

W. H. LOTZ.  
HOT-AIR FURNACES.

No. 177,857.

Patented May 23, 1876.

Fig. 2.

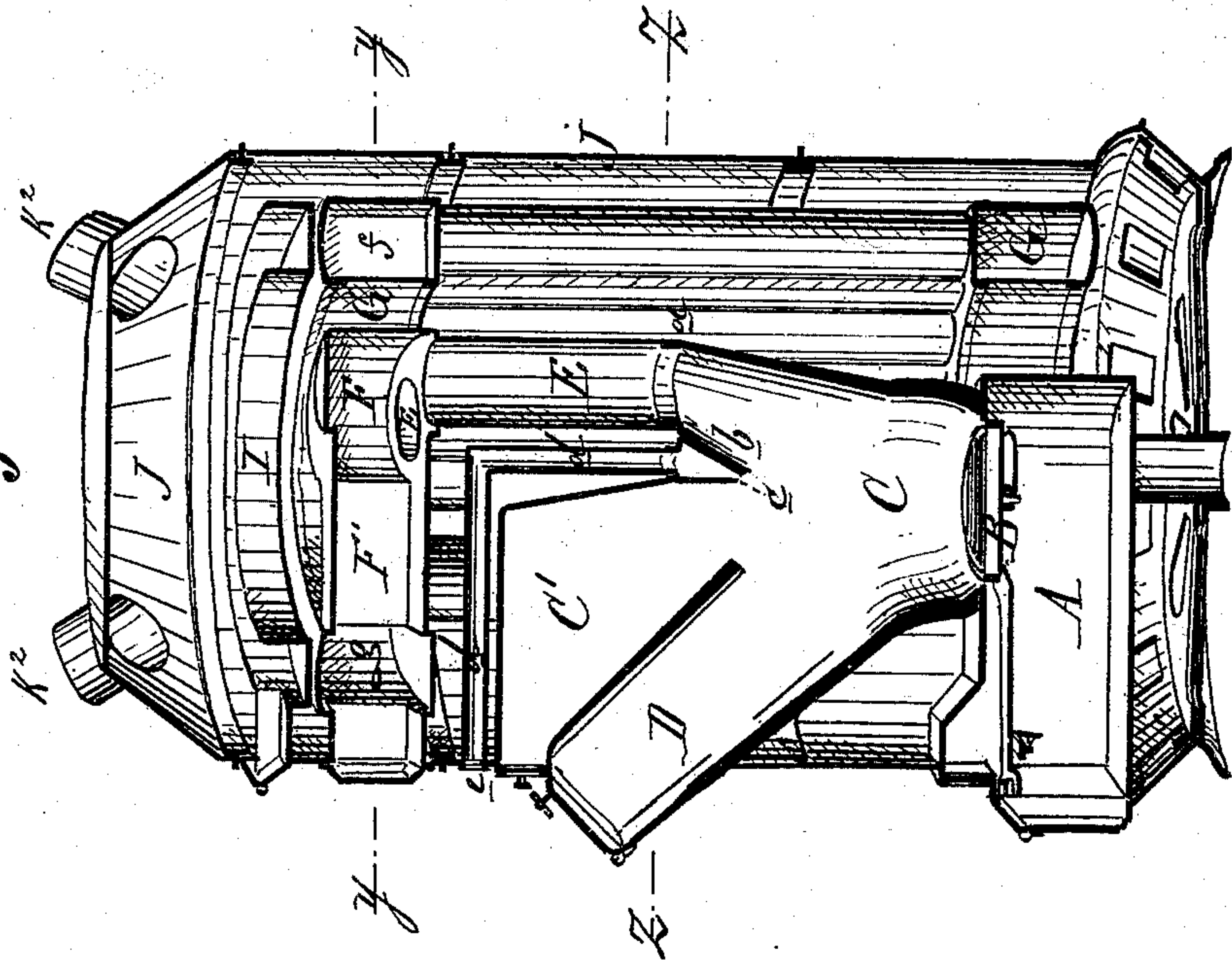
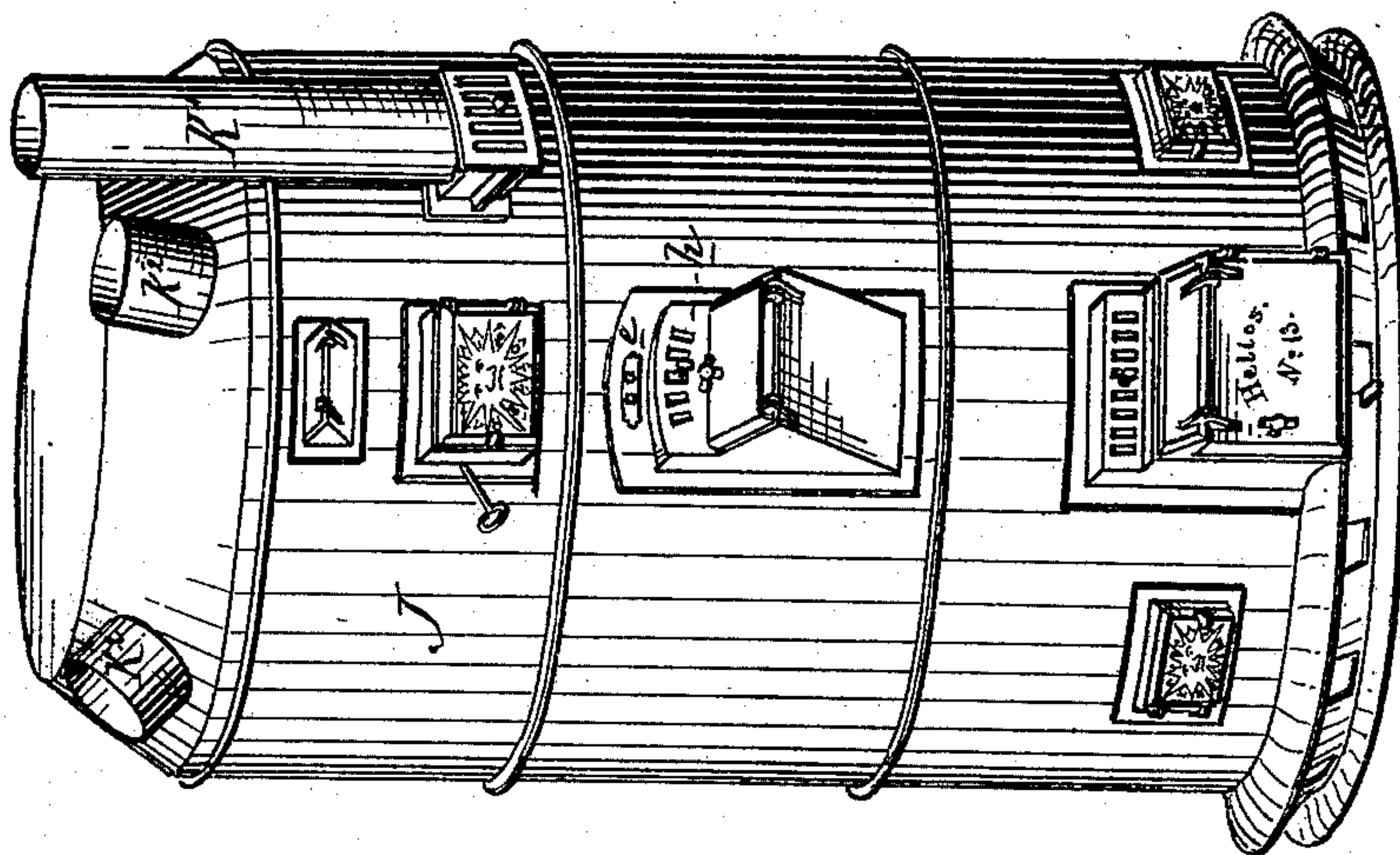


Fig. 1.



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Fig: 3

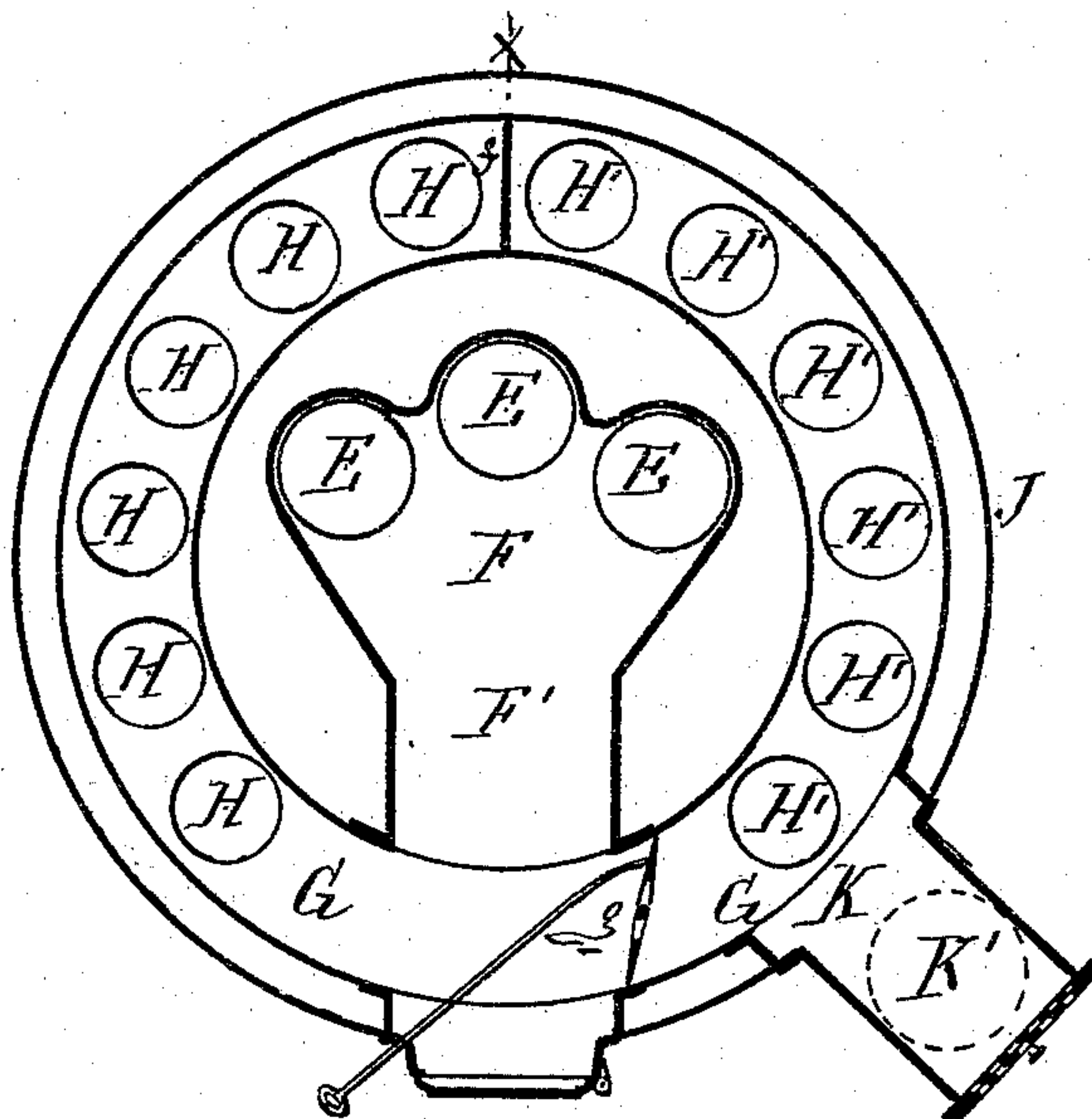
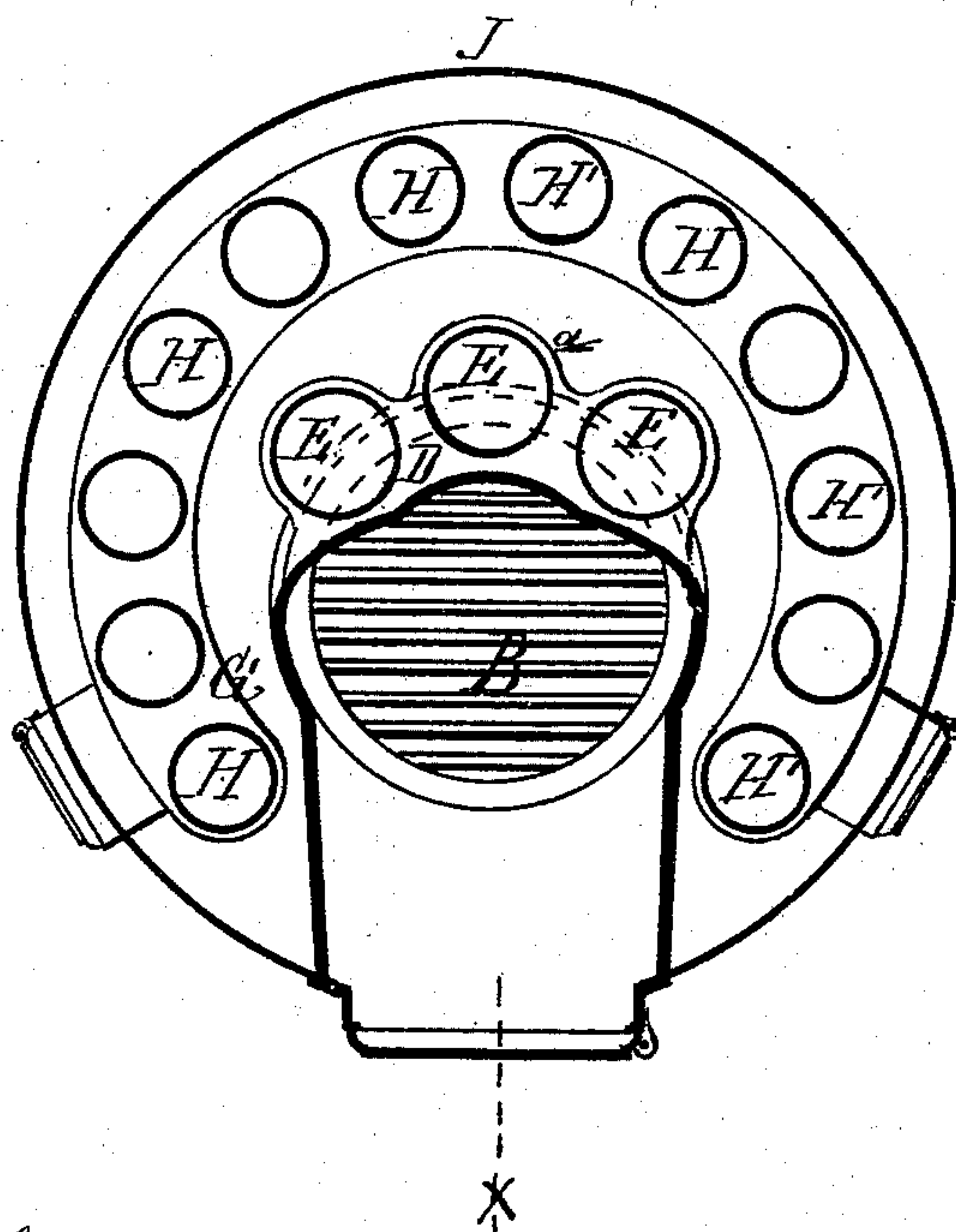


Fig: 4.



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# UNITED STATES PATENT OFFICE.

WILLIAM H. LOTZ, OF CHICAGO, ILLINOIS.

## IMPROVEMENT IN HOT-AIR FURNACES.

Specification forming part of Letters Patent No. **177,857**, dated May 23, 1876; application filed July 9, 1875.

*To all whom it may concern:*

Be it known that I, WILLIAM H. LOTZ, of Chicago, in the county of Cook and State of Illinois, have invented an Improvement in Hot-Air Furnaces, of which the following is a specification:

The nature of my invention relates to certain improvements in the air-heating furnace for which Letters Patent were issued to me August 11, 1874; and on October 27, 1874, for an improvement thereon; and has for its object to secure a more perfect combustion of the gases, through the means more fully hereinafter set forth and claimed.

Figure 1, Sheet 1, is a perspective view of my improved portable furnace. Fig. 2 is a vertical section at *x x*. Fig. 3, Sheet 2, is a horizontal section at *y y* in Fig. 2. Fig. 4 is a similar section at *z z* in the same figure.

In the drawing, A represents the ash-pit, having a circular opening in its top plate, in which is hung a grate, B. A fire-pot, C, rests upon the ash-pit, and incloses the grate-opening. The back part of the fire-pot is higher than the front, and is covered by a flat plate, *a*, whose shape is that of an irregular segment, in front of which there is a combustion-chamber, C', into the lower front part of which is carried an inclined fuel-chute, D, whose lower wall forms a prolongation of the front of the fire-pot. The upper end of the chute extends through the casing J, and is provided with a fuel-door. Between the inner edge of the plate *a* and the back wall of the combustion-chamber there is a pendent hollow bridge-wall, *b*, extending transversely across the combustion-chamber, with a narrow slit, *c*, along its lower edge for the delivery of air, which is carried to it by a bent pipe, *d*, extending up the back and over the top of the combustion-chamber, and through the casing, the volume of air admitted being regulated by a register, *e*. From the plate *a* three flues, E, rise into a horizontal flue-chamber, F, connected at the front by a passage, F', with an outer annular flue-chamber, G, at one side of which there is an exit-flue, K, carried out through the casing to a smoke-pipe, K'. G' is a segmental flue-chamber, which nearly surrounds the ash-pit. The annular flue G is divided into two parts by a partition, *f*, at the

back. Access is had to the front part by a door, at one side of which is a revertible draft-damper, *g*, which closes the said flue to the passage of the gases of combustion to the exit-flue, in which case they are compelled to pass into the left side of said flue G, thence down into the segment G', through six drop-flues, H; thence up through six ascending flues, H', to the right side of the flue G before finding an exit therefrom. Access is had to the flue G' through doors and passages through the casing, to remove accumulations of dust deposited therein. I is an annular evaporating-pan, supported by short legs above the annular flue G. J is the casing of the furnace, and K<sup>2</sup> are the hot-air flues issuing from its top.

The fuel-chute is inclined at the angle at which coal will fall from a pile, and serves as a magazine, in which the fuel is coked and caused to yield up its gases, which naturally rise and expand into the large combustion-chamber C', at the top of which there is a register, *h*, for admitting atmospheric air to mingle with them in the proper proportion to prepare them for ignition. The draft of the furnace is at the back part of the fire-pot, owing to the lesser depth of coal there, and the mixed air and gases are drawn back under the bridge-wall, where a thin stream of highly-heated air mingles with them at the proper temperature to ignite them, the ignition being secured by their passing over the incandescent fuel, in close proximity to its upper surface; so that clear flame alone will be found back of the bridge-wall, proof of which is found in the fact that bituminous coals of the poorest quality have been continuously consumed in such furnaces without giving off smoke.

What I claim as my invention is—

1. In an air-heating furnace, and in combination, the hollow bridge-wall across the back part of the fire-pot, and within the same, and having a narrow slit across its lower end, and an air-tube, having a register at its outer end, said tube passing over and behind the combustion-chamber, and its inner end terminating directly over the slit aforesaid, substantially as and for the purposes set forth.

2. In an air-heating furnace, the combina-



tion of the following elements, viz: a fire-pot, having an elevated combustion-chamber directly above and connected with it, and closed at the top; an inclined magazine-chute, adapted to deliver fuel to the front of the fire-pot; a hollow transverse bridge-wall, adapted to deliver a thin stream of hot air into the fire-pot back of the inner mouth of the magazine-chute; a tube with a register for admitting hot air to the gases of combustion before passing under the bridge-wall; and flues at the back of the fire-pot for carrying off the products of combustion, substantially as described.

3. In an air-heating furnace, the combination of the annular flue G, having the partition *f* and revertible damper *g*, the segment-

flue G', the diving and ascending flues H H', and the flues E, F, and F', and the fire-pot C, substantially as and for the purposes set forth.

4. In an air-heating furnace, in combination, the pendent bridge-wall within the fire-pot and across the same, the combustion-chamber, and the eduction-flues, for the purpose of interposing said bridge-wall and the current of hot air passing through it between the opening into the combustion-chamber and the opening into the eduction-flues, substantially as described and shown.

WILLIAM H. LOTZ.

Witnesses:

GEO. FROMMANN,  
CARL MEYER.