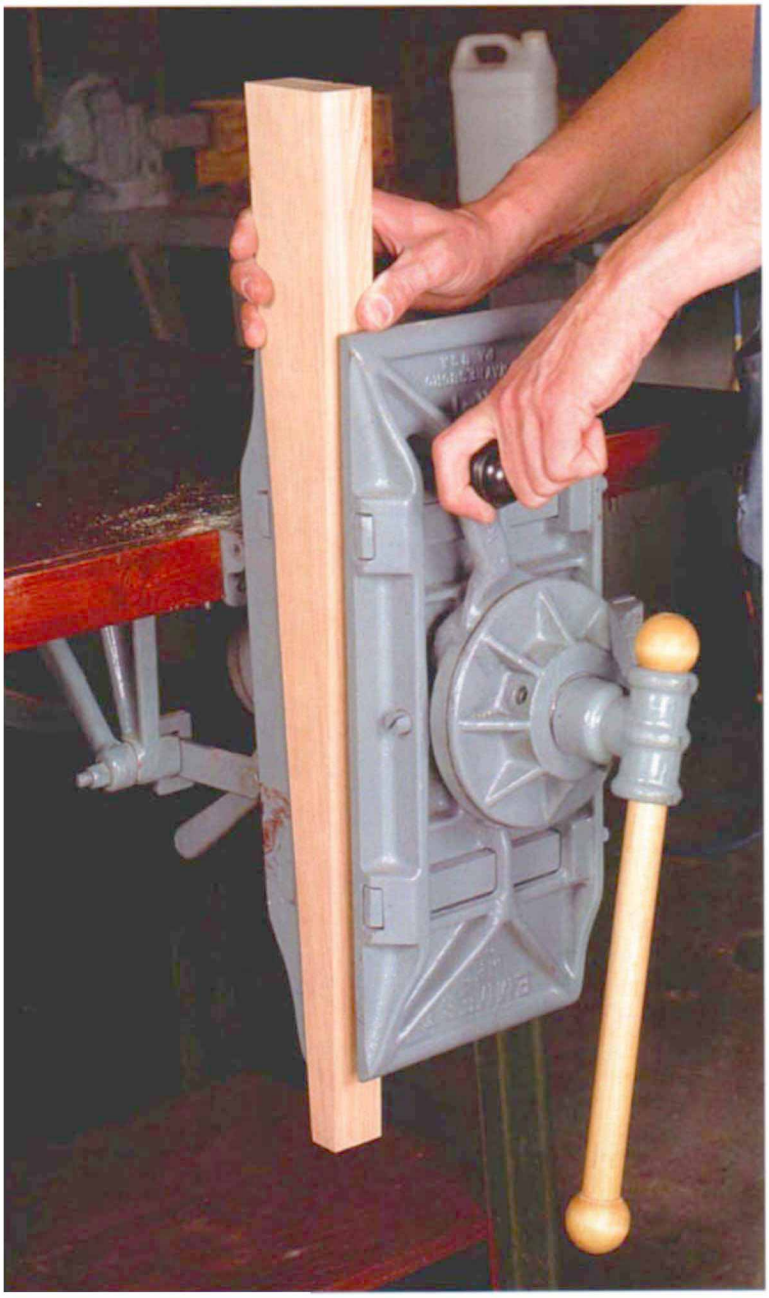
Patternmaker's Vises

The most versatile work-holding device ever bolted to a bench

by Benjamin Wild



Emmerts are classics. *Specialized vises, like this Emmert No. 1, were designed for busy patternmakers during the industrial boom years at the turn of the century. Vise jaws hold irregularly shaped workpieces (above) and swivel to improve access to the work (right).*

More than 20 years of woodworking and patternmaking taught me that the ideal vise is one that I can forget about while I'm working. I don't want to fight with a vise or spend much time setting it up. A vise should hold the work firmly, without marking it, and allow me to work in a comfortable position. I started my career as a patternmaker using the special vise that goes with the trade. Since then, I've tried every other type of vise on the market. No other vise comes as close to the perfect work-holding device as a patternmaker's vise.

The patternmaker's vise was developed specifically to meet the demanding needs of a specialized job. A patternmaker turns out wooden models (such as plane bodies, gears or tablesaw tops) that are used, in turn, to create molds for casting parts in metal. The models often assume odd shapes and sizes and are difficult to hold—hence the development of a special vise.

You don't have to be a patternmaker to appreciate this type of vise. It's better than other vises at holding the work firmly so that the woodworker and the tool have ready and easy access to virtually any part of the piece. I now teach woodworking, and I often see my students struggling with improperly held work. The result usually is inaccurate work or a botched job. The beauty of a patternmaker's vise is that it can hold a variety of different sizes and shapes in almost any position.

The vise attaches to the front of the workbench like a conventional bench vise. But from this position, the vise can be rotated 360° or lifted 90°, so the jaws are parallel to the benchtop, all with the wood clamped firmly in the jaws. The jaws can be angled up to about 5° from side to side to hold tapered objects. An accessory tilt plate will pivot up to 30° perpendicular to the vise for more severely angled work or for gripping pieces angled in two planes.

In addition to this versatility, the vise has two sets of jaws. In the

Photos: Charley Robinson

normal position, the jaws are the same as in any other woodworking vise. But rotate the vise 180°, and a pair of metalworking jaws, similar to a machinist's vise, are brought to the top (see the top photo on p. 80). The vise also has dogs built into both front and back jaws to hold round, curved or odd shapes (see the top photo on p. 81). Or the front jaw dogs could be used with bench-mounted dogs to grip objects beyond the capacity of the vise.

For clamping simple square pieces of limited size, any conventional vise will suffice. But a patternmaker's vise is so versatile that even mundane jobs become easier. You'll soon find yourself rotating and tilting your work for best access rather than twisting and turning your body to conform to the constraints of your bench and vise (see the bottom photo on the facing page). Once you've used a patternmaker's vise, you'll have a hard time going back to a conventional one. Fortunately, these vises are still available, from used Emmerts to newly manufactured imitators, at prices ranging from $250 to more than $1,500.

The Emmert vise

The Universal patternmaker's vise was first manufactured by Joseph F. Emmert in 1891. At that time, American factories were in full swing, creating a huge demand for the patterns necessary for casting the parts for all those wonderful cast-iron woodworking machines, as well as other equipment, that we covet so much today. These patterns assumed almost any shape, often were quite large and had to be worked to exacting tolerances. Emmert vises have been in use for more than 100 years, and they are still the benchmark, even though the company has been out of business for some time.

The original Emmerts came in two sizes, the No. 1 with jaws 7½ in. by 18 in. that opened 15 in. and weighed in at 87 lb. (see the photos on the facing page). A smaller No. 2 vise had 5-in. by 14-in. jaws that opened 12 in. and weighed a mere 56 lb.

What happened to the Emmert Co.?

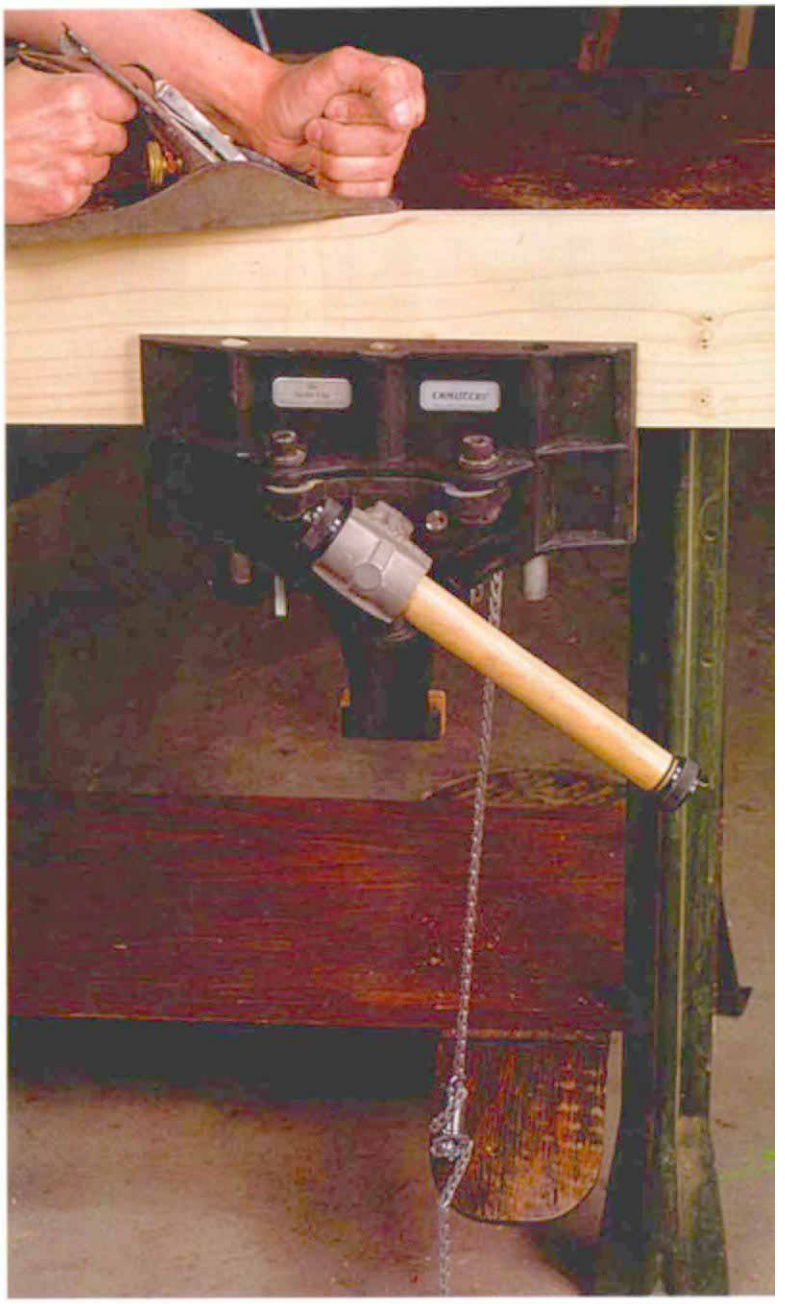
"If these things are so good, why doesn't everyone have one, and why did the Emmert Co. go out of business?" you might ask. For the same reason that I'm no longer actively making patterns. Most of the work that used to be done by patternmakers is done by welding, sent out of the country or done with computers and automated milling machines. And the materials are now plastics and ceramics worked to ever finer tolerances. Almost gone are the days of handworking patterns of clear mahogany, cherry and pine.

The closing of the traditional patternmaker's shops, meant not only that the market for Emmert vises was dwindling, but also that competition was increasing as thousands of used Emmerts hit the market. Some bad management decisions and new competitors also had a hand in the demise of the Emmert Co.

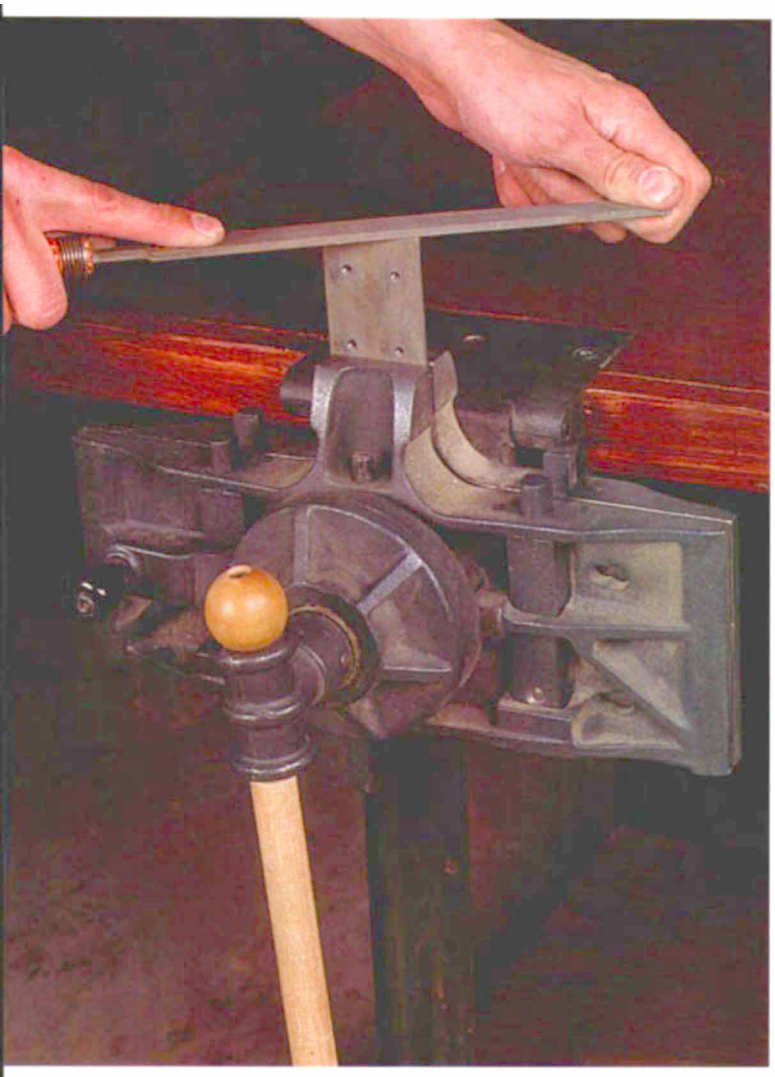
What's available today

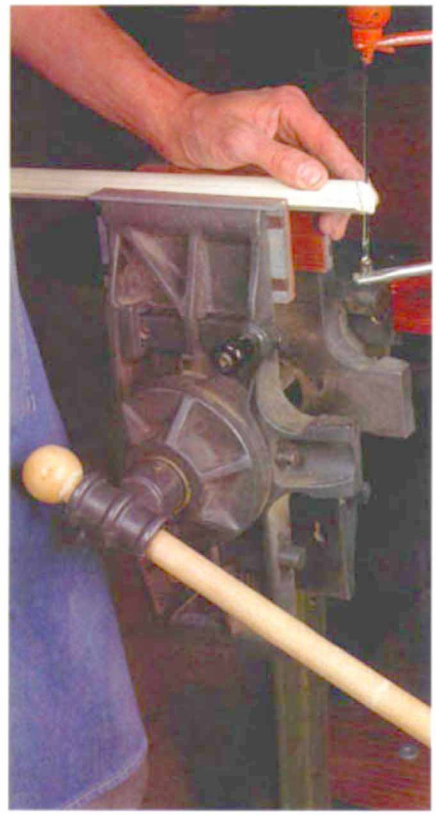
Ever since the original Emmert Co. closed, woodworkers who have wanted the versatility of these fine tools have had limited options. But thanks to the rising demand for woodworking tools, new sources have developed and old sources have come to light for patternmaker-style vises. American Machine & Tool Co. (AMT), Veritas Tools Inc. and The Kindt-Collins Co. all offer some version of a patternmaker's vise.

All of these vises work much like the old Emmert. They all tilt, angle and spin. They all require about the same effort to install. They all have metalworking jaws on one side, and they all hold the work firmly. They all have built-in dogs to hold things between the jaws or between the front jaw dogs and dogs set into the workbench. But there are differences. Choosing the right vise for you



Modern version uses alloy casting. *Made by Veritas Tools, this Tucker vise uses a zinc-aluminum alloy instead of cast iron, making it strong and light. A quick-release feature can be operated by a foot pedal (above). The vise's cork-lined jaws protect delicate workpieces (left).*





Vise handles metal, too. *Rotate this American Machine & Tool Co. vise 180°, and you'll have a pair of jaws for metalworking (above). A set of jaw inserts, which are lined with soft rubber (right), prevents dings in soft material.*

really depends on the type of woodworking that you do, how heavy your work is and how much money you're willing to spend.

The AMT vise

The AMT vise (American Machine & Tool Co., Fourth Ave. and Spring St., Royersford, PA 19468-2519; 800-435-8665) is a copy of the Emmert No. 2 vise. The specifications are almost identical: 5-in. by 13¾-in. jaws that open 12 in. and an overall weight of 55 lb. for the cast-iron and steel unit (see the photos at left).

The primary differences between the two are that the machining is not as good on the AMT as it is on the original, the cast iron is a little softer and the 13/16-in.-dia. handle fits sloppily in its 1-in.-dia. hole. In spite of the rough casting, though, everything seems to work well enough. In addition to the standard pivot plate, AMT offers a set of soft jaws as an optional accessory ($20 for the pair). The soft jaws are 3-in. by 6-in., rubber-faced aluminum plates that magnetically attach to the face of the jaws to protect your work, as shown in the bottom photo at left. I found the soft jaws helpful, particularly for small work.

Although I'm used to working with the bigger No. 1 vise, I liked this little AMT vise and would be tempted to buy it if I knew I would never need the size and strength of the larger one. At $250, it's the most reasonable entry into owning a patternmaker's vise, unless you find a real bargain on a used Emmert, which usually sells for $350 and up depending on size and condition.

The Veritas Tool vise

Veritas Tool Inc. (12 East River St., Ogdensburg, NY 13669-1720; 800-667-2986) introduced the Tucker vise in 1991, exactly 100 years after Emmert patented his vise. With jaws that are 4 in. by 13 in., the Tucker is only slightly smaller than the Emmert No. 2, but the 12-in. jaw capacity is the same (see the photos on p. 79). The Tucker operates much like an Emmert, but there are some differences and a few added features.

The Tucker is much lighter than the Emmert, which gave me some concerns about its durability. But the zinc-aluminum alloy used to cast the Tucker is not only much lighter than cast iron, it's stronger and less brittle. The other readily noticeable difference is machining. The finish is a highly refined, smooth surface similar to that found on the unmachined surfaces of machinist's tools.

The Tucker vise has some advantages over the Emmert and, in my opinion, some disadvantages. It has a quick-release mechanism, so the front jaw can slide open or closed easily without having to turn the handle. In addition to a top release button, a foot pedal allows the spring-loaded jaw to be popped open when both hands are full (see the top photo on p. 79).

The built-in dogs have a flat side and a round side to offer a variety of clamping surfaces. The jaws of the Tucker are cork-lined, which is great for protecting your work, but could be a pain if the cork lining gets damaged and needs to be scraped off. This is likely because even the metalworking jaws, which tend to get more abuse, are cork-lined. The directions are complete, and installation is easier than it appears. The exploded view of the vise makes it look as complicated as the control panel of a Boeing 747.

One thing I did discern from the mounting instruction's exploded drawing was that the Tucker has a lot more parts than the Emmert. Although I did not have a chance to use the vise for an extended period, I would be concerned that with so many parts, it might be easier for the vise to get out of alignment.

The big drawback to the Tucker vise is that the angle feature is not all that convenient to use. The other vises use a quick-acting cam lock to hold the vise at an angle. However, the Tucker requires a separate, large Allen wrench (provided) to make this ad-

justment. Because of the smaller size of the Tucker, when it's rotated 90° to the vertical position, the end of the vise is only about 2 in. above the bench.

The end of the next smallest vise, the AMT, when in the same position, is 4 in. above the benchtop. This extra height raises small work up to a better working position. Also, the Tucker doesn't have a pivot plate, which is good for holding odd-shaped pieces.

At $500, the Tucker might seem a little dear, but overall, this is a quality-machined product that works extremely well.

The Kindt-Collins vise

Although The Kindt-Collins Co. (12651 Elmwood Ave., Cleveland, OH 44111; 800-321-3170) master universal patternmaker's vise has been on the market for more than 20 years, it's been a relative secret. That may be because of its price: $1,555. Kindt-Collins continues to sell vises primarily to corporate patternmaker's shops and the government.

The Kindt-Collins is an improvement over the old Emmert. The angle and other adjustments work much more smoothly because all the working parts are machined and hand-fitted (see the photos at right). The surfaces of the large woodworking jaws (18 in. by 7 in.) are ground flat, and the metalworking jaws are ground, hardened and serrated. The tilt plate also is ground flat and fits perfectly into its groove in the back vise jaw, as shown in the bottom photo at right. The front jaw rides smoothly on a double-lead Acme thread and opens a full 16 in. A nice paint job makes the vise look as good as it works.

The Kindt-Collins vise has much thicker castings than the Emmert, so the Kindt-Collins can hold the heavy castings that patternmakers sometimes work on, but you'll probably have to bolt your bench to the floor. In fact, weighing in at about 170 lb., the vise alone may tip over some workbenches.

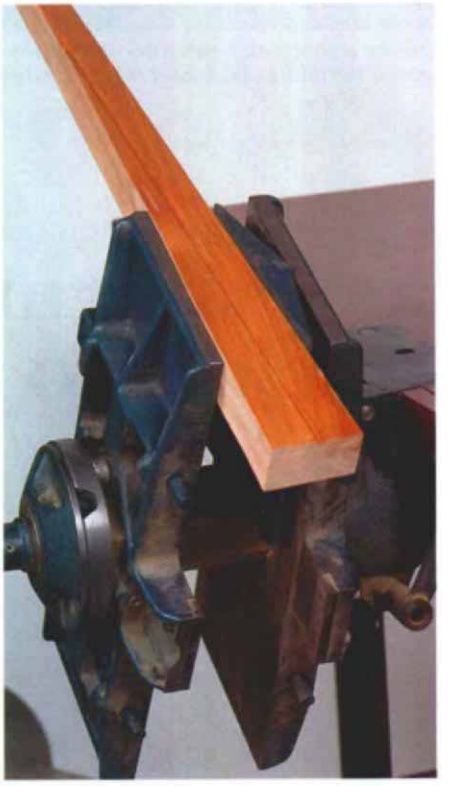
Although the extra heft makes the vise stronger, the increased bulk gets in the way when working near the jaws on smaller pieces. Because of its heavy-duty construction, the Kindt-Collins is obviously marketed to industry. The company must assume that these pros know what to do with this vise because it came without any mounting directions or hardware. The only other disadvantage of this vise is that it is about three times the price of the next cheapest model. In spite of the heavy price, the Kindt-Collins vise represents a good value for the user who needs the ultimate in holding power.

An Emmert in the future?

Along with these vises, I also had a chance to try out a new Emmert vise, as shown in the top photo on p. 78. That's right, a new Emmert. Back in 1984, Bob Kinslow of Hagerstown, Md., acquired the rights to the Emmert name, as well as remaining inventories, patterns and some production machinery. He has been struggling ever since to combine these ingredients into a going concern and has managed to put together a few of the vises. But recent health problems have dealt his efforts a serious blow.

If Kinslow can get things up and running, he speculates the selling price for a No. 1 (the only size he'll be producing) will be about $675. Until then, if you want an Emmert, keep your eyes open at flea markets or used tool shops in your area. One thing is for sure: Anyone who still calls himself a patternmaker is not likely to be selling his vise. □

Benjamin Wild worked as a patternmaker for 16 years. He is currently teaching construction trades for the City School District, Rochester, N.Y., and is the coordinator of the apprenticeship program for Rochester Carpenters Local 85.



Cadillac of vises. *With a price tag of more than $1,500, the Kindt-Collins vise isn't for everyone. Machined, hand-fitted parts explain its ease of operation, and the vise handles big, unwieldy objects (above). A tiltplate that fits between the jaws (left) allows the jaws to hold tapered stock firmly.*