UNITED STATES PATENT OFFICE.

HERBERT J. BROWNE AND EUGENE B. CLARK, OF WASHINGTON, DISTRICT OF COLUMBIA, ADMINISTRATORS OF WILLIAM FRANK BROWNE, DECEASED.

EMULSION-FUEL COMPOUND.

No. 827,139. Specification of Letters Patent. Patented July 31, 1906.

Application filed February 8, 1905. Serial No. 244,827.

To all whom it may concern:

Be it known that WILLIAM FRANK BROWNE, deceased, formerly of Washington, District of Columbia, did invent certain new and useful Improvements in Emulsion-Fuel Compounds, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a new emulsion-fuel compound manufactured from peat, oil, and water, the ingredients of which are subjected to a milling process for reducing them to a fine homogeneous emulsion which can be forced into suitably-heated coils or conduits wherein gas or gaseous vapor is continuously generated and discharged for illuminating or heating purposes.

The invention consists in a new emulsion-fuel compound composed of peat, oil, and water made by grinding or otherwise mixing the ingredients together in suitable proportions in a mill or other device wherein they will be intimately mixed and made into a semiliquid emulsion which remains in an inseparable condition without precipitation.

As each ingredient is possessed of a different gravity, they would without being emulsified deposit in separate zones, the peat having the greater gravity would precipitate, while the oil being the lightest in gravity would rise and float on top of the water; but when these three ingredients are properly emulsified, thus breaking up the cellular structure of the peat, it will combine with the oil and the mixture remain in suspension throughout the mass or body of emulsion. If the oil is in excess, the peat will float; but when in the right proportion the peat and oil will remain diffused throughout the mass.

In the manufacture of this fuel compound the peat is thrown or otherwise fed into a suitable mill to which are supplied suitable proportions of water and petroleum or other hydrocarbon liquid and ground and intimately mixed to form an emulsion, which is conducted therefrom to a storage-tank, from which it can be drawn into transporting-tanks and conveyed to places of use, where it may be forced through heated conduits wherein gas or gaseous vapor is generated, which may be discharged and burned in a furnace or stored in a holder for future use.

The required proportions of the materials to make a gas consisting of carbon monoxid and hydrogen gas are water fifty-eight parts, peat thirty-seven parts, and crude petroleum five parts, which will yield fifty thousand five hundred cubic feet of CO and H gas per one ton of emulsion-fuel. The proportions of the materials composing the emulsion fuel can be changed, thus using a comparatively small proportion of water at the time of grinding the ingredients together and then adding the required amount of water at the place of use, so that the equivalent of a ton of coal in heat units can be stored within the limits of thirty-five cubic feet. Part of the petroleum or other hydrocarbon oil can also be added at the place of use and forced with the peat and water into heated conduits.

The great obstacle heretofore experienced in the use of peat for fuel purposes consisted in the expense of mining and preparing the peat in suitable manner for the market. The peat after being mined or cut from the bog is shipped to a central point and then run through a mixing-mill and from there over a large area of shallow tanks or aprons or their equivalents, where it dries to a degree of hardness, and is then cut into suitable forms and pressed into solid blocks, which are piled up and thoroughly dried, naturally or by artificial means. This method of obtaining a fuel product requires a great amount of manipulation and expense, which makes the product so costly that it cannot successfully compete with other fuels. Hence the use of peat for a fuel in this country has become almost entirely obsolete. If, however, the peat could be put on the market so as to successfully compete with other fuels, it would be used to a great extent in many localities throughout the country.

Instead of eliminating the water from the peat, however paradoxical it may seem, more water is added to successfully make an emulsion with oil. Therefore in preparing peat for emulsion fuel by the new method it is only necessary to run it with the required

additional amount of water and hydrocarbon liquid through a suitable mill, wherein on its passage through the same the peat will be ground with the other ingredients into a suitable emulsion.

Water to the extent of eighty per cent. of the compound can be utilized in making an emulsion for ordinary work, such as gasifying to burn in boiler-furnaces to generate steam, while in some classes of work where the heat is cumulative upward of ninety per cent. of water can be used, which constitutes a very important discovery when practically applied to furnaces in which refractory ores and other analogous substances are treated.

The proportions of the different ingredients are varied to make different qualities of gas or to produce a flame suited to different kinds of work. The petroleum may be varied from five parts to twenty or more parts, and the parts of water and peat will be correspondingly varied. The peat may be ground alone and then mixed with water and the oil in suitable proportions, and the mixture may be agitated for maintaining uniformity while it is being pumped into gas-generating coils or conduits.

One of the formulas used in practice and which gives satisfactory results is as follows: hydrocarbon oil, twenty-five per cent.; peat-paste, thirty per cent., and water, forty-five per cent.

By grinding the peat to a fine paste the cellular structure thereof is broken, thereby liberating a viscid liquid composed of hydrocarbon oil and water which is in the condition of an emulsion. If oil and water are at the same time admitted to the grinding-mill, this viscid liquid combines with the oil and water and greatly assists them to combine in the form of an emulsion. The peat is also absorbent and seems to serve as a binder for the emulsified oil and water. While oil has an affinity for peat and water, it does not have an affinity for water alone, and it is very difficult to keep a mixture of oil and water only in a fixed and uniform condition. Some other material, such as finely-ground or pasty peat, is necessary to hold them together in the condition of an emulsion. The peat is ground to a true paste and serves admirably for the above-described purpose. Powdered coal will not serve as a substitute for ground peat for making an emulsion or as a binder for oil and water in an emulsion. This emulsion-fuel compound can be forced by a suitable pump through pipes over long distances. It can be ground so fine that it can be pumped equally as well as water and without obstructing the valves of the pump, and, furthermore, the finer the peat is ground the more rapid will be the chemical action in decomposing water when subjected to the required heat.

In Letters Patent No. 728,854, granted to William F. Browne May 26, 1903, an emulsion-fuel compound composed of peat and water is fully described and claimed.

What is herein claimed is—

1. The herein-described emulsion fuel, consisting of peat, hydrocarbon liquid and water, the peat being finely divided and emulsified with the hydrocarbon liquid and water to form a homogeneous emulsion-fuel compound, of a suitable consistency to be forced into heated conduits for generating fuel-gas.

2. The herein-described method of preparing an emulsion-fuel compound which consists in reducing peat to a state of molecular division and grinding it with hydrocarbon liquid and water, in suitable proportions, till the ingredients are emulsified and the heavier matter caused to remain in suspension throughout the mass in the condition of an emulsion, adapted to be forced into heated conduits for generating combustible gas.

In testimony whereof we affix our signatures in the presence of two witnesses.

HERBERT J. BROWNE,
EUGENE B. CLARK,
Administrators of the estate of William Frank Browne, deceased.

Witnesses:
HUGH M. STERLING,
M. M. AKERS.