

# United States Patent Office.

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## IMPROVED COMPOSITION-FUEL.

The Schedule referred to in these Letters Patent and making part of the same

*To all whom it may concern:*

Be it known that I, FRANK N. HOPKINS, of Baltimore, in the county of Baltimore, and State of Maryland, have invented a new and useful Composition of Matter to be Used as a Fuel; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention consists in combining, with either anthracite or bituminous coal, the material known as Ritchie mineral, also termed crystallized petroleum, and sometimes Grahamite, and also combining with the coal, either with or without the Ritchie mineral, the material termed Albertite.

To enable those skilled in the art to fully understand and manufacture my improved fuel, I will proceed to describe the process of manufacture, and nature of the ingredients used in its preparation.

Coal, both anthracite and bituminous, is too well known to require special description: Ritchie mineral, crystallized petroleum, or Grahamite is found in Ritchie county, West Virginia. It may be found in other places, but the above-named locality is, I believe, the only place where it is now obtained, at least in any appreciable quantity. Albertite is obtained in the Province of New Brunswick. Both the Ritchie mineral and Albertite are asphalts or bitumens, and are composed principally of asphaltene and bitumen, according to Raignault, a French chemist.

The following formula will technically express their nature.

Ritchie mineral: carbon, 78.22; hydrogen, 8.01; oxygen, 13.77.

Albertite: carbon, 86.12; hydrogen, 9.87; oxygen, 4.91.

My process of manufacture is as follows:

The coal may be cracked, broken, or pulverized by any suitable mechanical means, about as fine as coarse sand. In practice, however, it would be preferable, on the score of economy, to use the dust refuse of coal, which may be obtained in unlimited quantity in the vicinity of the mines, and also from the yards of dealers throughout the country at an inappreciable cost. This dust or refuse should be screened, and the coarse portions sold, or reground to the desired degree of fineness.

The Ritchie mineral, and also the Albertite, are reduced to a fine powder, by any suitable mechanical means, and then mixed with the pulverized coal in the following proportions:

From one to twenty-five per cent. of the combined Ritchie mineral and Albertite, the remainder coal-dust.

The same percentage of each of the above-named substances when used separately.

In preparing a fuel for ordinary stove-purposes, the amount of Ritchie mineral and Albertite would be small, from two to four per cent., but for smelting-furnaces, and in those cases where a long flame surface is required, and a high degree of heat well distributed in long circuitous flues, the proportion of Ritchie mineral and Albertite would vary from ten to twenty per cent. The greater the percentage of the latter-named substances, the greater the combustibility of the fuel, and, consequently, the more intense the heat.

The materials above named, which compose the fuel, after being well mixed or incorporated with each other, are heated by an ordinary furnace, and well stirred while being heated. They are brought to a degree of heat sufficient to cause the particles to adhere together, and form a conglomerate mass capable of being moulded and compressed into compact masses through the medium of any suitable apparatus.

Experience has shown that the materials here mentioned must be subjected to a temperature of about 400° Fahrenheit before they become sufficiently adhesive to allow them to be pressed into a solid mass, hardening when cooled. This difficulty can be obviated, however, by using a flux of rosin, pine, or coal-tar, petroleum, residuum, or other substances chemically equivalent thereto, the proportion of the flux depending upon its becoming adhesive at a low temperature.

When rosin is used, twenty-five per cent. of rosin, as compared with the quantity of Ritchie mineral or Albertite used, will reduce the temperature required, to insure the proper degree of adhesiveness, from 400° to 200° Fahrenheit. When the other fluxes mentioned are used, their proper proportions will be regulated by their faculty of producing adhesiveness as compared with rosin.

Having thus described my invention,

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

The composition of matter formed by combining Ritchie mineral and Albertite, or either, or their chemical equivalents, with anthracite or bituminous coal, either with or without using the flux aforesaid, in the manner substantially as and for the purpose herein described.

Witnesses: FRANK N. HOPKINS.

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