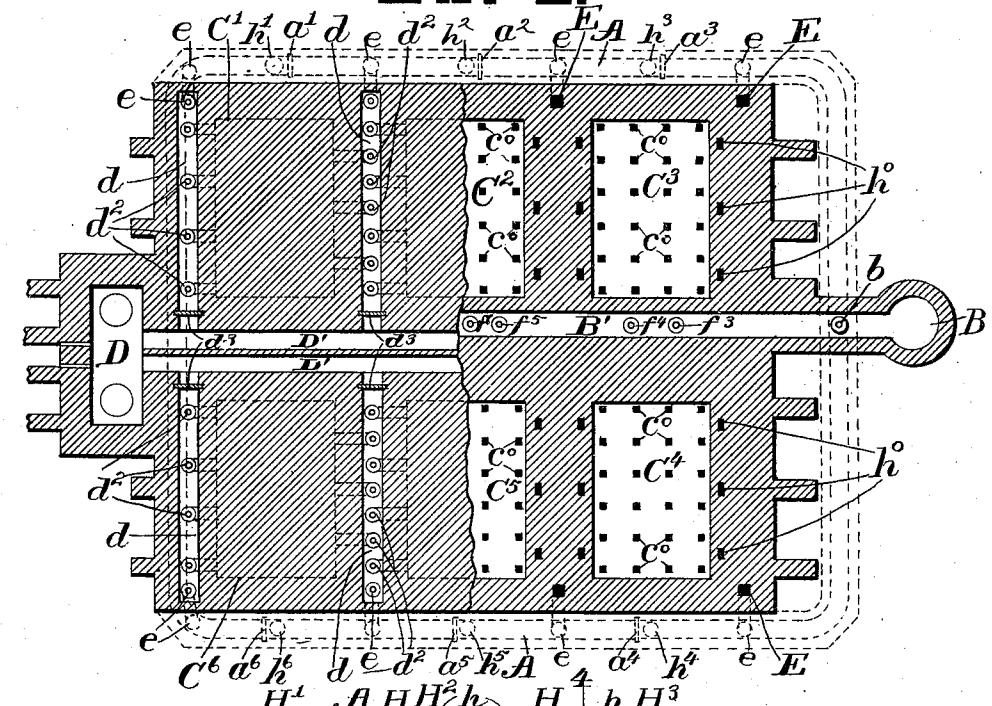
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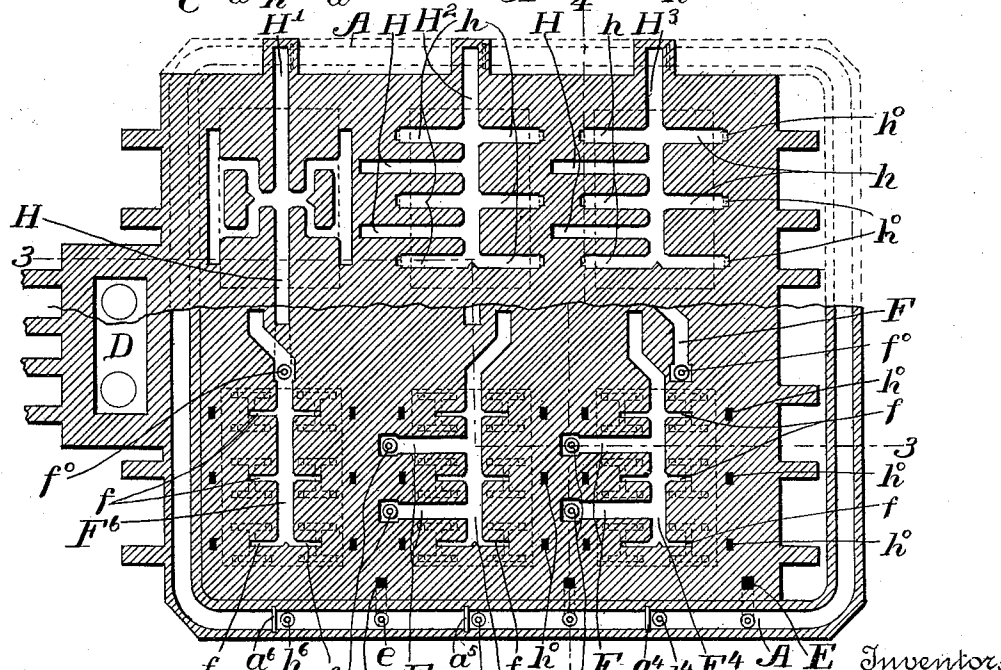
C. SCHLIMP & R. HONZIK.

KILN.

No. 588,885. Patented Aug. 24, 1897.

FIG. 1.





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FIG. 2.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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KILN.

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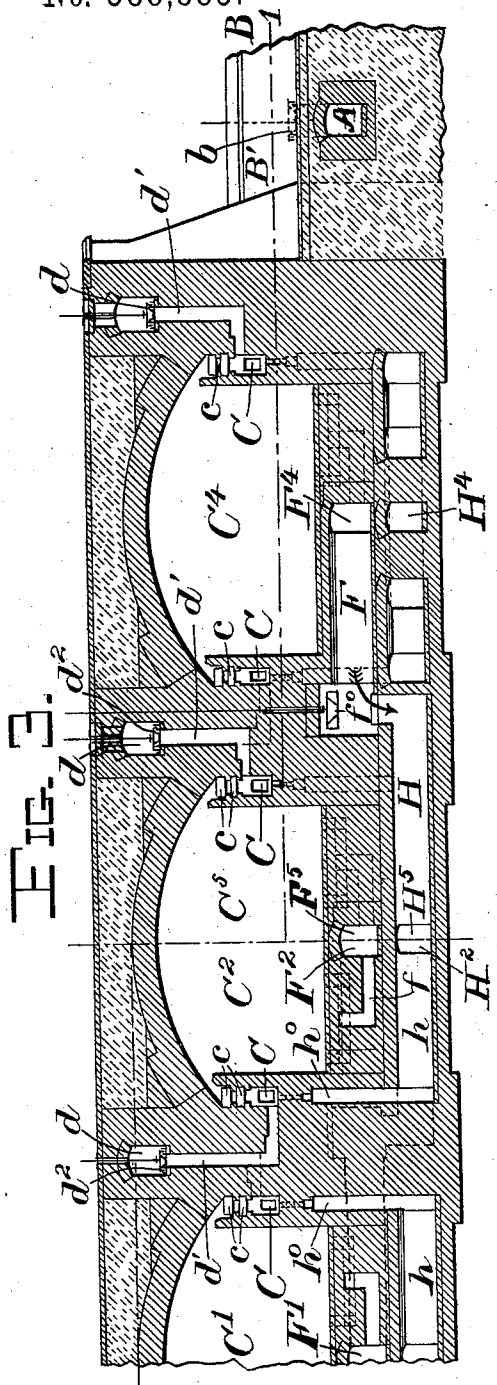


FIG. 3.

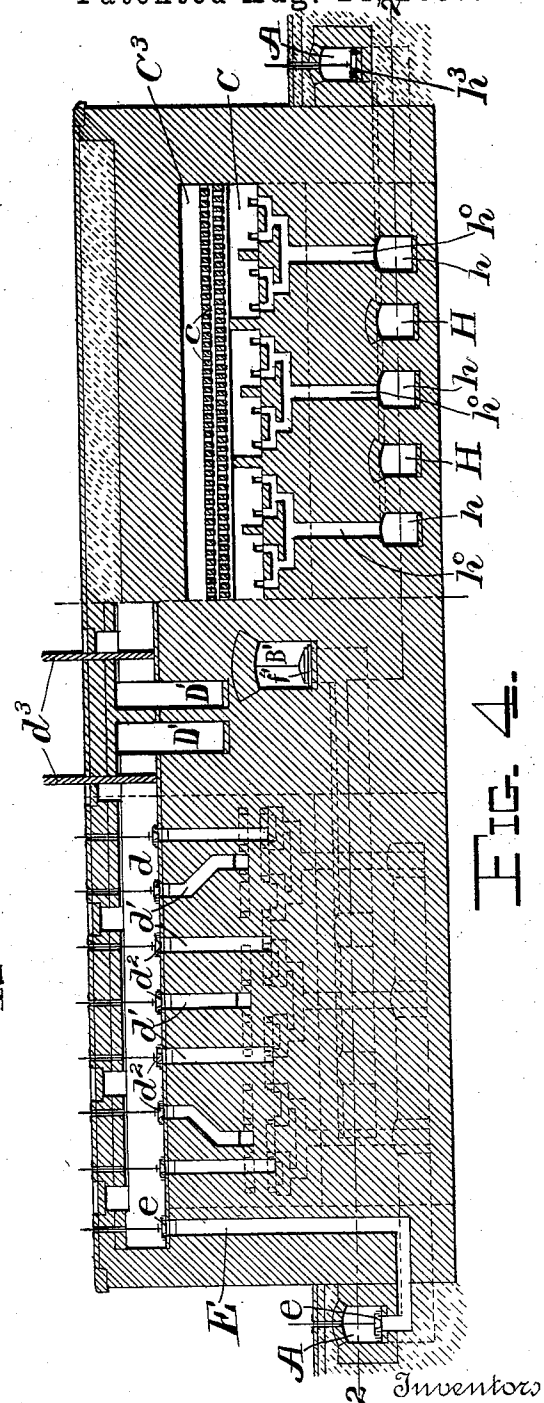


FIG. 4.

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UNITED STATES PATENT OFFICE.

CARL SCHLIMP, OF VIENNA, AUSTRIA-HUNGARY, AND RUDOLF HONZIK, OF BUCHAREST, ROUMANIA.

KILN.

SPECIFICATION forming part of Letters Patent No. 588,885, dated August 24, 1897.

Application filed August 4, 1896. Serial No. 601,663. (No model.)

To all whom it may concern.

Be it known that we, CARL SCHLIMP, manufacturer, residing at Vienna, Austria-Hungary, and RUDOLF HONZIK, engineer, residing at Bucharest, Roumania, subjects of the Emperor of Austria-Hungary, have invented certain new and useful Improvements in Kilns, of which the following is a specification.

Our invention relates to kilns of the class described in our United States Patent No. 235,907.

The main feature of the gas-heated kiln described in the said patent is the following: The gas supplied from above is mixed with the air heated in the chambers in which burning has previously taken place, such heated air being supplied from below. The two elements are mixed before entering into the kiln-chamber. The mixture is ignited and the flame passes in contact with the goods to be burned from top to bottom. For further utilizing the hot gases they are caused to enter through passages below the bottom of the said chamber into the next chamber for heating the goods in the same to a red heat preparatory to the burning operation proper. The products of combustion escaping from this second chamber are allowed to either go directly to the chimney, or to do so after having passed through a third chamber, for the purpose of initially heating the goods charged into the same.

The object of the present invention is to improve the working of such kilns.

Reference is had to the accompanying drawings, in which similar parts are indicated by the same letters throughout the several views.

Figure 1 is a horizontal sectional view through our improved kiln, taken on the line 1 1 of Fig. 3, one half of the section being above the kiln-chambers and the other half being through the lower part of the said chambers and the chimney. Fig. 2 is a similar view taken below the chambers on the line 2 2 of Fig. 4, one half being through the air-duct and the other half below it, the position of the air-duct, however, being shown in dotted lines. Fig. 3 is a vertical longitudinal section taken on the line 3 3 of Fig. 2. Fig. 4 is a vertical transverse sectional view taken on the line 4 4 of Fig. 2.

Our present invention consists in arranging an underground passage A entirely around the kiln, the said underground passage or conduit being built in the masonry of the furnace so as to communicate with the chimney B through an opening closed by a valve *b*, and also to connect with the various chambers and passages in the kiln, as will be hereinafter more fully described. In the present instance the kiln is provided with six chambers C′ to C⁶ consecutively, which, after the introduction of the articles to be burned, are closed with masonry, the process of burning occupying several days.

The chambers C′ to C⁶ are arranged with three on either side of the flue B′, which latter extends through the kiln and opens in the chimney B.

At one end of the furnace is situated the gas-generator D, of any suitable construction, and the said generator is opened to the main gas-passages D′, which extend along the upper part of the kiln near the middle portion thereof. Extending laterally from the main gas-passages D′ are passages *d*, from which latter passages other passages *d′* lead to the kiln-chambers. These passages *d′* enter mixing-chambers C in the sides of the kiln-chambers, where the gas may be mixed with air and pass thence through a grating *c* to the upper part of the chambers.

The passages *d′* are provided with valves d^2 at the point where they enter the lateral passages *d*, and the passages *d* are also provided with valves d^3, by means of which the said passages may be shut off from communication with the main gas-passages D′.

The outer end of the passages *d* are connected by vertical passages E, provided with valves *e*, with the underground conduit A.

Beneath the chambers C′ to C⁶ are passages F′ to F⁶, opening into the chimney-flue B′, and having valves *f′* to f^6 at the points of juncture with the said chimney-flue. These passages F′ to F⁶ are provided with branch passages *f*, which open through suitable passages into the openings c^0 in the bottoms of the chambers. The said passages F′ to F⁶ have other

branch passages F, which may be opened by means of the valves f^0 into the passages H of the adjoining kiln-chamber leading to the passages H′ to H⁶, which are formed in the base of the kiln beneath the passages F′ to F⁶.

The passages H′ to H⁶ open into the conduit A, and are provided at their points of junction with the said conduit with valves h' to h^6, by means of which they may be opened or closed to the said conduit at will. In the conduit A, just in front of each of the valves h' to h^6, are placed valves a' to a^6, by means of which the said conduit may be closed to throw the flow of air or gas into either of the passages H′ to H⁶, as will be readily understood. The passages H′ to H⁶ are each provided with branch passages H, which communicate with the branch passages F from the passages F′ to F⁶, as has been hereinbefore stated, and also with branch passages h, which open into the vertical passages h^0, which latter open into the mixing-chambers C in the sides of the chambers C′ to C⁶.

The branch passages F from the passage F′ extend over the branch passages H from the lower passage H² and communicate with the said passages H through the valves f^0. When the said valves f^0 are open, the passage F′ will discharge through the passage F, the valves f^0, and passages H into the passage H² beneath the chamber C². In like manner the passage F² delivers into the passage H³, and so on throughout the series.

The arrangement of passages H and h in the chamber C′ may be somewhat different from that in the other chambers, as will be seen in the upper left-hand corner in Fig. 2, but such change in arrangement is not essential.

The objects and operation of this arrangement are as follows: When, as it is often desirable, in burning various articles of pottery and the like the burning has to be effected with an excess of gas—that is to say, with a reducing flame—the gas is not completely consumed, and in the ordinary kiln the excess of gas would pass unconsumed to the chimney. For completely consuming it it must be mixed with air which is preferably heated, and this is effected in accordance with the present invention by admitting into that kiln-chamber into which enter the hot gases directly from the chamber which is at full fire a supply of pure hot air through the medium of the conduit A. Thus, for instance, suppose that the kiln-chamber C² is at full fire and that the hot gases from the latter are caused to pass through the chamber C³ by opening the valves f^0 between these two chambers, for heating the goods in the same preparatory to the burning proper, while in the chamber C′ the burning has been finished just before it was begun in chamber C² and the goods in chamber C′ are beginning to cool down by contact with air which finds its way in through the masonry, or may be admitted by making an opening in the same, the said air flowing through this chamber to chamber C², the valves f^0 between these two chambers being open, then by opening the valve h' in the passage leading from the conduit A to chamber C′ and the valve a' in the said conduit a portion of the air heated in the chamber is caused to enter the conduit, and by opening the valve h^3 in a passage leading from the conduit A to chamber C³ and closing the valve a^3 in the conduit such hot air is caused to enter the chamber C³ and shunting-chamber C², the valves in the other passages branching off from the conduit A being closed. Thus the unconsumed excess of gas escaping, together with the products of combustion from the chamber C², is mixed with heated air in the chamber C³, and is thereby fully consumed, the final products of combustion passing through the openings c^0 in the bottoms of the kiln-chambers and through the various passages below the chambers to the flue B′, the valve f^3 being open.

When the heating has to be done very carefully, so as not to impair the pure color of the goods, it is desirable to effect the first heating by pure hot air. To do this, we again open the valve h', as before described, and also the valve h^4 in the passage leading from the conduit A to the chamber C⁴, which is supposed to be the first heating-chamber. The valve a^4 in the conduit being closed, the hot air from the chamber C′ will pass through the chamber C⁴ for the first heating of the goods brought into it, shunting the other chambers through which it would have to flow if the passages below the chambers were the only means of communication between them. This air then escapes, together with the products of combustion of the kiln-furnace, into the chimney, through the openings c^0 in the bottoms of the kiln-chambers and the various passages below the said chambers. Besides the passages leading from the conduit A to the several kiln-chambers there are also provided passages E, controlled by valves e and leading, as already stated, from the conduit A to the gas-passages d in the kiln-furnace and also a passage controlled by a valve b, leading from such conduit to the chimney.

In starting the kiln the valves e and b are opened, so that the air contained in the gas-passages d is forced through the several channels into the conduit A and thence escapes into the chimney until the gas-passages are filled with gas or a combustible but non-explosive mixture of gas and air, whereupon the valves e are closed and the kiln may be started without danger of explosion. The valve b is of course closed in ordinary working.

The several valves may be constructed in any desired or preferred manner and are therefore shown only diagrammatically.

Having thus described our invention, what we claim, and desire to secure by Letters Patent of the United States, is—

1. In a kiln, the combination with a series

of chambers, a chimney, an air-duct extending around the said chambers, a passage from the said air-duct to the chimney, branch passages connecting the said air-duct with each of the chambers, passages connecting the said chambers with the chimney, and valves to open and close the said passages and to open the said air-duct into the chimney; of gas-passages extending between the said chambers, branch passages connecting the said gas-passages with the said chambers and with the air-duct, and valves in the said passages for controlling the supply of gas, substantially as described.

2. In a kiln, the combination with a series of chambers, a chimney, an air-duct extending around the said chambers, passages from the said chambers to the said air-duct, valves in the said passages, valves in the said air-duct in front of each of the openings of the said passages, passages connecting the said chambers with the chimney, and valves in the said passages, branch passages connecting the chambers with each other in series, and valves in the said passages, of gas-passages extending between the said chambers, branch passages connecting the said gas-passages with the said chambers and with the air-duct, and valves in the said passages for controlling the supply of gas, substantially as described.

In testimony whereof we have affixed our signatures in presence of two witnesses.

CARL SCHLIMP.
R. HONZIK.

Witnesses:
KARL HÜTTER,
HARRY BELMONT,
FIEBRECHT,
S. LOUVE.