UNITED STATES PATENT OFFICE.

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METHOD OF TREATING WURTZILITE.

SPECIFICATION forming part of Letters Patent No. 655,130, dated July 31, 1900.

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To all whom it may concern:

Be it known that I, ROBERT M. THOMPSON, a citizen of the United States, residing at Sutton, in the county of Clay and State of Nebraska, have invented certain new and useful Improvements in Methods of Treating Wurtzilite; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a method of treating the mineral wurtzilite and rendering it commercially valuable and in such condition that it can be utilized for various purposes, and particularly as an insulating material to serve effectually as a non-conductor of telluric influences, as heat and electricity.

As is well known, wurtzilite is a peculiar hydrocarbon mineral amorphous in form and usually found in large homogeneous masses free from mechanical mixture or contamination with earthy substances. When cold or at ordinary temperature, it is brittle and breaks with a large conchoidal fracture, giving very brilliant glossy surfaces, with a vitreous luster like uintahite and resembling in appearance the splendent conchoidal surfaces of newly-broken obsidian. It has, however, a decidedly-tough quality, which increases with the elevation of temperature, and it requires a quck, sharp blow to detach a flake and secure a good fracture. It shows a tendency to break in thin flakes rather than in cuboidal or spheroidal masses. In the midst of a large mass of the mineral remarkable for the growth of the conchoidal surfaces there is a small nodular mass with a granular fracture, the color and luster of which, however, is the same as in other portions and there does not appear to be any essential difference in composition.

An actual analysis of wurtzilite discloses that its specific gravity is 1.0510; color, black, streak brownish black, and, as stated, fracture conchoidal. It melts only when heated to the point of ignition and then burns with a smoky flame.

The composition of the mineral is as follows: carbon, 79.81 per cent.; hydrogen, 11.30 per cent.; nitrogen, 2.63 per cent.; sulfur, 4.50 per cent.; ash, 1.50 per cent.; total, 99.74; bitumen soluble in carbon bisulfid, 6.24 per cent.; bitumen soluble in 88 gasolene, none.

In carrying out my method the crude mineral is placed in a retort and heated to a high temperature—say from 800° to 1,000° Fahrenheit—for a longer or shorter period, accordingly as it is desired to reduce it to a complete liquid or melted state for combination with other elements or to a plastic or softened condition to adapt it to be easily worked or molded into a desired form. While still in a heated condition and at a temperature slightly below that of the retort the mineral may be placed under heavy pressure and molded to the desired form. In this latter operation it will be understood that the molds used may be varied to form different articles, and while undergoing the heating step sulfur and volatile elements are eliminated.

When the mineral is retorted, as just stated, it will melt and the molding operation is carried on while cooling. In heating the mineral, however, steam heat is preferable in that it retains all the properties of the mineral, and under the action of this medium the mineral is softened and has the consistency of cheese. The time consumed attaining the required temperature by the use either of a retort or steam will be varied in accordance with the size of the piece of mineral treated. As thus far treated the mineral will serve very efficiently for different purposes and may be used in this condition as a non-conductor of telluric influences, such as heat and electricity.

To insure a more positive insulating effect, the mineral is fused by the action of heat and a hardening material—such as mica, asbestos, or soapstone—is incorporated therein and afterward a quantity of sulfur. After the addition of these materials in proper proportions the mixture ferments or rises in the form of a yeast-like mass which is subjected to heavy pressure to form the article desired or reduced to a block of the material which may be afterward cut by any suitable means and polished.

In heating the mineral and before the addition of materials specified it is first fused or melted in a closed vessel or retort and then placed in an open vessel with as much heat applied thereto as it will stand without catch-

ing afire, and when in the latter condition the mica, asbestos, or soapstone, either one or all, if desired, are thoroughly commingled with the said heated mineral by stirring the mass. As much of any one of the said materials will be used as the heated mass of mineral will take up, and after this operation sulfur is incorporated in quantities from four to ten per cent. in weight and according to the hardness required. When the sulfur is mixed with the other materials, it will set up a fermentation, and while in this condition the mass is molded under very heavy pressure and preferably in a copper mold. The sulfur is added to the mixture to vulcanize it, and this is increased by molding under heavy pressure. In adding the mica, asbestos, or soapstone they are first pulverized, so as to become readily incorporated with the mineral, which when heated fuses or melts to the consistency of paste. It will be understood that by combining one or more of these materials or their equivalents with the wurtzilite the latter may be hardened to any desired degree by either a physical change, a chemical change, or a combination of these changes or actions. By using mica, asbestos, or soapstone separately or together in any desired combination the wurtzilite product will be physically changed and hardened, while by using sulfur alone the wurtzilite product will be chemically changed and vulcanized, and thereby hardened. Similarly by using one or all or any combination of two of the first-named materials in connection with sulfur the wurtzilite will be hardened by both changes or actions. My invention therefore broadly contemplates the use of any material or combination of materials which when combined with the wurtzilite will effect the hardening thereof in either of these ways.

Inasmuch as the ingredients are cheap, the mode of preparation extremely simple, and the material susceptible of being used to form the base of various compositions and molded into any desired shape or molded in bulk form and afterward cut or dressed down, it is obvious that the resulting product may be advantageously employed for fire-bricks, pavements, construction of sewers, electrical insulators, including knobs, handles, tubes, buttons, and the like, and for a great many other purposes, which will readily suggest themselves to persons familiar with the use to which similar materials or compounds are applied.

Having thus described the invention, what is claimed as new is—

1. The process of treating wurtzilite to render it available for commercial use, which consists in reducing the mineral to a softened or fused state by the action of heat, substantially as described.

2. The process of treating wurtzilite to render it available for commercial use, which consists in subjecting the mineral to the action of steam heat to reduce it to a softened or fused state, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT M. THOMPSON.

Witnesses:

THEO. MILLER,

A. W. CLARK.