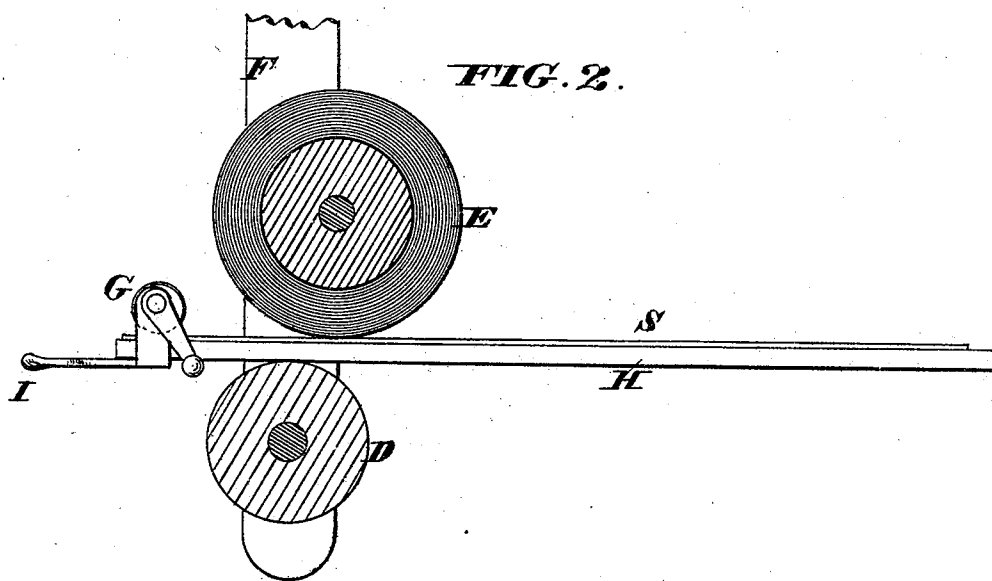
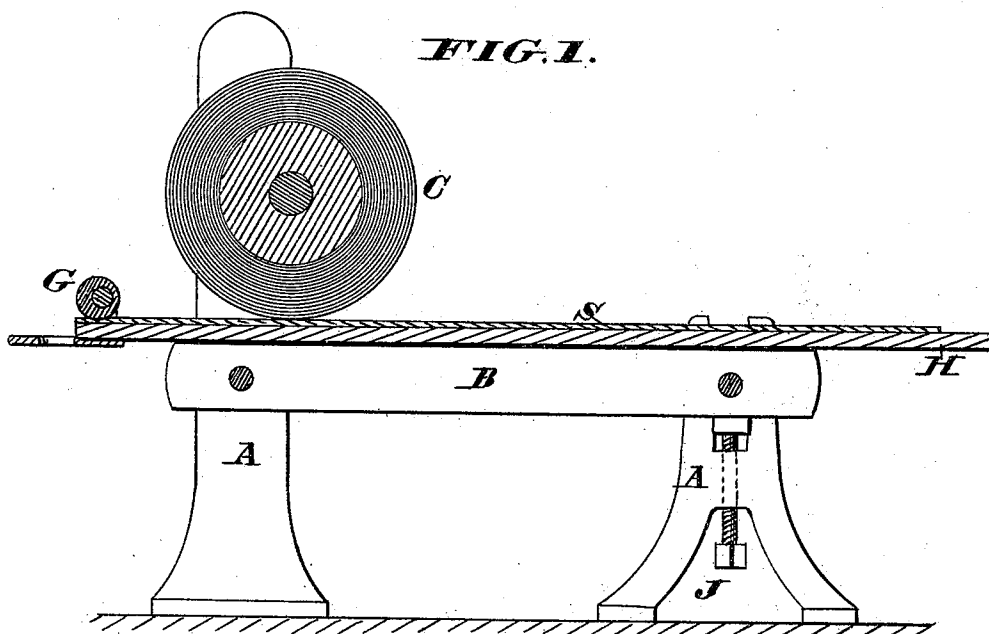


A. O'NEILL.

PREPARATION OF COPPER, &c., FOR THE MANUFACTURE OF CULINARY
VESSELS AND OTHER ARTICLES.

No. 179,462.

Patented July 4, 1876.



WITNESSES

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UNITED STATES PATENT OFFICE,

ANDREW O'NEILL, OF BALTIMORE, MARYLAND.

IMPROVEMENT IN THE PREPARATION OF COPPER, &c., FOR THE MANUFACTURE OF CULINARY VESSELS AND OTHER ARTICLES.

Specification forming part of Letters Patent No. **179,462**, dated July 4, 1876; application filed December 16, 1875.

To all whom it may concern:

Be it known that I, ANDREW O'NEILL, of Baltimore, in the State of Maryland, have invented a certain new and useful Improvement in the Preparation of Copper and other Sheet Metal for the Manufacture of Culinary Vessels and other articles, of which the following is a specification:

The subject of my invention is a permanently bright nickel-plated sheet of copper or brass, or other alloy of copper, prepared in the mode hereinafter described, and adapted for the manufacture of culinary vessels, and for other useful purposes.

In carrying out my invention, I take plates or slabs of copper or of brass, yellow metal, or other alloy containing copper, as they come from the rolling-mill, and subject them to rolling, either singly or in packs, until they are reduced to the thickness required. If rolled in packs, they are subsequently passed once or more (cold) between polished rolls to give them a permanent set, condense the metal, and remove any imperfections therefrom. In order to secure the advantages of cold-rolling in a single thickness without the cost of handling separate sheets of small size, it is preferred to roll the metal in continuous lengths, coiling and annealing it after each pass. When reduced to the required thickness, it is cut up in the desired size and shape, and the separate sheets are passed once between the rolls to stiffen and flatten them, remove any indentations they may have received in the muffler or annealing-furnace, and prepare them for the subsequent operation of buffing and polishing.

The machinery by which the rolling above referred to is performed is of ordinary construction, and hence requires no specific description.

For the buffing of small sheets I employ a traveling bed, B, sliding in a frame, A, to carry the sheets, and a rapidly-revolving buffing-roller, C, preferably made of felt. J represents a screw for setting the bed B up or down, so as to regulate its distance from the surface of the roller C, and thus cause it to act on the plate with any required pressure.

Brick dust and oil or other polishing material are applied to the surface of the metal.

For buffing large sheets, I employ the apparatus shown in Fig. 2, where D and E represent two rollers running in a frame, F, depending from above. D is a supporting-roller, running freely in the frame F, and E the buffing-roller, which is driven at a high velocity. Said buffing-roller E is placed, as shown, somewhat above, but not directly over, the roller D. The sheet S is fastened, by an eccentric clamp, G, to a board, H, furnished with handles I. In operation, the board, with the sheet thus attached, is rested on the carrying-roller D, the heel of the board being elevated by the workman to permit it to pass freely under the buffer-roller E as he thrusts it from him, and being pressed down as he draws it toward him, so as to press the surface of the sheet with any necessary force against the rotary buffer. One side being completely polished, the sheet is turned over, and again clamped to the board, and its other side is then polished in the same manner. Brick dust and oil, rotten-stone, or other cheap material are applied to the sheet during the buffing operation. The polishing being completed, the sheets are cleansed of oil and other foreign matters by rubbing with sawdust or other cheap material. The sheets are then electroplated with nickel on one or both sides, and subsequently buffed and polished again in the manner and by the same means already described.

If but one side is nickel-plated, the sheet is laid plated side down on a table, and the unplated side is coated with an enamel prepared as follows: Take one quart spirits of turpentine, one quart Dammar varnish, half a pound of sugar of lead, and about a tea-spoonful of oxalic acid dissolved in a half a pint of water. The sugar of lead has the effect of relieving the enamel of any sticky character which the varnish would otherwise impart to the sheet, and the oxalic acid prevents any opacity resulting from the use of the sugar of lead, and imparts to the enamel a clear and brilliant transparency. The lacquer is applied evenly with a soft brush, after which the sheet is

placed on a steam-table, the heat causing the evaporation of the turpentine.

My invention provides the artisan and manufacturer with sheet metal ready for use for the manufacture of culinary vessels of all kinds, bath-tubs, stove-trimmings, show-case frames, clock-movements, and a great variety of household and other articles for which various kinds of sheet metal are commonly used. The nickel-plated enameled sheets, prepared as above described, may be struck up or spun up, or formed by stamping machinery usually employed in working copper and other sheet metal.

The stamping operation does not impair the nickel-plating, and said plating will bear without injury a degree of heat much greater than that required for soldering.

Articles made of this material present a brilliant luster, and have a hard, glossy, planished surface, which renders them very attractive, at the same time that the cost is not greatly increased. The nickel-plating on one side and the enamel on the other render the metal permanently bright, and prevent the formation of verdigris.

For culinary uses, and for the purposes of of the laboratory, vessels made of my nickel-plated and enameled copper, brass, or yellow metal possess great superiority, in that the material is not liable to be affected by acids or by overheating. Vessels of tinned sheet metal require frequent retinning, which involves outlay, and causes injury to the body of the metal, impairing its density, toughness, and homogeneous character, and causing it to crack and to wear in holes.

My system of cold-rolling, annealing, and buffing constitutes a new process of machine-planishing, and greatly increases the strength, durability, density, and beauty of the metal. The nickel-plating, being applied on a surface already planished and polished, and perfectly

smooth, is not injured by the final buffing operation, or by the necessary wear it receives in being made up and in subsequent use.

The same result could not be attained with hand-planishing. The usual system of hand-planishing does not effectually remove imperfections from the surface, or render it sufficiently smooth for the purposes of nickel-plating. The eminences and ridges produced in hand-planishing cause the nickel to be worn away at those points by the action of the rotary buffer.

The scraps of copper removed in trimming the sheets for making up are capable of use by removing the nickel in a bath of sulphuric acid, and melting down the copper in a crucible. The use of nickel possesses an advantage over German silver, in that it is of much less cost.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The process herein described of preparing sheets of copper, or of an alloy containing copper, by cold-rolling, polishing, nickel-plating, and subsequent buffing or polishing, substantially as set forth.

2. The process of preparing and protecting sheet metal by cold-rolling, polishing, nickel-plating, buffing, and coating with an enamel, substantially as herein described.

3. The buffing apparatus constructed with two rollers placed one above, but not directly over, the other, as and for the purposes set forth.

4. As a new article of manufacture, the machine-planished, nickel-plated, polished, and enameled sheet of copper, brass, or yellow metal, herein described.

ANDREW O'NEILL.

Witnesses:

OCTAVIUS KNIGHT,
CHAS. J. GOOCH.