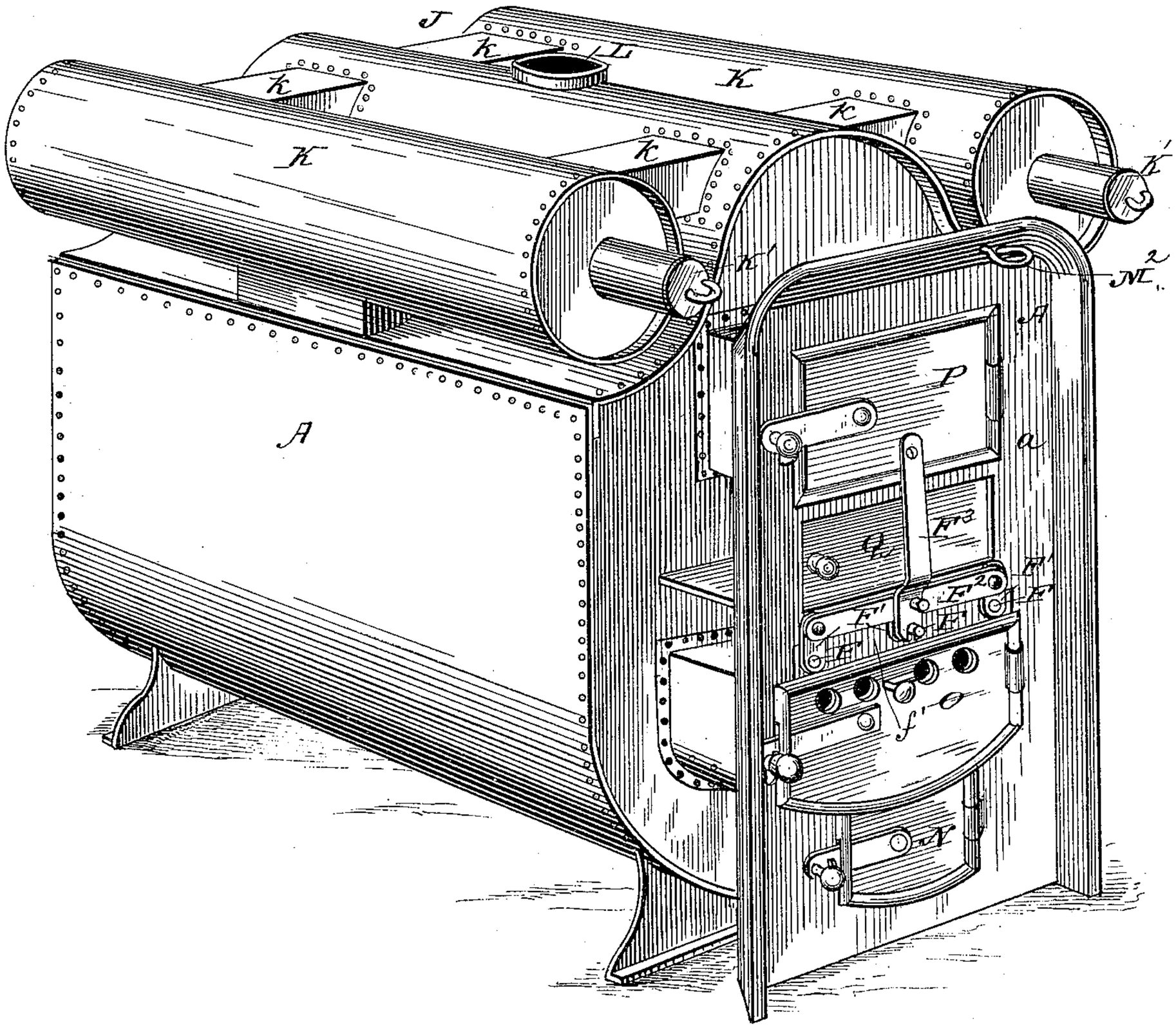
(No Model.) 3 Sheets—Sheet 1.

P. H. SCHEURER.

HOT AIR FURNACE.

No. 381,427. Patented Apr. 17, 1888.

Fig. 1



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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

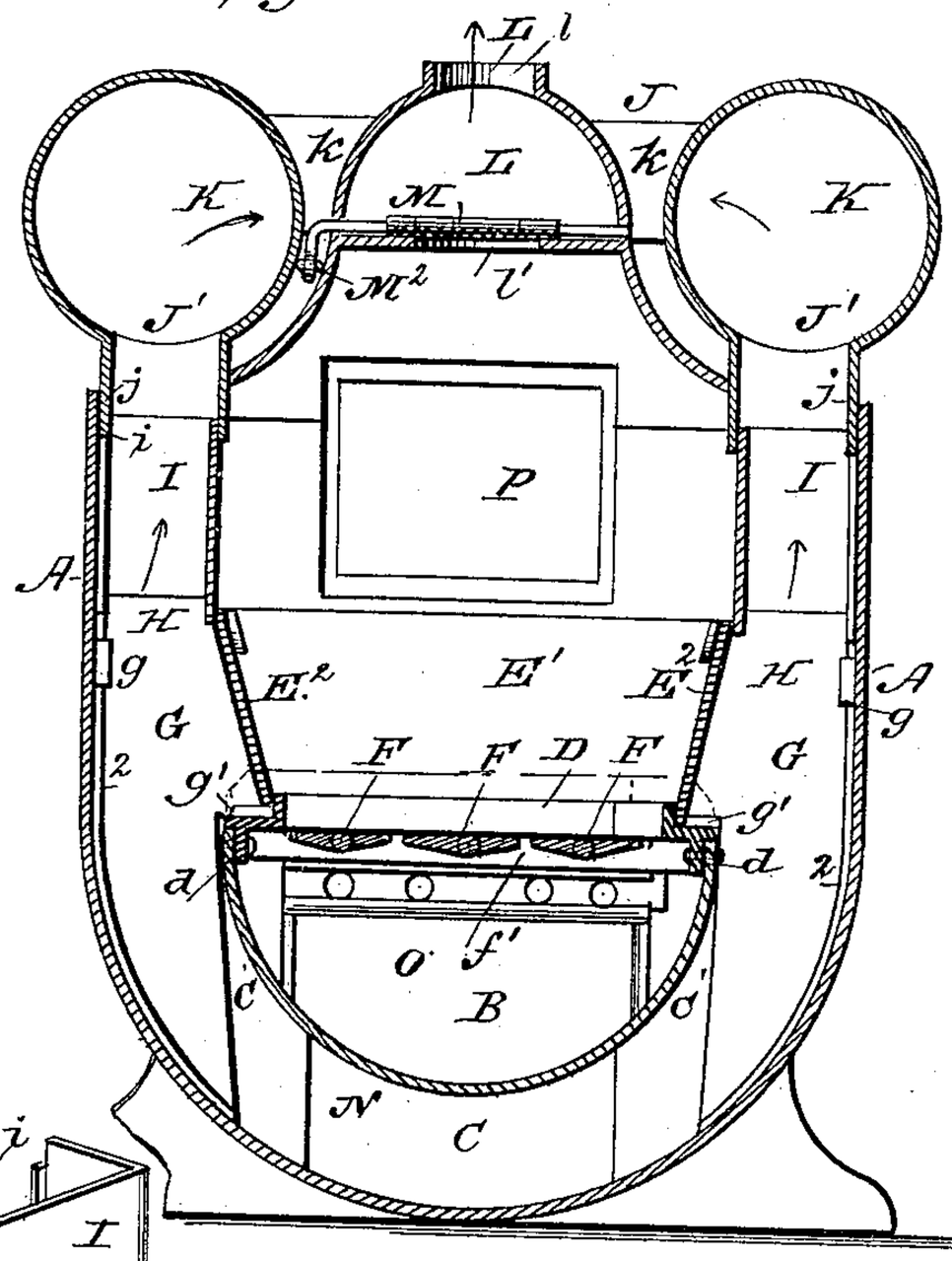

Fig. 4

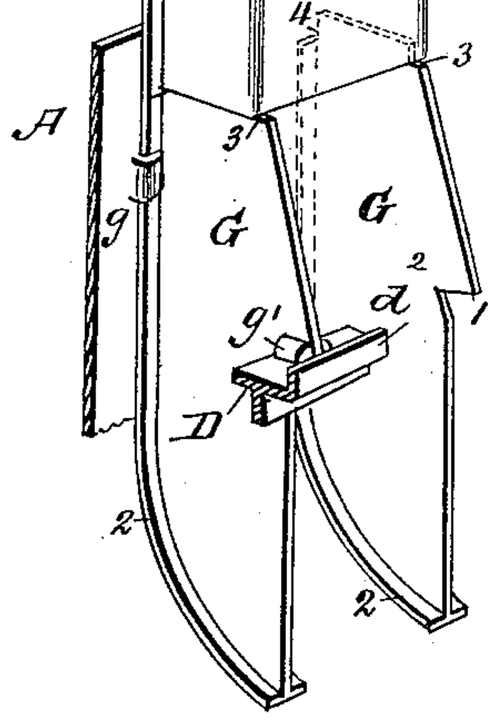

Fig. 5.

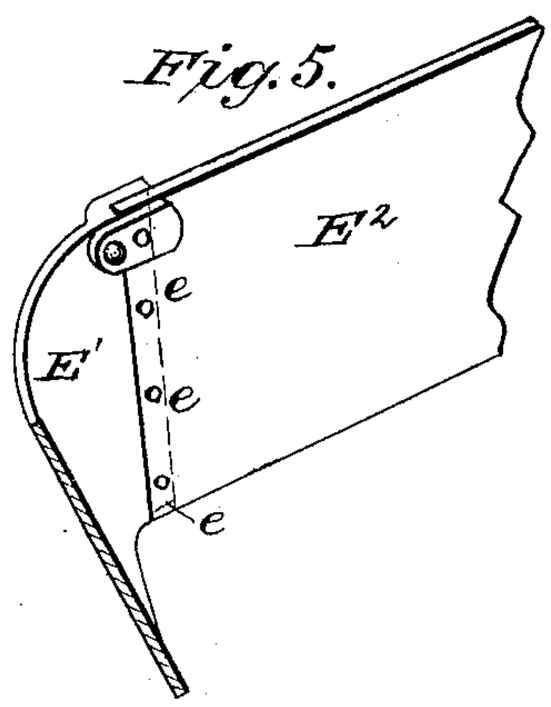

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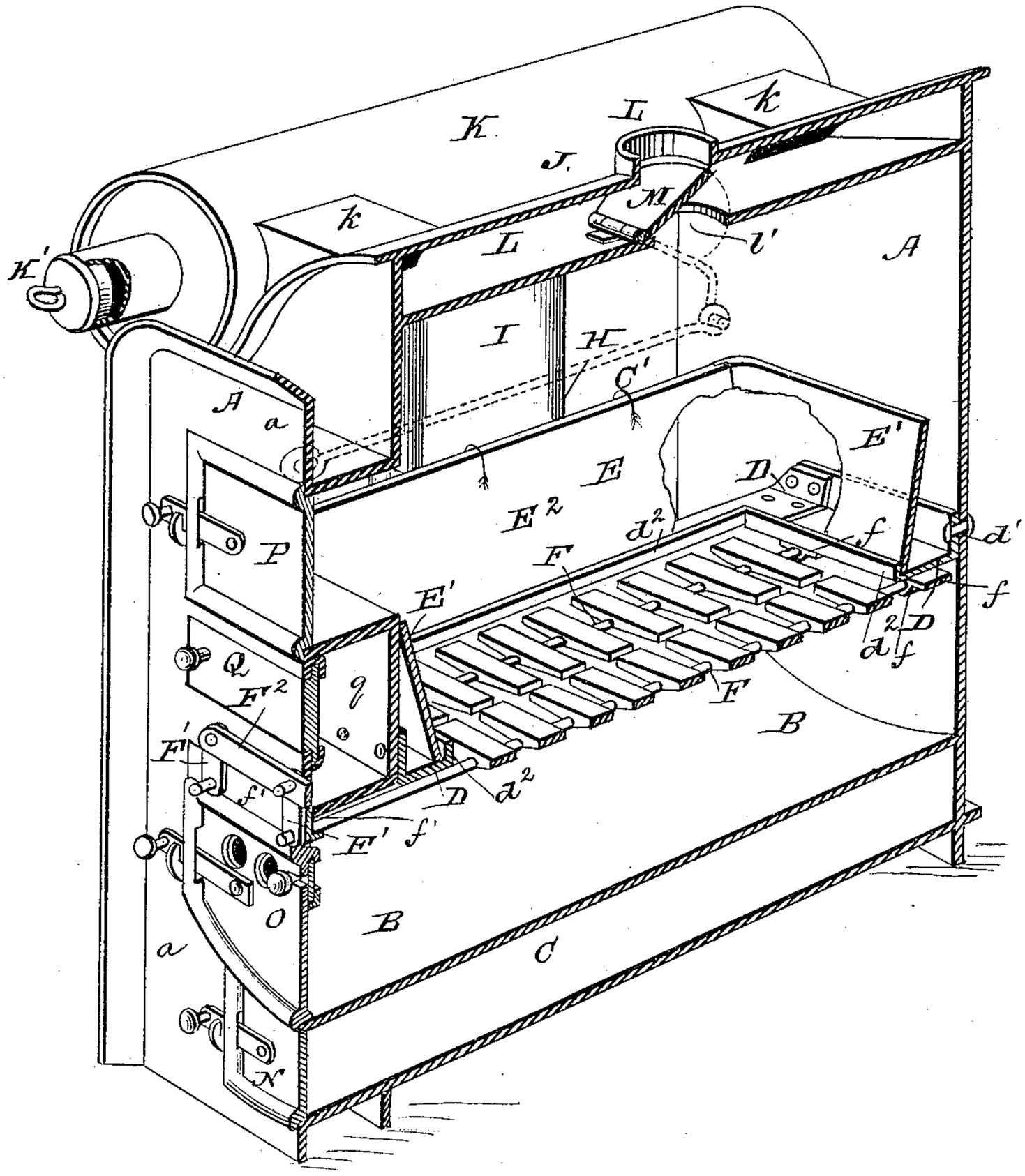
Fig. 3.



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UNITED STATES PATENT OFFICE.

PHILIP H. SCHEURER, OF NASHVILLE, ILLINOIS.

HOT-AIR FURNACE.

SPECIFICATION forming part of Letters Patent No. 381,427, dated April 17, 1888.

Application filed August 24, 1887. Serial No. 247,783. (No model.)

To all whom it may concern:

Be it known that I, PHILIP H. SCHEURER, of Nashville, in the county of Washington and State of Illinois, have invented a new and useful Improvement in Furnaces, of which the following is a specification.

This invention is an improved hot-air furnace; and it consists in certain novel constructions and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the drawings, Figure 1 is a perspective view of my furnace. Fig. 2 is a central vertical cross-section thereon. Fig. 3 is a central vertical longitudinal section in perspective of the furnace. Fig. 4 is a view showing the construction of the side flues and the supporting mechanism therefor, and Fig. 5 is a detail view of a part of the fire-pot.

The casing A is by preference formed of sheet-steel properly bolted together, and the furnace, except its face-plate *a*, is in practice incased in brick-work, (not shown,) as is common in hot-air furnaces. Within the casing, I support the ash-box B, the bottom of which is separated from the bottom of the casing forming the clean-out C, while its sides are also separated from those of the casing to form the air-passages C′, down through which the heat is directed in its passage to the central flues, hereinafter described. The grate-rest D is supported on the ash-box, and is usually made in two sections bolted together. This grate-rest is bolted at *d* to the ash-box, and may also be bolted at *d′* to the casing A, and is formed with an upwardly-projected flange, d^2, which serves as a bearing or guide to preserve the fire-pot E in proper position. This fire-pot fits over the flange d^2, and is formed of front and rear plates E′ and side plates E^2, lapped and bolted together at *e*, so that in use the construction will be firm and rigid, and yet may be taken apart when so desired. The rear bar of the grate-rest has bearings *f* for the rear ends of the grate-shafts F, and the forward ends of such shafts are journaled in a rest plate or bar, *f′*, bolted to the casing. At their forward ends the grate-shafts have cranks F′, connected by a pitman-bar, F^2, and which may be reciprocated by the wrench or lever F^3, as shown most clearly in Fig. 1.

The casing A and the grate-rest are provided at *g g′* with guides or supports for the partition-plates G, which form the side walls of the side flues, H. These plates G are all alike, and they are made of such length as to extend at their upper ends to the tops of the side plates of the fire-box, while their lower ends extend to a point within the clean-out, as shown. At their inner edges they have shoulders 1, which rest on the grate-rest, and their rear edges are provided with wings 2, or otherwise widened, to form a broader bearing against the main casing. Notches 3 are formed at the upper outer edges of the plates G, and similar notches or shoulders 4 are provided at the upper inner edge thereof, said notches being for engagement by the box-extensions I of the side flues, H, which extensions I fit at their lower ends over the upper ends of the plates G and snugly down against the side plates of the fire-box.

At their upper inner edges the box-extensions I have notches *i* for engagement by the depending side plates, *j*, of the top J, which latter are provided with openings J′, fitting over the box-extensions I. This top forms a drum, being provided with the side radiators or chambers, K K, and the central radiator or chamber, L, such chambers K and L being connected by passages or flues *k*, as shown.

The openings J′ lead into the bottoms of the side radiators, K, and such radiators have caps K′ at their forward ends, which caps may extend through the brick casing, and may be removed to enable the soot and other accumulations in the side radiators to be raked into openings J′, and so pass through the side flues down into the lower clean-out.

The central radiator, L, has an opening, *l*, through its top, communicating with the uptake or smoke-outlet, and through its bottom is formed an opening, *l′*, leading into the fire-box, and this opening *l′* is controlled by a valve, M, operated by a rod, M^2, so the said opening *l′* may be opened or closed at will.

Openings are provided through the furnace face-plate leading to the clean-out, the ash-box, and the fire-box, and such openings are closed, respectively, by doors N, O, and P. I also provide a door, Q, which may be a slide-door, and which communicates with a chamber or

water-compartment fitted to receive a vessel for holding water. This water vessel or pan may be used or not, as desired, and when used may be replenished through the door Q.

It will be seen that the grate, its rest, the fire-box, and the plates and box-extension forming the side flues are so made and connected that all of said parts may be placed and removed through the door P, thus avoiding the necessity of taking down any part of the brick casing.

When the fire is built, the valve leading into the central radiator may be opened to obtain a direct draft, and as soon as the fire is under way the valve may be closed and the heat forced downward, through the openings or air-passages C′ between the fire-box and casing, into the clean-out, and pass thence up the side flues into the side radiators, thence into the central radiator, whence it passes up the smoke-pipe.

Having thus described my invention, what I claim as new is—

1. The combination, in a furnace, of the casing, the ash-box located therein, and a clean-out formed below said ash-box, the fire-box, and the side flues formed between the fire-box and the casing and opening at their lower ends below the fire-box, and down flues or passages for the passage of the heat to the said side flues, substantially as set forth.

2. The combination of the casing, the fire-box therein and separated at its sides from the casing, forming spaces between the fire-box and casing, the plates G, fitted between the fire-box and casing and forming the flues H therebetween, the top having radiators, and the box-extensions I, extending between the said radiators and the plates G, substantially as and for the purposes set forth.

3. In a furnace, the combination of the casing, the ash-box, the grate-rest, the fire-box, and the side flues, said parts being formed in detachable sections, whereby they may be placed and removed through the fire-box door, substantially as set forth.

4. The combination of the main casing and the grate-rest therein, having guides *g g′*, the fire-box arranged above the grate-rest and separated at its sides from the casing, the furnace-top, the plates G, held in the guides *g g′*, and the box-extensions supported on plates G and extended therefrom to the furnace-top, substantially as set forth.

5. The combination of the casing, the top mounted thereon and having central and side radiators, the fire-box located in the casing and separated at its sides therefrom, the ash-box below said fire-box and the clean-out below the ash-box, and side flues extended from the side radiators of the top between the fire-box and casing and into the clean-out, substantially as and for the purposes specified.

6. The combination of the casing, the furnace-top, the fire-box located within the casing and separated therefrom, forming an air space or passage, and a flue connected at its upper end with the furnace-top, extended between the fire-box and casing, and open at its lower end, whereby the heat may be directed down between the fire-box and casing alongside of such flue, and thence upward therethrough to the furnace-top, all substantially as and for the purposes specified.

7. The combination of the casing, the top thereon, and the fire-box, grate, and rest D in said case, the plates G, fitted between the fire-box and casing and having shoulders 1 to bear on rest D, and provided with notches 3 and 4 at their upper ends, and the box-extension fitted on said plates and engaging the notches 3 and 4 thereof, substantially as set forth.

8. The combination of the casing, the ash-box and grate-rest therein, guides *g g′*, provided on the casing and grate-rest, the plates G, fitted between the fire-box and casing, and having shoulders 1 arranged to bear on the grate-rest between the guides *g′* thereof, and having wings 2 fitted to engage the guides *g*, and having notches 3 and 4 at their upper ends, and the box-extensions I, supported on the plates G and engaging the notches 3 and 4 thereof, substantially as and for the purposes specified.

9. A furnace having an ash-box, a fire-box, a clean-out below said ash-box, and air-passages leading from the clean-out into the fire-box, combined with the drum-like top, the side flues leading from said top into the clean-out, and a valve whereby the products of combustion may be permitted to pass directly from the fire-box through said top, or may be directed downward through the clean-out and side flues, and thence through the top, substantially as and for the purposes specified.

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