

# UNITED STATES PATENT OFFICE.

ANDREW O'NEILL, OF BALTIMORE, MARYLAND.

## IMPROVEMENT IN THE MANUFACTURE OF COPPER AND TINNED-COPPER SHEETS.

Specification forming part of Letters Patent No. **200,801**, dated February 26, 1878; application filed January 18, 1878.

*To all whom it may concern:*

Be it known that I, ANDREW O'NEILL, of the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in the Manufacture of Copper and Tinned-Copper Sheets; and I hereby declare the same to be fully, clearly, and exactly described as follows:

My present invention relates to sheet metals protected from oxidation by coatings of practically inoxidizable metals or varnishes; and it consists, first, in an improved article of tinned sheet metal; and, second, in the method employed in its production.

In order to avoid misapprehension as to the scope of this instrument, I will here refer to Letters Patent granted to me April 24, 1877, in which the state of the art is fairly acknowledged by reference to Letters Patent granted to me at various times prior thereto, and also to reissued Letters Patent No. 7,913, granted to me October 16, 1877.

The present invention relates more particularly to certain improvements upon the last-named invention, as will be understood from the following distinctive description.

The article covered in the reissue referred to consists in an article of tinned sheet-copper having a bright copper surface. This article is open to certain objections, which the present invention is designed to obviate, while retaining unimpaired all the advantages of the former.

I consider it neither necessary nor desirable to give here a detailed description of the apparatus employed in producing the sheet which is the subject of the present invention.

Suitable apparatus will necessarily suggest itself to one skilled in the art, and is described in my patents hereinbefore referred to.

I take a suitable sheet of copper and pass it between highly-polished steel rolls until it is reduced to the required thickness. The so-reduced sheet is next cleaned, laid upon an inclined table, and tinned, in the usual manner, by applying molten tin with a tow swab to one side of the sheet. The particles of tow or hemp adhering to the edges of the sheet being removed by singeing, the compound sheet is plunged into a bath containing cyanide or ferro-cyanide of potassium, soda, potash, or

similar alkaline solution, in order to remove or neutralize any of the pickle ingredients which may have adhered to the sheet in the process of preliminary cleansing or pickling, or any oxide from the untinned surface of the copper. The compound sheet, being then thoroughly rinsed and dried, is passed endwise, with but a slight squeeze, between highly-polished rolls. A slight buckle is thereby inevitably imparted to the sheet, which it has heretofore been necessary to remove by hand-hammering.

That the latter process is injurious to the plate or sheet is self-evident; and an important feature of my present invention consists in effectually eradicating the buckle, and in thereby imparting a novel and valuable feature to the sheet. This I accomplish by passing the sheet sidewise between a similar pair of rolls. This process not only removes the buckle, but with it that springy elastic stiffness which is an undesirable feature in sheet metal when rolled but one way. It eradicates all grain in the sheet, and greatly improves its appearance, presenting a dappled surface, similar to costly hand-hammered plate. The so-formed sheets, being cut to sizes, are next subjected to the action of a buff supplied with Vienna lime, crocus, or similar polishing material. Either or both surfaces are thus finished, depending upon the use to which the sheet is to be applied. The final step in the operation consists in treating the sheet on one or both sides with a shellac lacquer.

The compound sheet so formed possesses advantages peculiar to itself, besides all those arising from the processes described in my prior patents. It is especially adapted for the manufacture of culinary utensils, liquid-measures, water-coolers, refrigerators, bath-tubs, and similar articles.

In preparing the plate for uses in which the exterior surface will be concealed, the finishing of the same may be omitted.

The cross-rolling, as stated, diminishes that springy elastic stiffness which is an obstacle of considerable moment in working sheet metal—such as double-seaming, spinning, &c.; and as it eradicates all buckle, it greatly facilitates packing for transportation.

While I have, for the sake of brevity, re-

ferred to the base of the compound sheet as copper, any of its alloys (such as brass or yellow metal) may be employed without departing from the spirit of my invention.

I have laid stress upon the advantages of cross-rolling, but do not wish to be understood as assuming to be the first to cross-roll metals, broadly. Such a process is very old when it is merely desired to diminish the thickness of a plate. I do not cross-roll for that purpose; nor do I accomplish that end.

I have described the sheet as tinned, and either lacquered or not; but it is obvious that I may send the copper or copper-alloy sheet into commerce to be tinned, nickel-plated, or, in fact, treated in any desired manner, according to the use for which it is designed.

By the processes described—to wit, cold-rolling, cross-rolling, buffing, and lacquering—constituting what I propose to term “triple planishing,” (or such of them as may be necessary,) a superior article of sheet metal is produced, eminently adapted for use by the tinner or plater. Such an article is produced, as described, far cheaper and better than the ordinary hand-finished hammered plate now in use, commending itself by its finely-polished surface, uniformity of thickness, perfect homogeneity of metal, and freedom from buckle.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The method of finishing sheet-copper or tinned-copper sheets, the same consisting in rolling and cross-rolling, and, finally, machine-planishing, as set forth.

2. The method of preparing sheet-copper or tinned copper, consisting in cold-rolling the sheet at right angles, machine-planishing, and, finally, lacquering one or both sides, as set forth.

3. The method of preparing tinned-copper sheets, the same consisting in rolling the copper, pickling, tinning, immersing the plate in an alkaline solution, cross-rolling, machine-planishing, and, finally, lacquering, substantially as described, and for the purpose set forth.

4. A cold-rolled, cross-rolled, machine-planished plate of copper or tinned copper, one or both surfaces being lacquered or not, substantially as described.

ANDREW O'NEILL.

Witnesses:

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DAVID G. WEIMS.