

(No Model.)

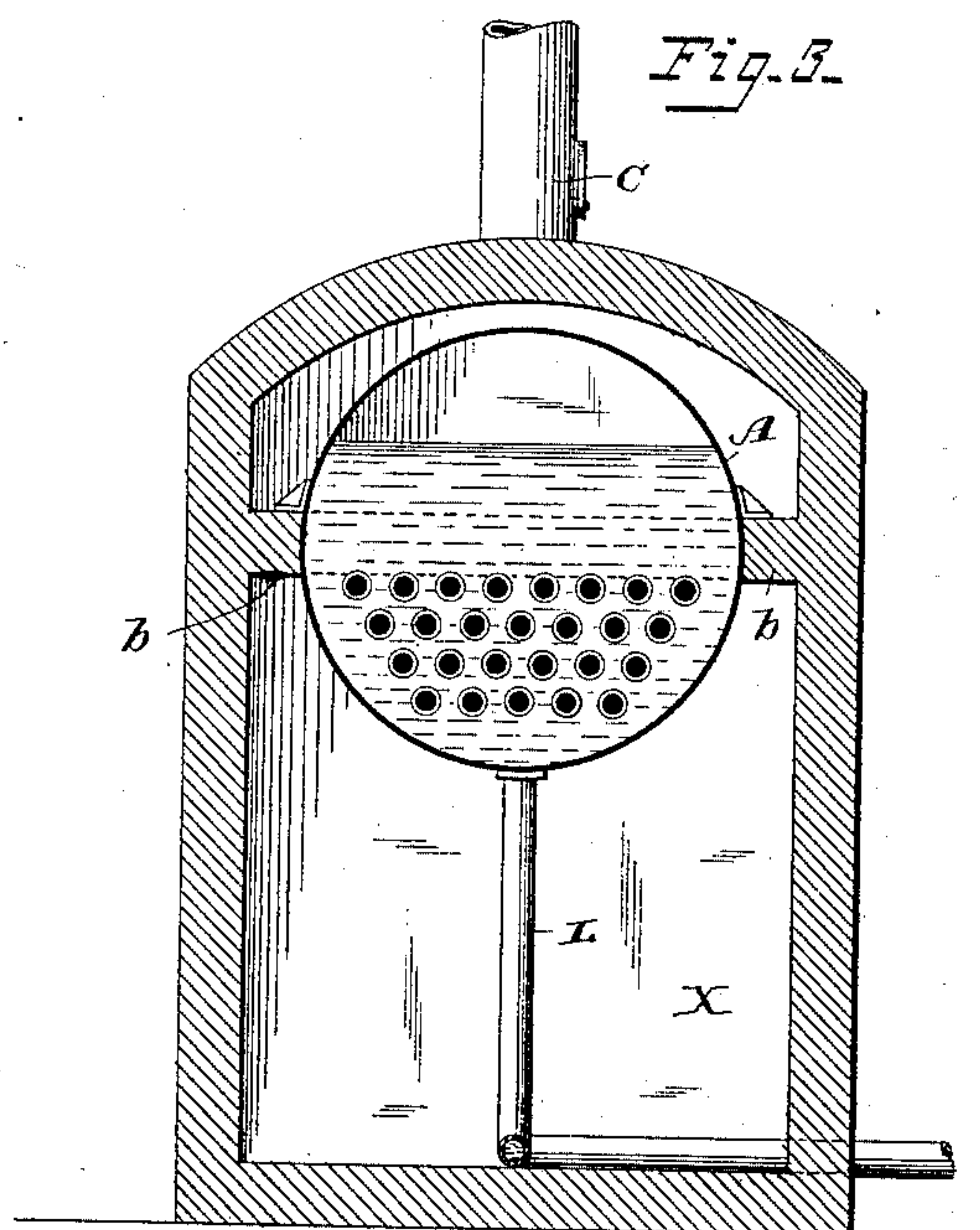
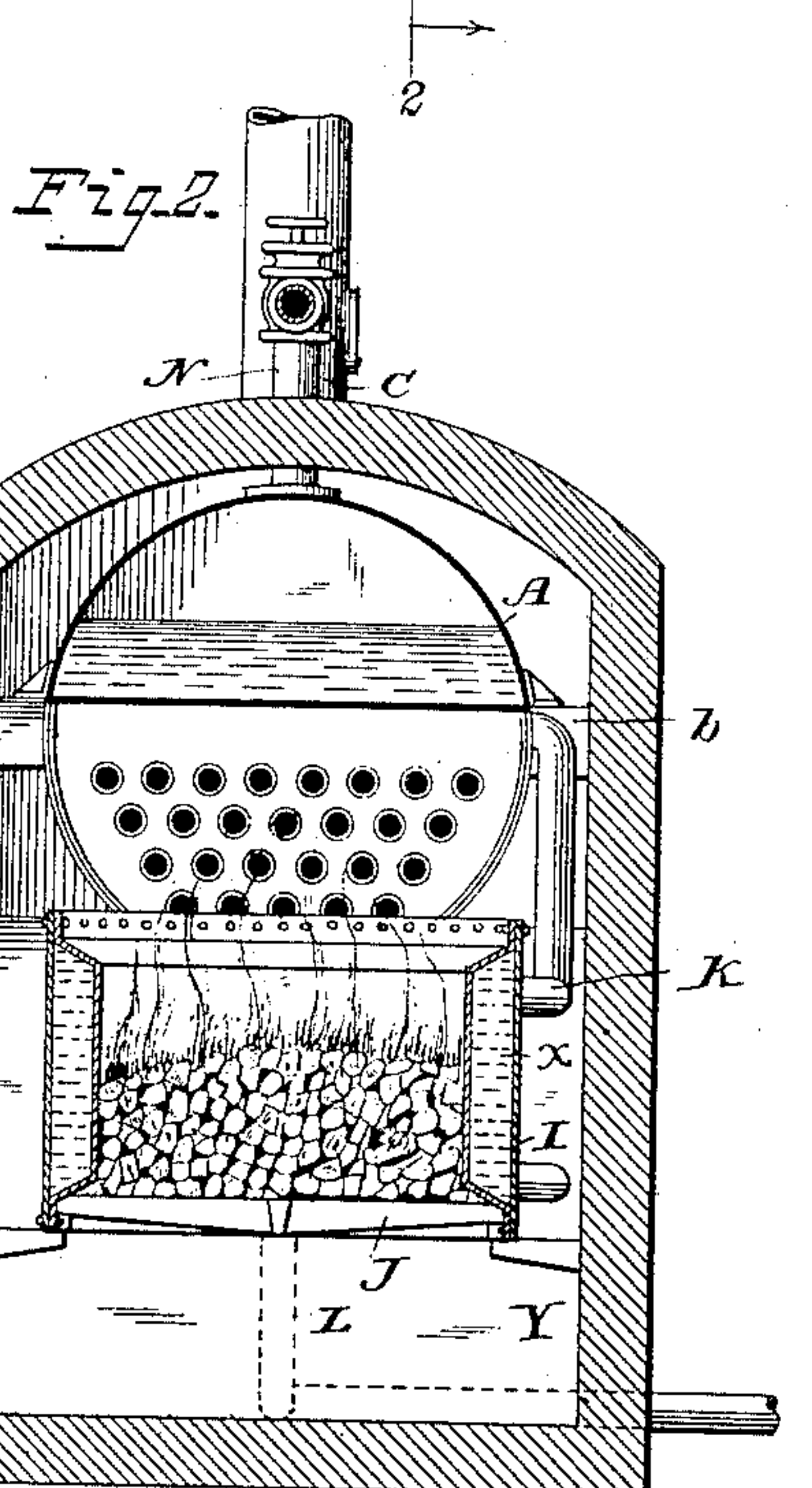
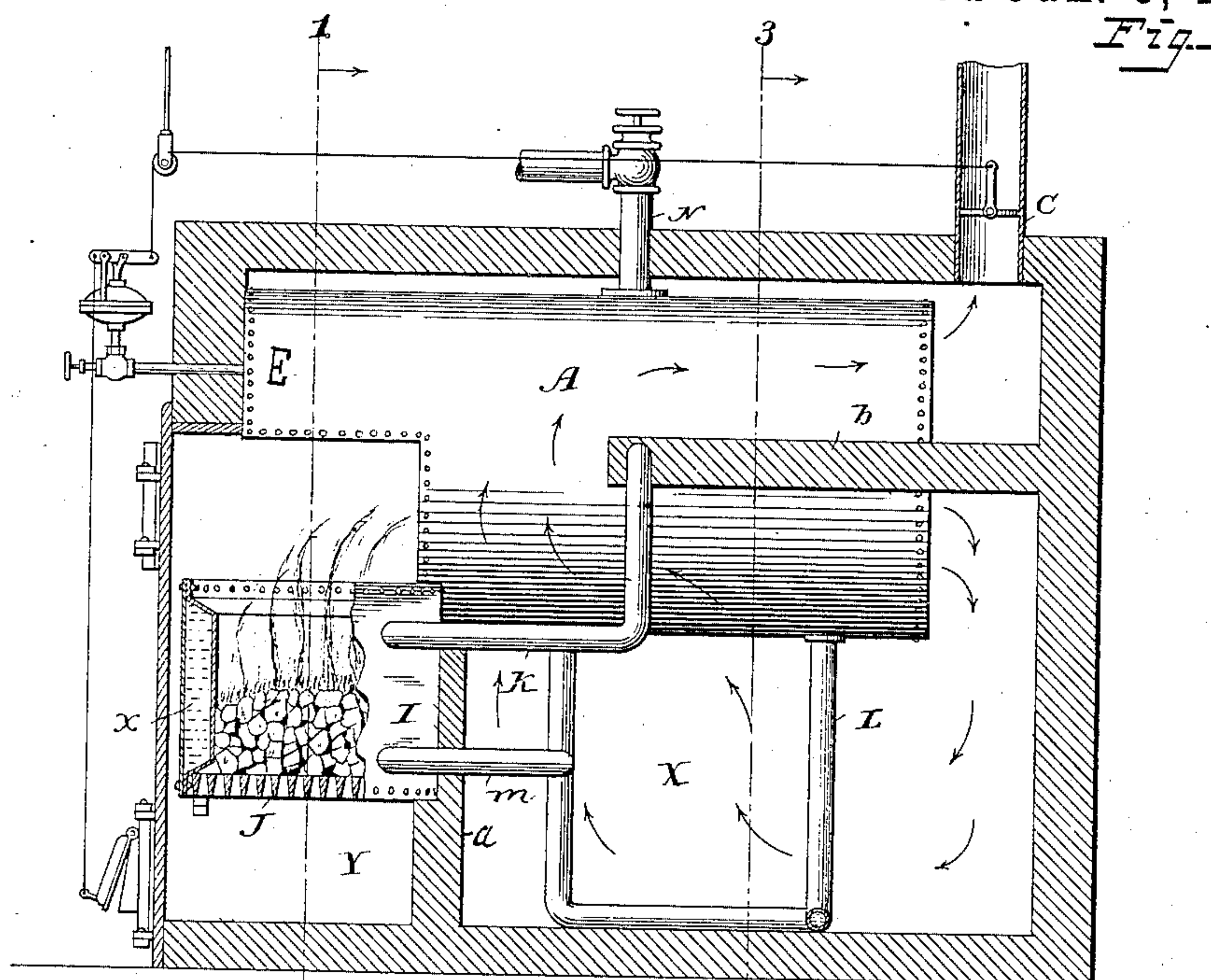
E. T. SYKES.

BOILER.

No. 333,571.

Patented Jan. 5, 1886.

Fig. 1.



*Attest:-*

Court A Cooper.

H. E. G. Hansmann.

*Inventor:*

Edmund T. Sykes,  
by Foster & Freeman  
Attys.

Atty.



# UNITED STATES PATENT OFFICE.

EDMUND T. SYKES, OF MINNEAPOLIS, MINNESOTA.

## BOILER.

SPECIFICATION forming part of Letters Patent No. 333,571, dated January 5, 1886.

Application filed August 4, 1885. Serial No. 173,579. (No model.)

*To all whom it may concern:*

Be it known that I, EDMUND T. SYKES, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Boilers, of which the following is a specification.

My invention relates to that class of boilers which are arranged horizontally, with the fire-place at one end; and it consists in extending the end of the boiler at the top to form an extension over the fire-place, and in forming the fire-place by means of an independent double-walled box arranged opposite to and below the end of the boiler and connected therewith, and in arranging the parts within a chamber divided by the partition, so as to insure the passage of the products of combustion over a greater portion of the surface of the boiler, substantially as set forth hereinafter, and shown in the accompanying drawings, in which—

Figure 1 is a part sectional elevation of my improved steam-generator. Fig. 2 is a section on the line 1 2, Fig. 1. Fig. 3 is a section on the line 3 4, Fig. 1.

The body A of the boiler is of a cylindrical or other shape, as may be preferred, and is provided with the usual longitudinal fire-tubes or flues, and is mounted within a chamber inclosed by walls and top of fire-brick or other suitable material, so as to leave a narrow space between the top of the boiler and the top of the chamber and between the rear end of the boiler and back of the chamber. A vertical bridge-wall, *a*, extends across the chamber and supports the forward end of the boiler, and serves to subdivide the chamber into two chambers, X Y.

In the chamber Y is a rectangular fire-box, I, having double walls to form an intervening water-space, *x*, and at the bottom of the box is a grate, J. The box is suspended within the chamber Y, with its upper edge near the bottom of the boiler A, and a pipe, K, communicating with the water-space of the fire-box I, near the top, extends upward and communicates with the water-space of the boiler A at one side, near the center. A partition extends between the sides and ends of the boiler A and the adjacent walls, so as to form a deflector, *b*, at a point above the upper

tubes or flues of the boiler, and the forward end of the latter is extended or prolonged above the said tubes, so as to form an extended hollow hood, E, the lower side of which constitutes a crown-sheet above the fire-box. A pipe, L, extends from the bottom of the boiler at the rear downward to the chamber X, along the latter at the bottom, and communicates through a branch, *m*, with the water-chamber of the fire-box I, near the bottom of the latter. The inclosing-walls of the boiler are provided at the front with feed and ash-pit doors, and the delivery-pipe N extends from the steam-space of the boiler at any suitable point. The products of combustion from the fire-box pass backward through the horizontal tubes or flues, and are deflected by the partitions *b* and caused to move forward through the chamber X in contact with the pipes L *m* K and with the bottom of the boiler and with the sides and over the top of the boiler, before passing to the uptake C. By this arrangement I cause the heated gases to traverse a large proportion of the boiler-surface. By means of this rapid circulation in contact with heated surfaces the water is quickly heated and steam rapidly evolved. The heating effect is further increased by the projection of the upper forward end of the boiler in the form of a hood, which, without greatly increasing the size or expense of the boiler, presents a very extended heating-surface at a point where there is an intense heat.

It will be evident that the fire-box increases the heating capacity, that it may be connected in any suitable manner with the boiler, and that by constructing it separate therefrom it may be arranged in respect to the boiler as circumstances require.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination of a horizontal boiler having horizontal flues or tubes, a fire-place at one end of the boiler, the said boiler having an upper extension above the fire-place, formed by projecting the boiler at the said point beyond the end, and an independent fire-box provided with double walls arranged beneath said extension, substantially as set forth.

2. The combination of a horizontal boiler having an upper extension, a fire-place opposite

and below the extended end of the said boiler, inclosing-walls forming a chamber around said boiler, and a partition, *b*, extending across the rear end and for a part of the length along the sides of the boiler, substantially as set forth.

3. The combination of the horizontal boiler inclosed within a chamber, a partition, *b*, extending along the sides and end of the boiler, a fire-place consisting of a double-walled box inclosing a hot-water chamber, and circulating-pipes extending from said chamber to the sides and bottom of the boiler, substantially as set forth.

4. A horizontal boiler provided with an ex-

tension, *E*, arranged within a chamber divided by a wall, *a*, and partitions *b*, in combination with a double-walled fire-box and with circulating-pipes connecting the chambers in the fire-box and boiler, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDMUND T. SYKES.

Witnesses:

E. D. BROWN,

H. H. MCINTIRE.