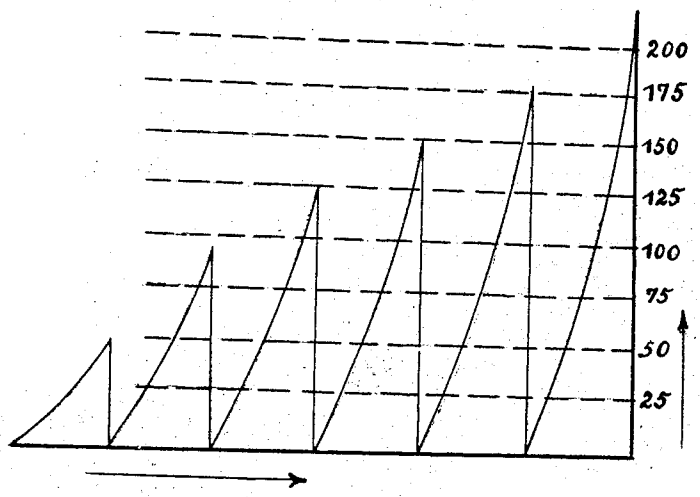
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METHOD OF BRIQUETTING COAL

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Inventors:
Peter J. Spengler
Johann P. Spengler
By Harvey Ordway Jr. Atty.

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PETER JOSEPH SPENGLER AND JOHANN PETER SPENGLER, OF OSTSWINE, GERMANY

METHOD OF BRIQUETTING COAL

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The production of briquettes, specially coal-briquettes, has hitherto been carried out by intimately mixing coal of small size grain, eventually dried, with finely ground pitch or other binding material, and then heating the mixture, moistening and compressing it under high pressure in a press. This manufacturing method presents several inconveniences. Principally for the reason that the compressed bodies are frequently of not sufficient resistance, because the inner cohesion of the interior of the briquettes is not uniform.

The present invention is a new method for the manufacturing of briquettes. It has been found that briquettes, possessing great resistance in all their parts, can be obtained by submitting the coal admixed with binding material for example coal-pitch, eventually heated, to repeated pressing and in such a manner that after every pressing the pressed bodies are deaerated. The deaerating is effected in the simplest manner by reducing the pressure.

In order to economically de-aerate the briquettes, i. e., to remove the compressed air contained in the mass, after each pressing stage the partially pressed briquette is partially or wholly ejected from the briquette mold, for example, the stamping or pressing member partially expels the briquette from the mold, whereby portions of the briquette surface are exposed to atmospheric air pressure, so that the air compressed in the preceding pressure stage may escape.

The new method serves principally for briquetting coal, pit coal, but it may be used also for briquetting coke and coke-like-masses; also coal-mixtures may be compressed. It has shown to be advantageous to compress coke-containing mixtures, for instance a mixture consisting of coal and coke.

The procedure is to first submit the heated mixture of coal and binder to a low pressure, then deaerate the same and press it again at increased pressure, to deaerate again, and to continue in this manner until the briquettes which have been produced possess the required resistance. The material is repeatedly submitted to pressing without any special intermediate treatment. The pressure at which the last treatment is carried out may amount for example to 100 to 120 kgs. per square cm. as usual in the hitherto used briquette-manufacturing. Higher pressures are useful.

The accompanying diagram illustrates how the method is carried out.

By the new method briquettes are obtained which are perfectly free of air-fissures, do not possess any slaty-structure and possess consequently an extraordinarily great resistance in all their portions.

It is of advantage to ensure an intimate and good mixing of the binding material with the coal. The binding material, for example coal-pitch, may be used in finely ground solid shape or in liquid, to vapor or mist-state.

A greater resistance of briquettes will be obtained even if a smaller percentage of binding means than usual be used. In the commonly used process according to the coal to be briquetted 7 to 10% coal-pitch had to be used to obtain a resistance sufficient to some extent. Working according to the present invention extraordinary resistance will be obtained using 3–4% coal-pitch.

By the new method it is also possible to utilize inferior binding material in smaller quantities with excellent result, which hitherto could be utilized only in large quantities and even then not always with good result.

As binding materials may be mentioned further thick tar, asphalt, resins, pitches of the most various kinds for example petroleum-pitch, cellular pitch, lignite-tar-pitch, naphthalene and the like, emulsions, for example aqueous emulsions to which alkalis may be added as stabilizers, for example a pitch-emulsion in alkaline reacting water and the like. If water has to be avoided, oils may for instance be used as liquids, and as binding materials a mixture for example of naphthalene and an oil, for example tar-oil.

The coal admixed with a binding material may be submitted to a stepwise pressing after previous heating for example in such a manner that the binding material is liquefied.

Under certain conditions it is advisable, to add a liquid prior to the pressing. Good results are obtained, if the binding material, for example coal-pitch, admixed with water, is added to the heated briquetting material, whereupon this intimately mixed mass is stepwise compressed. In this manner it is possible to reduce the percentage of binding material to an extraordinary small quantity and to obtain at the same time the best possible resistance.

Working according to the invention it is also possible to avoid wholly any binding means i. e. the coal alone to submit a repeated pressing and, after every pressing deaerating the pressed bodies. The briquettes produced without any binding means have a resistance sufficient for many purposes. Coal adapted for be briquetted according to the invention is the fine-part from coal-separation. Commonly a coal will be used the diameter of the grains of which is 0 to 10 mm or greater. Advantageously mixtures of coarser and finer coal can be used.

By the reduction of the percentage of binding material, for example coal-pitch, in the briquette or by working without any binding material it might happen that, when coal-sorts are used which are not bituminous or contain a small amount of volatile constituents, the volatile constituents of the briquettes remain below the prescribed minimum percentage. This only apparent inconvenience can be obviated by admixing with the non-bituminous coal fine-grained coal possessing a higher percentage of volatile constituents, for instance flame-coal, gas-coal, gas flame coal admixed with non-bituminous coal or forge coal, and then briquetting this mixture.

We claim:

1. A method of briquetting coal, comprising submitting a mixture of coal and binding material to repeated pressing, and after each pressing operation removing the pressure and de-aerating the briquette by exposing a surface thereof to atmospheric pressure.

2. A method of briquetting coal, comprising submitting a heated mixture of coal and binding material to repeated pressing, and after each pressing operation removing the pressure and de-aerating the briquette by exposing a surface thereof to atmospheric pressure.

3. A method of briquetting coal, comprising submitting a mixture of coal and binding material to repeated pressing, and after each pressing operation removing the pressure and de-aerating the briquette by exposing a surface thereof to atmospheric pressure, the successive pressures progressively increasing.

4. A method of briquetting coal, comprising submitting a mixture of coal and binding material to repeated pressing, and after each pressing operation removing the pressure and de-aerating the briquette by exposing a surface thereof to atmospheric pressure, the customary briquetting pressure being attained in the later pressing stages.

5. A method of briquetting coal, comprising subjecting a mixture of coal and binding material to repeated pressing, and after each pressing operation removing the pressure and de-aerating the briquette by exposing a surface thereof to atmospheric pressure, the pressure in the final pressing stage being greater than the customary pressures.

6. A method of briquetting coal, comprising subjecting a mixture of coal and less than the customary seven percent of binding material to repeated pressing, and after each pressing operation de-aerating the briquette by removing the pressure and exposing a surface of the briquette to the atmosphere.

7. A method of briquetting coal, comprising subjecting a mixture of coal and three to four percent of binding material to repeated pressing, and after each pressing operation de-aerating the briquette by removing pressure thereon and exposing a surface thereof to the atmosphere.

8. A method of briquetting coal, comprising subjecting a mixture of coal and pitch to repeated pressing, and after each pressing operation de-aerating the briquettes by removing pressure therefrom and exposing a surface of the briquette to the atmosphere.

9. A method of briquetting coal, comprising mixing with heated fine coal a binder mixed with water; successively compressing the mixture, and de-aerating the briquettes after each pressing operation by removing the pressure and exposing the briquette surface to the atmosphere.

10. A method of briquetting coal, comprising mixing therewith an emulsion of a binder, water and a stabilizer, successively compressing the mixture, de-aerating the briquettes after each pressing operation by removing pressure therefrom and exposing the surface of the briquette to the atmosphere.

In testimony that we claim the foregoing as our invention, we have signed our names hereto.

PETER JOSEPH SPENGLER.
JOHANN PETER SPENGLER.