

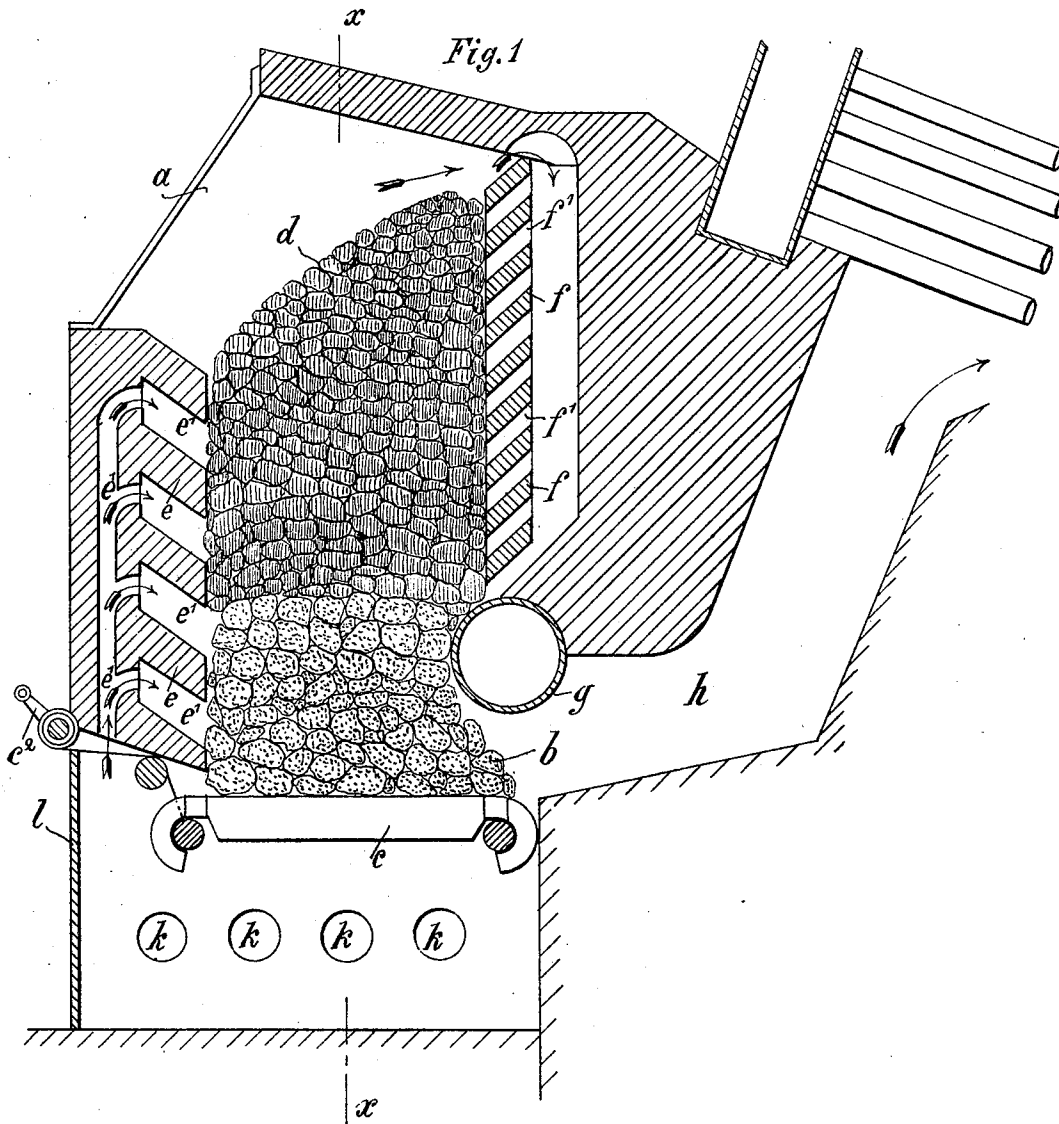
(No Model.)

3 Sheets—Sheet 1.

A. PAMPUS.  
SLOW COMBUSTION FURNACE.

No. 596,378.

Patented Dec. 28, 1897.



WITNESSES.  
*Julius Lott*  
*John Lott*

INVENTOR:  
*A. Pampus*  
BY *Munn & Co*  
ATTORNEYS.

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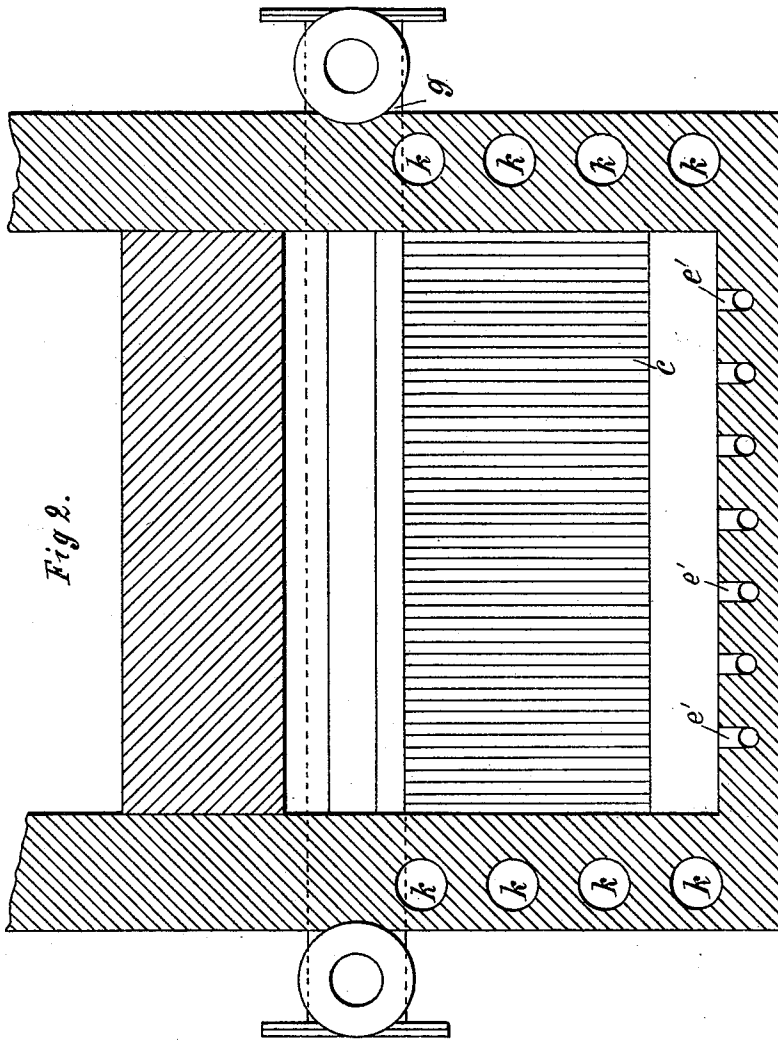


Fig 2.

WITNESSES.  
*Julius Lutz*  
*John Lott*

INVENTOR:  
*A. Pampus*  
BY *Munn & Co.*  
ATTORNEYS

(No Model.)

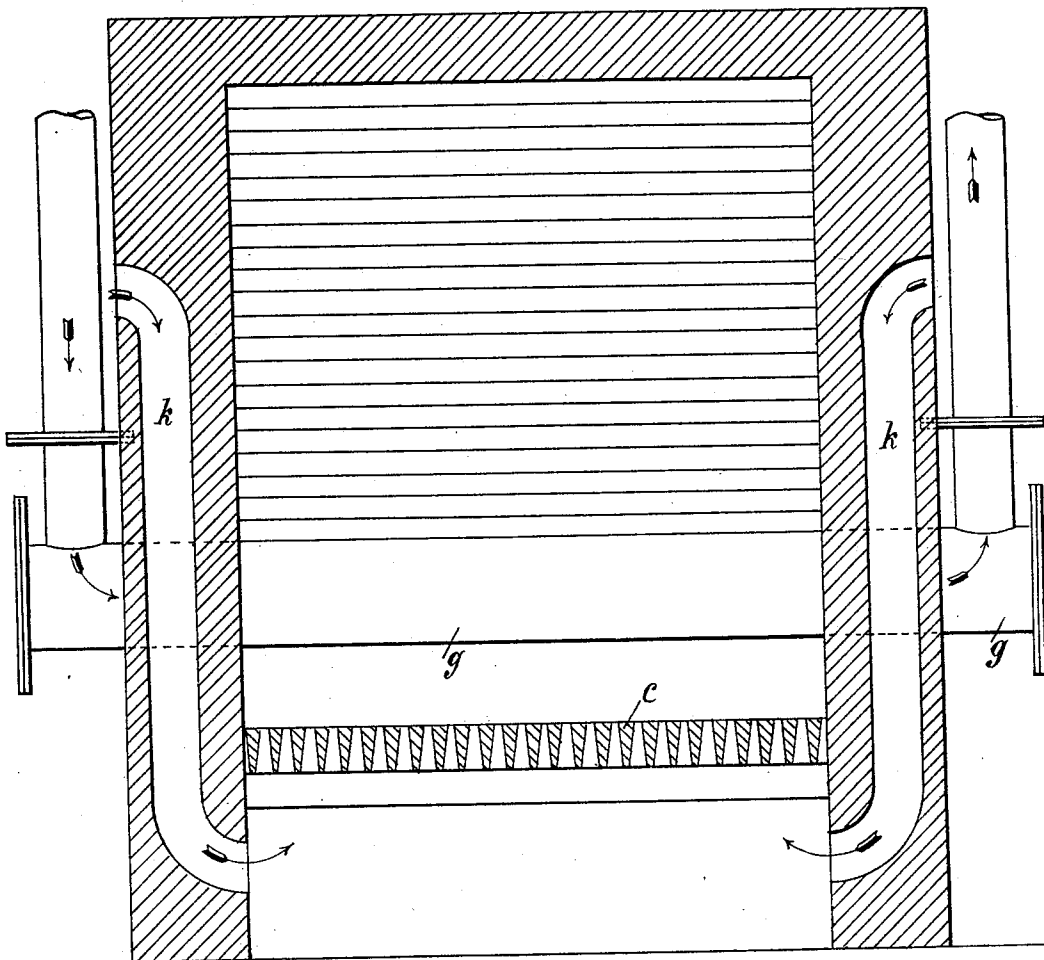
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*Fig 3.*



WITNESSES.  
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*John Lutz.*

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*A. Pampus*  
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ATTORNEYS.

# UNITED STATES PATENT OFFICE.

AUGUST PAMPUS, OF KIEL, GERMANY.

## SLOW-COMBUSTION FURNACE.

SPECIFICATION forming part of Letters Patent No. 596,378, dated December 28, 1897.

Application filed October 20, 1896. Serial No. 609,450. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST PAMPUS, engineer, of Nos. 13 to 17 Fleethörn, Kiel, in the German Empire, have invented Improvements in Slow-Combustion Grates or Furnaces, of which the following is a specification, reference being had therein to the accompanying drawings.

The disadvantage appertaining to slow-combustion furnaces and stoves has been hitherto that the air has been compelled to pass the fuel from below through the fire-grate. The passage from above through the feeding-orifice has not been possible on account of the resistance offered by the densely-packed column of fuel.

This invention has for its object the introduction of air in slow-combustion stoves from several sides along the whole column of fuel in such a manner that the gases developed from the fuel are completely saturated with air. The mixture of air and gas thus obtained requires, of course, the energetic production of heat, but it increases the capacity of the heating apparatus very considerably, and the fuel is used up in the most advantageous manner.

In order that my invention may be the better understood, I now proceed to describe the same, reference being had to the accompanying drawings, forming a part of this specification, and to the letters marked thereon.

The drawings show the invention as applied to a boiler-furnace, but it may be used with advantage for stoves and other heating apparatus.

Figure 1 illustrates a vertical section through the heating apparatus; Fig. 2, a horizontal section therethrough, and Fig. 3 a vertical section on the line  $xx$  of Fig. 1.

The fuel introduced through the feeding-orifice  $a$  falls on the grate  $c$  and forms, as soon as gasification has taken place, the glowing coke  $b$ , which serves as a support for and assists in the gasification of the coal  $d$  deposited thereon.

As shown in Fig. 1, the fuel is bounded on the left by a brick or other wall  $e$ , which has slanting air-admission channels  $e'$ . Opposite these air-admission channels is provided a wall  $f$ , preferably of metal or similar material,

which also has oblique or slanting air-admission channels  $f'$ .

Besides the channels  $e' f'$  there are provided through the side walls air-admission channels  $k$ , which enter below the grate  $c$  and are designed to cool the hot side walls and to lead the air thus preliminarily heated to the grate  $c$ . The air can find a passage below the grate only through the channels  $k$ , because the door  $l$  is kept closed and is only opened for the purpose of removing the ashes. Through these air-admission channels  $e' f'$  air is admitted evenly to all parts of the column of fuel, which air is mixed with the gases of combustion and completely saturates the same, the mixture of air and gas being then burned at  $h$  with energetic development of heat. The gases of combustion pass around a sharp brick or similar corner, or in order to obviate the destruction of the said corner by the fire a water-pipe  $g$  may be used instead and is provided with water from the boiler or service-pipes.

It will be seen that the pipe  $g$  or the projecting corner of brickwork forms a refractory ridge adapted to engage the fuel between the air-passages  $f'$  and the combustion-chamber  $h$ . All the air admitted through the channels  $f'$  is therefore compelled to pass through the fuel in order to reach the combustion-chamber. This feature is of great importance in securing a thorough combustion.

In order to allow of the easy cleaning of the grate and to facilitate the quick extinction of the flame in case of danger, the grate  $c$  is connected by a wire or similar device  $c'$  with a crank-windlass  $c^2$  and can be easily lowered to afford easy access to the fuel.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. A furnace having a fire-box with four vertical walls, said fire-box having a gas-outlet at the lower portion at one side and a feeding-orifice at its upper portion, the two of the side walls of the fire-box each having a vertical air-admission channel leading downward to the lower portion of the fire-box, the front wall of the fire-box having an air-distributing passage leading upward and having a plurality of openings leading into the upper portion of the fire-box, and the rear wall of the fire-box having an air-distributing passage

leading downward and having a plurality of openings leading into the fire-box, and a grate situated in the lower portion of the fire-box, substantially as described.

- 5 2. A furnace having a fire-box with a gas-outlet near its lower portion and a feed-orifice near its upper portion, the fire-box having an air-inlet at its lower portion and the fire-box also having an air-distributing passage leading up one wall of the fire-box, and  
10 having a plurality of openings leading into the upper portion of the fire-box, said fire-box having a second air-distributing passage leading from its upper end downward through a  
15 second wall and having a plurality of openings leading into the fire-box, and a grate situated in the lower portion of the fire-box, substantially as described.

- 20 3. A furnace having a fire-box with air-distributing passages in two opposite walls and having air-supply passages leading down through two other opposite walls, substantially as described.

- 25 4. The combination of the shaft or fire-box, adapted to contain the fuel and provided with superposed transverse air-admission channels in its back wall, and the refractory ridge arranged between the combustion-chamber and the lowermost air-admission channel and

adapted to engage the fuel to compel the air to pass therethrough, substantially as described. 30

5. A furnace having a fire-box with two passages in its opposite walls, one passage having a series of apertures opening in the fire-box and the said passage conducting a draft upward and into the fire-box, and the second passage also having apertures leading into the fire-box and conducting a draft downward from the upper portion of the fire-box into the lower part thereof, substantially as described. 35 40

6. The combination of the shaft or fire-box, adapted to contain the fuel and provided with superposed transverse air-admission channels in its back wall, and the refractory ridge formed by a water-pipe arranged between the combustion-chamber and the lowermost air-admission channel and adapted to engage the fuel to compel the air to pass therethrough, substantially as described. 45 50

In witness whereof I hereunto set my hand in presence of two witnesses.

AUGUST PAMPUS.

Witnesses:

K. WEGENER,  
F. MÜLLER.