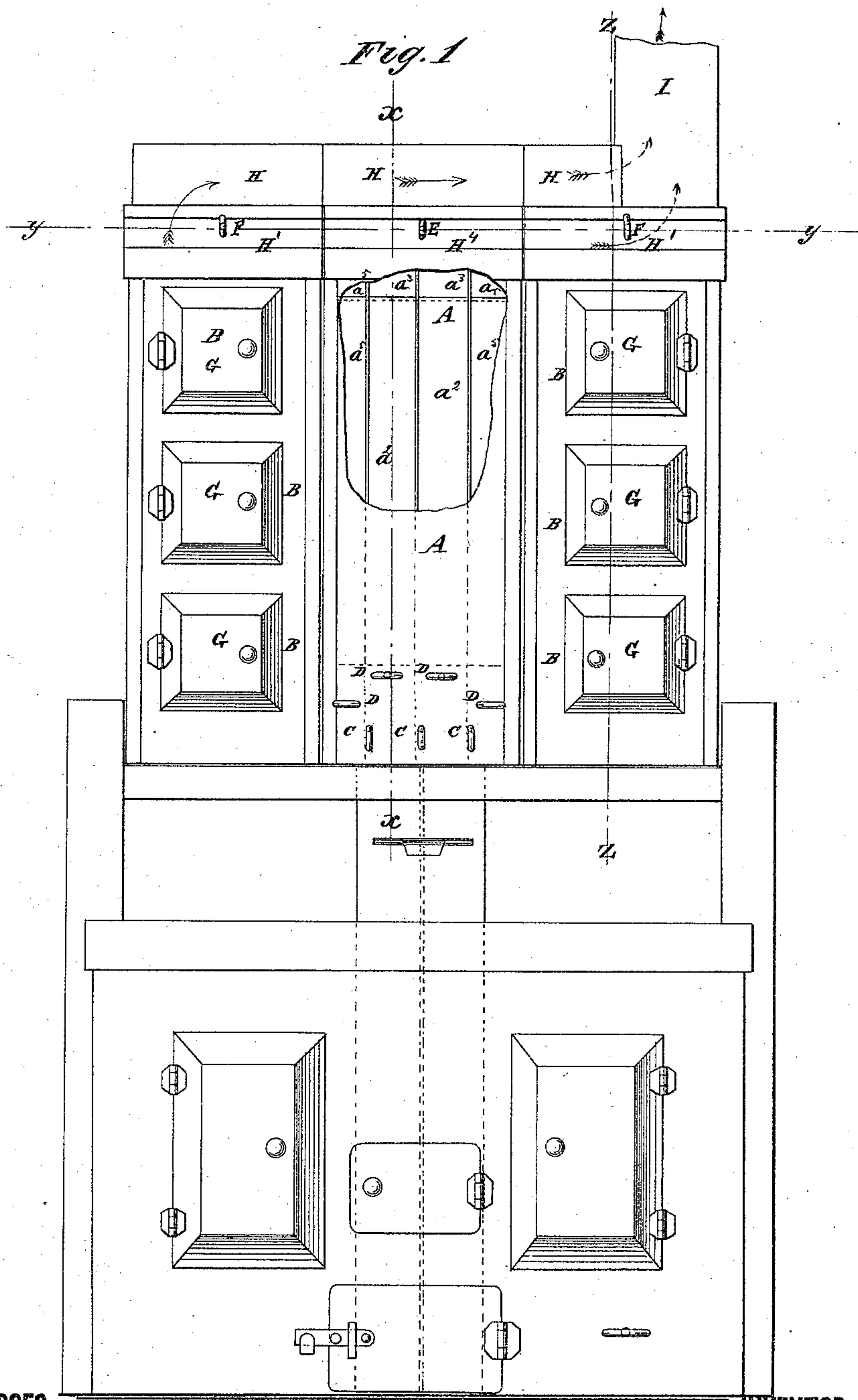


E. O. BRINCKERHOFF.
Ranges.

No. 157,784.

Patented Dec. 15, 1874.



WITNESSES:

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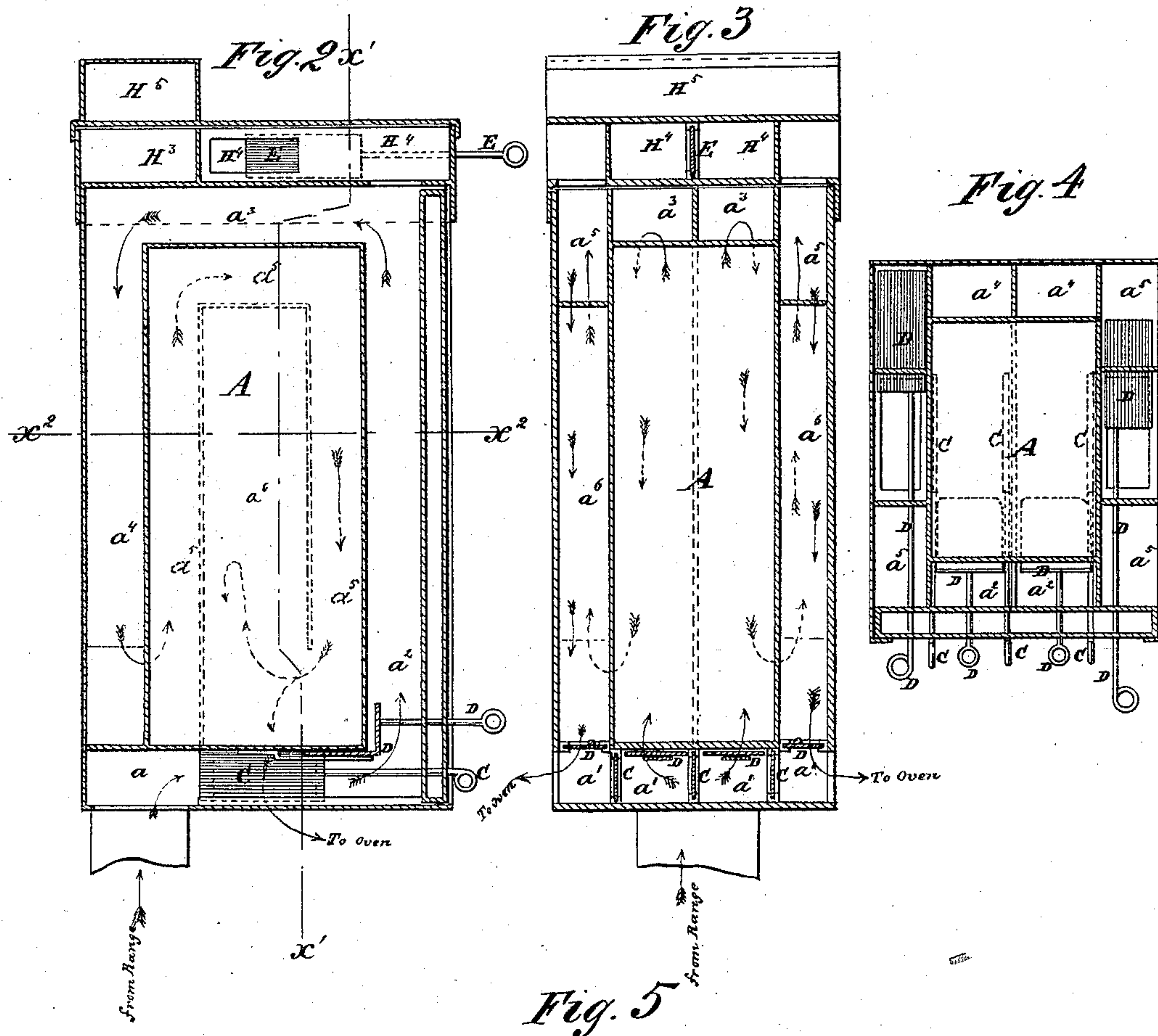
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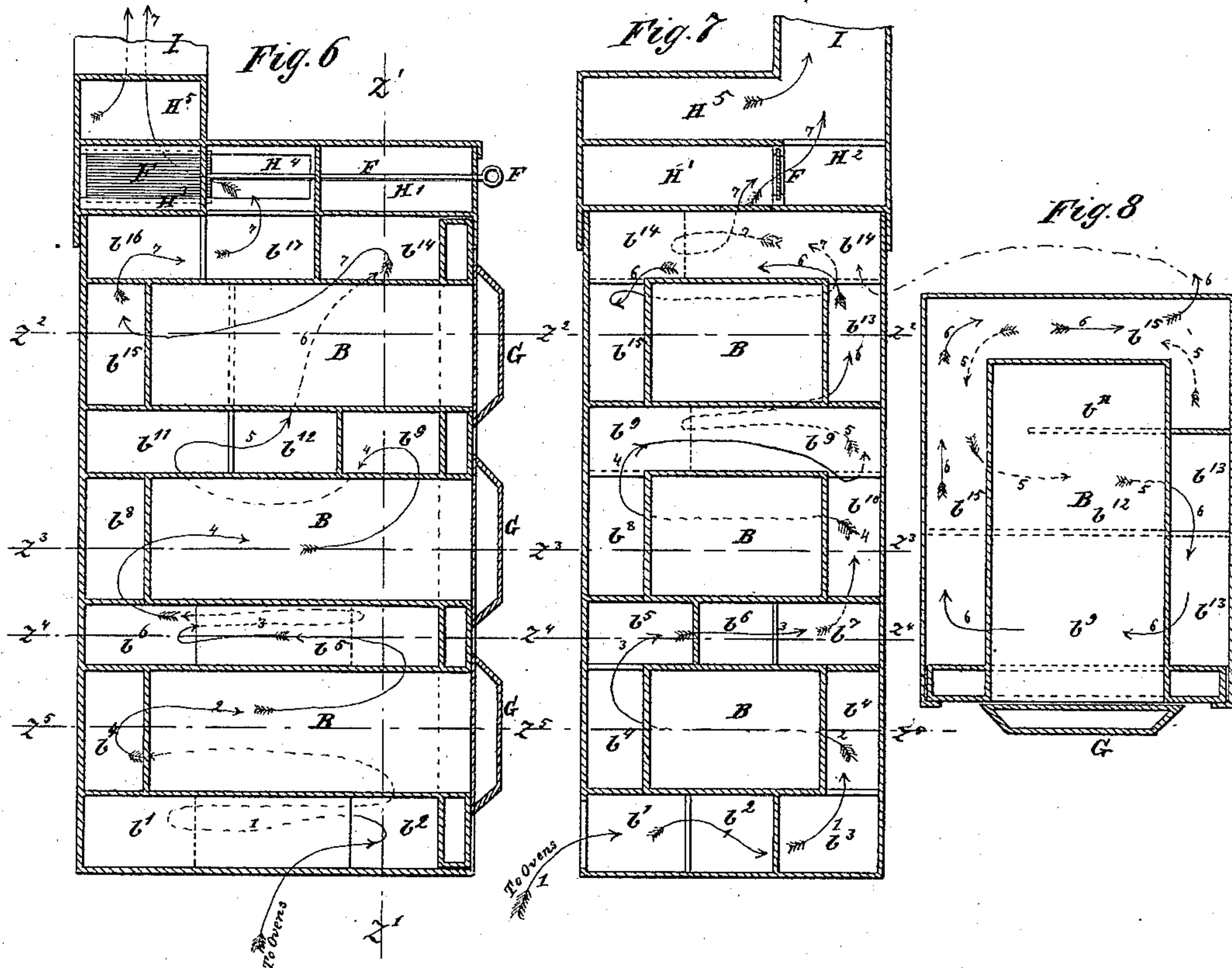


Fig. 9

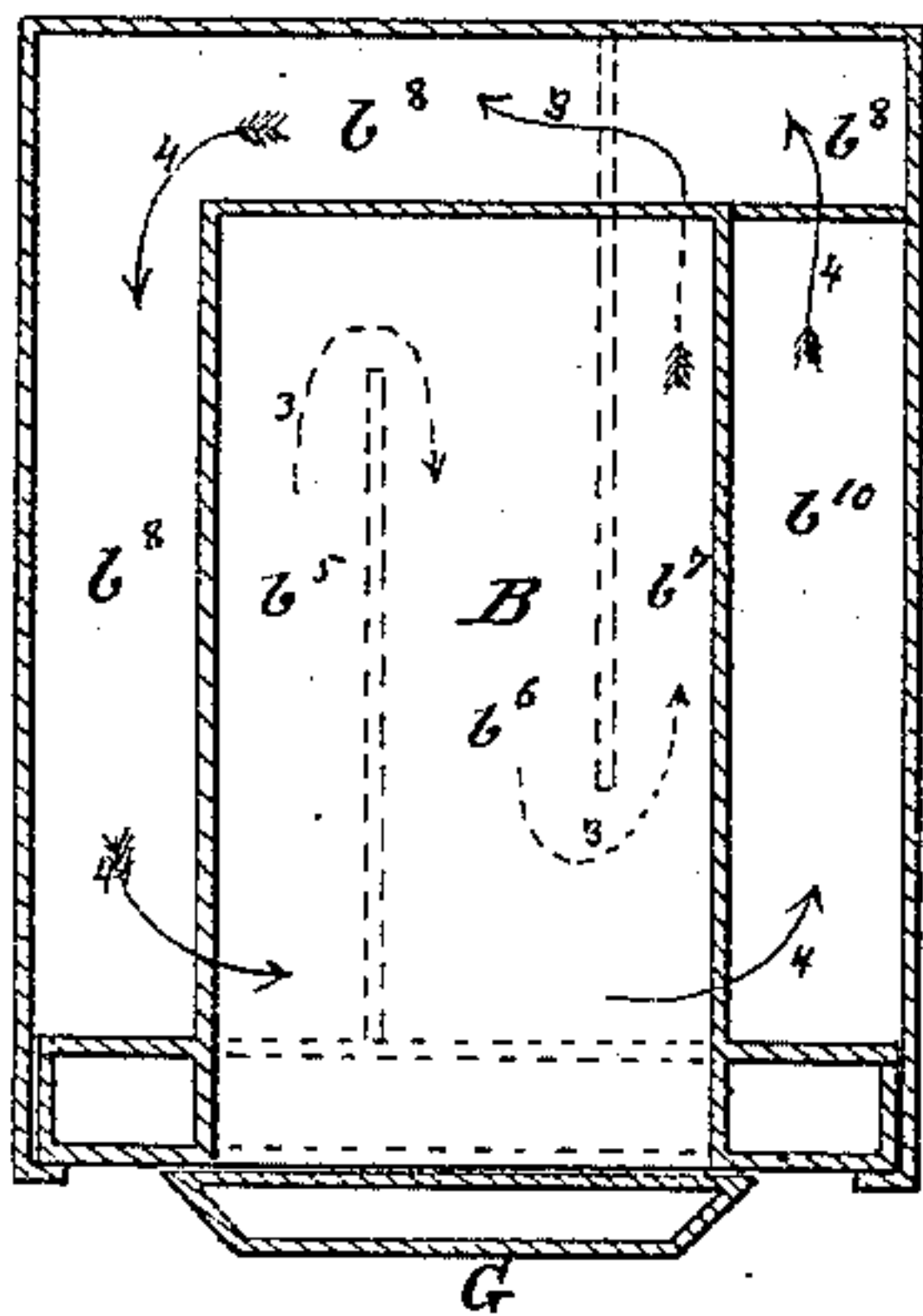


Fig. 10

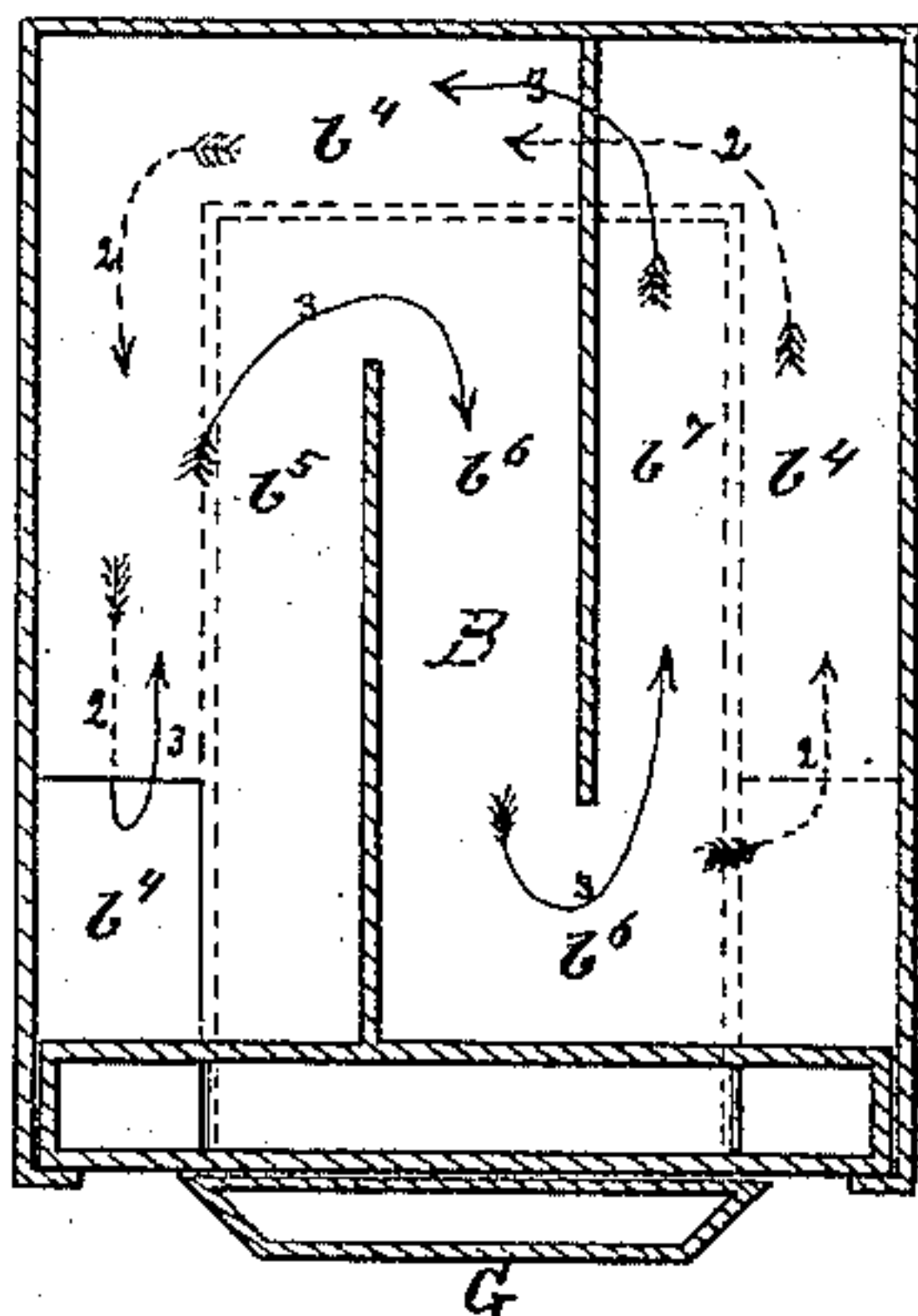
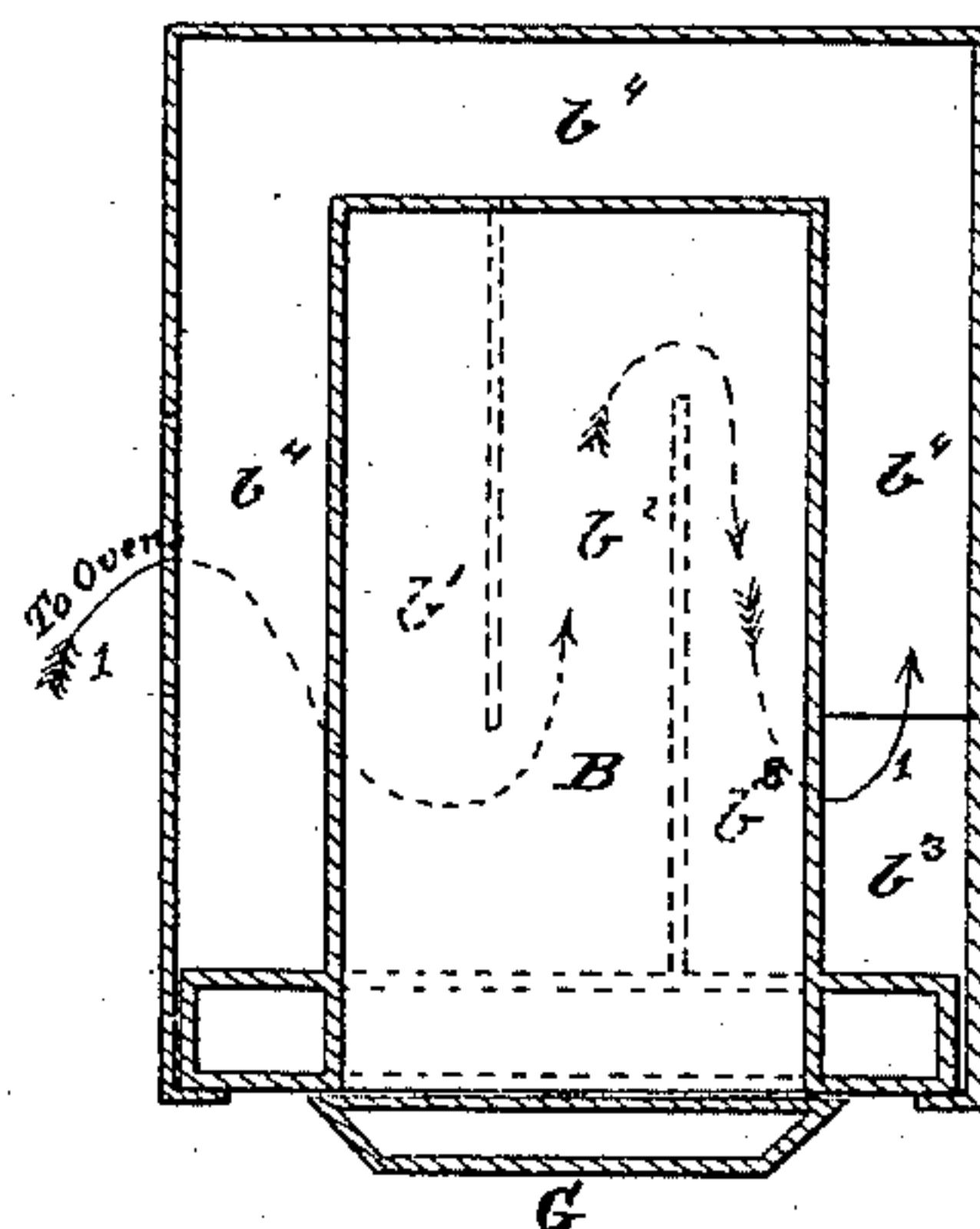


Fig. 11



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UNITED STATES PATENT OFFICE.

EDWIN O. BRINCKERHOFF, OF NEW YORK, N. Y.

IMPROVEMENT IN RANGES.

Specification forming part of Letters Patent No. 157,784, dated December 15, 1874; application filed November 14, 1874.

To all whom it may concern:

Be it known that I, EDWIN O. BRINCKERHOFF, of the city, county, and State of New York, have invented a new and useful Improvement in Elevated Boiler and Ovens for Cooking-Ranges, of which the following is a specification:

Figure 1 is a front view of my improved elevated boiler and ovens, illustrating their position with respect to a range, part of the front wall of the boiler being broken away to show the front flues. Fig. 2 is a vertical section of the boiler taken through the line $x x$, Fig. 1. Fig. 3 is a vertical section of the boiler taken through the line $x^1 x^1$, Fig. 2. Fig. 4 is a horizontal section of the boiler taken through the line $x^2 x^2$, Fig. 2. Fig. 5 is a horizontal section of the boiler and ovens taken through the line $y y$, Fig. 1. Fig. 6 is a vertical section of the oven taken through the line $z z$, Fig. 1. Fig. 7 is a vertical section of the oven taken through the line $z^1 z^1$, Fig. 6. Fig. 8 is a horizontal section of the oven taken through the line $z^1 z^1 z^2$, Figs. 6 and 7. Fig. 9 is a horizontal section of the oven taken through the line $z^3 z^3 z^3$, Figs. 6 and 7. Fig. 10 is a horizontal section of the oven taken through the line $z^4 z^4 z^4$, Figs. 6 and 7. Fig. 11 is a horizontal section of the oven taken through the line $z^5 z^5 z^5$ of Figs. 6 and 7.

Similar letters of reference indicate corresponding parts.

My invention has for its object to furnish an improved boiler and ovens to be placed upon a shelf above the range, and heated by the smoke and other products of combustion as they pass from the range to the chimney.

The invention consists in the combination of the circulation and exit flues in connection with an elevated boiler, to adapt it to be heated by the products of combustion as they pass from the range to the chimney; in the arrangement of the circulation and exit flues in connection with the elevated oven to adapt it to be heated by the products of combustion, as they pass from the range to the chimney; in the arrangement of the circulation and exit flues of the elevated boiler, and the circulation and exit flues of the elevated ovens, in connection with each other, to enable the products of combustion to be conducted around

both or either; in the arrangement of the base-dampers, in connection with the base-flues of the elevated boiler, to enable the direction of the products of combustion around the boiler and ovens to be controlled as desired; in the arrangement of the top dampers in connection with the exit-flues to enable the direction of the products of combustion through said flues to be controlled as desired.

A represents the boiler, which is designed to be placed upon a shelf arranged at a suitable distance above the range. B are the ovens, which are placed one upon each side of the boiler A, as shown in Fig. 1, and each of which consists of three baking-chambers placed one above the other, and surrounded and separated by flues b , as shown in Figs. 6, 7, 8, 9, 10, 11. The boiler A and ovens B are each surrounded by an outer case, the fronts of which are made with double walls inclosing air spaces or chamber, to prevent the loss of heat from the products of combustion by radiation, while said products are passing through the front flues. The doors G of the ovens are also made with double walls inclosing air-chambers to prevent the escape of heat from the ovens by radiation. The space below the level of the bottom of the boiler A is divided into four flues, a^1 , by a central partition and two side partitions, each of which three partitions is provided with an opening in its middle part closed by a damper, C. The side flues a^1 are separated from the space above them by horizontal partitions, having openings in their middle parts closed by dampers D.

I will describe the various flues, in connection with the course of the products of combustion, as they pass through said flues. The products of combustion, in all cases, pass from the flue leading from the range through openings in the rear part of the bottom of the outer case of the boiler A, into the rear part of the two central flues a^1 .

To heat the boiler without heating the ovens the three dampers C are closed, and the products of combustion pass into the two flues a^2 , which pass up the front of the boiler, pass back through the two flues a^3 , at the top of the boiler, and down through the flues a^4 , at the back of the boiler. At the lower ends of the flues a^4 the products of combustion pass

through openings in the side walls of said flues a^4 into the wide U-shaped flues a^5 at the sides of the boiler. At the upper end of the forward arms of the flues a^5 are formed openings which lead through the top wall of the outer case of the boiler into the flues H^1 , through which and through the flues H^2 the products of combustion pass into the chimney I. At the bottom of the forward arm of the U-flues a^5 openings are formed leading into the flues a^6 , the upper ends of which are closed, and at the lower ends of which are formed openings leading into the side flues a^1 , which openings are closed by dampers D, as hereinbefore described.

When the products of combustion, after passing around the boiler A, are to be taken around the ovens, the side dampers D are opened, which causes the products of combustion to pass from the flues a^5 a^6 down into the side flues a^1 , from which they pass into the flues b^1 under the inner part of the lower chamber of the ovens. At the forward ends of the flues b^1 they pass into the flues b^2 , beneath the middle part of said chamber. At the rear end of the flues b^2 they pass into the flues b^3 , beneath the outer part of said lower chamber. At the forward end of the flue b^3 the products of combustion pass up into the flue b^4 . The course of the products of combustion through the flues b^1 b^2 b^3 and into the flues b^4 is shown by the arrows 1, and the dotted lines in Figs. 6, 7, and 11. The flues b^4 pass around the outer side, the back, and the inner side of the lower chamber of the ovens, and at the forward or inner ends of said flues the products of combustion pass up into the flue b^5 , between the inner parts of the lower and center chambers. At the rear end of the flue b^5 the products of combustion pass into the flues b^6 , between the middle parts of the lower and center chambers. At the forward end of the flue b^6 the products of combustion pass into the flue b^7 , at the rear end of which they pass up into the flues b^8 . The course of the products of combustion through the flues b^4 b^5 b^6 b^7 and into the flues b^8 is indicated by arrows 2 and 3, and by dotted lines in Figs. 6, 7, and 10. The flue b^8 passes around the rear and inner sides of the center chambers of the ovens, and at its forward end the products of combustion pass up into the flue b^9 , which passes transversely between the forward parts of the center and upper chambers. At the outer end of the flue b^9 the products of combustion pass down into the flues b^{10} , which passes along the outer side of said center chamber, and at the rear end of which the products of combustion pass up into the flue b^{11} . The flue b^{11} passes transversely between the rear parts of the center and upper chambers, and at its inner end the products of combustion pass into the flue b^{12} , which passes transversely between the middle parts of the center and upper chambers. At the outer end of the flue b^{12} the products of combustion pass up into the flue b^{13} . The course of the products of

combustion through the flues b^8 b^9 b^{10} b^{11} b^{12} and into the flue b^{13} is indicated by the arrows 4, 5, and 6, and by dotted lines in Figs. 6, 7, and 9. The flue b^{13} passes along the outer side of the forward part of the upper chamber, and at its forward end the products of combustion pass up into the flue b^{14} , which passes transversely across the forward part of the top of the upper chamber. At the inner end of the flue b^{14} the products of combustion pass down into the flue b^{15} , which passes along the inner side, the rear end, and the rear part of the outer side, and at its outer end the products of combustion pass up into the flue b^{16} . The flue b^{16} crosses the rear part of the top of the upper chambers of the ovens, and at its inner end the products of combustion pass into the inner end of the flue b^{17} , which crosses the middle part of the top of the upper chambers of the ovens. From the flue b^{17} the products of combustion pass up through openings in the top plate of the outer case of the ovens into the flues H^4 , from which they pass into the flues H^2 . From the flue H^2 of the right-hand oven the products of combustion pass directly into the chimney I, and from the flue H^2 of the left-hand oven they pass up into the top flue H^5 , through which they pass into the chimney I. In the partition which separates the two flues H^4 is formed an opening, closed by a damper, E. F are dampers, which close the opening between the flues H^3 H^2 , or between the flues H^4 H^2 , according to the position in which they are placed. The course of the products of combustion through the flues b^{13} b^{14} b^{15} b^{16} b^{17} and through the flues H^4 H^5 and H^2 , into the chimney I, is shown by the arrows 6 and 7 in Figs. 6, 7, and 8. When the products of combustion are to be sent around the ovens before passing around the boiler, the four dampers D are closed, and the side dampers C are opened. In this case, if the dampers between the flues H^4 and H^2 are closed, the products of combustion will pass from the flues H^4 down into the flues a^3 , and after passing around the boiler in the direction hereinbefore described, they escape, the one part through the flues H^1 H^2 , and the other part through the flues H^1 H^2 H^3 into the chimney I. The lower dampers D C remaining as last described, if the dampers F are adjusted to close the openings between the flues H^3 and H^2 , and open the openings between the flues H^4 and H^2 , the products of combustion will pass directly to the chimney without passing around the boiler A. The center dampers C and E are only opened when the products of combustion are to be sent around only one of the ovens.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. The combination of the flues a and H , in connection with an elevated boiler, A, to adapt it to be heated by the products of combustion as they pass from the range to the chimney, substantially as herein shown and described.

2. The combination of the flues *b* and *H*, in connection with the elevated oven *B*, to adapt it to be heated by the products of combustion as they pass from the range to the chimney, substantially as herein shown and described.

3. The combination of the flues *a* and *H*, of the elevated boiler *A*, and the flues *b* *H*, of the elevated ovens *B*, in connection with each other, to enable the products of combustion to be conducted around both or either, substantially as herein shown and described.

4. The combination of the dampers *C* and *D*, in connection with the base-flues *a*¹ of the

elevated boiler *A*, to enable the direction of the products of combustion around the boiler and ovens to be controlled as desired, substantially as herein shown and described.

5. The combination of the dampers *E* *F*, in connection with the flues *H*, to enable the direction of the products of combustion through said flues to be controlled as desired, substantially as herein shown and described.

EDWIN O. BRINCKERHOFF.

Witnesses:

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T. B. MOSHER.