

UNITED STATES PATENT OFFICE.

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ARTIFICIAL FUEL.

SPECIFICATION forming part of Letters Patent No. 783,810, dated February 28, 1905.

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To all whom it may concern:

Be it known that I, HENRY R. WOLTMANN, a citizen of the United States, residing at Berkeley, Alameda county, State of California, have invented certain new and useful Improvements in Artificial Fuels; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of artificial fuel into the composition of which crude petroleum enters in such appreciable quantity as to furnish the motive for the mixture—namely, a high-grade economical fuel adapted for use as briquets.

Crude oil or petroleum, both on account of its cheapness and its combustible value, presents itself as a favorite ingredient of artificial fuels; but it also offers a disadvantage in that if used otherwise than sparingly the mixture will not harden and will not "stand up" under combustion. Consequently while it enters into the composition of many fuels it is generally found in such small percentages that its main purpose is that of a binder or a solvent of other ingredients, in which cases its true values of economy and heat are not utilized. In some cases in order to be able to use it more liberally attempts have been made by mixing it with resin, stearin, or other fatty acids and soda, potash, or other alkalies to harden it by more or less partial saponification; but these attempts are at best of somewhat doubtful economy.

The object of my invention is to secure the economic value of crude petroleum by using it in appreciably large percentages with certain ingredients which permit such use, whereby I am able to produce what may be termed an "oil" briquet, in contradistinction to a briquet the character of which depends on the preponderance of some other ingredient—such, for example, as peat or sawdust or coal-dust.

To this end my invention consists, essentially, in a composition of matter composed of the union with a suitable relatively low combustible vehicle of a relatively high combustible mixture in approximately close proportion, which mixture includes asphaltum

and crude petroleum in relatively approximately close proportions. This will be better understood by the more specific description which I shall now give.

The essential ingredients of my composition of matter are crude petroleum, asphaltum, and a suitable combustible vehicle having a lower heat value than either the petroleum or the asphaltum. Various substances will answer for this vehicle. As examples, I may name sawdust, paper-waste, or paper put through a shredding-machine, or peat. I prefer peat, and the best economic values are had with peat. The fuel in its better form includes a small percentage of lime, and in its best form it includes also a small percentage of coke.

With the specific materials mentioned an example of my composition of matter is as follows: asphaltum, twenty-five per cent.; crude petroleum, eighteen per cent.; lime, two per cent.; coke, five per cent.; peat, fifty per cent. These ingredients are mixed as follows: The asphaltum, petroleum, lime, and coke (the latter having been previously ground to a powder) are all put in a vessel, melted, and stirred thoroughly. The peat (which is best previously dried) is then added and stirred in well. The mass is allowed to cool and when cold or while still slightly warm may be pressed into suitable blocks or briquets. It will now be seen that the relatively low combustible vehicle—the peat—is half the mass, while of the high-combustible mixture the crude petroleum bears to the asphaltum a relatively high percentage. This is made possible by the presence of the asphaltum, which serves to stiffen the petroleum while adding to the heat value of the mixture.

Though asphaltum is expensive, its percentage is kept down by the peat, which also adds to the hardness or stiffness of the product. Thus while both the peat and the asphaltum serve to render the compound sufficiently hard for the purpose and enable the use of a relatively large quantity of petroleum, giving, as I have before stated, an "oil" character to the product, each performs its special object, the asphaltum adding to the heat value and

the peat keeping low the amount of asphaltum needed without itself being in such quantity as to give a "peat" character to the product. Thus, also, I am able to use a relatively large quantity of petroleum and yet have the product sufficiently hard for the purpose of briquets. The purpose of the lime is to improve the ash. Peat yields a fusible ash, making clinkers. The lime prevents this tendency. The ground coke increases the heat value and adds to the hardness of the product.

In giving the proportions of the essential ingredients above mentioned in the example stated I must not be understood as confining myself to them strictly. The relative percentage of the peat to that of the high-combustible mixture may be varied somewhat and even considerably in the direction of increasing the percentage of the latter with respect to the former; but the percentage of the high-combustible mixture should not be dropped much below that given in the example, nor in practice will it be found advantageous to increase it very much. The relative percentages of the asphaltum and crude petroleum may likewise be varied within reasonable limits.

I am aware that artificial fuels have contained crude oil, asphaltum, and peat; but, as far as I know, the peat or other low-grade combustible has been in such relatively large quantities as to give its character to the product, the oil and asphaltum being in very small quantities, only sufficient to serve as a binder to the peat, in many cases the only object of the oil being to temper the brittleness of the small amount of asphaltum to make it serve as a binder to the peat, which absorbs it. Such a product is not an oil briquet and has but low heat value. I do not, therefore, claim an artificial fuel containing these ingredients; but

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

1. An artificial fuel composed of a relatively low combustible vehicle, and a mixture of relatively higher combustibles consisting of crude petroleum and asphaltum, the petroleum and asphaltum being in approximately close relative proportions, and the relative proportions of said vehicle and mixture being approximately close.

2. An artificial fuel composed of peat, and a mixture of crude petroleum and asphaltum, the petroleum and asphaltum being in approximately close relative proportions, and the relative proportions of the peat and the mixture of petroleum and asphaltum being approximately close.

3. An artificial fuel composed of peat, and a mixture of crude petroleum, asphaltum and lime, the petroleum and asphaltum being in approximately close relative proportions and high with relation to the proportion of the lime, and the relative proportions of the peat and the mixture of petroleum, asphaltum and lime being approximately close.

4. An artificial fuel composed of peat, and a mixture of crude petroleum, asphaltum, lime and coke, the petroleum and asphaltum being in approximately close relative proportions and high with relation to the proportions of the lime and coke, and the relative proportions of the peat and the mixture of petroleum, asphaltum, lime and coke being approximately close.

In witness whereof I have hereunto set my hand.

HENRY R. WOLTMANN.

Witnesses:

WALTER F. VANE,
D. B. RICHARDS.