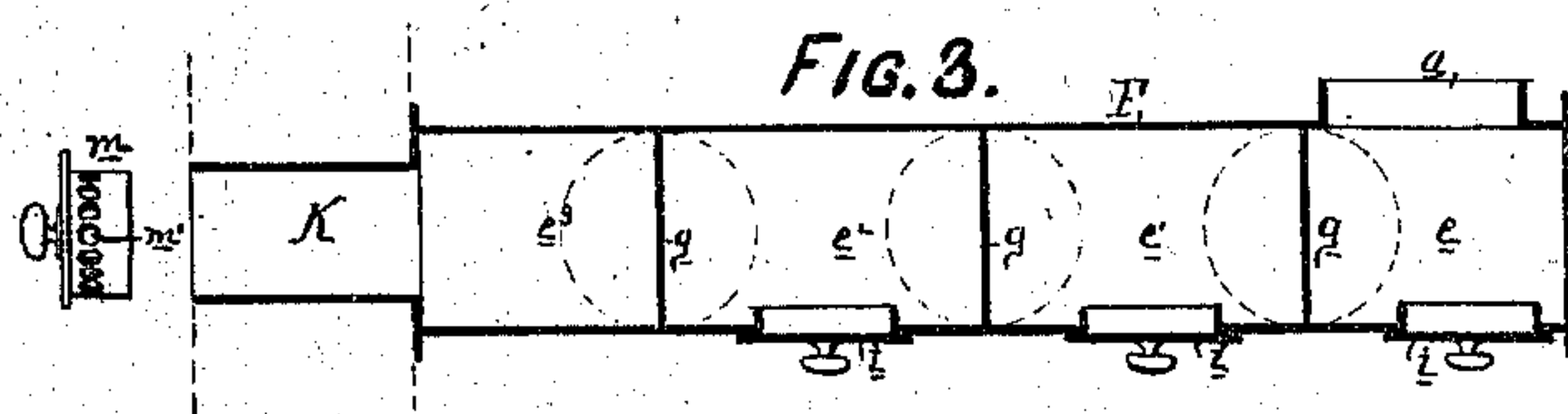
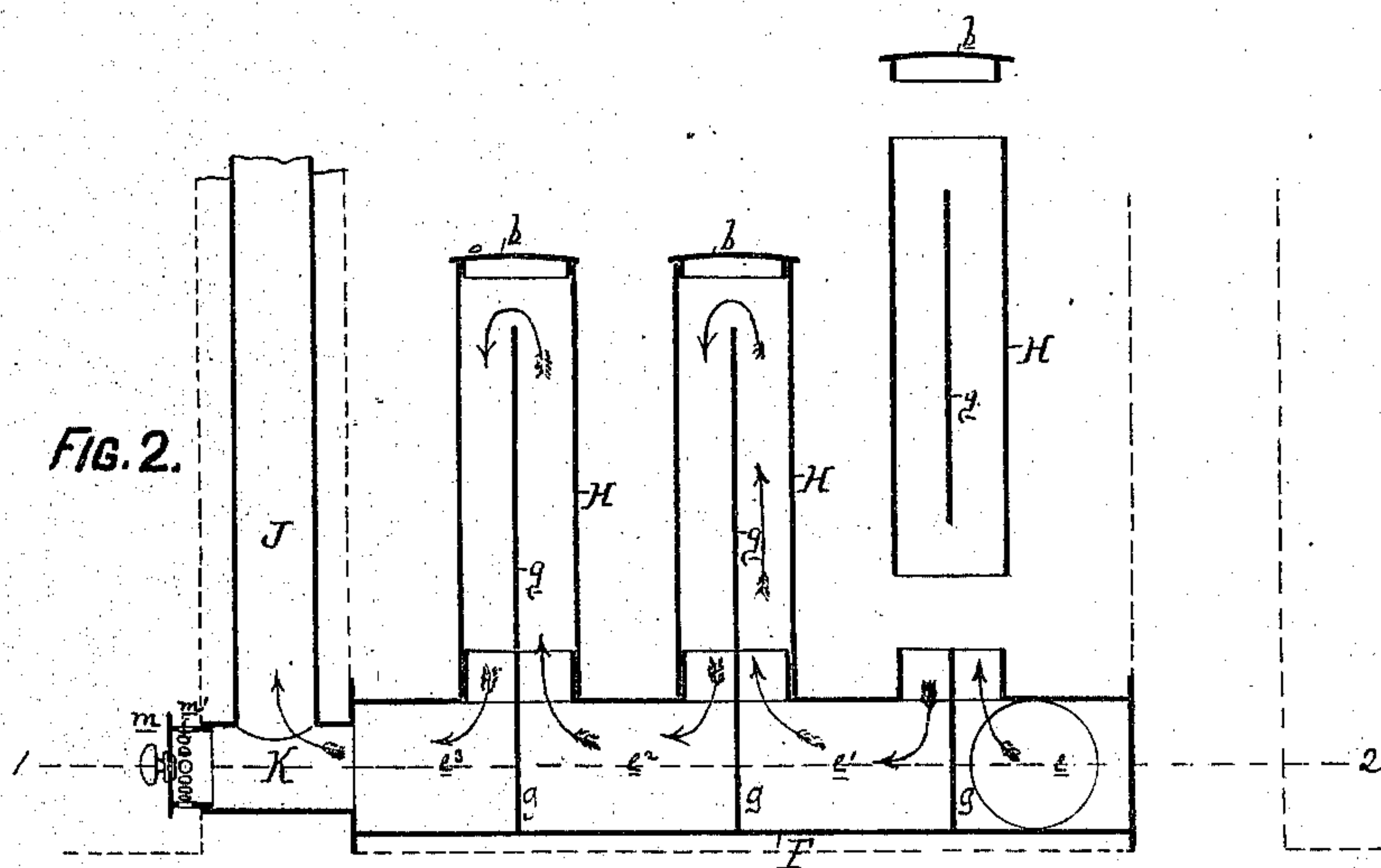
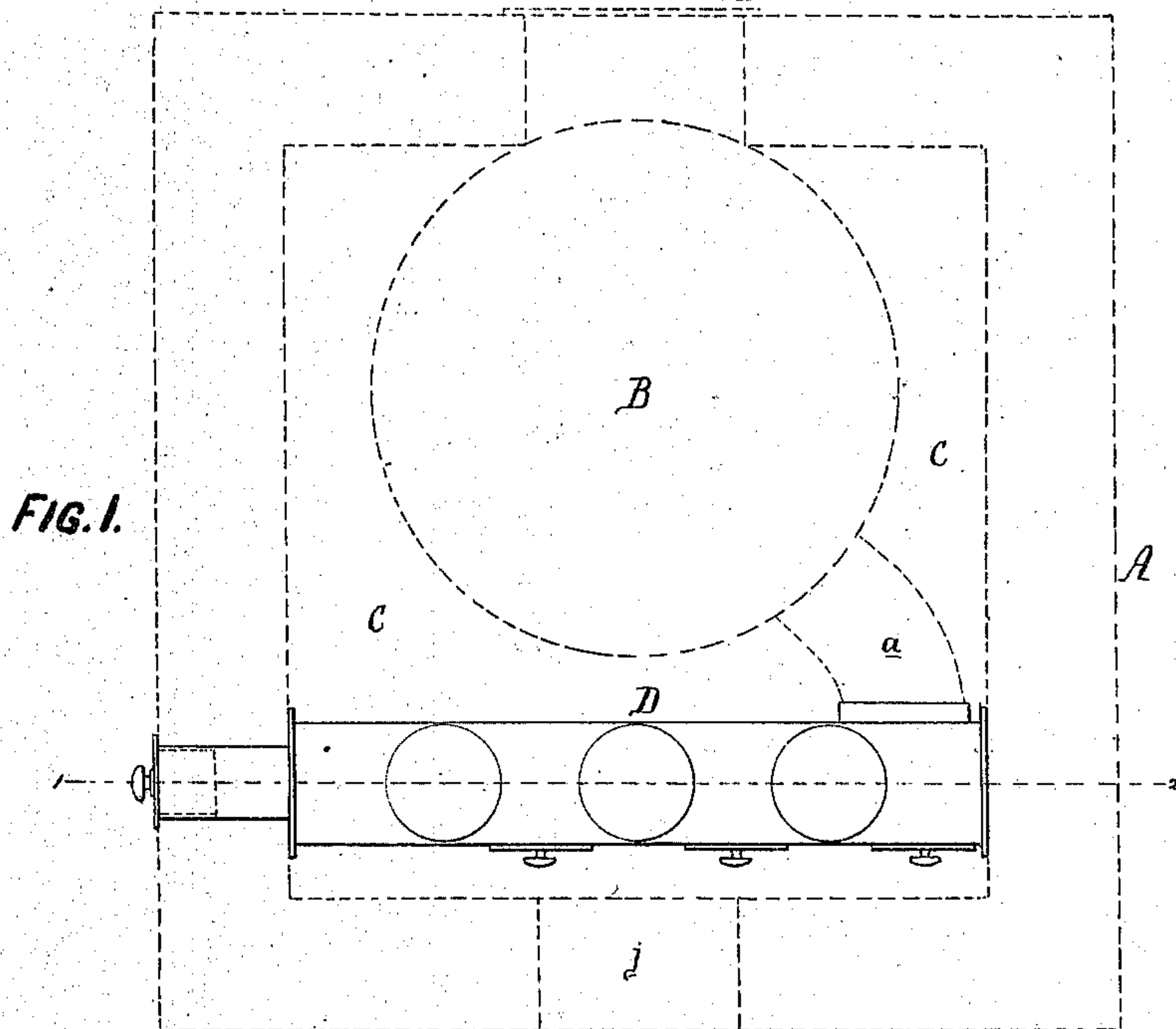


C. HARKINSON.
Furnace Radiator.

No. 103,176.

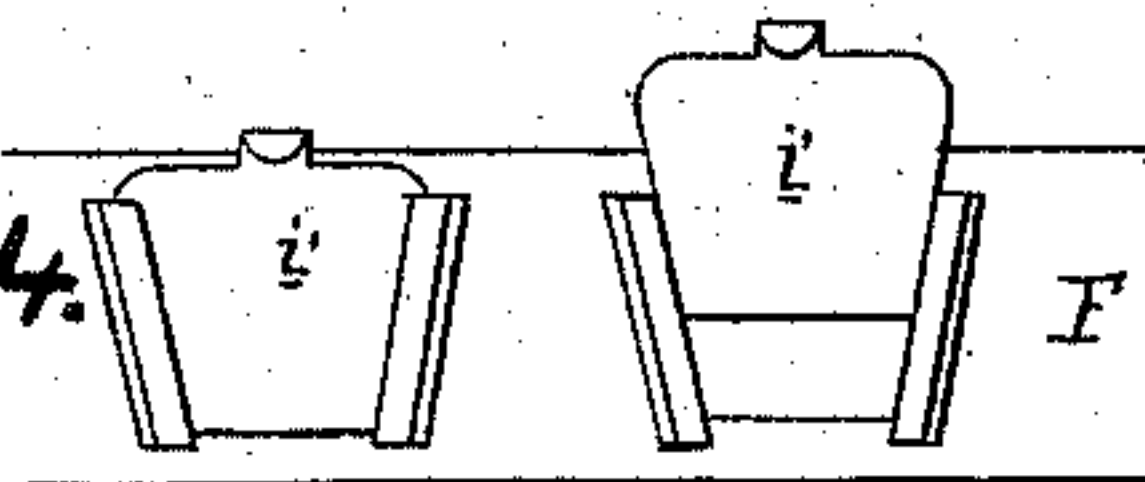
Patented May 17, 1870.



WITNESSES

Wm. A. Steel
John Parker

FIG. 4.



Chas. Harkinson
By his Atty
Harrison & Son

United States Patent Office.

CHARLES HARKINSON, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 103,176, dated May 17, 1870.

RADIATOR FOR HEATING-FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

I, CHARLES HARKINSON, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented an Improved Radiator for Heating-Furnaces, of which the following is a specification.

Nature and Object of the Invention.

My invention consists of an improved radiator, constructed in the manner fully described hereafter, so that dust and soot can find no lodgment in the upper portion of the same, but will fall to the bottom, whence it can be readily removed.

My invention further consists of certain improvements in the construction of the radiator, hereafter explained.

Description of the Accompanying Drawing.

Figure 1 is a plan view of my improved radiator, showing the furnace within which it is contained, in dotted lines;

Figure 2, a vertical section of the same;

Figure 3, a sectional plan on the line 1-2, fig. 2; and

Figure 4, a view of a modification.

General Description.

On reference to fig. 1—

A represents the outer brick casing of a heating-furnace;

B, the fire-chamber or furnace proper, arranged within the same and surrounded by the hot-air space C; and

D, my improved radiator, arranged within the casing at the back of the fire-chamber, and communicating with the latter through a pipe, *a*.

The radiator occupies, in the present instance, the entire width of the furnace, and consists of an oblong box, F, which I prefer to make of cast-iron, and of a number of vertical sheet-metal tubes or drums, H, attached to the top of and communicating with the interior of the said box, and each surmounted by a cap, *b*, which can, if desired, be made detachable, as shown in fig. 2.

The interior of the box F is divided into a number of compartments, *e*¹ *e*² *e*³, &c., by vertical partitions *g*, which also extend upward into each of the drums H, dividing the latter into equal compartments, which communicate with each other at a point above the partitions.

The products of combustion, therefore, which enter the first compartment of the radiator through the pipe *a*, must pass upward through the first drum at one side of the partitions *g* and descend at the opposite side, in order to enter the second compartment *e*², and must likewise rise to the top of each of the succeeding drums, as indicated by the arrows in fig. 2, before they can pass off through the outlet-flue J, which, in the present instance, extends upward from a branch, K, of the radiator, through one of the side walls of the furnace.

By thus compelling the heated products of combustion to pass in a circuitous course through the radiator, instead of escaping at once to the outlet-flue, an extended heating-surface is presented to the air within the chamber C, which is consequently rapidly heated and brought to a fit condition to be conducted to the rooms above.

In radiators of this class as heretofore constructed, the drums, instead of being divided by simple partitions, have been made in pairs, connected at the top by means of elbows, the latter affording a lodgment for dust and soot, which rapidly accumulates and interferes with the draught, and is exceedingly difficult to remove.

By employing single drums with simple vertical partitions, however, quite as effectual a circulation of the heated gases is obtained, while no lodgment for dust and soot is afforded, the latter falling to the bottom of the box F, from which it can be readily removed from time to time on removing caps *i* covering openings in the side of the box, access being had to these caps through a man-hole, *j*, formed in the rear wall of the furnace.

Instead of the caps *i* for covering the openings in the side of the box, sliding doors *i'*, such as represented in fig. 4, may be employed.

In order to enable the dust, &c., which accumulates in the compartment *e*³ of the radiator to be removed, the branch K, which communicates with the said compartment, is provided with a detachable cap, *m*.

This cap *m* is also perforated with a row of holes, *m'*, so that it may be drawn outward to a slight extent, as shown in fig. 2, when it is desired to check the draught of the furnace.

Although but three drums, H, are shown in the drawing, it will be evident that this number can be increased or diminished without departing from my invention.

Claims.

1. The arrangement within the box F and drums H of the vertical partitions *g*, substantially as described.

2. The arrangement in respect to the drums and compartments of the box F, of the covered openings in the side of the said box.

3. The branch K communicating with one of the compartments of the radiator, arranged to project through one of the side walls of the furnace, and having at its outer end a detachable perforated cap, *m*, substantially as set forth.

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

CHARLES HARKINSON.

Witnesses:

ROBERT THOMAS,
JNO. B. HARDING.