

Workshop in hiding. Wanting to create a bench for someone without a dedicated workshop, Baker built a mission-style solid white oak cabinet that can blend in with living room furniture.



Convertible Workbench



Open for business. After the lid is lifted, the hinged front panel can be lowered and then slid into the cabinet and out of the way.



Small bench for big passions. This cabinet is intended as a richly featured workspace for pursuing crafts and hobbies of relatively limited scope. In addition to a workbench, it offers shelving, ample drawer storage, a micro lathe, a retractable desk, air filtration, and power outlets. An avid guitarist, Baker finds it useful when adjusting the neck of a guitar.

A white oak cabinet fit for the living room opens to reveal a miniature workshop

BY GREG BAKER

When I conceived of this project, I was thinking about people with an urge to make things but no workshop to make them in. We would all like a full-size workbench, but for those of us living in an apartment or condo, that is sometimes not feasible. So I designed a cabinet that, when closed, can stand in a living room or bedroom with the appearance of fine furniture. Once opened, however, it offers a workbench with vises, hold-downs, and air filtration; drawers with ample storage for tools and hardware; a desk for writing or drawing; and even a small lathe. I wasn't thinking of the piece as suited for full-scale furniture projects (though who knows?) but rather for smaller-scale crafts such as chip carving, inlay, pyrography, jewelry making, or model making, and for modest turning projects.

The pivotal point

The major technical challenges of the project stemmed from my decision to include both a workbench and a lathe. I decided the way to do it was to mount the lathe to the underside of the workbench surface and make the slab pivot so either side could face up. How could I build this unwieldy hybrid work platform so it would rotate smoothly and effortlessly and lock in place securely? And how would I elevate the desk below, which would need to lift the lathe into position and then drop down again once the lathe was locked in place? As a longtime mechanical-design



Quick, add a vise. A Lee Valley pipe vise that Baker modified lives in one of the cabinet's drawers until it's needed, when it slides in and goes to work in a blink. Chip carving nicely suits the scale of work accommodated by the cabinet.

Convertible workbench cabinet

Built to blend in with living room furniture when closed, this piece becomes a mini workshop, complete with dust collection, when opened. The maple benchtop can be used with a vise and various hold-downs like a regular bench, or it can be turned upside down on pivots at both ends to reveal a lathe. When the lathe is rotated into place to be used, a shop-built lifting mechanism is cranked upward until the desk surface pushes the lathe up into working position.



Stay strong. Dual cabinet stays on each end help lift the solid-oak lid and secure it in its open position.

Solid white oak lid has pinned breadboard ends.

Crank for lifting mechanism is stored on underside of lid.

Dual cabinet stays assist in lifting the lid and lock it open.

Shelf is hinged so it can be closed when the lid closes.

Frame-and-panel case, solid white oak, is joined with wedged through-tenons.

Desk can be pulled forward for writing.

Solid white oak front panel is hinged at bottom edge; after being lowered, it slides into the cabinet. Barrister equalizer hardware keeps it from racking.

Twin heavy-duty casters at each corner carry the cabinet's weight.

draftsman, I found the mechanics of the thing intriguing, and I chose to design and build from scratch all the mechanisms required for rotating the work surface and lifting and lowering the desk.

The cabinet's frame-and-panel outer case is constructed from 1-in.-thick quartersawn white oak and joined with wedged through-tenons and dovetails. The desk, lifting mechanism, and rotat-



Drawer power. Eight drawers provide storage for a range of tools, jigs, fixtures, and hardware.



Air filters. A grille behind the bench slab covers a pair of exhaust fans that pull light sawdust into HEPA charcoal filters.

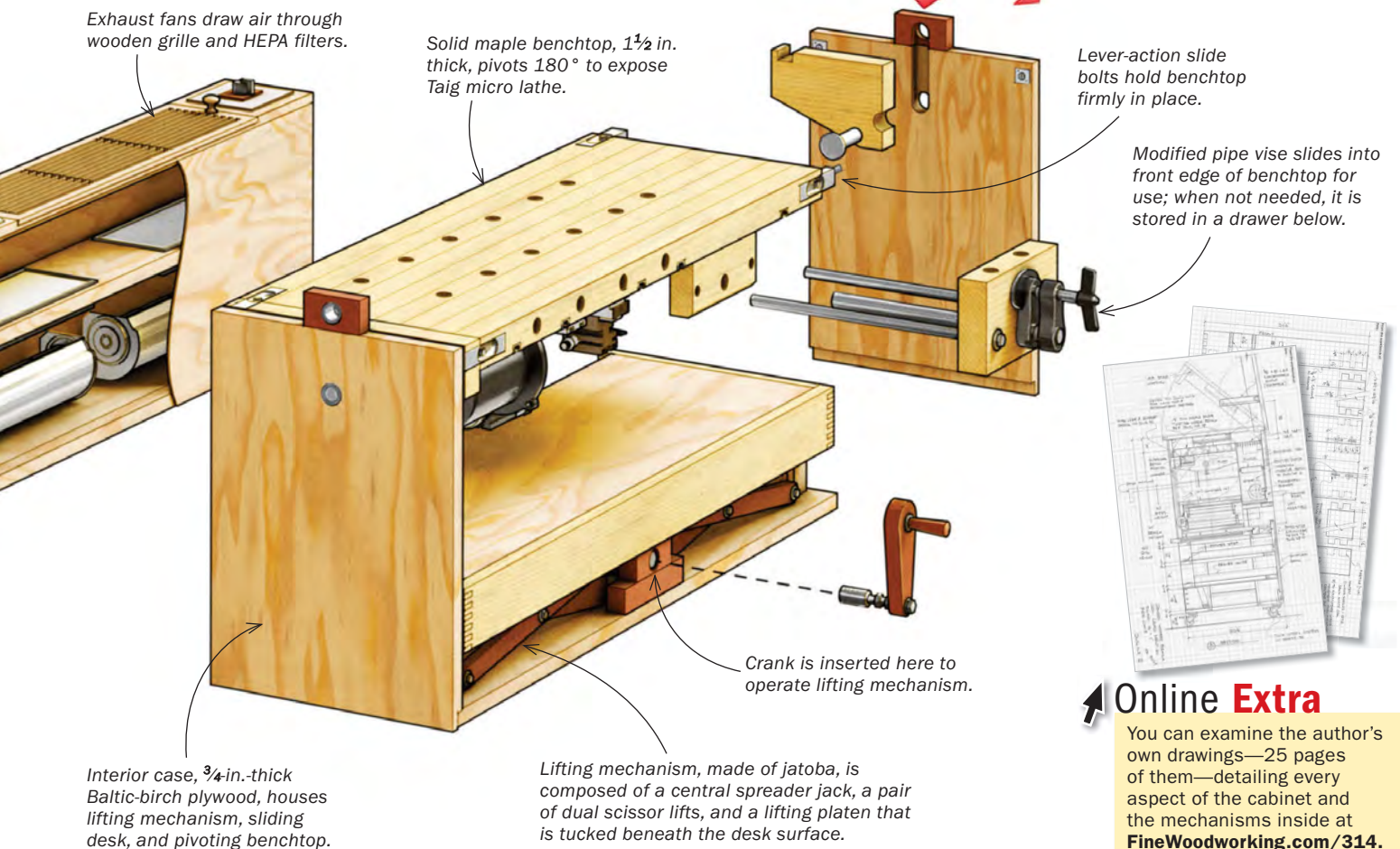
ing maple bench slab are all housed in an inner case made with 3/4-in.-thick Baltic-birch plywood and installed in the solid-wood outer case as an independent module.

The lifting mechanism

I built the lifting mechanism from jatoba, also known as Brazilian cherry, which I chose for its interlocking grain, density, and hardness. The lifting is initiated by a spreader jack, which engages a pair of dual scissor lifts, and the lifts contact the underside of a platen that moves the desk up and down. With the bench slab turned lathe side up, the desk is raised to contact the slab from

below and elevate the lathe into its operating position. The bench slab then gets locked tight with four sliding pins, and the desk can be lowered.

The spreader jack is activated by a crank handle that drives an Acme-threaded screw. I sourced that screw—a double-threaded shaft—from a kit for building a Dubuque hand-screw clamp; it works incredibly well for the spreader jack, as its right- and left-hand threads prevent the shaft from projecting beyond the cabinet. A sliding guide and socket retainer hold the spreader jack in position and prevent it from twisting.



Online Extra

You can examine the author's own drawings—25 pages of them—detailing every aspect of the cabinet and the mechanisms inside at FineWoodworking.com/314.

Flip the slab. To keep the benchtop secure for use, four lever-action bolts are engaged. To flip the bench over and reveal the lathe, the bolts are released.



Smooth inversion. Pivoting on two $\frac{3}{4}$ -in. pipes located precisely at the unusual assembly's center of gravity, the benchtop rotates effortlessly to reveal a Taij micro lathe.



An uplifting event. Using the crank handle stored under the cabinet's lid, Baker operates the lifting mechanism, which raises the desk until it pushes the bench slab and lathe into their topmost position. When four pins are pressed home to lock the slab in place, the desk can be lowered.



Time to turn. The micro lathe is secured to T-tracks on the underside of the bench slab. Turning tools, chucks, centers, and other paraphernalia are stored in the drawers below.

The bench slab

The workbench surface, made of solid maple $1\frac{1}{2}$ in. thick, has a double row of $\frac{3}{4}$ -in.-dia. dog holes where an assortment of clamps, hold-downs, and benchdogs can be inserted. Holes bored into the front edge of the slab accept guide-rail clamps and a modified pipe vise. Four lever-action slide bolts hold the slab securely in position. When you want to use the lathe, those bolts are released, and the bench slab is rotated 180° and cranked upward.

Just behind the bench slab there is a removable wooden grille that fits over the inlet for a pair of exhaust fans. The fans draw fine sawdust into HEPA charcoal air filters. There is an aluminum screen fastened to the underside of the inlet grille to catch larger particles. A removable panel on the back of the cabinet allows servicing or replacement of the fans. To the left of the inlet grille is a pair of 110v electrical outlets.

The desk, the lid, and the fall front

To use the desk for writing or drawing, I adjust it so its top surface is approximately 30 in. above the floor and then pull it forward on its heavy-duty mechanical slides. Its height can be locked to prevent flexing. Whenever the lathe or the workbench is in use,



the desk is pushed back into the cabinet, where it can be utilized as a shelf.

The cabinet's lid, a solid-oak panel with breadboard ends, is rather heavy, so I installed two cabinet stays on each side to help lift it and to secure it in its open position. The soft-close lifts are reverse-mounted to achieve additional clearance.

On the inside of the lid there is a folding shelf, and below that hangs the crank for the lifting mechanism. I sometimes mount a 12-in. by 16-in. magnetic whiteboard inside the lid as well, and an LED light bar can be added under the lid's front lip to illuminate the work area.

The frame-and-panel fall front, also made with solid quartersawn white oak, hinges forward and slides into the body of the cabinet for storage. I built a barrister equalizer to prevent the panel from racking as it slides in, and I installed jatoba wear strips inside the cabinet to prevent scratching on the panel face. □

Greg Baker works wood in a basement shop in Whitby, Ont., Canada. Trained as an engineer in the early 1960s, he may be one of the last to have worked with technical drawing pens and india ink on drafting linen. To build this cabinet, he produced 25 pages of intricate drawings.

Don't forget the desk. To use the desk for drawing or writing, Baker cranks it up or down until its surface is 30 in. from the floor. Then he pulls it out, locks in the height setting, and puts his pens to work.

