

UNITED STATES PATENT OFFICE.

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EMULSION FUEL COMPOUND.

SPECIFICATION forming part of Letters Patent No. 728,855, dated May 26, 1903.

Application filed January 23, 1901. Serial No. 44,341. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM FRANK BROWNE, a citizen of the United States, residing at New York city, in the county and State of New York, have invented certain new and useful Improvements in Emulsion Fuel Compounds; and I do hereby declare the following to be a full, clear, and exact description of the invention, 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, coal, and water, the ingredients of which are emulsified in a grinding-mill or other analogous device for the purpose of producing a fine liquid or semiliquid emulsion which can be forced into suitably-heated coils or conduits wherein gas or gaseous vapor is evolved and continuously discharged therefrom for heating purposes.

The invention consists in combining in suitable proportions peat, coal, and water, which are ground together in a suitable mill wherein a fine liquid or semiliquid emulsion is made and discharged therefrom into a receiver or tank. The peat can be taken in its wet or in a dry state and thrown with the coal into the mill, into which at the same time a suitable stream of water is admitted in order to emulsify with the solid carbonaceous matter and combine therewith as one of the constituents of the liquid or semiliquid emulsion fuel.

It is highly necessary that the carbonaceous compounds in the emulsion should be reduced to as fine a state or condition as possible. The cellular tissue of the peat, with its accompanying fiber, roots, and decayed wood, should be reduced with the water to a pulp, so that it will remain in suspension throughout the mass and which will be the case when the peat or vegetable products are manipulated in a properly-constructed mill. Also the coal should be as fine as it is practical to grind and should be bolted through a fabric no less than eighty meshes to the square inch. This milling should be done prior to incorporation of the coal with the peat in the mill used for emulsifying the fuel compound. Small coal, such as screenings

in a coal-yard and culm at the mines, can be mixed with the peat and water in the mill and reduced to a suitable liquid or semiliquid consistency for forcing by a pump into the heated conduits. As it is found to be practical to reduce the carbonaceous matter, peat and coal, to such a degree of fineness that it will remain in suspension throughout the mass, it obviates the necessity of using a stirring or mixing device while the emulsion fuel is being drawn from the tank and forced into the coil wherein the gas is evolved. The peat, coal, and water will be in the condition of a homogeneous liquid or semiliquid emulsion.

The proportions of the ingredients for the production of the emulsion are as follows: dry peat, ten per cent.; coal, five per cent.; water, eighty-five per cent. These proportions can be varied, when required for some specific purposes, as follows: dry peat, five per cent.; coal, ten per cent.; water, eighty-five per cent. These proportions of the component parts can be varied in percentages to suit different classes of work without departing from the principles of the invention herein enunciated. It is to be noted that the percentages herein stated are by weight of the different ingredients.

It will in all cases be necessary to keep the emulsion fuel in a liquid or semiliquid state, whereby it can be forced by a pump into heated coils or receivers for generating gas.

Either powdered anthracite or bituminous coal or lignite can be emulsified with water and manufactured into an emulsion fuel, and, furthermore, any solid carbonaceous matter that can be reduced to a powdered condition can be emulsified with peat and water and used for a combustible fuel when done in the manner herein described.

Coal or any other solid carbonaceous matter can be used alone with water; but in this case it will be necessary to keep the mixture agitated during the time the fires are kept up, for the reason that the solid matter, on account of its greater specific gravity, will settle and agglomerate in the bottom of the tank and stop its flow to the pump. Therefore it becomes necessary to emulsify it with

peat, which when reduced to a molecular condition becomes occluded throughout the mass and assists in overcoming the effect of the greater specific gravity of the powdered coal. When the percentage of peat is sufficient, it will cause the heavier matter to remain in suspension, so that the pump will draw in and force the emulsion in its proper proportions into the heated conduits, wherein it is continuously made into a gas and discharged into suitable places for use. This subject is further elucidated in an application for patent, Serial No. 44,340, for "a new method of treating peat and water for combustion," filed even date herewith.

In a previous patent for apparatus for generating gas granted to me I stated in the specification: "Any solid carbonaceous material, such as coal or resinous matter, which can be powdered or made liquid, or any material, like peat, which can be made into an emulsion, can be pumped and forced into the generator, wherein a fixed gas will be formed and discharged into a gas-holder and from thence into the furnace." In another patent for process of and apparatus for making gas granted to me I made the following statement: "Instead of using oil I may use powdered anthracite or bituminous coal for making an emulsion or mixture with water and force such emulsion into the generating-coils for producing gas." At the time these patents were granted I had not conceived the invention or demonstrated the necessity of reducing the peat to a state of molecular subdivision so that each molecule of peat shall be in contact with a molecule of water throughout a homogeneous mass, which I have now discovered to be the essential condition for producing a true emulsion fuel compound containing peat, coal, and water. I had not then discovered that the solid matter, such as powdered coal, on account of its greater specific gravity, will settle and agglomerate in the bottom of a tank unless it is emulsified with peat, reduced to a molecular condition, so that it shall be occluded throughout the

mass and assist in overcoming the effect of the greater specific gravity of the powdered coal. The lighter peat, in a state of molecular subdivision, properly emulsified with water, serves to hold the heavier powdered coal in suspension, so that a true homogeneous emulsion is formed composed of peat, coal, and water, which can be pumped into heated coils for generating a combustible heating-gas.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A fuel compound consisting of peat, reduced to a state of molecular division, finely powdered, coal, and water, the peat and the coal being emulsified with the water, whereby the peat will be occluded throughout the mass and cause the heavier matter to remain in suspension, and the mixture being in the condition of a homogeneous undepositable emulsion compound.

2. An emulsion fuel compound consisting of peat, coal and water emulsified together, the peat being in a state of molecular division, the coal being finely powdered, and the mixture of the three ingredients being a homogeneous compound, in a liquid or semiliquid condition adapted to be forced into heated conduits.

3. In the herein-described invention the method of manufacturing an emulsion fuel compound, consisting in grinding powdered coal with peat and water and reducing the peat to a state of molecular division, whereby it will be occluded throughout the mass and cause the heavier matter to remain in suspension in the condition of an undepositable emulsion fuel compound, adapted to be forced into heated conduits.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM FRANK BROWNE.

Witnesses:

HERBERT C. EMERY,
EUGENE B. CLARK.