

# UNITED STATES PATENT OFFICE.

CYRUS M. WARREN, OF BROOKLINE, MASSACHUSETTS.

## ROOFING AND PAVING MATERIAL.

SPECIFICATION forming part of Letters Patent No. 248,073, dated October 11, 1881.

Application filed April 26, 1880. (No specimens.)

*To all whom it may concern:*

Be it known that I, CYRUS M. WARREN, a citizen of the United States, residing at Brookline, in the county of Norfolk and State of Massachusetts, have invented a new and useful Improvement in Roofing and Paving Materials, of which the following is a specification.

The object of this invention is to provide a non-volatile or non-drying roofing and paving material that will be less expensive than the compound of natural asphaltum and petroleum residuum described in my Patent No. 179,828, and accomplish the purpose without materially sacrificing the toughness of the compound, or resorting to an admixture of coal-tar material, as described in my specifications Case C and Case D, both filed July 7, 1879.

My present invention consists in a roofing and paving material composed of natural asphaltum and petroleum residuum, or other equivalent non-volatile softening material, and a bituminous residuum, such as obtained by the distillation of wax-tailings, or other equivalent non-volatile materials, such as are produced at a suitable high temperature, either as a residuum or distilled product at or near the end of the distillation of natural bitumens, bituminous coals, bituminous shales, bituminous schists, or other substances yielding hydrocarbon oils by distillation, or at or near the end of the redistillation of such oils, or the residuums of the same at a high temperature.

That my invention may be fully understood I would state that refined Trinidad asphaltum is the most costly ingredient of the compound above referred to, and since this material is not hard enough to admit of an admixture of more than about ten to twenty per cent. of the heavy oil or the residuum of petroleum to bring it to the proper consistency for roofing or paving purposes, the cost of the compound by this method is unavoidably high.

By my invention I am enabled to employ much less of the expensive asphaltum by substituting a corresponding quantity of an artificial bituminous material of similar properties, (but lacking toughness at a low temperature,) and thereby the cost of the roofing and paving compound is materially reduced.

In carrying out my invention the wax-tailings, which are a distillate of the residuum of petroleum, are placed in a suitable iron retort

or still, such as employed in the distillation of coal-tar or petroleum, and the operation conducted in a manner similar to that of distilling those materials, continuing the distillation until the residuum in the still has acquired the desired consistency as determined by samples drawn and cooled at short intervals as the distillation approaches the desired point. The residuum may then be drawn out to cool, or mixed directly with hot melted Trinidad or other natural asphaltum, in about equal parts, or in any other suitable proportions, according to the requirements of the locality or the use to which it is to be applied, agitating the mixture thoroughly by any suitable means, and tempering, as may be required, with the heavy oil or the residuum of petroleum, or other equivalent softening material. To adapt the compound for the saturation of felt or paper it should be made of the consistency of thick tar or soft pitch, as may be preferred, by adding more of the petroleum residuum.

A similar compound may be made by fusing together, in suitable proportions, either the compound of natural asphaltum and petroleum residuum above mentioned and the pitchy residuum from the distillation of wax-tailings, or other equivalent material, and tempering with the heavy oil or the residuum of petroleum.

By distilling from wax-tailings about forty per cent. of oil, (variable with different samples,) a pitchy residuum is obtained, which, when fused with refined Trinidad asphaltum in the proportion of fifty parts of the latter to seventy parts of the former, will produce directly a compound of about the consistency and toughness of the ordinary paving-cement, although containing but about half as much of asphaltum, in this manner also greatly economizing the consumption of this more costly material; but I prefer the method above described—viz., of distilling the wax-tailings to a hard residuum, and softening the mixture of this and asphaltum with petroleum residuum, since the latter is somewhat less affected by the sun's heat than wax-tailings, which, being a distillate from petroleum residuum, would, as is well known, contain decomposition products, which would be more volatile.

I am aware of the patent granted to A. J. Crawford, February 6, 1872, No. 123,458, and of the patent granted to N. B. Abbott, Decem-

ber 18, 1877, No. 198,260. The products of petroleum described in said patents are oils distilled from the residuum, as stated in the specifications, while the product from wax-tailings, which I employ in my compound, is not a fluid nor a greasy material, but a hard or stiff retort residue of the consistency of either resin or pitch, possessing new properties adapted to new purposes, and producing new results. It differs so materially from the distillates from the residuum described in said patents that neither of them can serve as a substitute for my residuum for the purpose above specified, and they are both hereby disclaimed.

15 I do not claim in this application the resid-

uum obtained by the distillation of wax-tailings, such product forming the subject-matter of a separate application.

What I claim as new, and desire to secure by Letters Patent, is—

20 A roofing and paving material composed of natural asphaltum and petroleum residuum, or other equivalent non-volatile material, and of the bituminous residuum obtained by the distillation of wax-tailings, mixed together substantially as and for the purpose set forth.

CYRUS M. WARREN.

Witnesses:

JAS. B. BELL,

JOS. WEST.