

UNITED STATES PATENT OFFICE.

JOHN BOWING, OF LONDON, COUNTY OF MIDDLESEX, ENGLAND.

ARTIFICIAL FUEL.

SPECIFICATION forming part of Letters Patent No. 422,907, dated March 11, 1890.

Application filed November 28, 1888. Serial No. 292,129. (No specimens.)

To all whom it may concern:

Be it known that I, JOHN BOWING, a subject of the Queen of Great Britain, residing at 259 Gresham House, Old Broad Street, London, in the county of Middlesex, England, have invented a certain new and useful Improvement in the Manufacture of Fuel from Coal-Slack and Similar Substances; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

In the processes which have hitherto been followed in the successful manufacture of bricks or briquettes of coal, the coal is reduced to a more or less finely-divided condition and mixed with a certain proportion of pitch or tar, varying from eight or nine to twenty per cent., avoiding and eliminating moisture as far as possible in the process of manufacture. The sticky mixture is compressed into bricks of the desired form. The result is a brick in which the pitch is by no means uniformly distributed, and the compressing-machine which is required is both cumbersome and costly.

According to my invention, I take the coal, coke, or other fuel substance in a more or less finely-divided state, and I pour over it a considerable quantity of water, and to this I add a small amount of tar or pitch or tar and pitch, or I may add the tar or pitch or tar and pitch first and then the water. If tar and water alone have been used, I then continually agitate the mixture in some convenient manner for a few minutes until the substances have become thoroughly mixed, and in some cases I heat the same. If, however, pitch has been used, the application of heat sufficient to soften the pitch—not necessarily to melt it to such an extent that it will mix with the other bodies—will be necessary. The quantity of water must be so large that the mixture of coal, water, and tar or pitch is somewhat of the consistence of wet concrete—that is to say, somewhat like slush.

The actual amount of tar or pitch or tar and pitch which will best produce the result aimed at will vary with different classes of

coal; but the amount of water, provided there is enough of it, may be varied within wide limits.

The amount of tar or pitch or tar and pitch used will vary from about one and a half per cent. to five or more per cent. of the coal; but this may be at once determined for any particular kind of coal by observing whether sufficient tar or pitch or tar and pitch has been added to cause the coal to "set."

I may here observe that my object in using water is not to make the coal-dust damp, so as to bring it into a suitable state for applying pressure, the amount of water used in my process being far in excess of anything that would be suitable for such a purpose. The object of the agitation of the tar and coal-dust in the presence of this excessive quantity of water is to reduce the tar into a very finely-divided state. While in this state the tar possesses a strong attraction for the coal-dust, and before the agitation ceases the tar and the water have separated. The mixture being allowed to stand, it is found that the whole of the tar has been incorporated by the coal-dust, and the water, which has done its work in producing this effect, comes away charged only with the impurities it has taken up from the coal.

As an experimental proof that the coal-dust has a special attraction for the tar or pitch in the state to which it is reduced by agitation in the presence of an excess of water, it may be mentioned that if a foreign substance is mixed with coal—such as gravel or glass—the tar refuses these substances and they can be removed without any trace of tar upon them. Similarly the agitators and the agitating-vessel, whether of wood, iron, or any other substance, will continue to be perfectly free from any trace of tar. The result is, that the whole of the tar employed is employed directly, and a much better result can therefore be produced with a far less proportion of pitch or tar than is generally used.

The mixture may now be formed into suitable blocks or briquettes, from which the water may either be squeezed out or allowed to drain out.

The fundamental difference between a

briquette made by the above process and any other known briquette is that the former breaks with a fracture resembling ordinary coal, and consists of fine coal each particle of which is covered with a film of tar, whereas
5 briquettes made in the ordinary way consist of globules of pitch or tar coated with coal-dust.

I find it usually desirable to dry the blocks
10 or briquettes, which may be done either by exposing them to the air or more rapidly by gently heating them.

By my process I am able to prepare
15 briquettes from coal and coke dust so solid and firm that they may be used as fuel in the furnace of a locomotive. The fuel so obtained is much more uniform in composition and contains less pitch or tar and is much cleaner to the touch and freer from dust than

any artificial fuels which have been made
hitherto.

Having fully described my invention, what I desire to claim and secure by Letters Patent is—

The process of manufacturing fuel from
25 coal and coke dust, breeze, and similar substances by agitating a mixture of such fuel base and tar or pitch in or under water, allowing the same to settle, running off the water, forming the mixture of tar or pitch and fuel
30 base into blocks or briquettes, and afterward drying the same, all substantially as described.

JNO. BOWING.

Witnesses:

T. E. HALFORD,

J. ALAN WHITEHEAD.