C. WESTPHAL.

RETORT FURNACE.

APPLICATION FILED OCT. 27, 1910.

988,842. Patented Apr. 4, 1911.

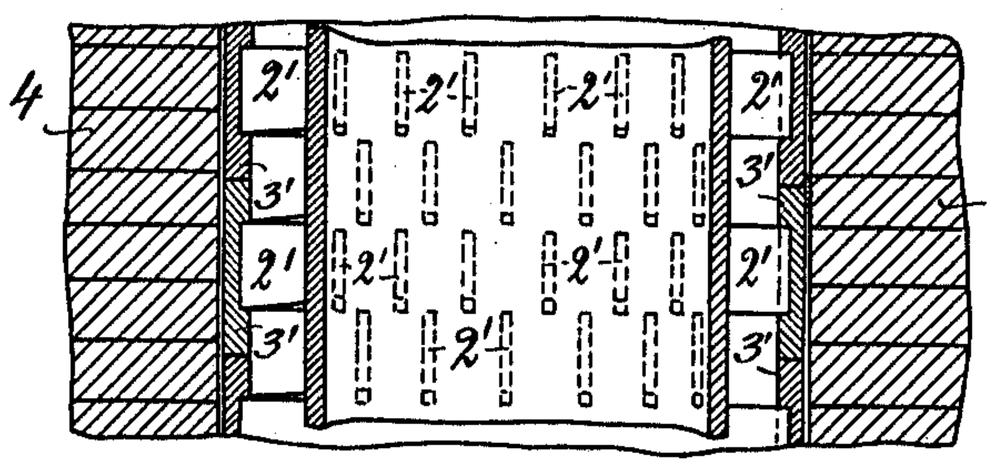

Fig. 1.

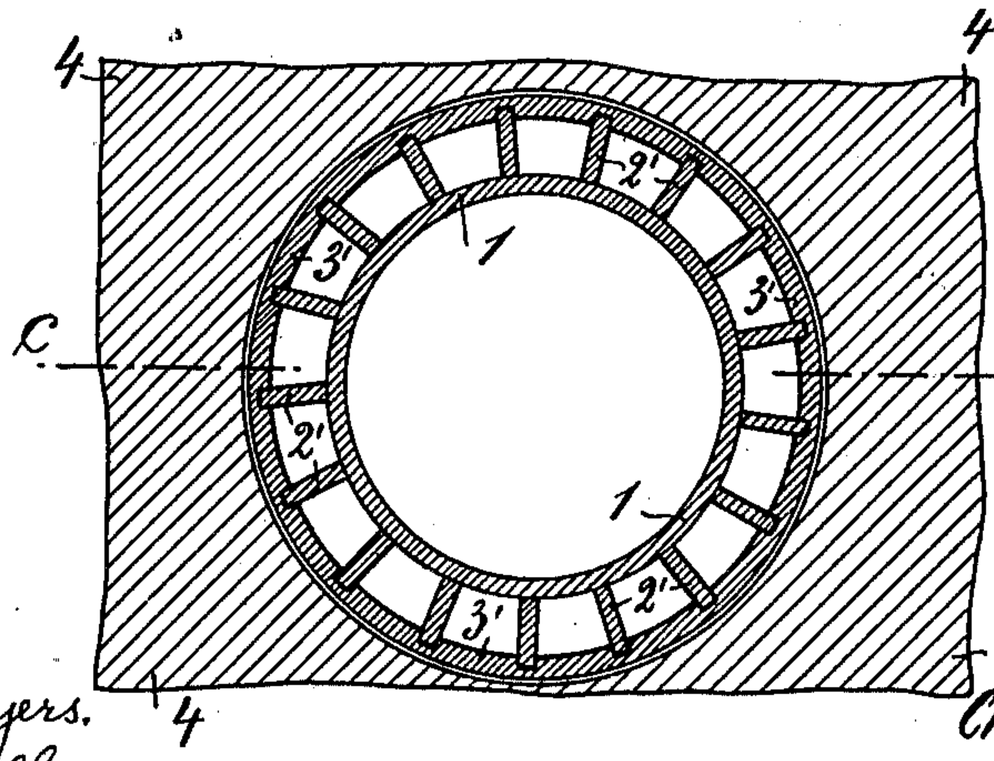

Fig. 2.

Witnesses:
Corinne Myers.
Thomas Donnellan.

Inventor:
Christian Westphal
by L. Ke. Söhn,
Attorney

THE NORRIS PETERS CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHRISTIAN WESTPHAL, OF BERLIN, GERMANY.

RETORT-FURNACE.

988,842. Specification of Letters Patent. Patented Apr. 4, 1911.

Application filed October 27, 1910. Serial No. 589,408.

To all whom it may concern:

Be it known that I, CHRISTIAN WESTPHAL, a subject of the King of Prussia, and resident of Berlin, in the Kingdom of Prussia, German Empire, have invented certain new and useful Improvements in Retort-Furnaces, of which the following is a specification.

This invention has reference to improved retort furnaces such as are employed for producing for instance carbonic acid gas from burning limestone.

The retort furnaces heretofore employed are deficient in so far as unequal expansion and contraction causes distortion or separation of certain parts rendering thereby the usual air conduits provided in the outer masonry ineffective. This is due to the present constructions which are too rigidly connected and of too heavy material. As the inner retort proper necessarily is the hottest part of the furnace its expansion is greatest while parts in rigid connection therewith and extending outwardly are subject to unequal lateral expansion. Furthermore the inner retort which becomes hottest vertically expands also tending to loosen or separate the various parts of the furnace.

It is the object of the present invention to avoid the described deficiencies and produce a retort furnace of such construction and such material that any distortion or separation of the various parts of the furnace is avoided.

The invention is illustrated in the accompanying drawing in which:

Figure 1 represents in vertical sectional view, on line *c*—*d* of Fig. 2, a retort furnace embodying in desirable form the present improvements, and Fig. 2 is a cross sectional view of same.

Similar characters of reference denote like parts in all the figures.

Referring to the drawing, 1 represents the inner retort which is made of a mixture of corubin and fire clay. These materials allow of constructing the inner retort relatively thin in comparison to the former retorts. Corubin, as is well known is a highly refractory slag resulting from aluminothermic metallurgical processes. The advantages resulting from the use of this material will be more fully pointed out farther down.

Surrounding the inner retort 1 there is an independent tubular lining 3′ made preferably of single annular members and forming thus a second retort. Stiffening or retaining plates 2′ are inserted into the refractory lining 3′ and engage with the retort 1 for the purpose of providing a connection between the inner retort and the lining which forms an outer independent retort. In this manner a structure is produced forming a retort furnace consisting of the inner retort 1, the retaining plates 2′, and the outer retort 3′ which are in contact with each other but are separate and independent from the surrounding outer masonry 4 as is plainly shown in the drawing. The plates 2′ and the outer retort 3′ are constructed with corubin, of the same material of which the inner retort is made. By the use of this material all the parts can be made relatively thin and light and by virtue of the described construction embodying an independent outer retort or lining and the thin connecting plates 2′ a more uniform heating of the entire retort takes place and over and above everything the expansion of the various parts forming the retort furnace is more uniform than with constructions heretofore used. This is particularly true if the present invention is compared with former retort furnaces having connecting ties, bonds or wedge-shaped pieces that are tightly within the surrounding masonry.

It is self-evident that a furnace of this kind having ties fixed in the outer masonry which remains cool is liable to distortion and breakage of interior parts. In the present invention the retort furnace proper is separate from the outer masonry and therefore not held tightly by same when by heating the furnace expansion of the furnace parts takes place. In fact the vertical expansion of the retorts may take place to any extent without damage to same because it is free and independent from the outer masonry.

I claim:

1. A retort furnace consisting of a thin inner retort, an outer retort composed of a series of annular members, and supporting plates protruding from the single members of the outer retort and bearing solely against the outer surface of the inner retort allowing thus of the vertical expansion of the in-

ner retort to any extent without affecting the other parts of the furnace.

2. A retort furnace consisting of a thin inner retort made of corubin material, a relatively thin outer retort of same material and composed of a series of annular members, and stiffening or supporting plates of like material protruding from said outer retort and bearing merely against the outer surface of the inner retort.

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

CHRISTIAN WESTPHAL.

Witnesses:

HENRY HASPER,

WOLDEMAR HAUPT.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."