

# UNITED STATES PATENT OFFICE.

EDWARD S. MEADE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE NORTH AMERICAN FUEL COMPANY, OF CAMDEN, NEW JERSEY, AND PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

## MANUFACTURE OF BRIQUETS.

SPECIFICATION forming part of Letters Patent No. 719,830, dated February 3, 1903.

Application filed May 16, 1902. Serial No. 107,657. (No specimens.)

*To all whom it may concern:*

Be it known that I, EDWARD SHERWOOD MEADE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in the Manufacture of Briquets, of which the following is a specification.

One object of my invention is to make briquets with lignite coal as a base, in combination with any suitable binder; and a still further object of the invention is to make such a briquet of lignite coal with a binder of molasses or equivalent material and which are rendered weatherproof by coking the binder after the briquet is formed. These objects I attain in the following manner.

In the manufacture of briquets from lignite coal and a binder the difficulties which have heretofore attached to the briquetting of lignite are two: first, the failure to eliminate the fixed moisture or moisture of combination from the coal before it was put into the briquetted form, and, second, the difficulty of binding the particles to form a solid briquet which will not disintegrate when exposed to moisture.

The presence of moisture in the briquets when they are placed in the fire causes a rapid evaporation of the moisture during the process of burning and the consequent disintegration of the briquet. This fixed moisture in the lignite can be removed by heating the lignite for a considerable time and at a temperature of about 500° Fahrenheit. Even after moisture is removed, however, it is found impossible by the use of any one of the known binders to produce a solid briquet. In order to make a briquet from a fine or granular substance, it is necessary that the particles should present a rough or broken surface, so that the adhesive material used as a binder when mixed with the coal may adhere firmly and closely to the particles of material in order to form a hard and firm briquet. When the surfaces of these particles are smooth, the binder can take no firm hold upon them, no matter how heavy may be the pressure to which the material is subjected, unless it be used in excessive amounts. I overcome this

difficulty by subjecting the lignite to a temperature sufficient not merely to expel the moisture of combination, but to expel it in such a sudden and forcible manner as to cause the particles of material to crack, break, or to become rough and serrated on their outer surface and to make them more or less porous, thus giving the binder a hold upon them when the mixture of material and binder is subjected to heavy pressure in order to form a briquet.

It is necessary that the moisture should be expelled suddenly by the application of a high temperature. Slow heating of the material expels the moisture so gradually that the surface of the briquet is not broken or roughened. The application of a high heat for a comparatively short period of time is sufficient to produce this result—say from 1,000° to 1,500° Fahrenheit.

In carrying out my invention I first finely divide or granulate the lignite coal and then subject it suddenly to a high temperature, so as to expel the moisture forcibly, and thus cause the particles of material to crack, break, or to become rough and serrated on their outer surfaces and to make them more or less porous. While the lignite is still hot I preferably spray it with water in order that the steam produced in the heated material may penetrate and moisten the entire mass, and thus facilitate the penetration of the binder, such as molasses or a similar material, throughout the mass and the thorough and complete amalgamation and incorporation of the binder with the base of lignite. The material is then put into a suitable briquet-press, subjected to the usual pressure, and dried at a temperature not exceeding 250° Fahrenheit; but if it is desired to make the briquet hard and weatherproof I subject the finished briquet to a heat sufficient to coke the molasses or equivalent material forming the binder, as fully set forth in the application for patent filed by me on July 26, 1901, Serial No. 69,757, allowed November 12, 1901.

I claim as my invention—

1. As a new article of manufacture, a briquet made of finely-divided lignite coal from



which the moisture has been expelled by its sudden exposure to a relatively high temperature, in combination with a binder, the surfaces of the particles of said coal being rough-  
5 ened, substantially as described.

2. As a new article of manufacture, a briquet made of artificially-roughened particles of finely-divided lignite coal from which the moisture has been expelled, in combination  
10 with a binder of molasses or other material, said binder being coked after the briquet has been formed, substantially as described.

3. The process herein described of manufacturing briquets, said process consisting in  
15 finely dividing lignite coal, expelling moisture from said coal by the sudden application of a relatively high temperature and thereby roughening the surfaces of the particles, then mixing said particles with a binder and form-  
20 ing the mixture into a briquet, substantially as described.

4. The process herein described of manufacturing briquets, said process consisting in finely dividing lignite coal, expelling moisture

from said coal by the sudden application of  
25 a high temperature and thereby roughening the surfaces of the particles, then mixing said particles with a binder of molasses or equivalent material, and forming the mixture into a briquet, substantially as described. 30

5. The process herein described of manufacturing briquets, said process consisting in finely dividing lignite coal, expelling moisture from said coal by the sudden application of  
35 a high temperature and thereby roughening the surfaces of the particles, then mixing said particles with a binder of molasses or equivalent material, forming said mixture into a briquet, and subjecting the briquet to sufficient heat to coke the molasses, substantially  
40 as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDW. S. MEADE.

Witnesses:

WILL. A. BARR,  
JOS. H. KLEIN.