

COMPOSITION FOR TREATING FUEL.

No. 911,960.

Specification of Letters Patent.

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To all whom it may concern:

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

This invention has for its object to provide a composition for application to coal and
10 other fuels for the purpose of making the combustion of the fuel relatively complete, and thus obtaining the maximum thermal efficiency of the fuel and economy in the use thereof, and reducing to the minimum the
15 escape of unconsumed combustible matter and the volume of black or dark smoke resulting therefrom, particularly in the case of soft coal.

The invention also has for its object to enable coal to be thoroughly consumed to a fine ash without the formation of clinkers.

The invention consists in a composition, the chief ingredients of which are; first, potassium chlorate; secondly, sal-ammo-
25 niac; and thirdly, oxalic acid. These ingredients form a compound which when presented to burning coal, produces the following desirable results; viz., first, it supplies oxygen in a nascent state; secondly, it
30 neutralizes the gases; and thirdly, it increases the length of time required to consume the fuel, the first result being due to the potassium chlorate, the second to the sal-ammoniac and the third to the oxalic acid,
35 this last being due to the fact that oxalic acid has a tendency to coke soft coal and thus make a hard mass which will not be consumed as rapidly as it would be in its natural state. Oxalic acid, with the other
40 ingredients, cokes the coal so quickly that the carbon does not have opportunity to escape before it is entirely consumed. The desirability of increasing the length of time in consuming coal is for the sake of economy
45 because more heat is obtained, with the chemicals added, than from the same amount of fuel without chemicals. The accelerating effect of potassium chlorate is offset by the oxalic acid which has the aforesaid faculty of
50 hardening the mass of fuel which, while increasing the heat, prolongs the length of time required to consume the fuel thereby making a great saving of fuel.

While the composition may be applied to

the fuel in the form of dry powder produced 55
by suitably pulverizing and mixing the ingredients, I prefer to apply the same in solution, the ingredients being dissolved in water and the solution sprinkled on the fuel.

The following are the preferred relative 60
proportions of the ingredients specified, as I have found that said proportions give a satisfactory result. Potassium chlorate one pound, sal ammoniac one-half pound, oxalic acid one pound, sodium chlorid fifteen 65
pounds, water fifty gallons. Fifty gallons of water is given as an approximate amount but may be varied according to the quality and kind of fuel used. The said ingredients being thoroughly dissolved, the solution is 70
used by sprinkling it on the fuel, preferably before the latter is introduced into the furnace. The water is used to insure the thorough saturation of the chemical to the coal. The solution should be sprinkled on the fuel 75
so as to wet all parts of it and better results are obtained by putting fuel in the fire while wet, but it can be used after the mixture has dried on the fuel, thus allowing the user to wet large amounts of fuel at one time. 80

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 85
increased; that a material saving of fuel is effected, and that the quantity of ashes and slag or clinker produced is materially reduced. The reason for the decrease in ashes and clinkers is due to the fact of the perfect 90
combustion which consumes everything combustible before the fire will go out. The use of the said composition also enables blowers and forced draft apparatus to be dispensed with; reduces the space required 95
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. 100

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 mate- 105
rial, 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.

Potassium chlorate is an oxidizing agent and accelerates the union of the fuel with the oxygen of the air and thereby hastens the action of the other ingredients. Sal-ammoniac and sodium chlorid are both put in for the purpose of reducing black smoke to a minimum, without relying on one alone. The amount of chemical used to sprinkle fuel is varied, according to quality 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. 20

I claim:—

1. A fuel-treating composition comprising potassium chlorate, sal - ammoniac or its equivalent, and oxalic acid.

2. A fuel-treating composition comprising potassium chlorate, sal - ammoniac or its equivalent, oxalic acid, and sodium chlorid. 25

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

EDWARD H. ELLIS.

Witnesses:

C. F. BROWN,
P. W. PEZZETTI.