

UNITED STATES PATENT OFFICE.

FRANÇOIS PHYLOGONE VALLET-ROGEZ, OF LILLE, FRANCE.

PRODUCT FOR IMPROVING COAL OR SOLID COMBUSTIBLES IN GENERAL.

SPECIFICATION forming part of Letters Patent No. 647,622, dated April 17, 1900.

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To all whom it may concern:

Be it known that I, FRANÇOIS PHYLOGONE VALLET-ROGEZ, of 223 Boulevard de la Liberté, city of Lille, Department du Nord, in the Republic of France, have invented certain new and useful Improvements in Products for Improving Coal or Solid Combustibles in General, of which the following is a specification.

Combustion is the result of a chemical reaction between a combustible body, which is oxygen, and a combustible body, which in manufacturing operations is generally more or less pure carbon. As in the case of all chemical reactions, the one in question requires that the bodies in presence shall be suitably proportioned. If combustion is complete, the heat produced reaches the highest point. On the contrary, when combustion is incomplete not only is there no heat produced by the unconsumed elements, but the latter become heated to the detriment of the heat produced, the usable amount of which is diminished.

In order that combustion shall be complete, the combustible or fuel must be in contact at a suitable temperature with a sufficient quantity of oxygen. In practice these conditions are never united, the result being a considerable loss of caloric. In order to prevent this loss, I have associated with solid combustibles or fuels a mixture of substances capable of supplying at the proper moment of the combustion and in the midst even of the mass of fuel such a quantity of oxygen in a nascent state as to make combustion absolutely complete.

The above mixture comprises, essentially, first, dichromates, permanganates, nitrates, &c., of alkaline, earthy alkaline, or other metals—that is to say, bodies which are rich in oxygen and can be readily decomposed by the heat in the presence of coal—and, second, an alkaline or an earthy alkaline baborate or carbonate intended to form a crust at the surface of the fuel, and thus retain momentarily the oxygen in order to prevent its partial escape from combustion by being given off too rapidly from its combination.

To the above substances I add in practice a certain proportion of lamp or smoke black or any other suitable dry and pulverulent body, the sole purpose of which is to main-

tain the mixture in a physical state favorable to its use.

The following is by way of example the composition of the mixture which I prefer: dichromate of sodium or potassium ($\text{Cr}_2\text{O}_7\text{K}_2$) or permanganate of sodium or potassium, (MnO_4K) or mixture of these substances, by weight, fifty parts; nitrate of potassium, (NO_3K) sodium calcium or ammonium, (NO_3NH_4) or a mixture of these substances, by weight, thirty parts; baborate of sodium or potassium ($\text{Bo}_4\text{O}_7\text{K}_2$) or carbonate of sodium, potassium, (Co_3K_2) or calcium, or a mixture of these substances, by weight, twenty parts; smoke-black in quantity sufficient to maintain the mixture in a pulverulent state or about, by weight, two parts.

The above proportions may be varied according to the nature of the coal or other fuel. The quantity of the said mixture to be used per ton of coal varies between five hundred and one thousand grams, (one pound one-tenth and two pounds two-tenths, respectively.) Close-burning coal requires less than coking coal. The scale of quantities to be used can be supplied by the analysis of the combustibles or fuels.

I will mention also the following composition, although it gives less perfect results than that given above: dichromate of potassium or sodium, by weight, fifty parts; nitrate of potassium or sodium, by weight, forty parts; baborate of sodium, by weight, ten parts; smoke-black, by weight, one part.

Among the compounds containing oxygen which may be efficaciously used I will also name particularly peroxid of manganese, (MnO_2) with or without sulfuric acid, chlorate of potassium, chlorid of lime, with a little slaked lime, mercuric oxid, (HgO) binoxid of barium, and binoxid of hydrogen.

The combustible mixtures according to my invention may be incorporated with the combustibles or fuels either in a dry and pulverulent state or in dissolution or in suspension in a liquid. The point essential is to obtain an incorporation as intimate as possible.

The numerous practical experiments made by me show that combustibles or fuels prepared by the above-described process give a more complete combustion and one more exempt from smoke, and procure an economy

of about one-third as to the quantity of combustible or fuel used to produce a given amount of caloric.

I claim—

5 1. The herein-described composition of matter for improving the combustion of coal and of solid combustibles in general, which consists of a salt of bichromate, a salt of permanganate, a salt of nitrate, an alkaline salt
10 of biborate and smoke-black, substantially as specified.

2. The herein-described composition of matter for improving the combustion of coal

and of solid combustibles in general, which consists of fifty parts in weight of a mixture, 15 in any suitable proportions, of alkaline bichromate and alkaline permanganate, thirty parts of a salt of nitrate, twenty parts of alkaline biborate and two parts of smoke-black, or soot. 20

Signed at Lille, France, this 6th day of November, 1899.

FRANÇOIS PHYLOGONE VALLET-ROGEZ.

Witnesses:

LÉON VALLET,
HENRI DERYCKE.