

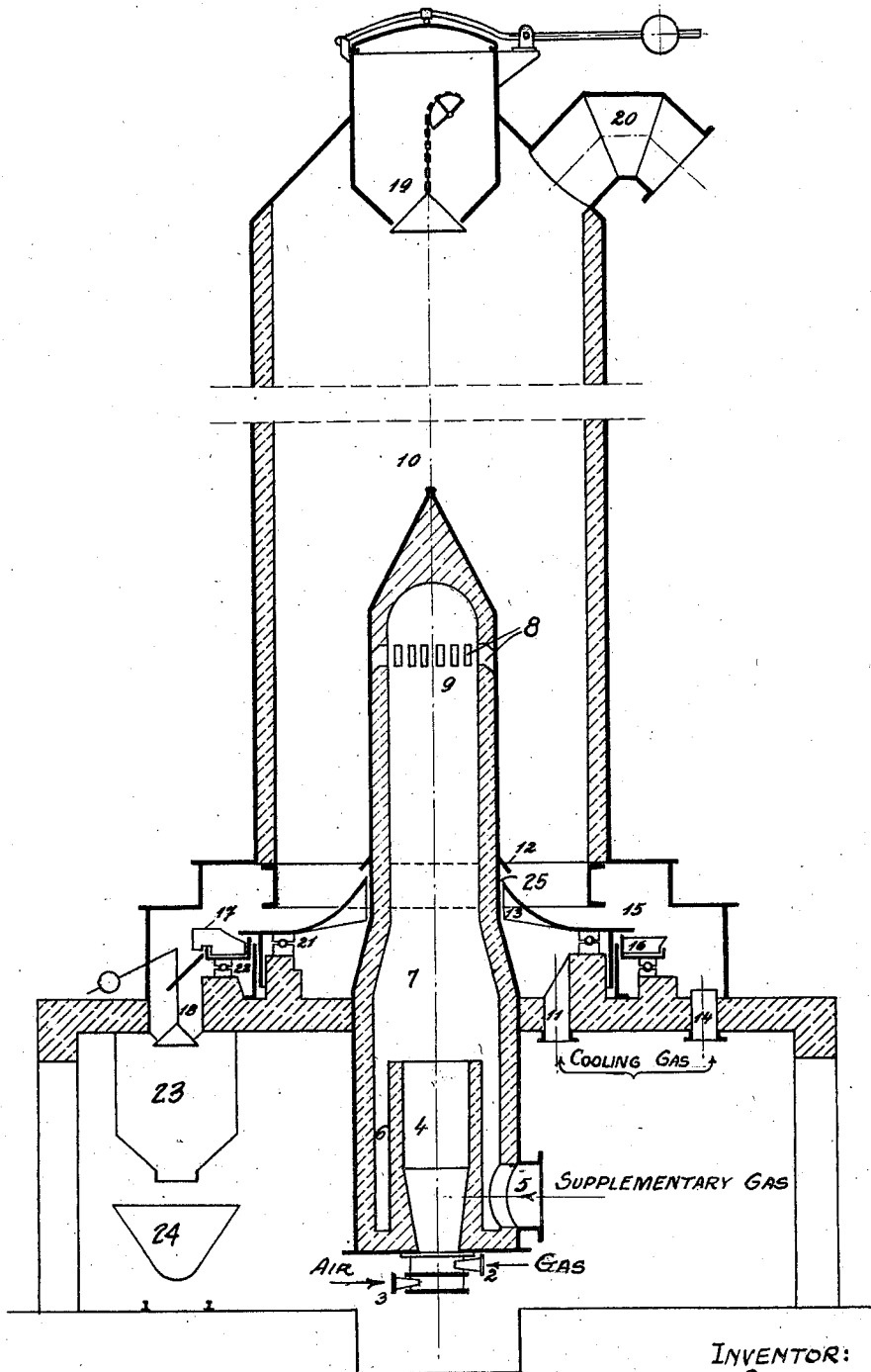
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COAL CARBONIZING APPARATUS FOR THE EXTRACTION OF BITUMINOUS MATERIALS

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# UNITED STATES PATENT OFFICE

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## COAL-CARBONIZING APPARATUS FOR THE EXTRACTION OF BITUMINOUS MATERIALS

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In the extraction of bituminous materials with hot neutral gases, internal combustion furnaces are frequently used, in which a gas is burned, the exhaust products of which serve as a means for distillation, i. e., combustion gases. These internal combustion furnaces are disposed next to, underneath or in the vertical distillation chamber. These devices all have the disadvantage however, in that the means for distillation or combustion gases, in consequence of its admission to the vertical distillation chamber from the side, is not drawn through the material being treated in a uniform manner, which is a great disadvantage in the process of distillation.

According to the invention, the internal combustion furnace is now built centrally and directly underneath the vertical distillation chamber, so that the hood of the internal combustion furnace fits in the said chamber and the combustion gases pass out from the centre to the sides and then to the top in a uniform manner through the material being treated. The internal combustion furnace is thereby arranged in such a manner that the cold gas to be added to the combustion gases for obtaining the temperature necessary for the distillation process circulates round the walls of the internal combustion furnace before it is mixed with them. This arrangement of the internal combustion furnace eliminates any loss through radiation.

For this purpose a portion of the gas from which the tar has been separated is itself taken from the apparatus while another portion is also introduced into the shaft as combustion gases through the hot residue from the material being treated, the heat of which it absorbs. Any other neutral gas available is, of course, quite as suitable for introducing as a supplementary gas.

In the drawing is shown a vertical section through a carbonizing apparatus.

Through the nozzles 2 and 3 combustible air and gas enter the chamber 4, in which combustion takes place. The waste or smoke gas enters through the pipe 5 into the annular chamber 6, circulates round the combustion chamber and is mixed in the mixing chamber 7 with the combustion gases from

nozzles 2 and 3. The quantity of supplementary gas is thus regulated in such a manner that the mixture has the temperature necessary for distillation. This distillation means, consisting of the combustion gases and the supplementary gas, then enters, through the apertures 8 of the hood 9, into the vertical distillation chamber 10, is loaded with distillation gas, on passing through the material being treated, and makes its exit through the gas conduit 20. The coke outlet passage is a hopper 23 under which is a lowry 24 into which the cooled coke falls. The coke cooling occurs in the following manner: A cooling gas, for instance a portion of the cold residue gas, enters through the conduit 11, between the internal combustion furnace and the rotary bottom 13, through the slots 25 formed between the projection 12 on the internal combustion furnace and the rotary bottom, another part enters through the conduit 14 and the chamber 15 through the coke in the coal carbonizing apparatus and then also rises upwardly as combustion gases through the shaft. The coke is carried away by the rotary bottom 13, which rotates on the ball or roller bearings 21, into a basin 16 which also rotates on the bearing 22, from which basin the coke is pressed out by means of an iron plate 17 inclined contrary to the direction of revolution of bottom 13 and is deposited through an adjustable funnel exit 18 into a lowry 24 standing below.

The coal supply to the carbonizing apparatus is made through a filler hopper mechanism 19 of known construction.

I claim:

1. In a coal carbonizing apparatus for the distillation of bituminous materials; a vertical distillation chamber, an internal combustion furnace disposed axially of and beneath the said chamber, means for circulating cold supplementary gas around the walls of said internal combustion furnace; and a mixing chamber receiving the combustion and supplementary gas, said mixing chamber having a perforated hood extending up into the distillation chamber.

2. In a coal carbonizing apparatus for the distillation of bituminous materials; a ver-

tical distillation chamber; an internal combustion furnace disposed axially of and beneath the said chamber; an annular chamber surrounding the walls of said internal combustion furnace for receiving supplementary gas before mixing with the combustion gases; a mixing chamber receiving the combustion and supplementary gas; and a perforated hood on the mixing chamber extending upwardly into the distillation chamber.

3. In an apparatus as set forth in claim 2, a rotary substantially conical shaped bottom for said distillation chamber surrounding the mixing chamber, an annular basin receiving the discharge of the rotary bottom; means for emptying the basin; and means for passing cooling gases upwardly into the distillation chamber adjacent the upper and lower faces of the rotary bottom.

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