B. F. MILLER.

Heating Drum.

No. 61,443. Patented Jan. 22, 1867.

Fig. 3.

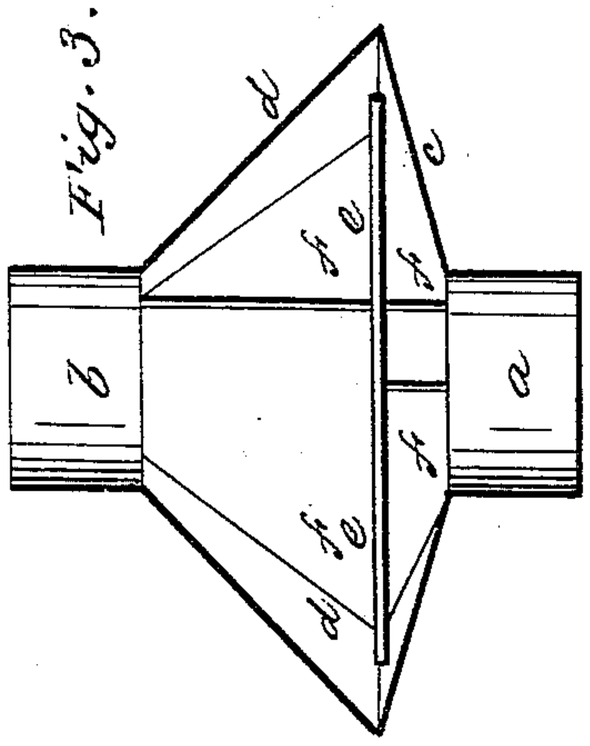


Fig. 4

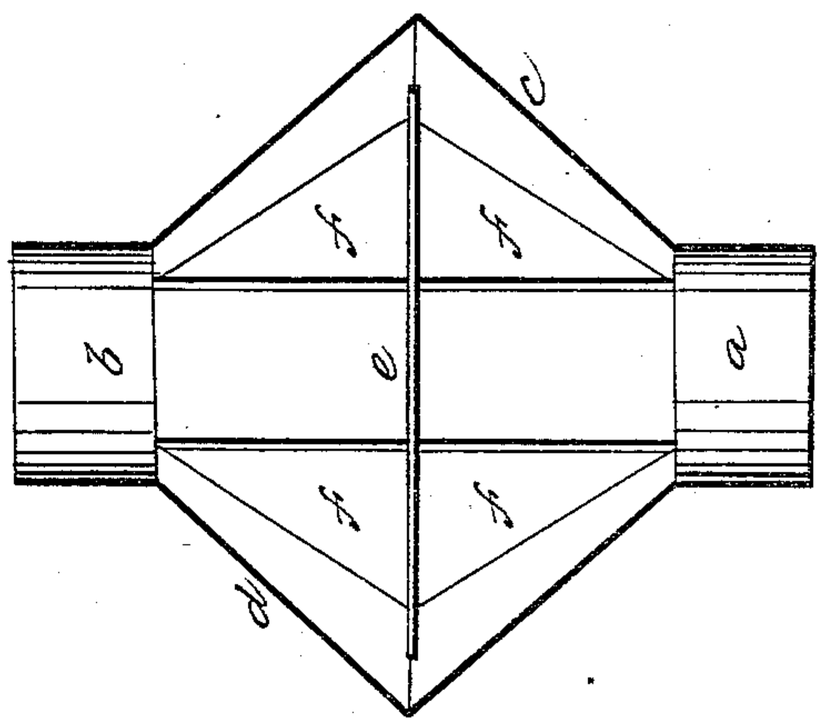


Fig. 1

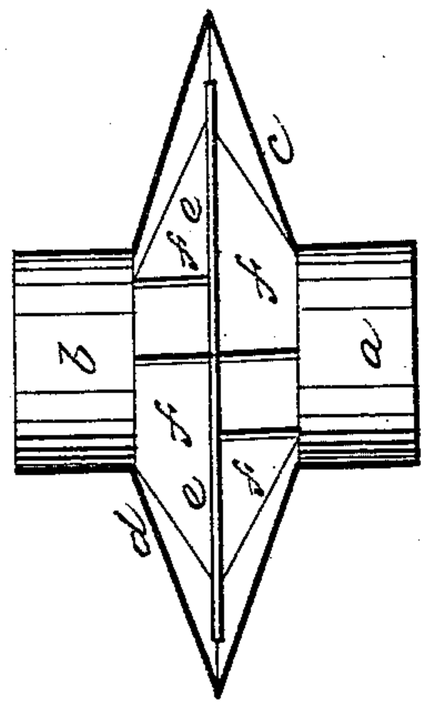
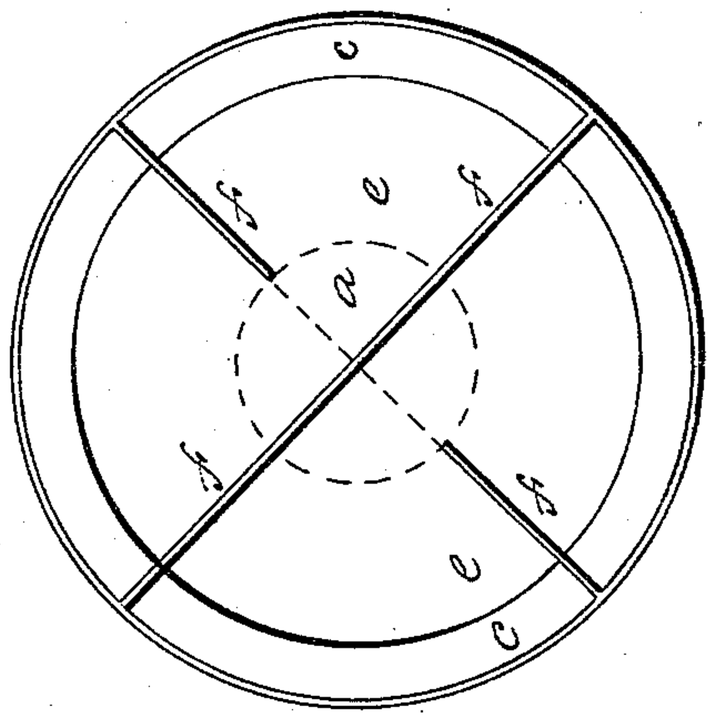


Fig. 2.



Witnesses:

Lemuel W. Serrell

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UNITED STATES PATENT OFFICE.

BENJAMIN F. MILLER, OF NEW YORK, N. Y.

CALORIC-RADIATOR FOR STOVE-PIPES.

Specification forming part of Letters Patent No. **61,443,** dated January 22, 1867.

To all whom it may concern:

Be it known that I, BENJAMIN F. MILLER, of the city and State of New York, have invented, made, and applied to use a certain new and useful Improvement in Caloric-Radiators; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1 is a section of my caloric-radiator. Fig. 2 is a sectional plan of the same. Figs. 3 and 4 are vertical sections of said radiators in a different shape to that shown in Fig. 1.

Similar marks of reference denote the same parts.

Radiators and drums for stove-pipes have heretofore been made in which an elliptical or flattened spheroidal chamber has been used, in which is a diaphragm standing at right angles to the pipe conveying the gases or products of combustion. The diaphragm in this instance is liable to become displaced by the action of the heat, and the thin sheet metal employed for the casing is sometimes bent and distorted by the weight of the superincumbent stove-pipe. Besides this, in all the radiators before employed, the ascending current of gases passed into a larger space than the area of the supplying-pipe, hence would expand, and thereby lessen its effective power in heating the exterior of the radiator; and said gases were not forced to travel in contact with the under side of the radiator, but came principally into contact with the diaphragm, and there exerted no external heating power.

The nature of the first portion of my said invention consists in sustaining the diaphragm by metal plates or septa that stand parallel to the axes of the radiator and stove pipe or flue, and occupying radial positions around the diaphragm, so as to keep the diaphragm in position, and also strengthen the case, so that the weight of the stove-pipe will not be liable to injure the same.

The nature of the second feature of my said invention consists in constructing and arranging the diaphragm and case in such a manner that there will be nearly the same area of opening in the radiator that there is in the stove-pipe, so that the products of combustion will travel through the radiator at the same speed that they do through the pipe, and will remain equally operative in heating the exterior surface, and will not expand into a larger space or travel out of contact with the exterior surface.

In the drawing, *a* represents the pipe passing the current of heated gases into the radiator, and *b* the exit-pipe. *c* is the conical lower part of the radiator, and *d* the conical upper part of the same. *e* is the circular diaphragm, and *f f* are the vertical plates or septa, which are cut out of a shape to fit the inside of the radiator, and notched for the reception of the diaphragm; and the edges of the diaphragm should also be sufficiently notched to hold the septa in their places. These plates *f f* may extend entirely across, or only partially across, the diaphragm; but I prefer that the four septa be formed of two plates, standing at right angles to each other—one notched to set down over the diaphragm from above and pass through the radial notches or slots of the diaphragm, the other to set up from below through the other radial slots of the diaphragm. This feature of my invention, consisting in supporting the diaphragm by the plates or septa, may be used with radiators of any desired exterior shape.

Figs. 1 and 3 illustrate the second feature of my said invention. The annular opening between the edges of the diaphragm *e* and the exterior casing is to be about the same in area as the pipe *a*, and the space between the upper edge of the pipe *a* and under side of the diaphragm *e* is to be about the same as the area of said pipe *a;* hence the conical space between the diaphragm *e* and case *c* will correspond in area, or nearly so, at any concentric point with the area of the pipe *a*, which will cause the products of combustion to travel at the same velocity as in the pipe *a*, and be equally effective in heating the portion *c* of the case.

I prefer that the portion *d* of the case be made in the same manner as seen in Fig. 1; but it might be made as seen in Fig. 2, because the heat in ascending will travel in contact with the inside of the radiator *d*.

What I claim, and desire to secure by Letters Patent, is—

1. The septa or plates *f*, in combination with

the diaphragm *e* and radiating-case *c d*, substantially as and for the purposes set forth.

2. Arranging the diaphragm *e* and case *c* in the manner shown in Figs. 1 and 3, so that the space through which the heated gases or products of combustion pass shall be nearly of equal area to the pipe *a*, for the purposes and as set forth.

In witness whereof I have hereunto set my signature this 12th day of June, 1866.

B. F. MILLER.

Witnesses:
GEO. D. WALKER,
LEMUEL W. SERRELL.