

# Making Sense of Vises

A user's guide to the heart of the workbench

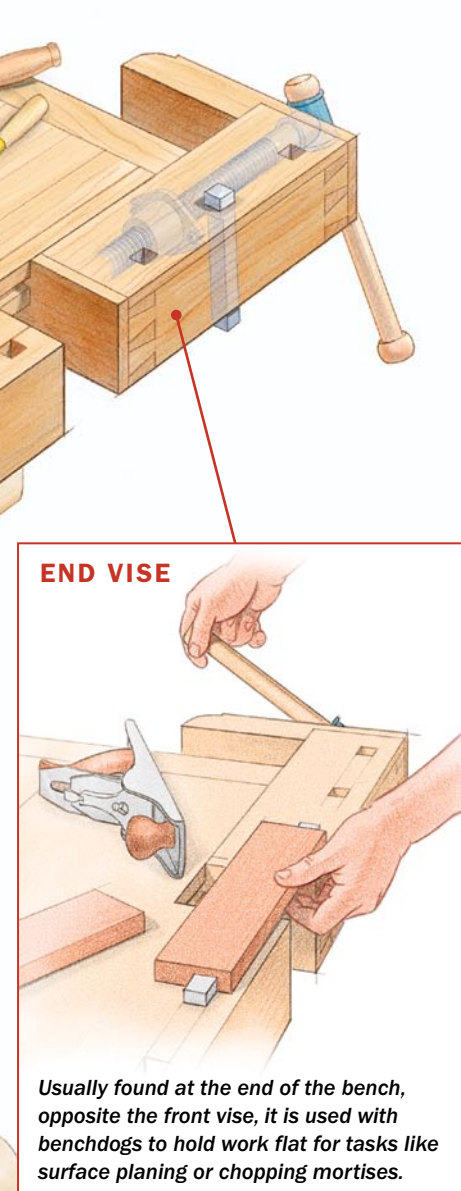
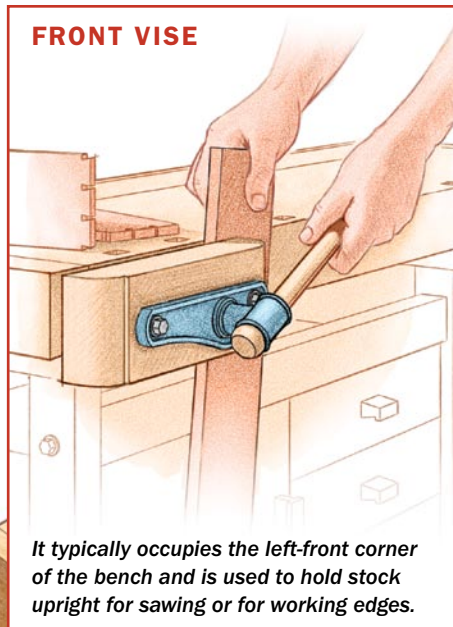
BY GARRETT HACK

**A** good bench vise is nearly as useful as a shop apprentice. On my bench I have a front vise and a large tail vise—I call them my right- and left-hand men. It's hard to imagine woodworking without them; they hold my work firmly so that I can concentrate fully on powering and controlling the tool I'm using.

In general, you'll find vises at two locations on a woodworker's bench: one on the long side of the bench, typically at the left-hand corner for right-handed woodworkers, and another on the short side at the opposite end.

The first, known variously as a side vise or front vise, matches the mental picture that most people have of a vise, with a movable jaw capturing work between it and the edge of the bench.

The second, called an end vise or tail vise, can clamp work like a front vise, but is more often used to hold boards flat on the bench, pinched between a pin or dog in the vise and another in one of the many holes along the benchtop. Together, these two vises can





## Front vises

meet all of a woodworker's basic needs when it comes to holding work firmly and within reach.

### **Up front: a vise to clamp work vertically or on edge**

A front vise, typically found on the bench's left-front corner, is ideal when you need to clamp a board to plane an edge, hold a chair leg while shaping it, or hold a board upright for sawing dovetails. The most common design is quite simple: a jaw of wood, or cast iron lined with wood, that moves with a single screw and a T-handle. The rest of the vise is mortised into the front edge of the bench. Mine opens about 10 in. and has about 4 in. of depth.

Many of the front vises on the market are fairly easy to fit to a benchtop. Look for one that has a large screw with well-cut Acme threads. These are the same square threads found on good clamps; they can smoothly deliver lots of force over a long life.

To hold long boards, wide panels, or doors securely on edge in a front vise, you need the added support of the deep front apron of the bench. Properly installed, the fixed half of the vise should be mortised into the bench so that the movable jaw clamps against the apron. This creates a great deal of stability, making it possible to



**Hold work vertically for sawing dovetails or planing end grain.** A scrap piece of similar thickness, clamped in the opposite side of the vise, prevents the vise from racking.



**Hold wide workpieces on edge.** The vise screw prevents a wide piece from going all the way through the vise (right). A clamp seated in a dog hole provides extra support (above).



clamp most boards on edge with no other support. For very long boards, just put one end in the front vise and rest the other on a short board clamped in the tail end vise, much like a board jack on traditional benches. You can clamp a large tabletop vertically against the front edge of a bench, one end held in the front vise and the other held by a bar clamp across the bench.

A problem can arise, though, when clamping on just one side of the vise, such as when holding just the end of a much larger piece, clamping pieces vertically for laying out or sawing dovetails, or holding tapered or oddly shaped pieces. When one side of the jaw is applying all the pressure—or trying to—it is very hard on the screw and any alignment rods, and can even distort them. One solution is to slip a block as thick as the workpiece into the other side



**Secure long boards on edge.** A block clamped in the tail vise supports the opposite end.

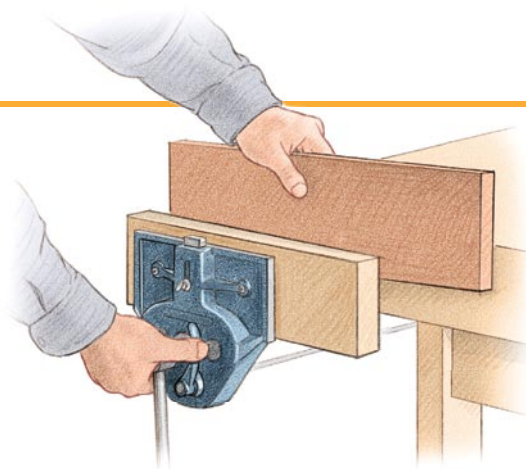


**Steady a wide panel.** A sawhorse provides support underneath, with the opposite end clamped to the bench apron.

## TYPES OF FRONT VISE

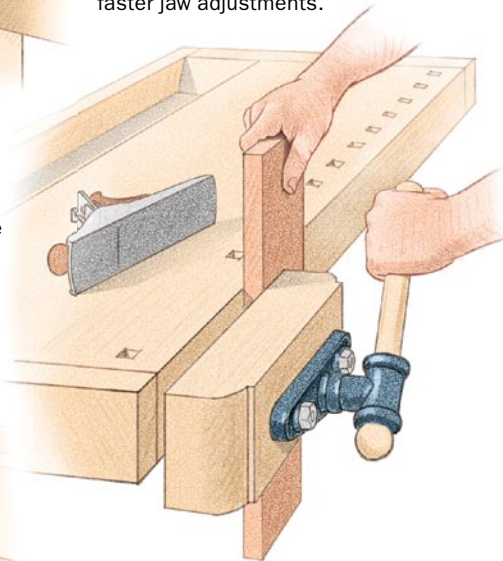
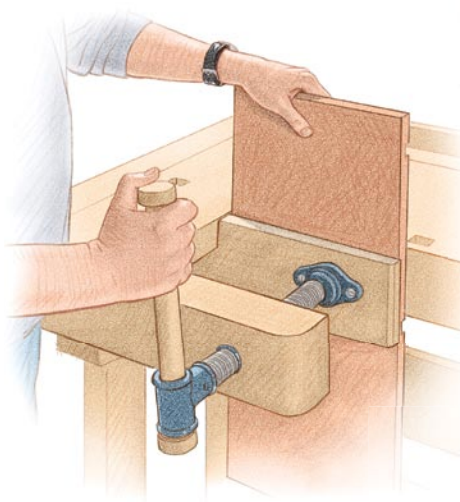
### ◀ CAST IRON

The most popular front vise is cast iron. A steel rod or two keep the jaw aligned. Some also have a quick-action release for faster jaw adjustments.



### WOODEN-JAWED ▶

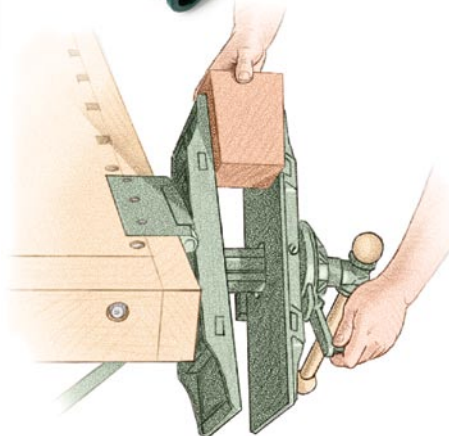
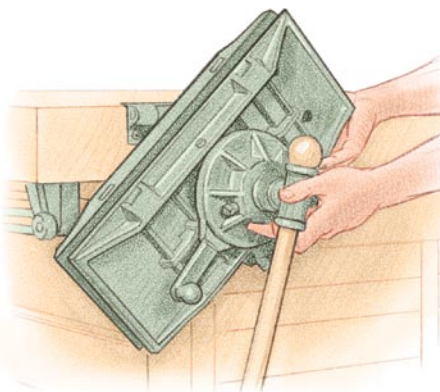
A wooden-jawed vise operates like its cast-iron cousin. The movable jaw is typically made from the same material as the bench. Some models offer quick-release.



### ▶ ARM VISE

An arm vise works well on wide boards. There are no screws or rods in the way. But the right-angled arm limits clamping force, which reduces the ability to clamp long boards horizontally.

**Build it yourself.** Many companies sell the hardware for these vises. Look for a large screw with square-cut threads.



### PATTERNMAKER'S VISE ▲

A patternmaker's vise can hold oddly shaped work at any angle. The vise body can pivot up and over the bench until the jaws are parallel to the benchtop. The jaws also can rotate 360° and angle toward one another for holding tapered work.



# End vises



**An end vise holds work flat.** Aligned with a row of dog holes, this vise has a wide capacity. It can hold smaller work and pieces nearly as large as the benchtop. It's ideal for smoothing a tabletop.



**A secure grip for cross-grain work.** The end vise allows you to clamp a panel across its width for tasks such as planing a bevel on the end.



**For chopping, a spacer keeps the work off the vise jaw.** The pounding could damage the vise. The best support is on the benchtop itself, right over a leg.



**An end vise also handles awkward shapes.** Pieces like this curved table apron can be held securely for scraping or other tasks.



of the jaw (use a wedge for odd shapes). This keeps the jaws parallel so you can apply all the pressure you need. Some bench manufacturers equip their front vises with a threaded stop that does the same job.

### At the end: a vise to hold work flat

At the other end of the bench, you typically will find one of two distinct types of vises, known as end vises or tail vises. Their main purpose is to hold work flat on the surface of the bench.

A traditional tail vise, with one row of dog holes along the front edge of the bench and several more in the movable jaw, allows you to hold work flat over nearly the entire length of the bench. This is ideal for holding long boards to smooth a face, bead one edge, or hold a leg while chopping a mortise. You can also clamp across the grain to bevel a panel end or shape the skirt of a chest side. Be careful to apply only modest pressure to hold the work, or you will bow it up.

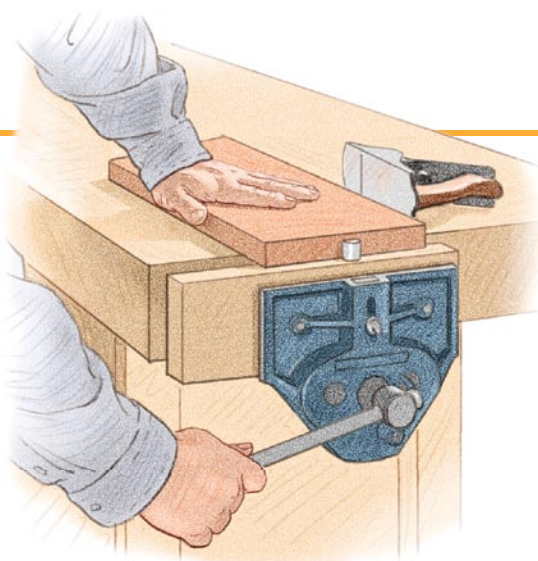
The tail vise is also great for holding long or odd pieces at any angle—there are no screws in the way and the hefty construction tends to prevent racking on odd shapes. Also, it can hold a workpiece at right angles to the bench edge, ideal for planing an end-grain edge, shooting a miter on a molding, or paring a tenon shoulder.

One drawback with this vise is that the large movable jaw can sag. A misaligned jaw makes it difficult to hold work flat on the benchtop. Avoid chopping or pounding over the movable jaw; it isn't as solid as the benchtop itself. Support the work as much as possible over the bench, with the least amount of jaw open. I keep small, square blocks handy to shim my work toward the bench or protect it from the dogs. I shouldn't have to say this, but never sit on your tail vise.

**Another type of end vise**—The other popular type of end vise looks and works like a front vise, except that the movable jaw is mounted to, and set parallel with, the end of the bench. If I had to outfit a bench with just one vise, it would be this type (see drawing, top right). My small traveling bench has an old front vise mounted on one end in line with a row of dog holes.

Some end vises of this type have a jaw that spans the entire width of the bench. Equipped with a dog on each end of the jaw, and paired with a double row of dog holes down the front and back of the bench, this is a great system for holding wide parts flat on the benchtop. Several ready-made benches are built this way. Lee Valley also sells the necessary hardware for making the vise yourself. □

*Garrett Hack, a professional furniture maker and woodworking instructor, is a contributing editor.*



## TYPES OF END VISE

### ◀ CAST IRON

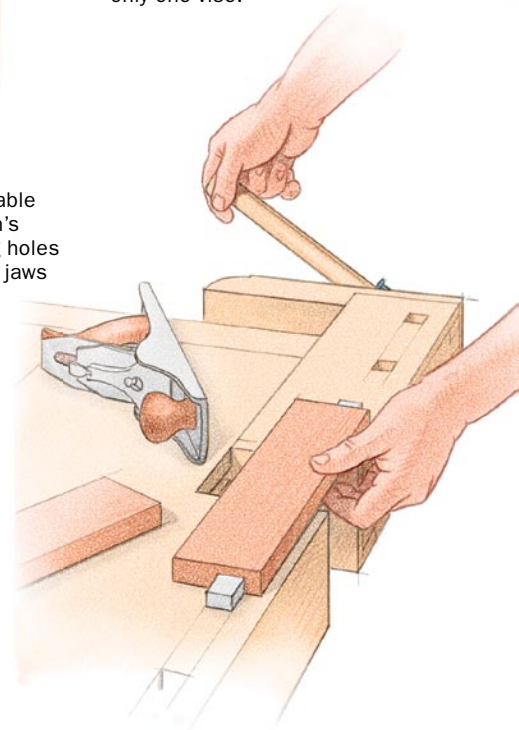
Same vise, different location. The cast-iron front vise also works well as an end vise—a smart solution if you have room or money for only one vise.

### TAIL VISE ▶

The traditional end vise. The movable jaw is a thick section of the bench's front edge, about 18 in. long. Dog holes hold work flat on the surface. The jaws also can hold work at an angle.

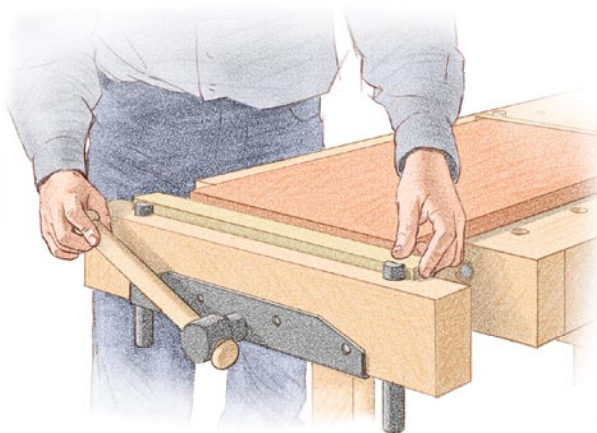


**The guts.** Tail-vise hardware comes with instructions for making the wood components.



### ◀ FULL WIDTH

A modern variation spans the width of the bench. With two rows of dog holes, the wide jaw of this vise is ideal for holding wider panels.



### TWIN-SCREW ▶

A twin-screw model can clamp wide stock vertically. A chain connects the two screws to prevent racking.

