

UNITED STATES PATENT OFFICE.

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CEMENTATION COMPOUND.

SPECIFICATION forming part of Letters Patent No. 546,933, dated September 24, 1895.

Application filed December 18, 1894. Serial No. 532,234. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM J. MILES, Jr., a citizen of the United States, residing at Marion, in the county of Marion and State of Ohio, have invented certain new and useful Improvements in Cementation Compounds; 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 production of steel, and has particular reference to compounds for cementation, wherein malleable and wrought iron may be case-hardened or carburized, and high grades of steel for tool purposes or lower grades having soft centers for use in the manufacture of plows, harrows, &c., produced.

The objects of my present invention are to produce a compound which during the process of heating will throw off for absorption by the metal such gases as will more readily produce the desired change in the nature in the metal, and to combine in such compound such constituent elements as will more readily combine to produce the compound desired, and also provide a method of producing steel to which this particular cementation compound is peculiarly adapted.

With such objects in view my invention resides in a cementation compound to be used during the process of heating upon wrought and malleable iron, the same consisting of the following ingredients in substantially the proportions specified, but to which I do not limit my invention, and also in the method to be described:

Ingredients.	Proportions.
Carbonate of lime.....	60 per cent.
Raw bone.....	10 per cent.
Charred bone.....	30 per cent.

The above proportions are to be varied in accordance with the grade of steel it is desired to produce.

The pot is filled with alternate layers of metal to be converted or operated upon and the cementation compound, after which the pot is sealed by the application of fire-clay or grinder's waste, as is usual, and subjected to the heating process, the intensity of the heat and length of exposure to the same governing the character of steel to be produced, all as is well known and commonly practiced.

By the regulation of the heat and the length of time to which the metal is exposed to the action of the heat the carbonaceous gases are regulated as to their depth of penetration, rendering the iron into steel of such tough and homogeneous a nature as to adapt it to be easily worked and forged under the hammer and at the same time be under a temperature at which steel is usually worked having the same percentage of carbon.

Having described my invention, what I claim is—

1. The herein described compound for cementation, the same consisting of carbonate of lime, charred bone, and uncharred or raw bone, the ingredients being combined together, substantially as and for the purpose specified.

2. The herein described process of converting iron into steel the same consisting in subjecting the same during heating to the action of a compound composed of carbonate of lime, charred bone, and uncharred or raw bone, substantially as and for the purpose specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM J. MILES, JR.

Witnesses:

HARRY E. WOODCOCK.
W. M. DAVIDSON.