

UNITED STATES PATENT OFFICE.

HENRY TUDOR BROWNELL, OF HARTFORD, CONNECTICUT.

IMPROVEMENT IN NICKEL-PLATING.

Specification forming part of Letters Patent No. **151,832**, dated June 9, 1874; application filed May 27, 1873.

To all whom it may concern:

Be it known that I, HENRY TUDOR BROWNELL, of Hartford, Hartford county, State of Connecticut, have invented certain Improvements in Nickel-Plating, and in the manufacture of nickel-plated articles, of which the following is a specification:

The object of my invention is to so intimately connect nickel to, or incorporate it with, any metallic surfaces as to effect a permanent union, which cannot be disturbed by any bending, straining, drawing, or compression of the plated article.

I attain this object by heating the metal article before it is introduced into the plating-solution, the latter being also heated.

When the plating has to be effected by galvanic deposit, the article to be plated is first immersed in a dilute solution of potash, or other cleansing composition, until its surface is free from all impurities, after which it is heated by immersion in water, or otherwise, to a temperature of nearly 212° Fahrenheit. This causes an expansion of the metal, and reduces the surface to the condition best adapted for receiving a permanent nickel-plating, the article while in its heated state being subjected to the heated plating-solution, which is deposited in the usual manner, the coating entering the pores of the metal which had been exposed by the heat, and such a thorough union of the nickel coating with the metal taking place that when the article is cool no bending or other distortion of the metal can disturb the nickel surface.

My invention is of such general applicability that it would be both difficult and un-

necessary to enumerate all the articles of manufacture which may be thus plated, but I may mention, among other things, boiler-iron, which, after being plated in the manner described, can be bent to any desired shape without disturbing the plating. The invention may be also applied to metal objects which have to be subsequently reduced or otherwise shaped by any of the appliances and processes which are employed in the treatment of ductile metals.

The heat to which the metal article to be plated is subjected may be varied; but I prefer to heat it to a temperature of nearly 212°, as I have found this temperature to be the best to effect the desired result.

I claim as my invention—

1. The improvement herein described in the process of nickel-plating, the article to be plated being heated to a temperature substantially as specified, and then subjected to a hot nickel-plating bath, as and for the purposes set forth.

2. The manufacturing of nickel-plated objects of ductile metals or alloys, by first heating and then nickel-plating the crude metal, and finally shaping the same to the desired article by drawing, bending, spinning, or other suitable means.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY TUDOR BROWNELL.

Witnesses:

WM. A. STEEL,
HUBERT HOWSON.