

UNITED STATES PATENT OFFICE.

EDOUARD MARTIN, OF PARIS, FRANCE.

MANUFACTURE OF COMPOUND PLATES OF STEEL OR IRON AND COPPER.

SPECIFICATION forming part of Letters Patent No. 682,632, dated September 17, 1901.

Application filed July 17, 1900. Serial No. 23,871. (No specimens.)

To all whom it may concern:

Be it known that I, EDOUARD MARTIN, a citizen of the Republic of France, and a resident of Paris, France, have invented certain new and useful Improvements in the Manufacture of Compound Plates of Steel or Iron and Copper, of which the following is a specification.

This invention relates to improvements in the manufacture of compound sheets of iron or steel and copper, so as to make them malleable and suitable to be used for the same purposes for which sheets of iron plated with tin are used.

In carrying out my invention I prepare steel ingots of a transverse section of from ten to fifteen square centimeters if the rolls in which the ingot is later to be rolled have closed grooves. If the rolls be of smooth flat surface, I prefer forty to fifty square centimeters. I have found these sizes very well adapted to preparing combined sheets of copper and steel for ordinary purposes; but the sizes may be varied if the circumstances seem to require it. The surface of the ingot is first scoured to clean it from oxids and then coated with an electric deposit of copper. Sheets of copper obtained by electrical deposit are then prepared of length, width, and thickness as may be required for a proper proportion of copper to be on the sheet when finished. These sheets of copper may be obtained by electric deposit in any common and well-known way. These sheets after being so obtained are to be rolled out to proper size. As the rolling produces a different molecular arrangement of the copper sheet—one that will prevent the success of the process—there must be an electric deposit formed on the surface of the prepared copper sheet to secure a perfect union with the steel ingot. This deposit may be produced in any common and well-known way. These sheets of copper and ingots of steel are then heated in separate furnaces, so that they will both be red-hot at the same time. The steel ingot is then taken from the furnace and placed in a hydraulic press. At the same time the copper sheet is taken out and laid on the steel ingot, so that the copper-coated face of the ingot and

the copper sheet will come together. The power is then put on the press. Its effect is to so compress the steel and copper as to firmly and permanently unite them. The plates so obtained may then be taken to rollers and rolled to any desirable size. Whenever it is desirable to reduce the thickness of a sheet of this metal, it is only necessary that it shall be heated and rerolled to any desired size. It will be found that the copper and steel in sheets so prepared have formed such a permanent union that they may be rolled, bent, struck, and formed in any ordinary shape just the same as if they were of only one metal. It is obvious that either one or both faces of the sheet may be coated with copper by this process. When more than one ingot and its accompanying sheets are placed one on the other in the hydraulic press, a plate of colder steel should be interposed to keep them from adhering to one another. It is also evident that iron may be used in this process instead of steel with an equally good result.

What I claim as my invention, and desire to secure by Letters Patent, is—

The process of making compound sheets of iron or steel and copper, which consists in scouring an ingot of iron or steel, coating the surface thereof with an electric deposit of copper, and heating such ingot, rolling a sheet of copper obtained by electrical deposit, plating the said sheet with an electric deposit of copper, and heating it, placing said ingot, while so heated in a hydraulic press, placing said copper sheet while so heated in contact with the copper-plated side of said ingot in the press, and therein compressing said sheet and ingot together until they are firmly united, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 22d day of June, 1900.

EDOUARD MARTIN.

Witnesses:

ERNEST MENUSIER,
ANTOINE LAVOIX.