

(No Model.)

3 Sheets—Sheet 1.

W. B. DUNNING.

STEAM BOILER.

No. 255,954.

Patented Apr. 4, 1882.

Fig. 1.

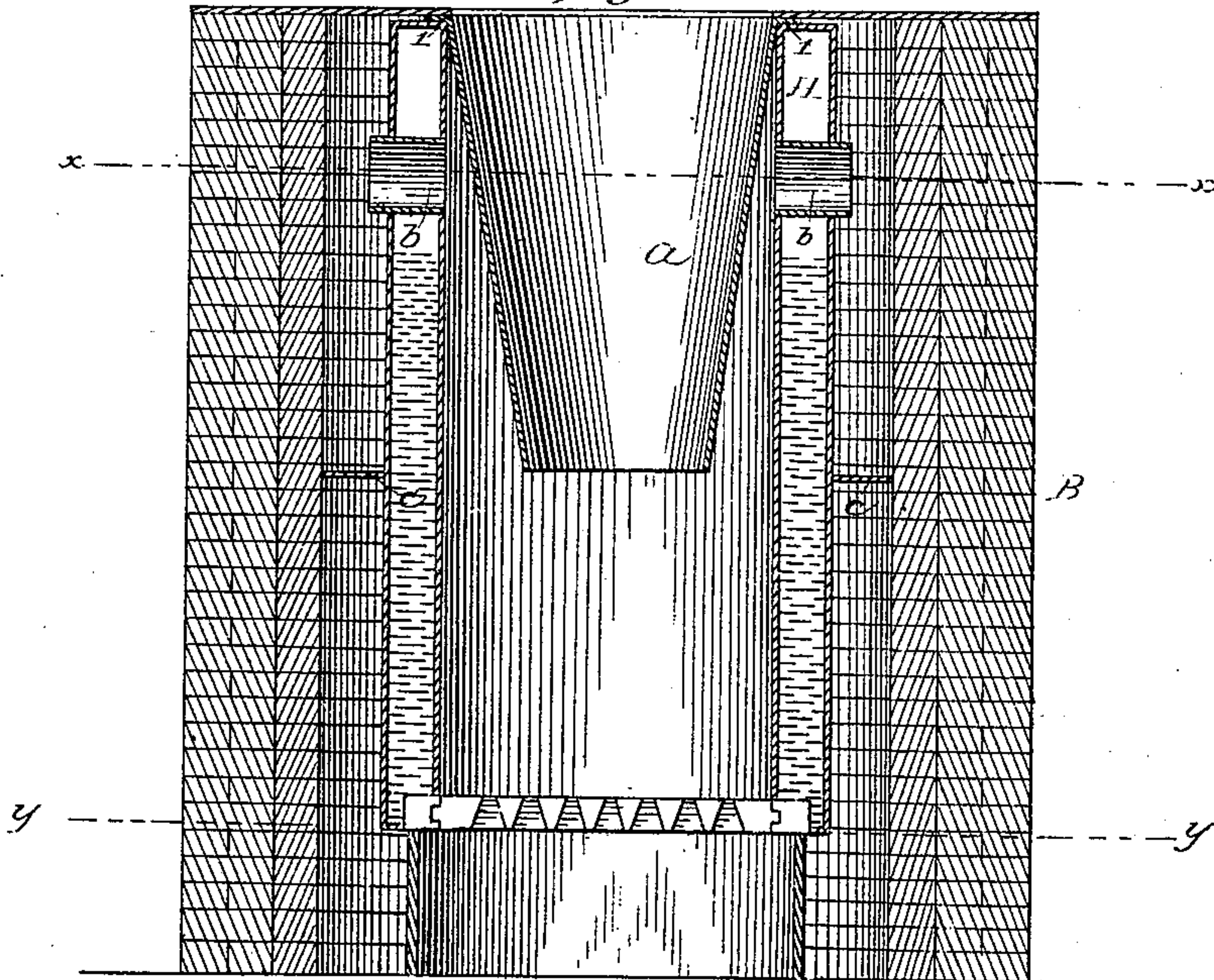
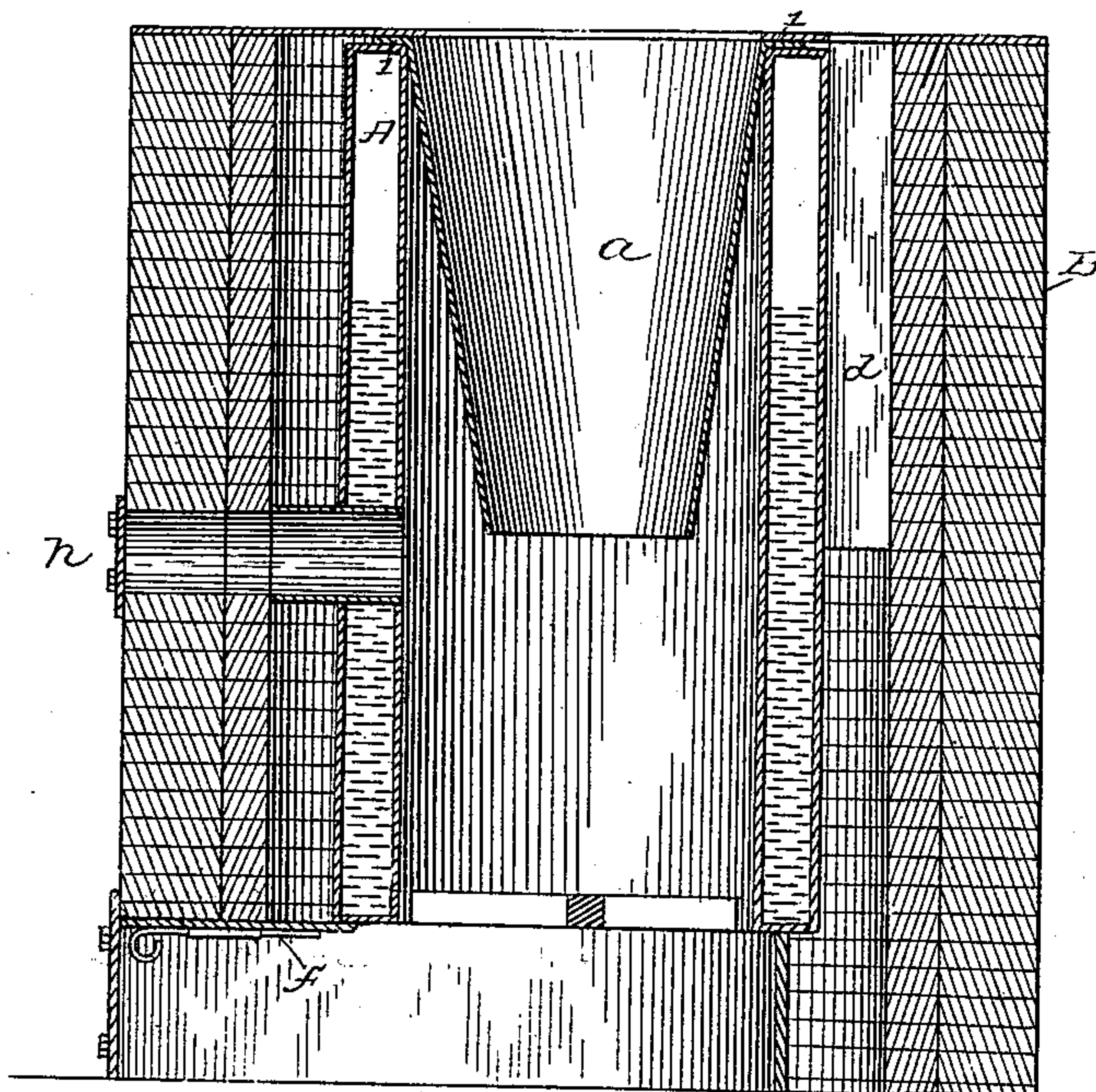


Fig. 2.



Witnesses:

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Fig. 3.

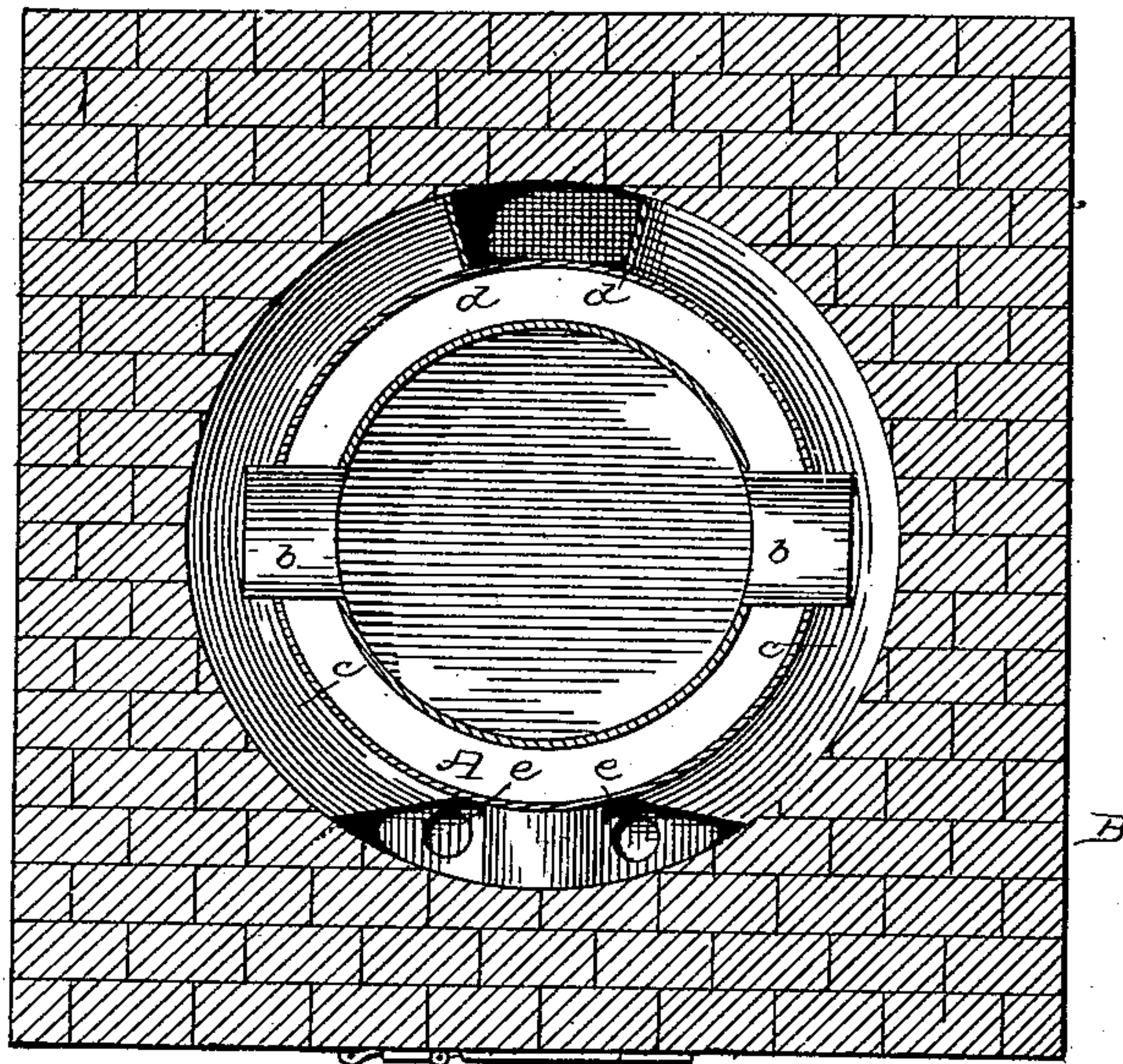
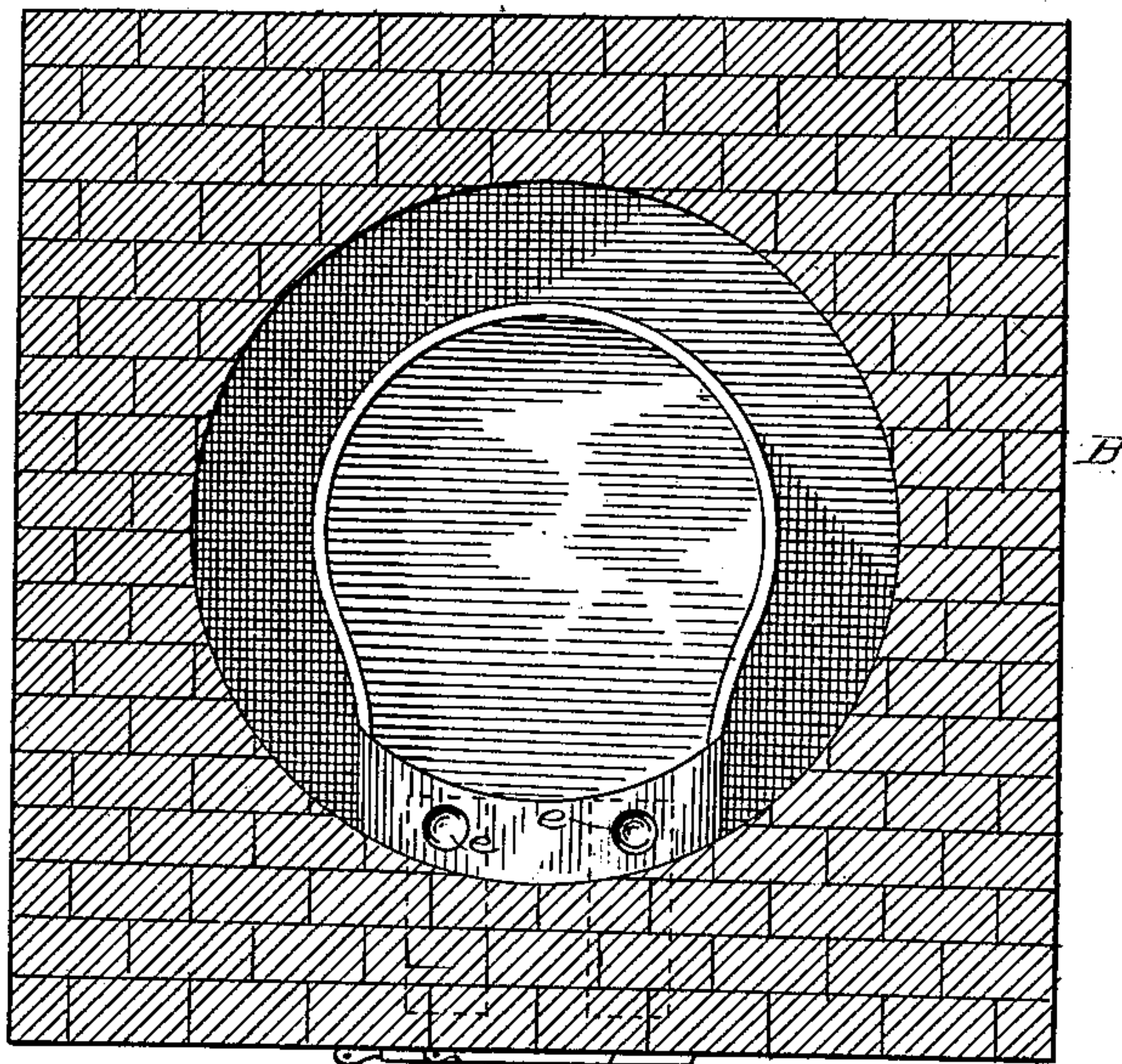


Fig. 4.



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(No Model.)

3 Sheets—Sheet 3.

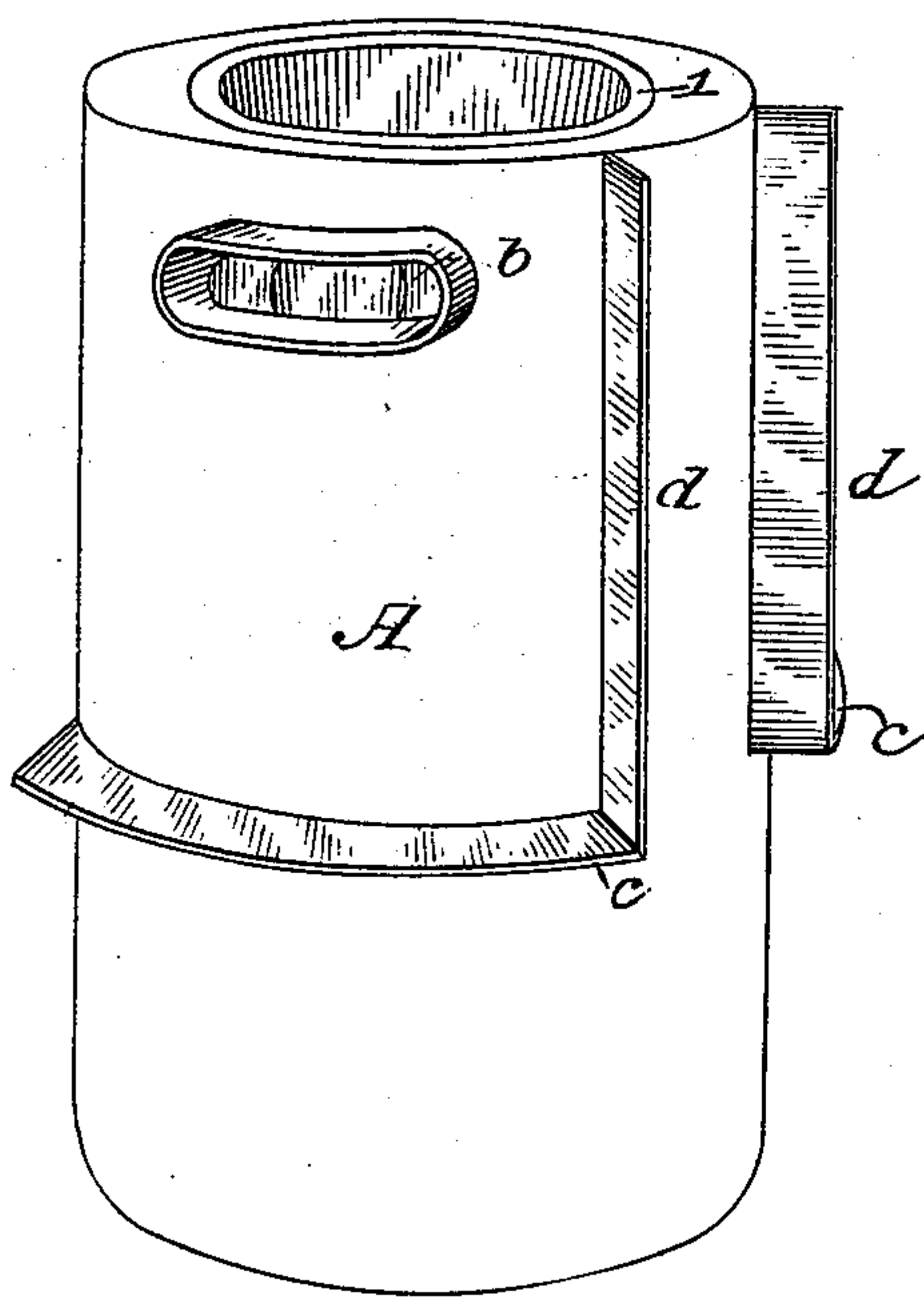
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Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM B. DUNNING, OF GENEVA, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 255,954, dated April 4, 1882.

Application filed January 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. DUNNING, of Geneva, in the county of Ontario and State of New York, have invented a new and useful Improvement in Steam-Boilers; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is an improvement in steam-heating boilers. The object of the invention is, first, to secure simplicity of construction, by means of which the heater can be cheaply made, and may be put up by a comparatively unskilled workman; and, in the second place, and in connection with this simplicity of construction, I purpose to gain a large amount of heating-surface and to utilize as far as possible the heat from the products of combustion before they finally escape into the smoke-flue.

The special construction in which my invention is embodied is fully described in connection with the accompanying drawings; and the particular matters which constitute my invention are particularly indicated in the claims.

In the drawings, Figure 1 represents a central vertical section of my improved heater, taken on a line parallel with the front. Fig. 2 shows a like section taken at right angles to the first. Fig. 3 shows a transverse section on line *x x* of Fig. 1, and Fig. 4 a transverse section on line *y y* of Fig. 1. Fig. 5 is a perspective view of the boiler-shell with the attached vertical and horizontal partitions.

I construct my improved heater without any tubes which complicate the structure and render it more liable to clog with ashes and soot, and also more liable to get out of repair. The boiler I make preferably annular, as represented in the figures at A. Within the interior I place a reservoir, *a*, preferably tapering from top to bottom, and suspended within the boiler by means of a flange, 1, which rests on the top. This leaves a space, annular in form and slightly diminishing upward between the reservoir and the inner surface of the boiler, for the free passage of the products of combustion. From this annular space the smoke and gases escape through short tubes *b b*, through the walls of the boiler, into an annular smoke-chamber between the outside of the boiler and the inner surface of the brick-work B, surrounding the boiler. In order to detain

these products of combustion, and to cause them to circulate about the periphery of the boiler, I place either on that periphery or upon the walls of the brick-work plates of cast-iron, or division-walls of brick or any suitable material, forming horizontal and vertical partitions *c c* and *d d*. The horizontal partitions *c c* do not meet either in front or rear, but leave a passage in front for the descent of the smoke and gases into that part of the smoke-chamber which lies below the horizontal flanges or partitions, while in the rear the vertical partitions *d d*, connecting with the rear ends of the horizontal partitions *c c*, form a smoke-passage through the upper part of the smoke-chamber to the exit. By this simple arrangement of the horizontal and vertical partitions a perfect exterior circulation of the smoke and gases is secured downward and then upward without any tubes and without any such inclosed spaces as would be liable to clog or require repairs. The boiler rests on the wall of the ash-pit, and has a clear smoke-space about it throughout its entire length.

By a simple construction I provide an escape into the smoke-chamber of dust and ashes which arise when the grate is shaken. This consists of an opening or openings, *e*, in the upper plate or wall of the ash-pit. I prefer to make two of these and cover them by slides *f*, the handles of which extend to the front. By drawing these out the holes *e* are opened and the dust and ashes caused by shaking the grate pass up into the smoke-space and out at the flues, instead of escaping into the room through the ash-pit door. These holes also serve to check the fire when steam is not required in the boiler.

The brick-work may be rectangular on the outside and on the inside conform to the shape of the boiler. The fire-door *h* is provided with a flange extending across the smoke-chamber to the opening in the brick wall. The tubes *b b* through the walls of the boiler are set preferably a little to the rear and near as practicable to the top.

The heater is provided with the ordinary pipes for supply and for conducting the steam, and with valves and the usual apparatus required for heaters of this class.

I am aware that a boiler-furnace has been

provided with a check-plate extending partially around the same at a point above the opening from the combustion-chamber to the smoke-stack, and that in connection with such
5 a horizontal check-plate above the smoke-outlet vertical plates have been employed on opposite sides of the boiler; and I desire to disclaim this construction.

I claim as my invention—

10 In a steam-heating boiler, the combination of the annular boiler, the inner and outer smoke-chambers, the tubes *b*, near the upper end of the boiler, connecting such inner and outer smoke-spaces, partitions *d d*, forming a verti-

cal flue, and the horizontal partitions *c c*, extending from the said vertical partitions partially around the boiler, whereby the products of combustion are caused to circulate around the boiler, first above and then below the horizontal partitions, to the flue or passage formed
20 by the vertical partitions.

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

WM. B. DUNNING.

Witnesses:

S. SOUTHWORTH,
CHAS. H. RUSH.