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FUEL COMPOSITION.

No Drawing.

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This invention relates to improvements in fuel compositions of a relatively slow free-burning and intensified heat-producing character.

8 A primary object of the invention has been to produce such a substantially improved dry artificial fuel, whether it is to be actually employed as a non-compact or loosely admixed granular mass, or as formed
10 into a suitably dimensioned cake, with which fuel a suitably controlled intensified heat is energetically generated by a chemical reaction of constituents thereof upon ignition of the mass.

15 Further objects of the invention have been to produce such a fuel which is peculiarly adapted for use with vulcanizing means, especially portable vulcanizing devices that are employed in repairing or applying vulcanized patches to automobile
20 tires and the like, although doubtless it may also be used very satisfactorily in various other relations, a fuel which energetically generates such a suitably controlled intensified heat that will properly treat or cook
25 the applied rubber or patch, for vulcanizing purposes, with an appropriate period of time, a fuel which may be safely shipped, mailed or otherwise conveyed in appropriate
30 packages or containers, and a fuel which may be facily ignited, as by the application of the flame of a match or the equivalent, and which burns freely and smoothly without substantial flame, sparks or other
35 undesirable features.

The foregoing and other objects, features and advantages of the improved fuel, however, will be so clearly apparent it is believed, as incidental to the following disclosure, that no useful purpose would be served
40 by further enlarging upon the same initially, and with these general outlining remarks, therefore, reference will now be immediately had to the constituents of the improved fuel composition and some examples
45 of the approximate relative proportions thereof.

In the broader application of the invention I employ, as the improved fuel base, a
50 suitably proportioned finely divided or powdered mixture of a metalliferous sulphur bearing substance, such as a suitable pyrite or its equivalent, and a combustion promoting substance substantially rich in and read-

ily parting with its oxygen, such as a suitable nitrate or a chlorate or either of their equivalents, which mixture of itself provides for an intensified heat producing fuel that burns slowly with a slight flame, a little smoke and a slight sulphurous odor. 55 60

To the foregoing, however, I preferably add a suitable energetically activating or combustion accelerating agent, and such an accelerating agent may consist of a relatively small portion of a suitable carbohydrate, such as dextrine, sugar, or other sweet substance of the saccharose or the glucose groups, which carbohydrous substance causes acceleration of combustion and intensification of the heat, and in some instances
70 I also preferably add a relatively small portion of soda ash, or carbonate of soda or the equivalent, which also functions as a combustion accelerator, when introduced in a relatively small amount, as well as a cost reducing agent as will later appear. 75

Such added agents also apparently tend to reduce the flame, while providing for a freely and smooth burning fire, and also apparently tend to substantially eliminate
80 smoke and sulphurous odors. However, to aid in the elimination of obnoxious odors, if any arise, it is obvious that I may add to the mixture an appropriate amount of a suitable scenting agent, such as a suitable bark, oil or other scenting medium. 85

In the following examples, the proportions are approximately given, being obviously variable to some extent, and are determined by weight, although they may be
90 determined by measurement otherwise than by actual weight:—

Mixture No. 1.

5 parts of finely divided or powdered metalliferous sulphur bearing substance, such as iron pyrites or the equivalent; 4
95 parts of finely divided combustion promoting substance, substantially rich in and readily parting with its oxygen, such as a suitable nitrate or a chlorate or either of their equivalents. 100

Mixture No. 2.

Add to Mixture #1 1/2 part approximately of a finely divided combustion accelerating substance, which may consist of a sweet compound rich in carbon, hydrogen and 105

oxygen, such as dextrine, sugar, or the sugar-like carbohydrates.

Mixture No. 3.

- 5 5 parts of metalliferous sulphur bearing substance, as in Mixture #1, 3 parts of combustion promoting substance, as in Mixture #1, 1/2 part approximately of combustion accelerating substance, as in Mixture No. 2, 1
10 part approximately of soda ash, or its equivalent, as an additional combustion accelerator, and as a cost reducing agent in substitution for the one part reduction of the combustion promoting substance of Mixtures
15 1 and 2.

In so far as I have yet determined, however, I prefer as a whole the following:

Mixture No. 4.

- 20 5 parts approximately of powdered iron pyrites; 3 parts approximately of powdered nitrate, preferably sodium nitrate perhaps, in point of lower costs, over potassium nitrate; 1/2 part approximately of dextrine,
25 1 part approximately of soda ash.

To any of the foregoing mixtures may be added if desired, and as has hereinbefore been suggested, any appropriate amount of a suitable scenting agent.

- 30 Any of the foregoing mixtures may be ignited and burned as a non-compact or loosely admixed finely divided mass, or moisture may be added thereto for aiding in the forming of the mixtures into suitably
35 dimensioned blocks or cakes, after which the cakes may be dried out, or allowed to dry out, for supplying the fuel in more compact block or cake form.

- As a matter of fact, however, it has been
40 found to be very effective especially with the preferred complete Mixtures Nos. 3 and 4, and at all events I contemplate doing the same if desired, to suitably moisten the mixture as a whole, then redry or substantially
45 dehydrate the same, and thereafter repowder the mass. The result of this is that the solid particles of the mixture are then brought into more appropriately closer relation or in a more uniformly balanced or
50 homogeneous suspension, that is to say that the constituents are more intimately and

coactively admixed or combined, for more effective combustion, and it also renders the mixture more moisture proof, because the soluble matter and especially the dextrine
55 functions as a binder, to keep the heavier particles from becoming segregated from the lighter ones, as well as forming a film-like coating or glaze for the small and less inflammable iron pyrite particles.

In the event that these steps are taken, as set forth in the immediately preceding paragraph, the dried out and powdered mixture may be suitably moistened again, if desired, and formed into more compact caked fuel
65 as before mentioned.

While I have thus described my invention, it will nevertheless be understood that I do not necessarily restrict myself to the exact constituents of my improved fuel composition nor to the exact proportions as disclosed herein, excepting as they may come within the terms of the claims or as fairly interpreted in the light of the specification
75 if necessary.

What I claim, as new and patentable, is:—

1. A relatively slow free-burning and intensified heat-producing combustible fuel embodying an appropriately proportionate
80 mixture of finely divided iron pyrites and a finely divided nitrate, and a small portion of a finely divided carbohydrate.

2. A relatively slow free-burning and intensified heat-producing combustible fuel embodying an appropriately proportionate
85 mixture of finely divided iron pyrites and sodium nitrate in a finely divided state, a small portion of dextrine, and a small portion of soda ash or its equivalent.

3. A relatively slow free-burning and intensified heat-producing combustible fuel embodying a mixture of approximately five parts of finely divided iron pyrite, approximately three parts of sodium nitrate in a finely divided state, approximately one-half
90 part of dextrine, and approximately one part of soda ash, with or without the addition of a suitable scenting agent.

In testimony whereof, I affix my signature.
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ARTHUR B. LOW.