UNITED STATES PATENT OFFICE.

THOMAS L. WILLSON, OF NEW YORK, N. Y.

PROCESS OF PRODUCING CALCIUM COMPOUNDS.

SPECIFICATION forming part of Letters Patent No. 563,527, dated July 7, 1896.

Application filed March 16, 1893. Serial No. 466,362. (No specimens.)

To all whom it may concern:

Be it known that I, THOMAS L. WILLSON, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in the Production of Calcium Carbids, of which the following is a specification.

The process of producing said calcium compounds, generally known as "calcium carbid," is as follows:

I take finely-divided calcium oxid or lime, which may be anhydrous, and finely-divided carbon in about the proportions of thirty-five per cent. of carbon and sixty-five per cent. of lime, and, having mingled them thoroughly together, subject them to the action of an electric arc in a furnace. This electric arc must be of sufficiently definite character to be distinguished from the mere heat of incandescence, which is no part of this invention. The reducing agents which I employ are preferably carbon in the form of coke, but hydrocarbons may be employed in admixture with the lime and coke, or the lime may be saturated with a liquid hydrocarbon. The electric furnace is preferably of the kind having a carbon or graphite crucible or hearth connected to one terminal of a suitable dynamo, and a carbon pencil connected to the opposite terminal thereof, and the carbon and calcium oxid are fed into the polar interspace.

To start the operation, the carbon pencil should be in contact with the crucible or hearth, or so close to the same that a current of electricity may pass. After establishing the current the carbon pencil is lifted so as to strike an arc, and during the process this arc is maintained by keeping the pencil sufficiently lifted to maintain a space between it and the conductor beneath. The intense heat of the arc decomposes the lime, the oxygen combining with the carbon, forming a carbon monoxid or dioxid, which escapes in gaseous form, while the calcium, or the greater part of it, combines with the carbon, forming a calcium carbid. At the conclusion of the operation the product is taken from the furnace and should be kept, if desired to be preserved, free from contact with the air or moisture.

I am aware of the patent to Cowles of June 9, 1885, for electric furnace, but this furnace does not operate by an arc passing in contact or close proximity to a mass of finely-divided carbon and lime, and therefore does not carry out the process of this invention. It is furthermore important to have an excess of carbonaceous matter over that necessary to unite with the oxygen, so as to enable the calcium to unite with such excess of carbon.

I do not in this application claim the making of metallic alloys by alloying the metal of an electrode with the metal of a bath in an electric furnace.

That which I claim as of my invention or discovery, and desire to protect by Letters Patent, is as follows:

1. The herein-described process of producing a calcium compound, which consists in subjecting mingled lime and a carbonaceous deoxidizing agent to the heat of an electric arc in an electric furnace, the carbonaceous matter being in excess of that required to combine with the freed oxygen, whereby the liberated calcium combines with the excess of carbon to form a calcium carbid, substantially as described.

2. The herein-described process of producing a calcium compound, which consists in mingling lime with a liquid reducing agent, such as liquid hydrocarbon, drying the said mixture, and subjecting it to the heat of an electric arc in an electric furnace, whereby the liberated calcium combines with the carbon to form a calcium carbid, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

THOMAS L. WILLSON.

Witnesses:

THOS. G. TAYLOR,

I. B. RAY.