

A. L. YATES.
FURNACE.

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919,802.

Patented Apr. 27, 1909.

FIG. 1.

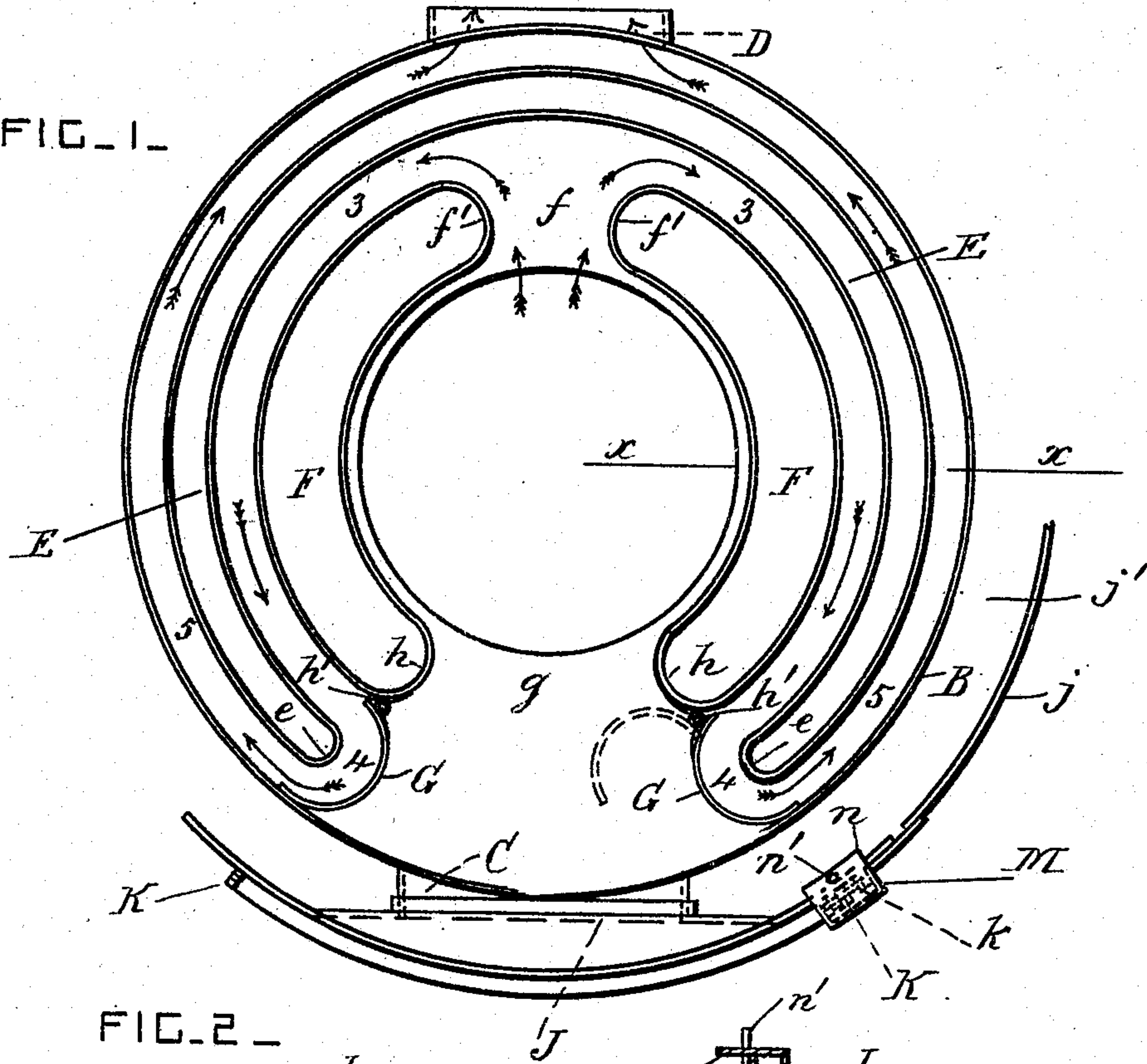


FIG. 2.

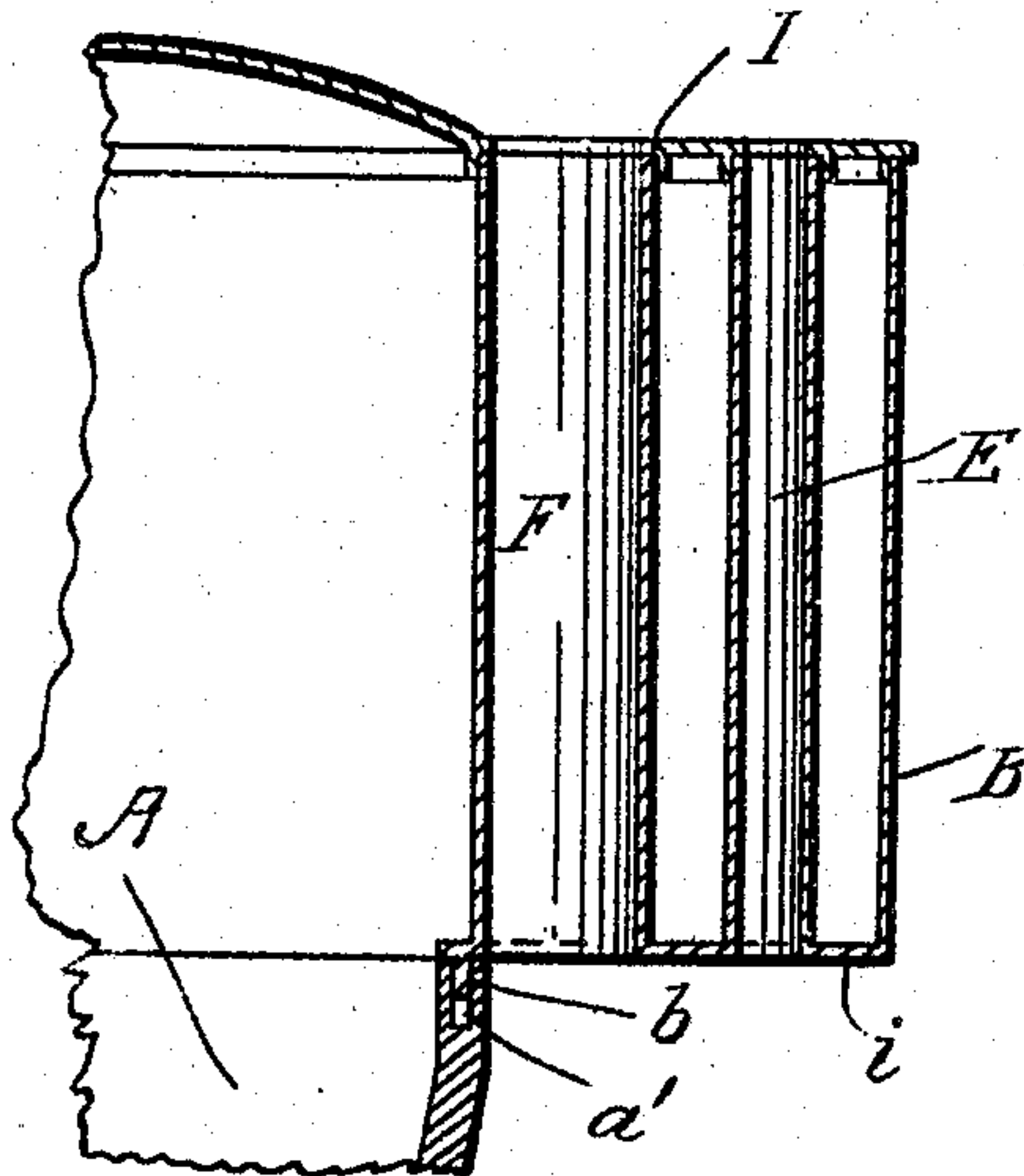


FIG. 3.

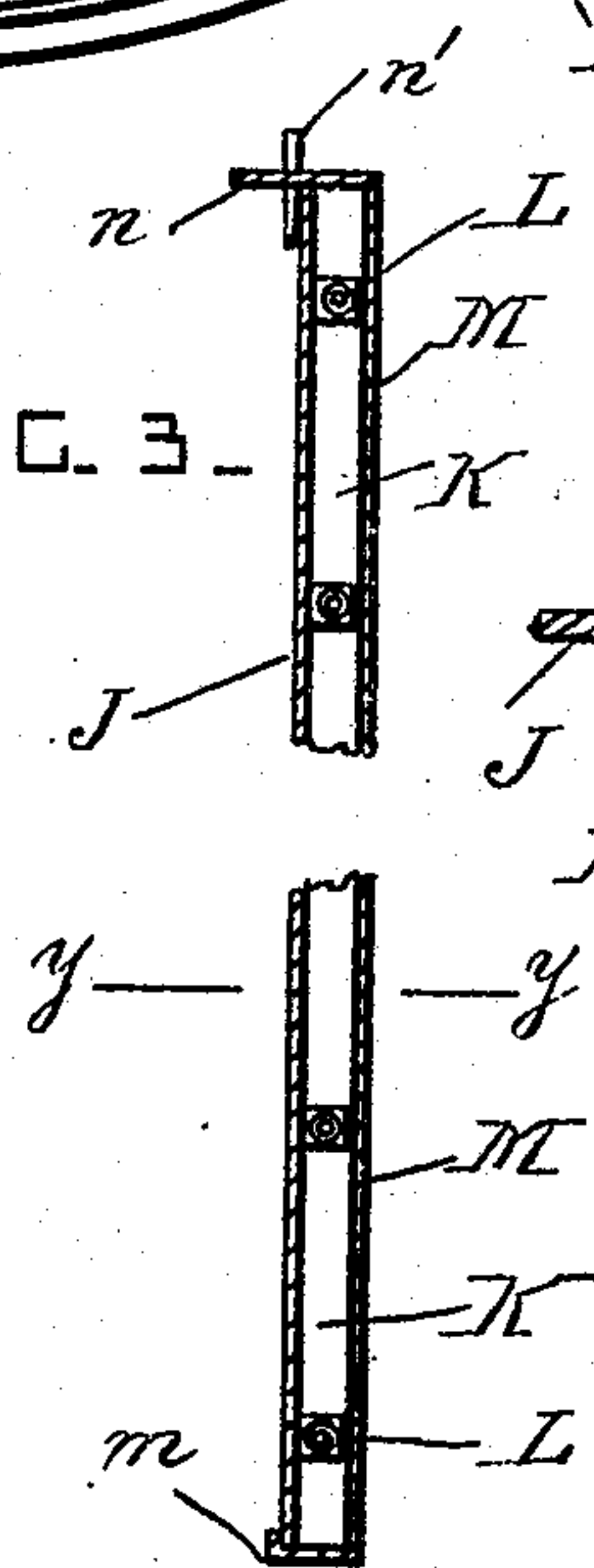
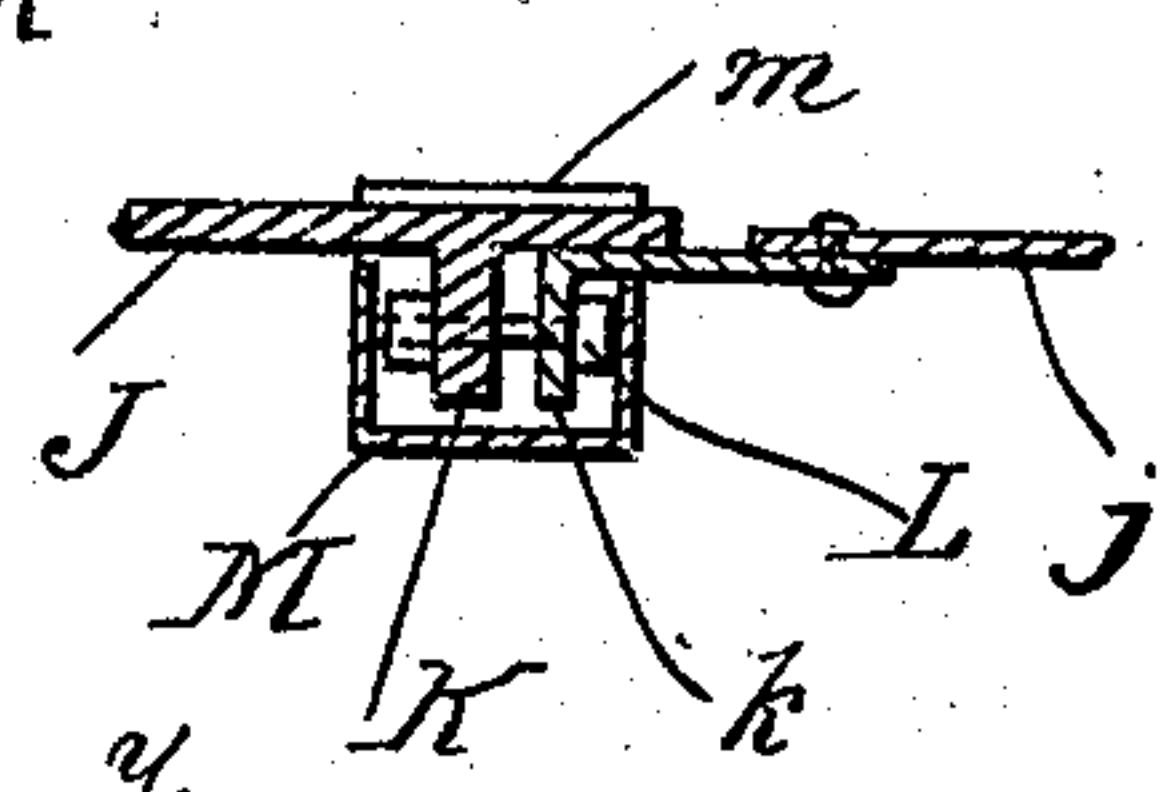


FIG. 4.



WITNESSES:

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FURNACE.

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To all whom it may concern:

Be it known that I, ABRAHAM L. YATES, a citizen of the United States, residing at Niagara Falls, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Furnaces; 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.

This invention relates to heating-furnaces; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a plan view of the furnace with the cover removed. Fig. 2 is a partial vertical section, taken on the line $x-x$ in Fig. 1. Fig. 3 is a front view of a portion of the front plate and the outer casing, showing their connection. Fig. 4 is a cross-section taken on the line $y-y$ in Fig. 3.

A is a portion of the fire-pot of a furnace, of any approved construction provided with an annular groove a' in its top edge.

B is a radiator drum provided with a tubular stem b on its bottom which fits into the groove a' .

C is the firing opening at the front of the radiator drum, and D is the smoke-outlet at the back of the drum.

E is an outer air-passage or chamber which extends vertically through the radiator drum, and which extends across the smoke-outlet D but not across the firing-opening C. F are two inner air-passages or chambers which extend vertically through the radiator drum, and which are arranged adjacent to the fire-pot. A smoke-space f is formed between the rear ends f' of the passages F, and a firing-space g is formed between their front ends h opposite the firing-opening C. All these air-passages are arranged concentric with the radiator drum and fire-pot.

G are curved flue-plates provided with hinges h' by means of which they are connected to the front ends h of the passages F. These flue-plates are formed of spring metal and their free end portions engage with the periphery of the radiator drum so that they are smoke-tight without catches or fastenings.

The direction of the smoke and products of combustion is shown by the arrows in Fig. 1, passing first from the fire-pot through the smoke-space f , thence through the two

smoke passages 3 between the air-passages E and F, through the spaces 4 between the flue-plates G and the ends e of the outer air-passage E, and around the space 5 between the air-passage E and the shell of the radiator drum, to the smoke-outlet D.

The fuel is shoveled into the fire-pot through the space between the flue-plates G and the ends h of the air-passages F.

I is the top of the radiator drum which closes the smoke-passages and the space over the fire-pot. This top I and the bottom i of the radiator drum are provided with openings corresponding to the air-passages E and F so that the air may be heated in its upward passage through the said air-passages.

This arrangement affords a very efficient heating apparatus, and the hinged flue-plates G afford a means for cleaning out the smoke-passages, suitable cleaning implements being introduced through the firing-opening.

J is the front-plate of the furnace, and j is the outer casing which extends around the radiator drum and fire-pot, and which forms an air passage j' between itself and the said parts.

K are radial flanges near the edges of the front-plate, and k are angle-shaped plates on the ends of the casing j which overlap the side edges of the said front-plate.

L are bolts for securing the parts K and k together and drawing up the sheet metal of the casing.

M is a trough-shaped guard which extends the full height of the casing, and which is slipped over the bolts L and the parts K and k . The guard M has a hooked lug m at its bottom which slips under the parts K and k , and n is a straight lug at the top of the guard which comes over the said parts. A pin n' is slipped through a hole in the lug n and engages with the front plate J so that the guard is held in place.

What I claim is:

1. In a heating-furnace, the combination, with a radiator-drum provided at its bottom with an inlet opening for the products of combustion, and having a smoke-outlet at its rear and a fuel-opening at its front; of an outer chamber arranged between the bottom and top of the said drum and extending across the said smoke-outlet but not across the said fuel-opening, said outer chamber forming a passage for air and a fuel-space, two inner chambers extending between the bottom and top of the said drum and afford-

ing two more passages for air, a smoke-passage
and a fuel-space being also formed between
the end portions of the said inner chambers
at the rear and front of the drum, and curved
5 flue-plates of spring metal hinged to the
front end portions of the said inner cham-
bers with their free end portions held in en-
gagement by frictional contact with the pe-
riphery of the said drum and forming con-
10 necting smoke-passages substantially as set
forth.

2. In a heating furnace, the combination,
with a radiator drum, of a front-plate pro-
vided with a flange near its side edge which

projects radially of the said drum, an outer 15
casing which encircles the said drum and
which has an angle-shaped plate on one end,
bolts connecting the said plate and radial
flange, and a trough-shaped guard covering
the said bolts, plate and flange and provided 20
with means for securing it in position.

In testimony whereof I have affixed my
signature in the presence of two witnesses.

ABRAHAM L. YATES.

Witnesses:

HERBERT W. T. JENNER,
JOHN L. FLETCHER.