

UNITED STATES PATENT OFFICE.

WILLIAM PENROSE AND WILLIAM F. RICHARDS, OF SWANSEA, ENGLAND.

IMPROVEMENT IN PROCESSES OF MAKING COKE.

Specification forming part of Letters Patent No. **175,744**, dated April 4, 1876; application filed November 13, 1874.

To all whom it may concern:

Be it known that we, WILLIAM PENROSE and WILLIAM FREDERICK RICHARDS, both of Swansea, in the county of Glamorgan, England, have invented Improvements in the Production of Coke, of which the following is a specification:

Our invention relates to the production of coke; and consists in the mixing or incorporating of anthracite or stone coal, or free-burning steam-coal, or coal known as Staffordshire slack, or other non-coking coals, with bituminous coal, or any other coal capable of making coke, together with pitch or tar, or with any form of tar or bitumen mineral oils containing bitumen, petroleum, or any of the waste products of petroleum, such coal or coals, pitch, tar, or other bituminous matters, being ground or mixed together, as aftermentioned.

The mixture thus produced is to be placed in any well-known form of oven or retort commonly used for coking, and the surface is then to be covered with a layer of bituminous coal or other bituminous matter.

In carrying out our invention, we cause the coals and pitch-tar, or other bituminous matters to be ground, granulated, disintegrated, or pulverized and thoroughly admixed simultaneously, by means of any well-known disintegrator, such, for example, as the machine known as "Carr's Disintegrator," or by any other suitable grinding and incorporating apparatus; or each article of a solid character may be ground, granulated, disintegrated or pulverized separately, and the several component parts necessary for the production of the coke afterward admixed by means of Carr's disintegrator, or any other suitable incorporating apparatus.

When such admixture or incorporation has been effected, the materials thus mixed, either with or without sufficient quantity of water to moisten the same, are to be introduced into a convenient retort or any of the well-known forms of coking-ovens, for the purpose of being convert-

ed into coke, and when placed in such oven or retort are to be covered with a layer of bituminous coals or matter, bituminous coal being preferred, or in lieu of such layer, a sufficient quantity of coal or bituminous matter may be placed in the oven, so as to insure the early ignition and proper working of the charge.

The proportions in which the coals or mixtures of the same are to be employed, together with one or more of the beforementioned materials, will vary according to the quality of the coals, and the nature of the bituminous matter employed. We have found that good results may be obtained by employing from about sixty parts, by weight, of anthracite or stone coal of average good quality to about thirty-four parts by weight of bituminous or coking coal and to about six parts, by weight, of pitch or ordinary coal-tar, but we do not limit ourselves to these proportions. The layer of bituminous coal we employ may vary from about two to six inches in depth, but, as we have before mentioned, these proportions and layers may be varied.

We claim—

The process of producing coke containing anthracite by reducing the several hereinbefore referred to constituents necessary for the production of such coke to a fine state of division and incorporation, then placing said mixture in a retort or suitable coking-oven with a layer or layers of bituminous coal, as described, and then submitting the same to the coking process, substantially as set forth.

In witness whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM PENROSE.

WILLIAM FREDERICK RICHARDS.

Witnesses:

ARTHUR J. RICHARDS, *Swansea*.

WILLIAM WALSH, *Swansea*.