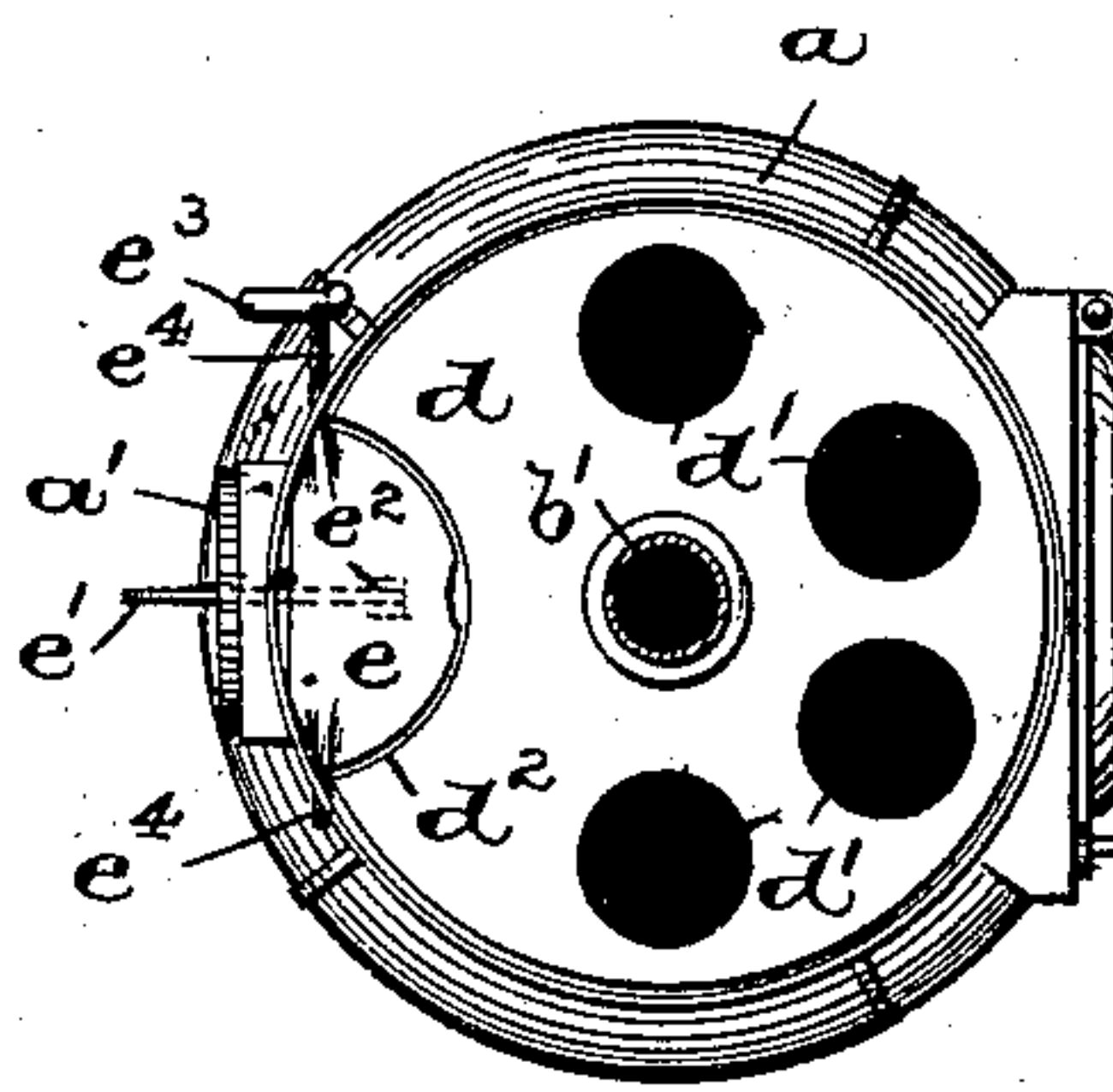
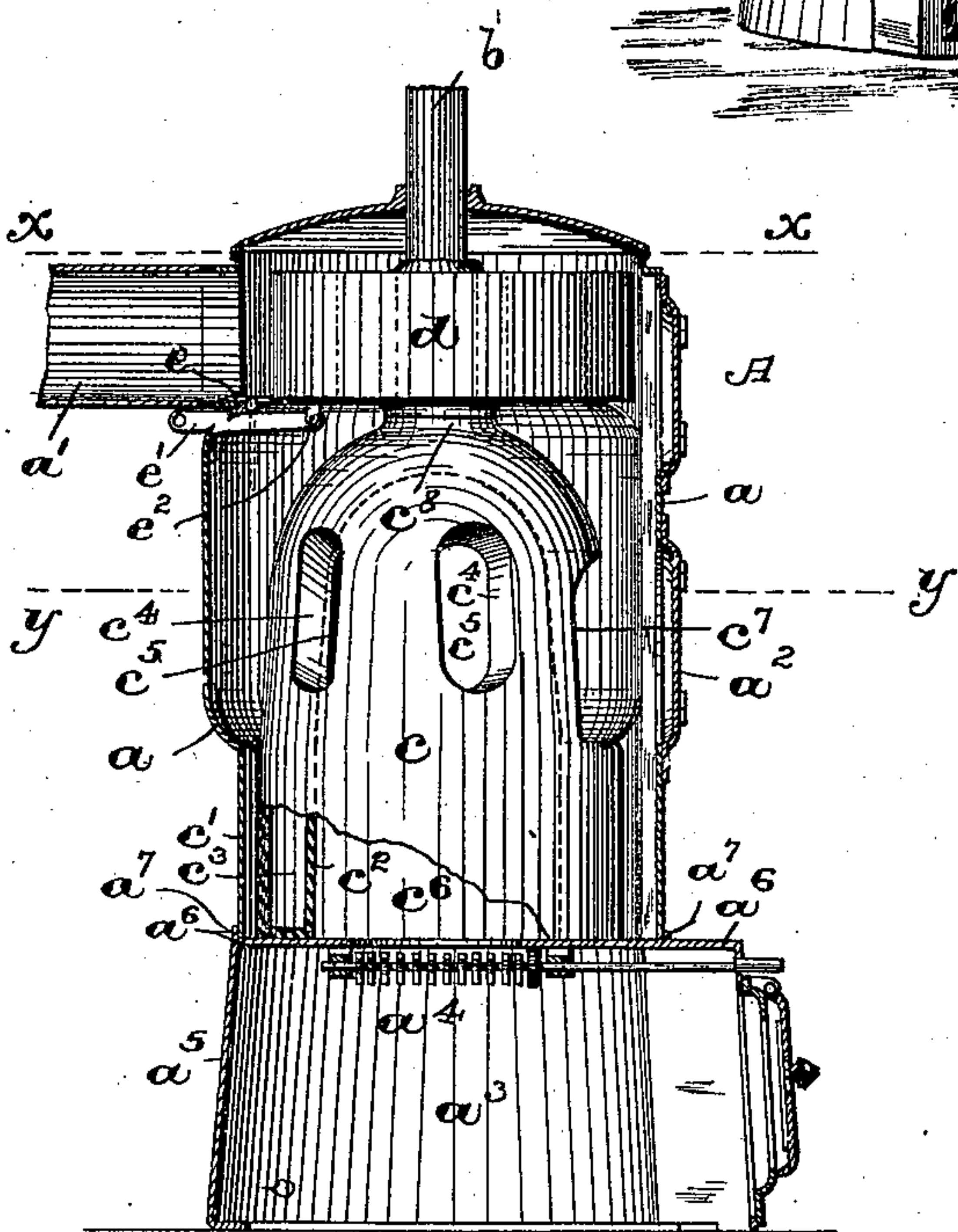
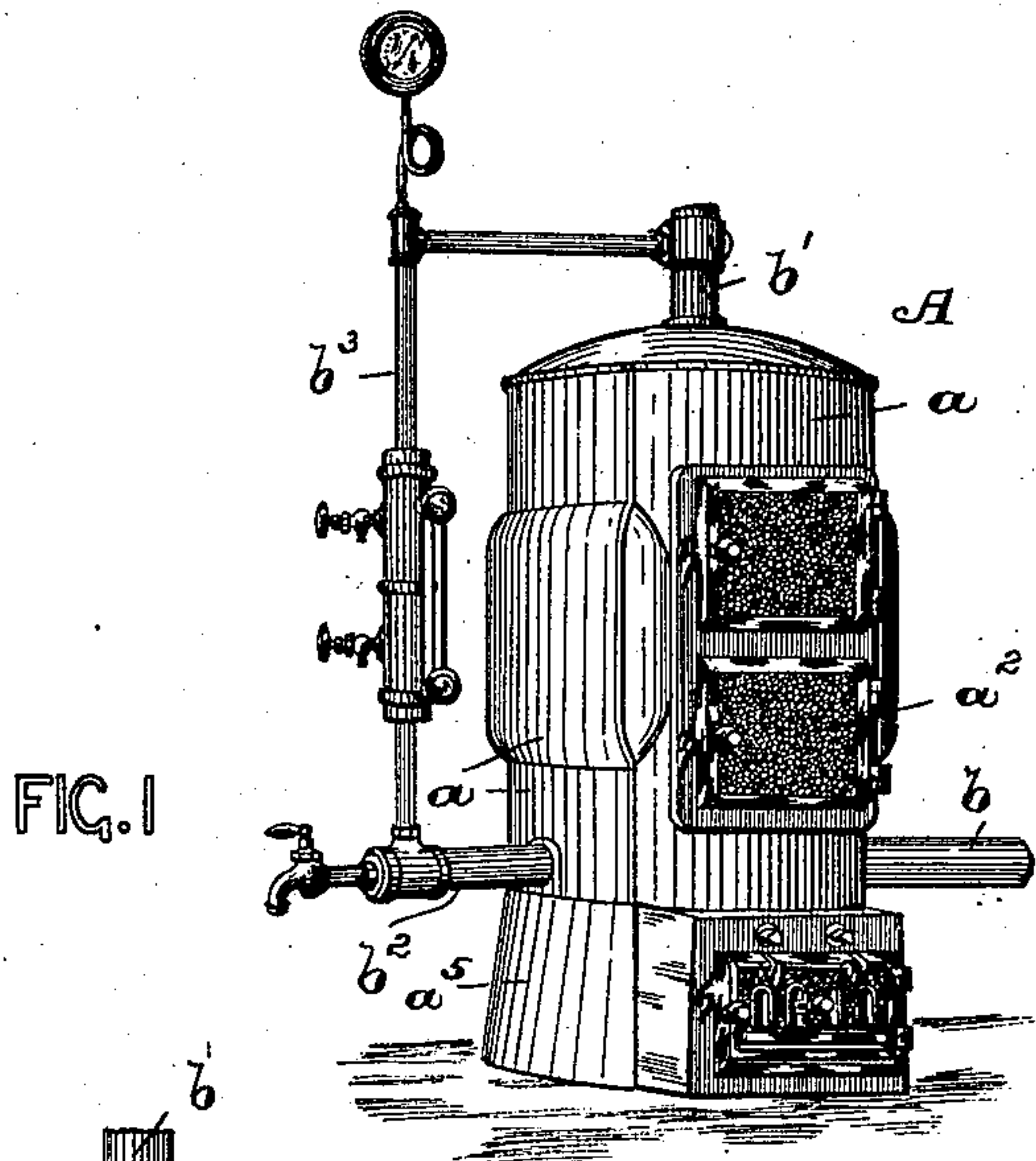


(No Model.)

E. BENEDICT.  
FURNACE.

No. 576,650.

Patented Feb. 9, 1897.





# UNITED STATES PATENT OFFICE.

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## FURNACE.

SPECIFICATION forming part of Letters Patent No. 576,650, dated February 9, 1897.

Application filed May 22, 1896. Serial No. 592,555. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD BENEDICT, a citizen of the United States, residing at Brooklyn, in the county of Kings 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, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention relates to a new and useful hot-water heater or steam-boiler to be used for general heating purposes; and the invention has for its primary object to facilitate the heating of the water in a very effective manner.

The invention therefore consists in the novel features of construction and the general arrangements of the parts hereinafter fully set forth, and finally embodied in the claim.

The invention is illustrated in the accompanying sheets of drawings, in which—

Figure 1 is a perspective view of my novel construction of furnace. Fig. 2 is another view of the same, illustrating the outer shell or casing in vertical section and the combined lower and top dome in side elevation. Fig. 3 is a horizontal section taken on line  $x$  in Fig. 2, and Fig. 4 is a similar section taken on line  $y$  in the same figure.

Similar letters of reference are employed in all the above-described views to indicate like parts.

In said drawings, A indicates the complete furnace, comprising therein a usual sheet-metal shell  $a$ , having a smoke-pipe  $a'$ , a door  $a^2$ , ash-pit  $a^3$ , and any suitable form of grate  $a^4$ . The lower casing  $a^5$  for the ash-pit is made of cast-iron and is provided with a top  $a^6$ , having a central opening, just below which the grate-bars are arranged. On said top  $a^6$  is an annular rim or projection  $a^7$ , which embraces the lower edge of the casing  $a$  and holds it in position on said top  $a^6$ . Resting loosely upon said top  $a^6$  is the lower water-dome  $c$ , which is preferably made in the shape

illustrated in Fig. 2. Said dome, which is of cast metal, comprises therein an outer shell  $c'$  and an inner wall  $c^2$ , as represented in section in the lower left-hand corner of said Fig. 2, which form the water-space  $c^3$  with which the inlet-pipe  $b$  is connected, substantially as shown. Said walls  $c'$  and  $c^2$  are also connected by suitable walls or partitions  $c^4$ , which form suitable openings  $c^5$ , through which the hot air and gases escape from the fire-pot portion  $c^6$  into the space formed by the outer shell  $a$ , surrounding said dome, and from which the gases can escape into the smoke-pipe  $a'$ , as will be more fully described hereinafter. In the front of said dome  $c$  is an opening  $c^7$ , through which the coal is passed to be deposited in the fire-pot  $c^6$ . Said lower dome  $c$  is formed at the top with a neck  $c^8$ , which has an opening therein communicating with the water-space  $c^3$  between the walls  $c'$  and  $c^2$  of the dome, and firmly secured in position on said neck in any well-known manner, but preferably by being screwed on a thread on said neck  $c^8$ , is an upper hollow dome  $d$ . Said dome is preferably cylindrical in shape, but may be of any other desirable shape, having its upper and lower sides preferably flat. Extending entirely through said upper dome  $d$  are suitable flues  $d'$ , through which the hot air and gases can be made to pass to the space over said upper dome  $d$  and down through a semicircular opening  $d^2$ , formed in the side of said dome  $d$ , whence they can escape into the smoke-pipe  $a'$ , as will be clearly evident. Said opening  $d^2$  in the upper dome  $d$  is directly back of the opening in the smoke-pipe  $a'$ .

As will be seen from Figs. 2 and 3,  $e$  is a damper, which is pivoted directly beneath said semicircular opening  $d^2$  and is operated by a rod  $e'$ , pivoted at  $e^2$  to the under side of said damper  $e$ ; but a handle  $e^3$  on one of the journal-pins  $e^4$  of the damper may be employed to turn said damper in the usual manner. When said damper  $e$  is closed, an indirect draft is the result produced by the gases and heat coming from the fire-pot  $c^6$  through the openings  $c^5$ , passing all around the lower dome  $c$  and under the upper dome  $d$ , through



the flues  $d'$  therein, and into the space above said dome  $d$ , into the opening  $d^2$  and the smoke-pipe  $a'$ , as will be clearly evident.

To produce a direct draft when starting a fire in the fire-pot and to produce a stronger draft, all that is necessary is to pull on the rod  $e'$  or the handle  $e^4$ , connected with the damper  $e$ , causing the latter to stand in its opened position, (indicated in said Fig. 2,) and the gases and heat coming from the opening  $c^5$  in the lower dome  $c$  will pass directly into the smoke-pipe  $a$  without first passing through the flues  $d'$  in the upper dome and around the dome, as has been described.

By the arrangement of the upper dome and the lower dome, connected by a comparatively small neck, it will be clearly evident that I have obtained a greater heating-surface, and by the arrangement of the damper  $e$  the hot air and gases surround the upper dome both on top and below and an efficient steam-generator or hot-water heater is the result. Connected with the top of said dome  $d$  is the outlet-pipe  $b'$ , which passes through the upper portion of the shell  $a$  to the radiators in the rooms to be heated.

Connected with the lower part of the dome  $c$  is a draw-off pipe  $b^2$ , and connecting said

pipe  $b^2$  and  $b'$  is a system of piping  $b^3$ , in which I place a pressure-gage and water-indicator, substantially as shown in Fig. 1.

Having thus described my invention, what I claim is—

In a furnace of the class herein set forth, in combination, with a base, an outer shell or casing, a lower dome  $c$ , having walls  $c'$  and  $c^2$  forming a water-space, and formed with a fire-pot  $c^6$ , partitions  $c^4$  connecting said walls  $c'$  and  $c^2$ , forming openings, as  $c^5$ , in said dome, a narrow neck  $c^8$  at the top of said dome, having an opening therein, and an upper dome  $d$  secured on said neck and communicating with the opening in said neck, and flues  $d'$  in said dome  $d$ , a semicylindrical opening  $d^2$  in one side of said dome  $d$ , a damper  $e$ , and means for operating said damper, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 20th day of May, 1896.

EDWARD BENEDICT.

Witnesses:

FREDK. C. FRAENTZEL,  
ALFRED L. DE VOE.