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PROCESS AND MATERIAL FOR TREATING GASOLINE AND HYDROCARBONS.

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My invention has among its objects the production of an improved process for increasing the efficiency of hydrocarbons such as gasoline or the like employed for various purposes, and more particularly has as one of its objects an improved process and composition of materials which will act on hydrocarbon clusters existing in gasoline and similar hydrocarbons, breaking such clusters up into minute particles, thereby making the gasoline or other fluid or liquid carrying similar quantities of clusters of hydrocarbons burn or ignite with a sharper and quicker combustion without leaving an undue carbon residue. Many other objects and advantages of my present invention will be obvious to those skilled in the art, after having reference to the following description.

Gasoline consists mainly of hydrocarbons, and as a standard product which is used to a great extent as fuel with high combustion energy it has a large variation in specific gravity due to the several present processes employed in reclaiming gasoline from petroleum. As petroleums vary in specific gravity and different percentages of different kinds of hydrocarbons, it is difficult to extricate or refine them to procure a uniform gasoline. We may get gasoline from petroleums which have the same specific gravity and yet such gasolines are not uniform as a combustible fuel. For example, in a petroleum which carries a large percentage of sulphur and asphalt, or a combination of asphalt, tar and paraffine mixed, the gasolines therefrom always contain sulphur, and while the specific gravities of such gasolines may be the same, their combustion may vary and their power effects be different.

I have found from tests and microscopic examinations that the various gasolines contain more or less of what may be termed small clusters of carbon and/or hydrocarbons, these clusters varying in size and nature with the different impurities in the gasoline such as sulphur, etc., and that if these clusters are permanently broken up, the quality of the gasoline and its efficiency is improved, and that combustion takes place leaving, if any, a very slight amount of carbon deposits or residue in the engine cylinder, burner or wherever the combustion may have taken place. I am aware that others have applied treatments to gasoline and like fuel to improve the illuminating qualities thereof or to improve its combustion, but in so far as I am aware, it has never been proposed to treat a hydrocarbon fuel in such a manner as to break up thoroughly and permanently the carbon and/or hydrocarbon clusters and with materials which not only act as aforesaid on the clusters but also have reactions with themselves so as to prevent the re-agents from forming objectionable products. For example, naphthalene when used in gasoline or like fuel has a tendency to form a body of its own called naphthalene wax, which is undesirable, but when combined with other materials as herein specified which re-act upon themselves and to some extent give an action resembling a catalytic action, the naphthalene will co-act and improve the gasoline without the formation of other products which are undesirable. I am aware that sulphuric acid has been used in compounds employed for increasing the efficiency of hydrocarbons, but treatment with sulphuric acid has a tendency to cause a combining or clothing of the carbon, thereby promoting the formation of clusters rather than breaking them up, as I propose to do.

In making up my improved material by which my present process is carried out, I prefer to employ a combination of naphthalene, anthracene, oil of mirbane and alcohol, which are suitably co-mixed and applied to the gasoline either at the refinery or at any subsequent time, this composition being used in comparatively small quantity.

In making up a batch of my material, one method of procedure may be as follows: The foregoing chemicals would be combined substantially in the proportion of 100 lbs. naphthalene, 5 lbs. anthracene, 1 lb. of oil of mirbane, and 1½ lbs. of alcohol. In mixing, I prefer to mix up first the anthracene, alcohol and oil of mirbane, thereby forming a paste, and then let this paste dry out so that it becomes a fine powder. The alco-

hol evaporates, leaving the anthracene thoroughly mixed with and saturated with the oil of mirbane. It is possible to operate without the use of this alcohol, if care be taken to thoroughly grind the anthracene and oil of mirbane together to form a homogeneous mixture. This is then mixed with the naphthalene and milled or ground. Thence the product is screened and packed in air-tight receptacles ready for use. Ordinarily I use 40% C. P. anthracene, but if a lighter product is desired a greater C. P., up to 85 or 90% C. P. anthracene may be employed.

When this product is applied to gasoline, generally in the proportion of substantially ¼ oz. of material to 5 gal. of gasoline, the naphthalene constituent serves as a cutter or shocker, tending to break up the clusters. The naphthalene itself has a tendency to work very fast, and the anthracene acts somewhat as a retarder on the action instituted by the naphthalene, slowing up its action but making the breaking up of the clusters permanent. The anthracene dissolves a little slower than the naphthalene, and a slight amount of agitation is desirable so that there may be a thorough treatment and the anthracene be effective throughout the mixture. The oil of mirbane decreases the fusing point of both the naphthalene and the anthracene, sharpening the action of the composition and causing the breaking or dropping of any moisture in the clusters so that the clusters are completely and permanently broken down. When the ingredients are combined together and added to gasoline or the like, there is a quicker co-mixing and dissolving and the oil of mirbane, and anthracene work upon the naphthalene, preventing its forming a body element of its own, i. e., naphthalene wax. While there are other equivalents which might be used in place of naphthalene, the naphthalene is convenient to handle and produce, and a greater quantity of it can be commercially manufactured, and it is comparatively inexpensive.

Observation of the effect of the foregoing treatment of gasoline under a high power microscope discloses that the carbon clusters are thoroughly and completely broken up by the comparatively small amount of my composition of materials in a manner entirely different from the treatment of gasoline with naphthalene alone or with anthracene and naphthalene combined. It is to be noted that in the ingredients of my composition of materials there is nothing that will have an injurious effect on the containers or on burners or engine parts with which the treated gasoline may come in contact. The broken up carbon clusters or particles instead of remaining in the burner or cylinder as unburned carbon, causing pre-ignition, scoring, charring, etc., are entirely burned up inasmuch as these particles are reduced to such small size that they are consumed and the efficiency of the gasoline is increased by their combustion. So far as I am aware, naphthalene or an equivalent hydrocarbon has never been treated in the manner set forth herein to produce the results which I have accomplished.

The carbon or hydrocarbon clusters mentioned herein are small particles of waxy or pitchy matter, due in part to so-called "free carbon", occasioned by cracking and other heating processes to which the hydrocarbon fuels are usually subjected in the course of manufacture. These small carbon or hydrocarbon particles exhibit a tendency to mass themselves together in the form of clusters. The addition of the material comprising my invention causes these clusters to break up so that each individual particle floats about the fluid by itself. These individual particles are just within the range of visibility with the ordinary oil-immersion lens of a microscope, but the aggregations or clusters of these particles are plainly visible under the microscope. In some instances, the addition of the materials comprising my invention will cause some of the particles comprising the clusters to pass actually into solution in the hydrocarbon fluid.

This can be demonstrated. For example, small paraffin particles floating in gasoline which is saturated with paraffin can be caused to disappear almost instantly by the addition of some naphthalene, anthracene and oil of mirbane. The addition of these substances appears to increase the solubility of the paraffin in the gasoline. This will, in part, explain the action upon which the present invention is based.

Having thus described my invention, it is obvious that in view of the varied processes which the hydrocarbons may have gone through, as well as the variations in the products themselves, that considerable variation may be made from the preceding disclosure without departing from the spirit of my invention as set forth in the appended claims, which should be construed accordingly.

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

1. A material for treating commercial gasoline motor fuels consisting of naphthalene, anthracene, and oil of mirbane.

2. A material for treating commercial gasoline motor fuels comprising 100 parts of naphthalene, at least 5 parts of anthracene and 1 part of oil of mirbane.

3. Process of improving commercial gasoline motor fuels which comprises adding thereto small amounts of a composition comprising naphthalene, anthracene, and oil of mirbane.

4. A composition for treating commercial gasoline motor fuels consisting of a major

portion of naphthalene and a minor portion of anthracene, and oil of mirbane.

5. A composition for treating commercial gasoline motor fuels consisting of naphthalene, anthracene and oil of mirbane, the naphthalene constituting at least 90% of said composition and the balance consisting of anthracene and oil of mirbane, the anthracene in amount at least four times as great as that of the oil of mirbane.

In testimony whereof, I have hereunto signed my name.

ALBERT H. ACKERMAN.