

UNITED STATES PATENT OFFICE.

CHARLES L. JEFFORDS, OF JAMESTOWN, NEW YORK.

IMPROVEMENT IN PROCESSES OF CONVERTING CAST-IRON INTO STEEL.

Specification forming part of Letters Patent No. **170,173**, dated November 23, 1875; application filed August 16, 1875.

To all whom it may concern:

Be it known that I, CHAS. L. JEFFORDS, of Jamestown, in the county of Chautauqua and State of New York, have invented a new and useful Process for Converting Cast-Iron into Steel, which process is fully set forth in the following specification.

My invention relates to a process for manufacturing edge-tools and other implements from ordinary cast-iron; and the invention consists in subjecting such articles, after having been annealed and refined by hammering, to the action of the hereinafter-described compound, whereby the cutting-edges and other thin portions of the articles which have been decarbonized and softened during the annealing are recarbonized, so that they may be tempered like ordinary steel.

The tools or other articles are cast of ordinary cast-iron in any common and well-known manner, and then partially decarbonized in a suitable annealing-furnace until capable of being worked under the hammer, when they are removed from the furnace and refined by hammering to any desired degree. By the process of annealing, the surface or outer skin of the articles, and more especially the cutting-edges thereof, have become so much decarbonized that they cannot be tempered in the ordinary manner. In order to recarbonize

these soft portions of the articles the latter are heated to a bright-red color and immersed in a compound or preparation consisting of the following ingredients proportioned as follows: Eleven parts of animal charcoal, nineteen parts of lamp-black, seventeen parts of sal-soda, seven parts of muriate of soda, five parts of black oxide of manganese, three parts of pulverized limestone, eleven parts of prussiate of potash. The heated articles are allowed to remain in this compound until cold, when their surface and thin portions will be found to be so recarbonized as to enable the articles to be tempered like ordinary steel.

What I claim as my invention is—

The process of converting malleableized cast-iron into steel by heating the iron to a bright-red color, and then immersing it in a compound or preparation consisting of eleven parts animal charcoal, nineteen parts lamp-black, seventeen parts sal-soda, seven parts muriate of soda, five parts black oxide of manganese, three parts pulverized limestone, and eleven parts prussiate of potash, and allowing the iron to remain therein until cold, as hereinbefore set forth.

CHARLES L. JEFFORDS.

Witnesses:

H. S. HALL,
E. T. CARPENTER.