

# UNITED STATES PATENT OFFICE.

THEODORE DAVIS, OF BIRMINGHAM, ALABAMA, ASSIGNOR TO STANDARD FUEL COMPANY, OF MONTGOMERY, ALABAMA, A CORPORATION OF ALABAMA.

## BINDER FOR CARBONACEOUS BRIQUETS.

966,803.

Specification of Letters Patent.

Patented Aug. 9, 1910.

No Drawing.

Application filed August 8, 1907. Serial No. 387,632.

*To all whom it may concern:*

Be it known that I, THEODORE DAVIS, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Binders for Carbonaceous Briquets, of which the following is a specification.

To be commercial, coal briquets should be moisture proof, sufficiently hard not to break in handling or shipping, and of a consistency which will prevent disintegration until their combustible matter has been practically consumed in the fire. Further the briquet should dry quickly and its binder should cause no objectionable odor and burn without producing smoke or injurious gases, or appreciably increasing the amount of ash. All these results are directly dependent upon the binder used, and in seeking to produce a successful briquet I have directed my attention principally toward discovering a binder which would act in the manner above described and still be sufficiently inexpensive to be practicable. In the first place to insure the briquet being water proof and free from any tendency to disintegrate when exposed, I utilize a main base or carrier for my binder which is soapy in character. This carrier is obtained by mixing water with linseed oil or any similar oil which will dry quickly in the briquets, and adding sufficient sal soda, or similar agent, to cause the water and oil to mix thoroughly. This soapy solution is best made by first heating the water and dissolving sal soda therein after which the oil is added, the ingredients being stirred while heating, but it will be understood that the ends in view are subserved when a given quantity of water is thoroughly impregnated with a quick drying oil. I prefer to use the linseed oil as it will dry quickly and effectively water proof the briquets without requiring them to stand a long time before the oil hardens.

To soapy water as a base I add an adhesive capable of holding the carbonaceous particles of the briquet against disintegration. As an adhesive I have obtained the best results from dextrin, which is readily obtainable in large quantity at a very low cost and which possesses to a high degree the adhesive qualities desired for my purposes. The dextrin, as soon as it becomes dissolved in the soapy water produces a compound

having adhesive properties to a high degree, the dextrin acting as in the case of other starchy gums in forming an effective binder or adhesive when dissolved in fluids. Other starchy or glucose gums, or even glue, may be dissolved in the oily water as the chief adhesive agent, but, without express limitation thereto, I prefer to use dextrin, dissolving about one pound in an oily water solution, preferably heated, formed by mixing in the manner above described five quarts of water, one-eighth ounce sal soda and one-eighth pint of linseed oil.

While the resultant solution is a completely successful binder, I find that by mixing about one-eighth ounce of sal soda or its equivalent with the dextrin before dissolving the latter in the oily water, the resultant binder will keep better in solution and without fermentation, and can be used hot or cold. In practice, about six gallons of binder are sufficient for admixture with a ton of briqueting material, the resultant mass being pressed in molds to form briquets which are then dried, the oil in the binder drying quickly and making the briquet water proof.

Where a non-coking coal stock is to be briqueted, I find it desirable to make provision for the absence of natural binding properties in the coal by adding to the pound of dextrin, or other chief adhesive agent, about one-eighth pound of low grade gelatin or ground glue which increases the strength of the binder and also of the resultant briquets. A greater percentage of dextrin might be substituted in place of the glue, but I find in practice that two adhesives give very satisfactory effects when combined.

To deodorize the briquet when necessary and also to assist the action of the binder, I add formaldehyde to the solution, mixing the dextrin, sal soda and glue substantially in the above quantities and dissolving them in the oily water, and after they have dissolved adding about one-eighth ounce of formaldehyde.

The essential elements of my invention are the provision of an oily water solution into which dextrin or an equivalent adhesive is dissolved, the other elements being desirable for the purposes and in the instances above described, but not essential to the successful use of my binder. The percentages of the



above ingredients per gallon of binder may be varied from those given, for which reason I do not desire to limit myself thereto.

What I claim as new, is:—

5 1. A binder for carbonaceous briquets comprising the following ingredients mixed in substantially the following manner, viz: to five quarts of warm water add one-eighth ounce of sal soda, one-eighth pint of linseed  
10 or similar oil, and after these ingredients have become thoroughly mixed, dissolve in the resultant oily water about one pound of dextrin, which has had mixed with it one-eighth ounce of sal soda.

15 2. A binder for carbonaceous briquets comprising the following ingredients mixed in substantially the following manner, viz: to five quarts of warm water add one-eighth ounce of sal soda, one-eighth pint of linseed  
20 or similar oil, and after these ingredients have become thoroughly mixed, dissolve in the resultant oily water about one pound of dextrin, which has had mixed with it one-

eighth ounce of sal soda and one-eighth pound of gelatin or ground glue. 25

3. A binder for carbonaceous briquets comprising the following ingredients mixed in substantially the following manner, viz: to five quarts of warm water add one-eighth ounce of sal soda, one-eighth pint of linseed  
30 or similar oil, and after these ingredients have become thoroughly mixed, dissolve in the resultant oily water about one pound of dextrin, which has had mixed with it one-eighth ounce of sal soda and one-eighth  
35 pound of gelatin or ground glue, and in the resultant binder solution dissolve one-eighth ounce of formaldehyde.

In testimony whereof I have hereunto set my hand in presence of two subscribing wit- 40  
nesses.

THEODORE DAVIS.

Witnesses:

NOMIE WELSH,

ROBT. D. JOHNSTON, Jr.