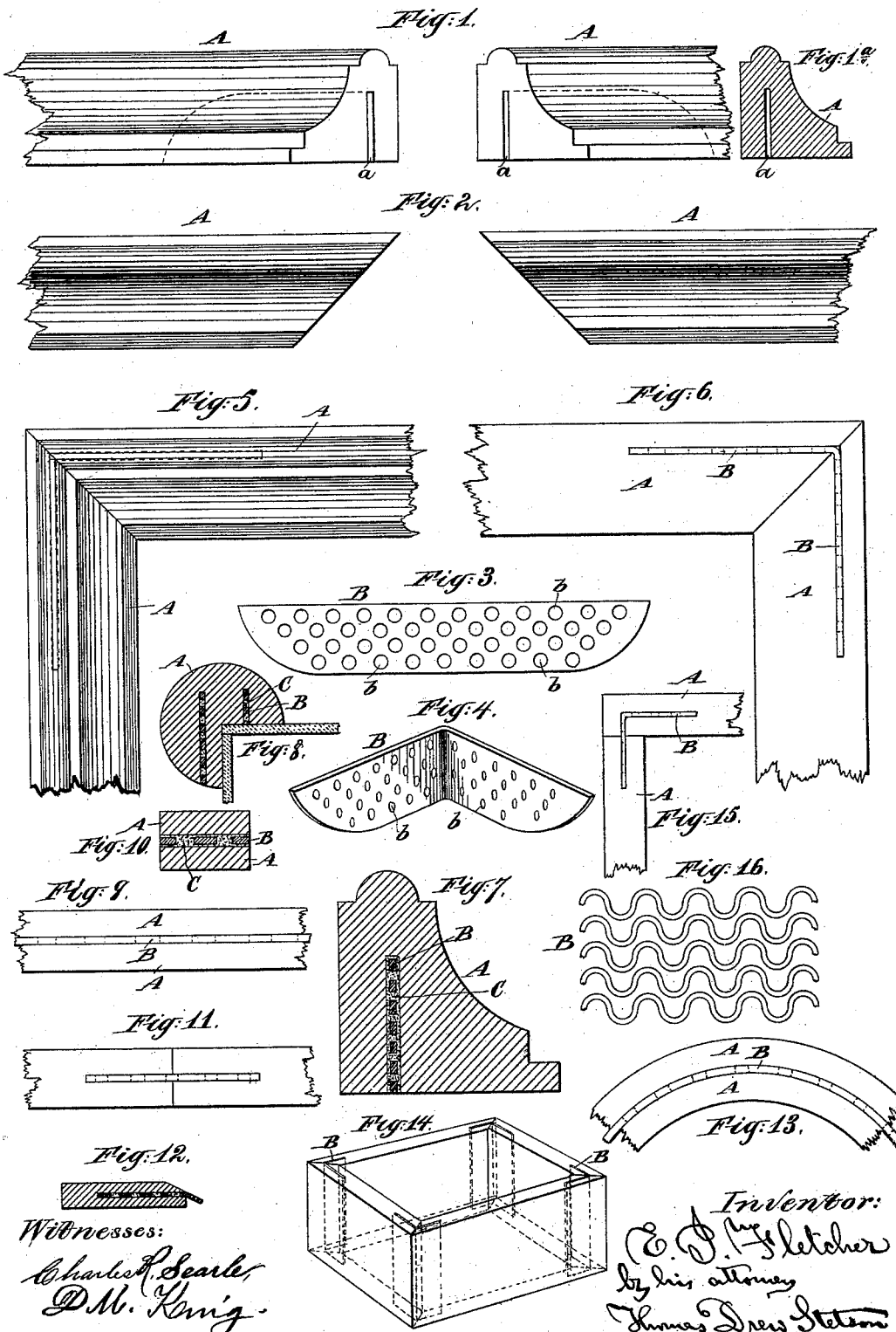


(No Model.)

E. J. FLETCHER.  
MEANS FOR JOINING WOOD.

No. 419,763.

Patented Jan. 21, 1890.



# UNITED STATES PATENT OFFICE.

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## MEANS FOR JOINING WOOD.

SPECIFICATION forming part of Letters Patent No. 419,763, dated January 21, 1890.

Application filed December 3, 1888. Serial No. 292,468. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN JOHN FLETCHER, of the city and county of New York, in the State of New York, have invented a certain new and useful Improvement in the Means of Joining Wood, of which the following is a specification.

There is a difficulty in making the corners of trays used in show-cases or elsewhere, and the corners of frames for pictures, looking-glasses, and the like of equal strength with the other parts. Dovetailing is unsightly. What is sometimes known as "blind dovetailing," the material being dovetailed together below, but made to show a simple miter-joint on the front face, is expensive. Most of the work has to be done by hand. I have discovered that a sheet of thin perforated steel or other strong metal may be secured by gluing in a space between two thicknesses of wood and will contribute great strength to the structure. The wood will be reliably secured together by glue extending through the holes in the metal. My experiments indicate that the elasticity of the material is sufficient to allow for the differences in expansion and contraction in all articles of moderate size and subjected to only ordinary changes of temperature. I join the moldings forming the border of a tray for a show-case, or the moldings forming the frame of a show-case itself, or the moldings for a picture-frame or looking-glass frame by sawing into the moldings from the back nearly through to the front with a circular saw of small diameter, and then inserting therein thin metallic fastenings adapted to serve upon the principle above outlined. I can make such fastenings of wire-cloth or of wires lying one above another, crooked or waved, and applied so as to form a nearly continuous layer of metal. I prefer to employ the metal in the form of perforated sheets. The invention carried out in either of these forms re-enforces the wood by metal, which metal is entirely concealed and makes the work very strong and reliable. I can apply it to straight pieces of wood for any purpose, applying the metal in the middle and the wood on the opposite

sides, either having the wood in two pieces pressed together, with the perforated metal and a sufficient quantity of glue between, and held till set, or having the wood in one piece of suitable thickness, sawed into from one edge, and the metal thrust into the saw-cut—technically "kerf"—and glued there.

In applying the invention to strengthen corners the metal should be bent in a short curve as nearly a sharp angle as can be made without much weakening the metal, and the wings extending each way from the angle should be planed and shaped by machinery or otherwise to the approximate form of the saw-kerf which is produced in the wood.

The following is a description of what I consider the best means of carrying out the invention.

The accompanying drawings form a part of this specification.

Figure 1 is an edge view of two pieces of molding smoothly sawed across at an angle of forty-five degrees, sometimes termed a "miter-bevel," and sawed to adapt them to receive the thin perforated metal and glue by which they are to be joined to form a corner of a tray or of a frame. Fig. 1<sup>a</sup> is a cross-section. Fig. 2 is a plan or face view of the same. Fig. 3 shows a piece of thin steel or other strong metal cut in the proper form and perforated. Fig. 4 shows the same metal after being bent or partially folded, ready to be thickly covered with glue and inserted in the saw-kerfs in the wood shown in Figs. 1 and 2. Fig. 5 is a face view, and Fig. 6 a bottom or back view of a corner completed. Fig. 7 is a cross-section on a larger scale, showing the condition after the metal has been properly inserted. Fig. 8 is a cross-section showing the work completed as applied to the horizontal framing around the edge of the top of a show-case. This and the succeeding figures show modified forms of the invention. Fig. 9 is an edge view of a piece of molding or analogous wood strip having the metal extend quite across from edge to edge. Fig. 10 is a cross-section of the same. Fig. 11 is an edge view showing the invention applied at the junction of two abutting pieces of wood. Fig.

12 is a cross-section showing the invention applied to a common form of office-rule. Fig. 13 is an edge view corresponding to Fig. 9, except that the wood and the metal are curved. Fig. 14 shows the invention applied to the corners of a box. It is a perspective view. Fig. 15 is an edge view of a box-corner, showing a modified form. Fig. 16 shows a series of serpentine wires, which may serve in place of the perforated metal in any or all the forms.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

A A are pieces of molding which are to be joined at a right angle to form the corner of a tray for a show-case or to form the corner of a frame. From the back of each a saw-kerf is produced, as indicated by *a*, reaching nearly through to the front and extending along the length of the molding to a sufficient extent to allow the metal introduced to get a strong hold.

B is a sheet of thin steel bent at right angles and perforated, as indicated by *b*. I term this a "key."

The glue is represented by C.

To produce my corner the moldings previously cut with the proper bevel or mitered are sawed into by a circular saw of small diameter, or the narrow cut *a* is produced by other tools. The interior of this cut is wetted with thin glue, which is allowed to penetrate the wood, and the material thus prepared is heated and partially dried. When all is in the proper condition, a sheet of thin metal B, previously perforated and cut to the proper size and shape and bent to the required condition, is covered with strong glue, taking care to fill the holes *b*, and, the moldings A A being held in the correct position by hand or otherwise, the metal is thrust edgewise into the saw-kerf in each part, forming a reliable key. These parts should be held firmly in the correct position until cold, after which the surplus glue, if any, may be removed and the job is complete. The glue takes hold of the wood over the whole of the interior surfaces of the saw-kerfs. It locks with the metal by extending through the holes *b* therein. The metal being locked in each molding, the parts are strongly secured together by the metal being continuous across the joint.

Fig. 8 shows the invention applied to a show-case having a glass top and glass side. It is a vertical section through the frame and glass at the top near one corner. There are two of the thin metallic perforated sheets or keys B, bent or folded to a right angle to correspond with the angular position of the molding, the same as shown with single perforated sheets or keys in Figs. 5 and 6, and arranged parallel at a little distance apart. In other words, there are two of my keys in this joint.

Figs. 9 and 10 show a corresponding method

of applying metal in the interior of straight pieces of wood.

Fig. 12 shows the wood of the thickness required, sawed into from one edge, and the metal forced in, the operation being the same as when the metal is employed to re-enforce a corner, except that the metal extends the whole length of the wood and is not bent, but is plane throughout.

Fig. 11 shows the wood in two pieces, which may have been originally associated together or not, this matter being immaterial so long as each is of the proper character for the glue to adhere strongly, and the parts are put together under proper conditions with regard to heat, pressure, &c., to insure a reliable gluing. I prefer to put the wood pieces together in a pile with a sheet of the metal glued between each pair, and sheets of paper or analogous material introduced between each pair and the next to avoid gluing the pieces together where it is not desired by the excess of glue, which is liable to exude, and strongly compressing the pile until cold.

Modifications may be made in the details without departing from the principle or sacrificing the advantages of the invention.

The metal sheet may vary in thickness and in the size and number of the holes. It is only essential that there be a thin body of strong rigid material in an open-work form and the glue applied to stand in the openings and take a reliable hold on the whole interior of the kerfs *a*.

I can use more than two thicknesses of the wood with perforated or open-work metal between each and the next, glued as described.

I attach importance to the use of perforated sheet metal for the key B, because that material may be thin and may have small holes so close together as to present a large area for the glue to extend through, and will require but a thin saw-kerf and but little glue or other cement and contribute great strength and stiffness.

I can use papier-maché or any easily-worked material to which cement will strongly adhere as an equivalent for wood.

I can use other strong cement as an equivalent for common glue.

I claim as my invention—

1. The sheet-metal key B, having apertures *b*, in combination with the cement C and with the wood A A, a layer of the wood being on each side of the metal and secured by the cement extending through the holes in the latter, substantially as herein specified.

2. A joint or junction of wood pieces A, held at an angle with each other and having narrow cuts or kerfs *a* extending partially through from the back, in combination with a thin open-work key B, bent to match therein, and cement C, the latter arranged

to apply to the interior of the kerfs *a* and  
to engage with each face thereof and to  
take a firm hold of the key by extending  
through the holes in the latter, all substan-  
5 tially as herein specified.

In testimony whereof I have hereunto set  
my hand, at New York city, this 30th day of

November, 1888, in the presence of two sub-  
scribing witnesses.

EDWIN JOHN FLETCHER.

Witnesses:

GEORGE S. MATHEWS,  
GEO. D. MERRILL.