

UNITED STATES PATENT OFFICE.

JESSE A. DUBBS, OF ALLEGHENY, ASSIGNOR OF ONE-HALF TO JAMES HARVEY WHITE, OF PITTSBURG, PENNSYLVANIA.

MANUFACTURING ASPHALTUM.

SPECIFICATION forming part of Letters Patent No. 468,867, dated February 16, 1892.

Application filed October 11, 1890. Serial No. 367,833. (No specimens.)

To all whom it may concern:

Be it known that I, JESSE A. DUBBS, a citizen of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Manufacturing Asphaltum, of which improvements the following is a specification.

The invention described herein relates to the manufacture of asphaltum from crude petroleum or petroleum residuum, and under the term "residuum" I include all heavy products which remain in the still after distillation, whether the distillation be effected with or without the aid of steam, such as tar, cylinder stock, heavy oils, &c.; and in general terms it consists in the combination, when subjected to heat, of the crude petroleum or petroleum residuum with sulphur, all as more fully hereinafter described and claimed.

When using Pennsylvania or Lima crude oils, or crude oils similar thereto as regards their lighter volatile constituents, the crude oil is subjected to distillation or evaporation until the volatile constituents, which seem to prevent the combination of the sulphur with the oil, are driven off. The charge in the still is then reduced about two hundred degrees in temperature, and a proper amount of sulphur is placed in the still with the cooled residuum. The amount of sulphur added is about one pound to each gallon of the residuum, though this amount of sulphur will vary slightly with the character of the asphaltum required, and also the specific gravity of the residuum. Heat is again applied and the contents of the still raised to a temperature a little below the point of distillation, and maintained at this temperature for from two to six hours, more or less, dependent upon the grade of asphaltum desired.

When using previously-formed residuum—such as has been allowed to become entirely cool—the entire amount of sulphur may be charged into the still, together with such residuum; but I prefer to charge in with the residuum only about twenty to twenty-five per cent. of the total charge of sulphur, and then heat the mixture until traces of sulphureted hydrogen (H_2S) are developed. Firing is then

stopped, and forty to fifty per cent. of the entire charge of sulphur is added. Heat is again applied and continued for from three to five hours, when the remainder of the sulphur is added and the heat continued until the resultant product will have the desired hardness, which can be determined by samples taken from the still. The heat to which the charge is subjected should be a little below the point of distillation. While the entire amount of sulphur may be added at the beginning of the operation, as above stated, I find that a more cohesive product is made by adding it at different stages in the operation.

When my process is carried on as a continuation of the distilling operation, the sulphur may be charged into the still with the crude petroleum; but no such combination as is required with the sulphur will be formed when Pennsylvania or Lima crude oils are employed until some of the more volatile constituents of the crude oil are driven off, such constituents seeming to prevent a combination of the sulphur, which remains as an inert matter until the distillation has been carried on to such an extent that the charge in the still will, as heretofore stated, become viscid when cooled.

Some crude petroleums, such as those as are found in Wyoming and other parts of the country, do not seem to contain the constituents which are, in the case of the Pennsylvania and Lima oils, preventive of the combination of the sulphur with the crude oils. Hence in working with such crude oils a suitable quantity of the crude oil is charged into a suitable still, together with twenty to twenty-five per cent. (20 to 25%) of the entire amount of sulphur designed to be employed, and heat applied until slight traces of sulphureted hydrogen are developed. The firing is then stopped and forty to fifty per cent. (40 to 50%) of the total amount of sulphur is added, when firing is resumed and the heat maintained at a point slightly below the temperature of distillation for from three to five hours, when the remainder of the sulphur is added and the heat continued until the asphaltum has been reduced to the required hardness. In this case, as the others heretofore

described, sulphur is added in about the proportion of one pound for each gallon of the crude oil. The product of this process is jet black and very close-grained, and somewhat
5 pliable at ordinary temperature; but this pliability, when undesirable, can be overcome by adding thereto about ten per cent. (10%) of sand or other silicious material, the addition of such material rendering the asphaltum
10 hard and rigid.

I claim herein as my invention—

The method herein described of manufacturing asphaltum, consisting in subjecting crude petroleum or residuum thereof and sul-

phur to a suitable heat, reducing such heat, 15 charging in an additional amount of sulphur, again subjecting the entire charge to a further heat, adding more sulphur, and continuing the heat until the product has attained the desired degree of hardness, substantially 20 as set forth.

In testimony whereof I have hereunto set my hand.

JESSE A. DUBBS.

Witnesses:

DARWIN S. WOLCOTT,
R. H. WHITTLESEY.