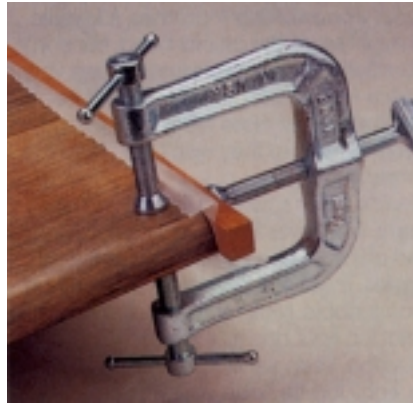


There are also three-way versions with an additional, sideways jaw for applying veneered edging strips or “breadboard” edging to plywood shelves and furniture tops.



Special, quick-release C-Clamps are also available. These models offer a lever that you squeeze to open and close their jaws in an instant for rapid adjustments.

Do remember, however, when working with any C-Clamps that their steel jaw pads will mar your workpiece surfaces, so you should always use wooden cauls (small, protective pieces of scrap wood) between the jaws and those surfaces to protect your project during assembly.

**Spring Clamps** are often a great substitute for C-Clamps, Hand Screws or other types of clamps in those cases where speed of application is more important than gripping power.



Working much like a clothespin, you merely squeeze the handles together to open the jaws, then release them to clamp your components together. These are normally available in opening capacities ranging from 1” to 3” or 4” and are quite inexpensive.

**Double Bar Clamps** make gluing-up wide panels a much easier task. They feature a unique, two-way clamping system that holds your workpieces perfectly flat while it squeezes them together during assembly.



These clamps offer wooden bars with a specially milled, ever-so-slight radius that distributes downward pressure evenly over the entire surface of the glue-up as the metal jaws (attached to a scissors-like mechanism) squeeze the boards inward. No more bowing or cupping !

Wooden **Cam Clamps** are light in weight, yet can easily exert up to 300 lbs. of pressure, when necessary.

Typically made of hardwood with steel bars, they work with an eccentric cam-type tightening mechanism and offer protective cork jaw pads that also minimize slippage. The larger sizes of these offer throat depths that exceed most bar-type clamps (often up to 6" or more)...a real advantage when you need the added reach for certain types of glue-ups.



**Web Clamps** are often the **only** way to grasp certain odd-shaped or extremely large projects like chairs, large pieces of furniture, drawers, etc. They're typically made with a nylon webbing material (usually 12 to 15-feet long), attached to a metal tightening mechanism. Flip a lever to release the tension for quick adjustments, then turn a ratcheting mechanism to apply pressure. They're usually fairly inexpensive and often the only way to grasp certain types of project components.



**Frame Clamps** are similar in design to Web Clamps...with the addition of angled, 90° clamping corners that help you apply equal pressure to all four corners of your frame at once.

With these clamps, you merely insert your components and turn a single handle or wing-type nut to tighten the clamp and draw all four pieces of your frame together at once. They can also be used to clamp drawers, doors and other types of projects.



Another type of frame clamp offers a series of rigid metal arms and adjustable corners that are tightened with a single, center wing nut.



These are also fairly inexpensive, can be used for picture frames or cabinet door assembly and can often accommodate a wide range of project sizes.

## SHOP-MADE CLAMPS

Sometimes, you need a specialized clamp that just isn't available in order to perform a unique holding task. In those cases, you may have to make it yourself. Here are a couple of examples of shop-made clamps that you can put together in about half an hour.

The first is nothing more than a couple of strips of hardwood (we used hard maple) containing a series of 3/8" diameter holes. This is an excellent tool for clamping a stack of parts together, "sandwich-style". Just use a couple of 3/8"-16 threaded rods, some fender washers, hex nuts and wing nuts to draw everything together. If you're planning to use a clamp like this to apply a great deal of pressure, you might consider making it out of steel bars or angle iron.



The second of our two shop-made clamps is a variation of the first, designed for more rapid assembly and disassembly. Instead of a series of holes, it offers a single position at each end. The bottom piece contains two 3/8"-16 Tee-Nuts, driven into shallow counterbores on the bottom side of a piece of hardwood (as before, we used hard maple). Once again we used two 3/8"-16 threaded rods with fender washers and wing nuts to apply the appropriate amount of clamping pressure. The slotted ends allow quick, simple attachment and removal of the clamp.



## VICES

Vises are another category of clamping tools that deserve a mention here. No shop is complete with a vise of some sort to hold projects as you work on them. Most woodworking vises attach to the end or side of your workbench with the tops of their jaws flush with the top surface of your bench. Vises are typically used to hold a workpiece (or complete project) in place, leaving both of your hands free to work on it. Some offer pop-up "dogs" that press against one edge of your workpiece while the opposing edge rests against another pop-up "dog" that slips into a hole in the opposite end of the bench.



Woodworkers' vises are usually available in two styles. The first is an inexpensive, "no-frills", light-duty model with a small capacity and no quick-release mechanism.

