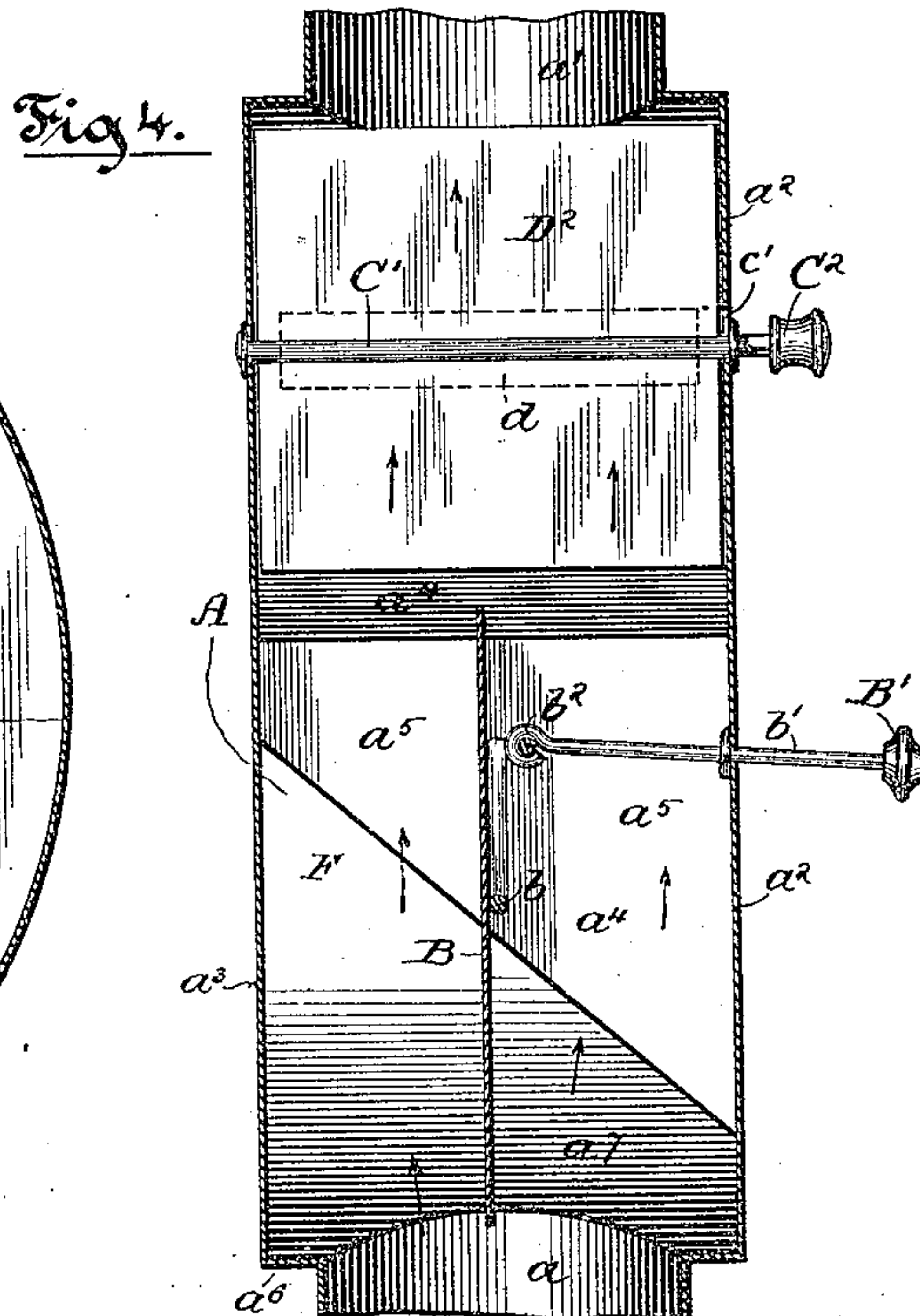
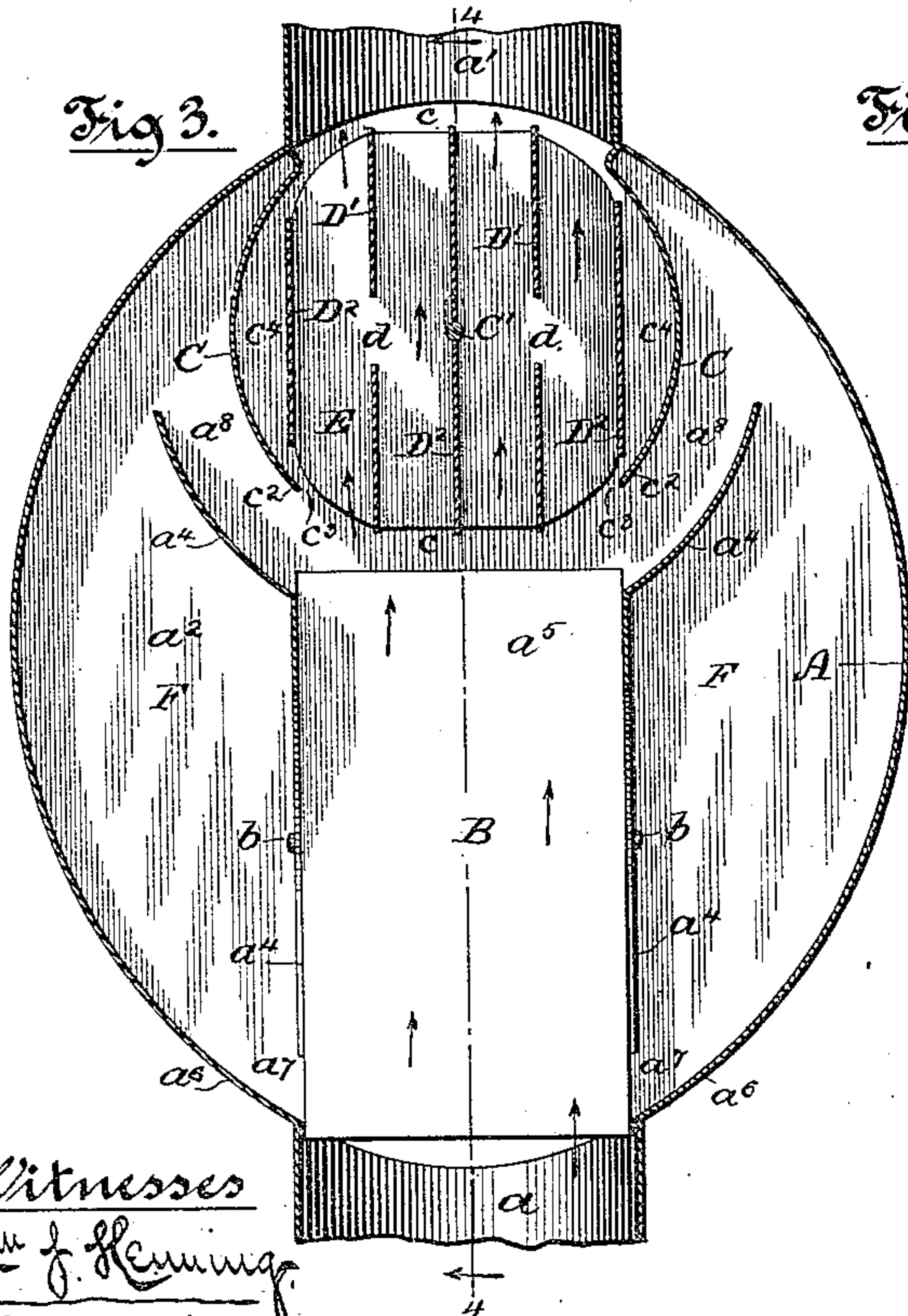
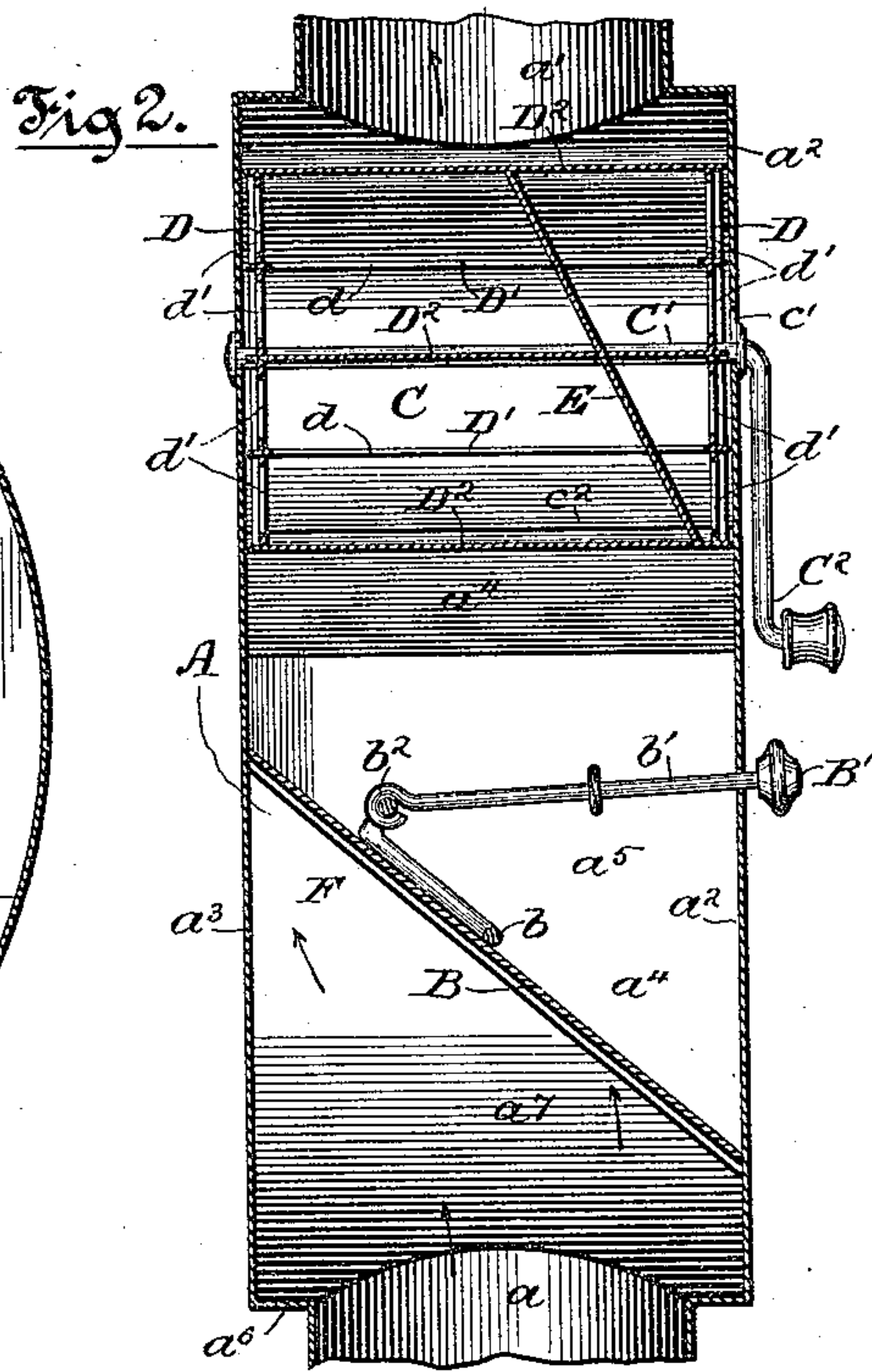
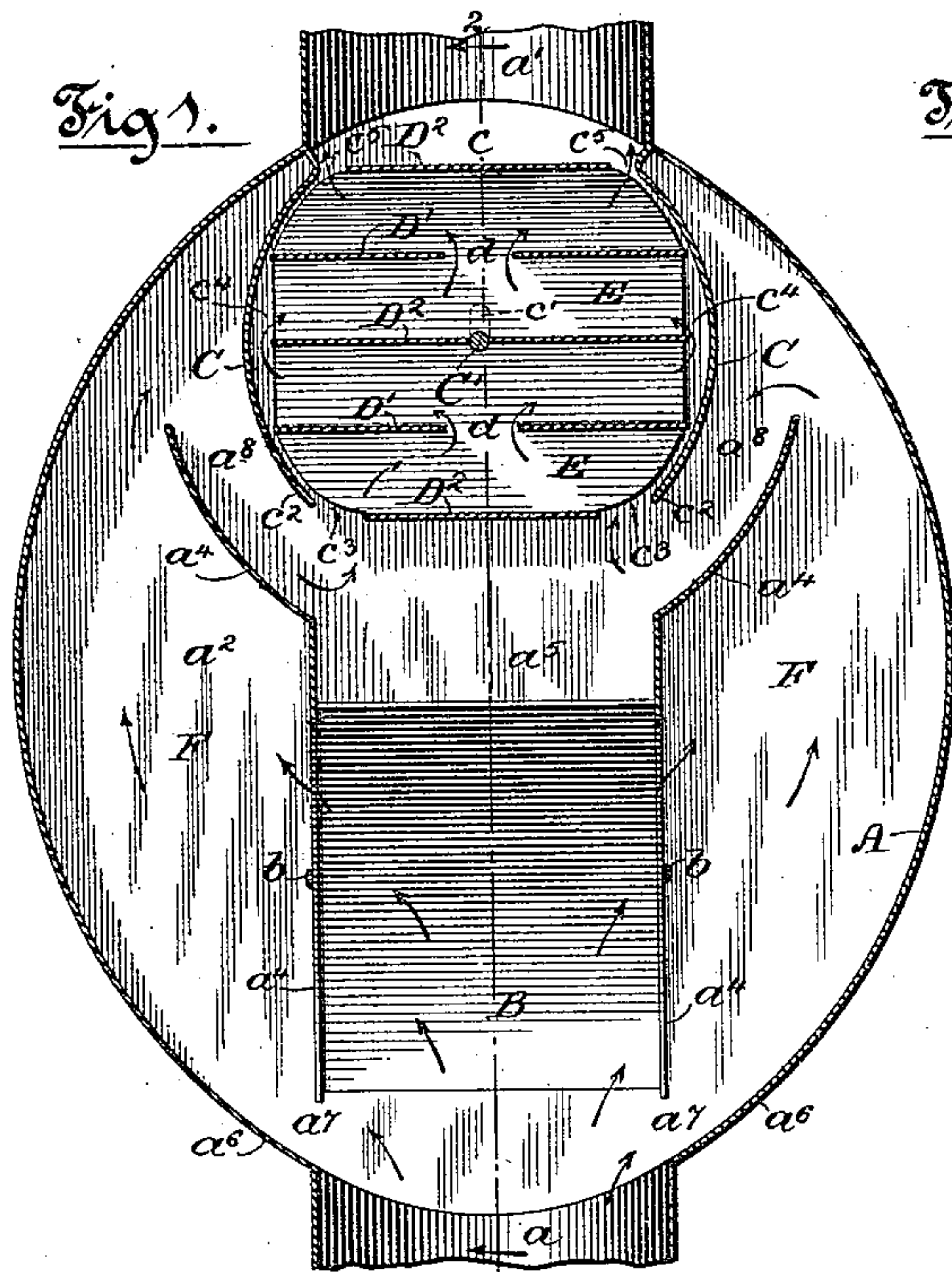


(No Model.)

G. G. BURTON.
HEATING DRUM AND DAMPER.

No. 438,297.

Patented Oct. 14, 1890.



Witnesses
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UNITED STATES PATENT OFFICE.

GARRETT G. BURTON, OF TRENTON, NEBRASKA.

HEATING-DRUM AND DAMPER.

SPECIFICATION forming part of Letters Patent No. 438,297, dated October 14, 1890.

Application filed December 31, 1889. Serial No. 335,496. (No model.)

To all whom it may concern:

Be it known that I, GARRETT G. BURTON, of the village of Trenton, in the county of Hitchcock and State of Nebraska, have invented certain new and useful Improvements in Heating-Drums and Dampers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in heating or radiating drums and dampers for stove-pipes; and the same consists in the several novel features of construction herein illustrated, described, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 represents a front sectional elevation of my invention, and Fig. 2 a transverse sectional view of the same, the latter being taken on the line 2 2 of Fig. 1. Fig. 3 is a view similar to Fig. 1, showing the movable parts in a changed position. Fig. 4 is a sectional view, the parts being positioned as in Fig. 3, taken on the line 4 4 of Fig. 3.

In the drawings, A is the outer shell of the drum or radiator, the same preferably being of oval form in side or front view.

a is a hollow sleeve adapted to fit into or over a section of a stove-pipe, thus permitting the products of combustion, smoke, and heated air to pass into the drum A. a' is a similar hollow sleeve diametrically opposite to the sleeve a, affording an exit for the cooled smoke or other products of combustion after having passed through the drum, as will be hereinafter explained.

a² is the back wall or face of the drum A, and a³ is the front wall or face.

Secured within the drum A by any suitable means are the diaphragms or partitions a⁴, located parallel to each other, as shown in Figs. 1 and 3, and forming between them the passage-way a⁵. The lower rear ends of the walls a⁴ extend downwardly almost to the oval end a⁶ of the drum, while the top portions of the walls a⁴ extend from the back wall a² to the front wall a³, thus leaving triangular-shaped passages a⁷, through which the heated air, smoke, and products of combustion may pass from the sleeve a when the passage a⁵ is closed by the inclined damper B.

Pivoted at b to the walls a⁴ is a movable deflecting-damper B, which, when in the inclined position illustrated in Figs. 1 and 2, completely closes the passage-way a⁵ between said walls a⁴ and forms the upper inclined wall of the passage-way a⁷, as will be readily understood.

B' is a handle secured at one end of a rod b', which latter is passed through a suitable opening in the rear wall a² of the drum, and is connected at its forward end b² to the damper B, as clearly shown in Figs. 2 and 4. The deflecting-damper B is opened by pulling the handle B', as shown in Fig. 4.

Extending into the top of the drum A are two concavo-convex walls C, constituting, as it were, a continuation of the pipe a'. These walls fit closely within the front and back walls a² a³ of the drum, thereby forming an air-passage c.

Centrally with the space c is a shaft C', revolvably mounted in the front and rear walls a³ a² of the drum, and extending outwardly at the rear to form a handle C², by means of which the shaft and the parts carried thereon may be rotated.

c' is an elongated slot in the rear wall a², through which the shaft C' passes, by which slot a vertical movement may be given to one end of the shaft C' when desired, as will be hereinafter explained.

A revolvable damper is mounted on the said shaft C', which damper consists of the two end plates D, mounted at right angles to the shaft C', and a plurality of plates D' D² supported on and mounted between the two end plates D. The end plates D are provided with suitable long and short openings d'. The horizontal plates D' are of the same width as the vertical end plates D, and are provided with central openings d. The lower horizontal plate D² is of less width than the end plate D, and is narrower than the spaces between the two lower ends c² of the walls C, thus forming a passage-way c³ between either side of said plate D² and the ends c² of said walls. The central plate D² is of the same width as the end plates D, thus forming on either side thereof a passage-way c⁴ between the ends of said plate D² and the inner walls of the plate C. The upper horizontal plate D² is less in width than the plates D and is

greater in width than the lower plate D^2 . Spaces or passages c^5 thus are formed between the edges of said upper plate D^2 and the upper ends or portion of the walls C , said spaces c^5 being less in size than the spaces c^3 .

By the construction shown in Figs. 1 and 2, as just described, it will be observed that the smoke and other products of combustion may pass from the drum A out through the sleeve a' by passing in the circuitous direction indicated by the arrows through the openings or passage-ways $c^3 d c^4 d c^5$, having, however, been turned and deflected *en route* by the several plates $D' D^2$.

Extending from the bottom plate D^2 toward the top plate D^2 and inclined from the rear wall a^2 toward the front wall a^3 is a deflecting-plate E , secured to the several plates $D^2 D'$, as clearly shown in Fig. 2. It will also be observed that the deflecting-damper B is inclined from the rear wall a^2 toward the front wall a^3 . The object of thus inclining both the deflecting-damper B and the deflecting-plate E toward the wall a^3 is to cause the smoke and other heated products of combustion to impinge against said wall a^3 , it being understood that the wall a^2 is the rear wall of the drum and will uniformly be positioned against or close to the wall of the compartment to be heated. It is therefore desirable that if one part of the drum A be warmer than another and capable of throwing off a greater amount of heat than the other it should be the front wall a^3 . For this reason the currents of heated air are directed by the deflecting-damper B and the deflecting-plate E toward this front wall a^3 .

The upper ends of the walls a^4 are flared outwardly, as clearly shown in Figs. 1 and 3, passing outside of the lower ends of the walls C , thus forming a passage-way a^8 between the upper portion of said walls a^4 and said wall C . The outwardly-extending upper portions of the walls a^4 also serve to deflect the heated currents toward the outer portion of the drum A , as will be readily understood.

The parts being positioned as shown in Figs. 1 and 2, the operation is as follows: The heated air and products of combustion pass into the drum A through the sleeve a , and impinging against the under side or face of the inclined deflecting-damper B are directed against the wall a^3 of the drum. The current is then divided and directed through the passage-way a^7 upwardly toward the top of the walls a^4 , then through the passage-way a^8 into the revoluble damper by means of the passage-ways $c^3 d c^4 d c^5$, and thence into the sleeve a' . In making this circuitous passage through the revoluble damper the products of combustion are directed by the deflecting-plate E toward the front of the heating-drum for the purpose above explained. It will thus be seen that a passage is formed for the heated air through the drum A , yet said passage is a circuitous one and of such construction as to retain the heated air and products of com-

bustion in the drum until the maximum amount of heat in said air is imparted to said heating-drum.

When it is desirable to give the air and smoke free passage through the drum—as, for example, when the fire in the furnace or stove is being built or replenished—the deflecting-damper B and the revoluble damper may be placed in the position illustrated in Figs. 3 and 4. These positions are formed by pulling the handle B' to the rear and by revolving the handle C^2 a quarter of a turn, as shown. It will thus be observed that a direct passage is formed on either side of the deflecting-damper B , as shown at a^5 , and that after passing through the passage a^5 the air and products of combustion pass directly to the sleeve a' , through the spaces between the now vertical plates $D' D^2$ and deflecting-plate E .

Should soot or dust collect upon the plates $D D' D^2$ of the revoluble damper, the latter may be easily cleaned by turning said revoluble damper in the position shown in Fig. 3, and then agitating the handle C^2 vertically, a sufficient vertical movement being afforded to the shaft C' by the slotted bearing c' .

The large cavities F on either side of the walls a^4 and within the outer shell of the drum A serve as reservoirs, wherein a large volume of heated air is held in suspension, from which heated air the surrounding parts receive and impart heat that would otherwise pass out through the outlet-opening a' .

Some of the advantages of my invention may be attained by dispensing with the diaphragms or walls a^4 and with the damper B , as the construction of the revoluble damper is such as to cause the smoke and heated air to pass very slowly through it and into the outlet-opening a' . In this case it will be found advantageous, as will be obvious, to have the inlet-opening a attached directly to the ends c^2 of the walls C , thus dispensing with the drum proper A . Such a construction, which is so obvious to those skilled in this art that I do not consider it necessary to illustrate the same, would be usually employed where it is desired only to use a damper in a length of stove-pipe and not for the purpose of heating a drum.

I claim as my invention—

1. A radiator comprising a hollow sheet-metal housing or drum having suitable openings for the inlet and outlet of heated air and smoke, a pair of diaphragms located within the drum near the inlet-opening, a damper located between said diaphragms, and a revoluble damper located within the outlet-opening, substantially as described.

2. A radiator comprising a hollow drum having an inlet-opening and an outlet-opening diametrically opposite each other, the walls of the outlet-opening extending into the drum toward the said inlet-opening, a revoluble damper located within the walls of said outlet-opening, and a pair of walls or diaphragms located between said damper and said inlet-

opening and provided with outwardly-extending or bell-shaped portions partially surrounding and extending above the lower end of the said outlet-walls, and a damper located between the lower or straight portions of said diaphragms, substantially as described.

3. The combination of a hollow drum provided with a diaphragm, which at its top extends from the back to the front wall of said drum and at its lower end extends diagonally from the front to the rear of said drum, a damper pivoted in the lower portion of said diaphragm, and means for operating the same, an inlet-opening in said drum opposite to the lower end of the diaphragm, and an outlet-opening from said drum opposite to the upper end of said diaphragm, whereby when said damper is closed air and smoke entering the drum and inlet-opening will pass on through either side of said diaphragm to the outlet-opening, substantially as described.

4. The combination of the hollow drum provided with inlet and outlet openings diametrically opposite to each other, a diaphragm located opposite said inlet-opening and adapted to cause the smoke and heated air to impinge against the sides of said drum, and a damper pivoted in said diaphragm and normally resting in an inclined position, whereby the smoke and heated air are caused to impinge the front faces of said drum, substantially as described.

5. The combination of a hollow drum provided with inlet and outlet openings diametrically opposite each other, the outlet-opening having walls extending into the drum, with a revoluble damper located within said walls,

consisting of a series of horizontal plates arranged substantially as described, whereby a circuitous passage is afforded for the smoke and heated air, substantially as described. 40

6. The combination of a hollow drum provided with inlet and outlet openings diametrically opposite each other, the outlet-opening having walls extending into the drum, a revoluble damper located within said walls, consisting of a series of horizontal plates arranged substantially as described, whereby a circuitous passage is afforded for the smoke and heated air, with an inclined diaphragm or deflecting-plate secured to said revoluble damper, whereby the smoke is also caused to impinge against the front face of said drum, substantially as described. 45 50

7. The combination of a hollow drum provided with inlet and outlet openings diametrically opposite each other, a revoluble damper located near the outlet-opening, provided with horizontal plates, substantially as and for the purpose described, a spindle C', on which said revoluble damper is mounted, and a slotted bearing c' in the drum, whereby a slight vertical movement may be imparted to the said spindle and damper, substantially as and for the purpose specified. 55 60

In testimony that I claim the foregoing as my invention I affix my signature in presence of two witnesses. 65

GARRETT G. BURTON.

Witnesses:

TAYLOR E. BROWN,
GEORGE W. HIGGINS, Jr.