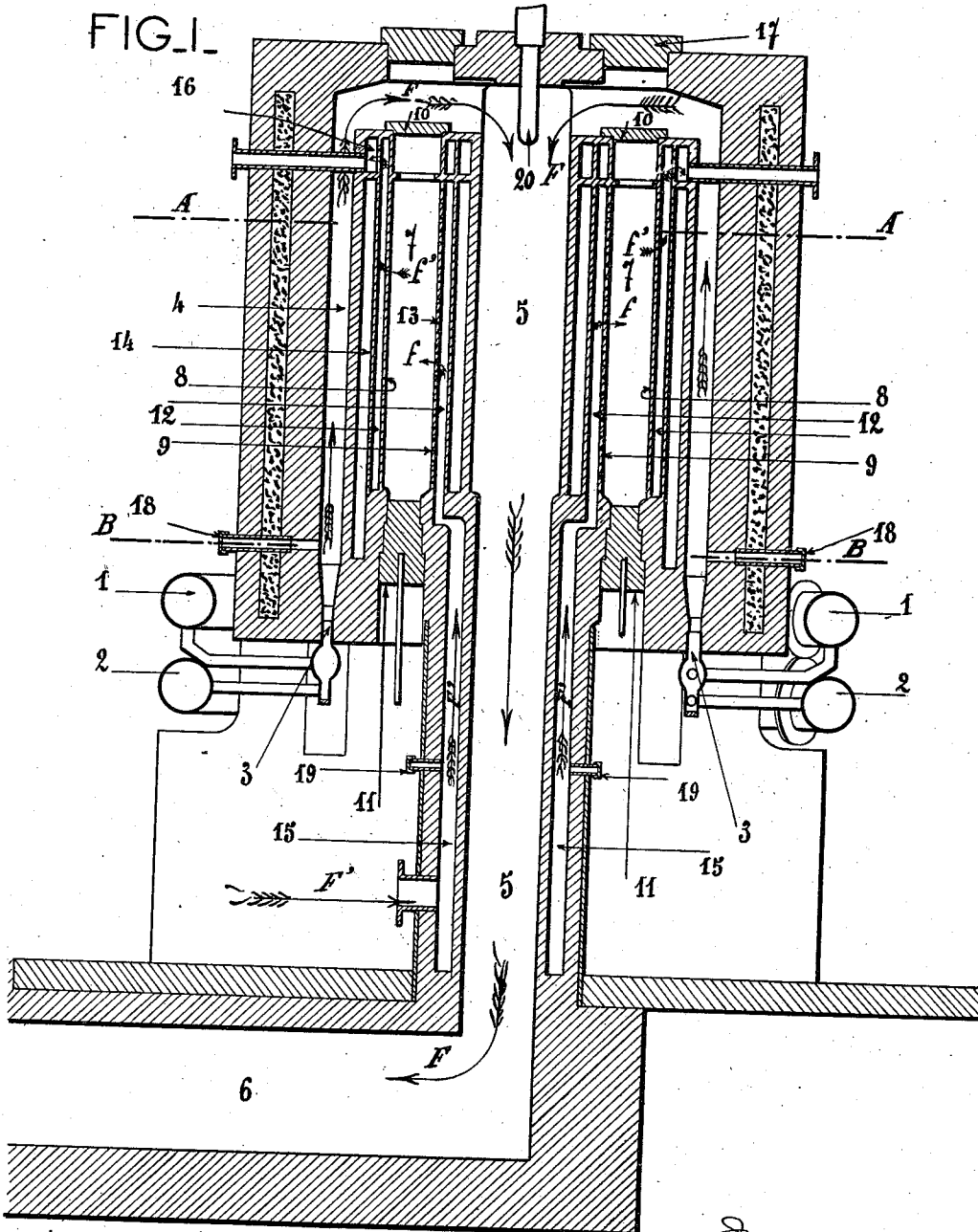


F. BÉLLET.
FURNACE FOR MAKING ULTRAMARINE BLUES.
APPLICATION FILED SEPT. 17, 1909.

1,014,689.

Patented Jan. 16, 1912.

2 SHEETS—SHEET 1.



Witnesses:-
M. A. Hood.
R. C. Fitzhugh.

Inventor:-
Ferdinand Bellot,
by
Maura Cameron Lewis & Masie
Attys.

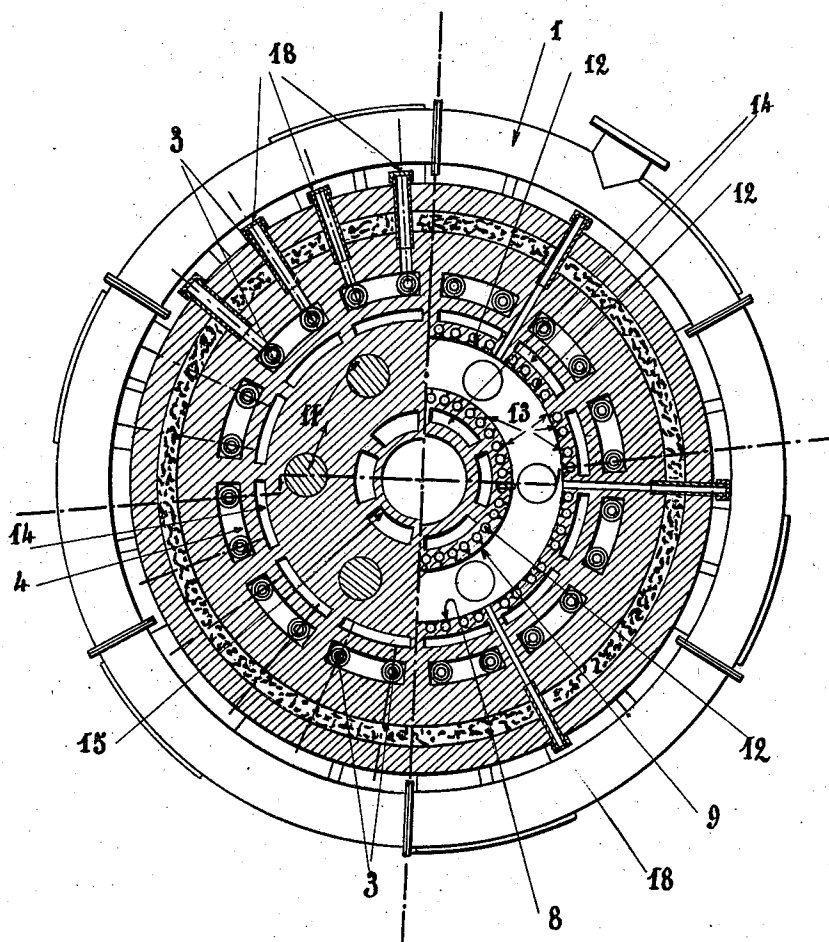
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2 SHEETS—SHEET 2.

FIG. 2.



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UNITED STATES PATENT OFFICE.

FERDINAND BÉLLET, OF PARIS, FRANCE.

FURNACE FOR MAKING ULTRAMARINE BLUES.

1,014,689.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed September 17, 1909. Serial No. 518,277.

To all whom it may concern:

Be it known that I, FERDINAND BÉLLET, a citizen of the Republic of France, and a resident of 10 Avenue Erudaine, Paris, France, have invented new and useful Improvements in Furnaces for Making Ultramarine Blues, which improvements are fully set forth in the following specification.

This invention relates to furnaces for treatment of products which it is desired to subject to the action of gaseous reagents, and more particularly to furnaces for the manufacture of ultramarine blues involving oxidation by means of air.

The accompanying drawings illustrate by way of example one form of the improved furnace.

Figure 1 is a vertical section of the furnace and Fig. 2 is a horizontal section thereof taken at different levels on the lines A—A and B—B of Fig. 1.

As shown, the furnace is generally of cylindrical form with its axis vertical. The furnace is preferably heated by gas. For this purpose gas flues 1 and air flues 2 are provided around the lower part of the furnace. A suitable number of burners 3 are arranged in a ring in the base of the furnace. The hot gases and the flame pass through the annular space 4 as indicated by the arrows F; they pass down again through the central passage 5 on their way through the flue 6 to the chimney. The hot gases thus travel around a sort of special retort 7 which is characteristic of the present invention and is built of bricks of peculiar construction. The retort is constituted by the annular space 7 existing between the two concentric cylinders 8 and 9 that are built of the said bricks; it is in this annular space 7 that the material to be treated is charged. The annular space 7 is closed at its upper part by a removable cover 10 composed of a suitable number of sectors, and it is closed at its lower part by means of plugs 11 which can be removed for the purpose of discharging the ultramarine blue.

As shown in the drawings, the bricks used in the construction of the concentric cylinders 8 and 9 are pierced along vertical lines, that is, parallel to the axis of the furnace, with passages 12 of relatively large diameter which extend throughout the entire length of each brick. Holes 13 of smaller diameter establish communication between the passages 12 and the annular space 7 that con-

tains the material to be treated. The total sectional area of the holes 13 is equal to the total sectional area of the passages 12. The faces of the bricks opposite the holes 13 or the convex faces of the outer bricks (cylinder 8), and the concave faces of the inner bricks (cylinder 9) may advantageously be coated with a suitable plastering or glaze for preventing the air from passing through these walls even when they are raised to a high temperature. The same result may also be obtained by arranging behind the said walls a filling of slag or ashes, fine sand, kieselguhr or any other suitable material. One or the other means prevents the air (or the gaseous reagent employed) from becoming lost unequally in the useful space 7.

Around the annular space 7 containing the material to be treated there is provided a double annular space 14 constituting a jacket of non-circulating air.

The vertical passages 12 of the various superposed rows communicate among one another in such a manner as to form continuous passages from top to bottom of the furnace (Fig. 1). The passages 12 of the inner cylinder 9 communicate with the passage 15 through which the gaseous reagent (such as air) required for the treatment of the material, enters as indicated by the arrows F'. The gases escape, as indicated by the arrows f, through the small holes 13 into the annular space 7. They thus pass through the material to be treated that is contained in the annular space 7. The final gaseous products of the reaction pass, as indicated by the arrows f', through the small holes 13 of the outer cylinder 8 into the passage 12 of the said cylinder. They pass thus into the annular collector 16 whence they escape into the outer air. The material to be treated is thus traversed throughout its mass by the gaseous reagent in an absolutely uniform manner.

The furnace is charged from the top. For this purpose the cover 17 composed of a suitable number of sectors, is removed, as is likewise the cover 10.

To discharge the furnace it is sufficient to remove the closing plugs 11. If necessary the descent of the treated material may be aided by means of pokers.

The furnace is provided with observation holes 18 which allow of ascertaining the progress of the operation and of taking samples of the product if desired. Other ob-

servation holes 19 provided in the wall of the central passage 5, serve to enable the temperature of the gases passing to the chimney to be ascertained. A pyrometer 20 is provided at a suitable point, for instance in the upper part of the central passage 5, as shown in Fig. 1.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A retort furnace for subjecting solid materials to the action of air or other gases, comprising two concentric cylindrical walls spaced apart forming an annular retort, removable end closures for said retort, the walls of said retort having a plurality of passages lengthwise of the retort and opening into the retort space, conduits for delivering air or gas to said retort through the passages in the inner wall of the retort, a conduit connected with the passages in the outer wall of the retort for escape of gaseous products, and means for heating said retort.
2. A retort furnace for subjecting solid materials to the action of air or other gases, comprising two concentric cylindrical walls spaced apart and forming a vertical annular retort, removable end closures for said retort, the walls of said retort having a plurality of passages lengthwise of the retort and opening into the retort space, the cross-sectional area of said passages being equal to the area of said openings into the retort, supply conduits delivering air or gas to the lower ends of the passages in the inner retort wall, a gas escape conduit connected to the upper ends of the passages in the outer retort wall, and means for heating said retort.
3. A retort furnace for subjecting solid

materials to the action of air or other gases, comprising two concentric cylindrical walls spaced apart and forming an annular retort, removable end closures for said retort, the walls of said retort having a plurality of passages lengthwise of the retort and opening into the retort space, conduits for delivering air or gas to said retort through the passages in the inner wall of the retort, a conduit connected with the passages in the outer wall of the retort for escape of gaseous products, concentric walls inclosing the said annular retort and forming around the same inner and outer dead air spaces, and means for heating the inclosed retort.

4. A retort furnace for subjecting solid materials to the action of air or other gases, comprising two concentric cylindrical walls spaced apart and forming an annular retort, removable end closures for said retort, the walls of said retort having a plurality of passages lengthwise of the retort and opening into the retort space, conduits for delivering air or gas to said retort through the passages in the inner wall of the retort, a conduit connected with the passages in the outer wall of the retort for escape of gaseous products, concentric walls inclosing the said annular retort and forming around the same inner and outer dead air spaces, and furnace flues arranged in heat interchanging relation to said dead air spaces for heating said retort.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

FERDINAND BÉLLET.

Witnesses:

DEAN B. MASON,
DOUMÉ CASALONGA.

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