

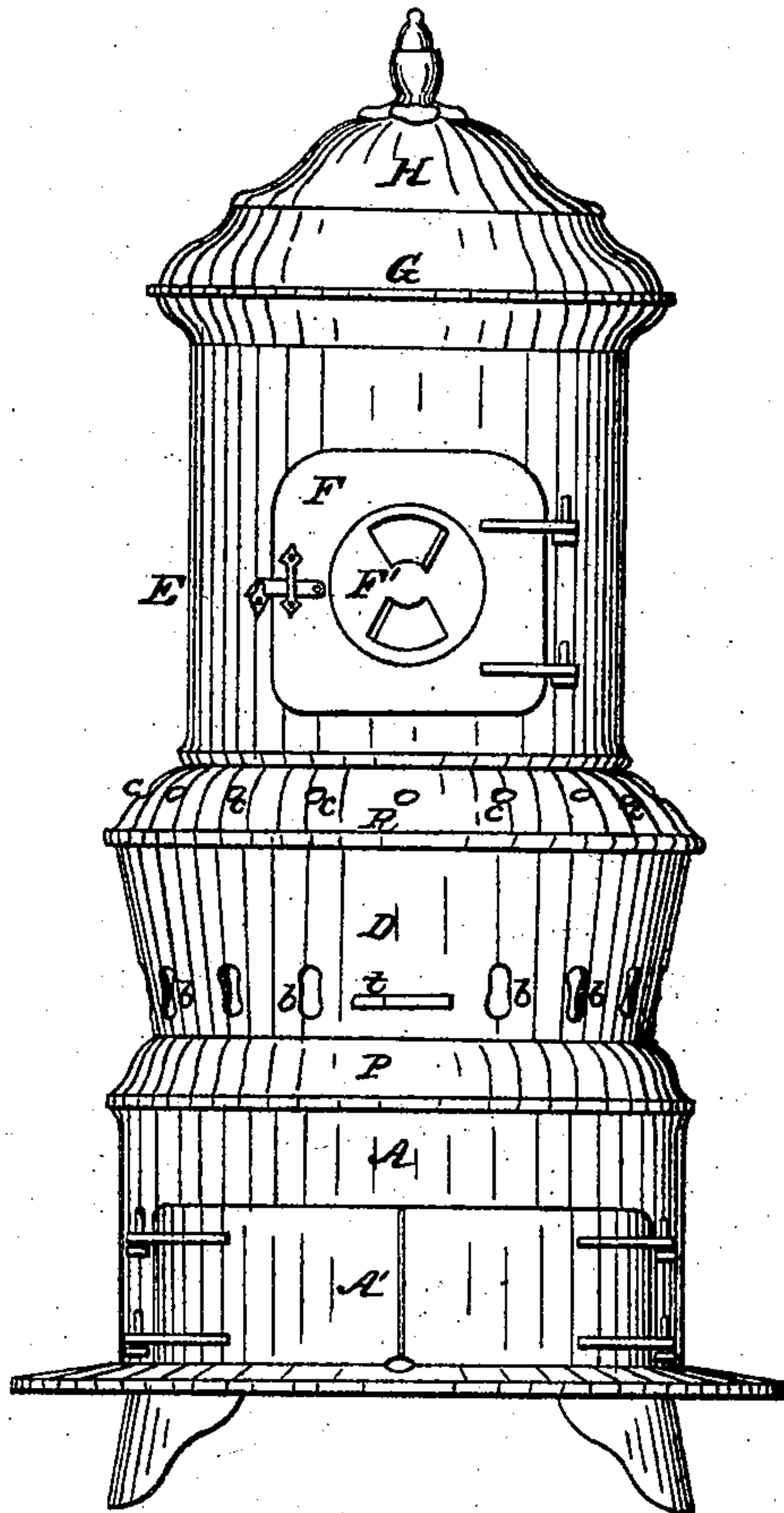
W. HAILES.  
Heating Stove.

2 Sheets—Sheet 1.

No. 92,043.

Patented June 22, 1869.

Fig. 1.



Witnesses:

R. T. Campbell  
J. B. Campbell

Inventor:

Wm. Hailes  
by  
Mason Hewitt & Lawrence

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Fig. 2.

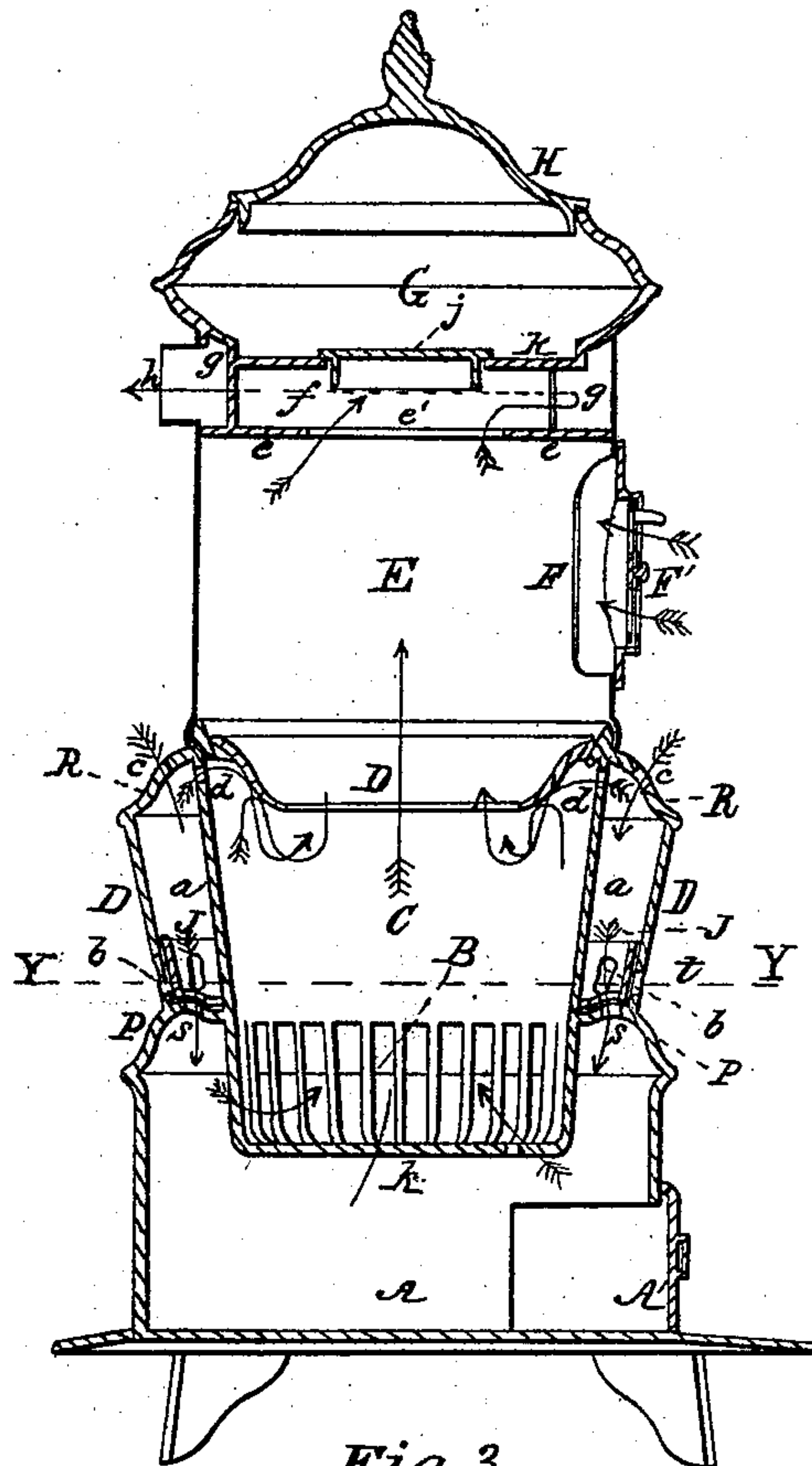
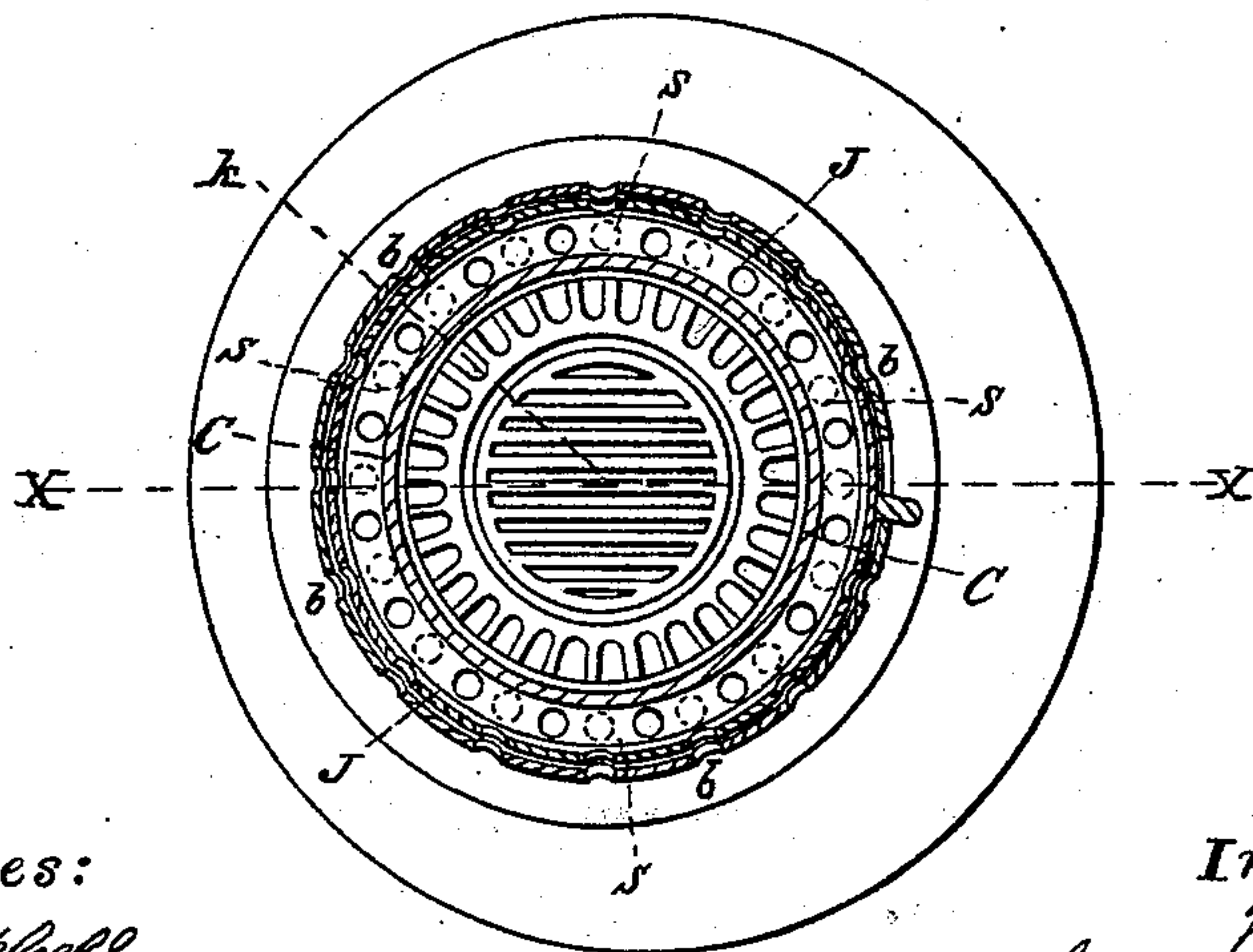


Fig. 3.



Witnesses:

R. T. Campbell  
J. M. Campbell

Inventor:

W. Hailes  
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# United States Patent Office.

WILLIAM HAILES, OF ALBANY, NEW YORK.

Letters Patent No. 92,043, dated June 29, 1869.

## COAL-STOVE.

The Schedule referred to in these Letters Patent and making part of the same.

### *To all whom it may concern:*

Be it known that I, WILLIAM HAILES, of the city and county of Albany, in the State of New York, have invented a new and improved Stove; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1, sheet 1, is a front elevation of my improved stove, arranged for heating-purposes.

Figure 2, sheet 2, is a diametrical section through such stove, taken in the vertical plane indicated by line *x x*.

Figure 3, sheet 2, is a section through the stove, taken in the horizontal plane indicated by line *y y* in fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists—

First, in a new and improved method of constructing a jacket or casing around a fire-pot, having a depressed or basket-grate, whereby an annular air-heating chamber is formed around the main body of the fire-pot, through which air can be caused to pass either in an upward or downward direction, at pleasure, and from which heated air can be caused to descend into the ash-pit, and thence pass into the fire-pot, through the basket-grate, to support combustion, or to pass directly into the room for warming-purposes.

Secondly, in arranging at the base of the annular air-heating chamber surrounding the fire-pot a double-acting damper, which, upon being turned in one direction, will shut off the communications for air between said chamber and ash-pit, and at the same time open communications between the external air and said chamber, so as to cause an ascending draught through the latter into the room.

Thirdly, in a fire-pot which is perforated at or near its upper end for the admission of air above the fuel to support combustion, in combination with an annular chamber surrounding said fire-pot, and means by which heated air can be conducted either downwardly through said chamber and into the ash-pit, to support combustion, or upwardly through said chamber into the room; thus causing certain quantities of heated air to pass into the combustion-chamber at points above the fuel, at all times during the operation of the stove.

Fourthly, in the arrangement of a heat-deflector, concentrating within the combustion-chamber, and in such relation to the passages through the fire-pot for the admission of air above the fuel, that the air-jets entering said passages shall impinge against the sides of, and be directed downward by said deflector, and thus caused to mingle with and assist in the combustion of the gases rising from the fuel.

Fifthly, in the arrangement, at or near the upper end of the smoke-chamber, of an oven for cooking or

boiling-purposes, which is constructed with a contracted flue-passage through the centre of a false bottom, and also with an annular flue-passage, through which the heated products are compelled to circulate on their way to the exit-pipe, all as will be hereinafter explained.

I am aware that it is not new to enclose a fire-pot by a casing or jacket, so as to have an air-heating chamber around it. Nor is it new to employ in a stove a basket-grate, depressed into the ash-pit, and supplied with air through an annular register arranged at or near the point of suspension of such a grate. Nor is it new, broadly considered, to arrange heat-concentrating deflectors within the smoke-chambers of stoves, for retarding the upward escape of the products. Nor is it new, broadly considered, to arrange an oven at the upper end of parlor-heating stoves.

I do not, therefore, claim as my invention any of these features, as hitherto employed in stoves.

To enable others skilled in the art to understand my invention, I will describe its construction and operation as applied to a stove adapted especially for warming-purposes.

In the accompanying drawings—

A represents the ash-pit section of the stove, which terminates at its upper end in an annular contracted flange or ring, P, through which ring perforations *s*, are made, entirely surrounding the fire-pot C.

From this ring P, rises the fire-pot C, which is entirely surrounded by an outer wall or casing, D, that forms an annular chamber, *a*.

Below the flange or ring P, the basket-grate of the fire-pot extends into the ash-pit A, and exposes the lower portion of the bed of coals in the fire-pot to the currents of the heated air admitted into the ash-pit through the perforations *s*.

The upper end of the annular chamber *a* is capped by a ring, R, through which perforations *c*, are made, at proper distances apart, all around it, for admitting air into chamber *a*, at certain times, and at certain times allowing air from said chamber *a*, to escape into the room.

Directly opposite the perforations *c*, perforations *d* are made, through the inner wall of the fire-pot, all around the same, for the purpose of admitting air in jets into the fire-pot above the level of the coal therein, to assist in the combustion of the gases rising from the incandescent coal.

At the junction of the upper end of the fire-pot C, with the smoke-chamber E, is an inverted frustum of a cone, D, which is suitably secured in place, and which is so arranged as to serve as a means for deflecting or directing downwardly the currents of air entering through the perforations *d d*.

This frustum D also contracts the outlet for the heated products rising from the fire-pot, and retards the products so that they are mixed with the heated



currents of air entering through *d d*, and, consumed. As the frustum *D* will become very hot, and it will heat the currents of air impinging against it, and produce below the contracted outlet an eddy of currents, and cause a complete combustion of the inflammable gases.

This frustum, or concentrating-deflector may be supported in its place by a flange, or by lugs formed on the inner edge of the ring *R*, or on the inner side of the fire-pot section *C*.

The section *E* is supported upon the ring *R*, and through this section a feed-passage is made for supplying fuel to the fire-pot, which passage is provided with a door, *F*, having a register, *F'*, applied to it, as shown in figs. 1 and 2.

*G* is the top section of the stove, closed on top by a movable cover, *H*, and constructed so as to serve as an oven for cooking-purposes.

*k* is the bottom plate of this oven, which may be centrally perforated to form a kettle-hole, which hole can be closed by the cover *j*.

Below the bottom plate *k*, of the oven, is an annular flue, *g*, which communicates at one point with the exit-flue *h*, and at another point with the central chamber *f*, into which latter the heated products of combustion enter from section *E*, through an opening, *e'*, made centrally through a plate *e*, as shown in fig. 2.

It will be seen that the heated products, on their way to the escape-pipe *h*, leave the smoke-chamber in section *E*, through the contracted passage *e'*, and enter the chamber *f*; they thence pass into the front part of the annular flue *g*, surround this chamber *f*, and finally escape through flue *h*, at the back of the stove.

Within the chamber *a*, which surrounds the fire-pot, and located at the base of this chamber, is a double-acting annular damper, *J*, one part of which will operate to open or close the passages *b*, and the other part of which operates to open or close the passages *s*. The perforations through one part of this damper are arranged in vertical planes between the perforations through the other part of this damper; consequently, when the passages *s* are shut, the passages *b* will be open, and *vice versa*.

When passages *s* are opened, (passages *b* being closed,) air will enter the chamber *a* through the passages *c*, at its upper end, and pass down through this chamber and through the passages *s*, into the ash-pit *A*, whence it will rise through the basket-grate *B*, and supply the fire therein.

In its passage through the chamber *a*, the air will become very hot by contact with and radiation from the wall of the fire-pot section *C*; and as this highly-heated air is carried, by the natural draught of the stove, down into the ash-pit, it will be seen that a large quantity of heat will be radiated into the room from the base of the stove, as well as from the upper part of the stove. The ash-pit door *A'* should be

tightly closed when it is required to supply the fire with heated air through the chamber *a*.

When the damper *J* is adjusted so that the passages *s* are closed, and the passages *b* are opened, the air will enter chamber *a*, through the passages *b*, and as it becomes heated, it will escape into the room through the passages *c*.

I do not confine my invention to an upwardly-flaring fire-pot, as shown in the drawings, fig. 2, as the fire-pot may flare in an opposite direction; that is to say, it may be made smallest at its upper terminus. And while I prefer to employ the depressed basket-grate, or fire-pot extension *B*, I do not confine myself to its use, in combination with the double-acting damper and air-space surrounding the fire-pot, as the bottom of the fire-pot may terminate on or nearly on a level with the air-passages leading into the ash-pit.

A fire-pot which is constructed as above described, with an air-circulating space around it, will be very durable, for the reason that currents of cool air are constantly impinging against its sides, which have the effect of reducing or keeping down its temperature, and preventing it from rapidly burning out.

This is also the case with the deflecting-ring or frustum *D*. This ring will have its temperature kept down by the jets of air issuing through the perforations.

Having described my invention,

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

1. A fire-pot having a depressed basket-grate extending into the ash-pit section of the stove, in combination with an air-heating chamber, *a*, surrounding said fire-pot, and having passages *s*, leading from it into the ash-pit, substantially as described.

2. A double-acting damper, *J*, or its equivalent, applied at the base of a chamber, *a*, surrounding a fire-pot, substantially as and for the purposes described.

3. The annular chamber *a*, perforated at four points, *b s c d*, substantially as described.

4. The relative arrangement of the annular deflector *D*, with the air-jet passages *d*, and a fire-pot having an air-heating chamber around it, substantially as described.

5. In a stove which has a depressed basket-grate, a heat-deflector *D*, arranged substantially as described.

6. The annular flue-space *g*, and chamber *f*, arranged below the oven-plate *k*, substantially as described.

7. The heat-concentrating plate *e*, in combination with the oven *G*, and exit-flue *h*, substantially as described.

WILLIAM HAILES.

Witnesses:

WILLIAM J. DUNN,  
JNO. G. TREADWELL.