UNITED STATES PATENT OFFICE.

DAVID E. BREINIG, OF BROOKLYN, N. Y., ASSIGNOR TO ANNA SOPHIA BREINIG, MARY R. BREINIG, AND LEONARD RICHARDSON, OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE OF FUEL.

Specification forming part of Letters Patent No. 125,656, dated April 16, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, DAVID EGNER BREINIG, of the city of Brooklyn, county of Kings and State of New York, have invented a new and Improved Fuel, and a new and improved process of manufacturing the same; and I hereby declare that the following is a full, clear, and exact description thereof, so stated that others skilled in the arts may make the same.

The object of my invention is to combine the coal-dust or braze from anthracite or other mineral or vegetable coal, from peat, or in the primary manufacture of dried peat into fuel, and also sawdust, either of them separately or combined, as I prefer, into a compact mass, which will adhere so as to bear transportation, and may be sold in the markets, and used in stoves, furnaces, ranges, or other vehicles for generating heat, in the same manner and form as is now the natural mineral coal, wood, or other material or materials from which I form my new and improved fuel. By this invention and process of manufacture I propose to use, as is seen, a substance or substances now almost entirely valueless, and in fact burdensome to coal-dealers and lumber manufacturers.

In all systems or modes of combining these substances heretofore proposed, the pitchy hydrocarbons, as asphaltum, tar, resin, &c., have been used in a raw state, some applying dry or confined heat to carbonize them after mixture with the material. These modes were expensive and the fuel made both offensive, in use, to smell, to touch, and gave off great quantities of smoke. Hence to effect the desired end of giving to anthracite coal-dust the brilliant clear burning property of natural cannel coal, it was made not only disagreeable but also dangerous. In the new and improved fuel for which I ask Letters Patent, all these difficulties are avoided, in the process of manufacture as well as in the use of the manufactured article; and at the same time I accomplish these results by a process inexpensive in the materials used, and neither unhealthy nor dangerous to the workmen engaged in conducting it nor the building in which the same is conducted.

The process by which I accomplish this result and manufacture my new and improved fuel consists in saponifying the resin or asphaltum, or both, and mixing therewith pulverized quartz or fine sand and the aforementioned anthracite or other coal-dust, peat, or sawdust; in intimately combining the same, by mechanical or other means, to a proper consistency, and then in molding or not, as I may deem best, and drying the mixture thus made by said process, molded or not, by artificial or natural heat, having, as I may have deemed best, used or not used pressure in the molding or drying. The details of this operation I carry out substantially as follows, using the materials for conducting the process in about or the proportions below stated, varying the same as may be the amount to be made or the character and fineness of the coal-dust, or peat, or sawdust to be treated, stating the said proportions as follows, as a rule by which my new and improved fuel may be made from anthracite coal-dust: I take three (3) pounds of resin, one and a half ($1\frac{1}{2}$) pound of asphaltum, (natural or manufactured from coal-tar or petroleum residuum,) one-half ($\frac{1}{2}$) pound of caustic alkali, either soda, potash, ammonia, or other, or alkali with a caustic base of such nature that it will saponify in hot or cold contact or boiling with fats, oils, or resins; to this last I add one (1) gallon of water, in which I dissolve the said alkali, either by dry heat or steam. When this solution shall reach the height of 212° Fahrenheit, being the boiling point, I slowly add the resin and asphaltum, having previously powdered the same or not, as I may deem best, and continue the heat upon the solution until the said resin and asphaltum shall be dissolved and saponification effected. By preference I may use the resin or asphaltum, either the one or the other alone, but stating that to effect the saponification of the asphaltum alone a large proportion of alkali is required. Neither do I confine myself to the exact quantity of water, as with very fine coal-dust a larger proportion may be used. To the liquid soap thus prepared I add one-half ($\frac{1}{2}$) pound of pulverized quartz or fine sand, and mix the same in the liquid soap thoroughly by machinery or other means. I now have my liquid prepared and ready for mixture and combination with the anthracite or other coal-dust, peat, or sawdust. Therefore I pour or dip or otherwise place the same liquid soap, as

mixed with the sand or pulverized quartz, in an apparatus prepared for mixing by mechanical means—that is, provided with agitators or arms for effecting an intimate mixture of any materials placed therein—and add thereto the anthracite or other coal-dust, peat, or sawdust in the following proportion, varying the same, however, for causes hereinbefore stated: To two hundred (200) pounds of the liquid soap and sand or quartz, prepared as above, I add gradually two thousand (2,000) pounds of the anthracite or other coal-dust, peat, or sawdust, either of them alone or in combination, and then I agitate or stir the same until a complete and perfect mixture is effected. I then draw or take the mixture from the tub, machine, or apparatus, and mold the same or not, as I may deem best, and dry the same, as molded or not, by artificial or natural means, as hereinbefore stated.

I do not state or affirm any of these materials to be new of themselves, as one or all of them may have been used before; but what I claim as new, and for which I desire to secure Letters Patent, is—

The manufacture of a new and improved fuel from the materials herein named, combined and mixed by a process of manufacture, substantially as herein stated.

DAVID EGNER BREINIG.

Witnesses:
REVERE M. BREINIG,
THOS. H. HORTON.