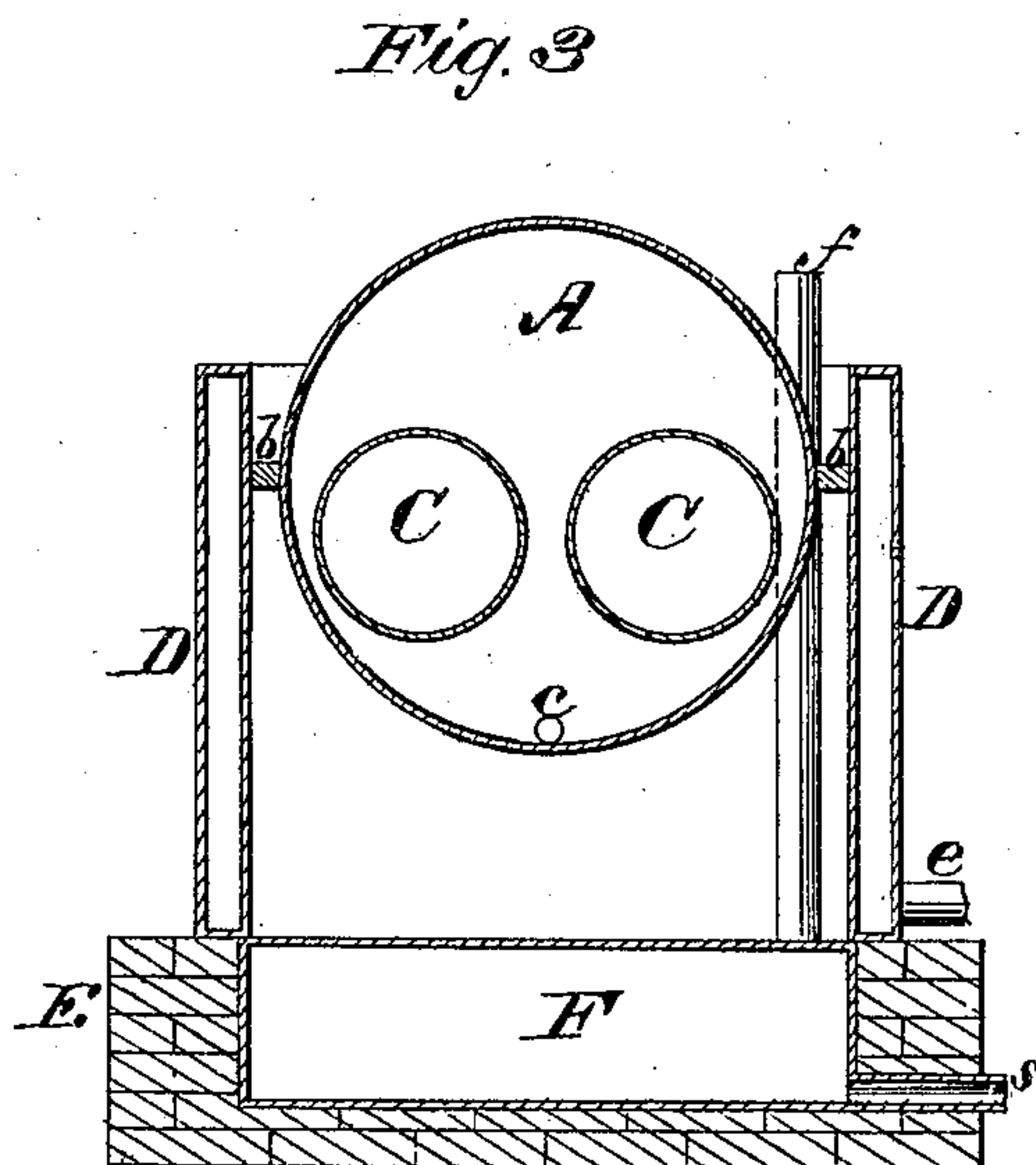
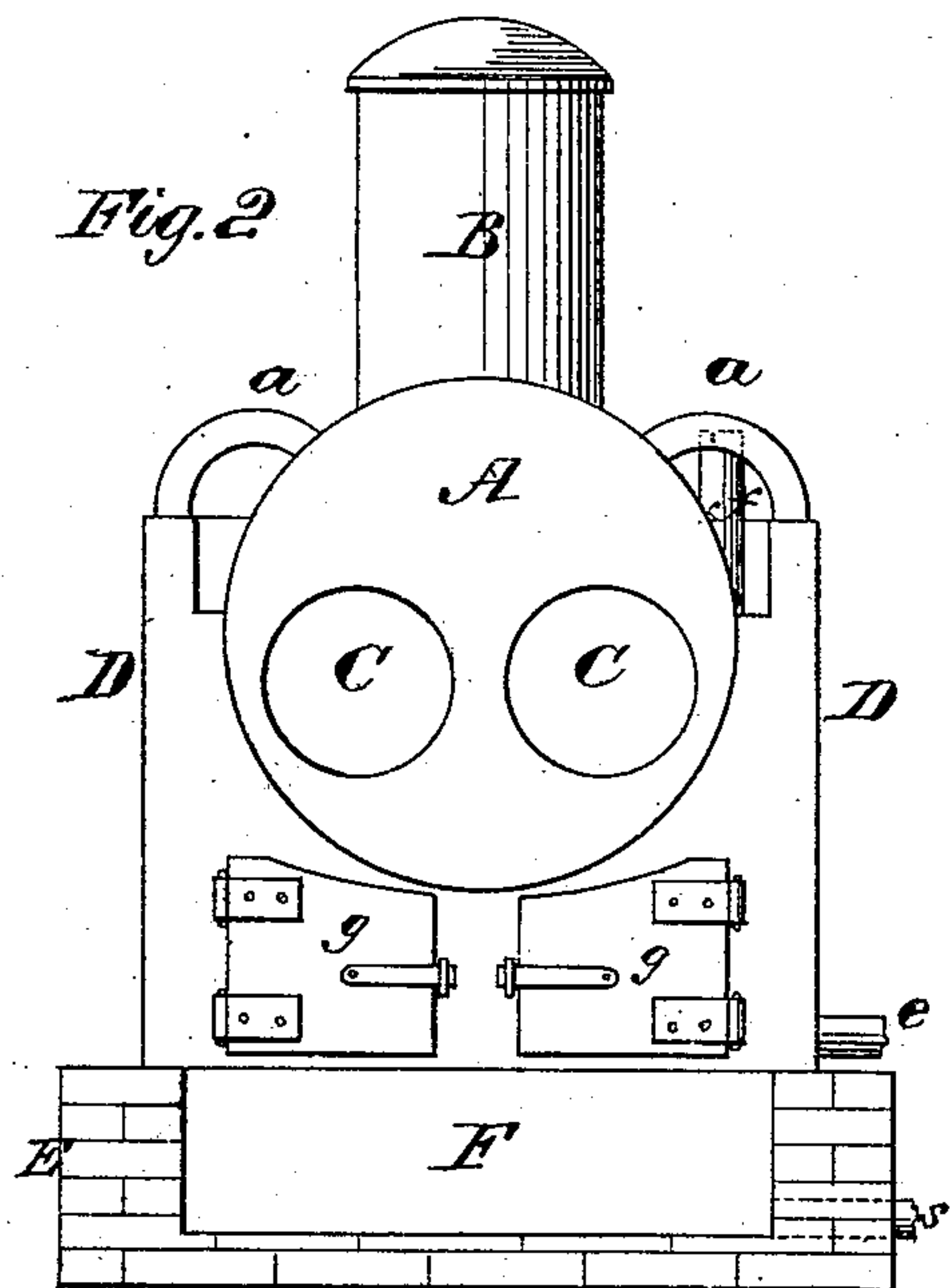
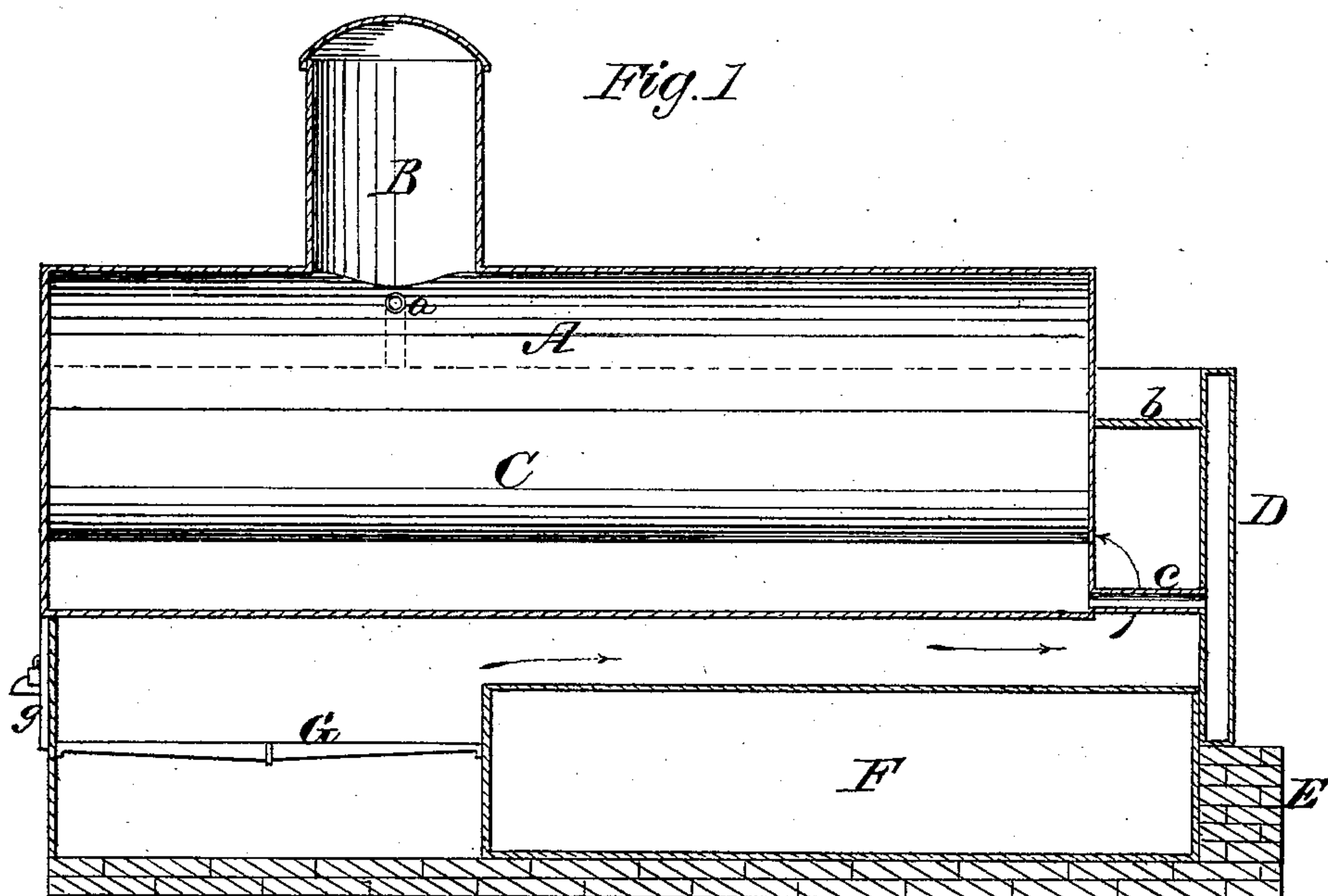


F. A. HUNTINGTON.

Improvement in Steam-Boiler Furnaces.

No. 132,209.

Patented Oct. 15, 1872.



Witnesses.
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J. N. Campbell.

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UNITED STATES PATENT OFFICE.

FRANK A. HUNTINGTON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO HIMSELF AND WASHINGTON J. MILLER, OF SAME PLACE.

IMPROVEMENT IN STEAM-BOILER FURNACES.

Specification forming part of Letters Patent No. 132,209, dated October 15, 1872.

To all whom it may concern:

Be it known that I, FRANK A. HUNTINGTON, of San Francisco, county of San Francisco, State of California, have invented an Improved Steam-Boiler Furnace; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawing making part of this specification, in which—

Figure 1 is a section taken longitudinally and vertically through the center of my furnace and through a steam-boiler mounted therein; Fig. 2 is a front view of the furnace and boiler; and Fig. 3 is a vertical transverse section.

Similar letters of reference indicate corresponding parts in the several figures.

This invention has for its object the arrangement of a steam-boiler within water-containing and steam-generating walls, the chambers between which communicate with the water and steam chambers of the steam-boiler, whereby a very large amount of water-heating surface is presented to the fire. Another object is to employ as the furnace-flue bed a feed-water heating-chamber, as will be hereinafter explained.

The following description of my invention will enable others skilled in the art to understand it.

In the accompanying drawing, A represents the steam-boiler, B its steam-dome, and C C the flues running through it, which parts are constructed in the usual well-known manner. This boiler is mounted in a furnace which is composed in part of hollow walls D, which are mounted on a bed, E, of masonry. The bed E consists of a horizontal hearth, the sides and back of which are raised so as to afford an elevated support for the furnace-walls proper. The front end of the hearth forms the ash-pit, in rear of which is a tank, F, for containing feed-water, which water will be more or less heated by the flames and products of combustion which pass over it on their way to the boiler-flues C. For the purpose of supplying this tank F with water and for drawing water therefrom to supply the boiler A, two pipes, s s, are applied to it, one of which is connected to the pipe communicating with the pump, and the other is in communication with the

water-reservoir. To prevent undue pressure of any steam which may be generated in the tank F an outlet-pipe, f, is applied to it which may rise vertically through the horizontal wall b, or it may be conducted off in any other desired manner and exhaust in the air. This tank F being arranged below the fire-flue and beneath the steam-boiler A, receives considerable heat from the flames and products of combustion on their way from the fire-chamber to the boiler-flues C; consequently the feed-water will be heated, and considerable heat utilized before said water is pumped into the boiler. The vertical sides walls and the back wall of the furnace-chamber are hollow, as shown in Figs. 1 and 3, and extend above the high-water line of the boiler. These walls are composed of boiler-plates, riveted together so as to safely withstand the greatest pressure which will be allowed in the boiler A. Said plates constitute the supporting-walls of the boiler in lieu of walls of masonry, and by means of the horizontal diaphragm b they inclose the space for the passage of the products of combustion on their way from the fire-chamber to the boiler-flues C. The front-inclosing wall is single in this case, but it might be double, like the side and back walls, and the horizontal connection b might be double, although it is represented as single.

Thus it will be seen that the walls within which the steam-boiler is placed afford a water-containing and steam-generating space, the water in which is heated by the influence of the direct heat, as well as the heat given off by the escaping products of combustion. The steam which is generated between the walls inclosing the furnace and lower flue-chambers is allowed to enter the steam-space above the water in the boiler A, through the arched pipes a a, which spring from the upper portion of the wall or jacket D, and enter the boiler on opposite sides of the steam-dome B.

The water-space in the boiler A communicates with the chamber between the walls D by means of a pipe, c, shown clearly in Fig. 1, and water is forced into the said chamber through a pipe, e, shown in Figs. 2 and 3.

If desirable, the outer sides of the walls may be coated with felt or other substance which is a poor conductor of heat; or if desirable, the

side and back walls of masonry may be extended up so as to inclose said walls and prevent a rapid radiation of heat therefrom.

Fire is made on the grate G, and the flames pass backward over the feed-water-heating tank F, thence forward through the boiler-flues C C, and finally may escape into the stack at the front end of the boiler.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination, with the boiler A and connecting-pipes *ac*, the vertical side and back

walls D, mounted on a hearth, E, and constructed to form water-containing and steam-generating chambers, and also as a means of support for said boiler, substantially as described.

2. The feed-water tank F, forming the flue-bed and bridge-wall beneath the boiler A, in combination with the walls D of the boiler, substantially as described.

F. A. HUNTINGTON.

Witnesses:

M. MEAGHER,

JOHN McELROY.