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W. WILKINSON ET AL

ORNAMENTAL SHEET METAL AND MANUFACTURE OF SAME

Filed August 24, 1925

FIG. 1.

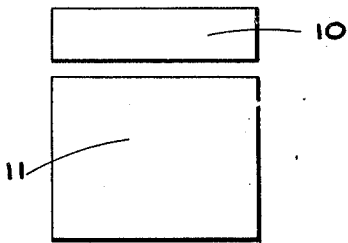


FIG. 2.

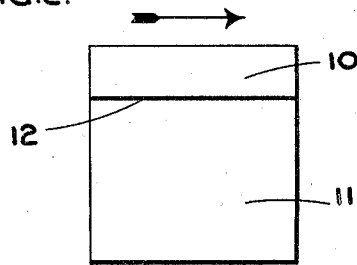


FIG. 3.

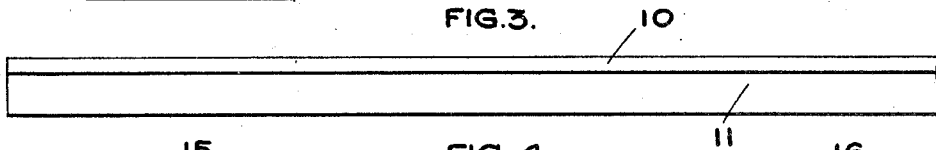


FIG. 4.

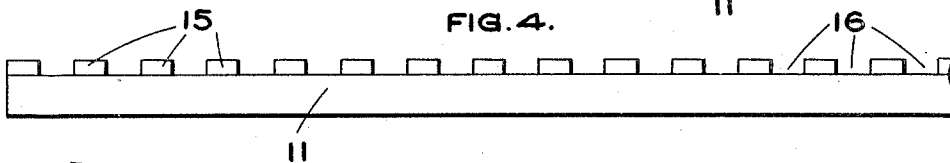


FIG. 5.

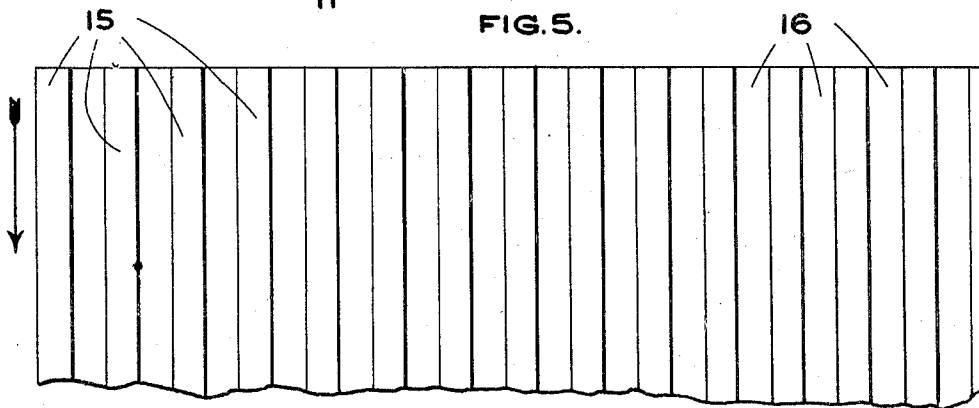


FIG. 6.



FIG. 8.

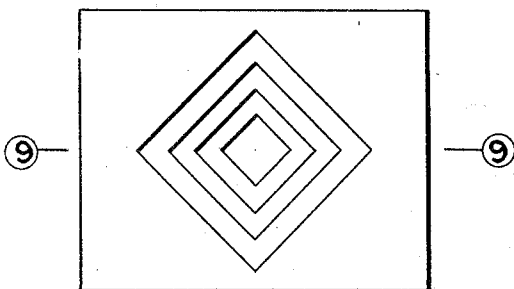


FIG. 7.

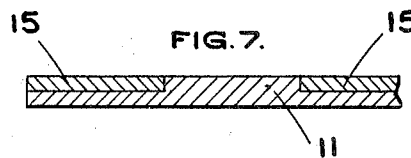


FIG. 9.



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ORNAMENTAL SHEET METAL AND MANUFACTURE OF SAME.

Application filed August 24, 1925, Serial No. 52,140, and in Great Britain September 13, 1924.

Our invention comprises improvements in sheet metal and in the manufacture of same and has for its object to produce sheet metal of an improved and ornamental appearance capable of being used for the manufacture of a variety of ornamental articles.

According to this invention, the ornamental sheet metal is manufactured by forming a composite ingot or slab from two or more ingots, sheets or slabs of different metal or alloy which are secured face to face, one or more of said ingots, sheets or slabs being shaped or cut to expose the surface of the metal or alloy beneath; and by subsequently rolling the composite ingot or slab until the desired cross section or thickness is obtained.

Referring to the drawings:—

Figure 1 is an elevation showing two ingots when separated.

Figure 2 is a similar view showing the two ingots secured to form a composite ingot.

Figure 3 is an elevation showing a part of the composite ingot after a preliminary rolling.

Figure 4 is a similar view to Figure 3 showing the result of a machining operation.

Figure 5 is a plan view of Figure 4.

Figure 6 is an elevation showing the edge of the sheet metal formed after a final rolling.

Figure 7 is a sectional view drawn to a larger scale illustrating the sheet metal illustrated in Figure 6.

Figure 8 is a plan of a composite ingot formed from five layers of different metal or alloy.

Figure 9 is a section on line 9—9 of Figure 8.

Figures 1 to 7 of the drawings illustrate the steps in the manufacture of ornamental sheet metal having a surface composed of strips of two different metals occurring alternately, for example, copper and brass. It is to be understood that this is merely a simple example of a large number of different patterns or ornamental surfaces that may be produced by means of this invention. In Figure 1, an upper ingot of brass is represented at 10 which is shown placed above a lower ingot of copper represented at 11. The brass ingot 10 is shown approximately one third of the thickness of the copper ingot 11 as an example of the way in which the relative thicknesses of the different ingots may be gauged in a proportion in-

versely of their relative hardness, in order to produce final sheet metal in which the thicknesses of the different metals are approximately equal. Figure 2 shows the ingots 10 and 11 secured face to face by brazing at 12, thereby forming a composite ingot. This ingot is then rolled in the direction of the arrow in Figure 2, hereinafter referred to as in a transverse direction, until its length has become equal to a standard width which it is desired that the finally produced sheet metal will have. Figure 3 shows a part of the ingot after this transverse rolling operation. The face of this ingot is then subjected to a machining operation so as to remove parts of the brass ingot or layer 10 to leave a series of strips 15 separated by a series of spaces 16 of approximately equal width. This machining operation may be conveniently carried out by means of a series of milling cutters secured the desired distance apart on a transverse spindle which is rotated continuously and gradually moved along the face of the work. It will be seen from the drawings that the machining is done in a longitudinal direction, that is, in a direction at right angles to the direction of the preliminary rolling operation. In the machining operation, the brass 10 is cut completely through, and the surface of the copper 11 is also slightly cut to remove the brazing material employed in securing the separate ingots.

This rolled and machined composite ingot is then subjected to a rolling process, or a series of rolling processes, in a longitudinal direction, that is, in a direction parallel to the strips 15. By this means the brass strips 15 become embedded in the softer copper matrix 11, and sheet metal having a flush smooth surface composed of alternate strips of brass and copper is produced. An elevation or view of the edge of this metal is shown in Figure 6, it being understood that the thickness is exaggerated for the sake of clearness. A still larger view of the final sheet metal is shown in Figure 7. From this figure it will be seen that the boundary between the copper surface and the brass surface is regular and clearly defined. It is found in practice that when the composite ingot shown in Figures 4 and 5 is rolled in a direction longitudinally of the strips 15, the strips 15 do not expand laterally, but they preserve their original width and are only extended longitudinally and become

embedded in the copper ingot or layer below, and thus sheet metal having a width equal to the length of the composite ingot after its preliminary rolling is produced.

The rolling operations may be carried out in several stages as found convenient, and the metal may be annealed one or more times as the rolling progresses. For example, the composite ingot may be annealed after the preliminary rolling and before its surface is subjected to the machining operation.

Figures 8 and 9 of the drawings illustrate, by way of example, a composite ingot formed from a plurality of ingots or layers of different metals or alloys so as to produce sheet metal having a more elaborate surface. The example shows an ingot formed from five layers of metal or alloy in which squares are cut out of the four upper layers, the squares becoming progressively smaller with the lower strata of metals. In this way a pattern is produced having a comparatively large number of different colours on its surface.

From the foregoing it will be readily appreciated that by means of this invention, we have invented a new method of manufacturing sheet metal, enabling a large variety of fancy or ornamental surface patterns to be produced. Although simple patterns or designs have been shown in the drawings, it is to be understood that more elaborate designs or patterns may be employed if desired, and that curved lines and pictorial representations may be resorted to. The invention is particularly applicable to working with brass and copper, and the final sheet metal produced may be spun or otherwise worked in the usual way. The metal can be used for making such articles as finger plates for doors, hearth furniture and flower pots with very pleasing results. The metal can also be formed into tubes which can be bent and used for constructions such as bedsteads.

What we claim then is:—

1. The process of manufacturing sheet metal involving the preparation of a composite slab formed by securing face to face layers of different appearance, removing parts of the surface of the composite slab in order to expose the metal of different appearance below said surface, and subsequently rolling the composite slab, whereby sheet metal having an ornamental surface is produced.

2. The process of manufacturing sheet metal involving the preparation of a composite slab formed by securing face to face layers of different appearance, rolling the composite slab previously to the removal of parts of its surface, removing parts of the surface of the composite slab in order to expose the metal of different appearance below said surface, and subsequently rolling the composite slab.

3. The process of manufacturing sheet metal involving the preparation of a composite slab formed by securing face to face layers of different appearance, subjecting the composite slab to a preliminary rolling, annealing the composite slab, removing parts of the surface of the composite slab in order to expose the metal of different appearance below said surface and subsequently rolling the slab to sheet form.

4. The process of manufacturing sheet metal involving the securing of layers of different metal face to face by fusion with an intermediate metallic joining substance to form a composite slab, subjecting the composite slab to a preliminary rolling, annealing the composite slab, removing parts of the surface of the composite slab in order to expose the metal of different appearance below said surface, said removal being effected by a machining operation with the use of milling cutters, and subsequently rolling the composite slab to produce sheet metal of uniform thickness and having an ornamental surface.

5. The process of manufacturing sheet metal involving the formation of a composite ingot by securing ingots of different metal face to face by fusion with an intermediate joining substance, subjecting the composite ingot to a preliminary rolling until its length becomes equal to a standard width, annealing the rolled ingot, machining the surface of the annealed ingot with milling cutters in a direction transversely of the direction of the preliminary rolling to expose strips of the different metal below said surface, and rolling the machined ingot in a direction transversely of the direction of the preliminary rolling to produce ornamental sheet metal of the standard width and uniform thickness.

In witness whereof we affix our signatures.

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