

UNITED STATES PATENT OFFICE.

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BINDER FOR PULVERULENT MATERIALS.

SPECIFICATION forming part of Letters Patent No. 621,579, dated March 21, 1899.

Application filed July 6, 1897. Serial No. 643,656. (No specimens.)

To all whom it may concern:

Be it known that I, MARK W. MARSDEN, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Binder for Pulverulent Materials Destined for Exposure to Heat, of which the following is a specification.

To successfully retain in the form of briquets pulverulent materials—as coal, ore, and the like—when exposed to moisture and heat is a very desirable thing; and it is the object of my invention to provide a binder that will hold such material in the form of briquets even when the latter are exposed to moisture and to a comparatively high degree of heat.

A binder of my invention consists of flour or starch, caustic potash or caustic alkali or lye, resin or pitch or oil, and water, and this binder is mixed with pulverulent coal, ore, or the like. The mixture is then molded, pressed, or otherwise formed into briquets or cakes and dried. In the preparation of finely-divided coal the briquets are or may be provided with a coating of resin and wax or resin alone or pitch by dipping them into a bath of such materials or otherwise. While the proportions in which these ingredients are combined may be varied, still I have obtained good results by the use of said ingredients in the following proportions: one pound of flour, three ounces of caustic potash or lye, six ounces of resin, and one and three-quarters gallons of water, and the binder so prepared is to be mixed in the proportion of from fourteen to fifteen gallons to the ton of pulverulent coal, ore, and the like.

The proportion of the binder employed may be increased or diminished, according to the weight or bulk of the pulverulent material, the lighter the pulverulent material the more binder required.

In combining the foregoing ingredients the caustic potash or lye is dissolved in water, the flour or starch is mixed with water, and these two are mixed together and the resin added.

The lye or caustic potash, as it were, cooks the flour and cuts the resin, so that the mixture is uniform and homogeneous and the ingredients are thoroughly combined. The binder and pulverulent material are mixed together in any appropriate manner, and this mixture is rolled, pressed, or otherwise formed into briquets or cakes, which are dried. In the case of coal I make use of a coating, for example, of resin with or without wax, as has been stated, and this coating is applied to the dried briquets and appears to penetrate quite deeply.

Among the many advantageous features of a binder of my invention the following may be mentioned: When incorporated or combined with pulverulent material and formed or dried into briquets or cakes, such briquets will upon exposure to a comparatively high temperature retain their form and escape disintegration, because the described binder when dried or set is capable of resisting the action of a considerable degree of heat—for example, 600° Fahrenheit. This is very desirable in connection with the use of briquets or cakes in a furnace, because the same retain their form for a comparatively long time in the furnace without disintegration or crumbling, which would result not only in waste of material carried off by the draft, but also in choking and retarding the draft. Such briquets also withstand the action of water.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

A composition of matter for a binder consisting of water, resin, flour, and caustic alkali, substantially as and in the proportions described.

In testimony whereof I have hereunto signed my name.

MARK W. MARSDEN.

In presence of—

F. H. MAC MORRIS,
A. B. STOUGHTON.