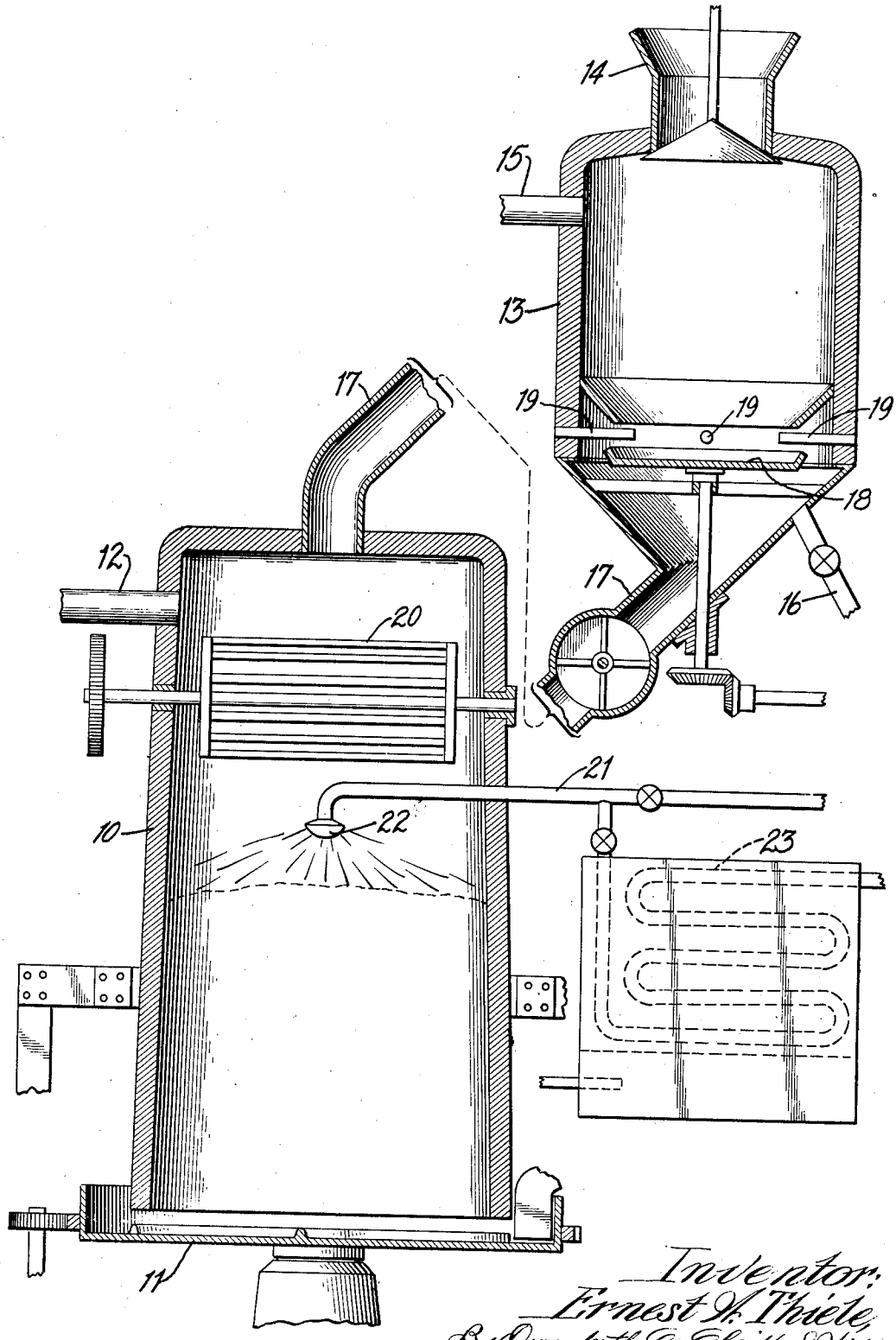
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METHOD OF COKING PETROLEUM RESIDUES FROM THE DISTILLATION OF PETROLEUM OILS

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METHOD OF COKING PETROLEUM RESIDUES FROM THE DISTILLATION OF PETROLEUM OILS

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This invention relates to the coking of tars and particularly petroleum residues.

The invention will readily be understood from the following description, in conjunction with the accompanying drawing, which is a diagrammatic sectional view of a suitable apparatus for effecting said coking.

Referring to the drawing, 10 is a vertical retort which suitably flares downwardly in known manner. At its base, the retort is provided with suitable mechanical means 11 for effecting removal of coke therefrom. Such means may suitably be constituted by a rotatable spiral coke remover of known type. From the upper end of the retort 10 leads a vapor outlet 12 for the removal of gases and volatile matter from the retort. This outlet 12 leads to suitable condensers, etc., (not shown) for the recovery of the volatile products in commercial form.

Near the upper end of the retort 10 is located a chamber 13 for the purpose of preheating finely divided coke. Said chamber 13 is provided with a feeding hopper 14 provided with a closing valve of the conical type. From the upper end of the chamber 13, a suitable conduit 15 leads to any suitable gas collector or burners where combustible gas from the chamber 13 may advantageously be consumed.

At its lower end, the chamber 13 is provided with an air inlet 16 for the purpose of causing partial combustion of the coke, whereby it is raised to a high temperature. From the bottom of the chamber 13, a conduit 17 leads into the upper end of the retort 10; and in the base of said chamber is located suitable mechanical means for the purpose of supplying coke to said conduit 17. Such means may suitably comprise a rotatable bottom 18 and stationary abutments 19 which engage the coke thereon.

Suitable means may be provided in the retort 10 for the purpose of distributing the coke thus introduced uniformly over the cross-section of said retort. Such means may, for example, consist of a bar-cage 20 rotatable from the exterior of said retort. A conduit 21 leads into the upper part of the retort and terminates in a distributing nozzle 22 which is directed downwardly so as to spray tar or petroleum residue downwardly over the surface of the body of hot coke in the retort 10. The conduit 21 may be connected to any suitable source of hot tar, for example, the last of a battery of continuous stills or a pipe-still coil 23 in which the residue may be pre-heated to any desired temperature.

Since the apparatus is not heated externally, it may suitably be insulated throughout.

The operation is as follows:

Crushed coke, for example, coke which will pass a half inch mesh, is supplied to chamber 13 and ignited. Air is injected by pipe 16 in order to bring the coke to a suitable temperature, for example 1400° F. The bottom 18 is rotated and the stationary abutments 19 continuously remove coke at this temperature and supply it to the conduit 17. At the same time, the spreader 20 is operated so that the coke is uniformly distributed over the cross-section of the chamber 10.

When a suitable amount of hot coke has been introduced into the chamber 10, hot petroleum tar residuum, for example, at 800° F., is supplied by pipe 21 to the distributing nozzle 22 which distributes it uniformly over the coke. With the temperatures mentioned, the oil and coke may suitably be supplied in the proportions of four to one by weight. In contact with the hot coke, the petroleum tar is rapidly coked and the coke produced unites with the hot coke introduced from the chamber 13. The coke remover 11 is operated so as to remove coke from the chamber 10 at substantially the same rate as it is supplied thereto and produced therein. In some cases, the petroleum residue may be heated to a desired temperature, for example, about 800° F., by rapidly passing the same through the pipe still 23.

It must be understood that the invention is not intended to be limited to the specific temperatures or proportions hereinbefore specified, since it is obvious that such proportions and temperatures may be modified within wide limits while insuring a sufficent temperature within the retort 10 for effec-

tive conversion of the petroleum tar to coke. For example, it may be pointed out that it is unnecessary to raise the tar to a high temperature before supplying it to the retort 10 since the coke may be regulated in quantity or in temperature so that sufficient heat is provided for raising the cold oil to coking temperature and effecting coking thereof.

It is found that an 8% residue of mid-continent crude can be readily heated in the pipe still to a temperature of about 800°, without substantial trouble from coke deposition. Such a residuum is suitable for coking, according to the present process. It is to be noted that the invention is not intended to be limited in this respect, since other residues and tars can readily be coked thereby.

The heated coke supplied from the chamber 13 appears to substantially prevent the tendency of the coke, formed in the retort 10, to adhere to the walls thereof.

Although the present invention has been described in connection with the details of a specific embodiment thereof, it is to be understood that such details are not intended to be limitative upon the scope of the invention, except in so far as embodied in the accompanying claims.

I claim:

1. The method of coking petroleum residue from the distillation of petroleum oils which comprises heating said residue by passing it through a heating zone in a confined stream at such speed that substantially no coke is formed therein, heating finely divided coke by partial combustion thereof to a high temperature sufficient to effect coking of said residue and intimately mixing said heated residue and the heated coke, the proportion of coke being sufficient to raise the residue to coking temperature and permitting the residue to become coked in contact with said coke and in the absence of extraneous heat.

2. The method of coking petroleum residue from the distillation of petroleum oils which comprises heating finely divided coke to a high temperature by partial combustion thereof, continuously supplying the heated coke to the upper portion of a closed retort and continuously distributing petroleum residue over said heated coke in said retort, coking said residue in said retort, withdrawing volatilized material from said retort, and continuously withdrawing coke from the lower portion of said retort.

3. The method of coking petroleum residue from the distillation of petroleum oils which comprises heating finely divided coke to a temperature of about 1400° F., supplying the heated coke to a closed retort, spraying petroleum residue at about 800° F. upon said coke in said retort, thereby raising said residue to coking temperature, and effecting the coking thereof by the contained heat of the coke.

4. The method of coking petroleum residue from the distillation of petroleum oils which comprises continuously supplying finely divided coke at a temperature of about 1400° F. to the upper portion of a closed retort, heating petroleum residue to a temperature of about 800° F. by passing it through a heated zone in a confined stream, continuously spraying said residue upon the coke, thereby raising the same to coking temperature and effecting the coking thereof, and withdrawing volatilized material from said retort by the contained heat of the coke, withdrawing coke from the lower portion of said retort.

5. The method of coking petroleum residue from the distillation of petroleum oils which comprises heating finely divided coke to a high temperature by partial combustion thereof, supplying said heated coke to an unheated closed retort, distributing petroleum residue upon the coke within said retort, coking said residue in said retort mainly by the contained heat of the coke, and withdrawing volatile material and coke from said retort.

6. The method of coking petroleum residue from the distillation of petroleum oils which comprises heating finely divided coke to a temperature of about 1400° F., supplying said coke to an unheated closed retort, distributing petroleum residue heated to about 800° F. upon said coke in said retort, thereby raising said residue to coking temperature, and effecting the coking thereof solely by the retained heat of the coke and in the absence of combustion.

7. The method of coking residue from the distillation of petroleum oils which comprises heating coke in a separate operation to a temperature sufficient to effect the coking of such residue, supplying the highly heated coke to a closed retort, and applying the residue to the highly heated coke in the retort and permitting the residue to coke solely by the contained heat of the coke.

8. The method of coking residue from the distillation of petroleum oils which comprises heating coke in a separate operation by partial combustion of the same to a temperature sufficient to effect the coking of such residue, supplying the highly heated coke to a closed retort, and applying the residue to the highly heated coke in the retort and permitting the residue to coke solely by the contained heat of the coke.

9. The method of coking residue from the distillation of petroleum oils which comprises heating coke in a separate operation by partial combustion of the same to a temperature sufficient to effect the coking of such residue, supplying the highly heated

coke to a closed extraneously unheated retort, and applying the residue to the highly heated coke in the retort and permitting the residue to coke solely by the contained heat of the coke.

In testimony whereof, I have hereunto set my hand this 28th day of April, 1928.

ERNEST W. THIELE