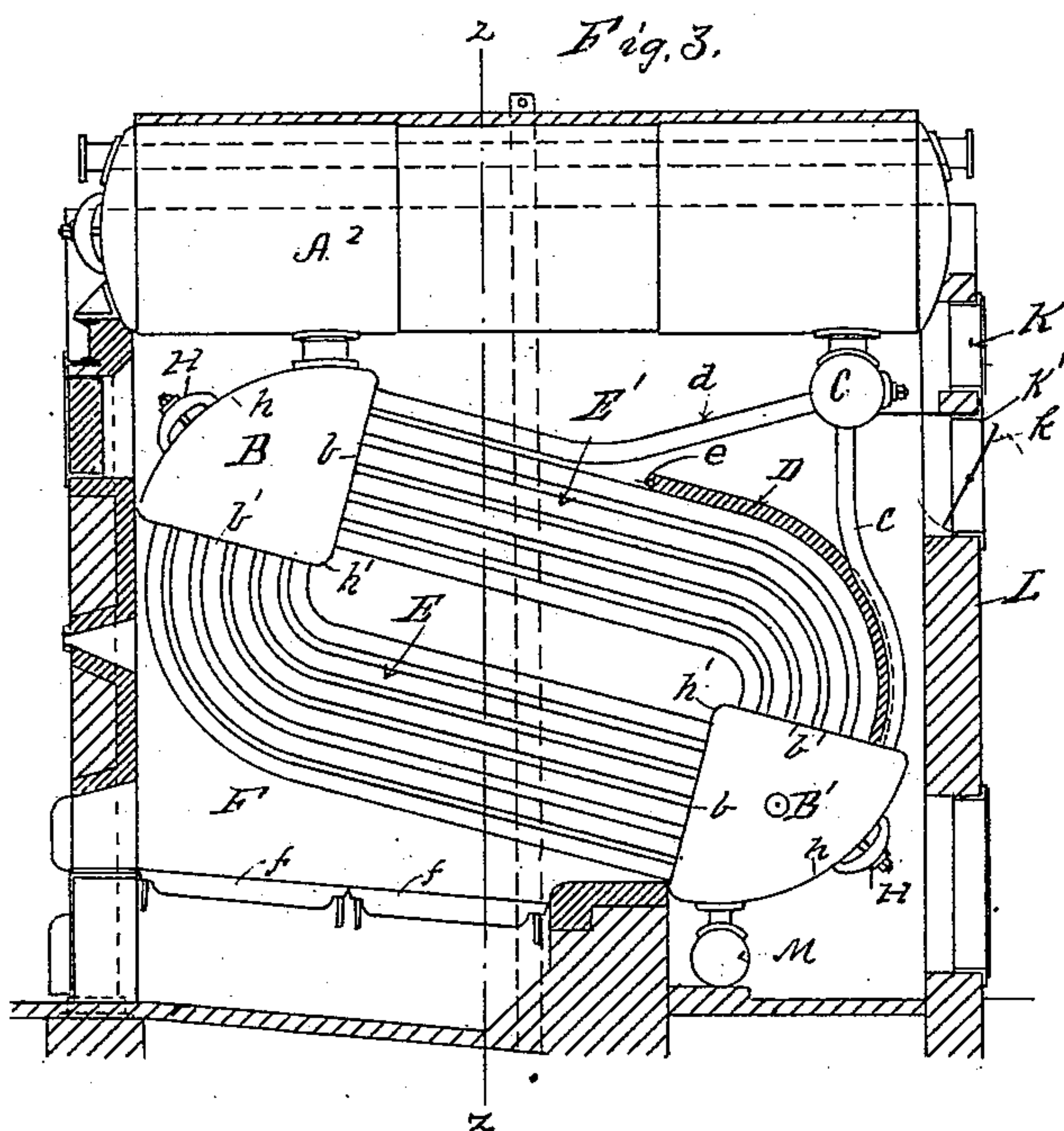
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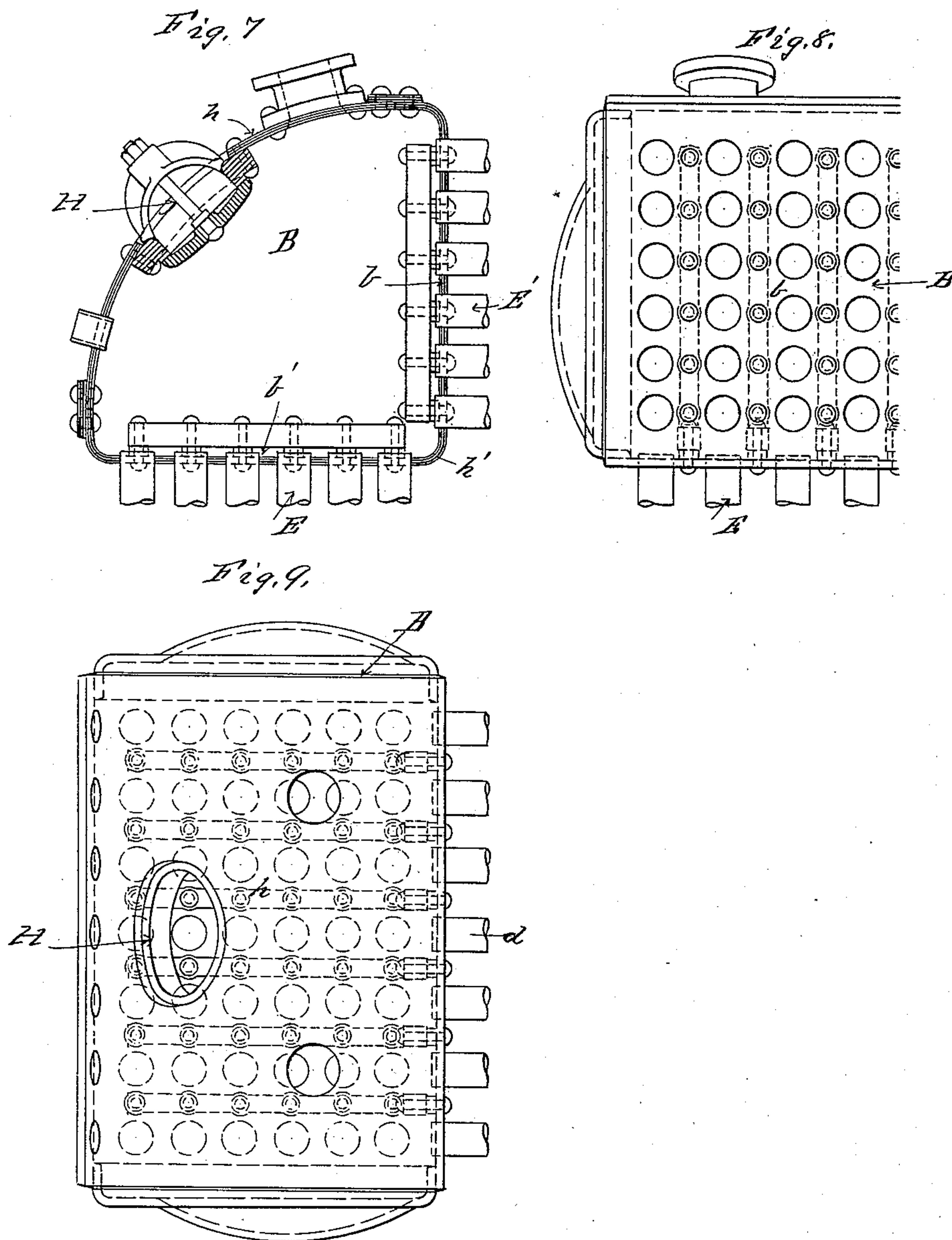
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UNITED STATES PATENT OFFICE.

HARRY W. SELLER, OF BROOKLYN, NEW YORK.

WATER-TUBE BOILER.

SPECIFICATION forming part of Letters Patent No. 464,109, dated December 1, 1891.

Application filed April 10, 1891. Serial No. 388,397. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. SELLER, a citizen of the United States, residing at the city of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Water-Tube Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, 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, and to the letters of reference marked thereon, forming part of this specification.

My invention consists in the improvements in water-tube boilers hereinafter set forth and described, and illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of my improved water-tube boiler, with the boiler-setting in section on the line $x x$ in Fig. 2. Fig. 2 shows a front end elevation of one half, the other half being in section on the line $y y$ in Fig. 1. Fig. 3 shows a side elevation of a modified construction of my improved boiler. Fig. 4 shows a vertical cross-section of same on the line $z z$ in Fig. 3. Fig. 5 shows a side elevation, partially in section, of another modified construction of my improved boiler. Fig. 6 shows a front end elevation of same. Figs. 7, 8, and 9 show detail views of the sector-shaped boxes in which I secure the ends of the water-tubes.

Like letters refer to like parts in all the figures.

The objects of my invention are, first, to construct a water-tube boiler having boxes preferably sector-shaped to receive the ends of the tubes forming the major portion of the heating-surface of such boiler, the upper of said boxes being at the front end of the boiler above the furnace and the lower of said boxes forming the rear end of the furnace, one or more banks of the water-tubes connecting said boxes together; second, to provide in the lower and rear box a partition extending from the bottom of said box upward about two-thirds of the height and from end to end thereof, so as to form a mud and sediment depository in said box at the rear of said partition; third, to provide a bridge-wall extending from the upper side of the rear box at the

rear of and above the upper tier of tubes connecting said boxes and conforming to the curve thereof; fourth, to connect the box at the front end of the furnace, in which the upper ends of the banks of water-tubes are secured, with steam-drums provided with tubes, as in ordinary tubular boilers, or made without such tubes, by means of upflow-pipes, and also the box at the rear end of the furnace, in which the lower ends of the banks of water-tubes are secured, with such steam-drums by means of downflow-pipes at the rear of the bridge-wall, so as to insure adequate steam and water circulation therein.

The other features of my invention are set forth hereinafter in the specification and claims.

In Figs. 1 and 2 I show a boiler constructed with two tubular steam-drums $A A'$, the front ends of both of which are connected to the upper sector-shaped box B and at their rear ends to a large cross-pipe C , from which pipe C a row of small tubes c extend down to and enter the rear portion of the lower sector-shaped box B' at the rear of the bridge-wall D , the pipe C being also connected to the upper portion of the face b of the upper box B by means of a row of horizontal pipes d . The boxes B and B' are connected together by means of banks of water-tubes $E E'$, the ends of which enter the plane surfaces b and b' of the boxes B and B' and are secured therein, preferably, by expanding the ends thereof in the manner ordinarily employed in securing tubes in boiler-heads. The major portions of the banks of tubes E and E' are preferably located at an inclination of about thirty degrees from a horizontal, so as to admit of room under the front ends thereof for a furnace F , in which the fuel is placed upon grate-bars f . At the rear of and above the upper tier of tubes in the upper bank E' of water-tubes I secure a bridge or fire wall, which extends from the upper face b' of the box B' , forming the rear of the furnace F , up, say, about three-fifths of the distance from the face b' of the box B' (following the curve of the bank of tubes E') to the face b of the box B , so that the heat from the fire-box F passes up between the tubes in the banks E and E' thereof and out between the end e of the bridge-wall D and the face b of the box B and

up between the horizontal pipes d against the lower sides of the steam-drums A and A' and along to the rear ends thereof, and through the tubes a therein to the front ends of said steam-drums and out through a chimney G , secured to the front ends of said steam-drums A and A' by means of breeching g of usual and ordinary construction. The sector-shaped boxes B and B' are provided with man-holes H on the curved sides h thereof, so as to admit of access to the insides thereof, and in the lower and rear box B' , I secure a partition I , extending from the lower and curved side h thereof upward, say, about two-thirds of the distance to the angle h' , formed by the junction of the plane sides b and b' of the box, and from end to end of said box, as illustrated by dotted lines in Fig. 2, the object of this partition being to form a chamber in the rear portion of the box B' for the reception of sediment, which can readily be blown out therefrom through the blow-off pipe J in the usual way.

The boxes B and B' , I preferably make of boiler-plate, the plane faces b and b' being stayed and braced in any convenient manner.

In Figs. 3 and 4 the construction shown of my improved water-tube boiler is the same in all respects as that hereinbefore described, except that it has but a single cylindrical steam-drum A^2 , and in that the products of combustion, after passing up to and against the lower side of the steam-drum A^2 , pass along to the rear end thereof and out through the opening K in the rear of the boiler-setting L to the chimney, (not shown,) a damper k being preferably placed in the opening K in the rear wall of the boiler-setting to control the draft, and also in that below the lower and rear water-box B' and communicating therewith is a mud-drum M , into which the sediment settles preparatory to being blown off, the partition I in this construction being dispensed with.

In Figs. 5 and 6 I show my invention in a modified form, viz: In this construction the steam-drum A^3 , instead of being located longitudinally over the banks of water-tubes, is located transversely over the front box B , and is connected thereto by a row of small pipes j and is connected to the large transverse pipe C by means of horizontal pipes l . The water-tubes in this form of construction are also made with a different curve from those in the two preceding forms hereinbefore described, in that they are so bent that the lower bank E^2 and the upper bank E^3 when in place nearly form the upper and lower

sides of an ellipse. In this construction it will also be observed that the inclination of the water-tubes E^2 and E^3 is greater than in the forms hereinbefore described. In all other respects the construction is substantially the same as that of the other forms hereinbefore described. Therefore

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, in a water-tube boiler, of banks of curved inclined water-tubes, with a water-box above the front end of the furnace in which the front and upper ends of said water-tubes are secured, a water-box at and forming a part of the rear end of the furnace in which the rear and lower ends of said banks of water-tubes are secured, and a steam drum or drums connected with both the upper and lower water-boxes, substantially as and for the purpose set forth.

2. The combination, in a water-tube boiler, of banks of curved inclined water-tubes, a water-box at the front end of the boiler above the front end of the furnace in which the front ends of said tubes are secured, and a water-box at and forming part of the rear end of the furnace in which the rear ends of said tubes are secured, with a partition I in the lower and rear one of said water-boxes, and a bridge-wall D , extending from the lower water-box upward and forward at the rear of and above the upper tier of water-tubes, substantially as and for the purpose set forth.

3. The combination, in a water-tube boiler, of banks of curved water-tubes, as E and E' , and water-boxes, as B and B' , in which the ends of said tubes are secured, with a steam drum or drums connected to the front water-box, as B , with a large transverse pipe or drum, as C , over the rear and lower water-box, as B' , pipes, as d , connecting said pipe or drum C with the front and upper water-box B , and pipes, as c , connecting said pipe or drum C with the lower and rear water-box, as B' , at the rear of the bridge-wall D , substantially as and for the purpose set forth.

4. The combination, in a water-tube boiler, of banks of inclined curved water-tubes, as E and E' , with sector-shaped water-boxes, as B and B' , in which the ends of said banks of tubes are secured, substantially as and for the purpose set forth.

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

HARRY W. SELLER.

Witnesses:

JOHN ARMSTRONG,
CHARLES E. HAYES.