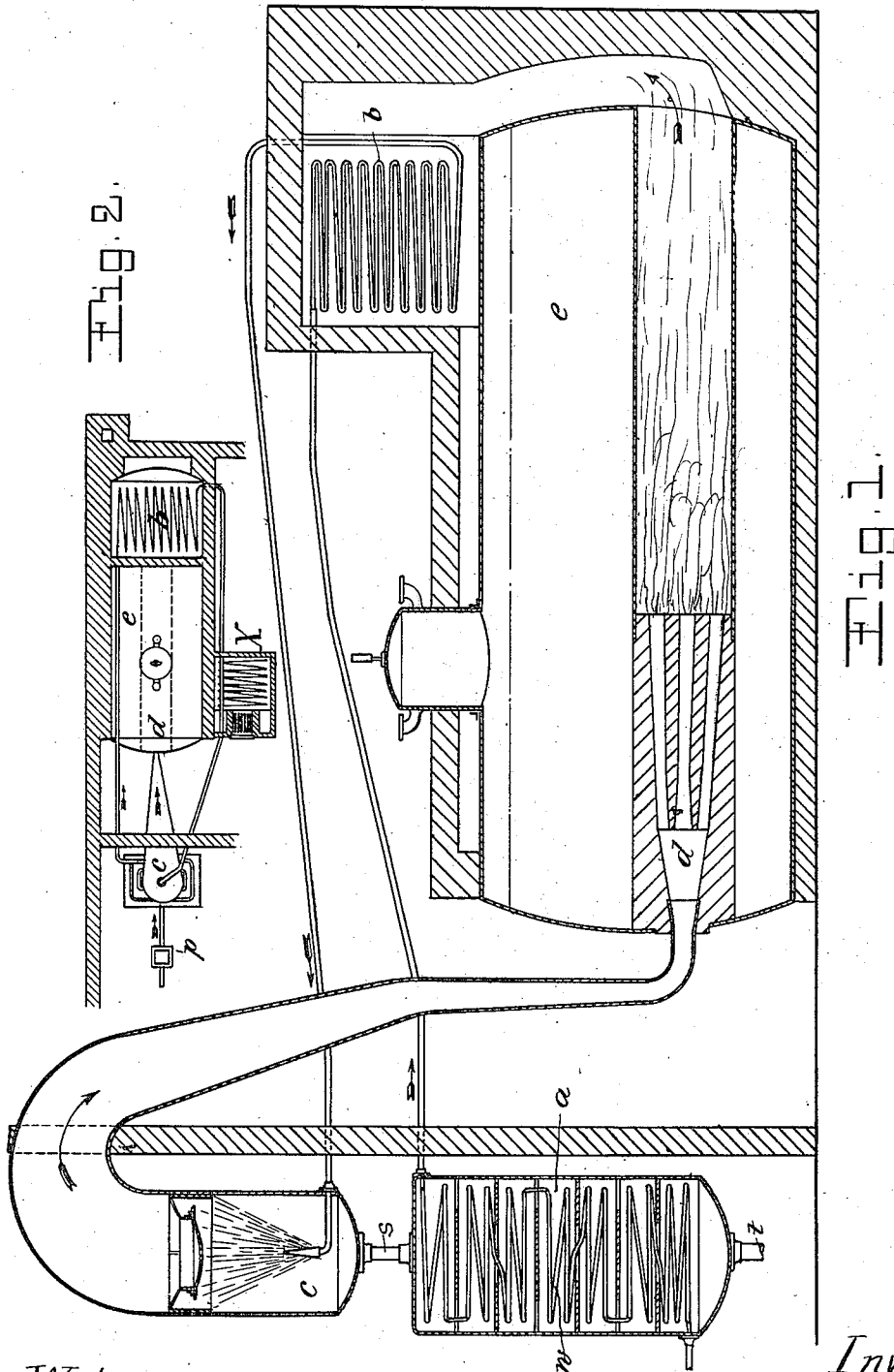


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PROCESS OF HEATING FURNACES.
APPLICATION FILED JULY 15, 1909.

980,797.

Patented Jan. 3, 1911.



Witnesses
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UNITED STATES PATENT OFFICE.

CLAUS HINRICH KÖHN, OF STADE, GERMANY.

PROCESS OF HEATING FURNACES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CLAUS HINRICH KÖHN, a subject of the King of Prussia, Germany, residing at Stade, Prussia, Germany, have invented certain new and useful Improvements in Processes of Heating Furnaces, of which the following is a specification.

The subject-matter of my invention is a process of heating furnaces by means of tar and other heavy hydrocarbons, my process admitting of pitch-like residues being simultaneously obtained.

My process is substantially carried into practice as follows: Tar or a similar heavy hydrocarbon is pumped through a system of coils which is heated by hot gases and converted into spray by a sprayer. The vapors are conducted thence to the furnace and burned there, a sufficient quantity of air being simultaneously supplied, whereas the pitch or other residue flows away from the sprayer to collecting tanks. Both operations conducted separately have been known heretofore. Obtaining pitch by atomizing tar is also well-known, but the vapors produced are precipitated and not burned. The association of the two above mentioned, well-known methods results in the process according to my invention and the technical effect of the invention:—oil firing, pitch being obtained simultaneously.

In order that my invention may be clearly understood reference will be made to the accompanying drawing showing one constructional form of apparatus for carrying the same into practice.

In said drawing: Figure 1 is a vertical longitudinal section, and Fig. 2 a top plan view of said apparatus.

Referring to the drawing, tar or other heavy hydrocarbon is forced by a pump *p* through the worm *w* in the vessel *a* and thence to the worm *b* built in the manner of a superheater in the flues of the steam boiler *e* where it obtains its vaporization temperature of about 300° C. or a higher temperature and is supplied thence to the sprayer *c* where it is converted into spray or atomized.

The vapors pass into the furnace *d* and are burned here in the well-known manner. The hot pitch obtained by precipitation in the sprayer *c* leaves said sprayer through the pipe *s* and flows continuously through the vessel *a* whence it flows by means of pipe *t* to collecting tanks not shown in the

drawing. In vessel *a* are arranged partitions or transverse members which compel the pitch to pass along a step-like course so that the worm in vessel *a* remains for a somewhat long time in contact with the hot pitch and is highly heated; in this manner the tar or other fuel is heated preliminarily to about 150° C. When such a plant is started working the tar must, of course, be heated in a separate auxiliary furnace *X* (Fig. 2) which is shut down a short time after it is started. The vapors which form during the conversion of the tar into spray may, if desired, be partially conducted to a condensation plant so that a common distillation and furnace apparatus is produced.

I claim:

1. The herein described process of heating furnaces by means of tar and other heavy hydrocarbons, which consists in preliminarily heating the fuel, in then heating the fuel to a higher temperature by means of hot gases, whereby a portion of the heated fuel is vaporized, in atomizing the heated fuel, whereby a pitch-like residue is precipitated and hydrocarbon vapors are discharged, in conducting the vapors into the furnace and burning the same, and in separately conducting away the said residue.

2. The herein described process of heating furnaces by means of tar and other heavy hydrocarbons, which consists in raising the fuel to or above its vaporization temperature, in atomizing the heated fuel, whereby a pitch-like residue is precipitated and hydrocarbon vapors are produced, in conducting the vapors into the furnace and burning the same, and in separately conducting away the hot residue and heating the cold fuel therewith.

3. The herein described process of heating furnaces by means of tar, which consists in preliminarily heating the fuel, in then further heating the fuel to or above its vaporization temperature, in atomizing the heated fuel, whereby pitch is precipitated and hydrocarbon vapors are produced, in conducting the vapors into the furnace and burning the same, and in separately conducting away the hot pitch and employing it for preliminarily heating the fuel.

4. The herein described process of heating furnaces by means of tar, which consists in heating the fuel by means of hot gases to or above its vaporization temperature, in atomizing the heated fuel, whereby

pitch is precipitated and hydrocarbon vapors are produced, in conducting the vapors into the furnace and burning the same, and in separately conducting away the hot pitch and causing it to travel in close proximity to the cold fuel so that the latter is heated thereby.

5 5. The herein described process of heating furnaces by means of tar and other heavy hydrocarbons, which consists in raising the fuel to or above its vaporization temperature, in atomizing the heated fuel, whereby a pitch-like residue is precipitated and hydrocarbon vapors are produced, in conducting the vapors into the furnace and burning the same, and in separately conducting away the said residue.

6. The herein described process of heating furnaces by means of tar and other heavy hydrocarbons, which consists in preliminarily heating the fuel, then further heating the fuel to or above its vaporization temperature, in atomizing the heated fuel, whereby a pitch-like residue is precipitated and hydrocarbon vapors are produced, in conducting the vapors into the furnace and burning the same, and in separately conducting away the said residue.

In witness whereof I have hereunto set my hand in presence of two witnesses.

CLAUS HINRICH KÖHN.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.