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BRIQUETTE AND METHOD OF MANUFACTURE.

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Our invention relates to briquettes and a method of manufacture, and particularly to the utilization of certain by-products of the petroleum refining industry in making such
5 briquettes.

In the refining of petroleum, it is common practice to treat the lighter distillates and lubricating oils with sulphuric acid and such treatment causes a sludge to be precipitated, which sludge is generally called acid
10 tars because of its tarlike characteristics and its acidity. These acid tars can be treated to recover the acid but at great expense, and the economical disposal of the
15 acid tars in refineries is a serious problem.

Further, in coke stills and in pressure or cracking stills wherein crude petroleum or its derivatives are destructively distilled, coke is formed and must be removed from
20 the stills and disposed of at suitable intervals. This coke is of substantially pure carbon and finds various limited uses, but the supply is so large that the economical disposal thereof is, like the acid tars, a matter
25 of difficulty.

It is the principal purpose of our invention to utilize the acid tars of the character above referred to, and petroleum coke or other carbonaceous materials in the manu-
30 facture of briquettes, which will be an efficient fuel having many advantages over other fuels now in use.

In the utilization of the by-products of the petroleum industry above referred to, we may first crush or pulverize the petro-
35 leum coke. Acid tars in proper proportions may then be added to the finely divided coke and the mixture well masticated and mixed. It is preferable to heat the acid tars so as
40 to render the same quite fluid in order to obtain the proper mixture, and it is also desirable to heat the mass while mixing. The mixed coke and tars may then be formed into briquettes under suitable pressure. The
45 briquettes will of course contain the acid which was present in the tars, and this acid, if allowed to remain in the finished briquettes would have deleterious effects on the furnaces in which the briquettes are later
50 burned. We therefore subject the formed briquettes to a roasting process which evaporates or drives off the acid, thus leaving the briquettes substantially free of acid, and therefore suitable for burning in ordinary
55 furnaces.

While we have mentioned petroleum coke

as desirable in forming the briquettes as above referred to, we wish it understood that other carbonaceous materials, such as coal-dust, lignite, etc., could be advantageously used in connection with the acid tars in case these materials can be availed of
60 more economically than the petroleum coke. By "carbonaceous materials" herein referred to we mean coke, coal, lignite and the like. The petroleum coke briquettes, however, are particularly advantageous in that upon burning there is substantially no ash residue, since the petroleum coke is substantially pure carbon, and there is little
70 mineral matter in the acid tars to form ash.

The proportions of carbonaceous materials and acid tars will vary between quite wide limits dependent upon the character and fineness of the carbonaceous material, as
75 well as upon the character and consistency of the acid tars. The tars as ordinarily formed, vary in consistency from a heavy asphalt to that of a light road oil, and obviously the amount of tars which can be
80 successfully employed in mixing with carbonaceous materials will depend, as one factor—upon the consistency and character of the tars. The proportions of the ingredients of the briquettes, however, should be
85 such that an intimate mixture is obtained, and so that the carbonaceous material will be bound into a relatively uniform, or homogeneous mass, which will not be readily broken or powdered upon being handled,
90 and the percentage of tars must not be so high that the form of the briquette will be substantially altered upon being subjected to the roasting process. We may say, by way of example, that with finely divided petro-
95 leum coke and an average sample of acid tars, approximately 15% of the tars and 85% of the carbonaceous material will give satisfactory results. Good results have also been obtained by mixing ground coke with
100 about 6% of acid sludge and, after briquetting, heating the briquettes to about 350° F. to drive off most of the acids. Higher temperatures produce a less smoky variety of fuel and a harder briquette usually results.
105 Generally speaking the greatest practicable proportion of acid tars will give the greatest economic return since the tars are now of little use and therefore cheap, and the heat value of the tars is quite high.

The finished briquette of the character above referred to is a superior fuel in that

there is substantially no ash residue upon being burned, may be made very dense and compact, will withstand comparatively rough handling and shipment without substantial breakage or disintegration, is easily ignited and burned, and may be burned so as to be substantially smoke free, is comparatively clean to handle, and the heat value is often as high as 15,500 B. t. u. per pound.

By so utilizing the two by-products of the petroleum industry above mentioned, we are able to form an excellent fuel, and also to provide a profitable means of disposal of the two by-products and to thus turn what was formerly a substantial economic loss into a gain.

Another notable feature forming part of our invention is the recovery of certain by-products from the acid tars and sometimes from the coke. The acid tars are of a very complex composition and contain many compounds among which may be mentioned ammonia, complex hydrocarbons, and alcohols, such as butyl and propyl alcohol. When the acid tars are heated sufficiently many of these compounds and others are vaporized, and since some of these are of considerable value should be recovered. We therefore propose to condense or otherwise collect certain or all of the products vaporized when the acid tars and coke are heated to drive off the acid.

In addition to recovering certain valuable products from the acid tars we secure an added advantage, namely the forming of a usable residue and one which may be readily handled. It may not be necessary in all cases to mix the acid tars or sludge acid with carbonaceous material when the sole object in view is the recovery of the by-products of the acid tars such as those mentioned, and other material might be substituted for the

carbonaceous material so as to give a residue which is easily handled and disposed of. However, since carbonaceous material has been found to be satisfactory and the residue is a valuable product, namely a valuable fuel, we prefer to employ such carbonaceous material with the acid tars or sludge acids.

While we have described the invention in some detail, it is to be understood that the details may be changed without departing from the invention as defined in the appended claims.

We claim:

1. The method of utilizing acid tars which comprises, mixing the same with finely divided carbonaceous material, compressing the mixture into briquettes, and roasting to drive off the acid.

2. The method of utilizing petroleum coke and acid tars resulting from the refining of petroleum which comprises, mixing the finely divided coke with the acid tars, compressing the mixture into briquettes, and roasting the briquettes to drive off the acid.

3. The method which comprises, pulverizing carbonaceous material, mixing the same with acid tars while heated, forming the mixture into briquettes, and then roasting to drive off the acid.

4. A briquette formed of finely divided carbonaceous material and a binder of acid tars, said briquette being readily ignitable, of high fuel value, leaving substantially no ash residue, and relatively compact and tough to withstand rough handling.

5. The method which comprises, mixing acid tars with carbonaceous material, then heating the mixture to drive off volatile products and collecting those products.

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