

# UNITED STATES PATENT OFFICE.

EDWIN T. GREENFIELD AND JUNIUS NAGEL, OF NEW YORK, N. Y., ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE INTERIOR CONDUIT AND INSULATION COMPANY.

PROCESS OF WORKING HIGH-BOILING HYDROCARBONS FOR IMPREGNATING PURPOSES.

SPECIFICATION forming part of Letters Patent No. 441,870, dated December 2, 1890.

Application filed February 25, 1890. Serial No. 341,757. (No model.)

*To all whom it may concern:*

Be it known that we, EDWIN T. GREENFIELD, a citizen of the United States, and JUNIUS NAGEL, (who has declared his intention of becoming a citizen of the United States,) both residing at New York city, in the county and State of New York, have invented a Process of Working High-Boiling Hydrocarbons for Impregnating Purposes, of which the following is a specification.

High-boiling hydrocarbons have been employed with bodies having a fibrous, porous, or cellular formation, in order to obtain the advantages of their insulating and other qualities. These hydrocarbons, when cold, are of a heavy consistency, and were hitherto brought to a workable condition either by thinning them with a solvent or by heating, the bodies to be treated being then immersed therein for a shorter or longer period, and a surface coating being effected. These processes were easily workable, as the material had no tendency, or, at any rate, but a slight tendency, to thicken while being used, as the volatile portions of the hydrocarbons were not freely given off, and as the result was merely a surface coating, if a thickening in some degree resulted it was of inconsiderable consequence. When, however, as in a process recently invented by us, a high heat is employed, the volatile portions of the hydrocarbons are freely given off and the remaining compound soon becomes so thickened as to be unworkable, and it then became necessary to draw off the hydrocarbons and begin on a new supply.

The object of the present invention is a process whereby high-boiling hydrocarbons may be economically worked without the necessity of drawing off the hydrocarbons on account of their becoming thickened during prolonged use.

Our invention is based on the discovery that a high-boiling hydrocarbon may be maintained in a workable liquid condition for a considerable length of time when high heat is employed by from time to time replacing the volatile matters given off from the high-boiling hydrocarbon, preferably by a lower-boiling hydrocarbon.

To illustrate our invention we will refer to that high-boiling hydrocarbon known as "petroleum-pitch," which is a bituminous black residuum obtained in the distillation of coal-oil. The boiling-point of this petroleum-pitch varies, but is generally about 900° Fahrenheit. With this petroleum-pitch a lower-boiling hydrocarbon, known as "yellow tailings," which is a yellow-brownish viscous residuum obtained in refining paraffine-oil, is adapted to be added from time to time to replace the volatile matters driven off. The boiling-point of said yellow tailings is generally about 600° Fahrenheit. These hydrocarbons, in a proportion of, say, seventy-five per cent. of petroleum-pitch to twenty-five per cent. of yellow tailings, when introduced into a suitable kettle or other vessel and maintained at that temperature which has been found suitable to keep them in a workable liquid state, which, for the proportion named, would be about 350° Fahrenheit, will be found to constantly give off volatile matters, the material in the kettle becoming of greater consistency in proportion as the volatile matters leave it. By, however, supplying from time to time, until the quantity in the kettle is used, a quantity of a hydrocarbon of lower boiling-point than that in the kettle, the tendency of the material in the kettle to become thick is avoided, and the same is maintained in the suitable liquid condition, or by adding with a renewed supply of the high-boiling hydrocarbon a quantity of a lower-boiling hydrocarbon the same result will follow.

In practice we have found that with a kettle started with four thousand pounds of petroleum-pitch alone, using about two hundred and fifty pounds daily, in about three days the material became thick and practically unworkable. By, however, supplying to the kettle enough petroleum-pitch and yellow tailings to bring the weight of its contents to about the original four thousand pounds, in the proportion of three of petroleum-pitch to one of yellow tailings, the tendency to thicken was overcome.

While we have described petroleum-pitch as the high-boiling hydrocarbon and yellow tailings as the preferable lower-boiling

hydrocarbon to be used therewith to effect a useful result in carrying out our processes, we are aware that other compounds may be used—as, for instance, instead of the petroleum-pitch what is known as “native asphaltum” may be used together with a lower-boiling hydrocarbon, and instead of yellow tailings may be used paraffine-oil or equivalent hydrocarbon.

10 What we claim is—

The process of working high-boiling hydrocarbons for impregnating fibrous, porous, or cellular bodies, which consists in maintaining

the same in a liquid condition by heat and adding thereto from time to time a lower-boiling hydrocarbon or equivalent to supply the volatile matters evaporated, substantially as set forth. 15

This specification signed and witnessed this 30th day of January, 1890.

EDWIN T. GREENFIELD.  
JUNIOUS NAGEL.

Witnesses:

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