

(No Model.)

A. RODIG.

PROCESS OF MANUFACTURING BIMETALLIC PLATES, SLABS, &c.

No. 543,192.

Patented July 23, 1895.

Fig. 1.

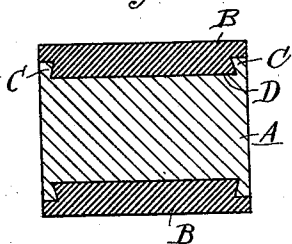


Fig. 2.

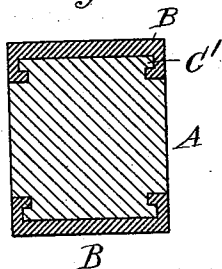


Fig. 3.

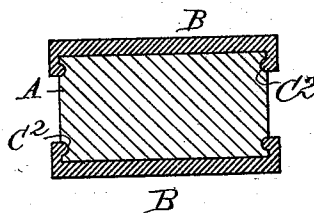


Fig. 4.

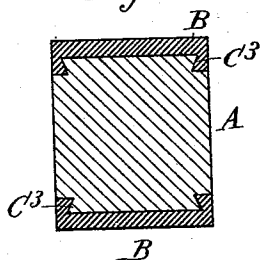


Fig. 5.

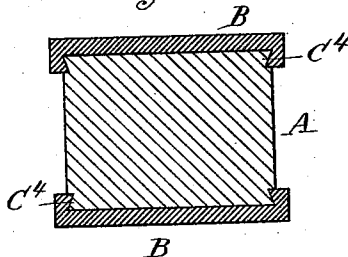


Fig. 6.

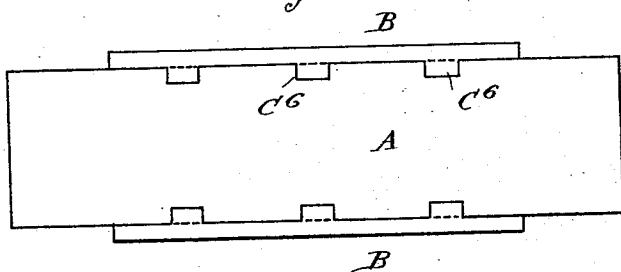
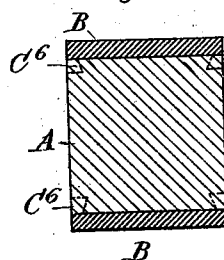


Fig. 7.



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UNITED STATES PATENT OFFICE.

ADOLF RODIG, OF LABAND, GERMANY.

PROCESS OF MANUFACTURING BIMETALLIC PLATES, SLABS, &c.

SPECIFICATION forming part of Letters Patent No. 543,192, dated July 23, 1895.

Application filed September 23, 1893. Serial No. 486,278. (No specimens.)

To all whom it may concern:

Be it known that I, ADOLF RODIG, a subject of the Kingdom of Saxony, residing at Laband, in the Kingdom of Prussia and German Empire, have invented new and useful Improvements in Processes of Manufacturing Bimetallic Plates, Slabs, &c., of which the following is a specification.

For manufacturing plates, sheets, slabs, bands, and similar objects provided on their surfaces with another metal as the covering metal the surface metal is cast on to two opposite surfaces of the ingot, the operation of casting being effected in the commonly-known way in ordinary chill-molds. As on one hand the different metals are not welded together or may not be completely welded together by this casting, and as on the other hand it may be desirable to stretch the surface metal over the core metal or to cover the latter with the surface metal by rolling before the corresponding metals are welded together—for example, in the case of plates plated with copper—it is necessary to attach temporarily the surface metal to the core metal.

My invention aims to provide an improved process for the manufacture of such plates, slabs, sheets, and similar objects from two or more metals.

To this end in carrying out the invention I provide the core metal on its upper and lower or side surfaces with provisional or temporary furrows, grooves, elevations, recesses or overhanging projections, receiving and engaging the covering metal when the latter is applied to or cast on the core. Preferably these overhanging projections extend longitudinally of the core and are formed near the corners thereof, adjacent to which the covering metal is to be applied. Preferably, also, transverse grooves, furrows, recesses, or overhanging projections are provided in the core metal for engaging the covering metal when cast thereon, these projections preferably intercepting those previously described. The applied covering metal is also formed with reciprocal provisional or temporary projections for engaging those of the core, this being accomplished when the covering is applied to the core by casting it thereon by the flowing of the cast metal into the adjacent portions of the core. After casting or applying the

surface metal onto the core so that it is engaged by the said projections, I weld the core and surface metal together by heat and the pressure of rolling, and reduce the compound ingot to the desired form and dimensions by rolling, preferably removing after the welding the portions of the metals constituting the fastening devices or interengaging parts of the two after casting, so that the resulting sheet shall be composed of layers of uniform thickness of the different metals throughout their width and length. This removal may be accomplished either during the subsequent rolling operations, as by rolling out or off the interengaging provisions, or in any suitable manner.

In the accompanying drawings, Figure 1 is a cross-section of a compound ingot constructed according to one form of my invention. Fig. 2 is a similar view showing another adaptation of the invention. Fig. 3 is a similar view showing another adaptation of the invention. Fig. 4 is a like view showing still another adaptation, and Fig. 5 is a corresponding view showing a further modified construction of ingot. Fig. 6 is a face view of an ingot constructed according to the preferred form of my invention, and Fig. 7 is a cross-section thereof.

Referring to all the drawings, let A indicate the core metal, and B B the surface metal, of a compound ingot.

According to my invention I provide overhanging projections on the core metal A for engaging and retaining the surface metal B thereon. These may be variously constructed. In the form shown in Fig. 1 these projections (lettered C) consist of undercut walls at the edges of the core and flanking a central depression D. In the form shown in Fig. 2 these projections consist of overhanging shoulders C' at the corners of the ingot. In the construction shown in Fig. 3 these projections are formed by grooves C² in the sides of the ingot. In the construction shown in Fig. 4 these projections consist of beveled walls C³ formed at the corners of the side walls of the ingot. In the construction shown in Fig. 5 these projections are formed by overhanging faces C⁴ at the sides of the ingot. In the construction shown in Figs. 6 and 7 these projections consist of undercut recesses C⁶ ex-

tending longitudinally and laterally of the core A and of less length than the latter, three being shown at each side, whereby the displacement of either surface metal relatively to the core is prevented both longitudinally and laterally.

In carrying out my invention the furrows, grooves, recesses, or projections need not extend the entire length of the core, as in certain cases it will be sufficient to arrange them on only one or more faces of the upper or lower or side surfaces of the core, as seen in Figs. 6 and 7. Likewise it is not necessary to join by casting the surface metal to the whole length of the ingot. It is rather sufficient in certain cases, in particular in the case of softer surface metals, to effect this casting only to the middle part of the core metal; but in order to prevent that the metal casings cast on and more firmly held by the furrows, grooves, &c., on the core piece shall be displaced one in respect to the other. When they are introduced between the rollers of a rolling-mill, it is advisable to arrange some small transverse grooves. This, of course, is not necessary if, as shown in Figs. 6 and 7, the furrows, grooves, &c., are applied only partially and do not extend over the whole core-piece. To prevent any displacement of the casings cast on when the furrows or grooves extend in the whole length of the block it will already be sufficient to arrange, prior to the casting in the longitudinal furrows, grooves, or projections; some transverse grooves having a depth of a few millimeters, in which transverse grooves the casing metal is held fast against longitudinal displacement. The double metal ingots produced in this manner are first rolled in the usual way in closed grooves until they are formed into rough bars, and then they are stretched, either longitudinally or laterally, or both, preferably by being passed through flat rollers, so as to form plates, sheets, slabs, bands, &c. The rolling pressure with heat welds the metals together and spreads the covering metal laterally and longitudinally on the core metal while also flattening the latter. The fastening borders or furrows, &c., arranged for casting on the surface metal to the core metal are removed or destroyed after the metals have been welded together, and they are to be considered as waste. This removal or destruction of these portions is done so that the remainder of the resulting ingot shall consist of layers of uniform thickness of the different metals, and it is accomplished by rolling out or off the portions constituting the overhanging provisions, or in any other suitable way removing them. These portions, when removed, can be employed for any purpose for which they can be utilized.

What I claim is—

1. The improved process for manufacturing plates, sheets, slabs, bands, and the like,

from two or more metals welded together, which consists in forming the core piece with temporary overhanging projections at its edges for engaging and retaining the surface metal, then casting the surface metal on two opposite surfaces only of the core-piece and into the overhanging projections thereof, whereby the surface metal and core piece are held firmly together by the said projections, and subsequently welding said metals together by heat and pressure, substantially as set forth.

2. The improved process for manufacturing plates, sheets, slabs, bands, and the like, from two or more metals, which consists in forming a core piece of one metal with temporary overhanging projections at its edges extending longitudinally and transversely thereof, then casting the surface metal on two opposite surfaces of the core piece and into said projections, whereby the surface metal and core piece are held fast together by said projections against relative longitudinal or lateral movement, and then welding said metals together, substantially as set forth.

3. The improved process for manufacturing plates, sheets, slabs, bands, and the like, from two or more metals welded together, which consists in forming a core piece of one metal with temporary overhanging projections at its edges, then casting the surface metal on two opposite surfaces of said core piece and into engagement with the projections thereof, whereby said core piece and surface metals are held fast together, then rolling the compound ingot thus formed and thereby welding said metals together, and then removing the portions of said metals in engagement at said overhanging projections, substantially as set forth.

4. The improved process of manufacturing plates, sheets, and the like from two or more metals welded together, which consists in forming a core piece of one metal with provisional overhanging projections at its edges for engaging and retaining on its surface another metal, applying to such core piece a coating of another metal with reciprocal overhanging projections at its edges engaging those of said core piece and firmly holding the two together, subjecting the compound member thus formed to heat and pressure, rolling the resulting member to the desired thickness, and destroying the interengaging portions thereof, substantially as and for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ADOLF RODIG.

Witnesses:

EDUARD PEITZ,
GUSTAV HÜLSMANN.