SINCLAIR REFINING COMPANY

July 2a, 1940

1783

Translation Book #170
Reel 123
Frame 139
Two Drawings

Drawings

S-102

Report - L-T Distillation of Oil Shale
by the process of Dr. A. Schweitzer
June 6, 1945

The Process : Oil shale is charged into an iron shaft kiln, and ignited at the top. Air is sucked from the top to the bottom, causing the combustion zone to travel downwards in the charge. Ahead of it travels a temperature drop, in which the shale carbonizes, or under goes a thermal decomposition. The so-called fixed carbon remains in the shale cinders. This fixed carbon is burnt and keeps up the exotherm process in the combustion zone. The hot exit gases of the combustion zone provide the heat required for the endotherm carbonization process and ensure that there is no oxygen in the air. When the carbonization and combustion zones have reached the bottom of the kiln, operation is discontinued; the kiln is discharged, re-charged and re-ignited.

The Distillation products of the thermal shale decomposition flow with the combustion gases of the combustion zone downward. A certain part will codense in the cold shale. The major part of the hydrocarbons evolves as an oil mist. The particles of which the mist consists are precipitated by an electrofilter(electrostatic gas purifier). In the exit gases are the low molecular hydrocarbons (benzines), which are absorbed by washing oil. The enriched washing oil is then freed from benzine by distillation, and re-used. One of the distillation products is Also the carbonization water. Part of it will already condense in the kiln, that is, as long as the temperature of ths shale layers subjacent to the carbonization zone has not yet risen. This will be the case until the combustion zone has approximately reached the bottom of the shaft. Otherwise, the carbonization water is contained in the oil sprays and is precipitated together with them, mainly in the electro - gas- purifier. When the condensation is terminated, nitrogen wh ch had been introduced with the combustion air will be the main constituent of the exit gases. Moreover, these gases will contain residues of non-converted oxygen, CO and CO_2 from the combustion zone, slight amounts of combustible gases and gaseous hydrocarbons, so that the exit gases are not of a substantial heating value.

The solid carbonization products consists of inconsiderable amounts of fixed carbon which is burnt, and of the anorganic slag.

Dr. Schweitzer developed the process in the following steps.

3.) Lias - plant Frommern: 28 Kilns Ø 3000mm
2.) Pilot plant METZINGEN: 1 kiln Ø 1500mm and 1 kiln Ø 3000mm

Pilot plant METZINGEN

~~FEED: shale, grain size 0-300mm, bulk density 1.2~~
Carbonization advance: 0.2-0.25m/hr.
Fisher analysis of charge: 4.5%
Yields of oil obtained: ca. 77% of Fischer content
" " of benzine " : ca. 10% " " "
Carbonization (exit) gas: ca 500m^3/to of shale/ca. 500cal.

Lias - plant Frommern:

The carbonization and condensation processes differ from METTINGEN scheme only in so far that ahead and behind the blower two more coolers have been installed.

The 28 carbonization kilns are installed within the reach of a crane which moves on tracks. A three - motor crane brings the carbonized kilns to the dumping grounds and takes re-charged kilns to the carbonization place.

M. Beth

M. Beth
June 18, 1948

July 22, 1948

MB:BMc

Distribution: All Divisions

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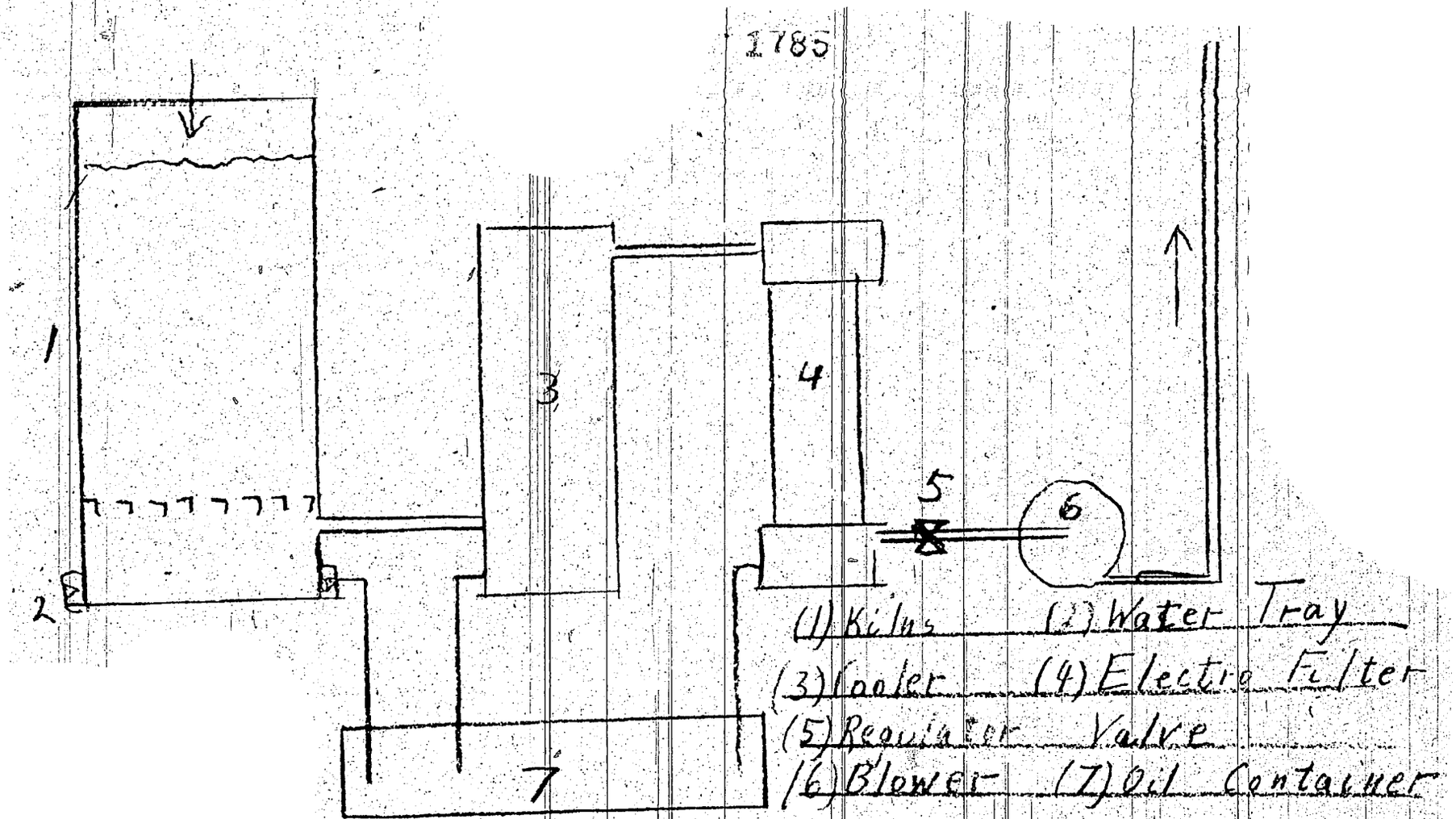

Experimental Plant Metzingen

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LIAS PLANT FROM HERN

M 1500