

# UNITED STATES PATENT OFFICE.

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## COMPOSITION FOR FUEL.

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### *To all whom it may concern:*

Be it known that I, GEORGE A. ZWICK, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented certain new and useful Improvements in Compositions for Fuel; and I do 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, reference being had to the accompanying specification.

My invention relates to improvements in artificial-fuel compositions; and the general object is to provide a fuel which ignites easily, burns freely, and which, while burning, is inodorous and smokeless.

In many of the existing fuel compositions the glue is the principal cause of the bad odor, and I have found by numerous experiments that only a purely vegetable binder is suitable. I have further found that such vegetable binder must be used in its natural state and without being previously treated by a chemical process—as, for instance, is the case with most kinds of starch, dextrine, and other similar substances. Any such chemical treatment makes the binder useless in such fuel compositions. Hence the special object of my invention is to provide a binder of the nature mentioned in the combination with the other ingredients below described.

The fuel consists mainly of pulverized mineral or vegetable coal or peat, to which as a deodorizer I add lime and its salts, sulphite, sulphate, and chloride. To aid the ignition I use saltpeter. To the whole mass, after being thoroughly mixed, is added in sufficient quantity a binder of a purely vegetable source prepared without chemical treatment—for instance, such as the mucilage derived from slippery-elm bark, quince seeds, or Irish moss, these being types only. Next, the mixture is formed into cakes or bricks of suitable size, and after drying is ready for use. With age the cakes or bricks get harder on account of the lime and its salts mentioned above acting similarly to cement. The lime and its salts—

sulphite, sulphate, and chloride of lime—in addition to acting as a deodorizer influence also directly the duration of combustion, and an increase or decrease of these ingredients in a certain quantity correspondingly increases or decreases such duration. This feature enables me to prepare my fuel in different kinds of longer and shorter combustible duration, as may best suit a certain purpose. Coal in one of the mentioned forms is, of course, always the principal ingredient as to quantity. Saltpeter, which is only used on account of its ignifying faculties, may remain substantially the same, but the balance of the ingredients may be varied for the reasons stated before.

To be more explicit, however, I describe here the preferred form of a mixture, giving the proportions on a basis of one hundred parts to the whole: coal, eighty-seven parts; saltpeter, three parts; lime, three parts; sulphite of lime, three parts; sulphate of lime, three parts; chloride of lime, one part.

The binder is added only in such a quantity as to give the mass the desired consistency for working.

I know it is not new to put up fuel compositions in such a shape and manner generally, but the combination of all of the above-mentioned ingredients, each having a special effect and in the proportions described, is original. Particularly is this the case in the use, in a fuel composition, of the binder being of vegetable origin and prepared without chemical treatment, which enables me to produce a practicable odorless fuel, which is impossible where any other vegetable binder chemically treated is used.

Having described my invention, I claim as new—

1. An odorless and smokeless fuel composition consisting of eighty-seven parts of carbonaceous matter, such as vegetable or mineral coal or peat, three parts of saltpeter, three parts of lime, three parts of sulphite of lime, three parts of sulphate of lime, and one part of chloride of lime, this whole mass bound together and held in suitable shape by a

binder of a purely vegetable origin and prepared without chemical treatment, as fully described.

2. In an artificial-fuel composition, the combination of the same with the binder of a  
5 purely natural vegetable source and with a deodorizer consisting of three parts of lime, three parts of sulphite of lime, three parts of

sulphate of lime, and one part of chloride of lime, as described. 10

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

GEORGE A. ZWICK.

Witnesses:

CARL SPENGEL,

L. C. BLACK.