

UNITED STATES PATENT OFFICE.

EDWARD H. ELLIS, OF WINTHROP, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO EDWARD H. ELLIS AND ALFRED D. CHANDLER, OF BROOKLINE, MASSACHUSETTS, TRUSTEES OF THE ELLIS HEATING COMPANY.

COMPOSITION FOR TREATING FUEL.

936,241.

Specification of Letters Patent.

Patented Oct. 5, 1909.

No Drawing.

Application filed October 16, 1908. Serial No. 452,006.

To all whom it may concern:

Be it known that I, EDWARD H. ELLIS, of Winthrop, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Compositions for Treating Fuel, of which the following is a specification.

This invention relates to compositions for application to coal and other fuels for the purposes of promoting combustion, reducing to the minimum the escape of unconsumed carbon and other combustible matter, and the volume of dense, dark smoke resulting therefrom, and also reducing to the minimum the quantity of ashes and slag or clinkers.

The invention consists in a composition, the chief ingredients of which are phosphoric acid and black oxid of manganese (manganese-dioxid). With these ingredients, I preferably employ saltpeter, oxalic acid, and sodium chlorid, the whole being reduced to a solution or suspension by the addition of a suitable quantity of water, so that the composition may be conveniently applied by sprinkling it upon the coal or other fuel either before or after (preferably before) it is introduced into a furnace or fire-box.

Phosphoric acid is a very important ingredient of the composition, and causes the rapid and copious generation of oxygen when subjected to heat, in the presence of manganese dioxid and particularly in the presence of the other ingredients specified. For this reason, a composition containing phosphoric acid may be effectively used in the presence of a much larger proportion of water relatively to the chemicals employed than would be possible without the phosphoric acid; consequently, the economy of the liquid as prepared for use is considerably greater than it would be without the phosphoric acid.

The black oxid of manganese gives off oxygen at a relatively low temperature, the evolution of the oxygen being facilitated to a marked extent by the employment therewith of phosphoric acid.

Saltpeter is rich in oxygen and when thrown on burning coal, is an effective ingredient of the composition. Oxalic acid has a tendency to coke soft coal, and thus make a hard mass which will not be consumed as rapidly as the coal in its natural

state. When the coal is quickly coked, the carbon does not have an opportunity to escape before it is entirely consumed. Sodium chlorid, when thrown on burning coal, gives a white smoke which neutralizes black smoke from the coal.

The following are the preferred relative proportions of the ingredients specified: phosphoric acid (which is a liquid) 1 pound, black oxid of manganese 1 pound, saltpeter 2 pounds, oxalic acid 2 pounds, sodium chlorid 15 pounds, water 100 gallons. The said ingredients being thoroughly dissolved or suspended, the solution is used by sprinkling it on the fuel, preferably before the latter is introduced into the furnace. The solution should be sprinkled on the fuel so as to wet all parts of it, and better results are obtained by putting the fuel in the fire while wet, although, if desired, the solution may be allowed to dry on the fuel before the latter is used.

Practical tests have demonstrated that bituminous coal treated with the described composition, burns without emitting black smoke, the combustion being more complete; that the quantity of heat given out is increased; that a material saving of fuel is effected, and that the quantity of ashes and slag or clinkers produced is materially reduced. The reason for the decrease in ashes and clinkers is due to the fact of the perfect combustion which consumes everything combustible before the fire will go out. The use of the said composition also enables blowers and forced draft apparatuses to be dispensed with; reduces the space required for coal, reduces the quantity of soot deposited on flue surfaces, etc., and gives better results from relatively low grades of coal than from more expensive coal used without it. The composition may be advantageously applied to anthracite coal, and other fuels, including wood, peat, etc. It may also be advantageously used by applying it to a body of fire brick or other refractory material, and placing the latter in or upon a mass of burning coal. The combustion of the fuel in the vicinity of said body is found to be complete and attended with all the above mentioned advantages. The amount of chemical used to sprinkle fuel is varied, according to quantity and kind, but a fair average is two gallons to the cwt. Another advantage of

this chemical is, that it may be thrown in on top of the fire in the liquid state, causing all of the aforesaid effects.

It will be understood from the foregoing that while I prefer to employ all the ingredients above specified, I may omit some of them and particularly the sodium chlorid.

I claim:

1. A fuel-treating composition, comprising phosphoric acid and black oxid of manganese.

2. A fuel-treating composition, comprising phosphoric acid, black oxid of manganese, and oxalic acid.

3. A fuel-treating composition, compris-

ing phosphoric acid, black oxid of manganese, and saltpeter.

4. A fuel-treating composition, comprising phosphoric acid, black oxid of manganese, oxalic acid, and saltpeter.

5. A fuel-treating composition, comprising phosphoric acid, black oxid of manganese, oxalic acid, saltpeter, and sodium chlorid.

In testimony whereof I have affixed my signature, in presence of two witnesses.

EDWARD H. ELLIS.

Witnesses:

E. BATCHELDER,

P. W. PEZZETTI.