# UNITED STATES PATENT OFFICE.

GUSTAV SPIECKER, OF BONN, GERMANY, ASSIGNOR OF ONE-HALF TO GOTTFRIED HÜTTEMANN, OF BRUX, AUSTRIA-HUNGARY.

## MANUFACTURE OF FUEL.

SPECIFICATION forming part of Letters Patent No. 617,867, dated January 17, 1899.

Application filed December 17, 1895. Serial No. 572,456. (No specimens.)

*To all whom it may concern:*

Be it known that I, GUSTAV SPIECKER, a subject of the German Emperor, residing at Bonn-on-the-Rhine, Germany, have invented certain new and useful Improvements in the Manufacture of Blocks or Briquets of Fuel, (for which Letters Patent have been obtained in Belgium, No. 113,518, dated January 4, 1895; in France, No. 225,016, dated January 4, 1895; in Great Britain, No. 283, dated January 4, 1895; in Luxemburg, No. 2,213, dated January 5, 1895; in Austria, No. 45/1,772, dated May 21, 1895, and in Hungary, No. 2,831, dated May 28, 1895,) of which the following is a specification.

This invention relates to fuel and to the manufacture of blocks or briquets of fuel from finely-divided combustible substances and resin, pitch, or other binding agent employed for uniting the material into block form. One example of such fuel is described in the United States Letters Patent granted to me October 24, 1893, No. 507,246. According to the process described in said Letters Patent the finely-divided fuel has been mixed with resin-pitch—that is, the residue left after boiling or distilling conifer-resin at about 260° to 300° centigrade, this boiling being for the purpose of eliminating the essence of resin known as "pinolin"—and the mixture thus formed was pressed while hot into the form of briquets by molding-presses.

The present invention aims to provide an improved process for manufacturing such fuel and an improved product, and to this end provides certain features of improvement, which will be hereinafter set forth.

Heretofore in the manufacture of artificial fuel from small coal or the like—for instance, of pit-coal, brown coal, coke, &c.—coal-tar pitch is generally employed as binding agent. The coal-tar pitch is a rigid brittle body with very inferior binding power. In consequence thereof it is necessary to employ seven-eighths per cent. coal-tar pitch for larger fuel-blocks and even ten-twelfths per cent. coal-tar pitch for smaller fuel-briquets, as addition to the small coal or coke in order to obtain resistant and transportable briquets. This absolutely necessary large proportion of coal-tar pitch to be added imparts to the briquets very disagreeable properties, so as to prevent the employment of such briquets for several purposes. Such briquets after having been brought into the fireplace develop while burning a large quantity of thick, dark, and black smoke, which molests the neighborhood in a very high degree. Railway-locomotives or steam-boiler plants heated with such briquets cause such inconvenience, which has been seriously felt. In a higher degree such inconvenience has been felt on passenger-steamers where the passengers being on a relatively small space near to the chimney are soiled and molested by the large quantities of black bituminous carbon particles not burned and suspended in the air. Furthermore, greens, herbs, and fruits stored near to such briquets are badly influenced by the gas developed from the latter and are rendered unserviceable as nourishment. All these inconveniences are avoided by the present invention, which consists in adding a very small proportion of conifer-resin or of its resin-pitch to the coal-tar pitch and thereby enabling the diminution of the quantity of the latter to be used, so that only one-half of the former amount is required.

Instead of employing the above-stated proportions of coal-tar pitch, it is sufficient with my invention to use 3.5 to four per cent. of coal-tar pitch, or with conifer-resin or its resin-pitch as much as corresponds to one-seventh to one-eighth of this quantity of the coal-tar pitch is used, and in this case a binding agent of an excellent binding power is the result. The briquets thus obtained are transportable, resistant, durable, and stable. Such briquets develop while burning only a small quantity of smoke and during their storage scarcely a smell caused from gases adhering to the coal-tar pitch. Therefore nourishments stored in the neighborhood of such briquets are not influenced in an injurious manner thereby.

The present invention consists in eliminating the rigid, brittle, and inferiorly binding property of the coal-tar pitch by means of very small proportions of conifer-resin or its resin-pitch added thereto, and thereby effects

a very important economical success, because the small quantities of resin employed are very much cheaper than the large quantities of coal-tar pitch saved by the addition of the resin. The gain by this invention is a very important one for this industry.

The employment of briquets developing very little smoke is highly important for men-of-war, because a thick black smoke forms for inimical artillery a mark visible at a very great distance.

In carrying out one form of my improved process I mix with, say, two hundred parts, by weight, of finely-divided carbonaceous material approximately seven to eight parts, by weight, of coal-tar pitch and about one part, by weight, of conifer-resin and I heat the mass up to a temperature of about 570° Fahrenheit until such conifer-resin is reduced to resin pitch and then compress the resulting mass into blocks.

In order to perform the improved process, the resin-pitch is preferably secured and applied by using conifer-resin, which may be (if desired) preliminarily freed in a more or less degree from its volatile constituents, which is finely pulverized and then added, together with coal-tar pitch, to the material to be molded into briquets and then converted into resin-pitch by heating. The resin may also be added to the coal-tar pitch during the preparation of the latter by adding the resin to the coal-tar before or during or at the end of the distillation from which the coal-tar pitch results. It is also possible to add coal-tar pitch and resin separately to the coal material. The essential point of the process is the result to be obtained, which consists in that during the formation of the briquets the resin and the coal-tar pitch are present in the coal material in a finely-divided state. It is not essential how the addition of resin and coal-tar pitch has been performed. The mixture of the coal material with the resin and with the coal-tar pitch is then heated in any suitable manner up to a temperature of about 570° Fahrenheit (about 300° centigrade) until the resin is converted into resin-pitch, and then the mixture is molded into briquets by means of pressure.

What I claim is—

1. The improved process of manufacturing fuel blocks and briquets from finely-divided carbonaceous material, which consists in uniting such material by adding to it a quantity of coal-tar pitch less than is necessary to unite the particles of such material, and in adding a quantity of conifer-resin to said material sufficient, with said coal-tar pitch, to unite the particles, in heating the mass up to a temperature of 570° Fahrenheit (300° centigrade) until such conifer-resin is reduced to resin-pitch, and compressing the resulting mass.

2. The improved process in the manufacture of fuel-briquets from carbonaceous material and coal-tar pitch, which process consists in heating said material, said coal-tar pitch and conifer-resin until such resin is converted into resin-pitch, and then compressing the resulting mass.

GUSTAV SPIECKER.

Witnesses:
RICHARD SCHMIDT,
W. HAUPT.