No. 720,402. PATENTED FEB. 10, 1903.

J. BUEB.

METHOD OF PRODUCING CYANOGEN COMPOUNDS.

APPLICATION FILED FEB. 17, 1900.

NO MODEL.

Fig. 1.

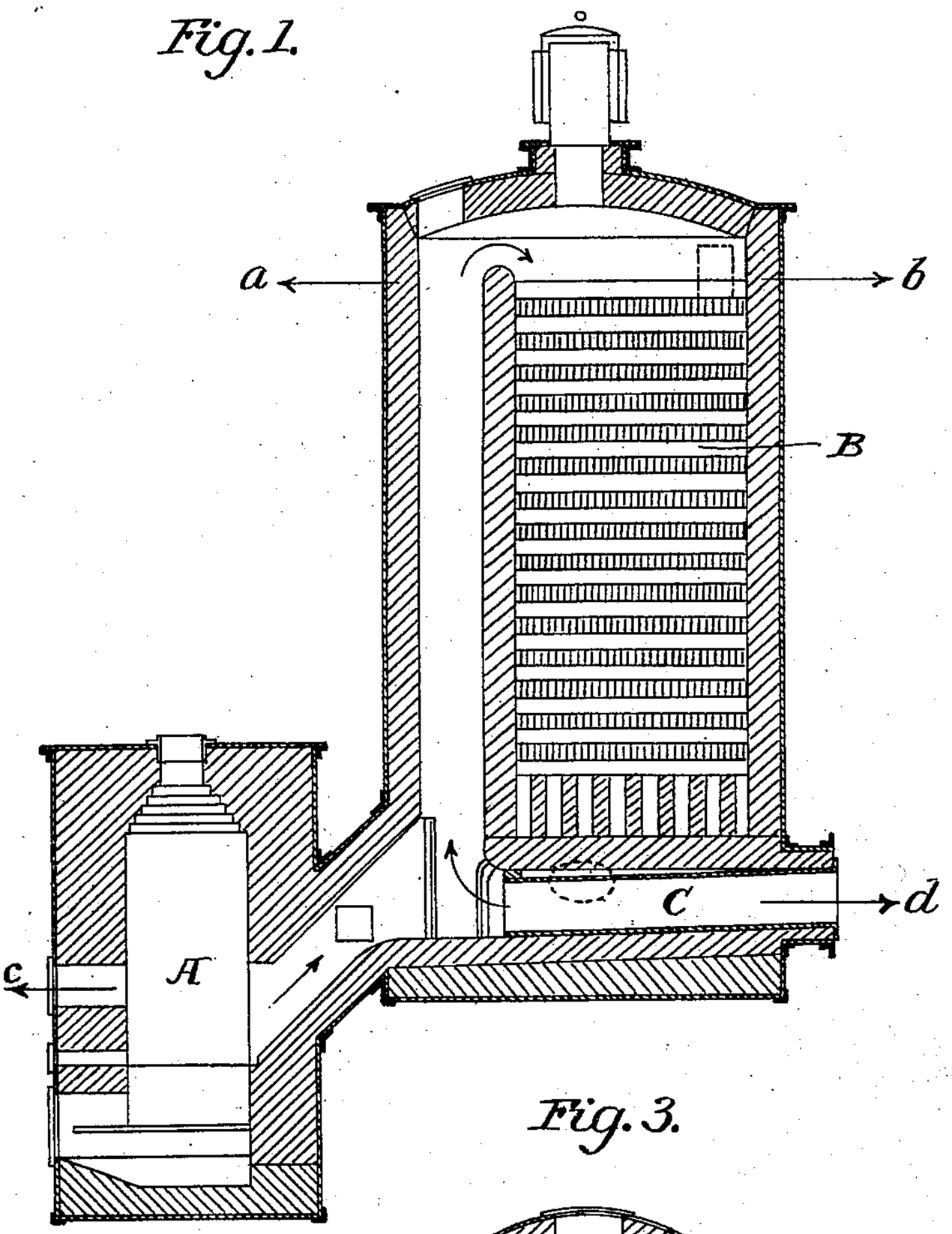


Fig. 2.

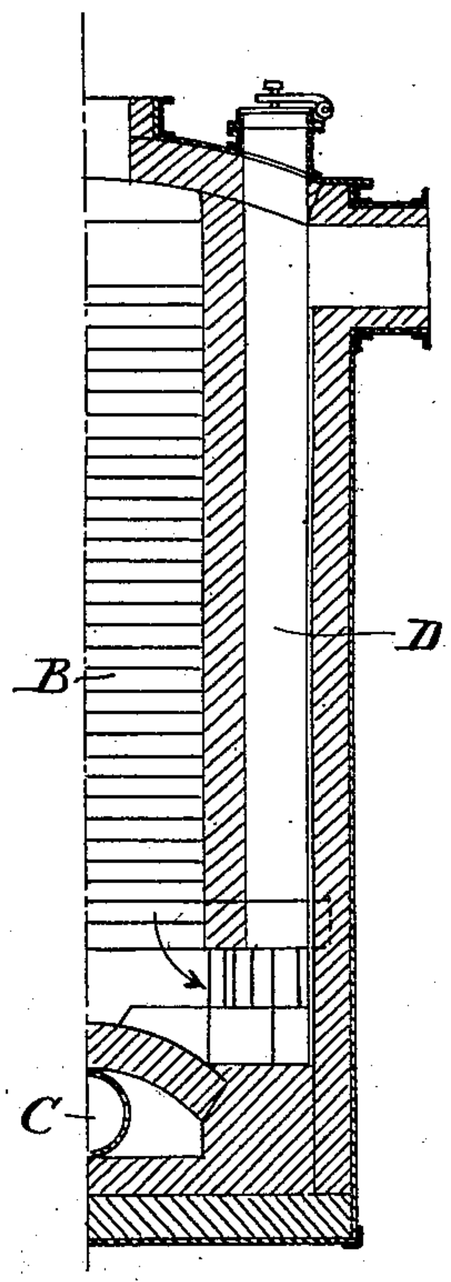


Fig. 3.

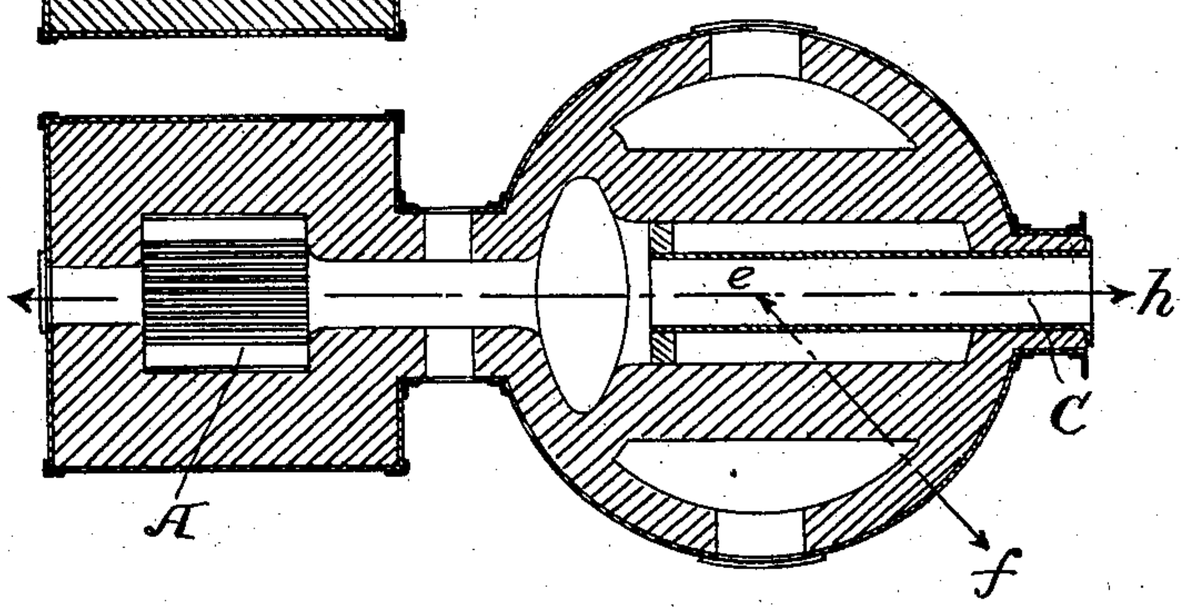
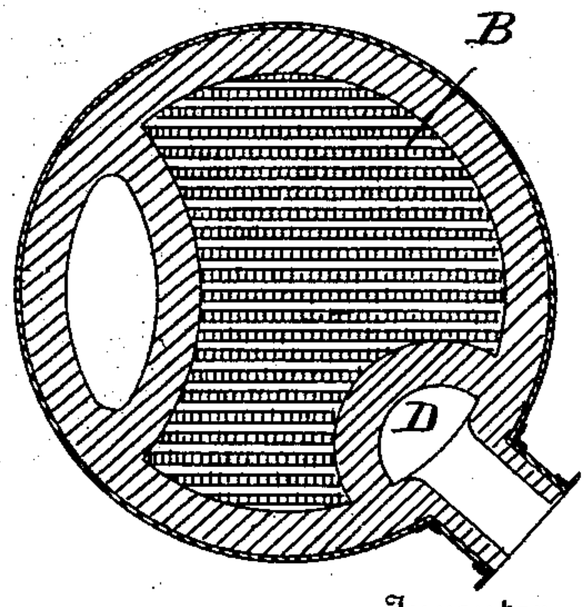


Fig. 4.



Witnesses
J. G. Strickel
Wm. Gillmanjr.

Inventor
Julius Bueb
By Thos. Isaacson
Attorneys

UNITED STATES PATENT OFFICE.

JULIUS BUEB, OF DESSAU, GERMANY.

METHOD OF PRODUCING CYANOGEN COMPOUNDS.

SPECIFICATION forming part of Letters Patent No. 720,402, dated February 10, 1903.

Application filed February 17, 1900. Serial No. 5,606. (No specimens.)

To all whom it may concern:

Be it known that I, JULIUS BUEB, a subject of the Emperor of Germany, and a resident of Dessau, Germany, have invented certain new and useful Improvements in the Production of Cyanogen Compounds, of which the following is a specification.

This invention relates more particularly to the production of cyanogen compounds from residues obtained in the manufacture of beet sugar—such as beet molasses, vinasse, and other residues analogous thereto—in that on carbonizing in chambers from which air is excluded they yield gases convertible in part into cyanogen compounds by exposure to a sufficient temperature to effect the conversion. Heretofore the conversion of said gases has been effected by passing them through narrow channels heated externally—that is, the heating-flames or fire-gases are outside the walls of the channels and the heat has to be conducted through said walls. In order to secure a good yield, the gases have to pass for a long distance through these channels. The heating of the gases to the requisite temperature for the conversion of their constituents into cyanogen compounds besides effecting such conversion results in a deposit of carbonaceous matter on the channel-walls, which soon so clogs the channels as to render them unserviceable and which seriously impairs the necessary conduction of heat through said walls. Moreover, the tightness of the channels is apt in working to become impaired, with consequent escape of the gases and corresponding loss.

By means of the present invention the deposit of carbon instead of being a hindrance is made an assistance by furnishing by its combustion a portion of the heat necessary for raising the said gases to the temperature of conversion, and at the same time the travel of the gases over the heated surfaces may be shortened and the danger from loss by leakage diminished.

In accordance with this invention the cyanogen-yielding gases are passed over pieces of fire-resisting material—such, for example, as potters' clay or the like—which pieces alternately with the passage over them of the said gases are raised to the converting temperature by direct contact of oxidizing fire-gases and flames (either or both) with the same surfaces which are exposed to the said cyanogen-yielding gases. Thus the deposit of carbon which takes place in the converting operation is burned on the working surfaces of the contact-pieces in the intervals during which the said operation is suspended and assists in reheating said surfaces. I have further discovered that the conversion can be carried on until the contact-pieces become completely covered with the carbonaceous deposit, so that the reheating need not be performed at very close intervals, and that there is a considerable body of fuel in the deposit before the reheating has to be performed. Most advantageously the converting operation is carried on until such complete coating results, and such working constitutes a special improvement or feature of my invention. While the contact-pieces in one retort or chamber are reheated, the cyanogen-yielding gases can be diverted into other retorts or chambers, so that the production of cyanogen compounds may be continuous.

Although the invention consists more particularly in the conversion of gases from the above-specified residues, other gases yielding cyanogen compounds on exposure to a sufficient temperature can be subjected to the same operation as the gases from said residues, and the production thereby of cyanogen compounds from such other gases is included also in the invention.

Any suitable apparatus can be used. One form is illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of suitable apparatus on line *g h* of Fig. 3; Fig. 2, a vertical half-section on line *e f* of Fig. 3; Figs. 3 and 4, cross-sections on lines *c d* and *a b* of Fig. 1, respectively.

The pieces of fire-resisting material which fill the converting-chamber B having been brought to the converting temperature, as explained below, the cyanogen-yielding gases from carbonizing the above-specified residues in close chambers (not shown) are introduced by the flue C and (after passing to the top of the converter) are conducted downward over the contact-pieces in the chamber B, wherein the said gases are in part converted into cy-

anogen compounds and wherein they deposit carbonaceous matter on said pieces. The gases containing the cyanogen compounds pass away by the flue D and may be subjected to any known or suitable operation for recovering the cyanogen compounds therefrom. If the contact-pieces have previously been properly heated, the passage of the gases can be continued until said pieces become completely covered with the carbonaceous deposit. Most advantageously this is done.

When the contact-pieces have cooled below an efficient temperature, the supply of cyanogen-yielding gases is cut off, and fuel-gas is introduced from the producer A, while air for burning the fuel-gas and giving an oxidizing character to the flames and fire-gases is let in by the flue C. The oxidizing-flames and fire-gases pass down over the pieces in chamber B, consuming the carbonaceous deposit therein and raising again their temperature to the necessary degree for the succeeding operation of conversion. The products of combustion pass off by the flue D.

When the contact-pieces have been suitably heated above the converting temperature, the supply of producer-gas and of air is cut off, and the cyanogen-yielding gases are again admitted by the flue C.

I claim as my invention or discovery—

1. In producing cyanogen compounds by subjecting cyanogen-yielding gases to a converting temperature, the improvement consisting in heating pieces of fire-resisting material to the said temperature by direct contact of oxidizing-flames or fire-gases with the same surfaces which are exposed to the cyanogen-yielding gases, carbonizing the specified residues in close vessels, passing the resulting cyanogen-yielding gases over the so-heated pieces, again heating said pieces to said temperature by direct contact of oxidizing-flames or fire-gases with said surfaces, which latter receive a carbonaceous deposit during the passage over them of the cyanogen-yielding gases, again passing the latter gases over the hot pieces, and so proceeding, the passage of the last-mentioned gases and the heating again of the fire-resisting pieces being performed alternately, substantially as described.

2. In producing cyanogen compounds by heating gases which yield such compounds on exposure to a sufficient temperature, the improvement consisting in heating pieces of fire-resisting material to the converting temperature by direct contact of oxidizing-flames or fire-gases with the same surfaces which are exposed to the cyanogen-yielding gases, passing the latter over the so-heated pieces, again heating said pieces to said temperature by direct contact of oxidizing-flames or fire-gases with said surfaces, which latter receive a carbonaceous deposit during the passage over them of the cyanogen-yielding gases, again passing the latter gases over the hot pieces, and so proceeding, the passage of the last-mentioned gases and the heating again of the fire-resisting pieces being performed alternately, substantially as described.

3. In producing cyanogen compounds by subjecting cyanogen-yielding gases to a converting temperature, the improvement consisting in heating pieces of fire-resisting material to the said temperature by direct contact of oxidizing-flames or fire-gases with the same surfaces which are exposed to the cyanogen-yielding gases, carbonizing the specified residues in close vessels, passing the resulting cyanogen-yielding gases over the so-heated pieces, continuing such passage until the said surfaces are completely covered with a carbonaceous deposit, again heating the said pieces by direct contact of oxidizing-flames or fire-gases with said surfaces, whereby also the said deposit is burned away, again passing the cyanogen-yielding gases over the hot pieces, and so proceeding, the passage of the last-mentioned gases and the heating again of the fire-resisting pieces being performed alternately, substantially as described.

4. In producing cyanogen compounds by heating gases which yield such compounds on exposure to a sufficient temperature, the improvement consisting in heating pieces of fire-resisting material to the converting temperature by direct contact of oxidizing-flames or fire-gases with the same surfaces which are exposed to the cyanogen-yielding gases, passing the latter over the so-heated pieces, continuing such passage until the said surfaces are completely covered with a carbonaceous deposit, again heating the said pieces by direct contact of oxidizing-flames or fire-gases with said surfaces, whereby also the said deposit is burned away, again passing the cyanogen-yielding gases over the hot pieces, and so proceeding, the passage of the last-mentioned gases and the heating again of the fire-resisting pieces being performed alternately, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JULIUS BUEB.

Witnesses:
WOLDEMAR HAUPT,
WILLIAM MAYNER.