

# UNITED STATES PATENT OFFICE.

WILLIAM HARROLD SMITH, OF CHICAGO, ILLINOIS.

## FUEL.

SPECIFICATION forming part of Letters Patent No. 233,884, dated November 2, 1880.

Application filed September 3, 1880. (No specimens.)

*To all whom it may concern:*

Be it known that I, WILLIAM HARROLD SMITH, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Fuel, of which the following is a specification.

My invention relates more especially to improvements in artificial wood to be used for fuel, for which I have heretofore made application for Letters Patent, and also in the improved process by which the same is produced; and my invention consists in mixing with the sawdust or other wood or vegetable waste from which the artificial wood or fuel is to be made, before or at the time of heating the same, about five per cent., by weight, of dry powdered lime, heating the mixture, and then compressing and solidifying the same by subjecting it, while still hot, to impact in molds. I have discovered that by mixing a small percentage of dry powdered lime with the sawdust or vegetable particles, before the same is heated, the material will shrink from thirty to fifty per cent. in bulk while being heated, is much more readily and easily compressed, and after being compressed forms a block of greater tenacity, density, and hardness, and one, too, which is practically impervious to water, and which will therefore not be injuriously affected by any ordinary exposure to the weather. The presence of the lime also increases the burning qualities of the block, as the block has no tendency to disintegrate under the action of the fire, but burns to the last as a solid coal. The presence of the lime also not only renders the block practically impervious to water, but acts as a preservative of the wood or vegetable fibers or particles, and the blocks are therefore subject to no kind of decay, but will last for an indefinite period of time, besides increasing the compressibility of the material, and the consequent solidity and density of the blocks. The strength, hardness, and resonance of the blocks are also increased by reason of the presence of the lime, and continue so to increase as the blocks become older, much in the same way as lime mortar is known to harden and become more tenacious with age.

My improved artificial wood blocks, especially when made from the finer qualities of sawdust, are adapted to be used for many other

purposes than fuel, such as the manufacture of various articles which are usually made of wood.

In the practice of my invention I usually mix with the sawdust or other vegetable comminuted or fibrous material about five per cent. of ordinary dry powdered lime; but I do not wish to confine myself to that exact proportion, as any proportion from one to ten per cent. may be used with good results. Either quick or slaked lime, hydraulic cement, or such like material may be used; but I find powdered quicklime preferable, as, more than any other form of lime, it acts as an aid in drying the sawdust or vegetable material. I usually heat the material from 300° to 400° Fahrenheit; but any degree of heat less than the burning or igniting point of the material, sufficient to soften and render plastic the wood or vegetable fibers and to loosen the gums and adhesive matters in the material, may be employed. However, the greater the heat, other things being equal, the better results will be produced, provided, of course, the material is not injured by the heat. After being thus heated the mixture is then, while still hot, placed in suitable molds and therein subjected to impact from the blows of a powerful steam-hammer, whereby the same may be readily compressed from four to ten times in bulk. It is then pressed from the mold and the solidified material is ready for use.

What I claim is—

1. The process of manufacturing artificial wood for fuel and other purposes from sawdust or other like comminuted or fibrous vegetable material, consisting in mixing with such material a small proportion of lime or its equivalent, heating the mixture, and subjecting the same, while still hot, to impact in molds, substantially as specified.

2. The product of the above-described process—namely, blocks of compressed solidified sawdust or other like comminuted or fibrous vegetable material containing an admixture of lime or its equivalent, substantially as specified.

WILLIAM HARROLD SMITH.

Witnesses:

EDMUND ADCOCK,  
JOHN W. MUNDAY.