UNITED STATES PATENT OFFICE.

MICHAEL R. CONLEY, OF BROOKLYN, ASSIGNOR TO WILLIAM BELL, OF NEW YORK, N. Y.

PROCESS OF PREPARING IRON ORES FOR SMELTING.

SPECIFICATION forming part of Letters Patent No. 314,113, dated March 17, 1885.

Application filed February 21, 1884. (No specimens.)

To all whom it may concern:

Be it known that I, MICHAEL R. CONLEY, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Processes of Preparing Iron Ores for Smelting, of which the following is a specification.

The object of my improvement is to provide a cheap and simple method for utilizing fine sand, sea ores, and other finely-divided ores in the manufacture of iron and steel. For this purpose I take sea-sand ores or other finely-divided ores which are practically free from sulphur, silica, and titanium and thoroughly cleanse them by the magnetic or other suitable process. I next take hard pitch, tar, or other suitable asphaltic material, and reduce it into small lumps. This I mix with the sea-sand ores or other finely-divided ores cleansed as described and put the whole into a pan, kettle, or tank. Of the whole mass about ninety-five per cent., by weight, will consist of the ore, and about five per cent., by weight, will consist of the pitch or analogous material. I prefer to use a pan, so that the ingredients may be evenly spread over a large flat surface. Heat is applied to the pan, and as the pitch or analogous material melts and becomes liquid the fine particles of ore are caused by gravity to descend toward the bottom of the pan, thereby forcing the liquid pitch or analogous material up through the particles of ore, so that the entire mass of ore becomes thoroughly impregnated with the liquid pitch or analogous material. I preferably stir the whole, so that there shall be no particles of the ore out of contact with the pitch or analogous material, my object being to so thoroughly mix the pitch or analogous material with the ore that all particles of the latter shall cohere. After the ore and pitch or analogous material shall have been thus mixed, and while the mass is still hot or warm, I take the mass and mold it into bricks, blocks, or lumps in an ordinary brick-machine, or by other suitable means, and then allow the bricks so formed to cool. When cold, the bricks are firm and solid, and will be adapted to remain approximately integral in any crucible or furnace in which they may be subsequently treated until they become deoxidized and the slag begins to form.

The bricks when to be treated are placed in the furnace or crucible with charcoal or other suitable carbons and lime or other suitable fluxes in a manner similar to that pursued in analogous treatments of ordinary ores.

Bricks of fine ore and pitch or analogous material prepared as described do not after cooling require to be dried previous to their use in a crucible or furnace. No lime or other flux, charcoal, or other carbon, peat, petroleum, or other spirits or inflammable liquids, water, oil, or other fluids, gum, gluten, molasses, or coal are incorporated in the bricks in addition to the pitch or analogous material.

I do not limit myself to the use of sea-sand ores, as I may use any other finely-divided ores; nor do I confine myself to the exact proportions of ore and pitch above specified, but the same may be slightly varied, as circumstances may require.

The bricks prepared as I have described may be treated in a puddling-furnace without previous treatment in a blast-furnace.

I am aware that finely-divided ore and pitch or tar have been combined in different proportions from those which I have adopted, and that such substances have been in many cases associated with other ingredients.

What I accomplish by my invention is to so treat finely-divided ore that it can be used as ordinary ore, using therefor only enough pitch or tar to cause the particles of ores to adhere but not enough to influence combustion.

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

1. The process of preparing finely-divided ores for reduction, consisting in mixing about ninety-five per cent., by weight, of said ores with about five per cent., by weight, of pitch or analogous material, heating the same in a pan or other vessel until the pitch or analogous material becomes liquid, thoroughly incorporating the pitch or analogous material with the ore, and while the mass is in a heated state forming the compound into bricks, blocks, or lumps, substantially as specified.

2. A brick, block, or lump consisting of about ninety-five per cent., by weight, of sea-sand ores or other finely-divided ores, and about five per cent., by weight, of pitch or analogous material, substantially as specified.

M. R. CONLEY.

Witnesses:
T. J. KEANE,
JAMES R. BOWEN.