

# UNITED STATES PATENT OFFICE.

J. EDWIN SHERMAN, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN COMPOUNDS AND PROCESSES FOR REFINING IRON.

Specification forming part of Letters Patent No. **188,077**, dated March 6, 1877; application filed February 23, 1877.

*To all whom it may concern:*

Be it known that I, JOHN EDWIN SHERMAN, now of the city of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Compound and Process for Refining Iron, of which the following is a full, clear, concise, and exact description, sufficient to enable those skilled in the art to practice the same.

One of the principal defects inherent in many kinds of iron is that known to iron-workers as "cold-short," a term used to indicate that the metal is brittle and rotten when cold; and the object of my invention is to cure this defect.

My invention consists in the treatment of iron with iodine, in connection with chlorine. I prefer to use the iodine and chlorine in the form of iodide of sodium and chloride of ammonia; but I have found that free iodine, in connection with chloride of sodium or of ammonia will give excellent results; and also iodide of potassium in connection with chloride of sodium.

The mixture I prefer is, for each ton of metal, four hundred (400) grains iodide of sodium, and eight hundred (800) grains chloride of ammonia; and I usually add about the same bulk of common salt, (chloride of sodium,) but this is not essential.

The best method of applying these chemicals is the same as is fully described in my

application for Letters Patent filed February 21, 1877, and therefore need not be here repeated, except to state that in the Martin-Siemens furnace the composition should be inserted by means of a metal box and rod when the molten metal commences to expand to a boil; and so in the Bessemer converter, and the puddling-furnace. In the crucible the chemicals are put in at the time of charging; and in the blast-furnace the mixture is applied from time to time as the furnace is tapped by being blown through the blast-pipe.

I do not claim the use of iodine alone, as this is set forth in patent to Atwood September 13, 1870; but

What I claim as my invention is—

1. The process of treating iron with iodine, in connection with chlorine, substantially as described, whereby the defect known as cold-short is cured.

2. The composition for treating iron, consisting of iodide of sodium and chloride of ammonium, substantially in the proportions specified.

In testimony whereof I have hereunto subscribed my name.

J. EDWIN SHERMAN.

Witnesses:

C. G. PATERSON,  
J. E. MAYNADIER.