

Jan. 22, 1929.

1,699,559

F. H. AULD

INLAID WORK

Filed Jan. 11, 1926

3 Sheets-Sheet 1

Fig. 1.

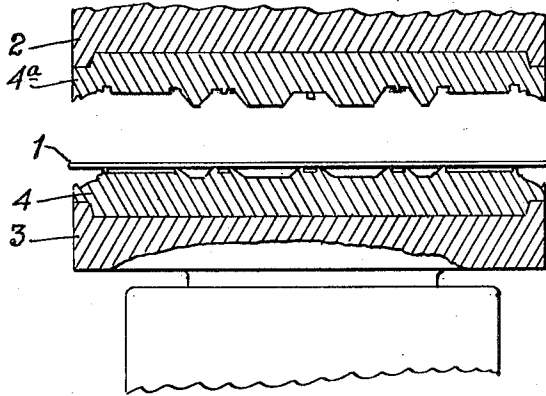


Fig. 2.

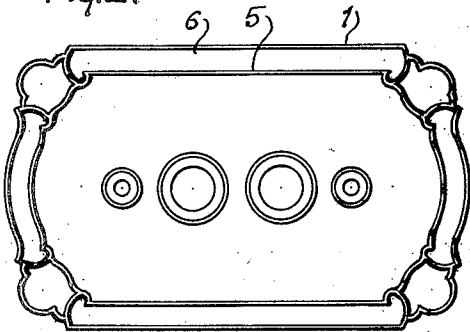


Fig. 3.

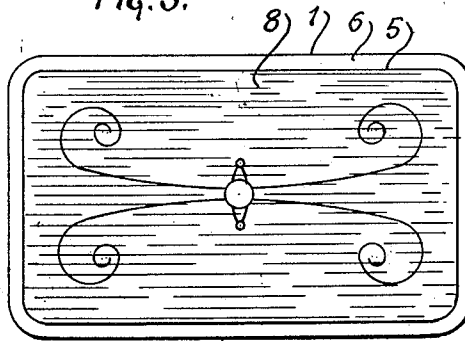
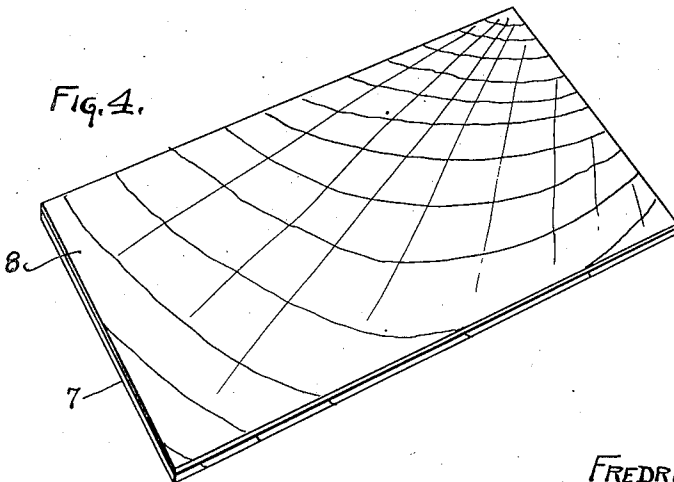


Fig. 4.



Inventor

FREDRICK H. AULD,

By Pauline Paulsen,

Attorneys

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F. H. AULD

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Fig. 5.

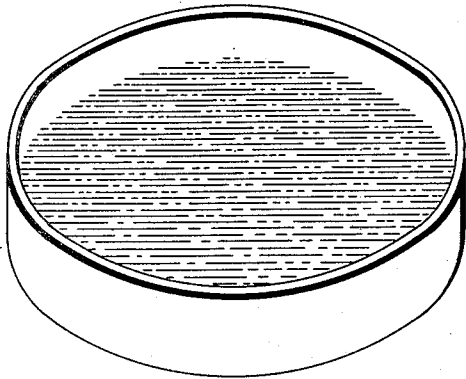


Fig. 6.

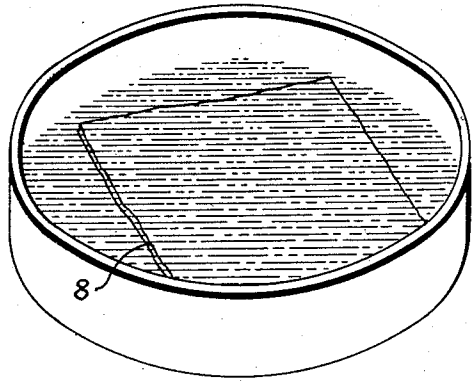


Fig. 7.

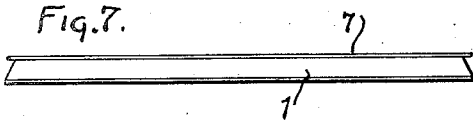


Fig. 8.

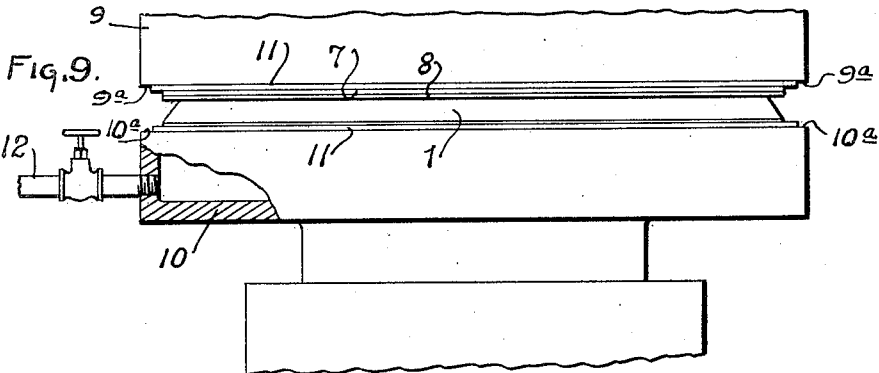
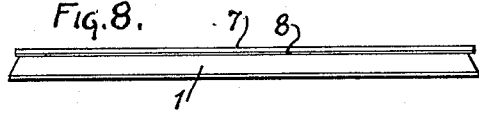
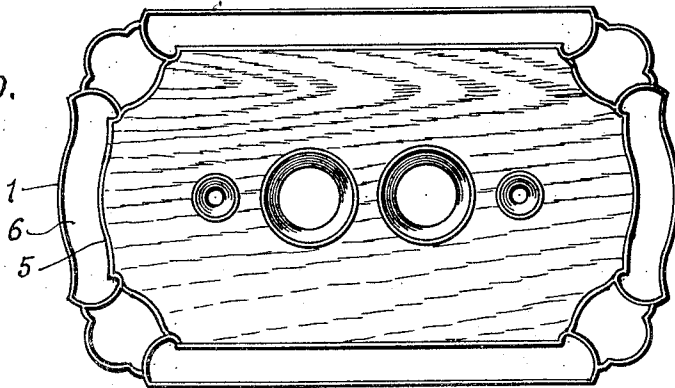


Fig. 10.



Inventor
FREDRICK H. AULD,
By Pauline Pauline,
Attorneys

Jan. 22, 1929.

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F. H. AULD

INLAID WORK

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3 Sheets-Sheet 3

Fig. 11.

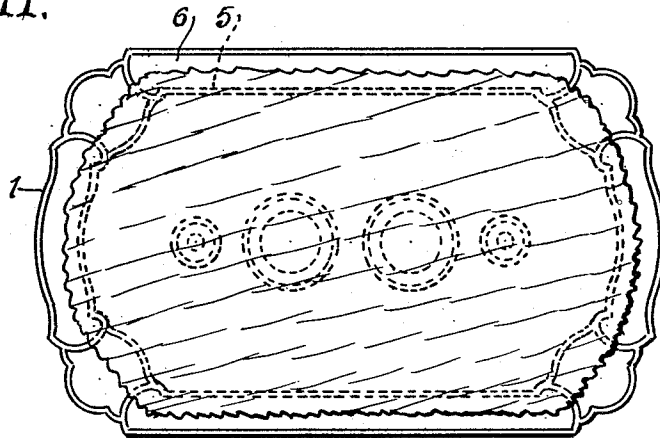


Fig. 12.

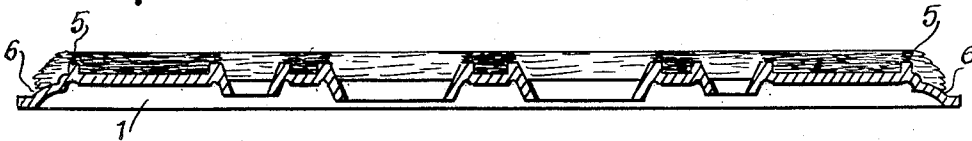
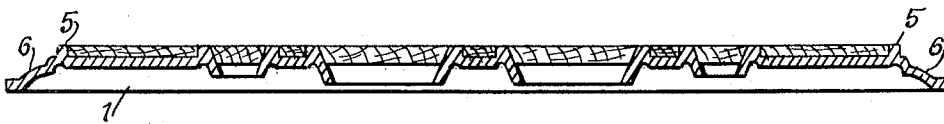


Fig. 13.



Inventor
FREDRICK H. AULD,

By *Faulstich & Faulstich*
Attorneys

UNITED STATES PATENT OFFICE.

FREDRICK H. AULD, OF COLUMBUS, OHIO, ASSIGNOR TO THE D. L. AULD COMPANY,
OF COLUMBUS, OHIO, A CORPORATION OF OHIO.

INLAID WORK.

Application filed January 11, 1926. Serial No. 80,483.

This invention relates to an improved method of producing inlaid work.

The first and principal object of my invention is the step of inlaying a veneer of wood into a plate having a design comprising raised tracery and depressed portions by the application of pressure applied to the veneer through the instrumentality of a substantially flat surface by which the portions of the veneer above the raised tracery are shattered into a splintered and partially disintegrated condition, whereby the portions of the veneer over the depressed places in the design may be forced by such pressure so applied with a substantially flat surface down into the recesses. I regard myself as the first to so shatter a veneer and so press it into depressed portions of a design through the action of a pressure instrumentality having a substantially flat pressure face.

A further object of the invention is to produce by this improved method various and sundry articles composed of a base plate of metal having a design wrought thereon in relief and an inlay of wood secured in the design in a manner which will render the articles durable with no liability of the inlay to work out of its places in the plate through the use of celluloid in sheet form partially dissolved on the surface and partially retained intact to form a bond and layer in the product and which is susceptible of a finishing step cheaply performed which gives the article a very beautiful and finished appearance with the tracery of the design on the plate and the fillings of the inlay intimately united and in striking contrast.

Such is the product produced by my improved method which may be cheaply and rapidly performed so as to render it feasible to commercially produce the product at low cost yet without impairing the finish and beauty of it.

The product comprises a great variety of articles such as plaques, name plates, electric button plates, picture frames, desk weights and ornaments, etc.

In the accompanying drawings forming a part of this specification:

Figure 1 is a diagrammatic representation of a die with a plate of metal within it preparatory to being treated to produce a design thereon;

Figure 2 is a face view of the metal plate

after the design has been impressed thereon; 55

Figure 3 is a view of a metal plate undergoing the operation of etching to produce the design instead of by the use of dies;

Figure 4 is a perspective view of a sheet of wood veneer after having been coated with acetone and overlaid with a thin skin or sheet of partially dissolved celluloid; 60

Figure 5 is a vessel containing a quantity of acetone or other solvent to be applied to the face of the metal plate and to the veneer; 65

Figure 6 is another vessel containing a quantity of acetone and a nearly dissolved sheet of celluloid;

Figure 7 is a side elevation of the metal base plate with the veneer applied to the ornamental face thereof; 70

Figure 8 is a like view to Figure 7 except that a sheet of celluloid is shown placed between the metallic base plate and the wood veneer; 75

Figure 9 is a diagrammatical view of a press with the plate and veneer therein, ready for the pressure step to be applied by the press;

Figure 10 is a face view of the completed product showing the veneer and tracery of the design after being dressed off; 80

Figure 11 is a plan view of the article in its condition after the inlaying or pressure step has been performed; 85

Figure 12 is a longitudinal sectional view of the same in the same condition;

Figure 13 is a like longitudinal sectional view after the dressing-off or finishing step has been performed, but before the removal of the portions of the veneer which have entered into the holes in the metal plate. 90

I have illustrated in the drawings above described in diagrammatical fashion, the means by which the several steps of my method are carried into effect in order to facilitate an understanding of the whole. 95

In practicing the method I take a plate of metal 1, preferably of brass, of suitable size for the particular ornamental article to be produced, say an electric push button plate adapted to be placed on the wall. This plate I place in a press comprised generally of a stationary head 2 and a movable head 3, the latter carrying a die 4 and the former a complementary die 4^a inscribed with the design to be produced on the plate, and in this manner by a die-action create in the plate the design 100 105

described. Or I may produce the design upon the plate by the well-known etching operation.

In Figure 2, I illustrate this base plate with a design fashioned on it by either of the ways above pointed out.

Assuming now that the design has been produced on the plate including a border line 5 and a beveled margin 6, I now apply to the raised surfaces constituting the tracery of the design and the depressed surfaces effected by the die or the etching a coating of acetone or other solvent which I allow to dry or partially dry. I next apply likewise a sheet of partially dissolved celluloid. Celluloid readily dissolves in a bath of acetone or other suitable solvent. I apply the celluloid in the form of a thin skin or partially dissolved sheet of celluloid as by laying the celluloid sheet, in a more or less advanced stage of dissolution by having been coated, dipped or immersed in acetone, on the design-face of the plate.

After applying the celluloid constituent to the plate, I then place a sheet 7 of wood veneer on the design-face of the plate, the celluloid sheet intervening.

I first coat the veneer with acetone as by dipping or with a brush. When more or less dry, I either coat the veneer or the metal plate with the partially dissolved celluloid sheet. Having so treated the wood veneer or the metal plate I place them together, the celluloid intervening between the veneer and the design on the face of the plate.

In Figure 7 will be seen the base plate, the veneer sheet, and an intervening sheet 8 of celluloid, preferably in a state of more or less dissolution as indicated in Figure 6.

I then place in the press composed of a head 9 and a platen 10 the partially completed product shown in Figure 7. As will be seen in Figure 8 I place one or more layers 11 of blotting paper or other soft material above and below the veneer and base plate to form cushions to prevent injury. I then operate the platen of the press and exert a strong compressive force on the veneer sheet and base plate, say from one hundred and fifty pounds to the square inch to one thousand pounds, according to the nature of the design and other conditions. The effect of this pressure is to drive the wood down into the recesses that border the tracery of the design, and to more or less crush that part of the veneer which lies above the lines of tracery. I maintain this pressure say from two minutes to ten minutes. That gives time for the adhesive materials composed of the partially dissolved celluloid sheet, to dry and firmly and permanently unite metal plate and the wood veneer which latter has now become inlaid in the depressions of the plate between the lines or tracery of the design. I also add heat ranging from two hundred to

two hundred and fifty degrees, Fahrenheit, to this operation, as by the introduction of steam into the platen which is made hollow for that purpose and is connected to a source of steam supply by a valve control pipe 12 having flexible connections to permit of the movements of the platen.

It will be observed that the face of the head 9 as well as the face of the platen 10 is in a single horizontal plane as indicated by the numerals 9^a and 10^a in Figure 9. This produces flat surfaces in the press, the surface 10^a to support the base plate and the surface 9^a to contact with the upper face of the wood veneer. It will be observed, and I lay particular stress upon this, that while the base plate on its upper face is composed alternately of the tracery of the design in relief and the depressed portions, as seen more particularly in Figures 12 and 13, still the face 9^a is flat or in one plane, and yet that the wood veneer pressed by this flat surface has been made to enter fully down into the recesses and become inlaid therein while those portions of the veneer which were above the lines of tracery have been shattered by the pressure to such an extent that the portions of the veneer over the recesses have been caused to descend therein. Thus it will be seen that while the pressure surface 9^a is essentially flat and while the profile of the base plate is a succession of elevations and depressions, all of which are overlaid by the veneer and partially dissolved sheet of celluloid before the pressure is applied, nevertheless when this step of the process is completed, parts of the veneer have gone down into the recesses and other parts of the veneer, over the tracery, have become shattered and reduced to a thin splintery condition which has permitted the flat pressure-surface to so cause parts of the veneer to descend into the depressions. The partially dissolved sheet of celluloid has also been in part depressed into the design recesses to form the permanent binder, while the remainder over the tracery of the design has been dispelled with the shattered parts of the wood. And a shearing action on the veneer takes place at those edges of the elevated tracery which border the depressions, so that the veneer parts over the lines of tracery becoming shattered permit the pressure surface to come so near the line of the raised surfaces that the remainder of the veneer is depressed into the depressions. A reference to Figures 11, 12 and 13 will make this matter plain. Those parts of the veneer, shown in Figure 12, which are above the lines of tracery are the shattered parts, the fragments of which are later removed by the planing or dressing-off step which leaves the product with all of the veneer removed save that which occupies the depressions and is inlaid therein, as shown in Figure 13.

I conceive myself to be the first to inlay

one material into another, as wood veneer into a metal base, by means of pressure exerted against the veneer through the instrumentality of a substantially flat surface as compared with the irregular topography of the design with its lines in relief and its surrounding fields depressed, the veneer portions over the relief lines being shattered and those over the depressed fields being thereby forced into inlaid position.

I further conceive myself to be the first to permanently and effectively secure together a veneer of wood and a metal base plate having designs in which the tracery is in relief and the surrounding fields are depressed, by combining therewith a partially dissolved sheet of celluloid placed between the veneer and such designs so in relief and depressions, and which composite structure I subject to pressure and heat, whereby the wood of the veneer is permanently fixed through the action of the partially dissolved celluloid, which constitutes a third layer, down in the depressions; and the portions of the veneer over the lines of tracery being shattered and that part of the partially dissolved celluloid sheet being removed with the shattered portions.

When the adhesive material has set I remove the article from the press and allow it to cool. I then bring the wood veneer, now in a more or less roughened or crushed state in part, while the remainder has been embedded or inlaid in the depressions between the tracery of the design, in contact with an abrading machine, say an endless belt coated with fine sand or other abrading material after the fashion of sand or emery paper. This grinds or rubs off the wood and removes the surplus along with that part of the celluloid sheet adhering thereto, leaving only that which is inlaid; and this also polishes or dresses off the exposed metal portions of the plate, whereby the product is finished and given a smooth and handsome appearance.

In the case of some woods I then apply either a finishing coat as oil or varnish to preserve the wood from the effects of moisture and to add to the completeness of the finish.

Thus it will be seen that my improved method consists of the following steps:—

(a) Fashioning by dies or etching, a base plate of metal with depressions which leave elevated tracery that constitutes the design.

(b) Coating the depressed and raised surfaces with acetone or any equivalent.

(c) Then coating such depressions and raised surfaces with celluloid in the form of a sheet saturated with acetone later pressed into the recesses and against the raised lines. When a sheet of celluloid is used it partially dissolves and makes a sticky mass from the action of the coating of acetone and the effects of the heat applied during the step of

pressing the veneer into the metal plate, while the undissolved portion of the sheet remains as a binding layer in the composite product.

(d) Coating a sheet of wood veneer with acetone by brush or immersion.

(e) Then placing such coated veneer against the celluloid sheet above referred to.

(f) Placing the veneer sheet so treated on the metal base so treated as above.

(g) Placing the structure now composed of the metal base and veneer sheet with the intervening partially dissolved celluloid sheet, in a press and subjecting it to pressure applied by a substantially flat surface ranging from 150 pounds to 1,000 pounds, more or less, per square inch, say for two to ten minutes, more or less, until the sheet of veneer has been forced down into all of the depressions in the metal plate, with the portions of the sheet in contact with the raised tracery of the design more or less disintegrated or shattered.

(h) In accompanying the pressure step with heat, as by introducing steam into the platen of the press to raise the temperature to about 200 to 250 degrees.

(i) In removing the structure and subjecting the veneer to a planing or abrading action to remove all the surplus and leave a smooth surface of both the now inlaid portions of the veneer and the exposed tracery of the design.

It will further be understood that I claim the step or feature of applying the pressure to the veneer, quite independently of the other steps, in a manner to shatter the veneer portions which overlie the tracery of the design and thereby enable or cause the pressure to depress into the recesses of the design those portions of the veneer which before the pressure is applied overlie such depressions and to effect this result by the application of such pressure to the veneer through the utilization of a substantially flat surface.

Wherever I have used the name acetone and the name celluloid I desire to be understood as including their equivalents, the one to render the other in a proper state to make it act most effectively as an adhesive, and the adhesive to perform the function of adhering the veneer to the metal plate.

It will be understood that I desire to comprehend within my invention such modifications as may be necessary to adapt it to varying conditions and uses.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The herein described method of producing ornamental inlaid work, consisting in fabricating a design on a plate of metal; in applying over such design a sheet of partially dissolved celluloid; in applying a wood veneer upon the design-face of the plate with said sheet intervening; in subjecting this now

composite article to severe pressure sufficient to embed the veneer and said sheet into the depressions in the design and to shatter those parts of the veneer and sheet which overlie the tracery of the design; in releasing said pressure and removing the article; and in subjecting the article to a dressing-action to remove the shattered parts of the veneer and polish the inlaid portions and the lines of tracery.

2. The herein described method of producing ornamental inlaid work, consisting in fabricating a design on a plate of metal; in applying to said plate a sheet of celluloid previously subjected to the action of a dissolving agent for partial dissolution; in applying a wood veneer saturated with such agent upon the design-face of the plate with said celluloid sheet intervening; in subjecting this now composite article to severe pressure sufficient to embed the celluloid sheet and the veneer into the depressions in the design and to shatter those parts thereof which overlie the tracery of the design; in releasing said pressure and removing the article; in subjecting the article to a dressing-action to remove the shattered parts and to polish the inlaid portions of the veneer and the lines of tracery.

3. The herein described method of producing ornamental inlaid work, consisting in fabricating a design on a plate of metal; in applying to the tracery and depressed portions of the design celluloid in sheet form; in applying a wood veneer coated with acetone and such celluloid sheet upon the design-face of the plate; in subjecting this now composite article to severe pressure sufficient to embed the veneer and said sheet into the depressions in the design and to shatter that part of the veneer and sheet which overlie the tracery of the design; in releasing said pressure and removing the article; and in subjecting the article to a dressing-action to remove the shattered parts of the veneer and polish the inlaid portions and the lines of tracery.

4. The herein described method of producing ornamental inlaid work, consisting in fabricating a design on a plate of metal; in coating the depressed and raised surfaces of the design with acetone; in then coating such depressions and raised surfaces with partially dissolved celluloid in sheet form; in coating a wood veneer with acetone; in placing the veneer sheet so treated on the metal base with the celluloid intervening; in placing the structure so composed in a press and subjecting it to pressure sufficient in pounds and time to force the veneer and celluloid down into all of the depressions in the metal place and to shatter the parts of the veneer over the tracery of the design; in accompanying the pressure step with heat sufficient in degree and time to cause the celluloid sheet to thoroughly bind

together the veneer and the metal; and in subjecting the article to a dressing-action to remove the shattered parts of the veneer and polish the inlaid portions and the lines of tracery.

5. The herein described method of producing ornamental inlaid work, consisting in fabricating a design on a metal plate by a die operation; in applying to the tracery and depressed portions of the design partially dissolved celluloid in sheet form; in applying a wood veneer coated with acetone upon the design-face of the plate with such celluloid intervening; in subjecting this now composite article to pressure ranging from approximately one hundred fifty pounds upward during a period of two to ten minutes and upward until the veneer and sheet have been forced down into all of the depressions in the metal plate and the raised portions of the veneer in contact with the tracery of the design have been shattered; in accompanying the pressure step with heat ranging from approximately 200 degrees upward; in removing the structure and subjecting the article to a planing action to remove the surplus veneer and celluloid sheet and leave a smooth surface of both the now inlaid portions of the veneer and the exposed tracery of the design.

6. In the herein described method of producing ornamental inlaid work, the step of fabricating a design on a plate of metal; and the step of applying to the tracery and depressed portions of the design a coating of acetone and a partially dissolved sheet of celluloid.

7. The herein described method of producing ornamental inlaid work, consisting in fabricating a design having raised and depressed surfaces on a plate of metal; in applying a sheet of partially dissolved celluloid upon the metal design; in applying a wood veneer upon such design face of the plate with said celluloid sheet intervening; in subjecting the now composite article to severe pressure applied by an instrumentality having a substantially flat surface to shatter that part of the veneer and sheet which overlie the tracery of the design and to embed in the depressions those parts of the veneer and sheet which overlie them; and in the application of heat to the composite article during the application of such pressure.

8. In an article of the character described, a metal plate having a design in relief wrought thereon, a veneer of wood occupying the depressions between the tracery of the design, the tracery being thereby exposed to the eye, and a sheet of surfaced-dissolved celluloid also occupying said depressions and located between the metal and the veneer, the state of partial dissolution of the celluloid acting as a permeating binder between

the wood and metal and the undissolved remainder thereof forming an adhering lamina.

9. In an article of the character described,
5 a metal plate having a design in relief wrought thereon, the plate being overlaid with a coating of acetone, a veneer of wood saturated with acetone and occupying the
10 the tracery being exposed to the eye, a sheet

of surfaced-dissolved celluloid occupying said depressions and located between the metal and the veneer, the state of partial dissolution of the celluloid acting as a permeating binder between the wood and metal and the undissolved remainder thereof forming
15 an adhering lamina.

In testimony whereof, I affix my signature.

FREDRICK H. AULD.