

# UNITED STATES PATENT OFFICE.

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## LIGNITE BRIQUETTE.

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*To all whom it may concern:*

Be it known that I, THOMAS JOSEPH SETCHELL, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Lignite Briquettes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the art of making briquettes from lignite coal and is directed to the provision of an improved binder, whereby the briquettes made from lignite will be tough, will not break under rough handling, will not disintegrate when exposed to the atmosphere even for a great length of time, and, moreover, will burn with great intensity and completeness.

Lignite when exposed to the atmosphere for a very short time will crumble or break up into fine form. If the lignite is not already in such divided form, it can be readily crushed or ground to such condition, and should be in pulverized or in finely divided form before it is treated with the improved binder, as preparatory to forming the same into briquettes.

The improved binder is made from tar-pitch, common rosin, and glucose. In practice, I have obtained extremely satisfactory results by using the above ingredients in the ground or dust lignite in approximately the following proportions:

One ton ground or fine lignite;  
Forty pounds of rosin;  
Fifty-five pounds of pitch;  
Four pounds of glucose.

The binder forming ingredients above noted should be thoroughly stirred and mixed with the ground or dust lignite, while the latter is warm or hot; and then the lignite thoroughly mixed with the binder and while hot or very warm, should be presented to the molds which will compress the same to very solid form. The mixing apparatus and the briquette molding machines now in general use, and the construction of which are well understood by those familiar of the art, may be and preferably are employed in making my improved briquettes.

All of the above noted binder forming ingredients are important. The tar-pitch has very good adhesive qualities and contains a large number of latent heat units, so that it is a good binder forming element except for the fact that by itself it produces intense smoke and will cause large accumulation of carbon.

The rosin is also a good binder forming element, for it is combustible and will stand the weather better than tar-pitch.

The glucose, as I have found, is an important element. When it is used, the combustion of the briquette, will be more complete than when it is omitted. Moreover, when the glucose is used, the smoke will be of very light color and there will be either an elimination or very greatly decreased accumulation of carbon. Experiments that I have made, lead me to believe that the glucose, although not in itself very combustible, enters into some reaction with the burning pitch and probably with the rosin which eliminates or decreases smoke and produces more complete combustion than when it is omitted.

The binder, in practice, has been found exceedingly efficient and satisfactory for the purposes had in view. It is not an expensive binder, since it costs only about one dollar per ton of briquettes produced. This one dollar per ton in cost of binder is not really all added cost for binder purposes alone, because the binder elements, except the glucose, which is in small quantity, contain so many latent heat producing units that they are in themselves valuable heat producers nearly, in part, if not quite, justifying their use for that purpose alone.

What I claim is:

A briquette having a main body of lignite particles compressed and bound together by a binder composed of tar-pitch, rosin and glucose, the said substances being approximately in the following proportions, to wit, two thousand pounds of lignite, fifty-five pounds of tar-pitch, forty pounds of rosin and four pounds of glucose.

In testimony whereof, I affix my signature.

THOMAS JOSEPH SETCHELL.