UNITED STATES PATENT OFFICE.

THOMAS H. JENKINS, OF NEW YORK, N. Y.

IMPROVED PROCESS FOR HARDENING IRON.

Specification forming part of Letters Patent No. **51,723**, dated December 26, 1865.

To all whom it may concern:

Be it known that I, THOMAS H. JENKINS, of the city, county and State of New York, have invented a new and useful Process for Hardening Malleable and Non-Malleable Cast-Iron; and I do hereby declare that the following is a full, clear, and exact description thereof.

What is termed in the arts "malleable iron" is cast-iron which by a well-known process is rendered comparatively malleable—that is to say, it has lost the brittleness which is one of the characteristics of cast-iron, and it may be bent and hammered, although not to the same extent as wrought-iron, and it can be filed and turned with comparative facility.

The object of my invention is to render malleable and non-malleable cast-iron tough and hard as hardened steel, so that it may be used for many of the purposes for which steel has heretofore been employed, and at much less cost.

I take the pieces of iron to be hardened, and of whatever shape and size, and either rough or after they have been filed and smoothed, and I heat them to a temperature known as "cherry red," and hammer them to compact the metal. After this I heat them again to a cherry-red heat, take them out of the fire, and sprinkle on the surface a preparation composed of seven parts, by weight, of prussiate of potash and one part, by weight, of charcoal, the composition being well pulverized and mixed; and I then put them in the fire again until this composition disappears, but taking care to raise the temperature again to a cherry-red heat, and then plunge them in a liquid bath composed of about twenty-eight gallons of water, eight pounds of oil of vitriol, forty-four ounces of sal-ammoniac, twenty ounces of Glauber's salts, and thirty ounces of common or table salt. The quantity to be used will of course depend on the size of the articles to be hardened. When taken from this solution it will be found that the iron has become very tough and hard, and sufficiently hard for axes, hatchets, and tools of that class.

For the shares and other parts of plows and for other articles that require to be hard, but in which a keen cutting-edge is not necessary, I can dispense with the composition of prussiate of potash.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The process, substantially as above described, for hardening malleable and non-malleable cast-iron by plunging it, while at or about a cherry-red heat, in a solution substantially such as herein described.

2. In combination with and preparatory to the hardening in a solution substantially such as herein described, the treatment of the iron in a heated state with a composition of prussiate of potash and charcoal, substantially as herein described.

THO. H. JENKINS.

Witnesses:

ANDREW DE LACY,
WM. H. BISHOP.