

# UNITED STATES PATENT OFFICE.

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## ARTIFICIAL FUEL.

SPECIFICATION forming part of Letters Patent No. 700,389, dated May 20, 1902.

Application filed October 4, 1901. Serial No. 77,572. (No specimens.)

*To all whom it may concern:*

Be it known that we, ALEXANDER EDWIN TUCKER, a resident of 35 Paradise street, in the city of Birmingham, and COLIN CORY, a resident of 1 St. James Gardens, Swansea, in the county of Glamorgan, England, subjects of the King of Great Britain and Ireland, have invented certain new and useful Improvements Relating to Artificial Fuel, (for which we have filed an application in Great Britain, No. 4,830, bearing date March 7, 1901,) of which the following is a specification.

Our invention relates to artificial or briquet fuel in which ground or finely-divided coal or other fuel is mixed with an agglutinant material whose purpose is to bind the particles together, thus enabling briquets to be produced therefrom. Many kinds of agglutinant material have been proposed. Some of these—as, for example, pitch—cause smoke to be produced apart from any which may be due to the small fuel forming the base material of the briquets. This production of smoke is a serious disadvantage for some purposes. It is also important that artificial or briquet fuel should not, as with some produced by existing methods of manufacture, become friable and disintegrate during combustion, but remain adherent till combustion of the whole mass is practically completed. This is especially important where the fuel has to be employed with forced draft.

Briquet fuel suitable for many services can be obtained by the employment of an agglutinant prepared from wheat and other grain; but the briquets produced with such an agglutinant material, although free from the aforesaid smoke-producing difficulty, are not in all cases sufficiently waterproof when exposed to the atmosphere.

The object of our invention is to produce an artificial or briquet fuel free from the smoke-producing difficulty which will be physically strong and practically waterproof, so that it will stand exposure and not tend to become friable during combustion.

We have found that the pith or medullary matter from certain palms or palm-like plants possesses properties which especially adapt it for use in the manufacture of artificial or briquet fuel. When a material of this char-

acter is moistened and raised to a temperature of about 100° centigrade, the mass becomes gelatinized. This gelatinous product has the property of being when cold practically waterproof, so that the blocks or briquets of fuel in which it is employed as an agglutinant will not disintegrate or be affected by ordinary exposure to rain or to a damp atmosphere, while the said agglutinant will not increase the bituminous or smoky and ashy properties of the original fuel. Further, the briquets so produced will not become friable and disintegrate during combustion.

Our invention consists, broadly, in the employment of the aforesaid material as an agglutinant in the manufacture of artificial fuel.

One method of producing artificial blocks or briquets of fuel in accordance with our invention is as follows: We take any crushed fuel—such as coal, charcoal, lignite, peat, coke, or the like—and having damped it, if it be not already damp, we mix it with an agglutinant formed from the medullary matter of the sago-yielding palm or allied species of plants. We preferably obtain the agglutinant by crushing the aforesaid medullary matter with or without separation of the coarse fibrous material contained therein, or instead of specially preparing the agglutinant directly from the medullary matter, as aforesaid, we sometimes employ the ordinary sago-flour of commerce. We macerate the specially-prepared agglutinant material or the sago-flour in water and by heating the same obtain a homogeneous emulsion, which we add to the crushed fuel, or we add the desired percentage of the agglutinant in the dry state to the fuel. After intimate mixture of the fuel and its agglutinant we submit the same to the action of heat or to heat and moisture, according to its hygroscopic state, to effect the gelatinization of the agglutinant and consequent cohesion of the mass, which is then formed into blocks or briquets in any suitable machine. We preferably effect the mixing of the crushed fuel and the agglutinant and the gelatinization of the latter in a pug-mill, in connection with which we arrange a series of pipes or coils for admitting wet steam, superheated steam, or hot compressed



air, according to the hygroscopic state of the mixture.

5 In cases where more than ordinary resistance to climatic action is desired we sometimes add to the mixture of fuel and agglutinant a small percentage of oleaginous matter, such as paraffin-oil, ozocerite, stearin, or the like.

10 Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. Blocks or briquets of artificial fuel consisting in part of an agglutinant formed from the medullary matter of sago-yielding plants,  
15 as set forth.

2. In blocks or briquets of artificial fuel, the combination with crushed or finely-divided fuel of an agglutinant composed of the

non-fibrous part of the medullary matter of sago-yielding plants, as set forth. 20

3. In blocks or briquets of artificial fuel, the combination with crushed or finely-divided fuel of an agglutinant composed of sago-flour, as set forth.

4. In blocks or briquets of artificial fuel, 25 the combination consisting of crushed or finely-divided fuel, an agglutinant formed from the medullary matter of sago-yielding plants, and oleaginous matter, as set forth.

In witness whereof we have hereunto set 30 our hands in presence of two witnesses.

ALEXANDER EDWIN TUCKER.  
COLIN CORY.

Witnesses:

W. SWINFEN COTTRELL,  
HERBERT BROCKETT.