

# UNITED STATES PATENT OFFICE.

ISAAC ADAMS, JR., OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN THE ELECTRO-DEPOSITION OF METALS.

Specification forming part of Letters Patent No. 100,961, dated March 22, 1870.

*To all whom it may concern:*

Be it known that I, ISAAC ADAMS, Jr., of Boston, in the State of Massachusetts, have invented an Improvement in the Electro-Deposition of Nickel.

This improvement consists in the use of three new solutions from which to deposit nickel by the electric current: First, a solution formed of the double sulphate of nickel and alumina, or the sulphate of nickel dissolved in a solution of soda, potash, or ammonia alum, the three different varieties of commercial alum; second, a solution formed of the double sulphate of nickel and potash; third, a solution formed of the double sulphate of nickel and magnesia, with or without an excess of ammonia.

In Letters Patent of the United States granted to me 3d of August, 1869, I have fully set out the difficulties which before my invention therein described had existed in obtaining a thick and sufficient coating of reguline nickel by electro-deposition. I therein claimed as my invention the electro-deposition of nickel by means of a solution of the double sulphate of nickel and ammonia, or a solution of the double chloride of nickel and ammonium, prepared and used in such a manner as to be free from the presence of potash, soda, alumina, lime, or nitric acid, or from any acid or alkaline reaction. I have since found that a good coating of nickel can be deposited by the battery process from the solutions hereinbefore mentioned, provided they are prepared and used in such a manner as to be free from any acid or alkaline reaction.

In preparing these solutions commercial nickel can be purified as described at length in hereinbefore-mentioned patent, and then

the solution herein described can be made by processes known generally to chemists, taking care always that the solution is free from any acid or alkaline reaction.

When these solutions are used great care must be taken lest by the use of too high battery power, or from the introduction of some foreign matters, the solution becomes acid or alkaline.

I prefer to use these solutions at a temperature above 100° Fahrenheit, but do not limit my invention to the use of these solutions at that temperature.

I therefore claim—

1. The electro-deposition of nickel by means of a solution of the double sulphate of nickel and alumina, prepared and used in such a manner as to be free from the presence of ammonia, potash, soda, lime, or nitric acid, or from any acid or alkaline reaction.

2. The electro-deposition of nickel by means of a solution of the double sulphate of nickel and potash, prepared and used in such a manner as to be free from the presence of ammonia, soda, alumina, lime, or nitric acid, or from any acid or alkaline reaction.

3. The electro-deposition of nickel by means of a solution of the double sulphate of nickel and magnesia, prepared and used in such a manner as to be free from the presence of potash, soda, alumina, lime, or nitric acid, or from any acid or alkaline reaction.

The above specification of my invention signed and witnessed at London this 1st day of February, A. D. 1870.

ISAAC ADAMS, JR.

Witnesses:

E. A. QUINTARD,  
R. C. CUTTING.