

# UNITED STATES PATENT OFFICE.

CYRUS M. WARREN, OF BROOKLINE, MASSACHUSETTS.

## ROOFING, PAVING, AND VARNISH MATERIAL.

SPECIFICATION forming part of Letters Patent No. 248,074, dated October 11, 1881.

Application filed December 24, 1879.

*To all whom it may concern:*

Be it known that I, CYRUS M. WARREN, of Brookline, in the county of Norfolk and State of Massachusetts, have invented a new and  
5 Improved Roofing, Paving, and Varnish Material, which invention is fully set forth in the following specification.

The object of this invention is to provide a  
10 non-volatile or non-drying material at a reduced cost to serve as a substitute both for the common grades of natural asphaltum and asphaltic cement, such as are used in the manufacture of roofs and pavements and for other  
15 ordinary purposes, and especially also as a substitute for the finer grades of asphaltum employed in the manufacture of varnishes and japans.

The invention consists in the residuum formed by the distillation or evaporation of wax-tail-  
20 ings or other equivalent non-volatile materials, (such as are produced at a suitably high temperature, either as a residuum or distilled product, at or near the end of the distillation of natural bitumens, bituminous coals, bitu-  
25 minous 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,) the distillation being  
30 carried to a point at which the said residuum has acquired either a thick tarry, pitchy, or resinous consistency, (requiring the elimination of oils to the extent of about thirty-five to sixty-five per cent. by weight,) as may be re-  
35 quired for any of the various purposes for which natural bitumen or bituminous cement of similar consistency respectively is or may be employed, being the same or similar to the pitch or residuum referred to on page 6 in lines  
40 26 to 29, inclusive, in my amended specification, Case A, filed about July 7, and allowed October 16, 1879, and also on page 4, lines 28 to 33, inclusive, in my other specification, Case D, filed July 7, 1879.

45 Wax-tailings and the other non-volatile hydrocarbon materials above mentioned being either products of petroleum; a species of natural asphaltum, or of other natural bitumen or bituminous material of substantially similar  
50 properties, and not materially altered by the process of distillation in respect to the properties for which it is here employed, the above-

mentioned residuums from these sources possess, if not identically, substantially the same properties, except in regard to toughness at a  
55 low temperature, as natural asphaltum or asphaltic cement of the same consistency, respectively, and may therefore, as already stated, be substituted directly and without any alteration but that of melting for most, if not all, pur-  
60 poses for which the latter are adapted.

In carrying out my invention the wax-tail-  
ings or other equivalent material to be distilled are placed in any suitable iron retort or still, such as commonly employed either in the dis-  
65 tillation of coal-tar or petroleum, and the operation is conducted in a manner similar to that of distilling such materials until the residue in the still has acquired the desired consistency, as indicated by samples drawn and  
70 cooled at short intervals as the distillation approaches the desired point—matters readily understood by persons skilled in the art to which they pertain—and then, or after partial  
75 cooling in the still, drawing off the residuum into a cooling-vat or barrels ready for use. Evaporation in an open vessel will give a similar result; but this is not recommended, since it would be attended with loss of the oils ex-  
80 pelled.

In operating upon wax-tailings I have found that a residuum of about the ordinary consistency for roofing-cement is reached on taking  
off about forty-five per cent. of distillate, and for a paving-cement about forty-two per cent.,  
85 and for a hard or resinous residuum for varnish purposes the removal of about sixty to sixty-five per cent. of distillate is desirable; but since commercial wax-tailings are of a more or less variable consistency, the proportion of  
90 distillate must also vary accordingly. Therefore the above proportions will not serve as a safe criterion, but an actual test only from time to time, as above stated, can be relied on.

For a saturating material for paper or felt  
95 the distillation is arrested at a point at which the residuum in the still is found by the test to have acquired about the consistency of thick tar or that of very soft pitch, as may be preferred, usually reached by taking off about  
100 thirty-five to forty per cent., by weight, of oil.

The roofing and paving materials above described may be heated and directly applied in any ordinary manner of applying any other



bituminous and coal-tar materials in the manufacture of felt and gravel roofs, roofing-fabrics, and concrete pavements, and according to any customary method of construction of such roofs, roofing-fabrics, and pavements.

The hard or resinous residuum from wax-tailings and from other equivalent material, being readily soluble in hot linseed-oil or turpentine spirits and of exceedingly brilliant luster—quite unlike coal-tar residuums in these respects—may be substituted directly for hard natural asphaltum in the manufacture of even the finer grades of black varnish and japans, and, being a purer black, and at least equally brilliant, is to be preferred to this substance, irrespective of cost, which is much less for the residuum.

I am aware of the patent of A. J. Crawford, February 6, 1872, No. 123,458, and of the patent to N. B. Abbott, December, 1877, No. 198,260. The products derived from the petroleum residuum, as described in said patents, are distillates and fluid, and in themselves destitute of cementing properties, suitable, therefore, only to serve as a solvent or softening ingredients for some hard or stiff material—such as Trinidad asphaltum—in the formation of a roofing or paving cement. They operate, therefore, on a different principle from the hard or stiff residual product that I describe, which serves the opposite purpose of a thickening or stiffening ingredient for any suit-

able liquid material to form such cement, or as a cement by itself for some purposes; hence the combination of my product with theirs in suitable proportions would constitute a roofing or paving cement. This indicates plainly that they are opposites of each other in operation and effect. Moreover, in a combination of my residual product with any material to form a roofing or paving cement of the ordinary or any suitable consistency it would require to be employed in about five to six times the proportion that the liquid products referred to are or can be employed in such cement, which also indicates an essential difference in properties, leading to new results. The liquid products referred to are therefore hereby disclaimed.

I also disclaim the product described in Letters Patent No. 239,260, granted to Warren Chemical Manufacturing Company, March 22, 1881.

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

As a new manufacture, the bituminous residuum obtained by exposing wax-tailings to a distilling process, substantially in the manner specified, or by any other method which will produce a like result.

CYRUS M. WARREN.

Witnesses:

JAS. B. BELL,

WM. C. SEVERSON.