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PROVISIONAL SPECIFICATION.

**An Improved Method of Inlaying Metals.**

We, S. MORDAN AND COMPANY, LIMITED, Manufacturers, of 41, City Road, London, and PERCY LEONARD BEDFORD, of 110, Rushmore Road, Lower Clapton, London, Silversmith, do hereby declare the nature of this invention, to be as follows:—

5 This invention relates to an improved method of inlaying metals, whereby the work can be effected in a more expeditious manner than has hitherto been possible.

In carrying out the invention, and according to a method for inlaying silver with gold, so that it can be readily rolled out into a sheet suitable for working  
10 up into any desired article, or object, an ingot or plate of silver is first prepared to the requisite thickness, and grooves are milled, or otherwise, formed therein. These grooves are then coated with a flux consisting, advantageously, of a thin solution of borax, this latter having, previously, been preferably  
slate ground.

15 An alloy, say of silver solder and gold solder mixed together, is then rolled down to the requisite thickness, and is cut into strips corresponding to the dimensions of the grooves, the said strips being then laid into these grooves and on to the borax coating. The alloy is then coated with the borax solution.

20 A length or strip of gold wire of suitable cross section, as for instance dovetail, is then laid in each of the grooves, and on the surface of the alloy, with its smaller face upwards.

The ingot or plate, thus prepared, is passed through a rolling-mill, sufficient pressure being applied to it to close the edges of the grooves tightly on to the edges of the gold wire. This ingot, or plate, containing the gold wire, borax  
25 solution, and alloy, is then fired at such a temperature as will completely "flush" or fuse the alloy until it rises or appears along the edges of the grooves of the ingot or plate, and along those of the gold wire.

30 The ingot or plate is then pickled in the usual and well-known manner, and the excess silver is milled off, or otherwise removed. The whole ingot, or plate, is then levelled down by any suitable means, for instance by a file, so that no trace of the solder alloy is perceptible. It is then ready for rolling  
down to the gauge required.

In order to ensure the gold fillings or bars being all of the same length when  
35 finally rolled, when there are intervening transverse spaces between the gold parts, the gold may be laid in the grooves in short lengths, in the manner above described, with a gap or interval between them. The ingot, or plate, after being fired, cleaned, and smoothed down, is then milled transversely, and in such a manner as to trim the ends of all the gold parts to equal length. A  
40 piece of silver wire is then pressed into the transverse grooves, and the ingot, or plate, is rolled: the free or loose lengths, or ends, of the silver wire are then removed, prior to the ingot, or plate assuming the thickness of sheet required. The ends of the gold band sections are then squared, either by a

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file, or by any other suitable tool, and either by hand, or mechanically, to correct the slight deviations caused by rolling, so bringing the ends of the gold bands level. The sheet is now rolled in order to bring it to the required thickness, ready for being worked up into the desired article, or object.

Obviously, the invention is applicable to inlaying other metals than silver with gold; for instance it may be applied to inlaying silver with copper. 5

Dated this 15th day of February, 1913.

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## COMPLETE SPECIFICATION.

**An Improved Method of Inlaying Metals.**

We, S. MORDAN AND COMPANY, LIMITED, Manufacturers, of 41, City Road, London, and PERCY LEONARD BEDFORD, of 110, Rushmore Road, Lower Clapton, London, Silversmith, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, that is to say:— 15

This invention relates to an improved method of inlaying metals, whereby the work can be effected in a more expeditious manner than has hitherto been possible. 20

In carrying out the invention, and as an example of inlaying silver with gold, according to the improved method, so that it can be readily rolled out into a sheet suitable for working up into any desired article, or object, we first prepare an ingot, or plate, of silver, of any suitable thickness and mill or otherwise form therein grooves as when working with thin plates, which have been previously rolled to the gauge required ready for making up into articles, or objects. But according to our invention we employ, instead of a thin plate, a thick ingot or plate, of say .25 inches which, after it has been grooved and the inlay strips inserted, as hereinafter described, is rolled down to the requisite thickness, thus saving time and labour, and ensuring, in the case of expensive inlaying, such as gold, a much thinner gold inlay. Previously, however, to inlaying the strips in the grooves these grooves are first coated, as is usual with a flux consisting, advantageously, of a thin solution of borax, preference being given to borax which has been slate ground. 25 30 35

An alloy, say of silver solder and gold solder melted together in equal parts, is next rolled down to the requisite thickness (say .007 inches) and is cut into strips corresponding to the dimensions of the grooves, and said strips are then laid into the grooves, and on to the borax coating.

A length, or strip, of gold (dovetail in cross section) is then laid, with its smaller face upwards, in each of the grooves, and on the surface of the alloy. 40

The ingot, or plate, thus prepared, is now passed through a rolling-mill, sufficient pressure being applied thereto so as to close the edges of the grooves tightly on to, or against, the edges of the gold strip. This ingot, or plate, containing the gold strip, borax solution, and alloy, is then fired at such a temperature as will completely "flush", or fuse, the alloy, and cause it to rise, or appear, along the edges of the grooves of the ingot, or plate, and along those of the gold strip. 45

The ingot or plate is then pickled in the usual and well known manner in

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inlaying metals, and excess silver is removed therefrom by milling, or otherwise. The whole ingot, or plate, is then levelled down, by any suitable means, (for instance a file), so as to leave no trace of the solder alloy perceptible, and it is then rolled down to the gauge required, say .025 inches, the effect of this rolling being to elongate the ingot to say 10 times its original length.

In order to ensure the gold fillings, or strips, being all of the same length, when the ingot, or plate, is finally rolled, and when there are intervening transverse, or other spaces between the gold parts, the gold is laid in the grooves, in short lengths, in the manner above described, with a gap or interval between the said parts. The ingot or plate is then fired, cleaned, and smoothed down, and is afterwards milled transversely, or otherwise, as required, and in such a manner as to trim the ends of all the gold parts to equal length, or length required. A strip, or length, of silver, is then pressed into each of the transverse grooves, and the ingot, or plate, again rolled; the free or loose lengths of these strips being removed prior to the ingot, or plate, assuming the thickness of sheet required, that is to say when the transverse grooves have been rolled down to the finished thickness required (usually .025 inches). The ends of the gold strip sections are then evenly trimmed, (either by a file, or by other suitable tool, and either by hand, or mechanically), to correct slight deviations caused by rolling, so bringing the ends of all the gold strips level. The sheet is now further rolled in order to bring it to the required thickness, (usually .025 inches) ready for being worked up into the desired article, or object.

Obviously, the invention is applicable to inlaying metals other than silver with gold: for instance it may be applied to inlaying silver with copper.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim, is:—

1. A method of inlaying metals, wherein a thick ingot, or plate, is employed, instead of a plate previously rolled to the final gauge required, and which thick ingot, or plate, after it has been grooved and the inlay strips secured therein, is rolled down to the requisite gauge, so ensuring a much thinner inlay than formerly, substantially as described.

2. A method of inlaying metals, as for instance silver with gold, which consists in forming grooves in a thick ingot, or plate; coating said grooves with a suitable flux, and introducing into the coated grooves strips of an alloy (say gold and silver solder) corresponding in dimensions with those of the grooves; laying on the alloy a length or strip of gold of appropriate cross section (say dovetail) with its smaller face upwards; rolling the thick ingot or plate to close the edges of the grooves tightly against those of the gold strip; firing the ingot, or plate, so treated, to "flush" or fuse, the alloy, and cause it to appear along the edges of the grooves and those of the gold strip; pickling the ingot, or plate, and removing excess silver therefrom; levelling the ingot, or plate, to remove all trace of the solder alloy; and finally, rolling the ingot, or plate, down to the gauge required, substantially as described, so bringing said inlaid plate, into a condition to be worked up into the desired article or object.

3. In the inlaying of metals according to Claim 1, and for ensuring the metal fillings being all of the same length when there are intervening spaces between the metal parts, laying the gold or other inlaying metal, in short lengths, in the grooves in the ingot, or plate, then firing, cleaning, and smoothing down the ingot, or plate, and milling it transversely, or otherwise, so as to trim down the ends of the inlaid metal parts to equal length; then inserting a strip, or length, of silver into the aforesaid grooves, and again rolling the ingot, or plate; then removing the free or loose lengths or ends of the silver strip from said grooves, prior to bringing the ingot or plate to the thickness of sheet required; then evenly trimming the ends of the inlaid metal sections to correct deviations due to rolling, and to bring all the ends of these sections level; and, finally,

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rolling the sheet to the requisite thickness, substantially as described, so bringing the said sheet into a condition to be worked up into the desired article or object.

4. The application of the said method, as under Claims 1, 2, and 3, to the inlaying of metals other than silver with gold. 5

5. The improved method of inlaying metals substantially as hereinbefore described.

Dated this 9th day of July, 1913.

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