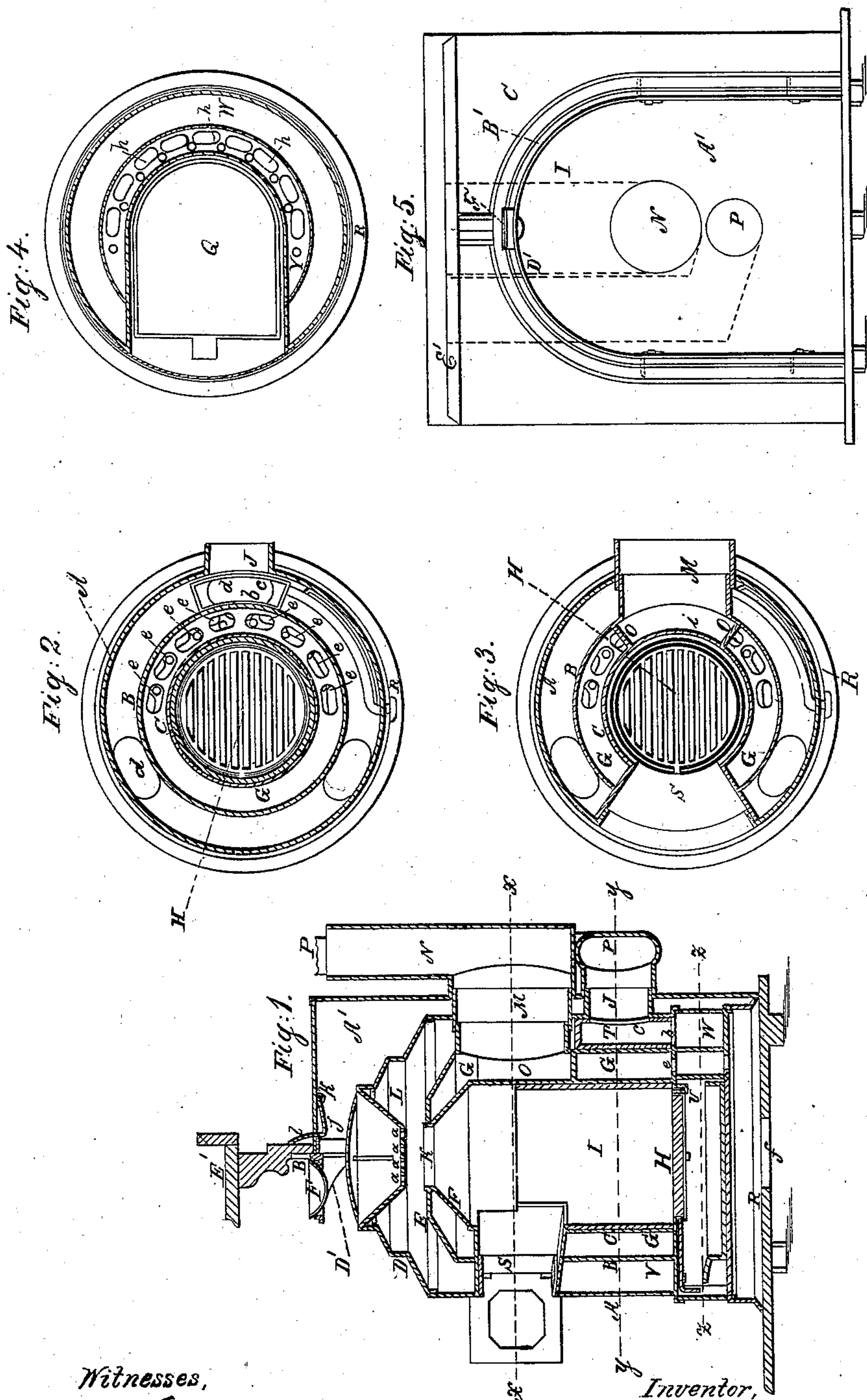


J. LIDDLE.
Heating Stove.

No. 70,233.

Patented Oct. 29, 1867.



Witnesses,
A. Wickham Rose
R. H. Seaton

Inventor,
John Liddle
By How & Weston
Atty.

United States Patent Office.

JOHN LIDDLE, OF BROOKLYN, NEW YORK, ASSIGNOR TO JANE E. LIDDLE,
OF THE SAME PLACE.

Letters Patent No. 70,233, dated October 29, 1867.

HEAT-RADIATING STOVE OR FURNACE FOR FIREPLACES.

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, JOHN LIDDLE, of Brooklyn, in the county of Kings, and State of New York, have invented certain new and useful Improvements in Fireplace Heaters; 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.

My invention is for the purpose of providing a radiating stove and air-heating furnace combined, which shall be small and low enough to be set into a fireplace, which is so constructed as to be capable of heating the room in which it stands, and also one or more rooms above, which shall be neat in appearance, and which shall be economical and efficient in operation.

Another object of my invention is to supply the room or rooms above with air drawn from any suitable source which is free from dust or other objectionable matter, as the vapors and odors from a kitchen, and heated entirely by being passed through the hot-air spaces provided for its passage inside the furnace, thus leaving the outside radiating surface of the furnace free to be used for heating the air in the room in which the heater stands.

My invention consists—

First. In the combination of three distinct cylinders, arranged one within another, each having a top or cover, and the two innermost tops or covers having openings through them for the passage of the products of combustion outward from the fire-chamber, whereby I am enabled to surround the air-heating chamber, which is between the inner and middle cylinders and their tops, with the fire and products of combustion, thus heating the said air-heating chamber very evenly and very hot.

Second. In taking the air for heating the room above that in which the heater stands from a point at or near the top of the hot-air chamber, by means of the combination with the hot-air exit pipe, which enters the heater low enough to permit the heater to stand in a fireplace of wings, partitions, or their equivalents, which shut off from such exit pipe all air except that coming from top of said air-chamber.

Third. In the combination with the heater, constructed substantially as herein set forth, of an air-tight casing, fitted into the fireplace, and suitable flues, whereby all the hot air which goes to the room above passes through the heater, leaving the exterior radiating surface of the heater to be used for the purpose of heating the room in which the heater stands.

Fourth. In the combination with a heater, constructed substantially as set forth, of an opening into the cellar or into the open air, whereby the air to be used in heating the upper room is drawn entirely from outside of the house or from the cellar, and the drawing of the dust from the basement up into the upper room is prevented.

Fifth. In the combination with the smoke-exit pipe of a heater, constructed substantially as herein set forth, of an annular sliding or swinging damper, resting on or near the top plate of the base, or operating in conjunction with it, the said box-damper having suitable holes in the bottom and side, which operate in conjunction with one or more suitable holes in the top plate of the base to produce or cause a direct or indirect draught by sliding or swinging the said box-damper, substantially as hereinafter specified.

Sixth. In the combination with the marble or other front of a fireplace, of the lining and the frame of hooks so constructed and applied that, being sprung into position they will bind the said front, frame, and lining securely together, substantially as hereinafter set forth.

In the accompanying drawings—

Figure 1 is a vertical central section of the heater and fireplace.

Figure 2 is a horizontal section of the heater alone through the line *y y*, fig. 1.

Figure 3 is a similar section through the line *x x*, fig. 1.

Figure 4 is a similar section through the line *z z*, fig. 1.

Figure 5 is a front elevation of the fireplace, lining, and frame, showing the hot-air and smoke exits and the flues in dotted lines.

A, B, and C are the three cylinders, arranged one within another, and each having a separate top, D being

the top of A, E the top of B, and F the top of C. G is the air-heating chamber, between the inner cylinder C and the middle cylinder B. H is the grate, I the fire-chamber, and J the smoke-exit pipe. K is an opening, up through the top of the cylinders B and C, through which the hot smoke and gases pass from the fire-chamber I into the combustion and smoke-chamber L, where the combustible gases are burned by means of air admitted through openings *a a a* in the top plate D. M is the hot-air exit pipe, communicating with the hot-air flue N, and with the hot-air chamber G over the top of the wings or partitions O. P is the smoke-flue, Q is the ash-pit, and R is the base of the furnace. S is the door, through which the fuel is introduced. The damper, by means of which the draught is controlled, is shown at T. This damper is annular in form, being similar to a radial section of a ring, and it has an opening, *b*, in the bottom, and another opening, *c*, in the rear side of it. U is the top plate of the base, and it has three holes, *d d d'*, through it between the outer and middle cylinder, and a series of smaller holes, *e e e*, between the inner and middle cylinder, the former connecting the smoke-chamber V, above said top plate, with the annular smoke-chamber W below said plate, and surrounding the ash-pit, except in front. Y is a narrow annular space, between the smoke-chamber or flue W and the ash-pit Q, through which the air, coming through the opening *f* to supply the hot-air chamber G, passes. It has a series of holes in its top, (*e e e* in the top plate of the base,) and another series, *h h h*, in its bottom for that purpose.

In operating this furnace a fire is kindled on the grate H, and the damper T is drawn around towards the left, so as to allow the smoke in the chamber V to pass freely into the smoke-exit pipe P without making the circuit of the chamber W, thus producing a strong direct draught. The air, to support the combustion of the fuel, enters the ash-pit Q by the door Z, passes up through the grate H to the fire. The products of combustion rise through the fire-chamber I, and, passing through the opening K into the combustion and smoke-chamber L, the combustible portion of the gases is burned by the aid of air admitted through the openings *a a a* in the top plate D. The greater portion of the heat in the products of combustion is given off here, rendering the upper part of the hot-air chamber G very hot, while the lower part is heated very hot also by the fire itself; and the exterior radiating surface of the heater is also made sufficiently hot by these hot products of combustion. Becoming somewhat cooled they pass down through the smoke-chamber V in contact with nearly the whole of the interior surface of the outer cylinder, thus heating the exterior radiating surface of the heater, and pass out through the smoke-exit pipe J into the flue P. When the fire has attained sufficient strength, and an indirect draught is desired, the damper T is pushed back into the position shown in the drawings, and the smoke then passes down through the holes *d d* into the chamber W, around to the opening *d'*, through which it rises into the damper T and passes through the opening *c* into the smoke-exit pipe J. The air to supply the hot-air chamber G rises through the opening *f*, having been brought for that purpose from the cellar or from the outer chamber G rises through the opening *f*, having been brought for that purpose from the cellar or from the outer air through a suitable conductor, and passes up into the chamber Y through the openings *h h*, and thence through the openings *e e e* into the chamber G. As it passes up through this chamber, it quickly becomes heated by coming in contact with the hot walls, and, having passed up to the top of this chamber, it escapes over the wings or partitions O into the hot-air exit pipe M, and up through the hot-air flue N to the room above. The wings O are connected at the bottom *i*, and fit snugly in between the inner and middle cylinder, cutting off all communication from the chamber G to the exit pipe M, except over the top of the said wings. By this arrangement of parts I am enabled to take the air for supplying the exit pipe from the top, or the hottest air in the chamber G, and at the same time make my heater sufficiently low and connect the exit pipe through the outer and middle cylinders below the top thereof. A' is a metallic casing, which is fitted into the fireplace in such a manner as to cut off all communication between the room in which the heater stands and the room to be heated above. Through this casing the smoke and hot-air exit pipes pass into their respective flues. B' is a metallic frame, which overlaps the junction of the casing A' with the marble casing C', and *j* are spring hooks, which serve to bind the lining A', frame B', and marble front C' securely together. For this purpose one end of the hook *j* is passed through openings in the lining A' and frame B', and the other end is then drawn back and hooked into the eye or staple *k*, thereby causing the point *l* to bear firmly against the marble C'. When the hook is in position, as seen in fig. 1, it bears against the inner edge of the hole in the frame B', the outer edge of the hole in the lining A', the marble C', and is held back by the eye or staple *k*, thus binding the whole snugly together. To the top of the frame B' a deflector, D', is secured, the object of which is to throw the heated air, which comes up from around the stove and passes into the room, out beyond the marble mantel E' to prevent the mantel from becoming overheated. Into a hole or depression in this heater a basin or vaporator, F', is set for containing a supply of water, which, by evaporation, shall keep the air of the room in which the heater stands sufficiently moist. By placing this vaporator upon the deflector D' it is sufficiently heated, and at the same time it is removed from the excessive heat immediately over the furnace where it is usually put.

Having thus fully described my invention, I claim—

1. The combination, in a fireplace heater, of the cylinders A, B, and C, with their tops D, E, and F, respectively, and a suitable opening or openings through the walls of the hot-air chamber G at or near its top for passing the hot products of combustion from the chamber I to the chamber V, substantially as hereinabove set forth.
2. The combination, with the hot-air chamber G and hot-air exit pipe M, of the wings O, connected at the bottom, or their equivalents, by which all the hot air which enters the said hot-air exit pipe M is taken from the top of the hot-air chamber G, substantially as and for the purpose specified.
3. The combination, with a heater constructed substantially as described, of the lining A', which prevents the hot air from the room in which the heater stands passing into the hot-air flue N, or into the room above, substantially as hereinabove set forth.
4. The combination, with the hot-air chamber G, of a fireplace heater, constructed substantially as described,

of an opening, *f*, for feeding the said hot-air chamber with air from the cellar, or other source free from dust, substantially as and for the purpose described.

5. The combination, with the openings *d d* and *d'* in the top plate of the base of a furnace, constructed, substantially as set forth, of the annular box-damper *T*, constructed and operating substantially as hereinabove specified.

6. The combination, with the lining *A'*, frame *B'*, and front *C'*, of the hooks *j*, substantially as set forth.

7. Taking the air from a point at or near the top of the hot-air chamber *G*, within the fireplace heater, out through the casing *A'*, and passing it into the hot-air flue *N* by means of a suitable exit pipe, substantially as described.

JOHN LIDDLE.

Witnesses:

THOS. P. HOW,

ROBERT Z. LIDDLE.