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A. E. BECKER

ART OF DISTILLATION

Filed March 6, 1923

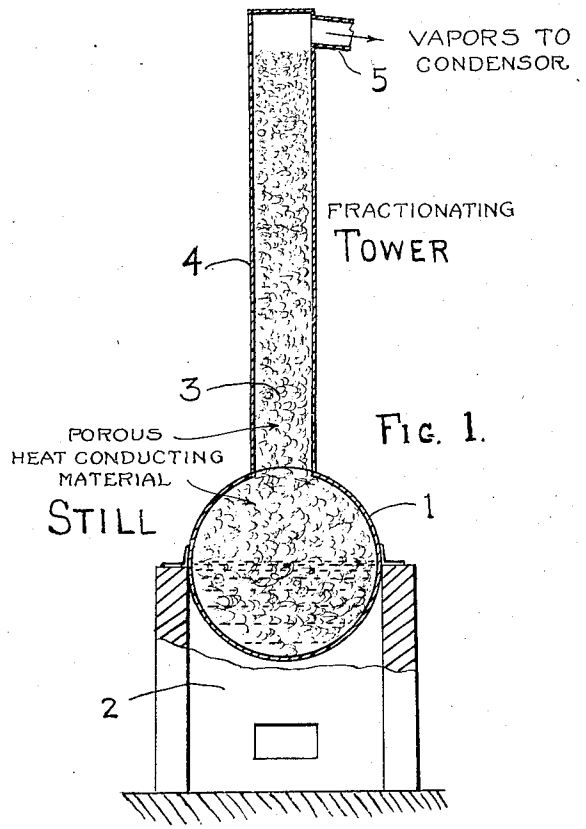


FIG. 1.

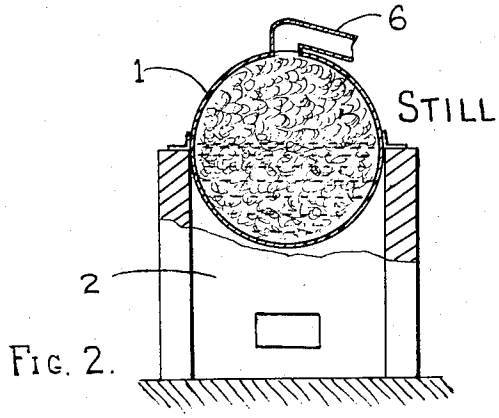


FIG. 2.

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UNITED STATES PATENT OFFICE.

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ART OF DISTILLATION.

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This invention relates to the art to distillation and will be fully understood from the following description, taken in connection with the accompanying drawing, in which—

Fig. 1 is a semi-diagrammatic transverse vertical section of one form of apparatus contemplated in the invention; and

Fig. 2 is a similar view of a modified form.

In distillation it has been an insistent problem to secure an even vaporization without localized overheating and without entrainment or mechanical carrying over of minute droplets of vaporized liquid, and to secure a final condensate of only the fraction desired. These difficulties increase as the boiling temperature of the liquid being distilled increases. When the liquid is for example a hydrocarbon of the character of petroleum, the flash point, viscosity, and color may be adversely affected by reason of local overheating and entrainment of liquid particles.

In proceeding in accordance with the present invention, the material in distillation is contacted with substances affording heat transfer, and extensive surfaces. Where it is desired to take the fullest advantage of the features of the invention, the substance is placed in the still, both in the liquid and vapor spaces, and in the tower above the still. As an example, referring to the drawing, the reference character 1 designates a still of any suitable form, mounted over a heating means, as a furnace chamber 2, and metal in divided or attenuated form 3, preferably metallic wool as for instance steel wool is placed in the still and tower 4; the liquid is maintained at the customary level in the still, say half way, and vapors rising pass up through the interstices of the wool in the still and in the tower and the final vapors thence proceed by a pipe 5 to a condenser (not shown). If desired, a vacuum may also be put on the still. The metallic wool in the body of liquid affords an equalizing heat transfer medium, while at the same time the actual bulk of such material is insufficient to substantially cut down the still capacity. In the vapor space over the liquid the wool catches entrained droplets and mist, and the mass of wool affords a progressively graduated temperature path on up the tower with adequate surface and affords conditions favorable for good fractionation. Along with such effects, where distilling paraffin lubricating stocks, a coordinate segregation of paraffins by progressive molecular weights appears to go with the successive cuts, the amorphous compounds of petrolatum character remaining in the still residue. In this manner it is possible to obtain cleanly-pressing paraffin cuts. Where fractionation is not desired, the tower is dispensed with, and the wool placed in the still and up to the outlet to the vapor line 6, as shown in Fig. 2. In cases where it may be desired to keep the liquid entirely free from any filling material, the advantages of the invention may be realized for the vapor path, by providing the wool in the top of the still and in the tower, or in the tower only.

Where corrosive materials are being distilled, wools of Monel metal, aluminum, or silicates or other desired substance may be used.

While a substance in the physical form of a fibrillar pervious mass as a "wool" is preferable, wire or metallic gauze bunched or rolled up or turnings of steel, iron or other metals may be used, and the advantages of the invention may be realized in lesser proportion, by the use of the heat-conducting substance in the form of pieces or fragments.

Although I have described the invention with reference to certain specific details, it will be understood that this is for the purpose of illustration and is not limitative, and the invention is to be considered as limited only as defined in the following claim in which it is my intention to claim all inherent novelty as broadly as the prior art permits.

What I claim is:

The improvement in the art of distilling hydrocarbon oils, which comprises subjecting a considerable body of oil to distillation at a temperature not materially in excess of its temperature of vaporization, while in contact with steel wool.

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