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R. S. KENT

SECTIONAL RETORT FOR RETORT KILNS

Filed Jan. 6, 1921

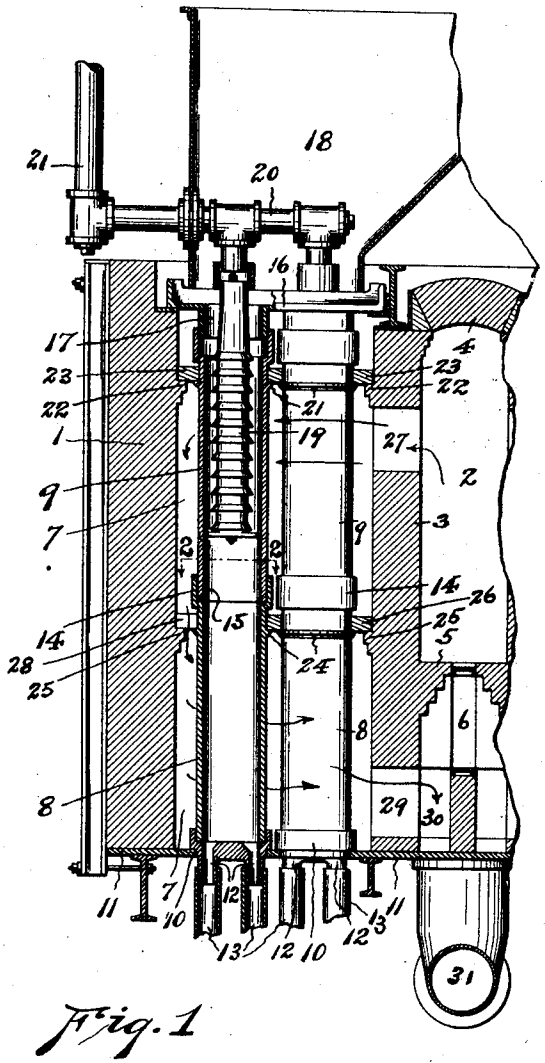
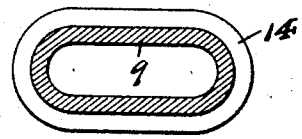


Fig. 1

Fig. 2



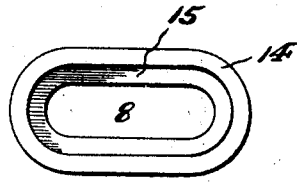


Fig. 3

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SECTIONAL RETORT FOR RETORT KILNS.

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The present invention relates, generally, to improvements in retort kilns which are used for revivifying or decarbonizing fuller's earth, bone black or other filtering materials, and for analogous purposes.

The invention has for its principal object to provide a stationary retort kiln with a novel construction of sectional tubular retort members, which permit of easy and quick repair and replacement when burned out or otherwise rendered inoperative.

The invention is clearly illustrated in the accompanying drawings, in which:—

Figure 1 is a transverse vertical section of a portion of a retort kiln equipped with the novel sectional tubular retort members made according to and embodying the principles of the present invention.

Figure 2 is a detail horizontal section through one of said novel sectional retort members, taken on line 2—2 in said Figure 1, and drawn on an enlarged scale.

Figure 3 is a top end view of the bottom section of one of said novel sectional retort members, showing the coupling joint whereby connection of the same with a removable top section of the retort member is made, said view being also drawn on an enlarged scale.

Similar characters of reference are employed in all of the above described views, to indicate corresponding parts.

Referring now to said drawings, the reference character 1 indicates a suitable housing, usually constructed of brick. Located within the upper central portion of said housing 1 is a combustion chamber 2 enclosed by the side walls 3, top arch 4 and floor wall 5. Arranged beneath said floor wall 5 are air boxes 6 which gain communication with said combustion chamber through said floor wall, so that a supply of air to support the combustion of fuel within said combustion chamber is delivered to the latter. Located within said housing 1, between the outer walls thereof and the side walls 3 of said combustion chamber 2 are vertical retort chambers 7. Disposed within said retort chambers 7 are a series of sectional tubular retort members, which extend vertically through said retort chambers 7, and which are suitably spaced apart one from another. Said sectional retort members comprise a bottom or lower section 8 and a top or upper section 9. The lower ends of said bottom sections 8 are supported by and connected with bottom closures or caps 10, which are seated upon the floor 11 of the kiln, said bottom closures or caps 10 having downwardly projecting discharge spouts 12, with which are connected the cooler tubes 13 into which the material treated in the retorts is discharged. The upper end of said bottom retort section 8 is provided with an upwardly extending outwardly off-set annular coupling flange 14 which provides an internal seating shoulder 15 at its point of juncture with the main body of said bottom retort section. The lower end of the upper retort section 9 fits telescopically into said coupling flange 14 and seats itself, in supported relation to said bottom retort section 8, upon said internal seating shoulder 15. When thus coupled with said bottom retort section 8, the upper retort section 9 extends upwardly through said retort chamber 7 in longitudinal vertical alinement with said bottom retort section. Supported in connection with the upper end of said retort chamber 7 are cover members 16 with which the upper ends of said upper retort sections 9 are engaged, so as to communicate with the intake passages or openings 17 of said cover members. Arranged above the series or gang of retort members and their cover members are material receiving and feed hoppers 18, which deliver the material to be treated through the cover member intake passages or openings 17 into the retort members. Arranged within the upper portion of each upper retort section 9 is a vapor collector device 19, the upper discharge end of which is suitably connected in communication with the intakes of a system of vapor vent or discharge pipes 20.

Said upper retort sections 9 are provided adjacent to their upper ends with exterior annular flanges 21. Said flanges 21 in conjunction with suitable supporting ledges 22 provided on the walls of the housing enclosing said retort chamber 7, serve to support the bricks or members of an upper baffle wall 23. Said bottom retort sections 8 are likewise provided adjacent to their upper ends, but beneath said flanges 14, with similar exterior annular flanges 24. Said flanges 24 in conjunction with suitable supporting ledges 25 provided on the walls of the housing enclosing said retort chamber 7, serve to support the bricks or members of a lower

baffle wall 26. Said baffle walls 23 and 26 enclose that portion of the retort chamber 7 in which are located the upper retort sections 9, wherein the material is first received for treatment and against which it is desired to direct the gases of combustion when at their highest temperature.

The products or gases of combustion generated within the combustion chamber 2 pass into the upper ends of the retort chambers 7, beneath the upper baffle wall 23, through entrance ports 27 provided in the side walls 3 of said combustion chamber. The products or gases of combustion thus delivered circulate around the upper retort sections 9, and thence flow downwardly through intermediate ports 28 in the lower baffle wall 26 to thereupon circulate around the bottom retort sections 8, thence escaping through the discharge ports 29 leading to the furnace flues 30, and thence to the stack conduit 31, all as indicated by the direction arrows applied to Figure 1 of the drawings.

As above mentioned the retort members are subjected to the most intense degree of heat at their upper portions, which are located in the upper ends of the retort chamber 7 between the baffle walls 23 and 26, since the hot and fresh gases of combustion flowing from the combustion chamber 2 through the ports 27 gain their first contact with the retort members at such points. It follows, therefore, that the said upper portions of the retort members are most likely to be burned through or injured long before the lower portions suffer any such injury. In the old style unitary tubular retort structures, when such injury to the retort members occurred, it was necessary to practically dismantle the retort kiln in order to make repairs or replacements. With the sectional style of retort members, such as the present invention contemplates, and such as is above described, upon the occurrence of any injury or burning of the upper retort sections 9, the same may be removed by uncoupling it from the bottom section without necessity of disturbing the latter and its connections, or removing the lower baffle wall 26. In such case, the proper cover members are removed together with the vapor collector, and the immediately surrounding portions of the baffle wall 23, and thereupon the injured upper retort section 9 may be removed, repaired and replaced, or a new upper retort section replaced therefor, with a minimum loss of time, labor and expense; and furthermore prolonged efficient use of the lower retort sections may be attained. My present invention, therefore, while of a comparatively simple nature mechanically, is one of considerable utility, novelty and value with relation to retort kilns of the kind described.

I claim:—

1. The combination with a retort kiln housing having a combustion chamber and a heating chamber, a separating side wall intermediate said combustion chamber and said heating chamber, a vertical sectional retort member extending through said heating chamber comprising a bottom section and a separable top section, a transverse baffle wall adjacent to the upper end of said top retort section to close the upper end of said heating chamber, a second transverse baffle wall adjacent to the upper end of said bottom retort section to provide an upper heating zone and a lower heating zone, said second baffle wall having an opening affording communication between said upper and lower heating zones, said side wall having an entrance port affording communication between said combustion chamber and said upper heating zone to first direct the products of combustion from the combustion chamber into said upper heating zone, and said top retort section being detachable from said bottom retort section for removal and replacement independently of the latter.

2. The combination with a retort kiln housing having a combustion chamber and a heating chamber, a separating side wall intermediate said combustion chamber and said heating chamber, a vertical sectional retort member extending through said heating chamber comprising a bottom section and a separable top section, a transverse baffle wall adjacent to the upper end of said top retort section to close the upper end of said heating chamber, a second transverse baffle wall adjacent to the upper end of said bottom retort section to provide an upper heating zone and a lower heating zone, said second baffle wall having an opening affording communication between said upper and lower heating zones, said side wall having an entrance port affording communication between said combustion chamber and said heating zone to first direct the products of combustion from the combustion chamber into said upper heating zone, said bottom retort section having at its upper end above said second baffle wall a longitudinally projecting and outwardly off-set coupling flange providing an internal seating shoulder, and the lower end of said top retort section being adapted to telescope into said flange and seat itself on said shoulder to hold said top section in vertically alined detachably connected relation to said bottom section and located with said upper heating zone.

In testimony, that I claim the invention set forth above I have hereunto set my hand this 31st day of December, 1920.

ROBERT SAYRE KENT.