The 1839 School Box

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A nearly forgotten tale of an English apprentice offers up an excellent lesson in hand-tool joinery.

PHOTO BY AL PARRISH

The plan for this box came from an 1839 book of fiction about an apprentice in a rural shop in England.

In 2007, a lightweight box showed up on my desk from Joel Moskowitz, who runs the Tools for Working Wood store in Brooklyn, N.Y. Inside was a short book that has yet to give up all its secrets and tricks to working wood by hand.

Called "The Joiner and Cabinet Maker," this book – first published in 1839 – was one of a series of short hardbacks written to introduce young people to the basic knowledge needed for a trade, such as baking, coopering, printing or joinery.

What's amazing about this particular little book is that it is an engaging work of fiction that tells the tale of young Thomas, a lad who is apprenticed to a joiner's shop in a rural English town. Thomas begins his apprenticeship by sweeping the shop, managing the hide glue pots and observing the journeymen.

Then, thanks to a plot twist, Thomas is tasked to build a rough box for a customer who is leaving on a journey that same day. The book follows Thomas every step of the way, from stock selection through construction and finally to delivery, when Thomas brings along an envelope of cut nails for the customer so he can secure the lid shut before his trip.

Thomas goes on to build a school box and finally a large chest of drawers, all the while picking up different joinery skills and the right attitude to become a competent and trusted journeyman.

It's an idyllic tale, and likely a bit sugar-coated compared to the reality of an apprentice's life in early 19th-century England. But that detail aside, the book is extraordinary. Not only is it fun to read, but if you build the three projects shown in its pages, you will get an excellent course in working wood with hand tools.

And so since January, I have been constructing these three projects by following the instructions in "The Joiner and Cabinet Maker." And as I followed the text, I learned a great deal about the fine details of English-style hand work, which relied on skill and cunning as much as sharp tools.

When I read it for the fourth or fifth time, I still picked up tips I'd missed during previous readings.

This fall, Moskowitz and I are republishing "The Joiner and Cabinet Maker" complete, and we're including a section from Moskowitz that explores historical England and woodworking during this period, and a section from me that will include detailed descriptions of the operations and complete construction plans.

"When tools were rude, great precision and nicety of finish could not be expected. To return to the crude joints of our ancestors would be a distinctly retrograde move."

— David Denning
"The Art and Craft of Cabinet-making" (1891)

(The original book had only two pages of illustrations without any dimensions, so the three projects had to be created in Google SketchUp using the advice in the text.)

All three of the projects have a lot of lessons for modern woodworkers who want to incorporate hand tools into their workshops. The second project in the book, the school box, is probably my favorite. Young Thomas is asked to build this box for a boy he befriended while building a rabbit hutch. The box will travel with the boy to boarding school (I presume) and is designed to hold his books, personal effects and snacks.

The school box project introduces the readers to gluing up panels, making them flat and joining them with through-dovetails. There's also a fair amount of interesting detail on stopped dados and installing hardware.

About the School Box

The joinery methods used in this project might make a modern woodworker cringe. Some joinery seems overkill; other joinery seems like a cross-grain wood-movement nightmare.

Despite my misgivings, I built the project as Thomas did (for the most part). We'll see how the project fares in the future.

Here, in a nutshell, is how it goes together: The front, back and ends are joined with through-dovetails. The bottom of the box is glued and nailed to the case. (An interesting detail here is the grain runs from the front of the box to the rear.)

After the case is assembled, you cut the stopped dados for the till, which slides into place and rests on cleats. The lid is attached with hinges (which you have to bend yourself). All the moulding is attached with nails and glue.

Here's the Deal

Young Thomas was told to build the box using "deal," a term that might be unfamiliar. In England and in Colonial America, deal was a generic term for a softwood that was nominally 9" in width (however the sources disagree on what the standard thickness was).

To create the panels needed for the school box using deal, Thomas glued up the panels with the material in the rough using hide glue and a "rub joint." This is when the glue is applied to the jointed edges and the pieces are rubbed together until the glue cools and sets up. You can then, if you wish, put a clamp across it. Or merely set the panel aside for the glue to set up overnight.

Dress all the panels using a fore, scrub or jack plane. Work across the grain to remove material and flatten the panel. To avoid spelching on the outfeed side of the board, bevel the far corner using your plane.

Once you get one panel flat, the book advised that you use that as a reference surface for checking the other panels as you worked. Place the true panel on top of the questionable one then check for twist by pressing at the corners. I was skeptical about this procedure, but it worked – I confirmed my results with winding sticks.

Finish dimensioning your panels to width then thickness. Then cut them to length. If you are following in Thomas's footsteps, you'll use a sash saw and a bench hook. Then clean up the ends by shooting them with a plane.

Pins-first Dovetails

The dovetail layout in "The Joiner and Cabinet Maker" was surprisingly specific, including the size of the pins. The book called for pins that were 1/8" wide on the narrow side and 1/4" wide on the wider side. This results in dovetails that are fairly mild in appearance in 3/4" material.

As I wasn't planning to paint this box, I decided to make a subtle alteration. I used the book's suggestion for the number of dovetails and the 1/8" spacing. However, I used a 14° slope, which resulted in a bolder dovetail. Feel free to follow the path of Thomas or your own eye. The historical record supports many slopes, both mild and wild.

Use a marking gauge to scribe your baselines on your pieces. Thomas set his gauge to the exact thickness of his work.

Thomas cut his pins first then chopped out the waste with a chisel. No sawing out the waste or other intermediate step was involved. Those of you who have watched me cut dovetails know that I prefer a tails-first approach and use a coping saw to remove the bulk of my waste.

But I'm just as comfortable cutting the pins first. It's all just sawing, chiseling and transferring the shape to the mating board. You can get worked up about the different approaches to the joint, or you can ignore that noise and spend the effort becoming a better dovetailer.

A "rub joint" is easy to execute in short panels such as needed for the school box. It's surprisingly easy to do. Use enough pressure to close the joint, but not so much that all the glue squeezes out.

Use strokes across the grain to remove the material. Then use diagonal strokes across the panel to get the board as flat as you can. Small softwood boards are easy to process this way.

Use one flat panel to check another. If your bench is truly flat, you also can use that as a reference surface. However, a freshly flattened board is likely the more reliable barometer.

Cut the panels to length using a sash saw, then clean up the results with a plane. I use my shooting board for both operations.

Mark the pins out with a pencil (or a knife if you please). Saw down to the baseline.

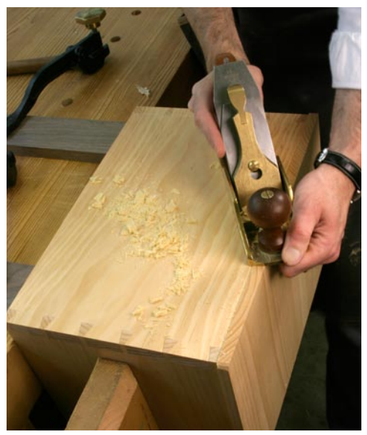
Chop halfway through the waste. Then flip the board over and chop through the remainder.

One of the advantages of cutting the pins first is that it's easy to reach in to mark out the mating tails with a sharp pencil. The disadvantage is that you have to balance the pin board on end while you do this.

After sawing out the tails, remove the waste with a chisel using the same method. Some people will put an additional kerf down the center of the waste so it breaks up more easily as you knock it out with a chisel.

The easy way to plane up the assembled box is to sleeve it over a piece of scrap that hangs off your benchtop. In this case, I also have the box wedged against the jaw of my leg vise, which allows me to work the carcase without ever clamping it to anything. Gravity and the force of the tools do all the work.

The book calls for the grain to run from the front to back – and for the bottom to be glued and nailed. While this might cause some problems down the road, it might also be a MacGuffin – I calculated that the quartersawn Eastern white pine bottom will move a little more than 1/32" in our Midwestern environment.



Plane up the bottom flush to the case with a smoothing plane. I'm keeping most of the tool's sole on the carcase to reduce the chance that my bottom's edge will have an odd slant. When my plane takes a shaving that is the full width of the bottom piece, I'm done.

Once you've chiseled out the waste, mark your tails from your pin board. Place the tail board flat on your bench and balance the pin board on the end. Reach in with a pencil and mark the tails. Then saw out the tails. Be sure to leave the entire pencil line behind.

After completing all four corners, tweak your joints for assembly. The dovetail elite will work right from the saw and chisel with no testing or dry-fitting of the joint. If you aren't able to do this, don't fret. Thomas couldn't, either.

"The really good workman, by long practice, will make even a large dovetail so exactly in the first instance as to have none of this fitting to do, and to be able to drive the joint up at once. But for a young hand like Thomas, it is very well to make a good dovetail at last, after some trouble in easing and fitting; much better than either to cut the pin-holes too large at first, or too small, and then to split the wood by driving the joint tight in a hurry."

When applying glue, paint it on all surfaces of the joint. While end-grain surfaces don't offer as much strength as long-grain surfaces, they do add strength to the assembly. Knock the box together. If your joints are tight you shouldn't need clamps.

One interesting piece of advice from the book is to hammer the pins after assembly to tighten up the joints. You can over-do this, but it will mushroom and compress the wood a bit and improve your fit.

"Some careless workmen look to this hammering to fill up all the spaces which their bungling has left, but it is impossible to hammer a bad dovetail into a good one, though a good one may be made better by this means."

With the glue dry, plane the box all around.

A Questionable Bottom

The bottom piece is planed up so it is oversized. Then it is glued and nailed to the carcase. It sounds simple enough, but "The Joiner and Cabinet Maker" specifies that the bottom piece should have its grain running from front to back, not end to end. Why? For strength.

I've seen this approach in old tool chests especially, but I was surprised to see it in such a small piece of work. Running the grain as the book suggests introduces more wood-movement problems than running it end to end.

With the grain running from front to back, the bottom will push the moulding away from the ends of the school box. Were the bottom's grain running from end to end, you could encourage the movement to push out the rear of the box, where there is no moulding to hinder it. Plus, the bottom wouldn't move as much because its width would be narrower.

To work around this "problem" I came up with a couple other wild ideas, but then I decided to just do what I was told and see what happens.

So I glued and nailed on the bottom using cut headless brads and set them below the surface of the wood. (Be sure to file or grind your nailset so it is rectangular in section. This helps your accuracy with cut nails.)

Moulding for the Bottom

The moulding that wraps around the front and sides has a small chamfer on the corner. (Thomas wasn't quite ready for the moulding planes I suppose.) No matter how you stick this profile, I recommend that you cut the chamfer on one long board then miter the board into your three lengths.

I'm using a chamfer plane attachment for my block plane, but small chamfers such as this can be easily freehanded by striking a couple gauge lines or pencil lines and working down to those.

This keeps the grain and the profile consistent at the corners – even if you aren't consistent.

Lay out the miters on your moulding and cut them with a handsaw (use a miter box if you have one). Then clean up the mouldings with a plane. If you've never tried this, give it a whirl. It's much easier than you think – especially if you don't have to fit the moulding on all four corners.

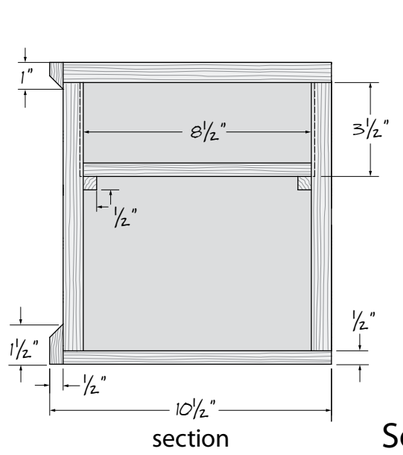
Keep working the corner miters until they look good. Then you can attach the moulding with glue and nails. Be sure to glue the mitered surfaces because those are critical.

If you lay out your miters with knife lines, planing down a miter is fairly simple work. I like using a block plane because it balances easily on the sawn miter.

Nail the moulding to the bottom of the carcase and nail through the miters as well. I'm always surprised how few people glue and nail their miters, but I'm not surprised by the resulting gaps.

1839 School Box

	NO.	PART	SIZES (INCHES) T	W	L	MATERIAL	NOTES
❑	2	Front & back	3/4	10	15	Pine	
❑	2	Ends	3/4	10	10	Pine	
❑	1	Bottom	1/2	15	10	Pine	Nailed and glued to case
❑	1	Till wall	1/2	3 1/2	8 3/4	Pine	In 1/8" dados
❑	1	Till floor	1/2	4	8 1/2	Pine	Rests on cleats
❑	2	Till cleats	1/2	1/2	4	Pine	Nailed and glued to case
❑	1	Lid	3/4	10 1/16	15 1/8	Pine	
❑		Base moulding	1/2	1 1/2	40	Pine	Chamfer on top edge
❑		Lid moulding	1/2	1	40	Pine	Chamer on bottom edge



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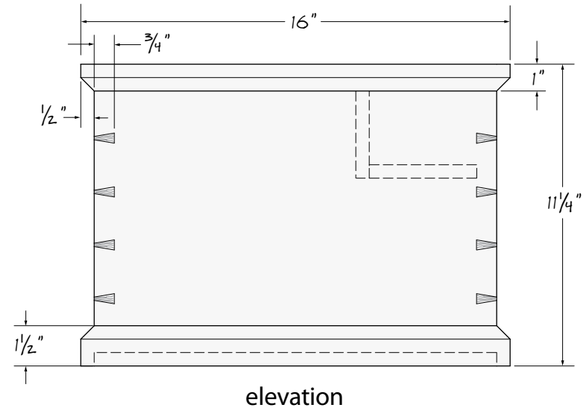


elevation

School Box

ILLUSTRATION BY ROBERT W. LANG

Handmade Stopped Dados

The till inside the box is an interesting piece of work. The wall slides into stopped $\frac{1}{8}$" x $\frac{1}{2}$" dados in the front and back pieces. The bottom of the till rests on cleats that are nailed to the front and back. The wall and the bottom are nailed at their corner and the whole assembly slides out.

What's the till for? Snacks for the student.

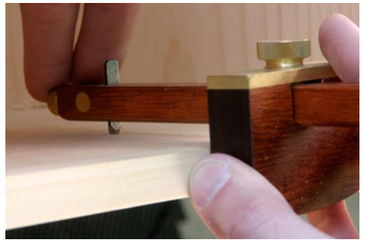
Begin work on the till by cutting the stopped dados in the front and back piece. Saw out the walls and then remove the waste with a chisel (or a router plane).

When you saw out the waste, you can work against a fence – a traditional technique. Also, feel free to saw past the line where the dado will end. No one will ever mind those kerfs. That will make chiseling out the waste quite painless.

Chisel out the waste to a $\frac{1}{8}$" depth. Use a small block of wood with a $\frac{1}{8}$" notch as a depth indicator.

Now nail the cleats to the front and back that will support the till's bottom. Nail and glue the bottom and wall together and slip the assembly into the dados.

Sorry about the period-inappropriate MDF in the photo. I use a scrap to guide my saw as I saw out the extents of the stopped dado. Push your fingers gently against the sawplate – don't worry, you won't get sawn.



Use a cutting gauge or a butt chisel to define the square terminus of the stopped dado.

Use a chisel to remove the waste between your sawcuts. You can use a small block of wood with an $\frac{1}{8}$"-long nub to determine when you are at your final depth.

A couple nails are enough to keep the cleat in place. Be sure to orient the wedge shape of the nail so it bites into the end grain. Otherwise your cleat could split.

Install the Lockset

Before you put the lid on the box, install the lockset in the carcase. The key to installing the lockset is a single hole that is the same size as the lock's pin (the round cylinder that the end of the key sleeves onto when working the lock).

Mark out where the pin should be and bore a hole through the case. I used a birdcage awl, which has a tapered tip. Once the pin can be press-fit into the hole, stop boring.

Press the lockset's pin into the hole through the front of the box. Put a clamp on it to keep it in place. Then use a knife and a square to mark the extents of the mortise you require on the top edge of the front. Then connect those two knife marks with your cutting gauge. Waste away the material. Score it with a chisel and pry it out with a small router plane set to the thickness of your lockset's top plate.

Now press the lockset's pin into the hole from the inside of the carcase until the works of the lock rest on the inside face of the carcase. Use a pencil to trace around the works.

Use a saw to define the left and right edges of the lockset's works – then lay in a bunch of kerfs to make it easy to remove the waste between those two initial kerfs. Waste away that area with a chisel and a router plane. You'll need to use a short bench chisel or a special lockset chisel, which has a very low profile.

Then fit the lockset's pin back into the hole and mark out the shape of the back plate. Remove the lockset and waste away that area until the entire piece of hardware fits flush to the carcase. This gradual process ensures you remove only the material necessary, which maintains the strength of the front piece.

This is the most critical part of the entire operation. Once the hole is marked out, ream out a hole that is the same size as the pin in your lockset. Take your time here.

Pressing the lock's pin into the hole this way allows you to mark out the mortise without danger of running your knife into the metal of the lock.

A cutting gauge makes a deeper mark than a pin gauge. Take a couple light passes at first to ensure the knife doesn't wander.

The Lid and its Hinges

Like the bottom piece, you should leave the lid slightly oversized as you fit it, so that if you make a mistake, you can trim things to fit. The first step is to mortise the hinges into the case and mark where you want the lower leaf to bend. Then bend the steel hinges to the correct shape and screw them in place.

The mortise in the case needs to be deep enough to accommodate both the hinge leaf and the thickness of the barrel. According to the book, the location of the hinges is key. It uses a proportion common in old furniture. Take the length of the lid and divide it in half. Then space the hinges so their centerlines are this dimension apart from one another.

Cut the mortises by sawing the walls and removing the waste with a chisel. Screw the lower leaf to the case as shown. Then mark where the bend should occur.

As far as bending hinges go, the ones in the Supplies box are a snap to manage. Secure the hinge in a metal-jawed vise then bend it with your hands and finish the job with a hammer. (If you are worried about mucking it up, buy three hinges instead of two.) Then screw the upper leaf to your lid piece.

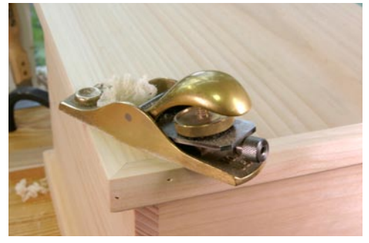
Trimming and Adding Trim

With the lid secure you can plane the lid so it has about $\frac{1}{16}$" overhang on the front and ends. Then you can add a chamfer to the lid moulding and miter it. Attach it with glue and nails.

When you attach the moulding to the ends of the lid, there is a cross-grain wood-movement problem to overcome. One common strategy is to add glue to the miter and the front third of the moulding. Then nail the moulding in place along the entire edge. The glue will hold the miter tight at the front. The nails will let the lid move at the rear.

Once the moulding is secure, trim it flush to the lid. Then attach the strike plate for the lock to the underside of the lid.

You can guess where the bend will happen or mark it directly. Keep in mind you need to accommodate the thickness of the leaf in your bend. So you want your bend to begin on your line.



I'll attempt to attach my lid moulding so it is either dead-on flush with the top of the lid or a little proud. Then it's a simple matter of trimming it down to the lid.

The easy way to attach the lid is with the case on its back. A small spacer under the case makes it easy to line up the hinges on your lid.

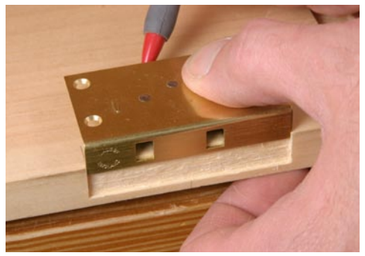
Finish the School Box

The finish Thomas used on this school box isn't discussed in "The Joiner and Cabinet Maker," though several finishes for pine objects are mentioned in its pages, including boiled linseed oil and wax, straight paint or even grain-painting.

I ragged on a thinned oil finish with a little varnish added to give the piece a little protection. Six coats gave me an acceptable sheen and build. Then I waxed the piece. To keep the lid from opening too far, I screwed a small strip of leather to the inside of the lid and the case.

I was so pleased with the proportions of the completed school box I did something I've never done before with a project: I started another school box immediately. This one in cherry. WM

— Christopher Schwarz



Be careful tracing around the works of the lock. Modern locks have curved corners so your pencil can go deeper than it should because of these curves.

A lockset chisel (this one is from Lie-Nielsen Toolworks) is a handy specialty tool. You can also do this work with a stubby chisel.

Supplies

Lee Valley Tools
800-879-8158 or leevalley.com

- 2 ■ Unequal strap hinges 7½" x 3½" #01H2127, $8.50/ea.
- 1 ■ 2½" box lock # 00P2325, $12.70
- 1 ■ Horizontal pressed old brass escutcheon # 01A1971, $1.45

Prices correct at time of publication.