

UNITED STATES PATENT OFFICE.

ARCHIBALD K. LEE, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN PROCESSES OF REDUCING ASPHALTUM TO A LIQUID.

Specification forming part of Letters Patent No. **188,646**, dated March 20, 1877; application filed February 28, 1877.

To all whom it may concern:

Be it known that I, ARCHIBALD K. LEE, formerly of the city and county of Galveston, in the State of Texas, but now of the city and county of Philadelphia, in the State of Pennsylvania, have invented a certain new and useful Process for Reducing Asphaltum to a Liquid, of which process the following is a specification:

In the various applications of asphaltum in the arts it is usually received by the consumer in the solid form, and liquefied when required for use by the application of heat. This process is, for many and obvious reasons, undesirable. The action of heat upon it is injurious, volatilizing and evaporating portions of its valuable constituents, rendering it brittle, and depriving it, to a great extent, of its qualities of tenacity, plasticity, and binding power. Moreover, the addition of dead-oils is required, the acids contained in which are pernicious, and the great heat required rapidly destroys the melting-kettles and renders the process very expensive, while it is always attended with great fire-risks.

Various liquids, such as ether, oil of turpentine, and naphtha, are stated by some authorities to be solvents of asphaltum; and I am aware that most of the hydrocarbons are, to some extent, soluble in their next lighter series, as various distillations of coal-tar, (artificial asphalt,) residuums of petroleum, &c.; but the operation is slow, uncertain, and imperfect, always leaving a considerable amount of thick, gritty residuum, which is unfit for use.

Letters Patent of the United States No. 162,394, for a process for reducing asphaltum to a liquid, were granted and issued to me under date of April 20, 1875; and the object of my present invention is to provide means by which asphaltum may be liquefied cheaply, speedily, and thoroughly without the application of heat, and maintained in a liquid or semi-fluid state, using either the solvent speci-

fied in my Letters Patent aforesaid or others hereinafter set forth.

To this end, my improved process consists in reducing the crude asphaltum to powder, and grinding it in ordinary burr-millstones or chasers, or any other well-known form of mill, to which a constant supply of a solvent hereinafter specified is fed, in quantities graduated to form a fluid of the desired consistency, depending upon the purposes for which it is to be used—as for varnishes, roofing or paving compositions, concretes, &c. The process is both chemical and mechanical in its operation, the grinding and crushing action of the mill and the warmth produced by the attrition of friction accelerating and perfecting the chemical action of the solvent, as a result of which I obtain a perfectly fluid asphaltum, ready for use.

Among the solvents suitable for use in my process are the following: Spirits of turpentine of commerce; petroleum of a gravity of 48°, mixed with thirty-three per cent. of anhydrous oil of turpentine; benzine, naphtha, or similar light hydrocarbon, and the purified spirits of turpentine specified in my patent aforesaid.

The grinding apparatus should be regulated to reduce the asphaltum to about the consistency of fine gunpowder, and the proportionate amount of solvent supplied, depending upon the requisite consistency, will be governed by the operator, a floating siphon or other proper automatic apparatus being advisable for the purpose.

I claim as my invention, and desire to secure by Letters Patent—

The method of reducing asphaltum to a liquid state by grinding it in burr-stones or other grinding apparatus, with the addition of a solvent, substantially as set forth.

ARCHIBALD K. LEE.

Witnesses:

J. SNOWDEN BELL,
F. E. HARDING.