

UNITED STATES PATENT OFFICE.

GUSTAV SPIECKER, OF BONN, GERMANY, ASSIGNOR OF ONE-HALF TO GOTTFRIED HUETTEMANN, OF WIKLITZ, NEAR KARBITZ, AUSTRIA-HUNGARY.

MANUFACTURE OF BLOCKS OF FUEL.

SPECIFICATION forming part of Letters Patent No. 507,246, dated October 24, 1893.

Application filed November 29, 1892. Serial No. 453,530. (No specimens.) Patented in Luxemburg October 19, 1892, No. 1,703, and in Italy December 31, 1892, XXVII, 3,284, LXIV, 328.

To all whom it may concern:

Be it known that I, GUSTAV SPIECKER, a subject of the German Emperor, residing at No. 46 Bach Strasse, Bonn, Germany, have invented certain new and useful Improvements in the Manufacture of Blocks or Briquets of Fuel from Small Coal, Slack, Coal-Dust, and Coke-Dust, of which the following is a specification.

This invention has been patented in Luxemburg, No. 1,703, dated October 19, 1892, and in Italy, XXVII, 3,284, LXIV, 328, dated December 31, 1892.

This invention relates to fuel and to the manufacture of blocks or briquets of fuel from finely divided substances, such as small coal, slack, coal-dust and coke-dust, for the purpose of utilizing these products. Such small coal, slack or dust forms usually an almost valueless product, that is to say, in the case of brown coal and coke they are almost always valueless, and in the case of black coal, such for instance as the very dry-burning or close-burning coal called anthracite, the value varies according to the quality of the same. The utilization of such small coal, slack or dust for mixed coals is frequently precluded by the location of the mine producing it relatively to the principal places of consumption for mixed coals, the highness of the freights between such places rendering the sale impracticable. The slight value of the small coal, slack or dust has a great effect upon the proceeds of the mine where it is produced, as frequently the small coal or slack (of a size up to ten millimeters) constitute half, or even a greater porportion of the coal extracted. As the cost of the extraction, or of the entire working of the mine, depends upon the small coal, slack or dust corresponding to its quantity, the coarser products are too much increased in cost in consequence of the small value of the small coal, slack, or dust.

In order to utilize small coal, slack or dust, numerous attempts have been made to the end of converting it into a valuable coal product. Binding agents have been used mixed with it, and this mixture has been compressed either in a cold state or after being heated, to form cakes, bricks or blocks. Such bind-

ing agents have consisted of boiled rosin or of vegetable or mineral pitch. Of the numerous binding agents heretofore proposed and employed, use is generally made of coal-tar pitch. This substance has a very unpleasant smell, due to volatile empyreumatic substances, which smell is retained by the blocks or briquets made therewith, and is disagreeably perceptible, not only when such blocks or briquets are stored in cellars (where its effect is to render vegetables and fruitinedible) and in the coalscuttles in rooms, but also during the burning of the fuel by reason of the emission of a great quantity of smoke. For this reason the blocks or briquets made with coal-tar pitch have not been extensively employed for domestic fuel, despite their convenient size and moderate cost, and still less as drawing room fuel for use in magazine, regulating and so-called American stoves.

There can be no doubt that it will be important and advantageous to manufacture suitable blocks or briquets from small coal, slack or dust, which will be suitable especially for drawing room fuel, and will be capable of use in place of the anthracite nut coals (of which the production is far less than the demand, and which are consequently high priced, and which often contain a large proportion of incombustible stones or rocks, and are subject to the disadvantage of crumbling during storage). Anthracite nut coals are popular because they burn without smoke or smell, because they produce very little or no soot, and because they fuse or cake together in the burning, so that when used in a suitably arranged stove (such for instance as the magazine, regulating or so-called American stoves), and even with slight attention to its regulation, the fire may be kept up for weeks.

The object of the present invention is to manufacture from the almost valueless slack or dust or refuse of black coal (anthracite coal), brown coal or coke, blocks or briquets which will possess the above mentioned advantageous properties of anthracite nut coals (and also absence of smell and solidity) and will be also without the disadvantageous properties of such coals, namely, without the pro-

portion of incombustible stones or rocks contained therein and without the crumbling during storage, and which can be kept without becoming deteriorated or suffering under the action of atmospheric influences. In carrying out this invention, this object is attained by making compressed blocks or briquets from small coal, slack, dust or the like, with the aid of an improved binding agent which does not possess the above mentioned injurious properties of coal-tar pitch, but imparts to the compressed material the qualities hereinbefore described as being desirable. This binding agent, which acts advantageously in a very high degree as compared with those heretofore known, is according to the present invention, an improved resinous pitch. Resin itself cannot be employed, as among other things it causes an emission of sparks during the burning of the blocks or briquets made with it.

The resinous pitch employed according to this invention is produced from the resins extracted from the coniferæ and is the residuum obtained by distilling or boiling them at a temperature of from 260° to 300° centigrade. This operation frees the said rosin from its essence or volatile "pinolin," and obtains a residue of a dark brown or black color. The resin from coniferæ is to be boiled or distilled at about 300° centigrade until the whole "pinolin" has been evolved and the residue shows, after being cooled, a brittle and readily friable property. The residue from this operation, that is to say, the resinous pitch then remaining in the distilling vessel or in the boiler, is an odorless pitch of very great binding or cementing power. Such resinous pitch is intimately mixed with the small coal, slack, or dust to be utilized. It may be mixed either in a liquid state or in the solidified dry state (in the latter case preferably by means of a disintegrator). The mixture is preferably heated, which may be effected by any suitable means, as by ordinary or superheated steam. After heating, the mixture is preferably compressed under a great pressure, which may be accomplished in any suitable manner, and by any well known form of compressing apparatus. Pref-

erably the substances are mixed in the proportion of five to six parts by weight of the above described resinous pitch to one hundred parts by weight of the small coal, slack or dust to be utilized, this proportion being generally sufficient. In this manner blocks or briquets are obtained at a small cost which possess in actual use the above described advantageous properties, and which are in all respects suitable as substitutes for the anthracite nut coals, and which even supersede them as regards purity (absence of incombustible stones or rocks) and solidity and durability against deterioration during storage. Blocks or briquets manufactured in this manner are not affected by moisture or water. Their manufacture is perfectly odorless, and free from the generation of vapors or gases injurious to the eye, skin and breathing organs, which occurs in the most unpleasant manner when using coal-tar pitch.

It will be seen that my invention provides an improved fuel and an improved method for its manufacture, by means of which a comparatively worthless product may be converted into a valuable fuel.

What I claim is—

1. The improvement in the art of manufacturing fuel blocks from finely divided combustible substances, which consists in mixing such substances with a binding agent consisting of the resinous pitch obtained as a residue from the distillation of resins extracted from the coniferæ at a temperature of from 260° to 300° centigrade, whereby the essence of resin, "pinolin," is driven off from said residue, and then compressing the mixture thus obtained, substantially as and for the purpose set forth.

2. A composition for fuel blocks consisting of a finely divided combustible material and coniferæ resinous pitch free from essence of resin, in substantially the proportion specified, substantially as and for the purpose set forth.

Signed the 16th day of November, 1892.
GUSTAV SPIECKER.

Witnesses:

J. DRITTUNANY,
G. LOUBIER.