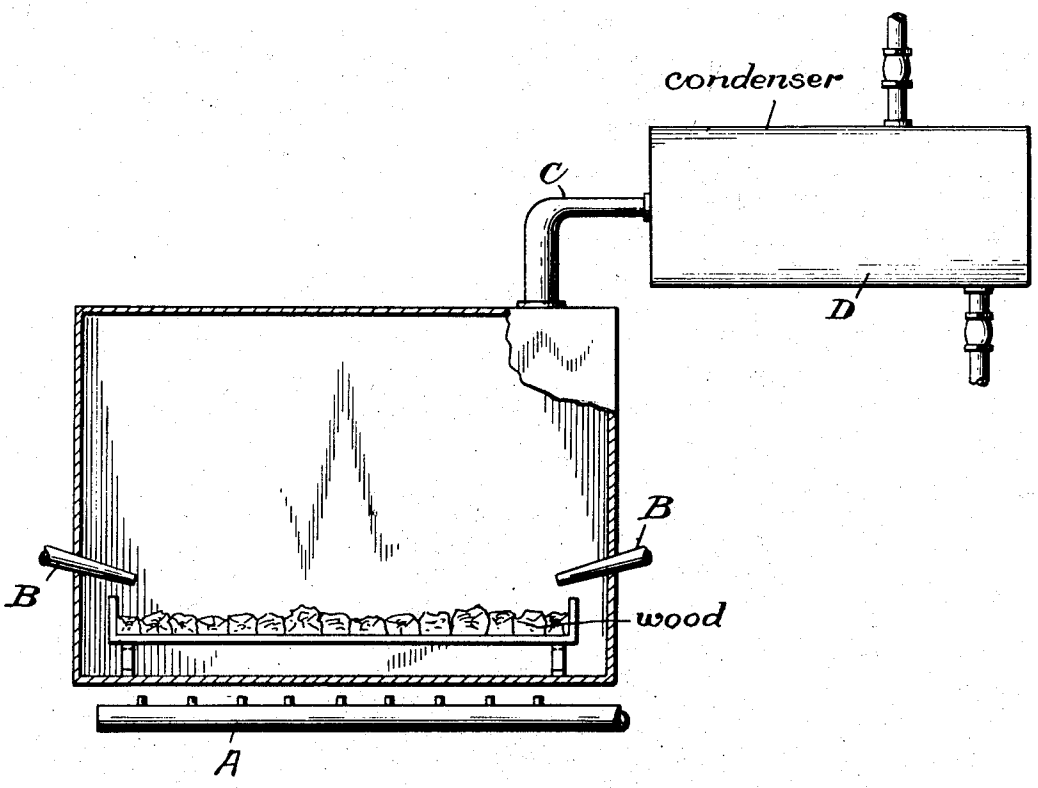
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DESTRUCTIVE DISTILLATION OF RESINOUS WOOD WITH SUPERHEATED STEAM

Filed July 28, 1931



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DESTRUCTIVE DISTILLATION OF RESINOUS WOOD WITH SUPERHEATED STEAM

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The present invention relates to the destructive distillation of resinous wood, for example pine wood, to obtain a pine distillate composed of wood spirit, pyroligneous acid, turpentine, pine oil, tar oil and tar.

The primary object of the invention is to conduct a process of destructive distillation in the presence of superheated steam to obtain a much higher yield of the desired product and at the same time effect an economy, since it is found that a larger amount of material can be treated in a shorter time to give an increased yield, and at the same time prevents the formation of tar coke ordinarily encountered on the retort bottoms, as destructive distillation of resinous wood is usually carried out. This coke is objectionable since it prevents proper heat transfer, is injurious to the retort bottoms, and necessitates cooling the retorts at intervals to remove same by mechanical means.

In carrying out the invention, I employ retorts of any suitable character and size. Such retorts are preferably rendered air-tight and the retort condenser outlets are under a slight vacuum at all times of approximately four inches water pressure.

The resinous wood such as pine wood to be destructively distilled is placed in the retort, preferably in suitable receptacles or containers and superheated steam is introduced to the retort to drive out any contained air.

The retort in which is disposed the resinous material in a suitable container as described is subjected to an external heating until the retort and the contents are approximately 212° F. Thereupon steam superheated to a temperature of 500° to 800° F. is supplied, at the same time continuing the application of external heat until the temperature on the interior of the retort reaches 750° to 950° F.

This temperature is held constant until the stream from the condenser outlets of the retort shows that the distillation is complete or substantially complete. The distillate which has been volatilized by this process and condensed, is recovered and treated as occasion may require.

When the distillation has been completed the retorts are opened, the substantially tar free charred contents and containers are removed, and a new charge is introduced into the retorts.

It will be understood that in accordance with this process a large amount of resinous material may be destructively distilled and I have found that not only is the time element extremely satisfactory, but the yield is much higher than heretofore obtained.

Also, instead of stopping the process and allowing the retort to cool while removing the containers, the process may be carried on continuously by supplying the resinous material to a travelling belt or containers carried by a travelling belt or conveyor. In fact, any convenient process for continually conducting the distillation will be satisfactory.

I have found that by initially driving out the air with superheated steam and thereafter heating the retort to a temperature approximating that of the boiling point of water before introducing the superheated steam for distillation purposes, that the process is extremely effective and results in a more complete volatilization than is possible with conventional methods. In other words, by initially heating the retort and contents and thereafter introducing superheated steam while continuing the external heating, the volatilization or destructive distillation is substantially complete.

The process is characterized by subjecting the resinous wood to the direct action of the superheated steam, and, as stated, the external heating is continued and the temperature raised until the desired point of volatilization is reached.

It is clear that the process may be departed from in various changed or modified ways, all of which are considered as comprehended within the appended claim. The drawing is a diagrammatic view of a retort having an external heating means A, and an internal injector means B, for supplying superheated steam to the interior of the retort. C is the outlet from the retort to the condenser D.

I claim:

The process of destructively distilling resinous wood to obtain a wood distillate, which comprises charging the wood into a retort from which the air has been exhausted, preliminarily heating the retort and its contents to a temperature of substantially 212° F., introducing superheated steam at a temperature of 500° to 800° F. to the heated wood in the retort and simultaneously heating the retort externally until the interior of the retort registers a temperature up to substantially 750° to 950° F., maintaining this temperature until the volatile resinous constituents have been removed, and a substantially tar free char remains, and condensing such volatiles.

In testimony whereof I affix my signature.

ROBERT FRYE.