UNITED STATES PATENT OFFICE.

CYRUS M. WARREN, OF BROOKLINE, MASSACHUSETTS.

ROOFING AND PAVING MATERIAL.

SPECIFICATION forming part of Letters Patent No. 248,075, dated October 11, 1881.

Application filed December 26, 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 useful Improvement in Roofing and Paving Materials, which invention is fully set forth in the following 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 to accomplish this purpose without materially sacrificing the toughness of this compound or resorting to an admixture of coal-tar material, as described in my specifications Cases C and D, filed July 7, 1879.

The invention consists in a compound of natural asphaltum and the residuum formed by the distillation or evaporation 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 redistillation of such oils, or the residuums of the same, at a high temperature,) the distillation being carried to a point at which the said residuum has acquired about the consistency either of refined Trinidad asphaltum or resin, preferably the former, being the same or similar to a product described in my specification dated December 22, 1879.

That my invention may be more clearly 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 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 too high.

By my invention I am able 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,) made by decomposition of wax-tailings or other equivalent non-volatile material, as above described, and thereby materially reduce the cost of the roofing and paving compound.

In carrying out my invention the wax-tailings or other equivalent material are placed in any 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 these materials, continuing the distillation until the residue 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 residuum of petroleum or other equivalent softening material.

To adapt the compound to the saturation of paper or felt it should be made of the consistency of thick tar or soft pitch, as may be preferred.

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 residuum of petroleum.

My compound may be prepared also by distilling, in suitable proportions, a mixture of natural asphaltum, with or without an admixture of petroleum residuum, and wax-tailings or other equivalent non-volatile or non-drying material; but I prefer the method above described.

By distilling from wax-tailings usually about forty per cent., by weight, of oil, (variable with different samples,) a pitchy residuum is obtained, which, 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-tailing to a hard residuum and softening the mixture of this and asphaltum with petroleum residuum, since the latter is somewhat less affected by the heat of the sun than wax-tailings, which, being a distillate from the former, would, as is well known, contain decomposition products which would be more volatile; but, notwithstanding this appreciable difference in quality, the wax-tailings may be used as a softening or tempering material for my compound instead of the oily or tarry residuum of petroleum when the latter cannot be conveniently procured.

I am aware of the patent to A. J. Crawford, February 6, 1872, No. 123,458, and of the patent to N. B. Abbott, December 18, 1877, No. 198,260. The products from petroleum residuum described in said patents are oils distilled from the residuum, as stated in the specifications, leaving (in the case of wax-tailings, and doubtless in others also) a retort residue of coke.

The product from wax-tailings that I employ in my compound is not a fluid, but a hard or stiff retort residue, possessing new properties adapted to new purposes, operating on a different principle, 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.

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

A roofing and paving material composed of natural asphaltum and a bituminous residuum such as obtained by the distillation of wax-tailings, substantially as and for the purpose set forth.

CYRUS M. WARREN.

Witnesses:
JAS. B. BELL,
WM. C. SEVERSON.