

UNITED STATES PATENT OFFICE.

BERNHARD MÜLLER, OF CHEMNITZ, GERMANY.

PROCESS OF MAKING BRICKS FROM COAL-DUST.

SPECIFICATION forming part of Letters Patent No. 526,936, dated October 2, 1894.

Application filed July 7, 1892. Serial No. 439,287. (No specimens.) Patented in Germany April 12, 1892, No. 70,481; in France May 20, 1892, No. 221,785; in England May 24, 1892, No. 9,854, and in Belgium June 8, 1892, No. 100,051.

To all whom it may concern:

Be it known that I, BERNHARD MÜLLER, a subject of the German Emperor, residing at Chemnitz, in the Kingdom of Saxony and Empire of Germany, have invented a new and useful Improvement in Processes of Making Pressed-Coal Briquets, (for which I have obtained Letters Patent in England, No. 9,854, dated May 24, 1892; in France, No. 221,785, dated May 20, 1892; in Belgium, No. 100,051, dated June 8, 1892, and in Germany, No. 70,481, dated April 12, 1892,) of which the following is a specification.

The refuse or residuum arising in the mining, lifting, digging and separating of pit-coal consists of a mixture of coal-dust and small pieces of coal which cannot be usually employed in the ordinary furnaces of industrial establishments, because the refuse is too small and drops through the grates of said furnaces, or is easily blown away when artificial draft is employed. It also burns too quickly and does not give the required steady heat, besides having other disadvantages and drawbacks.

The object of this invention is to furnish an improved process of making coal briquets from coal dust, and the invention consists in making such briquets by molding into blocks the coal dust containing from five to twelve per cent. of water and from one to three per cent. of tar, said molding operation being performed at a temperature from 40° to 70° centigrade and under a pressure of not less than eight hundred kilograms, the bitumen or tarry matter being brought to the surface of the coal and the separate particles made to adhere to each other thereby.

The processes heretofore used for the manufacture of compact coal have the following disadvantages, to wit:

First. That the small coal had to be very highly heated. A complete chemical alteration thereof was thereby effected, the carbureted hydrogen and the bitumen being melted and masses of a coky nature produced which are capable for use to some extent for fuel; but for chemical purposes, as for example the manufacture of gas, they are useless. Moreover the tarry products are entirely lost.

Second. In order to bind the small coal a large addition of pitch was necessary, and the product was thus rendered very expensive, as the cost of the binding material was considerable.

Third. The molded bodies so produced were neither ready for use nor adapted for transportation until after they had been kept in a drying chamber and baked for the purpose of hardening them.

Apart from the considerable increase of price occasioned by the processes mentioned, the gases developed by the process of drying the briquets have a most penetrating and offensive smell, which makes the carrying out of the process in any populated district obnoxious. The tar and oil-products are also by these processes entirely lost.

All of these defects are altogether obviated by my invention according to which—

First. The small coal need only be subjected to a temperature of not under 40° and not over 70° centigrade.

Second. The tar or pitch addition for the binding of the coal-particles is entirely omitted in the case of coal rich in bitumen, while in the case of inferior coal one to three per cent. of tar is added for the purpose of increasing the resistance of the coal briquets to the action of water and the weather.

It is clear that this decrease of temperature and dispensing with the addition of tar, or reduction in the amount thereof, must be compensated for by other means, as otherwise only brittle and quickly perishable briquets would be obtained. This compensation is effected as follows:

First. The pressure is increased to at least eight hundred kilograms.

Second. The coal, by moistening or drying, should be allowed to take up or retain respectively not less than five per cent. and not more than twelve per cent. of water.

It is only by the co-operative action of the three above mentioned factors—namely: first, a temperature of 40° to 70° centigrade; second, a pressure of over eight hundred kilograms, and, third, a moisture of from five to twelve per cent. of the coal—that the fluid matter, oily and tarry matter, or bitumen, can be pressed out of the pores of the coal so as

to unite the small particles of coal together so that they do not afterward fall to pieces.

For the practical application of the process therefore the small coal must contain from 5 five to twelve per cent. of water. If an excess of water is present the coal must be dried; if a deficiency the requisite quantity of moisture is added. The poorer coal is 10 mixed with from one to three per cent. of tar or a correspondingly small quantity of pitch and the mass then subjected to a pressure of over eight hundred kilograms. The resulting product is immediately ready for transportation and applicable to the same purposes 15 as coal from the pit.

I claim as my invention—

1. The process of making coal briquets which consists in molding into blocks bituminous coal dust, containing from five to 20 twelve per cent. of water, under an abnormally high pressure of not less than eight hundred kilograms, and under an abnormally low temperature of from 40° to 70° centigrade, the bituminous matter, under the high pressure and

the moisture, exuding from the pores of the 25 coal particles and serving to compactly unite them together, while owing to the low temperature, the mass remains wholly in an uncoked condition, substantially as set forth.

2. The process of making coal briquets, 30 which consists in mixing with coal dust containing from five to twelve per cent. of water, one to three per cent. of tar, and molding said mass into blocks under an abnormally high pressure of not less than eight hundred kilo- 35 grams and under an abnormally low temperature of from 40° to 70° centigrade, the oily and tarry matter under the high pressure and the moisture serving to compactly unite the coal particles, while owing to the low temperature, 40 the mass remains wholly in an uncoked condition, substantially as set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

BERNHARD MÜLLER.

Witnesses:

R. E. JAHN,

EUGEN A. FRAISSINET.