

UNITED STATES PATENT OFFICE.

HUGH RODMAN, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO RODMAN CHEMICAL COMPANY, A CORPORATION OF PENNSYLVANIA.

CARBONIZING STEEL.

981,474.

Specification of Letters Patent. Patented Jan. 10, 1911.

No Drawing.

Application filed August 22, 1910. Serial No. 578,474.

To all whom it may concern:

Be it known that I, HUGH RODMAN, a citizen of the United States, and a resident of Pittsburg, in the county of Allegheny and State of Pennsylvania, have made a new and useful Invention in Carbonizing Steel, of which the following is a specification.

My invention relates to an improved and novel method of carbonizing steel.

10 Low carbon steel articles, as for example, ball races, are superficially carbonized by being immersed in a heated medium capable of surrendering carbon to the steel. This medium may be solid, gaseous or liquid, for instance, bone charcoal, natural gas or fused cyanid, any of which at a minimum temperature of about 1500° F. will carbonize steel surfaces.

20 I have discovered that by making the steel cathode in a carbon-containing fused electrolyte, the rate of carbonization is increased; in fact, rapid electrolytic carbonizing is possible in a fused medium incapable of imparting carbon by simple contact.

25 As examples of fused electrolytes, I may employ the cyanids or ferro-cyanids, alone or fused with other compounds. As an example of a fused electrolyte inactive upon simple contact, I may mention sodium carbonate, or sodium carbonate mixed with sodium chlorid, both of which I have successfully employed in carrying out my invention.

35 The rate of carbonizing varies with the current density, one half ampere per square inch of cathode surface is satisfactory, but higher rates may be used. In some cases, high rates must be avoided to prevent erosion of the cathode surface.

A cast iron anode, as for example the containing pot, is ordinarily satisfactory, but other materials, such as graphite, may be used. Local carbonization may be effected by varying the size and position of the anode.

45 The electrolyte may be heated by any ordinary means as by burning fuel or by electrolysis.

Having thus described my invention, what I claim is:

1. The method of carbonizing steel by making it cathode in a fused carbon containing electrolyte.

2. The method of carbonizing steel which consists in making the steel cathode in a carbon containing electrolyte, ordinarily inactive as a carbonizing agent by simple contact.

3. The method of carbonizing steel which consists in making the steel cathode in a bath of fused sodium carbonate.

4. The method of carbonizing steel by making it an electrode in a fused carbon-containing electrolyte.

5. The method of carbonizing steel, which consists in making it an electrode and subjecting it to the action of electrolysis in a carbon-containing bath.

In testimony whereof, I have hereunto subscribed my name this 18th day of August, 1910.

HUGH RODMAN.

Witnesses:

C. W. McGHEE,

E. W. McCALLISTER.