Sept. 25, 1945. E. H. RECORDS 2,385,731

RETORT

Filed July 6, 1943

Fig. 1

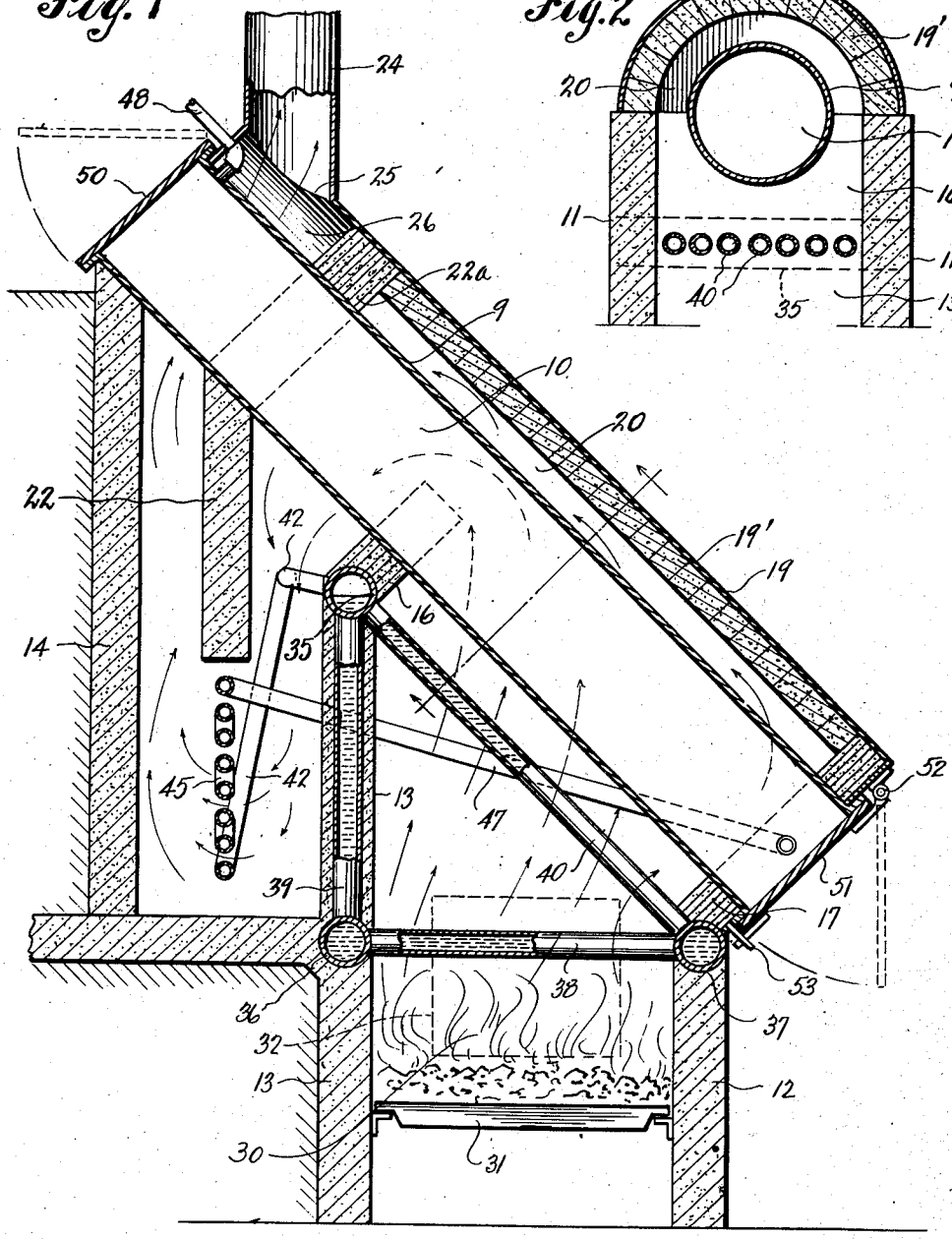


Fig. 2

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RETORT

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1 Claim. (Cl. 202—106)

This invention relates to improvements in retorts designed for calcining and similar operations. More particularly, the invention has reference to retorts of novel construction and disposition, especially adapted for the manufacture of commercial charcoal. It is to be understood, however, that retorts constructed like or similar to that herein shown, are suitable for various uses, and it is not the intention that the claims made in this application shall confine the invention to its uses for the making of charcoal.

It is the principal object of this invention to provide a retort of novel construction and disposition of parts, that greatly facilitates the charging and unloading of the retort chamber and wherein provision is made whereby the furnace heat, as supplied to the retort chamber, is utilized also to heat water in a boiler to furnish steam for use in the making of charcoal or for use in whatever operation is being carried out by the retort.

It is also an object of the present invention to provide a retort that is of simplified design and economical to construct and to operate.

Still further objects of this invention reside in the specific details of construction and combination of parts, and mode of use of the device, as will hereinafter be fully described.

In accomplishing the objects of the invention, I have provided the improved details of construction, the preferred forms of which are illustrated in the accompanying drawing wherein:

Fig. 1 is a vertical, sectional view of a retort constructed in accordance with the present invention, as used for the making of charcoal.

Fig. 2 is a cross section on the line 2—2 in Fig. 1.

Referring more in detail to the drawing:

9 designates an elongated, cylindrical sheet metal shell enclosing the retort chamber 10. This shell is supported in an inclined position by the wall structure of a furnace which comprises parallel, opposite side walls 11—11 as seen in Fig. 2, front and rear firebox walls 12 and 13, respectively, and a back wall 14 which is parallel with wall 13 and spaced therefrom. The retort shell 9 preferably is inclined at an angle of approximately 45°.

Adjacent its upper end, the retort shell rests upon the upper edge of the back wall 14 of the furnace, and it is likewise supported at a medial point and at its lower end respectively, upon cross walls 16 and 17 which, in effect, are continuations of the front and rear firebox walls 12 and 13.

Arched over the retort to enclose it in the furnace, and extending between the side walls 11—11, as seen in cross section in Fig. 2, is a top wall 19 of sheet metal, lined with a suitable refractory material designated at 19', and this arched wall is spaced from the retort shell to provide the intermediate open passage 20.

By reference more particularly to Fig. 2, it will be noted that the cross wall 16 which is a continuation of wall 13, extends about halfway up on the side walls of the retort, leaving the arch passage open above it, and it is shown in Fig. 1 that a vertical cross partition wall 22 is located approximately midway between the walls 13 and 14, in the upper portion of the space between them, and a continuation of this cross wall 22, designated at 22a, surrounds the retort and closes off the space between the retort shell and the side and top walls of the furnace. A stack 24 communicates through an opening 25 in the top wall, with the chamber 26 that communicates with the upper end of the passage that is provided between the walls 14 and 22.

Between the walls 12 and 13 is the furnace firebox or combustion chamber 30. This is equipped with a grate 31, and the firebox may be fed through a door 32 in a side wall.

Embedded in the wall 13, at vertically spaced intervals above the level of the grate, are horizontally disposed, tubular pipe headers 35 and 36. Likewise, in the wall 12, at the same level as header 36, is a header 37. The headers 36 and 37 are connected by spaced horizontal tubes 38. Likewise, the headers 35 and 36 are connected at their ends by pipes 39 and the headers 35 and 37 are connected by parallel, spaced pipes 40, as seen in Fig. 2. These various headers and tubes are filled with water to the level indicated. The header 35 here serves as a steam drum, and a steam pipe 42 leads from the top of the drum downwardly and rearwardly to the lower end of a vertically set pipe coil 45 which coil has a pipe 47 leading from its upper end into the lower end of the retort; and there is a pipe 48 leading from the upper end of the retort for the conduction of vapors from the retort chamber to a condenser or point of discharge.

The retort shell is equipped at upper and lower ends respectively with doors 50 and 51, suspended by suitable hinges, as at 52, and are equipped with latches 53 for holding them shut.

In use of the device for the making of charcoal, it is charged with material through the upper end opening, with bottom door 51 closed and latched. When the chamber has been filled to the proper or designated level, the top door is closed and

latched. Furnace heat then is maintained to heat the retort and at the same time to generate steam which becomes superheated and is admitted into the lower end of the retort through pipe 47 as required. Vapors evolved during the operation are evacuated from the upper end of the chamber through pipe 48 and may be conducted into a wash box for the separation and recovery of wood oil therefrom. In this use of the steam, all latent heat reaches the material to be treated and is not lost by radiation or condensation.

Upon completing the charring of the wood, the finished charge may be discharged upon opening the lower end door 51.

The apparatus is similarly used for various calcining operations.

Having thus described my invention, what I claim as new therein and desire to secure by Letters Patent is:

A retort of the character described comprising an elongated, cylindrical reaction chamber equipped with doors at its ends, a furnace enclosing the said chamber and supporting it in an inclined position for gravity unloading of charges therefrom, and in a manner whereby its ends are exposed at opposite sides of the furnace for charging it through its upper end and unloading from its lower end; said furnace comprising a fire box and a combustion chamber, a boiler in the fire box comprising horizontal headers at the same level at inner and outer side walls of the fire box and a header at a higher level, directly above the header in the inside wall, water circulating pipes between the headers at the same level and between those in vertical spacing, and a bank of water heating pipes extended between the header of higher level and that in the outside wall, a steam pipe leading from the header at the higher level, and forming a coil in the combustion chamber for the superheating of steam; said coil having an outlet into the lower end of the retort, and said retort having a pipe leading from its upper end for the conduction of gases to a point of use.

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