

PATENT SPECIFICATION



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249,155

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Complete Specification Accepted: Aug. 15, 1927.

COMPLETE SPECIFICATION.

Improvements in the Production of Liquid Hydrocarbons and Derivatives thereof from Coal, Tar and the like.

We, I. G. FARBENINDUSTRIE AKTIEN-
GESAMLSCHAFT, formerly known as
Badische Anilin & Soda Fabrik, of
Frankfort-on-Main, Germany, a corpora-
tion organized according to German
laws, do hereby declare the nature of
this invention and in what manner the
same is to be performed, to be particu-
larly described and ascertained in and by
the following statement:—

This invention is an improvement in
or modification of the invention described
and claimed in Specification No. 247,217
relating to an improved method of work-
ing with carbon monoxide under press-
ure, wherein it has been pointed out that
in order to avoid certain difficulties in
working, the gases should be protected
from coming into contact with iron walls
in such parts of the apparatus which in
the course of the operation reach a tem-
perature of 150° Centigrade or more.
The said method is specially intended for
working with substantially dry gases.
It is stated in the said specification that
this process is applicable to the treat-
ment of coal, tar and the like material
with carbon monoxide and steam.

Our present invention relates to an
improvement in the known process of
converting coal, tar, mineral oils and the
like into benzines, lubricating oils and
other valuable liquid hydrocarbons and
derivatives thereof by treatment with
gases containing hydrogen and carbon
oxides under pressure and at an elevated
temperature in the presence or absence of
a catalyst. In this process water is often
present whether introduced by the
materials to be treated or by the gases
or otherwise, and in order to avoid
trouble by its presence, we have found
that it is necessary that the gases con-

taining carbon oxides should be pre-
vented from coming into contact with
free iron, nickel and cobalt in the hot
parts of the apparatus exposed to the
gases under pressure.

To meet this difficulty the inner sur-
faces of the reaction vessel and of hot
heat exchanger pipings, are in accord-
ance with the present invention made of
a metal not reacting with carbon mon-
oxide, namely, copper, silver, aluminium
or alloys thereof, or of chromium,
manganese, vanadium or uranium, or of
special steels with a considerable per-
centage for example 10 to 20 per cent. of
manganese, titanium, chromium, tungsten,
vanadium or molybdenum such as steel
V2A or W12 or of alloys corresponding
to the special steels and containing nickel
or cobalt instead of iron. Metal carbonyl
vapours contained in the reducing gases
are removed therefrom before use, for
example by means of active adsorbents,
such as active charcoal or silica gel or in
any other suitable manner.

The present invention is not limited to
the use of a gas comprising hydrogen and
containing carbon monoxide from the
commencement of the operation as
carbon monoxide may be formed in the
course of the operation by the action of
water vapour on coal, tar, hydrocarbons
and the like, also when the gases contain
vapours of alcohols, a formation of
carbon monoxide may take place.

It has already been proposed to heat
tar oils in the presence of tin and hydro-
gen and under pressure at temperatures
of 250° Centigrade and more, the said
process being carried out in a tin-lined
apparatus but under the said conditions
the tin coating will melt and the react-
ing materials have access to the iron

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walls of the apparatus, thus giving rise to undesirable by-reactions.

We are aware of Specification No. 255,127 and do not claim anything 5 described or claimed therein.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we 10 claim is:—

1. The improvement in or modification of the invention described and claimed in Specification No. 247,217, consisting in the employment in the process of converting coal, tar, mineral oils and the 15 like into liquid hydrocarbons and derivatives thereof by a treatment with reducing gases containing hydrogen and carbon oxides under elevated pressure and at a high temperature in the presence 20 or absence of a catalyst, of an apparatus

the hot surfaces of which coming into contact with the high pressure gases, are made of a metal not reacting with carbon monoxide. 25

2. In the process claimed in the preceding claiming clause the employment of an apparatus the hot parts of which are made of copper, silver, aluminium or alloys thereof, or of chromium, 30 manganese, vanadium, or uranium, or of special steels with a considerable percentage of manganese, titanium, chromium, tungsten, vanadium or molybdenum, or of alloys of nickel or cobalt 35 corresponding to such special steels.

Dated this 13th day of March, 1926.

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Agents.

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