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METHOD OF PRODUCING A CARBONIZED FUEL BRIQUETTE

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My invention relates to a method of treating petroleum coke to form hard briquettes and to recover volatiles if desired.

In the destructive distillation of petroleum or its products such as residuum, wax, tars, etc. in coke stills and pressure or cracking stills, coke is formed in the still and is removed from time to time as it accumulates. This coke, which may be referred to herein as petroleum coke, contains some oils, mostly heavy hydrocarbons.

It is the principal object of my invention to provide an improved method of treating petroleum coke for the recovery of certain volatile products contained therein.

It is another object to produce a superior fuel briquette.

In carrying out the process I may first grind the petroleum coke into comparatively fine particles, and then add a liquid, preferably water, so as to form a thick, mud-like mass, which may be molded or pressed into form, such as a briquette. In place of water I may make use of other temporary binders such as light oils, which, like water, probably serve to bind through surface tension, residuum, or heavy mineral oils and the like, which probably serve to bind the coke particles by cohesive action rather than by surface tension. In using coke having a high percentage of wax or oils, I prefer to use a temporary binder other than water or in addition to water, but with most petroleum coke water will serve to temporarily bind the particles together satisfactorily. These pressed briquettes will be sufficiently coherent to withstand the handling necessary to place them in some form of still or retort. The briquettes are then heated in such still or retort so as to drive off the moisture and certain of the lighter oils and lighter volatile products contained in the coke.

If these vaporized products are to be recovered suitable devices, such as condensers or absorption apparatus, may be connected to the still or retort so as to collect and recover the volatilized products. The briquettes, after being thus dried, may then be roasted or destructively distilled at a comparatively high temperature, so that the heavy oils contained in the coke, as well as certain resins and gums, if present, may be carbonized, thus binding the coke particles together and forming a very hard briquette. Carbonizing at high temperatures will preferably be done out of contact with the air in order to prevent burning of the coke or other products.

During this carbonizing process considerable volatile material is given off, and this volatile material contains many valuable products, as heretofore mentioned. These volatile products may then be collected, either by condensing the same or absorbing the same in suitable media. During the carbonizing process it is advantageous to admit steam to the briquettes for the reason that, in the presence of steam, the valuable volatile products appear to volatilize more freely and the process is more completely and quickly carried out.

The residue, after roasting, will be in the form of hard, dense briquettes, which constitute a superior fuel.

The briquettes are substantially pure carbon, and thus leave substantially no ash upon burning.

Another advantage of forming the petroleum coke into definite masses before roasting is that the residue, namely, the briquettes, may be easily removed from the roasting still or retort, and these briquette residues are, in themselves, valuable for fuel purposes.

One example of a preferred process of producing briquettes is as follows:

Petroleum coke is ground to about 20 mesh size and mixed with about 6% to 10% of a temporary binder such as water or oils (more binder may be used, if a cheap or waste product, which will itself yield a coke at a price under the value of the finished coke briquette). Briquettes are then formed of the ground coke and temporary binder. The briquettes are sufficiently coherent to withstand the handling necessary to place the same in a heating apparatus, but will not withstand rough handling. The briquettes may then be heated to about 700° F. in about thirty minutes when most of the volatiles will have been evolved. Another twenty minutes may

be consumed in further heating to from 900° F. to 1100° F. for carrying out the carbonization of heavy oils or other carbonizable matter in the briquettes and there will be a further evolution of gases and volatiles which are probably products of the destructive distillation. It is also possible to make satisfactory briquettes by heating to temperatures as low as about 325° F. if this temperature is maintained for several hours. It is also possible to place the briquettes in an oven or other heating apparatus at about 1000° F. for a period of about thirty minutes, after which the briquettes will be dense and hard. The hot briquettes, if desired, may be dumped into water to cool.

While the invention has been described in some detail, it is to be understood that details of the process may be varied without departing from the invention as defined in the appended claims.

I claim:

1. The method of producing a hard fuel briquette, which includes mixing pulverized petroleum coke containing heavy mineral oil with water to form a thick paste, pressing the paste into coherent briquettes, destructively distilling the briquettes in the presence of steam to drive off volatiles and carbonize heavy mineral oils in the coke and form dense, hard briquettes.

2. The method of producing a hard fuel briquette, which includes mixing finely divided petroleum coke containing heavy mineral oils with water to form a paste, heating to drive off volatile matter, and then destructively distilling in the presence of steam to drive off the more difficultly volatile products of the coke and to carbonize heavy oils in the coke.

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