

JEAN-BAPTISTE CLAMENS.
PROCESS OF MAKING BIMETALLIC WIRE.
APPLICATION FILED JAN. 2, 1907.

1,011,744.

Patented Dec. 12, 1911.

Fig. 1.

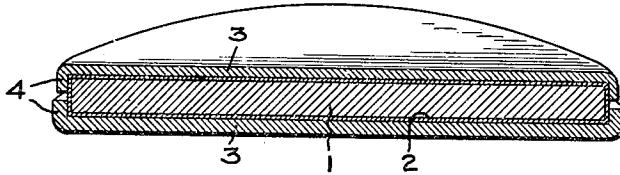


Fig. 2.

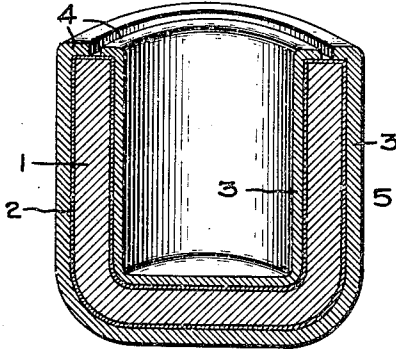


Fig. 3.

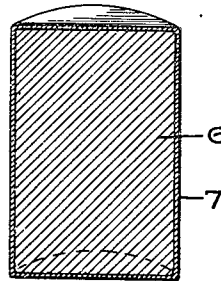


Fig. 4.

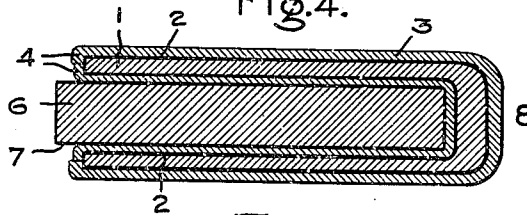


Fig. 5.

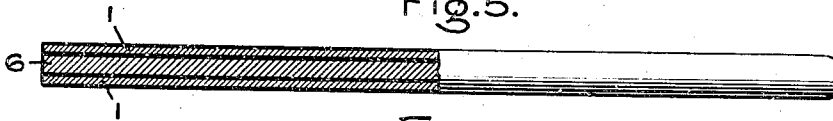
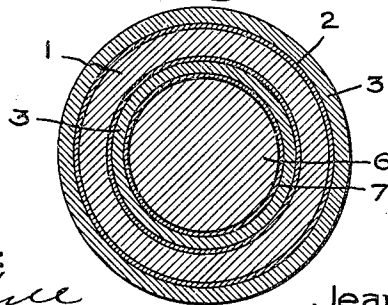


Fig. 6.



Witnesses:

Benjamin B. Hull
Allen Oxford

Inventor:

Jean Baptiste Clamens,
by *J. S. Whittey*
His Attorney.

UNITED STATES PATENT OFFICE.

JEAN BAPTISTE CLAMENS, OF PARIS, FRANCE.

PROCESS OF MAKING BIMETALLIC WIRE.

1,011,744.

Specification of Letters Patent.

Patented Dec. 12, 1911.

Application filed January 2, 1907. Serial No. 350,316.

To all whom it may concern:

Be it known that I, JEAN BAPTISTE CLAMENS, a citizen of the French Republic, residing at Paris, in the Department of the Seine and Republic of France, have invented certain new and useful Improvements in Process of Making Bimetallic Wire, of which the following is a specification.

This invention relates to a process of producing a bimetallic wire composed of steel and copper, the relative quantities of the two metals being varied in any proportion desired. The processes heretofore known for producing such wire do not enable one to vary these proportions to any considerable extent, some authorities stating that a wire having less than thirty per cent. of copper cannot be made.

The object of my invention is to solve this problem and permit any percentages desired to be employed.

In the accompanying drawing, Figure 1 is a section of a compound plate of steel and copper. Fig. 2 is a section of a cup or socket struck up from said plate. Fig. 3 is a section of a bimetallic plug or mandrel. Fig. 4 is a section of the ingot formed by inserting the plug into the socket and then rolling them down. Fig. 5 is a section of the bimetallic wire made in accordance with my improved process, and Fig. 6 is a cross-section of the completed wire, on a large scale.

My improved process consists of the following steps:—

1. Plates or disks 1 of steel are prepared, of any suitable diameter and thickness, preferably from 30 to 60 centimeters in diameter and from 15 to 50 millimeters thick. They are cleaned and milled, so that their surfaces are without any defect.

2. In order to prevent oxidation in subsequent operations the disks are electroplated with copper, tin or zinc. This coating is indicated in the drawing by the numeral 2.

3. Copper obtained by electrolysis is cast into ingots and then is rolled into sheets of from one half to two millimeters in thickness.

4. From these copper sheets are punched disks 3 having a diameter 8 millimeters larger than the steel disks.

5. These copper disks are struck up to form a flange 4 4 millimeters wide around their peripheries, so that when a steel disk is laid upon one of these copper disks it will be retained centrally in place.

6. To each face of each steel disk is applied a copper disk, the thickness of one of said copper disks being from 4 to 10 per cent. that of the steel, while that of the other copper disk is but one or two per cent. thereof. The thicker copper disk is to form the outside of the wire, while the thinner one is to be welded to the mandrel hereinafter described.

7. This operation being completed, the compound disks are superposed one upon another to any number desired, alternating with plain steel disks to prevent their welding together. Heavy top and bottom plates are applied to the pile and the entire mass is heated to a temperature of 800 to 900 degrees centigrade and placed in a hydraulic press to effect an association of the copper with the steel.

8. After thoroughly cooling, the compound disks are cleaned, and are then struck up by a press to form cupped sleeves or sockets 5 having a diameter of 100 to 150 millimeters, a height of 200 to 250 millimeters and an internal bore or cavity of 80 to 90 millimeters. The thicker copper layer is on the outside and the thinner layer on the inside of these sockets.

9. Extra mild steel core bars 6 of the same diameter as the interior of the sockets and somewhat longer are thoroughly cleansed and electroplated with a light coating of copper.

10. The copper-coated mandrel or core is introduced into the bimetallic sleeve or socket and the ingot 8 so obtained is reheated at a high temperature.

11. At the proper temperature, the ingot, which has a weight of about 40 kilograms, is rolled in mills having rolls provided with round grooves, so that the ingot will be reduced in diameter to about 45 millimeters. The closed bottom of the socket is presented first to the rolls so that the metal of the socket will be stretched and will cover the longer mandrel or core in the welding process effected by the rolls.

12. The ingot is then reheated and is further rolled in a three roll mill and an ordinary wire rolling train adapted to produce wire of 4, 5 and 6 millimeters in diameter. These wires may be still further drawn down to any desired diameter. They are quite inoxidizable, and may be coated with gold or silver, and are capable of use in any industry.

It will be seen from Fig. 5 that the wire is composed of a steel core provided with a thin copper sheath, outside of which is a thick steel jacket having an external heavy
5 coating of copper.

Having thus described my invention, what I claim is:—

The process of making bimetallic wire containing any desired predetermined low
10 percentage of copper which consists in electroplating a steel disk with copper, applying to each side of said disk a sheet of copper, one sheet being thicker than the other, subjecting this compound disk to a high tem-
15 perature and heavy pressure to effect a welding of the copper sheets to the steel disk,

cupping the compound disk to form a socket, the thinner copper being on the inside, inserting into the interior of said socket a steel core provided with a light copper coat- 20 ing, reheating the ingot thus formed, rolling said ingot to reduce its diameter and effect a weld of the socket and the core, and then drawing the ingot to form a wire having a steel core sheathed in copper and provided
25 with a copper coated steel jacket.

In testimony whereof I have affixed my signature in presence of two witnesses.

JEAN BAPTISTE CLAMENS.

Witnesses:

HENRY DANZER,

MERIEN CRESPIN.