

L. PATRIC.  
Hot-Air Furnaces.

No. 150,603.

Patented May 5, 1874.

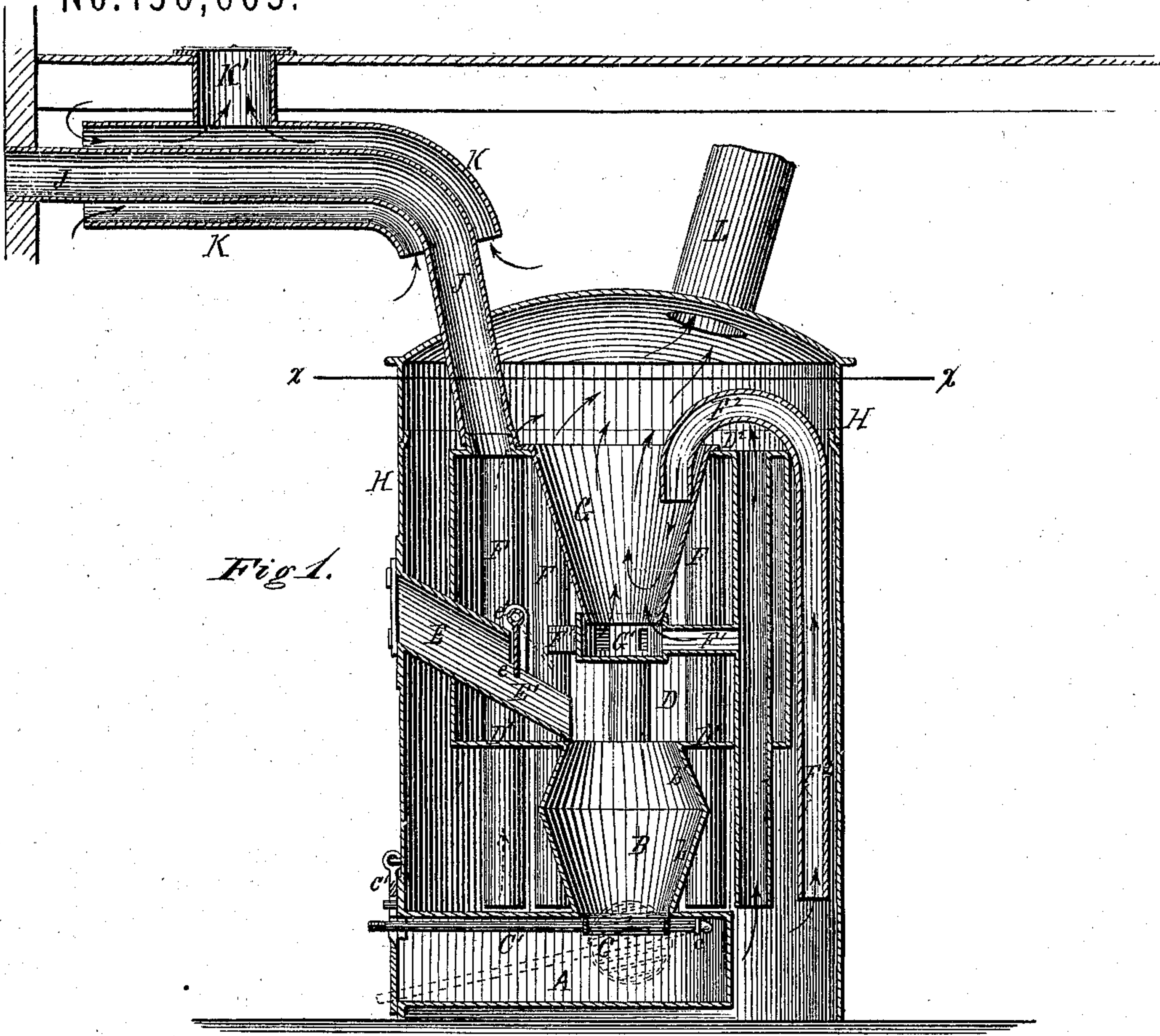


Fig. 1.

Fig. 2.

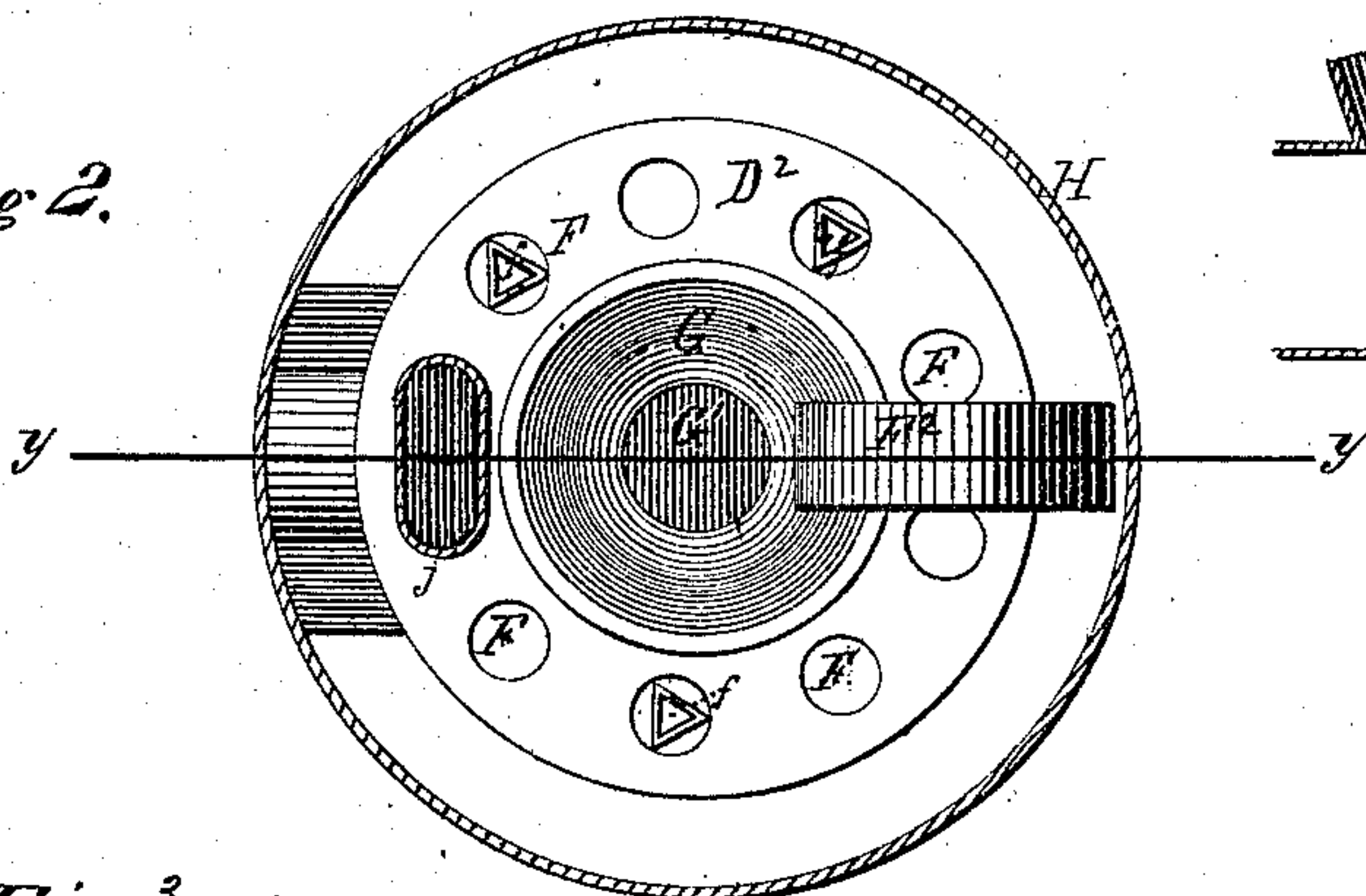


Fig. 4.

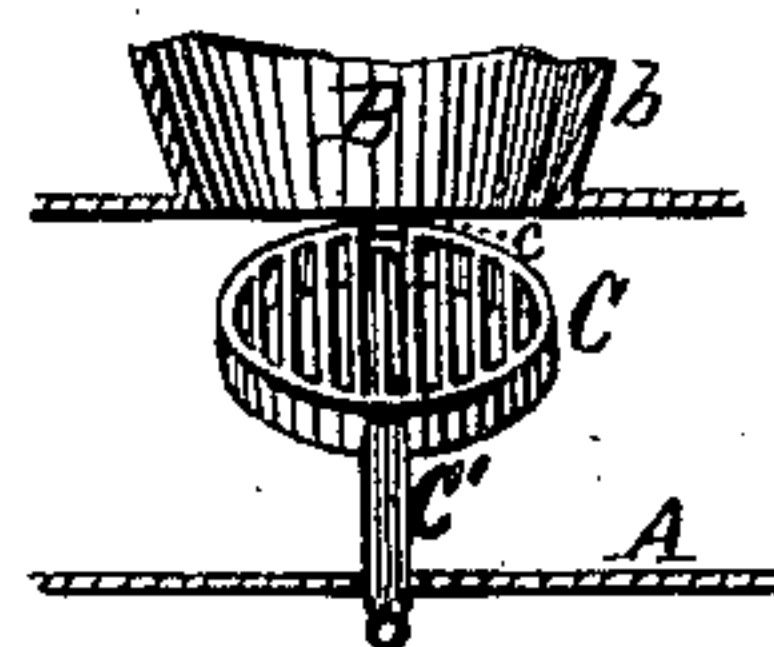
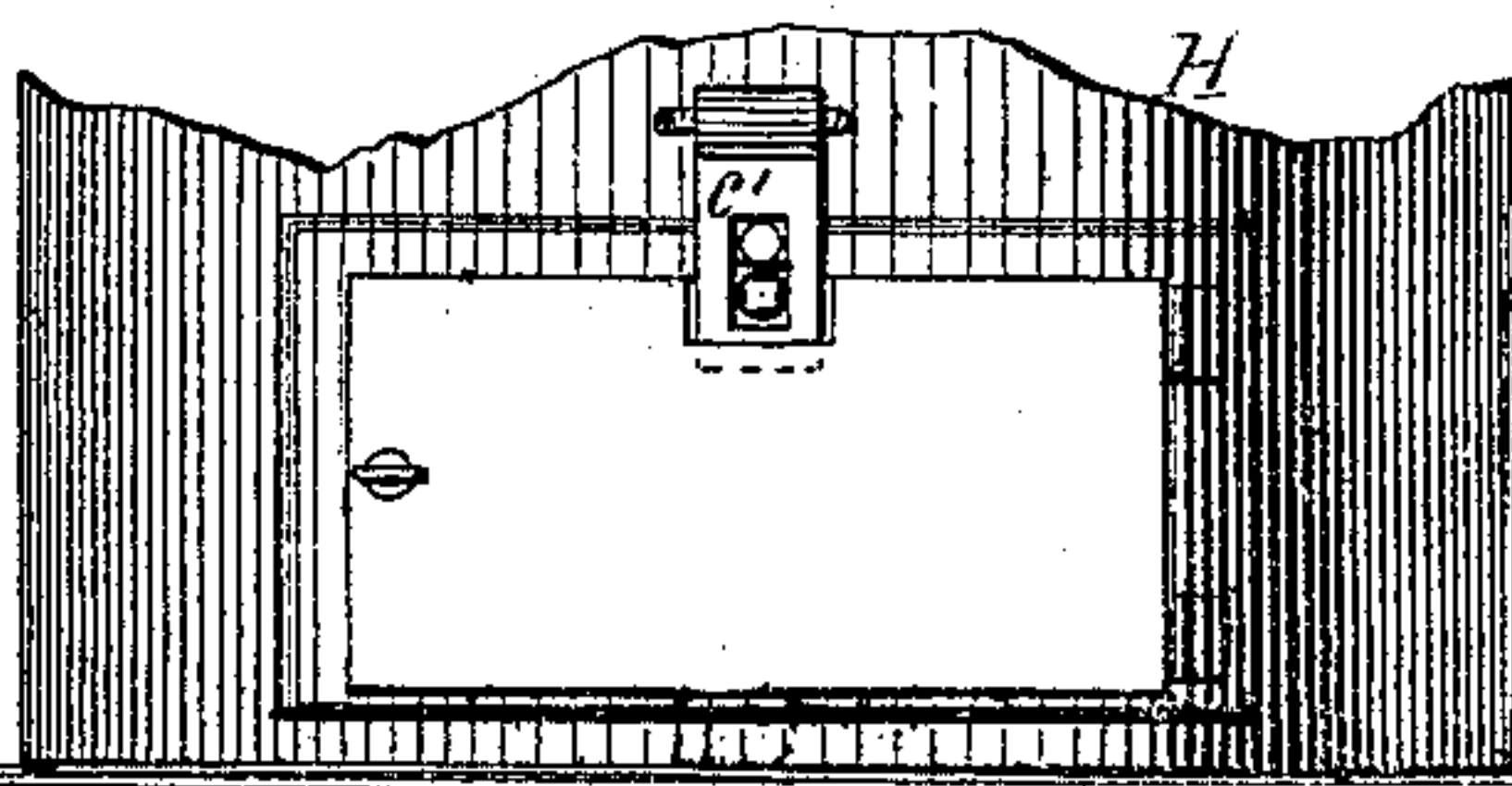


Fig. 3.



Witnesses.

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# UNITED STATES PATENT OFFICE.

LEWIS PATRIC, OF SPRINGFIELD, OHIO.

## IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. 150,603, dated May 5, 1874; application filed February 12, 1874.

*To all whom it may concern:*

Be it known that I, LEWIS PATRIC, of Springfield, county of Clarke and State of Ohio, have invented certain new and useful Improvements in Hot-Air Furnaces, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making part of this specification, in which—

Figure 1 represents a vertical section through the furnace. Fig. 2 is a plan or top view of the furnace, with the top or cover of the casing removed. Fig. 3 is a front elevation of the ash-pit door and grate-pivot and holder; and Fig. 4 is a perspective view of the grate, with the bottom of the fire-pot in section.

Similar letters of reference denote corresponding parts wherever used.

The invention consists in the combination, with the central inverted heating-frustum, of bent external flues or pipes, and also of a series of lateral flues connecting the vertical through flues with the central heating-frustum for conveying air thereto, as hereinafter described. The invention further consists in a novel manner of combining the grate of an inclosed furnace with the central fire-pot by means of a swiveling or tumbling joint in rear of the fire-pot, and a long pivotal arm or lever extending outside of the casing, and supported by a detachable loop or equivalent device, in such manner that the grate may be either rotated on said long arm and pivot for discharging its contents, or depressed at its front by means of the long pivotal arm or lever, for the removal of cinders without putting out the fire, all as hereinafter set forth.

In the accompanying drawing, A represents the base or ash-pit of the furnace; B, the fire-pot, which, by preference, is made in the form of two frustums,  $b$   $b'$ , joined at their bases with the grate C arranged at the bottom of the lower or inverted frustum  $b$ , and the combustion-chamber D, and coal-chute E at the top of the upper one, as shown in Fig. 1. The grate C, which may be of any usual or preferred construction, is provided with a long horizontal shaft or pivot,  $C'$ , extending from a point outside the casing of the furnace to a point in rear of the fire-pot, and is connected at its rear end by a loose swivel or tumbling

joint with a loop or eye,  $c$ , which permits the rotation of the grate for dumping its contents into the ash-pit, and also permits the forward end of the grate-pivot to be depressed, as shown in dotted lines, Fig. 1, for cleaning the grate of cinders or ashes without dumping the other contents of the fire-pot. The forward long arm of the pivot, extending from the central fire pot and grate to the outer face of the casing, constitutes a lever for depressing or raising the grate, as desired, and is supported in a pendent hinged loop,  $c'$ , which is swung outward and releases the pivot or arm  $C'$ , when it is desired to depress the forward edge of the grate. The front end of the pivot-lever arm  $C'$  is squared to receive a wrench for rotating or dumping the grate when desired. The combustion-chamber D is made by preference cylindrical in form, and is connected at top and bottom with perforated disks  $D^1$   $D^2$ , the latter,  $D^2$ , being connected with the top and forming the cover of the combustion-chamber D. These disks are provided each with a series of perforations for the reception of vertical pipes or tubes F, which extend below the lower disk  $D^1$  outside of and around the fire-pot for the reception and passage of cold air from the bottom of the heating-chamber through the combustion-chamber, to be heated during such passage. The upper disk  $D^2$ , directly over the fire-pot, is perforated centrally to receive an inverted frustum of a cone, G, open at the top and closed at the bottom, closely connected with the disk or cover  $D^2$ , to prevent the escape of gases into the heating-chamber. The lower small end of this inverted frustum G has connected to it either directly or through the intervention of a closely-fitting cylindrical cup,  $G'$ , a number of horizontal air-tubes,  $F^1$ , which, at their outer ends, connect with and receive air to be heated from the ascending flues F, conducting a portion of the air to the heating-frustum G. If desired, additional pipes  $F^2$  may be employed, arranged outside of the combustion-chamber D, with the upper end curved and entering the open end of the inverted frustum G, and passing down any desired distance within said cone, as shown, for supplying air to said frustum. The flaring form given to this central heating-chamber G serves to deflect the ascending column of heat



and other products of combustion outward against and around the vertical flues F, which are arranged around said inverted frustum, and in close proximity to its upper larger end, thereby giving increased efficiency to the volume of heat by causing it to act upon both the central heating-chamber and upon the surrounding vertical flues. This form of the heating-chamber G also provides for the rapid expansion and ready discharge, at the upper enlarged open end, of the air admitted at or near its lower end by the lateral and curved flues F<sup>1</sup> F<sup>2</sup>, as explained. At one side of the frustum G the disk or cover D<sup>2</sup> is provided with a collar at j for the reception of the smoke-pipe J, which, passing upward through the top or cover of wall or casing H, is deflected and connected with the chimney or smoke-flue.

Aside from the feature particularly described above, the furnace may be constructed and inclosed in any usual or preferred manner.

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

1. The combination, with the central inverted heating-frustum G, of the outer bent flues F<sup>2</sup> and the lateral flues F<sup>1</sup> connecting said frustum with the through-flues F, all arranged and operating as described.

2. In a heating-furnace, organized and operating substantially as described, the combination; with the central fire-pot and its inclosing-case, of a grate pivoted in rear of the fire-pot, and supported in front by the long pivotal lever-arm O' and pendent loop c', whereby said grate is adapted to be either rotated or depressed at its forward edge, as set forth.

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Witnesses:

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