

Designing and Building a Carpenter's Toolbox

The best ones are sturdy, lightweight and compact



No wasted space. The author's toolbox organizes hand tools in four drawers at the top, leaving a cavity below for a tool apron and a set of plans. Saws and a framing square are held by turn pieces to the back of the lid. Note how the tongue of the square rotates into the bottom of the box. This dovetailed box is made of paulownia.

by Scott Wynn

My grandfather was a carpenter, and he gave me my first toolbox more than 25 years ago. It was a benchmark gift—part utility and part good-luck talisman that signaled, if not the passing, at least the sharing of the family torch.

I still have that toolbox, but truth be told, I don't use it day to day. I outgrew it, and in the

process, my grandfather's toolbox did what it was supposed to do. It got me to thinking about refining this "tool," which probably gets more use than any other tool I own.

My current toolbox design is in its fifth incarnation. Its shape and articulation are, of course, specific to the kind of carpentry that I do, mostly

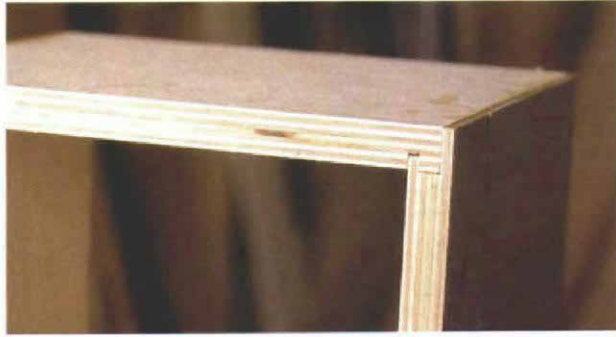
finish work. You might not need the kind of toolbox I describe, but my rules of thumb should help you to design one that suits your needs.

• **Rule 1.** *Know what tools you use regularly.* Honestly evaluate what is deadweight (literally) and what is used only occasionally. With your first-string tools spread out before you, sort

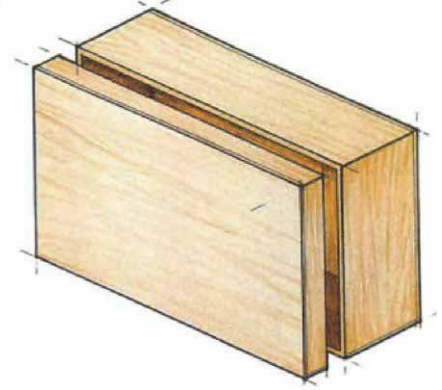
Assembly sequence

The author first builds a box with interlocking joints (1); then he applies the sides and cuts away a portion for the lid (2). Hinge-mounting blocks are glued to the inside of the lid (3), and a kerf is cut on the table saw for the piano hinge (4). The hinge-mounting base is cut free (5) and reattached to the box (6). The lid can now be hinged to the box (7).

- ① **Assemble and glue box.** An interlocking joint, called a drawer joint and made on a table saw, creates a durable corner that resists wracking.



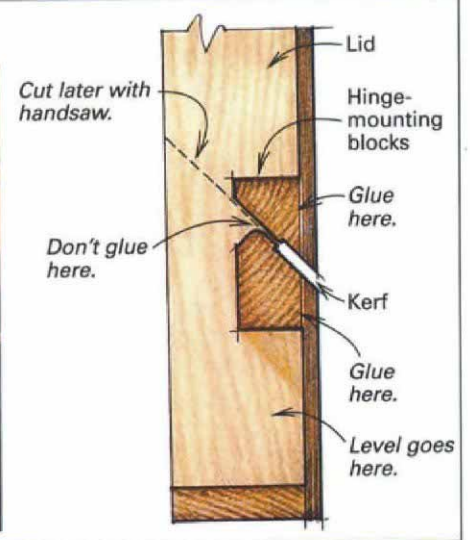
- ② **Cut lid free on a table saw.**



- ③ **Level locates mounting blocks.** Two hinge-mounting blocks, their 45° bevels facing one another, are glued to the inside of the lid. Note how their placement creates a cavity for a 2-ft. level, separated from the blocks here by plastic-laminate shims.



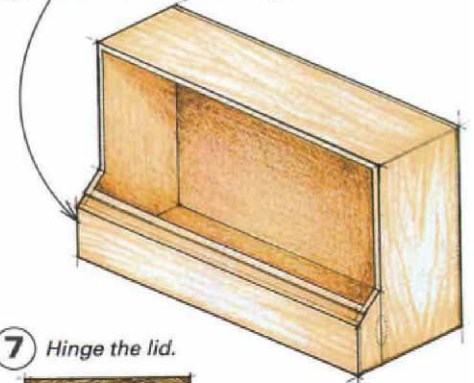
- ④ **Let's go kerfing now.** A shallow kerf, cut at a 45° bevel, creates a slot for a piano hinge.



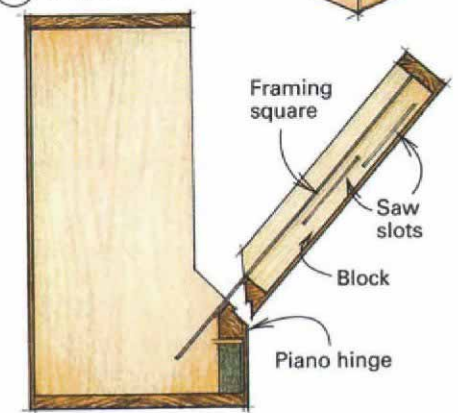
- ⑤ **Finish the cut with a handsaw.** Using a thin-bladed handsaw, the author separates the lid from its hinge-mounting base, which will then be reattached to the toolbox.



- ⑥ **Reattach hinge-mounting base with biscuits and glue.**

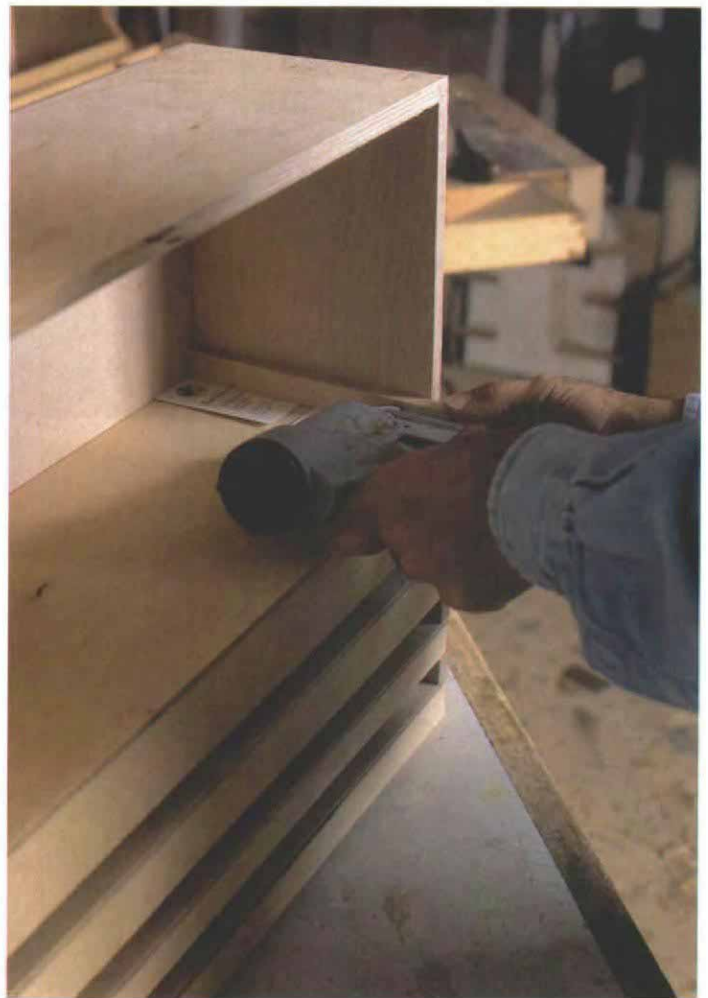


- ⑦ **Hinge the lid.**





Four drawers from a single box. A quartet of different-depth drawers are ripped to width on the table saw from a single box. Glued and nailed plywood bottoms, ¼ in. thick, complete the traylike drawers.



Drawer runners are glued and nailed to the sides. With the box flipped upside down, the drawer runners are affixed, located by the drawer and a couple of business-card shims.

them by task and/or size. This process will give you an idea of how you may want to group them, how much space you need and what your largest and smallest tools are.

- **Rule 2.** *Build the smallest toolbox that will contain your tools.* Nature abhors a vacuum, and apparently so do carpenters. If you build a lot of airspace into a toolbox, you will fill it up over time. Keep only hand tools in your toolbox. Caulk guns, power tools and miscellaneous fasteners should be stored in separate units.

- **Rule 3.** *Design the box so that you don't have to remove one tool to get at another.* This design will save time in moving and looking for tools, and it will minimize damage and loss.

- **Rule 4.** *Keep the box light.* My favorite wood for toolboxes is paulownia (photo p. 94). This strong, lightweight wood is used by the Japanese for their tonsus, the ubiquitous chests of drawers. But paulownia can be hard to find. Lacking it, I use Finply or Baltic-birch plywood. Avoid hardware by using finger holes instead of drawer pulls. Reduce the size and number of partitions and tool holders as much as possible.

- **Rule 5.** *Keep things simple.* Complicated mechanisms or joints will break eventually. Dovetails are good, but the width of the tails and pins should be about the same as the thickness of the board, not delicate as on fine cabinetry. Corner guards damage finished floors. The ones I've tried were eventually torn off, snagging on the truck during loading and unloading. So far, none of my corner-guardless toolboxes have worn out at the corners. Likewise, I've repeatedly broken off or damaged handles, knobs and virtually anything projecting from the box.

The largest tools determine the size of the box—Handsaws, framing squares and spirit levels are typically the largest hand tools that a carpenter has to fit into a toolbox. This trio certainly determined the size of my box, which is 28 in. long, 16 in. tall and 7 in. deep (photo p. 94). I laid out my tools and determined that they could be carried in four traylike drawers in the top half of the box. The bottom half is big enough for my tool belt or coveralls, plans and miscellaneous one-day tools. The saws are car-

ried on the inside of the drop-front lid, where they are held by turn pieces affixed to a mounting block. This block is the same thickness as the level, and the framing square is clipped atop the block, allowing the tongue of the square to rotate down and over the level when the lid is closed (bottom drawing, p. 95). This location keeps the square out of the way of other tools.

Assembly begins with a box—The toolbox I built to illustrate this article is of two different thicknesses of Finply, a birch plywood from Finland. This material has no voids, and the face veneers are the same thickness as the core veneers. I make the top, bottom and end panels of ½-in. plywood because these portions of the box carry the weight. The sides are ¼-in. plywood.

I assemble the box with a sturdy, glued-and-nailed interlocking joint between the top, bottom and end panels (step 1, p. 95). I make this joint, sometimes called a drawer joint, on the table saw. One piece passes over the blade face down, cutting the groove. The mating piece passes several times over the blade on edge,

plowing the corresponding tongue. I use water-resistant yellow glue and ringshank bronze nails to assemble the top, bottom and end panels. Care has to be taken at this stage to make sure the nails don't end up in the path of the sawblade when the box is cut open to make the lid.

The 1/4-in. plywood sides of the box are glued and nailed to the core assembly. Once the glue sets up, I cut the lid portion away from the box on the table saw (step 2, p. 95).

Angled blocks reinforce the hinge—The lid forms one side of the box. A portion of the lid is reattached to the bottom of the box, where it anchors the lid by way of a piano hinge (photo right). In order to provide a good grip for the screws that anchor the hinge, I back the edges of the lid and the box with blocking. The block starts out as a single piece, dressed to the thickness of my level. Then I rip the block with a 45° cut down its middle. The two block halves are glued to the inside of the lid, but not to one another (step 3, p. 95).

After the glue has set up, I pass the lid over the table saw with the blade set at 45°, cutting a saw kerf in line with the mating surfaces of the hinge blocks (step 4, p. 95). This kerf accommodates the piano hinge and creates a slight rabbet on each hinge block that aids hinge alignment.

Next I use a thin handsaw to finish the cut begun with the saw kerf (step 5, p. 95). This cut separates the lid from its mounting base, which I reattach to the box with biscuits and glue (step 6, p. 95). A piano hinge reunites the lid with the box (step 7, p. 95).

Tool trays ride on drawer runners—I keep my smaller tools in four shallow trays, or drawers, at the top of the box. Using the drawer-joint detail at the corners, I make a single, deep drawer box and then rip it into four drawer boxes on the table saw (photo left, facing page). The drawer bottoms are 1/4-in. finply.

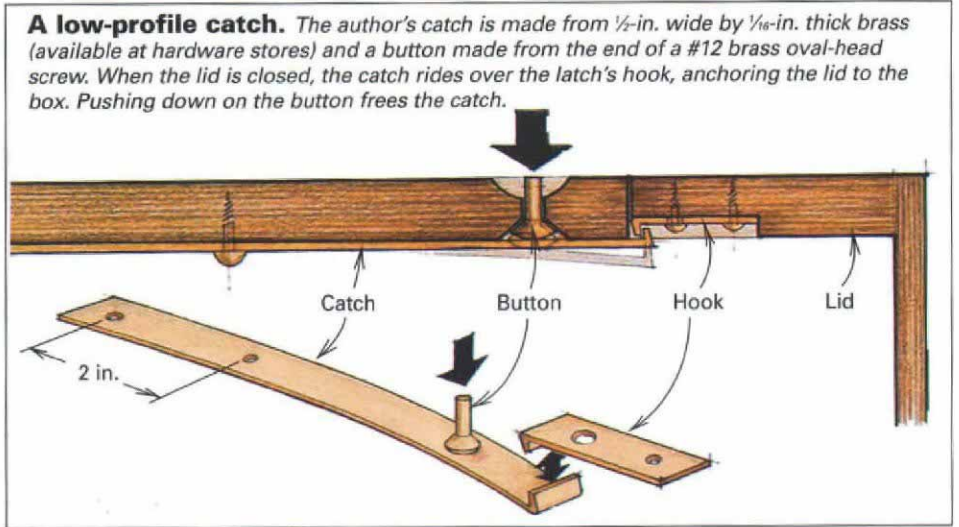
The drawers ride on hardwood runners affixed to the sides of the box with glue and brads. To install the runners, I flip the box over, slide in the top drawer and then place the runner atop the drawer, separated by a couple of business-card shims to give the drawers a little wiggle room (photo right, facing page).

The drawers tend to be a little sticky at first, so I sand their corners and round off their edges to get them to slide. When everything fits properly, I give the drawers and the box a couple of coats of spar varnish. Then I wax the drawer sides and put them back in their slots.

Handles and catches—The ideal handle for one of these toolboxes is no handle at all. I prefer recessed finger holes in the sides of the box: no weight, nothing to snag (photo p. 94). But



A piano hinge links box and lid. The bottom of the lid is lopped off at a 45° angle and is reattached to the box to become the mounting block for the lid's hinge. For this box, the author affixed bail-type handles to the box's ends.



A low-profile catch. The author's catch is made from 1/8-in. wide by 1/16-in. thick brass (available at hardware stores) and a button made from the end of a #12 brass oval-head screw. When the lid is closed, the catch rides over the latch's hook, anchoring the lid to the box. Pushing down on the button frees the catch.

the thin walls of the box don't leave much bearing for fingers, so I use bail-type handles as a second choice (photo above).

I use shop-made catches for holding the lid to the box. The catch is affixed to the underside of the box's top (drawing above). A button affixed to the catch protrudes through a tiny hole in the top. Push down on the button, and the catch disengages from the corresponding latch in the lid. I like this design because there are no

protrusions to snag on things, and it is not immediately apparent how it works. A couple of surface-mounted catches also get the job done. But if you use the top of your toolbox to work on as I do, you'll have to put some cleats across the top to raise the work above the catches. □

Scott Wynn is an architect/contractor in San Francisco, Calif. He also designs and builds furniture. Drawings by the author; photos by Charles Miller.