UNITED STATES PATENT OFFICE.

THOMAS CLARK, OF LOUISVILLE, KENTUCKY.

IMPROVEMENT IN MODES OF CONVERTING CAST-IRON INTO STEEL.

Specification forming part of Letters Patent No. 128,362, dated June 25, 1872.

To all whom it may concern:

Be it known that I, THOMAS CLARK, of Louisville, in the county of Jefferson and in the State of Kentucky, have invented certain new and useful Improvements in Mode of Converting Cast-Iron into Steel; and do hereby declare that the following is a full, clear, and exact description thereof.

The nature of my invention consists in making steel from cast-iron by first making said cast-iron partially malleable and then manipulating and tempering, as will be hereinafter described.

In the making of edged tools the tool is first cast of iron in any of the usual ways, and then placed in an annealing-furnace. It is kept in this furnace about two-thirds of the time it would be kept in order to make it thoroughly malleable—that is, it remains long enough to remove about two-thirds of the carbon from the casting. When this has been done the tool is removed from the annealing-furnace, cleaned, and hammered into shape, (straightened,) and about one-eighth of an inch is cut from the entire edge by means of shears or other suitable instrument. The tool is now placed into a heating-furnace and heated to a cherry red, and then immersed in water or oil, or other tempering liquids, as is customary in tempering steel. When removed it will be found that the carbon which was allowed to remain in the tool has been thoroughly scattered or diffused, and that the partially-malleable casting has been converted into steel. The object in removing the edge of the tool is to get rid of that portion of the casting which has become too much decarbonized. In the manufacture of files, the casting, after being removed from the annealing-furnace, has its outer coating or surface (which has been too much decarbonized) removed, and is then cut and tempered as any cast-steel file is. The coating to be removed is very thin, not being thicker than a sheet of ordinary writing-paper.

In using this process it will readily be seen that only so much of the tool is tempered as is immersed. Thus the handles of files, or the eyes of axes or hatchets, remain in a malleable state, or soft, and are, consequently, not liable to break from sudden blows or in bending.

I do not, of course, confine myself to the manufacture of tools from cast-iron, as any casting may be turned wholly or partially into steel in the same manner.

Having thus described my invention, what I claim is—

The within-described process of converting malleableized cast-iron into steel, substantially as herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand.

THOMAS CLARK.

Witnesses:

C. M. ALEXANDER,

J. M. MASON.