

UNITED STATES PATENT OFFICE.

J. EDWIN SHERMAN, OF BOSTON, MASSACHUSETTS.

IMPROVEMENT IN PROCESSES AND COMPOUNDS FOR REFINING IRON.

Specification forming part of Letters Patent No. **188,076**, dated March 6, 1877; application filed February 23, 1877.

To all whom it may concern :

Be it known that I, JOHN EDWIN SHERMAN, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Process and Compound 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 "red-short," a term used to indicate that the metal is brittle and rotten when hot; and the object of my invention is to cure this defect.

My invention consists in the treatment of iron with bromine, in connection with chlorine.

I prefer to use the bromine and chlorine in the form of bromide of sodium and chloride of ammonia; but I have found that bromide of potassium in connection with chloride of sodium, or of ammonia, will give excellent results. The mixture I prefer is for each ton of metal four hundred grains of bromide of sodium, and eight hundred grains of 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 chem-

icals 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 bromine alone, as this is not new; but

What I claim as my invention is—

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

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

In testimony whereof I have hereunto subscribed my name.

J. EDWIN SHERMAN.

Witnesses:

C. G. PATTERSON,

J. E. MAYNADIER.