

UNITED STATES PATENT OFFICE.

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PROCESS FOR PLATING METALS.

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Specification of Letters Patent.

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No Drawing.

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To all whom it may concern:

Be it known that I, CLARK W. PARKER, a citizen of the United States, and residing at Detroit, in the county of Wayne and State of Michigan, have invented a new and Improved Process for Plating Metals, of which the following is a specification.

This invention relates to the electro-plating of articles of iron and steel and its object is to reduce the number of operations and to cheapen the cost of such work.

This invention consists in first treating the finished surfaces of the articles of iron and steel by immersing them in a hot solution of phosphoric acid, then placing the articles thus treated in an ordinary electro-plating bath, and finally buffing the articles if a polish is desired.

It also consists in adding manganese oxid to the solution of phosphoric acid in order to intensify the action of the acid.

It further consists in scratch-brushing or buffing the surfaces after the acid treatment in order to obtain a fine smooth surface on which to deposit the nickel or other coating metal.

In the electro-plating of steel with nickel, the surfaces are first finished, then greased and buffed, then dipped in a solution of potash, and then in hot water, then brushed with pumice and dipped in cold water, then plated with copper, then buffed, then again dipped in a potash solution and in hot water, again brushed with pumice and dipped in cold water and then nickel plated.

In the present process, the surfaces are first finished, then treated with a weak solution of phosphoric acid, and then are immediately plated with nickel, brass or any other desired metal. The action of the phosphoric acid is to change the surface of the iron or steel to a dull black phosphate of iron which will readily receive and retain the deposit of coating metal.

For some reason not now understood, a much higher voltage may be used in nickel plating articles thus treated than is permissible with ordinary practice, as the burning of the edges of the articles being plated which is common with high voltage under ordinary conditions, is entirely lacking. The time required to deposit a given coat of metal is therefore greatly reduced.

To produce a smooth surface, the articles taken from the phosphoric acid bath may be cleaned and smoothed with a metal brush or by brushing with emery or pumice. For nickel plating on a surface thus prepared, a nickel sulfate solution has been found desirable. The acid bath is prepared by placing three pounds of manganese dioxide in a solution of one-half gallon of phosphoric acid in substantially one hundred gallons of water and then bringing the bath to practically the boiling point at which temperature it is most effective. As bubbles of hydrogen gas escape from the articles being treated it is possible that galvanic action takes place and that a film of ferric phosphate is deposited on the articles being treated. When the bubbles stop forming, this step in the process is completed.

While this process is especially adapted for nickel plating because it saves the preliminary step of copper plating, copper, brass and silver solutions may be substituted for the nickel solution and good results obtained.

I claim:—

1. The process of metal-coating articles of iron and steel which consists in immersing them in a heated solution of phosphoric acid and then suspending them in an electro-plating bath.

2. The process of coating articles of iron and steel with another metal which consists in immersing the same in a bath containing a solution of phosphoric acid and then suspending them in an electro-plating bath embodying a soluble compound of the metal to be deposited.

3. The process of coating articles of iron and steel with nickel which consists in immersing the same in a heated bath containing a solution of phosphoric acid and an intensifying agent and then suspending the same in an electro-plating bath embodying a solution of nickel sulfate.

4. The process of coating articles of iron and steel with nickel which consists in immersing the same in a heated solution of phosphoric acid and manganese oxid, then mechanically cleaning the surfaces, and then suspending the same in a nickel plating bath.

CLARK W. PARKER.