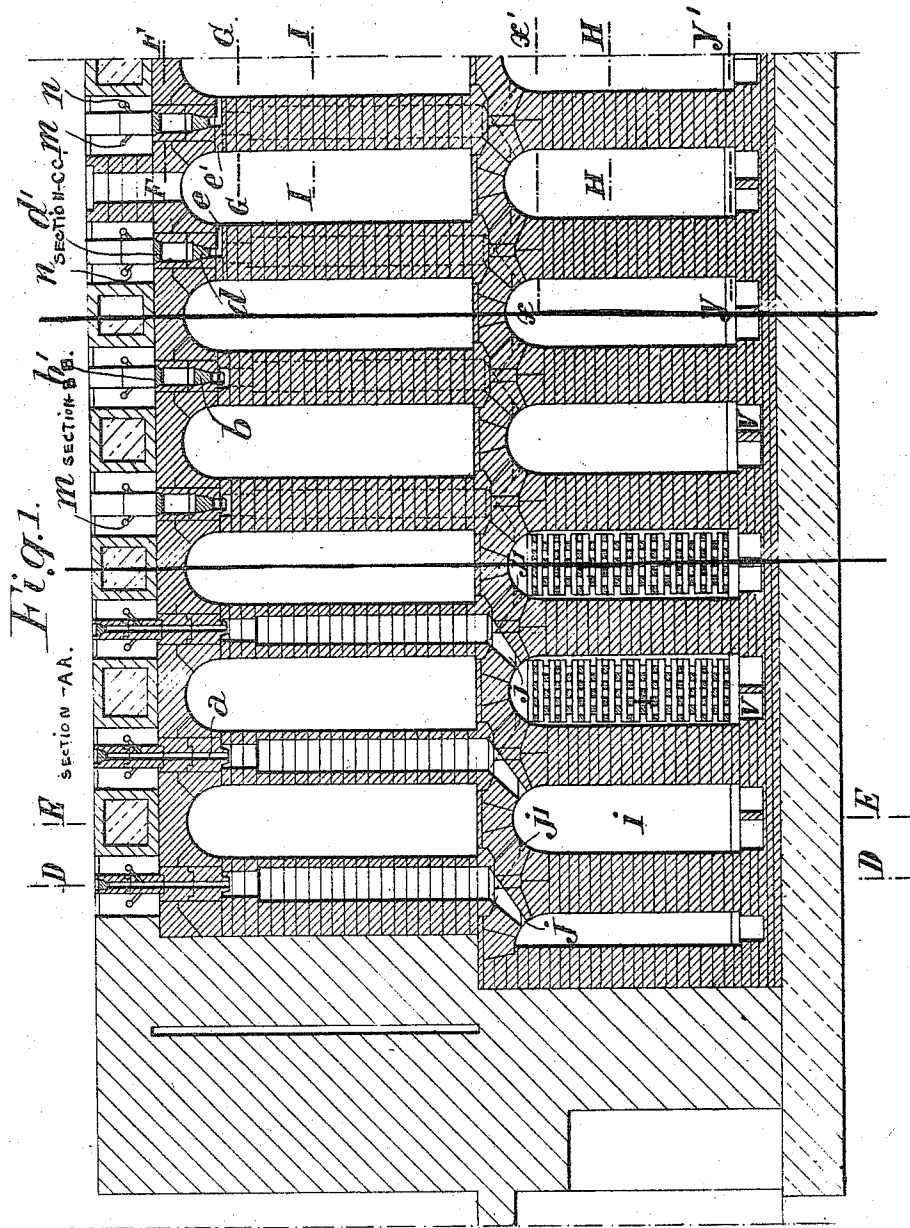


V. D. F. FIESCHI.
COKE RETORT OVEN.
APPLICATION FILED DEC. 17, 1907.

964,635.

Patented July 19, 1910.

4 SHEETS—SHEET 1.



Witnesses:

L. E. Barkley
L. A. Sands.

Inventor:

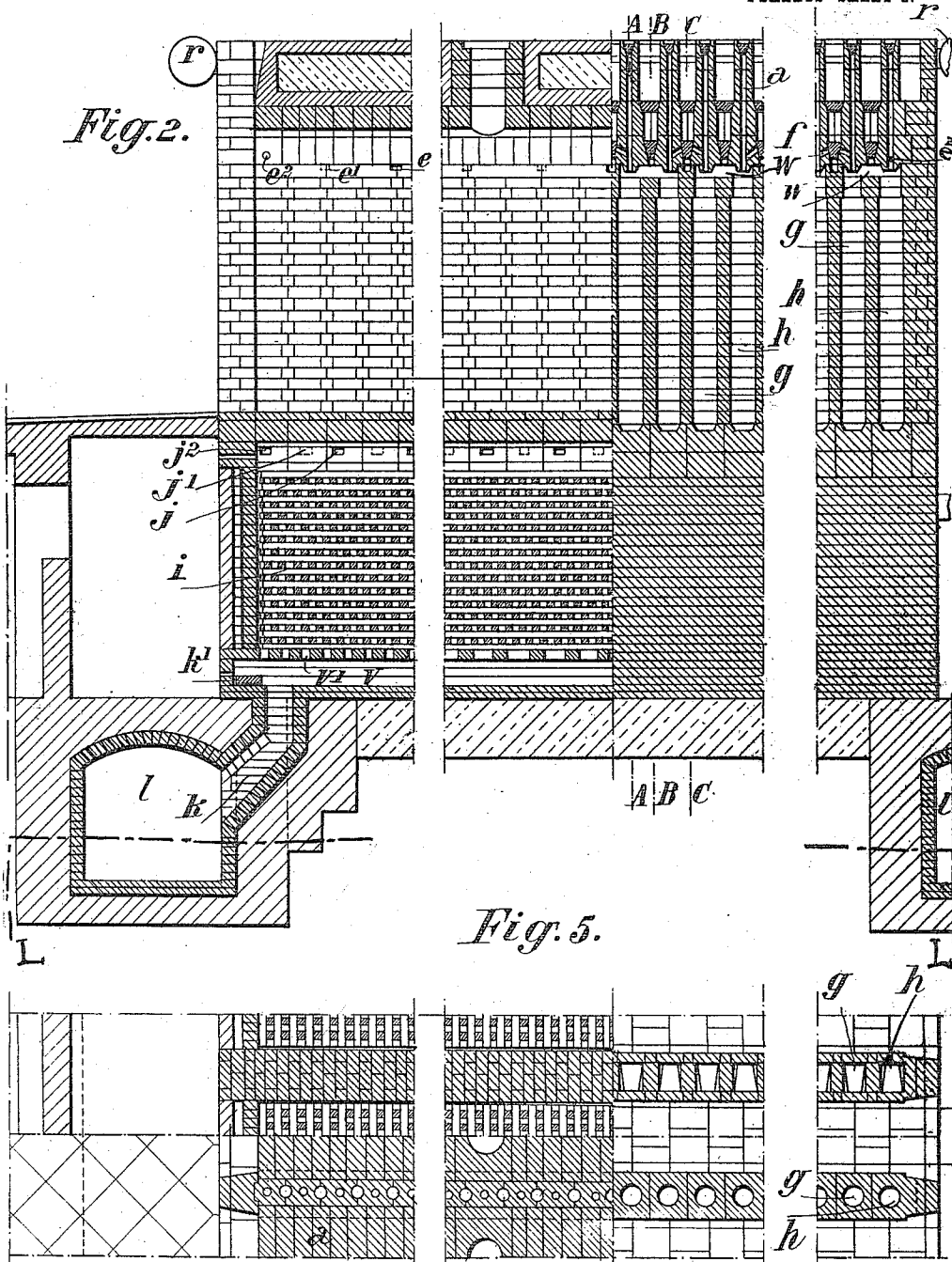
Victor Dominique Fernand Fieschi
& Francis Applegate
Attorney.

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4 SHEETS—SHEET 2.



Witnesses:

L. E. Barkley.
L. A. Sands.

Inventor

Victor Dominique Fernand Fieschi
& Frank A. Ahlmann, Attorney.

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4 SHEETS—SHEET 3.

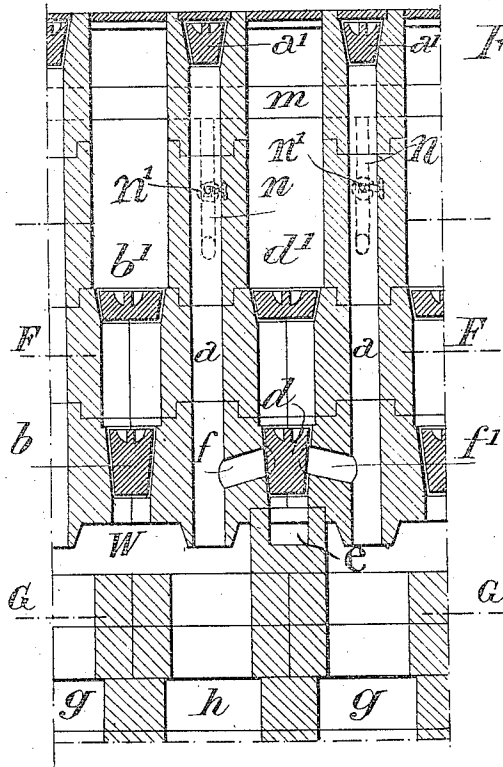


Fig. 3.

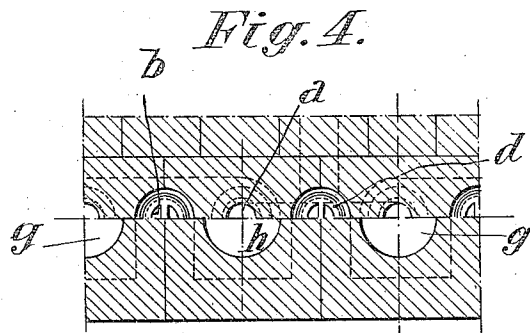


Fig. 4.

Witnesses:

L. E. Barkley
L. A. Sands.

Inventor:

Victor Dominique Fernand Fieschi
J. F. F. Fieschi, Attorney.

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4 SHEETS—SHEET 4.

Fig. 6.

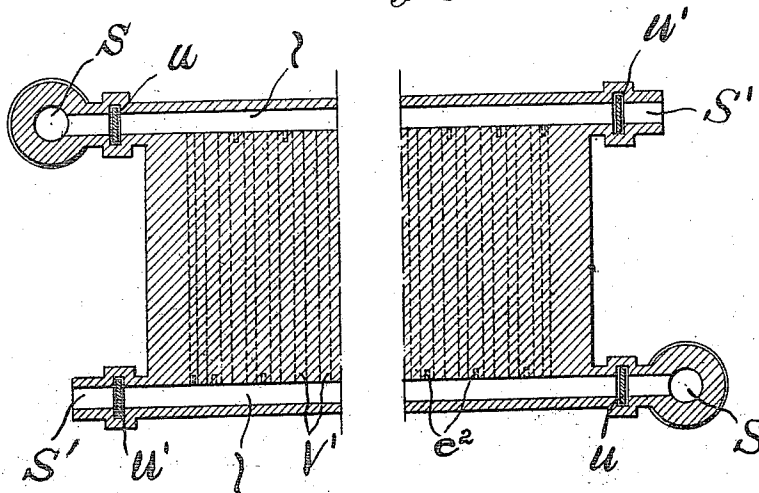


Fig. 8.

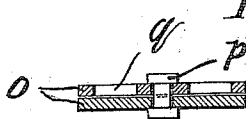
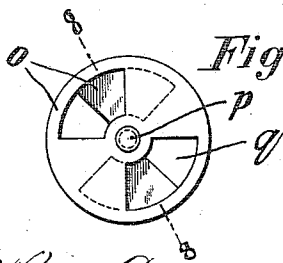


Fig. 7.



Witnesses:

R. E. Barkley
L. G. Gible

Inventor:

Victor Dominique Fernand Fieschi
by Frank S. Appelman,
Attorney.

UNITED STATES PATENT OFFICE.

VICTOR DOMINIQUE FERNAND FIESCHI, OF DOUAI, FRANCE.

COKE RETORT-OVEN.

964,635.

Specification of Letters Patent. Patented July 19, 1910.

Application filed December 17, 1907. Serial No. 406,919.

To all whom it may concern:

Be it known that I, VICTOR DOMINIQUE FERNAND FIESCHI, a citizen of the French Republic, and resident of Douai, France, have invented certain new and useful Improvements in and Relating to Coke Retort-Ovens, of which the following is a specification.

This invention relates to a coke retort oven and has for its object to provide an oven of this kind, working similarly with or without recuperation of the byproducts and with or without heating of the air.

This invention further has for its object to provide a coke retort oven adapted to realize the following conditions: 1. To cause the gases to descend vertically and to divide the combustion into numerous flues, which arrangement has for a long time been recognized as very advantageous and which has for a long time been currently employed in retort ovens working without recuperation. 2. To realize a standard type of retort ovens adapted to work similarly in three different manners: (a) with out recuperation of the by-products; (b) with recuperation of the latter; (c) with recuperation of the by-products and heating of the air by means of regenerators. 3. To realize with this retort oven of standard type and in three different specified cases (a, b and c) an absolutely similar working (mixture of air and gas at the same points, that is where the combustion begins, same circuit of flames and so forth.) 4. To obtain an easy control and adjusting of the oven, each flue or channel being adapted to be examined upon its whole length. 5. To realize an absolutely uniform heating, the gases owing to the special arrangement of the flues being obliged to heat the wall of the oven only at the places where they are admitted, that is to say the gases admitted at a determined point only heat the vertical zone of the wall, which corresponds to the vertical channel through which the gas arrives.

The annexed drawings show an embodiment of this invention and in these drawings.

Figure 1 is a longitudinal section on lines A—A, B—B and C—C of the Fig. 2. Fig.

2 is a cross section partly on line D—D, partly on line E—E of Fig. 1. Fig. 3 is a partial cross section drawn at a larger scale on line D—D of Fig. 1. Fig. 4 is a horizontal section drawn at an enlarged scale partly on line F—F of Figs. 1 and 3 partly on line G—G of the same figures. Fig. 5 is a horizontal section partly on lines F—F and H—H of Fig. 1 and partly on lines G—G and I—I of the same figure. Fig. 6 is a diagrammatical sectional view, on a small scale, taken on the line L—L of Fig. 2. Fig. 7 is a plan view of the metallic controlling device, and; Fig. 8 is a central sectional view on the line 8—8 of Fig. 7.

In this device each vertical wall or column is composed of thirty two vertical channels or flues forming sixteen groups of two channels *g* and *h* communicating with each other at the top by means of the duct *w* and connected at the bottom by means of the channels *j* and *j'* with the regenerator *i* placed directly under the oven. The said regenerators are alternatively put into communication by means of the passages *v* and *k* with two large flues *l* arranged alongside the battery at the front and the back thereof and communicating either with the chimney stack or with the atmosphere. This may be realized in different ways, as for instance by the arrangement diagrammatically shown in Fig. 6 of the drawings; in which the large channels or flues *l* are each in communication by one end with a draft chimney *S* and at the other end with the atmosphere as at *S'*; the dampers *u* and *u'* allowing these communications to be opened or closed as desired. The upper ends of each of the thirty-two vertical channels are provided with conical nozzles, the ducts *a* which form gas burners being closed at said upper ends by means of plugs *a'*, so that the interior of the ducts or channels may be examined when desired. The said burners are adapted to communicate:

1. By means of the pipes *m* and *n* with the ducts *r* as shown in Fig. 2 intended to receive the return gases freed from the by-products; this spring being arranged in such a manner that the burners having an odd number have a feed which is absolutely in-

dependent from that of the even numbered burners. As is also noted, the pipe n is provided with a cock n^1 and in the working explained above and in the following one the dampers u^1 are hermetically closed while the dampers u are open, leaving the channels l in direct communication with the chimney, this being obtained by manipulating the dampers u and u^1 , so that one pair of dampers are open while the other pair are closed.

2. With the interior of the oven by means of the openings e^2 for the two extreme burners and the openings e and e^1 for the others; the latter openings alternately end in the right hand oven and in the left hand one. This communication which is directly effected for the extreme burners, is made by the intermediary of the small ducts f and f^1 for the others; a plug d allows of this communication being established or done away with; a second plug d^1 closes the communication with the outside.

Each series of two channels may besides this communicate directly with the atmosphere by means of the plug b ; the plug b^1 may then be replaced by a metallic closing device, adapted to control the introduction of the burning agent and as shown in Figs. 7 and 8 is constructed of two circular metallic disks o , suitably secured for independent rotation by means of a headed bolt p and each provided with sector apertures q , so that by causing these disks to rotate upon each other, the amount of air admitted, can be increased or decreased, as desired.

Working of the Oven.

Working without recuperation.—The plugs d having been removed and the holes e^2 freed (which may be easily effected when the oven is open), the gas produced by the distillation goes from the oven into the burners a , as it has been stated hereabove; the sections of the openings have been calculated so as to admit the gas in a proportion which is the greater the farther one is away from the center of the battery in order to take into account the cooling due to the air surrounding the ends of the oven. As the plugs b have also been removed, the air the arrival of which may be controlled by the closing device which replaces b^1 , arrives at w and is equally distributed between g and h , the combustion therefore begins to take place at the conical end of the burners and the combustion gases aspirated by the draft of the chimney go into the lower part where the combustion must be more complete and from here through j and j^1 into the regenerator i , the channel k , the large flue l and from here into the chimney stack. The draft is controlled for each vertical channel

by means of the registers h^1 . For each of the thirty-two channels the draft is controlled by the construction of the oven itself by giving the sections of the connecting ducts j and j^1 variable values in relation with the amount of gas admitted at a and the distance which the gases must flow in the regenerator in order to arrive at the escape k .

Working with recuperation of the by-products.—The plugs d and d^1 are carefully luted as well as the plugs of the holes e^2 . The gases coming from the plant for the recuperation of the by-products arrive in the burners through two ducts r placed alongside and on each side of the battery. On these pipes are branched smaller pipes m , the burner a being supplied with gas through the medium of the pipes n , which are provided with cocks n^1 intended to serve as a controlling means through the pipe in leading from the supply pipe r and the air necessary for the combustion continues to arrive as in the working described in the preceding paragraph; this being given, the way of the gases and the heating are effected in exactly the same manner as it has been described above.

Working with recuperation of the by-products and heating of the air.—The plugs b , b^1 , d and d^1 are put in place and luted carefully. The combustible gases arrive as in the preceding method of working but owing to the presence of a set of cocks the burners a of even order receive alone combustible gas during twenty minutes; the following twenty minutes the burners of an odd order receive the gas supply; at the same time as this changing of working is effected one of the large channels l which was in communication with the chimney is put into communication with the atmosphere, while the other channel l is in communication with the chimney. The device producing the said operations is controlled in such a manner that when one series of burners receives the gas the sixteen corresponding vertical channels communicate through j , i , k , l with the chimney and the sixteen others with the atmosphere through the ports V as communicating means. Consequently when the burners corresponding to the sixteen channels h are feed with gas, the draft of the chimney will produce an air flow which entering through l will cross the generator and be reheated there; it will then rise in the sixteen channels g and support the combustion of the gas arriving from the top of the sixteen channels h , the products of combustion will go to the chimney passing through the regenerators which will be heated in order to yield a part of their heat to the air which will pass through them during the following

period of twenty minutes. During this latter period the same cycle will be repeated, but inversely and so on.

When one is certain not to have the working with regenerators (which will for instance be the case when one needs steam instead of gas) it is evident, that it is absolutely useless to construct regenerators; the latter have only, in this case, the proportions of a simple channel or passage, which has been realized by way of example on Fig. 1 of the annexed drawings wherein the pilings or part comprised between x , x' and y , y' has been supposed removed and the height of the piers of the regenerators reduced the entire amount comprised by said lines without anything being for this reason changed in the working and arrangement of the oven.

It will be seen from the foregoing specification of the oven and the four methods of working of same that the objects of this invention stated in the present specification have been realized. As a matter of fact the gases flow in a vertical descending direction and the combustion has been fractioned owing to the presence of numerous channels. Furthermore the oven constructed according to the principles of the present invention is adapted to work indifferently in three different manners (a) without recuperation of the by-products (b) with recuperation of same, (c) with recuperation of the by-products and heating of the air by means of regenerators. Besides this, the described oven allows of an absolutely similar working being obtained in these three cases a, b and c, the gas being admitted by the conical end of the duct a and the air being admitted at w that the combustion is always produced in the same manner.

As the pipes n are provided with cocks it is easy to perform the control and the examination of the channels may be carried out in the most easy manner by withdrawing the plugs a' , which realizes the fourth condition stated in the beginning. As to the fifth condition stated, *i. e.* the uniformity of heating, it is realized by the division of the vertical partition walls into sixteen elements absolutely independent and comprising each two channels, each of these sixteen elements being provided with a special admission of air and gas which will be ignited and be completely burned inside this element; the gas which is conveyed thereto will consequently be used solely for heating the corresponding part of the wall of the oven.

Having now fully described my said invention, what I claim and desire to secure by Letters Patent, is—

1. In a coke retort oven the combination with a series of juxtaposed retorts of vertical partition walls separating each pair of

retorts, a plurality of vertical channels provided in each of the said partition walls, a burner at the top of each channel, separate gas feeding ducts for all the burners, ducts for feeding air from the outside to two neighboring burners, adjustable means mounted into the said ducts and adapted to control the air flow therethrough, means for closing the said ducts, ducts leading from two neighboring burner pipes communicating with the adjacent retort, means for closing the said ducts and means for connecting the lower ends of the said vertical channels with the chimney, substantially as and for the purpose set forth.

2. In a coke retort oven the combination with a series of juxtaposed retorts, of vertical partition walls separating each pair of retorts, a plurality of vertical channels provided in each of the said partition walls, a vertical burner pipe arranged above each of the said vertical channels, a plug at the upper end of the said burner pipe and a nozzle at the lower end, separate gas feeding ducts for the burner pipes, ducts for feeding air from the outside to two neighboring burners, adjustable air inlet devices in the said air feeding ducts, means for tightly closing the said air inlet ducts, ducts leading from two neighboring burner pipes communicating within the adjacent retort, means for tightly closing the said ducts and means for connecting the lower ends of the said vertical channels with the chimney, substantially as and for the purpose set forth.

3. In a coke retort oven the combination with a series of juxtaposed retorts, of vertical partition walls separating each pair of retorts, a plurality of vertical channels provided in each of the said partition walls, a vertical burner pipe arranged above each of the said vertical channels and ending at its upper end in the atmosphere, a plug for tightly closing the said upper end, a nozzle at the lower end of said burner pipe, separate gas feeding ducts for the burner pipes, means for closing separately each of the said gas feeding ducts, ducts adapted to feed air from the outside to two neighboring burners, adjustable air inlet devices in the said air ducts, means for tightly closing the said air ducts, ducts leading from two neighboring burner pipes communicating with the adjacent retort, means for tightly closing the said last named ducts, two regenerators arranged in the lower vertical channels, ducts connecting one of the regenerators with those vertical channels of the partition wall which are of odd order and the other regenerator with the vertical channels of even order, a main duct arranged in

front of the said regenerators and connected
with those of them which are in relation
with the said channels of even order, a main
duct arranged at the sides of the said re-
5 generators and connected with those regen-
erators which are connected with the said
vertical channels of odd order and means
for connecting the said main channels al-
ternately with the chimney and the atmos-

phere, substantially as and for the purpose 10
set forth.

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

VICTOR DOMINIQUE FERNAND FIESCHI.

Witnesses:

ADRIEN JOSEPH GIOT,
ALBERT DÉPLAUOFE.