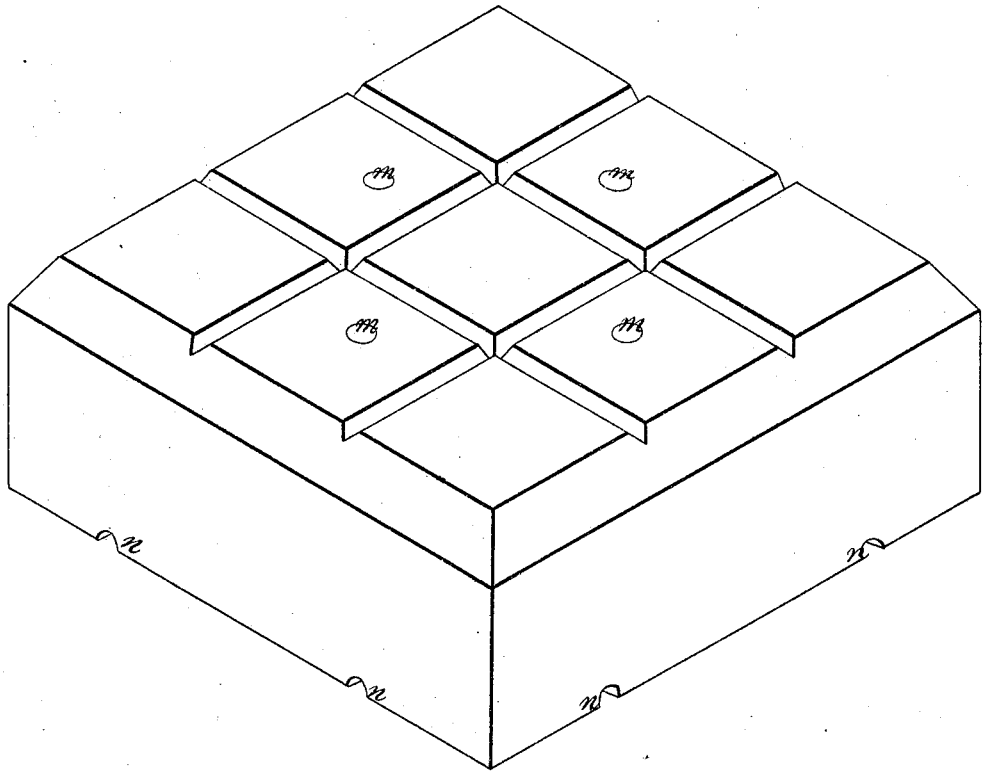
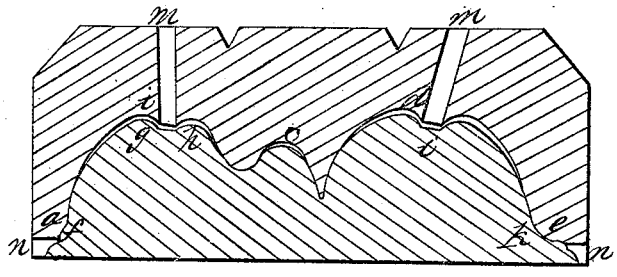
H. Wood,

Ornamenting Wood.

No. 7111. Patented Feb. 19, 1850.





UNITED STATES PATENT OFFICE.

HAMILTON WOOD, OF NEW YORK, N. Y.

BURNING ORNAMENTAL FIGURES UPON WOOD.

Specification of Letters Patent No. 7,111, dated February 19, 1850.

To all whom it may concern:

Be it known that I, HAMILTON WOOD, of New York, in the county of New York and State of New York, have discovered a new and useful Improvement in Ornamenting Wood; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view of a mold or die. Fig. 2 is a section of the mold or die and the manner in which it acts upon the wood.

The character of my invention for which I solicit patent of the United States is an improvement on an "art" or manufacture which consists of a process or processes for treating wood whereby from its rough or natural state, without the aid of cutting tools or like mechanical devices, may be produced fac-simile copies of ornamental moldings, panels, figures, medallions, busts, caryatids, or other objects and figures without limitations as to elaborateness and richness, the same being in high relief, having all the sharpness of outline, and perfection of the originals, whether the designs be square, concave, cylindrical, or otherwise.

The discovery or invention on which my improvements are based consists of a method of treating pieces of wood, so as to produce uneven surfaces or figures on them, by branding them with ret hot metallic molds or dies, which molds or dies, have the figures or uneven surfaces desired to be produced upon the wood, cast or cut upon them.

In the process referred to, which may be found described in the *Repertory of Patent Inventions* for 1845," a mold or figure of the object to be produced on the surface of wood, is first made, and from this a matrix or reverse mold is taken or cast in metal; this mold or die is then put into a furnace and heated red hot, it is then taken in its heated state and transferred to the bed of a press, in such a position that the block of wood intended to take the impression can be brought quickly upon the mold, so that the wood burns or chars in those places first touched. In deep molds constructed to have figures in high relief upon the wood one heating will not answer but it has to be again introduced into the furnace and reheated. The wood meanwhile being thrown into water or other liquid," (as the old specification has it), and cleaned by carefully brushing and scraping away the burnt parts. The mold or die being again re-heated as before stated, is brought in contact with the wood and the impression thereby deepened each time, the scraping and brushing being repeated as before until the figure is produced. This is the substance or *modus operandi* of the process referred to.

Having attempted to work the invention thus described I found that it could not be operated successfully. I have therefore discovered improvements upon it in the following particulars, in consequence of which I am enabled to reproduce, and multiply at trifling cost, when compared with the originals, the most elaborate, and exquisite carvings, with all the sharpness of outline, and delicacy of touch, belonging to the finest productions of the artist's chisel.

The improvement consists, first, in the method of constructing the dies or molds; second, in the treatment of the wood in removing the charred or burnt surface, so as to leave a perfect figure; and third, in the discovery of a peculiar tool or brush as applied thereto.

In the first place, by no process of making the dies or molds before described, could any figure be produced wholly without the aid of the chisel in retouching it, because it was impossible to produce the full depth of the figure, and retain the sharp outline on the high surfaces, as in drapery, foliage, &c., but by means of my improvements in making the dies I produce a perfect imitation in every respect to the minutest line without the aid of any cutting tool or like hand process whatever: That is to say when the char is cleaned away from the wood after my dies have been used, the figure is produced perfect. To accomplish this I take in the first place a cast of the figure to be imitated in wax or other substance, and from this cast a model which serves to form a matrix. In order from this to obtain a proper die or mold, which must contain the figure in reverse, I proceed to finish all the projections with an extra degree of sharpness, and also give greater depth and dimensions to those parts which are most prominent in the original figures, in the manner to be more fully described. From the matrix thus prepared a metal casting is obtained for the mold or

die. This is then to be chased and cleaned by the use of chasers, acids, and friction, until fit for giving the impression. The object of deepening the figure in the mold, is in order to allow for the increased degree the wood is charred in those sunken parts; calculations being thus made for the extra depth of the burnt surface, so that when the char is removed the wood shows the real dimensions of the original, for without this enlargement of the mold in those places the proper effect could not be produced unless attained by the carvers chisel afterwards.

In Figs. 1 and 2 are views of the mold thus prepared. Fig. 2 is a section.

The letters (*a*, *b*, *c*, *d*, *e*,) represent the outline of a figure to be produced in wood and (*f*, *g*, *h*, *i*, *k*,) is the section of the figure after it is finished and is the appearance it would have if then inserted in the die. The space (*b*, *g*,) (*c*, *h*,) (*d*, *i*,) is to represent the depth to which the die has charred the wood and for which calculation must be made in constructing the die; near the points (*a*, *f*,) (*k*, *e*,) so much calculation is not required, nor in the more shallow parts, as in these the heat does not concentrate with such force as in the prominent parts of a figure. During the process of burning the wood, much gas, vapor, smoke, &c., is formed at the points of contact of the die with the wood; this accumulates to such a degree as to burst the wood asunder in order to escape, and thereby destroys the piece, and this is especially the case in producing articles in high relief. To avoid this danger, and remedy such defects, is the object of a second improvement in the construction of the dies. This consists in boring a series of holes through the surface leading to the points of the figure where the accumulation will be greatest; these holes may be seen at (*m*, *m*,) and form suitable vents for the escape of these gases &c. The top of the die is crossed with a series of deep cuts to allow the smoke thus escaping to pass out from beneath the follower of the press.

(*n*, *n*,) are a series of vents cut also on the face of the die for the same purpose as (*m*, *m*). The face of the dies may be of various curves, as well as flat, by means of which moldings, corner pieces, chair backs, and all like articles, can be readily produced; also the dies may be formed with two faces, carved with figures, so as to produce at one pressure two subjects at a time.

The operation is as follows: The dies prepared as above described are put into a proper furnace and heated to redness, thence they are transferred to a press on the frame of which the wood to be acted upon is previously placed; the die being quickly put upon the wood, the follower is brought down upon it, and there subjected to severe pressure until it ceases to burn. The die being removed the wood is thrown immediately into an alkaline bath, consisting of a solution of lime and soda, in water, the strength being determined by trials, according to the character of the water used and wood acted upon, the die being returned to the furnace for another heat if more pieces are to be produced from it at that time. If however the design to be wrought is of such a size, either in extent of surface or by reason of the bold projection of the figures, that once branding will not produce the work, then several heats will be requisite, practice being required to ascertain the precise point to which the burning must be carried; the charred surface meantime being roughly scraped off between each heat. The last application of the die ought always to be of a less heat than the first ones. The wood is to be treated as follows: After it is finished as to the burning part, the char is to be scraped off as much as will yield in the alkaline baths, then it is to be racked up to dry, in which drying the shrinkage of the unburnt surfaces, being greater than of the burnt, (*i. e.* that which could not be removed by the scraper) the latter crumbles off, the more readily by reason of such shrinkage. In this state it is removed to a bath of water made slightly acid by the introduction of a small quantity of oil of vitriol, and there the process is completed by brushing with a brush of suitable materials until the charred parts are all removed, and the clear wood left with the various figures produced upon it.

It has required no little ingenuity to find a suitable brush for the purpose; the qualities required in the brush to perform the work well, are hardness and stiffness, but yet not so great as to scratch the surface of the clear wood, but sufficiently rigid to produce considerable mechanical action. Broom corn, whalebone, bristles, and wire, are deficient for the purpose; for where sufficient stiffness is obtained, the scratching quality comes with it, and materials which do not scratch have not the required mechanical action. It was necessary to find a material combining the two. This after numerous experiments I found in a weed called "India bass," a peculiar hard and tough grass; brushes made in the ordinary way with it, are perfectly successful.

In molding works of great extent I make numerous molds of the various parts, and form the wood in sections, gluing them up afterwards at their proper joints. In heating the molds care must be taken that they are not blistered in the furnace, the construction of which must be such as to allow of the heat coming from beneath them, and not to sweep over the surface as in reverberatory furnaces.

What I claim as my invention and dis-

covery, and desire to secure by Letters Patent, is—

1. The method I have described for constructing the molds or dies so as to allow for the excessive depth they will char the wood in certain parts of figures, in order that the whole figure when finished shall be an exact resemblance of the original.

2. I claim the channels or other like devices cut in the face of the dies, for escape passages for the gases, smoke, &c.

3. I claim the use of an alkaline and acid solution, or baths to aid the removal of the charred surface.

I do not claim branding or the production of uneven surfaces or figures by hot metal mold pressed upon wood but the several improvements as above claimed on the art within described.

HAMILTON WOOD.

Witnesses:
J. P. PIRSSON,
J. L. KINGSLEY.