

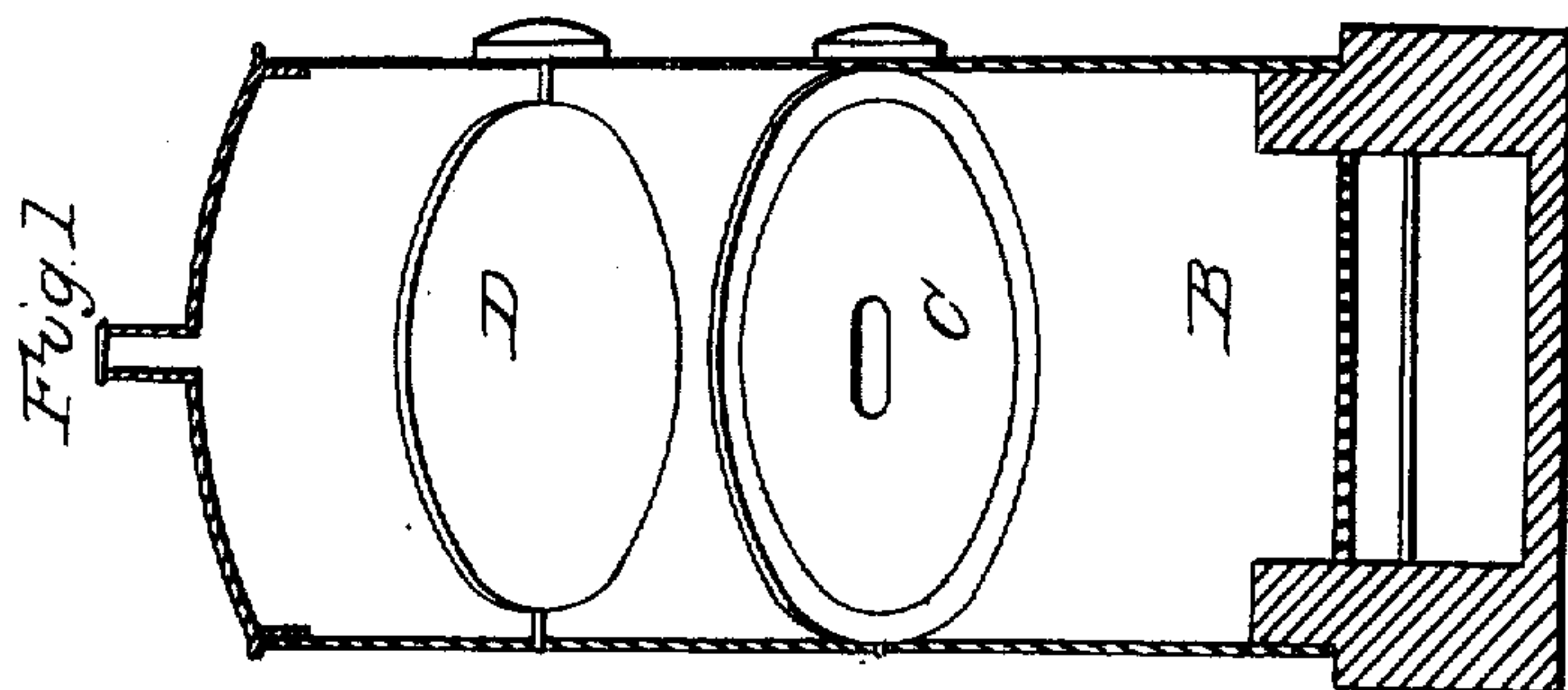
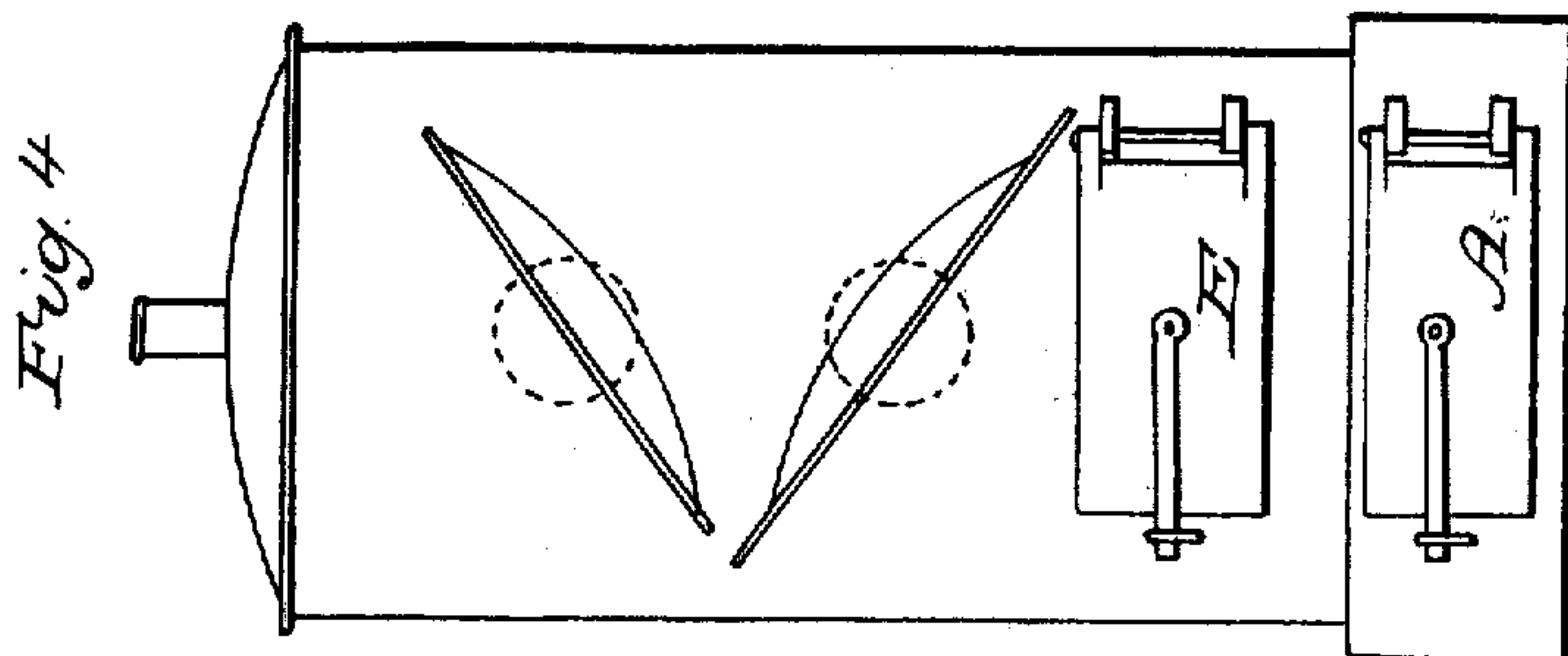
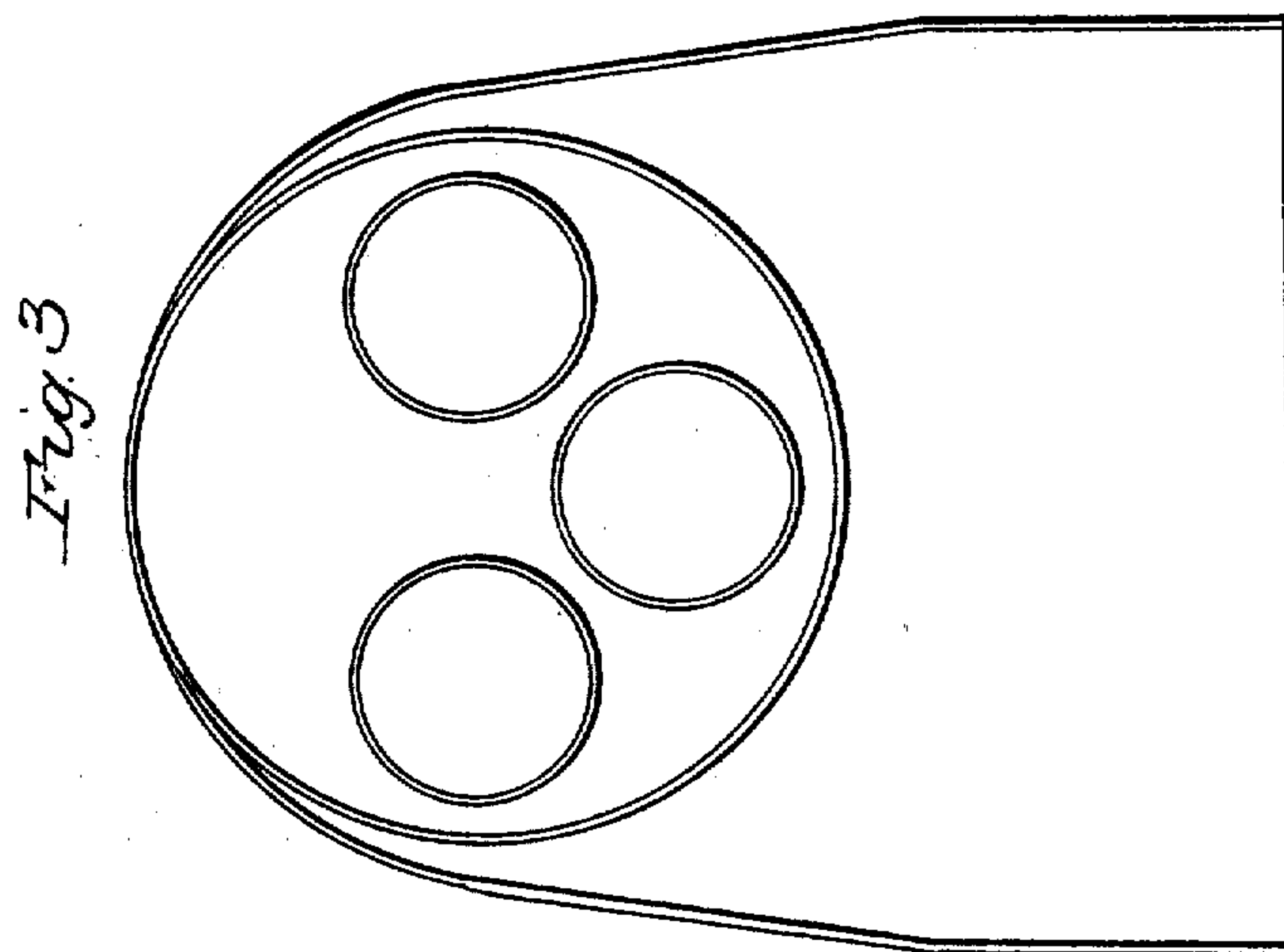
G. W. WILLIAMSON.

2 Sheets—Sheet 1.

Heating Apparatus.

No. 22,760.

Patented Jan'y 25, 1859.



Witnesses  
*Wm. Adams*  
*Wm. Lusk*

Inventor  
*Geo. W. Williamson*

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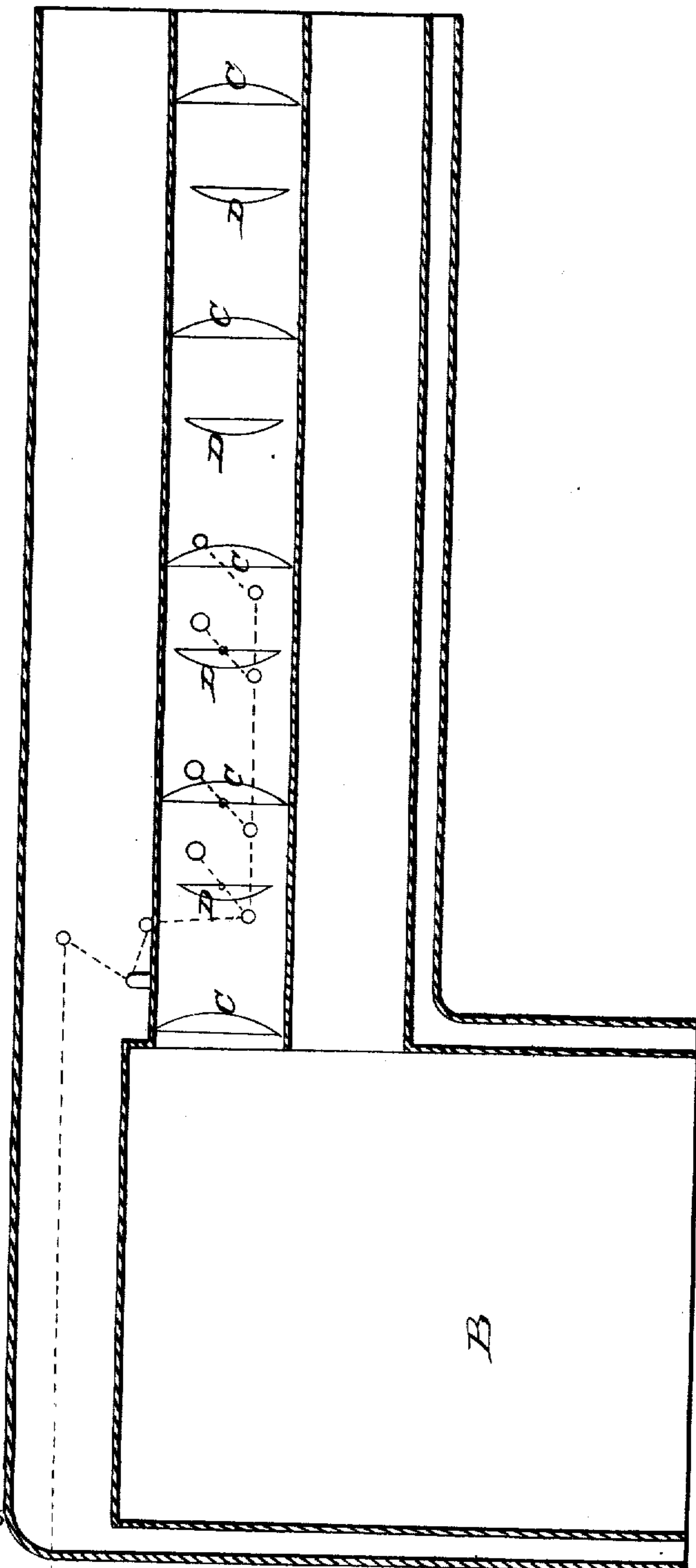
2 Sheets—Sheet 2.

Heating Apparatus.

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Fig. 2.



Witnesses  
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# UNITED STATES PATENT OFFICE.

GEO. W. WILLIAMSON, OF SCRANTON, PENNSYLVANIA.

## HEATING APPARATUS.

Specification of Letters Patent No. 22,760, dated January 25, 1859.

*To all whom it may concern:*

Be it known that I, GEORGE W. WILLIAMSON, of Scranton, in the county of Luzerne, State of Pennsylvania, have invented a new and Improved Mode of Applying Heat to Radiating-Surfaces; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 represents a sectional elevation of an ordinary cylinder stove, showing the arrangement and application of my improvement. Fig. 2 represents a horizontal section of one flue of a steam boiler with my invention applied thereto. Fig. 3 represents the front of a fire chamber or fire surface of a locomotive boiler. Fig. 4 represents an exterior elevation of the cylinder stove shown in Fig. 1.

Similar letters refer to similar parts throughout.

A, in said drawings (Fig. 4) indicates the ash pit door of an ordinary stove.

B, Fig. 1, represents the fire chamber therein.

C, shows a concavo-convex plate fitted in bearings and abutting against the wall or lining of the said fire chambers; said plate C, has in its center an opening for the passage of the draft and heat. D, also represents a plate of smaller dimension the space between its rim and the lining of the cylinder serving as the draft passage.

C D, and C D, Fig. 2, shows a series of plates constructed and arranged in accordance with my invention and applied to the flue of a steam boiler. These plates C and D may be flat or plain.

E, Fig. 4, shows the door of a fire chamber of an ordinary cylinder stove.

The object of my invention is to generate a greater amount of heat with a given quantity of fuel than by any other mode now in use, and to control and govern said heat in its application to fire chambers, smoke flues and steam boilers by the means hereinafter described.

The nature of my invention consists in so arranging within a fire chamber, smoke flue, or steam boiler a series of plates as that the heat will in its passage, be delayed or retarded as it were within combustion chambers, formed by said plates, and thereby throw off or give out a much greater amount

of heat and with a much less quantity of fuel than by any other method now in practice.

My said improvement is alike applicable to stoves for household use and to furnaces, steam boilers and locomotives and to all manufacturing establishments where economy of fuel is an object.

To enable others skilled in the art to make and use my invention, I will proceed to a description of its construction and operation.

Fire being started in the firebox or chamber a current of heat is transmitted through the opening in the center of plate C, and in its onward passage is expanded by the next plate D, which deflects said current against the sides of the fire chamber and passes through between it and the rim or edge of said plate D, and so to the exit flue, said current is alternately expanded which arrangement compels the giving off a greater amount of heat by reason of the deflection against the sides of the cylinder of the heated current within the series of combustion chambers. The said plates turn on their bearings.

By the application of my invention it will be evident that a great saving will be effected in the consumption of fuel and that the draft, so essential in furnaces, is not impeded but on the contrary enhanced, as well as placing a certain guide in the power of the attendant to control and govern the amount of heat or steam required.

It has long been a desideratum, with railroad companies especially, to economize the consumption of fuel in locomotives, and the same will apply to all who use motive power and require the agency of a simple, cheap and unfailing substitute for the present objectionable mode of construction.

By the application of my improvement the motive power of a steam engine will be generated by the use of one fourth the quantity of fuel now used; and by its use no impediment is offered to the passage of the draft, which evil has hitherto been an obstacle to the successful working of the many plans which heretofore have been devised for reducing the first cost of motive power.

My arrangement of plates with draft passages alternative first through the center of one plate and then between the edge of the



succeeding plate and the wall of the fire chamber furnishes the desired means of obviating the defects alluded to, and that too with a reduction of at least two thirds of the  
5 quantity of fuel now necessary to create the requisite motive power.

Having described the nature and operation of my invention, I wish it distinctly understood that I do not claim dampers or  
10 their equivalent in my invention; neither do I claim a stationary flat plate or a series of them, with an opening around the outer edge for a draft passage, neither do I claim

to be the inventor of a combustion chamber, but

What I do claim and desire to secure by  
Letters Patent is— 15

The application to fire chambers or smoke flues, of a double series of plates when the same are constructed, combined and ar- 20 ranged, in the manner and for the purpose hereinbefore set forth.

GEO. W. WILLIAMSON.

Test:

J. M. ILLI, .

B. W. FERGUSON.