

(No Model.)

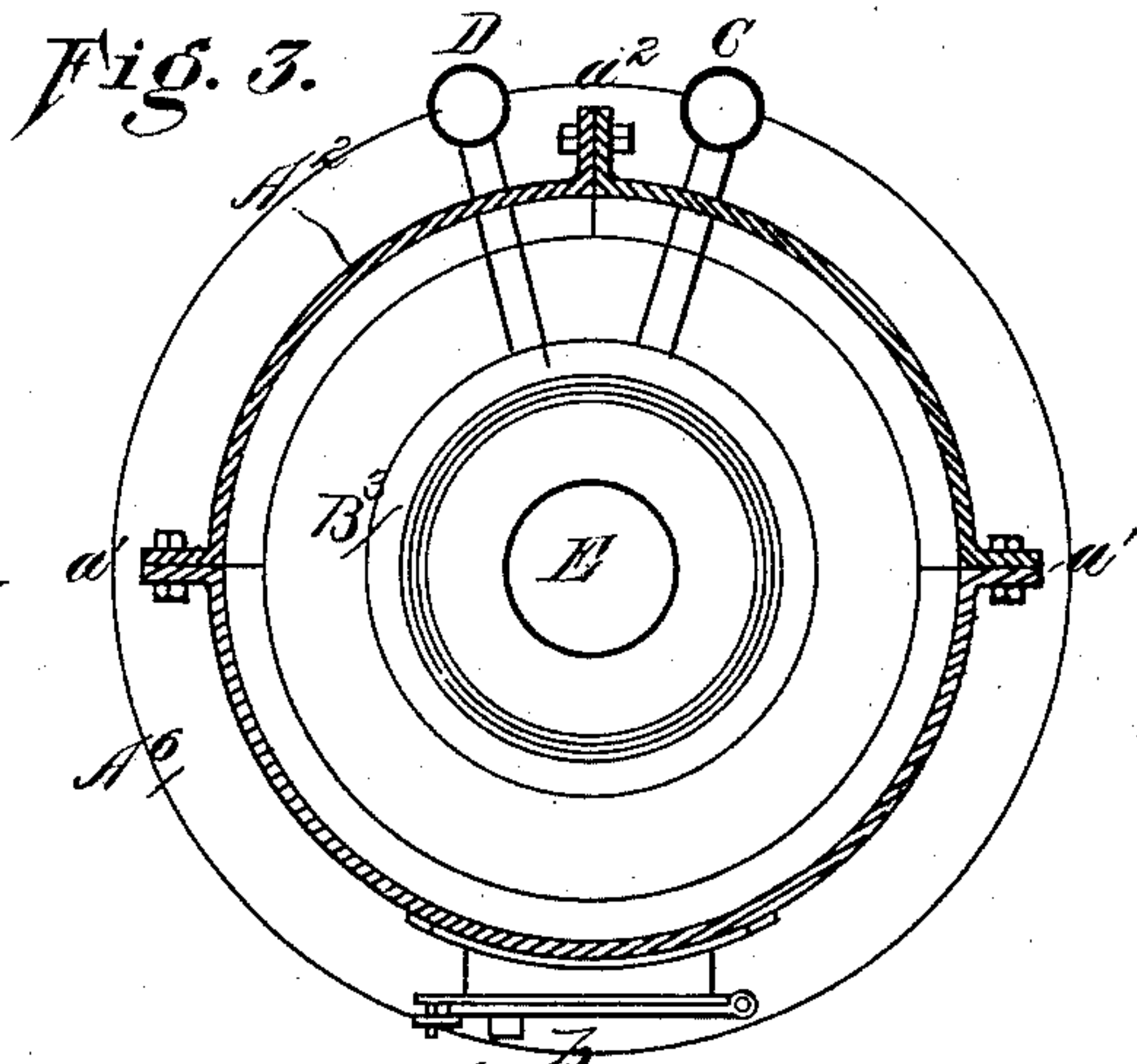
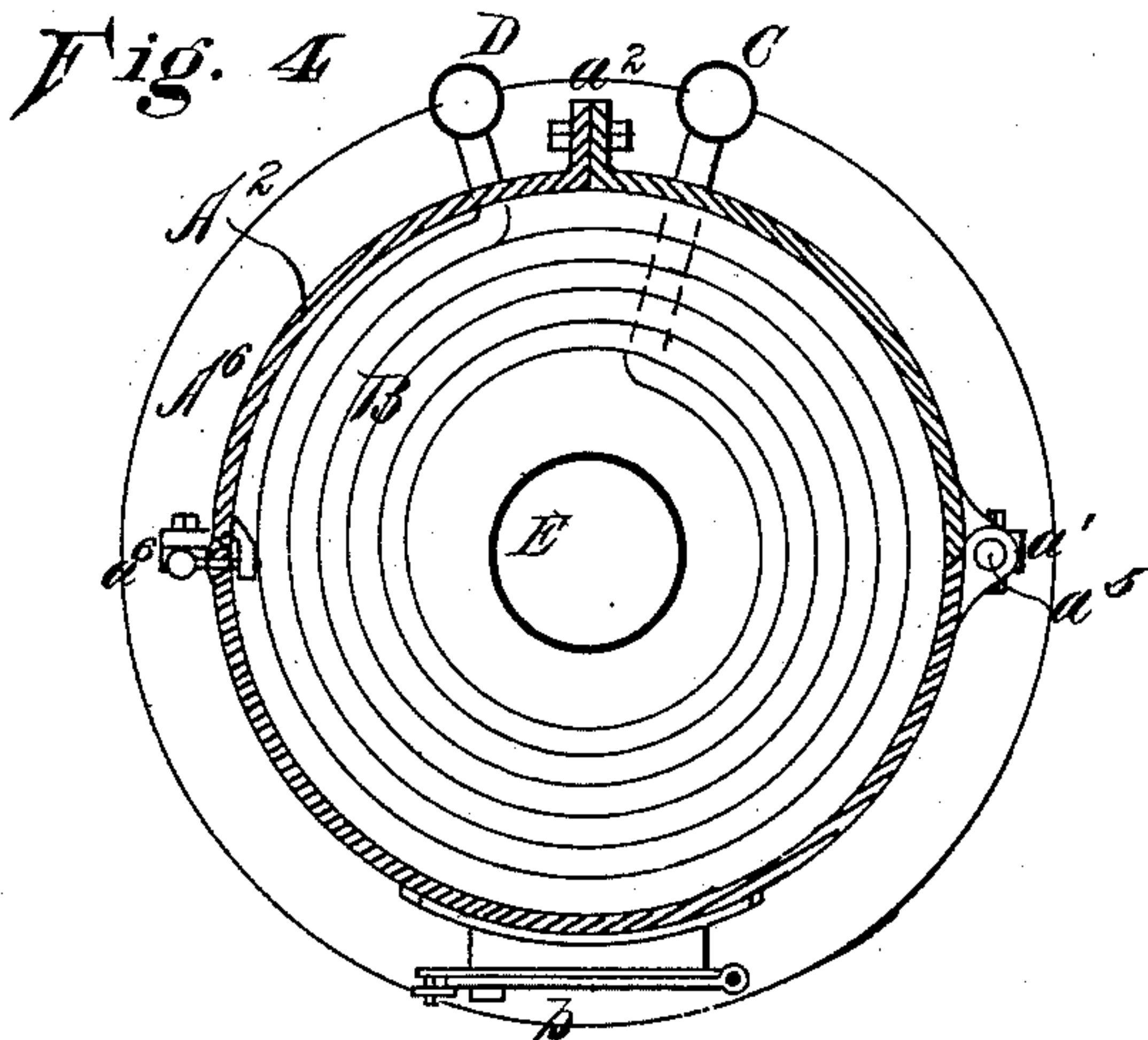
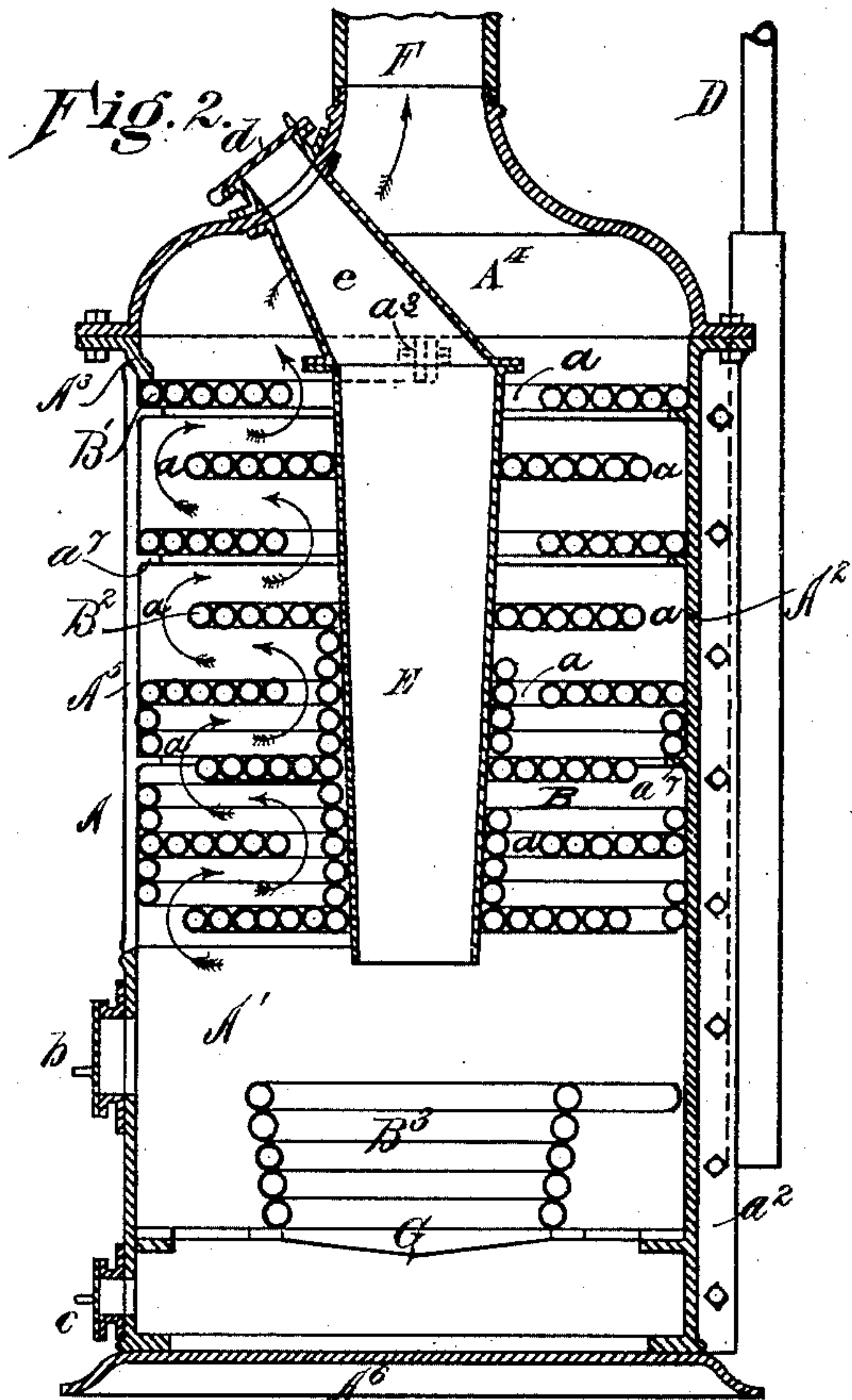
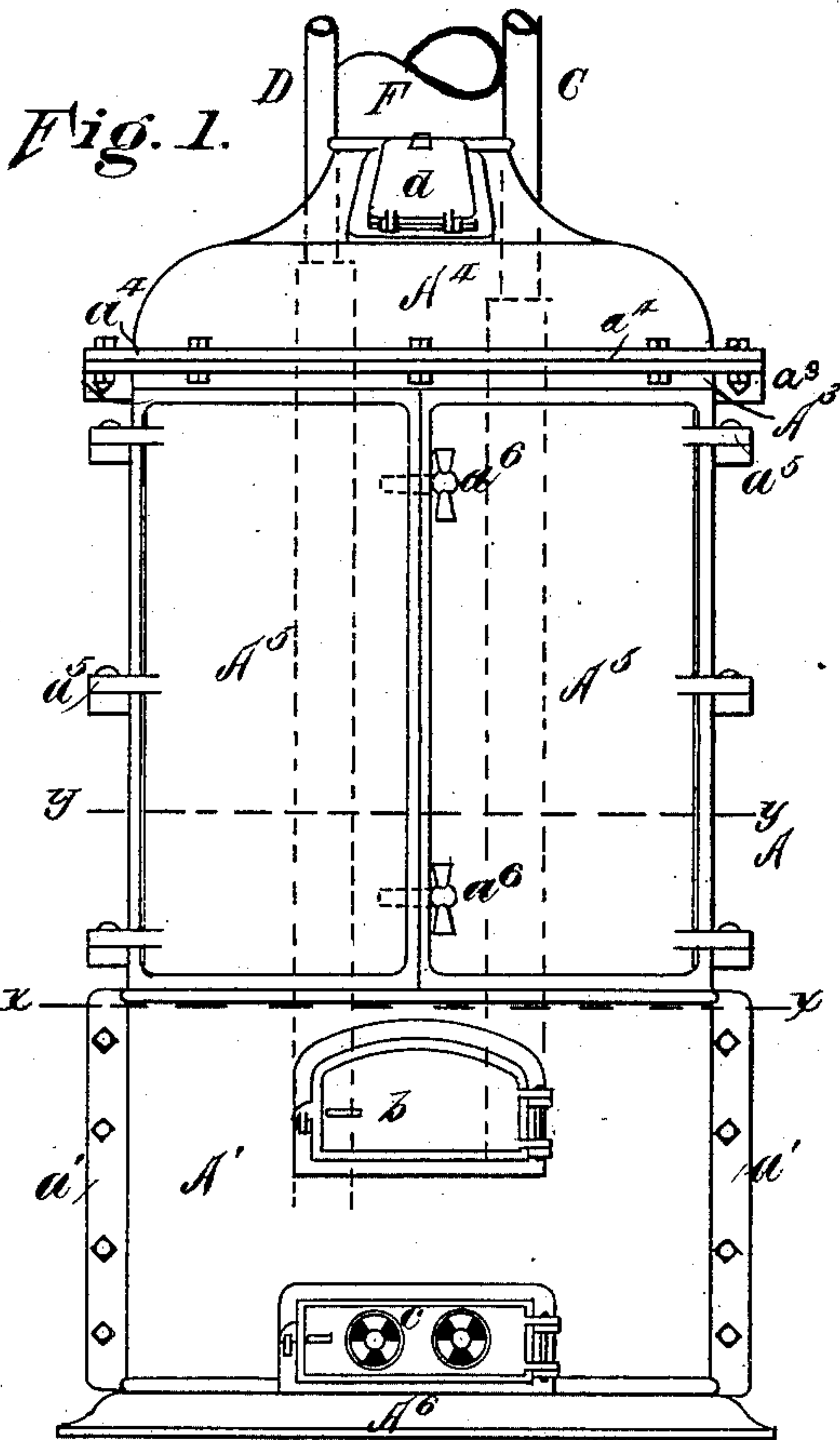
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E. S. WILBER.

HEATER.

No. 360,500.

Patented Apr. 5, 1887.



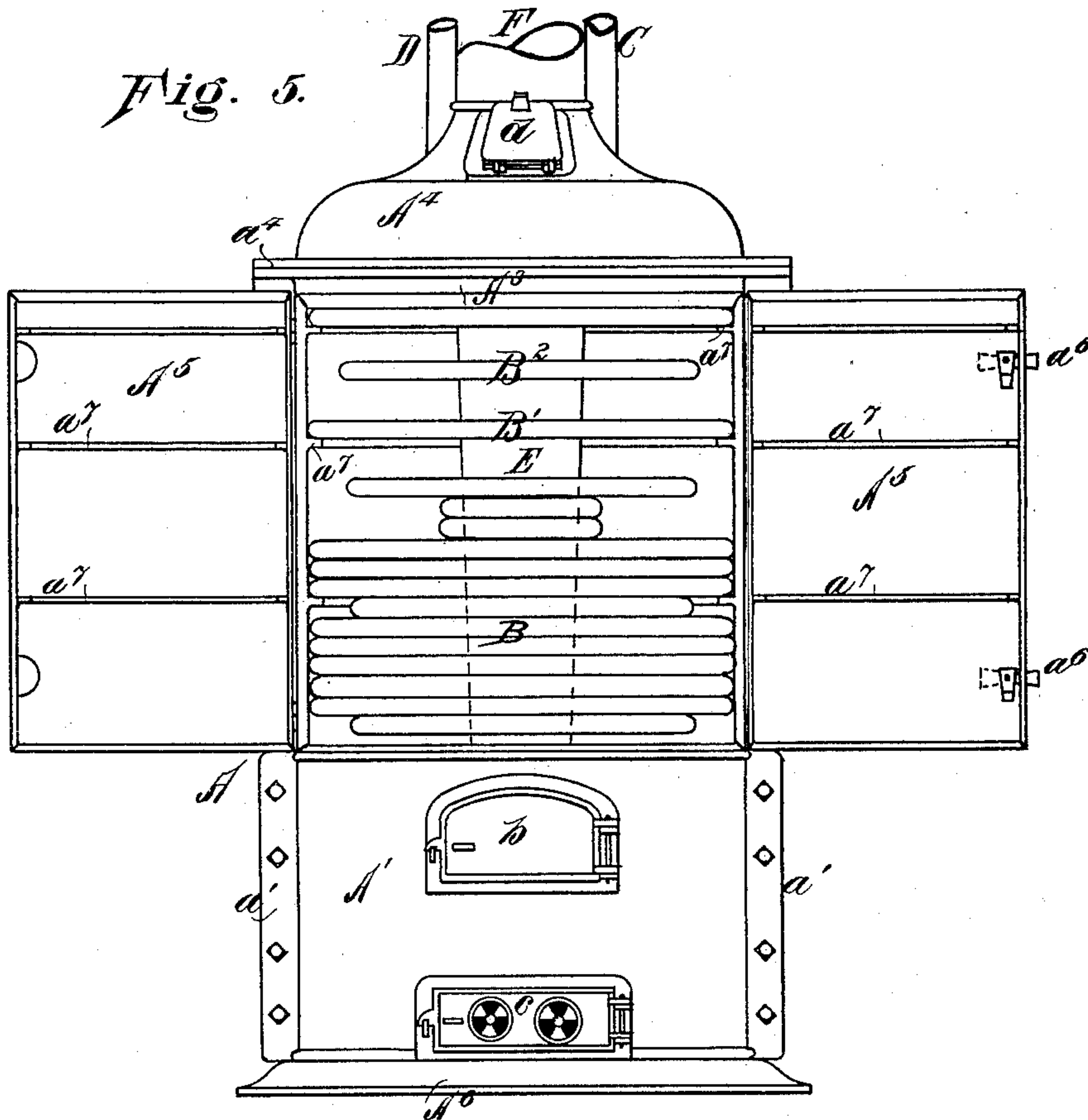
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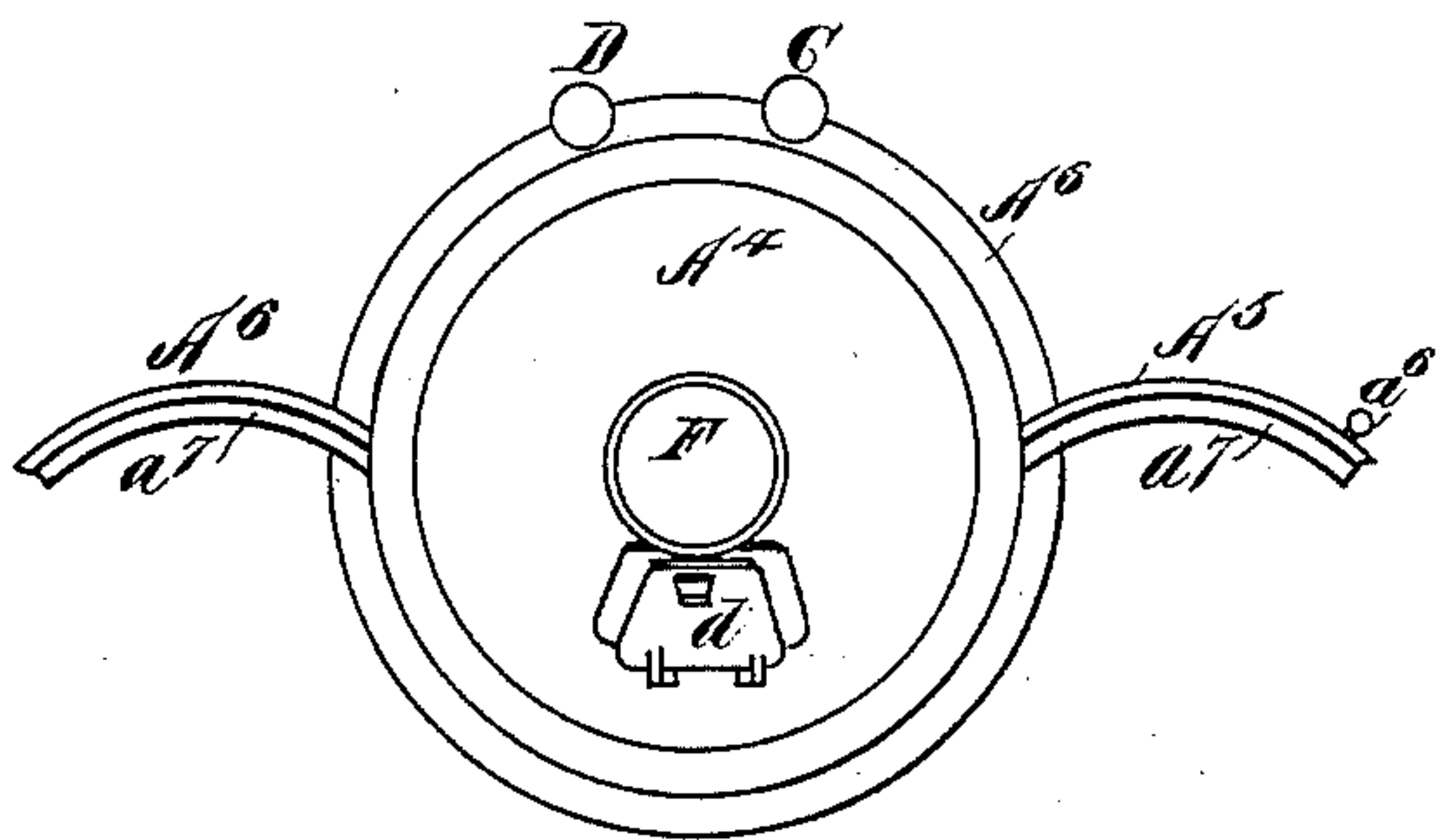
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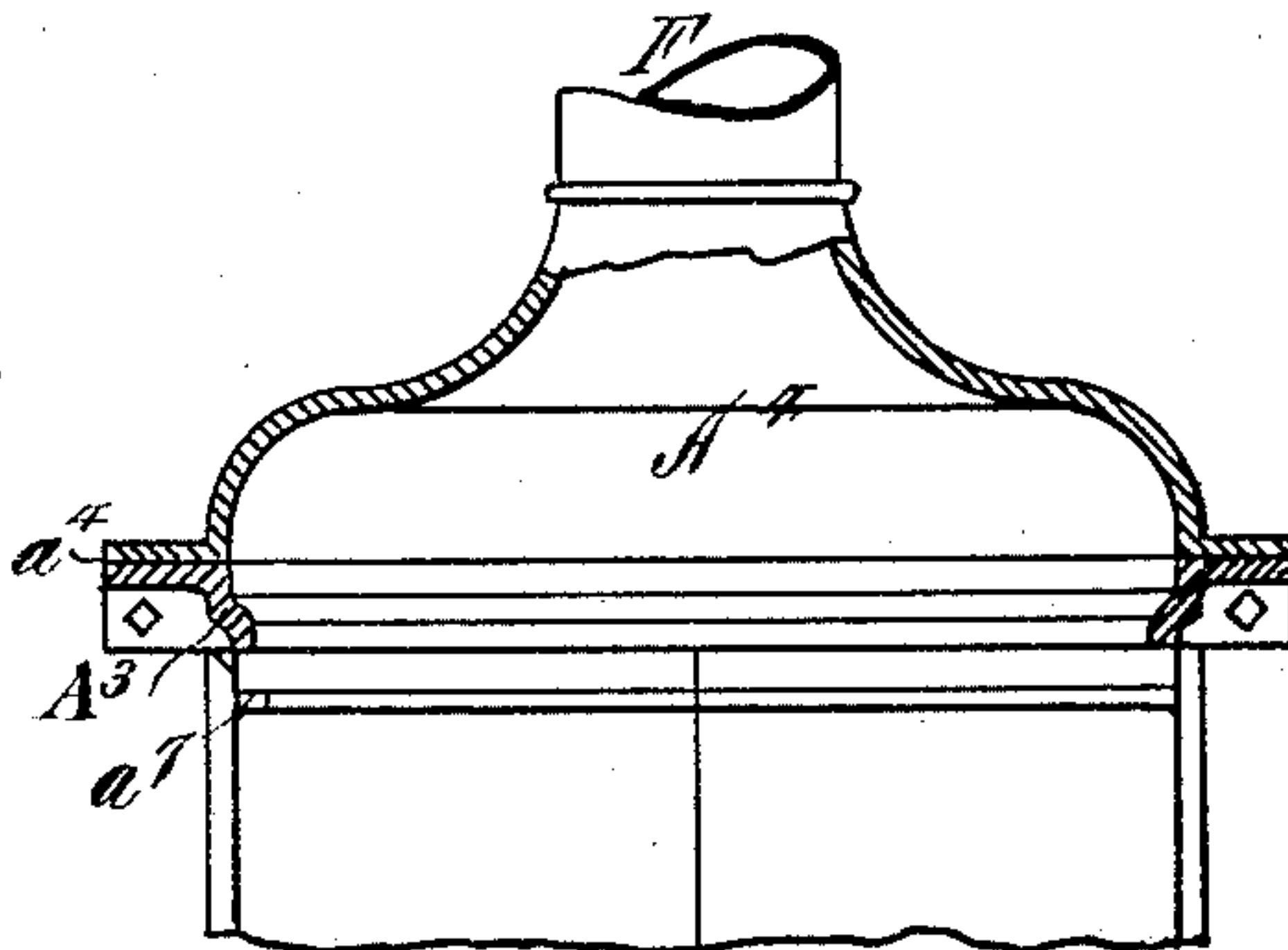
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*Fig. 6.*



*Fig. 7.*



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*Attorney*



# UNITED STATES PATENT OFFICE.

ELIJAH S. WILBER, OF CHICAGO, ILLINOIS.

## HEATER.

SPECIFICATION forming part of Letters Patent No. 360,500, dated April 5, 1887.

Application filed October 23, 1886. Serial No. 217,045. (No model.)

*To all whom it may concern:*

Be it known that I, ELIJAH S. WILBER, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful  
5 Improvements in Heaters, of which the following is a specification.

My invention is in the nature of an improvement upon a heater for which Letters Patent were granted me September 8, 1885, numbered  
10 326,004, and relates especially to the construction of the case or shell by which the water-heating coils are surrounded, all of which will be fully explained hereinafter.

In the accompanying drawings, Figure 1 represents in elevation a heater containing my improvements; Fig. 2, a vertical section at right angles on the axis of Fig. 1; Fig. 3, a transverse section of Fig. 1 on the line *x x*; Fig. 4,  
15 a transverse section on line *y y* of Fig. 1; Fig. 5, an elevation of heater with doors open; Fig. 6, a plan of Fig. 5 on a reduced scale, and Fig. 7 a detached view of upper part of heater.

Similar letters of reference indicate similar parts.

25 A represents the shell of a heater, containing the serial water-heating coil B, which latter consists of independent coils B' and B<sup>2</sup>, each having a connection with the return stand-pipe C and leading stand-pipe D.

30 By reference to Fig. 2 it will be seen that the coils B' are of larger outer and inner diameter than the coils B<sup>2</sup>, and that the former impinge against the shell A and the latter impinge against the magazine E, by which construction are provided flues or openings *a a* for  
35 the passage of the hot gas from the combustion-chamber to the flue F. These openings, alternating with the coils B' and B<sup>2</sup>, produce the serpentine course for the products of combustion shown by the arrows, Fig. 2, whereby  
40 all portions of the coils are subjected to the action of the products of combustion as they pass upward to the outlet-flue F. The lower basket-coil, B<sup>3</sup>, surrounds the grate G and  
45 makes the fire-basket, and takes up the radiant heat from the fuel on the grate.

The operation of so much of my heater as relates to the coils B' B<sup>2</sup> and their connected stand-pipes C and D is the same as described  
50 in my former patent. The shell A, which is preferably of cast-iron, is made in sections,

and bolted or otherwise secured together at the abutting flanges.

I prefer to construct the cylindrical portion of three or four separate parts, one of which, A',  
55 shall be semi-cylindrical and contain the fire and ash-pit doors *b* and *c*, and the other two, A<sup>2</sup>, quarter-circular and constitute the back.

The sections A<sup>2</sup> are flanged and bolted together at *a*<sup>2</sup>, and flanged and bolted to corresponding flanges on the section A' at *a'* *a'*. A  
60 semicircular brace or tie, A<sup>3</sup>, may be used to complete the cylindrical form of the shell at the top, which is bolted to the lugs of the sections A<sup>2</sup> at *a*<sup>3</sup>, although this is not necessary, as  
65 the bonnet A<sup>4</sup> may be used to brace the shell at the top.

Above the sections A<sup>2</sup> and brace A<sup>3</sup> is placed the bonnet A<sup>4</sup>, bolted or otherwise secured to the brace A<sup>3</sup> by flanges *a*<sup>4</sup> and bolts.  
70

In the head I construct an opening closed by the door *d*, through which the fuel is introduced through the chute *e* to the magazine E.

The sections A' and A<sup>2</sup>, when made up, constitute the full shell at the bottom, and the  
75 swinging door or doors A<sup>3</sup>, hinged to the sections A<sup>2</sup> at *a*<sup>5</sup>, when closed, constitute, with the sections A<sup>2</sup>, the full shell at the top, the whole being mounted upon the base-plate A<sup>6</sup>. This door, of which one may be used, as shown  
80 in Fig. 4, or two, as shown in Fig. 1, is of same or greater vertical depth or height than the heating-coil B, and when swung open uncovers the heating-coil B for the full half circumference of the shell and permits of access  
85 to all parts of the separate coils B' and B<sup>2</sup>, by which means soot or other débris may easily and quickly be removed and any necessary repairs of the coils conveniently be made.

The construction of the shell A in sections  
90 facilitates the introduction and removal of the coils B' and B<sup>2</sup>, and also contributes in some respects to the correct erection of the apparatus as a whole.

To meet the case of the coils B' not filling  
95 the shell completely, I propose to cast on the inner faces of the sections A<sup>2</sup> and of the door A<sup>5</sup> thin ribs or flanges *a'*, the flanges of the fixed sections A<sup>2</sup> and of the door A<sup>5</sup> meeting  
100 when the latter is closed and forming a continuous annular lip under the separate coils B', and preventing the hot gas from passing



between the outer convolution of the coil and the shell.

The door or doors  $A^5$  are fitted to the shell  $A$  air and gas tight, and when closed are secured by the usual latches or binders,  $a^6$ .

In the construction of the shell I do not wish to be limited to the exact form of flanges and bolts herein shown, because other and possibly neater methods of securing these parts together may be employed—as, for instance, the flanges may be circumferential instead of radial, made to lap over each other, and be secured by radial bolts with countersunk heads, which method would avoid the projecting flanges shown and give the points of junction the appearance of vertical ribs.

If in practice it should be found convenient to construct the coil  $B$  of other than the circular form shown—as, for instance, if it were made square in plan—then the shell  $A$  of course would take the same form; but the method of constructing it in sections with the lower portion bolted at the flanges  $a'$  and  $a^2$ , and the upper portion consisting one half of the fixed sections  $A^2$  and the other half of the swinging door or doors  $A^5$ , would remain as described for the cylindrical form of shell.

Having described my invention, what I claim is—

30 1. In a heater of the kind described, in com-

bination with a water-heating coil,  $B$ , a shell,  $A$ , made up in sections, the lower part of which forms a continuous ring of cylindrical or other form, with the sections rigidly secured together, and the upper part of which contains 35 a rigid back with a hinged door mounted thereon, which, when closed, forms with the back a continuous ring, and when opened exposes the coil for the full half circumference of the shell, substantially as and for the purpose specified. 40

2. In a heater of the kind described, in combination with a heating-coil,  $B$ , the alternate coils  $B'$  of which impinge against the shell and the intermediate coils,  $B^2$ , against the mag- 45 azine, whereby the passages  $a$  are formed for the flow of the products of combustion to the outlet-flue  $F$ , the shell  $A$ , provided with doors  $A^5$ , the shell and doors being formed with the internal annular ribs,  $a^7$ , to close under the outer 50 convolutions of the coils  $B'$ , substantially as and for the purposes specified.

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

ELIJAH S. WILBER.

Witnesses:

JNO. TAYLOR,  
GEORGE W. REED.