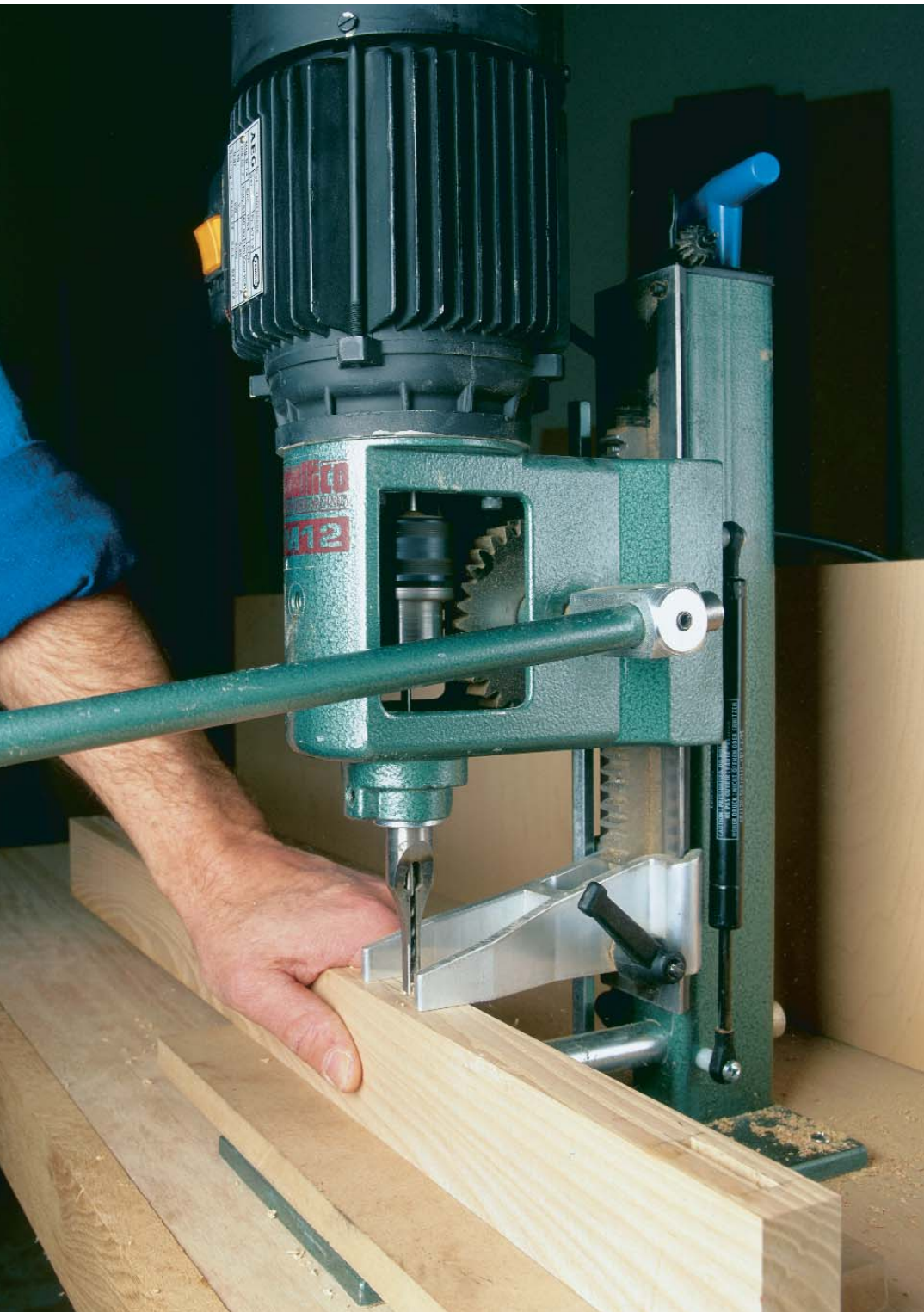


Benchtop Machines Make Mortising Affordable

A look at six models currently on the market

by Bernie Maas



Until Lewis Parks, the founder of Parks Woodworking Machinery, put a mechanical mortiser on the market in the 1880s, the only way to cut a mortise was to chop it out by hand. Parks Woodworking Machinery has passed into oblivion, but the company's original technology evolved over the years into some sophisticated and very expensive industrial equipment designed solely to cut mortises.

If you're not familiar with a mortiser, you might be stymied by the idea of drilling a square hole. But the concept is simple. A mortising bit and chisel cut a circle inscribed in a square. The chisel is hollow, housing a drill bit that protrudes from the chisel by a few millimeters (see *FWW* #116, p. 71). The drill bit hogs out most of the waste while the chisel shaves or shears out the corners. The big machines that do this quickly and efficiently are gems—but you need a wad of cash to buy one. Your other options, until recently, have been to buy one of those drill-press mounted attachments, set up a plunge router to do the job or chop the mortise by hand. Now, thanks to British ingenuity, small, affordable mortisers are generally available.

Multico started it all

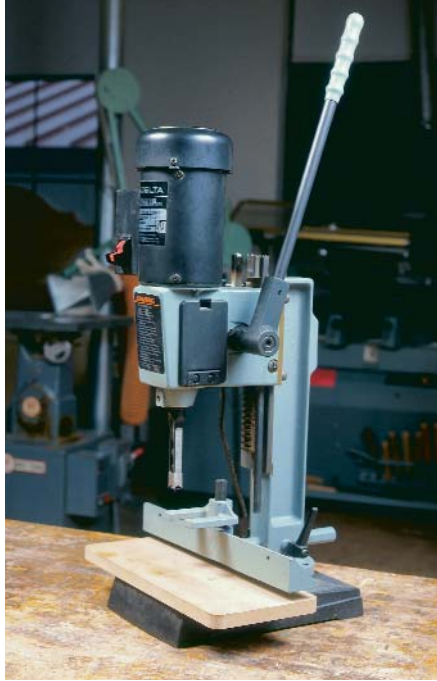
About four years ago, the original benchtop machine, the British-made Multico PM12, hit the popular woodworking market in the United States. Since then, a half-dozen or so knockoffs have jockeyed for a competitive edge. These include the models shown on the facing page. All of them sell for less than \$400.

With help from some of my students in the college shop where I teach, I evaluated all six machines. We had a few months to

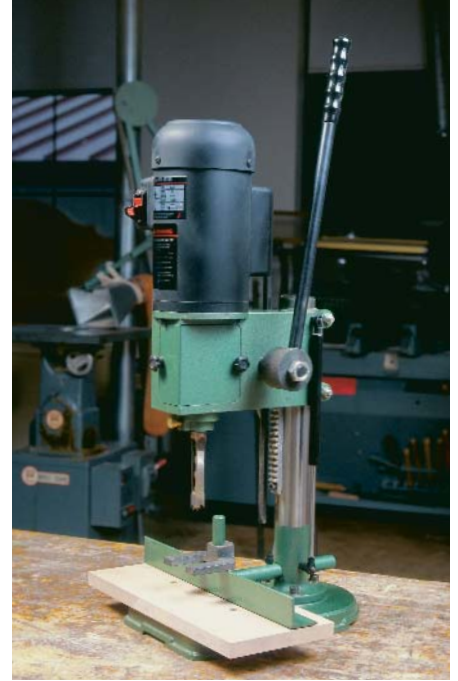
These benchtop machines cut square holes and make mortising easier and more affordable for the small shop.



AMT 5131



Delta 14-650



Grizzly G3183

Six mortisers compared

All of these machines are powered by 1/2-hp motors. The Multico is made in England, and the others are made in Taiwan.

Brand name	Suppliers	List price	Amps/rpms	Depth control	Head return	Chuck capacity
AMT	Am. Machine & Tool (800) 435-8665	\$249.00	6.0A/3,450	Stop rod	Gas cylinder	3/8 in.
Delta	Delta Machinery (800) 438-2486	\$380.00	4.8A/3,400	Stop rod	Gas cylinder	3/8 in.
Grizzly	Grizzly Imports (800) 541-5537	\$225.00	6.0A/3,450	Stop rod	Gas cylinder	3/8 in.
Multico	Garrett Wade (800) 221-2942	\$389.00	5.2A/3,460	Stop rod	Gas cylinder	1/2 in.
Reliant	Trend-lines (800) 767-9999	\$199.95	8.0A/3,400	Split ring	Springs	1/2 in.
Woodtek	Woodworker's Supply (800) 645-9292	\$239.95	6.0A/3,450	Stop rod	Gas cylinder	3/8 in.



Multico PM12



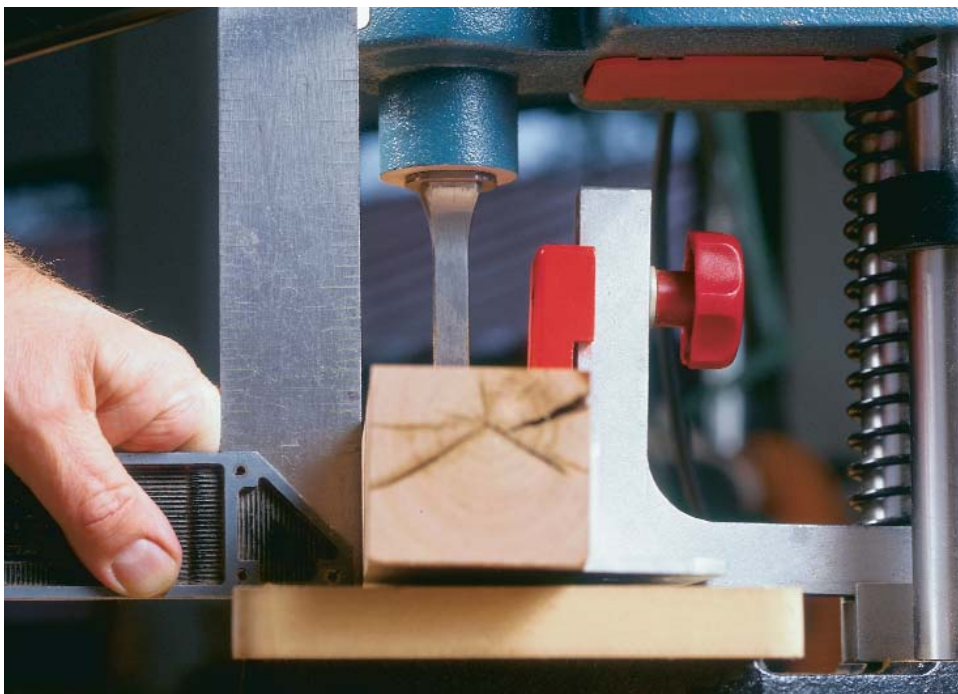
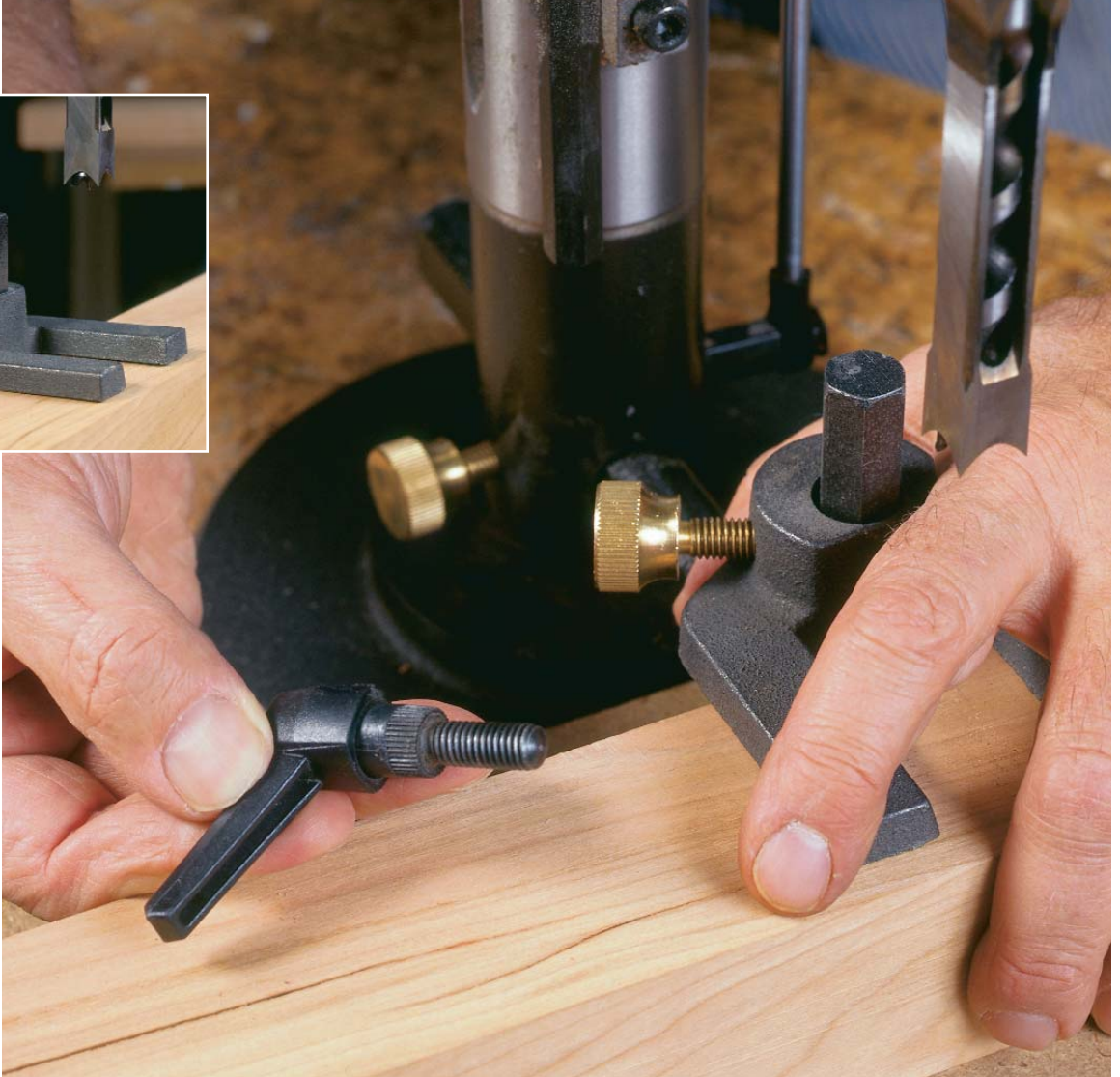
Reliant DD136



Woodtek 876-775



Faulty hold-down design. The AMT mortiser uses brass thumbscrews for making adjustments. But to secure them, the author had to use pliers (above). The author suggests using a ratcheting hand lever (right) to improve performance.



Reliant was the worst when it came to securing stock. Here, the hold-down assembly has been torqued as tightly as it will go. The chisel tilts the workpiece and jams the machine as the author lifts the chisel out of the cut.

play around with them, so we got a good feel for how well they work. At the outset, I should mention that the Grizzly, the Woodtek and the AMT machines look identical except for the paint jobs and that the AMT sports a few brass setscrews in place of Allen heads. In general, all the machines we looked at are well-crafted and nicely appointed—the only differences between them are in the minor details. But some of the minor details can make a big difference in the way they work.

Unpacking revealed a few problems

Out of the box, the Multico was the only machine ready to go. The rest had problems, albeit minor ones. AMT's hydraulic cylinder was shot. Grizzly's base was warped. Reliant's depth control didn't match the one pictured in the manual and was awkward to use. Woodtek's ratcheting fence-clamp handle was faulty. Delta's hinged chuck cover wouldn't lock. Although all five suppliers were very gracious about sending replace-

ment parts, these were five phone calls and five repairs I should not have had to make.

How the machines work

Using one of these mortising machines is simple enough. It's relatively safe, as machines go, and fairly easy to use. The hollow-mortising chisel and its corresponding drill bit are often sold as a set, and they come in a variety of sizes. A 1/2-in. chisel is the nominal capacity for tabletop machines. After scribing start-and-stop lines to delineate the length of the cut, the operator registers the stock against an adjustable fence, which locates the mortise within the thickness of the piece to be cut. A stop rod or lock collar on the machine determines the depth of the mortise.

The bit is forced into the stock using a hand lever attached to a rack-and-pinion gear drive. Often, this procedure will exact considerable force. As the chisel enters the stock, heat from friction causes the metal chisel to expand. Extracting the chisel is like yanking a spike out of a railroad tie. It takes muscle. As a consequence, extreme strain comes to bear against the machine's hold-down assembly. How well the machine is able to accommodate this strain is one key determinant in the overall value of the unit—one of eight categories we looked at to rate these mortisers.

The hold-down is essential—For rectangular mortises, the stock must slide back and forth under the hold-down. A happy medium must be struck between moving the stock horizontally and making it immobile vertically. If there's any up-and-down give, the stock will lock the chisel as you try to draw it out. The harder you yank, the tighter the grab, like one of those straw Chinese finger puzzles.

The Delta, Grizzly and Woodtek hold-downs are part of the fence assemblies. Their hold-downs weren't perfect, but they did the job. The AMT fence and hold-down arrangement is identical to Woodtek's and Grizzly's, but AMT substituted a knurled-brass thumbscrew for an Allen-head socket screw to lock the hold-down in place (see the top photos on the facing page). Although brass is pretty to look at, a finger-tightened thumbscrew can't deliver the same sock-it-home torque that an Allen key can. Consequently, the hold-down lifted up every time.

Fabricated of a heavy-weight aluminum extrusion and fixed directly onto the post with a ratcheting hand lever, Multico's

hold-down was the best performer (see the photo below). On the other end of the scale, because of an inordinate amount of flex in the hold-down/fence assembly, we found the Reliant to be virtually unusable (see the bottom photo on the facing page). Once I locked the fence to the table with a pair of clamps, the Reliant was in business. But dedicating two of my prized Wetzlers to any machine in the shop isn't in my game plan.

Motor power depends on amperage—

All the mortisers are equipped with 1/2-hp motors and posted speeds in the 3,400 rpm range, but the key factor is amperage. The Reliant is rated highest at 8 amps and the Delta the lowest at 4.8 amps. The Multico,

with a 5.2-amp rating, boasts the added advantage of both a fin- and fan-cooled AEG motor, which gives it an efficiency boost. We've been using a Delta mortiser in our shop for several years. Time and again, it would jam whenever we cut heavily fibered woods such as red or white oak. The Delta simply did not have the moxie to eject those tailings out through the exhaust slot on the chisel. Rated at 6.0 amps, the AMT, Grizzly and Woodtek machines have plenty of power to cut mortises well.

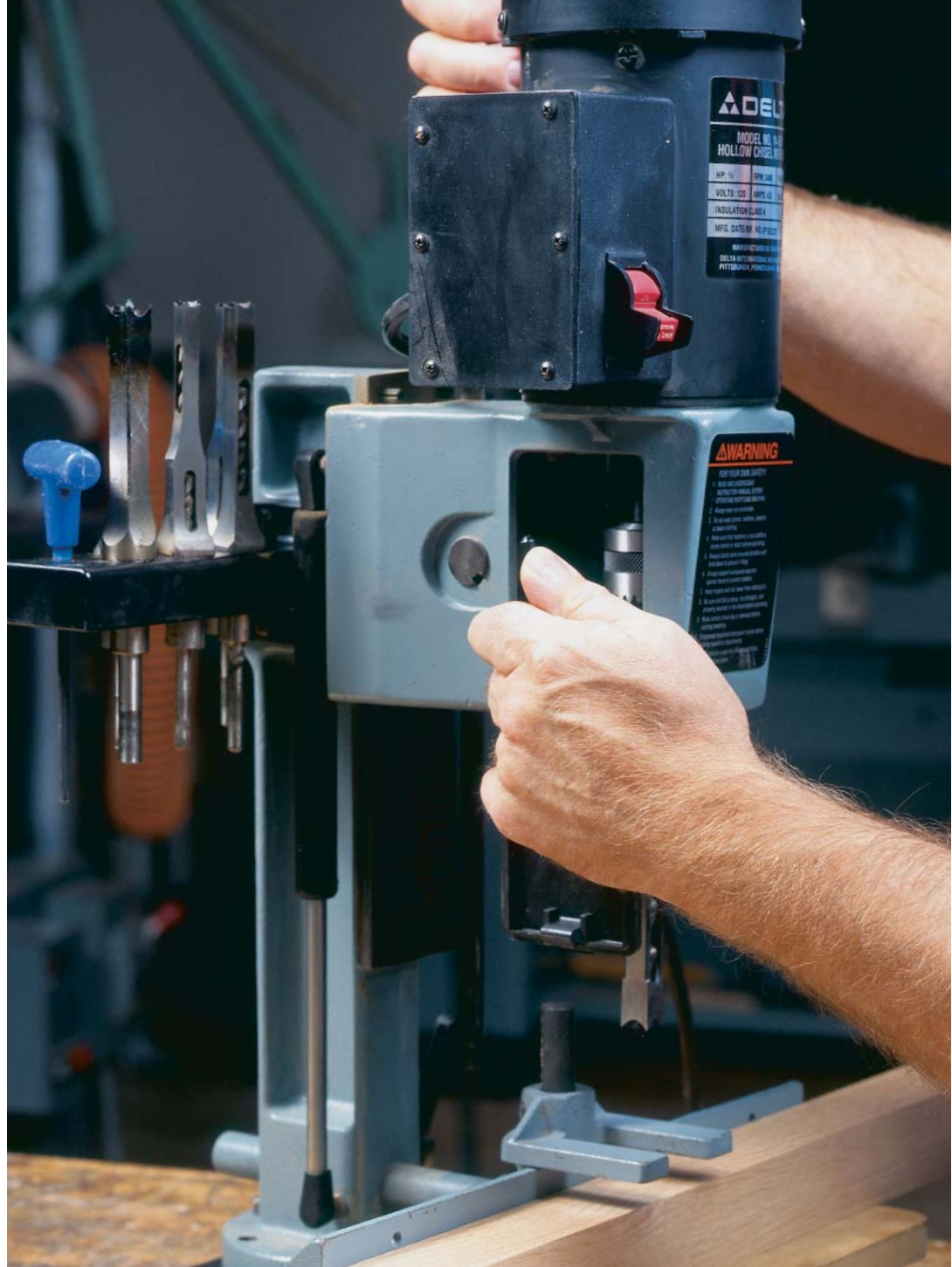
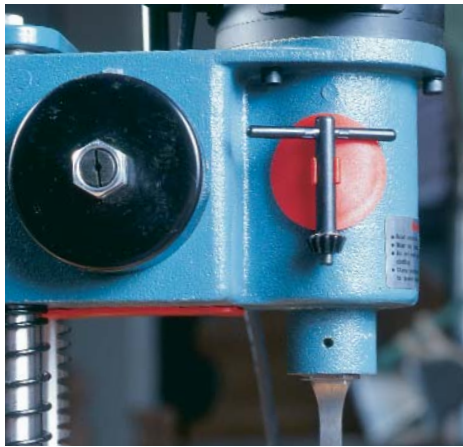
Accessing the drill chuck wasn't always easy—

Except for the Multico, all the machines have some sort of cover plate to keep errant fingers of careless operators from being mashed by the rack and pinion

Multico held the stock better than all the others. This hold-down is firmer and stronger because it incorporates a hand lever and is secured directly to the rack-and-pinion post of the machine.



Three chuck-cover designs—The Delta cover (right) is the most convenient—a hinged flap that simply drops out of the way. The plastic plugs on the Reliant (top left) provide a clip for the chuck-key, a convenience not found on all the other machines. The Grizzly (bottom left) has the same cover design as the Woodtek and AMT machines; it's better for right-handed people.



in the chuck housing. The Multico does well without it, and securing the bits in the chuck is easier and more efficient than with any of the other machines.

The best cover belongs to the Delta (see the photo at right above), which employs a hinged, drop-down door. Poorest is the Reliant, with its got-to-eventually-wear-out-and-fall-out plastic plugs (see the top left photo).

The other three machines have cover plates bolted to the right corner of the housing, as you face the machine, which makes them a pain to use if you're left-

handed, like I am (see the bottom left photo). The Multico, Delta and Reliant covers can be reached from either side, so they're non-handed for changing bits.

Access to all the drill chucks involves some uncomfortable gymnastics, which could easily be solved by revamping off-the-shelf chuck-keys with longer shanks.

Solid handle bars are stronger—All the machines have solid-steel bars except the Reliant, which has a hollow tube. An earlier version of the Delta mortiser we use in our shop also sported one of these tubes.

After a semester and a half, metal fatigue near the pinion shaft sent the tube to an early grave. I expect the same will happen with the handle on the Reliant.

Good counterbalance makes setups easier—The heads of all of the mortisers, except the Reliant, are counterbalanced with gas cylinders. These cylinders, which look a lot like miniature shock absorbers, are calibrated to keep the heads poised at any vertical position.

The heads neither slide down nor shimmy back up, but they can be moved up and

down effortlessly. This makes it easier to set the depth of the mortise. The head of the Reliant, which is subject to the forces of a set of powerful return springs, slams back to its uppermost position as soon as the handle is released. Unlike a drill press, it has no travel lock.

Setting the depth of cut is quick and easy—All of the mortisers, again except the Reliant, have an adjustable rod as a depth stop, like that found on some plunge routers (see the photo at right). It's easy to use. After bringing the chisel to the desired depth, the rod is then locked in place with a setscrew. When mortising, the rod limits the depth of cut.

The Reliant has an enigmatic split-ring depth control, the operation of which the manual patently fails to explain. It's just plain inconvenient for one person—without a third or even a fourth hand—to work this oddly contrived device (see the bottom photo at right).

Chisel bushings and spindle extensions, scarce extras—Only AMT, Grizzly and Woodtek provide additional chisel bushings and spindle extensions. These extras allow the machines to accommodate chisels other than 1/2 in. and bits with shorter shanks. These bushings and extensions make those machines more versatile if you want to buy additional tooling.

To use the spindle extensions, you first have to remove the drill chuck. I must confess that we didn't bother with this because the tooling we had on hand fit all the machines just fine. With some chisel sets, however, the bit is too long, so it has to be ground down to fit snugly into the hollow of the chisel.

Key and storage caddies keep tools in order—Because bits and other paraphernalia seem to grow legs and creep all over the shop, a tool caddie is a handy gizmo. Only Delta has one that stores the drill chuck and Allen key and several mortising chisels as well. Nice touch. The Multico has a spot for both keys, and the Reliant has a plastic clip for its chuck-key.

The Multico and the Delta offer another nicety: comfortable T-shaped handles for the Allen keys, which are easy to use and hard to lose. With the other mortisers, you're on your own when it comes to tracking your bits and keys, which is not always an easy job in my classroom and probably not any easier in a busy shop.



Depth stops are fairly simple. The author sets the Woodtek stop (left) for a 1-in.-deep cut by using a 1-in.-wide steel rule as a feeler gauge between the adjustable rod and the base of the machine. The Reliant (below) originally came from the factory with a split collar and an Allen screw, which did not match the catalog rendition. When the author called the supplier, it sent the knurled, red-plastic replacement knob shown here.



Multico is the best overall

At last, the bottom line: how did they rate? My students and I liked the Multico best—overall, the surest performer. It's the most expensive of the lot, and I guess you get what you pay for. The Delta is identical to the one we've used for several years, which still works fine except for the limited amperage, so I probably won't be buying another machine anytime soon.

The Grizzly and the Woodtek cut mortises equally well and both are probably good buys. Although virtually the same as the Grizzly and Woodtek machines, the AMT

rated poorly because its dandified brass thumbscrews couldn't provide enough grab for the hold-down assembly. Retrofitted with a ratcheting hand lever that can be tightened with a lot more torque, the AMT would do as well as the other two.

Last and least, the Reliant gets a rousing thumbs down and ends up at the bottom of our list. It would seem that the machine's designer never attempted to use it. □

Bernie Maas is a professor in the art department of Edinboro University in Edinboro, Pa.