

# UNITED STATES PATENT OFFICE.

FRANK E. PARKS, OF HOMESTEAD, PENNSYLVANIA, ASSIGNOR TO THE CARNEGIE STEEL COMPANY, LIMITED, OF PITTSBURG, PENNSYLVANIA.

## PROCESS OF MANUFACTURING STEEL.

SPECIFICATION forming part of Letters Patent No. 661,549, dated November 13, 1900.

Application filed March 9, 1896. Serial No. 582,405. (No specimens.)

*To all whom it may concern:*

Be it known that I, FRANK E. PARKS, of Homestead, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in the Manufacture of Steel, of which the following is a full, clear, and exact description.

I have discovered that important results in the manufacture of steel are obtained by adding to the steel at or after the end of the refining operation an addition of the compound of calcium and carbon, which is commercially known as "calcium carbid."

I will now proceed to describe my invention as I have hitherto practiced the same, premising that the claims of this specification are not limited thereto, but that modification may be made in the method in respect of the precise time at which the addition is made and in the proportion of the addition, and that, if desired, other compounds may be added to the steel with the calcium carbid either for the same purpose or for other purposes.

After the refining of the steel in a furnace or converter or in crucibles and at the time of casting the same into ingot-molds or into molds for making finished castings I add a small proportion of calcium carbid. I preferably add it in the form of a powder which may be inclosed in a small packet and thrown into the mold at the time of teeming the steel thereinto, though it may be added in the form of lumps or otherwise. I have obtained very excellent results by using the calcium carbid in the proportion of about one-third of a pound to a ton of steel. When such addition is made, for example, to dead soft steel in hot and wild condition tapped from an open-hearth furnace, in which condition it is most

difficult to control in the mold, the steel is quieted and an ingot is produced having a solid top practically free from sponginess or piping.

The calcium carbid is cheap, it is easily added to the steel, and the results of the process in affording uniformity and homogeneity of product are such as to make my invention of very great value in the art.

Instead of adding the calcium carbid to the steel in the mold it may be added thereto in the ladle or otherwise after its withdrawal from the furnace, converter, or crucible at the end of the refining operation, although I consider its addition in the mold to be the best. It will be understood also that the steel may be treated by the addition of manganese and other agents as heretofore in making steel where calcium carbid is not used.

I claim—

1. The process of making from steel, castings and ingots free from blow-holes, the same consisting in adding to the molten steel a carbid of an alkaline earth, when making castings and ingots from the steel, substantially as and for the purpose set forth.

2. The process of making from steel, castings and ingots free from blow-holes, the same consisting in adding to the molten steel, calcium carbid when making castings and ingots from the steel, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand.

FRANK E. PARKS.

Witnesses:

THOMAS W. BAKEWELL,  
G. I. HOLDSHIP.