

UNITED STATES PATENT OFFICE.

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BINDER FOR BRIQUETS.

SPECIFICATION forming part of Letters Patent No. 733,987, dated July 21, 1903.

Application filed November 1, 1902. Serial No. 129,786. (No specimens.)

To all whom it may concern:

Be it known that I, FRANCES B. MERRILL, of New York city, county of New York, and State of New York, have invented a new and
5 useful Improvement in Binders for Briquets, of which the following is a specification.

The aim of my invention is to provide a new and improved material for use as a binder or agglutinant in the manufacture of briquets from coal, coal-dust, flue-dust, iron ore,
10 or other granular material.

At the present day it is a common practice to produce briquets of coal or coal-dust by combining therewith the ordinary pitch of
15 commerce and subjecting the combination or mixture to pressure in suitable molds.

In the use of briquets as heretofore constructed two difficulties have been encountered—first, that the percentage of the binder
20 required was objectionably large, and, second, that owing to the character or nature of the binder the briquets when subjected to heat were liable either to disintegrate and assume the form of a loose granular mass or,
25 on the other hand, to melt down and assume a pasty or semifluid condition, both of which conditions were open to objection.

The aim of my invention is to provide a binder of such character that a small proportion or percentage of the same will serve to bind the granular material firmly together and produce a solid body or briquet adapted to withstand high temperatures without disintegrating or melting. In other words, I
30 aim to produce a briquet which will retain its solid condition as it is gradually reduced by the combustion of material at its outer surface or by the gradual fusion of non-combustible material, such as flue-dust or iron ore.

In carrying my invention into practice I make use of tar or crude pitch, preferably coal-tar pitch, combining therewith sulfate of iron and water, subjecting these materials to heat, as hereinafter explained, whereby
45 the tar is modified and a pitch or binder of new characteristics produced.

In proceeding to prepare my binder I add

to eighty-five parts of coal-tar ten parts, by weight, of water and five parts, by weight, of sulfate of iron. These combined materials
50 are placed in a still or equivalent apparatus and the temperature gradually raised to 570° Fahrenheit. During this distillation the contents of the still are subjected to agitation to facilitate the escape of the volatile matters
55 which it is desired to eliminate—that is to say, those which will pass over within the temperature named. When the distillation is complete and volatilization ceases, the mass is permitted to cool and the process is complete. The resulting product is a pitch differing materially from the material with which the operation was begun. It is exceedingly brittle or friable and may be reduced to the form of powder by rolls or other crushing
60 mechanism, such as is commonly employed for the reduction of granular substances. It will adhere tenaciously to coal-dust, iron ore, and other granular materials, and it is adapted to resist much heavier pressures and higher
65 temperatures than ordinary pitch before disintegrating or softening.

While I have named the proportions and the temperatures which I find best adapted for general use, it is to be understood that
75 the proportions of the iron sulfate and water may be varied within reasonable limits and that the limits of temperature employed in distillation may be modified to some extent, according to the particular use to which the binder is put or the character of materials with which it is to be combined. The best results are obtained by dissolving the sulfate of iron in the water before adding to the pitch. I propose to combine my binder in
80 granular form in the presence of heat and pressure with coal-dust or other material to be briqueted.

A separate application will be filed for the preferred mode of procedure.

Having thus described my invention, what I claim is—

1. The method of producing a binder or agglutinant for granular materials consisting in

distilling coal-tar, water and sulfate of iron in substantially the proportions and at substantially the temperature specified.

5 2. The process of modifying coal-tar to produce a binding pitch consisting in progressively distilling the tar in the presence of sulfate of iron until a temperature of 570° Fahrenheit or thereabout is reached.

In testimony whereof I hereunto set my hand, this 19th day of September, 1902, in the presence of two attesting witnesses.

FRANCES B. MERRILL.

Witnesses:

JOHN F. GEORGE,
P. T. DODGE.