

# UNITED STATES PATENT OFFICE.

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## ARTIFICIAL-FUEL BRIQUET.

SPECIFICATION forming part of Letters Patent No. 711,166, dated October 14, 1902.

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*To all whom it may concern:*

Be it known that I, WILLIAM A. KÖNEMAN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Artificial-Fuel Briquets, of which the following is a specification.

My invention relates to improvements in artificial-fuel briquets formed of finely-divided carbonaceous material, or, and more particularly, a mixture of two or more such materials, my object being to cheapen and improve their manufacture by the use of a peculiarly inexpensive and insoluble and combustible agglutinating extract which will serve to bind the carbonaceous ingredients together against danger of disintegration in handling and from the action of the elements, which will itself burn freely and without the production of smoke, and which will otherwise contribute to the production of a highly-desirable and economical briquet as a new article of manufacture.

Hitherto in the manufacture of artificial-fuel briquets it has been most common to provide an agglutinant consisting of asphaltum, tar, or other heavy hydrocarbon substances. Such agglutinating material is objectionable on account of the great amount of smoke produced during its combustion and because the proper admixture of these ingredients is difficult and expensive by reason of its being necessary to heat the entire mass of coal as well as the hydrocarbon agglutinant. The expense generally incurred by the use of such an agglutinant will approximate one dollar per ton of the briquets manufactured. Starch, dextrine, gluten, and the like have also been employed as binding materials for artificial-fuel briquets, but the expense thereof usually exceeds one dollar per ton of the briquets manufactured, and they are undesirable for other reasons. Lime, clay, gypsum, and other viscous earthy and mineral substances have been employed as agglutinants in fuel briquets; but they are objectionable more especially because they add greatly to the ash percentage of the fuel and are not sufficiently coherent. An efficient agglutinating material for fuel briquets has been employed,

consisting of a glue or gelatin solution obtained by boiling hide-scrap and the like; but such agglutinating material is also objectionable on account of the expense necessarily involved in its production.

In carrying out my invention I take advantage of certain economical conditions which not only render the product of agglutinating material produced cost less, in most instances, but inherently profitable on account of the by-products produced in its manufacture, which by-products are sufficiently valuable to cover a considerable proportion of the cost of manufacturing briquets irrespective of the agglutinant.

My invention lies in providing as an agglutinating material for artificial-fuel briquets crude extract of bones or "bone-soup," which is preferably produced by taking the bones and without preliminary preparation reducing them to small pieces and subjecting them in a suitable closed vat to steam under a pressure of forty pounds, more or less, to the square inch. While the action is progressing, the mass is sprayed intermittently with water, and the liquids are withdrawn periodically from the vat as they accumulate. The liquids thus withdrawn consist of a crude solution of gluten, chondrin, and grease. The liquid is run into a suitable separating-vat, where the grease, which is of lighter specific gravity than the other ingredients, is skimmed off, leaving the crude bone extract, which forms the agglutinating material for my present purpose.

In practice I employ what is commonly called "butchers' waste," consisting for the most part of bones denuded of their meat, which material may be obtained at very small cost. With the bones there may be tendons, cartilages, the drawings and feet of fowls, and other such material, all of which is commonly termed "butchers' waste" and usually carted to rendering establishments. The crushed bones, &c., are subjected without other preliminary preparation in the closed steam-vat to the action of the steam or steam and water for about six hours, by which time thorough separation of all the constituents thereof will usually have taken place. When



the liquids are withdrawn from the vat, any suspended matter, such as meat fiber, may be removed therefrom by passing the solution through a filter-press. In treating the average butchers' scrap the resultant products are substantially the following: grease, about twenty per cent., in weight, of the scrap treated; gluten and chondrin, about twenty-five per cent., in weight, of the mass; meat fiber, up to four per cent., in weight, of the mass; and dry bones, about forty per cent., in weight, of the mass. The grease may be disposed of for use by soap manufacturers, &c. The meat fiber may be pulverized and disposed of for any use for which it may be desirable, and the dried bones may be ground for fertilizer, sugar-house char, bone-ash, &c. The by-products have a market value much in excess of the cost of the butchers' waste, &c., and treatment, so that the bone extract or bone-soup, to say the least, costs nothing. This bone extract consists of about two-thirds gluten and one-third chondrin. Before its use in the manufacture of the fuel briquets it is diluted with water to make about a ten to fifteen per cent. gluten-chondrin solution. The gluten may be made insoluble by chlorin and the chondrin may be made insoluble by sulfate of iron. Instead of rendering the agglutinating material insoluble before mixing it with the carbonaceous material for the briquets I prefer, for reasons of economy, to subject it, after mixing, to the action of chlorin gas generated within the moistened carboniferous mass, to which is added a suitable sulfate-of-iron solution. In forming the briquets the diluted solution of agglutinating material prepared as described is thoroughly stirred into the finely-divided carbonaceous material to form a sufficiently coherent mass, after which the mixture is molded into briquets and dried.

My invention consists in providing as a binder for artificial-fuel briquets agglutinating material produced from bones, either alone or when mixed with other so-called "butcher-shop waste," and while I prefer to render the agglutinating material insoluble by the action of chlorin and sulfate of iron I

do not limit my invention to these materials for that purpose.

What I claim as new, and desire to secure by Letters Patent, is—

1. The process of making artificial fuel, which consists in subjecting bones to the action of steam to produce therefrom a crude extract containing their gluten and chondrin constituents, mixing the said crude extract in a diluted state and in proper proportion with finely-divided carbonaceous material, molding the mixture into briquets, and finally drying the briquets.

2. The process of making artificial fuel, which consists in subjecting bones, mixed with other butcher-shop waste, to the action of steam to produce therefrom a crude extract containing their gluten and chondrin constituents, mixing the said crude extract in a diluted state and in proper proportion with finely-divided carbonaceous material, molding the mixed mass into briquets and finally drying the briquets.

3. The process of making artificial fuel, which consists in subjecting bones to the action of steam to produce therefrom a crude extract containing their gluten and chondrin constituents, mixing the said crude extract in a diluted state and in proper proportion with a finely-divided carbonaceous material, treating the mass to render the said extract insoluble, molding the mass into briquets and finally drying the briquets.

4. The process of making artificial fuel, which consists in subjecting bones to the action of steam, to produce therefrom a crude extract containing their gluten and chondrin constituents, mixing the said crude extract in a diluted state and in proper proportion with finely-divided carbonaceous material, subjecting the mass to the action of chlorin gas and a sulfate of iron solution to render the extract insoluble, molding the mass into briquets, and finally drying the briquets.

WILLIAM A. KÖNEMAN.

In presence of—

ALBERT D. BACCI,  
WM. B. DAVIES.