

United States Patent Office.

JOHN F. BOYNTON, OF SYRACUSE, NEW YORK.

*Letters Patent No. 66,452, dated July 9, 1867.*

IMPROVEMENT IN CONVERTING IRON INTO STEEL.

*The Schedule referred to in these Letters Patent and making part of the same.*

TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN F. BOYNTON, of Syracuse, in the county of Onondaga, and State of New York, have invented a new and useful Method of Converting Iron into Steel; and I do hereby declare that the following is a full, clear, and exact description thereof.

The iron to be converted into steel is placed in an oven or retort and heated to near the welding point. Solid cyanides or solid ammoniacal compounds are then dropped into the oven through a tube or cock with a recess in the plug, so that the quantity introduced can be measured. While this process is going on I introduce into the retort or oven, through a suitable tube a current of gases, either atmospheric air, carburetted with hydrocarbons, or carburetted hydrogen. These gases may be made to pass through a solution of ammonia or nitrogen compounds, or the vapors of these compounds may be mingled with the gases before mentioned. By carbonizing the gases used by means of hydrocarbon vapors a larger volume of carbon vapors will be introduced and a less quantity of gas will be required to complete the process. It is obvious that by using the solid cyanides as above mentioned the requisite quantity of hydrogen compounds will be diminished. It is essential to keep up a free circulation of the gases through the oven, as the combination of these gases with the impurities of the iron will produce compounds detrimental to the steel, and which it is desirable in this way to get rid of. I make use for this process of crude coal gas just as it is evolved, without other purification than to separate the sulphuretted hydrogen and other sulphur compounds, (and with or without carbonizing the same by means of hydrocarbon vapors,) as it contains the nitrogen, ammonia, and other hydrocarbons necessary for this result.

I do not claim any special form of oven or apparatus for carrying this method into effect, as any form of tight oven in which the iron can be sufficiently heated, and through which a current of gas can be passed, will answer the purpose; but what I do claim as my invention, and desire to secure by Letters Patent, is—

The herein-described method of converting iron into steel by passing over or through it in a close oven or retort, and while in a highly-heated state, a current of carburetted or carbonized gas, and at the same time dropping into the oven solid cyanides or solid ammoniacal compounds, substantially as described.

JOHN F. BOYNTON.

Witnesses:

J. A. BASSETT,  
Jos. L. COOMBS.