UNITED STATES PATENT OFFICE.

HOWARD P. DECHERT, OF NEW YORK, N. Y.

IMPROVEMENT IN ELECTROPLATING WITH NICKEL.

Specification forming part of Letters Patent No. **162,630**, dated April 27, 1875; application filed July 14, 1874.

To all whom it may concern:

Be it known that I, HOWARD P. DECHERT, of the city, county, and State of New York, have invented an Improved Mode of Applying Chloride of Calcium in the Process of Electroplating with Nickel; and I do hereby declare that the following is a full, clear, and exact description thereof.

The nature of my invention consists in the application of chloride of calcium in solution to the bath in the process of electroplating with nickel, in connection with the solution of the salt of the metal to be deposited.

I employ a solution of chloride of calcium of about the test 30° Baumé, water being 1°, though I do not confine myself to that test or density. Into this solution I place a solution of the chloride of nickel in any proportion, preferring at least ten (10) per cent., by weight, of the salt, in crystals, to ninety (90) per cent. of the solution of chloride of calcium; or the nickel salt may be obtained in said solution of chloride of calcium by placing the necessary amount of hydrochloric acid in said solution of chloride of calcium, and passing the electrical current through it with an anode of nickel, when the anode will dissolve in the acid, and produce the desired solution of chloride of nickel.

The article to be plated upon is then placed as the cathode in the bath, and the electrical current passed through with a nickel anode until the requisite amount of metal is deposited.

The advantages secured in employing the solution of chloride of calcium in the electroplating-bath are that, first, chloride-of-calcium solution of considerable density is a fine conductor of electricity, better than the known plating solution. The process of electroplating by its employment can be accomplished by the use of a much weaker battery than it is necessary to employ with other solutions; or the strong battery now employed will do double or even treble the work now obtained by passing the same current through two or more anodes successively and connectedly. This is explained by the fact that the conducting properties of concentrated solution of *c t c a* bear the relation of about 3 to 1 of any other known nickel-plating solution.

Second. The density of the solution causes the hydrogen bubbles eliminated in the liquid to rise and pass off from the surface to be plated, thus removing the danger of spotting the electroplated surface. It possesses this advantage over all other plating solutions of nickel, in that it can be obtained and maintained at the density required. Besides, the limpid nature of chloride-of-calcium solution allows the bubbles to rise freely.

Third. The chloride of calcium, being a permanent and enduring solution, is so fine a permanent and enduring solution for chloride of nickel, securing it against decomposition, that it secures the deposition of a smooth, close, and tough layer of nickel upon the plating surface.

A small amount of chloride of ammonia may be added to the solution for the purpose of keeping the surface of the metal to be coated free from metallic oxide; but its employment is not imperatively necessary.

What I claim is—

In electroplating with nickel, an electroplating-bath composed of a solution of chloride of calcium and chloride of nickel, substantially as and for the purpose set forth.

HOWARD P. DECHERT.

Witnesses:

JAMES N. WELLS,

J. N. WELLS, Jr.