

Strengthening Oversized Frames: Strainers and Miters

by Jed Bark

Many of the most demanding techniques used by framers go unseen by the viewer. But these hidden details may be key elements for creating a frame that is both handsome and strong.

As framers, we must be innovative and develop effective ways to cope with the limitations of standard materials. Conventional mouldings, for example, often have rabbets too shallow to accommodate the thickness of all the material that must go in them. Mouldings may also be too fragile for some of the large scale work which they will house. What we need is a means of strengthening frames without requiring all the tools of a cabinet shop.

In this article we will consider how to strengthen a frame with a strainer and how to make a stronger frame corner. Building up the back of a moulding to effectively create a "deeper rabbet" has been covered recently in PFM's 1995 February Preservation Supplement, Creating Space for Preservation Framing.

The methods I will cover here are technically quite simple, however for some details a router or other specialized tool may be required.

STRAINERS

Strainers are used to add strength to a frame and are almost always

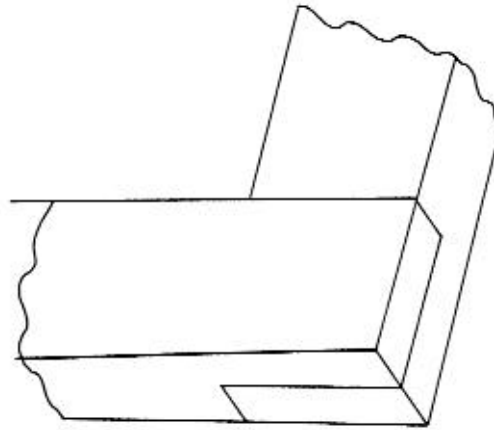
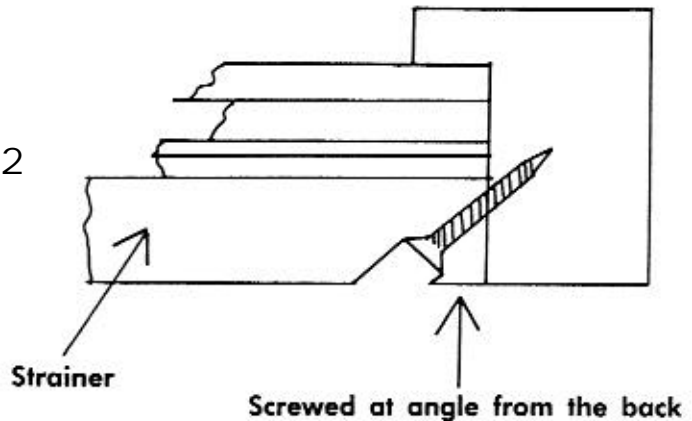


Figure 1

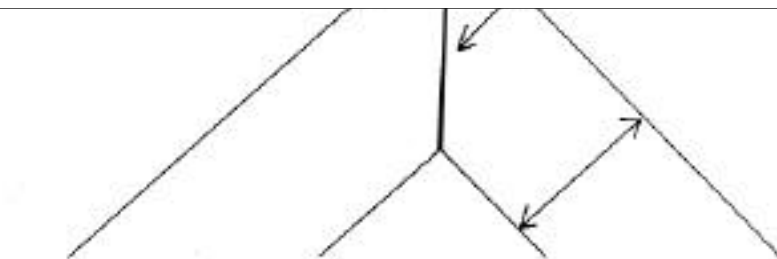
Half-lap corner

A half-lap corner joint is often stronger than a mitered corner.

Figure 2



Attaching the strainer from the back gives the treatment a more finished appearance.



Miter angle changes as moulding shrinks across the grain.

Figure 3

Even if corners are properly joined, they can still be weakened as the wood naturally expands and contracts due to changes in its environment.

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necessary for oversized frames. Strainers are required for framing large works of art in order to provide a secure base for mounting hanging hardware.

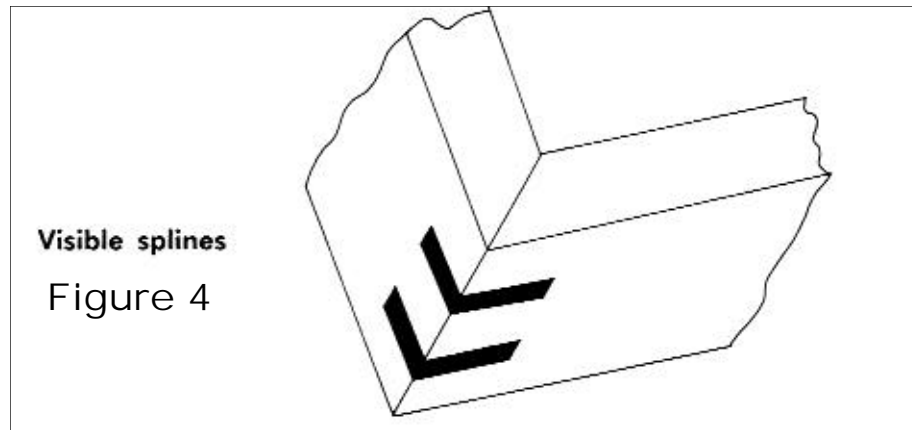
A strainer is similar to a painting stretcher, differing only in the joining of the corners. A stretcher is usually keyed or otherwise adjustable, to respond to the expansion and contraction of canvas, whereas a strainer is glued at the corners and cannot be adjusted.

Pine (ponderosa or sugar pine), other softwoods, basswood, and sometimes poplar are the most common species of choice for strainers. Sometimes imports are used, such as banak or obeche. Usually, simple rectangular stock is used for making strainers, although sometimes the stock may be beveled or otherwise modified. In our shop the stock ranges in size from 3/8"x1 1/2" to 7/8"x3 1/2". The size we use most often is 5/8"x2".

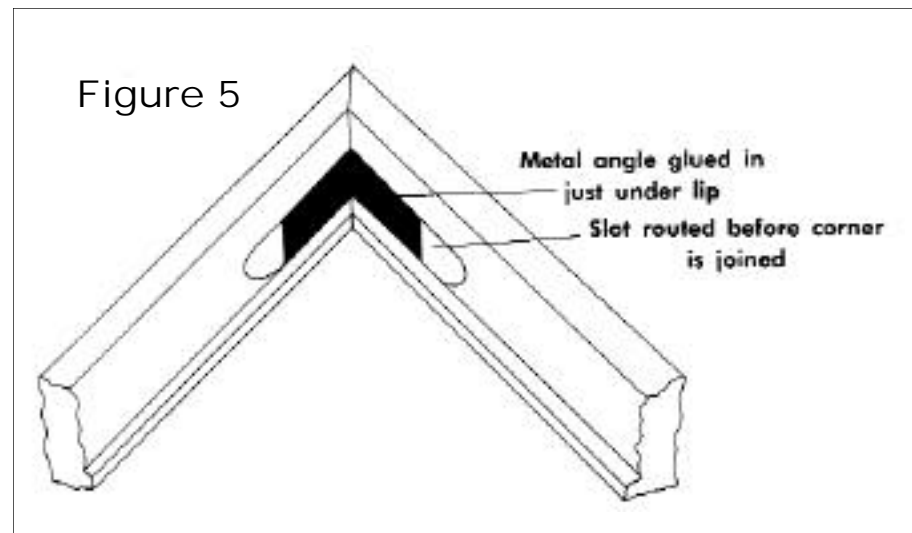
Strainers are generally joined like frames: mitered and glued. We use a v-nail underpinner to fasten the joint.

Strainers for very large frames may require braces at the mid-point in one or in both directions. We use half-lap joints (see Figure 1) for braces and, if the frame is particularly large, we half-lap the corners also.

The strainer may be screwed in from the outside of the frame (as has always been done with welded metal frames and plexi boxes) or, for a more finished, less mechanical treatment, it may be attached from the back, at an angle (see Figure 2). Although strainers may be installed with nails or other fasteners, screws are stronger and reversible — just as with a conventional frame back.



Visible splines offer strength and the potential for decorative detail.



Metal angles can be installed in corners to offer yet more support.

STRONGER MITERS

Corners fail for many reasons, and framers have various tricks to make them stronger. Assuming the miters are properly cut and glued, one common cause of joint failure is that wood seeks equilibrium with its environment and a frame made in any other season is likely to shrink across its grain during the winter (wood expands and contracts very little, and does so parallel to the grain). Such shrinkage changes the angle of the miter, causing the joint to open up on the inside (see Figure 3). The wider the moulding, the more likely that it will open up.

One technique for counteracting this tendency

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and making the corner much stronger is using a plate joiner. This tool is made by many manufacturers (the original brand is the Lamello and is a first-rate, Swiss made machine). This tool is quite costly so you may want to research less expensive versions that are on the market. The plate joiner uses a spline made of compressed beachwood shaped like a lozenge. The compressed spline, often called a 'biscuit', quickly expands after being inserted in a joint by absorbing water from the glue, thereby making a firm joint while the glue cures.

The biscuit spline makes a very strong miter. If the biscuit is too big, cut it off on the inside of the miter either before or after installing it in the joint.

There are many other ways to make splines, both with a table saw and with a router. Splines can either be hidden or they can become a visible detail, making them a decorative asset (see Figure 4).

Although splines may be the best solution for making stronger corners, there are several other alternatives. One is using screws instead of nails to secure the joint. Screws are stronger than nails, and if the joint should crack they can be backed out, the

joint reglued and the screws reinstalled. The screws can be applied to the top and bottom of the frame so as not to be visible from the side. The countersunk hole may, of course, be plugged with wood or filled with wood filler and then painted, if necessary, to match the frame color.

Another, more difficult, approach is to install metal angles in the corners. Angle steel (or aluminum, if available) can be glued into a pre-routed slot (see Figure 5). We use 3M "Scotch Weld" #DP 110 and have had no failures.

Other means of strengthening miters range from cross-nailing the corner to dowelling, or even gluing a strip of wood diagonally across the face of the miter. A list of miter gluing strategies could probably fill an entire issue of PFM.

Built up mouldings, strainers, and strengthened corners are all useful methods for dealing with special framing problems, especially for framing oversized works of art. Alone or combined, they enable us to create remarkably resilient structures for safely displaying and preserving large works of art. ■