

No. 616,320.

Patented Dec. 20, 1898.

H. E. HARRINGTON.

HEATING DRUM.

(Application filed June 2, 1898.)

(No Model.)

3 Sheets—Sheet 2.

Fig. 5.

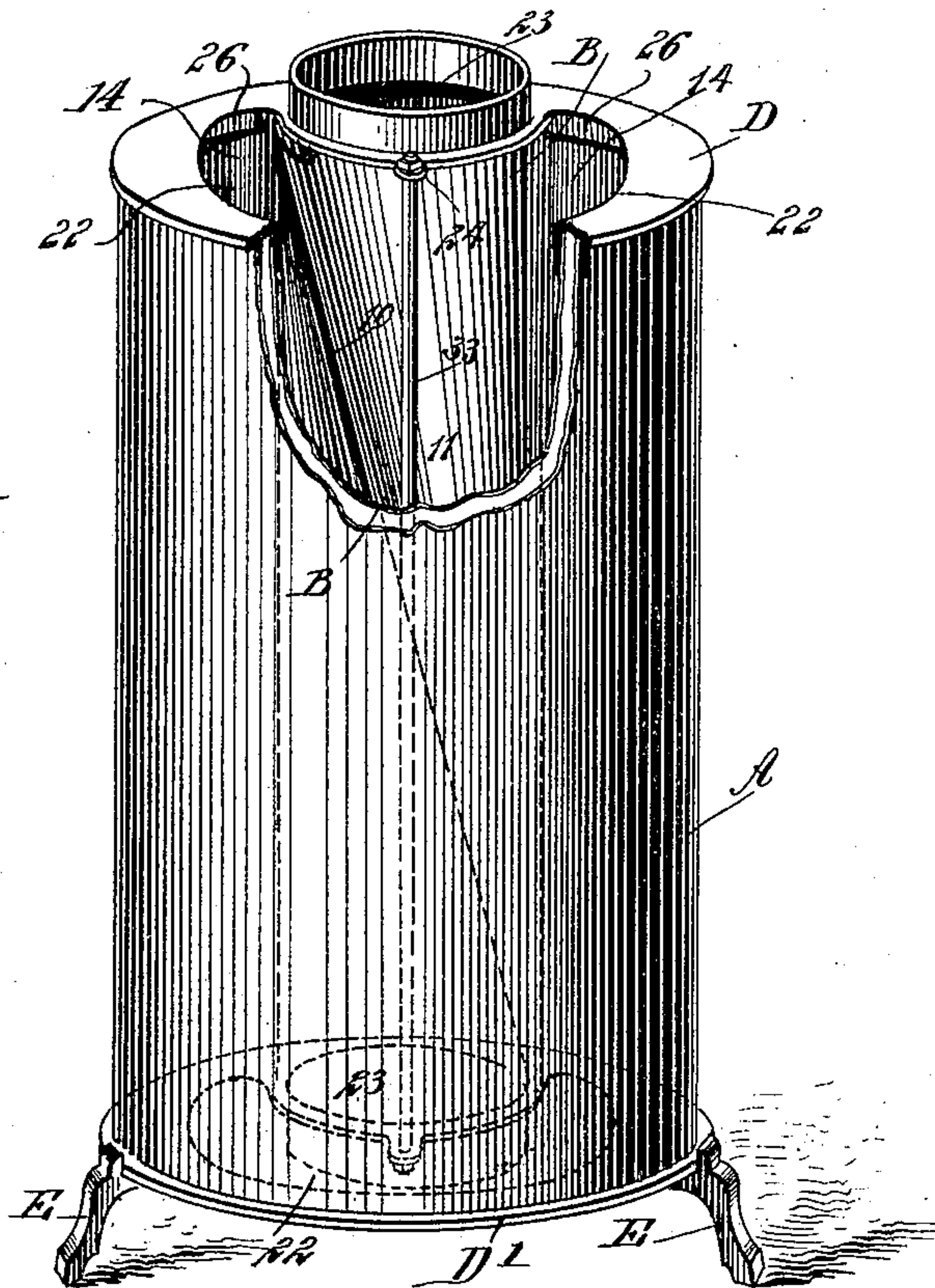
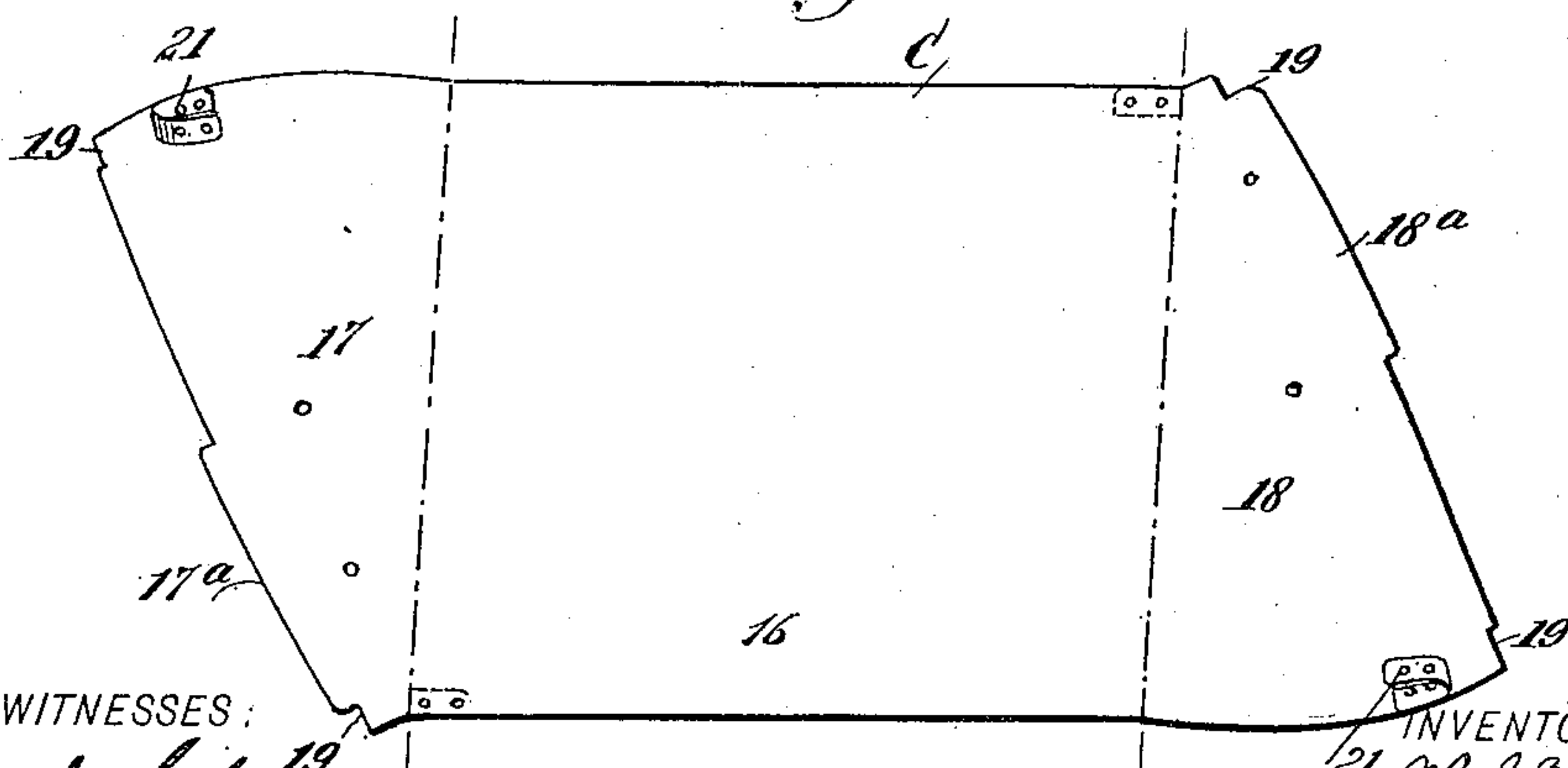


Fig. 6.



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Fig. 7.

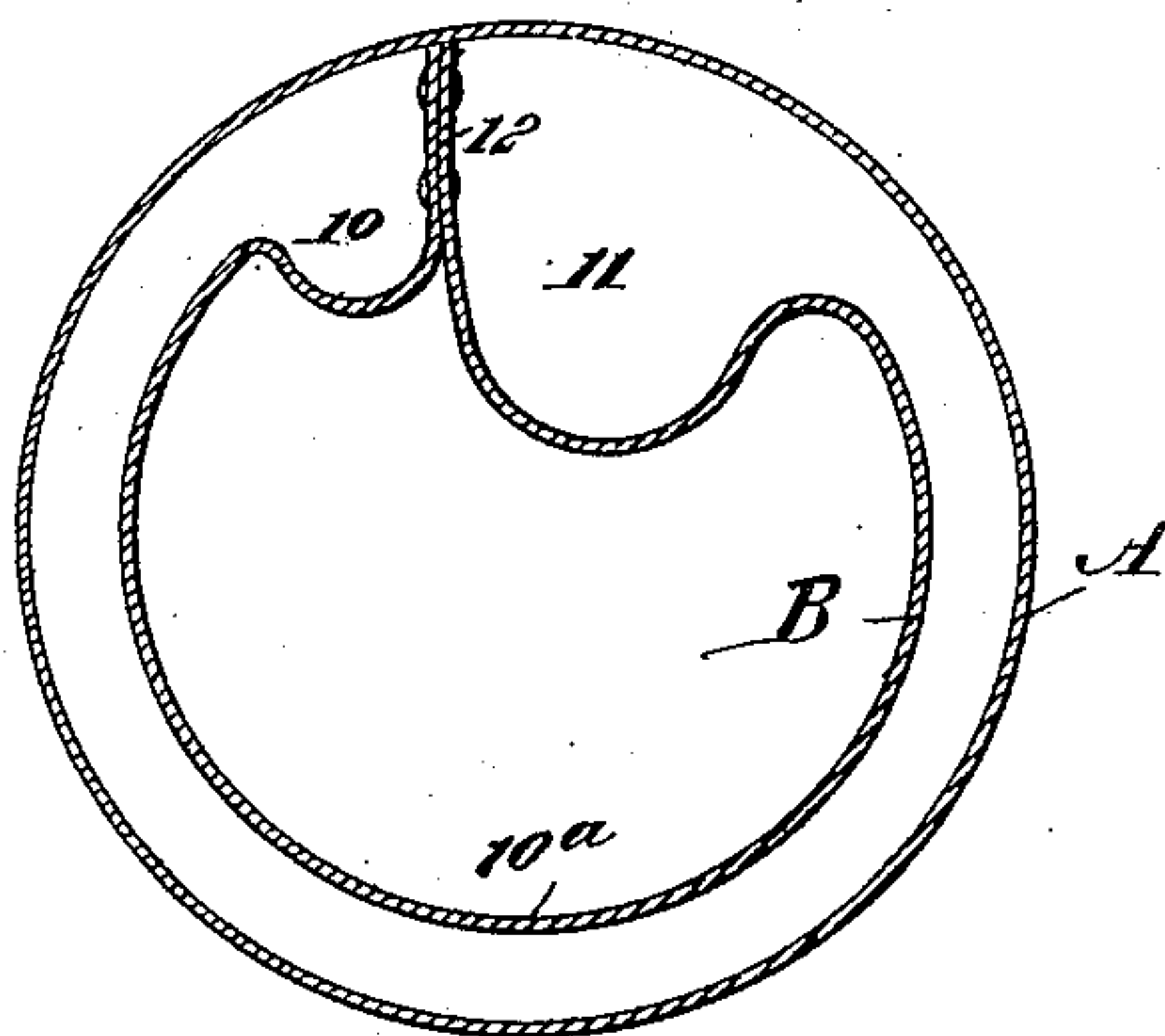


Fig. 8.

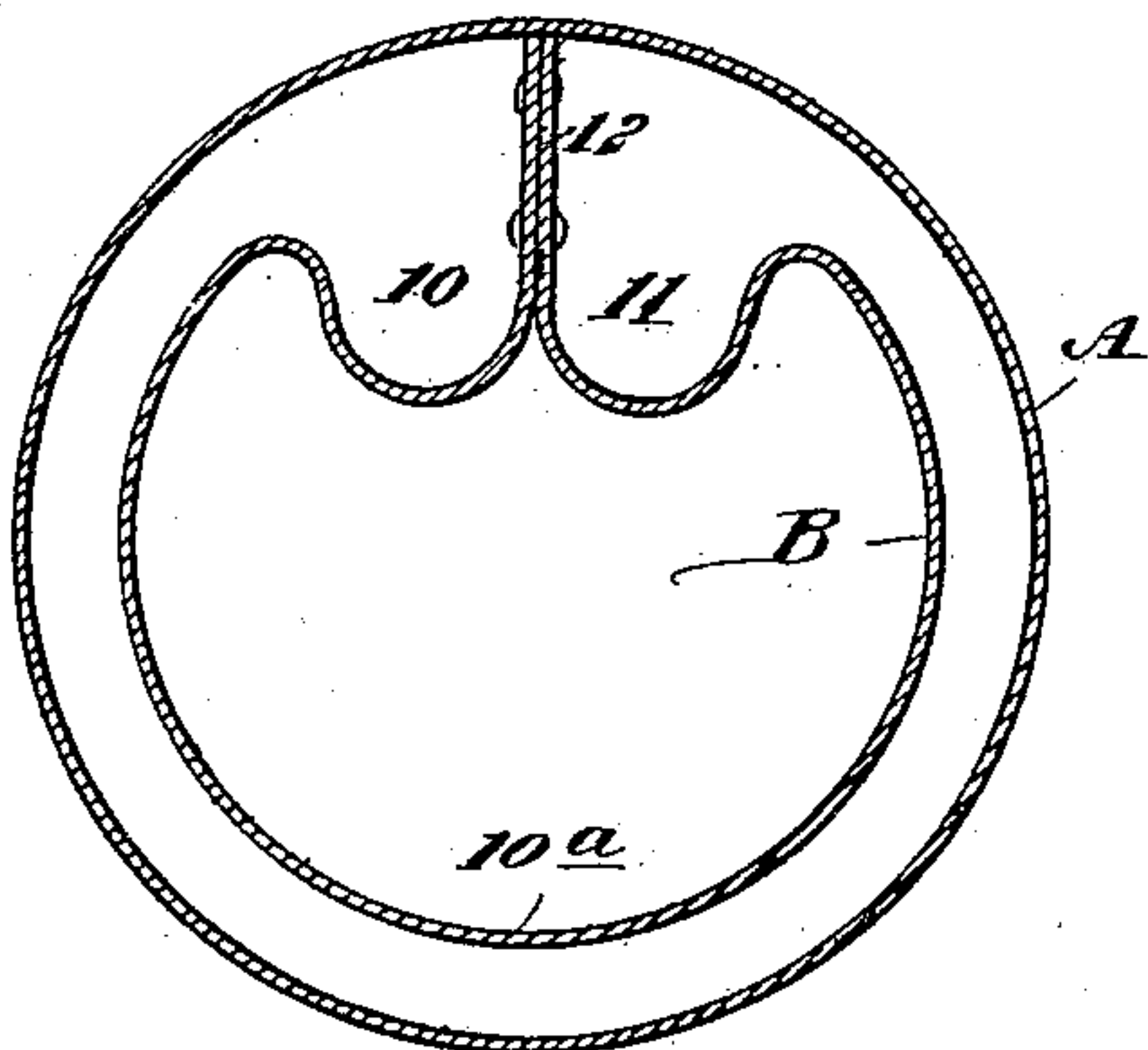
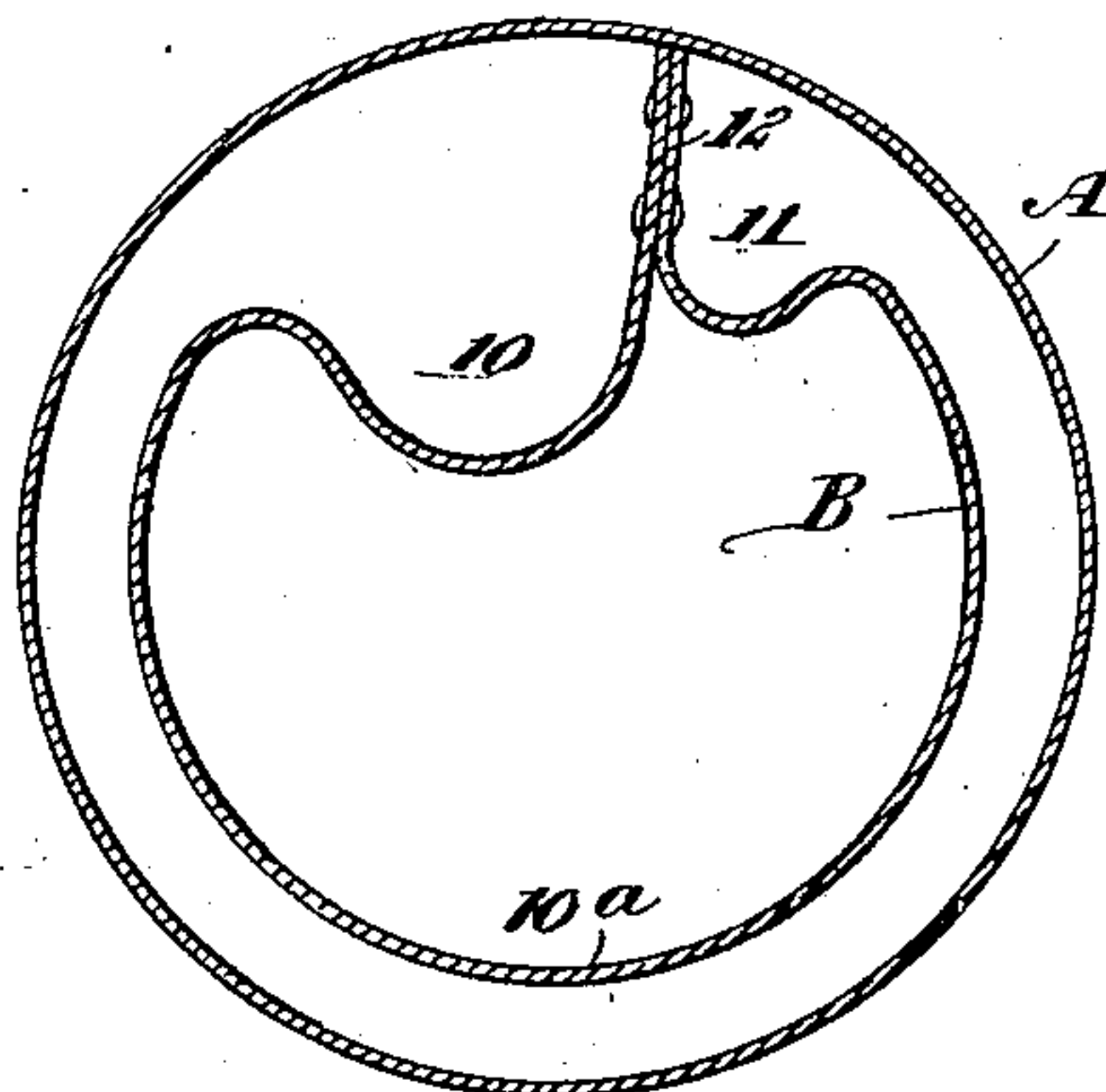


Fig. 9.



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UNITED STATES PATENT OFFICE.

HERBERT EUGENE HARRINGTON, OF WALDEN, VERMONT.

HEATING-DRUM.

[SPECIFICATION forming part of Letters Patent No. 616,320, dated December 20, 1898.]

Application filed June 2, 1898. Serial No. 682,361. (No model.)

To all whom it may concern:

Be it known that I, HERBERT EUGENE HARRINGTON, of Walden, in the county of Caledonia and State of Vermont, have invented a new and Improved Heating-Drum, of which the following is a full, clear, and exact description.

The object of my invention is to provide a heating-drum adapted to be attached to stoves or heating-pipes, which drum will be simple, durable, and economic, and to so construct the heater that the strongest and hottest currents will be conducted by centrifugal force to the outer surface of the drum, causing all the heated air and products of combustion to be utilized to a maximum extent.

A further object of the invention is to construct a drum which will be practically self-cleansing and a perfect spark-arrester, it being practically impossible for a burning particle to pass through the drum.

Another object of the invention is to so construct the drum that it may be turned out of the way when set up, as will be hereinafter more fully described.

The invention consists in the novel construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improved drum. Fig. 2 is a vertical section taken practically on the line 2 2 of Fig. 1. Fig. 3 is a horizontal section taken substantially on the line 3 3 of Fig. 2. Fig. 4 is a vertical section taken practically on the line 4 4 of Fig. 2, a portion of the inner cylinder being broken away. Fig. 5 is a perspective view of the drum, a portion of the top portion being broken away. Fig. 6 is a plan view of the blank from which the inner cylinder is constructed. Figs. 7, 8, and 9 are cross-sections through the drum taken respectively on the lines 7 7, 8 8, and 9 9 of Fig. 2.

The drum consists, practically, of four parts—an outer cylinder A, an inner cylinder B, and two heads D and D'. The outer cylinder A is preferably circular in cross-section and is open at each end; but the inner

cylinder B is of peculiar formation. The inner cylinder is of less diameter than the outer cylinder and is so formed as to provide a body-section 10^a, essentially crescent-shaped in cross-section, and two outer conical reverse-flues 10 and 11. These flues are arranged side by side, whereby the wider end of one flue will be at the top of the cylinder and the corresponding end of the other flue at the bottom of the cylinder. The flues are uncovered or open at their outer sides, and the inner or adjoining edges 12 of the flues are longitudinally inclined, as shown in Fig. 2. Their outer edges 13 are also longitudinally inclined, but to a lesser degree. The connected inclined edges 12 of the flues are quite flat and engage with the outer wall of the cylinder, while the opposite or outer edges 13 of the flues are horizontally and conically curved, as shown in Fig. 3, and a space intervenes them and the outer cylinder, which space 15 extends from the rounded edges of the flues around the body 10^a of the inner cylinder to the inclined edges 12. The chamber 15 is for the circulation of the products of combustion, and the said chamber is in communication with each of the flues 10 and 11.

The inner cylinder B is made from the blank shown in Fig. 6, which blank is provided with a central rhomboid-shaped section 16 and side sections 17 and 18. The side sections are somewhat triangular in shape, their wider ends being more or less curved and slightly inclined, and their side edges are likewise more or less curved. The narrower ends of the sections 17 and 18 are one at the top and the other at the bottom of the blank. The section 17 is provided with a longitudinal flap 17^a at its outer edge, and the panel 18 is provided with a corresponding flap 18^a, the flaps of each section being adjacent to their contracted ends.

In the formation of the cylinder the central section 16 is given a substantially crescent shape, forming a central chamber 14 open at top and bottom, as shown in Fig. 3. The side sections 17 and 18 are then given the necessary curves and are brought together in such manner that their longitudinal edges will be in engagement, whereupon these edges are secured together through the medium of rivets 20 or their equivalents, as shown in Figs.

3 and 4, and are furthermore secured together by bending the flap of one of the side sections over the opposing side section, the flaps thus serving to strengthen the connecting edges of the cylinder. In this manner the two conical reverse-flues 10 and 11 are produced; or, in other words, one end of the blank, as shown in Fig. 6, is bent by especial machinery into two distinct conically-ranging curves. The sheet is then turned half-way around, (not over,) and the same operation is repeated at the opposite end of the blank as was performed at the first-mentioned end, so that when the sheet is rolled up both ends of the sheet lie one against the other with the edges extending outward from the cylinder, so that when the contacting edges are riveted firmly together a slightly-spirally-ranging nearly-radial plate or cylinder is produced, which is the inner cylinder B shown in the drawings.

In the outer side edge of each section 17 and 18 at each end or at the top and bottom of the blank a recess 19 is formed, and upon the outer face of each section 17 and 18, adjacent to the recesses 19 at the wider portions of the said sections, a strap 21 may be secured, adapted when employed to strengthen the inner cylinder at the meeting edges thereof. The recesses 19 are produced in the blank to accommodate the inside flanges 26 of the two heads D and D'. Each head is provided with a crescent-shaped opening 22 and a circular opening 23, preferably surrounded by a collar, and the partition which separates the two openings is provided with a lug 24, as is best shown in Fig. 1. Each head is furthermore provided with a flange 25 upon its inner face, near its periphery, and a second flange 26, which is given the same formation as the opening 22 and forms a wall of said opening, while a third flange 27 is formed upon the head beneath the partition separating the two openings 22 and 23, as is best illustrated in Fig. 3. A space 28 is provided between the ends of the flange 27 and the ends of the flange 26; but the end of the flange 26 that enters that portion of the cylinder where the edges are brought together extends farther outward than the end which enters the inner cylinder at the point 13, as shown by the broken lines $x x'$. After the inner cylinder B has been introduced into the outer cylinder the heads are placed in position over both cylinders, the openings 23 in the heads being immediately over the larger ends of the flues and the openings 22 being in registry with the crescent-shaped body-chamber 14.

The outer flanges 25 of the heads engage with the inner wall of the outer cylinder, as shown in Fig. 2, while the inner flange 26 engages with the inner wall of the body-chamber 14, as best shown in Fig. 3, the flanges 27 of the heads engaging with the outer wall of the flues 10 and 11 at their wider ends. The heads are held firmly connected, preferably through the medium of a bolt 33 of suitable length, which bolt is passed through the lugs

24 of the heads and is held in place by suitable nuts.

Legs E are preferably provided for the drum, and these legs are detachable. Each leg is provided with a horizontal projection 29, adapted to fit against the lower head of the drum, and each horizontal projection 29 is provided at its inner end with an upwardly-extending flange 30, terminating in an outwardly-extending lug 31, the flange 30 being adapted to engage with the inner face of the head or the inner flange 26 of the head, while the lug 31 will extend over the said flange 26. At the outer end of the horizontal projection 29 of a leg a short flange 32 is formed, adapted when the leg is in position to engage with the peripheral surface of the drumhead to which the leg is applied, and, further, at or about the central portion of the horizontal projection 29 a clearance-recess 34 is formed, which enables the legs to be readily placed in position on the drum and conveniently detached therefrom. When the drum is connected with the heat-conducting pipes, if the drum should be in the way it may be swung around to one side or to the other without disconnecting the drum from such pipes. It is evident that when the inner cylinder is constructed as above set forth a large area of heating-surface may be obtained by the use of a small amount of material.

In operation the products of combustion enter through the opening 23 in the lower head, and after passing into the flue communicating with that opening the products of combustion enter into the chamber 15 and are finally conducted to the next flue, from which flue the products of combustion pass out through the opening 23 in the upper head of the drum. Each head is provided with a lug 28^a, and these lugs determine the position of the connecting edges of the flues 12 relative to the outer cylinder, and when the lugs 28^a engage with the connected ends of the inner cylinder the heads will be properly set to communicate with the flues.

It is obvious that the products of combustion in passing through chambers constructed as described will produce a great radiation of heat, since the fastest-moving currents, which are the more highly heated currents, will seek the largest diameter of the chamber they enter and will so heat the outer cylinder as to cause a maximum of heat radiation therefrom.

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

1. A heating-drum consisting of an outer and an inner cylinder, the inner cylinder being of less diameter than the outer cylinder, whereby a chamber is formed between the two cylinders, the inner cylinder being provided with conical reversed flues, each in communication with the chamber between the two cylinders and with outlets, one flue being adapted to receive the products of com-

bustion and the other flue being adapted to discharge the products of combustion, the inner cylinder being open at the bottom and top, admitting of the passage of air to be heated in the said cylinder, substantially as described.

2. A heating-drum consisting of an outer and an inner cylinder, the inner cylinder being of less diameter than the outer cylinder, the inner cylinder being provided with conical reversed flues, the said flues being arranged close together, their connecting edges being brought together in engagement with the inner face of the outer cylinder of the drum, for the purpose set forth.

3. A heating-drum consisting of an outer and an inner cylinder, the inner cylinder being of less diameter than the outer cylinder, whereby a chamber is obtained between the two cylinders, the chamber being closed at the top and at the bottom, the inner cylinder being open at the top and at the bottom and provided with conical reversed flues arranged close together, their connecting edges extending together across the said chamber to an engagement with the outer cylinder, as and for the purpose specified.

4. A heating-drum consisting of an outer cylinder, and an inner cylinder of less diameter, the inner cylinder being provided with a bottom chamber, and reversely-located conical flues in its outer face, the adjoining edges of the flues being carried to an engagement with the outer wall of the cylinder of the drum, whereby each flue is placed in communication with the space between the inner and outer cylinders, heads closing the space between the said cylinders at the ends of said cylinders, the said heads having openings registering with the body-chamber of the inner cylinder, as and for the purpose specified.

5. A heating-drum consisting of an outer cylinder, and an inner cylinder of less diameter, the inner cylinder being provided with a

body-chamber substantially crescent-shaped in cross-section and with flues in its outer side surface, the flues being conical and reversely placed, the inner edges of the flues being longitudinally tapering, the outer edges of the flues being also tapering longitudinally but to a lesser extent, the inner tapering edges of the flues being carried to an engagement with the inner wall of the outer cylinder, and heads for the drum, which heads have openings arranged to register with the body-chamber of the inner cylinder and the larger ends of the flues of the said inner cylinder, for the purpose specified.

6. A heating-drum comprising an inner and an outer cylinder, the inner cylinder being provided with a main chamber and with exterior, conical, reversely located and adjoining flues, the flues being open at the sides facing the outer cylinder, and the adjoining edges of the two flues being brought into engagement with the outer cylinder, as and for the purpose set forth.

7. In the construction of heating-drums, a blank for an inner cylinder, the said blank consisting of a central section of rhomboid shape, and triangular side sections reversely placed, as and for the purpose specified.

8. In the construction of heating-drums, a blank for the inner cylinder, the said blank consisting of a central section of rhomboid shape and triangular side sections reversely placed, the wider ends of the side sections being more or less curved, said side sections being provided also with flaps at their longitudinal edges near their contracted ends, and with recesses in their longitudinal edges at their end portions, as and for the purpose specified.

HERBERT EUGENE HARRINGTON.

Witnesses:

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JAMES M. PATCH.