

No. 885,800.

PATENTED APR. 21, 1908.

A. SICHERT.
SMOKE CONSUMING FURNACE.
APPLICATION FILED JULY 23, 1908.

2 SHEETS—SHEET 3.

Fig. 3.

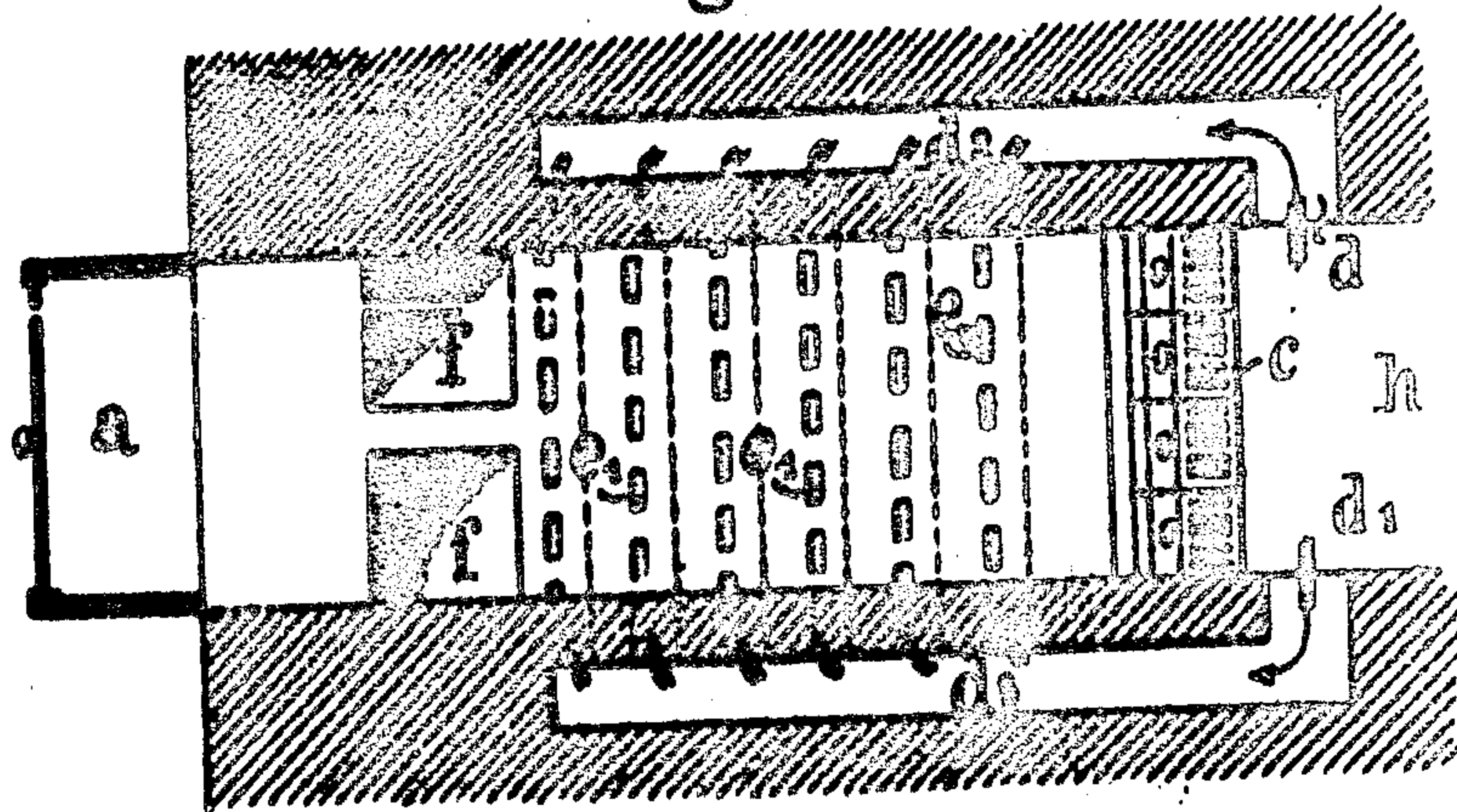
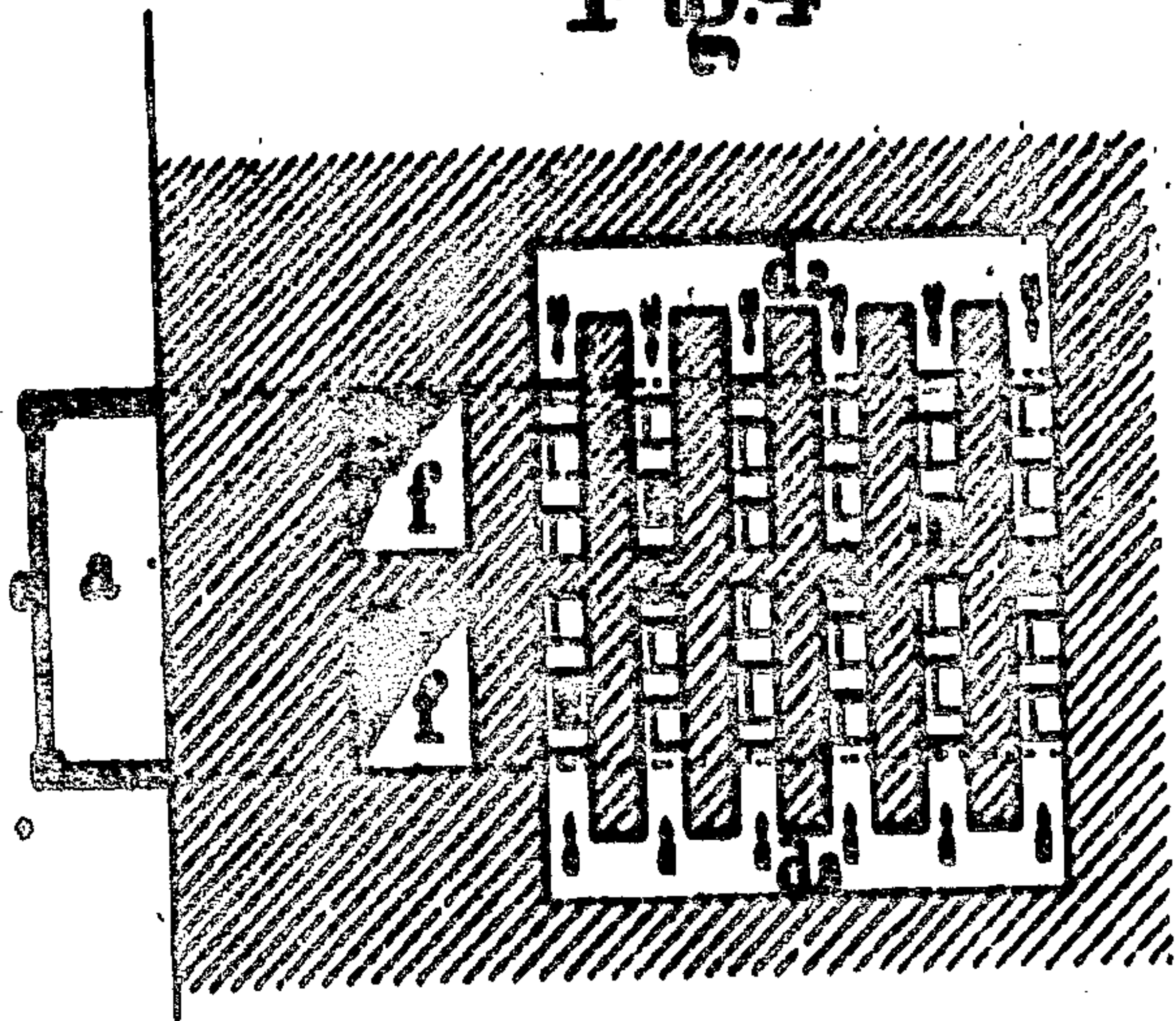


Fig. 4



Witnesses:

L. H. Keadon,

J. R. Wamlinger

Inventor:

Aloisichert,

by *[Signature]* atty.

885,300. SMOKE-CONSUMING FURNACE. ALOIS SICHERT, Carlsbad, Austria-Hungary. Filed July 25, 1906. Serial No. 327,602.

To all whom it may concern:

Be it known that I, ALOIS SICHERT, subject of the Emperor of Austria-Hungary, residing at Carlsbad, Austria-Hungary, have invented certain new and useful Improvements in Smoke-Consuming Furnaces, of which the following is a specification.

Heretofore, in all smoke-consuming furnace structures, so far as I am aware, satisfactory operation and entire absence of smoke have been more or less dependent upon the skilful attendance of a reliable stoker; such furnaces not giving complete satisfaction when in charge of careless attendants.

The subject of my invention is a furnace in which the fuel is burned entirely without smoke and which, by reason of its simplicity, can be operated by even the most inexperienced stoker; operating satisfactorily at all stages of combustion, without skilled attendance.

One constructional form of the furnace is shown in the drawing, wherein

Figure 1 is a vertical longitudinal section of the furnace on the line C, D, Fig. 2. Fig. 2 is a horizontal section on the line A, B, Fig. 1, looking upwardly. Fig. 3 is a section on the line E, F, Fig. 1, looking obliquely upward toward the crown of the arch; the right hand portion of the figure representing a diagrammatic section as along the line

G, H, Fig. 1, showing the manner in which air is supplied from the ash-pit to the lateral air passages, and Fig. 4 is a section on the line I, K, Fig. 1, looking obliquely downward.

The coal being placed into the feeding box *a*, slides therefrom over the inclined grate *b* to the flat grate *c* until the whole surface of the two grates is uniformly covered; the inclined grate *b* is provided at its upper half with narrow air apertures like a polygonal grate and at its lower half with wider longitudinal apertures; the flat grate *c* likewise has longitudinal apertures. The fire is started on the flat grate *c* and forms an intense flame-jet which extends over the inclined grate *b* to the flues *f*; during this operation the coal on the upper half of the inclined grate *b* up to the feeding box *a* gives off its gases and slides gradually downwards onto the flat grate *c* as the combustion on the latter proceeds, thereby continuously replacing the consumed coal. The feeding box *a* must always be kept full, in order to replace from the top the downwardly sliding coal. The necessary air is supplied to the grate through the air-valve *g* and this can be regulated in accordance with the degree of heat to be attained.

In the ash-pit immediately beneath the flat grate *c* are the inlet openings *d*, *d'* of the air-supply passages for consuming the smoke; through these passages the air previously heated in the ash-pit enters the ascending passages *d*², *d*³, passes into the arched passages *e*, is heated therein and passes through the apertures *e'* directly into the combustion chamber *a'* and combining with the flame produces a perfectly smokeless combustion; by this procedure all particles of smoke, soot and sulfur from the coal are entirely consumed; the flame burns quite white and passes out through the flues *f* as a perfectly smokeless flame into the chamber in which it is to be used for any special purpose. Moreover, in combination with each of the ascending flues *d*² and *d*³ a further air-supply passage *k* and *k'* is provided for the direct supply of external air, in order in the case of a coal containing a large amount of sulfur, to supply a sufficient quantity of air through the ascending flues *d*², *d*³ to the arched flues *e* and through these to the combustion chamber *a'*, when with a low fire the valve *g* is to a great extent closed. The passages *k*, *k'* can be controlled by dampers or the like.

If the grate surface is quite covered and an intense fire is required the valve *g* must be fully opened; by this means, a large quantity of air enters the ash pit *h* and passes from there through the air flues *d*², *d*³ into the arched flues *e* and through the apertures *e'* thereof into the combustion chamber *a'* and

this process keeps perfect step with the development of the fire in the combustion chamber *a'*; when a slower fire is desired, the valve *g* is more nearly closed the supply of air is less and therefore the fire is lowered. With a slower fire, less smoke is produced and less air is required to burn it; in this last case with coal containing a large amount of sulfur the supply of air can take place to the required degree through the passages *k*, *k'*.

The operation of the smoke consuming furnace as above described is therefore so to say automatic, since it is in intimate connection with the development of the process of combustion in the combustion chamber.

The object of this furnace is to produce a perfectly smokeless combustion with attention of the simplest kind and to utilize the fuel with the greatest efficiency, so that large economies in fuel and cost of working can be obtained as compared with the furnaces heretofore known.

Claims.

1. In a smoke consuming furnace, in combination, a fuel-supply box, an inclined grate, a substantially horizontal grate below said inclined grate, an ash-pit having a controllable air inlet, an integral arch extending entirely across the upper part of the combustion chamber, out of contact with the fuel, and having downwardly opening orifices

adapted to discharge air upon the upper surface of the fuel, lateral air-passages connecting the ash-pit with the arch orifices, independent means for supplying air to said lateral air-passages, and a discharge flue at the upper end of said arch, whereby the air and heated gases are passed over the entering fuel to burn the volatile elements thereof.

2. In a smoke consuming furnace, in combination a fuel-supply box, an inclined grate, a substantially horizontal grate below said inclined grate, an ash-pit having a controllable air inlet, an integral arch extending entirely across the upper part of the combustion chamber, out of contact with the fuel, and having downwardly opening orifices adapted to discharge air upon the upper surface of the fuel, lateral air-passages connecting the ash-pit with the arch orifices, supplemental controllable inlets for admitting external air to said lateral passages, and a discharge flue at the upper end of said arch, whereby the air and heated gases are passed over the entering fuel to burn the volatile elements thereof.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ALOIS SICHERT.

Witnesses:

LUDWIG KOHN;

KRISS A. SCHAFER.