

UNITED STATES PATENT OFFICE.

EDOUARD MARTIN, OF PARIS, FRANCE, ASSIGNOR TO ST. PICARD FRÈRES,
OF PARIS, FRANCE.

METHOD OF MANUFACTURING COMPOUND METAL SHEETS OR PLATES.

SPECIFICATION forming part of Letters Patent No. 673,525, dated May 7, 1901.

Application filed April 15, 1897. Serial No. 632,299. (No specimens.)

To all whom it may concern:

Be it known that I, EDOUARD MARTIN, a citizen of the Republic of France, residing in Paris, France, have invented certain new and useful Improvements in Methods of Manufacturing Compound Metal Sheets or Plates, of which the following is a specification.

This invention has been patented in France, No. 243,489, dated December 8, 1894, and in England, No. 11,763, dated June 17, 1895.

This invention relates to processes for manufacturing bimetallic articles, and aims to provide an improved method for manufacturing compound metal sheets or plates, especially applicable for use in making utensils and other articles, which process is particularly adapted to the manufacture of compound sheets of silver and copper.

By processes heretofore patented by myself it has been possible to manufacture bimetallic plates composed of iron or steel and copper, the latter covering either one or both sides of the steel.

My present invention provides a process permitting the manufacture of bimetallic plates composed of copper and silver, either of which may be either pure or an alloy. The silver may be on either or both sides of the copper, but is preferably on both faces thereof. The bimetallic sheet resulting from my process constitutes a new article of manufacture having many advantageous qualities and especially useful for making silvered copper utensils and other articles—such, for example, as table, kitchen, and toilet articles.

According to the preferred form of this invention in carrying out my improved process I use pure copper or in some cases, if desired, a special alloy consisting of ninety-eight parts of copper, 1.9 parts of tin, and 0.1 part of nickel. The copper or alloy is cast in ingots, which may have any suitable dimensions. I prefer the following: breadth, one hundred and sixty millimeters; thickness, ninety millimeters, and height four hundred and fifty millimeters. The ingot is slightly hammered while hot, which adapts it to better receive the plating, and then its surfaces are planed to make it smoother, so that it requires but little solder, and are coated

with a special preparation of silver, being a double nitrate of silver and mercury, which I have found to be especially adapted to the soldering of silver on copper. Then a plate of pure silver or of an alloy of silver and aluminium, preferably corresponding in width and length to the ingot—that is, one hundred and sixty millimeters wide and four hundred and fifty millimeters long—and of a thickness proportioned to that of the silver required on the copper, is placed on the ingot. The ingot and plate are then subjected to pressure under a press, and the ends of the plate are forced down so as to prevent its sliding. The whole is then inclosed in a sheet of copper about four or five tenths of a millimeter thick, which sheet is previously prepared in such a way as to prevent it from adhering to the silver. The sheet envelops the ingot and plate and is suitably secured, as by binding it around with a thin copper hoop. In preparing the ingot the silver plate is placed on the surface thereof which is to be covered with silver, usually both sides. The ingot thus prepared is heated, preferably, to 700° or 800° centigrade and is then rapidly rolled until it becomes a bar of, say, one hundred and eighty millimeters wide and five or six meters long. This bar is cut into lengths, which are reheated and cross-rolled to form sheets about one meter wide and two meters long. These sheets can then be used for making utensils and other articles. The improved sheet resulting from this process has the copper and the silver thoroughly united in such manner that the sheet can be worked as desired without impairing the connection between its metals. This sheet presents, when both sides are coated, a solid core of copper and solid walls of silver and has the advantages of a pure silver sheet combined with those of a copper sheet.

It will be seen that my invention provides a process which can be readily employed and that it produces an improved article having many advantageous features.

It will be understood that I do not limit myself to the particular details set forth as constituting the preferred form of my improved process, since these can be varied as circumstances or the judgment of those skilled in

the art may dictate without departing from the spirit of the invention.

The copper envelop may be removed when desired; but I prefer to retain it during part 5 or all of the rolling, or to move it after the rapid lengthwise rollings or after the reheating and before the cross-rolling. It will prevent injury to the silver either from heating or rolling and will prevent loss thereof during the rolling. When prepared as described, 10 so that it cannot adhere to the silver, it can be readily removed when desired and serves as a ductile guard for transmitting the rolling pressure to the silver while it covers the 15 latter.

What I claim is—

1. The improved process of making compound metal sheets or plates of silver and copper, which process consists in coating a 20 copper ingot with a double nitrate of silver and mercury, placing on such coating a silver plate, enveloping the resulting ingot in a non-adhering sheet-metal covering, heating the ingot so prepared, and rolling the whole 25 until the silver and copper are united and reduced to the desired thickness.

2. The improved process of making compound metal sheets or plates, which process consists in forming an ingot containing copper, hammering this ingot while hot, planing 30 its surface, soldering a plate containing silver on the planed surface, forcing down the ends of the plate to prevent its sliding, heating the ingot so prepared, and rolling the resulting ingot to the desired thickness. 35

3. The improved process of making compound metal sheets or plates, of silvered copper, which process consists in planing the surface of an ingot containing copper, coating such surface with a double nitrate of 40 silver and mercury, placing on such surface a plate containing silver, heating the ingot so prepared, and rolling the ingot thus prepared to the desired thickness.

In witness whereof I have hereunto signed 45 my name in the presence of two subscribing witnesses.

EDOUARD MARTIN.

Witnesses:

GUSTAVE JOBLIN,
AUGUSTE MATHIEU.